Developing Human Resources for Health in the Pacific

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## CONTENTS

### GUEST EDITORIAL
Lee E. Buenconsejo-Lum, Allen L. Hixon, Neal A. Palafox, Susan Matsuko Shinagawa 5-8

### ACKNOWLEDGEMENTS
9-13

### LIST OF REVIEWERS
14

### ORIGINAL PAPERS

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yap Assessment for Continuing Health Care Professional Development Program</td>
<td>G.G. Maskarinec, A.M. Durand, J. Habuchmai</td>
<td>67-72</td>
</tr>
<tr>
<td>Pacific Association for Clinical Training: e-Learning Telecommunication Infrastructure Assessment in the U.S.-Affiliated Pacific Islands</td>
<td>C. Higa</td>
<td>89-97</td>
</tr>
<tr>
<td>ICT Capacity and Human Resource Development in Island Economies</td>
<td>C. Higa</td>
<td>103-106</td>
</tr>
<tr>
<td>“Healthcare is not something you can isolate from life in general”: Factors Influencing Successful Clinical Capacity Building in the Pacific</td>
<td>R. Vezina, E.M. Reyes, C.K. Goshima, S.F. Morin</td>
<td>107-114</td>
</tr>
<tr>
<td>Meeting the Challenge of HIV Clinical Training Within 2.5 million Square Miles of the Pacific Ocean</td>
<td>K.D. Patrick, C.K. Goshima, T. Bowen, C. Lyden, J. Waldron, R. Vezina, E.M. Reyes, N.N. Andrade</td>
<td>115-118</td>
</tr>
<tr>
<td>Capacity Building for Cancer Awareness in Hawai’i’s Foreign-born Filipino Communities</td>
<td>C. Cuaresma, D.B. Mitschke, H. Robinett</td>
<td>128-134</td>
</tr>
<tr>
<td>Empowering Natural Clinical Trial Advocates: Nurses and Outreach Workers</td>
<td>D.B. Mitschke, K. Cassel, P. Higuchi</td>
<td>135-141</td>
</tr>
<tr>
<td>Evaluation of Distance Learning for Health Education</td>
<td>K. Withy, S. Berry, N. Moore, S. Walsh, L. Sekiguchi, J. Andaya, M. Inada</td>
<td>142-145</td>
</tr>
</tbody>
</table>
Age of Onset of Obesity, Diabetes and Hypertension in Yap State, Federated States of Micronesia
Z.W. Durand 165-169

Health Consequences and Health Systems Response to the U.S. Pacific Thermo-nuclear Weapons Testing Program

VIEWPOINTS AND PERSPECTIVES

“DC-OS”: Decentralized, On-Site Training: A Sadly Neglected Option for Building the Pacific Islands Health Workforce

Public Health in the Republic of Palau: What We Can Learn From a Small Island Country
T.S. Duerler, G.G. Maskarinec 182-187

Developing a Model of Evidence-Based Public Health Practice that Makes Sense for the Pacific
J. Rarick 188-190

How Can the University of Hawai’i Meet Needs for Public Health Education? Results of a Students’ Needs Assessment

Imi Ho’ola: An Educational Model for Disadvantaged Students at the University of Hawai’i School of Medicine
N.L.K. Judd, K.K. Sakamoto, E.S. Hishinuma, C. DeCamba, A.R. Malate 199-204

The Impact of the Military Presence in Hawai’i on the Health of Na Kānaka Maoli
K. Niheu, L.M. Turbin, S. Yamada 205-212

Maintaining Balance for a Long Voyage
C. Shehata, N. Anthony, G.G. Maskarinec 213-217

Reasons for Homelessness among Micronesians at a Transitional Shelter in Hawai’i

PACIFIC HEALTH INSTITUTIONS

Pacific Association for Clinical Training (PACT): Lessons Learned and Next Steps in Developing a Sustainable Continuing Health Professionals Education System in the United States-Affiliated Pacific Island (USAPI) Jurisdictions
L.E. Buenconsejo-Lum, G.G. Maskarinec, N.A. Palafox 224-233

The Yap AHEC: An Update 2004-2006

CASE REPORTS AND SHORT COMMUNICATIONS

A Cross-Sectional Evaluation of the Health Dispensaries, Community Health, and Current Techniques for Improving Health Assistant Education on the Outer Islands of Yap State, Federated States of Micronesia
M. Inada, M. Le, T.S. Duerler, G.G. Maskarinec 239-244

Dental Manpower Development in the Pacific: Case Study in the Republic of the Marshall Islands
O.K. Tut, J.R. Langidrik, P.M. Milgrom 245-250

Brief Report on Oral Health Prevention Training in Yap State, FSM
O.K. Tut, C. Lefagopal, P.M. Milgrom 251-253

Health Problems of Micronesian Patients at a Student-Run Free Homeless Clinic

BOOK REVIEWS

The End of Poverty: Economic Possibilities for our Time by Jeffrey D. Sachs
Reviewed by A.L. Hixon 263

Global Health Leadership and Management by William H. Foege, Nils M. Pauham, Robert E. Black, Clarence E. Pearson (Editors)
Reviewed by A.L. Hixon 264-265

ABSTRACTS

Abstracts from the Pasifika Medical Association Annual Conference – Tonga 2005 266-283

EDITORIAL ASSISTANCE 284
Guest Editorial

Lee E. Buenconsejo-Lum, MD, Assistant Professor, PACT Project Director, PHD Guest Co-Editor
Allen L. Hixon, MD, Associate Professor, PHD Guest Co-Editor
Neal A. Palafox, MD, MPH, Professor and Chair, PHD Guest Co-Editor
Susan Matsuko Shinagawa, Past Chair, Intercultural Cancer Council, PHD Guest Co-Editor and Copy Editor

Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, 95-390 Kuahelani Ave, Mililani, Hawai‘i 96789-1192.

Human resource development (HRD) in health requires a broad perspective and implementation of a number of careful strategic steps, beginning with a thoughtful needs assessment, which recognizes the critical role of all health workers (not just doctors and nurses) in both formal and informal health systems. It must include collection and analysis of data even when those data are not readily available or reliable. Development of training programs and curricula must grow out of local needs and conditions, and employ technology appropriate to the setting. Human resource development must effectively link continuing education to professional degree programs and work toward establishing both professional standards, as well as professional associations that maintain those standards in the various disciplines. Additionally, HRD must include provision of those tools needed by professionals to maintain current standards of quality medical care, while also facilitating improved health of community members. Sometimes this involves the latest technological advances, while other times it entails incorporating cognitive tools, such as evidence-based medicine or problem-based learning. This broad approach must be built upon recognition of the value of traditional healing systems, even as those systems are evolving, and also the value of local degrees and education, rather than focusing solely on imported credentials. Finally, HRD programs must incorporate an ongoing, critical evaluation of both process and outcomes, and allow feedback to drive improvement.

As we begin to explore these issues, taking an historical perspective may be instructive. The original systems of health in the Pacific were indigenous, traditional, and tied closely to fitting with the ecosystem. Rapid westernization over the past 100 years linked to periods of colonization by Spain, Germany, Japan and, most recently, the United States.

Development of training programs and curricula must grow out of local needs and conditions, and employ technology appropriate to the setting.

As we write this introduction, the Hawaiian sailing canoes, Hokule‘a and Alingano Maisu, have just navigated across thousands of miles of the Western Pacific from Hawai‘i through the Republic of the Marshall Islands and on to Pohnpei, Chuuk, Satawal, Ulithi, Yap and Palau. The canoes, sailing without modern navigational aids, carry a message of cultural renewal, pride, and collaboration to accomplish something significant. On several islands, crew members joined clinical teams to highlight how health could be improved if we all work together.

This special issue of Pacific Health Dialog examines capacity building through human resource development, sharing those values of cultural awareness, collaboration and creativity to set and reach specific goals. It focuses on our most important resource – people – and how professional development across the diverse health workforce can lead to improved outcomes. The timing of this special issue is critical as health leaders in United States-Affiliated Pacific Island (USAPI) jurisdictions embark on a strategic plan to improve human resources for health.¹

Photograph of Micronesian canoe.
Photo Credit: Na‘alehu Anthony, Polynesian Voyaging Society
States (U.S.), led to the introduction of secondary and tertiary hospital-based health systems, which tend to be centralized and particularly poorly aligned with the critical need to deliver healthcare to outlying areas. With hospitals staffed by U.S.-trained physicians and nurses under military and civilian contracts, a medical education system that roughly mimicked that found in the U.S. was variably developed. Beginning in the 1950s and well into the 1960s, recognition of the need for locally trained staff resulted in initial waves of trainees – often hand picked by the trusteeship governments – being sent to complete formal training in Hawai‘i and Guam. Graduating as nurses or medical officers, these pioneer trainees returned to their home islands and became the backbone of the healthcare system in the USAPI. From an HRD perspective, these groups imparted on-the-job training for other local doctors, nurses and allied health workers.

This informal training system was unable to keep up with increasing demands to improve health conditions in these resource-poor areas. Lacking appropriate curricula and programs necessary to adequately prepare students for careers in health, local public school graduates often found it difficult to succeed at universities and professional schools in the U.S., Fiji, and elsewhere. As the initial waves of trainees approached retirement age, the need for a new cadre of well trained health workers became apparent. One early effort, led by Richard Smith of the University of Hawai‘i, was the MEDEX training program in Chuuk, which trained a cadre of indigenous health care professionals, known as Medical Extenders, some of whom remain active today. From 1986 to 1997, a collaborative effort between the University of Hawai‘i and the W.K. Kellogg Foundation helped to fill the void by establishing the Pacific Basin Medical Officer Training Program (PBMOTP) based in Pohnpei State, Federated States of Micronesia (FSM). During the decade of its operation, PBMOTP produced a number of indigenous doctors who were deployed to hospitals and clinics, as well as USAPI government posts throughout the region.

In 1998, the Institute of Medicine’s Committee on Health Care Services in the U.S.-Associated Pacific released, “Pacific Partnerships for Health: Charting a Course for the 21st Century”. In its landmark report, the Committee concluded that the paucity of local professionals in the Pacific across all health disciplines resulted in the lack of available personnel to provide both formal training and continuing education sufficient to maintain currency of knowledge and skills among the existing healthcare workforce. At present (2007), some areas of the Pacific remain dependent on expatriate health workers from the U.S. and other countries.

Over the past six years there have been a number of initiatives to increase the training of health workers within the region. Some of these efforts have attempted to move away from the traditional U.S. training model in favor of modular curricula, problem-based learning, adult learning methods, and building the infrastructure for continuing education. Efforts have also focused on developing a health workforce pipeline by implementing higher learning standards beginning in primary school, as well as strengthening the relevance of educational content and methods. In addition, by changing the focus of learning away from a purely curative model, public and community health approaches have been infused. Management and organizational issues are increasingly being scrutinized and identified as areas for improvement. Recognizing the importance of these changes, this special issue of Pacific Health Dialog focuses on ensuring sustainable cadres of high quality, indigenous health professionals who are closely aligned with the health needs of local communities.

To address these broad issues, the articles in this special edition have been selected from among numerous submissions from many areas across the Pacific. Articles were submitted by clinicians, nurses, public health officials, academic physicians, community outreach workers, and voyaging sailors. The manuscripts span educational innovation and the testing of new learning modalities, presenting strategies that work well, and some that do not.

Three major HRD themes are explored: (1) needs assessment, (2) novel methodology and approaches, and (3) community health. The first theme is addressed up front in the initial series of Original Articles, in which health leaders from nine Pacific jurisdictions (the Territory of American Samoa, Commonwealth of the Northern Mariana Islands, Territory of Guam, the FSM states of Chuuk, Kosrae, Pohnpei and Yap, Republic of Palau, and the Republic of the Marshall Islands) report on their respective needs assessments for establishing a continuing professional development program. These nine articles are preceded by an
overall Summary and followed by a report on the e-learning telecommunications assessment of the Pacific Association for Clinical Training (PACT) by Higa. In each of the needs assessment articles, authors examine currently existing healthcare infrastructure and resources in the respective jurisdictions, and articulate strategies required to bridge existing gaps. While each jurisdiction reports its unique needs assessment, they all share the common challenge of adequately training their healthcare workforce to deliver quality and timely care across a vast expanse of the globe. A summary report on the PACT project – lessons learned (Buenconsejo-Lum et al), a Pacific Health Institutions article – describes successes and challenges and potential next steps for HRD in the region. 

Contributing authors whose articles pertain to the second theme explore new approaches and report on their experiences with novel HRD methodologies. In the lead article, authors Chen and colleagues review the PACT pilot project (“A Pilot Evaluation of Distance Education Modalities for Health Workers in the U.S.—A affiliated Pacific Islands”), and evaluate a variety of methods to deliver continuing education to health workers. Other authors discuss the utility of evidence-based medicine (e.g., Rarick), problem-based learning techniques (e.g., Yamada et al.), and distance education methods (e.g., Withy et al.). A second article by Higa presents challenges and opportunities for developing skilled information technology specialists who are needed to assist with distance learning opportunities in the USAPI.

Articles on the final theme highlight disease-specific approaches to HRD in the community, focusing on clinical issues, such as obesity (e.g., Durand), cancer (Tanjasiri et al.; Cuaresma et al.), oral health (Tut et al.), and the human immunodeficiency virus (HIV) (Vezina et al.; Patrick et al.). Other community health-related articles underscore the social determinants of health in the Pacific by examining homelessness (e.g., Omori et al.; Lee et al.), poverty (e.g., book review by Hixon), and a variety of public health initiatives (e.g., Mitschke et al.; Duerler et al.). Finally, issues of structural violence – in Paul Farmer’s sense of the ways that social status, history, and economics conspire to constrain individual agency⁴ – are revealed through a discussion of militarization (Niheu et al.) and the unfortunate legacy of nuclear testing in the Pacific (Palafox et al.).

It is imperative that HRD programs aimed at improving health across the Pacific be conducted in full recognition of the region’s existing historic and cultural patterns, as well as the changing paradigms of healthcare delivery. Innovative community-based training programs that are culturally relevant, technologically appropriate, and designed to leverage resources must both anticipate and lead that change.

Recognition of the importance of HRD in health is evidenced by the array of federal grants and other funding sources supporting the research and activities reported in this special issue. A complete listing of grant support by article and funding agency follows.

Like the Hokule‘a, this special issue of Pacific Health Dialog is a voyage of sorts – an exploration of the human potential to share ideas, techniques and resources in a collaborative and focused effort towards improving the health of populations. Our hope is that these articles will serve as “navigational aids” for all those concerned with improving healthcare and health outcomes in the Pacific.

Bringing this special issue of Pacific Health Dialog to its successful fruition would not have been possible without the assistance of many individuals. We thank all those who submitted manuscripts for consideration of publication, and we are especially appreciative for the generosity and responsiveness of all our contributing authors and peer reviewers. Their interest, dedication and collaborative efforts within and across the myriad of disciplines comprising human resource development bode well for the future of the healthcare workforce in the Pacific, as well as the health of Pacificans, both in and beyond the region. We also acknowledge Mr. YuSharn Wang and Mr. Richard Yutaka Okubo for their assistance with electronic files conversion, and especially Ms. Nikki Baraquio for her assistance in copy-editing many of the articles in this issue; their efforts were invaluable to its successful completion.

We hope you enjoy this special issue of PHD on "Developing Human Resources for Health in the Pacific". We encourage you to disseminate and discuss the information and strategies described in these articles with your colleagues, and invite you to share with us your reactions and comments. We look forward to working closely with many of you in the future as we all
strive to strengthen the healthcare workforce, enhance healthcare delivery, and better the health of individuals and communities throughout the Pacific.

References

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*Only those articles with grant support are listed

Original Papers


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A Pilot Evaluation of Distance Education Modalities for Health Workers in the U.S.-Affiliated Pacific Islands (Tai-Ho Chen, Lee E. Buenconsejo-Lum, Kathryn L. Braun, Christina Higa, Gregory G. Maskarinec) [pp 22-30]

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American Samoa Assessment for Continuing Health Care Professional Development Program (Lee E. Buenconsejo-Lum, Tai-Ho Chen, Victor T. Tofaeono, Ernest Oo) [pp 31-38]

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Commonwealth of the Northern Marianas Assessment for Continuing Health Care Professional Development Program (Tai-Ho Chen, Pedro Untalan, Gregory G. Maskarinec) [pp 39-45]

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Guam Assessment for Continuing Health Care Professional Development Program (Tai-Ho Chen, Lee E. Buenconsejo-Lum, Janice L.S. Yatar, Laurent Duenas, Gregory G. Maskarinec) [pp 46-52]

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Chuuk Assessment for Continuing Health Care Professional Development Program (Gregory G. Maskarinec, Tai-Ho Chen, Julio Marar, Romino Saimon, Don Bosco Buliche) [pp 53-57]

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Pacific Association for Clinical Training: e-Learning Telecommunication Infrastructure Assessment in the U.S.-Affiliated Pacific Islands (Christina Higa) [pp 89-97]

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Interdisciplinary Problem-Based Learning as a Method to Prepare Micronesia for Public Health Emergencies (Seiji Yamada, A. Mark Durand, Tai-Ho Chen, Gregory G. Maskarinec) [pp 98-102]

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ICT Capacity and Human Resource Development in Island Economies (Christina Higa) [pp 103-106]

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Healthcare is Not Something You Can Isolate From Life in General: Factors Influencing Successful Clinical Capacity Building in the Pacific (Richard Vezina, E. Michael Reyes, Cyril K. Goshima, Stephen F. Morin) [pp 107-114]

The authors acknowledge HRSA’s HIV/AIDS Bureau for its support, with the Pacific AIDS Education and Training Center (PAETC), under contract/grant number 1 H4A HA00058 awarded to the UCSF AIDS Policy Research Center (APRC). The authors further acknowledge the U.S. Department of Health and Human Services (DHHS) for its support, with PAETC, under grant No. 5H4A00016-02, and by the Sexually Transmitted Disease (STD)/AIDS Prevention Branch, Hawaii State Department of Health (DOH), awarded to UH JABSOM Department of Psychiatry. The contents of this article are solely the responsibility of the authors and do not necessarily represent the official views of HRSA, DHHS, or the Hawaii State DOH.

Meeting the Challenge of HIV Clinical Training Within 2.5 million Square Miles of the Pacific Ocean (Kevin D. Patrick, Cyril K. Goshima, Talita Bowen, Charles Lyden, Jane Waldron, Richard Vezina, E. Michael Reyes, Naleen N. Andrade) [pp 115-118]

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Developing a Community-Based Collaboration to Reduce Cancer Health Disparities Among Pacific Islanders in California (Sora Park Tanjasiri, Jacqueline H. Tran, Paula Healani Palmer, Mary Anne Foo, Marion Hanneman, Cevadne Lee, Lola Sablan-Santos, Alek A. Sripipatana) [pp 119-127]

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Capacity Building for Cancer Awareness in Hawaii’s Foreign-born Filipino Communities (Charlene Cuaresma, Diane B. Mitschke, Hali Robinett) [pp 128-134]

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Empowering Natural Clinical Trial Advocates: Nurses and Outreach Workers (Diane B. Mitschke, Kevin Cassel, Paula Higuchi) [pp 135-141]

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Evaluation of Distance Learning for Health Education (Kelley Withy, Shaun Berry, Nicole Moore, Sheila Walsh, Leah Sekiguchi, January Andaya, Megan Inada) [pp 142-145]

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Maximizing Successful Pursuit of Health Careers in Micronesia: What to do? (Kelley Withy, Nia Alatoa, Shaun Berry, Francine Amoa, Faye Untalan) [pp 146-155]

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Ulithi Atoll Health Assessment: A Peek at the Health of Rural Micronesia (W. Thane Hancock, A. Mark Durand, Arthur Yolwa, Josey Sagury, Ciotilda Legthar, Mihi Ratima, Kelley Wachi, Aparajita Adhikary, Mikela Yarawamai, Ana Yarawamai, Gregory G. Maskarinec) [pp 156-164]

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Viewpoints & Perspectives

Public Health in the Republic of Palau: What We Can Learn from a Small Island Country (Timothy S. Duerler, Gregory G. Maskarinec) [pp 182-187]

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Reasons for Homelessness Among Micronesians at a Transitional Shelter in Hawai’i (Jill S.M. Omori, Christina K. Kleinschmidt, Eric K.W. Lee, Christopher J. Lindshield, Tina Kuribayashi, Damon F. Lee) [pp 218-223]

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Pacific Health Institutions

Pacific Association for Clinical Training (PACT): Lessons Learned and Next Steps in Developing a Sustainable Continuing Medical Education System in the United States-Affiliated Pacific Island (USAPI) Jurisdictions (Lee E. Buenconsejo-Lum, Gregory G. Maskarinec, Neal A. Palafox) [pp 224-233]

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Case Reports & Short Communications

A Cross-Sectional Evaluation of the Health Dispensaries, Community Health, and Current Techniques for Improving Health Assistant Education on the Outer Islands of Yap State, Federated States of Micronesia (Megan Inada, Mary Le, Timothy S. Duerler, Gregory G. Maskarinec) [pp 239-244]

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Dental Manpower Development in the Pacific: Case Study in the Republic of the Marshall Islands (Ohnmar K. Tut, Justina R. Langidrik, Peter M. Milgrom) [pp 245-250]

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Brief Report on Oral Health Prevention Training in Yap State, Federated States of Micronesia (Ohnmar K. Tut, Cindy Lefagopal, Peter M. Milgrom) [pp 251-253]

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Health Problems of Micronesian Patients at a Student-Run Free Homeless Clinic (Damon F. Lee, Christopher J. Lindshield, Tina Kuribayashi, Christina Keolanani Kleinschmidt, Eric K.W. Lee, Jill S.M. Omori) [pp 254-262]

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Pacific Basin Health Worker Training in the United States-Affiliated Pacific Islands: Needs Assessment and Priorities for a Continuing Health Care Professional Development Program: Executive Summary

Tai-Ho Chen, MD*
Lee E. Buenconsejo-Lum, MD*
Neal A. Palafox, MD, MPH*

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa. Please direct correspondence to: Neal A. Palafox, MD, MPH, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, 95-390 Kuahelani Ave, Mililani, Hawai‘i 96789-1192; npalafox@hawaii.edu.

Abstract:
The United States-Affiliated Pacific Islands (USAPI) include the U.S. Flag Territories of American Samoa and Guam, the Commonwealth of the Northern Mariana Islands (CNMI) and three Freely Associated States: the Federated States of Micronesia (FSM), the Republic of the Marshall Islands (RMI) and the Republic of Palau. These six jurisdictions span four time zones and are separated by over 4,000 miles of the Pacific. There has been a well documented need for continuing education (CE) for health workers in the USAPI region. This executive summary highlights key points from a series of CE needs assessments conducted in the region in 2004. These reports are presented in their entirety (pages 31-88) in this issue. (PHD 2007 Vol 14 No 1 pp 15-21)

Background
In addition to the vast geographical distances throughout the USAPI region, there are wide variations in social and economic conditions, health infrastructure and health workforce training throughout this region. Selected demographic indicators are presented in Table 1.1-9

Although most jurisdictions have a network of outlying health dispensaries and clinics staffed by non-physician providers, most health care in the region is provided in centralized, state-funded hospitals and their associated outpatient departments. The most notable exceptions to this are Guam and the CNMI, which have larger numbers of private providers. Among the FSM states, only Kosrae has its population limited to a single island; Chuuk, Pohnpei and Yap all have outer island populations served by health dispensaries. Nevertheless, most health care is provided at centrally located state hospitals in each of the FSM states. Yap and Chuuk have a widely distributed system of dispensaries staffed primarily by community health assistants. The RMI includes a number of inhabited atolls, but most of the population lives on the Kwajalein and Majuro atolls where health care is primarily delivered in the centralized health centers on Ebeye island and in Majuro, respectively.

There are also a small number of private health clinics in American Samoa, Pohnpei (FSM), Palau and the RMI. Guam and the U.S. military base on Kwajalein, RMI also have U.S. military-affiliated hospitals and health systems primarily serving U.S. military personnel, dependents and contractors. These installations were not included in the Pacific Association for Clinical Training (PACT) survey, as they provide relatively few direct health services to the local population.

The remarkable and crucial Pacific Basin Medical Officers Training Program (PBMOT), which operated in the FSM between 1987 and 1996, trained 70 physicians, as well as additional health staff. Most of these graduates continue to serve throughout the USAPI and especially in the FSM, Palau and American Samoa, continuing to provide the backbone of the physician workforce. Nurse training programs continue to be active in the RMI, CNMI and American Samoa and are supplemented by an advanced nurse training program in Guam. Allied health staff throughout the region (except in Guam), typically have had limited or no formal training, with the exception of a few key supervisors. The need for advanced training and CE for this diverse health workforce was evident through the region, especially following closure of the PBMOT. Through the 1990s, regional efforts to address these needs have included programs for post-graduate and public health training through the Fiji School of Medicine, increasingly in partnership with the dynamic Pacific Basin Area Health Education Center (AHEC).10
The need for effective CE programs for health workers in the USAPI was also acknowledged by the Institute of Medicine in their 1998 report, “Pacific Partnerships for Health.” Subsequently the U.S. Health Resources and Services Administration (HRSA) provided funding to the University of Washington to develop the Pacific Islands Continuing Clinical Education Program (PICCEP). PICCEP presented workshops by content experts from the U.S. throughout the USAPI between 2000 and 2003. A subsequent four-year cooperative agreement between HRSA and the Department of Family Medicine at the University of Hawai‘i, John A. Burns School of Medicine established the PACT in 2003.

The HRSA mandate for PACT has been to develop and support CE programs for a broad range of health workers throughout the USAPI, exploring the appropriate use of distance education modalities. Leadership for PACT has been provided by an active advisory board of local and regional health professionals and leaders appointed by the Secretaries, Ministers and Directors of Health of the USAPI jurisdictions. Faculty members from PICCEP have also served on the PACT advisory board. Key support for PACT has been provided by the Pacific Island Health Officers Association (PIHOA). Recognizing the diversity of needs and geographical locations within the USAPI, PACT has organized its activities to focus on ten key locations within the six USAPI jurisdictions, providing separate advisory board representation and resources to each of the four FSM states, as well as to both Majuro and Ebeye in the RMI.

PACT conducted key informant-based needs assessment surveys throughout the USAPI in 2004. The goal was to foster an understanding of the diverse challenges in supporting appropriate, effective and sustainable CE programs for health workers in the region. These reports have been used to guide PACT CE activities and are presented in their entirety in this issue. This summary highlights the key findings of the surveys.

### Methods

The surveys collected information on health worker demographics, training and CE needs through questionnaires of key informants, supplemented by on-site interviews of health care leaders and health workers conducted by University of Hawai‘i faculty between April and November 2004. Nine reports were developed (separate reports were produced for each of the four FSM states) and reviewed for accuracy by health leaders from each jurisdiction.

### Health Workforce Characteristics

There are wide disparities in health workforce training between the Freely Associated States and the Flag jurisdictions. This section summarizes training for nurses, doctors and other health workers. The numbers of health workers identified in this survey are presented in Table 2.

### Nurses

Most nurses in the Freely Associated States have been trained in the region through programs at the College of the Marshall Islands. Associate-degree nurses are also trained in the CNMI, the RMI and American Samoa. Practical nurses are predominantly trained locally, on the job. The University of Guam offers Bachelor and advanced degree training for nurses. A shortage of nurses throughout the region has resulted in the hiring of expatriate nurses (typically from the U.S., Canada, Fiji and the Philippines) where budgets allow. There has been a trend for nurses to move to higher paying jobs within the region.

<table>
<thead>
<tr>
<th>Population</th>
<th>GDP per capita</th>
<th>Land Area</th>
<th>Life Expectancy</th>
<th>Annual Per Capita Health Expenditure</th>
<th>Infant Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Samoa</td>
<td>57,902</td>
<td>4,295</td>
<td>77</td>
<td>76</td>
<td>500</td>
</tr>
<tr>
<td>CNMI</td>
<td>78,252</td>
<td>8,582</td>
<td>177</td>
<td>76</td>
<td>519</td>
</tr>
<tr>
<td>Guam</td>
<td>166,094</td>
<td>15,439</td>
<td>212</td>
<td>78</td>
<td>1,032</td>
</tr>
<tr>
<td>Chuuk, FSM</td>
<td>53,595</td>
<td>1,203</td>
<td>49</td>
<td>65</td>
<td>80</td>
</tr>
<tr>
<td>Kosrae, FSM</td>
<td>7,686</td>
<td>3,270</td>
<td>70</td>
<td>66</td>
<td>125</td>
</tr>
<tr>
<td>Pohnpei, FSM</td>
<td>34,486</td>
<td>3,071</td>
<td>133</td>
<td>117</td>
<td>121</td>
</tr>
<tr>
<td>Yap, FSM</td>
<td>11,241</td>
<td>3,180</td>
<td>46</td>
<td>66</td>
<td>125</td>
</tr>
<tr>
<td>RMI</td>
<td>57,738</td>
<td>2,370</td>
<td>70</td>
<td>70</td>
<td>255</td>
</tr>
<tr>
<td>Palau</td>
<td>20,700</td>
<td>5,678</td>
<td>189</td>
<td>71</td>
<td>315</td>
</tr>
</tbody>
</table>

*Unless additional references are indicated, references are listed in the corresponding needs assessment article for each jurisdiction elsewhere in this issue. † Denotes overall FSM averages.
Physicians
With the exception of Guam and the CNMI, where most physicians are licensed in the U.S. or Canada, there is a wide diversity of training backgrounds for doctors in the USAPI. Throughout much of the region a large part of the physician level workforce is composed of graduates of the PBMOT Program, which concluded operations in 1997. Many of these doctors obtained additional specialty training at the Fiji School of Medicine and advanced practice settings in the region. The importance of providing CE opportunities for this crucial cohort of providers was highlighted in the 1998 Institute of Medicine report. There is a small number of prominent U.S. trained indigenous physicians working in the region. Additional skills, especially in specialty care fields, are provided by a larger number of expatriate physicians from the U.S., Philippines, South Asia and elsewhere.

Oral Health Providers
In Guam and the CNMI, only U.S. trained dentists can be licensed. In most other jurisdictions the majority of dentists received their training through the Fiji School of Medicine Dentistry Program, with a small number of expatriate dentists filling the remaining positions. Mid-level dental nurses provide services in the Freely Associated States, but are not licensed to practice in the territories. Dental assistants are usually trained locally.

Allied Health Staff
Except for the CNMI, Guam and Palau, most non-supervisory laboratory, radiology and pharmacy staff have had limited formal training. The Palau AHEC, Palau Community College and the Belau National Hospital have developed a cooperative program to increase recruitment and support the education of allied health staff. There are a number of ongoing health assistant training programs that are active in the region that are primarily focused on developing providers for distant health clinics and dispensaries.

Continuing Professional Development Programs
Throughout much of the USAPI, there are locally developed CE programs for clinical nurses at the local hospitals. CE for nurses is also supported by an active regional society, the American Pacific Nursing Leaders Council (APNLC). The annual APNLC regional conference serves a key educational role to supplement local CE programs. Across most of the region CE credit licensure requirements for nurses serve as a strong incentive for the maintenance of these local and regionally sustained continuing professional development (CPD) efforts. Nurses working in the public health sector, however, seldom have access to the same range of CPD opportunities.

Continuing medical education (CME) requirements for physician licensure were less consistent across the region, with an associated large variation in CE opportunities. In 2004, only Guam, CNMI and Palau had CE requirements for physician re-licensure; doctors in these same jurisdictions had generally good access to CE resources. While most jurisdiction health centers at one time held scheduled local CE sessions for physicians, many locations without formal physician CPD requirements discontinued these activities as of 2004 due to limited staffing and poor access to updated information resources. Currently legislative and other initiatives are underway to develop formal CME requirements.
requirements for doctors in other USAPI jurisdictions.

For almost all other health fields, including oral health, continuing training opportunities are extremely limited locally. This situation is especially critical given the lack of formal foundation training for many pharmacy, laboratory and radiology staff in the Freely Associated States. The relatively small numbers of health professionals in each field, along with the lack of local training expertise, have hindered the development of sustained local CPD efforts for allied health workers. Off-island training opportunities are often limited by cost and remain largely dependent on outside donor funding. Laboratory and pharmacy technician training programs through local and distance education efforts are underway in Palau and the FSM, in conjunction with outside partners. In addition to providing basic training and CE for their own staff, health officials in Palau have made efforts to extend these opportunities to health workers from neighboring jurisdictions. With the exception of Guam and the CNMI (which have CE requirements for allied health certification), USAPI jurisdictions do not offer regular support for allied health CPD activities. These opportunities generally remain available only on an ad hoc basis, dependent on outside funding.

Infrastructure and Distance Education Technologies

The 2004 survey identified significant limitations related to information technology infrastructure for distance education in most USAPI jurisdictions. These included the high costs of international telephone rates throughout the region, difficulties with satellite-based communications and limited computer and internet availability in the health sector.

The Technology and Information Policy Group (TIPG) at the University of Hawai‘i manages Pan-Pacific Education and Communication Experiments by Satellite (PEACESAT), a public service satellite program that provides video, voice and data communications at no metered cost for much of the USAPI. Local jurisdictions provide staff to run the associated earth stations, which are usually located in educational institutions rather than in health care centers. TIPG also provides additional support through training, technical assistance and some equipment support. TIPG is a PACT partner and their staff has provided significant technical support for the program, including the technology infrastructure assessment (see e-learning article by Higa in this issue).

In 2004, health worker utilization of PEACESAT for video and audio communications was most active in Majuro (RMI) and American Samoa. Technical and local staffing challenges limited the use for regular health education purposes in other parts of the USAPI. As of mid-2006, additional TIPG projects have been underway to develop increased PEACESAT Voice-over-IP and data connections in the RMI and FSM, and to extend service to Ebeye Hospital and Community Health Center. There has not been extensive use of commercial satellite communications for health information exchange through the region due to costs. A pilot project conducted by PACT in June 2004 evaluated the effectiveness of various modalities of distance education, as well as health worker interest in various modalities, including computer-based training (see the following article by Chen et al.).

At the time of the 2004 survey, most health workers in the USAPI had only limited access to computer stations, and even fewer had internet availability. American Samoa had a number of computers networked through the hospital for their implementation of an electronic health record system. In 2004, computer labs with internet access were being introduced throughout the Western Pacific Region, through the World Health Organization (WHO) sponsored Pacific Open Learning Health Network. That year, Palau, Majuro (RMI) and Pohnpei (FSM) received WHO-sponsored networked computer labs in their hospitals with low bandwidth, but non-metered internet access. Otherwise, most jurisdictions had limited computer resources with minimal or no internet capability for health workers. Available computers were often restricted to physicians only. Although primarily developed as a clinical consult service, web-based and email communications have been used effectively to provide consultation services and triage transfer of patients from the USAPI to the Pacific Islands Health Care Program at the Tripler Army Medical Center in Honolulu, Hawai‘i.

Distance education programs for physicians through the region have been active through the Palau AHEC in conjunction with the Fiji School of Medicine. Due to the limited access and reliability of satellite-based audio and video teleconferencing, a model based on telephone conferencing and internet forwarded materials was developed. Unfortunately, the inexpensive Hawai‘i-based commercial phone bridge system that enabled this to be conducted was discontinued in 2004. The Fiji
School of Medicine has since transitioned to a primarily on-site educational model with traveling faculty teaching courses directed towards certificate and diploma programs. Since the 2004 survey, there have been significant improvements in the availability of information technology access for distance health education for health workers in the USAPI. In addition to the hospital-based computer labs in Palau, Pohnpei (FSM), and Majuro (RMI), computer facilities with internet access have also been developed in the other FSM states of Chuuk, Kosrae and Yap. Ebeye Hospital (RMI) has also significantly improved access to computer resources. WHO and local funds have supported these efforts. Although bandwidth remains low in most of the USAPI, limiting the ability to transfer large files or stream video and audio, the overall availability of internet access for health workers has improved significantly throughout the region.

Priority Needs
The key priority needs identified from this survey included developing CPD activities, matching CPD content to local priorities, supporting allied health training, improving information technology access, and developing local technical support to sustain technology services. At the time of the 2004 survey, few jurisdictions offered regular, local CE opportunities for health workers. Notable exceptions included nursing CPD activities in many jurisdictions and the provision for weekly CE activities for health staff in Palau. Both these groups had CE requirements for professional license renewal. These activities notwithstanding, a strong need was identified to promote and sustain CPD activities for health workers as part of their routine work activities.

Health workers throughout the region expressed enthusiasm for increased CPD activities. This has been complemented by growing initiatives to mandate documentation of CE activities for professional licensure. Distance education for health workers in the region may help address some of the issues of high travel costs and limited staffing coverage that have restricted access to in-person CE activities. Distance modalities can also facilitate the dissemination of local expertise throughout the region as part of developing local and regional CE programs.

Surveys suggested other topics in addition to the HRSA mandated priorities of diabetes mellitus, oral health and geriatrics.

The limited CPD opportunities for allied health workers (especially in laboratory, pharmacy and radiology settings) are particularly disconcerting in light of the limited initial training provided to health workers in many jurisdictions. These concerns are especially significant for the Freely Associated States. On-the-job training is commonplace and regularly scheduled CPD activities are rare for allied health workers. The development of laboratory and environmental health technician training programs through the Palau AHEC and the availability of the pharmacy technician program via the University of Alaska–University of Hawai'i (Hilo) partnership serves as a possible model for other jurisdictions. While these programs are made available at nominal cost to workers from neighboring jurisdictions, there remain significant challenges to providing training for a significant number of allied health workers in the region. Transportation costs are prohibitive for most local health budgets, and existing allied health staffing shortages are exacerbated when personnel train off-island. Given the limited formal foundation training for many laboratory, pharmacy and radiology staff outside of Guam and the CNMI, a professional development foundation-level training model may initially be more appropriate than traditional CE offerings.

Distance education for health workers in the region may help address some of the issues of high travel costs and limited staffing coverage that have restricted access to in-person CE activities. Distance modalities can also facilitate the dissemination of local expertise throughout the region as part of developing local and regional CPD capacity. The increasing availability of information technology resources for health workers in the region over the past several years increases the potential role for distance education in the USAPI. Not all training can be effectively provided through available distance modalities; thus, the need for a range of CE programs remains. The optimal role of distance education as part of a comprehensive CPD model is likely to vary among different health specialties and across the diverse health settings in the USAPI.

Between 2004 and the present, there has been a trend of increased access to distance education resources
through computer technology for many hospital staff in the region. The centralized provision of health care and the associated concentration of health workers in most of the USAPI jurisdictions has allowed for high levels of access to be achieved with relatively small investments of resources. Further development of effective and affordable information technology resources throughout the region is essential to support distance education programs since technical and training challenges remain. In addition to equipment investments, training health workers to optimize their usage of newly available computer and internet resources has been identified as a priority across most of the region. With the increasing dissemination of technology, the accompanying need for improved local technical support to maintain equipment and networks was frequently reported. Efforts to address these needs in the near future will rely on support from local governments, academic centers and the efforts of programs like the WHO’s Pacific Open Learning Health Net.

Addressing the needs of health workers not based in the major centers – notably health assistants and public health personnel – remains an important priority especially for states with widespread populations. Often these same health personnel have had the fewest opportunities to improve and maintain their professional knowledge base. An active continuing distance education program for dispensary staff in Yap, FSM may serve as an effective model for other jurisdictions.

**Partnerships**

Leadership in formulating regional health policy is provided by the PIHOA, composed of Ministers, Secretaries and Directors of Health from each of the USAPI jurisdictions. This group works closely with the regional professional societies for nurses, doctors and dentists (the APNLC, Pacific Basin Medical Association, and Pacific Basin Dental Association, respectively) that are active in supporting CE activities for their members. Coordination with these established organizations is important for developing effective CE programs in the context of promoting capacity development and sustainability.

There are a number of public higher education centers in the region that provide foundation and professional training for health workers. These include the University of Guam, Guam Community College, the Northern Marianas College (CNMI), American Samoa Community College, Palau Community College, College of Micronesia (FSM), and the College of the Marshall Islands. Promoting increased partnerships between these institutions and health care centers may have mutual benefits that promote local capacity development initiatives. In addition to supporting foundation-level and health-specific training, these centers may offer a valuable resource for developing computer and health informatics skills among health workers. The partnership between the Belau National Hospital, the Palau Community College, and Palau AHEC programs serves as a model for a successful collaboration between academic and health care sectors that has helped to address a local shortage of trained health workers.

**The needs assessment surveys presented in this issue summarize the state of CE in the USAPI region in 2004 and highlight continuing key priority areas.**

A number of international and U.S. agencies promote resources and training activities for health workers in the region, including the WHO, Secretariat of the Pacific Community, and the U.S. Centers for Disease Control and Prevention. Grant funding agencies, such as HRSA, and aid agencies from other Pacific countries support a range of health-related programs in the USAPI. Health workers who participated in the 2004 survey frequently commented on the lack of coordination between various outside agencies despite complementary goals. Promoting increased coordination between funding agencies for resource sharing and design of complementary programs has the potential to improve training outcomes and optimize limited resources. Improved communication between agencies and with local health workers, perhaps through each jurisdiction’s CPD committee, may assist in developing effective programs in the context of specific local needs.

**Limitations**

With our focus on CE needs, an assessment to determine optimal present and future needs in the numbers, type and training of the health workforce in each jurisdiction was beyond the scope of our survey. Clearly, such assessments, ideally performed as part of locally developed human resource development plans, should influence the design of sustainable and appropriate CE programs into the future. Additionally, despite their importance in several jurisdictions, this study made no attempt to include outer island dispensaries in the site visits, thus their needs are under-reported.

**Summary**

The needs assessment surveys presented in this issue summarize the state of CE in the USAPI region in 2004, and highlight continuing key priority areas. These reports
were developed in conjunction with health workers and health leaders throughout the region and are guiding PACT in working to improve CE opportunities for health workers through a participatory process and with a focus on capacity development. PACT recognizes the dedicated work of generations of Pacific health workers—from the pioneers who returned to Micronesia from training at the Fiji School of Medicine, or in other Pacific nations or the U.S., to the remarkable faculty and graduates of the PBMOT, and the health workers currently pursuing continuing studies. We hope that the full reports presented in this issue help support the efforts of these individuals and the many organizations working for the common cause of improving the health of Pacific peoples.

References


Introduction

The U.S.-Affiliated Pacific Islands (USAPI) are comprised of three freely associated states (the Federated States of Micronesia [FSM], the Republic of Palau and the Republic of the Marshall Islands [RMI]), two U.S. territories (American Samoa and Guam) and the Commonwealth of the Northern Mariana Islands (CNMI). These islands are diverse in language, culture, economy, resources and infrastructure, and are separated by vast expanses of the Pacific Ocean.

The need for continuing education for health workers in the USAPI has been highlighted by health leaders in the region as well as the U.S. Institute of Medicine.\(^1\)\(^2\)\ The Pacific Islands Continuing Clinical Education Program, funded by the U.S. Health Resources and Services Administration (HRSA) and developed by the University of Washington provided continuing education support through a live on-site training model between 1999 and 2003.\(^3\) The Palau Area Health Education Center (AHEC) program, in collaboration with the Fiji School of Medicine, has provided distance and on-site training to enable health workers to attain university certificates and diplomas.\(^4\) Despite the benefits of these programs, there remains great need in many parts of the USAPI for sustainable continuing education for a broad range of health workers. Multiple factors, including the diversity of needs, limited health staffing, the great distances between islands, travel costs and budgetary constraints have limited the ability to provide continuing education through live lectures by content experts. Limited resources have also hampered sustained local continuing education efforts in many parts of the USAPI. These challenges are detailed and discussed in depth elsewhere in this issue.

Abstract

Background: Healthcare workers in many parts of the U.S.-Affiliated Pacific Islands (USAPI) have limited access to continuing education. Barriers to traditional on-site continuing education programs include the diversity of educational needs, limited health staffing, the distances between islands and associated high travel costs. A pilot evaluation of distance education modalities was conducted among USAPI healthcare workers. Methods: Three distance education modalities (live videoconference, live audioconference and a recorded computer-based format) were evaluated in comparison to live lecture during two separate half-day educational programs in Pohnpei, Federated States of Micronesia, in June 2004. Participants from the USAPI included 59 nurses, doctors, dentists and other healthcare workers who were assigned to different educational modalities for two training modules (diabetes/oral health and metabolic syndrome). We conducted pre- and post-tests and obtained participant feedback. Results: Comparison of pre-test and post-test scores showed statistically significant score increases among the live lecture and videoconference group for the diabetes/oral health module and among all three distance education modalities for the metabolic syndrome module. Participants expressed a high degree of interest in each of the distance education modalities. Computer-based training was well-accepted even by health workers with little prior computer experience. Conclusions: This pilot study validates the ongoing development and evaluation of distance education resources as part of a comprehensive approach to improving continuing education in the USAPI. The results have been used to guide continuing education efforts in the region.

Key words: Pacific Islands; Distance Education; Workforce Development.
Given the challenges to providing appropriate on-site continuing education throughout the region, there has been sustained interest in distance education methods. Various USAPI distance education efforts have utilized communications technology available through the region. Satellite transmissions of live video and audio through the University of Hawai‘i Pan-Pacific Education and Communication Experiments by Satellite (PECESAT) program have enabled low-cost international communications for some USAPI jurisdictions. Distance education through telephone conferences also have been used but have been limited by high costs of commercial telephone service throughout the region. The increased availability of computer resources for health workers throughout the USAPI, notably since 2004 under the World Health Organization’s (WHO) Pacific Open Learning Health Network project, offers the potential for increased use of computer-based training formats.

Moreover, many USAPI health workers have experience with the successful telehealth application of telephone and internet communications for clinical consultations and referrals. Many providers in the region, especially physicians, have used these resources effectively with the support of the Pacific Island Healthcare Program at the Tripler Army Medical Center in Honolulu, Hawai‘i.

PACT aims to support the development of comprehensive continuing education programs for health workers in the USAPI jurisdictions and is funded through a four-year cooperative agreement between HRSA and the Department of Family Medicine and Community Health at the University of Hawai‘i. Each module consisted of a pre-test, followed by a 45-minute educational presentation. The participants in the live lecture, videoconference and audioconference groups were able to ask questions of the presenter following the presentation. Participants in the computer-based training groups were able to review and return to previous slides at their own pace during this period, but did not have the ability to ask questions. A post-test identical to the pre-test was then administered. After completion of the post-test, participants were able to give verbal feedback to their group based on their experience with each modality. Comments were recorded and transcribed by the facilitators for each session. As is common to continuing education programs, participants also completed a written evaluation and questionnaire, which included questions regarding demographic and identifying information. The questionnaire asked about previous continuing education experiences and offered participants the opportunity to provide additional comments.

The project was conducted in conference rooms and the computer laboratory in the main library of the College of Micronesia FSM National Campus located in Palikir, Pohnpei. One conference room was configured for a live lecture with a videoconference broadcast unit. This unit provided a simultaneous audio-visual feed to a videoconferencing unit connected to a television in an
adjoining room, simulating the videoconference facilities available through much of the USAPI. A third room, configured to receive simultaneous audio from the live lecture through a speakerphone, had a computer and liquid crystal display projector to show the same slide presentation provided in the live session. Ten computer workstations in the library computer lab were used for the computer-based training modality consisting of a slide presentation identical to that presented in the live sessions with recorded audio narration by the same speaker (Dr. Buenconsejo-Lum). Participants in the computer-based module each had their own computer and headphones to view this recorded slideshow and were able to play, pause, and replay slides at their own pace. A facilitator was stationed in each room to advance slides or to provide computer assistance if needed. Technical setup and assistance was provided by PEACESAT affiliated staff from the University of Hawai‘i, the University of Guam, and the College of Micronesia.

The evaluation was performed during similar sessions on two separate days to accommodate the schedules of the APNLC and PBMA conferences. Leaders from these two associations assisted in recruiting participants and facilitating transportation to the seminar site. As an incentive, each day participants were entered into a random drawing for a video cassette recorder, which was awarded at the conclusion of each day’s session.

Scheduled Day 1 participants were predominantly nurses participating in the APNLC conference, while Day 2 participants were mostly physicians attending the PBMA conference. However, trainings were also attended by dentists, health assistants, and other health personnel working in the region. The modules were identical on Days 1 and 2 with the exception that a live lecture was not offered on Day 2 in order to provide greater numbers for evaluating the distance education modalities. On each day the intent was to assign participants randomly to the two different modalities. Evaluation packets with alternating assignments to two different modalities were given to participants in sequential order of their registration. After completing their first module, participants then proceeded to a different modality for their second module based on their packet assignment.

A total of 59 participants attended the sessions on two separate days. On Day 1, 36 participants were randomly assigned to two of the four different modalities. There were 23 participants on Day 2; 16 participants were each assigned using the same technique as for Day 1; an additional six participants arrived late and participated in the second module only. One participant from Day 1 chose to return on Day 2 to experience the two distance modalities he had not previously attended.

Table 1. Pilot Evaluation Participant Demographic Characteristics

<table>
<thead>
<tr>
<th>Total Participants</th>
<th>59</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age (years)</td>
<td>44.3 (Range 24 - 61)</td>
</tr>
<tr>
<td>Male</td>
<td>N %</td>
</tr>
<tr>
<td></td>
<td>20 (33.9)</td>
</tr>
<tr>
<td>Female</td>
<td>38 (64.4)</td>
</tr>
<tr>
<td>Missing</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>Professional Role</td>
<td>N %</td>
</tr>
<tr>
<td>Nurse</td>
<td>28 (47.5)</td>
</tr>
<tr>
<td>Hospital nurses</td>
<td>13 (22.0)</td>
</tr>
<tr>
<td>Public health nurses</td>
<td>11 (18.6)</td>
</tr>
<tr>
<td>Nurse midwives</td>
<td>2 (3.4)</td>
</tr>
<tr>
<td>Nurse practitioners</td>
<td>2 (3.4)</td>
</tr>
<tr>
<td>Doctor</td>
<td>15 (25.4)</td>
</tr>
<tr>
<td>Other Dental</td>
<td>3 (5.1)</td>
</tr>
<tr>
<td>Health Assistant</td>
<td>3 (5.1)</td>
</tr>
<tr>
<td>Teacher</td>
<td>3 (5.1)</td>
</tr>
<tr>
<td>Dentist</td>
<td>2 (3.4)</td>
</tr>
<tr>
<td>Other</td>
<td>4 (6.7)</td>
</tr>
<tr>
<td>Missing</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>Jurisdiction</td>
<td>N %</td>
</tr>
<tr>
<td>Chuuk, FSM</td>
<td>11 (18.6)</td>
</tr>
<tr>
<td>Ebeye, RMI</td>
<td>2 (3.4)</td>
</tr>
<tr>
<td>Guam</td>
<td>1 (1.7)</td>
</tr>
<tr>
<td>Kosrae, FSM</td>
<td>2 (3.4)</td>
</tr>
<tr>
<td>Majuro, RMI</td>
<td>20 (33.9)</td>
</tr>
<tr>
<td>Palau</td>
<td>2 (3.4)</td>
</tr>
<tr>
<td>Pohnpei, FSM</td>
<td>18 (30.5)</td>
</tr>
<tr>
<td>Yap, FSM</td>
<td>2 (3.4)</td>
</tr>
<tr>
<td>Missing</td>
<td>1 (1.7)</td>
</tr>
</tbody>
</table>

Figure 1 shows the prior experience participants in each modality had with that specific continuing education
modality. Only a minority of participants indicated prior access to continuing education through each of the modalities, with fewer having used the various distance education formats compared to the live lecture format. The smallest proportion of participants reported ever having used a computer-based training modality for continuing education.

Pre-test and post-test results for each module, stratified by modality and pooled for both days, are presented in Figures 2a, 2b and Tables 2a, 2b. There are some differences in pre-test knowledge among the participants for each modality, with the diabetes/oral health module live format group exhibiting the lowest pre-test scores. Statistically significant mean score gains were noted for the following groups: live lecture and videoconference in the diabetes/oral health module and all three of the distance education modalities in the metabolic syndrome group. While all other groups also trended towards a mean score gain, these mean gains were not statistically significant for those groups.

Table 2a. Pre- and Post-Test Scores: Diabetes/Oral Health

<table>
<thead>
<tr>
<th>Modality</th>
<th>Participants</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Mean Score Gain (95% CI)</th>
<th>p-value (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live</td>
<td>9</td>
<td>2.89</td>
<td>4.33</td>
<td>1.44 (0.0007 - 2.88)</td>
<td>0.050</td>
</tr>
<tr>
<td>Video</td>
<td>15</td>
<td>4.20</td>
<td>5.20</td>
<td>1.00 (0.018 - 1.98)</td>
<td>0.046</td>
</tr>
<tr>
<td>Audio</td>
<td>14</td>
<td>4.64</td>
<td>5.29</td>
<td>0.64 (-0.09 - 1.38)</td>
<td>0.082</td>
</tr>
<tr>
<td>Computer</td>
<td>15</td>
<td>4.47</td>
<td>4.67</td>
<td>0.20 (-0.32 - 0.72)</td>
<td>0.424</td>
</tr>
</tbody>
</table>

Table 2b. Pre- and Post-Test Scores: Metabolic Syndrome

<table>
<thead>
<tr>
<th>Modality</th>
<th>Participants</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Mean Score Gain (95% CI)</th>
<th>p-value (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live</td>
<td>9</td>
<td>3.22</td>
<td>3.89</td>
<td>0.67 (-0.35 – 1.68)</td>
<td>0.169</td>
</tr>
<tr>
<td>Video</td>
<td>14</td>
<td>2.33</td>
<td>4.39</td>
<td>1.06 (0.80 – 2.06)</td>
<td>0.000</td>
</tr>
<tr>
<td>Audio</td>
<td>15</td>
<td>3.17</td>
<td>4.33</td>
<td>1.17 (0.45 – 1.88)</td>
<td>0.003</td>
</tr>
</tbody>
</table>

An evaluation form for each module assessed participants’ level of interest in using the particular modality that they had just completed. The general level of interest was high for all educational formats, reflecting the enthusiasm for continuing education activities through any of these modalities. Despite limited prior experience with computer-based methods, interest was very high for this format (Figure 3). There was no statistically significant difference between the levels of interest in each modality.

Participant Comments

Some comments provided by participants at the conclusion of each training module are listed below. When available, participant job roles are identified.

General

“The speaking delivery could have been slower, since those who don’t speak English well would have had trouble following it.”
“With all continuing medical education, it is a question of how much time people are willing spend doing this. And you get interrupted, when you’re needed in your clinic.”

Nurse: “This is my first time sitting in this kind of conference, because all I do is work in the clinic.”

Live Lecture

“Technological deliveries appeal more to those under 30. Older people still prefer face-to-face presentations.”

Videoconference

“Before coming to the video, I was in the web [computer]-part and I really liked that, after the presentation you can go through the lecture in your own time, but with a video conference you have to be there at the set time and you can’t go back.”

Nurse: “We need to have good technical support, and we need to have both a tech person and a medical person familiar with the content to answer questions present for any such presentations.”

Nurse: “Many would still prefer face-to-face [presentations].”

Doctor: “We just do the audio with the slides, but this one is better because you can actually see the presenter and you can really interact. This is perfect.”

Doctor: “Before, we used to have video conferences but it is not operational any more. Seeing the presenter does help me to stay up and concentrate.”

Nurse: “Presentations like this are very cost effective and would be good for the Pacific. We need more of them.”

Audioconference

Nurse: “I like seeing the same presentation as other jurisdictions. I don’t like that there is no written material and we cannot interrupt speaker for questions. We need to wait to ask questions and sometimes forget. I have tried audio before through PEACESAT.”

Nurse: “Liked audio lecture since I can ask questions. Also liked computer training, but could not ask questions.”

Dentist: “First time using this format. This is more accessible to staff and cost-effective. Not really interactive. My mind wandered off at one point.”

“With audio you need more of the microphones, so that you can interrupt and ask questions when the time is right.”

Computer

Nurse: “Have not used in Chuuk. Don’t have power all the time. I think it makes me scared but I want to learn how to use the computer. We have a computer lab but I haven’t learned how to use it. But I would like to learn.”

“With the web [computer]-based, you can go over it at your own pace, except that I won’t be able to be asking questions.”

Doctor: “It would be good to have this to go back to on my own because sometimes when we have presentations on-island I missed them because I have to see patients.”

Dentist: “Other session was the audio lecture; in comparison the web format didn’t allow time to ask questions, the audio allowed us to ask questions to the presenter.”

Doctor: “First time exposed to this kind of training. It was very informative. I liked using the computer. I liked everything about it except that I would like to have more interaction.”

Discussion

The results suggest that the distance education modalities evaluated in this pilot study can be effective in promoting knowledge gain among health workers in this resource-limited region. For both training modules, participants demonstrated increases in mean knowledge gain through each modality, although the sample size was too small to demonstrate statistically significant differences in all cases. Participants were generally satisfied with all methods and noted a willingness to use them again. They expressed appreciation for the continuing education content. This pilot study validates the ongoing development and evaluation of distance
education resources as part of a comprehensive approach to improving continuing education in the region.

The number of participants who indicated having previous experience with distance education formats was lowest for the computer-based training group. The slightly higher numbers who had used live video and audio conferencing likely reflects the combined efforts of technology providers (including PEACESAT) and content providers, notably the Palau AHEC in conjunction with the Fiji School of Medicine. The response that less than half had ever participated in a live continuing education presentation was unexpected and may reflect the relative lack of continuing education resources available to public and allied health staff in the region. This percentage is likely skewed lower due to the absence of physicians in the live lecture group, which was not offered on Day 2.

Computer-based training using recorded presentations can be an effective learning tool for health workers in the USAPI. Participants appreciated the ability to review material at their own pace using this modality. They cited the inability to see the speaker and to ask questions as a disadvantage of this format. Even those participants lacking experience with computers showed an ability to navigate the sessions with very limited instruction. Moreover, these same participants generally showed enthusiasm for the computer-based modality, citing interest in learning more about technology. This recorded format also allows health workers to access training at convenient times and offers access to a greater number of health staff.

Limitations

Limitations of this pilot study included a lack of power in determining differences between modalities, due to the relatively small numbers in each group. The small number of test questions and the number of participants who showed high pre-test knowledge limited the ability of the test tool in measuring differences in knowledge gain between the groups. Utilizing lengthier and more rigorous pre- and post-tests, and including more participants or fewer modalities would address these quantitative limitations. The small numbers of participating allied health workers limits the ability to generalize these findings to allied health workers in the region. This was partially the result of recruitment from attendees of doctors’ and nurses’ conferences, but also reflects the relatively lower numbers of allied health staff throughout the region.

The lack of a statistically significant score increase among participants in the metabolic syndrome live lecture group can likely also be attributed to the decision not to assign Day 2 participants to this format in order to collect more information on the three distance education modalities. The smaller numbers in this group lacked the power to demonstrate a significant knowledge gain. The results from the live lecture format are also not representative of the entire range of health workers, since physicians were effectively excluded from this format. This may explain some of the differences seen in this group, which had the lowest diabetes/oral health pre-score and also the smallest increase in metabolic syndrome scores. This methodological difference limits the validity of direct comparisons of live lecture to the other modalities in a pooled analysis of results from both days. A sub-analysis of Day 1 results lacked adequate power to demonstrate statistically significant changes for any modality. The pooling of results, however, does facilitate comparisons between the three distance education modalities and also reflects the reality that continuing education offerings are often shared among doctors, nurses and allied health workers in this region.

An additional consequence of the analysis of pooled data is the inability to assess optimal formats for profession-specific needs. Since the presentations were prepared by a dentist and a physician, the lack of professional specificity might have limited the relevance and effectiveness for nurses and other health workers. Further ongoing evaluation of continuing education programs should also attempt to focus on profession-specific materials developed by experts from clinical nursing, public health, and allied health specialties.

The use of a post-test tool immediately after completion of the continuing education program to assess knowledge gain may not reflect long-term knowledge gain and cannot address changes in practice as a result of continuing education. These limitations are inherent to much of the current practice of evaluating continuing education. The group comment session in the presence of the facilitator might have limited some participants from providing possibly negative feedback on their experiences. For some individuals, this effect may have been accentuated by cultural norms among
many Micronesians that discourage open expressions of criticism. Providing participants with an opportunity to provide anonymous feedback might be helpful in eliciting a wider range of opinions.

The lack of representation from several jurisdictions in the USAPI limits the ability to generalize these findings throughout the region. In reality there is a great diversity of health systems, practitioners and health education needs throughout the USAPI region, as is documented elsewhere in this issue. Focusing this study on practitioners from the Freely Associated States, particularly the FSM and RMI, does provide useful insights for developing continuing education approaches for practitioners in these relatively resource-limited jurisdictions. Future efforts should also be directed at developing jurisdiction-specific distance education approaches given the evolving, yet diverse availability of technology and technical support in the region.

Application of Findings

The results of this study are being applied to the implementation and further evaluation of distance education resources as a component of a comprehensive approach to developing continuing education infrastructure in the USAPI region.

This evaluation highlights the potential effectiveness of computer-based training modules and the high degree of interest in this format among health workers, despite limited experience. Such store-and-forward computer-based training options may be a valuable additional training tool in a continuing education program. This format can offer self-paced learning in a setting where multiple time zones, heavy patient-care responsibilities and limited training budgets often challenge the ability to use live educational modalities. Although video and audioconferencing formats continue to serve a role in specific jurisdictions, notably American Samoa, Guam, Majuro, RMI, and parts of the FSM, PACT is also supporting further development and evaluation of the use of recorded computer-based content in order to broaden access to continuing education materials.

Since this 2004 pilot study, PACT has facilitated the recording and dissemination of numerous continuing education presentations by health workers in the region in a computer-based format. Recorded programs include presentations from the August 2005 PBMA Conference in Chuuk, FSM, the 1st FSM Health Symposium in January 2006 in Pohnpei, and the June 2006 APNLC Conference in Majuro, RMI. Additional content has been developed and recorded by local, regional and international experts for the benefit of USAPI health workers. PACT has collaborated with the U.S. Centers for Disease Control and Prevention in producing recordings of a tuberculosis clinical training seminar for Pacific health workers, and with the Pacific Island Health Officers Association in recording training modules for laboratory workers. These presentations are available on CD and DVD and can be played on Macintosh and Windows-compatible computer systems without additional commercial software. PACT has distributed content discs through local continuing professional development coordinators in each jurisdiction, to be offered at no cost to health workers. Participants can return evaluation forms through their local coordinators for regional continuing education credit offered through PACT.

The application of distance education modalities in the USAPI has also increased opportunities for local capacity development in providing professional education. By offering technologies that can enable recording and transmission of content rapidly and inexpensively throughout the region, local expertise can be readily highlighted and disseminated. In this way regional distance education can benefit and complement ongoing live, on-site continuing education efforts such as those currently provided in the region by the Palau AHEC and Fiji School of Medicine collaborative.

This study also highlights the limited experience of many USAPI health workers, especially non-physicians, with computer technology. A technological transformation through local, regional and international efforts has dramatically improved health worker access to computer resources in the USAPI since 2003. Additional funding for internet access and technical support has been provided by local governments. To attain the full potential from these important information technology developments, health workers in the region still require training in the optimal use of computer-based resources. Some support for health worker training has been provided through the dedicated efforts of the University of Guam, Robert F. Kennedy Memorial Library staff, but additional efforts to develop local capacity in order to provide widespread and ongoing training are needed. Moreover, while some important content resources have been made freely available in the region by agencies such as WHO through POLHN (Pacific Open Learning Health Net), Pacific
In summary, this pilot evaluation highlights the potential for applying distance education modalities to meet a critical need of health workers in the USAPI. Follow-up distance education activities based on the results of this study have provided additional experience to support computer-based training as a valuable component of a comprehensive continuing education program for Pacific health workers. A successful program for continuing professional development with distance education methods must include strong local coordination and facilitation. Capacity development of local expertise in applying newly available information technology resources should remain a priority given the limited experience of most USAPI health workers. Provision for adequate local technical support through training and hiring is essential to the sustainability of continuing education programs with a distance education component. Many of these conclusions may be applicable to health workers in other resource-poor settings who have limited access to ongoing training opportunities.

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Dr. Beatrice Gandara, University of Washington School of Dentistry
Dr. Peter Milgrom, University of Washington School of Dentistry
Lorraine Kerse, World Health Organization Western Pacific Regional Office

References


13 years ago in the Pacific Health Dialog, Larson and House stated, “…there is a consensus that population concerns need to be addressed alongside education, health, economics, environment and gender issues.” PHD, 1995;2(1):5.
American Samoa Assessment for a Continuing Health Care Professional Development Program

Lee E. Buenconsejo-Lum, MD*
Tai-Ho Chen, MD*
Victor T. Tofaeono, MD**
Ernest Oo, MD***

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai’i at Manoa; ** Assistant Medical Director, LBJ Hospital, Pago Pago, American Samoa, and PACT advisory board member; *** CME Committee Chair, LBJ Hospital, Pago Pago, American Samoa. Address correspondence and reprint requests to: Lee E. Buenconsejo-Lum, MD, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai’i at Manoa, 95-390 Kuahelani Avenue, Mililani, Hawai’i 96789-1192; lbuencon@hawaii.edu.

Abstract
In 2003, the University of Hawai’i Department of Family Medicine & Community Health entered a 4-year cooperative agreement with the U.S. Health Resources and Services Administration to establish the “Pacific Association for Clinical Training” (PACT). PACT’s goal is to develop effective distance education methods to improve the education and skills of healthcare professionals in the U.S.-Affiliated Pacific Island nations. To determine the situation existing in 2004, one of PACT’s first projects was to perform site visits to each jurisdiction, conducting needs assessments through interviews with key healthcare professionals, hospital administrators, and government officials. This article highlights findings of PACT’s American Samoa assessment. Meant to establish a baseline for future reference, all data are those collected in 2004/2005 and have not been updated.

Key words: American Samoa; Clinical Training; Workforce Development; Distance Education.

Introduction
This report was compiled from written surveys of key health administrators and personnel in conjunction with interviews and a site visit conducted by Dr. Buenconsejo-Lum in August 2004.

Additional telecommunications infrastructure needs assessment data were gathered by University of Hawai’i (UH) Telecommunications and Information Policy Group (TIPG) / Pan Pacific Education and Communication Experiments by Satellite (PEACESAT) staff as noted Higa’s article in this issue on Pacific Association for Clinical Training (PACT); Technology Telecommunication infrastructure assessment. A preliminary written needs assessment survey was distributed and completed by Dr. Oo, Ms. Wright, Ms. Misi and Mr. Lafitaga in November 2003. Dr. Buenconsejo-Lum of the UH John A. Burns School of Medicine (JABSOM) Department of Family Medicine and Community Health, completed a site visit in August 2004, interviewing the remaining key informants.1

Description of American Samoa
American Samoa is an unincorporated territory of the U.S. The territory consisting of a group of seven islands divided into three administrative districts: Tutuila (the Manu’a group: Ofu, Olosega, Ta’u), Aunu’u (Rose Atoll), and Swains Island (privately owned). The total land area of the territory is 199 sq. km, with 116 sq. km of coastline. Travel between the main island of Tutuila and the Manu’a group is by local airline, with flights offered several times per day. Passenger and cargo boat services are offered once-a-week and take approximately 9 hours between Tutuila and the Manu’a group. Public schools on each island are linked by satellite telecommunication (offering video-teleconferencing [VTC] capabilities), phone and fax. The territory’s only hospital, the Lyndon B. Johnson (LBJ) Tropical Medical Center, and the main Department of Health in Pago Pago also have VTC capabilities.2

The estimated 2004 total population was 57,902. The annual growth rate is 0.04%, the birth rate is 24.46 per 1,000 and death rate is 3.39. The net migration rate is 20.71 per 1,000 live
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human resource/personnel departments reports

health workforce data for 2004 was compiled from manu‘a group.

outreach programs to rural tutuila and the islands in the some portable equipment that they use for public health dental needs. lbj dentists do have houses the main dental clinic and provides most of the public health dental needs. there are three physicians in private practice and two private offices on the main island. lbj also houses the main dental clinic and provides most of the public health dental needs. lbj dentists do have some portable equipment that they use for public health outreach programs to rural tutuila and the islands in the manu‘a group.

health workforce demographics

the per capita income is 4,295,4 compared to $37,986 in hawai‘i. the majority of the territory’s revenues (63%) are derived from u.s. grants; the remaining 37% are from local sources, including tuna canning, agriculture and handicrafts. it is estimated that 58% of families fall below the u.s. federal poverty level.

there is one community health center and six public health clinics, six dispensaries and four dental clinics throughout the islands. most of the healthcare is provided either by lbj staff or public health staff, primarily comprised of licensed practical nurses (lpns) and certified health assistants.

many of the rn nursing staff received their education at the university of guam or at nursing schools in hawai‘i or on the u.s. mainland; some received scholarships from the american samoa government. those who trained in the u.s. tend to maintain their u.s. licenses. other rnns or lpns trained at the local nursing program at the american samoa community college (asc) or one of the regional nursing programs in saipan, commonwealth of the northern mariana islands (cmni), and the republic of the marshall islands (rmi). in american samoa, rnns have 3 years of training and at least an associate degree. lpns have 12 months of training. nursing aides or assistants receive on-the-job training.

the accrediting commission of community and junior colleges and the western association of schools and colleges. a land grant institution, asc offers an associate degree and certificate program in practical nursing and also provides coursework for other allied health fields. asc also offers associate degrees in health sciences, human services, public service and forensic technologies. all of the degrees can serve as a career ladder for bachelor degree programs outside

health workforce training

of the 47 physicians, five received their training at u.s. allopathic medical schools and are licensed to practice in the u.s. most physicians are graduates of the now defunct pacific basin medical officer training program. many of these medical officers went on to receive further training at the fiji school of medicine or in new zealand, some with financial assistance from the american samoa government. the remaining physicians are expatriate physicians from the philippines, burma, egypt, and elsewhere.

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of American Samoa. Graduates of the nursing program are potential candidates for the National Council Licensure Examinations for either LPNs or RNs. ASCC is exploring the possibility of developing a Bachelor of Science in Nursing Program.

Dentists, dental hygienists and dental assistants receive their training outside of American Samoa, typically at the Fiji School of Dentistry. Of the 15 dental assistants, four are certified and the remainder trained locally.

Certified health assistants receive basic training in health sciences, followed by a six-month intensive training curriculum developed by the University of Michigan.

Few of the radiology technicians are certified. Two have been at LBJ for over 20 years and function at the same level as certified technicians in the U.S. The chief technician was credentialed by the U.S. military and is working to establish credentialing policies, procedures and criteria. Most of the training is on-the-job and it is up to the two senior technicians and the radiologist to supervise the others and determine if the technician can receive a professional license from the Health Regulations Board. The ASCC allied health program provides basic training, but most technicians would need additional training off-island (for example at the UH, Kapiolani Community College program, or other programs on the U.S. mainland) in order to receive U.S. certification. LBJ has two certified mammography technicians and has contracted with a radiologist in Nevada to dramatically improve screening and early detection of breast cancer. For ongoing education, the radiologist pays for his own online continuing medical education (CME) credits through a commercial source (AuntMinnie.com) and then trains the rest of his staff. He has looked into various online CME opportunities, but costs are prohibitive. Continuing education (CE) credits for Aunt Minnie/University of California, San Diego are available for physicians, technologists, ultrasonographers, and nurses.

Laboratory technicians are also trained primarily on-the-job. Six out of 16 are certified. There are no medical technologists. Some of the younger technicians participate in distance education courses on their own. The College of American Pathology Proficiency Testing kit is used for instructional purposes and for evaluation of Clinical Laboratory Improvement Amendments compliance.

Pharmacy technicians are also trained primarily on-the-job. Beginning in Fall 2004, American Samoa and Palau will participate in a distance education pilot program for pharmacy technicians, administered by the UH in Hilo, in conjunction with the University of Alaska.

**Continuing Professional Development Programs**

**Continuing Professional Development as a Health Priority**

Most of the healthcare workforce and supervisors are eager for CE opportunities, especially those trained primarily on-the-job. Because LBJ is moving toward attaining JCAHO certification, the Board of the American Samoa Medical Authority has prioritized CE for all of their health personnel. There are currently no incentives for continuing professional development (CPD), but the Board and Hospital Administration, as well as the head of the Human Resources Department, would like to develop revised job descriptions and eventually link salaries and promotions to both job performance and participation in CPD activities. Other ideas that have been considered included mandating CPD activities in Medical Staff Bylaws or other rules and regulations. At the time of the site visit, little had been done toward achieving this goal. Ongoing efforts over several years have been directed at urging legislation to require a certain amount of CPD activities for re-licensure of physicians, nurses, dentists and other allied health providers.

The public health sector physicians are moving toward incentives by linking CME attendance to annual evaluation and pay.

**CPD Infrastructure**

LBJ supports the CME program by providing a designated CME coordinator (the current medical staff secretary), space for CME programs, and dedicated weekly time (early Wednesday morning) without clinical duties so that physicians and nurses can attend. The Hospital also provides financial support for a visiting team from Hawai‘i to give annual CME updates and has been promised $500,000 by the government to sponsor staff for off-island CE programs. The CME program recently obtained provisional Accreditation Council of Continuing Medical Education (ACCME) accreditation through the Hawai‘i Medical Association Facilities Accreditation Committee. There remain significant administrative and organizational challenges in order to maintain accreditation.
The CME program does not have its own laptop or projector and must borrow these from nursing education or other departments in the Hospital. A new library with electronic resources and workstations is under construction. Assistance is being sought to purchase a laptop, projector, two computers for the library, and to provide or subsidize online subscriptions for access to full-text journal articles. Despite installation of computer terminals in almost all offices or patient care areas, internet access remains very slow during regular work hours. After working hours, internet and e-mail are quicker, but health staff does not have ready access to computers after this time. The hospital's Information Technology (IT) Department plans to make a 4-computer lab (currently reserved for group training) available for after-hour use by health staff. There are two internet service providers in American Samoa and dial-up rates are reasonable compared to those in the Freely Associated States (Federated States of Micronesia and RMI) but access is limited by modem speed and bandwidth issues. Broadband and wireless networking was introduced in the country in August 2004, but the costs are very high and not affordable for most individuals. The Hospital IT Department is looking into options to increase bandwidth for internet and email access at LBJ. At the time of the visit, no computer in the network had PowerPoint or similar presentation software. Presentation files needed to be converted to .pps files in order to be viewed on the network.

American Samoa, like all other jurisdictions, received reference books and other materials from the University of Washington’s Pacific Island Continuing Clinical Education Program in 2001, based on a priority list made by physicians, nurses and allied health staff at each hospital. The CME chair and other physicians at LBJ are aware of these materials and able to access them; they generally feel that the materials were useful, pertinent and have improved the quality and usefulness of their medical library. Public health staff, on the other hand, were not aware of these text resources.

The CME coordinator posts flyers 1–7 days prior to CME events and also calls the different clinical departments and supervisors if a special topic or a guest speaker is presenting outside of the usual Wednesday morning conference. Nursing and other hospital staff are sometimes aware of the CME opportunities and a handful attend on a regular basis, but other allied health professionals and public health staff would benefit from improved communication. At present, public health staff are not routinely notified of hospital CME opportunities, although the public health physicians do occasionally attend. The public health physicians have started their own CME activities, where the four physicians rotate presenting to the group. Topics generally focus on non-communicable/chronic diseases because of their high prevalence.

No formal nursing CE activities are provided for the hospital nurses. Once a month, the nurses meet to receive updates from supervisors or staff who have traveled off-island for training. VTC opportunities are available for both nurses and physicians with VTC units at LBJ, Public Health, ASCC, and some of the outlying public schools; however they are rarely used. In the public health department, there are no computers for health providers to access online resources or view slideshow presentations. Most of the computers are used for administration purposes and the internet is only functional 60-90% of the time. There are a few conference rooms where public health staff conduct training, but there are no computers, internet access or projectors available for CE purposes. There is one main training coordinator for the public health nurses and the different program managers are also expected to provide continuing training for their staff.

There are no existing CPD opportunities for dental health professionals, radiology, laboratory or pharmacy personnel, rehabilitation services staff, nor for social work or mental health professionals.

**Current Continuing Professional Development Program**

The weekly Wednesday CME programs are well attended by 25–35 physicians and a small number of hospital nurses. Some of the public health physicians do attend the CME programs if they are not scheduled to work in the outlying or Manu’a clinics. As mentioned previously, this is the only structured CE program for the territory. Hospital nurses meet monthly for update sessions and public health nurses conduct their own separate in-service sessions approximately once per month with occasional special sessions. Only recently has cross-communication of CPD activities happened between LBJ and Public Health. CPD courses are not targeted toward allied health. On occasion there will be an oral health-related topic.

The hospital CME committee, led by an enthusiastic chair, meets regularly. Most of the presenters are local
physicians; about four programs per year are conducted by visiting physicians. Audio-teleconference programs occur approximately six times per year; previously emailed slideshow presentations are sometimes discussed via phone with the presenter. LBJ has a direct, consistent link with the PEACESAT system and is able to participate in VTC in Hawai‘i with some regularity (approximately once per month). Since the time difference is only one hour behind Hawai‘i there is the potential to access CME conferences from some Hawai‘i hospitals and residency programs. Visiting clinical (e.g., Benevolent Mission Program ophthalmologists) or public health specialists provide additional opportunities for CE staff. Many of these visits are not coordinated and do not necessarily coincide with the regularly scheduled Wednesday CME conference. Although the CME coordinator and the Public Health in-service coordinator attempt to notify relevant personnel about additional presentations, clinical staff are often not able to attend activities outside of the Wednesday morning sessions due to their workload.

The CME chair acknowledges that the quality of the local CME presentations should be improved and more evidence-based. The CME committee conducts an annual survey of physicians regarding desired topics and the evaluation form asks for suggested topics. There are plans to establish a CME schedule with topics and objectives for each month. All speakers are required to submit learning objectives and five questions that are used for a post-test. Participants must score at least 60% to receive credit for the CME session. Results are recorded by the CME coordinator.

The American Samoa Government has promised $500,000 to support off-island CE opportunities for health staff of LBJ, but the money is forthcoming. Some physicians and nurses are not aware of the process of applying for this support. The dental staff says that approximately 90% of their requests are approved whereas radiology and laboratory requests are seldom funded. Some physicians desire actual training and certification (e.g., U.S. residency training programs) but are not sure how to go about applying for such programs or governmental subsidy. Personnel who attend off-island training are expected to give a presentation to their colleagues upon their return.

Several barriers to CPD activities were identified. The promotion and pay structures do not include incentives for CPD activities. Staff felt that insufficient notice is given when visiting specialists make presentations. They feel that health workers are not familiar with and have limited access to online CPD resources. Internet speed and access are limited. In general, available CE content was felt to be relevant, but often the method of presentation was not effective for learning or not culturally appropriate. Distance to off-island CPD opportunities was felt to be prohibitive. It was felt that too little CE resources were available for nurses and other allied health professionals. Public health staff believe there is no central coordination and that their providers are not aware of online CPD resources.

In general, there is a large CPD and basic training need for the technicians in laboratory, pharmacy and radiology. As mentioned earlier, many of the technicians are trained on-the-job with little previous formal training.

**Priority Continuing Professional Development Needs**

Key informant and medical records data suggest that non-communicable diseases, especially diabetes and associated conditions such as coronary artery disease, heart failure, hypertension, chronic renal failure and obesity, are the most common disease conditions in American Samoa. In 2001, heart disease was the leading cause of death, followed by cancer, diabetes, stroke and accidents. Almost 80% of the hospital budget is spent on these chronic illnesses and both LBJ and Public Health feel management strongly that education for healthcare providers and the public must be directed toward primary and secondary prevention of these “lifestyle” diseases. Rheumatic fever and childhood caries were also noted to be highly prevalent. Based on December 2003 requests, physicians also desire training on basic pharmacology of anesthesia (especially regarding intubation and sedation), otitis media, appropriate antibiotic usage, seizure treatment, diabetes topics, including management of diabetic ketoacidosis and hyperosmolar state, pulmonary embolism, basic radiology and computed tomography.

Nursing supervisors at LBJ, Public Health and the ASCC also identified a large need for preparatory materials so that more of their nurses can pass the national licensing exams. This includes materials for board preparation, access to computers, updated CD-ROMs as well as protected and mentored time to take practice exams. They also identified a large need for managerial and supervisory skills for all of the nurse supervisors and program managers.
Public health also identified a strong need for CE for their health Educators. Currently, their health educators are not necessarily nurses and may have only an interest in the field without the formal training needed to update knowledge and skills in health education. The health educators not only educate the public, but are also looked upon as resource staff by other health professionals in the Department of Public Health. Public Health would also like examples of “Best Practices” so that they might adapt some specifically for the needs of American Samoa.

In general, there is a large CPD and basic training need for the technicians in laboratory, pharmacy and radiology. As mentioned earlier, many technicians are trained on-the-job with little previous formal training. The hospital administration is very excited to have the opportunity to pilot the distance education program for their pharmacy technicians. Laboratory has an acute need for training in general microbiology and parasitology due to upcoming staff retirements. Radiology department priorities include: formal CE training (especially for computed tomography), access to online resources or funding for off-island conferences, developing a credentialing process for the technicians and ultrasonographers, and instituting quality assurance assessments. The ability to participate in CE is limited by the staffing shortage.

For dental providers (dentists, hygienists and technicians), there is a need for standardized policies and procedures, and to establish standards of care. They also would like physicians and nurses in the pediatrics clinic and the emergency department to receive training in applying fluoride varnishes to the children. Because dental caries, gum disease and nutrition-related diseases are so common, nutrition and dental health education is also a high priority area for all who perform direct patient care.

Potential Collaboration

ASCC is willing to discuss with LBJ and Public Health arranging a special course for existing health providers on basic computer skills (word processing, presentation software, spreadsheet software, and internet use), since they already offer such courses. Similarly, ASCC provides training in human resources, management and administration, which were identified as high priority areas for Public Health and for some departments at LBJ. The main operations of the VTC equipment connecting eight rural schools (including in the Manu’a group) are located on the main ASCC campus. ASCC has just become part of an important collaborative project regarding cancer control and is willing to assist health providers in CE activities. Conceivably, a well-coordinated VTC session broadcast from LBJ, Hawai’i or elsewhere, could be simultaneously broadcast to the main Public Health conference room, ASCC main campus and the eight outlying schools (to which the health providers in the rural areas could easily drive or walk).

Because there are VTC systems at both Public Health and LBJ, it would appear possible for Nursing to do joint training (Public Health and LBJ) for topics that are relevant to all nurses. Additionally, the main Public Health clinic is directly across the street from LBJ, so many of the nurses could attend in person.

Distance Education Technologies

Existing Technology

American Samoa has one of the most complete and modern telecommunication systems in the U.S. Affiliated Pacific Islands (USAPI) jurisdictions. All inhabited islands have telephone connectivity. High quality voice and data service Integrated Services Digital Networking (ISDN, T1) is available as well as telex, telegram and facsimile services. The use of PEACESAT for VTC was discussed above. The launch of a commercial satellite-based communications system in 2001 has resulted in increased telemedicine and VTC capabilities being available to the hospital, the Department of Education and other agencies. The territory received GSM-1900 mobile service in July 1999.

Despite the recent implementation of an electronic health record (EHR) system (an open source version of the U.S. Veterans Affairs VistA program) at the LBJ Tropical Medical Center with the potential for internet access on each networked workstation and the installation of a 4-computer lab, barriers still exist in making these resources more available to Hospital and Public Health staff. The Management Information Systems (MIS) Department at the Hospital is faced with the priority of training all Hospital staff to use the EHR system correctly.

The Management Information Systems (MIS) Department at the Hospital is faced with the priority of training all Hospital staff to use the EHR system correctly.
Barriers to Accessing Available Technologies

limited bandwidth remain challenges. There are plans to hold regular classes to train health providers to use web-based resources. In general, staff have expressed strong interest in medical informatics.

In May 2004, several CME sessions (attended by 10-15 providers, mostly physicians) provided hands-on training for accessing online medical information resources. In August 2004, several live CME presentations were provided and a CD-ROM of the presentations was given to the MIS Department to install on the local network. A new hospital library is being built and funds are being sought for two desktop computers. The intent is for library resources, including a variety of electronic equipment and a total of three to four workstations, to be accessible 24 hours per day to health providers. It is not clear whether public health staff will also be able to utilize the resources at LBJ when the library is fully operational.

For the Public Health staff, basic telecommunications (local and long-distance phone and fax) are usually reliable, but computer, email and internet are accessible to Administration only. The outlying clinics are even more resource-limited and are afflicted by occasional power outages.

Nursing access to the internet is limited. According to nurse trainers and supervisors, there currently is little opportunity or incentive for nursing CE, hence many of the nursing workforce do not appear to be pursuing distance education opportunities for CE credit.

Distance Education Resources Currently In Use

Some physicians, nurses, dentists and dental assistants use their own computers to access online CME or web-based literature searches. At the time of the needs assessment, there was no formal/group access to online full-text databases. Audio-teleconferences, either with or without accompanying PowerPoint presentations are used approximately six times per year. VTC opportunities are more numerous, but attendance is variable if they take place anytime other than the standing Wednesday morning CME conference. Tripler Army Medical Center’s store-and-forward program is no longer being utilized (for consultation regarding potential off-island referrals to Tripler), in part because of decreased capacity to accept referrals from the USAPI (due to deployment of many of the staff).

Barriers to Accessing Available Technologies

LBJ has great potential for overcoming most of their barriers (internet speed), as most of them are administrative issues (policies, more security, and training). Public Health does have at least one computer in each clinic, but they are not networked, nor do they have internet access. VTC is widely available, including in the rural areas (through the Department of Education network), but under-utilized. In general, all health providers require more training using distance education modalities. Importantly, there needs to be incentive for healthcare providers to utilize the many resources available to them.

There are no incentives for CPD for any health personnel, but efforts are being made to push legislation, as well as to change job descriptions and other Human Resource issues at the hospital and for the public health physicians.

Summary

There are no incentives for CPD for any health personnel, but efforts are being made to push legislation, as well as to change job descriptions and other Human Resource issues at the Hospital and for the Public Health physicians. The current CME program at the LBJ hospital is U.S. accredited but still faces significant administrative challenges to maintain full accreditation. The current program does not target allied health, nursing or dental personnel, but some nurses and dentists do attend relevant sessions. CE programs for LBJ and public health nursing are currently completely separate, although fledgling efforts are being made to communicate better between the two entities for all training activities.

American Samoa is fortunate to have an integrated EHR system in the Hospital and reliable video-teleconferencing capabilities for the Hospital, Public Health and Department of Education (including rural schools). The computer supply at LBJ is adequate, although there are still issues with accessibility and training. Internet access is still slow at the Hospital and throughout the country. Public health is challenged with little or no computers for training, no internet access and no formal program. The CME committee at the Hospital and all key informants who participated in the assessment are enthusiastic and hopeful that PACT will be able to meet some of their needs for CPD.

Acknowledgements

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References


13 years ago in Pacific Health Dialog, S. Vete stated that, “AIDS has not raised any new issues for the church to deal with. What it has done is to highlight all the issues which the church has in the past chosen to ignore.” PHD, 1995;2(2):135.
Commonwealth of the Northern Marianas Assessment for a Continuing Health Care Professional Development Program

Tai-Ho Chen, MD*
Peter Untalan**
Gregory G. Maskarinec, PhD*

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa; **Former Deputy Director of Public Health, CNMI, and PACT Advisory Board member. Address correspondence and reprint requests to: Gregory G. Maskarinec, PhD, Department of Family Medicine and Community Health, University of Hawai‘i at Manoa, John A. Burns School of Medicine, 95-390 Kuahelani Avenue, Mililani, Hawai‘i 96789-1192; gregorym@hawaii.edu.

Abstract
In 2003, the University of Hawai‘i Department of Family Medicine and Community Health entered a four-year cooperative agreement with the U.S. Health Resources and Services Administration to establish the “Pacific Association for Clinical Training” (PACT). PACT’s goal is to develop effective distance education methods to improve the education and skills of healthcare professionals in the U.S.-Affiliated Pacific Island Nations. To determine the situation existing in 2004, one of PACT’s first projects was to perform site visits to each jurisdiction, conducting needs assessments through interviews with key healthcare professionals, hospital administrators, and government officials. This article highlights findings of PACT’s Assessment of the Commonwealth of the Northern Mariana Islands (CNMI). Meant to establish a baseline for future reference, all data were that collected in 2004/2005 and have not been updated.

Key words: Commonwealth of the Northern Mariana Islands; Clinical Training; Workforce Development; Distance Education. (PHD 2007 Vol 14 No 1 pp 39-45)

Introduction
This report was compiled from written surveys of key health administrators and personnel in conjunction with interviews and site visits performed by Drs. Tai-Ho Chen and Gregory Maskarinec in April 2004. Additional information was obtained through ongoing communications with “Pacific Association for Clinical Training” (PACT) partners on the Commonwealth of the Northern Mariana Islands (CNMI). Discussion at the November 2004 PACT Advisory Meeting provided additional information on recent activities. The report has been reviewed and revised by the Advisory Board members from CNMI.

The CNMI is comprised of 14 islands with an estimated (in 2004) population of 78,252. Most residents live on the island of Saipan, which is about 12.5 miles long and 5.5 miles wide and has a total land area of 46.5 square miles. The population is served by the Commonwealth Health Center and private medical and dental clinics, with most care provided through the government. There are health centers on both Tinian and Rota.3,53

Health Workforce Demographics
The CNMI has 30 physicians, 226 nurses, 10 midwives, eight dentists, nine dental assistants, seven laboratory staff, eight pharmacists or pharmacy technicians, two radiology technicians, and 14 other (dieticians, health inspectors, rehab or mental health) healthcare professionals.

Health Workforce Training
The issue of primary training has been an area of recent focus in CNMI. As part of an overall workforce development plan under the newly developed Area Health Education Center (AHEC) program, school programs have been developed to draw students to health careers. Healthcare staff have been providing instruction at Northern Marianas College (NMC), logging their hours in an in-kind “trust-fund” that will enable health staff to take NMC courses without charge. The apprenticeship model of training is being more fully explored to draw more new workers into the field.

Physicians are trained in the U.S. or Canada, and except for two doctors from Saipan who returned after U.S. training, are expatriates.
NMC has a 2-year associate degree program for nurses. There are presently five U.S. trained faculty and 27 students in the program. There are 23 graduates of whom 12 have taken the National Council Licensure Examination (NCLEX); nine passed and three failed. Nursing students come from throughout the world and only one local nursing student has passed the NCLEX in the past 3 years. Thirty-two potential students are in the application process to enter the program. The hospital nursing managers feel that local graduates would benefit from assistance in passing the NCLEX certification. Without this certification they cannot work at the hospital.

The Community Health Center (CHC) has nurses who are NMC graduates and also a significant number of expatriate nurses from the Philippines and some from Canada, Australia and New Zealand. Nurses from the Philippines have been noted to have widely varying skill and experience levels. CHC will not hire expatriate nurses unless they have 2 years of experience. Local nurses are exempt from this requirement.

Based on the 2004 Pacific Basin Dental Association Oral Health Needs Assessment, there are four dentists and nine dental assistants, two lab technicians and one dental hygienist who work in the government dental clinic. There are an additional four dentists in the private sector in Saipan. Only U.S.-licensed dentists can practice in CNMI. The position of Chief of Dental Health has been vacant.

Pharmacy staff in CNMI are comprised of nine U.S. and Canadian-licensed pharmacists and 26 pharmacy technicians, of whom two each are on Tinian and Rota. Most of these technicians were trained in the Philippines as "pharmacy specialists" with more training than U.S. pharmacy technicians.

There are six licensed medical technologists in the laboratory who are required to have U.S. licensure and American Society for Clinical Pathology (ASCP) or American Medical Technologist (AMT) certification and 2 years of work experience. There are also two technicians who have 2-year degrees, plus six locally trained phlebotomists. Two of the phlebotomists were successfully trained and recruited through the Government’s Workforce Development Agency.

The Community Guidance Center has two Bachelor-level and five Master-level clinicians. There are three substance abuse professionals; two Clinical Psychologists (PhD); two Psychiatrists (MD); and four mental health social workers.

The Director of Radiology notes that it has been challenging recruiting radiology techs from the U.S. owing to the high demand for these services, particularly in fields such as echocardiography. As a result, many technicians are multi-specialty staff, hired from other countries, who are not U.S. certified. There is a plan to train local ultrasound technicians on Tinian and Rota through periodic on-site training visits.

Current Continuing Professional Development Programs

Recently, there have been significant discussions of healthcare priorities in CNMI with a clear focus on human resource development. The need for primary and continuing training has been highlighted and addressed. Strong partnerships have been established between Public Health, the Governor’s Office, public schools, NMC, the Nursing board, business community, as well as with the general public. A newly created AHEC program has been tasked with health workforce training and development. CNMI has made a firm commitment to use government funds to support the core training mission rather than relying exclusively on external grant funding. Externally-funded continuing professional development (CPD) programs, such as PACT and Bioterrorism Programs, will function under the direction of the AHEC program in order to provide services that are part of a cohesive overall workforce development plan.

Physicians

There is a regular weekly continuing medical education (CME) program taught by the medical staff. In addition, visiting specialists provide continuing education (CE) programs while they are on-island. CHC staff expressed interest in obtaining Accreditation Council for Continuing Medical Education (ACCME) certification for the CME program.

The hospital has occasionally participated in video teleconference training sessions, but this has not been used regularly due to the expense of the connection and challenges in coordinating the feed to the hospital through the Department of Education.

Although there is no hospital librarian, there is a collection of selected journals available to staff.
Nursing
Nurses are required by the CNMI Board of Nursing to maintain 30 credit hours of CE every 2 years for relicensure. A CE program is taught every Wednesday by one of the nursing supervisors who is also Chair of the CNMI Board of Nursing. Attendance tends to be poor as few nurses are consistent in maintaining ongoing CE hours.

Nursing faculty at the college use free online resources to maintain their CE requirements. Two years ago a visiting team from the University of Pittsburgh gave an endoscopy workshop that provided 16 hours of CE credit.

CHC has recently instituted a hemodialysis training program to meet their needs for nurses in this field.

Oral Health
Based on the 2004 Pacific Basin Dental Association Oral Health Needs Assessment, there are four dentists and nine dental assistants, two lab techs and one hygienist who work in the government dental clinic. There are an additional four dentists in the private sector in Saipan. Only U.S. licensed dentists can practice in CNMI. There are adequate textbook resources, but inadequate journal resources available to the staff. Journals and texts are the preferred mode of receiving oral health CE in CNMI. There are no CE requirements and no regular CE programs for oral health staff. Recognizing that dental assistants should be a target group for receiving training, CNMI is about to initiate a training program using the Republic of the Marshall Islands model with assistance from the World Health Organization.

Allied Health
CE for radiology staff is a challenge since many of the staff have visa difficulties when traveling to the U.S. to attend conferences. The Unit Director sees significant potential for online CE.

The Unit Director sees significant potential for online CE.

Mental Health
Treatment team meetings are held twice a week for all clinicians to attend. During these meetings, cases are presented and a case analysis is done with input from all clinicians. New treatment modalities are discussed during these treatment team meetings. In addition, there is a monthly 2-hour clinical in-service program where all the clinicians from the Community Guidance Center, Tinian Health Center and those in private practice get together for clinical in-service. A clinician is assigned in advance to present during these in-service trainings as part of the peer education program. Plans are in the works to have these in-services sanctioned by the Office of Personnel Management. The Community Guidance Center is also looking into having these meetings count towards CE credits.

Priority Continuing Professional Development Needs
The staff at CHC presented the following overall priorities to our on-site assessment team:

1) Access to continuously available health training and information sources, including internet resources;
2) Advanced Cardiac Life Support (ACLS) training;
3) Applying for American Medical Association Category 1 CME Certification for local CE programs.

With regard to ACLS training, equipment has been budgeted from the PACT Year-1 budget and a recent U.S. Centers for Disease Control and Prevention (CDC) Training Program certified a small number of ACLS providers in CNMI. More information is required on the
availability of ACLS instructor training, either through the Guam Memorial Hospital Authority or elsewhere.

In support of the overall human resource development plan under the new AHEC program, grant-writing skills, program management and data collection/review were noted as important needs.

In addition to these priority areas, other needs were elicited in interviews with the unit directors.

Specialty nursing certification exams are not held in the region, requiring travel to Hawai‘i or the U.S. mainland. The college nursing faculty noted two key areas of training to be nurse leadership/administrative skills and diabetes care. The specific needs for nurses in both the hospital and Public Health areas include the following:

1. Refresher Course on RN Assessment Skills – the basic head-to-toe assessment, recognizing normal and abnormal heart and lung sounds, active bowel sounds, and neurological exam, etc. Nurses need to know how to do these assessments properly because they are part of day-to-day patient care.

2. Pharmacology Review – drug interactions, dosage calculations, familiarization of drug formulary for medications use at CHC and/or public health clinics.

3. Basic EEG – basic physiology and interpretations, and common interventions.

4. Basic Life Support (BLS) & ACLS – train the trainer. Staff are needed who can teach BLS & ACLS to all the nursing/medical staff, several times in the year.

5. Chemotherapy Training – for initial training/certification and recertification. Only two nurses (RNs) on staff have received chemotherapy training in Hawai‘i in the mid-90s. Neither went back for recertification. Other RNs need to be trained, with the hope that all RNs can be certified to properly administer chemotherapy. Back-up staff are also needed for continuity of services, in case the two certified RNs should be unavailable.

6. EEG Technician Training – for initial training/certification and recertification. There is only one EEG technician on staff who received EEG training in Hawai‘i in the mid-90s; she never went back for an update. Other staff need to be trained for back-up and continuity of services.

7. Fetal Monitoring Skills are especially important for nurses who work in Labor & Delivery, the Obstetrics Unit, and possibly for nurses in Outpatient Clinics who conduct prenatal care visits.

8. Assertiveness and Communication Skills

9. Critical Thinking Skills

10. CHC needs someone with experience in CE for nurses, and to assist in revitalizing the CE program for the Nurses Department. There is a desire to set up a program where nurses can be required to take CE classes annually that are specific to their area of work or specialty. For example, nurses in Labor and Delivery must take classes related to high-risk pregnancies, and contraceptives, etc. Also, it would be useful to have a program where a CE Needs Assessment can be conducted with the nurses (use questionnaires that will be given to nurses and then sent out for analysis) so that the CE programs can be updated based on the nurses, stated needs.

11. A new computer system should be assigned for CE, including software for CE programs that nurses can use for independent studies. The goal is to have all nurses on board be NCLEX-RN-licensed; therefore NCLEX-RN review programs would be a start.

The Lab Director thinks his staff would benefit from phlebotomy training models, materials and supplies as well as online and CD-ROM resources that could be shared throughout the region.

The Radiology Director believes his staff would benefit from phlebotomy training models, materials and supplies as well as online and CD-ROM resources that could be shared throughout the region. According to the Director, the Department is short-staffed and would ideally have an additional four licensed technologists and another technician.
It is well known that CE is a basic component of staff development and building job interest and proficiency. There are numerous sources available to U.S.-trained technologists through U.S. registering bodies and associations (i.e., American Registry of Radiologic Technologists [ARRT], American Society of Radiologic Technologists [ASRT], American Registry For Diagnostic Medical Sonography [ARDMS], Society of Diagnostic Medical Sonography [SDMS]), however, these groups have minimum training/registry requirements for membership that most of the non-U.S. trained technicians do not possess. Although these are good sources for CE for the U.S.-trained staff in the Radiology Department, there is little opportunity for the remainder of the staff to acquire this educational source.

Online access to job-specific CE should be available that would not require membership by the individual, or could be supplemented by the provider to include the “unregistered” staff as a part of the targeted group.

Access to online journals could be an option since the publications tend to focus on everyday clinical encounters as well as new technologies. Many home study courses are good sources of CE and, as in the case of the specialty field of mammography, proof of at least 24 hours of CE is required for all personnel performing mammograms (whether they are U.S. trained or not) due to the FDA’s, Mammography Quality Standards Act (MQSA) regulations. These courses generally require a fee, but are easily acquired through the home study process.

Potential Collaboration

The new AHEC program will serve as a focus for health worker training and development. PACT activities will be coordinated to help meet priorities within the scope of an integrated development plan. This model may have great potential to be applied in other jurisdictions but will require significant legislative and community support to establish the broad coalitions and priorities that have driven the process in CNMI.

The Laboratory Director, Albert Gurasamy, is very interested in working with regional training initiatives and feels that CHC has the resources to host some local training through programs like the Palau AHEC.

The CHC lab is also participating with a Pacific Island Health Officers Association (PIHOA)/CDC sponsored initiative to evaluate the centralization of certain esoteric infectious disease testing at a central facility in Guam. As part of this program, the lab is also being challenged to be active in testing for common diseases in the community and the region. The lab is trying to obtain some personnel training resources and is also willing to provide some training resources to other labs in the region and is currently waiting for direction and coordination from the PIHOA group.

Lois Gage, Director of Nursing at NMC, notes that there are significant needs faced by her faculty in maintaining specialty certifications. Their students may benefit from additional review courses directed at passing the NCLEX certification exam. Improving computer and software resources might supplement and strengthen their existing NCLEX review courses.

Distance Education Technologies

Presently, there is limited video teleconferencing capability for the hospital using a video feed through the Public School System. The Pan-Pacific Education and Communication Experiments by Satellite (PEACESAT) station has not been functional for several years.

Internet access is available to doctors as well as pharmacy and radiology staff. Physicians only have access to one computer in the hospital with an internet-connection. Other groups have limited computer and internet resources. Nurses do not have the use of an internet connected computer at CHC. There are no repair contracts for existing equipment. One hospital staff member is responsible for all IT support and development.

Limitations

Some respondents had difficulty ranking or prioritizing the various barriers or content areas. This occurred for several reasons: varying exposure or access to the different types of information, varying educational backgrounds, and varied job duties; however, all uniformly agreed that additional training was essential for better healthcare.

No attempt was made to include health personnel on Tinian and Rota in the survey; hence their needs may not be addressed. Overall, no assessment was attempted to determine how many or what kind of health professionals are needed in the future to maintain and improve healthcare services in the CNMI.

Finally, the situation is a dynamic one; consequently,
Summary
CNMI has taken significant steps to meet their short- and long-term human resource needs through developing a cohesive plan to be implemented under a new AHEC program. There are primary and continuing training components of this plan. Local CPD coordinators will work under the AHEC program which will coordinate the activities of PACT and other externally funded educational programs to meet specific needs within the overall health workforce development plan.

The CHC lab has also successfully recruited and hired four additional technologists to complement existing staff. The staffing in the lab currently is adequate for hospital needs and consists of 12 lab technologists, five phlebotomists and clerical/support staff.

CNMI has physicians who are licensed in the U.S. and Canada and require regular certification to maintain their licenses. Nurses are also required to have passed the NCLEX certification exam and to maintain CE credits for licensure.

There are regular CE programs taught locally for both physicians and nurses. Nursing staff note that attendance has been inconsistent. There has been occasional use of video teleconferencing, but this has not received heavy use recently.

In general, doctors have access to internet resources, although there is only one general use terminal in the hospital. Nurses presently do not have any internet-enabled terminals available for general use. Other allied health staff do have access to computers and the internet and feel that they could benefit significantly from computer-based training.

In the short term, PACT should focus first on addressing the very practical requests made by the CHC staff regarding their priority needs; increased access to online information resources, developing capacity for local ACLS training and attaining ACCME accreditation for local CME programs. The CPD Coordinator has shown the ability to facilitate previous educational programs and would likely benefit from training to use the electronic course management system to track participation and to assist local staff in accessing this resource.

Specialized online and CD-ROM training resources could benefit laboratory and radiology staff. These resources should be added to the PACT curricular library for the region. Beyond these short-term objectives, PACT should remain responsive to the requests of the CNMI AHEC program to assist with workforce development as part of an overall human resource development plan that has been driven by a broad partnership of community groups, health services, government, and educators. The model of this program may be applicable to other jurisdictions within the region.

Acknowledgements
The authors gratefully thank the following individuals for their considerable assistance in preparing this report, all of whom have tried their best to provide accurate information. Drs. Chen and Maskarinec are alone responsible for any errors that remain. We wish to thank: John Tagabuel, Acting Director of Public Health, Environmental Health; Edward Camacho, Deputy Environmental Health Officer; Pasquana Clavo, Acting Director of Nursing; Rosa Tudela, Nurse Unit Manager, Chair of CNMI Board of Nursing; Anthony Raho, Director of Pharmacy; Del Lieto, PACT CPD Coordinator, Breast/Cervical CA Case Management Coordinator; Dan Harding, Radiology Manager (ARDMS registered ultrasonographer); Dr. Norma Ada, former PACT Advisory Board member, Internist/Pediatrician; Albert Gurasamy, Lab Director, brother of Ruth Gurasamy from Guam; Richard Brostrom, MD/MSPH, Medical Director of Dept of Public Health Services; Frank Palacios, CHC IT Director; Lois Gage, RN, Director of the Nursing Program at Northern Marinas College; Robert Suzuki, Northern Marinas College (former PEACESAT station manager); and Laticia Lochabay, CNM/RN/NP Nurse Manager of Public Health, for their participation in this study.

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References


Guam Assessment for a Continuing Health Care Professional Development Program

Tai-Ho Chen, MD *
Lee E. Buenconsejo-Lum, MD *
Janice L.S. Yatar, RN **
Laurent Duenas, BSN, MPH, RN-CAN ***
Gregory G. Maskarinec, PhD *

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa; 
**Assistant Administrator, Bureau of Family Health and Nursing Services, Guam; 
***H-Latte Director, University of Guam, President, American Pacific Nursing Leaders Council, and PACT Advisory Board member. Address correspondence and reprint requests to: Gregory G. Maskarinec, PhD, Department of Family Medicine and Community Health, University of Hawai‘i at Manoa, John A. Burns School of Medicine, 95-390 Kuahelani Avenue, Mililani, Hawai‘i 96789-1192; gregorym@hawaii.edu.

Abstract
In 2003, the University of Hawai‘i (UH) Department of Family Medicine and Community Health entered a 4-year cooperative agreement with the U.S. Health Resources and Services Administration to establish the “Pacific Association for Clinical Training” (PACT). PACT’s goal is to develop effective distance education methods to improve the education and skills of healthcare professionals in the U.S.-Affiliated Pacific Island nations. To determine the situation existing in 2004, one of PACT’s first projects was to perform site visits to each jurisdiction, conducting needs assessments through interviews with key healthcare professionals, hospital administrators, and government officials. This article highlights findings of PACT’s Guam Assessment. Meant to establish a baseline for future reference, all data are those collected in 2004/2005 and have not been updated.

Key words: Guam; Clinical Training; Workforce Development; Distance Education. (PHD 2007 Vol 14 No 1 pp 46-52)

Introduction
This report was compiled from written surveys of key health administrators and personnel in conjunction with interviews and site visits performed by Drs. Tai-Ho Chen and Gregory Maskarinec in April 2004. A draft of this report was reviewed at the November 2004 Pacific Association for Clinical Training (PACT) Advisory Board meeting and the report was revised by the Advisory Board members from Guam. Additional information was obtained through ongoing communications with PACT partners on Guam.

Guam is an unincorporated territory of the United States with an estimated 2004 population of 166,090 living on the largest and southernmost island of the Mariana Islands archipelago. The island has an area of 212 square miles. The population is comprised of persons of Chinese, Japanese and Korean descent. Life expectancy is 78 years and infant mortality is 7.15 deaths per 1,000 live births. The estimated income per capita is $21,000, the highest in the United States Affiliated Pacific Islands (USAPI) region.¹ There is one public hospital and one military hospital on Guam.²

Health Workforce Demographics
The Guam Memorial Hospital Authority (GMHA) is the only civilian hospital on Guam, which serves the public sector. The U.S. Naval Hospital primarily serves the military population. There are two community health centers (one in northern and one in southern Guam), one public health (MCH and CDC)/dental clinic and social services (in central Guam) and a satellite site in the northern community health center. There are numerous private medical and dental clinics on Guam.³

Guam has 280 physicians, 609 (111 off-island) licensed professional nurses (NP, RN, and retirees), 126 licensed practical nurses (15 off-island), 5 midwives, 53 DDS/DO, 187 dental assistants, 10 extenders (health assistants, medex, and community health workers), 28 laboratory staff, 8 pharmacists or pharmacy technicians, 18 radiology techs, and 12 other (dieticians, health inspectors, rehabilitation/occupational therapist or mental health) healthcare professionals.⁴

Health Workforce Training
Physicians on Guam are required to have at least 1
year of U.S. Accreditation Council for Graduate Medical Education approved post-graduate training to qualify for a license.

The University of Guam (UOG) offers nursing, social work and related health science education. The nursing program provides undergraduate education in nursing. Graduates are eligible to take the registered nurse licensing examination. Students are eligible to take the nursing assistant certification examination after their sophomore nursing courses and the practical nursing licensing examination after their junior nursing courses. Training is also provided for clinical faculty and student preceptors. Faculty and students conduct research and other activities to increase their body of nursing knowledge and also provide community service in Guam and the region. The faculty provide and also collaborate with the Guam Nurses Association to offer continuing education (CE) to the nursing community. CE is provided based on identified educational needs and availability of resources. Educational and training needs surveys are conducted every 2 years and during the American Pacific Nursing Leaders Council (APNLC) conference. Several faculty have offered CE via Pan-Pacific Education and Communication Experiments by Satellite (PEACESAT) to island jurisdictions. One such experience is the modular community health course, which combined the use of the satellite PEACESAT sessions and sending documents by mail. Other CE courses include leadership, health assessment and pathophysiology classes. Currently, these services are offered as resources permit. The last PEACESAT session with nursing faculty was an update on the jurisdictions’ implementation of their HIV programs.

Guam Community College (GCC) offers nursing assistant and medical assistant education courses. Graduates are eligible to take the nursing assistant certification examination after completing 11 credits in approximately 6 months. The college also offers an 18-month certificate program and a 2-year Associate’s degree for the medical assistant program. Graduates are eligible to take the national certified medical assistant examination after completing one of the tracks. CE is offered to nursing assistants and medical assistants in the community on an as needed basis.

The Guam Nurses Association offers CE hours to all nurses and nursing assistants through the Center for Nursing Education and Testing (C-NET) program on a quarterly basis.

Most GMHA specialty nurses working in the NICU (Neonatal Intensive Care Unit), PICU (Pediatric ICU) and the operating room have had little formal structured training, but have rather been trained on-the-job. The clinical training component is felt to be strong, but administrators feel that these nurses would benefit from a stronger, formal didactic program. Other fields, such as chemotherapy, were highlighted as requiring more specialty training opportunities.

Guam Naval Hospital offers opportunities for the civilian healthcare staff to participate in some training programs, but space is limited.

Current Continuing Professional Development Activities
Nurses, Physicians and Oral Health Staff

Guam requires 15 CE hours for nurses every 2 years. Physicians are required to complete 100 CE hours every 2 years of which half must be category 1. The Guam Medical Society incorporates a monthly continuing medical education (CME) presentation open to all physicians immediately prior to its monthly members’ meeting. Dentists are required to earn 75 hours of CE every 2 years in order to renew their Guam dental licenses. Of the 75 hours, 20 hours must be earned on-island. The on-island courses must be approved by the Guam Board of Dental Examiners. The Guam Board of Dental Examiners approves the Guam Dental Society meetings/courses. The Guam Dental Society has a strong CE component for dentists. Other dental personnel are not required to earn CE contact hours but are encouraged to be at least certified in CPR. Guam has adequate numbers of journals and provides in-services for dental assistants.

GMHA has an active CME coordinator who manages a number of ongoing activities. There is a weekly video teleconference CME session from Hawai’i that is broadcast through an Integrated Services Digital Network (ISDN) connection. The quality of the connection is good, but the cost to the hospital is $200 per hour. Attendance is not very high and it has been an ongoing challenge for the coordinator to improve attendance. Timing of programs is likely a factor and it
was felt that distance education programs that could be completed simultaneously might be helpful. There was some disruption to this service in the aftermath of the typhoon in August 2004. The CME coordinator is able to obtain journal articles from the UOG or U.S. Naval libraries for physicians upon request.

There is an active coordination between GMHA and Department of Public Health and Social Services-Bureau of Family Health and Nursing Services (DPHSS-BFHNS) CE coordinators. Training opportunities provided at the hospital are distributed to all regions in DPHSS-BFHNS. In addition, training opportunities provided at DPHSS-BFHNS are coordinated with GMHA for the staff to receive CE hours and to provide a speaker for the GHMA’s grand rounds session.

UOG’s School of Nursing, Social Work and Health Sciences continues to offer National Council Licensure Examination (NCLEX) RN review courses at the end of the spring and fall semesters when resources permit. In addition, in order to increase the capacity of the RN workforce to produce evidence to support their practice in a unique setting, a nursing research training project was implemented starting December 5, 2004, culminating in a research conference in November 2005. This is a collaborative effort between the UOG and the Guam Nursing Association’s Commission on Nursing Leadership.

Commencing FY 2003, the Department of Education provides CE contact hours for the school health counselors once a year at their health education conference. This is a collaborative effort between the school health counselors and the Guam Nurses Association.

Beginning in Fall 2005, the GCC commenced a Licensed Practical Nursing (LPN) Certificate Program based on the community’s needs. GCC offers an 18-month certificate program. Graduates are eligible to take the licensed practical nurse examination after successfully completing the courses.

As noted above, Guam Naval Hospital offers opportunities for the civilian health staff to participate in some training programs, but space is limited.

**Allied Health**

Many allied health staff do not have any structured CE opportunities in their specialty field. Radiology technicians require 24 hours biannually, half Class A (directly related to the specialty) and half can be more general Class B credit. Some of this training is done through using enduring materials but some specialties like mammography require off-island continuing training. Pharmacy staff typically use free online journals in order to maintain their certifications. Dietetic staff must leave Guam for their CE needs to maintain certification. Laboratory staff previously had routine CE programs but these are not presently active.

Unlike most healthcare markets in the United States, private vendors do not play a significant role in providing continuing training opportunities for allied health workers in Guam.

**Public Health**

CE activities are offered Friday afternoons; these are usually lectures given by local staff and experts. Activities offered at other times are not well attended due to staffing shortages and the resulting heavy workload. Few sessions are given by outside consultants. There is very limited use of other continuing professional development (CPD) modalities such as audio/video-teleconferencing or computer-based training. The public health nursing outreach CE program is hindered by lack of equipment, such as a laptop and VGA projector.

**Priority Continuing Professional Development Needs Nursing**

There are approximately 25 unfilled LPN positions at the hospital and four at DPHSS causing a nursing shortage; this does not include the vacancies in other government agencies and the private sector. GCC and the GMHA have created LPN Certificate Programs to address the island-wide nursing shortage. In addition, the RN vacancy rates throughout the government agencies ranges between 25-50%. The UOG is producing nursing graduates but not enough to meet the needs of the community. Additionally, specialty nursing certification in fields such as chemotherapy is required. There are adequate clinical preceptors, but a lack of formal didactic training opportunities to complement the clinical training opportunities.

Nurses with experience teaching in Micronesia have suggested incorporating the local expertise of nurses in the region into continuing training activities. There is a need to teach skills that support the ability of
local nurses in the region to pass on their knowledge and experience. Often local CE providers are not as valued as outside consultants. It was suggested that clinical faculty appointments with outside educational institutions such as the UH would provide added prestige to local experts.

**Oral Health**

Overall it was felt that there was not enough CE for oral health providers. The School Oral Health Prevention Program that applied sealants to children’s teeth was discontinued due to lack of funding. The need for increased attention to early childhood oral health with a focus on prevention was noted. The DPHSS Dental Section implemented the Guam Fluoride Vanishing Program as of August 2004. The program is geared towards children under 5 years old. Fluoride varnish has been proven to be a safe and effective way of preventing tooth decay. It has been shown that by the time children attend school, they have already experienced dental decay. Fluoride varnish is recommended as soon as the teeth erupt. Children enrolled in Headstart, receiving immunizations, under the Women, Infants and Children (WIC) Program, and children seen in the Well Child Clinics are eligible for the program. There is a need to educate parents and partners regarding the program.

**Other Allied Health Professionals**

It was felt that there are insufficient continuing training opportunities for medical technologists, radiology and pharmacy staff. Given the generally busy clinical schedules, being able to complete CE activities outside of patient care time was felt to be important. Videotapes or online and CD-based materials would be helpful. Laboratory staff would benefit from having available American Society for Clinical Pathology certification packages in order to keep up their skills and knowledge. Radiology staff does have some enduring materials that they can use for continuing training but some staff still must go off-island for specialty training for fields such as mammography. A need for improved communication and coordination between public health and clinical services at GMHA was identified and basic computer skills training was requested for some allied health staff. Basic computer skills training was requested for some allied health staff. Library staff at UOG felt that obtaining broader access to electronic health information resources such as full-text journal packages was important for the entire Pacific region.

**Potential Collaborations**

Given the expertise and experience of UOG faculty, developing strong partnerships with the UOG could have significant benefits to the region. Discussions with the UOG, School of Nursing, Social Work and Health Sciences have suggested the potential for significant collaboration. The programs that might be most easily applied to the Pacific region might be the Health Leaders Achieving Today Tomorrow’s Excellence (HLATTE) administration and management skills workshop, developed by Laurent Duenas, which has been successfully taught in the region through on-site training. There are also links between the UOG’s School of Nursing, HLATTE and the American Pacific Nursing Leaders Council for consultation and CE.

**Public Health**

Lack of time to attend CPD activities has been highlighted as the greatest barrier to continuing training. Other significant concerns included lack of funds to attend activities, excessive distance to training opportunities, lack of distance education infrastructure, insufficient notice and coordination of activities, and lack of awareness of online resources.

Social workers noted the lack of continuing training resources directed at their specific needs. In Guam, social workers often take on patient and caregiver education responsibilities for home health patients and would benefit from training in this area. Increased coordination with physicians and increasing the use of multi-disciplinary teams was requested. Social workers would benefit from training related to general patient health issues such as use of common medications and their effects. Younger social workers are likely to be very comfortable using computers.

A need for improved communication and coordination between public health and clinical services at GMHA was identified and basic computer skills training was requested for some allied health staff. Library staff at UOG felt that obtaining broader access to electronic health information resources such as full-text journal packages was important for the entire Pacific region.

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Academic partnerships between UOG and other universities are needed to prepare more nurses seeking graduate education, at least until UOG has more nursing faculty to develop an UOG-based Master’s degree in nursing program.

Potential partnerships with the School of Social Work at the UOG may help meet the diverse needs of social workers on Guam in providing outreach services. Discussion with the Dean of the UH School of Social
Work revealed that there are plans to develop a Master’s degree level partnership course with significant distance education components between the two schools. The role of social workers in the Pacific region and their specific training needs as not been well studied. There is interest among the Guam Association of Social Workers in developing a survey of social workers that can be administered on Guam and throughout the region.

Various UOG departments and faculty members are experienced at conducting educational programs in the Pacific region through live on-site workshops as well as through distance education. Bruce Best, the UOG PEACESAT Station manager, plays a valuable role in developing and coordinating communications throughout the region using a combination of satellite (both PEACESAT and commercial) and radio technologies. His experience in developing, installing and repairing communications systems in the region will be invaluable in maintaining the distance education infrastructure in Micronesia.6

Dr. Ahmed El-Ghoneimy, a U.S.-trained geriatrician at the UOG, has expressed interest in providing some clinical training programs for the region. At the request of PACT, he prepared and presented a 1-hour program on home health issues to an audience at GMHA. This presentation was videotaped for future broadcast to the region by satellite.

As noted above, the UOG School of Nursing faculty has experience in teaching a community health curriculum in the region using distance education. Modules were forwarded and paper assignments were returned to the instructors. The various time zones hindered communication. The difficulty of maintaining updated videotaped modules was also noted. The importance of having effective local coordinators and facilitators was stressed.

The UOG Agriculture School has pioneered their own electronic course management system for use with a distance education training extension program offered in the Marshall Islands, Commonwealth of the Northern Mariana Islands, Palau and the FSM. The importance of having well-trained local facilitators with clear roles and responsibilities was stressed.

The role of the Robert F. Kennedy Memorial Library in providing health information and informatics training in the region has been important. Arlene Cohen has conducted numerous on-site workshops in the region and has received positive feedback from health workers.

**Distance Education Technologies**

Health workers on Guam have access to video-teleconference technologies through an ISDN connection at GMHA and through PEACESAT at the UOG. Each system provides two-way transmission capability that allows Guam to both receive and broadcast. In general, access to computers and the internet is good, especially among physicians. GMHA is in the process of expanding their medical library computer resources. Although GMHA offers regularly scheduled programs, these are often not well attended. PEACESAT has not been used for regular health education broadcasts.

Access to medical library resources on Guam is good and there is coordination between the GMHA CME coordinator, the UOG Robert F. Kennedy Library and the U.S. Naval Hospital Library which enables access to full-text articles for physicians at the hospital.

**Limitations**

Though we had a suggested a distribution list for the initial survey, it was ultimately the choice of each Director to do the preliminary distribution. Some respondents had difficulty ranking or prioritizing the various barriers or content areas. This occurred for several reasons: varying exposure or access to the different types of information, varying educational backgrounds, and differing job duties.

There were no visits to the two Community Health Centers on Guam; hence, their needs may not be reflected accurately in this report. Overall, no assessment was attempted to determine how many or what kind of health professionals are needed in the future to maintain and improve healthcare services in Guam.

The actual numbers and type of health workforce personnel was obtained through several means (i.e., there was no uniform methodology) depending on the information available to the person who managed human resources/personnel issues in each facility. Guam provided data based on licensure board records, but that information could not be used to identify personnel...
actually working and practicing in Guam. Therefore, Guam’s nursing numbers are probably overestimated. The physician listing on Guam was obtained from the medical staff roster at GMHA. It is possible to have missed some physicians who only have ambulatory (outpatient) practices.

Summary
Guam has the largest and most diverse healthcare community in the USAPI region. In addition to those health workers employed by the government there are many health workers in private practice settings and in the military.

Physicians, nurses and most allied health providers on Guam are required to maintain U.S. certifications and must fulfill the corresponding CE requirements. The lack of specialty continuing training programs requires some staff to seek training off-island. Visa restrictions may make this difficult for non-U.S. health staff.

Although physicians have relatively good access to CPD opportunities, there remains a significant need among nurses, including those in public health. Oral health staff and other allied health providers in fields such as radiology, medical technology and social work would also benefit from additional opportunities.

The use of enduring materials such as videotapes and online or CD-ROM materials might play a significant role in addressing some of the needs for healthcare providers on Guam, where access to computers and internet connections is generally good. The ability to provide CE in nursing specialties would be particularly welcomed.

Most health personnel have had experience with various distance education modalities. GMHA has used distance education in the form of live video teleconferences with Hawai’i.

The resources and expertise of health personnel on Guam make this jurisdiction a potential source of important CE initiatives for the rest of the region. Existing partnerships with the UOG should be strengthened and developed.

Acknowledgements
The authors gratefully thank the following individuals for their considerable assistance in preparing this report, all of whom have tried their best to provide accurate information. Drs. Chen and Maskarinec are alone responsible for any errors that remain. We wish to thank: Christine Scott-Smith, Director, RFK Memorial Library, University of Guam (UOG); Arlene Cohen, Outreach Librarian, RFK Memorial Library, University of Guam; Lucynn Kerry, UOG; Carol Perez, CME Coordinator, Guam Memorial Hospital Authority (GMHA); Leonel Arcangel, Quality Assurance Coordinator/Continuing Education Coordinator, BFHNS, DPHSS; Lillian Posadas-Perez, Assistant Administrator of Nursing Services, GMHA; Arthur San Agustin, Administrator, Division of Senior Citizens, DPHSS; Cerina Mariano, Social Service Supervisor, Division of Senior Citizens, DPHSS; Bruce Best, PEACESAT Station Operator, UOG; Dr. Ahmed El-Ghoneimy, Geriatrician, UOG; Dr. John Taitano, President, Guam Medical Society; Dr. Suzanne Sison, Chief Public Health Dental Officer, DPHSS; Dr. Francisco San Nicolas, President, Guam Dental Society; Kathy Wood, School of Nursing, UOG; Maria Salomon, Program Director, School of Nursing, UOG; Ruth Gurasamy, Director, private home health agency; Dr. Tom Greening, Radiologist, GMHA; Catherine C. San Nicolas, Dietitian, GMHA; Louann Harrack, RN, Staff Nurse Training Officer, Infection Control, GMHA; Robin Olmo, Respiratory Therapy, GMHA; Glenda Pangelinan, Laboratory, GMHA; Alesia Ogo, Rehabilitation Services, GMHA; and Adonis Mendiola, Pharmacy Technician, GMHA, for their participation in this study.

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13 years ago in Pacific Health Dialog, W. J. House stated that, “informations which succeed in increasing and diversifying income and employment opportunities for women will tend to reduce the diare for child bearing by raising the opportunity cost of staying at home to care for children.” PHD, 1995;2(2):16.
Chuuk Assessment for a Continuing Health Care Professional Development Program

Gregory G. Maskarinec, PhD*
Tai-Ho Chen, MD*
Julio Marar**
Romino Saimon***
Don Bosco Buliche, MO****

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa; ** Director of Health Services, Chuuk State Hospital, PACT Advisory Board Member; *** Former Director of Health Services, Chuuk State Hospital, former PACT Advisory Board Member; ****CME coordinator, Chuuk State Hospital, PACT Advisory Board Member.

Address correspondence and reprint requests to: Gregory G. Maskarinec, PhD, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, 95-390 Kuahelani Avenue, Mililani, Hawai‘i 96789-1192; gregorym@hawaii.edu.

Abstract
In 2003, the University of Hawai‘i Department of Family Medicine and Community Health entered a four-year cooperative agreement with the U.S. Health Resources and Services Administration to establish the “Pacific Association for Clinical Training” (PACT). PACT’s goal is to develop effective distance education methods to improve the education and skills of health care professionals in the U.S.-Affiliated Pacific Island nations. To determine the situation existing in 2004, one of PACT’s first projects was to perform site visits to each jurisdiction, conducting needs assessments through interviews with key health care professionals, hospital administrators, and government officials. This article highlights findings of PACT’s Assessment of Chuuk State, Federated States of Micronesia. Meant to establish a baseline for future reference, all data are those collected in 2004/2005 and have not been updated.

Key words: Chuuk; Clinical Training; Workforce Development; Distance Education. (PHD 2007 Vol 14 No 1 pp 53-57)

Introduction
This report was compiled from written surveys of key health administrators and personnel in conjunction with interviews and site visits performed by Drs. Tai-Ho Chen and Gregory Maskarinec in August 2004. Discussion at the November 2004 Advisory Meeting provided additional information, and was further supplemented during three subsequent visits to Chuuk by Dr. Maskarinec during 2005. The report has been reviewed by the Advisory Board members for Chuuk who, as co-authors of this report, have provided additional revisions.

Located in the middle of the Caroline Islands, Chuuk (formerly Truk) is one of the four states of the Federated States of Micronesia (FSM). Chuuk is composed of six inhabited islands forming a main lagoon and over 15 outer island atoll groups spread over 100,000 square miles of the Western Pacific. The islands of Chuuk Lagoon have a total land area of 39 square miles, while the lagoon itself has a total surface area of 822 square miles surrounded by 140 miles of coral reef. More than half of the entire population of the FSM, 54,000 residents live in Chuuk; 30% of Chuuk’s population live on the island of Weno (Chuuk’s capital), another 48% live elsewhere in Chuuk Lagoon, 12% on the Mortlock Islands and the remaining 10% on the Western and Hall Islands. The median age of the population in Chuuk is 18.5 years, making it the youngest population of the FSM. Chuuk is the poorest state of the FSM, with an annual per capita income of about $1,400. Chuuk has the highest fertility rate (6.0%) of the four states. Life expectancy at birth is about 65 years. The literacy rate is 91%.1,2

Chuuk State Hospital is the only inpatient facility. The hospital has 120 beds staffed by 20 doctors and 80 clinical nurses, and has over 4,000 admissions a year. There are also three private clinics in Weno, two staffed by Filipino doctors. Elsewhere throughout Chuuk, medical care is provided at 80 dispensaries, staffed by 97 locally-trained health assistants. Complex cases are referred to the hospital in Weno. The anticipated arrival of a new government ship in October 2004 to
support transportation between the outer island atolls and the main lagoon will improve the capacity for medical transfers. At the time of the site visit, there were no government vessels, nor funding in the budget for medical staff to fly out to the dispensaries.

The state of the outer island dispensaries and the availability of services is reported to be catastrophic; many of the dispensary buildings are empty shells. Radiology services are limited to x-rays and EKGs. There is no mammography unit in Chuuk, and no computed tomography scanner. An ultrasound machine was donated 2 years ago but has not been used so far. The hospital lacks a working fax machine and the most basic supplies, such as paper, are in short supply. An additional critical barrier is the lack of consistent electricity in Chuuk. During the November 2004 PACT Advisory Meeting it was noted that there are approximately 4 hours of power daily.

**Health Workforce Demographics and Training**

As of August 2004, there are reported to be 20 physicians at the Chuuk State Hospital, 175 nurses, four midwives, five dentists, 97 external health workers in the community, 10 laboratory workers, five pharmacy workers, six radiology techs, and seven other health professionals (rehabilitation, mental health, and health inspectors).

Seventeen of the 20 doctors are Chuukese graduates of the now defunct Pacific Basin Medical Officer Training Program. Some, including the surgeon, the obstetrician, and the pediatrician, have received additional training at the Fiji School of Medicine. There are three expatriate doctors who were trained in the Philippines. Salaries in the hospital have been frozen for 10 years. The base salary for the local doctors is about US$18,000 annually, while nurses’ salary is around US$3,000 annually.

There are a total of 80 clinical nurses in Chuuk State Hospital who work in pediatrics, labor and delivery, surgical ward, medical ward, operating room, emergency room, outpatient department, and physiotherapy. Of the 80 nurses, 40 are registered nurses, of whom four are certified nurse midwives, and three are nurse anesthesiologists. The other 40 nurses are licensed practical nurses. Most nurses were trained at the College of the Marshall Islands (CMI). Besides the 80 clinical nurses, there are an additional 55 public health nurses. Recently there have been challenges with nurses who graduate from CMI not returning to Chuuk; instead choosing to remain in the Republic of the Marshall Islands (RMI) to work.

The majority of the allied health staff received on-the-job training supplemented with occasional short workshops off-island. There have been limited opportunities for continuing training of health staff due to the lack of local programs. Off-island training is expensive and puts strains on an already short-staffed workforce.

The laboratory has a total of 12 personnel, of whom 10 are assigned to the Chuuk State Hospital, and two are assigned to the Public Health Department. Mioki Stanley, head of laboratory, studied psychology in the U.S. The lab is able to provide the following tests: manual complete blood counts (no differential white cell count), urinalysis, Hepatitis B screening, and HIV screening. There is no screening for PSA or stool occult blood. Pap smears and cervical biopsies are sent directly to a regional laboratory in Hawai‘i. They are to be paid through a contract with the FSM national government’s Maternal and Child Health and the Family Planning programs. All other biopsy samples are sent to Queen’s Medical Center or Tripler Army Medical Center in Hawai‘i; according to the physicians the results sometimes take up to 3 months to be returned. At present, there is no computer in the lab, but one is expected through the FSM Bioterrorism Grant, as is a chemistry analyzer that will be connected to it. The laboratory sends people to 6-9 month training courses in Fiji, to specialize in certain areas, such as hematology and chemistry. The U.S. Centers for Disease Control and Prevention (CDC) has sponsored on-site training for cholera. The World Health Organization (WHO) has sponsored a laboratory blood safety training and an HIV course.

Debbie Stae, Chief of Radiology, was off-island during this assessment. She and Korio Neveh have had some formal radiology technician training. The other four radiology staff have had practical training only. There is no computer in the department.

Of the five dentists, three are from Burma, one is from the Philippines, and one is from Chuuk, Yalberg Enlet, who is the supervisor. He uses a personal account for internet access, as the dental office has no connectivity. He observed that for the past 10 years, the dentists have had to use their own vehicles to do school sealant programs. Lack of official transportation is not a serious
problem within the lagoon, but it does adversely affect visits to the outer islands.

There are no certified pharmacists in the hospital. Pharmacy has five staff total, including one enrolled in a year-long training program in Fiji at the time of the assessment. Frankie Stanley, Head of Pharmacy, has also completed short-term training in Fiji, but none of the other pharmacy staff have been off-island for training. There is no tracking of possible drug interactions.

The distant and off-island dispensaries are staffed primarily by health assistants. There have been recent successes with a Health Assistant Training Program at the state hospital that was scheduled to graduate 28 new Health Assistants in 2004.

The Office of Health Statistics has a staff of 11 personnel, which is headed by the health statistician and includes three data technicians and seven data clerks.

The Division of Public Health has a total of 40 employees, of whom nine are in Administration, 12 in the Maternal and Child Health Program, nine in the Immunization Program, four in the Family Planning Program, three in the Tuberculosis and Leprosy Program, two in the HIV/AIDS Program, and one with the Non-Communicable Diseases Program. William Sanphay, MPH is Chief of Public Health in Chuuk. Continuing training opportunities for public health staff are limited. Two employees are nurse practitioners trained on the U.S. mainland.

**Current Continuing Professional Development Activities**

Nurses require 40 hours general continuing education (CE), and 45 hours of specialty CE for those in specialized fields. Completing adequate hours of specialty CE for specialty nurses, such as the three nurse anesthetists, is a recurrent problem. There is insufficient funding to send them for regular off-island training. There is currently no physician CE requirement in FSM.

Formerly there was a regular series of case presentations by the medical staff of the hospital, but no CE credits were given for attendance. These presentations have been discontinued. Lectures are now limited to those given by occasional visitors. Since the 1990, physicians have benefited from internet-based case consultations through the Tripler Army Medical Center’s Pacific Island Health Care Project. The physicians view these case consultations as an opportunity for distance learning as well.

Periodic workshops for health workers and the community are also conducted by several U.S. funded programs on topics such as, HIV and maternal and child health.

The CE nurse coordinator, Irene Nero, is the only Master of Science in Nursing in the hospital, but is now assigned to Administration. Nurses are encouraged to study for the National Council Licensure Examination (NCLEX). There are state scholarships and federal grant funds available. One nurse recently graduated from the Fiji School of Medicine on an Australian scholarship; her contract specifies that she must work in Chuuk for 3 years. Others attend the RMI and Saipan programs. Five nurses graduated in May 2005 from the nursing program in the RMI, but three remain there, as they can’t afford airfare to come home. Wages for nurses are higher everywhere else in the Pacific: in Pohnpei they earn $275 a week (even more in the RMI and Palau) but in Chuuk the salary is $190 a week. The hospital has a shortage of over 20 nurses. However it was noted that there are Chuukese medical staff working in Hawaii and the U.S. mainland as registered nurses, laboratory specialists, pharmacists, and radiology techs.

**Priority Continuing Professional Development Needs**

With no current efforts at continuing medical education reported in Chuuk, the continuing professional development needs are very basic and initiating programs is likely to be challenging. The top five barriers to providing a sustainable continuing professional development program were identified as:

1) lack of materials/supplies (paper, projector, and computers, etc.)
2) geographical challenges
3) poor communication between departments
4) no incentive structure for continuing professional development
5) lack of funding for human resource development and internet access

Targeting education based on leading causes of mortality is one approach to developing a relevant CE curriculum.
Central Nervous System (CNS) meningitis.

Other topics that might be of high relevance based on the available literature, include teenage suicide, domestic violence, and problems associated with alcohol consumption and drug abuse.

More than specific medical topics, however, basic training for allied health is clearly a pressing need, as few of the workforce has little more than on-the-job training. Medical staff are uncertain how these needs can be addressed through distance education. Although the doctors and nurses have some form of CE activities, other health fields have lacked continuing training.

Potential Collaboration

The success of the Health Assistant Training Program based at Chuuk State Hospital to develop new primary care providers for the numerous distant outer island dispensaries is an encouraging development. PACT partnerships with this program may have the potential for translating successful elements to other parts of the region.

Several of the physicians expressed interest in developing their research skills and experience using the well-maintained health databases at Chuuk State Hospital. Some of these individuals may have the potential to not only develop their research skills, but also start an effective evidence-based local CE program.

Distance Education Technologies

A Pan-Pacific Education and Communication Experiments by Satellite (PEACESAT) earth station is located in the Department of Education, about 300 meters away from the hospital on a deeply rutted road. It would be possible to establish a line of sight link from the hospital to a different satellite communication dish just down the hill, but frequent power outages throughout Chuuk make all forms of distance education problematic.

Health information resources are limited in Chuuk. There is a small collection of old textbooks donated by various agencies in the past. The nursing division has only one computer. Recently, the FSM National Bioterrorism Program has started a program to place several networked computers for epidemiological tracking in the medical statistics office and laboratory. Six computers in the hospital have internet access, but only two of these are in a common area, one of which is accessible only to doctors.

Internet access is through dial-up accounts at speeds usually significantly slower than 56 kbps (actual bandwidth rates are as low as 8 kbps). FSM Telecom serves as the local internet service provider and charges a monthly rate of $19.95 for 10 hours and then $1.95 per hour thereafter. The absence of computers in common areas and the connection costs limits staff access to internet health information resources.9

Tripler Army Medical Center distance consultations are reported to have worked well in the past, but the scanner that was previously used is currently not functioning. The equipment did not appear to have been used recently.

The Shriners Hospital in Honolulu has set up a regular teleconference for pediatric referrals. The intent is for physicians and patients to use the Department of Education PEACESAT video conferencing link for case-interviews with Shriners staff for assessing potential referrals.

As was noted in the 1998 Institute of Medicine report, “Pacific Partnerships for Health,” Chuuk suffers from a poorly developed infrastructure, crowded conditions, and inadequate hospital services. Chuuk has faced financial crises in the past ten years.

Limitations

Data is based on official records as well as first-hand reports. In some cases there were discrepancies between these sources, resolved in favor of information provided by the Director of Health.

The most serious limitation of this study was its failure to include the outer island dispensaries of Chuuk during the site visit despite their importance to the health of Chuuk’s people and the urgent needs of their staff for additional health education. Chuuk’s Department of Public Health was also not fully assessed. Additionally, with our focus on CE needs, no assessment was attempted to determine how many or what kind of health professionals are needed in the future to maintain and improve healthcare services in Chuuk, although this will be important in developing CE recommendations that are appropriately integrated into a Chuuk and FSM health and human resource development plan.

Summary

As was noted in the 1998 Institute of Medicine report, “Pacific Partnerships for Health,” Chuuk suffers from a poorly developed infrastructure, crowded conditions, and inadequate hospital services. Chuuk has faced financial crises in the past 10 years. Education and
healthcare are poorly funded. However, staff in the hospital continue to show interest in CE and would appear to welcome any efforts and additional resources. With frequent power outages and limited computer connectivity, it is likely that stored (e.g. CD-ROM-based) training modules may be more appropriate than other distance education modalities that require live distance connections. However the issue of incentives also needs to be addressed, in the face of frozen salaries and limited opportunities for promotion.

The success of the Health Assistant Training Program has been encouraging. PACT should look to provide support for this as well as to expand training opportunities for allied health workers in particular.

Acknowledgements
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Kosrae Assessment for a Continuing Health Care Professional Development Program

Tai-Ho Chen, MD*
Arthy Nena, MPH**
Kun Mongkeya†
Gregory G. Maskarinec, PhD*

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa; **Director of Health Services, Department of Health Services, Kosrae State Government, PACT Advisory Board Member; †Curative Services Administrator, Department of Health Services, Kosrae State Government, PACT Advisory Board Member.

Address correspondence and reprint requests to: Gregory G. Maskarinec, PhD, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa; 95-390 Kuahelani Avenue, Mililani, Hawai‘i 96789-1192; gregorym@hawaii.edu.

Abstract
In 2003, the University of Hawai‘i Department of Family Medicine and Community Health entered a 4-year cooperative agreement with the U.S. Health Resources and Services Administration to establish the “Pacific Association for Clinical Training” (PACT). PACT’s goal is to develop effective distance education methods to improve the education and skills of healthcare professionals in the U.S.-Affiliated Pacific Island nations. To determine the situation existing in 2004, one of PACT’s first projects was to perform site visits to each jurisdiction, conducting needs assessments through interviews with key healthcare professionals, hospital administrators and government officials. This article highlights findings of ACT’s Assessment of Kosrae State, Federated States of Micronesia. All data were collected in 2004/2005 and have not been updated since it was to establish a baseline for future reference.

Key words: Kosrae; Clinical Training; Workforce Development; Distance Education. (PHD 2007 Vol 14 No 1 pp 58-62)

Introduction
This report was compiled from written surveys of key health administrators and personnel in conjunction with interviews and site visits performed by Drs. Tai-Ho Chen and Gregory Maskarinec in June 2004. Additional information was obtained through ongoing communications with PACT partners in Kosrae. Discussions at the November 2004 PACT Advisory Meeting provided additional information on recent activities. The report has been reviewed by the Advisory Board members for Kosrae who provided additional revisions.

Kosrae is the only single-island state in the Federated States of Micronesia (FSM) and is the least populated, although it is the second largest inhabited island in the FSM with a land area of 42 square miles.1,2 Because of the rugged mountains in the center of the island, all communities are located on the coast and are connected, except for the isolated village of Walung, by a paved road. The island is surrounded by low-lying reefs and mangrove swamps. Travel around Kosrae is not difficult. It is possible to drive from one end of the island to the other end in approximately 2 hours. Most government buildings and offices, the high school, and Kosrae State Hospital are located in Tofol, the capital. There are five health clinics scattered around the island. Walung (population of about 200 people), the most remote community, is mostly accessible by boat, but the island circumferential road is being built now to provide quicker access into town. A dispensary will be built in Walung to provide access to health programs.

The population of Kosrae is 7,686 residents according to the 2000 FSM census3 male residents 50.2%, female 49.8%. The median age is 19.2 years. In 2000, there were a total of 1,087 households, of which 1,059 (97.4%) reported some cash income, with a median household income of approximately $7,528 and a mean household income of $12,400.4,5 Literacy approaches 100%. In 2004, Kosrae had 187 high school graduates, the most ever. A large percentage of the high school graduates enroll at the College of Micronesia in Pohnpei, while some enroll in the local Kosrae Campus. Few students go off to higher institutions in Hawai‘i or the U.S. mainland.
Developing Human Resources For Health in the Pacific  Vol. 14, No. 1. 2007  Original Papers

The total annual hospital budget is approximately U.S. $1,000,000. Most off-island referrals go to St. Luke’s Medical Center in the Philippines and Pohnpei. Children with orthopedic problems are sometimes sent to the Shriner’s Hospital in Honolulu and some patients are sent to the Tripler Army Medical Center.

Health Workforce Demographics

Kosrae has 10 physicians; 25 hospital-based nurses, of whom 18 are associate nurses and seven are practical nurses; 10 public health based nurses; one nurse practitioner (family planning); four nurse midwives; three dentists, no dental nurses; one dental lab tech; one dental lab tech assistant; one dental aid; six med lab techs; no pharmacists; two pharmacy techs; two radiology techs; one rehab specialist; one dietician; one health educator; 23 community health workers and no social workers.

Health Workforce Training

Kosrae: three dentists and one dental lab technician trained in New Zealand, and the dental lab assistant received on the job training. The office has two computers and there is unlimited access to the internet for purpose of research and continuing education. One dentist is an expatriate American, the other two trained in Fiji, as did one of the lab techs. The dentists, on a rotation schedule, go out to the schools and the communities every week to do screening, sealants and fluoridation varnish for children. The program in the schools has been in place for 4 years and provides sealants and fluoride, offers restorative dentistry with portable equipment, provides instruction on proper oral hygiene, and dispenses toothbrushes. There is a need for a repair specialist to work on dental units and equipment. There is also a need for continuing training and certification of the dental assistants. Appliances for cleft palate patients, prosthetic and orthodontic materials and funds for maintenance is needed. The division also needs continuing training in post-graduate, preventive dentistry and oral surgery.

Most of the 18 more qualified nurses are associate nurses and have had training in the Commonwealth of the Northern Mariana Islands (CNMI), Guam, or the Republic of the Marshall Islands (RMI). The seven practical nurses were trained locally in a hospital-based program. The College of Micronesia has plans to start a nursing program in each of the four states, including Kosrae. Of the four certified mid-wife nurses, three trained in Fiji and one in Japan. There is no Obstetric Gynecology (Ob-Gyn) physician in Kosrae, so the midwives have a very high degree of responsibility, with 16-17 deliveries a month. Hospital resources include one washer and an incubator. They are unable to handle deliveries under 33 weeks. Complicated obstetric cases are sent to Pohnpei. The surgeon in Kosrae can do Cesarean sections if necessary.

The one nurse practitioner in family planning studied for 4 months at University of California, Los Angeles (UCLA). One staff member from Kosrae has attended Dr. Gigliola Baruffi’s Maternal and Child Health annual training workshop at the University if Hawai’i since 1987. One physician is currently enrolled in the program. Kapiolani Medical Center in Hawai’i sent over nurse midwives to do a practicum in 1987.

The pharmacy supervisor had only one year of formal training in 1995. The second pharmacy technician recently came on board but has no formal training in pharmacy. He is a graduate of the College of Micronesia. The pharmacy computer is used for filing and labeling, but is not yet set up for an internet connection. All department staff has unlimited internet access for research and continuing education. The FSM has plans to standardize its hospital formularies and drug procurement policies, but that has not yet been implemented. Kosrae currently gets most of its medications from New Zealand, Australia, Perry Point, Guam and private clinics in Pohnpei.

No one in the lab has a degree. Some lab techs have certificates from New Zealand. One lab tech went to Fiji 3 years ago to begin a 4-year course sponsored by the World Health Organization (WHO), but he never finished the program and returned after one year. He is expected to take over being groomed to head the lab to replace the recently retired Chief of Laboratory Services. The chief was not aware of the Palau Area Health Education (AHEC) lab training program.

The head of Radiology trained in Guam, Fiji, and Japan. The other radiology tech has 2 years of on-the-job training. There is an ultrasound in x-ray that can only be operated by the physicians, who use it for pregnancy exams. The Government of Kosrae and Medpharm Pharmacy, Inc. entered into a preventive maintenance contract recently. A new portable x-ray machine...
(Chinese made) that was recently purchased is currently utilized in the hospital. A fluoroscopy machine is expected and training will be required. Currently, the only communication with other radiology departments in the FSM is to obtain supplies from Pohnpei.

**Current Continuing Professional Development Programs**

Throughout the FSM, neither physicians nor dentists presently require continuing medical education (CME) hours to renew their licenses. A recently established FSM Medical Board will now look into developing regulations on medical practices in the FSM, especially to regulate and establish standards for medical practice. Only nursing has formal requirements; the FSM National Board requires nurses to complete 30 CME hours every 2 years.

Kosrae State Hospital continuing education conferences have not occurred regularly due to staff time constraints. Attendance for sessions that have taken place was very limited. Budget constraints are a major problem for initiating new programs, since the government-mandated work hours have been cut to 64 hours per 2-week period in order to address payroll shortages. WHO is the chief source of funding for training courses. Possible funding sources for professional development programs include the AusAID Scholarships, New Zealand Government aide and others. Staff members are required to teach their colleagues when they return from a training course, but this seems to happen infrequently. The Department of Public Health, through the assistance of Dr. Sitaleki Finau, Head of the School of Public Health at the Fiji School of Medicine, started a certificate course under the Flexible Learning Program in Kosrae to provide training opportunities for department staff. Two sessions were taught in Kosrae by faculty for both undergraduate and graduate students. The possibility of expanding the courses into diploma and degree programs is being considered.

The Canvasback Missions and other charitable organizations have provided a variety of visiting specialists for a week or two every year, including OB, Ear, Nose, Throat (ENT) and other specialty surgeons, who primarily provide clinical services, but have not done much teaching. Other specialized medical consultations in Cardiology and Urology have been retained by the FSM Department of Health, Education, and Social Affairs to provide services on the island over the past several years. Specialists from medical institutions in Hawai‘i, Australia, and Israel have expressed interest in providing short-term medical consultations in Kosrae.

Major barriers to continuing education were identified as a lack of resources (educators and materials), inappropriate scheduling, inadequate technology infrastructure for video teleconferencing and audio conferences, insufficient time to attend training, lack of funding for off-island staff development courses, and the absence of incentives to participate in training.

**Priority Continuing Professional Development Needs**

The major health concerns of Kosrae were identified by the local health workforce interviewed in the needs assessment as diabetes, hypertension, coronary artery disease, cancer, upper respiratory infections, skin disorders, and mental health issues, particularly suicide. A need for education in geriatrics and home care issues was also noted. Priority topics might also be based on the leading causes of death, which in Kosrae are related to cardiovascular disease (35%), followed by diseases of the endocrine system (12%), which are primarily due to diabetes and its secondary complications. The third most common cause of death is infectious diseases (7%), chiefly sepsis.

Other topics include main areas of focus identified by the Kosrae State Preventative Health Plan for 2001-2006: (1) maternal and child care services, (2) immunizations, (3) non-communicable diseases, (4) communicable diseases control and prevention, (5) AIDS prevention, (6) mental health/ substance abuse prevention, (7) Sexual Transmitted Disease (STD) prevention, (8) environmental health services, (9) family planning, and (10) community centers.

Doctors expressed an interest in research methods in order to develop their own capacity to utilize local data to publish papers on priority local health issues. There was some sensitivity about the history of outside individuals using data from the local population to publish papers with limited benefit to and collaboration with health workers on Kosrae.

However, even more than these specific medical topics, there is clearly a need for better foundations in math, science, and computer skills for many of the allied health professionals, followed by structured basic training in their assigned specialties.

Finalized by the departure of experienced staff to other islands

Finally, the situation is fairly marked by slow change. Consequently, this report was outdated upon completion, however it does establish a baseline for future comparison.

Summary

With a small hospital serving a small population on an isolated island with limited communications infrastructure, Kosrae's health education challenges will be difficult to address through topic-based distance education. The staffing shortages are exacerbated by the departure of experienced staff to other islands for better job opportunities. The severe impact of budget shortages on health staffing and resources are tremendous barriers to health worker training. In order to develop successful long-term sustainable training programs for Kosrae State, the budget situation facing health services will need to be addressed at the FSM national level.

Potential Collaboration

Local healthcare provider expertise from Kosrae can be shared throughout the region. Dr. Vita Skilling, from Kosrae State Hospital, has presented at many conferences on diabetes in Kosrae and the region. Dr. Livinson Taulung, Hospital chief of staff, has expressed a strong interest in developing research capacity throughout Micronesia.

College of Micronesia – Kosrae State Campus

The proposed nurse-training program in the FSM would serve as an obvious partner in PACT training activities for nurses on Kosrae. The WHO, in collaboration with the College of Micronesia and the FSM Department of Health, Education, and Social Affairs, has conducted a needs assessment for the nursing program. Additionally, recent developments in computer lab infrastructure and internet access at the Department of Health Services may provide training opportunities for health workers.

Distance Education Technologies

There are very limited functional computer resources for health workers training. The library has been converted into a computer lab to provide CME and research. With unlimited internet access being supported by the WHO and the FSM Bioterrorism grants, staff can now use the computer lab for internet research and continuing education purposes. Telemedicine is currently available through the computer lab. Overseas conference calls and distance education is also now available with the new telephone system being installed in the department. PEACESAT Pan-Pacific Education and Communication Experiments by satellite is available for video teleconferencing and audio conferencing at the Department of Health Services, with free overseas connection capability.8

Limitations

Some respondents had difficulty ranking or prioritizing the various barriers or content areas. This occurred for several reasons: varying exposure or access to the different types of information, varying educational backgrounds, varied job duties; however, all uniformly agreed that additional training was essential for better healthcare.

Overall, no assessment was attempted to determine how many or what kind of health professionals are needed in the future to maintain and improve healthcare services in Kosrae.

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References


There is interest among healthcare workers in developing the capacity to provide more local training needs. PACT should help develop the research capabilities of interested individuals through training in research techniques and guidance in scholarly writing while addressing concerns over ownership issues.
Pohnpei Assessment for a Continuing Health Care Professional Development Program

Lee E. Buenconsejo-Lum, MD*
Tai-Ho Chen, MD*
John Hedson, MBBS**
Gregory G. Maskarinec, PhD*

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai’i at Manoa;** Pohnpei State Hospital Chief of Staff, President PBMA and PACT Advisory Board member. Address correspondence and reprint requests to: Gregory G. Maskarinec, PhD, Department of Family Medicine and Community Health, John A. Burns School of Medicine University of Hawai’i at Manoa, 95-390 Kuahelani Avenue, Mililani, Hawai’i 96789-1192; gregorym@hawaii.edu.

Abstract
In 2003, the University of Hawai’i Department of Family Medicine and Community Health entered a 4-year cooperative agreement with the U.S. Health Resources and Services Administration to establish the “Pacific Association for Clinical Training” (PACT). PACT’s goal is to develop effective distance education methods to improve the education and skills of health care professionals in the U.S.-Affiliated Pacific Island nations. To determine the situation existing in 2004, one of PACT’s first projects was to perform site visits to each jurisdiction, conducting needs assessments through interviews with key healthcare professionals, hospital administrators, and government officials. This article highlights findings of PACT’s Assessment of Pohnpei State, Federated States of Micronesia. Meant to establish a baseline for future reference, all data are those collected in 2004/2005 and have not been updated.

Key words: Pohnpei; Clinical Training; Workforce Development; Distance Education. (PHD 2007 Vol 14 No 1 pp 63-66)

Introduction
This report was compiled from interviews and site visits performed by Drs. Tai-Ho Chen and Lee Buenconsejo-Lum in November 2003 and by these “Pacific Association for Clinical Training” (PACT) faculty and Dr. Gregory Maskarinec in June 2004. Additional information was obtained through ongoing communications with PACT partners on Pohnpei. A draft of this report was discussed at the November 2004 Advisory Board meeting and further review and revisions were offered by the Advisory Board members from Pohnpei.

Pohnpei State consists of a large volcanic island, Pohnpei, and six inhabited atolls. The population approaches 40,000 (in 2005), most residing on the main island, the land area of which makes up most of Pohnpei’s 133 square miles. The estimated total outer atoll population is 2,500. The capital of the Federated States of Micronesia (FSM) is located in Palkir on Pohnpei.

Pohnpei has a single hospital and seven dispensaries located on the main island with an additional five outer atoll dispensary sites. Pohnpei has 18 physicians, 83 nurses, five midwives, three dentists, 16 dental assistants, 31 extenders (health assistants, medex, community health workers), seven laboratory staff, five pharmacists or pharmacy techs, five radiology techs, and two other (dieticians, health inspectors, rehab or mental health) healthcare professionals. The distant atolls are served by boat and have limited communications with the main island.

Health Workforce Training
Many of the physicians are graduates of the now-defunct Pacific Basin Medical Officer Training Program, which was based in Pohnpei from 1986 to 1996. Some have gone on to receive further specialty training at the Fiji School of Medicine. Other physicians have been trained in Papua, New Guinea.

Most of the nurses have been trained through the College of Nursing in the Marshall Islands. The Chief of Dentistry is a recent graduate of the dental program in Fiji. Much of the training for allied health staff has typically been informal on-the-job training.

A training program for health assistants has been initiated by two volunteer physicians from the hospital in conjunction with the Pohnpei State campus of the College of Micronesia, but has been hampered by limited instructional resources and faculty time constraints.
Current Continuing Professional Development Activities
Nurses are required to have 20 continuing education (CE) credit hours for licensed practical nurse (LPNs), 30 CE hours for graduate nurses, and specialty nurses are required to obtain 45 CE hours annually for license renewal. At present there are no formalized CE requirements for physicians, dentists, dental assistants, or other allied health staff in the FSM.

Teams of visiting specialists routinely give CE talks as part of their contribution. However, at present the local CE program is irregular. Many nurses use the annual American Pacific Nursing Leaders Council (APNLC) conference in order to obtain their licensure CE requirement. Oral health staff were aware of the Pacific Basin Dental Association video library located in Palau, but had not accessed this service. Lack of video viewing equipment was noted as one barrier. Pharmacy has no ongoing continuing professional development (CPD) training at this time, but recently four of the six pharmacy techs had undergone structured pharmacy tech courses through distance education from Alaska Pharmacy College via the University of Hawai‘i. Some laboratory staff received out-of-country training funded by the World Health Organization (WHO) and other agencies.

Priority Continuing Professional Development Needs
Providing regularly scheduled CPD programs at the State Hospital would benefit both doctors and nurses. Good attendance among nurses would be expected to meet their CE licensure requirements.

Computer skills training, including both basic literacy and specific informatics training in order to take advantage of available resources like the WHO computer lab, would be helpful. Improved access to commercial health information resources such as full-text journals has been requested.

Possible Collaborations
Dr. John Hedson, has suggested a role for PACT in supporting the advocacy efforts of the Pacific Basin Medical Association (PBMA) in the region. One specific CPD issue the PBMA is working on is developing region-wide standards for CE for physicians.

College of Micronesia, FSM Campus
Spensin James, the Acting President of the College of Micronesia at the FSM Campus in Palikir, has expressed interest in working with PACT on developing health training and computer training programs at the FSM and satellite state campuses of the College.

College of Micronesia, Pohnpei State Campus
A Health Assistant Training Program has been developed by volunteer faculty from Pohnpei State Hospital at this campus. They are short on resources such as instructional materials.

Lois Englberger, PhD, of the Island Food Community of Pohnpei, is an ethnobotanist who has studied the nutritional content of indigenous foods, focusing on carotenoid levels in an area where Vitamin A deficiency appears to be only a modern disease. PACT faculty discussed the possibility of producing informational posters for health staff and patient education on local food choices. Dr. Englberger has agreed to provide content for the PACT curricular library.

The Micronesian Seminar
Discussions with Fr. Francis X. Hezel, SJ, who has written extensively on social change in Micronesia, indicate several benefits of collaboration. Fr. Hezel has agreed to share his instructional materials for free access in the region. PACT could also benefit from the Micronesian Seminar’s extensive experience in promoting health-related messages to populations in Micronesia through paper and broadcast media.

World Health Organization, Pacific Open Learning Health Network
The placement of a Pacific Open Learning Health Network (POLHN) computer lab in the Pohnpei State Hospital provides a powerful site for computer-based distance education. PACT staff are involved in ongoing discussions with the WHO regional office in Fiji that manages the POLHN program, to explore areas of potential collaboration and resource sharing.

Distance Education Technologies
Pohnpei has access to PEACESAT Pan-Pacific Education and Communication Experiments by Satellite audio and video broadcasts in the computer laboratory room, with marked technical problems. Success with using this for CPD programs has been mixed. The use of other distance education modalities such as telephone conferencing has also been challenging and expensive. A three-way telephone conference held at the June 2004 PBMA Conference in Pohnpei, linked a speaker in Fiji with conference participants in Pohnpei and Palau. Due to various technical coordination difficulties,
the proposed one-hour session took almost 2 hours to complete at a cost of US$700.

There is some use of an internet-based clinical referral system linked to the Pacific Islands Health Care Program at the Tripler Army Medical Center in Honolulu.

The WHO, through POLHN, funded a computer laboratory located at Pohnpei State Hospital. The WHO project covers the cost of internet access for the first year and the FSM government has committed to covering this leased line cost after the first year. There are 10 computers in the lab running on Windows XP Professional and sharing the 64 kbps line leased from FSM Telecom. The remaining computers throughout the hospital are not yet connected to a local area network (LAN). Currently there are dial-up connections at several locations, at the Secretary of the Administrator’s desk, the medical supplies office, medical records and federal services. The FSM National Bioterrorism Program will expand the LAN network connections to other computers throughout the hospital, increasing the opportunities for electronic health information access.5

Limitations
Overall, no assessment was attempted to determine how many or what kind of health professionals are needed in the future to maintain and improve healthcare services in Pohnpei. None of the seven main islands or five outer island dispensaries were included in the PACT survey, hence the education needs of their staff remains unaddressed in this report. Additionally, with our focus on CE needs, no assessment was attempted to determine how many or what kind of health professionals are needed in the future to maintain and improve healthcare services in Pohnpei, although this should also be factored into CE recommendations.

Some respondents had difficulty ranking or prioritizing the various barriers or content areas. This occurred for several reasons such as, varied exposure or access to the different types of information, varied educational backgrounds and job duties. However, all uniformly agreed that additional training was essential for better healthcare.

Finally, the situation is a dynamic one, slowly changing; consequently, this report was outdated upon completion. However, it does establish a baseline for future comparison.

Summary
As the location of the capital of the FSM, Pohnpei benefits from more reliable access to information technology than other FSM states. The potential for applying resources such as the WHO POLHN computer lab at the hospital is encouraging. With access to these resources, health workers should be encouraged and supported in developing their own local CPD materials and programs. PACT should look to provide support for the existing local programs that provide education for health workers. Despite the relative telecommunication advantages of Pohnpei, live communication by video or audio across the region remains problematic due to cost and reliability issues.

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13 years ago in Pacific Health Dialog, A. M. Durand stated, “Risk behaviours began at a very young age and tend to cluster in the same individual. Therefore interventions ... should be targeted to children of junior high school age and below.” PHD, 1995;2(2):30.
Yap Assessment for a Continuing Health Care Professional Development Program

Gregory G. Maskarinec, PhD*
A. Mark Durand, MD, MPH**
The Honorable Joe Habuchmai†

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa.
**At the time this article was written, Director of Health Services, Yap State, Federated States of Micronesia, and PACT Advisory Board Member. †At the time this article was written, Lt. Governor of Yap, Federated States of Micronesia, and PACT Advisory Board member. Address correspondence and reprint requests to: Gregory G. Maskarinec, PhD, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, 95-390 Kuahelani Avenue, Mililani, Hawai‘i 96789-1192; gregorym@hawaii.edu.

Abstract
In 2003, the University of Hawai‘i Department of Family Medicine and Community Health entered a 4-year cooperative agreement with the U.S. Health Resources and Services Administration to establish the “Pacific Association for Clinical Training” (PACT). PACT’s goal is to develop effective distance education methods to improve the education and skills of healthcare professionals in the U.S.-Affiliated Pacific Island nations. To determine the situation existing in 2004, one of PACT’s first projects was to perform site visits to each jurisdiction, conducting needs assessments through interviews with key health care professionals, hospital administrators, and government officials. This article highlights findings of PACT’s assessment of Yap State, Federated States of Micronesia. Meant to establish a baseline for future reference, all data are those collected in 2004/2005 and have not been updated.

Key words: Yap; Clinical Training; Workforce Development; Distance Education. (PHD 2007 Vol 14 No 1 pp 67-72)

Introduction
This report was compiled from interviews of key health administrators and personnel and a document review during a site visit performed at Yap Memorial Hospital by first author Gregory Maskarinec in August 2004. Although written surveys were attempted in advance of the site visit, none were completed; however, the survey instrument, described in the PACT executive summary in this issue, formed the organizational basis for the interviews and provided the structure of this report. Additional information was obtained through ongoing communications with PACT Board members in Yap, co-authors of this article, Dr. Durand and Lt. Governor Habuchmai. Discussion during the November 2004 Advisory meeting in Saipan provided additional information on recent activities, while Dr. Durand provided further corrections in 2005.

Description of Yap
Yap, the western-most state of the Federated States of Micronesia (FSM) is midway between Guam and Palau. Yap has a population of 11,200; 65% of the population reside on Yap Proper (Wa’ab): four islands connected by roads, waterways and channels, which includes the town of Colonia, Yap’s capital, with a population about 1,000.2

Stretching 600 miles east of Yap Proper are 78 outer islands of which 22 are inhabited. Including the outer islands, the state of Yap covers approximately 500,000 square miles of ocean, yet consists of only 45.8 square miles of land area.

Yapese is spoken by the inhabitants of Yap Proper, while the distinct Micronesian languages of Ulithian, Satawalese, and Woleaian are spoken by outer islanders; communication between the island groups most often takes place in English (understood by all islanders). According to the 2000 census, there were a total of 2,030 households in Yap, with a median of 5.4 persons per household. 1,578 households (77.7%) reported some cash income, with a mean household income of US$8,300. Yap’s literacy rate is 92%. Life expectancy at birth is 66.5 years for males, 67.6 years for females. In 2004, per capita expenditure on health was US$180, an increase from US$116 in 2002.3,4

Yap Memorial Hospital in Colonia is the only hospital in Yap and is directly accessible only to those residents who live in Yap Proper. Residents who live on the outer islands find access difficult due to limited transportation. Both of the government’s regular ships were out of service for more than a year, but one returned to service
in September 2004. Other cargo ships that can also carry passengers sail infrequently. Only three of the outer islands (Woleai, Ulithi, and Fais) have runways. These are serviced irregularly by Pacific Missionary Airways (PMA), although PMA does offer free evacuation for medical emergencies and charges the Yap State government only fuel costs for non-emergent medical trips.

Yap Memorial Hospital has 43 beds and 10 doctors, including one obstetrician, one anesthesiologist, and one surgeon. The hospital has an emergency room, outpatient clinics, inpatient wards, surgical suites, a dental clinic, pharmacy, laboratory, x-ray services (the x-ray machine is 25-years-old), physical therapy services and health administration offices, including data and statistics offices. The hospital does have a ventilator but no dialysis unit. X-rays and EKGs (electrocardiograms) are the only tests performed by radiology. There is no mammography equipment in the state. There is a new ultrasound machine. A gift of a used defibrillator from Queen’s Hospital in Honolulu in July 2004 replaced the hospital’s only other defibrillator, on which the screen no longer worked.

The pharmacy dispenses 200-400 prescriptions daily. The Public Health Clinic provides services within the same facility as the hospital. Because the department receives a limited supply of Pap smear test kits through a contract with Clinical Laboratories Hawaii, screening is limited to those patients who seek out this service; 119 tests were done in 2003. For 6 months of 2003, no kits were in stock.

In 2005, the total number of admissions to the hospital was 964, with an average length of stay of 5.7 days, though in 2003, the total number of hospital admissions was 1,062, with an average length of stay of 7.66 days. Outpatient visits averaged just over 1,300 per month. At the time of this assessment site visit (August 2004), the hospital was still repairing significant damages to its roof caused in April 2004 by super-typhoon Sudal, which also severely damaged over 80% of the homes on Yap. The books in the hospital library were ruined by water damage during the typhoon, as was the library computer, and many other rooms were flooded.

Yap has 17 outer islands dispensaries, of which two (on Ulithi and Woleai) have been designated “super dispensaries.” In May 2004, one doctor was assigned to each super dispensary, and they were provided with more extensive pharmacy stock. The other 15 outer island dispensaries are served by health aides. Only the most basic health care services are available at these sites; consultation with medical personnel at the hospital is necessary for any complicated medical care. The doctor assigned to Ulithi, Dr. Arthur Yolwa, conducts a daily “distance” morning report by radio with the outer island clinics and has used a combination of radio and face-to-face sessions to deliver six College of Micronesia dispensary manager program courses since August 2004.5 However, radio systems and power supplies are weak on some of the outer islands resulting in limited contact. A major upgrade of solar and radio systems in the outer island dispensaries was performed in October 2006 and should improve radio contact. The Director of Health recently (Oct/Nov 2004) completed an on-site assessment of each outer island clinic.

During the 5-month period of June-Oct 2004, Yap Hospital saw 514 cases of dengue fever, with 20 hospitalizations. Cases are determined by means of a clinical case definition, as the only four test kits initially available were being saved to test outliers when the epidemic wanes. By October, confirmatory rapid test kits were obtained for questionable cases.

One AIDS patient died in Yap. As of August 2004, there is one confirmed HIV positive case. Yap has a lower suicide rate than Chuuk6 but both are much higher than the U.S. The elderly, mentally ill, and disabled are cared for at home by extended families.8

In 2005, Yap’s referral program spent $102,000 to send 34 patients off-island for treatment, of whom 32 went to St. Luke’s in Manila. For comparison, in 2003, the medical referral program spent $322,321 (overspending its budget by $119,493) to send 47 patients off-island for treatment. The majority of these (32) also went to St. Luke’s. Nine patients went to Tripler Army Medical Center in Honolulu, three to Palau, and two to Shriners in Honolulu. In 2002, the medical referral program spent $260,672 (over budget by $57,844) to send 30 patients off-island for treatment: 18 to St. Luke’s, four to Palau, five to Tripler, two to Guam.

In 2005, the state of Yap imported $1,200,000 worth of alcohol and $600,000 worth of tobacco. In 2003, Yap imported $1,000,000 worth of beer and tobacco valued at $600,000, and hard liquor valued at $110,000.
large majority of the adult population habitually chews betel nut. Dr. Stanislaus Gufasg, Yap’s dentist, reports that 98% of the children by 4th grade have dental caries. A 2005 survey showed that only 11% of 4-to 12-year-old children are caries-free. Public Health has a Well Baby Clinic in the hospital that applies fluoride, and an outreach dental program for application of fluoride varnish for pre-school-age children and fissure sealants for elementary school-age children began in 2005.

Health Workforce Demographics
Yap has 12 physicians (including two now assigned to super dispensaries in Ulithi and Woleai); 32 nurses who are hospital based, of whom 16 are practical nurses (i.e. without formal training); and 10 nurses who are public health-based; three nurse midwives; one dentist; seven dental nurses; 24 health assistants (health assistants staff outer island dispensaries); three medexes (having 2 years of formal medical training); six med lab techs; one pharmacist; four pharmacy techs; four radiology techs; three health inspectors; and one rehab specialist. Yap has no nurse practitioners, dental assistants, dieticians, patient educators, or social workers. Twelve new community health workers have recently completed training to provide outreach services for the new Wa’ab Community Health Center project (a U.S. 330 grant-funded Community Health Center with four new health center sites in the main islands of Yap).

Health Workforce Training
Dr. Durand, the Director of Health in 2004, is the only U.S.-board-certified physician. Dr. Gufasg, the only dental officer in Yap in 2004, trained in Fiji with one additional year of public health training in Australia. In 2005, Dr. Lefagopal returned from dental school in Fiji to replace Dr. Gufasg, who had retired. Dr. Lefagopal spent an additional 3 months of preventive dentistry attachment in the Marshall Islands following graduation, an activity that was supported by PACT. All six dental nurses trained in Palau (five are on the outer islands and one in Yap Proper).

Yap has no nurse practitioners, dental assistants, dieticians, patient educators, or social workers. Twelve new community health workers have recently completed training.

Yap has one BSN (Bachelor of Science in Nursing), Anna Boliiy, who works in nursing education at Yap Hospital. The nurse supervisor, Doris Chutneg, trained in the Republic of the Marshall Islands (RMI) when the college was still part of the Community Colleges of Micronesia. Others have graduated from the RMI more recently; government scholarships requiring a service commitment upon completion of the course are available, but (as is true throughout the FSM) it has been difficult to enforce the service commitment. Since January 2005, the practical nurses in Yap have been enrolled in an associative degree nursing program which is being administered as a satellite of the Palau Community College nursing program.

In Radiology, only the chief, Eddie Yamnang, has a certificate, from Saipan in the 1980s; the other radiology techs have on-the-job training, but started classes with the University of Alaska Limited Radiology Program in April 2006, a web-based program with a local facilitator.

The lab supervisor, Maria Marfel, has a Bachelor of Arts degree (BA) from Michigan; all other lab techs have had on-the-job training. Some have gone to the Pacific Paramedical Training Center in New Zealand for one month of training and have completed short workshops in various areas (two just completed the blood safety course taught recently in Palau).

Of the three employees in vital statistics, one studied at a medical careers school in Nevada and has a biology degree from Hilo. The other two have one-the-job training only.

Current Continuing Professional Development Activities
Anna Boliiy, has been the Continuing Education (CE) Coordinator since 2004. Yap Memorial Hospital holds regular CE sessions every Friday morning; most are lectures prepared by the staff. Medical Staff Chief, Dr. Paul and the staff expressed a strong interest in using problem-based-learning cases in these weekly sessions. Efforts toward the CE of other staff were disrupted by the typhoon, but have been resumed. In May 2004, Dr. Durand led a week-long workshop training course in data management for health professionals. The course was PH 143, Intro to Information Systems for Health Managers. Course materials were from Fiji through the Pacific Health Open Learning Network (PHOLN), which will offer pilot on-line courses sponsored by the World Health Organization.

At the same time, Dr. James Edilyong (OB/GYN) had begun a 6-month course for the outer island birthing attendant trainees (BATs). Dr. Edilyong, himself, designed the curriculum for this course, which has been combined with three credit courses from the College of Micronesia health assistant curriculum: anatomy/
physiology, Maternal Child Health (MCH) I and MCH II, which are provided to the BATs.9

As is true throughout the FSM (National Board standards) practical nurses need 15 hours of CE every 2 years with staff nurses need 30 hours CE (15 in their speciality). Doctors in the FSM currently need no CE to maintain their licenses.

**Priority Continuing Professional Development Needs**

Targeting education based on leading causes of mortality is one approach to developing a relevant CE curriculum. However, in Yap the actual numbers of deaths in the given 4-year period is so small that any ranking of cause has little or no statistical significance.

Based on hospital death certificates, the 10 leading causes of death (1998-2002) for Yap were: (1) cancer; (2) pneumonia; (3) heart disease; (4) renal failure; (5) suicide; (6) Chronic Obstructive Pulmonary Disease (COPD); (7) Cerebrovascular accident (CVA); (8) trauma; (9) infant mortality; (10) sepsis.10

The 10 most common reasons for out-patient visits were: (1) respiratory infection; (2) diarrhea or vomiting; (3) fever; (4) injury; (5) hypertension; (6) diabetes; (7) cellulitis; (8) conjunctivitis; (9) prevention; and (10) prescription refills.

Additional topics that emerged during needs assessment discussions included computer literacy training, management and administration skills; basic pharmacology, especially risks in pediatrics and obstetrics; formal training for practical nurses (who have on-the-job training only); basic sciences for public health; and more training for outer island healthcare providers.

There is a pressing need to promote preventive dental care for children. Provision of continuing professional development (CPD) to public health nurses, health assistants, and dental nurses is needed to help with this.

Much of the healthcare workforce lacks even the basic education that would make most CPD a meaningful activity. Math, science, and language skills are very basic. Any courses provided, if they are to have any significant impact, need to be prepared to address very basic issues.

**Potential Collaboration**

The new Yap Area Health Education Centers (AHEC) program has recently initiated training for dispensary managers based on a curriculum from the Pohnpei College of Micronesia campus using distance education with books and daily morning radio conferences that include case discussions and core topic review. College foundation courses in math, science, and English have been started at Yap State Hospital. A public health BA program from Fiji School of Medicine has started and a clinical nursing associate degree program from Palau Community College will begin in January 2005.

**Distance Education Technologies**11

The Yap PEACESAT (Pan-Pacific Education and Communication Experiment by Satellite) station is located a few miles from the hospital at the Education Department; it is neither very accessible nor very reliable. No one at the hospital could recall any recent use of PEACESAT. No other distance education resources are currently used, although computer photo images (.jpg) are sometimes sent to Tripler Army Hospital, Honolulu, for consultations.

Through the FSM Federal Bioterrorism Grant, Yap Memorial Hospital recently received four new computers, which have LAN internet connectivity. One is in the director’s office, the other three are used by the vital statistics and IT (Information Technology) specialists (Maria Marfel, Lucille Stevens, and Daisy Fanapin). There is also another new computer purchased by the Hawai‘i AHEC Bioterrorism Grant that has been installed in the library for general staff use once the typhoon damage has been repaired. There are also computers with slow internet access in the public health offices and in the pharmacy. The pharmacy also uses a computer for dispensing. The lab has a computer with internet access; the Dental Department has no computer. There is a VCR to watch training films.

Staff internet skills are rudimentary; there was no reported use of CD-ROMs for learning, nor any other computer-based education efforts. The classroom physically needs repairs and new furniture, in addition to any technology for distance learning. Access to full text journal articles is also a high priority for the medical staff, at present these are difficult to obtain.

Pacific Resources for Education and Learning (PREL)-Hawaiʻi has installed radio side band systems that provide simple e-mail communications with 14 outer islands schools. There is a need for computers and
printers for the super dispensaries in Woleai and Ulithi so that these sites may make better use of this system.

**Limitations**

The most serious limitation of this study was its failure to include the outer island dispensaries in the site visits, despite the large percentage (45%) of Yap's population that is served by them and the urgent need for better training of their staff. That the initial survey was done while repairs to damage from super-typhoon Sudel were still underway, also affected the assessment, although everyone at Yap Memorial Hospital very generously granted adequate time for full interviews and site inspection.

Additionally, with our focus on CE needs, no assessment was attempted to determine how many or what kind of health professionals are needed in the future to maintain and improve health care services in Yap, although this should also be factored into CE recommendations.

Some respondents had difficulty ranking or prioritizing the various barriers or content areas. This occurred for several reasons: varying exposure or access to the different types of information, varying educational backgrounds, and varied job duties; however, all uniformly agreed that additional training was essential for better healthcare.

Finally, the situation is a dynamic one, constantly changing; consequently, this report was outdated upon completion; however, it does establish a baseline in 2004/2005 for future comparison.

**Summary**

Growing social and environmental health problems, including rising prevalence rates of non-communicable diseases, rising rates of cigarette and alcohol consumption, and the threat of natural disasters (such as typhoons) leading to epidemics (such as dengue fever) all complicate the health situation on Yap.

The state of Yap has very limited resources with continuing dependence on outside funding sources, administrative organizational challenges, a very limited budget for healthcare, and unique geographical barriers.

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References


Palau Assessment for a Continuing Health Care Professional Development Program

Tai-Ho Chen, MD*
Gregory Dever, MD**
Stevenson Kuartei, MD†
Gregory G. Maskarinec, PhD *

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa;
**Bureau of Hospital & Clinical Services, Ministry of Health, Republic of Palau; †Bureau of Public Health, Ministry of Health, Republic of Palau. Address correspondence and reprint requests to: Gregory G. Maskarinec, PhD. Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, 95-390 Kaahelani Avenue, Mililani, Hawai‘i 96789-1192; gregorym@hawaii.edu.

Abstract
In 2003, the University of Hawai‘i Department of Family Medicine and Community Health entered a 4-year cooperative agreement with the U.S. Health Resources and Services Administration to establish the “Pacific Association for Clinical Training” (PACT). PACT’s goal is to develop effective distance education methods to improve the education and skills of health care professionals in the U.S.-Affiliated Pacific Island nations. To determine the situation existing in 2004, one of PACT’s first projects was to perform site visits to each jurisdiction, conducting needs assessments through interviews with key health care professionals, hospital administrators and government officials. This article highlights findings of PACT’s Palau assessment. Meant to establish a baseline for future reference, all data were collected in 2004-2005 and have not been updated.

Key words: Palau; Clinical Training; Workforce Development; Distance Education. (PHD 2007 Vol 14 No 1 pp 73-80)

Introduction
This report was compiled from written surveys of key health administrators and personnel in conjunction with interviews during a site visit performed by Drs. Tai-Ho Chen and Gregory G. Maskarinec of the Department of Family Medicine and Community Health, University of Hawai‘i John A. Burns School of Medicine (UH JABSOM) in May 2004. Dr. Maskarinec added observations from a September 2004 site visit while in Palau on a separate project. Additional information was obtained through ongoing communications with Pacific Association for Clinical Training (PACT) partners in Palau. Discussion at the November 2004 PACT Advisory Board meeting provided additional information on recent activities. The report has been reviewed by the two PACT Advisory Board members for Palau, Drs. Dever and Kuartei, who, as co-authors of this assessment, provided additional revisions in 2005.

The Republic of Palau (also known as Belau), the westernmost archipelago of the Carolines, is a chain of more than 340 islands, of which eight are permanently inhabited. Palau, in the same time zone as Japan, is 500 miles equidistant from the Philippines to the north and Papua New Guinea to the south, 800 miles from Guam, 1,900 miles from Tokyo, and 4,450 miles from Honolulu. Palau has a land mass of 189 square miles (of which one island, Babeldaob, is 128 square miles), surrounded by an exclusive economic zone of ocean extending over 237,000 square miles.

Following 200 years of colonial history, including three decades under U.S. administration as part of the United Nations Trust Territory of the Pacific, Palau chose independence from the U.S. in 1978, as well as separate political status from the Federated States of Micronesia. A Compact of Free Association with the U.S. was approved in 1986, but not ratified until 1993. The Compact provides Palau with up to $700 million in U.S. aid over 15 years in return for permitting military facilities and alliance with the U.S. for a period of 50 years.¹

Census and Demographics
Palau’s total population (2006 estimate) is 20,579 of whom 70% are ethnically Palauan (Micronesian with Malayan and Melanesian admixtures). Asians (mainly Filipinos, but also Chinese, Taiwanese, and Vietnamese) comprise another 28% of the population and 2% are
Caucasian. Palau’s official languages are Palauan (64.7%) and English (9.4%); Sonsoralese-Tobian is spoken in the Southwest Islands. Palau’s literacy rate is 92%.

Most of the population lives on the three-island complex of Koror, Meyuns, and Malakal, with a combined land area of 7.1 square miles. Most remote are the southwest islands, 180 miles from Koror, which include Sonsorol, with a population of 60. Sonsorol can only be accessed by ocean vessel, a trip that takes about 18 hours from Koror, reported by the Director of Belau National Hospital to cost approximately US$7,000 per round trip. During an epidemic of scrub typhus from August 2003 through January 2004 medical evacuations from Sonsorol created a significant burden on the Sonsorol state health budget.

Health Care and Health Statistics
Palau has two private medical clinics and an 80 bed public hospital, the Belau National Hospital, in Koror. The number of patients admitted to Belau National Hospital in 2001 was 3,436.

Four community health centers, known as “super dispensaries,” provide urgent care and preventive services, and are located in Ngarchelong, Ngeremlengui, Melekeok and Peleliu. Five smaller community clinics are located in outer villages and islands.

In 2001, 300 live births and 138 deaths were recorded. The crude birth rate in 2000 was 14.5 per 1,000 people; the crude death rate was 6.5 per 1,000. Life expectancy is 67.26 years for men, and 73.77 years for women (2006 estimates). In 2004, Palau’s per capita Gross Domestic Product (GDP) was US$9,000. The World Health Organization (WHO) reported the 2003 total health expenditure per capita was US$607 (9.7% of GDP). As WHO noted, this high health expenditure per capita demonstrates the advantages of a high level of foreign assistance and a small population. Quality of life appears to be better in Palau than in many other Pacific Island countries, but as a result, the prevalence of modern lifestyle-related diseases is increasing. There has been an average of five youth suicides per year in Palau over the past several years.

In 2002, a total of 33 cancer-related referrals were made to two off-island facilities, Tripler Army Medical Hospital in Honolulu and St. Luke’s Medical Center in the Philippines. In 2005, the 140 off-island referrals (most of which were for preventable diseases) along with treatment for 28 hemodialysis patients, according to the hospital director, accounted for a significant share of Palau’s total national health care costs.

Health Workforce Demographics
In 2004, the Republic of Palau had a total of 25 physicians, 19 employed by the Ministry of Health (MOH) and six private practitioners. Palau’s MOH employs approximately 400 persons. Belau National Hospital is staffed by 24 physicians (an increase from 20 in 1998), one medex (medical extension officer with 2 years of pre-doctoral training), 56 clinical nurses, 54 public health nurses, 12 nurse aids (divided between the wards and Public Health), nine pharmacy staff (plus one studying in Fiji for a PharmD degree), 11 laboratory technicians, five physical therapists, seven radiology technicians, four dentists, 10 dental workers, and three social workers.

Health Workforce Training
Laboratory Services
Of the 62 allied health workforce positions, four are expatriates and four are Palauans (all eight are certified in their respective fields). The remaining 54 allied health workers received on-the-job training by senior allied health personnel. Locally, allied health salaries range from US$6,000 to $8,000 annually.

Radiology Services
Of the seven radiology technicians, two are certified. One, a Palauan, is a computed tomography technician who trained in the U.S. and the other is a New Zealand-trained ultrasound technician.

Pharmacy Services
The head of pharmacy at Belau National Hospital is from Kiribati and was trained and certified in New Zealand. A pharmacy technician training program began in 2004 in conjunction with the University of Hawai‘i, Hilo and the University of Alaska, with eight participants in the first class.

Physical Therapy Services
In the 1980s, a U.S. Department of Energy grant provided training for all physical therapists in the Pacific region; however, none received subsequent formal training.

Bureau of Public Health, Ministry of Health
It is important to note the critical services provided by Palau’s Bureau of Public Health. Programs in Emergency Health, Community Advocacy, Social and Spiritual Health, and Health Information Systems are...
provided through the Bureau’s four Divisions.

Division of Environmental Health
Palau’s Environmental Health (EH) workforce includes two Master of Public Health (MPH)-level personnel, one undergraduate diploma-recipient from Fiji School of Medicine (FSM), one certificate-level recipient from FSM, 14 EH personnel undergoing on-the-job training, and four students. By 2005, nearly all of Palau’s EH personnel are expected to be studying for undergraduate certification and/or diploma through the Palau Area Health Education Center (AHEC)/Fiji School of Public Health and Primary Care (FSM/SPH&PC).

Division of Behavioral Health
Twenty-eight to 30 staff personnel in the Behavioral Health (BH) Division provide inpatient and outpatient mental health services, tobacco and substance abuse education and prevention programs, and substance abuse treatment services, as well as day group programs to assist severely ill BH patients with participation in community activities.

Division of Oral Health
Four dentists (two expatriates and two locals trained in Fiji) provide oral health services in Palau. Of Palau’s 10 current dental assistants, eight completed a year-long training program. The only dental school in the region is the Fiji School of Oral Health (SOH). Palau has sent four students to Fiji SOH, two completed their dental training.

Division of Primary and Preventive Health
The Division of Primary and Preventive Health provides an array of services in five general categories: infectious diseases, non-communicable diseases, cancer, family health, and community health.

Division of Nursing, Belau National Hospital
Although Palauans prefer to stay in the Pacific, many of Palau’s nurses have moved to Guam or Saipan (capital of the Commonwealth of Northern Mariana Islands [CNMI]), since they are able to earn four times their salary there compared to Palau. As of 2004, Palau had lost 30 nurses to Guam or Saipan, and a number of Palau’s Chamorro nurses have moved to the U.S. mainland.

The Training Pipeline
Pipeline programs to develop new health staff are a priority in Palau. In 2005, the Palau AHEC, based at Palau Community College (PCC), conducted a nine-month “Nursing Assistant and Allied Health Training Program” with WHO and Work Incentive Act funding support. This program was successful in addressing the low completion rate of students in existing educational channels for health careers. The program recruited 40 local students who were paid stipends and rotated through various health specialties. Of the 28 graduates, Palau’s MOH either hired or mainstreamed selected graduates to PCC for further nursing training. There is interest within the Palau MOH to further develop Palau’s health careers pipeline (elementary school, high school, community college, graduate programs) and bridging programs (targeting under-trained health professionals) to provide a clearer pathway for progression into the health workforce. To affect this, the MOH will partner with the Ministry of Education, the Palau AHEC, and local non-governmental organizations, and will join the UH JABSOM’s Health Careers Opportunity Program competitive renewal application.

Integration of primary and continuing training into ongoing health services activities was recommended as a possible model to meet the specific needs identified in Palau.

Current Professional Development Activities
The importance of developing a coherent health services plan first in order to effectively direct human resources training priorities was emphasized by co-authors Dr. Stevenson Kuartei (Director, MOH Bureau of Public Health) and Dr. Gregory Dever (Director, MOH Bureau of Hospital and Clinical Services) at the November 2004 PACT Advisory Board meeting. Integration of primary and continuing training into ongoing health services activities was recommended as a possible model to meet the specific needs identified in Palau.

Continuing Professional Education
Palau has the most active continuing medical education (CME) efforts in the region, most of which are conducted through Palau AHEC and under the Hospital’s Division of Professional Services. The physician CME requirement is 50 credits per year (weekly attendance logs are kept at local medical conferences), while 30 hours of annual continuing education units (CEUs) are required by the MOH for all nurses. Currently, no continuing education standards are set for Palau’s social workers.

Ongoing continuing education programs through Palau MOH/AHEC include medical laboratory technician training with daily “hands-on-training” and more formal training modules which will be opened to the region. As an example, in April 2004 the MOH conducted a two-week pilot program on blood safety, which was attended by laboratory technicians from Yap and Pohnpei (the Federated States of Micronesia). This program was
conducted by an expatriate laboratory trainer recruited through the Pacific Paramedical Training Center in Wellington, New Zealand and was funded by the U.S. Department of Health and Human Services (DHHS) Health Resources and Services Administration (HRSA) Hospital Preparedness Program.

Undergraduate and Postgraduate Training

Between its inception in 2002 and the time of the PACT assessment in 2004, the Palau AHEC has conducted 39 formal undergraduate and/or postgraduate certificate/diploma courses, including nine postgraduate courses in general practice taught by the University of Auckland’s Faculty of Medicine, and 30 undergraduate/postgraduate courses taught by FSM/SPH&PC faculty. The relationship with the FSM has been very positive in providing instruction that can lead to formal certifications and diplomas for Palau’s health workforce trainees.

By November 2004, the Palau AHEC had coordinated the training of over 130 regional physicians, nurses, health administrators and EH workers, primarily from Palau, and also including Yap State, and the Republic of the Marshall Islands. In August 2004, one physician and 11 nurses comprised the inaugural cohort of program graduates. In 2004, the Palau AHEC expected to award certificates to 13 local nurses in undergraduate training in Public Health (midway towards receipt of a diploma in the British system). The next graduating class in 2005 was expected to number over 50 graduates.

Included as a component of the FSM/SPH&PC postgraduate training for physicians was an extensive community health project to determine local health indicators, in which all 5,500 households in Palau were interviewed to ascertain community health needs and problems. Additionally, six Palauan physicians completed a 12-month Clinical Residency Training program at Belau National Hospital, conducted by the Palau AHEC. There is also an ongoing emergency response program conducted with the University of Auckland.

Although PCC has a nursing program, few students from the community enroll directly into the program. The majority of students are first recruited into a public health position and later transfer to the MOH, from where they are offered part-time salary support while they attend PCC’s nursing program. This approach has proven more successful than past efforts in which Palauan students were sent directly to the FSM because many failed to complete training due to insufficient development of English, math and other academic skills.

Training Opportunities through the Palau Ministry of Health

The following is a list of continuing education and other training opportunities conducted by staff of the MOH Division of BH:

a) Basic counseling strategies for employees of Palau’s Ministries of Health, Education, and Justice (nurses, social workers, case managers). This training includes three 1.5-hour seminars (two parts didactic, one part hands-on) with group breakout sessions.

b) Critical incident management.

c) CMEs/CEUs on integrating mental health care into the broader medical system, including issues related to the intersection of diabetes and anxiety, diabetes and depression, and mental health and substance abuse; concurrent disorders, hypertension, and post-cerebrovascular accident personality changes.

d) Training for school Parent-Teacher Associations on the prevention and/or early intervention of student behavioral problems that may hint of an emerging behavioral illness. Programs included the creation of a monitoring system in conjunction with Head Start programs to encourage appropriate classroom behaviors and identify students with learning disabilities or at potential risk of illness.

e) Case management and patient care coordination techniques utilizing social work skills.

f) Differential diagnosis of psychosis and different modalities of therapy.

g) Rapid substance abuse and addiction interventions for dispensary nurses, medical officers, physicians, health educators and triage nurses in the Outpatient and Emergency Departments.

h) Handling mentally ill patients in terms of degrees of aggression and violent behavior.

i) Crisis response training, suicide risk assessment, prevention and intervention, as well as treatment after attempted suicide.

j) Addiction counseling training and certification (14 trainees completed the course, seven received International Red Cross certification).

k) Crisis counseling training as part of an Emergency
Management Plan (22 volunteer crisis counselors have been certified).

**Priority Continuing Professional Development Needs**

Targeting education based on leading causes of mortality is one approach to developing a relevant continuing education curriculum. In 2003, the MOH reported the ten leading causes of death in Palau to be: 1) cancer (n=22); 2) injuries (n=20); 3) heart disease (n=18); 4) cerebrovascular accident or stroke (n=15); 5) diabetes (n=11) and kidney disease (n=11); 6) septicemia (n=10); 7) chronic obstructive pulmonary disease (n=7); 8) natural causes, unknown (n=5); 9) congenital anomalies (n=4); and 10) cirrhosis/liver disease/alcohol abuse (n=3). As the number of deaths of this single-year period totaled only 127, ranking by cause has little, if any, significance. However, the list provides some indication of those topics for which further medical education would be helpful. Common risk factors and determinants of health should also be addressed in any training curriculum.

**Priority Future Training Opportunities**

Recent continuing training programs in Palau have focused on physicians, nurses and a subset of allied health staff, but minimally on administration and supportive services. This has been acknowledged through needs assessments conducted in the areas of physiotherapy, radiology, laboratory and clinical nursing. Training of current administrative and allied health staff through bridging programs remains an area of high priority in Palau since the vast majority of administrative and allied health staff have had no baseline formal training in their fields.

Additional training in health promotion, risk reduction, and culturally-based social services has been requested, particularly for community advocacy personnel, who conduct health research, social marketing, health promotions and health education programs. Key geriatrics training needs identified include program organization, management, clinical skills for nurses, and psychosocial aspects relating to end-of-life care.

As is true throughout the Pacific, there is a critical need to train service chiefs in management skills since many were elevated from clinical positions with limited or no training or experience in administration and leadership.

Palau’s MOH has identified two local experts, Benita H. Decherong, Certified Substance Abuse Counselor, Ministry of Education Counselor, and Josepha “Seba” Tiobech, RN, MOH Behavioral Health Nurse Supervisor, to advise on cultural diversity issues as part of the training curriculum.

Story-based teaching may be better received than a strict didactic approach. As one source noted, “We’ve had CEUs on communication and management, but getting people to apply what they know is still really hard. A case-based, practical approach to team building across different professions is what is needed.”

**Potential Collaboration**

The success of the Palau AHEC is a strong model for training programs in the region. Critical support from MOH for human resources development has enabled the strong efforts of this program to be successful in Palau. Through ongoing Palau AHEC courses offered in the region, coupled with the implementation of new AHEC programs in Yap and CNMI in recent years, the benefits of this model is now more widely available to other parts of the region. The notable success of the Nursing Assistant and Allied Health Training Program in recruiting, supporting and developing new healthcare personnel has provided a model for meeting Palau’s allied health and clinical nursing needs.

The success of the Palau AHEC in working with the FSM suggests that further discussion of partnerships with this institution may prove to be extremely valuable. The expertise and experience of health staff on Palau is a valuable resource for the U.S. Associated Pacific Islands (USAPI). An appropriate role for PACT may be in helping to make this expertise more available to other countries in the region.

**Distance Education Technologies**

Satellite communications through Pan-Pacific Education and Communication Experiments by Satellite (PEACESAT) are tenuous, since Palau falls at the edge of the satellite footprint and has had inconsistent results from this technology. PEACESAT facilities are located in the Department of Education. Two dedicated lines for teleconferencing are available in the library and conference room. Palau has only one local Internet Service Provider. The experience of medical staff with the Tripler Army Medical Center’s online consultation
program has been very positive. The Honorable Victor M. Yano, MD (appointed by President Tommy E. Remengesau as Palau’s Minister of Health in January 1995) is a U.S.-trained private practice physician and founder of the Belau Medical Clinic. In his private medical practice, Dr. Yano has successfully accessed Tripler’s medical rounds using net-to-phone technology, at a cost of US$2.50 per hour, however he points out the need to train technicians to repair and maintain the medical equipment. Moreover, the U.S. military has mandated increased security measures making recent access difficult.

A relatively economical (US $18 per hour per line) phone bridging service provided by Verizon Hawai‘i provided greater clarity and reliability than PEACESAT for audio-conferencing, but this service was discontinued in 2004. The cost of long-distance service has recently dropped in Palau. The Palau AHEC experience with distance education through audio-conferencing has been generally positive when reliable and affordable telecommunications have been available. For sensitive topics, such as discussion of psychosocial issues, face-to-face interactions may still be preferred.

In 2003, the WHO installed a 10-station Pacific Open Learning Health Network (POLHN) computer lab in the Belau National Hospital library. This remains underutilized and there is limited access to commercial health information sources, such as printed journals. Health professionals agree that internet and other computer-based distance learning courses, such as via CD-ROMs, could work well.

Pharmacy Services personnel have requested computerization of the prescription system to provide for automatic warnings of possible adverse drug interaction or prescription errors. They noted that the State Hospital in Yap is currently using a computerized pharmacy warning program.

Additional details on communications and information technology infrastructure are provided in the PACT Telecommunication Infrastructure Assessment article in this issue.10

**Limitations**

The most serious limitation of this study was its failure to include the four super-dispensaries or any of the outer island community clinics of Palau during the site visit, despite their importance to the health of Palauans and the needs of health care staff for continuing education. Additionally, with our focus on continuing education needs, no analysis was attempted to determine the ideal number or composition of health professionals needed to maintain and improve health care services in Palau at present or in the future.

Since we relied on many key informant interviews, the assessment is limited where respondents may have shown inconsistency in ranking or prioritizing the content areas or specific challenges. This occurred for several reasons: varied exposure or access to the different types of information, varied educational backgrounds and varied job duties. However, all interviewed personnel uniformly agreed that additional training was essential for better health care. Data is based on official records as well as first-hand reports. In some cases there were discrepancies resolved in favor of the version provided by the Minister of Health.

Finally, the health worker training situation in Palau is exceptionally dynamic and was evolving even as the site visits progressed. This assessment does describe a baseline of health worker education for comparison and measurement of subsequent progress. This report was used to guide initial PACT policy with continual discussion and development of PACT activities through ongoing collaboration with partners in Palau.

**Summary**

Of all Freely Associated States of the USAPI, Palau has the highest per capita health care expenditure and has the most active CME efforts. However, despite Palau’s relatively high standard of living compared to most of the Pacific, Palauans have high rates of life-style associated diseases such as illicit drug use, alcohol, and tobacco consumption. Mental health problems and domestic violence are also serious issues.

Although satellite communications through PEACESAT are tenuous, Palau’s health care workforce shows considerable computer aptitude and a willingness to explore new modalities of learning, suggesting that internet or CD-ROM-based distance learning programs have good chances for success, especially given that computer resources at Belau’s National Hospital are easily accessible and reliable.

The success of the Palau AHEC is a strong model for
health care workforce training programs in the region. Strong, systematic support from the MOH for human resources development has enabled the program’s success in Palau. Through ongoing Palau AHEC courses offered in the region and with implementation of new AHEC programs in Yap and CNMI in recent years, the benefits of this model is now more readily available to other parts of the Pacific. The notable success of the Nursing Assistant and Allied Health Training Program in recruiting, supporting and developing new health care personnel also provides a model for meeting Palau’s allied health and clinical nursing needs.

Given the sophistication and success of ongoing continuing medical training activities in Palau, PACT should provide continued support for targeted local and regional AHEC programs, such as supplementing health information resources and grant research support, as requested by AHEC staff. The expertise and experience of the health care workforce in Palau is a valuable resource for the region. PACT could play an effective role in making such expertise available throughout the USAPI.

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References


Republic of the Marshall Islands Assessment for a Continuing Health Care Professional Development Program

Justina R. Langidrik, MPH*
Seldon Riklon, MD**
Salome Lanwi, RN†
Kamal Gunawardane, MBBS‡
Tin Soe, MD§
Tom Jack, MD‡
Grace Ann Balaoing, MD§
Lee E. Buenconsejo-Lum, MD¶

*Secretary of Health, Ministry of Health, Republic of the Marshall Islands (RMI); **Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa; †Department of Energy Clinic, Majuro, RMI; ‡Majuro Hospital, Ministry of Health, Majuro, RMI; §Kwajalein Atoll Health Care Bureau, Ministry of Health, RMI; ¶Ebeye Hospital, Ministry of Health, RMI. Address correspondence and reprint requests to: Lee E. Buenconsejo-Lum, MD, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, 95-390 Kuahele Avenue, Mililani, Hawai‘i 96789-1192; lbuencon@hawaii.edu.

Abstract
In 2003, the University of Hawai‘i Department of Family Medicine and Community Health entered a 4-year cooperative agreement with the U.S. Health Resources and Services Administration to establish the “Pacific Association for Clinical Training” (PACT). PACT’s goal is to develop effective distance education methods to improve the education and skills of healthcare professionals in the U.S.-Affiliated Pacific Island nations. To determine the situation existing in 2004, one of PACT’s first projects was to perform site visits to each jurisdiction, conducting needs assessments through interviews with key health care professionals, hospital administrators, and government officials. This article highlights findings of PACT’s assessment of Republic of the Marshall Islands. Meant to establish a baseline for future reference, all data are those collected in 2004/2005 and have not been updated.

Key words: Republic of the Marshall Islands; Clinical Training; Workforce Development; Distance Education.

Introduction
A preliminary written needs assessment survey was distributed in November 2003 and completed by key informants in the Republic of the Marshall Islands (RMI) Ministry of Health and Environment (MOHE) and at Majuro and Ebeye Hospitals. Drs. Sheldon Riklon and Lee Buenconsejo-Lum interviewed additional participants in person and through written communications. Cherie Shehata (University of Hawai‘i Family Practice Resident) conducted the key informant interview for the laboratory staff during a clinical rotation in the RMI. The draft was reviewed and discussed at the November 2004 Advisory Board meeting and with the Secretary of Health for the RMI (fist author, Justina Langidrik).

The RMI is an island nation located in the central Pacific. The country consists of 29 coral atolls, including the world’s largest, Kwajalein, and five coral islands (1,225 islands in total) running in two parallel chains. Total land area is 70 square miles, but the Exclusive Economic zone covers 750,000 square miles. The RMI is divided into 33 municipalities, with Majuro, Ebeye, Wotje and Jaluit as major district centers. Majuro and Kwajalein are served by international airlines and by Air Marshall Islands that offers flights between Majuro, Kwajalein and the outer islands, 23 of which have airstrips. Travel between many outer islands is by small boat. Most outer islands do not have electricity or running water. Supplies for some of the outer islands are transported by ship.

The RMI is a self-governing democracy in free association with the U.S. and has been independent since 1986, and a member of the United Nations since 1991. During the period 1946-1958, the U.S. detonated total of 67 nuclear weapons in the atolls of Bikini and Enewetak and the total yield during the 12-year testing period equaled 108 megatons (equivalent to over 7,000 Hiroshima bombs). Radioactive material was absorbed from the contaminated food and water and increases...
in leukemia, breast cancer and thyroid cancer after radiation exposure have been established, especially for those with childhood exposure.

Between 1986 and 2003, a targeted health care program (the 177 Health Care Plan) provided more comprehensive care for approximately 10,000 persons, including radiation-affected and displaced Marshallese and their descendants from the atolls of Rongelap, Ulitik, Bikini and Enewetak. Funding for the 177 program, along with all other sector grants, is scheduled for incremental reduction per the Amended Compact of Free Association with the U.S., so it exists on a smaller scale. A U.S. Department of Energy-sponsored program (Ejmour Mokta) provides screening and treatment for 207 Marshallese citizens considered by the U.S. to have been most directly exposed to radiation from nuclear weapons testing.

The total RIM population, based on a July 2004 estimate, is reported at 57,738 with a growth rate of 2.3%, a birth rate of 33.88 per 1,000 and a death rate of 4.94. Infant mortality is 30.5 per 1,000 live births, in comparison to the U.S. infant mortality of 6.63. Overall life expectancy is 69.7 years, compared to 77.4 years in the U.S. Over 62% of the population are age or older.

A 1999 World Health Organization (WHO) report estimated that the population growth has outpaced the facilities for the provision of safe water and sanitation.

The overwhelming majority of the population is ethnic Marshallese or part-Marshallese. Major languages spoken include two major dialects of Marshallese and English; Japanese is also spoken by some. Ninety percent of the population is defined as literate (percent of the population >14 years of age who can read), based on a 1999 estimate from the RMI census. Approximately half of the population lives on Majuro Atoll. Another 13,000 citizens reside in densely populated Ebeye Atoll, which is a 78-acre (0.14 square miles) island 3 miles north of Kwajalein atoll. There are some homes and rural villages on all inhabited islands that do not have electricity or running water.

The RIM Gross Domestic Product (GDP) per capita is $1,194, in comparison with the Hawai'i GDP of $37,986. Per capita income in urban areas is $1,379 and in rural areas, $520. Thirty percent of the country's revenue is from local sources (small-scale agriculture and handicrafts); 70% are from U.S. grants. The unemployment rate is approximately 31%. In 2002, the RMI spent $248 per capita on health care expenditures compared to $4,499 for the U.S.

### Health Workforce Demographics

There are two MOHE hospitals in the RMI, Majuro Hospital and Ebeye Hospital. Majuro is the main referral center. Basic health services are provided at the two hospitals and 49 dispensaries and health centers (most on the outer atolls). The majority of health care workers in both hospitals, including MDs, registered nurses (RNs) and laboratory staff are expatriate contract workers, while outer atoll health centers are staffed by medical officers, health assistants and local support staff. Majuro Hospital has a radiologist and pathologist (Table 1 details the number of health workers in various fields in the RMI).

A 1999 World Health Organization (WHO) report estimated that the population growth has outpaced the facilities for the provision of safe water and sanitation.

Included in the count of nurses in the RMI are Marshallese-licensed RNs, licensed practical nurses (LPNs) and certified nurse aides (CNAs). Nurses hold a variety of degrees, including Associates of Arts (AA), Bachelor of Science in Nursing (BSN) and Master of science in Nursing (MSN). The majority of nurses are practical nurses without formal degrees; most of the others hold Associate-level degrees.

The RMI Public Health Council employs approximately 16 nurses and eight health educators, and most participate in all prevention and education activities, ranging from immunizations, sexually transmitted disease prevention, Tuberculosis (TB) prevention, to high school education sessions. Additional public health services are provided by the Department of Reproductive Health and the Outer Island Health Care Services.

### Health Workforce Training

Of the 32 physicians, one (author, Dr. Sheldon Riklon, who is Marshallese) received and completed his training in a U.S. allopathic medical school and is licensed to practice in the U.S. Some physicians are graduates of the now defunct Pacific Basin Medical Officer Training Program. The remaining physicians are expatriate physicians from the Philippines, Burma (Myanmar), Sri Lanka, and elsewhere.

Many of the graduate nursing staff received their education (Associate's degree) at the College of the Marshall Islands (CMI) nursing program or at Northern Marianas Community College in Saipan,
LPNs receive 9-12-month on-the-job nurse aide training. Many of them have difficulty succeeding in the nursing program at the CMI, according to key nursing personnel at MOHE.

Dentists, dental hygienists and assistants receive their training outside of RMI, typically at the Fiji School of Dentistry or in the United Kingdom. None of the seven dental assistants are formally certified. Dr. Ohnmar Tut, Preventive Service Dentist with RMI’s Ministry of Health, with the assistance of Dr. Peter Milgrom from the University of Washington, School of Dentistry and others, has started a local dental assistant training pilot program that also incorporates training in health education and community outreach skills. Other U.S.-Affiliated Pacific Island (USAPI) jurisdictions have expressed great interest in sending potential candidates to the RMI for training and certification in such a program.

A WHO-funded consultant has been conducting formal health assistant training. Participants are high school graduates who receive an intensive 18-month core curriculum, covering English, basic anatomy and pathophysiology, and basic pharmacology. Once the health assistants return to their outer island dispensary, ongoing case-based education is conducted via shortwave radio. Currently, the health assistant training program is only open to Marshallese.

A new Health Professions Licensing Board was recently appointed and members are beginning the process of creating formal and standardized policies and procedures. One radiologist was recently hired, so mammograms are now performed with increasing frequency. Few of the radiology technicians are certified. Until recently, radiology services were limited to x-rays and mammograms. However, a new computed tomography scanner is now in place. There is no fluoroscopic unit or magnetic resonance imaging scanner. Most of the technicians in Majuro and all of the technicians in Ebeye do not hold college certificates.

A pathologist was recently hired, so pap smears can now be read in Majuro. Technicians are also trained primarily on-the-job, and in Ebeye, none of the staff are certified medical technologists. Pharmacy technicians are also trained primarily on-the-job.

Continuing Professional Development Activities

Continuing Professional Development as a Health Priority

The RMI has recently endorsed a national strategic plan, Vision 2018, to guide the development of the country. The plan strongly emphasizes the need to develop human resource potential through improved education and other specific initiatives. The plan proposes to “establish a knowledge-based economy by equipping Marshallese citizens with internationally competitive skills, qualities and positive attitudes towards work and society.” Priorities include improving the education system in order to develop a local health care workforce (educational “pipeline” programs), create or expand on opportunities for maintenance of skills of the existing workforce locally, through capacity building and addressing the many systemic issues that affect development of a sustainable health care workforce and a continuing professional development (CPD) program.

Most of the health care workforce and supervisors are eager for CPD opportunities, especially for those professionals trained primarily on-the-job. MOHE and hospital administrators have strongly supported this effort. A new Health Professions Licensing Board was
Continuing Professional Development Infrastructure and Program

A small group of dedicated physicians and nurses at both Majuro and Ebeye Hospitals have been at the forefront of developing and improving CPD efforts over several years. However, there is still insufficient administrative or financial support despite their efforts.

At Majuro Hospital, one or two physicians lead a fledgling group CPD program, mostly centered on interesting cases where medical care is discussed similar to “morbidity and mortality” rounds. Monthly speaker assignments are made a year in advance and the presenters often review hospital statistics for the previous month, summarize most of the cases they cared for and then discuss one case in more detail. Some of the discussions are evidence-based, while others describe the clinical course and ask for input on management or advice on improving care for future cases.

There is a regular continuing education time established, so at least half the physicians are able to attend. Although there is no dedicated administrative support person for CPD activities, fliers are posted and announcements are made overhead, which does improve attendance. Health professionals feel this method of communication, as well as the monthly assigned schedule, are very effective. Tracking of participation in group CPD activities is mainly the responsibility of the Chief of Nursing (for nurses) and one physician. There is no formal CPD committee structure, nor is there a written assessment of learning needs; potential topics for CPD discussion are also discussed at department meetings.

When University of Hawai’i Family Medicine residents were rotating in the RMI, they were required to make at least one educational presentation for health staff. The residents’ topic selection were independently selected or guided by the rotation supervisor, Dr. Riklon.

With the recent expansion of video-teleconference (VTC) capability to Majuro Hospital and the hiring of a dedicated support staff to coordinate distance-education opportunities, more hospital staff members have been able to participate in routine educational conferences held at the Queen’s Medical Center and Shriners Hospital in Honolulu, Hawai’i. Access to a WHO Pacific Open Health Learning Network (POHLN) computer laboratory at Majuro Hospital also provides opportunities for some individual CPD and basic training opportunities. Please refer to the in-depth assessment of e-learning capacity by Higa, also published in this special issue (pp 89-97). The information technology (IT) staffer at Majuro Hospital helps to coordinate VTC and online learning opportunities, but she does not track nor is she responsible for tracking participation and completion of the online courses.

Nurses at Majuro have regular training and update sessions, and the need for this training is mostly based on quality improvement or training to support new services offered at Majuro Hospital. Nurses also try to take advantage of VTC opportunities, but with the timing of their shifts and the time difference between Hawai’i and the RMI, many are unable to participate. Recently imposed access restrictions to the WHO computer lab present further barriers to nurses and allied health personnel working in the evening or night shifts.

The continuing medical education programs borrow a computer and VGA projector from the Department of Energy Ejmour Mokta programs in Majuro and Ebeye. The RMI received selected core texts from the University of Washington’s Pacific Islands Continuing Clinical Education Program to augment their hospital libraries in the early 2000s. Other text resources are at least five to15 years old.

There are no coordinated CPD opportunities for dental health professionals, radiology staff, laboratory or pharmacy staff or other allied health providers in the RMI. Occasionally a funding agency will offer on-site continuing education opportunities, but those are usually limited to personnel in particular funded public health programs only, even though the topics may be relevant to a broader audience. Some staff rely on web-based CPD for individual learning, but most do not participate...
in regular CPD opportunities. Many of the allied health providers who participate in online courses do so under the direction of their supervisors.

In Ebeye, no formal CPD program exists for any of the health providers. Several staff members are interested in CPD, but administrative barriers and lack of incentives prevail. The University of Hawai'i Family Medicine residents conducted at least one continuing medical education session while rotating at Ebeye Hospital.

In the RMI, there was a recent emphasis to preferentially allow native Marshallese health staff (rather than expatriates) to participate in off-island travel opportunities. However, many of the off-island trips are associated with administrative meetings and do not include opportunities for continuing education. The restriction on travel by expatriate physician staff, that provide much of the health care to the population, has been eased in large part after Marshallese physician leaders advocated on behalf of their expatriate colleagues. At the June 2004 PBMA meeting in Pohnpei, FSM, the majority of physician participants from the RMI were expatriates.

**Barriers to Accessing Currently Available Continuing Professional Development Opportunities**

In Majuro, historically there has been little administrative infrastructure to help formalize CPD programs or to provide support services for presenters. Even when programs are relevant and presented effectively, providers are often not able to implement the new knowledge or skills because of resource and infrastructure limitations or other systemic barriers. A prevalent concern among key informants was that many health providers are not familiar with online CPD opportunities and might not be comfortable using this technology. Those that are comfortable with or enthusiastic about utilizing online resources face slow and costly internet connections, as well as limited access at work. In general, there are insufficient CPD opportunities for providers. No group activities exist for dental or allied health providers and limited opportunities exist for nursing staff.

CPD opportunities on Ebeye are even more limited due to lack of incentives, limited administrative support, limited staffing and other infrastructure restrictions.

**Priority Continuing Professional Development Needs**

Key informant and hospital data sources point toward diabetes mellitus and associated non-communicable illnesses (coronary artery disease, heart failure, hypertension, renal failure, metabolic syndrome and obesity) as the most common diseases in the RMI. A majority of the hospital and off-island referral budgets are for these chronic illness and their complications. In 2001, diabetes (including complications) was the leading cause of death, followed by heart disease, cancer, neonatal deaths and accidents. A high and increasing rate of sexually transmitted diseases (syphilis and chlamydia, in particular) and other infectious diseases, as well as a high teen pregnancy rate, are of concern; these contribute to one of the highest infant mortality rates in the USAPI.

All providers interviewed agreed that more emphasis on preventive health and preventive oral health is needed. Otitis media and pneumonia were also consistently identified as priorities, based on the high prevalence of these two conditions. Nursing staff at Majuro Hospital also identified issues surrounding rape, especially unreported childhood rape, as a priority. Nursing staff in each department also identified content and skill areas needed to improve the quality of care provided at the hospital and public health clinics. Physician, nursing and pharmacy staff indicated a great desire to develop local capacity for advanced cardiac life support training and certification.

For dental providers (including dentists, hygienists and technicians), there is a need for education of all providers regarding preventive and curative aspects of bottle caries, caries in general and periodontal disease. Because dental caries, gum disease and nutrition-related disease are so common, nutrition and dental health education is also a high priority area for all who perform direct patient care.

In general, there is a great need for basic, foundational training in addition to continuing education for the technicians in the laboratory, pharmacy and radiology. Many technicians are trained on-the-job without prior formal training. Pharmacists would like to see pharmacy and other staff, including nurses and doctors, receive training aimed at reducing medication errors, appropriately selecting antibiotics and properly using medications in emergency situations.

The laboratory has an acute need for training technicians in all areas of operation, from understanding what tests are used for, to developing policies surrounding blood transfusions, to skills building in histopathology and microbiology, to interpreting and analyzing laboratory statistics. The recently hired pathologist actively seeks...
online training courses for the lab technicians. He makes recommendations on which of his staff should apply for specific courses, and works with the IT support person to facilitate this training. The pathologist also hopes to develop a training opportunity for a pathology resident, which would serve both the learning needs of the resident and the training needs of the lab staff.

For the Radiology Department, their priority is to get some formal continuing education training.

**Potential for Collaboration**

The Hawai‘i Board of Medical Examiners is willing to assist the RMI and other jurisdictions in setting up licensing bodies by sharing Hawai‘i policies and procedures for revision and adaptation to the local setting. Potential computer skills/informatics skills training opportunities exist at the CMI, but this has not been formally explored.

**Distance Education Technologies**

**Existing Technology**

All telecommunications services on the RMI are provided by the National Telecommunications Authority (NTA). Until mid-2003, there was no local Internet Service Provider (ISP), so internet access was provided through a commercial satellite link via Guam. A digital TDMA-800 cellular service launched during 2000, replacing the Island’s original advanced mobile phone system. This system includes both fixed and mobile services and provides telephone service to some of the other islands in the Kwajalein Atoll where no fixed-line service is available. The NTA received government funding in August 2002 to build and operate the first earth stations for telephone communication on the remote islands of Jaluit and Wotje Atolls.

Majuro Hospital has a WHO POHLN laboratory with a shared 64 Kbps internet connection leased from the NTA. The monthly charge of $800 per month reflects a special discounted rate. WHO funding covers the cost of this internet link for the first year. There are 10 client computers, and one mail server in this lab. In total there are approximately 35 computers in the hospital. There are four computers that are networked in the medical records room, without internet access. One client computer has a dial-up internet connection in the pharmacy and sits alongside three computers without internet access. Other locations with dial-up internet access include the hospital administrator’s office and a common computer located in the administrative office. There are no computers in the emergency room and outpatient department. Majuro Hospital also utilizes a wireless local area network beyond the computer lab and has connectivity to the Majuro library and MOHE through the Pan-Pacific Education and Communication Experiments by Satellite (PEACESAT) network based on a past National Library of Medicine grant for this specific purpose. This allows for internet access at Majuro Hospital at no metered cost. Initially, hospital staff had almost 24-hour access to the computers in the lab; however problems arose with staff using the computers instead of being at their duty stations and other internet-related infractions. Subsequently, the hospital’s IT Department and Administration are working on an internet use policy and deciding on strategies for appropriate use during evening and night shifts.

Video-teleconferencing (VTC) now works fairly reliably in both Majuro Hospital and in the Department of Education. The main IT person at the hospital serves as the coordinator for VTC program opportunities (from Hawai‘i, mainly) and also coordinates registration of online courses for allied health and other health professionals.

The newly built Ebeye Hospital has approximately 30 computers. Ten of these computers share the only available commercial dial-up access line at a cost of $22 a month and an additional $3 per hour. The access charges limit the current hours of hospital internet access to between 8:00 a.m. and 5:00 p.m. The connectivity is very slow and it can take several minutes to open a basic webpage. The medical director has expressed interest and offered staff support for developing a computer lab at the hospital.

**Health Care Provider Experience or Comfort Level with Using Computers/Distance Education**

Experience and comfort level with basic computer skills vary widely, but in general, physicians are more experienced or comfortable than other providers. Some nurses had never used a computer before or had never participated in an online learning experience.

In Majuro, VTC conferences from Hawai‘i are being utilized regularly, as well as some online learning opportunities for allied health professionals. There is such a demand at Majuro Hospital, that they are requesting more computers/internet access from the MOHE. Some physicians, nurses, dentists and dental assistants use their own computers and home internet to access online continuing education resources or perform web-based literature searches, but internet access is slow and costly. Although the RMI is eligible to access the Health InterNetwork Access to Research Initiative (HINARI) databases and full-text journal offerings, they have been unable to afford the user fee.

With rare individual exceptions, no distance education is being used consistently in Ebeye. Ebeye will...
ocasionally send interesting cases via Tripler Army Medical Center’s store-and-forward technology program, but this is mainly for consultation and limited to one or a few individuals instead of the entire staff.

High cost, slow access, limited bandwidth and challenging telecommunications policy limit regular access to online CPD opportunities. Lack of VTC capability in Ebeye is also viewed as a large barrier. Rural clinics on Majuro do not have computers and outer island clinics and dispensaries often do not have electricity. Health providers also require varying amounts of training to utilize online health information resources.10

Summary
The health infrastructure and workforce in the RMI face difficult challenges in addressing many of the pressing health disparity and infrastructure problems due to geographical isolation, a struggling economy and inadequate and declining health funding provided from the renegotiated Compact of Free Association with the U.S. Despite these challenges, the nation’s strategic plan, Vision 2018, strongly emphasizes development of human resource capacity and includes plans to “grow” a local workforce, as well as improve opportunities for the existing local Marshallese workforce of health providers. The Secretary of Health remains committed to improving quality and capacity of the workforce and the Hospital Administrator in Majuro is strongly supportive. A dedicated group of health providers at both Majuro and Ebeye Hospitals, as well as in the outer islands health systems remains a driving force for increasing knowledge, skills, and expectations for CPD. Providers in Majuro are utilizing recently acquired VTC capability and the WHO Open Health Learning Center for computer and internet access. Systemic issues still need to be addressed regarding internet usage policies and increasing the availability of the computers for the health provider staff.

Ebeye Hospital has recently greatly expanded the numbers of computers available to health providers and has created some time on Friday mornings for continuing education. Challenges still remain with the cost, speed and reliability of internet access in Ebeye and Majuro. Health leaders continue to struggle with the issue of structuring incentives for CPD (mostly for physicians and allied health); a formal Health Professions Licensing Board has been appointed and members of the board will be working with the Hawai’i Board of Medical Examiners to develop standard operating procedures, policies and regulations. Although significant systemic and infrastructure barriers exist, the overall momentum toward a formal and, eventually, sustainable CPD program has been positive. All of the key informants and policy makers seem motivated to continue working toward these goals.

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Pacific Association for Clinical Training: e-Learning Telecommunication Infrastructure Assessment in the U.S.-Affiliated Pacific Islands

Christina Higa, MA

Address correspondence and reprint requests to: Christina Higa, MA, Associate Director, Telecommunications and Information Policy Group (TIPG), and Director, Pan Pacific Education and Communication Experiments with Satellite (PEACESAT) Social Science Research Institute, University of Hawai‘i at Manoa, 2424 Maile Way, Saunders Hall 713, Honolulu, Hawai‘i 96822-1192; christina@tipg.net.

Abstract
This article summarizes the key points of a technology and telecommunications infrastructure assessment conducted by the University of Hawai‘i Telecommunications and Information Policy Group (TIPG) in partnership with the Pacific Association for Clinical Training (PACT). It includes an overview of telecommunications infrastructure and services in the U.S.-Affiliated Pacific Islands (USAPI) jurisdictions. The objective is to review the technical capacity, in the USAPI, to support PACT e-learning programs and activities. Telecommunication infrastructure is fundamental for successful and sustainable e-Learning programs. This article outlines the capabilities that may be available for multipurpose uses including health, education, research and other public service applications. (PHD 2007 Vol 14 No 1 pp 89-97)

Introduction

The Pacific Association for Clinical Training (PACT), in planning for the most effective and efficient means of delivering health-related education and training programs in the U.S.-Affiliated Pacific Islands (USAPI), recognized that delivery of these programs through e-Learning may potentially increase program distribution and participation. However, major constraints of e-Learning in the USAPI involve Information Communication Technology (ICT), particularly in telecommunications capacity, access and cost. In order to plan for the development and implementation of appropriate and innovative e-learning modules, PACT, in partnership with the Telecommunications and Information Policy Group (TIPG) of the University of Hawai‘i (UH), conducted a technology and telecommunications assessment in the USAPI.

The information collected from the assessment is useful for the planning of health education and training and also for improvement in the facilitation of public service network development across various user sectors. These sectors include, but are not limited to, health, education, and government. There are several successful examples of multipurpose and shared networks in the Pacific Islands. These examples include partnerships between health and education agencies that facilitate the sharing of telecommunications equipment, service costs, and skilled human resources for the operation and maintenance of the technical infrastructure and systems.

Components of Effective e-Learning Programs

There are many factors that contribute to effective e-Learning activities in any sector. This article does not address all of them. Some factors will briefly be discussed and will identify where technology fits into the overall objectives of e-Learning. Successful implementation requires an institutional framework that will address partnerships, accreditation, and certifications among and between education, health and/or professional institutions; an institutional business plan for sustainability, including faculty/teacher compensation, participant registration, support, and program overhead; intellectual property rights; and, finally, the management of learning and teaching objects. Many of these factors require institutional leadership support, individual faculty/staff champions, and resources.

Since e-Learning generally means that the learner and the teacher are in different locations, it is essential for the content, focus, and topics to be relevant, appropriate, and adaptable to the learner’s environment (e.g., culture, way of doing things, laboratory conditions, availability of supplies and equipment). In developing e-Learning courses, pedagogy and e-Learning instructional design need to take into consideration the technical capacity of the hosting institutions and learner. The application of educational technology in teaching is more than
knowing how to use a computer. It is also knowing how to incorporate appropriate computer applications to enable and enhance learning. Technical infrastructure is an important fundamental prerequisite that plays a role in determining the appropriate and optimal e-Learning modality. This article has a primary focus on the available technical infrastructure to support public service applications in the USAPI.

Varying Levels of Development and Funding Support
The level of development, accessibility, and affordability of telecommunications services for distance learning varies dramatically across the USAPI jurisdictions. There are several U.S. federal government programs that support the development of public service telecommunications networks and services. Some of these programs include the National Telecommunications and Information Administration of the U.S. Department of Commerce, the Rural Utilities Services of the U.S. Department of Agriculture (Rural Development), and other programs of the U.S. Department of Education and U.S. Department of Health and Human Services. There is also the U.S. Universal Service Fund that, unlike these federal discretionary funding programs, is not subject to annual scrutiny via U.S. Congressional appropriations.

U.S. Universal Service Fund and Program
The Telecommunications Act of 1996 established the U.S. Universal Service Fund and Program. This is one of the major contributing factors in the recent expansion and sustainability of networks for health and education. The Universal Service Fund and Program is funded via mandated contributions from all interstate telecommunications service providers in the United States. There are four major areas of the program: High Cost (to assist telecommunication carriers that provide service in rural and expensive-to-serve areas); Low Income (to assist low-income consumers with basic telephone services; Rural Health Care (to assist health care facilities in rural areas) and Schools and Libraries (to assist schools and libraries gain access to more affordable services).

Schools and Libraries Program – Educational Rate (E-Rate)
The Pacific Island U.S. Territories have received significant funding for telecommunications network infrastructure and services from the Schools and Libraries program, otherwise known as the E-Rate program. Since initiation of the program in 1998 to 2005, American Samoa has received a total of $15 million U.S. E-Rate funds; Guam received nearly $19 million and the Commonwealth of the Northern Mariana Islands (CNMI) received about $8.5 million. With this level of funding support, the telecommunications infrastructure and services have improved dramatically. Every public and private school in American Samoa has connectivity to the Internet and video teleconferencing (VTC) services. Guam and CNMI, through the U.S. Universal Services Fund, have developed robust networks for elementary and high schools, and libraries.

Rural Health Care Program
The goal of the U.S. Universal Service Rural Health Care Program (RHCP) is to ensure equal access to affordable telecommunications services for rural health care providers. Generally it is more costly and not financially profitable to develop telecommunications infrastructure in rural areas. This is because of the large geographic distances, challenging terrain (e.g., vast ocean) and high cost for the physical infrastructure (e.g., fiber optic, coax cable). Rural areas generally have smaller populations, markets and revenues.

RHCP funding is determined by a rural and urban cost comparison of telecommunications services. Under this program the rural health care provider receives comparable services at the comparable services at the same cost as health care providers in urban areas. RHCP subsidizes the difference between the rural and urban telecommunication rates.

For example, in Honolulu an urban health care provider may pay approximately US$400 per month for a T-1 (1.533 Mbps [megabits per second]) connection and in the island of Kaua‘i (designated as rural) the cost for the same service is approximately US$1,050 per month. Under the RHCP, the health care provider located in Kaua‘i would pay the urban rate of US$400 and the RHCP would pay the difference of US$650. This benefits the telecommunications services provider that is paid the full amount of US$1,050 per month. This program is utilized, in part, to subsidize the State Telehealth Access Network (STAN), which connects nearly 40 health care facilities in the State of Hawai‘i.

Health care providers in American Samoa, Guam and the CNMI, however, have not been able to receive
any benefits from the RHCP, although their telecommunications carriers have contributed to the Universal Services Fund. The first reason was a problem with the Federal Communications Commission’s (FCC) definitions of ‘urban’ and ‘rural’, developed primarily for states located in the continental U.S. These definitions were not appropriate for the Pacific Islands, given the demographics and geography of the region. The definition for ‘urban’ included areas with a population of at least 50,000 and access to specialized health care services or advanced medical facilities. Although no communities in the Pacific Islands met this definition, the FCC designated their largest population centers as urban. For example, the entire island of Tutuila in American Samoa, the island of Saipan in CNMI, and the city of Agana in Guam were all designated as urban. Urban areas are not eligible for RHCP funding. In 2003, upon review of the situation and in response to many comments from the Pacific Island constituencies regarding this matter, the FCC created a special provision that designates these jurisdictions as “all rural”, however with no urban comparison and therefore no basis to establish an RHCP discount. In 2005, the FCC created a special 50% discount of advanced telecommunications services for health care providers designated as completely rural. Unfortunately, even with the 50% discount, the jurisdictions have not applied for subsidies because of the unaffordable matching costs. A T-1 circuit from American Samoa to Hawai'i, for example, costs $28,000 per month; half of this amount is still cost prohibitive.

The U.S. Universal Service Program and Freely Associated States
The Freely Associated States (FAS), which include the Federated States of Micronesia (FSM), the Republic of Palau and the Republic of the Marshall Islands (RMI), are not eligible for U.S. Universal Service Program funds. These jurisdictions are not governed by FCC regulation and do not contribute to the U.S. Universal Service funding. The Republic of Palau made attempts to join the U.S. National Exchange Carrier Association (NECA), which would also provide inclusion in the U.S. Universal Service Program. These efforts were associated with terms for renewal of the U.S. Compact of Free Association and Palau’s good effort to join NECA never materialized.

The FAS vary in levels of telecommunications infrastructure development, each jurisdiction is in severe need of more accessible and affordable telecommunications services and support. Each jurisdiction has established national ICT policies to address telecommunications costs existing infrastructure, and future plans for development. However, there are no Universal Services provisions implemented in the FAS.2,3,4,5

National Bioterrorism (BT) Program
Until recently, hospital facilities were lacking sufficient telecommunications infrastructure in both technical and human resources to support basic operations, telehealth, and distance learning. Many improvements are developing in part through national Bioterrorism (BT) funding from the U.S. Center for Disease Control (CDC) and the U.S. Health Resources and Services Administration (HRSA). The BT Program is presently funded for a period of five years. One of the BT Program objectives is to prepare hospitals and health facilities for emergency response and many multi-purpose networks are now being established.

Using bioterrorism funding, the FSM has made a commitment for all hospitals in FSM to support a 64 Kbps (kilobits per second) leased line connection to the Internet through these programs. Local area networks (LANs) are also being implemented in the hospital facilities.

In the Republic of Palau bioterrorism funds were used to establish a first response communication network. This network will be described in more detail later in the article.

Telecommunications Networks and Services
Private Sector, Internet Service Providers (ISP)
In the majority of Pacific Islands the ISP remains a monopoly, with the exception of Guam, American Samoa, and CNMI. In the Freely Associated Pacific Islands, dial-up Internet costs include a monthly fee of approximately US$10-30 and hourly fees from US$1.95 to US$3.60 per account. The dial-up connection is very slow and often much slower than advertised speeds. This slow connectivity increases the cost and prohibits the effective use of many applications. The basic Internet package in Palau cost US$15.00 per month including 4 hours of usage and US$2.50 each additional hour. Palau LocalNet Access provides free access to any servers located in Palau. International Internet access in Palau incurs a per-minute fee. The FSM National Telecommunications Corporation (FSMTC)
provides other service packages including a “Home Saver” rate that provides five Internet user accounts for US$44.95 per month with 30-hours and US$19.95 each additional hour. The FSMTC also offers prepaid Internet access at $.08 per megabyte and prepaid email at $4.95 per month. A rate structure based on data throughput verses per-minute usage generally provides consumers with a cost savings because the cost is based on actual data transmission and reception and not just connection time. The limited bandwidth and slow transmission speeds could result in long connection times and very little data resulting in the consumer paying more for less data.

If leased line options are available, they are also costly. For example, a 128 Kbps circuit ranges from US$980 (e.g., FSM) to several thousand dollars per month (e.g., US$2,000 in the RMI). It is reported that information communications technology service fees in the Pacific Island jurisdictions, on average, are five times higher and range up to 20 times higher than in APEC developing economies.

Public Service Networks

American Samoa
American Samoa is advanced in terms of ICT infrastructure, partnerships, and programs. Their advanced level is partly due to the establishment of a consortium of government agencies specifically focused on sharing ICT resources. This consortium has leadership with a clear vision of the importance and potential benefits of ICT. American Samoa leadership has prioritized and developed ICT capacity-building programs for local management and operations of the networks.

American Samoa Distance Education Learning and Telehealth Applications (ASG – DELTA) Consortium
The ASG DELTA Consortium is made up of all major government agencies and educational institutions. The American Samoa Telecommunications Authority (ASTCA) donated a 384 Kbps circuit from LBJ Tropical Medical Center to the TIPG/PEACESAT (Pan Pacific Education and Communication Experiments by Satellite) Network Operations Center (NOC) at the UH. This link is dedicated to public service applications including e-Learning, e-Health, and e-Commerce. The link also interconnects the American Samoa Community College (ASCC), government agencies, American Samoa Power Authority, and Pacific e-Commerce Development Corporation (eCDC).

This prioritization enables quality video conferencing at a defined rate and allows for reallocation of bandwidth for data in the absence of video conference in sessions.

American Samoa Community College
The ASCC campus is connected to the Internet through a local area network. There are four VTC locations that utilize Polycom and PictureTel H.323 codecs. The systems are located in their Departments of Nursing and Continuing Education, and Small Business Development Center and offices.

ASCC is a member of the DELTA Consortium and currently has four strands of single mode fiber on the DELTA/PEACESAT Network. Through the DELTA connections, ASCC receives interactive video, audio, and data services.

American Samoa Department of Education
The E-Rate Network of the American Samoa Department of Education interconnects all public and private schools and the public library. This connection is established through a high-speed fiber optics network on Tutuila Island at 135 Mbps rates. The other islands of Manu’a and Aunu’u are connected via microwave at T-1 speeds that can support up to three simultaneous VTC sessions operating at 384 Kbps.

Pacific eCommerce Development Corporation (Pacific eCDC)
The Pacific eCDC is a 501(c)(3) private non-profit corporation focused on education and charitable economic development through eCommerce business development. Pacific eCDC is an instrumental partner in the design and development of ICT training, computer literacy and e-Learning practices and theory courses, and works in collaboration with the DELTA Consortium, Department of Education, ASCC, and UH TIPG.

CNMI Public School System
The CNMI Public School System (PSS) has benefited tremendously from the U.S. Universal Service’s School and Libraries Division E-Rate Program. The current CNMI PSS E-Rate Network consists of T-1 connections between Tinian and Saipan, Rota and Saipan, and Saipan and Honolulu. The CNMI PSS E-Rate Network is very robust with a Gigabit Ethernet fiber optic backbone. The hub is connected to 1 Gbps Ethernet segments with a maximum of four nodes per segment. There are two T-1 connections off-island (to TIPG/PEACESAT at the UH) for H.320 video conferencing and Internet access.

Commonwealth of the Northern Mariana Islands

Northern Marianas College
The Northern Marianas College (NMC) supports
three fully-equipped computer classrooms on Saipan and computer labs on Tinian and Rota. For VTC, an asymmetric Digital Subscriber Line (DSL) 384 Kbps is used. The quality of the VTC varies as it utilizes the commodity Internet.

Guam
Guam Public School System (GPSS)
The GPSS has an E-Rate Network which consists of two T-1 lines to Honolulu and fiber connectivity between all schools. The GPSS network is primarily a fiber-based 100 Mbps Ethernet network with an ATM (Asynchronous Transfer Mode) backbone. ATM is implemented for off-island T-1 links to provide certain levels of service, such as H.320 video conferencing priority over data. This prioritization enables quality video conferencing at a defined rate and allows for reallocation of bandwidth for data in the absence of video conference sessions.

University of Guam (UOG)
The UOG’s Computer Center routes multiple T-1’s around the campus and to the public Internet but most of the Micronesian islands are serviced by the Telecommunication and Distance Education Operation (TADEO). The UOG’s TADEO is equipped with multiple PEACESAT earth stations that are capable of interactive VTC and digital data services. TADEO has an Accord multipoint conferencing unit that supports ISDN (Integrated Services Digital Network) connectivity primarily for on-island ISDN circuits remain costly (US$86 per hour per 128 Kbps). TADEO’s telecommunications infrastructure enables cross connection of various networks in the Asia-Pacific region. The PEACESAT NOC at TADEO connects the Guam Education Network to the Pacific Islands PEACESAT locations. UOG PEACESAT has an operations staff that facilitates daily programs and manages network scheduling and program requests.

Federated States of Micronesia
College of Micronesia, FSM
The National Campus in Palikir has a 768 Kbps global leased line connection through FSM Telecom for Internet services. This connection is shared with all state campuses for Internet services, each of which have a 128 Kbps domestic leased line connection to the National Campus through FSM Telecom for Internet connectivity.

FSM State Departments of Education
Yap State, FSM
There is a 384 Kbps connection from the Yap Department of Education (Yap DOE) Technology Center to FSM Telecom. There is also a 64 Kbps circuit from Ulithi High School to the Technology Center. FSM Telecom has a 256-Kbps international link for dial-up Internet services. The hospitals, clinics, public library, and historical preservation office are incorporated into the Yap DOE wide area network (WAN) design.

Pohnpei State, FSM
At the time of this writing, Pohnpei State DOE consists of 30 schools of which five have dial-up access to the Internet through FSM Telecom. The schools with dial-up Internet access are: Pohnpei Island Center School, Kolonia Elementary School, Ohmine Elementary School, Sokehs Pha Elementary School and Wone Elementary School. There is no WAN connecting the schools and administrative offices. A high frequency (HF) radio system is available for communication to the outer islands. There is a joint project between DOE and TADEO (mainly Mr. Bruce Best) to implement HF radio email systems in the outer island schools.

Kosrae State, FSM
Kosrae has a total of seven public schools (one high school and six elementary schools). All schools, with the exception of Walung Elementary, have computer labs that are networked and have a minimum dial-up Internet service. Walung is located in the westernmost region of Kosrae and does not have terrestrial telephone service. Communication between Walung Elementary and the DOE is made through the principal’s cellular telephone.

Basic FSM Telecom Internet service is used at a cost of US$19.95 per month; after 10 hours, a usage fee of US$1.95 per hour is assessed. Many schools go over the 10-hour-per-month allocation. According to the DOE Information Technology (IT) Director, Mr. Lugo Skilling, a summary of the number of computers in Kosrae’s DOE schools is as follows: Kosrae High School (30 personal computers [PCs], 128 Kbps shared through COM [College of Micronesia]), Lelu Elementary School (14 PCs), Tafunsak Elementary School (12 PCs), Malem Elementary School (7 PCs), Utwe Elementary School (12 PCs), Sansrik Elementary School (8 PCs) and Walung Elementary School (2 PCs). Each school has approximately one staff designated to cover ICT matters.

Chuuk, FSM
The Department of Education oversees 32 schools (two
high schools and 30 elementary schools). Total student population is approximately 16,673. Chuuk High School has two computer labs consisting of 16 PCs and a dial-up Internet connection. Chuuk High School has a student population of 1,236 and 51 teachers with one computer lab staff. The other schools do not have computer labs or access to the Internet.

**Republic of the Marshall Islands PEACESAT Consortium**

Although telecommunications access is limited and costs are high in the RMI, a consortium of PEACESAT users, consisting of Majuro Hospital, College of the Marshall Islands, Emergency Management Office, and Pacific Resources for Education and Learning (PREL), has taken advantage of various e-Learning programs. This PEACESAT Consortium was established to support data and VTC using the PEACESAT system. VTC services are available at the Majuro Hospital (Telemedicine Room), College of the Marshall Islands (IT Division) and the PREL Service Center.

**Majuro Hospital**

The nurses, physicians, and health care providers of Majuro Hospital are ranked as the highest users of the PEACESAT interactive VTC services. Some of the programs delivered by various health care providers and educators include Continuing Medical Education (CME) and Grand Rounds. Examples of CME topics are Treating Motor Fluctuations in Parkinson’s Disease, Retinopathy of Prematurity, Skin and Wound Care Treatment, and Geriatric Care. Other examples of health-related programs include the RMI Diabetes Program, Pacific Deaf and Blind Advisory meeting, E Ninau Aku I Ke Kauka (Ask a Doc), and the Pacific HIV/AIDS teleconference.

**Leroj Kitlang Memorial Health Center, Ebeye**

The Ebeye Health Center provides an excellent model for collaborating in developing network infrastructure and maximizing resources. The Ebeye Health Center, through a U.S. Department of Interior (DOI) grant, upgraded a PEACESAT earth station in 2006. The system now supports interactive VTC and a computer lab consisting of 10 computers donated by the U.S. Department of Health and Human Services (DHHS) Office of Public Health and Human Services, Region IX Office of the Regional Health Administrator, and is being coordinated with the World Health Organization (WHO) distance education initiatives in the Pacific. UH’s TIPG and PEACESAT worked with DHHS Region IX in transferring and refurbishing the computers with Ubuntu open source Linux-based software. After careful consideration of the available budget, and applications and computer support in Ebeye, it was decided, together with the Ebeye Health Center Administration, that free, open source software was appropriate. The computers are used in a lab environment and so, in the event that something should go wrong, it will be easier to reinstall the complete Ubuntu program rather than require a skilled computer specialist to reconfigure it. The Ebeye Health Center will evaluate whether the Ubuntu open source software meets their needs and applications. To further leverage resources, two Carnegie Mellon University student consultants, through the Technology Consulting in the Global Community Program, provided extended 10-week training for Health Center staff on the use of the computer lab, VTC and network operations and maintenance. The Health Center was only required to pay for the students’ accommodations. The collaborating partners included the DOI, which funded the PEACESAT system upgrade, the DHHS Region IX Office, which donated the laptop computers for the lab, TIPG / PEACESAT, which installed the systems and provides telecommunications services for voice and data at no per-minute fee, and the Carnegie Mellon University’s student consultant program that provided the ongoing training. This is a very good example of synergy in planning, coordination, collaboration for increasing the overall value of funds and effort. Ebeye Hospital health professionals actively participate in diabetes collaborative projects and other CME programs by VTC.

**Republic of Palau**

**Palau National Hospital**

Through the use of Bioterrorism Preparedness funding, the Belau National Hospital has implemented an improved first response system utilizing HF and very high frequency (VHF) radio systems. The emergency and ambulatory communication systems have extended reliable communication coverage. There is also an extension of HF radio communications to dispensaries in remote areas. Most impressive is the interoperability between the dispensaries, the Hospital, National Emergency Management Office, Fire Department, Police Department, the Airport, Quarantine, Customs, Immigration, Environmental Health, Koror State Rangers, and Marine Law (D. Rykken: personal correspondence, 2005 Apr 11).

**Palau Area Health Education Center (AHEC)**

The Palau Area Health Education Center (AHEC) conducts effective regional distance learning using
audio telephone conferencing. The Palau AHEC is a collaboration for “in-country and community-based postgraduate family practice for Micronesian physicians”. Commercial audio teleconferencing is used for regional telephone conferences. The cost generally includes a per-hour fee of approximately US$15-$20 for use of the audio conference bridge. The participants pay for the long distance per-minute charges to the bridge. Visual media, such as PowerPoint presentations, are often emailed in advance and played locally.

Palau Community College
The Palau Community College (PCC) has limited Internet access available to students and faculty. PCC utilizes three DSL circuits from Palau National Communication Corporation (PNCC) for Internet services. The main DSL 128 Kbps circuit connects a total of 149 workstations. The library and federal programs share another 128 Kbps DSL circuit that connects 66 computers. Finally, the Financial Aid Office and College President share a 192 Kbps circuit that connects 25 workstations. San Diego State University (San Diego, California) works with PCC in delivering on-line Bachelor of Arts (BA) and Master of Science (MS) programs.

Palau Ministry of Education
Seventeen of the 20 public schools in Palau connect through the Ministry of Education (MOE) gateway, at 192 Kbps, to the PNCC. An Internet café, at 128 Kbps, and the MOE, at 64 Kbps, share the same HDSL (High bit-rate Digital Subscriber Line) telecommunications connection to PNCC. There is a wireless network connection between MOE and Palau High School. Four public elementary schools connect to the MOE by 768 Kbps DSL while the other 13 use 56 Kbps dial-up.

Regional Networks in USAPI – PEACESAT Network and Cross-Connections
The Pan Pacific Education and Communication Experiments by Satellite (PEACESAT) is a satellite telecommunications network that supports distance learning, telehealth, and other public service applications. There are no per-minute fees to use the service that includes narrowband interactive VTC, voice conferencing, and access to the Internet. The Network provides access to affordable services. At times there are interruption of services due to intermittent problems with the satellite, earth station equipment, or operations. PEACESAT headquarters at the UH works with the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA) in the maintenance of the satellite and space segment to minimize interruption of services. Other issues include the reliability of the local operations managed by the organizations hosting the PEACESAT earth stations. These stations are primarily in education, health, or emergency management agencies. Some jurisdictions are able to provide more reliable services than others. PEACESAT is looking to improve the overall reliability of network technology and support resources. This effort requires local commitment and continued collaboration.

In order to achieve a successful collaborative e-Learning program in the Pacific Islands region, some resources must be reserved for ICT capacity building.

PEACESAT/TIPG Network Operations Center (NOC)
The PEACESAT/TIPG NOC maintains a full, 7-day-per-week operation schedule for facilitating video and audio teleconferences, network cross-connections, network scheduling and monitoring, and technical support. The NOC operates two-multipoint VTC bridges that enable the cross-connection of direct network links (PEACESAT, Hawai’i State Telehealth Access Network (STAN), and the Pacific Partnering Networks), and switched networks using ISDN or Internet protocols (IPs). The PEACESAT/TIPG NOC enables cross connections to UH network links including: University of the South Pacific in Suva, Fiji; via the Australia Academic Research Network (AARNET; 155 Mbps); the Asia Pacific Advanced Network in Japan (APAN; 155 Mbps); and the Internet2, based in the U.S. (10 Gbps).

World Health Organization (WHO) Pacific Open Learning Health Net (POLHN)
There are several health centers in the Pacific Islands that have received funding through WHO’s Pacific Open Learning Health Net (POLHN) Project, for a computer laboratory with Internet service. The program supported the first year of Internet service fees. POLHN Centers in the USAPI are located in Palau, Majuro, Yap, Pohnpei, Kosrae, and Chuuk. There are approximately 12 Windows XP Professional operating system computers in the lab running off a 56 Kbps leased line from local
telecom carriers. In general, each laboratory is open for use by hospital staff and the community at large during normal hours of operation.

**Open Source Course Management System – Moodle (Modular Object-Oriented Dynamic Learning Environment)**

Telecommunications network infrastructure is a fundamental requirement to successfully support e-Learning activities. There are other systems that further support and enable e-Learning, such as course management systems. Moodle is a very powerful open source eCourse management tool that has similar functions as commercial products, such as WebCT and BlackBoard. Moodle is open source, meaning that there is no cost for software or licensing fees.

Implementing any on-line eCourse management system may be problematic for Pacific Islands with limited Internet bandwidth. In these cases, managing local Moodle servers is ideal for local programs, but it may be difficult to support regional programs that need synchronized course materials. Synchronizing the eCourse management systems is difficult since they do not have the ability to update local cache servers through remote updates. PACT, the American Samoa Pacific ICT Academy (PICTA), and the CNMI Public School System implemented Moodle. Course material, such as syllabi, PowerPoint presentations, handouts, video clips and web references, are all stored on Moodle. Moodle also includes interactive discussion forums, an online quiz creator, a grade book, a calendar, and many other features that make it easier to manage an e-Learning course.

**Discussion**

The effective application of ICT provides a potential avenue for increased connectivity to information and resources in the Pacific Islands. Moreover, there are associated benefits in terms of local, regional, and international e-Learning, e-Health, and economic development opportunities.

This article summarizes some of the existing telecommunications networks in the USAPI that support interactive VTC and Internet services for e-Learning, e-Health, and other public service applications. These networks include: Pacific Partnering Networks – American Samoa DELTA Network, American Samoa E-Rate Network, CNMI E-Rate Network, Guam PSS E-Rate Network, and the PEACESAT Network. These networks are able to cross connect to other educational institutions in the Asia/Pacific region, such as the University of Hawai‘i, University of the South Pacific, National University of Samoa, and others through VTC bridging services from the UH TIPG/PEACESAT. It is important to note that these networks do not incur per-minute fees, as they are primarily based on IP technologies and not ISDN. Affordable telecommunications is a critical component in the sustainability of e-Learning programs. However, it is also important to carefully analyze network capacity and operations because quality of service of IP-based VTC and other high bandwidth intensive applications will also impact the quality of the e-Learning program.

Although there are several reliable networks with good connectivity for interactive VTC and Internet services, access to these services from the Pacific Islands is still a major challenge and concern. It is important to recognize that there are some very innovative projects and ideas for bringing connectivity to remote areas or outer islands and islets. Some of these are projects using technologies such as HF radio, and weather systems (e.g., Emergency Managers Weather Information Network – EMWIN, or Radio and Internet Communications – RANET) for e-mail and transmission of other information. Last mile solutions may include telephone lines with HDSL technology, coaxial cable, electric power lines (power line communications), and wireless technology. It is recommended that anyone interested in developing an e-Learning program continue to pursue a multimedia approach to e-Learning in the Pacific Islands where there are varying levels of development.

Access and affordability of reliable telecommunications services is a primary challenge. This is in part due to limited market size, lack of infrastructure, and, in some cases, outdated telecommunications policy, regulatory regimes, and government-owned telecommunication monopolies. Some USAPI jurisdictions have initiated telecommunications policy reform to enable sustained development of local and regional network infrastructure and market liberalization. It will require several years for policy transformation to directly impact quality of service, access and cost. However since this is a critical issue in the implementation of successful e-Learning programs, following, supporting and advocating policy development and change is important, not only to the private sector, but also the public sector.

Finally, in order to achieve successful collaborative e-Learning programs in the Pacific Islands region, some resources must be reserved for ICT capacity building. There is, however, an opportunity to use available network infrastructure and, in parallel, provide local education and training in the design, development, and
delivery of e-Learning programs in the Pacific Islands region.

References


13 years ago in Pacific Health Dialog, S. A. Finau, stated, “Pacific men must be domesticated. This can be easily done if children to whom women have had the most access, are socialised to new gender roles.” PHD, 1995;2(1):101.

97
Interdisciplinary Problem-Based Learning as a Method to Prepare Micronesia for Public Health Emergencies

Seiji Yamada, MD, MPH*
A. Mark Durand, MD, MPH†
Tai-Ho Chen, MD‡
Gregory G. Maskarinec, PhD§

*Asia Pacific Center for Biosecurity, Disaster and Conflict Research; Hawai’i/Pacific Basin Area Health Education Center, and Clinical Associate Professor, Office of Medical Education, University of Hawai’i at Manoa, (UH) John A. Burns School of Medicine (JABSOM); †At the time this study was conducted, Dr. Durand was Director, Department of Health Services and Yap State Area Health Education Center, Yap State, Federated States of Micronesia; ‡At the time the study was conducted, Dr. Chen was PACT Project Director and Assistant Professor, Department of Family Medicine and Community Health, UH JABSOM; §Associate Professor and Director of Research, Department of Family Medicine and Community Health, UH JABSOM.

Address correspondence and reprint requests to: Seiji Yamada, MD, MPH, Hawai’i/Pacific Basin Area Health Education Center University of Hawai’i John A. Burns School of Medicine, 651 Ilalo Street, MEB 401G, Honolulu, Hawai’i 96813-5534; seiji@hawaii.edu.

Abstract
Context: The University of Hawai’i Pacific Basin Bioterrorism Curriculum Development Project has developed a problem-based learning (PBL) curriculum for teaching health professionals and health professional students about bioterrorism and other public health emergencies. These PBL cases have been incorporated into interdisciplinary training settings in community-based settings, such as in the small island districts of the U.S.-Affiliated Pacific Islands. Methods: Quantitative and qualitative methods have been utilized in the evaluation of the PBL cases, PBL tutorials, and the accomplishment of learning objectives. Findings: Evaluation of the PBL tutorials demonstrates that PBL is an educational and training modality appropriate for such settings. Participants found it helpful to learn in interdisciplinary groups. The educational process was modified in accordance with local culture. Conclusion: PBL is a useful educational modality for settings where healthcare staffing and available resources are limited. (PHD 2007 Vol 14 No 1 pp 98-102)

Context
Terrorist incidents, such as 9/11a and the anthrax attacks, a emerging diseases, such as Severe Acute Respiratory Syndrome (SARS)b and avian influenza,c and natural disasters, such as the 2004 Indian Ocean tsunami and Hurricane Katrina, have demonstrated the need for the health professional workforce to be prepared to respond to bioterrorism and other public health emergencies. Health professionals need to be knowledgeable about specific public health emergencies and the expected community response. The conventional method of teaching and training on such subjects is to consider sequentially the problems, agents, or pathogens that might be encountered. Typically, a lecture series or chapters of a manual on unconventional weapons sequentially covers anthrax, smallpox, chemical weapons, and so on. In a real situation, however, those first responders to an incident are unlikely to know the responsible agent in an emergency. This is the rationale for field exercises in which participants are not informed prior to the emergency exercise to which they must respond. In such exercises, health personnel may be confronted with any number of agents with which they are unfamiliar, and must make on-the-spot decisions in the face of uncertainty. For example, they might have to decide whether or not to utilize personal protective equipment, to isolate patients, to request specific laboratory tests or imaging, to alert specific staff, or to notify public health authorities. Without personal experience in such situations, it is difficult to recognize the deficits in one’s knowledge or skills.

Conducted with personnel likely to be involved in responses, tabletop exercises are less resource-intensive than field exercises. An example of a tabletop exercise was conducted in New Orleans, Louisiana on August 29, 2005, 10:00 a.m., with 125 mph sustained winds, breaching its levees and flooding 80% of the city. The destruction, coupled with a poor federal emergency response effort, resulted in >2,500 people dead or missing, and $81.2 billion in damages across the gulf region, in the U.S., alone.

[a] September 11, 2001 terrorist attack on the World Trade Center, New York City, New York. [b] 2001, 2002 deliveries of deadly anthrax spores to multiple targets, primarily in New York and Washington, D.C., through the U.S. Postal Service. [c] First reported in Asia in early 2003, SARS spread to other countries in Asia, North and South America, and Europe before it was contained. [d] Avian influenza, bird flu, commonly found in wild birds, can infect and kill domestic poultry. Now passed on to humans, 270 humans have died or missing. [e] On December 26, 2004, a 9.0 earthquake, NW of the Sumatra, Indonesian coast, generated massive tsunamis across the Indian Ocean, resulting in over 300,000 deaths, and leaving several million people homeless in 11 coastal and island countries. [f] Hurricane Katrina hit land and
exercise for public health officials to learn about pandemic influenza can be found on the world wide web.\(^2\) A scenario is presented, and questions are posed to participants. The instructions for this tabletop exercise mention little regarding the prior preparation of participants, but a degree of expertise (participation by “epidemiologists and emergency management staff”) is assumed. Thus, tabletop exercises are generally intended for participants to apply knowledge that they have acquired via other means.

One concern that goes unaddressed in conventional pedagogy regarding public health emergencies is the motivation for the non-expert learner to acquire the requisite knowledge and skills. Secondly, conventional curricula lack a mechanism by which the learner can systematically discover deficiencies in his or her knowledge base. Thirdly, conventional curricula do not provide a mechanism by which learners can engage the material in an active, self-directed manner.

Because learners are initially unaware regarding which agent is responsible for casualties, problem-based learning (PBL) is an appropriate educational modality for education regarding public health emergencies. By a process of self-directed learning, learners fill in the identified gaps in their knowledge. They identify and research learning issues relevant for their particular disciplines and for the interdisciplinary response to bioterrorist events or public health emergencies. At a subsequent tutorial session, students present learning issues to the PBL tutorial group.

In community settings, such as small island districts or community health centers, where the absolute numbers of health personnel are limited, health workers must be ready to respond in a coordinated, multidisciplinary manner to any contingency. In the face of public health emergencies, health professionals will assume specific roles to any contingency. It is, therefore, appropriate for health personnel are limited, health workers must be ready to respond in a coordinated, multidisciplinary manner to any contingency. In the face of public health emergencies, health professionals will assume specific roles to any contingency. It is, therefore, appropriate for learners in the various disciplines to learn about the roles of other professionals and participate in interdisciplinary curricular offerings.

Efforts to train students in the health professions together began in the late 1970s.\(^3\) Variations on “interdisciplinary” and “multiprofessional” have been used to describe such educational efforts. The meanings of these terms have ranged from; “to know about,” to “be able to work with,” to “be able to substitute for,” and to having the ability to “move across careers.”\(^4\) Here, the term, “interdisciplinary,” means that group members move beyond their specific disciplines to develop collaborative approaches to problem solving.\(^5\)

One concern that goes unaddressed in conventional pedagogy regarding public health emergencies is the motivation for the non-expert learner to acquire the requisite knowledge and skills.

Methods
Setting
The small islands of Micronesia – the Northern Marianas, Palau, Yap, Chuuk, Pohnpei, Kosrae, and the Marshalls – were held in trust by the U.S., following World War II through a 1947 United Nations Mandate, as the “Trust Territories of the Pacific Islands” (TTPI). Strategically located relative to U.S. military concerns, particularly as sites for conducting nuclear weapons testing, these Micronesian islands constituted a colonial war prize in the region, as did the U.S. Territory of Guam (as well as The Philippines) after the Spanish American War of 1898. Beginning in the 1960s, U.S. aid for TTPI increased, leading to a cash economy fueled by government jobs. In the late 1980s, the former Trust Territories became the Commonwealth of the Northern Mariana Islands (CNMI) and the Freely Associated States: the Federated States of Micronesia (FSM), the Republic of the Marshall Islands (RMI), and the Republic of Palau (ROP), whose Compact was delayed by a non-nuclear provision in their proposed constitution.

Development
At the University of Hawai‘i, the Pacific Bioterrorism Curriculum Development Project has developed cases for the teaching and training of bioterrorism and other public health emergency topics, drawing upon the principles of and long experience with PBL, as well as with community-based, interdisciplinary training. We have written a series of case studies set in small island settings and in community health settings in Hawai‘i. These cases have patients and practitioners representative of the islands’ ethnicities, with cultural beliefs and attitudes reflecting their respective backgrounds. Cases depict resources typically available in such settings.

Implementation
The cases are written in the McMaster/University of Hawai‘i sequential disclosure style;\(^6\) as such, prepared as Microsoft Word documents of five to eight pages in length. One of the case studies utilized is summarized in the Appendix. Led by a facilitator familiar with the case studies, student groups review the cases, page by

Suggest facilitator involve all the members for their
I believe some of us learn things easily with
Should have more in-depth knowledge of the
This present case went well, but for our part,
oRiginal papers
Have more cases to train the facilitator, so everyone
No formal evaluations were conducted at the first
Overall, was this case worthwhile as a continuing
In interviews, participants indicated that they

page, ascertaining patient histories, physical findings, etc., as well as the respective public health responses. Utilizing a whiteboard, groups organize their collective understanding of cases through discussion, then develop lists of topics, called learning issues, for further study. Dividing up learning issues among them, students research their topics before their next meeting, generally creating handouts or other teaching materials for the benefit of the group. At a subsequent session, students present learning issues to the group, teaching each other regarding the results of their information search. These case studies have been implemented in multidisciplinary learning groups in CNMI, FSM, RMI and ROP.

At a 2005 meeting of the Pacific Basin Medical Association (PBMA), we introduced the use of PBL for public health emergency training. In order to implement PBL, we have trained in-country personnel in Saipan and Palau; and the FSM states of Yap, Chuuk and Kosrae; and Majuro and Ebeye of RMI in PBL tutoring skills, education and training.

Particular enthusiasm for PBL has been displayed in Yap State in the FSM where the cases have been used to train interdisciplinary groups of clinical and public health practitioners. As a result, Yap State has adopted PBL cases as a central methodology for delivering continuing education for healthcare professionals of all disciplines.

Evaluation Methodology
Evaluation of the cases in the USAPI has been via attendance logs, anonymous post-session evaluation questionnaires, and qualitative data obtained from participant interviews. Suggestions from participants have guided subsequent editing and continuous quality improvement of the cases.

Suggestions from participants have guided the subsequent editing and continuous quality improvement of the cases.

Participants
Of 85 participants who completed evaluation forms, there were 31 physicians, 24 nurses, four public health workers, three hospital administrators, seven lab workers, four radiology technicians, four medical records clerks, two cancer registrars, three pharmacy workers, and one dental assistant. The remaining participants were in other professions or chose not to indicate their profession.

Findings
No formal evaluations were conducted at the first sessions in Yap and Palau. The responses to the evaluation questionnaires (N=85) were compiled from sessions held in Saipan, Chuuk, Kosrae, Majuro and Ebeye, as well as the second session in Yap. Results of subsequent Yap sessions were not included since many of the participants repeated the training.

1. Was the case appropriate to the setting in your hospital?
   Yes: 83, No: 0, Possibly: 2

2. Do you like having several staff members research and present parts of the teaching for the second session (instead of one person giving a lecture as usual)?
   Yes: 84, No: 1

3. Do you have any suggestions to make the case better for learning?
   Yes: 33, No: 52
   * This is very good to have wide vision of this case which stimulates our thoughts to come up with different thoughts.
   * Longer time to analyze the case and prepare for the discussion on the learning issues.
   * More time to discuss about the case.
   * Involve staff from different departments within the hospital including administrators, too.
   * Doing any research on anything refreshes us and also gives us more knowledge.
   * I believe some of us learn things easily with pictures so it is good to provide quality image of things discussed (e.g., shapes of coronaviruses).

4. Do you have any suggestions for the group facilitator?
   Yes: 22, No: 63
   * Should have more in-depth knowledge of the cases.
   * Suggest facilitator involve all the members for their input in the group discussion.
   * Have more cases to train the facilitator, so everyone will have hands-on training.
   * This present case went well, but for our part, whoever is going to facilitate next session needs to know how to stimulate and lead the discussion.

5. Is it helpful to have a mixed group of doctors, nurses, lab and public health for learning in this kind of case?
   Yes: 80, No: 6

6. Overall, was this case worthwhile as a continuing education activity?
   Yes: 84, No: 1

In interviews, participants indicated that they look forward to working through more such cases.
Participants readily appreciated and volunteered many of the positive points of PBL, including direct evaluation comments on the PBL process: (1) active learning, (2) universal participation, (3) more motivating and interactive than "PowerPoint talks", (4) shared teaching roles, and (5) emphasis upon the intrinsic learning value of teaching others.

Quality Improvement Modifications Based on Cultural Considerations
After conducting three case study trainings in Yap, participants suggested that the research of identified learning issues should be assigned to teams composed of two to three participants, rather than to individuals. Typically, junior health workers and participants of differing disciplines (e.g., a physician with a laboratory technician and a nurse) have been assigned to each team. This has given team members opportunities to share research techniques (e.g., PubMed searches) with one another. In Yapese culture, which maintains a traditionally rigid hierarchy of status, people of certain social backgrounds are uncomfortable instructing others in public settings; learning issue teams select a spokesperson to speak for the team, allowing other members to participate comfortably behind the scenes.

It became apparent that many of the Micronesian facilitators (usually physicians) adopt an overly didactic style, which interfered with the identification of learning issues by group participants. To address this, a workshop for PBL facilitators was conducted at the PBMA meeting in Chuuk state (in FSM) in August 2005, in which facilitators from each jurisdiction had the opportunity to observe others lead cases as facilitators, highlighting the differences between facilitator and traditional teaching roles.

Discussion
PBL is a useful teaching modality for small islands and community settings where healthcare staffing and available resources are limited. Appropriately written PBL cases encourage training participants to discover and address deficits in their knowledge and skills, and become more familiar with methods of gaining access to needed information. Participants also become aware of the resource limitations in their practice settings. Interdisciplinary learning environments encourage learners to explore the interdisciplinary nature of the response necessary for bioterrorism and other public health emergencies.

Limitations
Ideally, it is preferable to present cases with unusual scenarios, such as bioterrorism interspersed into a general PBL curricula, to ensure that trainees are unable to anticipate case content. Indeed, victims of bioterrorism may not always recognize themselves to be such, thus they present for health services interspersed with other patients. In health curricula, such as that of the University of Hawai'i, School of Medicine, utilizing PBL as the main mode of instruction allows for the promotion of authenticity and the unexpected nature of such incidents. As districts, such as Yap, adopt PBL as the central mode of interdisciplinary continuing education, bioterrorism cases can be interspersed among other PBL cases.

Further Directions
As we expand these trainings to districts where medical practitioners desire continuing medical education credits, we will develop post-tests on which learners will need to achieve a predetermined percentage of correct answers in order to receive credit. These case studies are also being implemented in discipline-specific training settings, such as public health, medicine, nursing, medical technology, and emergency medical services.

Appendix
Summary of a PBL Case
This case is an eight-page sequential disclosure case.

Page 1: A 33 year-old Chinese garment factory worker presents to the outpatient department of the Commonwealth Health Center in Saipan with (page 2) cough, fever, and a few crackles on respiratory examination. She is treated for community acquired pneumonia with oral antibiotics. Page 3: She returns to the emergency department in (page 4) respiratory distress.

Page 5: Peripheral opacities are seen on chest x-ray.
Page 6: She is admitted to the hospital and placed on intravenous antibiotics.
Page 7: She is placed on mechanical ventilation on the third hospital day.
Page 8: The patient dies. An epidemic of respiratory illness is recognized. Commercial flights into and out of the Commonwealth are cancelled. SARS is identified as the pathogen.

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13 years ago in Pacific Health Dialog, C. Chang stated, “In our moral posturing, based in parts on the notion of innocence and guilt, we justify the withholding of information and means that could help more people from being infected.”

ICT Capacity and Human Resource Development in Island Economies

Christina Higa, MA

Address correspondence and reprint requests to: Associate Director, Telecommunications and Information Policy Group (TIPG), and Director; Pan-Pacific Education and Communication Experiment with Satellite (PEACESAT) Social Science Research Institute, University of Hawai‘i at Manoa, 2424 Maile Way, Saunders Hall, Suite 713, Honolulu, Hawai‘i 96822-1192; christina@tipg.net.

Abstract
There is significant potential for Information Communication Technology (ICT) to play a major role in assisting economic and social development. However, the technology, infrastructure, plans, and policies must be sustained and supported by people that have ICT skills, knowledge, and abilities. There are many facets in ICT capacity development in Island economies that this paper will touch upon: What are the best strategies for a country to develop a robust ICT skilled workforce at all levels which include the user, operator, administrator, and policy maker? What level of ICT education and training is needed? What are some of the challenges in delivering ICT education and training programs? What are some strategies for the design, development, and delivery of these programs? What are some examples of ICT capacity development programs in the Pacific Islands region? (PHD 2007 Vol 14 No 1 pp 103-106)

What level of ICT education and training is needed?
There is a severe need for skilled ICT human resources at all levels in the Pacific Islands region.¹ This need includes the users in the public (e.g., educators and health care providers) and private sector; those that design, develop, implement, operate, and manage networks and systems, and those that are responsible for policy decisions and regulation of the ICT sector. The development of the skills, knowledge, and abilities in these diverse areas involves many different disciplines and programs.

For the users, education and training should be focused on the incorporation and application of ICT services in their work. This may involve both technical training on how to use a software program, the internet, or a video teleconference VTC service. It may also include application of theories and practices in their specific area of interest. For example, while an educator may taught how to use a computer eCourse Management System, they also may need to learn about distance distance learning theory and practice. It is necessary to learn how to use the technology as an effective tool to assist in achieving improved learning outcomes.

Technician or operator training also varies. The type of training fits into categories such as: telecommunication systems and networks, end-user equipment (hardware), and computer systems (software). Even within these categories there are many different types of systems and software programs (e.g., Cisco routers, Oracle database, and Microsoft applications) that may require very specific professional education and training certificate programs.

There are fewer structured education and training programs for policy and decision makers. Policy related courses may cover general public policy and administration but specific telecommunication policy courses and those relevant in the Pacific Islands are very few.

Developing local human resources will decrease the reliance on expensive foreign ICT consultants, increase ICT related jobs and markets, and improve institutional efficiencies through the use of ICT systems and services.

What are some of the challenges in delivering ICT education and training programs?
The challenges include:
- Local academic institutions are often not prepared to offer needed courses. There may not be the resources or staff to adequately develop these programs and courses.
- Sending students off-island is costly. The cost includes: the training program, air fare, and daily per diem for accommodations, meals, and transportation. It also includes the employee’s time away from the job.
- Sending students off-island may disrupt their work and family life.
- The cost and availability of off-island travel for extended periods of time limits the number of trainees that are sent for training.
- Often the students do not pass the certification exams at the end of the technical training programs. This failure may be due to different teaching and learning styles and the fact that for many students English is a second language. Instructors may speak too quickly and use jargon that is difficult to understand. Students may not be accustomed to taking tests. Finally, the course material may require prerequisite technical knowledge in order for the students to grasp, in the short amount of time allocated for the training program, the material presented.
- Students receive training abroad in an environment where there are technical resources, equipment, etc. that are not available in their countries. This foreign environment makes it difficult to anticipate and troubleshoot technical problems when back in their home environment.
- If a foreign trainer conducts on-island training sessions, it is often not for an extended period of time. Although more local people can be trained, often the allocated amount of time is not long enough for student skill building. For example, a one-week computer training course might first require keyboarding. This cannot be learned in a short period of time and requires on-going practice.
- Brain drain is a difficult problem to resolve. Once people are trained, they become a scarce commodity and are difficult to keep employed locally because of more lucrative job offers in competing markets.

Brain drain is a difficult problem to resolve. Once people are trained, they become a scarce commodity and are difficult to keep employed locally because of more lucrative job offers in competing markets.

What are some strategies for the design, development and, delivery of these programs? There are several strategies for overcoming some of these challenges, maximize resources, improve learning outcomes, and enhance sustainability of education and training programs. Some strategies include:
- Establishing collaborative partnerships
- Paying employees to learn on their own time
- Developing e-Learning programs
- Supporting multipurpose networks: Sharing resources
- Utilizing open source software
- Adapting training programs to local teaching, learning styles, and pedagogy
- Developing approaches to knowledge management
- Developing and mentoring a core team

Establishing Collaborative Partnerships
Strategic partnerships for collaboration provide opportunities for sharing and optimizing limited resources. Colleges and public school systems may collaborate to establish a program on computer literacy for teachers. The telecommunication carrier may work with private sector ICT departments to pool resources for bringing in outside expertise for training in a particular subject. Similarly, an organization might work with others in the region with comparable training needs.

Paying Employees to Learn on Their Own Time
Providing educational stipends for and allowing employees to attend capacity development programs during off-hours and on weekends is cost-effective. The organization benefits by supporting employees who are willing to advance their ICT skills by taking classes on their own time to learn skills that will, in turn, assist the organization.

Developing e-Learning Programs
There are many modes of e-Learning. The variations include: completely online where the students and teacher never meet face-to-face, a combination of face-to-face and on-line, and interactive VTC plus on-line support for supplemental learning and resource management (handouts, presentations, reading assignments, etc.).

The benefits of utilizing ICT to deliver ICT education and training are many. The use of ICT provides a real world lab for students to understand some of the benefits of ICT and how technical systems and services function.

e-Learning enables wider distribution of programs to many students. It provides students with the flexibility of attending courses without leaving their home and/or work. This permits students to enroll and participate in long-term programs.

Cost becomes an issue to overcome when delivering e-Learning programs. These programs are more time consuming for the instructor to develop and telecommunication costs for quality services may be prohibitive. The use of public service telecommunication networks and/or networks that utilize information technology for VTC is recommended because there is no basic per minute fee. In the Pacific Islands, programs such as Pan Pacific Education and Communications Experiments by Satellite (PEACESAT) or the University of the South Pacific Network (USPNet) through Australia Research and Education Network (AARNet) are other options for e-Learning support infrastructure.
Supporting Multipurpose Networks
Part of optimizing limited resources and developing collaborative partnerships includes the shared use of technical networks and services. This collaboration might include cost-sharing monthly recurring costs and sharing the use of facilities and equipment. Partnerships may be within one sector or between multiple sectors (e.g., health, education, and emergency management, etc.).

Utilizing Open Source Software
The use of open source software such as Moodle (an eCourse management system similar to WebCT© or Blackboard©) is usually just as functional as commercial systems, is easy to use, and has no licensing fees. Without licensing fees, organizations are permitted to share systems and share the cost of a server and maintenance.

Adapting Training Programs to Local Teaching and Learning Styles
It is important that the pedagogy is appropriate for the local culture and environment. If available, language and cultural interpreters are useful. If not, the instructor should be mindful to present the material in a way that is understood by the students to whom English may be their second, third, or fourth language. Using local environments and situations are imperative.

Developing Approaches to Knowledge Management
Storing information from courses in a way that is easily managed is beneficial to both the instructor and student. Students are able to review lessons on their own time and when necessary. Instructors may elect to share learning objects such as PowerPoint© presentations and hand-outs. The objects can be reused in other courses.

Developing and Mentoring a Core Team
Initially, it is very useful to start off with a small core team that is designated and willing to learn all the different components of ICT. The team will work with technology and policy stakeholders to establish partnerships among agencies, train the trainers, become the liaison with management and leaders, and monitor the always changing local ICT capacity development needs.

What are some examples of ICT capacity development programs in the Pacific Islands region?
Here are a few examples of programs that the University of Hawai'i (UH) Telecommunications and Information Policy Group (TIPG) and PEACESAT have developed in collaboration with Pacific Island partnering agencies.

Pacific ICT Academy (PICTA)
PICTA (http://picta.ecdc.as) was established in 2005 in American Samoa through a partnership between the American Samoa Community College (ASCC), Department of Education, Pacific eCommerce Development Corporation and the University of Hawai'i TIPG. The purpose of PICTA is to provide training in Cisco networking, Microsoft and Oracle applications for both academic credit and preparatory sessions for professional certification tests.

The program was specifically designed to address the need for developing a skilled cohort of ICT professionals in American Samoa to support the many advanced telecommunications networks that have been developed in recent years. It was also designed in an attempt to meet the challenges of ineffective investment in short off-island intensive professional certificate training courses, such as the Cisco certification classes. Often pass rates were low due to the need for increased foundational work, short time to learn and digest a lot of new and in-depth material with no local adaptation or facilitators.

The UH TIPG is considering the development of a health information focused Telecommunication Information Resource Management course because of the need and demand for this type of training in Hawai'i and the Pacific Island jurisdictions.

The PICTA program was offered over a one-year period and held daily from 8:00 AM to 12 Noon, Monday through Friday, with mandatory weekend laboratories.2 UH TIPG instructors provided the training to participants at ASCC through interactive video teleconferences. At ASCC there were local on-site facilitators to coordinate the overall course administration and provide additional student support. Many students were sponsored by their employers (government agencies, as well as private sector) with the understanding that they would retain their employment for a period of two years. Due to retention issues, the participants were obligated to reimburse the full cost (USD$20,00) of the training program (USD$20,000) to the company, if they did not meet this requirement.

Of the 21 registered students, 19 successfully completed the program. The feedback has been very positive regarding the increased quality of technical support.
and response time for troubleshooting and resolving problems. The first PICTA cohort was comprised of ICT staff from educational institutions and government agencies that have formed informal networks for continued information sharing and support.

Telecommunications & Information Resource Management (TIRM)

UH TIPG/PEACESAT administers the TIRM graduate certificate program (http://tirm.tipg.net). The hybrid program uses VTC and on-line delivery. Recently, students have participated from American Samoa, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia (Pohnpei), Republic of the Marshall Islands (Majuro), Republic of Palau, and Hawai‘i. The Sasakawa Pacific Islands Nation Fund has awarded a grant to support participants from each U.S.-Affiliated Pacific Island jurisdiction for 3 years. The first cohort to include policy makers, administrators, and technical support staff will begin in August 2006. There are a total of five 3-credit courses required for this graduate certificate. The courses are: Telecommunication Systems and Networks (COM 681); Telecommunication and Information Services (COM 682); Information Research and Development Methods (COM 683); Telecommunication Planning and Management (COM 684), and Seminar (COM 680). Moodle is used to organize course materials, teaching/learning objects, assignments, and on-line quizzes. The UH TIPG is considering the development of a health informatics-focused TIRM course because of the need and demand for this type of training in Hawai‘i and the Pacific Island jurisdictions.

ICT Policy Awareness Workshops

In 2006, the Pacific Island Digital Opportunities Program of the Sasakawa Pacific Islands Nations Fund supported the UH TIPG, in conducting ICT Policy Awareness workshops in the Federated States of Micronesia and the Republic of the Marshall Islands. The workshops were geared toward policy makers and ICT stakeholders in education, health, and other public sectors. The workshops covered topics such as basic telecom terms and concepts, policy reform and liberalization, and ICT regulatory frameworks. Several interested participants became candidates of the TIRM graduate certificate program for continued and ongoing telecommunications policy training.

Instructional Technologies (ED 240) and Distance Learning Practice and Theory (ED 250)

The American Samoa Community College (ASCC), American Samoa Department of Education (AS DOE), Pacific eCDC, and UH TIPG/PEACESAT deliver two courses specifically geared toward computer literacy and e-Learning capacity development. These courses are Instructional Technologies (ED 240) and Distance Learning Practice & Theory (ED 250). Students that complete these courses receive ASCC credits. The courses, which develop the capacity of local teachers to effectively utilize and incorporate educational technology in instruction, have been designated as requirements for the teacher certification program of the AS DOE. More than 355 teachers have been trained in eight sessions. Outcomes of these trainings include teachers creating Microsoft PowerPoint slide presentations for classroom instruction and implementation of distance learning classes in algebra and physics.

Discussion

There are many important issues in designing and delivering cost effective and efficient education and training. e-Learning opportunities are increasing. But, there is a challenge in the Pacific Islands to access affordable telecommunication networks and services. The goal of affordable services alone is quite involved since it requires policy and social change. ICT capacity development is needed at all levels throughout the Pacific Islands region in parallel with the development of e-Learning programs. This development is needed across both public and private sectors. Some of the strategies outlined in this paper are observations derived from successful and failed ICT capacity programs in the region.

References


106
“Healthcare is not something you can isolate from life in general”: Factors Influencing Successful Clinical Capacity Building in the Pacific

Richard Vezina, MPH*
Michael Reyes, MD, MPH**
Cyril Goshima, MD†
Stephen F. Morin, PhD‡

*Research Analyst, AIDS Policy Research Center, University of California San Francisco. **Adjunct Professor; Director, Pacific AIDS Education Center, University of California, San Francisco. †Assistant Professor; Director, Hawai‘i AIDS Education Training Center, Department of Psychiatry, John A. Burns School of Medicine, University of Hawai‘i at Manoa. ‡Professor of Medicine; Director, AIDS Policy Research Center, University of California San Francisco. Address correspondence and reprint request to: Richard Vezina, MPH, AIDS Research Institution at UCSF, University of California, San Francisco, 50 Beale Street, Suite 1300, San Francisco, California 94105-1823; rvezina78@yahoo.com.

Abstract
Capacity building assistance (CBA) uses multiple techniques, including training and technical assistance, to develop a sustainable infrastructure for healthcare agencies. Although there is some evidence that CBA is effective, much remains to be learned about the best ways to implement it. We assessed factors influencing the delivery of an HIV-related CBA project for health professionals in the U.S.-Affiliated Pacific Jurisdictions. We found some factors clearly facilitated CBA (e.g., implementing programs over long time periods), while others were clearly limiting influences (e.g., AIDS-related stigma). Lessons from this study can be applied to other CBA programs, where CBA providers can assess barriers and facilitators to implementation in order to target their services to the needs of local health experts. (PHD 2007 Vol 14 No 1 pp 107-114)

Introduction
Capacity building assistance (CBA) has become an increasingly important means of developing human resources for health worldwide.1,2 In 2006, the World Health Organization (WHO) identified many advances in the development of human resources for health, highlighting the successes of local CBA programs in developing nations.3 The 2005 Annual Report of the U.S. President’s Emergency Plan for AIDS Relief (PEPFAR), identified CBA as a critical strategy to create sustainable HIV prevention and treatment programs worldwide.4 However, much remains to be learned about the best ways to implement CBA programs. The WHO suggests conducting further research on the context in which CBA programs are delivered. Adapting CBA strategies to the local context is essential to their successful uptake. Identifying the contextual factors affecting CBA implementation is a critical step in this process.

In this article we present factors that influenced the implementation of a CBA program in the U.S.-Affiliated Pacific Island (USAPI) jurisdictions. Since 2000, the Pacific AIDS Education and Training Center (PAETC), through its Hawai‘i AIDS Education and Training Center (AETC) site, has worked with USAPI health professionals to develop local organizational and clinical HIV capacity. In 2005, we evaluated the program to understand the contextual factors affecting the delivery of CBA services.

Background on the project
PAETC delivers AIDS-related training to healthcare professionals in California, Arizona, Nevada, Hawai‘i, and the USAPI (American Samoa, Commonwealth of Northern Mariana Islands, Federated States of Micronesia [FSM], Guam, Republic of the Marshall Islands, and the Republic of Palau). The agency is part of a national network of AETCs whose mandate is to improve the care of people living with HIV/AIDS by providing education, training, clinical consultation, and other assistance to HIV-treating clinicians. Within the AETCs, Minority AIDS Initiative Programs assist minority-serving community agencies to build organizational and clinical HIV capacity.

In 2000, the PAETC launched a multi-year Minority AIDS Initiative Program in the USAPI. While each jurisdiction has a formal relationship with the U.S., they differ from
it – and one another – in terms of culture, language, economics, healthcare, and access to resources. In a desire to understand this region better, PAETC conducted an assessment of the needs of clinicians in the region prior to launching the program. Findings showed a limited level of direct experience with HIV care, treatment, and prevention, though experience levels varied somewhat by jurisdiction. The assessment also showed overburdened health workforces and limited healthcare resources in most jurisdictions.

In response to these findings, the PAETC and Hawai’i AETC launched a CBA program to enhance the HIV-specific clinical skills of health professionals and strengthen the capacity of healthcare organizations in the jurisdictions. The program’s main capacity building mechanisms included:

- Annual clinical training conferences in Guam and Hawai’i, with a focus on informational and skills-based training sessions, and organizational strategic planning;
- Periodic site visits to each jurisdiction and on-site clinical consultation.
- Expert health policy advising with local clinic administrators, Health Ministers, and other officials;
- Clinical “mini-residencies” in Hawai’i and California. Health professionals from the jurisdictions shadowed U.S.-based expert HIV clinicians during clinical practice;
- Bi-monthly satellite-based teleconferencing;
- On-going expert consultation via telephone and email, for clinical and organizational matters.

These activities were carried out over the course of 4 years. In addition, specific CBA was provided in Chuuk, FSM to establish a regional training center. Since its establishment, the Chuuk AETC faculty members have participated in U.S.-based professional development, and have conducted trainings in every state of FSM and in the Republic of the Marshall Islands. Further description of all these activities can be found in the following paper in this journal.5

Findings showed a limited level of direct experience with HIV care, treatment, and prevention, ...

Methods

Findings presented in this paper were collected during the long-range evaluation of the program described above. Data were collected and analyzed via two qualitative methods: focus groups and semi-structured interviews. Participation in focus groups and interviews was voluntary; respondents were asked to provide informed consent using procedures approved by the University of California, San Francisco, Committee for Human Research.

Focus Groups

An external evaluator conducted focus groups (n=4) with clinicians and other health professionals from the USAPI who had received CBA from this program (“CBA recipients”). With support from Hawai’i AETC staff, we recruited focus group participants from among those clinicians attending an annual training conference in Honolulu in 2005. In the months preceding the conference, we announced the upcoming focus groups through emails and during the satellite-based teleconferences. A total of 20 participants, representing all six USAPI, participated in the focus groups. This number represented almost all the CBA recipients attending that conference, as well as a large majority of the total health professionals receiving CBA through the program.

Interviews

The evaluator also conducted semi-structured interviews with core staff and trainers (“CBA providers,” n=7) involved in the development and implementation of the project. Potential respondents were initially
identified with the assistance of Pacific and Hawai'i AETC leadership. All initial interviewees were asked to identify other potential respondents. A purposeful sample was selected from these candidates to maximize familiarity with the project and diversity of perspectives and recruitment stopped when saturation of information was achieved. Because a small group of CBA providers had worked consistently on the program for its duration, saturation was achieved at a relatively smaller threshold than occurs in many qualitative studies.

**Focus group and interview analysis**

The evaluator taped and transcribed all focus groups and interviews. Following transcription, we conducted preliminary coding by hand, engaging in interactive discussions of preliminary data to identify the emergent themes. Focus groups and interviews were considered two separate data sources, and separate codebooks were developed and applied to these two data sets. After initial analysis, we entered transcripts into the analytic software (Atlas Ti) to develop more formal focus group and interview codebooks to review response data. During this stage of analysis, focus group and interview findings were compared and contrasted to identify the most salient themes.

**Findings**

We discovered many factors influencing the ability of the Pacific-based health professionals to implement the information, skills, and resources acquired from the CBA program. Many of these factors overlapped with one another and some were perceived at different times as both beneficial and detrimental to implementation.

**Relationships**

The development of professional and personal relationships was beneficial to successful implementation of the CBA. These relationships occurred on many levels: between CBA providers and CBA recipients, among fellow CBA recipients from different jurisdictions, and between CBA providers and government officials in the jurisdictions. A CBA provider summed up the sentiment expressed repeatedly in interviews and focus groups: “Our bringing [the USAPI clinicians] together, particularly at the conferences, and pulling them together as a group of HIV clinicians, has given them a sense of belonging to that group. And they are able to freely communicate with each other about whatever issues come up in the region. It has developed into a camaraderie and good professional relationship.”

CBA recipients saw the building of a strong group identity among their peers as particularly important and meaningful. One CBA recipient stated that the program had encouraged him to build stronger connections with professional peers, “The training has led us to expand ourselves to other service providers (in our region who are not receiving the CBA). We collaborate with other people who look out for the patients’ interests.” This has led some CBA recipients to increase their involvement in professional organizations such as the Pacific Island Jurisdiction AIDS Action Group and the Pacific Island Health Officers Association.

One CBA provider reflected at length on her experience delivering training in the Pacific jurisdictions, “(We had to) demonstrate that we were committed to (the CBA recipients) and we were going to be there and stick with them at their pace. It took those relationships developing for us to be more effective as trainers, and that took time and good will on both parts. And that’s maybe one of the hardest things to realize from a logistical standpoint, you can’t just go in and think you’re going to provide training and then leave and be done with it. What really fundamentally underlies effective training is good relationships between trainers and trainees.”

**Time**

Having enough time to build these relationships was essential to the project’s long-term success. CBA recipients and providers stated that many program effects, such as improvements in HIV testing and laboratory facilities, occurred slowly. Without a long-term commitment to the program, they said, these changes may not have developed.

Some CBA recipients felt having a long-term involvement in the program enabled them to build comfort and confidence in their newly acquired skills and knowledge. In a focus group, two CBA recipients responded to a question about what had changed for them over time:

CBA Recipient A: “When we were first starting out, we learned about how to talk about sex. To me, that was really beneficial because I went back home and was talking to clients, and people were hearing me talking about anal sex and things like that. And you know, you’re not supposed to say that! My biggest lesson was feeling comfortable talking about sex and getting someone to talk about their sexual behavior without feeling uncomfortable.”
CBA Recipient B: “Yeah, I think the main point I get from this training is that I have more confidence when I encounter my patients. Because there are a lot of questions! It prepares me to deal with that, if they ask me some questions. Out of this training, I would like to say that I am more prepared when I encounter a patient with HIV/AIDS.”

In addition, long-term participation allowed some individuals take on new roles. Most notably, the establishment of a local training office in the Micronesian state of Chuuk provided new opportunities for clinicians there to take on increased leadership responsibilities. This opportunity only emerged after several years of planning and collaboration; according to some CBA recipients and providers, it could not have occurred without that amount of development time. One CBA recipient spoke excitedly about the Chuuk AETC, “And the program is extended now to Chuuk. I think it’s a step forward that we have resources that are in our backyard. Hopefully that will continue. I think the program has made that possible, I think that’s a very strong point. We have experts in the area to help us now.”

Buy-in
The concept of “buy-in” commonly means that affected parties believe in the importance of an issue and of the need for action to address that issue. In this program, “buy-in” came to mean that stakeholders (CBA recipients, CBA providers, leaders in the Pacific jurisdictions and the mainland U.S., patients, and others) believed in the importance of HIV care and prevention. In particular, stakeholders from the jurisdictions valued the CBA services being provided.

Buy-in was slow to develop among some stakeholders because they did not see HIV as a health priority. Because of the few detected HIV cases and because CBA recipients were balancing numerous responsibilities beyond HIV care, HIV was not seen as a critical issue needing immediate attention. According to one CBA recipient, “We wear so many hats, and HIV is not the only disease that we are looking after. Sometimes it’s very difficult to connect all the points, because of the other things that you do in-between. There is a lot of work!”

In order to build greater buy-in from the various stakeholders, CBA providers emphasized the importance of preparing the region for the future and potentially helping prevent a growth in HIV cases. In addition, the program emphasized how new skills and information acquired through trainings could be applied to other aspects of clinical care. One participant summed up the experience of many when he said that the program had allowed him to address “other areas of our work. And that’s a trade off from the program, not only HIV, but we use this in other areas to develop our skills.”

Cultural and Language Diversity
The group of Pacific jurisdiction CBA recipients was representative of the great diversity in the region, and the addition of CBA providers from Hawai‘i and the U.S. mainland only increased this dynamics of the program. Such diversity was identified as both challenging and helpful to the program’s successful implementation.

Most barriers associated with diversity involved issues of communication. Several CBA providers and recipients said that while having the common language of English was useful, for many of the CBA recipients, it was a second or third language. “The capacity to communicate in English is quite variable within the group,” stated a CBA provider. He observed that many experienced health professionals from the jurisdictions struggled to explain things in English that they would be able to do easily in another language. But, he said, “We couldn’t communicate with [the CBA recipients] without English!” Meanwhile, several CBA recipients found difficulty in translating clinical information from English to a local language for patients. According to one, “Sometimes it is easier to ask [a patient a health-related] question in English. But when you ask it in another language, you know, you really have to find the [right] words.”

The diversity of those delivering and receiving CBA also provided new learning opportunities for all. A CBA provider said that she benefited from efforts by CBA recipients to “teach us too” about their cultures and healthcare systems. While cross-cultural challenges existed, many CBA recipients and providers approached the situation with openness and willingness to learn. One CBA recipient said that “one of the biggest things I’ve learned, being with the other participants from the other islands, is how to be more culturally aware.” She worked in a clinical setting where she saw patients of different Pacific cultures and had to learn how to adapt her word choices when conducting health assessment with some patients. “What we learned at the first sessions here was how to ask (patients) questions. I’m more culturally sensitive now (to the patients’ comfort..."
level).” Another CBA recipient said simply, “the biggest thing that has changed in me (after) all these years is my awareness of other cultures.”

**Stigma**

HIV-related stigma was identified by CBA recipients and providers as a particularly challenging barrier to success. Many CBA recipients spoke about their own personal fears when they first encountered HIV patients. Most stated that lack of experience with the disease had led to misconceptions. One stated, “When we first heard about it, I kept asking myself, 'Am I ready to manage a patient who comes in with HIV or AIDS?' And that was a challenge to motivate myself personally to where I’m comfortable enough. (In the beginning) I wasn’t, to be frank, prepared enough to know what I should do if someone walked into my clinic.” Other CBA recipients saw HIV stigma and discrimination in their workplaces. “In the past, for our health workers, no one had been trained yet about HIV. We had one experience with a case that came from (a different jurisdiction). The family brought him to the emergency room. Some of the providers were afraid to see him, they were not accepting it. They had a little knowledge (of what HIV was), but they were afraid.”

Several CBA recipients spoke about their efforts to fight stigma in their workplaces and communities as a result of their involvement in this program. One CBA recipient observed changes in his local community, “One of our cases last year, before she died, the whole island came to her place, brought food, they showed sympathy. So there was a big change, instead of accusing her, they turned around to bring food. And even our patients that we admit to the ward! When we had our first patient in the hospital no one went to see him except his brother. The next patient came, and the rest of the family came to the hospital to take care of him. I wouldn’t say there’s no more (stigma) now, but (the community members) understand more now.”

Some CBA recipients and providers linked community stigma against HIV to greater stigma against behaviors associated with HIV-risk, specifically sexual and/or drug use behaviors. Cultural values condemning sex between men, for example, were cited as a barrier to creating a supportive clinical environment for some HIV-infected patients. One CBA recipient related an experience with a male client who has sex with other men. While her peers were uncomfortable answering health questions for the client, she felt equipped to speak about his risk behavior in a non-judgmental way. “And now,” she said, “every two weeks he calls on a long distance phone call, and he’s asking for me. Maybe I’m the only one who accepted what he was asking me.”

**Geographic Isolation**

The isolation of each participating jurisdiction from one another and other locations (including Hawai‘i and the U.S. mainland) has created some of the greatest challenges for CBA recipients and providers alike. The providers and recipients of CBA worked in different time zones, creating difficulties in communication. Physical isolation limited the degree to which clinicians could refer their patients to another location for specialty services. “There are issues with that,” stated a CBA provider, “What if a patient is deathly ill? Where are you going to transport them? And is the airline going to transport them?” This distance was also cited as a barrier to gathering participants on a more regular basis, as travel was expensive and time consuming. Several CBA recipients said they found it difficult to take time away from their clinical practices to travel for trainings.

**Resources and Technology**

Lack of resources, in particular supplies for medical care and laboratory testing, was another challenge to successful implementation. The jurisdictions’ distance from larger, more populous nations limited their ability to participate in those nations’ commercial activities. Thus obtaining resources was often more costly and time consuming. Access to medical supplies was difficult in some of the more remote regions of the jurisdictions. In discussing this problem in his jurisdiction, one CBA recipient said simply, “We can’t get the resources, so we need the AETC training” to learn how to deal without certain supplies.

In response to this, CBA providers have tailored the program to local needs. One CBA provider asked rhetorically, “How do you work with clinicians who may not have a way of measuring viral load, not to mention doing resistance tests or having the whole armamentarium of antiretrovirals? For one, you make sure they have (medications) for primary care provider prophylaxis. We’ve definitely had to temper the curriculum based on the reality that not everyone has the same resources.”

Lack of appropriate laboratory technology had forced clinicians in some jurisdictions to ship specimens off-island for testing. One CBA recipient described the situation: “We don’t have Federal Express, so we
have to work with the commercial airlines. ...it's an expensive solution, a lot of training, packaging, and capacity building. A lot of energy just to get a lab test.” CBA providers and recipients alike were still struggling to determine the best way to get appropriate supplies to some jurisdictions.

In addition, communications technology was seen as unreliable in some parts of the Pacific jurisdictions, making timely communication a challenge. A CBA provider described one example of how communications technology has affected the project: “Our experience with the satellite teleconferences has been interesting: We’re still having them regularly and people still attend. This is amazing particularly since we have technical problems every time always different; weather, billing, sensitive hardware! But people are still committed in spite of the barriers.”

While the limited availability of medical and communication technology was identified as a barrier, many CBA providers and recipients simultaneously identified benefits to having access to such technology. With assistance from the program, CBA recipients were able to use alternative means of communication, particularly email, when telephone access was unavailable. Email was described as valuable because it allowed rapid communication in spite of time zone differences that made phone or video conferencing difficult. “We send emails overnight and then in the morning get the responses,” said one CBA recipient, referring to clinical consultations she received from a mainland-based CBA provider. “It was very comforting to know who to contact.” CBA recipients also greatly valued access to the internet, which provided them a regular flow of up-to-date clinical information.

Discussion

This program was established because HIV in the Pacific jurisdictions, though low in prevalence, posed an emerging threat to the region. Over time, CBA providers and recipients identified numerous factors that affected the successful delivery and uptake of the program. Some factors were surprising to participants in this study, such as the benefits of getting buy-in over time; others were expected, such as the challenge of geographic isolation. But more important than detecting any particular factor, CBA providers and recipients realized that identifying all these factors would enable them to engage in a more effective CBA process that would create a more sustainable health system in the future.

Some of the factors described are particularly relevant to programs in the Pacific region. Most notably, geographic isolation will continue to be a challenge for the Pacific jurisdictions. The distance of the islands from one another and the U.S. makes many seemingly simple activities, such as conducting telephone consultations, more difficult. Isolation limits health professionals’ opportunities to leave their islands for professional development, and similarly inhibits frequent visits from outside colleagues or trainers. This program attempted to overcome this challenge primarily through the use of communications technology. For many CBA recipients, the use of telecommunication technology (especially the internet) has been essential to their participation. It has improved their access to clinical HIV experts, and enhanced communication with one another about regional health issues. While availability still varies greatly across the region, investment in such technology would greatly benefit the Pacific region.

Our findings also expand upon some of the existing research on CBA. We found that stakeholder buy-in was necessary for effective program implementation. Because so many clinicians had competing professional demands, they had to carve out a special amount of time and energy to participate in the CBA activities. Moreover, the U.S.-based CBA providers learned the importance of gaining buy-in from important figures in the jurisdictions such as government officials, tribal leaders, and clinicians not participating in the program. We also found that relationships were important facilitators to program success. In this program, these relationships took many shapes, ranging from long-standing consultative relationships between CBA providers and recipients to more active participation in professional associations among the CBA recipients. Furthermore, our findings supported the existing evidence that long periods of time are needed to implement CBA programs. We show in clearer detail how the mechanism of having extended time strengthens program outcomes by allowing relationships to grow and improvements in the healthcare workforce to take root.

CBA programs are particularly well suited to strengthening health systems and human resources for health in developing regions such as the USAPI. An examination of the contextual factors affecting CBA implementation can enable an agency to deliver such services more effectively. The importance of understanding contextual factors to the delivery of CBA is perhaps best stated by
one of the CBA providers interviewed in this study. As she stated about the Pacific jurisdiction CBA recipients she trains, "Healthcare is not something you can isolate from life in general. Understanding the social, political, and economic issues that bear directly on their capacity as (healthcare) providers, and then trying to move my own head around how to support them on those things, has been tremendously challenging and meaningful."

**Limitations**

The use of qualitative methods, while appropriate as an exploration of barriers and facilitators, may limit the scope of our findings. However, this limitation is outweighed by the substantial depth of description collected through qualitative methods that would not be achieved otherwise. Furthermore, by comparing our findings to the existing literature on CBA, we were still able to present data that are generalizable to CBA programs in other parts of the world or that address other healthcare issues.

Although the evaluator conducting the focus groups and interviews was "external," he was a U.S.-based researcher brought into the program by CBA providers. His connection to the CBA provider group, both professionally and culturally, may have inhibited the CBA recipients from sharing concerns with him in focus groups. A related limitation lies in the fact that all focus group respondents were still receiving CBA services from PAETC at the time of the focus groups. Thus these respondents may have had motivation to provide overly positive responses, or to avoid identifying challenges.

Interview and focus group respondents were asked to reflect on their experiences of the last several years. As a result, a particular respondent's ability to recall the events of the past accurately may have been limited.

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Meeting the Challenge of HIV Clinical Training Within 2.5 Million Square Miles of the Pacific Ocean

Kevin D. Patrick, MA*
Cyril K. Goshima, MD**
Talita Bowen, MPH*
Charles Lyden, MPH, MBA*
Jane Waldron, PhD*
Richard Vezina, MPH†
E. Michael Reyes, MD, MPH‡
Naleen Andrade, MD§

*Hawai‘i AIDS Education and Training Center, formerly in the Department of Psychiatry, John A. Burns School of Medicine, University of Hawai‘i at Manoa. **Director, Hawai‘i AIDS Education and Training Center, formerly in the Department of Psychiatry, John A. Burns School of Medicine, University of Hawai‘i at Manoa. †Research Analyst, AIDS Policy Research Center, University of California, San Francisco. ‡Director, AIDS Policy Research Center, University of California, San Francisco. §Chair, Department of Department of Psychiatry, John A. Burns School of Medicine, University of Hawai‘i at Manoa. Address correspondence and reprint requests to: Cyril K. Goshima, M.D., Hawai‘i AIDS Education and Training Center, formerly in the Department of Psychiatry, John A. Burns School of Medicine, University of Hawai‘i at Manoa, 3675 Kilauea Avenue, Sinclair 200, Honolulu, Hawai‘i 96816-2333; cgoshima@pdchawaii.com.

Abstract
In the U.S.-Affiliated Pacific Islands, an area that encompasses 2.5 million square miles of ocean, the incidence of HIV is unknown. The area is susceptible to increased HIV activity because of high birth rates, high STD rates, a sexually active younger population, and a mobile population. The Hawai‘i AIDS Education and Training Center (HAETC) has provided training in clinical care to the providers in the area since 2000. HAETC is part of the Pacific AIDS Education and Training Center that is part of a nationwide effort to educate and train professionals in HIV care. An adaptive multi-faceted curriculum appeared to be the best approach for training. HAETC has used conferences, mini-residencies, clinical consultations, and satellite conferencing. (PHD 2007 Vol 14 No 1 pp 115-118)

Introduction
The U.S.-Affiliated Pacific Islands (USAPI) can be described as many small inhabited islands scattered over 2.5 million square miles of Pacific Ocean comparable in area to that of the continental U.S. The approximately 500,000 inhabitants of the Republic of the Marshall Islands (RMI), the Federated States of Micronesia ([FSM] includes Kosrae, Pohnpei, Chuuk, and Yap), the Republic of Palau, the Commonwealth of the Northern Mariana Islands, and Guam are cared for by dedicated health professionals with limited diagnostic and therapeutic options. HIV/AIDS threatens this culturally diverse area. Although HIV incidence in the region is difficult to discern because many local health departments do not publicly report HIV/AIDS cases, the rapid rise of HIV to epidemic proportions in the Pacific Island nation of Papua New Guinea may indicate problems for the rest of the region.1 The jurisdictions are vulnerable to HIV infection because of high birth rates, sexually active young populations, the increased incidence of sexually transmitted diseases, and mobile populations.2 3

The Hawai‘i AIDS Education and Training Center (HAETC) has played a role in providing HIV education and training in the USAPI since 2000. HAETC is a sub-site of the Pacific AIDS Education and Training Center that received initial support from the U.S. Department of the Interior and subsequent funding from the Health Resources and Services Administration’s Minority HIV/AIDS Initiative. In 2000, a needs assessment in this area revealed low familiarity with and apprehension about HIV and insufficient resources for diagnosis, prevention, and care. To improve clinician ability to recognize HIV and understand treatment, HAETC developed innovative ways of training and building capacity. This is a report of our experiences with these clinicians.
Methods
Over the 5 years of the program, we collected evaluation and needs assessment data for our trainings and multiple capacity building activities. These data were collected in a variety of ways, including site visit reports, post-training quality assessments, knowledge tests, interviews, and focus groups. In addition, we developed annual work plans to guide the content and format of our trainings. In the following section, we use the various records to present a full picture of the processes, as well as some of the outcomes, of this project.

Findings
The HAETC created a multi-faceted clinical training program consisting of: 1) annual HIV clinical conferences; 2) week-long mini-residencies; 3) on-site consultations; 4) bi-monthly satellite-based teaching; and 5) ongoing clinical consultation with HIV specialists. Whenever patients were involved, standard privacy and confidentiality procedures were followed. One physician and two nurses were selected from each jurisdiction to be trained in HIV care and as educators for their area. In this cohort of providers, over 75% have been participants in these trainings from the beginning.

Guam hosted the first conference in January 2001 because of its proximity to the region, availability of HIV-positive patients for interviews, and its multicultural society. The conference included 12 didactic sessions and two full days of observing specialists taking care of and interacting with patients. Similar annual conferences have followed in Guam or Hawai‘i. The contents of the conference have changed yearly, as the needs have changed, but have always included patient interactions primarily employing interviews and history taking. There is ample opportunity for clinicians to network with each other and to share their experiences in HIV treatment. Both community and government partners are sought and are key participants in presentations and problem solving break-out sessions. An example of this is a session on incorporating HIV prevention in the medical care of HIV patients that was given by speakers from the U.S. Centers for Disease Control and Prevention (CDC) “Prevention for Positives” program. Another example would be the Association of Asian Pacific Community Health Organizations co-sponsoring the conference with HAETC.

The annual conferences have revealed several challenges. Although the curriculum is driven by needs assessment and current HIV treatment developments, obtaining the services of appropriate educators has been difficult. For example, finding an HIV and nutrition speaker who understood the unique Pacific Island diets and could integrate that knowledge with practical guidance proved challenging. Speakers also had to be aware of the limited availability of medications and diagnostic tests. Some islands have no antiretroviral medications and most do not have CD4 cell measurements. However, participants valued the broader learning spectrum afforded by the conference’s HIV-positive speakers since many had not cared for an HIV patient. When they did, the patient often presented late in the disease so treatment consisted primarily of palliative care. A participant from Kosrae said that he felt more empathy for HIV-positive patients because of what they went through and he was amazed at how long they had HIV.

For the mini-residencies, several clinicians per rotation were immersed in a week-long training. The clinicians observed high-volume HIV specialists providing primary care, and participated in case-based discussions and problem solving. These Hawai‘i and California specialists consulted with the trainees to help them address HIV issues using the resources available in their region in a culturally appropriate manner. The patient centered curriculum emphasizes: treatment of HIV and opportunistic infections; complications and side effects of therapy; treatment of co-morbid conditions; prevention strategies; and social issues like stigma and discrimination are covered. The lesson from the nearly 40 mini-residencies was clear: attention to detail was critical for successful outcomes. Without comprehensively briefed mentors, trainees can become lost in the hectic shuffle of routine patient care. The mentor must regularly ascertain if the trainee was being inundated with excessive information, or if the material was out of context. Additionally, the case-based study sessions needed to be reviewed to insure that material was challenging, but still comprehensible to the trainee. Terminology and acronyms were assessed for applicability to the trainee’s usual medical lexicon. Producing an effective curriculum relevant to each trainee’s need evolved over time. A participant said that “In the beginning no one wanted to be involved with the program. I felt uncomfortable. Since I have been in the program, I have a different perspective.”

Some islands have no antiretroviral medications and most do not have CD4 cell measurements.

On-site and on-going distant consultations are two types of consultations provided by HAETC. The on-site consultations consist of an HIV specialist from Hawai‘i or California reviewing and discussing medical records of patients receiving HIV care on a one-on-one basis with...
the treating clinician. In distance consults, the clinician contacts an HIV specialist in Hawai’i or California with questions regarding care of an HIV patient via telephone or the internet. These consultations helped the clinician put into practice what they had learned through didactic sessions and served as direct measurements of the success of educational opportunities provided by the HAETC.

The on-going distant consultations remain the most challenging component of the training strategy. It is a strategy that is underutilized by the HIV coordinators and clinicians in the region. This appears to be changing over time as the consultants who provide the training are recognized as a resource to the clinicians. The key to using a consultant appears to be establishing a personal rapport with clinicians. When properly cultivated, it becomes a powerful strategy for learning on an ongoing basis outside of the conference or mini-residency. Contact information for available consultants has been disseminated to each jurisdiction. Lack of antiretroviral medications may also diminish usage. There may be more consultations in the future for choices of medication and dealing with side effects.

Satellite technology was used to facilitate bimonthly trainings via the Pan-Pacific Education and Communication Experiments by Satellite (PEACESAT) located at the University of Hawai’i, Manoa. Video conferencing is used for case based discussions across the region and is facilitated by an HIV specialist based either in Hawai’i or California, and coordinated by the HAETC. One of the cases discussed was that of a woman from Chuuk who had chronic conjunctivitis. This led to a discussion of a similar case in Kosrae and a more global discussion about how common illnesses that present in unusual ways could raise the suspicion for an HIV diagnosis. Recently, protocols such as perinatal care of an HIV infected mother have been discussed and developed as a result of this technology. PEACESAT also offers a vehicle for the clinicians to discuss common problems such as the processing and shipment of lab specimens and the acquisition of medications.

Discussion
It was important to build rapport and foster dedication to HIV care with the clinicians. The islands have had a history of foreign interventions without consideration for sustainability. Recognition of what is important to the participants culturally would enhance the training process and build a network that would be useful in the future. HAETC tried to do this by being culturally sensitive using island appropriate behavior like greeting participants at the airport with leis, preceding the conferences with social activities, and opening the conference with a welcoming prayer or chant. Conference participants also shared examples of their local culture such as a Samoan war dance/chant and a Kosraean dance at an evening gathering. Since many of these participants have been with the program since the start, they have developed a professional camaraderie. They recognize that HIV currently is just a fraction of their concerns, but they are dedicated to learning about it, preventing its spread, and obtaining treatment for it as best as they can.

Although they are expensive, the annual HIV clinical conferences have been appreciated by participants and educators alike and felt to be a necessity. Finding educators who understand the unique cultures of the region remains challenging. An instructor’s HIV knowledge and teaching ability mean little when the presentation is of modest applicability to the region. The content of the conferences continue to evolve with a shift toward: case presentations; capacity building on topics, such as how to obtain medications; mentoring new leaders for regional HIV care; and problem solving with the active involvement of other agencies like the CDC.

The HIV mini-residency offers participants an opportunity to immerse themselves in HIV care and education. The chance to augment or hone skills is tempered by the possibility of being lost in a sea of new information. Thorough preparation and constant attention to the daily experiences helps curtail ineffective learning sessions. This strategy has been useful for the new HIV clinician.

Satellite-based training offers educators economical access to clinicians, but technological limitations and insufficient financial resources curtail its usefulness. Persistent technological problems include omission of locations and intermittent reception. When working on sensitive topics, such lapses can frustrate the learning process. There needs to be consideration of the use of the internet for discussion and communication in the future.

Comprehensive program evaluations have been limited, but are planned for and will soon be implemented. Evaluations using pre- and post-conference tests and clinician interviews have been started. Goal specific
evaluations are important to modify and improve education and training. Continued support with long term funding will ensure long-term program stability that will hopefully improve sustainability of HIV care in the region as well as foster a long term evaluation plan.

A major outcome for the project has been the establishment of a sub-site in Chuuk, FSM. The sub-site has a team of clinicians that has provided training to multiple groups in Chuuk as well as in other states in Micronesia and in the RMI.

Next Steps
Although a one-size-fits-all Western medicine-styled training can be an option, an approach to education and training that considers the unique attributes of Pacific healthcare and culture can provide an experience that empowers trainees to meet the task of HIV care. It is important for organizations and funding agencies to make long-term educational commitments. The HAETC feels that the use of a combination of strategies that is continually analyzed for its effectiveness and modified over time is the best way to provide education and training in the Pacific. In the often under-resourced USAPI, sporadic educational efforts initiated with the best of intentions are no substitute for sustained commitments to meet the regional challenges facing clinicians. The development of regional educators and resource clinicians in HIV care remains one of the primary goals for the region. Assisting the region in obtaining HIV medications through various resources remains one of our capacity building efforts.

The development of regional educators and resource clinicians in HIV care remains one of the primary goals for the region.

References
Developing a Community-Based Collaboration to Reduce Cancer Health Disparities among Pacific Islanders in California

Sora Park Tanjasiri, DrPH, MPH*
Jacqueline H. Tran, MPH**
Paula Healani Palmer, PhD†
Mary Anne Foo, MPH‡
Marion Hanneman, RN§
Cevadne Lee‡
Lola Sablan-Santos¶
Alek Sripipatana, MPHc

*Associate Professor, Department of Health Sciences, California State University at Fullerton, Fullerton, California; **Program Manager, WINCART, Department of Health Sciences, California State University at Fullerton, Fullerton, California; †Institute for Health Promotion and Disease Prevention Research, University of Southern California, Los Angeles, California; §Orange County Asian Pacific Islander Community Alliance, Garden Grove, California; ¶Samoan National Nurses Association, Carson, California; cCenter for Health Policy Research, University of California, Los Angeles, Los Angeles, California. Address correspondence and reprint requests to: Sora Park Tanjasiri, DrPH, MPH, Department of Health Sciences, California State University, Fullerton, P.O. Box 6870, Fullerton, California 92834-6870; stanjasiri@fullerton.edu.

Abstract
Cancer is a leading cause of death for Asians and Pacific Islanders in the United States, but education and research efforts addressing the needs of Pacific Islanders in the continental U.S. is sparse. The purpose of this paper is to describe the development of a community-based participatory research network dedicated to addressing cancer health disparities among Chamorros, Marshallese, Native Hawaiians, Samoans and Tongans in Southern California. Community-based organizations (CBO) comprise the focus of the network, and their efforts have included increasing cancer-related awareness in their communities, developing capacities regarding cancer control, and initiating collaborative research efforts with academic partners. First year processes and outcomes are described, and specific examples are given from two CBO partners.

Introduction
This article describes the development of a community-based participatory research (CBPR) network dedicated to addressing cancer health disparities among Chamorros, Marshallese, Native Hawaiians, Samoans and Tongans residing in Southern California. Funded by the Center to Reduce Cancer Health Disparities of the National Cancer Institute (NCI), "Weaving an Islander Network for Cancer Awareness, Research and Training (WINCART)" involves a partnership between individuals from eight community-based organizations (CBO) serving Pacific Islanders and five universities. All WINCART efforts are based upon CBPR principles, which stress shared participation, cooperative engagement of community and university researchers in processes of co-learning, systems and capacity development, and empowering processes that involve both research and action for community change. We will describe WINCART’s origins, our first year activities and achievements, and highlight case examples of community-based capacity building within two member CBO.

Background
Pacific Islanders in the continental U.S. are as diverse as their islands of origin, each having different reasons for leaving their home islands and coming to the continental United States. For example, migration from Tonga (an independent kingdom in the South Pacific) began in the mid-1970s, spurred by opportunities for higher education and/or jobs that could generate income to support families back home. In contrast, migration from the Federated States of Micronesia and the Republic of the Marshall Islands was initiated after signing the Compact of Free Association in the mid-1980s, which allowed for open migration between the islands and the continental U.S. According to Census 2000, 874,414 Native Hawaiian and other Pacific Islanders were living in the U.S. (alone or in combination with one or more
other races). With 221,458 Pacific Islander residents, California is second only to Hawai‘i as the state with the largest Pacific Islander population. In large part, this is due to California’s geographic proximity to Hawai‘i, American Samoa and other Pacific Island nations, as well as its large military bases, which have attracted Pacific Islanders, such as those from Guam and Hawai‘i, with ties to the U.S. military. Southern California has become home to many Pacific Islanders, with concentrations of Samoans in the cities of Carson and San Diego, Tongans in Gardena, Marshallese in Costa Mesa, and Chamorros in Long Beach and San Diego. Although Pacific Islander social groups and religious organizations (e.g., churches) have been established in each of these cities, there are still relatively few culturally appropriate social service agencies to meet the health needs of these growing and largely underserved populations.

While data on cancer rates or needs of Pacific Islanders in the continental U.S. are sparse, available evidence universally points to critical needs for this diverse group. Among the primary factors associated with cancer onset, several are of particular concern for Pacific Islanders. In California, combined data from the 2001 and 2003 California Health Interview Surveys indicate that 30.4% of adult Pacific Islanders in Southern California (defined as the six counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino and San Diego) were obese, with a body mass index ≥30 compared to only 19.8% of the non-Pacific Islander adult population. Studies have also documented high rates of tobacco use among Pacific Islanders. In Southern California, significantly more adult Pacific Islanders are current smokers (27.2%) compared to their non-Pacific Islander counterparts (16.9%).

Pacific Islanders in the continental U.S. also face challenges in obtaining services across the cancer care continuum. In Southern California, Pacific Islanders have lower rates of screening for colon, breast and cervical cancers compared to non-Pacific Islanders. Of Pacific Islander women ages 40 and older in Southern California, 19.2% report never having had a mammogram compared to 11.1% of non-Pacific Islanders, and 18.9% of Pacific Islander women 18 and older were more likely to report never having had a pap test in comparison to 7.6% of non-Pacific Islanders. Other studies highlight cancer screening disparities within particular Pacific Islander ethnic groups. In the first study of Chamorro women in Southern California, only 37% of participants had ever performed a breast self-examination (BSE), with 77% having obtained a mammogram. Studies of female Samoans residing in Hawai‘i and California found that only 33% had ever received a mammogram and only 63% had ever had a pap smear. Tongans in California face considerable barriers (such as lower insurance coverage and higher language barriers) with baseline screening rates of only 40% for women who had ever performed BSE, 26% who had ever received a clinical breast exam, and 25% who had ever obtained a mammogram. Focus groups and interviews with Samoan and Tongan women in California identified barriers to obtaining mammogram and Pap tests, including cost, lack of transportation, lack of someone to accompany them to the tests, and difficulty communicating with doctors. The majority of women in both communities stated that mobile screening units would facilitate their obtaining regular exams. These studies underscore the lower general screening rates with higher incidence and death rates from cancer among Pacific Islanders in California. In contrast, a study in Hawai‘i found that Native Hawaiian women had higher mammography (50%) and pap smear (91%) rates, which suggests that the lack of availability of culturally appropriate services may be a major barrier to screening in the continental U.S.

Published studies of follow-up care disaggregating ethnic Pacific Islanders on the continental U.S. are non-existent, and point to another gap in scientific knowledge. In addition, institutional barriers exist that place Pacific Islanders at high risk for fragmented cancer care in the U.S. For example, while nearly 17.3% of Pacific Islanders in the U.S. are linguistically isolated (in which no household member over the age of 14 has English proficiency), there is lack of institutional support of and adherence to existing legal mandates pertaining to language access (e.g., Title VI of the Civil Rights Act) and cultural standards for care, such as the U.S. Department of Health and Human Services Culturally and Linguistically Appropriate Services recommendations. One unpublished study in California found that while nearly 9% of medical providers surveyed included ethnic Samoan among their patient population, only 1% had Samoan language-specific interpreters, a contributing factor to Pacific Islanders being disproportionately affected by cancer health disparities across the cancer care continuum.
Methods Development of the WINCART Network

In late 2003 and early 2004, leaders from several Pacific Islander CBO in Southern California held informal conversations about the need to develop a collaborative network to address multiple cancer health disparities facing their communities, including lack of data, underserved status, and unrecognized health needs. Representatives from many CBOs were involved in these conversations, including the Samoan National Nurses Association (SNNA) based in Carson, Guam Communications Network (GCN) in Long Beach, the Orange County Asian Pacific Islander Community Alliance and Pacific Islander Health Partnership in Garden Grove, Tongan Community Service Center/ Special Service for Groups in Gardena, and the Union of Pan Asian Communities in San Diego. These conversations also included two university-based researchers, both of whom had a minimum 8-year history of collaborating with each of the participating CBOs on various Pacific Islander health programs and/or advocacy efforts. The authors’ most recent collaborative effort was on a 6-year, Centers for Disease Control and Prevention (CDC)-funded Racial and Ethnic Approaches to Community Health (REACH) 2010 initiative to increase breast and cervical cancer screenings among Pacific Islanders, through which a uniquely collaborative relationship between community partners and academic researchers was established.11 These researchers were aware of a potential future funding opportunity, and suggested to the CBO leaders that they consider applying to NCI for grant funding to develop a cancer control network.

Figure 1. WINCART’s Organizational Structure

Chamorro Community
Native Hawaiian Community
Samoan Community
Tongan Community
Marshallese Community
Other Pacific Islander Communities

Community Advisory Board
CBO (‘Ainahau, GCN, PIHP, SDGC, SNNA, TCSC/SSG, UPAC)\(^\text{A}\)
Other cancer-related entities (hospitals, cancer societies & foundations, local health departments, cancer detection partnerships, cancer survivorship groups, and the Cancer Information Service)

WINCART Steering Committee\(^\text{B}\)
Principal Investigator (SPT)
Project Manager (JT)
Research Coordinator (PHP)
Community Coordinator (MAF)
Policy Coordinator (AS)
Clinical Coordinator
Network Evaluator
NCI Program Officer

Scientific Advisory Board\(^\text{C}\)
CSUF
UCLA
UC Irvine
UC Riverside
USC
ICC

Community cancer awareness
Community prevention & control
Minority researcher training
Cancer control research projects
Policy, advocacy, and sustainability

\(^\text{A}\) ‘Ainahau O Kaleponi Hawaiian Civic Club
CBO Community-Based Organizations
GCN Guam Communications Network
PIHP Pacific Islander Health Partnership
SDGC Sons and Daughters of Guam Club
SNNA Samoan National Nurses Association
TCSC/SSG Tongan Community Service Center/ Special Services for Groups
UPAC Union of Pan Asian Communities

\(^\text{B}\) SPT Sora Park Tanjasiri
JT Jacqueline Tran
PHP Paula Healani Palmer
MAF Mary Ann Foo
AS Alec Srrippatana

\(^\text{C}\) CSUF California State University, Fullerton
UCLA University of California, Los Angeles
UC Irvine University of California, Irvine
UC Riverside University of California, Riverside
USC University of Southern California
ICC Intercultural Cancer Council
April and May of 2004, two meetings were held with a larger group of CBO representatives, including leaders from the ‘Ainahau O Kaleponi Hawaiian Civic Club (Ainahau) in Huntington Beach, Hawaiian Daughters Guild in Los Angeles, Pacific Islander Community Council in Carson, and Sons & Daughters of Guam Club in San Diego, in addition to the aforementioned groups. While attendees represented primarily Chamorro, Marshallese, Native Hawaiian, Samoan and Tongan communities, many have worked (and continue to work) with other Pacific Islander groups, such as Fijians and Tahitians. Researchers from three universities, California State University Fullerton (CSUF), the University of California at Los Angeles (UCLA), and the University of Southern California (USC) also attended to help facilitate discussions as to whether sufficient interest existed to develop a Pacific Islander cancer control network. During their first meeting, 20 attendees (13 of whom were indigenous Pacific Islanders) discussed the goals of partnership, capacity and infrastructure building, based upon existing ties between organizations and members. Images such as weaving baskets, sewing leis (flower garlands) and building canoes were used to describe both the commonalities across Pacific Islander communities and the connections that needed to be made among all Pacific Islander groups. With universal and keen interest, attendees decided that this network would start in Southern California, with eventual ties to other regions on the continental U.S. (such as Northern California and states, such as Utah) as well as the island regions (such as Guam and American Samoa). The focus of work would be on issues that cross-cut all Pacific Islander populations, such as obesity, physical activity, and tobacco use, using cultural and community approaches, such as strengthening family supports, preserving cultural beliefs and behaviors, and mentoring young people. At the second meeting, the partners agreed to move forward with a grant proposal, brainstorming the name “WINCART: Weaving an Islander Network for Cancer Awareness, Research and Training”, and establishing an administrative structure for the network that specified key leadership positions, including identification of Steering Committee and Community Advisory Board members (see Figure 1 for details of the network structure). The relationships and decisions made at these two meetings formed the foundation of the structure and consensus-based processes of the proposed WINCART network.

This collective effort led to development of a proposal, which was submitted to the NCI in July 2004 in response to its Request for Proposals (RFP) on Community Network Programs (CNP), by the identified principal investigator on behalf of the entire network. The collective communities served as the driving force for the collaborative, with the intentions of increasing cancer and other health-related data on Pacific Islander communities and increasing community capacity building to participate in health research, with the ultimate goal of improving the community health. Seven CBO comprised the founding members of WINCART’s Community Advisory Board, all of whom serve Pacific Islanders clients and community members. Eleven researchers from five universities (none of whom are Pacific Islander) agreed to serve as Scientific Advisory Board members, and the Core Steering Committee was comprised of eight lead staff, two of whom are Pacific Islanders.

In April 2005, a cooperative agreement was initiated between NCI and CSUF, awarding official CNP status to WINCART, with five main goals: 1) to identify individual, community and health service barriers to cancer control among five Pacific Islanders communities in Southern California: Chamorros, Marshallese, Native Hawaiians, Samoans and Tongans; 2) to improve access to and utilization of existing cancer prevention and control services among Pacific Islanders by enhancing existing relationships and services, and establishing new linkages between community members and service providers, including clinicians, social service agencies, NCI’s Cancer Information Service (CIS), etc.; 3) to facilitate the development, implementation and evaluation of CBPR studies that address the unique cancer needs of Pacific Islanders, with a focus on primary prevention (obesity and tobacco), access and navigation, and survivorship; 4) to create opportunities to increase the number of well-trained Pacific Islander researchers through training, mentorship and participatory research projects; and 5) to sustain community-based education, training and research activities by increasing partnerships with governmental and community agencies, funders and policymakers.

The remainder of this article will describe the efforts of WINCART’s first year, from the perspective of the entire network, as well as two CBO partners.
### Figure 2.: Examples of WINCART’s First Year Capacity Building Activities and Outcomes

<table>
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<th>Capacity Building Activities</th>
<th>Education</th>
<th>Training</th>
<th>Research</th>
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<tbody>
<tr>
<td></td>
<td>• Worked with each member CBO to develop a scope of work, including their plans for community outreach and education</td>
<td>• Bimonthly trainings for member CBO to increase knowledge and skills about a wide variety of cancer issues, including: basics of cancer, cancer epidemiology, diet and nutrition.</td>
<td>• Facilitated networking between researchers and member CBO about their interests in conducting CBPR studies on cancer prevention and/or control.</td>
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<td>• Trained member CBO to complete an online education log form for each event they conduct during the year</td>
<td>• Created pre- and post-test surveys of trainees to measure changes in knowledge and intentions</td>
<td>• Created WINCART policy on data sharing and publication for all WINCART-supported grant proposals</td>
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<td></td>
<td>• Created a project website to provide access to in-language cancer materials created by the WINCART partners</td>
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<td>• Disseminated information to community and scientific members about grant opportunities</td>
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<td></td>
<td>• Partnered with other NCI CNPs to create a web portal for Asian and Pacific Islander cancer education materials</td>
<td></td>
<td>• Worked individually with community-researcher teams to develop proposals</td>
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<td></td>
<td>• Increased access to quality in-language cancer materials (to be used for outreach and education)</td>
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<td>• Bimonthly trainings for member CBO to increase knowledge and skills about a wide variety of cancer issues, including: basics of cancer, cancer epidemiology, diet and nutrition.</td>
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<td>• Increased access to quality in-language cancer materials (to be used for outreach and education)</td>
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<tr>
<td>Outcomes</td>
<td>• A total of 41 educational events presented by member CBOs reaching 4,215 community members (cancer education topics: tobacco control, breast cancer, cervical cancer, colon cancer, liver cancer, lung cancer, prostate cancer, nutrition/diet, physical activity, cancer survivorship)</td>
<td>• Pre- and post-tests from two trainings showed an increase on 7 of 11 items (related to fat intake, whole grains, refined grains and data collection), with already high knowledge on the remaining 4 items (related to healthy diets, fruit/vegetable intake, and portion size)</td>
<td>• Facilitated submission of 9 CBPR research proposals on the topics of epidemiology, diet and physical activity, cancer screening, and cancer survivorship</td>
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<td>• 6 of 9 proposals were led by community-based organizations or community members</td>
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<td>• Successfully obtained funding for 2 proposals thus far</td>
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### Results: WINCART’s Community Capacity Building Activities and Outcomes

During its first year of existence (May 1, 2005 through April 30, 2006), WINCART initiated activities in several areas to increase local community and organizational capacity to become actively involved in cancer control education, research and training (see Figure 2). Each network CBO member developed a scope of work to address cancer disparities within their respective communities, based upon their pre-existing knowledge of and experience with the Pacific Islander communities they served. All plans included outreach education pertaining to different cancers, early detection practices, prevention methods, and information sharing to access health care facilities.

During the first year, educational activities primarily involved dissemination of cancer-related materials, including pamphlets, brochures and small incentive items. Printed materials were available in Chamorro, Marshallese, Samoan, and Tongan languages, and were developed prior to WINCART, originating from the CDC REACH 2010 project, the American Cancer Society (ACS), and the Susan G. Komen for the cure (Komen). Materials were disseminated at special community cultural events (e.g., Samoan Flag Day, Hawaiian Ho‘olaule’a) and workshops, and community partners tailored their presentations to address the cancer topics in a context appropriate for each community and venue. A total of 41 outreach activities (e.g., one-to-one discussions, educational presentations, and both small and large community events) were conducted by CBO members, reaching 4,215 community individuals. These presentations were made to community members...
and leaders, nurses, doctors, social service providers, researchers, students and cancer survivors, with topics including tobacco control, cancers of the breast, cervix, colon, liver, lung and prostate, nutrition/diet, physical activity, and cancer survivorship.

Members from each of the WINCART CBOs also participated in bimonthly trainings to increase their knowledge and skills about a wide variety of cancer issues, such as "Cancer 101" (i.e., what is cancer?), cancer epidemiology, diet and nutrition, obesity, and cancer survivorship. Trainings were presented by WINCART Scientific Advisory Board members, as well as other cancer experts. Didactic information was augmented by skills-building exercises and sharing between CBO to promote "cross-training" and experiential learning. Pre-tests and post-tests from these trainings revealed an already high level of knowledge among CBO representatives, with enhanced knowledge on selected topics following the trainings. In addition, WINCART CBO representatives and Steering Committee members participated in a two-day "retreat" to encourage relationship-building and team-building. During a visioning exercise designed to identify long-term goals for WINCART, community members surprised themselves with the near-consensus with which they articulated their vision: "Empowered and Healthy Pacific Island Communities." Subsequently, the entire WINCART network adopted this vision statement to symbolize the goal of our cancer-related efforts toward broader and lasting community engagement and empowerment – the hallmarks of true CBPR.

Lastly, WINCART Steering Committee members and CBO representatives worked together on a case-by-case basis to develop and refine specific ideas for research proposals. Some ideas were initiated by Steering Committee members, such as an NIH R21 (Exploratory/Developmental Research Grant Award) proposal to measure physical activity and nutrition, while others originated from CBO members, as was the case for a proposal on assessing the needs of Samoan breast cancer survivors. Additional collaborative efforts were developed, not only between WINCART partners and external organizations, but also among WINCART partner agencies. A total of nine research proposals were developed and submitted during the first year, generating two successfully funded projects. WINCART Steering Committee members also drafted a CBPR-founded data sharing and publication policy based on previous work from the CDC-funded REACH 2010 project, which articulated the shared nature of data ownership and dissemination of findings. The proposed policy was reviewed and approved by the WINCART’s Community Advisory Board.

In addition to the Network’s many first year successes, partnership with WINCART has also facilitated and enhanced the health promotion activities and profiles of existing CBOs. Thus, the remainder of this article will describe differing capacities and activities of two CBO partners during WINCART’s formative period and through its first year.

**Guam Communications Network**

GCN was established in 1993 as the sole non-profit 501(c)(3) corporation serving Chamorros in Los Angeles, Orange, Riverside and San Bernardino counties; later expanding to San Diego. GCN operates more than a dozen unique cultural enrichment and social service programs designed to encompass cultural promotion and preservation, health and welfare, breast cancer research, senior care management, tobacco education and prevention services, HIV/AIDS education, youth leadership and advocacy development, senior health and welfare, tobacco usage cessation, and free or low cost insurance enrollment application services.

GCN also spent the first year developing relationships with Chamorro cancer survivors, Chamorro organizations, and Guam government agencies.

As a founding community partner of the WINCART collaborative, GCN provided key input and guidance into the creation of grant proposals and first year activities. During WINCART’s first year, GCN was active in the three main areas; community education, research, and training, for Chamorros in Southern California, conducting eight community outreach/education events to provide information on breast cancer, cervical cancer, prostate cancer, nutrition and diet to 302 Chamorro community members. These outreach sessions provided information and resources on cancer awareness and screenings, including discussions pertaining to cancer survivorship. GCN also spent the first year developing relationships with Chamorro cancer survivors, Chamorro organizations, and Guam government agencies. This resulted in planning future activities for CNP grant Year 2 (May 2006 through April 2007), securing funding commitments from: 1) the Lance Armstrong Foundation (LAF) to develop a Chamorro cancer survivors network; 2) the Orange County Komen Affiliate to conduct Chamorro breast cancer forums, and 3) the Los Angeles Komen Affiliate to develop a Chamorro patient navigation program.
GCN took the lead in a collaboration with Partnered for Progress (Los Angeles County’s breast and cervical cancer screening partnership, facilitating screening services for the County’s uninsured and underinsured women), developing a culturally-tailored breast cancer education/screening reminder card for Chamorro, Samoan and Tongan communities in Los Angeles. GCN also initiated collaborations with new researchers and organizations in the development of two research proposals on cancer screening and survivorship. For GCN, the WINCART collaboration has provided increased opportunities to expand and enhance its network as a community research entity and to contribute to the development of a true community-campus partnership model. Having participated in other CBPR projects, GCN has established a foundation of trust in the community to address cancer and other health issues, facilitating GCN’s success in its outreach, intervention, and research efforts.

**Samoan National Nurses Association**

Established in 1996 by a dedicated group of health professionals serving U.S. Samoan communities, the SNNA is also a 501(c)(3) nonprofit organization, focusing on improving and expanding community opportunities through service, education, advocacy, organization, and research. SNNA employs 11 nurses who conduct outreach and education activities on a variety of health topics: 1) tobacco control; 2) Pacific Islander Women’s Breast Health and Breast Cancer Early Detection Program; 3) Promoting Access To Health (PATH) for Women Project (advancing breast and cervical health); 4) Breast Cancer Awareness – the Fa’a Samoa Way Project; 5) Care and Resource Management for Asian and Pacific Islander Older Adults (CARE for APIs); and 6) the Health Access for Pacific Asian Seniors Project. SNNA is also a founding member of WINCART, bringing with them and contributing 6 years of experience in community cancer control education.

Since WINCART’s inception, SNNA has conducted 20 outreach/education workshops, has participated in a large community event reaching 1,049 community members, and has exhibited health booths at two community social events and one city health fair, providing cancer control education and resources on breast cancer, early detection and screening, diet and nutrition, and physical activity to nearly 4,000 individuals. SNNA established a Samoan Community Advisory Board, comprised of community members and leaders, medical professionals, and breast cancer survivors. Having successfully secured funding from the Los Angeles Komen Affiliate, the LAF, and the City of Carson in support of their activities pertaining to breast cancer survivorship, patient navigation, care giving, and prostate cancer outreach/education, SNNA’s cancer control activities continue to increase. SNNA also applied for two research grants, one of which was successfully funded for $125,000 by the California Breast Cancer Research Program to conduct research on survivorship and social support among Samoans in Southern California.

From SNNA’s perspective, partnership with WINCART facilitates and empowers Pacific Islander-serving CBOs to “lengthen their stride” by participating in research opportunities that address, not only cancer disparities among Pacific Islander communities, but also enhance the capacities of CBOs to serve their respective communities.

**Allowing communities to develop their own scope of work, WINCART appreciates the differences between communities.**

Collaborations across communities and researchers represents one of WINCART’s aims, as well as one of its strengths, and GCN and SNNA have exemplified this by jointly partnering with two other entities on efforts of relevance to Pacific Islanders in the continental U.S. In 2005, both organizations partnered with the Asian Pacific Islander American Health Forum to assess the needs of Pacific Islander cancer survivors through focus groups and community report-back forums, conducted in both Northern and Southern California. Early in 2006, GCN and SNNA also assisted the LAF to conduct focus groups for the development of a Pacific Islander survivorship booklet. These are just a few examples of successful collaborations that expand the Network’s reach and resources to and for Pacific Islander communities in cancer, strengthening the role of CBOs as expert resources for cancer control.

**Discussion**

Despite the many cancer health disparities faced by Pacific Islanders residing in the continental U.S., the development and implementation of the WINCART network demonstrates the existence and strength of considerable community resources and capacities...
to focus on these challenges. The Network was conceived and initiated by leaders from multiple Pacific Islander communities in Southern California, many of whom brought considerable knowledge and experience in addressing cancer-related problems in their respective communities. Several CBO partners were already actively involved in CBPR efforts, resulting in the development of true partnerships and trusted relationships with several university-based academic researchers. Thus, the two “founding” meetings out of which WINCART was developed were based on the experiences of community leaders, and reflected historical relationships of trust and respect with traditional (academic) researchers, who not only had experience working with community partners, but were also committed to engaging in a true CBPR model. WINCART exemplifies a successful community and academic partnership.

For some of the community partners, WINCART represents their first CBPR project and collaborative effort. As a result, the development of capacity and the ability to address WINCART’s aims have occurred in variable activities at differing levels. Thus, while some partners have experience with research capacity and have initiated research proposal submissions, other groups have yet to fully engage in the academic research process. While some groups have developed multiple educational materials and tools to increase community cancer awareness, other groups are only beginning to identify and develop resources appropriate for and accessible to their communities. The broader Network vision of “Empowered and Healthy Pacific Island Communities” has helped to focus WINCART efforts at all levels, while acknowledging the various capacities and strengths of respective community groups. Trust and respect between individuals and across communities helped to facilitate the timely process of development and submission of the WINCART proposal. These relationships have endured, matured and grown throughout WINCART’s first year, contributing to the strength of the collaborative process, and facilitating inclusion of many CBPR elements, as discussed by other researchers. CBPR rests firmly in the strength of relationships, not only between community and academia, but also across community groups.

WINCART’s role is to strategically focus community and university efforts on decreasing cancer health disparities through education, research and training. In its first year, WINCART’s diverse partners have successfully established the groundwork in these three areas: 1) developing and implementing outreach education plans; 2) training leaders in additional cancer-specific topics; and 3) creating research ideas and proposals. Over the next four years, plans include increasing collaborations across communities on focused campaigns (such as decreasing obesity), creating a pipeline program to encourage and support Pacific Islander youth to go into health professions, and advocating for disaggregation of health data and oversampling of Pacific Islanders to improve understanding of community needs and intervention outcomes.

Acknowledgements
We thank all the community and scientific members of the WINCART network for their commitment, involvement and support in developing and implementing this important collaborative effort. WINCART is a Community Network Program funded by the National Cancer Institute’s Center to Reduce Cancer Health Disparities, Grant No. CA U01 114591-01.

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Original Papers

Capacity Building for Cancer Awareness in Hawai‘i’s Foreign-born Filipino Communities

Charlene Cuaresma, MPH*
Diane Mitschke, PhD**
Hali Robinett, MPH**

*Asian American Network for Cancer Awareness, Research and Training (AANCART), in collaboration with Pacific Health Research Institute, Honolulu, Hawai‘i; **Cancer Information Service Pacific Region, National Cancer Institute, Cancer Research Center of Hawai‘i, Honolulu, Hawai‘i. Address correspondence and reprint requests to: Ms. Hali Robinett, MPH, Program Director, Cancer Information Service Pacific Region, National Cancer Institute, Cancer Research Center of Hawai‘i, 1236 Lauhala Street, Suite 502, Honolulu, Hawai‘i 96813-2479; halir@crch.hawaii.edu.

Abstract

Community-based capacity building for cancer awareness, screening, diagnosis, treatment and survivorship is an integral component in addressing existing disparities apparent in many minority and underserved populations. Empowering community leaders within Hawai‘i’s Filipino immigrant community to increase awareness about cancer was the focus of a collaborative partnership between Asian American Network for Cancer Awareness, Research and Training (AANCART) and the National Cancer Institute’s Cancer Information Service. A model curriculum was developed and tailored from existing resources and presented in a series of workshops designed in a “train-the-trainer” format. A total of 35 Filipino community leaders were trained and subsequently hosted community forums, which were designed to increase general awareness about cancer and promote regular cancer screening among Filipinos on the islands of Oahu and Kaua‘i. Significant increases in knowledge related to cancer and prevention guidelines were apparent as a result of these community-wide efforts. In addition, the forums provided an opportunity for leaders and stakeholders within the Filipino community to engage in thoughtful inquiry related to existing barriers that prevent the dissemination of accurate cancer information, and also it also enabled them to engage in facilitated discussions about opportunities to empower community members in order to educate others. This collaborative partnership and the resulting community-based intervention created the foundation for future efforts to increase cancer screening rates among Filipino immigrants, with a potential to impact and reduce existing cancer disparities in this population. (PHD 2007 Vol 14 No 1 pp 128-134)

Background

The traditional Filipino proverb, “You cannot get to where you are going without looking to where you came,” encompasses a cultural paradigm that speaks to the importance of acknowledging and appreciating a shared history, in an effort to enhance a shared future. This paradigm guided efforts to impact the health and wellness of Filipino immigrants in Hawai‘i through a community-based process of shared leadership, reflection and education. It is through this collective process that a broader understanding of the unique health beliefs and attitudes of communities can be established and utilized to affect and improve the health of populations and communities with disparate health indicators.

In Hawai‘i, foreign-born Filipinos are less likely than U.S.-born Filipinos and other Asian populations in the state to participate in cancer screening, be diagnosed at an early stage of cancer, and survive greater than five years from diagnosis.1 According to data from the Hawai‘i Medical Service Association (HMSA), Hawai‘i’s largest medical insurance provider, Filipinos represent the largest percentage of patients lost to follow-up for mammography and pap tests in the state (personal communication, R. Pang, HMSA, May 2004). Additionally, a recent quality of life study among individuals diagnosed with cancer indicated that Hawai‘i’s Filipino cancer survivors described a poorer quality of life, and were less likely than other populations to follow through with physicians’ prescribed treatment plans.2

In order to address these disparities, the Hawai‘i site of the National Cancer Institute (NCI)-funded Asian American Network for Cancer Awareness, Research and Training (AANCART Hawai‘i) partnered with the NCI’s Cancer Information Service, Pacific Region (CIS Pacific) to develop, implement and evaluate a community-centered cancer awareness curriculum integrated within Hawai‘i’s Filipino community. Initial efforts to address these disparities focused on cancer education and awareness outreach within the Filipino communities on the islands of Oahu and Kaua‘i through
community-based participatory educational forums and training sessions. This article recounts the process of development, implementation and evaluation that took place to increase Filipino community awareness and knowledge about cancer through these efforts.

**Review of Literature**

Addressing cancer disparities through community-based participatory interventions has been shown to be an effective strategy for engaging and empowering Asian American/Pacific Islander (AA/PI) communities. These efforts have several key theoretical underpinnings relevant to community development theory that guide their development and integration within various community groups. First, a successful effort must enable and encourage empowerment for both the individual and community. In Sacramento, California, for example, efforts to engage the Hmong community in learning about cancer prevention and screening eventually resulted in regular, ongoing educational sessions about cancer, facilitated by Hmong women and sustained within the Hmong community. Not only is the community empowered by the development of leadership among their individual members, but the Hmong community has also embraced the education of its members about cancer through a culturally relevant paradigm.

Another key feature of community development theory reflected in similar interventions with AA/PI populations is enhancing community competence while creating critical consciousness. According to Lindsey and colleagues, two necessary elements in community consciousness are: 1) stimulating people to think critically and to identify problems and new solutions; and 2) providing a process through which the community can discuss its own issues in the most productive way possible. Choudry found that a project to enhance health promotion behaviors by focusing on “emancipatory knowledge and self-understanding” among South Asian women was successful in not only increasing awareness about health and facilitating behavior change, but also in enhancing feelings of empowerment at the individual and community levels.

Finally, successful interventions based on community development theory reflect a commitment to addressing issues relevant to the needs and interests of the community. For example, the NCI-funded ‘Imi Hale - Native Hawaiian Cancer Awareness, Research and Training network conducted a comprehensive needs assessment with various segments of Hawai‘i’s Native Hawaiian community. The results of their needs assessment were then used within a community-based participatory research framework to create targeted interventions that were directly responsive to the needs, interests and desires of community members. Fong and colleagues acknowledged that this approach to addressing the needs of the Native Hawaiian community “demands continuous assessment of needs, concerns, and issues of power and control, followed by the appropriate course corrections and improvements.”

The ability of these approaches to successfully garner support and facilitate broader awareness of health issues in these PI communities channeled AANCART Hawai‘i’s efforts in a similar modality. A “Cancer 101” curriculum was developed through a partnership between CIS Pacific and AANCART Hawai‘i with assistance from an experienced local consultant, and focused on basic education about cancer, ways to prevent cancer, and various cancer screening recommendations. The use of a curriculum-based model for integration into community-level trainings and seminars has been demonstrated to be successful in other cancer education interventions.

**Cancer Awareness Forums Leadership**

Enlisting a broad and diverse cadre of leaders with roots within Hawai‘i’s Filipino community was key to both the planning and implementation of the cancer awareness forums. Thirty-five Filipino leaders were first generation Filipino cancer survivors, family caregivers, nurses, physicians, business leaders, and academicians who were recruited to provide input used to tailor a cancer awareness curriculum and to become multilingual presenters and facilitators. Most were members of Filipino professional, health, business or academic
organizations, civic groups, and churches with ties to local, state, national and international networks. These leaders provided insight into linguistic barriers, as Ilokano, Tagalog, Visayan and Pampanga were among their first languages. Establishing ownership and pride in the cancer awareness curriculum and the overall intervention was key to later recruitment efforts and resulted in high participation rates in the forums.

Role-play was effective in the Kaua‘i train-the-trainers program, implemented for presenters and multilingual facilitators, and was scheduled a few weeks prior to the community forum. The entire curriculum was presented at the first train-the-trainers exercise, with opportunities to obtain community feedback to improve the trainer’s script included in the training manual. Teams of trainers were formed to present the contents of each module. A dress rehearsal was conducted one day prior to the cancer forum during which designated community leaders presented the entire curriculum. This role-play session provided substantive questions, discussion and feedback on curriculum content, skills building in public speaking, group facilitation, group dynamics, and the need for community partnerships to address cancer disparities. In contrast, designated community trainers and facilitators on Oahu received small group and one-on-one instruction, due to competing priorities, schedules, and a short project implementation period.

Content
An adapted version of a basic “Cancer 101” education curriculum served as the core educational content for the forums. This curriculum adapted for Hawai‘i’s Filipino communities was based on two separate cancer education curricula, one originally developed and evaluated by the NCI-funded Spirit of EAGLES network in the American Indian community, and a second curriculum utilized to educate Hmong medical interpreters in California. The Cancer 101 curriculum was enhanced by feedback from the Filipino community trainers, who recommended the use of graphics whenever possible, as well as culturally-tailored metaphors, in order to provide simple, yet accurate explanations of cancer concepts. In addition, images of the Filipino leaders, themselves, were also integrated into the curriculum in order to ensure visual appeal and cultural relevance.

The curriculum consists of five modules that were presented by a team of medical professionals and lay community leaders through Microsoft® PowerPoint (PPT) slide-enhanced lectures, complete with scripts in the trainer’s training manual, and small group discussions facilitated by multilingual community leaders. At the onset of each cancer module, a brief, but compelling personal story about cancer screening, risk factors, diagnosis and staging, treatment options or community resources was shared by a Filipino cancer survivor, family caregiver, or healthcare provider. The titles and learning objectives of each of the five modules in the Cancer 101 curriculum are depicted in Table 1.

Table 1. Cancer 101 Curriculum

<table>
<thead>
<tr>
<th>Module No.</th>
<th>Title</th>
<th>Learning Objectives: Upon completion of this module, participants will be able to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What is Cancer?</td>
<td>describe how cancer develops and identify different types of cancer.</td>
</tr>
<tr>
<td>2</td>
<td>Cancer Screening and Early Detection</td>
<td>understand why screening and early detection is important.</td>
</tr>
<tr>
<td>3</td>
<td>Cancer Diagnosis</td>
<td>understand what is meant by the term &quot;biopsy,&quot; understand how cancer is diagnosed and why staging is important, and recognize disparities in the staging of cancers among Filipinos.</td>
</tr>
<tr>
<td>4</td>
<td>Cancer Risk and Risk Reduction</td>
<td>explain the meaning of &quot;risk factor,&quot; explain how risk factors can affect the development of cancer, identify cancer risk factors for Filipinos, and describe what can be done to reduce cancer risk.</td>
</tr>
<tr>
<td>5</td>
<td>Cancer Treatment</td>
<td>recognize how different cancers are treated, understand why side effects commonly occur during cancer treatment, and understand the purpose of a clinical trial.</td>
</tr>
</tbody>
</table>

Structure
Each forum lasted approximately five hours, including a complimentary lunch provided for all attendees. Pre- and post-forum evaluations measuring knowledge and attitudes related to cancer and health promotion were administered at the beginning and conclusion of each training. Filipino cultural values were exemplified throughout the various segments of the workshops, examples of which include an opening blessing, acknowledgement of lay community leaders with presentation of traditional leis, and the integration of a traditional Filipino folk song encouraging a spirit of cooperation and community.

While the Cancer 101 PPT slideshow was the central focus of the forums, interactive components were also
integrated into the trainings and served to engage participants and sustain commitment. For example, following the presentation on cancer disparities, leaders initiated a dialog with participants to identify possible causes and to solicit strategies for community partnerships to address these health issues. Multilingual facilitators led small group discussions, and worksheets were available in participants’ packets for written or verbal input. In addition, community organizations and cancer care providers displayed exhibits and distributed educational materials during the forums.

**Participation**

Recruitment of participants was accomplished using a variety of methods, including word of mouth, organizational networks, and media. A local radio station serving Hawaiʻi’s Filipino community promoted the forums through live interviews with community leaders, and produced and aired a 30-second public service announcement to encourage participation. Social organizations, community councils, and a local civic club recruited forum participants from their membership.

In all, a total of 108 community members attended the two forums. Filipinos comprised 80%, or 86 of 108 forum participants. Others participants were Japanese (6), Chinese (4), Caucasian (7), Hawaiian (2), Vietnamese (1), Samoan (1), and South Asian Indian (1). In attendance at both forums were Filipino community leaders, who represented an array of organizations and professions, including multilingual Filipino nurses and physicians (13), and representatives of Filipino civic, business, professional and women’s groups (43). Additional participants included multi-ethnic health professionals from healthcare organizations and programs in the public and private sectors (22), Filipino educators and university officials (7), and Filipino community members (5). In addition, a significant number of Filipino adult residential care home operators attended (18), motivated by the offer of a certificate of participation for continuing education credits. Because Hawaiʻi’s Filipino-operated care home community is well organized and widely networked, and because the majority of those who staff care home facilities are Philippine-born women, the care home industry proved to be a key partner in this effort to increase cancer awareness and knowledge in Hawaiʻi’s Filipino community.

**Feedback**

Approximately 60% of forum participants (65) completed a written baseline knowledge assessment prior to their participation in the forum, plus another knowledge assessment following the forum. The survey included 13 true/false statements related to cancer screening, diagnosis, and treatment, and was based on specific key facts within the Cancer 101 curriculum. Significant increases (p <.05) in knowledge were apparent on three knowledge variables. First, the data analyses indicate an increase from 92% on the pre-test to 100% on the post-test of respondents answering correctly that “metastasis is how cancer spreads.” Analyses indicate an increase from 72% to 98% of respondents answering correctly that “staging determines the extent of the cancer in the body.” Finally, survey results showed an increase from 72% to 98% of respondents answering correctly that “people should get at least 30 minutes of exercise each day.” Table 2 depicts the results of the forum pre- and post-tests.

While the pre- and post-test results indicate that participants had a high level of knowledge about several cancer topics prior to their participation in the forum, these results provide a launching pad for initiating discussion about cancer and screening with foreign-born Filipino Hawaiʻi residents. Qualitative feedback

<table>
<thead>
<tr>
<th>Item</th>
<th>% Correct (Pre)</th>
<th>% Correct (Post)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metastasis is how cancer spreads. (T/F)</td>
<td>92%</td>
<td>100%</td>
<td>.046</td>
</tr>
<tr>
<td>Filipinos have the highest rates of breast, lung, and prostate cancer. (T/F)</td>
<td>94%</td>
<td>100%</td>
<td>.083</td>
</tr>
<tr>
<td>Some early cancers may not have any symptoms. (T/F)</td>
<td>96%</td>
<td>93.9%</td>
<td>.564</td>
</tr>
<tr>
<td>A biopsy is the surgical removal of a small piece of tissue. (T/F)</td>
<td>100%</td>
<td>100%</td>
<td>1.00</td>
</tr>
<tr>
<td>Staging determines the extent of the cancer in the body. (T/F)</td>
<td>72%</td>
<td>98%</td>
<td>.001</td>
</tr>
<tr>
<td>Risk factors are conditions that increase the chance that cancer might occur. (T/F)</td>
<td>100%</td>
<td>98%</td>
<td>.317</td>
</tr>
<tr>
<td>People should get at least 30 minutes of exercise each day. (T/F)</td>
<td>72%</td>
<td>98%</td>
<td>.001</td>
</tr>
<tr>
<td>Another word for something that causes cancer is carciogen. (T/F)</td>
<td>92%</td>
<td>94%</td>
<td>.564</td>
</tr>
<tr>
<td>The type of treatment does not depend on ethnicity or race. (T/F)</td>
<td>86%</td>
<td>88%</td>
<td>1.00</td>
</tr>
<tr>
<td>Chemotherapy and hormonal therapies are systemic treatments. (T/F)</td>
<td>78%</td>
<td>88%</td>
<td>.102</td>
</tr>
<tr>
<td>Two forms of radiation therapy are called internal and external. (T/F)</td>
<td>62%</td>
<td>66%</td>
<td>1.00</td>
</tr>
</tbody>
</table>
from the training participants indicates a high level of interest in the content, as well as in expanding the reach of the training to other foreign-born Filipinos in Hawai‘i that would not be reached by traditional information channels. The open-ended training evaluation inquired about specific aspects of the training related to structure and content. The qualitative feedback indicated that participants appreciated the simplified content of the Cancer 101 curriculum, and specifically benefited from the information that was presented on early detection, screening, treatment, and clinical cancer trials. In terms of the presentation of the information, participants noted that the slides, overheads, and printouts were clear and helpful in understanding the information presented in each module of the curriculum. Further, attendees also felt that the speakers were interesting and presentation of cancer information through stories was appreciated by several respondents. Finally, many participants responded that both small group and open discussions were useful in learning about cancer and networking to discover available resources within the community.

Several participants provided suggestions related to structure and content. For example, some felt that a longer workshop was needed to elaborate on specific cancer topic areas. Reinforcement of information was suggested through the availability of a follow-up workshop. Other participants suggested the need for more group discussions during the workshop. Additional audiences who could benefit from the information presented during the forums, such as Filipino youth, were recommended to receive the Cancer 101 training. To reach Filipino youth, respondents suggested training teachers and student leaders, and partnering with the Department of Education, as well as community groups and organizations working with youth. Working Filipino adults were also identified as target audiences; hotel personnel, restaurant managers, care home providers, health professionals, union leaders, and other work-related organizations were suggested as avenues to reach this community. Many participants emphasized the importance of conducting additional forums to educate small groups of Filipino leaders by incorporating small group discussion and problem solving with community members. Finally, other participants highlighted the need for linguistically appropriate messages for Filipino immigrants.

To reach Filipino youth, respondents suggested training teachers and student leaders, and partnering with the Department of Education, as well as community groups and organizations.

Discussion
The cancer education forums conducted on the islands of Oahu and Kaua‘i were successful in eliciting interest and garnering support among members of the Filipino community, a medically underserved population in Hawai‘i facing cancer-related disparities as compared to other ethnic groups in the state.

Although success of the forums can be attributed to a number of factors that were important in the design and implementation of the project, three of these elements were central to the overall success of the intervention. First, the forums embodied key features of community development theory, including focus on developing the skills and knowledge of community leaders to expand the capacity of the Filipino community to address its cancer needs, and to discuss disparities in a constructive and solution-focused setting. The forums empowered natural leaders within the Filipino community to vocalize a commitment to the health and wellness of their communities, thus enhancing the reach and importance given to educational messages about cancer and health promotion.

Because the Cancer 101 content is directly relevant to addressing the specific disparities that exist within Hawai‘i’s Filipino community, this educational intervention and programs that build off this foundation have tremendous potential to succeed and impact the health and wellness of the larger community. For example, equipped with knowledge gained in Module 1: “What is Cancer?” participants were able to dispel myths and misconceptions about cancer based on specific religious and cultural beliefs. Similarly, by focusing specifically on screening and diagnosis in Modules 2 and 3, participants not only learned about the recommended guidelines for detecting cancer early, but also faced relevant facts and statistics about late diagnosis within the Filipino population in Hawai‘i. A second key element of success was that the forum not only allowed participants to learn about cancer and the effects of cancer on people in their own community, but it most importantly facilitated an essential dialogue, in the participants’ own languages, between community leaders, healthcare professionals, and lay persons about how to address cancer disparities. This opportunity, above all else, is vital to the empowerment of the Filipino community and to the eventual eradication of disparities in cancer screening and diagnosis.

The third key feature that contributed ultimately to the success of the forums was the commitment to collaboration demonstrated by organizations involved in the project, especially the alliance established between

132
CIS Pacific and AANCART Hawai‘i. This mutually beneficial partnership blended AANCART Hawai‘i’s unique and expanding community relationships with CIS Pacific’s expertise in ensuring the accuracy and quality of the curriculum, training and evaluation components of the forums. It should be noted that a well-trusted PI trainer and consultant, who had previously established relationships with Kaua‘i’s Filipino leaders, brought credibility to the forums, AANCART, and its partners. Her involvement served to jump-start forum planning and implementation efforts on the neighbor island of Kaua‘i. It was this unique blending of skills, expertise and trust that contributed to the sustainability of the relationships with organizations and individuals resulting from the forums. Without the combined efforts of the Filipino community, AANCART Hawai‘i, CIS Pacific, and other contributing partners, it is unlikely that the forums would have had the reach and impact still visible many months after the first forum was conducted.

Conclusion
This project served to build AANCART’s visibility and credibility in Hawai‘i’s Filipino community, as the forums were the first of several projects and pursuits coordinated by AANCART Hawai‘i. In addition to building the capacity of Filipino community leaders to deliver and discuss cancer disparities, the forums laid the groundwork for the integration and involvement of a number of individuals and community groups committed to cancer education and health promotion. As a result of the forums, new partnerships were established with several key organizations, which led to subsequent grant funding for research interventions targeting mammography screening in Filipino communities.

Specifically, three major projects were a direct outgrowth of the forums’ successes in developing new and sustainable community partnerships. First, a partnership with the HMSA and the University of Hawai‘i’s Cancer Research Center of Hawai‘i resulted in an intervention to increase and improve doctor-patient communication related to mammography screening in primary care settings within Filipino communities across the island of Oahu. This intervention aims to increase regular mammography screening among first generation Filipinas over age 40, and uses a combination of ethnic media and incentives to boost screening rates in this population.

A second ongoing project aims to translate breast cancer education materials into Ilokano and Tagalog for inclusion in the internet-based Asian and Pacific Islander Cancer Education Materials (APICEM) web portal, jointly sponsored by AANCART and the American Cancer Society (ACS). Representatives from the Filipino Community Center, the University of Hawai‘i Ilokano Language, Literature and Film Program, University of Hawai‘i Tagalog Language and Literature Program, ACS and the Hawai‘i Comprehensive Cancer Control Program join AANCART Hawai‘i in this effort.

A third project builds on ACS’s nationwide “Tell A Friend” program, known in Hawai‘i as “Friend to Friend,” which also aims to increase mammography screening. This intervention will focus on multiple generations of Filipina immigrants and will utilize strategic cultural events and social networks to disseminate information about health and breast cancer screening, thus reaching a segment of the Filipino community that has not been moved to action by mainstream cancer screening campaigns.

As a result of the forums, new partnerships were established with several key organizations, which led to subsequent grant funding for research interventions.

Finally, to sustain and continue the growth of these and other interventions addressing health disparities in the Filipino community, many of the Filipino leaders involved as forum trainers and facilitators are now committed members of AANCART Hawai‘i’s Advisory Council. Future efforts will build on the success of these educational forums and the strength of the resulting partnerships, while shared resources from within and outside the Filipino community will address existing cancer disparities in this community.

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3. Lindsey E, Sheilds L, Stajduhar K. Creating effective nursing partnerships: relating community


13 years ago in Pacific Health Dialog, R. F. Schultz stated, “It is ironic that while children are acknowledged to be our most valuable resources, they also represent the most vulnerable group within any community...” PHD, 1995;2(2):31-36.
Empowering Natural Clinical Trial Advocates: Nurses and Outreach Workers

Diane B. Mitschke, PhD*
Kevin Cassel, MPH*
Paula Higuchi, MSW**

*Partnership Program Coordinator, Cancer Information Service, Pacific Region, Cancer Research Center of Hawai‘i, Honolulu, Hawai‘i; **Partnership Program Manager, Cancer Information Service, Pacific Region, Cancer Research Center of Hawai‘i, Honolulu, Hawai‘i. Address correspondence and reprint requests to: Kevin Cassel, MPH, Cancer Information Service, Pacific Region, Cancer Research Center of Hawai‘i, 1236 Lauhala Street, Room 502, Honolulu, Hawai‘i 96813-2479; kevin@crch.hawaii.edu.

Abstract
Cancer clinical trials are essential to advancing the prevention and treatment of cancer; yet adult participation rates in clinical trials remain abysmal. Despite the essential contributions of clinical trials to science and medicine, adult participation in clinical trials remains exceedingly low, with only 2%-4% of all adult patients with cancer in the U.S. participating in clinical trials. Clinical trials accrual rates in Hawai‘i follow this national trend of less than 3% of eligible patients participating in trials. Recognizing the need to increase awareness about clinical trials, the National Cancer Institute’s Cancer Information Service-Pacific Region, through the Hawai‘i Clinical Trials Education Coalition, has employed strategic dissemination plans to train and educate key target audiences, including registered nurses, nursing students, and community outreach workers about the availability of over 90 cancer clinical trials in Hawai‘i. Previous research suggests that nurses often play a vital role in increasing a patient’s understanding of clinical trials and may also act as a patient advocate in regards to participation in a clinical trial. A train-the-trainer model curriculum was developed using the Clinical Trials Education Series (CTES), a collection of multi-level resources designed by the National Cancer Institute, to educate various constituents about clinical trials. The training curriculum and workshop format is adapted based on both formal and informal needs assessments conducted with audiences prior to the planned training, yet key elements remain central to the training model. In addition, an interactive, internet-based case study was developed using local place names and cultural cues to allow training participants to engage in realistic and practical methods for locating and sharing information about clinical trials with patients and the public. This training model has been implemented in a variety of settings including three statewide nursing conferences, two college campuses, and a community-based workshop. Evaluation results consistently indicate statistically significant increases in participants’ knowledge and awareness related to clinical trials, and a cadre of trained clinical trials advocates is developing. Health professional advocacy toward adult participation in clinical trials is gaining momentum, with plans to expand the training model throughout the Pacific region. (PHD 2007 Vol 14 No 1 pp 135-141)

Background
A number of studies have attested to the important roles of registered nurses in educating and recruiting cancer patients on clinical trials.1 In fact, a randomized trial that compared registered nurses and surgeons recruitment of patients to a prostate cancer treatment trial, indicated that nurses were equally effective in recruiting patients to the study as surgeons. Further, cost-benefit analyses indicated that utilizing nurses to recruit patients to the study was more cost effective than urologic surgeons.2 For this reason, registered nurses often fulfill the role of clinical trial coordinators, with duties ranging from overseeing recruitment of trial participants, serving as patient advocates, and evaluating outcomes of trials.2,3 As medical research clinical trial sites shift from academic medical centers to community-based clinical practice settings,3 the role of nurses in clinical trials coordination may continue to grow in both magnitude and importance. In response to the increasing need for nurses to engage in clinical trials education and implementation efforts, several U.S. universities, including the Institute for Johns Hopkins Nursing, Boston University, Duke University, and George Washington University, among others, have established formal certification and training programs for nurses. These programs prepare registered nurses for certification by the Association of Clinical Research Professionals, the Society of Clinical Research Associates, or the Center for Clinical Research Practice as Clinical Research Coordinators. Certification by these bodies involves formal recognition of the nurses as clinical research professionals who have met professional eligibility requirements and demonstrated job-related knowledge...
and skills required to support clinical research. These programs emphasize research design, nursing ethics, and outcome measurement, among related topics. CRC training is also available to nurses in the form of continuing education credits through these programs, most employers prefer at least two years of acute-care nursing experience for CRCS.  

Although registered nurses can vary in their education and training regarding medical research, several common factors contribute to the unique role that all types of registered nurses can serve in educating and recruiting patients to clinical trials. First, nurses “comprise the largest single component of hospital staff, are the primary providers of hospital patient care, and deliver most of the nation’s long-term care.” Practically speaking, nurses outnumber physicians in the U.S. four to one; hence, the reach and scope of registered nurses to patients far exceeds that of physicians, in terms of sheer numbers alone. Finally, nurses communicate with patients in important, and qualitatively different ways than do other members of the healthcare team. Communication between nurses and patients can be instrumental or affective, depending on the needs of the patient and the comfort level of the nurse. Instrumental communicative behaviors are typically associated with addressing a patient’s need to comprehend an aspect of their disease or treatment regimen, while affective communicative behaviors address a patient’s need for emotional support. A review of the literature in the area of nurse-patient communication found that emphasis on affective behaviors is characteristic of nurses’ relationships with oncology patients. This includes “facilitating behaviors such as empathy, touch, comforting, and supporting”, all of which are key to communicating with and educating patients about their potential involvement in a research study. Recognizing the key role that nurses and other healthcare providers play in communicating with cancer patients about prevention, screening, treatment, and follow-up care, the National Cancer Institute created a unique and comprehensive set of educational resources called the CTES. Designed to influence and increase adult participation in cancer clinical trials by targeting and training a cadre of trained health professionals to serve as advocates for clinical trials participation, the Series was distributed to organizations throughout the U.S. to infiltrate local communities and disseminate clinical trial awareness and educational messages throughout the ranks of health professionals in local communities. This article describes the efforts of the National Cancer Institute’s Cancer Information Service, Pacific Region, to increase awareness and accessibility of clinical trials information and resources among registered nurses, nursing students, and outreach workers across the state of Hawai‘i.

Training Components

Didactic PowerPoint

A basic lecture provides an introduction to clinical trials and ensures that participants have a general understanding of core concepts that are central to understanding cancer research. The CTES slide program provides a core set of PowerPoint slides and lecture notes that can be adapted based on the learning needs of the audience. The didactic portion of the training stresses the importance of clinical trials participation as key to advancing cancer research. It provides information about the phases and types of trials, while also refuting common myths about trial participation related to participant protection measures and institutional review boards. This portion of the training is useful in ensuring that training participants have accurate, up-to-date information about clinical trials in their own communities.

Instrumental communicative behaviors are typically associated with addressing a patient’s need to comprehend an aspect of their disease or treatment regimen.

Interactive Case Study

A detailed case study follows the fictional experience of Maria, a 62-year-old Filipina woman, living in Honolulu, Hawai‘i, as she becomes the caregiver for her sister, Cora, who is diagnosed with Stage II breast cancer. The story line follows the women through a series of exercises that encourage the learner to complete a series of tasks such as searching for applicable clinical trials, locating relevant publications from the National Cancer Institute, and finding accurate answers to typical questions that patients have regarding clinical trials on the National Cancer Institute’s website, http://cancer.gov. The excerpt below exemplifies the multi-faceted features of the case study including: 1) introducing actual cancer treatment centers and trial locations; 2) acknowledging different types of clinical trials, for healthy people who are interested in cancer prevention, as well as for people with cancer that are interested in treatment trials; 3) the concept of advocacy, and sharing knowledge and enthusiasm about clinical trials with others; and 4) skills in finding accurate information about clinical trials and in locating specific trials within a geographic region.

Case Study Excerpt A. Maria has an appointment to meet with a research assistant at the City of Hope Comprehensive Cancer Center about a breast cancer...
prevention trial that is testing the effects of grape seed prevention in preventing breast cancer in postmenopausal women who are at high risk for the disease. She has been so enthusiastic about all she has learned about clinical trials that some of her excitement has rubbed off on her sister, Cora, who was diagnosed with Stage II breast cancer. Maria would like your help in finding resources to educate her sister about cancer treatment trials, and also in locating a few specific trials for which she might be eligible.

In addition to prevention and treatment trials, information and resources about survivorship are also woven into the case study. In the excerpt below, breast cancer survivor Cora assumes the role of advocate in assisting a friend with prostate cancer in locating information about supportive care studies in Hawai‘i that explore the management of treatment side effects. By incorporating fluidity and flexibility in the types of trials, roles of fictional characters, and geographic locale, the case study is accessible and relevant for a variety of audiences.

Case Study Excerpt B. Cora has joined a local church where she participates in a cancer survivors’ support group that meets once a month. At the support group, Cora has become close friends with Melvin, a handsome gentleman who is currently undergoing hormone therapy for prostate cancer. Melvin seems to have handled his initial treatments well, but now talks about awful hot flashes he’s been having consistently over the past few weeks. Cora wonders if she might be able to suggest a clinical trial in which Melvin could participate to help him with the side effects he’s been experiencing.

Other Training Elements
While the PowerPoint presentation and the interactive case study are the core components of a clinical trials training workshop for nurses and outreach workers, a number of other elements are also incorporated on a case by case basis, depending on the interests, needs, and time constraints of a particular audience. As is the case with any successful training model, a willingness to adapt and change the structure of the training while maintaining the core messages and intent of the curriculum is key to the ability of the training to achieve its goals. Incorporating the use of role play generated an enthusiastic response from nursing students, who appreciated the opportunity provided within the training workshop itself to practice sharing the information they learned about clinical trials with mock patients.

Other CTES Materials
A number of other materials including publications, workbooks, videos, and CD-ROMs have also been helpful supplements to the core training curriculum. While the ideal setting for a typical clinical trials workshop for nurses would include small group access to computers for use in the interactive case study, this is not always possible. In some circumstances, training workshops can be adapted to incorporate print, rather than online resources, and clinical trial searching can be accomplished through the use of a single presenter in a more didactic approach.

Interactive Discussion
Collaborative discussion is often a key piece of the training workshop, and can help to promote a deeper understanding of the issues involved in talking with potential participants about clinical trials. Because barriers to participation in trials vary by culture, age, socioeconomic status, geographic location, and other factors, providing training participants the opportunity to generate barriers to their specific population group by facilitated brainstorming activities and interactive discussions is necessary and important at the onset of a training workshop. Table 1 displays a list of barriers to clinical trials participation by Native Hawaiians that were generated by a group of outreach workers who attended a clinical trials training workshop. These barriers were ranked by the outreach workers in order from 1 (most serious impediment to trial participation) to 5 (least serious impediment to trial participation). The results of this ranking clearly indicate a need for education and training regarding the availability of clinical trials and the purpose and procedures associated with medical research in Hawai‘i.

Results
To date, over 300 nurses, nursing students, and outreach workers across the state of Hawai‘i have participated in an educational workshop or seminar that has implemented the core clinical trials curriculum described in the previous section. Workshop participants individually and anonymously completed a
Sample Questions
1. This type of clinical trial tests new procedures which identify and stage cancers more accurately: (multiple choice)
2. Identify 2 barriers patients face when considering participating in a clinical trial. (short answer)
3. <Blank> is a method used to prevent bias in research. (multiple choice)
4. List 2 types of clinical trials. (short answer)
5. Only people who have cancer are eligible to participate in a cancer clinical trial. (True/False)
6. Informed Consent is a process where potential participants learn the details of the study before deciding whether they wish to participate. Once a person signs the consent form, they are not permitted to leave the study until its conclusion. (True/False)
7. List two sources of information about clinical trials. (short answer)
8. The Cancer Information Service is a public service of the National Cancer Institute and provides the latest, most accurate information about cancer to which group(s) of people? (multiple choice)

Through an examination of the evaluation data from each individual training, results indicate that the training model is successful in engaging training participants in an active learning process that increases their knowledge about clinical trials. All participants completed a written evaluation of the training following their participation in a workshop or session. Table 2 provides a sample of the type of written feedback typically given from a group of trainees. These particular data were collected from a group of advanced practice nursing students (N=17) who participated in a training session in Spring 2006.

In addition to the consistently positive feedback that is generated regarding the structure of the clinical trials training workshops and specific components within the training model, significant differences in knowledge are observable when comparing written pre- and post-workshop knowledge assessments. Again, a set of 10 multiple choice questions that assess knowledge were developed specifically for each training. To examine the difference from pre-test to post-test, we used the McNemar test for nonparametric statistics and ran

Table 2. Training Evaluation Feedback: Graduate Nursing Students (N=17)

<table>
<thead>
<tr>
<th>All students agreed that:</th>
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</thead>
<tbody>
<tr>
<td>✓ Content of the course matched the stated learning objectives</td>
</tr>
<tr>
<td>✓ Speakers were knowledgeable about the subject matter</td>
</tr>
<tr>
<td>✓ The course made them more familiar with the resources available through the National Cancer Institute and Cancer Information Service</td>
</tr>
<tr>
<td>✓ They now have a better understanding of why clinical trials are important in the progress against cancer</td>
</tr>
<tr>
<td>✓ They now have a better understanding of how clinical trials participants’ rights and safety are protected</td>
</tr>
<tr>
<td>✓ They now have a better understanding of the clinical trials process and why clinical trials may be a viable treatment option</td>
</tr>
<tr>
<td>✓ They would recommend the training to other nursing students</td>
</tr>
<tr>
<td>✓ The information was presented in an easily understood manner</td>
</tr>
<tr>
<td>✓ They are now willing to talk with others in their respective communities to increase awareness about clinical trials</td>
</tr>
<tr>
<td>✓ They now plan to use the tools they had been provided to educate others about clinical trials</td>
</tr>
</tbody>
</table>
CrossTabs to attain levels of significance and a chi-square for each item.

Topics that consistently produce significant gains in knowledge include: 1) identifying the approximate percentage of adult cancer patients currently participating in clinical trials; 2) identifying specific barriers that inhibit participation in cancer clinical trials; and 3) identifying at least two types of clinical trials (e.g., prevention, screening, treatment, and supportive care, etc.). For example, data from a workshop held for undergraduate nursing students (N=71) in the fall of 2005 indicated that students significantly increased their knowledge related to the percentage of adult cancer patients currently participating in clinical trials due to their participation in the clinical trials education workshop ($X^2=45.021$, $p<.05$). In a workshop with undergraduate nursing students (N=32) held in Spring 2006, students were significantly more likely to understand that participation in clinical trials was not limited to cancer patients ($X^2=6.125$, $p<.05$). Questions that were commonly administered at trainings for undergraduate and graduate nurses that did not show significant improvement in correct responses included: “randomization is a technique to reduce bias” (98% correct responses in pre-tests in one sample), and “people who do not have cancer are eligible to participate in trials” (87% correct in pre-tests in one sample). Clearly, baseline knowledge about these issues was high among the nurses trained.

While clinical trials participation rates are low across all population groups in Hawai‘i, participation also varies by ethnicity. Historically, clinical trials in Hawai‘i have been unsuccessful in attracting Native Hawaiian and Pacific Islander participants. For example, although Native Hawaiians comprise approximately 12% of Pacific Islander participants. For example, although Native Hawaiians comprise approximately 12% of the state’s five major islands about clinical trials, and eight (8) of these individuals enrolled in a clinical trial, for a 9.25% success rate. In addition, the trained outreach workers also assisted in conducting a clinical trials training sponsored by ‘Imi Hale, the Native Hawaiian Cancer Awareness, Research, and Training Network, for outreach workers from the Hawai‘i Breast and Cervical Cancer Control Program.

### Discussion

Raising awareness about clinical trials among registered nurses and outreach workers who are in direct communication with cancer patients and their friends and families, is an important step in developing a cadre of clinical trials advocates that may influence participation rates. It is clear that health professionals have a unique influence on the choices that their patients make regarding participation in clinical trials; yet, efforts to systematically educate nurses about core concepts in clinical trials research have lagged behind the focus on clinical research included in medical education. Now, as growing numbers of nurses and other health professionals find themselves tasked with various responsibilities in the area of study coordination, patient education, and outcome evaluation, the need for clinical trials education in the nursing workforce is clear. Nurses and other allied health professionals are often primary providers of patient care and education in many settings. As such, they have a unique perspective on ways to improve patient outcomes. Today, clinical trials research has expanded beyond treatments to encompass broader patient outcomes including building family support, managing the side effects of therapy, and improving quality of life. Clinical trials trainings for nurses...
and other health professionals may have the added effect of empowering this group to have an increased role in the development of new areas for clinical trials research. Finally, patients today have unprecedented access to medical and health information due to the diffusion of the internet. Clinical trials trainings develop healthcare providers’ competency in accessing creditable resources on medical information, and can enable nurses and other allied health professionals to respond to the increasing demands for health information from patients.

Conclusions
It is expected that the clinical trials training of nurses and allied health professions will ultimately improve the adult participation rates in cancer clinical trials. The tremendous advances seen in the treatment of childhood cancers are attributed to the total integration of clinical trials research as part of a routine care protocol for children. A paradigm shift is necessary in adult oncology so that clinical trials become a part of the standard of care in oncology. Training and education of nurses and outreach workers is a first step in pushing forward this new paradigm.

The impact of clinical trials training for nurses and other health professionals serves to increase familiarity and comfort for these professionals to include clinical trials as part of a patient’s healthcare options. In turn, this increased awareness of trials and the subsequent boost in trial accrual rates can result in an improved ability to manage cancer. The clinical trials trainings for registered nurses, nursing students, and outreach workers revealed that the interactive train-the-trainer model curriculum increased participants’ knowledge and awareness about clinical trials. However, follow-up evaluations are needed to determine if knowledge gained is retained, and whether trainees have discussed clinical trials with potential participants. Clinical trials training and continuing education is important for health professionals and community outreach staff who are responsible for reaching those experiencing the greatest cancer health disparities.

Clinical trials training and continuing education is important for health professionals and community outreach staff who are responsible for reaching those experiencing the greatest cancer health disparities.

References

Evaluation of Distance Learning for Health Education

Kelley Withy MD, PhD
Shaun Berry, MD
Nicole Moore, CHW
Sheila Walsh
Leah Sekiguchi
January Andaya, BA
Megan Inada, MPH

Address all correspondence and reprint requests to: Kelley Withy, MD, PhD, Director, Hawai‘i / Pacific Basin Area Health Center, John A. Burns School of Medicine, University of Hawai‘i, 651 Ilalo Street, MEB 4th Floor, Honolulu, Hawai‘i 96813-5525; withyk@hawaii.rr.com. All contributing authors can be contacted at the above University of Hawai‘i address.

Abstract
The Hawai‘i Unified Telehealth program is a distance learning health education program for rural communities, created with federal grant funding from the U.S. Department of Commerce and the National Institutes of Health. These grant funds helped develop a network of rural community learning centers that employ distance learning technologies to provide community-driven peer education to isolated areas across Hawai‘i and Majuro, Republic of the Marshall Islands. In this article, the authors briefly describe the development of the ongoing health education program and the results of outcome evaluation completed at the end of the funding period. (PHD 2007 Vol 14 No 1 pp 142-145)

Introduction
Significant geographic and cultural barriers to healthcare exist in the Pacific, resulting in poor health in many underserved communities. For example, Hawai‘i ranked no. 1 through 2004, and second in 2005 for the highest incidence of tuberculosis in the U.S.1 Native Hawaiians have rates of type 2 diabetes four times higher than the U.S. standard population2 and mortality rates from diabetes eight times that of non-Hawaiians.3 Samoans in Hawai‘i have extremely high rates of obesity4. In addition, in its “Pacific Partnerships for Health” report, the Institute of Medicine (IOM) documented that life expectancies in the U.S. Affiliated Pacific Islands (USAPI) are 9 to 12 years shorter than that in the U.S. mainland.5

Factors that contribute to health disparities in the region are many and include a lack of healthcare providers in rural areas, a lack of trust in western medicine and a general lack of understanding of health issues. In addition, since people with the least resources often live in remote areas and are unable to travel to urban medical centers, it is even more difficult for them to obtain healthcare due to isolation. Distance learning provides an option for decreasing isolation, but is expensive and requires significant equipment, training and coordination, making it of limited use in many communities.

The Hawai‘i Unified Telehealth (HUT) program was designed to use distance learning to increase communication and understanding of health by having rural communities share health education information with other rural communities. The HUT activities were funded by a Technology Opportunity Program grant from the U.S. Department of Commerce (DOC), and from the National Institutes of Health (NIH) National Library of Medicine (NLM) between 2001 and 2005. The program was designed to increase connectivity between existing networks by bridging the existing video technology communication (VTC) systems to improve access to these networks from community sites in order to share culturally sensitive and community driven educational experiences relating to health. The University of Hawai‘i (UH) John A. Burns School of Medicine (JABSOM) Hawai‘i Pacific Basin Area Health Education Center (AHEC) partnered with many rural, state and regional organizations to develop a network of VTC sites spanning rural Hawai‘i and also including Majuro Hospital in the Republic of the Marshall Islands (RMI). A weekly health education seminar was developed; the outcome evaluation is described below.
Methods
Participating sites were identified based on the criteria of rural location or service area, accessibility of the community site or center to the public during session times, and community interest. Twenty-eight rural communities expressed interest in participating. Each site was assessed for distance learning connectivity resources, and all received assistance in connecting to the developed network. U.S. DOC HUT grant funds were used to install VTC units and connectivity at 15 sites in Hawai‘i. Connection of 10 sites via computer through the internet were paid for by NIH NLM grant funds, and three additional sites had existing equipment and connectivity. The appropriate technological solution was selected based on each site, and included use of VTC units over the UH ethernet system, microwave bandwidth, cable modems, high speed internet, including digital subscriber line (DSL), or integrated services digital network (ISDN) lines, as available in each location. At every site where VTC equipment was installed, two community members were trained on equipment set-up, connecting to other sites, type of connectivity used at the site, and general troubleshooting of problems. Each site was required to have a safe location for equipment and program oversight while equipment was in use. Once connectivity was established at 10 sites, health education sessions were introduced. Each new site was included in the network as connectivity was established. All 28 sites expressing interest in the network were included (see Table 1).

Initial educational sessions, based on topics assumed to be of importance, such as diabetes treatment, skin cancer prevention, kidney disease and nutrition, were broadcast live from the UH JABSOM to VTC sites. Participation was very low and community members expressed significant distrust in the equipment. At sites where an individual invested in the success of distance learning or a program champion existed, interest began to grow in the second year of program funding. Participants expressed the desire for experts from rural areas to teach the sessions twice monthly, and distance learning sessions began originating from the Ke Anuenue AHEC in Hilo, Hawai‘i. Participants were polled about

<table>
<thead>
<tr>
<th>Hawai‘i Sites</th>
<th>USAPI Site</th>
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<tr>
<td>Ke Anuenue AHEC, Hilo</td>
<td>Ka‘u Rural Health Community Center, Pahala</td>
</tr>
<tr>
<td>Bay Clinic - Hilo</td>
<td>Bay Clinic - Ka‘u</td>
</tr>
<tr>
<td>Bay Clinic – Pahoa</td>
<td>Community Clinic of Maui-Wailuku</td>
</tr>
<tr>
<td>Hale Halaawai ‘Ohana ‘O Hanalei, Hanalei</td>
<td>Hale Hulu Mamo, Hana</td>
</tr>
<tr>
<td>Hamakua Health Center, Honoka’a</td>
<td>Hawai‘i Primary Care Association, Honolulu</td>
</tr>
<tr>
<td>Ho‘ola Lahui - Lihue</td>
<td>Ho‘ola Lahui – Waimea</td>
</tr>
<tr>
<td>Hui Malama Ola Na ‘Olwi, Hilo</td>
<td>Kalihi-Palama Health Center, Honolulu</td>
</tr>
<tr>
<td>Kaua‘i Community College, Lihue</td>
<td>Koku Kalii Valley Family Health Center, Honolulu</td>
</tr>
<tr>
<td>Legal Services for Children, Wa‘ianae</td>
<td>Maui Community College, Kahului</td>
</tr>
<tr>
<td>Na Pu‘uwai’, Kaunakakai</td>
<td>Na Pu‘uwai’ – Lanai</td>
</tr>
<tr>
<td>Queen Emma Clinic, The Queen’s Medical Center, Honolulu</td>
<td>University of Hawai‘i School of Nursing, Manoa</td>
</tr>
<tr>
<td>Tutu’s House, Friends of the Future, Waimea</td>
<td>University of Hawai‘i at Hilo</td>
</tr>
<tr>
<td>Wa‘ianae Coast Comprehensive Health Center, Wa‘ianae</td>
<td>Waikiki Health Center, Honolulu</td>
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<tr>
<td>Waimanalo Community Health Center, Waimanalo</td>
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topics of interest, and speakers, including pharmacists, nutritionists, healthcare workers and health professions students, were recruited.

The location of all 28 HUT sites are listed in Table 1. Of the sites connected to the network, seven sites demonstrated regular attendance: Hilo, Pahoa, Waimea, Ka’u, Pahala, and Kuanakakai in Hawai’i, and Majuro Hospital, RMI. Educational sessions are now held weekly from Hilo, and have been renamed “E Ninau Aku I Ke Kauka”, which means “Ask a Healer” in Hawaiian. Examples of program topics in the ongoing distance learning curricula include diabetes care, identifying nutrition in Hawaiian and Filipino dishes, planting gardens for health, saying no to drugs, healthy cooking food demonstrations, smoking cessation and early prevention and screening for cancer.

Evaluation of program effectiveness was measured via participant surveys during the final year of grant funding. Qualitative and quantitative data was collected from program attendees who voluntarily completed a form approved for exemption by the UH Committee on Human Subjects. Survey questions pertained to date, topic, participant ethnicity, whether the technology was useful, whether the session improved the participant’s comfort with the technology, whether the learning center was a useful location for the educational session, suggestions for improvements, and suggested future topics, and included the Likert scale rating (1-7) of educational experience. Only two network sites – Hilo and Ka’u – completed and submitted the requested survey forms. The results of this voluntary survey for the E Ninau Aku I Ke Kauka health education program were compiled, responses tabulated, and qualitative, questions analyzed for common themes by the three-person research team.

Survey Results
A total of 149 participants at either the Ke Änuenue AHEC in Hilo or the Ka’u Rural Health Community Center in Pahala completed the written survey. Ninety-four individuals self-identified on ethnicity: Hawaiian 34%, Caucasian 27%, Japanese 18%, Filipino 8%, Chinese 6%, Vietnamese 2%, and other Pacific Islander 3%, and Hispanic 2%. Of the participants responding to specific questions, 99% of 129 respondents reported that the technology was useful, and 94% of 116 respondents responded affirmatively to the question regarding whether the session improved comfort with technology. All 142 people who responded to the question regarding whether the learning center was a useful location for the educational experience, answered, “Yes.” On a 7-point scale, with 1 representing “excellent,” the educational experience had an average rating of 1.5 for the 149 participant respondents.

The most common qualitative feedback terms were; “great,” “helpful,” and “informative.” Specific comments included “Fascinating,” “Impressive technology,” “Presentation and video teleconferencing both are good,” “Lots of good and pertinent information,” “Good information and resource,” “Modern technology is an advancement in presenting information. Literatures are very interesting,” and “We will incorporate much of this info in our diabetes education programs.” However, there were many frustrations reported with the technology; “Good presentation, some areas were difficult to understand,” “Unable to understand speaker clearly, probably video problem,” “Hard time to see and hear,” “Video connection was not good and distracting.” Suggestions for the future included increasing publicity, and advertising in communities by using bulk mail, using a human model for demonstration of point pressure, and using slides with a multi-media projector. In addition to collection of survey data, program activities also resulted in 50 individuals receiving technical training and at least four participants were hired to program-topic employment by the conclusion of grant funding.

Discussion
Health education using distance learning has been successfully employed in more than 28 communities in the Pacific region. Community response indicates that although not free of challenges, the technology was felt to be useful by over 99% of respondents, and, in fact, 94% of respondents indicated an increased general comfort with technology. Community learning centers as venues for video teleconferencing were universally
reported as helpful by survey respondents from the two sites returning evaluation forms.

Study limitations include the fact that only seven sites continue to make use of the distance learning sessions, and only two sites completed the evaluations. In addition, responses were open ended, so the opinions of more responsive participants are likely to be over represented. It is likely that participants who chose to respond were those most impacted by the activity, and, therefore, it is unlikely that we received a representative sample. Nonetheless, the responses indicate a positive outlook to technologies that were foreign to many of the participating community members prior to program implementation.

Lessons learned through this experience include the fact that, once accepted, distance learning using VTC can be an excellent source of health information. However, the initial introduction to a rural community must be supported by a local champion who has the skills to understand the technology and assess interest in topics. Only in communities with such a champion did this program take hold. Session timing changed over the course of the program, with the preferred time for meetings being in the evening. Because of the time difference between Hawai'i and RMI, sessions in RMI were conducted at mid-day. Since nursing staff comprised the interested group in RMI, this time was satisfactory when participation was approved by the hospital administration.

An initial challenge encountered was that many communities were so isolated, they lacked the technical infrastructure required to have functional VTC connectivity. While broadband connectivity was finally obtained at most of the sites, for one site, adequate connectivity speed for satisfactory participant interaction was never achieved. Challenges to the continuity of this and similar projects include obtaining funds for connectivity charges and bridging fees, aiding participating sites in troubleshooting with technological expertise, and stability of organizations accessed by end point users of the technology, as community sites sometimes changed location or leadership.

Despite these challenges, the effectiveness of distance learning between community sites certainly deserves further investigation of effectiveness and efforts toward expansion. To measure the impact of the program, future research could be conducted to track changes in physical measurements of health, such as body mass index and blood pressure in regular session participants, with comparison of these numbers to a control group receiving standard nutrition counseling.

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References


Maximizing Successful Pursuit of Health Careers in Micronesia: What to do?

Kelley Withy, MD, PhD*
Nia Aitaoto, MPH**
Shaun Berry, MD*
Francine Amoa, MS*
Faye Untalan, DrPH***

*John A. Burns School of Medicine, University of Hawai’i, Honolulu, Hawai’i; **Papa Ola Lokahi, Native Hawaiian Healthcare System, Honolulu, Hawai’i; ***Commonwealth of the Northern Mariana Islands Area Health Education Center, Saipan, Commonwealth of the Northern Mariana Islands. Address correspondence and reprint requests to: Kelley Withy, MD, PhD, Director, Hawai’i/Pacific Basin Area Health Center, John A. Burns School of Medicine, University of Hawai’i, 651 Balo Street, MEB 4th Floor, Honolulu, Hawai’i 96813-5525; withyk@hawaii.rr.com.

Abstract
The people of the U.S.-Associated Pacific Islands (USAPI) suffer significant health disparities when compared with industrialized countries. One explanation for this is a lack of a sufficient number of skilled healthcare workers. The current research examines the factors that current health professionals from the region describe as helping and hindering them in their pursuit of health careers, as well as the barriers seen by students, educators and health professionals. Methods: Two separate interview studies were conducted with a convenience sample of individuals in the five USAPI jurisdictions in the Northern Pacific. The first study utilized the responses of 15 individuals regarding the barriers to the pursuit of health careers in order to develop a logic model map of the most common problems in the pursuit of health careers. The second study involved in-depth questions of 32 health professionals regarding barriers to and facilitation of health career training. Results were analyzed using constant comparative analysis. Results: Interview results indicate that facilitators of students pursuing health careers included having a family member working in healthcare, the desire to help people, available training opportunities and personal experiences. Facilitators of completion of training included family support, financial support, personal commitment and social support during school. Barriers to pursuit and completion of training included limited academic preparation, exposure and guidance; family obligations, and other careers seen as being more desirable. Discussion: Efforts to improve successful pursuit of health careers should start at the family level and must give a clear message to students that their goal is supported. Furthermore, there should be significant effort given to: improving the academic preparation provided for students, making career information available to students, and providing financial support, mentoring and guidance. Homesickness was a significant barrier that could be decreased by regional programs or a support system at locations with concentrated pockets of students from a given area. (PHD 2007 Vol 14 No 1 pp 146-155)

Introduction
The people of the U.S. Associated Pacific Islands (USAPI) suffer significant health disparities when compared with industrialized countries, including high rates of both non-communicable diseases and infectious diseases such as kwashiorkor, marasmus, Vitamin A deficiency, dengue fever, measles, and cholera.1,2,3 In fact, compared to the U.S., the USAPI countries have an average life expectancy up to 12 years shorter and infant mortality rates up to six times higher.4 While disparities are greater in some jurisdictions than others, one factor potentially contributing to these disparities is the lack of a health workforce large enough to meet all the healthcare needs. In fact the Health Professions Shortage Areas score between 4 and 22, with 25 being the most severe5 shortage as evaluated by U.S. Bureau of Health Professions. Therefore it is important to develop the local health workforce that will care for the medical and public health needs of the region.

Currently there are four associate degree nursing programs and one baccalaureate nursing program in the USAPI. However there is no regional medical school or allied health training program since the closing of the Medical Officer Training Program in Pohnpei in 1997. The University of Fiji School of Medicine offers distance public health training and the University of Hawai’i at Hilo recently began offering distance pharmacy technician training. However many students must leave the region for training. These students face significant challenges
Factors that are described in the literature as correlating with pursuit of health careers include socioeconomic factors (higher income), academic ability, cultural values conducive to education and a supportive background environment. Factors found to be directly related to continuation in educational programs were: financial support, program staff, research internships and mentors, existence of a program community and strong positive expectations of their high academic potential from faculty. However, there is no literature to demonstrate that these factors are the most significant in the Northern Pacific.

In order to elucidate factors that would help in the goal of expanding the workforce of the region, the investigative team performed two separate sets of interviews to: 1) draw out ideas about the barriers to pursuit of health careers training from the viewpoint of students, educators, and providers; and 2) to gain insight into the recruitment and training needs of healthcare workers from the perspective of those who successfully completed training and returned to practice in the region.

Methods
Two separate interview studies were conducted with different subjects and are described here independently as: 1) logic model mapping interviews and 2) qualitative interviews. Human subjects exemption was obtained from the University of Hawai‘i Committee on Human Subjects and the Belau National Hospital.

Logic Model Interviews
Convenience sampling was utilized to recruit 15 educators, students and healthcare providers readily accessible to the researchers through their affiliation with Pacific Basin Area Health Education Centers (AHECs) in Micronesia and their participation in healthcare worker conferences. In August of 2005, 15 individuals representing education and health fields from the five Northern Pacific USAPI countries were interviewed individually by the first and last authors. Each interview began with the question: Why do so few students pursue health careers? Individuals were interviewed in English and the answers were solicited in a sequential disclosure format to create a logic map for each interview (increasingly detailed explanations). The results were then compiled into a single map with like answers combined. The resulting map was emailed or mailed to participants for their approval and corrections.

Qualitative Interviews
A second study was conducted from March to August 2005. Ten interview questions were developed based on a comprehensive review of existing literature and results from informal discussions with teachers, providers and students in the countries of Micronesia. The original questions were refined through team discussions and input from internal experts and community educators. The final research questions addressed barriers/facilitators to entering and completing health careers training and advice for students.

Convenience sampling was again used to recruit 32 participants who were present at regional medical conferences, during visits for other medical research studies, and from the faculty and trainees known to the Pacific Basin AHECs. Participants not practicing in Micronesia were excluded. The initial target number of interviews was 20, with at least three healthcare workers from each jurisdiction. Additional grant funding allowed the researcher to increase the number of professionals contacted to 33. Of those individuals, only one declined study inclusion. Each interview was conducted in person, by the first or second author, often in the primary language of the interviewee (it is estimated that 10 interviews were conducted in English entirely). Interviews lasted an average of 45 minutes. The questions were asked in an open-ended fashion, such that participants were allowed to offer multiple...
answers. At least 27 participants provided answers to all questions. Data was recorded by the interviewer in the form of notes and when available, a tape recorder. The notes and tapes were transcribed and results were typed in English for each question. The research team met to analyze the results. They reviewed all answers without the participant demographics to maintain confidentiality. Qualitative responses were clustered by themes using card sorting and negotiation between the researchers. Responses by theme were then tabulated for frequencies and the researchers negotiated the most important participant comments for dissemination.

Results

Demographic Characteristics

Logic Model Map Interviews

Fifteen individuals were interviewed representing three health professions students, two administrators, four educators and six practitioners (MD, MO, RN, MPH) from Saipan, Guam, Yap, Palau, the Republic of the Marshal Islands. Two of the participants were Caucasian, the rest representing the ethnicity of their practice location. Six of the participants were male and nine female.

Qualitative Interviews

In total, 32 interviews were conducted representing 14 physicians (MD or MO), 14 nurses and four public health workers or medical technicians. The interviews were distributed over the five USAPIs previously mentioned. Interviewees were evenly balanced between males and females (16 men and 16 women). Twenty-eight of the interviewees saw patients ≥20 hours a week and four (primarily nursing and public health) spent <20 hours a week in direct patient care. Patient demographics were difficult for participants to describe as there is very little insurance in the region and the patients are primarily of the local ethnicity, “We see whoever comes.”

DATA

Logic Model Analysis and Map Creation

The 15 interviews had significant overlap and were combined into one map that is represented in Figure 1. The four primary antecedent conditions were found to be limited academic preparation, negative perceptions of health careers and health careers training, lack of exposure to health careers and lack of guidance.

Limited academic preparation was the most commonly sited reason for students not pursuing health careers. Particular mention was made of math and science education, but also English, since most medical training programs that students would attend are in English. There was also significant discussion of the learning styles of the region being more hands-on and oral compared with the ‘Western’ written educational and testing style. Reasons for poor academic preparation included internal factors (students not pushing themselves, lacking study and time management skills), school specific (lack of experienced teachers and educational resources due to low funding) and external (low expectations from society, lack of encouragement from family and teachers).

Negative perceptions of health careers and health careers training was reported by many participants. The primary reason for this was that family and teachers discourage children from health careers. The fact that other jobs are much more appealing is also a factor. Participants described health careers as having low pay, associating negative perceptions with them (bed pans, long hours), and believing that non-health government

Figure 1: Abbreviated Logic Model Map
Developing Human Resources For Health in the Pacific  


Table 1: What interested you in a health career?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family member was a healthcare provider</td>
<td>13</td>
</tr>
<tr>
<td>Desire to help people</td>
<td>9</td>
</tr>
<tr>
<td>Health career opportunity opened up</td>
<td>7</td>
</tr>
<tr>
<td>Personal experience with healthcare system</td>
<td>6</td>
</tr>
<tr>
<td>Social encouragement/mentor/role model</td>
<td>5</td>
</tr>
<tr>
<td>Desire for respect</td>
<td>4</td>
</tr>
<tr>
<td>Good in school</td>
<td>2</td>
</tr>
<tr>
<td>Interest in subject</td>
<td>2</td>
</tr>
<tr>
<td>Desire for good salary</td>
<td>1</td>
</tr>
<tr>
<td>Family encouragement</td>
<td>1</td>
</tr>
</tbody>
</table>

Jobs paid better and had more job security. Also of note, the training was known to be expensive and would cause at least temporary displacement from home. Homesickness was a definite theme preventing people from pursuit of health careers. The lack of significant government funding for training and local programs was noted repeatedly.

Lack of Exposure to Health Careers

It was described that students rarely get hands-on experience with medical providers and that the region lacks effective vocational programs or shadowing experiences due to lack of human resources. It was noted that there is a lack of curriculum and not enough collaboration between schools and future employers to market available careers.

Lack of Guidance

Participants noted that there were not enough career counselors, and the ones that were present were too busy to help all children. Role models and mentors were also lacking, in part because professionals did not have time or incentives to go into schools to do recruitment or have students work with them in their offices. A theme throughout the project was also lack of information. Counselors, parents and teachers don’t have information about health careers, therefore students don’t get the guidance they could.

Qualitative Results

Of the 27 participants who answered the question regarding location of education, only nine remained in Micronesia for all of their post secondary training. The rest completed training outside of Micronesia, in areas including Hawai‘i, Fiji, Papua New Guinea and the continental U.S.

Table 2. "What helped you complete your training?"

<table>
<thead>
<tr>
<th>Factor</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family support (including image, prestige)</td>
<td>26</td>
</tr>
<tr>
<td>Financial support (family and government)</td>
<td>17</td>
</tr>
<tr>
<td>Personal commitment (dedication, discipline and focus)</td>
<td>17</td>
</tr>
<tr>
<td>Social support during school (faculty, role model, counselor, colleagues)</td>
<td>8</td>
</tr>
<tr>
<td>Cultural aspects of the job (the fact that it is hands on)</td>
<td>5</td>
</tr>
<tr>
<td>Education (in Hawaii, in English)/Tutoring</td>
<td>4</td>
</tr>
<tr>
<td>Desire to make more money/Prestige/Respect</td>
<td>3</td>
</tr>
<tr>
<td>Job opening</td>
<td>1</td>
</tr>
<tr>
<td>Prayer/faith</td>
<td>1</td>
</tr>
</tbody>
</table>

Positive Forces in Health Careers

The most important factor positively affecting students interested in health careers was a family member in healthcare (13/32). The desire to help people (9/32) and opportunities becoming available in health care training (7/32) also impacted the pursuit of health careers. Personal experiences with the healthcare system (6/32) such as having to wait for long periods to see the doctor as a child and the desire to correct the situation was the third most frequent answer. Social encouragement from a mentor or role model (5/32) was reported less than half as frequently as was having a family member in the profession. Finally, the desire for respect was an occasionally reported factor (4/32), but the desire for a good salary was only cited by one individual (Table 1).

Help with Completing Training

Family encouragement (26/32) was the primary factor influencing the completion of training for the providers interviewed. Multiple participants stressed the importance of not embarrassing or disappointing the family and upholding the family’s image by avoiding shame. Financial support (17/32) and personal commitment (17/32) were the second most frequently described factors influencing completion of training. Seventeen respondents identified these factors as important. Social support during school in the form of faculty guidance, role modeling, counseling and colleague support was important to eight of the 32 interviewees as described in Table 2.

Barriers to Pursuit

Study participants offered many descriptions of barriers in the pursuit of health careers which most often relate to the lack of education and early knowledge  

149
Many participants described the difficulties of going to a new place and feeling homesick and alone, disconnected from their family and needing someone to keep them on track with their studies. Respondents also reported having considered quitting, or having friends who quit to work at fast food restaurants because they felt discouraged, and the pay seemed high in comparison to pay scales they had experienced.

The most common barrier to completion of training was the lack of a structured health careers preparation program (16/32) that included mentors, tutors, role models and peer support in high school (16/32). The second greatest barrier was the lack of foundation training in math, science and especially English. A second barrier was the impression that other fields of work were more lucrative and less labor intensive, therefore, making them more appealing to students (13/32). The lack of role models, mentoring and career counseling was described as an obstacle to pursuit of health careers (10/32). Finally, the lack of funding was sited by six individuals, and the lack of emotional support from family was noted by five.

<table>
<thead>
<tr>
<th>Table 4. Barriers to Completing Trainings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of structured health careers preparation program, mentors, role models, peer support</td>
</tr>
<tr>
<td>Lack of foundation and English training</td>
</tr>
<tr>
<td>Family obligations</td>
</tr>
<tr>
<td>Lack of funding</td>
</tr>
<tr>
<td>Cultural differences/a different educational system</td>
</tr>
<tr>
<td>Poor infrastructure in country</td>
</tr>
<tr>
<td>Family separation</td>
</tr>
</tbody>
</table>

Many individuals felt that they were not academically prepared for the entrance exams while others cited their lack of basic foundational training in math, science and especially English. A second barrier was the impression that other fields of work were more lucrative and less labor intensive, therefore, making them more appealing to students (13/32). The lack of role models, mentoring and career counseling was described as an obstacle to pursuit of health careers (10/32). Finally, the lack of funding was sited by six individuals, and the lack of emotional support from family was noted by five.

<table>
<thead>
<tr>
<th>Table 3. Barriers to Pursuit of Training</th>
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</thead>
<tbody>
<tr>
<td>Poor foundation training / limited educational opportunities / entrance exam</td>
</tr>
<tr>
<td>Other fields are more attractive (easier training, less physically demanding, better pay)</td>
</tr>
<tr>
<td>Lack of adequate counseling, mentoring, role model</td>
</tr>
<tr>
<td>Lack of funding</td>
</tr>
<tr>
<td>Lack of emotional support from family</td>
</tr>
<tr>
<td>Geographic separation from family</td>
</tr>
<tr>
<td>Desire to start a family</td>
</tr>
<tr>
<td>Lack of health careers class</td>
</tr>
</tbody>
</table>

The factor that was reported as the greatest barrier to pursuing health science careers in Micronesia was academic preparation (28/32). Many individuals felt that they were not academically prepared for the entrance exams as displayed in Table 3. The second greatest barrier was the lack of foundation training (13/32), especially in English. In particular, participants felt they could not keep up with the coursework of college and graduate school. Family obligations (12/32) were the third most common barrier described by participants as a challenge. Most individuals felt discouraged, and the pay seemed high in comparison to pay scales they had experienced.

The most common barrier to completion of training was the lack of a structured health careers preparation program (16/32) that included mentors, tutors, role models and peer support in high school (16/32). The second greatest barrier was the lack of foundation training in math, science and especially English. A second barrier was the impression that other fields of work were more lucrative and less labor intensive, therefore, making them more appealing to students (13/32). The lack of role models, mentoring and career counseling was described as an obstacle to pursuit of health careers (10/32). Finally, the lack of funding was sited by six individuals, and the lack of emotional support from family was noted by five.

<table>
<thead>
<tr>
<th>Table 5. What would help students pursue training today?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better K-12 preparation, customized tutoring</td>
</tr>
<tr>
<td>Health science track in high school with career counseling, mentoring, outreach network, summer internship, adds on the radio</td>
</tr>
<tr>
<td>Social support for transition to college</td>
</tr>
<tr>
<td>Better working environment/better pay/continuing ed</td>
</tr>
<tr>
<td>Family support</td>
</tr>
<tr>
<td>Training being more community focused and in-country</td>
</tr>
<tr>
<td>More scholarships</td>
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(13/32), especially in English. In particular, participants felt they could not keep up with the coursework of college and graduate school. Family obligations (12/32) were the third most common barrier described by participants as a challenge. Most individuals felt family pressure to return home to help their families financially or pressure to have children. Lack of funding (7/32) was described as a challenge by seven individuals. Cultural challenges the different educational system and learning new educational modalities were described by six people.

**For Today’s Students**

Participants felt that the most important factor to help students today was better educational preparation (16/32). It was felt that this should include mentors and the existence of health science training tracks in high school to include components such as mentoring, counseling and outreach to community (12/32). Eleven individuals described the importance of social support for the transition to college and professional school. Almost a third of the interviewees felt that the one thing that needs to change for more students to go into health careers is creating a better working environment for healthcare providers when they return after training (9/32).

**Advice to Future Students**

Respondents all had ideas for students who may be thinking about health careers. These included providing a strong educational foundation (11/32) and vocational counseling to assure that this career is what they want to do (9/32). Staying focused was also felt to be important (5/32). Other factors mentioned included not having to worry about the cost, not getting married early, sticking together, helping one another, and telling your family “no.”

**Guidance and mentoring are very important to the process of health careers training.**

**Discussion**

The importance of family on health careers was found to be high in the population studied. Unlike U.S. mainland students, the factor most likely to foster interest in a health career turned out to be a family member in healthcare. The interviewees indicated that the family member was not necessarily in the same field of healthcare that they chose to pursue, and that the effect was separate from that of a role model or mentor. Family support was the most cited factor influencing the ability to complete health professions training, while simultaneously, family obligation was the third most common barrier to completing training. Family support was also mentioned as an important factor in support of students’ health careers training while at the same time the respondent’s advice for future students was to say “no” to your family. In addition, lack of family support, geographic separation from family and the desire to start a family were mentioned as barriers to pursuing health careers.

While family support is probably the single greatest positive factor impacting health workforce career choice in this population, family opinion is also one of the most common barriers to health careers completion. Respondents explained that for Micronesian students, it is important to be part of a family or clan. That clan shares your identity and what you do reflects upon them. Therefore, both pride and shame are shared throughout the family unit. However, families often do not see the value of pursuing a career which requires a prolonged course of study but would prefer their youth to get jobs and help the family out immediately. Some students had to quit training to care for aging family members and others to help run family businesses. If it was requested of them, they had little choice but to subjugate their career goals for their family. In addition, many women were pressured to start families and not pursue what is still considered by some to be ‘men’s work’. Families also provide some of the financial support required for training in addition to social support. If a student is to be successful, therefore, it is very important to have family support.

**Academic and Social Preparedness**

Academic preparation was discussed in both interview studies as a very important consideration in the ability to pursue a health career. Limited quality of math, science and English education were clear cut difficulties for students. Math skills have been documented in the literature as very important to student success in health related fields. Students with higher average 8th grade math test scores were more likely to take math in high school and more likely to major in science and math in college;13 science-mathematics self-efficacy was the factor most closely linked to career interest in science.

<table>
<thead>
<tr>
<th>Table 6. Advice for Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Get a strong educational foundation early</td>
</tr>
<tr>
<td>Make sure it is what you want to do</td>
</tr>
<tr>
<td>Focus/do not give up</td>
</tr>
<tr>
<td>Don’t worry about cost</td>
</tr>
<tr>
<td>Don’t get married yet</td>
</tr>
<tr>
<td>Stick together and help one and other</td>
</tr>
<tr>
<td>Tell your family “no”</td>
</tr>
</tbody>
</table>

151
and was closely linked to academic performance as demonstrated by PSAT scores;\textsuperscript{14} math performance, particularly in early high school, was highly correlated with college preparatory grade point average, eligibility and college type;\textsuperscript{15} and the likelihood of entering science and engineering postsecondary education was highest for students who took advanced science courses, were self-motivated to study science, and had parents with higher levels of education and high expectations for college education for their children.\textsuperscript{16} Therefore, it follows reason that academic preparation should be addressed if there is to be a change in the number of students successfully pursuing health careers.

Also, interviewees described how Micronesian students are accustomed to learning through oral histories and accomplishing tasks in a group setting. This is very different from the Western style of individual learning and written examinations. Therefore, there is a large cultural adjustment to be made when leaving the region for health professions training. Whether this can be taught in preparation for leaving, or regional programs can adapt to this need remains to be seen.

**Guidance and Mentoring**

Guidance and mentoring are very important to the process of health careers training. While growing up, there needs to be more opportunities for students to experience health careers in a positive way, and more ways to get information about health careers to students, counselors and parents. Other research has shown that different ethnic groups respond best to different types of support: Native Hawaiian students preferred addressing issues of low self esteem; Filipino students described the need to confront family responsibilities; and Samoan students remarked on homesickness and environmental factors.\textsuperscript{8} Our research found that there is a special bond that is formed among Pacific Island students such that social groups are described as “surrogate” families. A great majority of those interviewed indicated that their Micronesian classmates are considered “brother” or “sister.” Participants described the need for a social structure allowing for group activities of Micronesian students, positive peer pressure to study harder and complete training, and tutoring assistance to help with the adjustment to a new learning style. Local clubs, resources centers, tutors, counselors and role models are important and were recommended because students are more likely to complete training if they are guided, supported and helped through the educational process.

Respondents felt that this would be easier if the training program were located closer to home and utilized a learner-centered, culturally appropriate methodology that would maximize learning for Micronesians.

**Role Models**

Role models and peer mentoring have proven very significant to career success in the literature,\textsuperscript{17} with self efficacy (personal belief about level of ability) correlating with positive role models.\textsuperscript{18} However, the lack of exposure to role models is a common theme in Micronesia. Since there is a lack of adequate workforce, it follows that there are not enough role models. In addition, healthcare workers are described as too busy to go into schools and talk about their careers. Being overworked is also a factor discouraging students from considering healthcare a desirable field. Participants described the need for a better working environment and better pay for healthcare workers, in order to increase the interest in such careers today. Study participants indicated that a strong vocational training program that: began at an early age, included mentors, role models, in-school activities and special tutoring would improve interest in health careers, as would increased funding for schools, teachers and guidance counselors.

In the group of Micronesian healthcare professionals interviewed, personal commitment was very high, and fear of failure, or bringing shame to their family, was a significant motivator not usually described in U.S. populations.

In the group of Micronesian healthcare professionals interviewed, personal commitment was very high, and fear of failure, or bringing shame to their family, was a significant motivator not usually described in U.S. populations. Interestingly, racism was never mentioned by the participants, although cultural differences were noted. This may be due to the fact that most of the students attended schools in Hawai’i, Papua New Guinea and Fiji for their post graduate training, areas that are more diverse than most schools in the U.S. Future research should examine how having a family member in healthcare impacts pursuit of health care, this is not clear from the present study.

Limitations of this study include the small numbers of individuals interviewed; however, many of the answers converged such that the authors believe that the results can be generalized to the region. Because each participant was not pressed for an answer to each question in the second study, and some participants offered more than one answer, it is likely that the opinions of more vocal participants were overrepresented. In addition, participants were not queried regarding their
age or their years of practice, therefore, differences in responses based on these factors were not analyzed. These potential biases could be addressed by performing a written survey of all healthcare workers in the region and using a statistical analysis program to analyze the larger response pool.

Conclusions And Recommendations
In order to build up the necessary workforce, local students must be encouraged to enter the health workforce, they must have extensive academic preparation, be trained locally or assisted with the difficult transition to distant training locations and be supported emotionally and financially throughout the process. Family factors must be given extensive attention, as well as the educational preparation that students receive.

Programs in the international literature that have been shown to effectively recruit and retain minority health professions students include aspects such as: tailoring the admissions and training to the cultural needs of a group, beginning recruitment at an early age by recruiters who understand local cultural needs, advertising culturally appropriate programs and support services, and involving native communities in recruitment efforts; encouraging the maintenance of attachment to significant people from home; financial assistance; transitional support services for college, academic support services for at-risk students, math intervention programs, vocational support services, tutoring and student support services; family/community encouragement, academic training; mentoring, guidance and role modeling; ongoing support; knowledge and skill development, academic and social integration, support and motivation, and monitoring and advisement; and freshman-only advising, orientation courses for credit, monitoring of attendance for at-risk students, targeting minority groups with specific retention plans, and required tutorial and mentoring activities for certain at-risk students.

Based on the current research, the factors that may be of most significance in the areas of Micronesia studied would be getting students interested early through activities that engender family support such as in-school or after school activities that require parental involvement, community health fairs and early mentoring programs. While it is premature to suggest selecting students who have family members in health careers based on this study, the results can be interpreted to indicate that involving family members who have experience in healthcare in mentoring, school-based and community-based activities may increase student success at pursuing such careers based on the findings of this study. Strengthening the academic support in English, math, and science is very important to provide the foundation necessary for success in post graduate study of health fields. Providing local training, or providing training at an institution where there are a critical mass of students from Micronesia, a system of mentoring by Micronesian healthcare workers and a location conducive to staying in touch with family and cultural practices would maximize success.

The Medical Officer Training Program that was present in the Pacific from 1987-1997 had many of these qualities: it was a 5-year long training program, designed to be culturally appropriate, locally based, and utilize extensive social support systems. Local nursing training programs have educated most of the indigenous nursing workforce in the area. Distance learning, either alone in combination with local face-to-face training or oversight, has been used successfully to provide public health, pharmacy technician and laboratory technician training. In order to meet the health workforce needs of the region, programs such as this should be expanded or created, and, there must be significant effort given to academic preparation of and social support for students who leave to go to distant training locations.

References


Ulithi Atoll Health Assessment: A Peek at the Health of Rural Micronesia

W. Thane Hancock, MD, MPH*
A. Mark Durand, MD, MPH**
Arthur Yolwa, MD**
Josey Sagury**
Clotilda Legthar**
Mihi Ratima, PhD†
Kelly Wachi, MD‡
Aparajita Adhikary, DO§
Mikela Yarawamai¶
Ana Yarawamai¶
Gregory G. Maskarinec, PhDc

*Wu’ab Community Health Center, Colonia, Yap State, Federated States of Micronesia; **Yap State Department of Health Services, Colonia, Yap State, Federated States of Micronesia; ‘Harvard Medical School’s Center of Excellence in Women’s Health, c/o Brigham and Women’s Hospital, Boston, Massachusetts; ‘Department of Internal Medicine, John A. Burns School of Medicine, University of Hawai‘i at Manoa, Mililani, Hawai‘i; ‘Department of Pediatrics, John A. Burns School of Medicine, University of Hawai‘i at Manoa, Mililani, Hawai‘i; ‘Oceania Community Health, Kailua-Kona, Hawai‘i; ‘Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, Mililani, Hawai‘i. Address correspondence and reprint requests to: Gregory G. Maskarinec, PhD, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, 95-390 Kualuelani Avenue, Mililani, Hawai‘i 96789-1192; gregorym@hawaii.edu.

Abstract
Background: The health challenges of Micronesians are generally well known. However, most of the health-related data collection occurs in the population centers and relatively little is known about the health of the residents of Micronesia’s rural outer islands. This is of particular concern in the Federated States of Micronesia (FSM) where a large portion of the population lives on the outer islands. To gain a better understanding of the health issues facing the isolated outer islands of Micronesia, a health survey was performed on Ulithi Atoll in Yap, FSM. Methods: A survey was created by the Yap State Department of Health Services and members of the Ulithian community. The survey was carried out on two of the four inhabited islands of Ulithi Atoll in July 2004. Both island communities actively participated in the survey providing translation and data gathering assistance. Results: It was estimated that a >90% response rate for both islands was achieved. Analysis demonstrated that relative to the U.S., the Atoll’s population experienced high rates of obesity (45%), hypertension (29%), and smoking (55%). Sixty-six percent of men surveyed reported alcohol use versus 16% of women. Use of alcohol was markedly lower on Fatharai Island where a Chief had mandated abstinence. Preventative health screening was limited with over 80% of women having pap smear in the past 2 years. In addition, the community identified finances and transportation as the main difficulties in accessing healthcare. Conclusion: Overall, the research identified a number of health issues that require closer attention, in particular hypertension, overweight, obesity, alcohol misuse, smoking prevalence, betel nut/tobacco chewing, and domestic violence. There is indication that the community may be ready to address some of these issues. The value of community action within cultural frameworks is apparent, and there may be potential to extend culturally-based approaches to address a broader range of issues. (PHD 2007 Vol 14 No 1 pp 156-164)

Introduction
There is little reliable data to give an accurate picture of the health status of rural Micronesia. While headcounts of the outer island residents receiving treatment at population center clinics provides some indication of disease prevalence, this provides at best a hazy picture of community health status and little indication of lifestyles and health-related behaviors in rural communities. This is especially pertinent given the rapid social changes affecting the islands. Movement from a traditional subsistence lifestyle to a more sedentary “modern” lifestyle has often been identified as responsible for problems in Micronesian health.1 The introduction of imported foods, tobacco, and alcohol, alongside reduced physical activity symbolizes this “modern” lifestyle. Because of their relative isolation, the rural communities in Micronesia have been slower to adopt these lifestyle changes and it was often assumed that this was health protective. However, over time increasingly rural communities are transitioning to a “modern” lifestyle. There is little to no data on the health status of these communities.
To gain a better understanding of the health of rural Micronesia a health assessment was done on Ulithi Atoll in Yap State, Federated States of Micronesia (FSM). The survey was designed to get a picture of basic health statistics such as population height, weight, and blood pressure, and to collect information on health behaviors, including alcohol use, tobacco use, and betel nut chewing.

Yap State is the westernmost state of the FSM, and is composed of Yap Proper and approximately 66 outer islands and atolls, 22 of which are inhabited. Yap State stretches approximately 600 miles, encompassing 500,000 square miles of area. However, because of the small size of the islands, Yap State consists of only 45.8 square miles of land area. According to the 2000 Preliminary Census of the FSM, the population of Yap State is 11,241. Yap Proper is the population center with approximately 60% of the population. The other 40% of the population resides on the outer islands. Ulithi Atoll is an outer island of Yap located 100 miles northeast of Yap Proper. The 2000 census estimated the atoll to have a population of 1,016. The atoll is comprised of 35 islands, however only four of those islands are currently inhabited: Falalop, Azor, Mogmog, and Fatharai (Figure 1). The population of Ulithi fluctuates with the movement of students during the school year.

**Methods**

The health assessment project was initiated and supervised by the Yap State Department of Health Services. It utilized a survey tool initially developed to survey the community of Yap Proper. The survey tool was translated into Ulithian and pre-tested with four Ulithian community members residing on Yap Proper. The collection techniques were approved by the Yap State Department of Health Services, following consultation with local community health leaders to ensure that the survey would be conducted in a culturally acceptable manner.

The study was conducted on two of the islands in July 2004 with the assistance of members of the local communities and volunteers from Oceania Community Health. Community agreement to take part in the survey was sought and secured prior to the initiation of fieldwork.

On Fatharai the assessment was directed by Clotilda Legthar, the island’s community health aid. Because the population often moved between households in the small village, it was decided by Ms. Legthar that it would be best to invite potential participants to a central community center where interviews would be conducted. Women and children were interviewed on one day and the men were interviewed the following day. Those who were unable to attend the interviews at the community center were given the option of being interviewed in their homes.

On Mogmog, the survey was directed by the island’s medic, Josey Sagury, and the island’s physician, Dr. Arthur Yolwa. Community members were invited to be interviewed at the community health dispensary. Josey Sagury coordinated the interviews so that households came to the dispensary a few at a time. The men were interviewed by a male interviewer, and the women by a female interviewer. It was estimated by the co-coordinator, who has a good knowledge of the local community, that only 20 residents were not interviewed as they were off island collecting food for an upcoming feast.

Blood pressures were collected using manual sphygmomanometers. Hypertension was defined as a systolic blood pressure of >140 or diastolic blood pressure of >90. Severe hypertension was defined as a blood pressure >160 or diastolic blood pressure >110.

Weight was calculated using a portable scale that was checked for accuracy with the Yap Hospital scale prior to the survey. Body mass index (BMI), an estimate of body fat based on height and weight, was calculated using the standard kilograms divided by the square of height in meters. Consistent with usual standards, overweight was defined as a BMI ≥25. Obese was defined as a BMI ≥30.

Blood sugars on Fatharai were taken using a One Touch Ultra® blood sugar monitor. Random blood sugars were...
Table 1. Total Number of Individuals Surveyed

<table>
<thead>
<tr>
<th>Island</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>% Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatharai</td>
<td>58</td>
<td>61</td>
<td>119</td>
<td>51.26</td>
</tr>
<tr>
<td>Mogmog</td>
<td>90</td>
<td>92</td>
<td>182</td>
<td>50.55</td>
</tr>
<tr>
<td>Total</td>
<td>148</td>
<td>153</td>
<td>301</td>
<td>50.83</td>
</tr>
</tbody>
</table>

Results

Population

The total number of people surveyed on Mogmog and Fatharai was 301 (Table 1). These numbers represent the individuals on the island at the time of the survey. As noted previously, there were an estimated 20 people who were not surveyed on Mogmog. In addition, there may be individuals who were spending the summer in other locations at the time of the survey.

The community is predominately composed of younger individuals with 43% of the population under the age of 18. This compares to 26% of the U.S. population being under the age of 18 in the 2000 census. The islands’ populations were 49% male and 51% female. This is consistent with the Yap State trend noted in the 2000 census, with 49% male (5,508) population, and 51% (5,733) female.

Blood Pressure

Blood pressure readings demonstrated that 29% of people on Fatharai and Mogmog age 20 years and over had hypertension. This compares with a U.S. rate of 25.2% for the same age group. Approximately 10% of individuals on the two islands had severe hypertension. This elevated rate of blood pressure may be due to high rates of tobacco and alcohol use. Although the numbers are not large enough to be statistically significant, it is interesting that the rate of hypertension is 15% in Mogmog females, compared to a rate of 35% for all other groups (Figure 2). This may be linked to the significant differences in alcohol consumption between the two groups. There are no major differences in smoking rates by gender.

Blood Sugar

Because of a lack of supplies, random blood sugars were only collected on individuals on Fatharai age 35 and over. On Fatharai, 5.2% of individuals age 35 and over had elevated blood sugars. This compares with a U.S. prevalence of diabetes of 5.5%. Although one random fasting blood sugar does not meet the American Diabetes Association definition for diabetes (two random blood sugar readings of ≥200 [mg/dl] with symptoms of diabetes mellitus, or a fasting blood sugar reading of ≥126 [mg/dl] on two occasions, or 2 hour postload glucose readings of ≥200 [mg/dl]) it may suggest a prevalence of diabetes of around 5%.

Body Mass Index

The average BMI for individuals aged 20 years and over on the two islands was 30. One hundred twenty-six of 154 individuals (82%) were overweight or obese with a BMI ≥25, and 70 of 154 (45%) were obese with a BMI ≥30 (Figure 3).

On Mogmog, 79 of 95 (83%) were overweight or obese, and 42% met the criteria for obesity. On Fatharai, 47 of 59 (80%) were overweight or obese, and 51% met the criteria for obesity (Figure 3). This compares to a U.S. prevalence of 66.3% overweight or obese, and 32.2% obese. The average BMI is 30 for Fatharai and Mogmog for persons aged 20 and over are similar to the average BMI of 31 revealed in a 1994 survey of Kosrae, another island state of the FSM.
When examining BMI by age group, the average BMI for those ages 36-60 years is >30, meeting the criteria for obesity (Figure 4).

**Access to Care**
Individuals on both islands were asked if they had difficulty accessing healthcare. The survey contained the examples of possible reasons for poor healthcare access; these were “money difficulties, lack of family support, transportation difficulties, language difficulties, insurance problem and other.”

![Body Mass Index Average by Age Group](image)

Forty percent of individuals age 15 years and over stated they had difficulties. The main reasons were financial and transportation difficulties.

On Mogmog Island, 45% reported difficulties in accessing healthcare. On Mogmog, money difficulties, transportation difficulties, and lack of medications at the local dispensary were the top three reasons (Figure 5). On Fatharai, 34% reported difficulties. On Fatharai, the main three reasons were money difficulties, transportation difficulties and lack of trust (Figure 5). In the “other” category, the most commonly identified difficulties were lack of medications and lack of trust.

**Cervical Screening**
Of the women surveyed aged 15 years and over, 79 of 94 (84%) reported that they had not had a pap smear in the past two years.

On Fatharai, 32 of 37 (86%) were without a pap smear in the past two years. On Mogmog, 47 of 57 (82%) were without a pap smear. This compares with approximately 15% of women in the U.S. not being properly screened. 9

**Family Planning**
Of the women surveyed, ages 15 to 55 years (age at risk for pregnancy), 18% indicated use of some form of birth control. An additional 17% of women were interested in using family planning methods.

On Mogmog, 20% used family planning and 15% of women were interested in using birth control in the future. Therefore, 35% of the women ages 15-55 years surveyed on Mogmog were interested in some form of birth control.

On Fatharai, 16% used family planning and 22% of women were interested in using it in the future. Thus 38% of the women ages 15-55 years surveyed on Fatharai were interested in some form of birth control.

![Are There Problems on the Island That Need Community Action?](image)

This compares with a median prevalence of 84% for birth control use in the U.S. (percentage of women at risk for pregnancy who said they or their partner were using some method of birth control). 10

**Community Action Issues**
Survey participants were asked to identify health-related concerns on the island. The survey instrument contained the following list of examples of possible community problems, “…alcohol, suicides, child abuse and neglect, elderly abuse and neglect, violence against women, tobacco use by teens, marijuana and other.” Of those surveyed aged 15 years and over, 93% indicated that there were problems on the island that required community action (Figure 6). The three most common community problems identified were alcohol misuse, teenage smoking and marijuana use.
On Mogmog, 96% felt there were community problems. The three main problems were alcohol abuse, teen smoking and marijuana (Table 2 & Figure 7).

On Fatharai, 89% felt there were problems. The three main problems were alcohol abuse, teen smoking and marijuana (Table 2 & Figure 7).

When only examining the female responses, 6 of 37 (16%) of the women from Fatharai identified violence against women as a problem. However, on Mogmog, 41 of 57 (71%) of women identified violence against women as a problem. Therefore, 50% of all the women surveyed identified violence against women as a problem. Other self-identified problems were: cultural change, no toilets, diet changes, children up late at night, home abortions, high blood pressure, tobacco chewing with betel nut, erosion, and pollution of the ocean.

Table 2. Island Problems Identified by Island

<table>
<thead>
<tr>
<th>Island</th>
<th>Alcohol</th>
<th>Suicide</th>
<th>Child abuse</th>
<th>Elderly abuse</th>
<th>Domestic violence</th>
<th>Teen smoking</th>
<th>Marijuana</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatharai</td>
<td>56</td>
<td>17</td>
<td>39</td>
<td>27</td>
<td>17</td>
<td>49</td>
<td>41</td>
<td>2</td>
</tr>
<tr>
<td>Mogmog</td>
<td>99</td>
<td>76</td>
<td>63</td>
<td>52</td>
<td>48</td>
<td>89</td>
<td>90</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>155</td>
<td>96</td>
<td>102</td>
<td>78</td>
<td>65</td>
<td>139</td>
<td>131</td>
<td>9</td>
</tr>
</tbody>
</table>

Of note, none of the individuals interviewed under the age of 18 indicated that they drank alcohol.

On Mogmog, the frequency of drinking was much greater than on Fatharai with over 80% drinking daily (Figure 8). Of those that drank daily on Mogmog, the majority had 4-8 drinks per drinking episode.

**Smoking**

The prevalence of smoking for all individuals age 18 years and over was 55% on the islands. Mogmog had higher rates of smoking than Fatharai, 57% vs. 50% respectively. This compares to a smoking prevalence of 22.5% for U.S. adults. On, 54% of females smoked and 49% on Mogmog. Of note, 2% under the age of 18 indicated that they smoked (three of 133). Smoking rates increase substantially after the age of 20, from a rate of 16% in the 16-20 age group to 40% and greater in all other age groups (Figure 9).

**Betel Nut**

Betel nut is a type of palm nut traditionally chewed in Yap (as well as other parts of the Pacific and Asia.) It is chewed with powdered lime (in Yap, made from burnt coral) and pepper leaf. The combination of the three ingredients produces psychoactive effect similar to smoking a cigarette. Traditionally, only these three
ingredients were used. Now tobacco is often added as a fourth ingredient, sometimes after it has been soaked in alcohol.

The survey showed that 81% of individuals age 15 years and over used betel nut on the islands. Mogmog and Fatharai had similar rates of use, 82% and 81%, respectively. Of those that used betel nut, only 24% used the traditional mixture of betel nut, lime and pepper leaf. Seventy-six percent added tobacco to their betel nut. Of those that added tobacco 71% soak it in alcohol first. There was a higher rate of soaking tobacco in alcohol for betel nut chewing on Mogmog (Figure 10).

On the islands, betel nut use appears to begin at an earlier age than smoking or drinking with 7% of individuals age 15 years and under admitting betel nut use (Figure 11).

While it should be noted that overall numbers of survey participants were not large, the rate of hyperglycemia was 5.2%. If this is close to the rate of diabetes in the communities, this would be substantially lower than the rate of diabetes in "urbanized" areas of Micronesia. For instance, the rate of diabetes in Ebeye of the Marshall Islands has been estimated at 20% for those age 30 years and over. This may represent a beneficial effect of the traditional subsistence lifestyle that persists in the outer islands. However, further research would be required to accurately gauge diabetes prevalence in rural Micronesia. It would be worthwhile to compare prevalence rates between rural and "urbanized" populations to investigate the extent of any differences and the reasons for any identified difference.

Despite the apparent lower rates of hyperglycemia, the outer island lifestyle on Ulithi does not seem to improve population BMI profiles. For both islands and genders, there were high rates of overweight and obesity, even when compared to U.S. standards. However, the prevalence of overweight and obesity appear to be consistent with those of other Pacific Island communities. It should be noted that there are ethnic differences in the extent to which universal BMI standards reflect the risk of obesity-related disease. There is a growing body of evidence that the associations between BMI, percent body fat, and health risks vary across ethnic groups.
Also, in some individuals BMI can be a poor indication of obesity as a fit individual with high lean mass could have an elevated BMI.

When examining access to care lack of money and transportation were listed as key barriers to healthcare. Other reasons included lack of medications, lack of trust and language difficulties. All of these factors highlight the difficulty of delivering healthcare across the isolated, distant and culturally diverse communities of the outer islands. Transportation is essential for the movement of patients and supplies in the outer islands. Most transportation is provided by a state government run ship that visits the outer islands once every two months. In addition, there is a small air service operated by Pacific Missionary Airlines can provide emergent health evacuations to three of the outer islands. The movement of patients is important because only primary medical care is available in the outer islands. All complex cases, including primigravid women, are referred to Yap Proper for medical care. The cost of healthcare becomes an issue for many when traveling to Yap is required. If a patient is evacuated, the air services are provided free of charge by Pacific Missionary Airways, however, family members must self-fund travel to Yap Proper. This is often cost prohibitive. In non-emergent situations, outer islanders may feel pressure to access healthcare from Yap Proper. This is likely due to a more reliable supply of medications and greater choice of health providers. Since the survey was conducted, the Yap Department of Health Services has moved two previously Yap Proper based physicians to the outer islands to improve access to care. A small number of respondents indicated a lack of trust in their healthcare providers. Since this study, the Yap Department of Health Services has increased the amount of training offered to outer island health professionals. Most of this education has been via single side band radio. The additional training has the potential to contribute to increasing the community’s trust in their health providers.

The low rates of cervical screening relate to poor resources for obtaining and evaluation of cervical smears. At the time of the survey, the State of Yap had a limited number of pap smears (300) allocated each year through its contract with Clinical Laboratories in Hawai’i. This enables coverage of around 12% of the women aged 20 years and over. Due this limitation, screening is only available for expectant mothers, and patients who visit the family planning and gynecology clinics.14 Recently there has been lobbying to increase the number of pap smears available to the FSM.

While the survey indicates that the percentage of women interested in family planning was low relative to the United States, the results may underestimate interest in birth control. Birth control is likely to be a culturally sensitive issue and data collection through face-to-face interviews may have therefore led to a degree of underreporting. Another possible explanation may be strong influence of the Catholic Church in the islands. Of the total population of Yap 60% is Catholic.15 This percentage is much higher on Ulithi Atoll where all churches are Catholic.

The State of Yap has a limited number of pap smears (300) allocated each year through its contract with Clinical Laboratories in Hawai’i this enables coverage of around 12% of the women aged 20 years and over.

The community listed several issues as island concerns. It is generally recognized that there are high levels of alcohol consumption among Micronesians. Both surveyed communities identified alcohol misuse as the most important community problem, indicating that there may be a high degree of community readiness to address the concern and therefore reduce alcohol consumption. The high rate of alcohol use among the men of Mogmog is consistent with trends across Micronesia. The much lower rates of drinking in Fatharai and among the women of Mogmog indicate there is much potential to reduce alcohol misuse. Both of these lower rates are due to “cultural interventions” put in place. On Fatharai the Chief used his cultural authority to place a ban on alcohol consumption. On Mogmog, it is considered culturally inappropriate for women to consume alcohol. This suggests that cultural beliefs and values may provide a vehicle for future public health initiatives that support behavioral change. The Fatharai intervention involved an action that was developed within the cultural paradigm of Ulithi Atoll. It utilized the customary power of the Chief to implement health protecting “rules” for the island community. This is similar to the Polynesian concepts of tapu (restricted access) and noa (free access) that, some argue, functioned as a public health system by providing a framework for acceptable and unacceptable behavior for individuals and communities.16 This type of intervention differs from the usual approach in the U.S. whereby a “mainstream” program is adapted to be culturally acceptable to various ethnic groups through, for example, the translation

The low rate of family planning in the outer islands likely accounts in part for the higher percentage of the population being under the age of 18.
of program materials. Rather, this intervention was uniquely Ulithian, developed within a Ulithian paradigm, and therefore specifically tailored for an Ulithian community. Certainly, pre-colonization indigenous societies had traditional public health systems already in place to deal with the health challenges of the time. Many of the principles underlying those systems have retained relevance to the present day, and can form the basis for a public health approach to meet modern challenges. There is a small, but growing literature base on these types of culturally derived interventions most notably in the indigenous communities of New Zealand, Australia, the U.S. and Canada. New Zealand Maori have demonstrated success in utilizing cultural interventions as a modern public health tool. For instance, a program developed completely within a Maori model was successful in lowering asthma morbidity in a rural Maori community.17 It is apparent that similar public health interventions that utilize customary systems and principles are likely to be successful in rural Micronesia.

Another striking feature of the survey results is the high number of women on Mogmog that identified violence against women as a problem. This is an important result that justifies further investigation. Domestic violence is not often publicly discussed among the Micronesian community. The high rate of alcohol use among Mogmog men may contribute to increased rates of domestic abuse. Further work is required, not only to identify the extent to which domestic violence is a problem on the islands but more importantly to facilitate the development of community-based interventions to address the problem.

Smoking rates in the outer island community are very high, over twice the rate found in the U.S. As a primary modifiable risk factor for a range of chronic diseases, smoking cessation should be actively pursued in rural Micronesia. This may be difficult as tobacco has been engrained in Micronesia since exposure to Western traders in the 1500s. Much of the smoking in the outer islands uses locally grown tobacco that is then wrapped in newspaper. The effects of smoking the newsprint dye are unknown.

Although identified as a carcinogen, betel nut chewing is considered a part of Yapese tradition. This is evident by the high rates of betel nut use, even on the outer islands where it usually is not grown. It would be extremely difficult to stop betel nut chewing without affecting the larger culture and individuals' self-identification as being Yapese. However, adding tobacco to betel nut is not a Yapese cultural tradition. No doubt, this increases the cancer risk of chewing and may be a behavior that should be targeted in future public health interventions.

We acknowledge there are limitations to the study. While the numbers of survey participants are small, it should be noted that over 90% of the two communities participated, therefore, results are representative for these communities. Due to language and literacy issues, as well as cultural preferences, interviews were carried out face-to-face. While there was a high level of interaction between the interviewer and respondent, which may have impacted data quality, this was an interview style that was considered to be culturally appropriate.

Overall, the research has identified a number of health issues that require closer attention, in particular hypertension, overweight and obesity, alcohol misuse, smoking prevalence, betel nut chewing, and domestic violence. There is some indication that there may be a high degree of community readiness to address some of these issues. The value of community action within cultural frameworks is apparent, and there may be potential to extend culturally-based approaches to address a broader range of issues. Unfortunately, public health action on Ulithi is constrained by the limitations imposed by small island isolation and limited health resources. Survey participants indicated that financial and transportation issues were barriers to obtaining healthcare. However, culturally-based interventions that are tailored to the particular needs of the communities, such as increased training of health professionals to enhance community trust and the reduction of alcohol misuse, have much potential in the short, medium and long term. There is clearly much value in the implementation of broader public health action to address these community defined health priorities.

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Age of Onset of Obesity, Diabetes and Hypertension in Yap State, Federated States of Micronesia

Zoë W. Durand
Summer Intern, Wa‘ab Community Health Center, Yap, Federated States of Micronesia. Address correspondence and reprint requests to: Ms. Zoë W. Durand, 1109 Melvin Avenue, Maryville, Tennessee, U.S.A. 37803-5730; shadygrove@att.net.

Abstract
Background: As in many areas of the world, obesity, non-insulin dependent diabetes mellitus and hypertension have become major problems in Yap. Methods: The population of the main island cluster of Yap age 2 years and older was surveyed and clinically evaluated. Results: Obesity becomes common in people ages 15-25 years, diabetes (random blood sugar 144) at ages 45-55 years, in females and 55-65 years in males, and hypertension (SBP>140 or DBP>90) at ages 25-35 years. Conclusions: Female and male children might be targeted for obesity prevention as young as 15 years of age and tested for hypertension at 20 years and diabetes at 40 years. (PHD 2007 Vol 14 No 1 pp 165-169)

Background
Obesity, non-insulin dependent diabetes mellitus and hypertension cause morbidity and mortality around the world. These diseases are often interwoven.

In a subsistence economy obesity is nearly nonexistent. The transition from subsistence living to processed foods, however, results in a higher prevalence of obesity. Along with obesity comes a higher prevalence of diabetes and hypertension. These modern epidemics cause suffering due to amputations and increased risk of blindness, stroke, nerve damage, kidney disease, and heart attacks.

Worldwide prevalence of diabetes, hypertension, and obesity have dramatically increased in the past few decades. The World Health Organization (WHO) found the four leading causes of mortality in the Federated States of Micronesia (FSM) to be diseases of the circulatory system, neoplasm, diseases of the respiratory system, and endocrine, nutritional, and metabolic diseases, respectively.

The five leading causes of mortality in Yap are heart disease, pneumonia, cancer, stroke, and diabetes, respectively. Of the five leading causes, heart disease, stroke, and diabetes are directly related to obesity; hypertension, diabetes, pneumonia and cancer may sometimes be associated with obesity.

Dr. James V. Neel noted that American Indians, Pacific Islanders and Esquimaux (Eskimos) are seemingly more susceptible to obesity and diabetes than other ethnic groups. He proposed that the cycle of feast and famine that hunter-gatherers and subsistence farmers experienced caused evolution to favor body types that could easily convert sugar and carbohydrates to fat, this is known as the “thrifty gene” hypothesis. In times of plenty, people would eat much more than was healthy to build up fat for times of want. With modernization and the cash economy, enough cheap foods high in salt, sugar and fat are available, that the subsistence economy and cycles of feast and famine are becoming rare, while sedentary lifestyles are becoming the norm.

Easily acquired, pre-packaged foods now dominate the diets of most Yapese. New staples of canned fish and meat (mackerel, spam, and corned beef) and white rice have replaced traditional taro and fresh fish. On average, 41% of household income is spent on imported food, alcohol, and tobacco.

In 2005 grant funding was secured to establish a network of primary care centers in the main island cluster of Yap State. As part of this project, 11 community health workers were trained to provide preventative services to the villages and households of their respective communities. A house-to-house survey was designed to familiarize the health workers with the households in their districts, to identify opportunity for improvement, and to find cases of diabetes, pregnancy, malnutrition, hypertension, tuberculosis, leprosy, and other conditions. Each health center surveyed the geographical area that they were responsible for. All of the households were visited and all residents were surveyed. This data source was used to determine the prevalence of overweight, obesity, and hypertension to determine the age of...
onset of these conditions. This information is useful for deciding how to target interventions and measuring their success over time.

Methods

A cross-sectional household survey conducted between April and August of 2006 was used to gather raw data. The survey was designed and pilot tested in 2005, and then revised to its present form in the Yapese language. Community health outreach workers were trained to administer the survey and to deliver other preventative services through six college level courses administered through the College of Micronesia. These courses included in-depth training in traditionally appropriate means of approaching local communities, establishing rapport with survey respondents and taking measurements. The study was directed toward all of the residents of one of the main districts of Yap, Nimigil. Height and weight were recorded for all ages, blood pressure for people age ≥15 years and random capillary glucose for people age ≥35 years because substantial rates of hypertension and diabetes were thought to be unlikely in younger age groups.

Random blood sugar was measured using a capillary blood glucose meter using standard procedure as described in the meter’s package insert. Glucose measurements were taken without regard to meal times. Subjects were also asked, “Has a doctor or health worker ever told you that you have high blood sugar or diabetes?” Random blood sugar of >144 or self-professed diabetes identified a person as diabetic. Height was measured in inches in a standing position using a rigid measuring stick. Bed bound subjects were measured in supine position. Weight was measured in pounds using a portable spring scale calibrated with 50- and 100- pound reference weights. Shoes and excess garments were removed when subjects were weighed, but lightweight garments were left in place.

Blood pressure was measured on adults with an arm cuff sphygmomanometer with a dial pressure gauge. Hypertension was defined as a systolic blood pressure of >140 or a diastolic blood pressure >90. The target group was subdivided into age groups as follows: >2-5 yrs; 5.1-10 yrs; 10.1-15 yrs; 15.1-25 yrs; 25.1-35 yrs; 35.1-45 yrs; 45.1-55 yrs; 55.1-65 yrs; 65.1-75 yrs; and >75 yrs; The age groups were further stratified by sex. Epi Info™ was used to convert weight in pounds to weight in kilograms, height in inches to height in meters, and to calculate body mass index (BMI) (kg/m²). Adults were defined as people over the age of 15 years and children as people aged 2 through 15. For adults, overweight was defined as a BMI of 25 to 29.9, and obesity was recorded as a BMI of 30 or greater as defined by the U.S. National Institutes of Health’s National Heart, Lung, and Blood Institute. For children, overweight and obesity were defined as BMIs > 85% and 95% of the reference population by age and sex. Epi Info was used to calculate the prevalence of obesity, overweight, hypertension, and diabetes, stratified by age groups and sex. Non-respondents were excluded from the prevalence calculations.

Results

There were 3,496 adult participants in this study. The response rate for this study was 71% of the population of Yap Proper compared to the 2000 census. Female adults (1869, 53%) outnumbered male adults (1627, 47%). There were 1736 child participants in this study. Male children (888, 51%) outnumbered female children (848, 49%) (Tables 1 and 2).

Table 1. Characteristics of the Adult Population Sample

<table>
<thead>
<tr>
<th>Population</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male adults</td>
<td>1627 (47%)</td>
</tr>
<tr>
<td>Female adults</td>
<td>1869 (53%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;15 - 25</td>
<td>884 (25%)</td>
</tr>
<tr>
<td>&gt;25 - 35</td>
<td>693 (20%)</td>
</tr>
<tr>
<td>&gt;35 - 45</td>
<td>642 (18%)</td>
</tr>
<tr>
<td>&gt;45 - 55</td>
<td>664 (19%)</td>
</tr>
<tr>
<td>&gt;55 - 65</td>
<td>326 (9%)</td>
</tr>
<tr>
<td>&gt;65 - 75</td>
<td>181 (5%)</td>
</tr>
<tr>
<td>&gt;75</td>
<td>106 (3%)</td>
</tr>
<tr>
<td>Obese (BMI ≥30)</td>
<td>1264 (36%)</td>
</tr>
<tr>
<td>Overweight (BMI ≥25)</td>
<td>955 (27%)</td>
</tr>
<tr>
<td>Mean BMI</td>
<td>28</td>
</tr>
<tr>
<td>Diabetic (RBS&gt;144)</td>
<td>696 (20%)</td>
</tr>
<tr>
<td>Hypertensive (SBP&gt;140 or DBP&gt;90)</td>
<td>1229 (35%)</td>
</tr>
</tbody>
</table>

The mean BMI for adults was 28. Thirty-seven percent of female adults (696) were obese and 25% (473) were overweight. Thirty-five percent of male adults (568) were obese and 30% (482) were overweight. Female children had an obesity prevalence of 20% (144) and an overweight prevalence of 13% (99). Male children had an obesity prevalence of 21% (164) and an overweight prevalence of 10% (78) (Table 3).
The overall prevalence of obesity was 36% (1264) for adults and 16% (243) for children. The overall prevalence of overweight adults was 27% (955) and 12% children (177). In both males and females, the prevalence of obesity and overweight were remarkably high. The prevalence of obesity started to rise steeply at 15 years of age for both males and females. Prevalence of obesity peaked between the ages of 55 and 65 years for males and between the ages of 45 and 55 years for females. Although the prevalence of obesity or overweight rose sharply in both males and females, females had a higher rate (Figures 1 and 2).

The overall prevalence of hypertension in adults was 35% (1229). The prevalence of hypertension for males was overall much higher than the prevalence for females. Males experienced a notable rise in prevalence at a slightly older age than females did. While males experience dramatic changes in prevalence across the age groups, females had relatively little change. The prevalence of hypertension in males peaked between age 55 and 65. The hypertension in females had a maximum at 75 years of age (Table 3).

In both females and males, the prevalences of obesity, overweight, hypertension, and hyperglycemia took upswings between the ages of 25 and 55. Males generally had higher prevalences than females, except occasionally before the age of 45.

Of the 696 subjects with diabetes, 71% (496) reported never having been informed that they were diabetic.

### Discussion

This is the first systematic, population-level study of these conditions in Yap. The population of Yap Island has significant burdens of obesity and overweight, hypertension, and diabetes. Obesity and overweight appear in children as young as 2 years of age and skyrocket between ages 15 and 25 years in both males and females. Males experienced a notable rise in prevalence at a slightly older age than females did. While males experience dramatic changes in prevalence across the age groups, females had relatively little change. The prevalence of hypertension in males peaked between age 55 and 65. The hypertension in females had a maximum at 75 years of age (Table 3).

In both females and males, the prevalence of obesity, overweight, hypertension, and hyperglycemia took upswings between the ages of 25 and 55. Males generally had higher prevalences than females, except occasionally before the age of 45.

Of the 696 subjects with diabetes, 71% (496) reported never having been informed that they were diabetic.

### Table 2. Characteristics of the Child Population Sample

<table>
<thead>
<tr>
<th>Population</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male children</td>
<td>888</td>
</tr>
<tr>
<td>Female children</td>
<td>848</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age in years</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 - 5</td>
<td>359</td>
</tr>
<tr>
<td>&gt;5 - 10</td>
<td>584</td>
</tr>
<tr>
<td>&gt;10 - 15</td>
<td>588</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overweight</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(85-95% reference population)</td>
<td>177</td>
</tr>
<tr>
<td>Obese</td>
<td>243</td>
</tr>
</tbody>
</table>

| Table 3. Prevalence of Obesity, Overweight, Elevated Blood Pressure, and Diabetes by Age Group

<table>
<thead>
<tr>
<th>Age Group (Yrs)</th>
<th>Obesity # (%)</th>
<th>Overweight # (%)</th>
<th>Hypertension # (%)</th>
<th>Diabetes # (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
<td>Females</td>
<td>Both</td>
<td>Males</td>
</tr>
<tr>
<td>&gt;2-5</td>
<td>51 (27)</td>
<td>37 (22)</td>
<td>88 (25)</td>
<td>11 (6)</td>
</tr>
<tr>
<td>&gt;5-10</td>
<td>56 (19)</td>
<td>54 (19)</td>
<td>110 (19)</td>
<td>36 (12)</td>
</tr>
<tr>
<td>&gt;10-15</td>
<td>57 (19)</td>
<td>53 (19)</td>
<td>110 (19)</td>
<td>32 (11)</td>
</tr>
<tr>
<td>&gt;15-25</td>
<td>82 (18)</td>
<td>119 (24)</td>
<td>200 (23)</td>
<td>119 (26)</td>
</tr>
<tr>
<td>&gt;25-35</td>
<td>125 (41)</td>
<td>157 (42)</td>
<td>282 (41)</td>
<td>93 (30)</td>
</tr>
<tr>
<td>&gt;35-45</td>
<td>123 (46)</td>
<td>167 (47)</td>
<td>290 (45)</td>
<td>88 (33)</td>
</tr>
<tr>
<td>&gt;45-55</td>
<td>151 (48)</td>
<td>151 (44)</td>
<td>302 (45)</td>
<td>98 (31)</td>
</tr>
<tr>
<td>&gt;55-65</td>
<td>62 (41)</td>
<td>66 (45)</td>
<td>128 (39)</td>
<td>50 (33)</td>
</tr>
<tr>
<td>&gt;65-75</td>
<td>19 (24)</td>
<td>33 (31)</td>
<td>52 (29)</td>
<td>28 (35)</td>
</tr>
<tr>
<td>&gt;75</td>
<td>6 (17)</td>
<td>4 (8)</td>
<td>10 (9)</td>
<td>6 (17)</td>
</tr>
</tbody>
</table>
and females. Following the development of obesity, both males and females begin to experience hypertension and diabetes within 10 years.

On Yap, obesity, overweight, elevated blood pressure, and diabetes were virtually unknown prior to 1960.² It is likely that as economy and level of development continue to change these diseases will become more prevalent. To understand the changes in patterns this is a useful study for comparison with future findings.

Although not much is known about effectiveness of interventions at community level for prevention and control of obesity, especially in developing country settings, this study has implications for policy. Female and male children as young as two years old might be targeted for obesity prevention. Cutoffs of 15 years old for hypertension and 35 years old for diabetes testing were chosen because substantial rates of hypertension and diabetes were thought to be unlikely in younger age groups. Testing, however, might begin at age 15 in both males and females for hypertension, and younger than 35 for diabetes since there is a considerable prevalence of hypertension in the 15.1-25-year age group and diabetes in the 35.1-45-year age group.

Community-wide campaigns for exercise programs and dietary changes and personalized lifestyle counseling are strongly recommended by the Guide to Community Preventive Services. The U.S. Task Force on Community Preventative Services suggests non-family social support such as exercise groups and sponsored walks, informational outreach activities, plus the creation and maintenance of places for physical activities,¹⁰ although the effectiveness of these strategies in developing country settings are unknown.

The use of Wellness Centers to deliver anticipatory guidance can be useful in preventing these non-communicable diseases, although this approach would have to be tested in Yap. Physical education in school and well-maintained sports facilities can also help combat obesity. This study found Yap to have a colossal burden of obesity. TV is associated with obesity and so far the residents of Yap do not have easy access to television and cable service. This study provides further reason to preserve Yap’s traditions and block the setup of a local TV station.

For obesity prevention, some measures should be administered to children as young as preschool, perhaps through promotion of breastfeeding and local foods. Particular attention should be focused on people aged 15-25, because these people are the most vulnerable to developing obesity according to the results of this study.

Obesity on Kosrae, Pohnpei, and Chuuk is now 2.5 to 3 times the prevalence of that in the U.S.⁴ Studies on other Pacific Islander populations demonstrate the same affect of lifestyle on disease prevalence. Residents of the island of Tuvalu who live in the city have over double the prevalence of diabetes than rural Tuvaluans. Samoans in Hawai‘i and California have a very high prevalence of obesity.

Other states in the FSM have higher rates of obesity than Yap, perhaps because the Yapese are more traditional. A recent study on the island of Kosrae in the FSM found the average BMI to be 31, compared with the Yap average of 28.7. Thirty-five percent of the entire Kosrae population had a BMI between 30 and 34. Furthermore, 12% of adults older than 20 years were diabetic. A significant increased risk of diabetes with increasing age was noted, with individuals older than 50 years having 35 times the risk of diabetes as individuals 20-34 years of age.⁴

There are several limitations of this study. Unsophisticated instruments could have contributed to measurement error that could in turn have affected findings. There are several potential problems with regard to validity.

The instruments used by surveyors to measure height, weight, blood pressure, and blood sugar were not the most sophisticated, precise tools that most prominent laboratories utilize. The spring scales that were used may be more accurate at middle weights, than at higher and lower weights. The accuracy of determinations of blood pressure and glucose by use of an arm cuff sphygmomanometer, and glucose meter are somewhat dependent upon technique, though efforts were made to control this source of error by thoroughly training and certifying proficiency for surveyors.

The study had several non-respondents, but there is no indication that they would exhibit different distributions of non-communicable diseases than those who participated. Blood sugar was measured once with a single random capillary blood test. People with impaired glucose metabolism may have normal blood glucoses on a single, random sample. On the other hand, people with normal glucose metabolism may occasionally
have heightened blood glucose readings higher than the cutoff used in this study, especially after a large dietary glucose load. This study’s use of a random blood capillary glucose test with a cutoff of 144 mg/dl has a sensitivity of 69 and a specificity of 95%. A more specific method would be a fasting blood sugar of greater than or equal to 126 or a 2-hour oral glucose tolerance test greater than or equal to 200. Diabetics were asked to identify themselves, which may be a source of bias. Previous studies on validity, however, indicate that self-reports of diabetes are accurate.11

The use of a single blood pressure measurement may misclassify elevated blood pressure, since blood pressures fluctuate and people with normal blood pressure may temporarily have elevated blood pressures. In addition, people with normal blood pressure readings were not asked if they were hypertensive. Some of these may have been on medication with normal blood pressures at the time of survey and been misclassified as non-hypertensive.

In regard to BMI, there is some controversy regarding the appropriate BMI cutoffs for obesity and overweight in various ethnic groups. It appears that due to differences of body build, some Asian ethnic groups experience the adverse health effects of obesity at lower levels of BMI than Europeans. The use of the higher standard BMI cutoffs for such groups would underestimate the proportions of Asian populations at risk.12 Micronesians, however, have not been studied specifically in this regard, therefore the WHO recommended BMI cutoffs of 25 and 30 were used in this study.

This study was performed to determine age of onset, but the cross-sectional study cannot infer age of onset with complete confidence. It is possible that recent environmental factors may have affected certain age groups more than others which would give the same appearance as a chronic condition that began early in life (i.e., a "cohort effect"). However, no such environmental factors exhibiting this effect have been observed for these conditions.

References


5. OneTouch Basic™. LifeScan Inc., Milpitas, California, U.S.A.


Health Consequences and Health Systems Response to the Pacific U.S. Nuclear Weapons Testing Program

Neal A. Palafox, MD, MPH*
Sheldon Riklon, MD*
Wilfred Alik, MD**
Allen L. Hixon, MD*

* Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, Mililani, Hawai‘i; **Kaiser Permanente Koolau Clinic, Kaneohe, Hawai‘i. Address correspondence and reprint requests to: Neal A. Palafox, MD, MPH, Department of Family Medicine and Community Health John A Burns School of Medicine, University of Hawai‘i at Manoa, 95-390 Kuahelani Avenue, Mililani, Hawai‘i 96789-1192; npalafox@hawaii.edu.

Abstract

Between 1946 and 1958, the United States detonated 67 thermonuclear devices in the Pacific as part of their U.S. Nuclear Weapons Testing Program (USNWTP). The aggregate explosive power was equal to 7,200 Hiroshima atomic bombs. Recent documents released by the U.S. government suggest that the deleterious effects of the nuclear testing were greater and extended farther than previously known. The Republic of the Marshall Islands (RMI) government and affected communities have sought recompense through diplomatic routes with the U.S. government, however, existing medical programs and financial reparations have not adequately addressed many of the health consequences of the USNWTP. Since radiation-induced cancers may have a long latency, a healthcare infrastructure is needed to address both cancer and related health issues. This article reviews the health consequences of the Pacific USNWTP and the current health systems ability to respond.

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Background

In 1946 the U.S. began thermonuclear weapons testing in the RMI. During the 1946-1958 testing period, 67 thermonuclear devices were detonated, equivalent in power to 7,200 Hiroshima atomic bombs. The vast majority of the detonations were above ground and atmospheric explosions, accounting for almost 80% of the total atmospheric testing in the history of U.S. nuclear testing. In 1954, the Bravo hydrogen bomb test exposed approximately 250 Marshallese from the Rongelap, Utrok and Ailinginae Atolls to high doses of direct radioactive fallout. Additionally, it has been argued that the 400 residents of Ailuk were exposed to radiation levels similar to the populations of Utrik and Rongelap. Radiation levels on Rongelap were so high that a majority of those exposed developed acute radiation sickness, and one community suffered from exposure to doses in the lethal range.1-3

Nuclear weapons were tested at sites where Marshallese people had lived for hundreds of years. Entire communities were moved from their homes so that the nuclear testing could commence. They were promised a quick return to their homeland. The Bikini and Rongelap communities, who were moved off their atolls because of the Bravo test, were returned to their atolls while the islands were still heavily contaminated with radioactive cesium. The Rongelap communities were returned to their atolls from 1957 to 1985. Some of the Bikini community returned from 1972 to 1978. These communities consumed a contaminated traditional diet during these years before they were relocated to safer locations.4-6 It is now more than 61 years after the USNWTP began and two communities still have not been returned to their ancestral lands.

A 2004 analysis by the U.S. National Cancer Institute (NCI) now suggests that people living on all atolls of the RMI were also directly affected by the testing.7 In addition, nearly 300 workers had exposures as part of the post-testing nuclear clean-up operations; the health effects on this group has never been evaluated.1

Health Effects of the U.S. Nuclear Weapons Testing Program

Health, as defined by the World Health Organization, is a state of complete physical, mental and social well-being,
Radiation from the U.S. Nuclear Weapons Testing Program
Radiation is defined as energy propagating from electromagnetic waves, photons or subatomic particles. A by-product of nuclear reactions is radiation. Radiation released from nuclear testing can cause damage and death to living cells. Nuclear debris can remain in the environment from days to centuries, and emitting damaging energy to living organisms in close proximity. In the Marshall Islands, isotopes of cesium, strontium and plutonium remain in the environment and continuously release potentially harmful radiation.8-9

Illness from acute radiation exposure
Acute radiation illness results from sudden exposure to very high doses of radiation. The Rongelap community suffered acute radiation illness when they were dusted by the nuclear debris from the Bravo hydrogen bomb test. Hours to days after nuclear fallout covered Rongelap, the people suffered severe nausea, vomiting, burns, and hair loss from acute radiation sickness.5
Some of the Rongelapese suffered severe anemia, feta; death and malformation, severe hypothyroidism, or bone marrow shutdown.

Illness from chronic radiation exposure
Illness from chronic low levels of radiation may also occur. Chronic exposure to radiation results from living in a contaminated environment. Exposure to deleterious radiation may result from external radiation in the ground, inhalation of the radioactive particles from dust in the environment, or by ingestion of the concentrated radioactive particles in plants, animals, and fruit. The cell DNA can be damaged, thereby initiating abnormal cell growth (cancer) and potential genetic mutations. Chronic exposure to low doses of ionizing radiation in the environment and food chain are responsible for at least 20 types of cancers, including leukemia, multiple myeloma, lung, intestine, stomach, kidney, liver, bone, thyroid, skin and brain cancers. These cancers may be latent (i.e., an individual exposed to chronic low doses as a child or adolescent may develop a radiation-related cancer 20-70 years after the initial exposure).6-7,10-15

In 1972, the U.S. National Academy of Sciences established a committee to study the biological effects of low dose ionizing radiation (BEIR). In 1990, the BEIR V Committee concluded that radiation is almost nine times more damaging than estimated by the 1972 BEIR I Committee.16 The latest scientific evidence from the 2005 BEIR VII report stated that exposure to even extremely low doses of ionizing radiation place individuals at a risk for cancer.17

A 2004 NCI report regarding the RMI estimated 530 excess cancers from the USNWTP, a 9% increase above the baseline prevalence of cancer for the period under study. In 2003, 56% of the 530 excess cancers had not yet manifested in the Marshall Islands population because of the latency period following the deleterious effects of ionizing radiation. Thyroid cancer prevalence was estimated to increase by 200% above the baseline.7

Notably, 85% of the stomach cancers and 75% of the colon cancers caused by the nuclear testing will manifest themselves in the next decades. Most of the excess cancers will occur in Marshallese exposed in the northern atolls. However, the NCI report notes that the ionizing radiation exposure from the testing extended throughout the Marshall Islands, including the southern atolls, and is expected to place populations previously considered not exposed at increased risk of cancer.7

Non-cancer radiogenic illness
BEIR VII also noted that intergenerational (hereditary) genetic effects, albeit small, may be possible in humans since intergenerational effects caused by ionizing radiation have been noted in mice, plants and fruit flies.16-17
BEIR VII further noted that a dose response relationship with mortality from non-neoplastic (non-cancer) disease has been demonstrated with heart disease, stroke, digestive, respiratory, and hematopoiesis diseases. Ionizing radiation at high doses is now associated with illnesses other than cancer.

Although a great deal is known about the health effects of short-and-long term exposure to radiation, it is difficult to quantify the direct health impact of nuclear testing in the RMI, because of the limited resources available for diagnosis and monitoring. There was no
comprehensive cancer registry, thyroid tumor registry or health information system developed in the RMI before, during or after the testing period.

**Cultural and Social Disruption**

Cultural and social disruptions from the USNWTP are associated with adverse health outcomes and illness. Alienation from the land and critical natural resources through radioactive contamination or forced evacuation destroyed the physical and cultural means of sustaining and reproducing a self-sufficient way of life. It also destroyed community integrity, traditional health practices and sociopolitical relationships. Furthermore, community history and knowledge is destroyed when there is no lineage land from which to pass on knowledge about the local environment and traditions.1,18

Food supplementation became necessary for those who were displaced from their land, and for those whose lands and food sources were contaminated with radiation. For many years, the U.S. government provided U.S. Department of Agriculture (USDA) foods (mostly white rice and other processed foods) to the people of the four atolls. Some atoll communities are now using U.S. funding to purchase and ship their own foods rather than depending on USDA foods. Adverse health impacts following the introduction of a Western diet are evident throughout the Pacific. However, the rate of change from traditional to Western diet caused by forced relocation was extreme in the recipient communities. Several of these adverse impacts are noted below.1,18

The traditional diet has been altered. The available Western diet is high in fat and carbohydrates, low in fiber, and lacks vitamin A and iron. There has been a loss of the cultural activities and norms surrounding food gathering and preparation. The industriousness and work ethic required to prepare local foods from coral atolls with few natural resources has been stifled. The loss of the physical activities surrounding food preparation has resulted in a more sedentary lifestyle. Diseases, such as diabetes, atherosclerotic diseases, and hypertension have been exacerbated by the Westernized diet and more sedentary lifestyle. Dependency on food supplementation has become the norm, destroying the fabric of a once self-reliant community.

**Land**

Ancestral land was the basis of social structure and wealth in the traditional Marshallese society.18 There were specialized land zones for agriculture, living, burial sites, bird breeding grounds, turtle breeding grounds and fishing grounds. The land where an individual lived often determined social status. The cultural, individual and social trauma suffered when home islands were vaporized or contaminated was devastating.

The lasting impact of the USNWTP can be understood through examination of the impact on the Marshallese land. The Bravo hydrogen detonation alone created a crater nearly a mile in diameter and 200 feet deep in the Bikini Atoll. Two islands in the Bikini Atoll were vaporized. A cement dome which houses nuclear waste, covers one island in Enewetak Atoll. Parts of Rongelap, Bikini and Enewetak Atolls remain contaminated with nuclear fallout and are unsafe living environments. In areas where testing was done the islands were scraped to remove contaminated debris, destroying all traditional landmarks. The contaminated soil was deposited in another section of the atoll.

The USNWTP destroyed homes. It was not safe to resettle for decades because of nuclear contamination. The Marshall Island communities from Bikini, Enewetak, and Rongelap were bounced between several locations during the 12-year weapons testing period. Two communities are still waiting to be resettled 49 years after the testing ended.

The cleanup is still underway, but will likely remain incomplete as the cost to clean the contaminated areas has been determined to be cost-prohibitive for the U.S. Within their home atolls only the main island is safe for inhabitation; the other adjoining islands remain contaminated.

The Bikinians and Rongelapese peoples were relocated to atolls, which were not their ancestral lands and belonged to other Marshallese communities. Several of the locations were chosen because they were uninhabited and subsequently turned out to be hostile environments for living. The Bikinian community starved for a year in one instance before being relocated again. The post-traumatic stress, depression, anxiety, hopelessness, and the loss of ancestral identity is difficult to quantify.18

**Healthcare Environment, Services, and Funding in the RMI**

Understanding the environment, structure and organization of the health systems that are available to address the healthcare needs associated with the USNWTP is important. The health systems must be able to provide comprehensive cancer care (prevention, screening, diagnosis, treatment, survivorship and palliative care) and healthcare for thyroid disease. Comprehensive healthcare must be provided for those
who cannot return to their homes, who lost access to their traditional foods and ways of life, and who have suffered post-traumatic anguish.

Who should be included in these health programs? The official Department of Energy (DOE) position is that only the peoples of the four atolls (Bikini, Enewetak, Rongelap and Utrok) that were most directly affected by the nuclear weapons testing program should have access to these health programs. A 1987 publication in the Journal of the American Medical Association concluded that the radiation from the testing extended to at least 14 atolls in the Marshall Islands. Most significantly, the 2004 NCI study stated that the radiation exposure was enough to increase the risk of cancer in all the people of the RMI living between 1946 and 1958, albeit radiogenic cancers were predicted to occur in a higher proportion in the northern than the southern atolls. Since the 2004 NCI report found that the entire RMI is at risk for cancer from the USNWTP, and because there is presently no method to differentiate cancers caused by radiation or other carcinogens, differential treatment for cancer care in the RMI is not reasonable or prudent.

Health Systems in the RMI
There are three tiers of healthcare in the RMI: the National Healthcare System, the 177 Health Care Program, and the DOE Program.1,20

RMI Ministry of Health and Environment (National Healthcare System)
The present healthcare environment of the RMI is brittle. Many unnecessary illnesses and deaths occur because the healthcare system cannot systematically respond to the needs of the people. The health situation will get worse as the population expands, as the proportion of elderly increases, as the burden of costly chronic illnesses grows, and as the limited health dollars and finances wane. The infant mortality rate is 3 times that of the U.S. and the longevity of Marshallese is 12 years less than people in the U.S. Hansen’s disease (leprosy) and tuberculosis are endemic. In response to the heavy burden of cancer, the RMI completed a Comprehensive Cancer Plan in 2007. Cancer is the second leading cause of death in the RMI. The paucity of cancer care infrastructure is described in a later section.

RMI’s 15-year Strategic Health Plan (2001-2015) describes a health system that is not financially sustainable with health resources of $12 million annually. According to the RMI Strategic Health Plan, the Ministry of Health is projected to lose an equivalent of $21 million dollars in services over the next 15 years.

In 2000 and 2001 the RMI paid over $4 million per year (a significant portion of its total annual health expenditure) to send patients out of the country for treatment. The monies spent in referral health centers abroad are not directed towards the RMI health infrastructure.22-23

The RMI, a former territory of the U.S., is now “Freely Associated” with the U.S. A legal document called the Compact of Free Association defines the political relationship between the RMI and the U.S., and was designed to provide enough economic support for this island nation to become economically self-sufficient. The first Compact (1986-2001) failed to provide the necessary infrastructure to achieve economic self-sufficiency for the RMI, according to the U.S. Government Accountability Office (GAO) report. The second Compact is now in place (2002-2021). The 2005 GAO report suggests funding of the second Compact is insufficient to allow RMI to achieve the goal of self-sufficiency. Notably, the Compact is the primary source of healthcare dollars and resources.21,25 Funding from the Compact represents nearly half of the gross national product of the RMI, and 40% of all healthcare funding (direct Compact funds, Section 177 funds, U.S. Federal Grants) in the RMI.

The total amount of all the sources of health revenue for fiscal year 2005 was approximately $14 million, an increase of $2 million annually. Part of the $2 million annual increase is derived from additional Compact-II funding of $1.5 million to the Ebeye Hospital. This infusion of money is helpful, but will have a minimal impact in advancing population health in the RMI. In comparison, the 2005 U.S. healthcare expenditure was about $5,500 per capita annually. The RMI annual per capita healthcare expenditure is $272.

Federally Funded Medical Programs for Marshallese Affected by the USNWTP
There are two federally funded medical care programs for people affected by the USNWTP, the U.S. DOE Medical Program and the 177 Health Care Program.

The U.S. DOE Medical Program
Section 103(h) of the Compact “provide(s) special medical care and logistical support” to the populations present on Rongelap and Utrok during the Bravo hydrogen bomb test on March 1, 1954 (currently less than 120 patients). These individuals were exposed to direct fallout from the Bravo detonation. The DOE program also provides medical care to a comparison population, now with 80 patients remaining. Members of the comparison group were not exposed to the
Bravo fallout in 1954, however they lived in a nuclear contaminated environment with the Rongelapese people from 1957 to 1985.1

There is $1.1 million annually to provide medical care to those exposed to the Bravo detonation and to the comparison group. An additional $800,000 annually is applied for logistic support for the medical mission. The funding for the program participants is adequate, as it screens and cares for all radiogenic illnesses in this population — largely cancers and thyroid disease. The program is not designed or funded to take care of illnesses which the DOE defines as non-radiogenic (i.e., illness other than cancer and thyroid disease).

The 177 Health Care Program
The 177 Health Care Program, mandated in section 177 of the 1986 Compact, is designed to provide primary, secondary and tertiary medical services to the people of Enewetak, Bikini, Rongelap and Utrok islands who were affected by the USNWTP. This includes most of the people enrolled in the U.S. DOE Medical Program. The design of the 177 Health Care Program was tasked to the U.S. Public Health Service (USPHS) in 1985. The structure proposed by the USPHS is laudable, having essential elements of primary, secondary and tertiary medical care. However, delivery of UPHS’s proposed program services has been impossible because of limitations in funding and the RMI healthcare infrastructure.

The 177 Health Care Program began in 1986 with $4 million annually. In 1988 it was reduced to $2 million annually and $1 million annually from 2001-2007. The 1997 and 2006 per patient capita per month (PPPM) expenditures for the 177 Program were $13.60 and $5.95, respectively. In comparison, Medicare expenditures in 1997 were $221 PPPM in the U.S. State of Nebraska. In 2006, Medicare expenditures were $660 PPPM in Hawai‘i. U.S. standards of healthcare for cancer, thyroid illness, or other medical conditions that would be associated with the USNWTP cannot be purchased or developed with these limited resources.

RMI Ability to Address the Healthcare Consequences of the USNWTP
The ability for health services in the RMI to systematically address existing medical encounters is limited.22-23 When the 177 and DOE Programs cannot provide adequate services, patients turn to the RMI Health Care System. The RMI Health Care System, although improving, struggles to provide adequate routine healthcare for its citizens. The 177 Program is severely under-funded and contributes modestly to the overall healthcare needs of the 177 participants. The DOE Program is adequately funded for its patient base and present mandates, however, the Program design lacks comprehensive care and is not improving the capacity of health services.

There is considerable evidence that the present RMI Health Services are unable to care for the current burden of cancer.23,27,28 From October 1, 2004 through June 6, 2005, there were 26 Marshallese patients with cancer who were presented to the medical referral committee to determine if they would benefit from referral to an off-island tertiary care center. Eleven of the 26 cases were denied referral because the cancers were too far advanced;28 such cases suggest the health system is unable to provide timely screening and early medical interventions. The fact that 26 cancer patients were presented to the medical referral committee for out-of-country treatment substantiates that necessary medical care could not be provided in the RMI. Chemotherapy is not given in the RMI because of deficiencies in qualified laboratory, nursing and pharmacy staff. There is no oncologist, and radiation therapy is unavailable.

Comprehensive cancer care requires local health systems to address prevention, screening (early detection), biopsies, pathology services, surgical expertise, intensive care unit, chemotherapy expertise, scanners, lab support, palliative care (reducing suffering) and attention to issues of survivorship. None of these systems is fully operational, and some are non-existent.27 In 2003, only 9% of women in the age category to receive cervical PAP smears (to screen for cervical cancer) actually received a PAP smear. Almost 50 years after the nuclear testing program, there is no cancer registry nor oncologist in the RMI.14,27-28

The status quo — inclusive of the RMI Health System, the 177 Program and the DOE Program — is unable to handle the cancer burden imposed by the USNWTP. The three tiers of health delivery cannot adequately address the other health effects of radiation and the health challenges brought about by nuclear testing. New systems of health delivery must be developed.

Building a Healthcare System for Cancer
The costs and design of a health system to care for cancer patients in the RMI are dependent on the answers to several questions:1

1. What standard of healthcare does the U.S. government owe to the victims of the USNWTP?
2. How much is the U.S. government willing to invest to support the designated standard?
3. What illnesses and health conditions will the
Comprehensive cancer care requires access to high functioning primary, secondary and tertiary health systems. A comprehensive cancer care system requires an intact primary care system, screening system, cancer registry (data tracking and surveillance), mammography, colonoscopy, medical laboratory, pharmacy, surgical capabilities, intensive medical care capabilities, supplies, prosthesis, pharmaceutical, a computed tomography scanner, x-ray unit, ultrasound, and the medical expertise to staff and run the system. A hospital with these capabilities is necessary. In the RMI, adequate screening should be available to the people of the outer islands. Inhabitants of the outer islands should be brought to the urban hospitals to get recommended cancer screening.\textsuperscript{27, 28}

Other health conditions
The 2005 BEIR VII report suggested that other medical conditions, such as heart disease, strokes, genetic effects, and hypothyroidism, are associated with ionizing radiation. There are also many indirect effects of nuclear testing, including cultural, social and mental health trauma. The 2004 NCI report suggested that the ionizing radiation reached beyond the “four atolls” and even beyond the northern atolls of the RMI. The lack of a defined boundary to determine who was affected by nuclear fallout and the multiple health consequences of nuclear testing makes supporting a nation-wide comprehensive system of healthcare ideal for the RMI. Building such a system could provide comprehensive cancer care to all Marshallese while meeting their overall, comprehensive healthcare needs.

A program that provides high-standard comprehensive healthcare for all Marshallese would address the health consequences of the USNWTP in a cost-effective, capacity-building manner. This system could also address the healthcare needs of over 200 Marshallese and other indigenous Pacific Islanders who participated in the clean-up of the Bikini and Enewetak atolls. This subgroup has had little access to appropriate healthcare services.

Unanswered Questions Regarding the Health Consequences of Nuclear Testing
A number of unanswered questions regarding the effects of nuclear testing confound the health planning process. Were excess cancers generated in the populations who lived and ate in contaminated environments after 1958? What is their risk of cancer from ionizing radiation exposure, including low level exposure, and is there a hereditary genetic effect? How should these health-consequences be treated, given the changing scientific understanding of the health circumstances of radiation exposure? Finally, how are health-related problems that are not radiogenic, such as the displacement of people, social and cultural disruption, and psychological trauma, to be treated though these effects have yet to be fully determined?

The 2004 NCI report quantified the risk of cancer for Marshallese who were alive between 1946 and 1958. However, there were Marshallese who lived and ate local foods from fallout contaminated environments after 1958. The people of Rongelap were evacuated in 1954, resettled on Rongelap in 1957, and again moved off in 1985 because of significant levels of cesium isotopes in the food supply. People of the northern atolls also lived in an environment that may not have been safe. In light of the BEIR VII report, even small amounts of ionizing radiation in the food chain may have affected the generations after 1958 in regards to cancer. In addition, there were nearly 300 Marshallese and other Micronesian workers who participated in the clean-up of the contaminated nuclear debris of Bikini and Enewetak in the 1960s and 1970s. The effect on their health remains unclear.

The NCI report addressed cancer issues but not other radiogenic illnesses. The BEIR VII report noted other non-neoplastic (non-cancer) effects of ionizing radiation, including strokes, heart disease and genetic abnormalities. Some of these conditions are related to high-dose radiation, some to low-dose radiation, and others to both.

Bodily harm is a tragedy that affects an individual for a finite period of time, whereas cultural destruction adversely affects the health of entire communities for generations. Cultural, mental and social impacts are difficult to quantify and measure, therefore it is easy to pretend they do not exist. The cancer burden generated
from the nuclear testing program was quantified by the NCI 50 years after the insult, after much unnecessary suffering had taken place. Other health consequences will likely be quantified soon. These unanswered questions, _inter alia_, form an important focus for future research.

**Discussion**

Developing a healthcare system to address the health consequences of the USNWTP in the RMI is vitally important. Issues related to the burden of those health conditions, and the standard of care to be applied for each illness must be addressed. The present RMI Health Plan is a healthcare system that lacks infrastructure and funding. Both the 177 and DOE Programs fall short of providing the healthcare necessary for the affected peoples of the RMI. The 2007 RMI Comprehensive Cancer Plan details the current inability to manage the burden of cancer in the RMI. The 2004 NCI report and the 2005 BEIR VII report of the National Academy of Science provide new information about the extent and health consequences of the USNWTP. Given the new knowledge currently available, and the inability of the RMI’s existing health system to manage the effects of the USNWTP, a proactive stance and policy review is essential.

The evolution of scientific discovery and understanding has made the NCI and BEIR VII reports possible. Historically, direct measurements of ionizing radiation have been technically difficult due to geography, human movement, and the temporal sequence of testing. Newer methods now incorporate the previous data into new models of dose reconstruction to create a more accurate assessment of cancer risk. The BEIR VII report stated that the new science of ionizing radiation has been possible by “using new information from epidemiologic and experimental research that has accumulated during the 10 years since the 1990s.” The cancer burden has been clearly defined by the NCI for the cohort of people alive before 1958. The cancer burden of Marshallese who were not part of this cohort but who were exposed to other sources of ionizing radiation is still not known. Other health consequences of ionizing radiation (heart disease, strokes and genetic effects) and the indirect cultural impacts, though present, are more difficult to quantify.

The 12-year period of USNWTP in the RMI was initiated to advance the science of nuclear weaponry and to insure that the U.S. remained the world leader in its nuclear arsenal. The testing caused significant health consequences to several Marshallese communities from ionizing radiation, effects that continue to this day. There was also disruption and destruction of the cultural, social, and nutritional fabric of the Marshall Islands that resulted as a consequence of the testing.

The U.S. government has the science, resources, and technology to address many of the consequences of its nuclear testing. The current medical programs for the radiation-affected peoples and their families are limited in scope, and are delivered with standards of healthcare far below that of the U.S. At present, the U.S. government has a very conservative and outdated view of health risks from the USNWTP. This position is not in the interest of good healthcare for those affected by the USNWTP. The ethical, moral, and scientifically substantiated position would be to provide more comprehensive and higher standards of healthcare for the RMI.

Nuclear weapons testing in the RMI is a story about social injustice, disparate compensation and decades of substandard healthcare. U.S. federal agencies have the resources to address these issues in light of the new scientific data regarding the health consequences of the USNWTP. This situation, in which a more economically and politically dominant nation causes or perpetuates inequity in a less powerful nation, has been termed “structural violence.” This may result from direct action such as the nuclear testing program. Notably, it may also result from inaction, such as failure to fully address the health consequences of the testing program. U.S. policies in response to healthcare needs must be updated to include current knowledge from the 2004 NCI and 2005 BEIR VII reports.

Unnecessary and unfair suffering has continued in the RMI for the past 50 years because the U.S. has not taken a proactive stance on healthcare issues. The radiogenic illnesses, combined with the indirect health consequences of the Pacific USNWTP, make health system improvements imperative. Such improvements must consider the full range of health consequences from direct nuclear fallout to the disruption of culture from the loss of ancestral lands. While there are important scientific and clinical questions that remain to be answered, maintaining the status quo of healthcare in the Marshall Islands is an unacceptable option. While political debates regarding responsibility and costs ensue, Marshallese continue to suffer as they develop and die from illnesses directly attributed to the USNWTP.

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Over the past half-century, Pacific Island jurisdictions have mostly resorted to one of three strategies for obtaining the health workers needed to run health services. Each of these strategies has serious disadvantages.

First, most jurisdictions rely on campus-based college programs to supply health workers. While programs have produced a steady supply of excellent health workers, the supply has fallen far short of regional needs. The geography of the Pacific, with relatively small, widely scattered populations, makes travel and communication difficult and expensive. Sending students abroad is too costly to allow the training of the large number of needed health workers in the region. Even if they could afford to do so, health services with large numbers of under-trained health workers could not send most away for training because there would be too few left to do the work. Family, community, social and emotional support is vital to most young people in the Pacific. Travel to a distant college results in the loss of social and emotional support for many students, resulting in high dropout and failure rates. Underdeveloped primary and secondary educational infrastructure in much of the region compounds this problem by leaving many students academically unprepared for more rigorous college programs. Students have limited opportunity to master course material. By the end of the semester, if they have not grasped the material, they will fail their courses and be “weeded out.” Many of these students might learn the material if given more personalized attention and flexibility in time needed to succeed. By the end of their training, the students who do succeed have been away from their homes for years, and often do not return.

The second strategy is to train health workers on the job. These training activities typically consist of a series of lectures provided by various members of the district health service staff, supplemented by clinical attachments with senior health staff in the same discipline for which the student is being prepared. Following “certification,” attempts are made to bolster this training with miscellaneous workshops as they come along. Usually, in this style of training, there are no clearly defined learning objectives, little accountability for learning on the part of either teachers or students, and no assurance of competency for procedural skills. The result is health workers who have serious gaps in training. They may be prone to errors of judgment and practice. They add to the disorganization of the health service by their inability to work effectively with their colleagues in other health disciplines.

The third strategy is the importation of expatriate health workers. This strategy is also very costly. It deprives health service clients of workers who speak their language and fully understand their cultural background. It deprives the host jurisdiction of the opportunity to develop leadership from the ranks of the health workforce and handicaps the jurisdiction of origin of needed human capital.

“DC-OS”: Decentralized, On-Site Training; A Sadly Neglected Option for Building the Pacific Islands Health Workforce

A. Mark Durand, MD, PhD
Anna Bolí, BSN
Leona Tamag
Lourdes F. Roboman
Jean C. Thoulag, MA
Terry Ngirmang, BSN
Kelley Withy, MD, PhD

*Director, Yap State Department of Health Service and the Yap Area Health Education Center, Colonia, Yap State, Federated States of Micronesia (FSM); **Chief of Clinical Care, Yap State Department of Health Services, Colonia, Yap State, FSM; †Associate Director, Yap Area Health Education Center, Colonia, Yap State, FSM; ‡Campus Director, College of Micronesia – FSM, Yap Campus, Colonia, Yap State, FSM; §Vice President for Instructional Affairs, College of Micronesia – FSM, Kolonia, Pohnpei, FSM; ¶Nursing Program Director, Palau Community College, Koror, Republic of Palau; cDirector, Hawai’i and Pacific Basin Area Health Education Center, Honolulu, Hawai’i. Address correspondence and reprint requests to: A. Mark Durand, MD, PhD, Director, Yap State Department of Health Service and the Yap Area Health Education Center, Colonia, Yap State, Federated States of Micronesia 96943; Durand@att.net. (PHD 2007 Vol 14 No 1 pp 179-181)
There is a promising alternative to these three strategies. Please allow us to introduce a new acronym into the language of health training in the Pacific: DC-OS. DC-OS stands for decentralized (satellite programs away from the main campus of the sponsoring college), on-site (delivery within the health worksite) formal college health worker training programs. While the concept is not new, it is underappreciated and underutilized. It has many advantages and addresses many of the problems which prevent more conventional strategies from succeeding in the region.

The central idea of DC-OS is to bring the college to the health worksite (e.g., to the district hospital), rather than sending the health workers to the college. This is done by identifying a college in the region that already has a high-quality, appropriate curriculum for training the type(s) of health worker needed by the health service. Then a formal agreement is established with the college to allow the worksite to become a satellite site for delivery of the program (Figure 1).

Faculty can either come from the host college or be recruited from the senior ranks of the health service (and be credentialed as faculty for the sponsoring college). Faculty from the health service can often continue to perform many of their usual functions in addition to teaching. Since they use the pre-made course plans, syllabi and other course materials from the college, instructors are spared the difficult work of creating training programs themselves. Classroom space is provided and equipped by the health service.

In addition to qualifying the instructors, the sponsoring college sets and assures quality standards for instruction and evaluation, registers students and assists with financial aid applications. In effect, the college supplies ready-made educational planning and accountability to the health service. The health service loans library and computer facilities and clinical equipment to be used by the students and faculty.

Students are recruited from both the health service and from the community. Those who are already employed by the health service are required to attend class as part of their workday schedule, but also continue to function in their jobs. Since accredited college programs are being delivered, students are often eligible for financial aid programs, which can help to support the costs of training.

Because they are on-site, DC-OS programs can be more easily tailored to the prevalent conditions in the local health service. Being on-site, real-life examples related to instruction are immediately at hand and it is possible to take advantage of the numerous “teachable moments” that arise at the site.

Teaching schedules can be adjusted to both the workload of the health service and to the progress of the students, as long as college requirements such as minimal teaching contact hours are kept. For example, during an epidemic the teaching schedule can be delayed; if there is a class that many of the students are failing, the class can be extended so students can meet the learning objectives and successfully complete the course. Work supervisors can closely follow the progress of students. They can carve out more study time from the workday for students who are having trouble with a course or arrange for extra tutoring to avoid failure. Since students do not have to travel long distances from their homes to attend school, they continue to enjoy family and social support while in school and there is much less risk of being lost to their home jurisdiction by moving away.

DC-OS is much less costly than campus-based training, especially when the campus is out of the jurisdiction of the health service. By saving on the costs of travel and off-island housing, by keeping students on the job while they are taking classes using the resources of the health service (including instructors), and minimizing attrition, the health service can afford to train many more students at one time.

There are several caveats for DC-OS. Senior health staff who become instructors must adapt to a new role.
Some orientation to this role, to the requirements of the college, and some mentoring by experienced faculty are helpful. The logistics of DC-OS can be challenging. Foresight and frequent follow-up are needed to assure that course texts and materials are available, students are registered on time, and required documentation (class rosters, examination forms, test results, course grades, and instructor evaluations) are submitted properly. Fitting work with class schedules can be challenging, especially when health workers from all shifts (e.g. clinical nurses) are being trained. Care is needed to guard against a nurse being scheduled for an all-night ward shift followed by 3 hours of class.

Worksites policies, procedures and quality standards must be clearly defined for the hands-on components of DC-OS training to be effective. Students cannot learn excellent practice in a disorganized worksite with poor or non-existent standards. A functioning quality assurance system, including a system for regular quality audits and corrective plans should be considered a prerequisite for DC-OS programs.

DC-OS requires a strong commitment and partnership between the sponsoring college and the host institution. The host institution must adhere strictly to teaching standards such as instructor qualifications, prescribed teaching contact hours, course learning objectives and evaluation requirements. Failure to do so compromises not just the quality of the student experience, but also may jeopardize the reputation and accreditation of the college. For its part, DC-OS requires college administrators to reach beyond the comfortable limits of their campuses to assure appropriate delivery of courses at distant sites. Off-site students are out of sight, but must not be out of mind. Staff should be deployed to the site to register students and observe classes in session. Colleges should strive to be flexible with regard to class scheduling, as long as educational standards are not compromised, recognizing that in the context of the worksite classes may need to start before or end later than the standard campus semester schedule. It is also desirable for program curricula to be structured with a minimum of sequential pre-requisites. A student taking an educational program on a college campus can be ill or called away to a funeral and reschedule the class to the following year, then proceed with the next class through the rest of the curriculum. In contrast, DC-OS programs typically have very few instructors. This can be limiting since the program must proceed from course to course over time with the instructors teaching a new course each semester without backtracking. If students who miss or fail a course are deemed ineligible to take the following courses the program will become pyramidal, with fewer and fewer students remaining as time goes on.

If students who miss or fail a course are deemed ineligible to take the following courses the program will become pyramidal, with fewer and fewer students remaining as time goes on.

DC-OS programs bring a flood of new ideas and a culture of learning into the health service. Students who are learning the proper way to perform tasks challenge more senior staff to explain why they may not be following the same procedures. This can have a powerful, rejuvenating effect. With DC-OS it is possible to train entire cohorts of semi-skilled health staff and thus to take a huge stride toward a professionalized, high performance health service.
Public Health in the Republic of Palau: What We Can Learn From a Small Island Country

Timothy S. Duerler, MD*
Gregory G. Maskarinec, PhD*

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa. Address correspondence and reprint requests to: Gregory G. Maskarinec, PhD, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, 95-390 Kuahelani Avenue, Mililani, Hawai‘i 96789-1192; gregorym@hawaii.edu.

Abstract
The Republic of Palau has a well-run public health system despite being a small, relatively isolated island country with limited resources and limited funds. Using interviews with key informants, participant observation in clinics throughout Palau, and a review of available reports, we identified themes locally regarded as central to the success of Palau’s public health programs. These include a comprehensive definition of “health,” a sense of community-ownership, creative efforts to identify effective behavioral modification techniques, efforts to improve internal training and infrastructure, quality assurance, the importance of leading by example, and a general willingness to collaborate and compromise. We suggest that recognition and application of these concepts would improve not only the public health systems and primary care settings of other Micronesian nations, but also help correct the increasingly dysfunctional healthcare of the United States. (PHD 2007 Vol 14 No 1 pp 182-187)

Introduction
The Republic of Palau (Belau), the westernmost archipelago of the Caroline Islands in the Western Pacific, is a chain of more than 340 islands, of which eight are permanently inhabited. In the same time zone as Japan, Palau is 500 miles equidistant from the Philippines to the north and Papua New Guinea to the south, and 4,450 miles from Honolulu. Palau’s population is approximately 20,000, of whom 70% are ethnically Palauan. Most of the population lives on the three-island complex of Koror, Meyuns, and Malakal, with a combined land area of 7.1 square miles. Palau’s literacy rate is 92%.1,2 Palau is known for having a well-organized, efficient, innovative, and effective public health system despite being a geographically isolated country with a small population and limited resources. Within this setting, this project had three objectives. First, our goal was to understand how public health is locally approached to determine how Palau has developed its innovative public health system, apparently capable of addressing the needs of its people. Second, we attempted to identify which, if any of Palau’s public health projects or underlying principles might be applied or modified to fit the public health needs of other Micronesian countries. Third, we sought common themes that run throughout Palau’s programs that might be taught and applied to very different settings, such as that in the United States.

Methods
Information was collected by interviews with key informants, participant observation in clinics throughout Palau during a four-week long visit in July/August 2006, and a review of available reports and documents. Since it is impossible to critique a nation’s entire public health system adequately in a short time, especially in regard to the outcomes of specific programs, the goal was to identify key concepts or “undercurrents” that inform various divisions in the Bureau of Public Health and that were articulated as important by various different key individuals. Interviews were conducted with the Director of Public Health, directors and coordinators of the different programs and divisions, and with physicians and staff of most of the main community health centers throughout Palau, all of whom were extremely cooperative and helpful. This project was reviewed and approved by Palau’s Ministry of Health Institutional Review Board, and preliminary findings were reported back to interested physicians, staff, and officials in a semi-formal “grand rounds” session at Belau National Hospital.

Key concepts
These are a series of concepts or themes that are evident within the Bureau of Public Health (some concepts may be more pronounced in some divisions or pro-
grams than in others). These themes may not provide answers to acute problems, but serve as reminders to determine if programs are properly aligned with the overall public health objectives.

**Definition of Health**

How does one identify “health?” In Palau, the Bureau of Public Health has embraced a comprehensive definition of health, and by doing so it has shown a commitment to understanding the complex factors that affect health. This includes understanding the impact on health of physical, emotional, social, spiritual, cultural and environmental forces. Social and environmental forces are especially relevant for Palau as it experiences rapid economic expansion and associated cultural change, demonstrating that officials in Palau understand the potential ecologic and social consequences of rapid development. Palauans remain very proud of their cultural heritage, but as a consequence of modern political-economic forces, many traditional patterns, including the extended family structure with its complex values of reciprocity and responsibility, patterns of income distribution, and Palau’s traditional chiefly hierarchy, are all changing. An emphasis on clan wealth is slowly evolving into concentrations of personal wealth. Even traditional funeral practices are changing to accommodate a more western work ethic of wage labor on fixed schedules.

One area of rapid change with clear consequences on health is diet. Palauans traditionally consumed primarily taro, breadfruit, coconut, fresh fish and other seafood, but these items are being replaced by imported rice, ramen noodles, and canned meats, fish and beverages. Palau recognizes how diet changes have already severely affected many other island countries in the Pacific, and is trying to avert such a rapid shift to these foods within its own borders. A spiritual health division within the Bureau of Health has been created in response to recognizing the potential threats to health from excessively rapid changes in cultural values and practices. The comprehensive definition of health is summarized in the Department's motto: “A Healthy People in the Healthy Republic of Palau.”

**Community-Ownership**

Another way to think of public health is to consider it primary healthcare for communities. Primary healthcare is commonly associated with concerns of physical health (non-communicable diseases, communicable diseases, cancers, palliative care, and oral care). However, for primary healthcare to be genuine healthcare, it must address social health, interactions between family members, unhealthy and healthy behaviors by individuals, families and communities, the health of the environment and the impact of each of these on physical, emotional and spiritual health. To tackle such a broad range of issues with limited resources, Palau’s answer is through the key concept of “community-ownership.”

When a community feels that they own or take part in an idea or a project, they are more likely to get involved and more willing to make changes. As one interviewee described it “There is a tremendous power in creation and to community-creation.” Decentralization often goes hand-in-hand with “community-ownership,” providing a sense of continuity, not as part of some large institution, but a “home.” This is being done in Palau with the community health centers created throughout the nation. For example, in one community health center they have a garden plot of herbal medicines. The community decided that they wish to continue to use herbal medicines and at a community “owned” health center it is easier to embrace this idea and to make it happen than it would be at one that was centrally controlled.

The concept of community-ownership might help explain diverse public health dilemmas; for example, it may help us understand reasons for the poorer screening numbers for pap smears in Koror and more urban areas. In Palau, the total compliance rate for pap smears in eligible women over age 18 is 62-63%, but it is much higher in the rural areas. In the rural areas, community health centers are identified as medical “homes” where the healthcare providers are often neighbors, family members and friends. People are more comfortable with coming in, they are reminded by family and friends, and there is closer follow-up if an appointment is missed or simply forgotten.

With community-ownership, community leaders clearly secure more of a voice and can be more actively involved with health programs. The community programs, then, are seen less as an externally imposed system or outreach project, but rather as internally created with participants and leaders along with their families and neighbors who are also part of the intended audience. The ultimate achievement of this community-ownership concept is realized when public health workers can
approach a community with a new outreach program and simply listen, applaud, and encourage the community that has internally created their own advocacy to decide how to apply or not apply the new program. An internal or “grassroots” movement would be expected not only to be more effective than top-heavy vertical health programs, but also more cost-effective. However, this effectiveness cannot simply be assumed but must be assured especially in a setting of limited resources. Also, efforts to create community-owned medical homes cannot deprive the central healthcare infrastructure of necessary resources. Health leaders and planners must ensure that there remains a firm base upon which to draw, including more specialized care and an appropriate referral and follow-up system for those identified with further medical needs at the outlying community level.

Behavioral Modification
Behavioral modification was repeatedly emphasized as a key concept, even though people were often left with more questions than answers regarding how best to accomplish it. Obviously, changing what people do is and will continue to be a difficult objective, not only in Palau. It is very difficult to address a person’s behavior, monitor it, and effect positive, measurable change. Overall, many of Palau’s public health officials feel that although the knowledge base of Palauans is generally high, this doesn’t translate into behavioral changes. As the Director of Behavioral Health summarized, “Behind every diagnosis there are cultural issues.” A need has been identified for individualized intervention strategies that can work in specific socio-cultural contexts; this is an area that the international health community must research further.

Sometimes simply imparting knowledge can make a difference in improving behavior. One example is breastfeeding, with an increased number of Palauan women now breastfeeding due to social marketing and other interventions that targeted the population. However, there have also been failures. For example, the number of smokers during pregnancy has not decreased despite prenatal and antenatal counseling. Another example is in oral health. Despite public education campaigns, people apparently remain unaware that a betelnut/tobacco combination will increase the amount of oral cancers, cause accelerated breakdown of enamel, periodontal loss, and worsen bone loss. Dental problems are likely to increase in Palau as even first-graders are now chewing tobacco with betelnut, most often obtaining tobacco from their parents. One way this has been addressed in rural areas is by educating the parents and children simultaneously about oral health, realizing that the parent’s behaviors will have a much greater impact than anything that is said to the children. Many parents, however, continue to believe that it is okay for baby teeth to rot and fall out because the children will grow new permanent teeth.

Certain ambitious initiatives have been directed at the problem of adding tobacco to betelnut, such as the efforts by one State Senator to replace tobacco with cloves. However, this did not work; people simply began adding both cloves and tobacco to their betelnut. Nevertheless, the effort by political leadership to acknowledge an issue such as this and attempt to initiate a solution is certainly commendable.

Clearly, knowledge is often not enough to break behavioral patterns. Returning to the area of oral health, many people in Palau still think that repairing teeth is all the dental care that is needed; they don’t take regular care of their teeth. It is estimated that while 75% of people brush their teeth, at least 25% don’t, and that at least 25% use betelnut for cleaning their teeth on a daily basis. The only private dentist office in Palau had to close and once the public office started charging fees for services the numbers of visits to it decreased. This demonstrates the necessity for early education programs, improving children’s oral health is seen as a “battle that we can win.” One of Palau’s innovative approaches is a program that sends a dental coordinator on home visits to meet parents and distribute toothbrushes while teaching about their usefulness.

Another example of a program improving local conditions is the Behavioral Health Division. Until 2001, although Behavioral Health was located in the Public Health Division it remained very clinically-oriented, emphasizing the diagnosis and categorization of mental illness. However, the Public Health Division began to recognize that behavioral health is critical as a first line defense against future problems. Realizing that behavioral change is the key, they have evaluated various ways in which to affect this change. An effective model has been tested, derived from the American Psychiatric Association’s “stages of change” and motivational changes counseling. Implementation has remained problematic, as this approach is time-consuming and labor intensive, but the Behavioral Health Division hopes to test whether this can be developed on a larger scale, such as in a community-wide setting or whether this may destroy the very effectiveness of the intervention.
The Behavioral Health Division has conducted community-wide assessments to determine the stage of change a given community is in, hoping to tailor outreach for that community on that basis. If community-wide approaches are effective, then funding may be directed for larger efforts. If not, back-up strategies include marshalling other community groups and services, such as faith-based organizations and churches, to help provide this counseling, understanding that a person’s spiritual health is intertwined with their overall physical health and their behaviors. This approach has yet to be fully evaluated, but it demonstrates Palau’s attempt to try innovative strategies to solve common problems.

Internal Training and Infrastructure
“Internal training” encompasses training programs within Palau, partnerships with regional schools and internally funded programs to send Palauans elsewhere to receive a specific set of skills. Palau has yet to identify what are the most cost-effective strategies for different sets of special skills training and has consequently developed multiple strategies that have attempted to address this issue. Clearly, it makes little sense to recruit a very specialized oral surgeon when the general dentists are stretched beyond their capacity. One innovative and successful example is the Health Alliance Training Program, which attempts to minimize the cost of sending people for training while linking specific individuals with needed specific skill sets. The program begins by teaching basic auxiliary health care skills in Palau, then works to identify each individual’s specific talents and aptitudes and then places them in settings where they can further develop those skills in Palau, if the training is available, or elsewhere. The program allows Palauans to be trained and to care for their community while trying to minimize recruitment of outside healthcare providers.

A common concern across divisions was the ability to get information back in a timely manner. Every public health system requires infrastructure to function, monitor and accomplish its goals. If the “community-ownership” model of healthcare is utilized, then perhaps there would be less centrally-based infrastructure required. There are a wide variety of training and infrastructure needs across the different divisions and programs, including problems with sufficient manpower, adequate space, lab capacity, outdated databases, and similar weaknesses. However, the overall approach to improved infrastructure must not be to seek ways to increase manpower for specific needs, but rather to focus on decreasing the need for a given level of workforce and infrastructure by permanently reducing a population’s morbidity rates and improving overall health.

Quality Assurance
There is increasing emphasis on evidence-based practices with the ability to measure outcomes and results from these interventions. This is easier to accomplish for a screening program, such as cervical cancer, but more difficult for programs that focus on community awareness, education and behavioral intervention strategies. When these programs come out of a public health system’s budget, then there needs to be a systematic way to look at the given population before, during, and after the intervention strategies.

For example, in Palau there have been two surveys on risky behaviors and other data on adolescents collected in schools across Palau. A large volume of data has been collected since 2002, but most has not been analyzed. If interventions are targeted at the behavior of these populations, there should ways to evaluate whether the strategies make a difference. If not, then that program should be stopped, evaluated to determine why it didn’t work, and a different intervention that might work should be developed.

It is also important to collect and manage the data efficiently by using databases. Palau has made great strides in this area but there remain multiple non-compatible databases for different programs. An ultimate goal is to upgrade these systems so that they are all synchronized into one database.

Leadership Modeling
The concept of leadership modeling means to lead by example. It is difficult for dental staff to lecture clients and effectively convince them to quit chewing betelnut with tobacco, when 90% of the Palauan public health
dental staff chew betel nut with tobacco. Often when addressing this issue it becomes very personal and people start talking about their individual rights. An initiative was put forward to make tobacco illegal in Palau, but it was defeated. Other issues that require leadership modeling include alcohol consumption, diet and exercise. In discussions of how to change behaviors, key public health personnel repeatedly confessed that this remains a problem, admitting that they seem powerless to control their own known destructive behaviors.

Collaboration
There must be collaboration within the Public Health Divisions and Programs. For example, Family Health works with Oral Health, Communicable Diseases, and a variety of other programs to enhance effectiveness. “We argue and we fight, but we move forward together at the same time,” summarized one key official. All of the different programs try to coordinate visits to the community health centers at the same time. There is collaboration so that Public Health can persuade the government to enact laws that improve health and encourage healthy behaviors. Local government has also collaborated with Public Health by providing transportation for women who need follow-up or mammography for the Breast Cancer Screening Program.

Collaboration between public health, community organizations, and the private sector is also crucial. For example, there is an agreement with a local water company to add fluoride to their 5-gallon jugs of water. However, because Public Health is a government bureau they cannot promote this specific company in the private sector and have to find indirect ways to promote the fluoridated water. The Breast Cancer Program realized that to adequately address its agenda it requires a multidisciplinary group of psychologists, religious organizations and other groups. Collaboration with Palau’s Public Health efforts also includes agencies outside of Palau, including the Fiji School of Medicine, University of Hawai’i, the World Health Organization and other organizations.

Conclusions
The Republic of Palau has an efficient, well organized public health system despite being a small, relatively isolated island country with limited resources and limited funds. Contributing to this success has been Palau’s embrace of a comprehensive definition of health that makes explicit the complex forces involved in keeping a community healthy. Several key concepts also contribute to Palau’s public health successes, including the themes of community-ownership, behavioral modification, internal training and infrastructure, leadership modeling, and collaboration. Palau’s definition of health and these key concepts could be utilized and developed in other public health settings within the Pacific that have similarly limited resources and are likewise relatively isolated geographically.

These concepts can be applied more widely to other healthcare settings throughout the world. Everyone involved in public health or primary health care should be reminded of the Alma-Ata declaration of 1978, which stated, “health, which is a state of complete physical, mental and social wellbeing, and not merely the absence of disease or infirmity, is a fundamental human right and that the attainment of the highest possible level of health is a most important world-wide social goal whose realization requires the action of many other social and economic sectors in addition to the health sector.”

Each of Palau’s public health key concepts can be applied across public health and primary care settings. For example, the concept of community-ownership is being realized in the United States as patients report increasing dissatisfaction with the fragmentation and specialization of Western healthcare. The American Academy of Family Physicians, in their Future of Family Medicine Project, has identified this as creating a “medical home,” a top priority in redefining the clinic and primary healthcare providers.7 Empowering people with knowledge alone is inadequate. Worldwide, we know that knowledge doesn’t always change behaviors, however, it remains part of public health’s and primary care providers’ obligation to lead the way by example. Countries also should encourage political pressure and initiatives to make unhealthy behaviors more difficult or more costly. For healthcare there should be appropriate infrastructure that allows individual physicians and public health personnel to access data from various programs quickly and easily. This is a challenge, especially as the terminologies of computer specialist and medical provider are often foreign to each other. However, in developing medical and public health databases these two are often required to communicate effectively. Bringing healthcare back to the community level, providing effective behavioral modification, funding adequate healthcare infrastructure and training, leading by example and a willingness to collaborate and
compromise will go a long way toward ameliorating the fragmented and dysfunctional healthcare system in the United States today and will move us toward "Healthy People in a Healthy World."

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13 years ago in Pacific Health Dialog, K. Helu-Thaman stated, "Today in our Pacific Islands we can no longer use 'culture' as an excuse for inaction — rather we ought to use 'culture' as a privilege that enables us to move meaningfully towards those objectives..." PHD, 1995;2(2):83.
Developing a Model of Evidence-Based Public Health Practice that Makes Sense for the Pacific

James Rarick, MPH

Address correspondence and reprint requests to: James Rarick, MPH, Cancer Information Service, Pacific Region, National Cancer Institute, Cancer Research Center of Hawai‘i, 1236 Lauhala Street, Suite 302, Honolulu, Hawai‘i 96813-2479; jrarick@crch.hawaii.edu.

Abstract
The new paradigm for public service organizations is summed up in the phrase “evidence-based practice,” a concept grown from its origin in clinical medical practice to include a broad range of disciplines, including non-clinical approaches to disease prevention and health promotion. From a “global” perspective, this movement reflects the modernization policies of national governments that are intended to ensure effectiveness and increase accountability of publicly funded programs. It has also been fueled by rapid developments in information technology and the burgeoning growth in evidence-based research that forms the foundation of the movement. As the concept of evidence-based public health (EBPH) is exported to the Pacific, it will be imperative to keep in mind the historical and political forces that have shaped this movement, as these have important implications for attempts to advance the use of EBPH in Pacific Island communities. This commentary describes the basic format and evaluation results from an early attempt to introduce EBPH to public health workers in the Pacific at a 2-day workshop conducted at the Pacific Global Health Conference, June 13-14, 2005. This article will conclude with recommendations for developing a culturally competent model for promoting EBPH practice among public health workers and policy makers who serve Pacific Island communities. (PHD 2007 Vol 14 No 1 pp 188-190)

Introduction
The Pacific Global Health Conference (PGHC) is a biennial conference, which brings together academics, educators, policymakers, and practitioners from across the Pacific to share research, discuss current issues, develop strategies for the future, and increase avenues of communication across the widespread geographic and cultural area that comprise the Pacific Islands. The event is sponsored by the Hawai‘i Public Health Association in collaboration with several regional, national and local partners interested in building public health capacity within the Pacific Region.

The U.S. Centers for Disease Control and Prevention (CDC) played a key role in the 2005 conference planning effort, including coordination and support for a two-day pre-conference workshop on EBPH that was geared specifically to chronic disease program managers in the U.S.-Associated Pacific Islands (USAPI): American Samoa, the Republic of the Marshall Islands (RMI), the Federated States of Micronesia (FSM), the Republic of Palau, Guam and the Commonwealth of the Northern Mariana Islands (CNMI). As a major funding agency for public health activities in the USAPI, the CDC is interested in promoting greater use of evidence-based strategies that could lead to improved health outcomes. The workshop was conducted by Ross Brownson, PhD, Beth Baker, PhD, and Leslie McIntosh, MPH, all of whom are affiliated with the University of St. Louis, School of Public Health. The PGHC Steering Committee and CDC’s National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) hosted conference calls between the workshop instructors and chronic disease managers in several of the Pacific Island jurisdictions prior to the training in an attempt to tailor the workshop to meet local needs. A somewhat condensed version of the workshop was developed, consisting of seven modules designed to provide hands-on opportunities for participants to develop the skills needed to apply EBPH principles in their daily work. A summary of each module’s content follows.

Descriptions of Module Content
Module 1 provided the course overview and introduced participants to the basic concepts of evidence-based decision making, including a review of both the similarities and important distinctions between evidence-based medicine and EBPH. While medical studies often rely on randomized clinical trials (considered the most scientifically rigorous of epidemiologic studies), public health interventions tend to be complex, programmatic, and are often context-dependent. Consequently, there are fewer studies of the effectiveness of public
health interventions than there are for medical practice. Attendees were also shown several applications within public health practice that were based on strong evidence, along with several that were based on weak evidence. The last part of the module defined some of the barriers to evidence-based decision-making in public health settings.

Module 2 covered the steps for developing an operational statement for a particular public health issue, which includes setting priorities for public health and developing a concise statement of the problem, issue or policy in terms that are measurable. Module 3 focused on quantifying the issue, provided a short review of the basic concepts of descriptive epidemiology, and concluded with a review of several major sources of public health surveillance data, while also providing an opportunity for participants to access data from on-line sources. Module 4 provided participants with instruction and hands-on practice in conducting literature searches, and emphasized the importance of conducting a systematic search process.

Module 5 covered two important aspects for developing program or policy options. First, this module conducted a review of the sources of information on various health programs in order to understand the criteria that may be invoked in choosing among options, and secondly, to understand the importance and basic approaches of economic evaluation. Module 6 explored various program planning models that could provide useful strategies and covered the importance of setting realistic and measurable objectives. Lastly, Module 7 allowed for evaluation of the program or policy to be implemented, covering the differences and unique contributions of quantitative and qualitative evaluation, and reviewing the basic concepts of measurement validity and reliability.

Workshop Evaluation Results

Forty-three attendees representing 15 islands participated in the workshop. Overall, workshop evaluation scores were very good (8.7/10.0), with participants commenting that the workshop was clear, concise and easy to follow. Greater than 80% of workshop participants were satisfied with the workshop content, and 94% indicated that additional similar workshops for Pacific Islanders should be taught in the future. When queried if they planned to use the information learned, 91% of workshop participants responded in the affirmative. Asked specifically how they planned to use the information in the 6 months subsequent to the workshop, the majority of responses fell into five categories: 1) information dissemination, 2) planning, 3) networking, 4) program improvement/ modification, and 5) grant proposal writing. The modules cited as most useful were Module 5 (“Developing an Action Plan and Implementing Interventions”) and Module 6 (“Evaluation of Evidence-based Programs”). The main concern expressed by participants was that the workshop was too short (the typical workshop was 3.5 to 4.5 days); many attendees also expressed interest in participating in follow-up training.

An important function for such a network could also be to review current models for teaching EBPH and consider what changes need to be made to ensure the development of culturally competent curricula congruent with the skills and resources available in various public health settings around the Pacific.

Future Directions

While the workshop evaluation indicated that most of the participants felt the information could be useful in their work in the Pacific, it is also clear that there is a need for an extended course to allow more time for participants to learn and practice the skills needed to apply the basic principles of EBPH. There are a number of key issues that should be considered in the future development and/or adaptation of this training curriculum in the Pacific. First, consideration should be given to the historical and political forces that have shaped the evidence-based practice movement, and to what extent these forces may or may not be relevant within the various local contexts. Some workshop participants suggested that the course be taught to department directors and policy makers, implying that there would be little expectation to adopt EBPH approaches until local leadership understands the direct benefits of doing so.

Secondly, the formal training of persons working in public health varies much more than it does in medicine, and this is particularly true for public health workers in many parts of the Pacific where much of the workforce has not had the benefit of formal training in core public health competencies. Building the capacity of public health workers to perform these core functions is critical to any attempt to promote EBPH practice at the local level. Key public health training institutions and public health advocacy groups serving the Pacific Islands might consider establishing a regional partnership modeled after the National Public Health Leadership Development Network that was established under CDC leadership in 1991.
An important function for such a network could also be to review current models for teaching EBPH and consider what changes need to be made to ensure the development of culturally competent curricula congruent with the skills and resources available in various public health settings around the Pacific. The development of such a network is anticipated to be an important topic of discussion during the 2007 PGHC conference, at which three major topic areas will be addressed: 1) workforce training and development; 2) evidence-based practice in the Pacific Islands; and 3) emerging health issues in the Pacific.

It is encouraging to note that EBPH course participants cited the modules on “Developing an Action Plan” (Module 5) and “Evaluating the Program or Policy” (Module 6) as the two modules they were most likely to use and share with their colleagues in the Pacific. From a purely practical point of view, this could be a good start in building local evidence as to what works towards improving the health of Pacific Island communities.

From a purely practical point of view, this could be a good start in building local evidence as to what works towards improving the health of Pacific Island communities.

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13 years ago in Pacific Health Dialog, M. J.O’Leary stated that, “The collection and storage of data in cabinets has been described as a “data cemetery.” We recognise that computers can make a good system more efficient but they will not make a bad system good.” PHD, 1995;2(1):128.
How Can the University of Hawai‘i Meet Needs for Public Health Education? Results of a Students’ Needs Assessment

Jana Lindsey, BSN*
Kathryn L. Braun, DrPH†
Nandar Aung, MBA, MPH*
Jaime A. Campos, BA*
Lehua Choy, MPH*
Jane Chung, BA*
Sharon F. Dellinger, BSN*
Lauren Gentry, BA*
Jinlan Li, MPH*
Sara Mayet, MB,BS*
Kristen Mitchell-Box, MSPH, REHS*
Joan Pan, BA, MPH*

*Member of the PH 649 (Needs Assessment and Program Planning) class, Department of Public Health Sciences, John A. Burns School of Medicine, University of Hawai‘i at Manoa, Honolulu, Hawai‘i. †Department of Public Health Sciences, John A. Burns School of Medicine, University of Hawai‘i at Manoa and ‘Imi Hale Native Hawaiian Cancer Network, Papa Ola Lokahi, Honolulu, Hawai‘i.

Address correspondence and reprint requests to: Ms. Jana Lindsey, Shriners Hospitals for Children, 1310 Punahou Street, Honolulu, Hawai‘i 96826-1027; jlindsey@shrinenet.org.

Abstract

Introduction: A strong public health workforce is necessary to maintain the health and well-being of any community. Currently, the ability of the public health workforce to meet demand is being challenged in Hawai‘i and the Pacific. This is due, in part, to the downsizing of the public health program at the University of Hawai‘i (UH) in the year 2000. Knowing the current perceptions of the community in regards to public health and identifying ways to attract more students to public health are essential in reversing this trend. Materials and Methods: Students from a class on needs assessment and program planning at the UH Department of Public Health Sciences assessed public health education needs. The class first conducted a literature review, focus groups, and interviews to inform the development of an on-line survey. The survey was sent to 200 individuals, including current public health students, faculty, workers, employers, and alumni. Results: Of the 200 individuals invited to participate in the on-line survey, 128 (64%) responded. Almost half of the respondents were >50 years of age, and another 19% were between ages 41 and 50. Of the 118 who responded to this question, 85 had degrees in public health (80% from UH), and 62% had worked in public health for at least 10 years. However, only 50% of the total respondents knew that UH Masters of Public Health (MPH) and the Masters of Science (MS) programs were accredited. Forty percent or more of public health workers noted continuing education needs in 1) policy development and program planning skills, 2) analytical skills, 3) leadership and systems thinking skills, and 4) financial planning and management skills. Fully 43 of the respondents would consider applying to a DrPH program at UH, and 27 public health workers without an MPH would consider pursuing one. However, potential students noted lack of time and timing of classes as barriers to attending school. Specific ideas for attracting students to public health were provided. Respondents also called for a greater commitment to public health from top leadership at UH and in Hawai‘i. Discussion: Findings confirm a need for a strong public health education program in Hawai‘i and a lack of awareness about the MPH and MS programs at UH. Expanding options and opportunities for public health education will require better marketing and a cohesive commitment to public health education at UH. (PHD 2007 Vol 14 No 1 pp 191-198)

Introduction

Public health and safety are traditionally taken for granted, and the importance of public health goes unnoticed until there is a problem. “Because of public health’s emphasis on prevention, it is virtually invisible when it is most successful in performing its duties and achieving its goals.” Aside from the “invisible” public health issues, in this decade the world has witnessed more obvious public health threats ranging from natural disasters, infectious disease outbreaks, and bioterrorist events to community epidemics of diabetes, obesity, and drug abuse. With the variety of threats that face us, every community needs a diversified and well-trained public health workforce.
Residents of Hawai‘i experience the longest life expectancies in the U.S. However, not all residents realize the same level of health. For example, Native Hawaiians and other Pacific Islanders have lower life expectancies than other ethnic groups in Hawai‘i. Native Hawaiians and Filipinos have higher rates of cancer mortality, and Japanese, Filipinos, and Pacific Islanders have a higher prevalence of diabetes than other groups. Smoking prevalence is highest in Native Hawaiians, and obesity (including childhood obesity) is a growing concern for almost every ethnic group. Drug abuse and homelessness are increasing. Hawai‘i needs to guard against morbidity from infectious diseases, including leprosy, leptospirosis, and dengue fever. The state is also at risk of environmental disasters, especially earthquakes, tsunamis, flooding, and landslides. All of these issues require the attention of trained public health workers.

The Pacific Ocean covers one-third of the earth’s surface and includes thousands of islands and atolls scattered across five time zones. Each island-state has a unique culture and language, but most share a history of colonization and have experienced rapid cultural upheaval from subsistence to wage economies in the past 50 years. Most jurisdictions are burdened with health conditions found in developing countries (e.g., malnutrition, filariasis, and dengue fever), and diseases associated with developed countries (e.g., diabetes, heart disease and cancer). More indigenous Pacific Islanders need to be trained to address these public health issues.

Unfortunately, educational institutions are not keeping up with the demand for maintaining and improving the public health workforce. A 2006 study by the American Public Health Association identified that “the average age of state public health workers is about 47 years,” and that “(U.S.) states could lose up to 45% of their experienced public health workforce through retirement by the end of 2006.” The public health workforce in Hawai‘i is aging as well, with many planning to retire in the next 10 years. In the Pacific Basin jurisdictions “health professionals are so profoundly difficult to come by that organizations in the Pacific Basin must draw from a variety of health education systems in Fiji, Southeast Asia, as well as the United States.” According to the U.S. Health Resources and Services Administration, “To assure a competent public health workforce in the 21st century, it is essential (that) training be built around public health core competencies. This training is particularly important for public health employees who have not had any formal training in public health.”

The ability to meet the public health workforce demands of Hawai‘i and the Pacific region has been challenged by the downsizing of the public health program at the University of Hawai‘i (UH) in the year 2000. At that time, the UH School of Public Health was the only public health school in the Pacific Basin region, graduating about 100 students each year. Hawai‘i, well known for its cultural and ethnic diversity, provided a unique environment for public health students. With an average annual enrollment of 300 students, the School of Public Health was an exciting training ground for individuals from Hawai‘i, the Pacific, the continental U.S., Asia, and Africa. Students pursuing a Masters in Public Health (MPH) could major in one of nine content areas: biostatistics, community health development, environmental and occupational health, epidemiology, gerontology, health administration and planning, health education, international health, and maternal and child health. The School of Public Health also sponsored two doctoral programs, including a PhD in Public Health Science and a DrPH. The UH School of Public Health was the closest U.S. public health school to the U.S.-Affiliated Pacific Islands (USAPI) including American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau. Many individuals currently in public health leadership positions in the USAPI received their public health degrees from the UH School of Public Health.

Due to catastrophic losses in faculty, funding, and support from UH administration and concerns about low research productivity, the Council for Education in Public Health (CEPH) did not reaccredit the School of Public Health in 2000.
Federal grant funding also supports a 16-credit Public Health Certificate in maternal and child health (MCH) leadership. Currently, the Department graduates about 15 students per year. Meanwhile, other educational programs have been developed to fill the void in the Pacific, including the Fiji School of Public Health, the Area Health Education Centers, and the Pacific Association for Clinical Training.8,9

In a beginning effort to expand public health training at UH, students in the Department’s fall 2006 class on Needs Assessment and Program Planning agreed to examine this issue. The purpose of the needs assessment was to collect data to answer three questions:

- What should UH Public Health education look like to meet Hawai‘i needs?
- What are the continuing education needs of public health workers?
- How can we attract more students to public health?

Materials and Methods

The 11 students in the UH public health class on Needs Assessment and Program Planning (PH 649) designed and implemented this project. The initial task was to review pertinent literature from respected sources, including the U.S. Institute of Medicine, the U.S. Department of Health and Human Services, and the Council for Public Health Education (CEPH). Students took responsibility for summarizing the key points from these documents and sharing them with each other. Concurrently, the class invited Dr. Jay Maddock (Department Chair), Nancy Kilonsky (Assistant Dean), and Dr. Paulette Williams (President of the Public Health Alumni Association) for an informal discussion on the history of public health education at UH and their impressions of public health in Hawai‘i. At the same time, the class instructor (KLB) sent an e-mail to people in public health, recruiting them for participation in focus groups, interviews, and an on-line survey. Those who received this e-mail were encouraged to forward the invitation to others, thus increasing the reach of recruitment. The list of 200 consenting individuals included public health students, current and former faculty, people who attended the April 2006 Revitalization of Public Health Celebration, members of the Hawai‘i Public Health Association, and other professional contacts.

To gather qualitative data, the 11 students worked in three groups, each focusing on a different target audience; current public health students at UH, public health employers/workers, and UH public health faculty. UH public health alumni were represented in both the public health employer/worker group and the faculty group. Based on information about public health gleaned from the literature and from Ms. Kilonsky and Drs. Maddock and Williams, each student group prepared a qualitative interview schedule for use in a focus group and one-on-one interviews with its target audience. Questions for the student group explored why they chose UH, their perceptions of the program’s quality, and how well they thought the program was preparing them for a career in public health. Faculty members were asked to discuss their perceptions of the program and the advantages and disadvantages of being a program rather than a school of public health. Employers and workers were asked about their needs for future public health workers and their own continuing education needs.

Interview and focus group training was provided in class through which students pre-tested their interview schedules and refined interview skills. Each group conducted one focus group session following their interview schedule, one with eight current public health students, one with five current faculty members of the UH Department of Public Health Sciences, and one with four individuals in managerial positions at the Hawai‘i Department of Health. Each student also used the interview schedule to interview at least two individuals in their target group (students, faculty members, and public health employers/workers), for a total of 34 interviews. Each group summarized the focus group and interviews it conducted.

Information obtained from the focus groups and interviews was reviewed and discussed by the class to identify common themes, issues, and response options that should be included in the on-line survey. The survey instrument went through several drafts and revisions, was pre-tested with six members of the target audience, and revised again. It was formatted into an on-line survey program called SurveyMonkey.10 The survey was piloted in this format to identify any glitches and then modified to increase ease of understanding and flow of questions. The final on-line survey contained seven general questions, ten demographic questions, and three open-ended questions. Respondents were asked to classify themselves as a public health student, faculty member, alumni, worker, and/or employer. Additional survey questions were separated into sections corresponding to this self-classification. For example, if the respondent was both a public health worker and alumni, SurveyMonkey prompted them to

Still, responses were received from 128 of the 200 individuals, yielding a 64% response rate.
answer additional questions relevant to public health workers and alumni. The project and on-line survey tool were reviewed and approved by the UH Committee for Human Studies.

An invitation to participate in the on-line needs assessment survey was sent by e-mail to the 200 individuals who had agreed to participate in the needs assessment. Due to time limitations imposed by the semester’s calendar, the data collection period was limited to two weeks in November 2006. At least 15 individuals were off-island during this time and were unable to participate. Still, responses were received from 128 of the 200 individuals, yielding a 64% response rate.

SurveyMonkey provides a summary of data to the subscriber. Additionally, the dataset can be downloaded into Excel. From these sources, students created data tables, produced a PowerPoint presentation, and prepared an abstract summarizing the project’s methods, findings, and recommendations. Because the students met only once a week in class, most work had to be accomplished by e-mail and outside meetings, including the planning, coordination, and data sharing.

**Results**

Many of the 128 respondents classified themselves in more than one category. Thus, the sample included 83 (65%) public health workers, 78 (61%) alumni, 30 (24%) public health employers, 15 (12%) current students and 16 (13%) faculty members (Table 1).

Of the 118 respondents who provided information about age, 53 (45%) were age 51 or older and another 23 (20%) were between ages 41 and 50 (Table 1). This finding is consistent with national data and local observations about the aging of the public health workforce. Of the 113 respondents who have been working in public health, 70 (62%) had been

<table>
<thead>
<tr>
<th>Table 1. Characteristics of the Survey Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
</tr>
<tr>
<td>Types of respondents (check all that apply)</td>
</tr>
<tr>
<td>- Current student</td>
</tr>
<tr>
<td>- Faculty</td>
</tr>
<tr>
<td>- Alumni</td>
</tr>
<tr>
<td>- Public Health worker</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>- Female</td>
</tr>
<tr>
<td>Age group</td>
</tr>
<tr>
<td>- 18-25</td>
</tr>
<tr>
<td>- 26-30</td>
</tr>
<tr>
<td>- 31-40</td>
</tr>
<tr>
<td>- &gt;50</td>
</tr>
<tr>
<td>Years working in Public Health</td>
</tr>
<tr>
<td>- &lt;1</td>
</tr>
<tr>
<td>- 1-3</td>
</tr>
<tr>
<td>- 4-9</td>
</tr>
<tr>
<td>- 10-19</td>
</tr>
<tr>
<td>- 20-29</td>
</tr>
<tr>
<td>Has degree in Public Health</td>
</tr>
<tr>
<td>- Total yes</td>
</tr>
<tr>
<td>Which Public Health degree do you have?</td>
</tr>
<tr>
<td>- MPH</td>
</tr>
<tr>
<td>- MS or MSPH</td>
</tr>
<tr>
<td>- DrPH</td>
</tr>
<tr>
<td>University where Public Health degree earned</td>
</tr>
<tr>
<td>- UH</td>
</tr>
<tr>
<td>- Other</td>
</tr>
</tbody>
</table>

*Respondents could choose more than one option.

<table>
<thead>
<tr>
<th>Table 2. Interest in Further Education</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
</tr>
<tr>
<td>Knows that UH MPH and MS programs are accredited by CEPH</td>
</tr>
<tr>
<td>- Yes</td>
</tr>
<tr>
<td>- No</td>
</tr>
<tr>
<td>Those without MPH who would consider pursuing one</td>
</tr>
<tr>
<td>- Yes</td>
</tr>
<tr>
<td>- At UH</td>
</tr>
<tr>
<td>Those who would consider applying to the DrPH at UH</td>
</tr>
<tr>
<td>- Lack of time</td>
</tr>
<tr>
<td>- Class times/schedule</td>
</tr>
<tr>
<td>- Financial support</td>
</tr>
<tr>
<td>- Parking</td>
</tr>
<tr>
<td>- Other</td>
</tr>
</tbody>
</table>
working in the field for at least 10 years (including 12% who have worked more than 30 years and 20% who have worked 20-29 years). Among the respondents, 85 indicated that they had a degree in public health, and 68 (80%) of them obtained their degree from UH (Table 1).

Surprisingly, only 50% of the total respondents knew that UH Masters of Public Health (MPH) and the Masters of Science (MS) programs were accredited (Table 2).

When public health workers without a degree in public health were asked if they would consider pursuing an MPH, 64% (27 of the 42 respondents) answered “yes.” When asked if they would pursue this degree at UH, 61% (19 of the 31 respondents) answered “yes.” Nearly 40% (43 out of the 112 respondents) would consider applying to the DrPH program at UH. However, 65 potential students identified a number of obstacles to pursuing an MPH or DrPH, including lack of time (79%), inconvenient class times (72%), lack of financial support (30%), and other personal and professional constraints (20%).

Table 3. Continuing Education Needs

<table>
<thead>
<tr>
<th>Item</th>
<th>Number responding</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuing Education needs for employees</td>
<td>69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Policy development and program planning skills</td>
<td></td>
<td>39</td>
<td>56.5%</td>
</tr>
<tr>
<td>• Analytical skills</td>
<td></td>
<td>38</td>
<td>55.1%</td>
</tr>
<tr>
<td>• Leadership and systems thinking skills</td>
<td></td>
<td>37</td>
<td>54.6%</td>
</tr>
<tr>
<td>• Financial planning and management skills</td>
<td></td>
<td>33</td>
<td>47.8%</td>
</tr>
<tr>
<td>• Collaboration and coalition-building skills</td>
<td></td>
<td>26</td>
<td>37.7%</td>
</tr>
<tr>
<td>• Communication and advocacy skills</td>
<td></td>
<td>20</td>
<td>29.0%</td>
</tr>
<tr>
<td>• Basic public health knowledge (concepts, theory, functions,</td>
<td></td>
<td>18</td>
<td>26.1%</td>
</tr>
<tr>
<td>history, ethics)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cultural competency skills</td>
<td></td>
<td>14</td>
<td>20.3%</td>
</tr>
<tr>
<td>• Other</td>
<td></td>
<td>11</td>
<td>15.9%</td>
</tr>
</tbody>
</table>

Table 4. Ways to Market and Strengthen the UH Public Health Program

<table>
<thead>
<tr>
<th>Item</th>
<th>Number responding</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the advantages of becoming a School</td>
<td>124</td>
<td>99</td>
<td>79.8%</td>
</tr>
<tr>
<td>• Greater diversity in classes, more professors, more choices</td>
<td></td>
<td>68</td>
<td>54.8%</td>
</tr>
<tr>
<td>• More visibility</td>
<td></td>
<td>60</td>
<td>48.4%</td>
</tr>
<tr>
<td>• Increased funding</td>
<td></td>
<td>55</td>
<td>44.4%</td>
</tr>
<tr>
<td>• Independence from the School of Medicine</td>
<td></td>
<td>51</td>
<td>41.1%</td>
</tr>
<tr>
<td>• Increased prestige</td>
<td></td>
<td>22</td>
<td>17.7%</td>
</tr>
<tr>
<td>• Other</td>
<td></td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Strategies to attract students to Public Health at UH

<table>
<thead>
<tr>
<th>Item</th>
<th>Number responding</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Show clear need for public health, what it does, and how</td>
<td>126</td>
<td>83</td>
<td>65.9%</td>
</tr>
<tr>
<td>effective it is</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Improve visibility of program in Hawai’i</td>
<td></td>
<td>78</td>
<td>61.9%</td>
</tr>
<tr>
<td>• Offer an introductory course in public health at the</td>
<td></td>
<td>76</td>
<td>60.3%</td>
</tr>
<tr>
<td>undergrad level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Offer collaborative degrees or certificates</td>
<td></td>
<td>72</td>
<td>57.1%</td>
</tr>
<tr>
<td>• Offer online/distance learning opportunities</td>
<td></td>
<td>65</td>
<td>51.6%</td>
</tr>
<tr>
<td>• Market the program in the Pacific Basin</td>
<td></td>
<td>60</td>
<td>47.6%</td>
</tr>
<tr>
<td>• Market the program nationally</td>
<td></td>
<td>58</td>
<td>46.0%</td>
</tr>
<tr>
<td>• Offer more evening and weekend classes</td>
<td></td>
<td>57</td>
<td>45.2%</td>
</tr>
<tr>
<td>• Educate UH undergrad advisors about public health as a</td>
<td></td>
<td>53</td>
<td>42.1%</td>
</tr>
<tr>
<td>career option</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Market the program to people working in public health</td>
<td></td>
<td>47</td>
<td>37.3%</td>
</tr>
<tr>
<td>• Establish a Community Advisory Board for the program</td>
<td></td>
<td>46</td>
<td>36.5%</td>
</tr>
</tbody>
</table>

Strategies to strengthen Public Health education at UH

<table>
<thead>
<tr>
<th>Item</th>
<th>Number responding</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improve ties with the communities locally and in the</td>
<td>125</td>
<td>91</td>
<td>72.8%</td>
</tr>
<tr>
<td>Pacific</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Secure a commitment to public health from the</td>
<td></td>
<td>74</td>
<td>59.2%</td>
</tr>
<tr>
<td>Chancellor on down</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Collaborate with other departments at UH in offering</td>
<td></td>
<td>61</td>
<td>48.8%</td>
</tr>
<tr>
<td>degrees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Gain independence from the School of Medicine</td>
<td></td>
<td>48</td>
<td>38.4%</td>
</tr>
<tr>
<td>• Increase opportunities for practitioners to lecture and</td>
<td></td>
<td>45</td>
<td>36.0%</td>
</tr>
<tr>
<td>serve as adjunct faculty</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Respondents were asked to indicate areas in which continuing education was needed. In all, 69 participants provided information, including 63 public health workers and 6 public health employers. Together, these 69 participants wanted more continuing education in these skill areas: 1) policy development and program planning (57%); 2) analytical skills (55%); 3) leadership and systems thinking skills (55%); 4) financial planning and management skills (48%); and 5) collaboration and coalition-building (38%) (Table 3). Fewer respondents identified continuing education needs in communication and advocacy skills (29%), basic public health knowledge (26%), and cultural competency (20%).

From a list of several reasons, survey participants were asked to select up to three in response to this question: “What are the advantages of becoming a school of public health?” (response options were developed from themes that emerged in the focus groups and interviews). The lead advantage chosen by the 124 who responded to this question was greater diversity in classes, more professors, and more choices (selected by 80% of respondents). Other advantages included increased visibility for public health education (55%), increased funding for public health education (48%), independence from the School of Medicine (44%), and increased prestige (41%) (Table 4).

The participants were given a list of 22 options to choose from and asked to indicate the top 10 strategies that would best help to attract students to the UH public health program. Of the 126 respondents to this question, the top three choices were: 1) to show clear need for public health, what it does, and how effective it is (66%); 2) to improve the visibility of the public health program in Hawai‘i (62%); and 3) to offer an introductory course to public health at the undergraduate level (61%). Another question asked about ways to strengthen public health education at UH. As identified by 125 respondents, the top five strategies were: 1) to improve ties with the community locally and within the Pacific (73%); 2) to secure a commitment to public health from the UH Chancellor on down (59%); 3) to collaborate with other departments at UH in offering degrees (49%); 4) to gain independence from the School of Medicine (38%); and 5) to increase opportunities for public health practitioners to lecture and serve as adjunct faculty (36%) (Table 4).

Based on these suggestions, the class proceeded to develop two proposals related to marketing of the UH public health program. One proposal outlined ways to increase visibility of the program on campus, including improved signage, outreach to undergraduate and graduate students in other fields, and increased contact with other UH professors and administrators. The second proposal outlined ways to meet the needs of individuals already working in public health. Strategies included working with public health worksites and their human resource directors to develop ways to enroll workers in continuing education and degree-granting public health programs.

Discussion
The needs assessment study on the public health workforce in Hawai‘i conducted by the UH PH649 students verified that Hawai‘i’s community may be entering into an era of a public health workforce shortage. It is critical to develop and maintain a cadre of public health workers to ensure and sustain public health and safety. The Pacific Basin also needs more individuals trained in a wide range of public health issues and skills. If our local and regional public health workforces are not strengthened, we will not be able to adequately respond to current and emerging disasters and epidemics.

The sample population was constructed of individuals who responded to invitations from the professor to participate; so many public health practitioners were not included in the study.

The UH is an ideal location for an expanded public health education program (and ideally a new School of Public Health) because of its location in the middle of the Pacific Basin, its access to good practicum sites, an experienced group of public health faculty with good research and community-service records, and Hawai‘i’s ethnically and culturally diverse environment. However, UH first needs to increase local and regional awareness of the fact that the current MPH and MS programs are accredited. It should market itself to students, counselors, and administrators on campus, as well as to public health worksites across the state and region. It may need to offer more courses through distance education, at the worksite, and in the evening to address identified scheduling and parking barriers. UH should enhance ties with the community.

There were several limitations to this study. First, the students had only 16 weeks to design, carry-out, and report on the needs assessment and to develop proposals. Because of this, data collection was restricted to 2 weeks in November. Students did not have a budget to travel to Hawai‘i’s neighbor islands or
to the Pacific to interview other key informants about their needs. The sample population was constructed of individuals who responded to invitations from the professor to participate; so many public health practitioners were not included in the study. There were difficulties in specifying skip patterns within SurveyMonkey, so some items were not responded to by as many participants as expected. This may have been exacerbated by the overlapping characterization of individuals in public health (e.g., worker and employer and student), which made it difficult for SurveyMonkey to filter out the responses for each separate group.

The potential bias of the study investigators bears examination. Admittedly, the UH public health students who designed and conducted this study had a vested interest in the program, which could have influenced them to ask questions and interpret findings in a favorable light. On the other hand, none of the students in this class were familiar with the history of the UH School of Public Health, so that their questions were unlikely to reflect judgments and opinions expected of individuals who had lived through the closure of the UH School of Public Health. Lack of awareness of this past history also limited the students’ ability to anticipate and comprehend the range of emotions and opinions over the UH School of Public Health closure expressed to them. These emotions and opinions, a potential focus for another paper, are not prominently reflected in the survey results because most of the survey questions were close-ended.

It is the opinion of the authors of this paper that the Department of Public Health Sciences at UH is in a catch-22 position. To get more students, there needs to be more professors and courses to attract them. However to justify the need to increase the professors and classes, there needs to be an increase in enrollment, and it appears that the public is unaware that UH offers accredited public health degrees. Regardless of which must come first, the bottom line is that Hawai‘i must strengthen its workforce and public health program at the UH will help enrollment and entice individuals to pursue public health as a profession.

Increasing the visibility of and access to the public health program at the UH will help enrollment and entice individuals to pursue public health as a profession.

References


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Imi Ho'ola: An Educational Model for Disadvantaged Students at the University of Hawai'i School of Medicine

Nanette L. K. Judd, PhD, MPH, RN
Karen K. Sakamoto, MS
Earl S. Hishinuma, PhD
Chessa DeCambra, MBA
Agnes R. Malate, MEd

"Imi Ho'ola Post-Baccalaureate Program, Department of Native Hawaiian Health, University of Hawai'i John A. Burns School of Medicine, Honolulu, Hawai'i; "Department of Psychiatry, University of Hawai'i John A. Burns School of Medicine and Asian/Pacific Islander Youth Violence Prevention Center, Honolulu, Hawai'i; 'Asia Pacific Leadership Program, East-West Center, Honolulu, Hawai'i. Address correspondence and reprint requests to: Dr. Nanette L. K. Judd, Imi Ho'ola Post-Baccalaureate Program, Department of Native Hawaiian Health, University of Hawai'i John A. Burns School of Medicine, 651 Ilalo Street, Honolulu, Hawai'i 96813-5525; judd@hawaii.edu.

Abstract
This paper describes an educational model that provides opportunities in medicine to students from disadvantaged backgrounds that have a commitment to serve in areas of need, and it presents guidelines on how this model could be adapted to various settings. From 1973 to 2002, the Imi Ho'ola Program (Hawaiian for “Those Who Seek to Heal”) of the University of Hawai'i John A. Burns School of Medicine (JABSOM) has provided opportunities in medicine to 379 students from disadvantaged backgrounds. In 1995-1996, Imi Ho'ola underwent a transformation from a pre-medical enrichment program to a post-baccalaureate program that included provisional acceptance and financial support into JABSOM for students who successfully completed the program. As a result, the acceptance rate increased from 47.6% to 98.0%. In addition to provisional acceptance to JABSOM and financial support, the program’s educational model incorporates five components, the key factors of the program’s success: 1) JABSOM commitment and the institutionalization of the program; 2) emphasis placed on a comprehensive approach and the implementation of a curriculum and learning process that are aligned with JABSOM curricula; 3) faculty and staff who support the instructional methodology and work as a team to address students’ needs; 4) assessment of students and systematic feedback regarding individualized education plans and academic and non-academic progress; and 5) a positive learning environment for students. Guidelines are provided in this article for consideration in adapting this educational model to other academic settings. (PHD 2007 Vol 14 No 1 pp 199-204)

Introduction
Premedical enrichment and pre-admissions programs designed to increase the pool of underrepresented minority (URM) and socio-economically disadvantaged applicants in medicine have been in existence for decades and have had to address important issues such as affirmative action. Their successful and diverse approaches have been reported in medical education publications. Currently, there are over 100 post-baccalaureate programs, of which, two stand as national hallmarks: 1) Wayne State University School of Medicine’s post-baccalaureate program, the first such program in the U.S.; and 2) Southern Illinois University School of Medicine’s post-baccalaureate Medical/Dental Education Preparatory Program (MEDPREP). Both programs enrolled URM students from educationally and/or economically disadvantaged backgrounds. These individuals needed assistance to improve their basic science knowledge, learning/study skills, and test-taking strategies in order to be admitted to medical school and to subsequently succeed in various courses and skill areas required of medical students.

In describing Wayne State University’s post-baccalaureate program, Whitten reported the continuing need for increased numbers of URM students in medical schools and in the profession. He expressed the importance of providing financial assistance and guarantee of admission to medical school as a means to address the shortage of URMs in the profession.
The second post-baccalaureate program, MEDPREP at Southern Illinois University School of Medicine reported by McGlinn and Jackson enrolled students of economically and educationally disadvantaged African American, Hispanic, mainland Puerto Rican, and Native American ancestry. It was found that the strengths included: (a) designated teaching faculty; (b) high expectations of student success; (c) individualized student curricula; (d) extensive academic and personal counseling (including assistance with basic learning and study skills, Medical College Admissions Test (MCAT) preparation, upper-level science classes, seminars on the medical school admissions process, an emphasis on problem solving and active learning); (e) fully equipped, centralized facility where faculty could interact with students; (f) professional and social involvement of students with faculty, medical students and professionals in healthcare facilities; (g) involvement in on-going community service projects; and (h) regular monitoring of progress focused on individualized curriculum that enables the students to stay on track and to matriculate into medical school.

Despite the existence of over 100 post-baccalaureate programs, there remains a shortage in the number of physicians from minority backgrounds, especially underrepresented Native Hawaiian physicians. The lack of these physicians impacts negatively on communities and educational institutions. At the community level, patients are not accessing healthcare services due to lack of consideration of their social-cultural backgrounds, which may impact morbidity and mortality negatively. Additionally, there are a small number of physicians who can serve as role models to make medicine a possible career choice for students from these underrepresented backgrounds. At the institutional level, without URM faculty, there is less chance for the development and

### Table 1

**Description of Students of the Imi Ho'ola Program Based on Time Period, Ethnicity, Gender, Acceptance, and Age (N = 379)**

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Gender</th>
<th>Accepted</th>
<th>Age (in years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>No</td>
</tr>
<tr>
<td>1973-1994 Chamorro</td>
<td>13</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Chinese/Japanese</td>
<td>6</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Filipino</td>
<td>36</td>
<td>40</td>
<td>46</td>
</tr>
<tr>
<td>Micronesian</td>
<td>33</td>
<td>10</td>
<td>32</td>
</tr>
<tr>
<td>Native American Indian</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Native Hawaiian</td>
<td>64</td>
<td>40</td>
<td>46</td>
</tr>
<tr>
<td>Samoan</td>
<td>27</td>
<td>11</td>
<td>22</td>
</tr>
<tr>
<td>Vietnamese/Cambodian/Laotian</td>
<td>8</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Other*</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>192</td>
<td>121</td>
<td>164</td>
</tr>
<tr>
<td>%</td>
<td>61.3%</td>
<td>38.7%</td>
<td>52.4%</td>
</tr>
</tbody>
</table>

| 1996-2002 Chamorro/Micronesian | 3 | 0 | 0 | 3 | 23.0 | (3.46) | 3 |
| Chinese/Japanese               | 2 | 4 | 0 | 6 | 26.2 | (4.83) | 6 |
| Filipino                         | 10 | 11 | 1 | 20 | 24.7 | (3.31) | 21 |
| Native American Indian          | 0 | 3 | 0 | 3 | 24.7 | (2.89) | 3 |
| Native Hawaiian                  | 13 | 11 | 0 | 24 | 25.8 | (3.31) | 24 |
| Samoan                           | 3 | 0 | 0 | 3 | 29.0 | (4.00) | 3 |
| Vietnamese/Cambodian/Laotian    | 1 | 5 | 0 | 6 | 24.2 | (3.76) | 6 |
| **Total**                        | 32 | 34 | 1 | 65 | 25.4 | (3.80) | 66 |
| %                                | 48.0% | 52.0% | 2.0% | 98.0% |

| **Total**                        | 224 | 155 | 165 | 214 | 24.8 | (3.38) | 379 |
| %                                | 59.1% | 40.9% | 43.5% | 56.5% |

*Other: Caucasian, Hispanic
implementation of culturally appropriate curricula and instruction that address the cognitive and learning styles of students from diverse backgrounds. Without such faculty, there are also decreased opportunities for positive role modeling (e.g., URM faculty as teachers or preceptors) in medical schools.

**Imi Ho'ola Program**

**History**

Imi Ho'ola (Hawaiian for “Those Who Seek to Heal”) was established at the John A. Burns School of Medicine (JABSOM), University of Hawai'i (UH) in 1972 under the leadership of Dean Windsor Cutting and subsequently, Dean Terrence Rogers. The school felt it was important to provide access to medical education for disadvantaged students, and was fully committed to this venture. Imi Ho'ola’s first class of 15 students began in 1973. Funding was initially provided by the U. S. Public Health Service to recruit applicants who had the potential for a career in medicine. The early success of the program is attributed to the passion and visionary leadership of Dr. Benjamin Young, one of the few Native Hawaiian physicians at the time. Since then, funding has been provided by various federal and state agencies, community health systems, grassroots organizations, and private donations.

For the past 30 years, the Imi Ho'ola Program has been assisting underrepresented and disadvantaged students to qualify for and complete the MD program at JABSOM. One hundred forty-nine Imi Ho'ola alumni have graduated from medical school and are in practice or residency training in Hawai'i, the Pacific and the U.S. continent. The mission of the program is to improve healthcare in Hawai'i and the Pacific Basin by increasing the number of physicians through an educational program that addresses disadvantaged students’ academic and social-emotional needs in an effort to increase diversity in the medical profession.

**Overview**

The first two decades of the Imi Ho'ola Program had an admissions policy that was different from the last 6 years. The Program began as premedical enrichment and its primary focus was preparing participants to apply to JABSOM. In 1989, JABSOM instituted a Problem-Based Learning (PBL) curriculum, which is student-centered, problem-based, and active learning. As a result, Imi Ho'ola began to align its curriculum and learning process to the PBL method at JABSOM. Beginning with the 1996-1997 class, the program underwent a significant transformation and became a post-baccalaureate program due to federal funding preferences. Part of this change resulted in provisional acceptance into JABSOM for students who successfully completed the program. The acceptance rate increased from 47.6% to 98.0%.

As Table 1 illustrates, Imi Ho'ola has provided educational opportunities to 379 students from disadvantaged backgrounds. Eighty-seven percent of the participants are Native Hawaiians, Filipinos, and individuals from the U.S.-Affiliated Pacific Islands (i.e., American Samoa, Guam, Commonwealth of the Northern Mariana Islands [CNMI], the Republic of the Marshall Islands [RMI], the Republic of Palau, and the Federated States of Micronesia [FSM]). The average age of the participants is 24.8 years and the majority are male (59.1%). The overall acceptance rate to medical school shows that of the 379 participants in the program, 214 (56.5%) students were accepted into JABSOM.

The Imi Ho'ola Program was developed with the unique cultures and environments of Asian-Pacific Islanders in mind, as illustrated in Figure 1. The geographical area of Guam, CNMI, RMI, Palau, and the FSM covers an area as large as the continental U.S., but the total land mass is only half the size of the (U.S.) state of Rhode Island. UH JABSOM is the only U.S. accredited medical school in the Pacific that serves this expansive area. The program's faculty and support staff are from multicultural backgrounds of the Pacific Region.

![Figure 1. Map of Pacific Illustrating the Geographic Area Served by JABSOM](image-url)
Post-Baccalaureate Program Description
The Imi Ho‘ola Post-Baccalaureate Program started in 1996. Since then up to 10 individuals are selected each year to participate in an intensive 12-month curriculum. Upon successful completion of the program, students matriculate into JABSOM as first-year medical students. Imi Ho‘ola’s educational model emphasizes the instruction and integration of concepts and principles in natural and social sciences plus the humanities, and aligns itself with JABSOM’s learning process and teaching methods. This familiarizes the student with the academic expectations of JABSOM upon matriculation and prepares them for success on through medical school graduation. To encourage a focus on academics, students are provided financial support through a stipend.

In addition to provisional acceptance to JABSOM and financial support, the Program incorporates components found in other post-baccalaureate programs for disadvantaged students into its educational model.

### Table 2. Imi Ho‘ola Program

<table>
<thead>
<tr>
<th>Program Components</th>
<th>Description</th>
<th>Time-Line</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recruitment</strong></td>
<td>Target students from disadvantaged backgrounds who are committed to serve in areas of need in Hawai‘i and the U.S.-Affiliated Pacific Islands.</td>
<td>Annual year-round, systematic presentations and outreach at high schools, colleges, universities, and communities in Hawai‘i and the Pacific. Application deadline in December.</td>
<td>Number of applicants accepted into the program.</td>
</tr>
<tr>
<td><strong>Selection &amp; Admission</strong></td>
<td>Three-stage selection process occurs: 1) Applicants screened for ties to Hawai‘i and the Pacific; disadvantaged eligibility; baccalaureate degree with a minimum GPA of 2.0; coursework in biology, chemistry, biochemistry, and physics; and MCAT with minimum of “5” in verbal reasoning; 2) Community Advisory Committee assists with screening applicants based on cognitive and non-cognitive factors and commitment to serve in areas of need. Committee submits list of candidates to medical school Admissions Committee. 3) Candidates interviewed by medical school Admissions Committee and recommendations submitted to Dean for final selection.</td>
<td>Selection and admission process occur in January through May. Applicants invited for interviews in April and May.</td>
<td>Evaluate students’ performance through graduation and on possible factors related to success or failure related to graduation.</td>
</tr>
<tr>
<td><strong>Phase I</strong></td>
<td><strong>Summer Orientation and Assessment:</strong> Administer assessments to obtain base-line data on students’ knowledge in the sciences, reading, and learning skills. Curriculum includes instruction in learning skills (e.g., time management, exam preparation) with application to content-specific material; exercises to foster self-esteem and confidence as a learner; cultural impact on learning and problem-solving; introduction to PBL process, and use of campus resources.</td>
<td>6 weeks in summer, from July to August. Assessments administered include the Nelson-Denny Reading Test, Myers-Briggs Type Indicator (MBTI), Learning and Study Skills Inventory (LASSI), Survey of Reading and Study Efficiency (SR/SE), and Watson-Glaser Critical-Thinking Appraisal. Based on the results of the assessments, an individualized education plan is developed by the faculty and shared with the student. Student feedback includes identification of learning styles, strengths, and areas of development. Students must attend all of the class sessions.</td>
<td></td>
</tr>
<tr>
<td><strong>Phase II</strong></td>
<td><strong>Enrichment Curriculum:</strong> Integrated approach to learning is emphasized, whereby students learn to improve critical thinking skills in content areas. Curriculum includes biology, chemistry/biochemistry, scientific basis of medicine, speech and ethics in healthcare. Biology taught in a modified PBL format, and chemistry/biochemistry in lecture format. Gross Anatomy Lab and chemistry/biochemistry lab conducted. Cultural and health experiences are integrated within the context of the Scientific Basis of Medicine course and contributions from the Pacific are emphasized. Students enroll in speech and ethics in healthcare courses.</td>
<td>Fall and spring semesters of academic school year.</td>
<td>Students progress monitored by faculty followed by systematic feedback to students at mid-semester and at the end-of-semester. Students must achieve 85% or higher in Academic Performance and satisfactory or better in Professional Standards and Ethical Behavior.</td>
</tr>
<tr>
<td><strong>Phase III</strong></td>
<td><strong>Prematriculation:</strong> Bridging component designed to ease students’ transition into medical school. Students taught the medical school’s PBL format and evaluation. Students introduced to clinical skills with focus on doctor-patient relationship and cultural competency. Students participate in 2 week shadowing experience with a physician in a rural-setting.</td>
<td>6 weeks in the second summer, from May to July. Post-tests of assessments administered.</td>
<td>Students must achieve 85% or higher in their academic performance and satisfactory or better in Professional Standards and Ethical Behavior. Exit interviews provide students feedback on performance.</td>
</tr>
<tr>
<td><strong>Post-Imi Ho‘ola</strong></td>
<td>Monitoring of students’ progress in medical school through graduation.</td>
<td>Services include USMLE Exam preparation, advising and counseling, and basic science enrichment on an as needed basis.</td>
<td>Student enrichment/retention activities plan formulated in collaboration with JABSOM’s academic and student services leadership.</td>
</tr>
</tbody>
</table>
They are as follows:

1. JABSOM’s Commitment to the Program

JABSOM contributes to the Imi Ho’ola program in a multitude of ways. Most notably, faculty positions are designated to the program and funding for these positions is made available in the operating budget of the school. Instructional space specifically for Imi Ho’ola students is provided at JABSOM’s Medical Education Building. Office space is also provided for all faculty and support staff within close proximity to the Imi Ho’ola classroom. Imi Ho’ola students have access to common areas and resources used by medical students at JABSOM and therefore, interact on a daily basis with medical students and medical school faculty. These areas include the library, computer lab, and clinical skills resource room.

2. Curricula and Learning Process

The curricula spans over 12-months and is taught in three phases (see Table 2). Incorporated into the curricula are critical thinking, problem-solving, communication and time management skills. An integrated approach to learning is emphasized, engaging students in collaborative and cooperative learning. Students learn to function as a team and learning is active, hands-on, and self-directed.9 The learning process takes into consideration the students’ range of needs, interests, and learning styles. The psycho-social and cultural concepts that influence healthcare delivery to Hawai’i’s multicultural population and basic science concepts are introduced through a modified PBL methodology.

3. Faculty and Staff

Imi Ho’ola faculty members assume multiple roles in the program. They serve as advisors, mentors, and valuable resources through their retention and enrichment efforts of Imi Ho’ola alumni. All of the faculty and staff members are in full support of the educational model, and demonstrate their dedication by participating in all of the activities of the program, including service learning. A number of the faculty members are also Imi Ho’ola alumni, who impart a realistic view of the medical profession to students enrolled in the Program.

4. Student Assessment and Evaluation

Imi Ho’ola provides students the opportunity to become aware of their individual learning styles and academic strengths and weaknesses through assessment results, individualized education plans, and feedback from faculty. This is systematically done according to a specific timeline throughout Phases I, II, and III to monitor students’ progress. This allows for early identification and intervention for any student that displays signs of poor academic performance.

5. Positive Learning Environment

Imi Ho’ola strives to provide a nurturing and safe environment through a support system comprised of faculty, staff, and students themselves. The activities and the interpersonal relationships that are established assist students to increase their confidence as learners and individuals. The environment fosters a climate of personal concern for one another, provides access to resources, and creates an atmosphere of respect and confidentiality where students feel that their ideas and opinions are valued in bringing about positive change. Strong bonds are established, both socially and academically among students, faculty, and staff. Particular emphasis is placed on equal respect for the background and circumstances of all students.

Table 2 describes the program’s major activities including the year-round curriculum and services for students.

In summary, the key factors in the Program’s success are the following: 1) the school’s commitment and the institutionalization of the program; 2) emphasis placed on a comprehensive approach and the implementation of a curriculum and learning process that are aligned with the UH JABSOM curricula; 3) faculty and staff who support the instructional methodology and work as a team to address students’ needs; 4) assessment of students and systematic feedback regarding individualized education plans and academic and non-academic progress; and 5) a positive learning environment for students.

Adaptation of the Model to Other Settings

Modifications would be necessary in adapting the Imi Ho’ola educational model to other populations and social-cultural environments. Factors to consider are:

- A leader or group of individuals who have the foresight, ability, and passion to develop the mission and vision of the program.
- Designated faculty and classroom space within the school.
- Faculty who support the philosophy and instructional methodology of the Program.
- Curriculum and instructional methodology reflective of the philosophy and goals of the Program and the needs of the target population. The closer the
methodology is aligned to the philosophy of the Program, the smoother students’ transition into their first-year in medical school.

- Curriculum that incorporates the varied learning styles of the students, emphasizing the application and integration of learning skills (e.g., communication, reading, problem-solving, and critical thinking skills) into content-specific areas so that students can become effective learners and to facilitate their academic success.
- Administration of assessments upon admission to the program. Baseline data on students’ knowledge in the sciences and skill levels will help to determine the individualized education plan for students.
- Systematic method to monitor students’ academic performance and to develop a plan of enrichment as appropriate.
- A formalized method of providing feedback on students’ academic performance and assessing the influence their home and social-cultural environment has on their learning needs.
- Social support to foster students’ feelings of security and sense of belonging. The faculty and advisors can serve as mentors in the lives of students. Administrators, family, and other students are also critical elements of social support.
- Integration of retention efforts in medical school to make students’ transition seamless and to monitor and support students’ success through graduation. It is desirable to have faculty with dual teaching and counseling roles, in the program and in medical school.
- Partnerships among the federal and state governments, health profession schools, community groups, and grass-root organizations and programs graduates will ensure continued success in training disadvantaged health professionals to meet the challenge of diversity in the healthcare workforce.

References

Academic enrichment together with attention to social and cultural issues, successfully prepares the student to become a physician capable of helping individuals and families, and advocating for healthy communities.

Conclusion
The Imi Ho’ola Program plays an important role in ensuring diversity at the JABSOM and in the healthcare care workforce in Hawai’i and the Pacific region. Imi Ho’ola is an educational model that embraces a comprehensive approach to preparing disadvantaged students to quality and complete medical school. Academic enrichment together with attention to social and cultural issues, successfully prepares the student to become a physician capable of helping individuals and families, and advocating for healthy communities. Partnerships among the federal and state governments, health profession schools, community groups, grass-root organizations, and program graduates will ensure continued success in training disadvantaged health professionals to meet the challenge of diversity in the healthcare workforce.
The Impact of the Military Presence in Hawai‘i on the Health of Na Kānaka Maoli

Kalamaoka‘aina Niheu, MD*
Laurel Mei Turbin, MPH**
Seiji Yamada, MD, MPH†

Ke Ola Mamo Medical Clinic, Honolulu, Hawai‘i; **WE Act for Environmental Justice, New York, New York; Hawai‘i/Pacific Basin Area Health Education Center, University of Hawai‘i, John A. Burns School of Medicine, Honolulu, Hawai‘i. Address correspondence and reprint requests to: Ms. Laurel Mei Turbin, MPH, WE ACT for Environmental Justice, 271 West 125th Street, Suite 308, New York, New York 10027-4424; Laurel@weact.org.

Abstract

The presence of the United States military on the islands of Hawai‘i has affected the health and well-being of Native Hawaiians through large-scale historical processes, most notably Western colonization. This history has been shaped by the takeover of land for the purposes of military and commercial interests. We explore the effects that these interests have had upon the health of Native Hawaiian people, also known as Na Kānaka Maoli. Changes in policy and new program development are needed to improve the current poor health status of Native Hawaiians. In addition, potential avenues of research are proposed to evaluate the effects that the military presence has had upon the indigenous peoples of Hawai‘i.

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The History Of the Military in Hawai‘i

The process of military takeover for the purpose of economic profit is discussed in this paper. A brief historical overview serves as a logical starting point for understanding the present resources and health outcomes for the Native Hawaiian people, also known as Na Kānaka Maoli.

Militarization, commodification of island resources and foreign land ownership characterizes the 19th century in Ka Pae ‘Aina (the indigenous term for Hawai‘i). Captain James Cook and his crew were the first Europeans to come in contact with Hawai‘i in 1778.1 While it is often said that their voyages were driven by the spirit of scientific exploration, Cook was an officer and the HMS Resolution was a military vessel in the British Royal Navy. This makes the first Hawai‘i contact a military contact.

Shortly after, Hawai‘i became an integral part of trade routes and a source of valuable resources, such as cheap reliable labor and sandalwood. In 1842, President John Tyler and the U.S. House Committee on Foreign Affairs recognized the strategic value of the islands, both in war and commerce, when they declared control of the islands as a “virtual right of conquest.”2 A small group of haole (white) businessmen, later referred to as “The Big Five,” exploited the strategic importance of Hawai‘i in their pursuit of political and economic power. By the mid to late 1800s, sugar cane was the cornerstone of Hawai‘i’s economy. The Big Five exerted political influence on the Hawaiian Monarchy to grant exclusive rights to Pearl Harbor, identified as the military “key to the central Pacific Ocean.” In exchange, the tariff on importing sugar to America was decreased. The extent of this political influence is seen clearly in the infamous “Bayonet Constitution” of 1886. National protests over the excessive influence of the Big Five resulted in then King Kalakaua’s attempt to return political power to the Monarchy. The backlash resulted in a constitution, signed at gunpoint, which ceded most of the sovereign power over to the Big Five.3 The U.S. countered challenges to its client state through military means. When King Kalakaua’s successor, Queen Lili‘uokalani, attempted to return power to the Kingdom of Hawai‘i, U.S. Minister Stevens landed U.S. Navy troops on the shores of Ka Pae ‘Aina in what was later recognized as an illegal act of war.4

The health of Na Kānaka Maoli suffered tremendously in the years following European arrival. Infectious diseases became rampant, resulting in death tolls of holocaust proportions. Wave after wave of epidemics were introduced, including tuberculosis, scabies, smallpox, measles, leprosy, and typhoid fever. Venereal diseases, previously not seen in Ka Pae ‘Aina, quickly spread and killed at least 10,000 Na Kānaka Maoli over the 20 years after first contact.5 By 1890, a little over 100 years after the arrival of Captain Cook, the population of
Hawaiians had dwindled from an estimated one million people to 40,000, a 96% decline so devastating that it has been described as a population collapse. While many see the death toll as an inevitable result of contact, the original purpose of that contact remains a military expedition for the purposes of economic gain. Significantly, the population of all Na Kānaka Maoli, both part Hawaiian and pure Hawaiian, was at an all time low in the time following the overthrow of the Hawaiian Monarchy in 1893. It was during this time that the Big Five seized control of Hawai'i with the necessary aid of American naval troops, and subsequently consolidated political control over the islands. The Big Five occupied the highest political seats in the Republic of Hawai'i, including that of President. Martial law, supported by U.S. military forces, was requested in Ka Pae 'Aina from 1893 to 1898 to maintain control of a population opposed to their rule.

The presence of the American military increased tremendously over the next century, especially following the Spanish-American War. According to scholar and activist Kyle Kajihiro, construction of a naval base at Pearl Harbor began in 1900, destroying 36 traditional Hawaiian fishponds and transforming what was once a rich food source for O‘ahu into a vast naval station. This was soon to be followed by the construction of Fort Shafter, Fort Ruger, Fort Armstrong, Fort DeRussy, Fort Kamehameha, Fort Weaver and Schofield Barracks. General Macomb wrote “Oahu is to be encircled with a ring of steel.”

A fundamental process that affected the mental and physical health of Na Kānaka Maoli is structural violence. Johan Galtung defined “structural violence” as the harmful influence of economic and political structures on human potential and well-being. Such violence denies communities and individuals of opportunities to reach their full physical and mental potential. In Hawai'i, structural violence has occurred through the invasion of space, notably military take-over of land. The loss of land, the mounting political presence of the U.S. imposed by military forces, and the dwindling number of Native Hawaiians due to death from disease resulted in the loss of indigenous political autonomy. Thus, expansion of the American empire in the Pacific and Asia via military and commercial interests brought about the loss of lives, political autonomy, and nation for Na Kānaka Maoli.

The Military Presence in Hawai'i Today
Currently, Ka Pae 'Aina is the most densely militarized state in the nation. According to the U.S. Department of Defense, the combined military branches in 2004 include 161 military installations in Hawai'i. Furthermore, the military controls 236,303 acres, or 5.7% of the total land area. On O‘ahu, the most densely populated island, the military controls 85,718 acres, or 22.4% of its land. On O‘ahu these lands include Pearl Harbor, Schofield Barracks, Hickam Air Force Base, Lualualei Naval Reservation, and the Kane‘ohe Marine Corps Air Station. We will show that the occupation of land for military use has resulted in the destruction of the natural environment, the release of dangerous toxins, the destruction of people’s homes, and the displacement of people.

The environmental impacts of such widespread presence are far-reaching. According to the Environmental Defense Fund, 2002 rankings of major chemical releases and waste generation, Honolulu County ranks in the top 20% of the “dirtiest/worst counties in the U.S.” for total environmental releases. Military installations make up five of the top 10 polluters in Hawai'i. More than 798 military contamination sites have been identified by a report prepared for Congress, entitled the 2004 Defense and Restoration Program. Currently, there are three “Superfund” locations in Honolulu County. “Superfund” is a deceptively benign sounding term for areas that are defined by the significant dangers they impose upon the environment and the population due to abandoned or uncontrolled waste. Two out of the three sites are associated with the U.S. military, including the U.S. Pacific Command Naval Computer and Telecommunications area, and the Pearl Harbor Naval Complex.

Numerous additional examples of military negligence in the treatment of toxic substances exist. These include but are not limited to the following.
Military contamination hazards, such as unexploded ordnance, various types of fuels and petroleum products; organic solvents such as perchloroethylene and trichloroethylene; dioxins and polychlorinated biphenyls (PCB); explosives and propellants such as cyclotrimethylenetrinitramine (RDX), trinitrotoluene (TNT), octogen (HMX) and perchlorate; heavy metals such as lead and mercury; napalm, chemical weapons, and radioactive waste from nuclear powered ships, and Cobalt 60, a radioactive waste product from nuclear-powered ships, have been found in sediment at Pearl Harbor. Between 1964 and 1978, 4,843,000 gallons of low-level radioactive waste was discharged into Pearl Harbor. Between 1964 and 1978, 4,843,000 gallons of low-level radioactive waste was discharged into Pearl Harbor.

The complete magnitude and prevalence of environmental toxicity is unknown because the routine monitoring of toxins and any correlating effects upon health is not required. The information cited above is from areas already designated as sites for cleanup response and likely represents only the tip of the iceberg.

Nevertheless, military bases in Hawai'i continue to expand because Hawai'i is home to Pacific Command, the command center for U.S. military operations for half of the globe. Its outposts include bases in the Marshall Islands, Guam, Okinawa, Japan, and Korea. According to the U.S. military, bases are built for the purpose of "defense" in the event of violent struggle with other nations. However, military dominance also protects and enables commercial interests. The most direct example is the armaments industry, a business worth $200 billion worldwide.

The Health of Native Hawaiians
European contact has had a devastating effect upon Na Kānaka Maoli. Although the disease processes have changed, epidemiological data show Na Kānaka Maoli continue to experience significant health disparities. Native Hawaiians represent 22% of Hawai'i's population. Compared to all other ethnic groups in Hawai'i, Na Kānaka Maoli have the highest prevalence rates for chronic diseases, such as obesity (69%) and asthma (33%), and when adjusted for age, among the highest rates of cancer, diabetes, hypertension, and heart disease. The rate of deaths due to cancer and heart disease are also highest when compared to other ethnic groups in Hawai'i. The prevalence of high risk behaviors such as smoking, substance abuse, and violent behavior are higher than the general population and have been identified by Na Kānaka Maoli as significant problems facing the Native Hawaiian community today. Not surprisingly, Na Kānaka Maoli die at younger ages than Hawai'i residents in other ethnic groups.

Low education level, working class job status, and low income correlates with poor health status. We argue that the military presence in Hawai'i has played a significant role in the loss of political autonomy, access to land, and therefore healthy food sources for Na Kānaka Maoli. Furthermore, previously healthy lifestyles have been replaced by toxic activities with unknown and unstudied health ramifications. Therefore, the resultant poor health status of the indigenous people of Ka Pae 'Aina is a form of structural violence.

Mākua Valley: A Living History
The history of Mākua Valley is a striking example of the history of Ka Pae 'Aina and the complex relationship between the islands and the U.S. military. At the time of European contact a vital community existed, based upon ahupua'a, the traditional pie-shaped land division extending from the mountain to the sea on the western coast of the island of O'ahu. The infrastructure included sacred sites, rich fishing ponds, irrigation, schools for specialized training, and agriculture designed to be almost completely self-sustaining.

In 1929, the U.S. Army began to acquire parcels of land for the purposes of military training. The strategic importance of Mākua valley (see Figures 2 and 3) increased following World War II, and the army eventually seized more than 4,000 acres for the purpose of training operations. The injustices associated with this land seizure are apparent in a lease granting the Army rights to 1,500 acres for a mere $1 a year. Over the next 70 years, the people of Mākua were repeatedly
and forcibly removed from the valley in a cycle of dispossession and reclamation. From 1848 to the present, Mākua residents have been displaced more than six times, a figure which includes only the major land clearances.24,25

The most recent major land clearance took place on June 18, 1996. At the time, the community at Mākua was comprised of approximately 60 families and 282 people who built hale (homes) and created their own form of self-governance. The residents could be defined as homeless, because all were indigent and living in a village that existed outside of the boundaries of western land ownership. In a population comprised of the dispossessed, 83% of the population were Na Kānaka Maoli, many of whom represented generations of displaced Mākua residents.26 The village exemplified the current living conditions of many of the indigenous people of Hawai‘i.

Homeless vs. Houseless

Though severely compromised by generations of colonization, depopulation, and westernization, Kānaka Maoli cultural values provided inspiration to survive in Mākua, where living conditions were extremely difficult. Scant rainfall, almost constant exposure to the sun, infrastructure damaging ocean winds, lack of electricity, almost no access to potable water, no real sewage system, and frequent harassment by local authorities were conditions that defined their daily life. Sparky, a former resident, described the community as consisting of Hawaiians who practiced a “traditional lifestyle,” symbolic of the resilience of the Hawaiian culture in the face of oppression and injustice.27 Many of the villagers resisted the term “homeless,” and instead redefined themselves as “houseless.” “We’re not homeless,” stated another resident. “We’re Hawaiians. Before the word ‘homeless’ they called us squatters. But let’s go even further back. Before that it was Hawaiian lifestyle.”28 In traditional times, Na Kānaka Maoli had access to pu‘uhonua, or place of refuge, in times of trouble. Due to the loss of a land base, Native Hawaiians no longer have access to places of refuge. Despite significantly adverse conditions, the people of Mākua created a sanctuary, drawing upon the traditional concept of pu‘uhonua. As one resident described, Mākua served as a safe place for “healing our past of torment and destruction.”29

With no outside funding or social support from the wider population, an intertwined community of governance, agriculture, fishing, and self-protection evolved which was arguably more successful at dealing with issues of malnutrition, familial instability, hygiene, shelter, and substance abuse cessation, than many government-sanctioned programs (see Figure 4). Unfortunately, all public health efforts focused upon transferring the residents of Mākua to state and federal programs, and little data was collected on the effectiveness of their own interventions. Not only had the residents identified their own needs, but they also did the work necessary to address these own concerns. Community-initiated programs, such as those seen at Mākua, are often less expensive, have more inherent loyalty by participants, and maintain more cultural relevance. More importantly, they empower their creators to reclaim a feeling of being active participants in their own destiny. Instead of the world simply acting upon them, they had the power to act upon the world. Contemporary clinical discourse on empowering patients and clients often fails to recognize that community members are engaged in this constructive and challenging process themselves.

The effectiveness of culturally-based interventions in the healing of Na Kānaka Maoli has been well established.29,31 Of note, such interventions require a stable land base with access to an abundant supply of clean water in order to provide the means to cultivate and harvest traditional food sources. As noted above, Pearl Harbor is a striking example of how a source of healthy food in the form of traditional aquaculture has been replaced by a toxic military site.

The stated purpose of the 1996 Mākua eviction was to clear the area for public use.25 However, it was no coincidence that the land clearance occurred at a time when the need for military training sites became a priority.21 To this day, the U.S. Army continues to utilize Mākua Military Reservation and their activity has resulted in significant damage to the valley. Damage
includes but is not limited to numerous disastrous fires. The most recent example was in the summer of 2003. The fire, deliberately set by the Army, was meant to clear 900 acres of land. Due to a shift of wind, the fire raged out of control burning 2,100 acres and destroying many of the remaining sacred sites in the valley. In Mākua Valley, the homes and communities have been burned repeatedly, both literally and figuratively.

In 2004, the Hawai‘i State Legislature passed Act 50, banning people from living on all beaches and public parks. The act calls for arrest, a $1,000 fine and/or 30 days in jail if the banned individual returns to the location of their citation within a year. The Act has effectively prevented the return of the Mākua community, and has served as another step in the criminalization of homelessness in the islands.

Mākua Valley is not an isolated incident of the ongoing separation of Na Kānaka Maoli from a land base. The transfer of land to foreign interests and unkept promises to return land continues to this day. During Hawai‘i’s Statehood Act, two million acres of land were reserved for Native Hawaiians and thousands were promised homestead awards. Today, 45 years after statehood, an estimated 30,000 have died while waiting for their land, and approximately 22,000 Hawaiians remain on the waiting list. Next, we will explore the effects that the proposed military expansion in Ka Pae ‘Aina, the Stryker Brigade, may have upon the islands.

The Stryker Brigade

The presence of the military in Ka Pae ‘Aina is part of a global dynamic. The control of extensive land masses in the Pacific as sites for military training, storage, and testing is particularly pertinent to current international politics, such as the ongoing war in Iraq and tension with North Korea. The tragedy lies not only in the historical dispossession of Ka Pae ‘Aina, but also in the fact that Hawai‘i is now part of an empire, serving as a location for soldiers drawn from working class communities all over the U.S. At the crux of a global stratagem, the militarization of Ka Pae ‘Aina is a base for further injustice and dispossession throughout the world.

Environmental hazards and health risks include the release of particulate matter, volatile organic compounds and metals into the air, the contamination of groundwater resources from munitions, fuel and support facilities, the risk of range fires, and the destruction of habitat and ecosystems. Na Kānaka Maoli suffer from disproportionate rates of asthma. The significant amount of particulate matter generated will disproportionately affect those who suffer from this respiratory ailment. Environmental damage that disproportionately affects the poor and communities of color is called environmental racism.

The Stryker Brigade will also ultimately increase risk to civilians globally. Unlike most other military brigades, designed for environments such as the jungle or the desert, the Stryker Brigade was primarily designed as an urban assault vehicle. Around the world, civilians are often killed in counter-insurgency operations; these fatalities will inevitably increase when warfare is practiced in heavily populated urban centers. The examples of New Orleans after Hurricane Katrina and the announced plans for the use of the military to enforce quarantine in the event of an avian influenza pandemic are symptomatic of the increasingly domestic use of the military. Residents of the U.S. must critically address the potential for harm imposed by such military training and technology, both globally and domestically.

Recommendations

Structural violence has impacted the health of Na Kānaka Maoli through historical and political processes.
Addressing the health of Na Kānaka Maoli necessitates action on multiple levels, including policy reform, program development, and much needed research.

Policy
The United Nations Declaration on the Rights of Indigenous People states that the deprivation of Na Kānaka Maoli nationality and the theft of land represent human rights violations. In the process of self-determination, all indigenous people should rightfully and freely pursue economic, social and cultural development. Therefore, land repatriation, education, medical, and social services for Na Kānaka Maoli should be prioritized. We recommend halting further military expansion in Hawai'i while the health effects of the military presence is investigated. The historical effects have been of such magnitude and devastation to Na Kānaka Maoli, that we also recommend the cessation of the global deployment of soldiers and arms based in Hawai'i. The concern is to prevent globally the negative repercussions that have occurred locally.

Program Development
Effective public health programs must be culturally appropriate, relevant, community-based, and sustainable. A key strategy would be to identify community created systems that seek to redefine healthy alternatives. The residents of Mākuʻa Beach organized themselves to form a self-governing community, and tried to establish an officially recognized puʻuhonua (place of refuge) for houseless residents of Hawai'i. If a community were to arise, that had self-initiated systems, which addressed their own needs, such processes should be identified and evaluated for effectiveness. If they are found to be effective, we should then lend our resources, education, and expertise to support such approaches. At the very least, we must defend such communities from destruction, and identify and discontinue policies, such as Act 50, that inhibit growth and survival.

Future Research
The health effects of the military in Hawai'i have been inadequately researched. Initial efforts should include a detailed catalogue of all the major toxins that have historically been discharged into the air, water, and land of Ka Pae 'Aina. Routine monitoring of common toxins produced by military activity should be required. An entity funded by the U.S. government, but comprised of researchers mutually chosen by the community, needs to be created. In addition, all known toxic sites, in particular those designated to be Superfund sites, need a comprehensive environmental study. Also an in-depth evaluation of the health status of the residents in the surrounding areas should be undertaken. Such a study would have to take into account time spent in the area, water source, habits such as fishing in contaminated waters, and age of residents, to assess degree of exposure. Ethnicity and income should be taken into account as historically, toxic exposure has been seen disproportionately among the poor and people of color.

Evaluating the effects of the military and dispossession of land on the current poor health of Na Kānaka Maoli will be a challenge. Another potential avenue of research would be to perform a genealogical survey of a population that has been removed (e.g. Mākuʻa), and evaluate the rate of disease among their descendants. The rates would then have to be compared against not only that of the general population of all Native Hawaiians, but also those Na Kānaka Maoli who have had a history of a stable land base for generations. The latter would be very difficult to find, as very few populations exist in Ka Pae 'Aina that have not been removed from their ancestral base.

Effective public health programs must be culturally appropriate, relevant, community-based, and sustainable. Policy changes, program development, and research can be made possible by reallocating funds away from such projects as the $1.5 billion appropriated for the Stryker Brigade.

Glossary of Hawaiian Terms
ahupua'a: traditional land division extending from the mountain to the sea
‘aina: earth/land
haole: originally, foreigner; current usage, of Caucasian ancestry
Ka Pae ‘Aina: the traditional name for Hawai'i, used prior to Western contact. The literal translation is a group of islands or archipelago. Also seen referred to as Ka Pae'aina O Ka Moananui, referring to Hawai'i's connection to all of Oceania.
Kānaka Maoli: Native Hawaiian
na: makes the noun that follows, plural
puʻuhonua: places of refuge in traditional times, where people could go in times of trouble and find safety

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13 years ago in Pacific Health Dialog, S. Siwatibau stated, “Ultimately consumption will have to be contained to reduce imports and/or exports allowed to increase. The subsistence sector which is a neglected area in our development plans, should also be allocated priority.” PHD, 1995;2(1):86.
Maintaining Balance for a Long Voyage

Cherie L Shehata, M.D.*
Na'alehu Anthony, MBA**
Gregory G. Maskarinec, PhD†

*Kaiser Waipio Clinic, Waipahu, Hawai‘i; †Polynesian Voyaging Society, Honolulu, Hawai‘i; ‡Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, Mililani, Hawai‘i. Address correspondence and reprint requests to: Gregory G. Maskarinec, PhD, Department of Family Medicine and Community Health, University of Hawai‘i at Manoa, John A. Burns School of Medicine, 95-390 Kuahelani Avenue, Mililani, Hawai‘i 96789-1192; gregorym@hawaii.edu.

Abstract

This article introduces cultural aspects of health, using Hokule‘a, the voyaging canoe, as a model for maintaining balance on a long voyage through life. Maintaining balance encompasses physical, nutritional and mental health. This triangle is crucial for the well-being of a person. In the stress of the modern world we often disregard the basics in an effort to become more efficient and more productive, neglecting physical activity, eating fast foods instead of healthy meals, and forgetting our mental well-being. Eventually, this can lead to devastating co-morbidities. We discuss balanced nutrition, physical activity, and mental health, relating to living on the canoe, with lessons that can be applied to daily living.

Key Words: Native Hawaiian health; traditional sailing; cultural models for healthy living.

Introduction

The Polynesian Voyaging Society (PVS) is the nonprofit organization that oversees operations of the voyaging canoe Hokule‘a. Its mission is to perpetuate the art and science of traditional Polynesian voyaging and the spirit of exploration through experiential educational programs that inspire students and their communities to respect and care for themselves and each other, and their natural and cultural environments.1

PVS was founded in 1973 to investigate how Polynesian voyagers could have found and inhabited almost every island in the Pacific well before the great European voyages in the 16th century. Started by Ben Finney, an anthropologist, Tommy Holmes, a waterman, and Herb Kane, an artist, PVS set out to prove that Hawai‘i was not settled by Polynesians accidentally, as some scholars of the time believed.2 Rather, Finney and his colleagues asserted that the voyages to different islands were calculated and that Polynesians were capable of sailing great distances without the use of Western instruments. The way in which PVS set out to prove this theory was to build a performance-accurate Polynesian canoe and retrace the traditional migratory routes that were held in oral traditions throughout the Pacific for thousands of years.¹

Hokule‘a was launched on March 8, 1975 in Kualoa on O‘ahu. She was made of modern materials, like fiberglass, but was performance-accurate in terms of size and shape to that of a canoe 600 years old. For the next year, Hokule‘a sailed around Hawai‘i for sea trials and searched for possible crew-members for the upcoming trip to Tahiti. Communities across Hawai‘i embraced Hokule‘a wherever she went.

In May of 1976, Hokule‘a sailed to Tahiti in the way of ancient times. Without the help of modern instruments, the captain, navigator and crew relied on the stars, winds, birds and sea swells to navigate the 2,400 miles of open ocean to Tahiti. After 33 days at sea success was achieved as Tahiti was sighted. More than 17,000 people crowded Papeete Harbor to greet Hokule‘a and her crew. With that success, came a sense of cultural connection throughout Polynesia. The voyage to Tahiti proved that the ocean was a pathway rather than a barrier.¹

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Since that first voyage, PVS has built and launched a second deep-sea voyaging canoe, Hawai‘iloa, and completed six voyages to the South Pacific to retrace the migratory routes of Polynesians and recover the ancient arts of canoe building, and way finding.¹

In 2000, Hokule‘a returned to Hawai‘i from the successful voyage to Rapa Nui, by far the most
challenging expedition *Hokule‘a* and her crew had attempted to date. Rapa Nui is a mere 7 miles long by 14 miles wide and is considered the single most isolated landmass on the planet.¹

In 2004, *Hokule‘a* voyaged to the Northwestern Hawaiian Islands. This 2-month voyage was special for many reasons. First, it was meant to bring awareness to the very fragile ecosystems that exist there. While all previous voyages had an educational component, this was the first time that there was such a large educational push within a voyage, directly from the canoe. The Honolulu Advertiser newspaper coordinated with schools to post questions on the web that were answered by crew-members who were on the canoe. The education partners included local, state and federal agencies who branded the effort “Navigating Change.” There were teleconferences via satellite phones with schools from as far away as the U.S. East Coast. The idea behind this educational effort was to take the school students along on the voyage with the crew and broaden the educational reach of the canoe using technology. Technology, however, provides a conduit to disseminate information, reaching a broader based audience. Even where the use of oral tradition is important or even necessary in perpetuating knowledge, when combined with technology we can increase the human resource base needed to convey meaning.¹

**Figure 1. *Hokule‘a* in the Northwestern Hawaiian Islands**

**Bringing Balance to Home Using the Canoe as an Example**

The canoe serves as a model of what a balanced life can be like. During a voyage, you have a group of people working as a team to achieve a goal. In the process they eat balanced meals, they are physically active up to 8 hours per day, and have mental health as a result of being focused on a difficult but achievable goal - to find land thousands of miles away. An individual cannot survive alone; all are integrated and interdependent. With nutritional health, one has the physical strength and stamina needed to meet daily challenges, bringing satisfaction and a sense of mental well-being.

The lessons learned in preparing for a voyage are not as simple as those expressed in a Western classroom structure. Textbook style teaching can take one only so far, and then more traditional teaching methods take over. There are different levels of learning about voyaging. The first level is just to understand everyone’s role on the canoe. This is not necessarily stated verbally but is demonstrated through action. Lessons taught are often obtained at moments when one might least expect them. They may come when a pattern in the ocean appears in the waves, generating a lesson on swells and intersecting wave patterns. Or it can be simply how to flake out rope or tie a knot. If a certain pattern or layers of clouds appears, then you learn about wind patterns and what they signify. Much of the learning is through observation, oral lessons, and trial and error. These traditions are important, and the further development of leaders, navigators and crew is integral in maintaining the culture and further developing the human resources needed to continue such traditions.

These are important lessons that can be transferred and taught to those on land. There are many medical co-morbidities and illnesses, including hypertension, diabetes, and hyperlipidemia, that exist at a higher level in the Native Hawaiian population than in other ethnic groups living in Hawai‘i. Many of these medical problems can be alleviated by lifestyle modification.³ The *Hokule‘a* voyaging canoe serves as a model for culturally appropriate lifestyle changes. It brings together a community of otherwise diverse individuals and educates them about the host culture. The process encourages physical activity and working with others. Leading by example is an important means of educating others about healthy lifestyles. This message of health and culture is already being taught to children, through programs like “Navigating Change.”⁴ This program brings together multiple agencies and programs to educate students about traditional navigation and introduces them to federally protected waters and lands in the Northwestern Hawaiian Islands. Programs like this serve as a model of what can be achieved with cooperation. Perpetuating this knowledge is key to balance. *Hokule‘a* is just one key, which shows how maintaining balance for a nautical voyage and the voyage of life are integral.
**Voyage Preparation**

**Canoe Preparation: Dry dock**

The voyage does not begin out at sea; it begins months and years prior to sailing. The entire island community comes together to help prepare the canoe for a voyage. Each person contributes their skills and wisdom to the canoe in the best way they can. Dry dock is a time where any and all can help. The hulls, decks, lines, spar, mast and various other parts of the canoe need to be inspected and brought up to par. Sometimes there are large, structurally important jobs like applying fiberglass; other times there are less laborious tasks like sanding and varnishing all of the hundreds of wooden parts that make up the canoe. This takes hundreds of human hours to achieve and takes coordination and team effort. In the process of preparation there are many important spiritual, physical and health gains achieved.

On the spiritual level, one has time to meditate on the ways to further the greater goal and to help the canoe *ohana*. Furthermore, friendships and camaraderie is fostered, helping individuals appreciate and understand each other on different levels. There is an understanding in preparing for something that is greater than the individual. With this also means shedding preconceived conceptions and treating one another as equals. Regardless if you are a physician, photographer, lawyer, student, tradesman, healer, teacher, etc.; there is respect and a trading of roles. The teacher in one arena becomes the student, and the student a teacher. Releasing these preconceived societal labels takes great effort for some. This release is liberating for many, and provides an escape to an alternate reality, one of role reversal or change. It can be very humbling for a person who is used to being in charge to finally have to take directions from another, and to accept the directions and instructions given. One of the most important lessons is having respect for others and their knowledge they can share, and the willingness to learn. This also helps maximizes the roles that individuals play and thus increases the human resources available in a different way.

On the physical level, the dry docks can be very demanding. It begins with the removal of the canoe out of the sea and onto land, to the bay where the canoe can have repairs and maintenance done. We work together in groups at a defined task. An example of a task can be lashing two boards on deck together, which is no easy task, easily requiring six individuals. To demonstrate the physical demands required to lash, one must imagine having three persons on the top of the deck, and three persons standing on the ground below the deck. One person under the deck is threading rope through a hole in one board; another on the top of the deck pulls the rope through the hole in the board, and passes it down through another hole in the second board. The same person on ground then pulls the rope through the second board. This rope is then passed to two other persons on the ground who then pull the rope very tight, using a large stick as leverage. This process is repeated on the top of the deck, with the other two persons pulling. This whole process is repeated at least six times for a single lashing and is orchestrated as a team. The act of pulling the rope tight is laborious and critical, since no nails hold the boards together. This process is repeated hundreds of time for the entire deck. Each person pulling knows that they may be out at sea, standing on deck (on the board); therefore, they want to make sure that particular board will not come apart. All these things go through your mind as you pull tight, knowing that if you don’t do your best, you or someone you care about could be placed in mortal danger. A similar team process is repeated for sanding, painting, and preparing the sails. By spending time painting and lashing, one does aerobic exercise without having to spend hours at the gym. This simple sequence demonstrates team work, patience, focus, and physical endurance, while at the same time using energy to accomplish a necessary task.

Balance between mind and body can be achieved. In the above description, integration of spiritual, cultural, and physical health are achieved. The tradition and knowledge of how to prepare a canoe for voyaging is preserved. In order to gain such knowledge, one must spend time with those who are skilled. It requires patience, humility, and the willingness to observe, understand, and implement the lessons. Being part of traditional voyaging is not just about being out at sea and navigating by the stars; more important than the voyage is the preparation for the voyage. Respect for knowledge and understanding the history behind the lessons taught is what matters most.

**Food Preparation**

Food and water must be prepared for the long voyage, requiring teamwork and cooperation of the entire community. This is an essential part of a voyage, since the food and water we have is mostly limited to what can be carried. Food is rationed and calculated, with menus based on a healthy, balanced dietary regimen. Excess
or waste means that there will be a shortage toward the end of the voyage. Hence, we take and eat what is needed and do not waste. Fresh fruits and vegetables are packed and prepared to last for the initial few weeks of a long voyage. Once the fresh produce is used, then preserved fruits and vegetables are consumed. Water is prepared and stored in hulls. There is a limited and designated amount for each person. The water used for cooking is also taken into consideration for the ration. Protein is supplied in a variety of forms. There are beans and canned meats. Seafood can be obtained from the ocean, however in certain areas the biomass is greater than others, and is not always dependable. Thus, although there is some availability, the protein needed is stored before voyaging and that which is caught at sea is considered a bonus.

The food preparation for the voyage is based on a balanced diet, using Western defined basic dietary guidelines and integrated with some traditional Hawaiian foods. The diet is balanced by limiting saturated fat, eating fruits and vegetables, and when possible eating fresh fish. Sweets and added sugars are kept to a bare minimum on the voyage and are considered a rare treat. The goal on the voyage is to stay within nutritional and dietary needs based on activity levels loosely parallel to recommendations made by the U.S. Department of Agriculture. Through prior trials, it has been determined that a strictly Western dietary model or a strictly traditional Hawaiian diet is not feasible on a long voyage. When Mau Plaug was training early apprentice navigators to sail, there was an effort to bring nothing but traditional foods by some of the crew, and nothing but Western foods by other crew. It was found that the strictly traditional foods spoiled too quickly. A balance of the two traditions is now maintained, integrating traditional foods with some Western styles of preserving and eating foods.

A healthy, balanced diet is key to mental and physical health. If a healthy, balanced diet is not maintained, then it is difficult to function well on a voyage. An unbalanced diet can lead to many serious medical problems and nutritional deficiencies. On a short trip (about 1 week) an unbalanced diet may not be too serious. However, on longer voyages (greater than 1 month) it can have a cumulative effect. If nutritional needs are not met, then judgment can be impaired, placing the crew at risk.

Training sails
Training sails are also an important part of preparation for the voyage. Since only a limited number of persons can sail, it is important that each member be proficient and understand the physics of sailing. This can range from how to set a sail, to how to steer the canoe once the navigator has set and adjusted the course. Every person becomes critical to the success of the voyage; if one person becomes ill or injured, then the other crew members have to step in to make sure that the canoe stays on course. A person must be physically (aerobically) fit for challenges at sea, since the demands of pulling ropes and adjusting the steering require quick bursts of energy.

Usually the training sails can be short day sails, or longer inter-island trips. They test a person’s ability to endure the sea, especially in channels in-between the islands, where the waters are rougher. Sea sickness can be quite a challenge when on a long voyage and can pose several risks. One can easily become dehydrated, secondary to poor fluid intake or loss of fluids via emesis. Furthermore, it can be mentally challenging, with severe cases developing psychosis. For others, not being able to see land can be anxiety provoking. These trips are useful for identifying which volunteers are better suited for sailing and which are better for voyage support and preparation.

There is also a documenter who ensures that the history of the voyage is recorded, whether in the form of video, photos, written, or oral stories.

Actual Voyage
Roles
During the voyage, life is a microcosm of what happens on shore. There is a designated leader - the captain. There is one who provides literal guidance - the navigator. There is someone who helps provide sustenance, in the form of fishing or cooking, and rationing water for the day. There are educators, who take various forms - one who teaches the next generation of navigators and crew; one who teaches about the local geography and marine biology, and others who teach basic survival skills. There is also a documenter who ensures that the history of the voyage is recorded, whether in the form of video, photos, written or oral stories. This ensures that the next generation will understand those who preceded them and can take that knowledge to build and learn from it. Finally, there is also the healer, who helps maintain the health of the crew. Although everyone has his or her designated specialties or roles, everyone is still considered a crew member, and as such, is responsible for helping maintain the integrity of the vessel during the voyage. All these specialties together integrate the needs of the culture (navigation and documentation), health (healer and cook), and spirit (leadership and crew).
Shifts
During the voyage, the crew is divided into watches, which are even smaller than shifts. They represent key elements of the voyage: there is a navigator, watch captain, and two crew (with varying roles). The day is divided into sets of three 4-hour shifts, which means you are up sailing for 4 hours, and off for 8, and then up again for 4, and off for 8. The first shift begins at 6 a.m. and ends at 10 a.m., the next runs from 10 a.m. to 2 p.m., and the next one goes from 2 to 6 p.m. This cycle repeats for the next 12 hours. Time is kept by the stars and sun. During the 4-hour shift on deck, responsibilities include maintaining the course set by the navigator, trimming sails, steering, checking the hulls for any salt water intrusion, and keeping the decks clean. This can be a physically demanding time, especially if winds and swells are strong. One must be alert and focused, because a mistake can throw the canoe off course and put the crew at risk. Between work shifts there are other tasks to be done such, as preparing meals, laundry, and bathing. Once all tasks are completed and everything is set and there are no imminent needs, then there is free time. Sometimes, although it may not be your work shift, there is a need to have everyone on deck helping. When this occurs there are no complaints or abstaining, this is part of working as a cohesive unit. Once again there is evidence of teaching and passing on culture and the tradition of sailing and navigation via traditional means.

Finding Balance in Culture and Health
Some programs have tried to integrate traditional diet into current Western diet. One such approach was dubbed the Hawai‘i Diet. This diet focused on a traditional meal that consisted of 77% complex carbohydrates, 11% protein, and 12% fat. There was no restriction on portion or calorie size. During this 3-week trial it was found that there was a decrease in body mass index, blood pressure, and serum blood sugar. Although this type of project is a start, it is important to note that this alone cannot be the only solution. One must integrate all aspects of life to create a healthy unit. This means that physical exercise and activity should not only be limited to the gym, but also should be achieved through productive activities. Families should work together as a unit; cooking, cleaning, doing yardwork and working on projects. Furthermore, cultural well-being is important. This means that connection to culture should be identified as a goal while healthy eating and physical exercise is maintained. Sailing long voyages on canoes, such as Hokule‘a gives people the opportunity to build in a routine over the course of 30 days to achieve this balance. Diet is maintained by careful pre-trip planning and the physical exercise portion of the voyage is guaranteed. The renewal in cultural pride by literally sailing in the wake of one’s ancestors provides great motivation for success. By the end of a 30-day voyage, finding land typically 2,500 miles away, almost every crew member sees weight loss in varying levels, as well as increased muscle tone and renewed cultural pride.

Conclusion
During the voyage of life, balance needs to be ensured. This means that physical, mental health, nutrition, professional well-being, family, and culture all need to be in balance. Each of these aspects in life should be integrated. Hence, if one falters then the others will, too. The Hokule‘a voyaging canoe serves as a microcosm of life and is an example of how we can change our lives in simple ways. The crew is a family; each person has a role, and without everyone’s cooperation the entire voyage is at risk. The balance achieved with health, diet, culture and sense of ohana is integral to survival. Voyages like “Navigating Change” set an example of living a balanced life and demonstrate how these lessons can be carried onto land in our communities.

References
Introduction
The problem of homelessness in Hawai‘i has reached epidemic proportions. A 2003 survey done by the State of Hawai‘i found that there were over 6,000 individuals who were homeless on any given day in the State.¹ This was a dramatic increase from surveys done in 1999, which estimated Hawai‘i’s homeless population at just over 3,000. Although data are not now available, another point-in-time count was taken in January 2007, and most believe that the number of homeless in Hawai‘i has again grown significantly. Since the 2003 study, the cost of living has skyrocketed while minimum wage has essentially remained the same.² This has increased the burden on Hawai‘i residents and has forced many into homelessness. On the island of O‘ahu, recent “clean-up” efforts in a major community park uprooted hundreds of homeless people who resided there, many of whom were of Micronesian descent. Charitable and state-run organizations were inundated with individuals in need of assistance. Fortunately, the State was able to provide a transitional shelter in Kaka‘ako on the island of O‘ahu, the Next Step Shelter, for displaced individuals. After 4 months of the shelter being open, approximately 49% of the shelter residents were reported to be of Micronesian descent.³

Micronesia is the region of Oceania consisting of many hundreds of small islands, which are spread across a large region of the western Pacific. It includes the Federated States of Micronesia (FSM): Kosrae, Yap, Pohnpei, and Chuuk; the Republic of the Marshall Islands (RMI), the Republic of Palau, the Commonwealth of the Northern Mariana Islands (CNMI), the Republic of Nauru, the Republic of Kiribati, and the Territory of Guam. Over the last few years, there have been increasing numbers of Micronesians, particularly from the FSM and RMI, migrating to Hawai‘i. The Compact of Free Association (COFA) signed between the FSM, RMI, and the U.S. in 1986 allows Micronesians from these areas to freely migrate between the nations without visas or time limits. As a result, more than 20,000 Micronesians from the FSM and RMI have migrated to Guam, Hawai‘i, and the CNMI since 1986.⁴ It is estimated that more than 8,000 of these Micronesians are currently residing in Hawai‘i. The 2003 Census of Micronesians in Hawai‘i reported nearly 3,000 Marshallese in the State of Hawai‘i, a 20% increase from the 1997 enumeration of about 2,500.⁵

Reasons for Homelessness among Micronesians at a Transitional Shelter in Hawai‘i

Jill S.M. Omori, MD*
Cristina Keolanani Kleinschmidt, MD*
Eric K.W. Lee**
Christopher J. Lindshield, MD*
Tina Kuribayashi**
Damon F. Lee, MD*

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, Mililani, Hawai‘i; **University of Hawai‘i at Manoa, Honolulu, Hawai‘i. Address correspondence and reprint requests to: Dr. Jill Omori, Assistant Professor, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, 95-390 Kaahelani Avenue, Mililani, Hawai‘i 96789-1192; jill.omori@hawaii.edu.

Abstract
Background: Over 6,000 people are homeless in the State of Hawai‘i and a growing number are of Micronesian descent. This study looks at reasons for homelessness in the Micronesian population. Methods: The authors conducted a retrospective chart review of 145 patients who were seen in a free student-run medical clinic at a transitional shelter in Hawai‘i. Demographics and reasons for homelessness were compiled for the patients of Micronesian ancestry. Results: Of the 56% of patients that were found to be of Micronesian ancestry, overcrowded housing was the most common reason leading to homelessness. Conclusion: Overcrowded housing, probably caused by poverty, along with social and cultural differences, likely play a significant role in the reasons for homelessness in Micronesian migrants. More research needs to be done to discern the reasons for, attitudes towards, and solutions for homelessness in this population. (PHD 2007 Vol 14 No 1 pp 218-223)
This same comparison showed that the Marshallese impact population (defined as those who migrated to Hawai‘i after the 1986 COFA took effect) grew by 25.5% from 1997 to 2003 and that the impact population from the FSM grew by 35.7% during the same time period. While the largest group of migrants from Micronesia are from the RMI, the individuals from the State of Chuuk in the FSM are the fastest growing community of Micronesians in Hawai‘i.6 Many of the Micronesian migrants (which we define as individuals migrating from the FSM and RMI for the purposes of this paper) have migrated for medical, social, and financial reasons, with a desire for better education and healthcare topping the list.

The desire to emigrate can be linked to post-war social, political, and economic policies of the U.S. This includes the infusion of funds by the U.S. and the development of a wage economy which undermined the subsistence economy that was predominant until the 1960s. This increase in the importance of money, coupled with a decrease in households producing their own food, forced individuals to migrate to areas where jobs were available. Displacement from homes, secondary to economic pressures and/or from the nuclear weapons testing, which occurred in the RMI from 1946-1957, led to an abandonment of agriculture and gathering of reef resources. This was replaced with a commodity economy based on processed foods and canned goods. The poor nutritional value of these food products has led to high rates of malnutrition in children and chronic diseases in adults, such as diabetes and coronary artery disease, with very few healthcare resources to deal with these problems. In addition, when the FSM and RMI declared their independence, the U.S. administration dramatically reduced the level of financial support to these areas. This caused a rapid economic decline and loss of existing jobs. The accelerated modernization, erosion of traditional culture, and decline in U.S. assistance have all contributed to the impoverished and resource-poor conditions that many in the FSM and RMI are trying to escape.6,7

There is currently a paucity of data concerning the numbers of Micronesian homeless in Hawai‘i. The Institute for Human Services, one of the main local service providers for the homeless in Hawai‘i, report that approximately 90% of the families they assisted were of Micronesian descent.8 This statistic, coupled with the number of Micronesians residing at the newly established Next Step shelter raised an important question: Why are so many Micronesian families who migrated to Hawai‘i for a better life, homeless?

One of the services utilized by the homeless population at the Next Step Shelter is the Hawai‘i Homeless Outreach and Medical Education (H.O.M.E.) project. Established in May 2006, H.O.M.E. operates a student-run free medical clinic, which provides a wide range of health services to the individuals at the shelter. As part of their intake and history taking, the medical students have gathered demographic data from these patients and have explored their reasons for homelessness. This created an opportunity to explore the question previously posed.

Methods
This study was reviewed by the University of Hawai‘i Committee on Human Studies and received a certificate of exemption (CHS#14887). A retrospective chart review of patients seen in the H.O.M.E. clinic at the Next Step Shelter was conducted. The authors collected data from charts of patients seen during the time period spanning May 30, 2006 through September 10, 2006. A total of 145 charts were reviewed. The patients were split into two categories: Micronesian and non-Micronesian individuals. Only data from those patients who self-identified as Micronesian (either Chuukese, Yapese, Pohnpeian, Kosraean, Marshallese, Palauan, or Chamorro) were compiled, for a total of 82 charts.

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*Patients were asked to check all boxes that applied to them
At the time of registration, all patients are asked to fill out a registration form which includes questions regarding their age, gender, ethnicity, marital status, employment status, and health insurance status. The registration form is written in English, so non-English speaking patients are given assistance in filling out the forms through an interpreter. All of the questions are open ended except for “Employment Status” and “Ethnicity” which have pre-determined lists for the patients to choose from (see Tables 1 and 2). As part of all first visits to the clinic, medical students complete a history intake form for each patient. The information is gathered through interviews and utilizes interpreters when necessary. Information gathered on the intake form includes the patient’s medical history, their family’s medical history, and aspects of their social history. Two of the questions included in the social history portion of the form are “How long have you been without a regular home?” and “What was the main cause of your homelessness?” For the second of these questions, the patients are asked to choose from a list of options (see Table 3).

For this study, demographic data including age, gender, ethnicity, marital status, employment status, and health insurance status were obtained from the patient registration forms. Reasons for homelessness and duration of homelessness were obtained from the adult history intake forms.

### Table 3. Causes of Homelessness on Intake Form

<table>
<thead>
<tr>
<th>Reason</th>
<th>Total (N=82)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Could not afford rent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EtOH/substance abuse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evicted (other than for rent)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family conflict</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental disability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My Choice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over-crowded housing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical disability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stranded visitor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (asked to specify)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Results

#### Demographics

The demographic data for these patients are displayed in Table 4. The majority of the patients were females between the ages of 19 to 40. Most were either employed or looking for employment. The Micronesian patients were comprised only of people who self-described themselves as Chuukese, Marshallese, and Kosraean. Eighty-nine percent of these Micronesian patients were Chuukese (Table 4).

#### Reasons for Homelessness

The reasons for homelessness in the adult Micronesian population at the H.O.M.E. clinic are outlined in Table 5. For more than half (53%) of the Micronesian adults, overcrowding leading to the individual’s subsequent removal from the household was their major reason for homelessness. Some respondents clarified this as

| Table 4. Demographic data of the Micronesian patients at the H.O.M.E. clinic |
|---------------------------------|-------------------|-------------|
|                                | Total (N=82)      | Percentage  |
| **Gender**                     |                   |             |
| Male                           | 24                | 29%         |
| Female                         | 58                | 71%         |
| **Age in years**               |                   |             |
| 0 - 18                         | 33                | 40%         |
| 19 - 40                        | 39                | 48%         |
| 41 - 60                        | 9                 | 11%         |
| >60                            | 1                 | 1%          |
| **Ethnicity**                  |                   |             |
| Chuukese                       | 73                | 89%         |
| Kosraen                        | 1                 | 1%          |
| Marshallese                    | 8                 | 10%         |
| **Health Insurance**           |                   |             |
| Quest                          | 55                | 67%         |
| Medicaid                       | 3                 | 4%          |
| Private                        | 7                 | 8%          |
| None                           | 17                | 21%         |
| **ADULTS ONLY**                |                   |             |
| **Marital Status**             |                   |             |
| Single adults                  | 27                | 55%         |
| Married                        | 20                | 41%         |
| Divorced                       | 0                 | 0%          |
| Widowed                        | 2                 | 4%          |
| Separated                      | 0                 | 0%          |
| **Employment Status**          |                   |             |
| Employed                       | 17                | 35%         |
| Unemployed, looking            | 15                | 31%         |
| Unemployed, not looking        | 5                 | 10%         |
| Unemployed, disabled           | 5                 | 10%         |
| Unemployed, homemaker          | 6                 | 12%         |
| Left blank                     | 1                 | 2%          |
being asked to leave by family, friends, and/or landlords because the total number of individuals residing in the household exceeded the maximum number of tenants allowed. The second most common reason for homelessness was the inability to afford rent, representing 31% of the adults. Other reasons included being evicted, physical disability, and family conflict (Table 5).

Duration of Homelessness
The majority of the patients, 77%, had been homeless for less than one year and only 7% of the patients had been homeless for greater than 3 years.

Discussion
In the 2003 Homeless Point-in-Time Count Report, the State of Hawai‘i found that “problems paying rent” was the top cause of homelessness, representing 41% of the homeless population.1 This study did not include a category for overcrowded living conditions or separate out evictions secondary to overcrowding. Thus, it is difficult to compare the “reasons for homelessness” reported by our Micronesian patients to those of the general homeless population that was studied in 2003. The percentage of individuals who had been homeless for less than a year was higher in our Micronesian patient population than that found in the Point-in-Time Count Report, 77% and 60%, respectively. This may be a result of the recent surge in migration of Micronesians to Hawai‘i in the last few years, or the opportunity to get out of overcrowded housing with relatives and into the Next Step Shelter until they may be able to afford their own housing.

Title I (Section 103) of the McKinney-Vento Homeless Assistance Act (PL100-77) defines a homeless person as (1) an individual who lacks a fixed, regular, and adequate nighttime residence; and (2) an individual who has a primary nighttime residence that is: (A) a supervised, publicly or privately operated shelter designed to provide temporary living accommodations (including welfare hotels, congregate shelters, and transitional housing for the mentally ill); (B) an institution that provides a temporary residence for individuals intended to be institutionalized; or (C) a public or private place not designed for, or ordinarily used as, a regular sleeping accommodation for human beings. Using this definition, homelessness is virtually absent in the FSM and RMI. This may be attributed to the social and cultural traditions of the Micronesian people. It is customary for many individuals belonging to an extended family to live with one another in a single home. Historically in the FSM, “homes”, as viewed by the Western world, were mainly used for sleeping and most other activities occurred outside of the “home.” Rather, the central gathering place for household members is the utu, or meeting house, and cooking activities are done in a common cookhouse for the village.8,9 This perception of the significance of the “home” is very different than that which is prevalent in the Western world, where much of our important daily social interactions occur within our “homes”. This difference in perception has been anecdotally confirmed through conversations with some of our Micronesian patients.

Micronesian migrants often conform to the social norms they are accustomed to upon moving to the U.S. Many arrive in Hawai‘i expecting to live with friends or relatives. However, landlords and housing regulations often prevent large numbers of tenants from occupying individual units, resulting in the newly arrived migrants becoming homeless. The majority of these Micronesian migrants, who were more than likely trying to escape the poverty they experienced in their home countries, are in the process of seeking employment or have only recently started a job, many which pay only minimum wage. This makes it very difficult for them to afford rent on a separate unit and they must resort to living on the streets, in parks, in cars, and if they are lucky, in shelters. Although poverty and the cost of housing in Hawai‘i is a deterrent to most homeless individuals in the state, the Micronesian homeless face additional barriers that others may not. These include cultural differences, language barriers, and lack of documentation.
The Homeless Service Utilization Report, released in 2006 by the University of Hawai'i Center on the Family in collaboration with the Homeless Programs Branch of the Hawai'i Public Housing Authority, reported that "compared to overall state population estimates, other Pacific Islanders (15%) and Native Hawaiians (28%) were substantially over-represented among individuals receiving Shelter Stipend Program services..." The group referred to as "other Pacific Islanders" included, but was not limited to, individuals from the FSM, the RMI, Palau, Guam, Tonga, and Fiji. Shelter Stipend Programs were defined as emergency and transitional shelter services and supportive case management services. Of note, this study was conducted in 2005, prior to the closure of the community park where many Micronesian migrants resided and the establishment of the Next Step Shelter. We speculate that if the study were to be repeated, the percentage of "other Pacific Islanders" utilizing Shelter Stipend Programs would be even higher than the original report. The study also reported that "other Pacific Islanders" utilized shelter stipend programs five times more than outreach programs (services and referrals available through mobile street outreach and at drop-in centers to those who are homeless and living unsheltered). This may be due to language barriers present in the Micronesian migrants, which may lead to a lack of awareness of these services or an apprehension to access them. However, the report released by the University of Hawai'i Center on the Family did not specifically investigate the reasons for these disparities.

If we take into account the social and cultural norms discussed earlier, one could propose that the Micronesian migrants, who are comfortable living within extended family living conditions and that may be accustomed to using homes merely as "shelters" as they had done in their home countries, may view our homeless shelters as reasonable alternatives for housing. If you extrapolate further, these individuals may not even view "homelessness" as we define it as a problem that needs to be addressed. In this respect, they may be houseless, but not homeless. So why should we be concerned about "homelessness" in the Micronesian population?

While many of these individuals may not necessarily view living in a shelter as a problem, it was much less comfortable for them to live without any shelter at all prior to the creation of the new transitional shelters in Hawaii. The cost of these shelters and their associated social services will have a very large economic impact on the state of Hawaii. As healthcare providers, it is also essential to understand the impact of homelessness on an individual's health. Without stable housing and a reliable food source, it is difficult to manage both acute and chronic medical problems and health is rarely a top priority. With the health status of many Micronesian migrants already being compromised secondary to limited access, cultural differences, and language barriers, it is imperative that the issue of homelessness in the Micronesian population of Hawaii be addressed. The number of migrants from Micronesia continues to grow and with this influx we can anticipate that the number of Micronesian homeless will grow along with it.

Although this study was very small, it highlights the prevalence of homelessness in the Micronesian population. It also establishes the need for more research in this area, including but not limited to, a more extensive look at reasons for homelessness among Micronesian migrants, in the prevalence of homelessness among Micronesian migrants from different countries, the comparison of Micronesian and non-Micronesian reasons for homelessness, and a thorough study to look at the attitudes regarding homelessness among Micronesian migrants. We also hope this article will engender more discussion regarding the issue of homelessness among Micronesian migrants and that perhaps through these discussions, we will be able to find culturally appropriate solutions for providing assistance to these individuals. By providing more culturally and linguistically appropriate housing assistance and utilizing Micronesian community leaders to educate and inform their communities about U.S housing regulations and available social services, perhaps we can begin to see a decline in the number of homeless migrants from Micronesia. It is also important for us to keep in mind that homelessness among the Micronesian migrant populations, as in other homeless populations, is actually a symptom of the policies and societal structures that create and maintain poverty—and that should be our paramount concern.

References
It is also important for us to keep in mind that homelessness among Micronesian migrant populations, as in other homeless communities, is actually a symptom of the policies and societal structures that create and maintain poverty...

13 years ago in the Pacific Health Dialog, A. Ravuvu stated, “Rural development . . . is the thin wedge of the international economy, under which our small Pacific countries are already at the mercy of those who control the system and it is financial institutions.” PHD, 1995;2(1):94.
Pacific Association for Clinical Training (PACT): Lessons Learned and Next Steps in Developing a Sustainable Continuing Health Professionals Education System in the United States-Affiliated Pacific Island (USAPI) Jurisdictions

Lee E. Buenconsejo-Lum, MD
Gregory G. Maskarinec, PhD
Neal A. Palafox, MD, MPH

Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa. Address correspondence and reprint requests to: Lee E. Buenconsejo-Lum, MD, Department of Family Medicine and Community Health, John A Burns School of Medicine, University of Hawai‘i, 95-390 Kuahelani Avenue, Mililani, Hawai‘i 96789-1192; lburencon@hawaii.edu.

Abstract

In response to the 1998 Institute of Medicine report, “Pacific Partnerships for Health”, acknowledging the need for the continuing education of health workers in the United States-Affiliated Pacific Island (USAPI) jurisdictions, the U.S. Health Resources and Services Administration (HRSA) awarded a grant (1999-2003) to the University of Washington for a continuing education project in the Pacific. When shortfalls in HRSA funding threatened continuation of the program, Pacific advocates aggressively made a case for refunding of this important project. In 2003, HRSA announced competitive funding for a new program for continuing education. The Department of Family Medicine and Community Health (DFMCH) at the University of Hawai‘i (UH), John A. Burns School of Medicine (JABSOM) was awarded the HRSA Cooperative Agreement to run from September 2003 through August 2007, creating PACT, the Pacific Association for Clinical Training.

PACT assembled a professional, community-based advisory board, most of whom were indigenous Pacific Islanders, and conducted a continuing clinical education needs assessment in every jurisdiction, subsequently developing and delivering programs utilizing distance education relevant to the needs of each USAPI jurisdiction. Priority health areas included diabetes, oral health and geriatrics, as mandated by HRSA. This report describes the processes, accomplishments, challenges and lessons learned from the project. PACT needs assessment reports for each jurisdiction and an executive summary are published as Original Articles in this issue of Pacific Health Dialog.

As funding for PACT comes to an end, it is clear that much work remains to be done in the region. “Continuing clinical education” is only one part of a continuum of human resources for health (HRH) workforce development. Continued USAPI regional, U.S. national and international collaboration and resources are needed to achieve the ultimate goal of improved health and health care delivery in the USAPI. (PHD 2007 Vol 14 No 1 pp 224-233)

Introduction

The U.S.-Affiliated Pacific Islands (USAPI) consists of three Flag Territories and three Freely Associated States (FAS). The Flag Territories are American Samoa, Guam and the Commonwealth of the Northern Mariana Islands (CNMI); the Freely Associated States are the Federated States of Micronesia (FSM; comprised of the states of Yap, Pohnpei, Kosrae and Chuuk), the Republic of the Marshall Islands (RMI), and the Republic of Belau (ROB known as Palau). The total population of the USAPI is approximately 460,000 people, with 182,000 of the inhabitants living in the FAS. The expanse of the USAPI is twice the size of the continental United States (U.S.) and crosses four time zones and the International Date Line.

American Samoa has been a territory of the United States (U.S.) since 1900, and Guam was annexed as possession of the U.S. in 1898. In 1947, under a United Nations Mandate, the U.S. took responsibility for the “health, education and welfare” of the U.S. Trust Territories of the Pacific Islands (TTPI), which included what is now the RMI, ROB, and the FSM. The FAS countries are voting members of the United Nations and are sovereign, except for military matters. Each FAS is governed by a Compact of Free Association with the U.S., allowing the FAS to participate in specified federal programs, including programs funded by the U.S. Department of Health and Human Services (DHHS) and the U.S. Department of Education (DOE).
FAS are represented as independent countries with embassies in Washington, although, as former U.S. colonies, the USAPI have become heavily dependent on U.S. assistance. Citizens of the Flag Territories, while classified as U.S. citizens, are not allowed to vote in U.S. Presidential elections. FAS citizens, classified as non-immigrants, are also not allowed to vote in U.S. elections, but can freely immigrate to the U.S. to work without a visa. Guam and American Samoa have non-voting representatives in the U.S. Congress. The CNMI has a representative in Washington, D.C. who is not a member of Congress. Citizens of the Flag Territories qualify for Medicare, Medicaid benefits, and all U.S. Federal Grants. Because of the hospitals’ Medicare certification requirements, many of the physicians in the Flag territories must be licensed to practice in the U.S. or Canada. FAS citizens do not qualify for Medicare or Medicaid.

The ability of each jurisdiction to respond to the health needs of the region is dependent upon the health infrastructure, financial resources, and the size and level of training of the health workforce. The health care budget expressed as a per capita expenditure of each jurisdiction in 2001 (the most recent year for which data is available for all sites) ranged from $87 (FSM) to $1,032 (Guam), far below that of the U.S. at $4,929. Expensive tertiary care is obtained from Hawai’i (HI) or the Philippines for advanced cases of cancer, heart or kidney disease, and purchased via medical referrals. Nearly one-fourth of the already inadequate USAPI health care budget is expended on tertiary care abroad. The 1998 Institute of Medicine (IOM) report, entitled, “Pacific Partnerships for Health: Charting A New Course”, describes the glossy inadequate health facilities and infrastructure in most of the USAPI. Funding provided by the amended U.S. Compact of Free Association fails to provide for significant improvements in health care financing for the FSM and RMI, and in some health areas, funding is reduced. Health services patients, providers and administrators in the FSM and RMI are already feeling the adverse impact of the diminishing Compact payments. The varied and complex factors influencing policy issues, political relationships, economics, the environment, culture, health systems, education and human resource development all play significant roles in the present state of health and the health infrastructure in the USAPI.

Health Workforce Training Issues
There are limited qualification criteria for the local health care workforce in the respective USAPI jurisdictions. Formal education, training and continuing education opportunities for health care workers in the USAPI are variable. Rapid westernization of the USAPI has accelerated the epidemiologic transition in the region, and the existing workforce was not prepared in training or numbers for the double burden of communicable and noncommunicable illnesses.

Developing a sustainable indigenous workforce to address growing USAPI health needs will be challenging. The colonizing governments of Spain, Germany, Japan and the U.S. gave (what is now) the USAPI secondary and tertiary health care systems without providing the tools and resources needed to sustain these systems. USAPI public school systems continue to face significant challenges in preparing students for successful entry into health careers, and scholarship programs are insufficient to make up for inadequately trained students.

There was a medical officer training program in Hilo, HI during the late 1960s and 1970s. The Pacific Basin Medical Officers Training Program (PBMOTP) in Pohnpei, FSM, was a satellite program of UH JABSOM from 1986-1997, committed to developing an indigenous physician workforce to serve the USAPI. PBMOTP intensified the curriculum of the original Physician’s Assistants Program, known as MEDEX. One-hundred seventy students entered the program, but only 70 graduated. Some students were able to complete enough training to serve as health assistants or MEDEXes. All 70 graduates earned a Medical Officer (MO) degree and are licensed physicians able to practice in the participating jurisdictions. Prior to 1995, physicians graduating from PBMOTP returned to their home islands for a year-long, loosely structured apprentice-style internship. The 70 Micronesian and American Samoan PBMOTP physician graduates entered the health workforce with little opportunity to keep their knowledge current through continuing education. In 1995, a model for distance learning was adopted by the Fiji School of Medicine (FSMed) under the auspices of the World Health Organization (WHO) for dissemination in much of the western tropical Pacific basin. U.S. funding sources, awarded to UH JABSOM and PBMOTP, supported initiation of clinical post-graduate training courses, which commenced at FSMed in 1997.

The 1998 IOM Report included four recommendations to improve health in the USAPI:

1. Adopt and support a viable system of community-based primary care and preventive services.
2. Improve coordination within and between the jurisdictions and the United States.
3. Increase community involvement and investment in health care.
4. Promote the education and training of the health care workforce.

Local governments, the Pacific Island Health Officers Association (PIHOA) and other U.S. national and international partners have addressed the IOM’s first two recommendations over the past 10 years, and community involvement has been increasing to varying degrees. The fourth recommendation, promoting education and training of the health workforce based on a workforce development and training plan established by each jurisdiction, called for several strategies:

- Improving and supporting basic education (primary and secondary schools);
- Utilizing distance-based learning, telemedicine and electronic data libraries;
- Provide postgraduate and continuing medical education (CME) programs for all levels of practitioners and incorporated into each jurisdiction’s health care workforce training plan;
- Sponsoring training for dentists;
- Sponsoring training for nurses; and
- Providing health administration and systems management training to the Chief Health Administrator through a certificate or degree program.

The Pacific Islands Continuing Clinical Education Program (PICCEP), through the University of Washington, developed as a result of recommendations in the 1998 IOM report. PICCEP was created to provide continuing clinical education with an emphasis on primary care, for practicing health providers in the USAPI. PICCEP was aimed largely at physicians and provided text books and other learning materials to the “libraries” in each of the jurisdictions. These libraries provided educational resources, however an infrastructure to support and encourage a culture of learning was absent. Thus, USAPI health providers and policy-makers involved in health workforce planning advocated to HRSA to continue funding to develop a sustainable system for continued learning.

Development of the University of Hawai‘i Pacific Association for Clinical Training Program

In 2003, HRSA entered into a 4-year Cooperative Agreement with the UH JABSOM DFMCH to develop and coordinate a comprehensive continuing education (CE) program for health care workers in the USAPI, to include nurses, physicians, oral health and other allied health providers. Activities were to be directed by a multidisciplinary advisory board representing each jurisdiction and the major regional nursing, medical and dental professional associations. Program goals included developing capacity for and implementing distance education in the region.

The UH PACT team approached this issue of CE through an indigenous, people-focused, participatory model of health education and training development. The ultimate goal of PACT is to improve the quality of health care and health outcomes in the USAPI through ensuring a sustainable CE program. An additional requirement of the HRSA Cooperative Agreement was to have an independent evaluator; Dr. Kathryn Braun, Research Director of ‘Imi Hale—Native Hawaiian Cancer Network, worked with PACT staff and board members to design and conduct the evaluation.

UH PACT Advisory Board

The Ministers, Secretaries and Directors of Health from each USAPI jurisdiction appointed two persons to form PACT’s community-based Advisory Board, which also included one representative from each of the regional health professions associations for nurses, dentists and physicians (please refer to the Acknowledgements at the end of this article). Given the distribution of the USAPI health workforce (refer to the Needs Assessments section, below) and health leadership in the region, the initial PACT Board of 23 members consisted of four nurses, two dentists, four non-physician health administrators, and four physician health administrators. The relative distribution has remained stable over the 4 years of the project. The Board first met in Honolulu in February 2004, where they crafted the strategic plan, set priorities for PACT activities and contributed to the design and implementation of the needs assessments. At subsequent annual meetings, progress and challenges in implementing the various portions of the strategic plan were discussed. Additionally, the Advisory Board and PACT partners discussed resources, training opportunities, reviewed the independent evaluator reports from the preceding Program year, and agreed on the objectives and evaluation measures for each subsequent year.
Needs Assessments
Unlike traditional CE needs assessments that usually focus on content areas, these assessments also examined existing laws, policies, support and infrastructure required to support a continuing professional development program in each jurisdiction. The assessments attempted to include each item or factor noted in the 1998 IOM report. A combination of written surveys, key respondent interviews, and reviews of existing data and reports were used to assist the Advisory Board in developing and refining the Regional Strategic Plan. As stated earlier, an Executive Summary of the needs assessment and priorities for a continuing professional development program, along with individual jurisdiction needs assessments are published as Original Articles in this issue of Pacific Health Dialog.

Regional Strategic Plan
The PACT Strategic Plan was developed by the Advisory Board at their February 18-19, 2004 inaugural meeting in Honolulu, HI. Despite the tremendous diversity and disparity in infrastructure and human resources available throughout the region, economic and political challenges, and frustration at the generally slow progress made since the IOM report was published, this group, assembled for the first time ever, was able to develop seven strategic priorities, discussed in subsequent sections. One of the key first steps in defining the strategic priorities was to broaden the definition of "continuing clinical education" used in the HRSA Cooperative Agreement. The Board strongly felt that the term "clinical" put less emphasis on public health and primary health care and also would not include the managerial and administrative educational priorities that were so badly needed. Accordingly, the Board chose to use "continuing professional development" (CPD) to more accurately capture the type of educational priorities and activities needed under the PACT program. The term "professional" implies prior attainment of a degree or other professional certification specific only to physicians, dentists and some nurses. At the heart of their discussion was the strong need for better foundational training for the existing and future health workforce via certificate or degree-granting programs, because many of their health workers, including practical nurses, had received only on-the-job training from others who were also trained on-the-job. The Board acknowledged, however, that the much larger issue of health workforce development or human resources for health development was beyond the scope and budget of the HRSA Cooperative Agreement. Some of the priority areas in the plan were developed to help focus their health administrations’ advocacy efforts in health workforce development. The Board also stressed the need for flexibility for jurisdictions to determine, request, and receive financial assistance with their respective priority needs, as well as to develop their health infrastructures. Individual jurisdiction and regional progress in each priority area were discussed at the annual board meetings.

Distance Education
Another focus of the HRSA Cooperative Agreement was to deliver the community-driven educational content via distance education. Distance Education in the U.S. and other developed countries is now commonly conducted using a combination of synchronous or asynchronous teaching via web-based interfaces, webcams, chat rooms, electronic study halls, online discussion groups, message boards, e-learning systems, or interactive videoconferencing programs. However, the experience in the USAPI has been very different. Video teleconferencing (VTC) via satellite is not reliable at all locations. Each of the countries, with the exception of Guam and CNMI, utilize dial-up connections at expensive per kilobyte or monthly rates. Lack of bandwidth and insufficient numbers of adequately trained Information Technology (IT) staff to support distance learning are pervasive problems.

The UH Telecommunications and Information Policy Group (TIPG) conducted an in-depth assessment of existing and needed resources to conduct distance education in the USAPI. Additionally, a pilot project was conducted in Pohnpei in June 2004 testing various modalities of distance education. Original Articles by Chen et al. and Higa reporting on these two projects, respectively, are also published in this issue of Pacific Health Dialog. As a result of the pilot project, much of the “content” has been captured and delivered using Tegrity, videotapes or distributed via CD-ROM or DVD, allowing for flexibility in scheduling for group meetings, as well as individual learning styles, and use of the existing technological infrastructure in the respective jurisdictions.

Accomplishments and Challenges with the Strategic Priorities
The UH PACT Advisory Board identified seven strategic priority areas:
1) Prioritize Continuing Professional Development at the Governmental Level;
2) State-Level Coordination;
3) Incentive Structure;
4) Collaboration and Partnerships;
5) Curriculum Modules and Library;
6) Computer Skills and Telecommunications Access;
7) Educational Priorities;
discussed below. The priority areas encompass health care policies and systems, health workforce, telecommunications infrastructure, and technology literacy. Each jurisdiction was to develop a continuing professional development plan for all their health workers; from there, content areas were further prioritized.

**Prioritize Continuing Professional Development at the Governmental Level**

Despite the 1998 IOM report and country-specific Strategic Health Plans or Strategic Development Plans (if such existed in 2004), PACT Advisory Board members strongly felt that “each individual government must make CPD a priority and work on improving current systems to enable health providers to apply the knowledge and skills learned in CPD programs.” As of early 2007, each government has made CPD a priority in at least one of several ways: formal language regarding CPD in existing legislation; plans emphasizing the importance of CPD; incorporating expectations of CPD into policies relating to hiring, retention or licensure of health workers. However, as described below, economic and political challenges continue to hamper effective implementation of these policies.

**State-Level Coordination**

Despite the economic constraints faced by the countries, in February 2004 the Advisory Board concluded that governments should support a dedicated CPD coordinator to demonstrate their commitment to improving health workforce training. Such individuals would also work to improve coordination between hospital and public health staff. Prior to establishment of the CPD coordinator positions, relevant health workers were often unaware of visiting medical teams or consultants who traveled to the jurisdictions, resulting in overlapping scheduling, poor attendance, and wasting of valuable resources. Recognizing that special skills were needed to facilitate distance learning, the Board also felt it was important to either require CPD coordinators have adequate computer skills, or to hire a local technology facilitator. Thus, the priority area for State-level coordination was established, with Advisory Board members helping to identify and recruit at least one CPD coordinator in each state who could facilitate and manage the local technology (logistics, computer training), as well as content (supporting CPD programs conducted via distance education) activities. “Where necessary, equipment and infrastructure support should be provided to enable the CPD coordinators access to the internet for communication,” was the second strategic priority identified by the Advisory Board.

In response to this priority area, established in February 2004, each jurisdiction designated a CPD Coordinator, although no new positions were funded. Coordination functions were assumed by the HRSA-funded Area Health Education Centers (AHEC) in Palau and Yap, by existing Education or Quality Assurance (QA) Coordinators in American Samoa, Guam Hospital, Guam Public Health, and Kosrae, and by physician or nurse leadership in RMI, Pohnpei and Chuuk. HRSA granted permission to transfer some of the budgets for infrastructure development (i.e., supplies, equipment, specific on-site or off-site training), which were requested via a mini-grant mechanism.

At the second PACT Advisory Board meeting in November 2004, a push was made for each jurisdiction to develop a coordinated CPD plan for all health workers with input from all disciplines. In March 2005, training for CPD Coordinators was held in conjunction with a Comprehensive Cancer Control Leadership Institute (CCCLI) in Honolulu, HI, specifically designed for the USAPI and largely sponsored by the major National Partners for CCC. This approach was chosen because many of the techniques and strategies used in developing a community-based action plan for cancer could be utilized in developing a multidisciplinary plan for USAPI health workforce training. CPD Coordinators also received training via Moodle, an e-learning system, and received a Coordinator handbook, which included sample policies, procedures, forms and tools for creating a basic CPD program organized and based on systematically identified needs in the region. Despite the training and resources, jurisdictions were in different stages of readiness to embark upon or complete such a CPD plan. Thus, at the third Advisory Board meeting, held in January 2006, Board members agreed to assemble a multidisciplinary teams to guide CPD development based on each jurisdiction’s systematically identified needs and priorities. At the final PACT Board meeting in December 2006, it was clear that challenges remained in this area. With the exception of the Palau and Yap AHECs, interdisciplinary by their nature, the other CPD teams lacked the necessary interdisciplinary make-up, and those coordinators were overwhelmed with other clinical and managerial duties. Many of these challenges stemmed from the lack of funded, dedicated CPD coordinators. Since CPD is but a part of the spectrum of human resources for health (HRH) development and also due to resource limitations, the Advisory Board feels that funded coordinators with appropriate administrative and communication skills are needed to keep moving forward with CPD and HRH planning. Some of the USAPI jurisdictions face incredible economic challenges just to maintain basic
Incentive Structure
Lack of incentives to participate in continuing education was cited as one of the many barriers to establishing a CPD program in those countries without licensure requirements that include attaining a minimum number of CPD credits. Therefore, the Advisory Board identified the third priority: “as a minimum incentive, all jurisdictions should move towards mandating a minimum number of CPD credits for continuing licensure of health workers. Professional organizations such as the American Pacific Nurses Leader Council, Pacific Basin Dental Association and the Pacific Basin Medical Association should take an active role in determining region-wide professional CPD requirements.” Other incentives discussed included incorporating some CPD activities into existing certificate and degree programs, and developing links between CPD and career advancement. Much progress has been made in these areas, to the credit of health leaders faced with multiple competing priorities. Each jurisdiction now has in place policies that include continuing education for re-licensure of health professionals. The regional health professions organizations continue to work on organization-based incentives, and several jurisdictions have partnered with institutions of higher learning to offer relevant coursework to current health workers. In this issue of Pacific Health Dialog, Durand AM et al. describe training efforts in Yap being used as the model in other FSM States, in two articles: “DC-OS”: Decentralized, On-Site Training” (Viewpoints and Perspectives section) and “The Yap AHEC Update” (Pacific Health Institutions section). Though some of partnerships with educational institutions commenced prior to or simultaneously with the PACT project, PACT has been instrumental in advocating for these issues, has sought closer collaboration between Health and Education sectors, and has provided funding for teachers or materials for some of these courses.

Curriculum Modules and Library
Given the diversity of learning needs in the region, flexibility in requesting and using the curriculum modules is imperative. Thus, the Advisory Board identified its fifth priority as, “PACT CPD activities should augment locally and regionally available training programs. Pre-existing content modules will be identified and modified as needed to utilize various distance education modalities. New modules will be developed using local, regional and international expertise to complement existing training materials. A “smorgasbord” of training modules provided by community colleges, regional institutions (such as Fiji School of Medicine and Public Health and the University of Guam), Federal and international agencies (including CDC, WHO, SPC) and other grant supported activities (such as regional AHEC programs and Maternal/Child Health programs). CPD training should also support existing health worker training programs where possible to address the health provider shortages in the region.”

The FSMed and Massey University offer some formal academic credit programs in the FAS, and WHO Pacific Open Health Learning Network programs are being used in some areas as part of their academic credit programs. PACT has partnered with the Centers for Disease Control and Prevention (CDC) Division of Tuberculosis Elimination (DTBE) to help design, record, and distribute the clinician and nurse training components of various regional TB meetings. Comprehensive Cancer Control (CCC) resources, through CDC’s Division of Cancer Prevention and Control (DCPC) and National Partners for CCC have provided cancer-specific training modules and other administrative and management training activities related to community capacity building. The University of Washington School of Dentistry, Preventive Dentistry Division, has been a strong partner. Largely supported by PACT, WHO and additional HRSA funding, Dr. Peter Milgrom and Dr. Ohnmar Tut (President of the Pacific Basin Dental Association [PBDA]; Preventive Services Dentist in the RMI) have worked with dental chiefs in Yap, CNMI, Kosrae, and, soon, Chuuk and Pohnpei, to develop comprehensive programs and provide training in preventive oral health techniques. PACT and PIHOA (both supported by HRSA), along with other HRSA and WHO funds, have been used to support PBDA conferences, and provide learning materials to upgrade the knowledge and skills of dentists in the region. As PIHOA embarks on their strategic plan for HRH, strengthening existing and establishing new collaborations and partnerships will be developed with the Pacific Post-Secondary Education Council, FSMed, Massey University, and many others.

Collaboration and Partnerships
Given the many challenges described above, coupled with small populations in the jurisdictions, the Advisory Board acknowledged collaboration and partnering to be critical to the success of the project in establishing the fourth priority area: “The program has explored and will continue to develop active collaboration with existing infrastructure (electricity, clean water supply), and to pay for fuel costs to provide basic health care and immunizations to the outer islands. Therefore, external funding sources remain a critical need for the next few years, at minimum, in order to fund dedicated CPD coordinators, with requisite computer skills, in those jurisdictions where they presently do not exist.
will be made available so that workers within each jurisdiction can select the most appropriate content and delivery method for their training needs and available resources. An open source library will be maintained of all clinical education materials.” Specific modules developed by either UH, physicians and nurses from RMI, FSM, Palau, American Samoa, and Guam, CDC or others have been distributed on CD-ROM or DVD to all jurisdictions. Some of these modules are also available through Moodle on the PACT website, but because of bandwidth limitations and/or lack of supplies, individuals in most of the jurisdictions do not download the materials or utilize Moodle. PACT also partnered with NetCE,™ another well-establish, web-based continuing education program specifically designed for medical, nursing, social work and dental health professionals, to make their content available to USAPI health providers at no-cost to individual participants. NetCE is able to track passing and completion rates, generate certificates of completion, and provides reports of such information with PACT staff.

Some of the lectures and trainings for physicians are eligible for U.S. American Medical Association (AMA) Category 1 CME credit, while others are eligible for Category 2 credit. While the great majority of health professionals in the FAS do not need U.S.-accredited CME credits, those health professionals in Guam, CNMI and American Samoa who need such credit obtain them through U.S.-accredited education programs for physicians and nurses delivered on-site (Guam and American Samoa) or via distance or off-island conferences (CNMI). However, even in the Flag Territories, limited local CME opportunities exist.

One contact-hour is defined as one person participating in 1 hour of a continuing education activity designed or facilitated by PACT, regardless of format (i.e., individual or group setting, live lecture, CD-ROM/DVD, web-based, VTC, audio conference or problem-based learning session). Delivery of the educational modules started in grant year 02 of the program, during which over 2,500 contact-hours were accrued. In year 03, more than 1,900 contact-hours were accrued, excluding NetCE participant data. NetCE converted their database in 2006 and was unable to provide the needed information for reporting in that year. The great majority of contact hours were obtained in group settings by viewing and discussing content captured via Tegrity and distributed on CD-ROM. Problem-based learning (PBL) has been introduced in each of the jurisdictions and is still being utilized in Yap and Chuk States in the FSM, and in Ebeye, in the RMI. In December 2006, TB clinicians participated in a workshop that focused on converting a traditional case history into an interdisciplinary PBL case. Periodic reinforcement to utilize PBL continues to be needed, but this holds promise as a learning modality that is both sustainable and builds capacity. An Original Article by Yamada et al., highlighting the use of PBL is published in this Pacific Health Dialog issue (pp 98-102).

**Computer Skills and Telecommunications Access**

The Advisory Board identified its sixth priority as, “Basic computer and internet skills training must be provided to increase the capacity of local health providers to access web-based resources including the PACT curricular library. PIHOA will assist in negotiating fair internet and telecommunications access rates for health providers in states where current pricing is prohibitive. UH faculty will explore opportunities for access to clinical support information, such as full text articles, for providers in the region.” PACT staff and partners have been able to conduct basic health informatics training in some of the jurisdictions. FSM health professionals who participated in trainings at the College of Micronesia FSM received basic computer skills training with financial assistance from PACT and PIHOA. Recent emphasis has been placed on better utilization of available resources at community colleges in each jurisdiction. The UH TIPG, a major PACT partner, has helped to improve telecommunications infrastructure in several jurisdictions. PACT provided a laptop and computer projector for continuing education program use in each jurisdiction, and helped support access to full-text articles through online medical literature databases. The mini-grant mechanism also helped fund other electronic equipment and supplies to build the infrastructure for CPD programs in each locale or with respective regional professional organizations. Primarily because of bandwidth limitations and time differences, web-based meetings or seminars have not been widely utilized in any of the USAPI jurisdictions. However, nurses and allied health staff in the RMI have successfully utilized VTC, because it works well, and because the timing of meetings in Hawai’i more closely matches trainings to be held pre- or post-work shift.

**Educational Priorities**

At UH PACT’s first Advisory Board meeting, significant discussions took place regarding our target audience, content and what made sense for the region and the individual jurisdictions. The HRSA Cooperative Agreement mandated diabetes, geriatrics and oral health as priority health concerns. Geriatrics was redefined by the Advisory Board as the upper age-range of persons who typically utilize most of the health resources. Given the wide disparity in educational needs between the jurisdictions, only regional educational priorities were
identified. The jurisdictions would be free to prioritize and request specific content according to their own local needs. The Board decided that priority educational needs should be based on the most prevalent health indicators and diseases. Thus, the seventh and final strategic priority area was established as, “Region-wide priorities were identified (in descending order) as: diabetes, oral health, cancer, environmental health, administration and leadership, injury and mental health/suicide. Geriatrics will be incorporated into each content area as applicable.” Advisory Board members further emphasized the importance of nursing and preventative care/public health training, and the need for public health management training, including inventory management. “The number one killer in Micronesia is disorganization,” declared one PACT Board member. The Board acknowledged that only focusing on content without improving the processes and context in which health professionals practice would result in well-trained but frustrated individuals, unable to apply their new knowledge and skills.

A partial listing of distributed content (more than 80 separate training modules) includes: “Diabetes and Oral Health”, “Approaches to Preventing Metabolic Syndrome,” “Diabetic Foot Exam,” “Wound Care,” “Delirium and Dementia,” “Home Care,” “Update in Geriatrics,” “Palliative Care,” as well as a variety of cancer-related topics (e.g., cancer screening, cancers of the breast, cervix and colon, U.S. Preventive Services Task Force [USPSTF] guidelines, human papillomavirus [HPV] vaccine, liver cancer, Hepatitis B & C, cirrhosis), greater than 20 topics related to tuberculosis, a variety of nursing education and nursing quality improvement initiatives, various presentations by physicians on public health, case series, and other topics. Oral health training has been largely delivered in face-to-face capacity-building sessions. A PACT mini-grant supported a Palauan physician to deliver a 20-hour curriculum on mental health to public safety and health officials in Yap. To date, more than 20 PBL cases have been distributed to the jurisdictions, and some have begun to develop their own problem-based learning cases.

Evaluation
Kathryn L. Braun, DrPH, Director of Research for ‘Imi Hale, conducts PACT’s annual evaluations. Using the original Cooperative Agreement application as a framework, the PACT Advisory Board refined and approved annual objectives and indicators. Because of the complexities throughout the region, the PACT Board determined at their first meeting that it would take many years to measure “meaningful” outcomes in terms of patient care or visible systems changes. Therefore, most evaluation indicators are process-oriented. Data to measure progress consists of meeting reports, attendance and evaluation sheets from the PACT-facilitated modules, as well as direct feedback from PACT Advisory Board members. Overall, program evaluation has been positive in each year, with PACT reaching or exceeding most of the indicators. Nearly all responding Advisory Board members provided positive feedback about PACT and its achievements in funding years 01, 02 and 03. For example, overall consensus was received for the following indicators:

1) PACT staff members are interested in Pacific issues and are well-intentioned, respectful, and responsive.
2) Good relationships have been established.
3) Health professionals across the region want CPD.
4) CPD opportunities are being provided through multiple mechanisms and venues, increasing options for individuals and jurisdictions.
5) Goods and services related to CPD have been realized by all jurisdictions.
6) The project is supporting infrastructure development.
7) Expectations of PACT are being met.

To date, PACT has been successful in building the infrastructure for CPD in the Pacific. Its major impact has been through (a) developing and distributing Tegrity training CDs; (b) supporting local/regional trainers and meetings (although post tests and CPD tracking mechanisms still need to be added); (c) awarding mini-grants in support of local infrastructure and associations; and (d) securing additional grants (e.g., in the area of cancer) to support training and capacity building in the region. Despite these limited successes, many challenges remain. Capacity for CPD still varies by jurisdiction and is significantly influenced by budget and health workforce shortages. While Pacific health providers are willing to utilize new technologies, their ability to receive non-face-to-face CPD programs remains constrained by lack of equipment, staff trained to operate the equipment, and a consistent supply of electricity. A proposed website planned as a central information clearinghouse has not been fully developed due to staffing issues and also because many of the jurisdictions are unable to utilize web-based curriculum and tracking. Few of the jurisdictions have developed plans, targets, and internal tracking mechanisms for CPD.
Developing Human Resources for Health in the Pacific

The 1998 Institute of Medicine report identified the need for continuing education for physicians of the USAPI and was the initial step that allowed PACT to evolve. HRSA then funded two consecutive 4-year projects. The initial one helped define the magnitude of the problem, documenting that all health professionals in the USAPI had been neglected for decades. The second 4 years of HRSA funding utilized a participatory model of development, identified and addressed infrastructure, human resource and policy issues that could promote a sustainable continuing education system. However, despite the IOM report and 8 years of HRSA funding, local sustainability of the PACT program is questionable. The professional health education efforts cannot be continued in a robust manner without continued funding and support. The health care resources that presently exist in the USAPI remain insufficient, requiring external assistance similar to the HRSA grants for at least another 15-20 years to enable sustainability and to produce significant positive outcomes.

Next Steps
Developing local capacity and identifying a dedicated CPD coordinator for each jurisdiction is vital to ensure sustainable workforce development through CPD. Additionally, coordinators are needed to implement policies and procedures related to CPD planning and implementation in the RMI, Pohnpei and Chuuk States in the FSM, American Samoa, and the CNMI.

Local and distance-based courses for academic credit need to be expanded for adequate training and certification of each jurisdiction's health care workforce. CPD priority areas, to be wed to larger HRH planning under the auspices of PIHOA, should be developed in concert with health workforce planning. Multi-level and multi-sector collaboration and coordination is also needed to develop and implement relevant HRH plans for long-term improvements in the provision of health care.

The UH JABSOM DFMCH, in collaboration with the Pacific Cancer Coalition and PIHOA, will continue to seek U.S. federal and international resources to provide training and capacity building as it relates to cancer control. Ongoing advocacy efforts highlighting the unique strengths and challenges of the USAPI is needed at all levels.

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CNMI: Mr. Joseph Santos (Assistant Secretary of Health for Hospital Services); Dr. Leticia Borja (Chief of Pediatrics); Mr. Pedro Untalan (former Deputy Secretary of Public Health); Dr. Norma Ada (former CME Committee member).

Guam: Mr. Arthur San Agustin (former Acting Director of Health); Ms. Margarita Bautista-Gay [Community Health and Nursing Services (CHNS) Administrator, Department of Public Health and Social Services (DPHSS)]; Mr. Leonel Arcangel (DPHSS Education Coordinator); Ms. Carol Perez [Guam Memorial Hospital Authority (GMHA) Education Coordinator]; Ms. Janice Yatar (former CHNS Administrator).

FSM, Chuuk State: Mr. Julio Marar (Director of Health); Dr. Don Bosco Buliche (CPD Coordinator); Mr. Romino Saimon (former Director of Health); Dr. Lyma Setik (formerly representing the Chuuk Organization for Community Action (COCA)).

FSM, Kosrae State: Mr. Arthy Nena (former Director of Health); Mr. Rhine William (CPD and QA Coordinator); Dr. Livinson Taulung (Chief of Medical Services); Mr. Ben Jesse (former Kosrae State Hospital Administrator); Mr. Kun Mongkeya (former QA/CPD Coordinator; current Kosrae State Hospital Administrator).

FSM, Pohnpei State: Dr. John Hedson [Chief of Medical Services; Pacific Basin Medical Association (PBMA) President; interim CPD Coordinator]; Dr. Marcelle Gallen (Chief of Dental Services).

FSM, Yap State: Dr. A. Mark Durand (former Yap State Director of Health); Mr. Joseph Habuchmai (former Lt. Governor); Ms. Leona Tamag [CPD Coordinator/Director of Yap Area Health Education Center (AHEC)].
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References
1. U.S. Pub. L. No. 108-88, Article VI, Section 461 in the Amended Compacts of Free Association for the RMI and FSM, Definition of Terms. (December 17, 2003).


Footnotes
[b] Bandwidth: the transmission capacity of electronic communication system; the speed of data transfer. (www.tegrity.com).
[c] Tegrity: a proprietary e-learning technology system.
[d] Comprehensive Cancer Control Leadership Institute (CCCLI): a public/private/govt collaborative designed to help states, territories and tribal nations implement and improve their comprehensive cancer control plans.
[e] Moodle (Modular Object-Oriented Dynamic Learning Environment): a free, open-source electronic course management system, downloadable in 75 languages. (Moodle.org).
[f] NetCE Continuing Education Online (www.netce.com)
The Yap AHEC: An Update 2002-2006

A. Mark Durand, MD, PhD*
Leona Tamag**
Arthur Yolwa, MD†
Victor A. Ngaden, MD††
Anna Boliy, BSN‡
Vincent Tafleimal, MD‡‡
Kelley Withy, MD, PhD§
Gregory J. Dever, MD§§
Pedro T. Untalan¶
Faye Untalan, PhD¶¶
Marcus Samo¶
Nena S. Nena¶

*Director, Yap Area Health Education Center (AHEC) and Yap State Department of Health Service, Colonia, Yap State, Federated States of Micronesia (FSM); **Associate Director, Yap AHEC, Colonia, Yap State, FSM; †Instructor, Yap AHEC and the College of Micronesia–FSM, Yap State Campus, Colonia, FSM; ††Special Projects, Yap State Department of Health Services, and Instructor, Yap AHEC and College of Micronesia–FSM, Yap State Campus, Colonia, FSM; ‡Chief of Clinical Care, Yap State Department of Health Services, Instructor, Yap AHEC, Colonia, FSM and Palau Community College, Koror, Republic of Palau; ‡‡Medical Staff, Yap Department of Health Services, and Instructor, College of Micronesia–FSM, Yap State Campus, Colonia, FSM; ‡§Director, Hawai‘i/Pacific Basin AHEC, and Associate Professor, University of Hawai‘i John A. Burns School of Medicine, Honolulu, Hawai‘i; ‡§§Director, Palau AHEC, Koror, Republic of Palau; ¶Executive Director, Pacific Islands Health Officers Association, Honolulu, Hawai‘i; ¶¶Director, CNMI AHEC, Saipan, Commonwealth of the Northern Mariana Islands; ¶‘Deputy Director, Department of Health, Education and Social Affairs, FSM National Government, Palikir, Pohnpei, FSM; “Secretary, FSM Department of Health and Social Affairs, FSM National Government, Palikir, Pohnpei, FSM.

Address correspondence and reprint requests to: A. Mark Durand, MD, PhD, Director, Yap State Department of Health Service, and the Yap Area Health Education Center, Colonia, Yap State, Federated States of Micronesia 96943; Durand@att.net.

Abstract:
The Yap Area Health Education Center (AHEC) is one of three U.S. Health Resources and Services Administration-funded AHEC programs in the U.S.-Affiliated Pacific Island jurisdictions (together with those in Palau and the Commonwealth of the Northern Mariana Islands). The Pacific Island AHECs are administered through the University of Hawai‘i, John A. Burns School of Medicine and were founded in response to recommendations for development of the local health workforce by the U.S. Institute of Medicine in its 1998 report, “Pacific Partnerships for Health”. The goal of the Yap AHEC is to build human capacity in the health workforce, and thereby strengthen the health service and improve health status for the people of Yap State. An ancillary goal is to pilot test new approaches to health workforce development, which might be shared with others in the region. These goals have been pursued by building partnerships with colleges in the region, with the new Wa‘ab Community Health Center project in Yap and the Yap State Department of Health Services to bring formal college programs for students and health service staff to Yap State. To date, formal relationships have been established with five colleges; Palau Community College (PCC), the College of Micronesia-Federated States of Micronesia (FSM), Fiji School of Medicine (Department of Public Health & Primary Care), University of Hawai‘i, Hilo, and the University of Alaska, Anchorage. A total of 143 students have been enrolled in 48 courses in several health worker disciplines, including clinical nurses, health assistant/ dispensary managers, community health outreach workers, public health program staff, pharmacy technicians and x-ray technicians. In addition to facilitating the delivery of courses in Yap, a new 6-course certificate program has been developed for community outreach workers in collaboration with the College of Micronesia, FSM and the Wa‘ab Community Health Center (Wa‘ab CHC) in order to support the CHC’s innovative health service delivery model. The Yap AHEC has also assisted the College of Micronesia-FSM in the World Health Organization sponsored development of a proposal for the establishment of a nursing program, which is based on the decentralized, on-site (DC-OS) nursing training model that has been pilot tested in partnership with PCC at Yap State Hospital. (PHD 2007 Vol 14 No 1 pp 234-238)

Background
The Yap AHEC was founded in 2004 as an offshoot of the Palau AHEC. The Palau AHEC was founded in 2001 when the Palau Ministry of Health approached the John A. Burns School of Medicine (JABSOM) at the University of Hawai‘i and petitioned to be included in JABSOM's Hawai‘i AHEC funding reapplication to the U.S. Health Resources and Services Administration, U.S. Department of Health and Human Services,
to support the provision of post-graduate training in primary care for medical officers in the region. The AHEC program has been in existence in the U.S. since 1973. AHEC’s mission is to improve the supply, distribution, diversity and quality of the health workforce in medically underserved areas. AHEC has funded 120 centers in 46 U.S. states. This mission is fully congruent with the recommendations of the 1998 U.S. Institute of Medicine in its report, *Pacific Partnerships for Health: Charting a New Course in the 21st Century*, to promote the development of the health workforce in the U.S.-Affiliated Pacific Island (USAPI) jurisdictions. Within 3 years, the Palau AHEC had delivered both academic and clinical post-graduate training to 11 physicians in Palau, Yap and the Marshall Islands. The Palau AHEC also expanded its programs to include undergraduate and post-graduate training for public health, environmental health, nutrition, and health administration (see Palau Assessment for a continuing Health Care Professional Department Program in this issue). In 2004, building on the success of the Palau AHEC, an application was submitted through the JABSOM Hawai‘i AHEC for funding to establish new AHEC centers in Yap and the Commonwealth of the Northern Mariana Islands (CNMI). In late 2004, A. Mark Durand, supported by the Palau AHEC, moved to Yap to expand training programs there.

Like most of the health services in the region, Yap State has been largely staffed by health workers who lack formal academic training for their jobs. The goal of the Yap AHEC is to build human capacity in the health workforce, and thereby strengthen health service and improve the health status for the people of Yap State. An ancillary goal is to pilot test new approaches to health workforce development, which might be shared with others in the region. These goals are being accomplished by bringing formal college programs to train health workers in Yap State. We do this by building partnerships with regional colleges, decentralizing their programs to the state, and delivering them on-site in the workplaces of the Yap State Department of Health Services (see "DC-OS": Decentralized, On-Site Training; A sadly neglected option for building the Pacific Islands health workforce, this issue, pp. 179-181). Our experiences with each program is summarized below.

**Yap State has been largely staffed by health workers who lack formal academic training for their jobs.**

Many of our nursing students have had trouble with the English and math courses in the curriculum. To address this, we have repeated one of the courses and hired an English tutor. When most of our students were failing a 3-credit pre-algebra math course, we requested the instructor continue classes for as long as necessary until the students met the learning objectives of the course. After 11 credit hours of contact, 15 of 17 of the students had met the learning objectives and passed the course. Of the nursing courses, two have been taught by visiting PCC faculty while the rest have been taught by Anna Boliy, a BSN at Yap State Hospital who has taken on teaching, in addition to her former duties as Chief of Clinical Care for the hospital. These multiple duties have caused some gaps of time when no nursing instruction was taking place. A full-time nursing instructor from abroad has recently been recruited to increase the pace of the program.

**Palau Community College, Clinical Nurse Training**

The Palau Community College (PCC) Nursing Program is a 3-year, Associate of Science degree, career ladder program, with exit points at 1 year for "practical nurses" and at 3 years for "graduate nurses." The following courses have been delivered at the Yap State Hospital (in a room on the hospital ward that has been converted to a classroom):

- ESL 088  *English Reading IV*
- ESL 098  *Writing IV*
- MA 90   *Pre-Algebra*
- NU 102  *Basic Nursing Concepts (twice)*
- NU 103  *Child Health Nursing I*
- NU 104  *Health Assessment*
- NU 105  *Patient Education*
- NU 106a *Nursing Trends I*
- NU 106  *Nursing Trends II*
- NU 108  *Child Health Nursing II*

The first two of these courses are foundation English, which are required in the PCC curriculum, but have been offered through the local branch of the College of Micronesia-Federated States of Micronesia (COM-FSM), but delivered at Yap State Hospital. A total of 25 students have been enrolled in any of the courses to date, including 20 who were already members of the nursing unit staff and five who were recruited into the program from outside. Twenty-one of these students are currently enrolled.

Ms Boliy has also been contracted by the COM-FSM to develop a nursing program plan for the college, based on the decentralized, on-site, career ladder program we have been delivering at Yap State Hospital. As of this writing, the proposal has been endorsed by the four FSM State Health Directors, the FSM Secretary of Health, Education and Social Affairs, the American Pacific Nurse
Leaders Council, and the Board of Regents of COM-FSM. Final endorsement by the FSM Board of Nursing and the accrediting agency of COM-FSM (the Western Association of Schools and Colleges) is pending.

**College of Micronesia-FSM, Dispensary Manager/Health Assistant Certificate Program**

This 12-course, 47-credit hour certificate program provides both public health and clinical skills training to health workers in outer island dispensaries. Most courses have been delivered by two senior physicians, Drs. Arthur Yolwa and Vincent Tafeimalal, who are also stationed and supervise medical services in the outer islands. Courses are delivered by a combination of distance learning over a network of high frequency radios (using materials that are pre-delivered by monthly field ship) in addition to twice yearly 4-6 week-long face-to-face sessions. For the face-to-face sessions, half of the health assistants are brought in to a central site (usually, one of the larger outer islands) and the rest are redistributed to provide service coverage to all of the islands. When the first session is complete, those who attended are sent back out to cover services, and the second group is brought in to take the courses. The following courses have been delivered to date:

- CHS 220 *Review of Health Sciences*
- CHS 231 *Maternal and Child Health I*
- CHS 233a *Behavioral Health*
- CHS 242a *Environmental Health*
- CHS 235a *Dental Health*
- CHS 241 *First Aid Care*
- CHS 240 *Maternal and Child Health II*
- CHS 224a *Health Problems in Adults*
- CHS 251a *Health Problems in Children*

A total of 28 students have been enrolled in the courses to date. This includes 21 who were already working as outer island health assistants, and eight women who were recruited to train to be birth attendants on outer islands that had no female health workers. The initial plan was for the birth attendants to take just the Maternal and Child Health courses. However, five students became interested in taking the full curriculum, and have continued through the entire series to date. A total of 27 students are currently enrolled in this program.

**College of Micronesia-FSM, Community Health Worker Certificate Program**

This 6-course certificate program was developed in collaboration with the new Wa’ab Community Health Center (CHC) project in Yap, to supply a new category of health worker, equipped specifically to deliver preventive services to people in their homes, schools and villages. The Wa’ab project features four new health center sites in the main island cluster of Yap, each of which is responsible for delivery of primary care and all preventive services to the populations within their respective catchment areas. Registries of clients in target populations for the various public health programs are used to identify lists of patients needing preventive services, which are relayed to the CHC sites and then delegated to the community health workers in order to deliver healthcare to the community. The curriculum is competency-based on the development of specific skills, such as preventive dental care for young children (application of fluoride varnish and counseling parents for children’s dental care), directly observed therapy for tuberculosis, use of a flip chart to counsel diabetics who are delinquent for clinic visits, monthly assessment for stability of chronically mentally ill clients and household sanitation inspections. The curriculum also includes detailed training in survey techniques, as the health workers are being used to conduct a health survey of all households.

The curriculum consists of the following courses:

- CHS 220a *Review of Health Services*
- CHS 231a *Maternal and Child Health I*
- CHS 234a *Nutrition*
- CHS 233a *Behavioral Health*
- CHS 242a *Environmental Health*
- CHS 235a *Dental Health*

The community health worker certificate program in Yap was delivered full-time by Dr. Victor Ngaden, a senior physician with the Yap Department of Health Services, over a 7-month period in a classroom at Yap State Hospital. This program started with 16 students, 10 of
which have completed the full curriculum and now work for the CHC.

**Fiji School of Public Health & Primary Care, Undergraduate and Post-Grad Public Health Training**

As has been done in Palau, courses from the Fiji School of Medicine, Department of Public Health and Primary Care have been delivered in Yap by faculty visiting for 2-3 weeks at a time from Fiji. At first, each visiting faculty member delivered two undergraduate courses to the same enrolled students during each stay. However, it became clear that, though it was possible to deliver sufficient classroom contact hours, the pace was too fast for many of the students. Recently, visiting faculty members teach an undergraduate course each morning to one group, and a post-graduate course each afternoon to staff members who already have an undergraduate degree. The following courses have been delivered at the Yap State Hospital to date:

**Undergraduate:**

PH 143 *Information Systems for Health Managers* (offered twice)
PH 133 *Community Development and Health*
PH 121 *Community Health Practicum*
PH 142 *Introduction to Health Services Management*
PH 242 *Health Care Management in the Pacific*
PH 243 *Project and Participatory Management*
PH 151 *Introduction to Human Nutrition* (twice)
PH 122 *Introduction to Environmental Health*
PH 241 *Communications in Health*
PH 346 *Practical Health Services Management*
PH 322 *Environmental Health Project Management*
PH 332 *Settings Approach to Health Promotion*

**Post-Graduate:**

PH 731 *Health Promotion*
PH 748 *Principles of International Public Health*
PH 752 *Nutritional Problems of Public Health Significance*
PH 721 *Introduction to Ecology and Health*
PH 722 *Environmental Assessment*
PH 751 *Food, Nutrition, Health and Development*

A total of 37 undergraduate students and 12 post-graduate students have taken courses to date. Seventeen undergraduate and 10 post-graduate students are currently active in the program. In May 2006, the Dean of the Fiji School of Medicine, Dr. David Brewster, came to Yap to preside over the first-ever graduation ceremony of the Fiji School of Medicine in the FSM. Seventeen undergraduate and graduate certificates and diplomas were awarded.

**University of Hawai‘i, Hilo/University of Alaska, Anchorage, Pharmacy and X-Ray Tech Web-based Training**

The University of Hawai‘i in Hilo is in the process of creating a school of pharmacy which will serve students from Hawai‘i and the Pacific Island jurisdictions. They have received some startup funding from the U.S. Health Resources and Services Administration, including funds for developing distance learning models for pharmacy training. In order to meet the expressed need in Palau for basic pharmacy technician training, they identified a web-based program from the University of Alaska in Anchorage that had been developed for training of health staff in isolated communities. This is a year-long, 4-course curriculum, wherein CD-ROM and printed materials are forwarded to students first, with weekly assignments, discussion sessions, and readings conducted with faculty at the University of Alaska for each course. In early 2005, the program was launched in Palau and in late 2005, in Yap. Courses delivered to Yap so far include:

**Phar A101** *Introduction to Pharmacy*
**Phar A105** *Pharmacology for Technicians I*
**Phar A107** *Pharmacy Dosing Formulae & Concentrations*

While six of ten students in Palau successfully completed the program, only one of 10 students in Yap has successfully completed all of the three courses that have been offered to date. The difference appears to be in the degree of on-site student support. In Palau, a very enthusiastic pharmacy supervisor met with students weekly throughout the courses and addressed problems as they arose-in Yap, students were given materials, computer lab passwords, initial instructions regarding how to sign into the website, and were simply offered help if they felt they needed it. We are repeating the program starting in August 2006 in Yap with 11 students, this time with more intensive on-site support, including a lead-in period of weekly face-to-face orientation sessions with the Chief Pharmacist at Yap State Hospital, and weekly, proctored, half-day sessions in the computer lab to assure that web connections are successful and to address difficulties promptly as they arise.

We have also begun preparing students for the University of Alaska Limited Radiography Program, a 3-
course program, which is also web-based and designed for isolated communities. We have recruited a radiology technician to teach the courses face-to-face ( unofficially) and to supervise hands-on procedures. We plan to register those students who are successful in this portion to take the courses for official credit on-line. We are offering these courses in two stages as an experiment to determine whether this strategy will allow a higher percentage of students to succeed in the Program. We also hope to identify students who are sufficiently motivated to stick with the entire on-line Program and save the cost of tuition for those students who are prone to drop out. To date we have delivered the following courses:

RADT 194k  *Radiation Protection and Biology for Non-Imaging Professionals*
RADT 194L  *Chest, Upper Extremity and Lower Extremity Examinations*

Ten of the 14 originally enrolled students are still active in the Program.

**Discussion**

Healthcare is delivered by people. Its quality can only be as good as the skills of those who deliver it. Many Pacific Island health services are fatally handicapped by the lack of formal preparation of a large portion of their health workforce. Health administrators who wish to improve services in small island states must consider the development of the health workforce as a priority of the highest order. While healthcare organizations in developed countries must make some effort to recruit a sufficient workforce, those in developing countries are saddled with the extra burden of organizing basic training for available staff. For this reason, multinational donors and aid organizations who wish to improve health in the Pacific should be particularly concerned with assisting district health services with the development of their workforce.

For this reason, multinational donors and aid organizations who wish to improve health in the Pacific should be particularly concerned with assisting district health services with the development of their workforce. In partnership with regional college programs and donor organizations it is possible for district health services to professionalize multiple components of their health workforce within a few years by becoming virtual health science academies, even while continuing to provide day-to-day healthcare.

**Acknowledgements**

The Yap AHEC is indebted to the Wa’ab CHC Board of Directors; to the instructors and administrators of our partners at the Fiji School of Medicine, the PCC, the University of Alaska, Anchorage and the University of Hawai‘i, Hilo, to the wonderful staff at the Hawai‘i/Pacific Basin AHEC, Lee Buenconsejo-Lum and Tai-Ho Chen of the Pacific Association for Clinical Training of the Department of Family and Community Medicine of the University of Hawai‘i John A. Burns School of Medicine. Special thanks to Lourdes Roboman and Jean Thaulog of the College of Micronesia-FSM. Acknowledgement in memoriam is made to Deedri Veehala of the Ke‘Anuenue AHEC.

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A Cross-Sectional Evaluation of the Health Dispensaries, Community Health, and Current Techniques for Improving Health Assistant Education on the Outer Islands of Yap State, Federated States of Micronesia

Megan Inada, MPH*
Mary Le, MD**
Timothy S. Duerler, MD**
Gregory G. Maskarinec, PhD**

*Pacific EMPRINTS: Pacific Emergency Management, Preparedness and Response Information Network and Training Services, Department of Anthropology, University of Hawai‘i at Manoa, Honolulu, Hawai‘i; **Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, Mililani, Hawai‘i. Address correspondence and reprint requests to: Gregory G. Maskarinec, PhD, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, 95-390 Kualalani Avenue, Mililani, Hawai‘i 96789-1192; gregorym@hawaii.edu.

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Introduction

Yap is the westernmost state of the Federated States of Micronesia. The state of Yap covers approximately 500,000 square miles of ocean, though it consists of only 45.8 square miles of land area² with a total population of approximately 11,200.² Stretching eastward over 600 miles of ocean from the cluster of islands known as Yap Proper (Wa‘ab) are 78 outer islands, of which 22 are inhabited. Forty-five percent of Yap’s population live on the outer islands and speak languages (Ulithian, Wolleaian and Satawalese) distinct from that spoken on Yap Proper.³ Most outer islanders, except for older women, speak English.

This project had four main objectives:
1) To set a baseline to determine how successful distance education methods have been in improving health care in Yap’s outer islands.
2) To examine the prevalence of disease among the residents of Ulithi Atoll - Falalop, Fatherai, Mogmog Islands and Fais Island, Yap, Federated States of Micronesia.
3) To determine the ability of local health dispensaries to meet the perceived health care needs of the community and the level of satisfaction with available services.
4) To elicit any perceived barriers to health care access for women on these islands.⁴

After obtaining official approval from Yap’s Council of Tamol (the Outer Island Chief Council) and from Yap’s Department of Health, we visited one “super dispensary” and four ordinary outer island health dispensaries, on Fais Island and four islands of Ulithi Atoll - Falalop, Fatherai, Mogmog and Azor.

Ulithi Atoll is located 100 miles northeast of Yap Proper, approximately 400 miles southwest of Guam. The atoll is composed of more than 30 islets, of which four are presently inhabited. The total lagoon surface is 183 square miles while the total land area is only 1.8 square miles. Yap and Ulithi belonged to the most extensive traditional exchange system in Micronesia.⁵

Fais Island is geologically distinct in Yap as a raised-coral atoll.⁶ Fais is located 50 miles east of Ulithi. A relatively level central plateau 65 feet above sea level accounts for most of the island’s 1.083 square miles.⁷ Fais has a subsistence economy with a strong reliance on local food, including fish, lobster, turtle, taro, coconuts, breadfruit, and bananas. Fais has an extensive network of gardens growing not only taro and potatoes, but also tobacco, pumpkins, and a variety of vegetables.

Methods

On each of these five islands, we interviewed medical staff and members of the communities in both individual and gender-segregated group settings. Health care workers in the dispensaries served as key informants, as did selected members of each community. Volunteer interpreters were used as needed, most often drawn from the local healthcare workforce. Additional interviews were conducted with healthcare professionals at Yap
Memorial Hospital and recent health department reports on outer island health were reviewed.8

Results
Overall, the health dispensaries are competent to treat or refer to the Yap State Hospital,9 common non-communicable diseases such as diabetes and gout, as well as infectious diseases such as Hansen’s disease and tuberculosis. The dispensaries vary in condition; Fais, Mogmog, and Falalop dispensaries have good structural integrity and are well organized and sanitary; however, Azor’s dispensary was in poor condition and Fatherai’s was destroyed by super-typhoon Sudal in 2004.10

There has been an increase in drinking alcohol (including home-made yeast fermentation as well as imported beer and hard liquor), smoking, adding tobacco and alcohol-soaked tobacco to betel nut, and consumption of salty, high fat imported foods. Marijuana use is slowly becoming a problem, but gasoline sniffing is reported to have become much less common, and teenage suicide (increasingly alarmingly elsewhere in Micronesia),11 remains exceedingly rare. On both Fais and Fatherai, alcohol consumption has been prohibited by the chiefs, resulting in covert consumption. However, local foods are still commonly consumed.

Regarding the general health of the outer island population:

1) Incidence of gout for both men and women is reported to be increasing. Informants note immediate gout attack after eating turtle, a local delicacy, for which traditional cultural norms regulating consumption are weakening.

2) Rates of diabetes and hypertension are reported to be increasing.

3) A recent outbreak of syphilis has swept through Yap, including the islands visited.

4) Chlamydia remains common.

5) Most women apparently become sexually active as teenagers and are increasingly aware of the danger of STDs and the need for safe practices, but the use of condoms remains rare. Family planning is discussed, but the use of birth control is limited by religious teachings (nearly all the outer islanders of Yap are Catholic). One informant noted that she “just asks God” to limit the size of her family.

6) Women did not regard menopause as a particularly difficult time, regarding it as a normal part of life.

7) While it was difficult to gauge the amount of domestic violence that may occur, it was concerning that one teenager reported that it is “normal” for boyfriends to hit their girlfriends.

Yap clearly has the best health assistant education program within the Federated States, a project supported by the Yap Area Health Education Centers (AHEC).

8) Women did not regard menopause as a particularly difficult time, regarding it as a normal part of life.

9) On Fais, there was nearly universal prevalence of tinea corpora.

10) Local perception is that both men and women are dying at an earlier age than in the past.13

11) Informants insisted that there was no single word for “depression” expressing it in terms of “homesickness,” “loneliness,” “grief,” or a very general “sickness in the head.”

12) Traditional massage and the use of traditional medicines is widespread.

Key findings regarding women’s health issues included:

1) Pap smears are not routine; there is no wet mount and no microscope.

2) Self breast exams are not performed.

3) Even in Yap Proper, there is no mammogram, suspicious lesions are biopsied and surgically removed.

4) There were no pregnancy test kits at any of the clinics visited.

5) Most women apparently become sexually active as teenagers and are increasingly aware of the danger of STDs and the need for safe practices, but the use of condoms remains rare. Family planning is discussed, but the use of birth control is limited by religious teachings (nearly all the outer islanders of Yap are Catholic). One informant noted that she “just asks God” to limit the size of her family.

Outer Island Health Assistant Education
Yap clearly has the best health assistant education program within the Federated States, a project supported by the Yap Area Health Education Centers (AHEC) through Oceania Community Health. Dr. Arthur Yolwa, who lives on Mogmog, not only conducts a daily morning report by radio with the outer island dispensaries, he also delivered a combination of radio and face-to-face sessions to deliver six College of Micronesia dispensary manager program courses since August 2004. The next face-to-face session was scheduled for the end of January 2007 (a week after our site visit), when the field ship would bring half of the health assistants back to Falalop to complete another course. As noted in a report accompanying this one,14 to date nine Community Health Sciences (CHS) courses have been taught: CHS
There is a need for an internet link for Ulithi’s super dispensary and for the Mogmog dispensary (both of which have reliable electricity) to enable e-mail and internet access, which would facilitate additional opportunities for distance education.

Site-Specific Findings

Falalop
Falalop is the site of one of Yap’s two designated outer island “super dispensaries.” Staff includes a MedEx, a health assistant, a dental nurse and a birth attendant. The super dispensary is well constructed and well stocked with supplies. It can admit patients and has a room for deliveries and basic surgical procedures.

Recently Falalop staff started a health education class where every Monday, Wednesday and Friday people meet at the airstrip to walk. Both men and women participate, however those with diabetes don’t often come, instead it is the “younger people” who are participating.

One concern mentioned in Falalop is the perception that people are dying younger. In the past people would live to be over 100 years of age, but now are dying in their 50s from heart attacks and strokes. This is attributed to changes in diet and increase of alcohol consumption. People, including women, drink yeast and tuba (palm wine made from coconut flowers), and come to the dispensaries with dehydration. Teenagers are also smoking marijuana which they get from Yap Proper via the field ship.

Fatherai
Fatherai has no dispensary building since super-typhoon Sudal destroyed the previous one in 2004; the Oceania Community Health Organization was planning to rebuild the dispensary this year (2006) and had shipped construction materials to Fatherai at the time of our visit for this purpose.\(^\text{15}\)

2) The health assistant works out of her home, has a stethoscope, otoscope, blood pressure cuff, glucometer, and a hemometer with no batteries.

3) All charts and records were destroyed by the typhoon.

4) There is no traditional birth attendant.

On Fatherai, women would like to deliver their children on their island, but currently need to go to Falalop or to Yap. The women of Fatherai also identified an urgent need for more syphilis treatment. The health assistant listed specific needs that included a new dispensary, batteries, one touch lancets and test strips, proton pump inhibitors or other antacids, and a new otoscope. She agrees with the community that a second health assistant is needed.

The Mogmog dispensary is well-stocked and the library includes up-to-date textbooks, including a World Health Organization blue trunk collection.

Mogmog
In Mogmog, the dispensary design has been functionally improved to fit local conditions and the local culture. Locally appropriate modifications carried out by the Medex include replacing metal louvers with wooden ones; replacing metal bed frames with wood; having a door to the maternity ward that opens facing the women’s house; and burying local electricity lines underground (Mogmog has a functioning 240 volt generator donated by a German aid organization). The Mogmog dispensary is well-stocked and the library includes up-to-date textbooks, including a World Health Organization blue trunk collection. Mogmog dispensary runs separate diabetes and hypertension clinics.

On Mogmog, women noted that there remain problems with worms, amoebae and scabies. They noted increasing alcohol consumption and associated hepatitis, as well as increased violence. Increasing marijuana use was noted, and one arrest has been made for drug dealing. Cigarette smoking and chewing tobacco with betel nut is less of a concern, although they are aware of the health hazards. Women of Mogmog noted that they experience a lot of back pain and shoulder ache due to heavy work such as carrying baskets and buckets of water and gardening. They joke, however, that this work is not as bad for their health as is Western/American food. Men expressed a concern with the effects of climate change on local practices, including its weakening the for success in fishing and farming.
Azor

Currently the population of Azor is around 50 with approximately 11 women, six men, and the rest children. Azor’s health assistant had been off island for 3 weeks to take care of his son on Yap. However, the dispensary looked as though it had been neglected for a much longer time. The women of Azor were frustrated and sad, almost hopeless. With few men left on the island, the women must bear the brunt of all daily living requirements. Most of the women on Azor are related to the health assistant, and so are embarrassed to come to him for gynecological issues.

On Azor there is a heavy reliance on local medicine, herbs, and massage. However, one woman noted that now that the family ‘unit’ is lost, knowledge is not getting passed down and is being forgotten. Women would like to see a female health assistant appointed to Azor, and noted a need for improved sanitation including toilets, soap and insect control. A need to carry out STD screening was noted.

Fais

The local community infrastructure was impressive with an exceptionally well-organized dispensary managed by an active community board. In the dispensary, notes on patients were detailed, tallies were kept of types of illnesses seen and of medicines used. The small library was well organized, as were the stocks of medicine. The building itself, however, had damaged screens, termite damage to the ceiling, a non-functional toilet, and no water catchments. There is an active effort to preserve cultural practices, including a distinctive weaving tradition, shark fishing and various forms of local medicine.

The health assistant conducts a very active campaign of community education, rotating through the three villages to deliver lectures on selected health topics each Sunday after church. The level of health awareness in the community was impressive, and the community is quite cosmopolitan: one woman explained that her first child was born in Hawai‘i, her second in Pohnpei, her third on Guam, and her fourth on Fais.

Predominate illnesses noted on Fais included hypertension, gout, diabetes, schizophrenia,⑥ and Hansen’s disease (six patients currently being treated, several others have completed treatment), abdominal pain, back pain and various skin infections.

On Fais, although many women are still embarrassed to see a male health assistant for women’s health issues, they are nevertheless comfortable seeking care at the dispensary for many other general health concerns. For the most part, all persons have access to basic healthcare services in terms of antibiotics, analgesics, diabetic medicines and anti-hypertensives.

Community needs, particularly among the women of Fais, include a need for a female health assistant. Women noted the difficulty and expense of seeking health care in Yap Proper, as transportation is free only for patients in very critical condition. Covert drinking and marijuana use are an increasing concern. Women noted that having a “big,” heavy body was a sign of good health. “When you are in the obese section of the chart, that’s when you’re beautiful,” noted one woman and others agreed.

Conclusions

A recurring theme on each island is the female residents’ perceived need for appropriate medications, ultrasound machines to assist in safe deliveries and trained female medical personnel. Except on Fatherai, all the health assistants were male, which made it too “embarrassing” for many women to seek female preventative or curative healthcare. In the past, knowledge of local medicines was passed down from mother to daughter, alleviating this barrier of awkwardness due to male medical staff. However, younger generations are not educated in local medicines. All women who were interviewed acknowledged using both local and Western medicine and think the practice of both types of medicines is important. We suggest that more incentives should be introduced to expand the recruitment and retention efforts to facilitate more outer island female health assistants and birth attendants expanding the recent effort to train six BATs. As one public health nurse remarked, referring to educated outer island women, “All the good ones go to Yap.”

There are a number of areas in which Yap State clearly leads the Federated States of Micronesia and could provide a model for the other states. These include:
1) Daily morning report via radio with supervising doctor.
2) Careful charting and documentation, including inoculation records and illness tallies (though not uniform throughout the health posts visited).
3) An active program of continuing education for health using both distance education techniques as well as classroom teaching.
4) Yap’s outer islands retain a strong sense of community and pride in their cultural traditions.
5) The hospital has regular, well-conducted quality assurance projects.
6) Women were aware that breast milk is best for infants and that formula is only an option in exceptional circumstances.
7) Community education has already been effective in promoting basic ideas of diet and exercise. All were aware that too much imported food was dangerous to their health, knew the importance of exercise, and acknowledged the health hazards of alcohol and tobacco. On several islands visited, members of the community attributed the recent trend of decreasing life span and increase in incidence of diabetes, gout, hypertension, and heart attacks to lifestyle changes of too much imported food and too little exercise. 17

Overall we conclude that Yap’s health care can provide competent general health care. However, there is much that could be done to improve women’s healthcare. During the course of each group discussion, one or two women stood out who were comfortable speaking on behalf of the group and were knowledgeable about their community’s health situation. These natural leaders should be recruited to help disseminate health information to the women in their communities. If it is not currently possible to train women as health attendants, these women should at least be taught how to educate their peers in preventative health measures for themselves and their children. More efforts must be made to explore culturally appropriate healthy lifestyle options to prevent the incidence of common non-communicable diseases.

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Dental Manpower Development in the Pacific: Case Study in the Republic of the Marshall Islands

Ohnmar K. Tut, BDS*
Justina R. Langidrik, MPH**
Peter M. Milgrom, DDS†

*Preventive Services Dentist, Ministry of Health, Republic of the Marshall Islands Majuro, RMI; **Secretary of Health, Ministry of Health, Republic of the Marshall Islands, Majuro, RMI; †Director, Northwest/Alaska Center to Reduce Oral Health Disparities, University of Washington, Seattle, Washington. Address correspondence and reprint requests to: Dr. Ohnmar K. Tut, Ministry of Health, P.O. Box 16, Majuro, MH 96960, Republic of the Marshall Islands; ddsmohe@ntamar.net.

Abstract
This case study reports the ongoing progress and results of a manpower development program to expand indigenous dental personnel at four levels in the Republic of the Marshall Islands. The program was designed to: 1) increase the number of Marshallese students who successfully complete dentistry training; 2) recruit and train a group of Marshallese high school graduates in dental assisting for service in new preventive outreach programs within the community; 3) enhance the dental training of health assistants providing primary medical care to outer islands away from the main population centers of Majuro and Ebeye; and 4) provide in-service training on tooth decay prevention for Head Start teachers. The program resulted in the training of one Marshallese dentist and two Marshallese dental therapist, 16 primary care health aides who received oral health training for work in the outer island dispensaries, and 200 Head Start and kindergarten teachers who completed in-service training in oral health. Additional expertise was shared with other United States Affiliated Pacific Islands (USAPI) to enhance the dental workforce throughout the Pacific.

Key words: Dentistry/manpower, Pacific Islands, Republic of the Marshall Islands. (PHD 2007 Vol 14 No 1 pp 245-250)

Introduction

The Republic of the Marshall Islands (RMI) was one of the former Trust Territories of the Pacific Islands until they gained independence in 1986. The country is a self-governing democracy in free association with the U.S., negotiated under the 1986 Compact of Free Association.

There are two Ministry of Health and Environment (MOHE) hospitals in the RMI, Majuro Hospital and Ebeye Hospital. Majuro is the main referral center. Basic health services are provided at the two MOHE hospitals and 60 dispensaries and health centers (most on the outer atolls). The majority of healthcare workers in both hospitals, including dentists, physicians, nurses, and laboratory staff are expatriate contract workers, while outer atoll dispensaries are staffed by medical officers, health assistants and local support staff.

Prior to RMI’s independence, basic healthcare services in RMI were provided through the main hospital on Majuro Atoll and a smaller service in Ebeye on Kwajalein Atoll. However, few Marshallese had been trained during the transition period before independence to assume the burden of health services for a rapidly growing population while many older health service workers were retiring. Similar problems have faced all the U.S.-Affiliated Pacific Islands (USAPI) jurisdictions.1 From 1986 to 1996, the Pacific Basin Medical Officers Training Program operated in Pohnpei as part of the John A. Burns School of Medicine at the University of Hawai‘i to provide primary healthcare services to island jurisdictions;2 however, no dentists or dental therapists were trained. In the early 1990s, the RMI government moved to expand the availability of prenatal care, immunizations, preventive services and surveillance through retraining of health aides (HA),3 however, dental health manpower has not kept pace.

Published reports on dental care in RMI are few. Anecdotal data suggest that between independence in 1986 and prior to 2001, services were limited to primarily symptomatic treatment. The few systematic efforts at community-based prevention were not sustained because manpower was limited and transitory. In the 1998 Institute of Medicine (IOM) monograph, entitled, “Pacific Partnerships for Health: Charting the course
for the 21st century," four dentists, four dental nurses, and eight dental aides were reported to provide dental services in RMI. At the same time, dental disease rates, particularly dental caries, rose as a consequence of a changing diet, which focused on imported, high carbohydrate foods.

**Setting**

RMI is an island country comprised of 29 atolls and five islands spread across 750,000 square miles in the central Pacific, with a July 2006 (estimated) population of 60,422. RMI’s total land mass is roughly equivalent to that of Washington, D.C. The bulk of the population lives in the capital, Majuro. The birth rate is 33 per 1,000 population. Thirty-eight percent of the population is 14 years of age or younger. The estimated fertility rate is 3.85 children per woman.

**Dental Disease Rates**

A surveillance system for childhood tooth decay was established on Majuro in 2001. Data from this system suggests that 50% of children developed cavities by 24 months of age, and 92% had at least one cavity by 60 months of age. Eighty-five percent of RMI children had at least one cavity in a permanent tooth by age 6. The 2005 caries rate among elementary students in Ebeye was 80%, a four-fold (or greater) rate increase over that recorded among the highest-rate U.S. mainland communities, and many times higher than the average U.S. child caries rate as a whole. The caries rate in most of the outer islands is lower than that found in Majuro and Ebeye.

**Dental Manpower**

In 1999, the revitalization of RMI’s dental service began. At that time there were two ex-patriot dentists, one of whom had considerable experience, having worked elsewhere in the Pacific. The other dentist was carried over from the pre-revitalization period. In 2001, a separate preventive dental services program was established by the MOHE’s Dental Division, with dedicated leadership. As part of the revitalization effort and consistent with recommendations in the 1998 IOM report, the government aimed to increase community participation in improving future dental services in RMI.

**Program Goals**

The IOM report on the Pacific asserted that improved health in the islands would only come about through greater community-based primary care and prevention, better coordination between jurisdictions, increased community involvement, and promotion of education and training of the healthcare workforce. Consistent with these recommendations, the goal of RMI’s dental manpower development program is to expand indigenous dental personnel at four levels:

1) Increase the number of Marshallese students successfully completing primary care dentistry training, with a goal of graduating three or more Marshallese dentists by the end of 2006;

2) Recruit and train a group of Marshallese high school graduates in dental assisting for service in new community preventive outreach programs. The goal was to successfully train and graduate at least six assistants;

3) Enhance the dental training of health assistants providing primary medical care to outer islands away from RMI’s main population centers in Majuro and Ebeye, with a focus on managing both dental emergencies and prevention; and

4) Provide in-service training on tooth decay prevention for Head Start and Kindergarten teachers.

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<th>Type of Personnel</th>
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</thead>
<tbody>
<tr>
<td>Dentists</td>
<td>Tutoring and monitoring of student progress at the Fiji dental program. Enhanced opportunities during school holidays.</td>
<td>3</td>
</tr>
<tr>
<td>Dental Assistants</td>
<td>Development of a local training program.</td>
<td>8</td>
</tr>
<tr>
<td>Head Start / Elementary Teachers</td>
<td>In-service training and increased outreach.</td>
<td>200</td>
</tr>
<tr>
<td>Health Aides</td>
<td>Oral health component of training expanded with emphasis on disease prevention.</td>
<td>16</td>
</tr>
</tbody>
</table>

**Development Activities**

**Dentists**

The Fiji School of Oral Health, part of the Fiji School of Medicine in Suva, trains prospective dentists throughout the region in a 5-year program based on an Australian model. The curriculum is designed to facilitate a career ladder through which students could progress from dental hygienist to dental therapist to dental surgeon. Students from the Marshall Islands ideally take one year of foundation courses in English, biology, and chemistry, etc. at the University of the South Pacific campus in Majuro. In practice, however, not all students complete the program before entering the university program in Suva. Students are typically sponsored by their home countries or the World Health Organization (WHO).
There is no standardized testing and no programs exist in RMI to insure the study skills of students being sent off-island to school. During school holidays, dentistry students returned home to work in the dental clinic as temporary dental assistants, the rationale being that students would benefit by working in the environment in which they would eventually practice. However, the students were young and without the maturity and study skills required for a university-level course. Thus, though well intentioned, the school-break jobs in dental clinics failed to address the more fundamental academic skill needs of the students. In order to address this deficit, the MOHE established an academic training course during school breaks for the three Marshallse students enrolled in the dentistry program. The individualized instruction was developed in consultation with the Fiji School of Medicine, and with the assistance of the University of Washington (UW) School of Dentistry. A basic library of up-to-date textbooks was purchased and instruction was organized to focus on problem areas for each student. The MOHE tutor became a member of the UW clinical faculty and gained access to online electronic journals and textbooks, as well as online professional search engines. During the summer break, students were supported by government stipends, receiving individual assignments and tutorials for one hour each day. Completion and comprehension of reading assignments were tested via oral examinations, aimed at helping students master the material in order to pass the required examinations at Suva. Students used electronic mail (email) to stay in touch with their tutors in Majuro throughout the school year, and received supervision and support for their required student research projects. Tutors helped to facilitate arrangements and provision of funds for the students’ research. To enhance communication and program success, faculty members in Suva provided regular reports of the students’ progress to their respective tutors in Majuro.

Dental Assistant Program

Selection of Trainees

Announcements of the training program were listed in the newspaper. Applicant prerequisites included graduation from high school, good English speaking and writing ability, demonstrated reliability, responsibility and capacity to work based on school or prior work record, and the ability to maintain a positive attitude and professionalism when working with others. The trainee selection committee included the Preventive Services Dentist, National Health Planner, Chief Nurse of Majuro Hospital, and a nurse tutor. Six recent high school graduates and two previously hired dental assistants were selected for training from an applicant pool of over 80 individuals. The two previously hired assistants had received limited on-the-job training in the clinic.

Curriculum Development

The UW Northwest/Alaska Center to Reduce Oral Health Disparities and the Hawai’i State Department of Health provided technical assistance in curriculum development. Site visits of dental assistant programs at Kapiolani Community College in Honolulu, Columbia University in New York City, and the Salish-Kootenai College in Montana were conducted. These programs were specifically chosen as they were known to include students from native communities. Additionally, these training programs provided curriculum outlines and course syllabi.

Curriculum Content

A three-and-one-half month local training program, appropriate to the community, was developed, with the objective to prepare graduates for work in both the clinic and preventive programs within the community. Contents include an orientation on professional demeanor and comportment, teamwork, basic medical sciences (such as: basic head and neck anatomy), physiology and pharmacology, medical emergencies (including CPR training), oral anatomy and the dentition, tooth morphology, dental disease etiology, prevention and pathology with a focus on caries and periodontal disease, infection control, sterilization and maintenance of dental instruments and equipment, dental materials, dental radiology and radiation hygiene, and laboratory procedures (e.g., pouring models). Each student trainee received chair-side training, as well as clinical training in the application of topical fluoride varnish, uncomplicated prophylaxis and supragingival scaling, and both chemical and light-cured occlusal sealants. Students also received training in community oral health education.

Methods of Instruction (Table 2)

The course was conducted as lectures, assignments and a hands-on practical workshop. Special tutorials were designed for skills development and enhancement.

Evaluation

Each student trainee was assessed on attendance, professionalism, reliability, responsibility and commitment to the dental profession. Attendance was monitored using an employee time clock and no student missed more than five days of class. Each student was issued three scrub tops and was expected to wear a clean...
top each day, as well as hospital-appropriate footwear. Grooming was reviewed based on hospital standards. Students logged each of their home visits. Assessments and evaluation were conducted at the end of each topic, and again, at the end of the training program. Each student received a written assessment at the mid-point of training, as well as at the completion of the course.

Health Aide (HA) Training
As part of the on-going HA Training Program in Majuro, instruction was provided on oral health to 16 HA trainees. HAs are high school graduates; upon completing training, they provide primary medical care services through outer island dispensaries. They are connected to the main hospital by radio and regularly obtain medical consultations from medical staff that are available by radio or during their periodic visits to the outer islands. Dentists and preventive assistants from Majuro also make regular visits to the outer islands to work with the HAs and to provide treatment.

Development of the Oral Health Curriculum
The HA training course includes rudimentary dental treatment skills, primarily for the relief of pain. A key goal is to improve the quality and appropriateness of inter-island referrals to the dental clinic. An additional aim was to focus more on primary prevention.

Content of the Curriculum and Instructional Methods
Training consisted of eight hours of lectures on dentistry and dental preventive procedures. Instruction included dental anatomy, tooth eruption patterns, and common dental emergencies (e.g., toothache, abscess, teething pain, pericoronitis). HA trainees also received instruction in the dental clinic on dental preventive procedures, particularly fluoride varnish application. Trainees rotated through the clinic four hours per day for one week. Home assignments involved charting the dentition of children at various ages.

<table>
<thead>
<tr>
<th>Table 2: Dental Assistant Program: Methods of Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subject</strong></td>
</tr>
<tr>
<td>Individual review with instructor after each lecture topic</td>
</tr>
<tr>
<td>Effective tooth brushing (for the student and patient)</td>
</tr>
<tr>
<td>Prophylaxis</td>
</tr>
<tr>
<td>Fluoride varnish applications (each student completes two applications under supervision)</td>
</tr>
<tr>
<td>Development of posters and health education brochures in Marshallese</td>
</tr>
<tr>
<td>Home visits for fluoride varnish applications, toothpaste and brush distribution, and dental health education (each student completes 25 home visits, visiting each home twice)</td>
</tr>
<tr>
<td>Infection control and clinical assisting (after lecture, groups of students rotate through afternoon clinic)</td>
</tr>
<tr>
<td>Front desk and communication skills</td>
</tr>
<tr>
<td>Public speaking (students are required to make class presentations and respond to questions)</td>
</tr>
</tbody>
</table>

Evaluation
Students were evaluated using comprehensive written examinations, including questions from the dental lectures. All HA trainees passed their examinations.

Head Start Teacher Training

Training Objectives
A workshop was conducted for Head Start and kindergarten teachers to augment teacher knowledge of oral health with a focus on preventing tooth decay.

Content of the Curriculum
In-service training focused on effectively brushing children’s teeth using fluoride toothpaste, applying fluoride varnish, and educating families on good oral health practices. The training lasted eight hours spread over two days and included both lecture/discussion and hands-on demonstrations.

Funding
The MOHE successfully applied for a State Oral Health Collaborative Systems Grant from the Maternal and Child Health Bureau, Health Resources and Services Administration (HRSA) for overall program development, and also to the RMI Work Investment Board to provide dental assistant student stipends. The UW provided assistance in grant proposal writing.

Results

Dentists
Three Marshallese students graduated from the Fiji School of Medicine, Department of Oral Health; one dentist and two dental therapists. A fourth student has successfully completed the first year course. The key to success in this program has been excellent communication with instructional staff in Fiji and support for the tutorial program in Majuro, allowing the tutorial program to be focused and efficient, and the students to be more accountable for their studies, developing mature study skills more rapidly.
**Dental Assistants**  
The eight dental assistants trained through this program were employed by the MOHE and are currently working as dental preventive assistants. One has been promoted to the position of dental preventive coordinator, one was accepted to study dentistry and another was accepted to study dental technology, both at the Fiji School of Oral Health. With new personnel, preventive dental programs are reaching out to young pregnant mothers, well baby clinics, kindergarten and elementary schools, and to pre-kindergarten children through home-visits on Majuro, Ebeye, and the outer islands.

**Health Aides**  
Sixteen HAs received training and successfully passed their formal examinations. Now that they have graduated, the HAs are working in the outer islands. As a result of their training, they are capable of making provisional diagnoses for referrals and can perform simple dental preventive procedures, such as fluoride varnish applications. They have greater knowledge with which to counsel parents about tooth eruption, teething and other problems, and to provide anticipatory guidance and preventive instruction for families.

**Head Start/Elementary School Teachers**  
Two hundred Head Start and elementary school teachers received training. As a result of the teacher trainings, oral health and preventive dental measures are reaching the community, reinforcing the efforts of the dental preventive assistants working in the outreach program. Yearly workshops are planned to update information and train new teachers.

**Discussion**  
These training programs were designed to develop local manpower to implement nationwide oral health promotion activities in the Marshall Islands, and are consistent with the needs identified in the 1998 IOM report on health partnerships in the Pacific.

The trainings have largely been successful because the national government has embraced the program goals and supported its participants. The program primarily relies on expatriate instructors from within the MOHE and collaborating state health departments and universities. In the future, local staff will need to take on greater responsibility and establish their own teachers’ training program.

Improvements in training dentists and other dental professionals in school, while necessary, is insufficient to produce practitioners with skills that more closely meet the needs of the islands. Dentists and other personnel need internships, allowing them to practice their first few years in a supervised setting and with emphasis on public health prevention. New graduates are not fully prepared to assume the responsibilities of a primary care practitioner in the Pacific. Moreover, these dentists, in addition to focusing on children and tooth decay prevention, should focus much effort on improving oral health in the growing diabetic population. Although good oral health is thought to be associated with better diabetes outcome, the oral health of diabetics in the Pacific has largely been ignored.

The Dental Assistant Program has been successful and well received. The strength of the program has been the pride with which the students take their new responsibilities and embrace the concept of professionalism and the career ladder. At least one additional student will likely re-enter the educational system within the coming years. With solid work records and experience in the field, these students have excellent future career opportunities. The program could be strengthened with the addition of formal in-service trainings and by implementing a strategy to replace dental assistants as they advance in the workforce or return to school for additional education. Furthermore, expanded outreach to the outer islands is needed.

An abbreviated, 2-week dental assistant training program was conducted by MOHE staff members for the Commonwealth Health Center in Saipan. With support from the WHO and the Pacific Association for Clinical Training at the University of Hawai'i, MOHE personnel also provided dental preventive training, which focused on dental preventive services and planning oral health integration into Maternal and Child Health (MCH), Head Start and School Sealant Programs. UW personnel also participated in this training.

The HA training program has been successful, further increasing the available manpower for public health prevention work and lessening the gulf between oral health and other forms of public health practice. Nevertheless, the course could be strengthened by increasing training time spent on oral health, and additional hands-on training with formal evaluation to ascertain if HAs put into practice what they have been taught. More attention should also be focused on the supply chain to be sure that the dispensaries are equipped with preventive dentistry materials. In the future, in-service training might also include symptomatic care, including
simple extractions, and evaluation should include record audits of the dispensaries to assess the extent of dental problems and their disposition as handled by HAs, in order to provide feedback to instructors.

The initial training of Head Start and elementary school teachers was conducted as a small part of an overall regional and local summer in-service training program in the coming year, trainings will be expanded to include all kindergarten classes on Majuro and Ebeye, as well as in the outer islands served by the dental mobile teams. On-site training has focused primarily on effective tooth brushing, use of toothpaste, and the importance of home visits to reach young siblings. Future trainings should be expanded to include simple preventive procedures, such as the application of fluoride varnish, and enhanced formal assessments as to whether teacher trainees effectively use their new skills in their classrooms.

To advance self-determination and local responsibility in the USAPI, these training programs have also been shared with other Pacific Islands at the Pacific Islands Health Officers Association meetings, the Board of Directors for the Pacific Islands Primary Care Association, and the Pacific Basin Dental and Medical Associations. In Yap state, of the Federated States of Micronesia (FSM), a newly graduated dentist was assigned to the MOHE Dental Department for 3 months of field training on preventive program planning and implementation. Also, due to the success of the training program, RMI staff members were requested to take the lead in training the dental chiefs and dental preventive coordinators from Guam, Palau, and FSM for the Pacific Islands Early Childhood Caries Prevention Project. This project targets Head Start and kindergarten children, along with their younger siblings, and is designed to motivate their families through home visits and by providing tooth brushes and fluoride toothpaste through local dental preventive coordinators.

This dental training initiative for human resources development in the region is an achievement for the Pacific Islands. The program has been fully supported by the Ministries, which enabled sharing of local expertise to address the needs in the Pacific region in a manner sensitive and adaptable to local cultures, and well accepted by local people and governments.

Infrastructure development was supported in part by Grant No. 6 H47 MC02052 from HRSA's Maternal and Child Health Bureau, State Oral Health Collaborative Systems Grants program, and the RMI Work Investment Act. Technical assistance from the Northwest/Alaska Center to Reduce Oral Health Disparities, University of Washington was supported in part by Grant No. U54 DE14254 from the National Institute of Dental and Craniofacial Research (NIDCR), National Institutes of Health. Training in Saipan, Commonwealth of the Northern Mariana Islands, was supported by the WHO and HRSA Grant No. U12 HP01064 to the University of Hawai‘i. The University of Hawai‘i HRSA grant also supported training in Yap state, FSM.

To advance self-determination and local responsibility in the USAPI, these training programs have also been shared with other Pacific Islands.

Acknowledgements
The authors acknowledge Karen Hu, DDS of the Hawai‘i State Department of Health for technical assistance and as a co-instructor for the RMI Dental Assistant Training Program.

References


Introduction

Yap State is one of four states of the Federated States of Micronesia (FSM). FSM is one of the former Trust Territories of the Pacific that gained independence in 1986. The country is a self-governing democracy in free association with the U.S. negotiated under the Compact of Free Association.

Yap State consists of 138 islands and atolls of which 22 are populated. The main island of Yap has a population of about 5,000. The state hospital and Community Health Center are located in Colonia, the capital. Remote villages and the outer islands are served by dispensaries manned by Health Assistants and teams of Community Health Outreach Workers (CHW). There is a single dentist at the hospital in Colonia and seven dental nurses; four nurses are assigned to the clinic, two to the elementary schools and one to the early childhood education (kindergarten) program. No recent data on the oral health of the population has been published.

For most of the last decade, dental workers have had little access to continuing professional education. During the past 2 years, the CHW were employed and received a basic orientation to oral health. The purpose of this report is to present some preliminary data on the oral health of 5-year old children on Yap Island and to describe the first formal training program for the dental personnel and CHW focused on public dental health and prevention of tooth decay.

Oral Health Findings

A convenience sample of one classroom in each of two early childhood centers was surveyed. One was in the capital Colonia and the second was in a rural area of Yap. Thirty-nine children were examined with an average age of 61 months (range 48-72 months). The examinations were conducted in a knee-to-knee position using a dental mirror and a head lamp to improve visibility. The primary teeth were rated as either sound or decayed. Prior to the examinations, the dental nurses and CHW were trained using pictures of sound and decayed teeth and all of the examinations were supervised by two experienced dentists. When there were questions, one of the dentists was asked to examine the child. In addition, the dentists spot checked about 10% of the exams.

Thirty-eight of 39 children had at least one decayed primary tooth. The average number of decayed teeth per child was 16 with a range of 0-20 teeth.

Oral Health Professional Training

The University of Washington offered a three-day training course under the auspices of the Pacific Association for Clinical Training at the University of Hawai’i. The objective of the training was to increase the skills and knowledge of oral health and CHW in the area of prevention of dental caries from infancy through school age.
The 16 participants included the dentist, dental nurses and assistants and nine CHW. Three experienced public health dentists served as instructors. The program was organized around a formal program of primary and secondary prevention of tooth decay for children from infancy through school age. Table 1 describes the program.

The training consisted of seminar instruction using slides and demonstrations and hands-on clinical sessions at the early childhood education centers. The clinical techniques taught were visual oral examination, application of sodium fluoride varnish for the prevention of caries in children under 3 years of age, application of an antimicrobial (iodine: Betadine®) for suppression of mutans streptococci in children under 3 years of age, and topical application of diammine silver fluoride to arrest active caries in children 3 years and older and to

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### Table 1. Outline of Pilot Preventive Program Interventions

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Activity</th>
<th>Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infancy to age 3</td>
<td>Home visits for: Assessment. Parent education. Distribute fluoridated toothpaste/toothbrush - 2yr. Schedule for varnish and iodine. Apply fluoride varnish every two months and substitute topical iodine for varnish twice per year.</td>
<td>Community Health Workers</td>
</tr>
<tr>
<td>Ages 5 to 6 (Early childhood education period)</td>
<td>Examination - 1/yr at start of school Distribute toothpaste/toothbrush for school and home 2/yr, once at start of school and again after Christmas. Silver fluoride for cavities in primary teeth - 1/yr at start of school. Arrange referrals for extraction of abscessed teeth.</td>
<td>Dentist and Dental nurses</td>
</tr>
<tr>
<td>School Age (elementary grades 1 to 3)</td>
<td>Examination at start of year. Toothpaste/toothbrush school and home - 2/yr at start of school and after Christmas Occlusal sealants Silver fluoride for cavities including permanent molars. Arrange referrals for extraction of abscessed teeth or fillings as possible.</td>
<td>Dentist and Dental Nurses</td>
</tr>
</tbody>
</table>

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### Table 2. Yap Training Course Schedule

<table>
<thead>
<tr>
<th>Day</th>
<th>Wednesday Dec 13</th>
<th>Thursday Dec 14</th>
<th>Friday Dec 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning session</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:30 – 10 am</td>
<td>Oral Cavity in Health and Disease Oral Exam Tooth brushing and Toothpaste</td>
<td>Application of topical Iodine (Betadine®) Application of Silver Fluoride</td>
<td>Caries recording Written Examination</td>
</tr>
<tr>
<td>Break</td>
<td></td>
<td>Break</td>
<td>Break</td>
</tr>
<tr>
<td>10:15 – 12 pm</td>
<td>Prevention of tooth decay</td>
<td>Hands on training on oral exams and application of fluoride varnish and Iodine</td>
<td>Hands on training on Application of Silver Fluoride</td>
</tr>
<tr>
<td>Lunch</td>
<td></td>
<td>Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td>Afternoon session</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 to 4 pm</td>
<td>Home Visits to educate parents of young children about tooth decay and tooth brushing</td>
<td>Discussion and review of morning session</td>
<td>Review of written examination and presentation of certificates of completion</td>
</tr>
</tbody>
</table>

252
prevent additional tooth decay. The Pacific Association for Clinical Training (PACT) provided initial supplies of preventive materials. The training course schedule is described in Table 2.

The students were evaluated using a multiple choice and fill-in written examination covering the key elements of the prevention program and clinical procedures. A minimum score of 75% was required for passing. In addition, each student was observed examining and treating at least six children. All of the trainees passed the examination. After the exam, the trainees were debriefed. Certificates of completion were presented by the Executive Director of the Community Health Center in a formal ceremony.

Discussion
The preliminary oral health surveillance survey of preschool children demonstrated extraordinary levels of tooth decay where nearly every child had cavities and where the number of cavities per child greatly exceeds every the worst areas of mainland U.S. Moreover, services are very limited and thus training in oral health prevention at the community level is a priority. In this training program the expertise of senior dentists from another Pacific Island jurisdiction (Republic of the Marshall Islands), and from programs for Alaska Native children and the University of Washington collaborated to deliver focused preventive instruction. A key element in going forward will be the active participation of the CHW in making oral health a priority within the villages and communities of Yap State. Moreover, the Community Health Center and dental program will need to join forces to be sure that the prevention program has the supplies and other materials needed to deliver an effective program to the community.

13 years ago in Pacific Health Dialog, A. Pointer stated, “…where the text books fail is that they present an ideal situation, without describing the process of moving from the current reality towards the ideal.” PHD, 1995;2(1):167.
Health Problems of Micronesian Patients at a Student-Run Free Homeless Clinic

Damon F. Lee, MD*
Christopher J. Lindshield, MD*
Tina Kuribayashi, BA**
Christina Keolanani Kleinschmidt, MD*
Eric K.W. Lee, BS**
Jill S.M. Omori, MD*

*Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, Mililani, Hawai‘i; **John A. Burns School of Medicine, University of Hawai‘i at Manoa, Honolulu, Hawai‘i.
Address correspondence and reprint requests to: Damon F. Lee, MD, Assistant Professor, University of Hawai‘i at Manoa, John A. Burns School of Medicine, Department of Family Medicine and Community Health, 95-390 Kuahelani Avenue, Mililani, Hawai‘i 96789-1192; damonlee@hawaii.edu.

Abstract
Background: As of November 2006, 41.3% of the residents at a newly established transitional homeless shelter in Hawai‘i were of Micronesian descent. A student-run medical clinic operates at this shelter every week. This study examines the medical problems found in the Micronesian patients at this clinic. Methods: A retrospective chart review of 213 patients was conducted. Data was compiled from registration forms, intake forms, and progress notes. Results: The most common medical conditions that patients reported having were musculoskeletal problems, hypertension, and diabetes. For actual patient encounters, health maintenance visits and acute conditions, such as upper respiratory infections, were the most frequent. Conclusions: Homeless Micronesian patients seen at this shelter presented with problems more similar to the general homeless population than for chronic conditions commonly cared for by providers of care to Micronesians in the community. More information about the health and other needs of homeless Micronesians in Hawai‘i is warranted. (PHD 2007 Vol 14 No 1 pp 254-262)

Introduction
On March 27, 2006 the city of Honolulu closed Ala Moana Beach Park at night, displacing hundreds of homeless who slept there. Local churches attempted to fill the void left by the closure of the park, but their resources were quickly overwhelmed by the number of homeless affected. The State of Hawai‘i stepped in on May 1, 2006, and designated a former storage facility as a temporary shelter for those who had been residing at the churches. In response to the homeless crisis, the Next Step shelter opened the following day. Coincidentally, the warehouse that houses the shelter is located next to the University of Hawai‘i, John A. Burns School of Medicine (JABSOM). The Hawai‘i Homeless Outreach and Medical Education (H.O.M.E.) Project is a JABSOM project committed to healthcare for the homeless, medical education and curriculum development in caring for the underserved, and patient advocacy for the homeless. Shortly after the Next Step shelter’s establishment, the first JABSOM H.O.M.E. Project student-run free clinic site was created on May 30, 2006, to provide and coordinate medical care for the shelter’s residents. The Next Step shelter initially opened to 200 residents; however, by September the numbers grew to more than 300. Although this is a temporary shelter, the majority of homeless residents at the Next Step shelter have resided there since its opening through the present (March 2007). According to census reports from the Next Step shelter, as of September 2006, of the over 300 residents, 49% were of Micronesian descent. Children comprised approximately 28% of the shelter’s occupants, and 82% of these children were Micronesian.

Through Compacts of Free Association between the United States, the Federated States of Micronesia (FSM [Yap, Chuuk, Pohnpei, and Kosrae]) and the Republic of the Marshall Islands, a large number of migrants
from Micronesia now reside in Hawai‘i. Micronesians make up a growing percentage of patients seen in Hawai‘i’s community outpatient clinics, and are increasingly utilizing the healthcare systems in Hawai‘i. It is estimated that from 1996-2000, that Micronesians accounted for approximately $86 million in costs to Hawai‘i’s healthcare system. The majority of these visits are for the care of chronic medical conditions such as hypertension, diabetes mellitus, pregnancy, respiratory problems, and abnormal lipid metabolism. Routine visits, such as contraception management, well child and prenatal care also occur frequently.

Homeless patients, on the other hand, often present for acute medical problems. National data illustrate that infections, trauma, and mental health problems are some of the more frequent reasons for homeless patients to seek medical care. One of the reasons homeless patients are not seen for routine visits stems from the large number of homeless without health insurance. Some national estimates put the percentage of homeless without medical insurance as high as 75%. The actual number of homeless individuals in Hawai‘i without health insurance is uncertain and has not been well quantified.

Since Micronesians make up a large proportion of the residents of the Next Step shelter, we sought to determine the number of homeless Micronesian patients cared for at the shelter’s H.O.M.E. clinic. We attempted to characterize the medical conditions that the Micronesian patients at the H.O.M.E. clinic are seen for, as well as the preexisting medical conditions that they have.

We anticipated that many of the problems we would encounter in our. Micronesian homeless patients would mirror the common problems, as documented by the Hawai‘i Primary Care Association, that Micronesian patients present with in other local outpatient clinics. We further hypothesized that not only would our Micronesian patients have multiple chronic diseases, such as diabetes, hypertension and asthma, but that these would be compounded by health conditions that are common to the homeless, including cellulitis, insect bites, and musculoskeletal injuries.

So that we may better care for our patients, we plan to use the demographic and medical data obtained to tailor the H.O.M.E. clinic to address the unmet needs of our homeless clinic population.

### Methods

#### Table 1. Demographics of Micronesian H.O.M.E. Clinic Patients

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total H.O.M.E clinic patients (as of 11/20/06)</td>
<td>213</td>
<td></td>
</tr>
<tr>
<td>Number of Total Patients that are Micronesian</td>
<td>88</td>
<td>41.3</td>
</tr>
<tr>
<td>Number of Micronesian patients that were seen by a provider</td>
<td>76</td>
<td>86.4</td>
</tr>
<tr>
<td>Number of Micronesian patients that registered but did not see a provider</td>
<td>12</td>
<td>13.6</td>
</tr>
<tr>
<td>Total Number of Micronesian Patients Seen by a Provider</td>
<td>N=88</td>
<td>100.0</td>
</tr>
<tr>
<td>Sex of Micronesian Patients Seen by a Provider</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>28.9</td>
</tr>
<tr>
<td>Female</td>
<td>54</td>
<td>71.1</td>
</tr>
<tr>
<td>Total Number of Micronesian Patients</td>
<td>N=76</td>
<td>100.0</td>
</tr>
<tr>
<td>Mean Age</td>
<td>22.9</td>
<td></td>
</tr>
<tr>
<td>Median Age</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Age Range: 5 months – 73 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Number of Children (17 or younger)</td>
<td>29</td>
<td>38.2</td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>34.5</td>
</tr>
<tr>
<td>Female</td>
<td>19</td>
<td>65.5</td>
</tr>
<tr>
<td>Total Number of Adults</td>
<td>N=29</td>
<td>100.0</td>
</tr>
<tr>
<td>Male</td>
<td>12</td>
<td>25.5</td>
</tr>
<tr>
<td>Female</td>
<td>35</td>
<td>74.5</td>
</tr>
<tr>
<td>Reported Ethnicity of Micronesian Patients</td>
<td>N=76</td>
<td>100.0</td>
</tr>
<tr>
<td>Chuukese</td>
<td>64</td>
<td>84.2</td>
</tr>
<tr>
<td>Marshallese</td>
<td>10</td>
<td>13.2</td>
</tr>
<tr>
<td>Kosraean</td>
<td>1</td>
<td>1.3</td>
</tr>
<tr>
<td>Pohnpeian</td>
<td>1</td>
<td>1.3</td>
</tr>
</tbody>
</table>
University of Hawai‘i Institutional Review Board (IRB) approval was obtained for this study (IRB number CHS#14886). A retrospective chart review was performed on the patients seen at the Hawai‘i H.O.M.E. Project student-run free medical clinic. As of November 20, 2006, 213 charts, representing the clinic’s active population from its inception on May 30, 2006, were available for review. For each patient, we examined the self-reported ethnicity, age, sex and medical history on the clinic intake forms. Visit diagnoses, as documented in the progress note assessment and plan section, were also reviewed. The self-reported history asks whether or not our adult patients currently have or have ever had the following illnesses/conditions: allergies (hay fever), anemia, arthritis, back trouble, bowel, cancer, cataracts, diabetes, emphysema, fractures, gastroesophageal reflux disease (GERD), glaucoma, heart problems, hepatitis, high blood pressure, HIV/AIDS, leprosy, liver problems, mental illness, pneumonia, seizures, stroke, thyroid problems, tuberculosis, ulcers, or venereal diseases/STDs. Children are screened for histories of asthma, anemia, allergies, chicken pox, cancer, fractures, heart problems, kidney problems, measles, mumps, polio, rheumatic fever, rubella, scarlet fever, and whooping cough. This historical data is reviewed with patients/parents through medical interviews on their initial visit. Clinic providers, comprised primarily of third year medical students under the supervision of attending faculty physicians performed the history-taking. The patient intake form also asks whether or not the patient has health insurance and responses to this question were reviewed.

Patient progress notes were reviewed by the attending physicians, and final visit diagnoses were taken from the note assessment and plans. The data were compiled, categorized, and analyzed to determine the most common diseases and ailments of the Micronesian adult and pediatric patients. Children were classified as age 17 or younger.

**Results**

**Demographics**

Of the 213 patient charts examined, 88 individuals were of self-reported Micronesian ethnicity; this represented 41.3% of the patients seen at the clinic as of November 20, 2006 (Table 1). From the 88 charts, 12 were excluded for having registered at the clinic, but never received medical care, and consequently they were not interviewed to complete the history intake forms. Therefore, 76 charts of Micronesian patients were included in our final analysis. The patients of Micronesian ethnicity were further subdivided by their state of origin. 84% of the patients were Chuukese, 13% were Marshallese, 1% were Pohnpeian, and 1% were Kosraean.

<table>
<thead>
<tr>
<th>Table 2. Patient Reported Medical Conditions - Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Condition</strong></td>
</tr>
<tr>
<td>None/did not Answer</td>
</tr>
<tr>
<td>Back trouble</td>
</tr>
<tr>
<td>Arthritis</td>
</tr>
<tr>
<td>High blood pressure</td>
</tr>
<tr>
<td>Diabetes (Type I or II)</td>
</tr>
<tr>
<td>GERD</td>
</tr>
<tr>
<td>High cholesterol</td>
</tr>
<tr>
<td>Bowel trouble</td>
</tr>
<tr>
<td>Other condition not specified</td>
</tr>
<tr>
<td>Allergies (hay fever)</td>
</tr>
<tr>
<td>Fractures</td>
</tr>
<tr>
<td>Heart problems</td>
</tr>
<tr>
<td>Anemia</td>
</tr>
<tr>
<td>Asthma</td>
</tr>
<tr>
<td>Kidney problems</td>
</tr>
<tr>
<td>Seizures</td>
</tr>
<tr>
<td>Stroke</td>
</tr>
<tr>
<td>Venereal diseases</td>
</tr>
<tr>
<td>Cancer</td>
</tr>
<tr>
<td>Cataracts</td>
</tr>
<tr>
<td>Glaucoma</td>
</tr>
<tr>
<td>Hepatitis (A, B, or C)</td>
</tr>
<tr>
<td>Liver problems (non hepatitis)</td>
</tr>
<tr>
<td>Migraine headaches</td>
</tr>
<tr>
<td>Thyroid problems</td>
</tr>
<tr>
<td>Emphysema, HIV/AIDS, leprosy, mental illness, pneumonia, TB, ulcers</td>
</tr>
</tbody>
</table>

The vast majority of Micronesian patients seen in the clinic were female (71%). Of the 76 Micronesian patients seen at the homeless clinic, 29 were aged 17 or younger (38%), and 47 were adults (62%). Of the children 19 (65.5%) were female, and 10 (34.5%) were male. Micronesian children also made up a two-thirds majority of the total pediatric patients seen at the clinic, with 29 out of 44 total children being of Micronesian descent (66%).
Reported Existing Medical Conditions

The most common response reported on the medical history intake form for existing medical conditions in both adults and children was "none." This response included those who reported "none" to the questions as well as those who did not answer the question (i.e., space left blank). Of those adults who responded that they had pre-existing medical conditions, musculoskeletal problems were the most commonly reported, with back problems being the most frequent response in 14 patients and arthritis in nine. Hypertension, diabetes, GERD, and high cholesterol followed musculoskeletal problems in decreasing frequency (Table 2).

For children, 22 respondents did not have any reported existing medical conditions. Of those who responded, histories of chicken pox and asthma were the most frequently cited, followed by anemia and allergies (Table 3).

Medical Visit Diagnoses

Table 4 lists the H.O.M.E. visit diagnoses for all patients. Upper respiratory tract infection (URI) was the most common diagnosis for all patients, representing 11.9% of all visit diagnoses. Health maintenance visits and musculoskeletal complaints were the next most common assessment diagnoses, making up 8.6% and 6.6% of the total, respectively. Health maintenance included visits for physical examinations, well-child care, vaccinations, and disease screening (i.e., hepatitis B). Examples of musculoskeletal diagnoses included patello-femoral syndrome, knee pain, neck strain, chest wall pain, plantar fasciitis, shoulder strain, costochondritis, neck strain, and sciatica. In descending order, the next most common assessed diagnoses were headaches, menstrual problems, diabetes, pulmonary problems, and insect bites, including scabies and bedbugs.

For adults, the two most common reasons for clinic visits were musculoskeletal complaints (8.2%) and headache (7.3%) (Table 5). This was followed by URIs,

Table 3. Patient Reported Medical Conditions – Children*

<table>
<thead>
<tr>
<th>Condition</th>
<th># of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not completed</td>
<td>22</td>
</tr>
<tr>
<td>Chicken pox</td>
<td>5</td>
</tr>
<tr>
<td>Asthma</td>
<td>5</td>
</tr>
<tr>
<td>Anemia</td>
<td>1</td>
</tr>
<tr>
<td>Allergies</td>
<td>1</td>
</tr>
</tbody>
</table>

*Cancer, fractures, heart problems, kidney problems, measles, mumps, polio, rheumatic fever, rubella, scarlet fever, whooping cough – asked but no reported answers

Table 4. Numbers of Medical Visit Diagnoses - Total

<table>
<thead>
<tr>
<th>Diagnoses/Problems</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper respiratory tract infection</td>
<td>18</td>
<td>11.9</td>
</tr>
<tr>
<td>Health maintenance/vaccination update</td>
<td>13</td>
<td>8.6</td>
</tr>
<tr>
<td>Musculoskeletal problems excluding arthritis</td>
<td>10</td>
<td>6.6</td>
</tr>
<tr>
<td>Headache (including migraine)</td>
<td>8</td>
<td>5.3</td>
</tr>
<tr>
<td>Menstrual problems</td>
<td>6</td>
<td>4.0</td>
</tr>
<tr>
<td>Diabetes and associated complications</td>
<td>6</td>
<td>4.0</td>
</tr>
<tr>
<td>Pulmonary problems (including asthma)</td>
<td>6</td>
<td>4.0</td>
</tr>
<tr>
<td>Insect infestations</td>
<td>5</td>
<td>3.3</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>5</td>
<td>3.3</td>
</tr>
<tr>
<td>Urinary problems (including urinary tract infections)</td>
<td>5</td>
<td>3.3</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Acute gastroenteritis</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Arthritis</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Cellulitis/abscess</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Eczema</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Non-eczematous / Non-infectious skin lesions</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Tinea pedis/corporis/facialis</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Vaginitis</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Gastroesophageal reflux disease</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Ophthalmologic problems</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Otitis externa/media</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Allergic rhinitis</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Dental problems</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Ear nose and throat problems</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Gastrointestinal problems</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Gynecologic problems (excluding disorders of menstruation/vaginitis)</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Hypertension</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Neurologic problems</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Polydipsia</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Psychiatric problems</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Anemia</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Fever</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Laceration</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Pinworms</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Venous insufficiency</td>
<td>1</td>
<td>0.7</td>
</tr>
</tbody>
</table>

N=151 100.0
Table 5. Numbers of Adult Medical Visit Diagnoses

<table>
<thead>
<tr>
<th>Diagnoses/Problems</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Musculoskeletal problems</td>
<td>9</td>
<td>8.2</td>
</tr>
<tr>
<td>Headache</td>
<td>8</td>
<td>7.3</td>
</tr>
<tr>
<td>Upper respiratory tract infection</td>
<td>7</td>
<td>6.4</td>
</tr>
<tr>
<td>Health maintenance/vaccine update</td>
<td>7</td>
<td>6.4</td>
</tr>
<tr>
<td>Menstrual disorders</td>
<td>6</td>
<td>5.5</td>
</tr>
<tr>
<td>Diabetes and associated complications</td>
<td>6</td>
<td>5.5</td>
</tr>
<tr>
<td>Respiratory symptoms</td>
<td>5</td>
<td>4.5</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>4</td>
<td>3.6</td>
</tr>
<tr>
<td>Arthritis</td>
<td>4</td>
<td>3.6</td>
</tr>
<tr>
<td>Tinea pedis/corporis/facialis</td>
<td>4</td>
<td>3.6</td>
</tr>
<tr>
<td>Urinary symptoms/problems</td>
<td>5</td>
<td>4.5</td>
</tr>
<tr>
<td>Cellulitis/abscess</td>
<td>3</td>
<td>2.7</td>
</tr>
<tr>
<td>Skin lesions</td>
<td>3</td>
<td>2.7</td>
</tr>
<tr>
<td>Vaginitis</td>
<td>3</td>
<td>2.7</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>3</td>
<td>2.7</td>
</tr>
<tr>
<td>GERD</td>
<td>3</td>
<td>2.7</td>
</tr>
<tr>
<td>Insect bites/infestations</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Eczema</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Ocular problems</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Otitis externa/media</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Allergic rhinitis</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Other gynecologic symptoms</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Hypertension</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Neurologic symptoms</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Polydipsia</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Psychiatric problems</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>AGE</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Dental problems</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Ear nose throat problems</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Other gastrointestinal symptoms</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Anemia</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Laceration</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Pinworms</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Venous insufficiency</td>
<td>1</td>
<td>0.9</td>
</tr>
</tbody>
</table>

N=110 100.0

Micronesian patients had was Med-QUEST (60.5%), the state insurance coverage for low-income individuals. Of those with a Med-QUEST plan, 78.3% had Aloha Care. Almost all of the insured (n=50, 84.7%) belonged to programs for low-income individuals, including Aloha Care, Hawai‘i Medical Service Association (HMSA) Quest, and Medicaid.

Twenty (26.3%) of the patients with health insurance reported having a primary care physician that they had seen before their H.O.M.E. clinic visit. Patients who did not know if they had a primary care physician or who had never established care with their primary care physician were counted the same as those patients without one.

Discussion

Hawai‘i H.O.M.E. Project clinic patients reflect the overall ethnic distribution of the shelter’s residents as a whole. At the time of this chart review, Micronesians made up 49% of the residents of the Next Step shelter, and represented 41% of the patients seen in the clinic (Table 1). However, the percentage of men and women seen in the clinic was reversed. Females represented 43.4% of the shelter population and 71.1% of the clinic patients. Males represented 56.6% of the shelter population but only 28.9% of the clinic patients. This discrepancy may be expected given the general propensity for women to seek medical care at a higher rate than men.

By far, the largest Micronesian group living in the shelter, and cared for by our clinic, are the Chuukese (84%) (Table 1). In contrast, the largest Micronesian group living in Hawai‘i as suggested by recent counts, are the Marshallese. However, the Marshallese comprised only 13% of the clinic’s Micronesian population. We speculate that the numbers of Chuukese living in the Next Step shelter,
shelter and receiving care at our clinic may be higher than other groups because they are the fastest growing community of Micronesians living in Hawai‘i. As newer migrants, they may not have as many established ties to Hawai‘i and, as such, may be more likely to be homeless as compared to the Marshallese. The reasons for their homelessness, however, were not addressed in this study. Percentages of the different Micronesian groups cared for by our local outpatient clinics and community health centers have not been officially quantified and may also be an additional area of further inquiry.

For both children (76%) and adults (28%), the most common response to the medical history intake form was no prior existing conditions or no response to the questions (Tables 2 and 3). Because our overall patient population is young (mean age 23), they may be less likely to have existing chronic diseases such as diabetes and hypertension.

Of the responses we did gather from the history forms regarding prior existing medical conditions, chronic diseases such as diabetes, high cholesterol, and hypertension were reported in greater frequency by our patients (Table 2). This is consistent with what would be expected from a Micronesian population. According to the World Health Organization, chronic disease accounted for 64% of all deaths in the FSM in 2002. Common chronic diseases included cardiovascular disease, cancer, respiratory disease, and diabetes. Furthermore, while there is limited data about chronic diseases among Micronesians in Hawai‘i, according to the Hawai‘i Primary Care Association, top reasons for medical visits among Micronesians in Hawai‘i in 2003-2004 included hypertension (first), diabetes (second), and disorders of lipid metabolism (eighth). Hence, our study results coincide with observational and anecdotal reports from providers of care to Micronesian patients in outpatient clinics and community health centers in Hawai‘i.

While our adult patients reported having existing chronic medical conditions, with the exception of diabetes and pulmonary problems such as asthma, the majority of our actual patient visits were for acute problems such as URIs, musculoskeletal complaints, headaches and skin conditions (Tables 4 and 5). When patients presented for chronic medical conditions, the visits were focused more on management of these conditions, such as providing refill prescriptions, checking of blood sugars, and taking blood pressure measurements, rather than diagnosis of them. Homeless individuals in general have high rates of both acute and chronic health problems, however, because they lack housing and are often subject to financial difficulties and harsh conditions of life on the street, meeting basic needs such as shelter, food and finances takes priority over receiving care for chronic diseases. For these reasons, health problems commonly encountered in homeless health clinics tend toward the acute, including URIs, trauma, infectious diseases and skin conditions. Our Micronesian patients were no exception to this trend.

Likewise, the conditions for which we treated our pediatric patients are consistent with national homeless statistics for children’s healthcare (Table 6). Studies examining the medical problems of homeless children have also shown that the leading health concerns for patient medical visits in this population are acute illnesses with URIs, ear disorders, skin disorders and gastrointestinal problems topping the list.

### Table 6. Numbers of Children (≤17) Medical Visit Diagnoses

<table>
<thead>
<tr>
<th>Diagnoses/Problems</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper respiratory tract infection</td>
<td>11</td>
<td>26.8</td>
</tr>
<tr>
<td>Well child care/vaccine update</td>
<td>6</td>
<td>14.6</td>
</tr>
<tr>
<td>Acute gastroenteritis</td>
<td>3</td>
<td>7.3</td>
</tr>
<tr>
<td>Bedbugs/insect bites/scabies</td>
<td>3</td>
<td>7.3</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>3</td>
<td>7.3</td>
</tr>
<tr>
<td>Eczema/atopic dermatitis</td>
<td>2</td>
<td>4.9</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>2</td>
<td>4.9</td>
</tr>
<tr>
<td>Abscess</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Acute otitis media</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Asthma</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Candidal vaginitis</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Epistaxis</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Fever</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Strabismus</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Teething</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Hives</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Shoulder strain</td>
<td>1</td>
<td>2.4</td>
</tr>
</tbody>
</table>

N =41 100.0
Due to a recent hepatitis awareness campaign at the shelter, as well as the availability of vaccinations at our clinic, health maintenance items including vaccination updates, hepatitis screening, and physical examinations may have been seen in relatively higher frequency in both our adults and children than may be expected for a homeless shelter clinic. The fact that the majority of the medical students providing care to our H.O.M.E. patients are in their third year Family Medicine clerkship where health prevention and promotion are emphasized may have also influenced the higher numbers of adult and pediatric patients seen for health maintenance visits as the students are expected to inquire about what preventive services their patients need.

Approximately one-time of the homeless nationally have mental illnesses with up to one-half having substance abuse disorders. In a needs assessment performed at the shelter prior to the clinic’s opening, out of 96 residents surveyed, 51 (49%) responded that they were in need of mental health services. Of these 51 residents, almost one-half (n=25) identified themselves as being of Micronesian ethnicity. Contrary to our needs assessment, none of our Micronesian patients have identified themselves as having a mental illness on our review of their history intake forms (Table 2), and only two were assessed as having mental illness during patient encounters (Table 4). The discrepancy between our needs assessment and actual numbers of patients being treated for mental illness may be due to patients not being comfortable with seeing our providers for a problem like mental illness. Language barriers in obtaining the needs assessment data, in completing our history forms, or in patients communicating their illness to our providers may also have influenced this variance. Furthermore, since most of our patients have health insurance, patients may seek mental healthcare from other health providers in the community, just as many patients see their primary care physician for chronic medical conditions and use the H.O.M.E. clinic mainly for acute visits.

In order to address the mental health needs of our patients, we hope to recruit mental health professionals as volunteers at our clinic as well as to collaborate with the University of Hawai‘i’s Department of Psychiatry. We are also in the process of hiring Chuukese and Marshallene translators to assist us in obtaining more accurate histories and to help the patients with completing intake paperwork.

Homelessness seems to play a larger role than being of Micronesian descent in determining the types of conditions our clinic treats; however it is not the only possible explanation. As illustrated in Table 7, over three-quarters of our homeless Micronesian patients had some form of health insurance, a surprising statistic since the majority of homeless nationwide lack health insurance as well as access to medical care. Although the specific number of homeless in Hawai‘i with and without health insurance is unknown, one anecdotal report from another local shelter estimates that 70% of their population has health insurance. Despite a large percentage reporting having health insurance, only one-fourth of the Micronesian patients seen in our clinic reported having visited a primary care physician prior to visiting our clinic. Due to language barriers, our patients may not understand the concept of having a primary care physician. Being homeless, establishing care with one may not be as important as meeting basic needs, and as such, they may only seek medical care when acute illnesses arise, which may have influenced our results.

Since we are only present one evening per week, we encourage

| Table 7. Health Insurance Status & Visits to Primary Physician per Patient Report |
|---------------------------------|-----------------|-------|
|                                  | # of responses  | %    |
| None/no response                 | 17              | 22.4 |
| Med-QUEST plan                   | 46              | 60.5 |
| Private (non-QUEST insurance)    | 9               | 11.8 |
| Medicaid                         | 4               | 5.3  |
| Total Percentage of Micronesian Patients with Health Insurance | N = 59 | 77.6 |
| Med-QUEST breakdown             |                 |      |
| AlohaCare                        | 36              | 78.3 |
| HMSA Quest                       | 10              | 21.7 |
| N=46                            |                 | 100.0|
| Private Insurance Plans Breakdown|                 |      |
| HMSA                             | 7               | 77.8 |
| HMAA                             | 1               | 11.1 |
| Summerlin                        | 1               | 11.1 |
| N=9                             |                 | 100.0|
| Reported having been seen by primary care physician prior to visiting the H.O.M.E clinic | N=20 | 26.3 |
patients with health insurance to follow-up with their primary care physicians or to establish one, not only for their chronic problems, but to follow-up on any recommendations we may make with regards to their acute complaints as well. Our clinic availability may also have independently contributed to the primarily acute nature of our clinic visits.

With nationwide statistics suggesting that the majority of homeless lack healthcare resources, it may at first seem surprising that our Micronesian patients are homeless, yet a majority have health insurance. Understanding reasons for migration of Micronesians to Hawai'i helps put this into perspective and has been reviewed by Pobutsky, et al.

In brief, poor health and education systems in Micronesia coupled with opportunities for migration to Hawai'i via the Compacts of Free Association have enabled large numbers of Micronesians to emigrate freely to the United States for medical, social and financial reasons. Many are eligible for health insurance under the state MedQUEST program, qualification of which is based on the federal poverty level. Prior to 1996, many were eligible for Medicaid without waiting periods. In 2003, $18 million was spent by the Hawai'i Department of Human Services for Micronesians migrants under the QUEST program.

We speculate that the inability of many Micronesian patients to find adequate housing highlights a perhaps unforeseen challenge of the Compacts of Free Association whereby the Micronesian migrants are eligible for certain social services but others, such as public housing, may not be as readily available. Given that there are as many as 6,000 homeless individuals in Hawai'i on any given day, lack of affordable housing is a problem that many in Hawai'i, Micronesian, or otherwise, face.

While anecdotal reports from the community as well as Pobutsky et al.'s review suggest that large numbers of Micronesians, including the Chuukese, are being cared for by Hawai'i's community health centers and outpatient clinics. The exact numbers of those cared for that are homeless have not been well quantified with the exception of the data reported here from those living at the Next Step shelter. Given that at least 8,000 to more than 12,000 Micronesians now reside in Hawai'i with more growth anticipated, further inquiry about Micronesians in Hawai'i, including the number that are homeless, would be valuable.

Although we limited our chart review to those of Micronesian ethnicity for purposes of this paper, further reviews to compare non-Micronesian patients in terms of their stated medical histories and reasons for visiting the clinic would not only allow comparison between our Micronesian and non-Micronesian homeless patients, but provide further detail about the services our clinic has provided to the shelter residents. Just as our current review allows us to anticipate what types of problems our Micronesian patients may present with, a similar review will allow us to anticipate the needs of all our patients.

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Given that at least 8,000 to more than 12,000 Micronesians now reside in Hawai‘i with more growth anticipated, further inquiry about Micronesians in Hawai‘i, including the number that are homeless, would be valuable.


13 years ago in Pacific Health Dialog, A. Chand stated, “Unwanted and needy children are a direct result of other social and economic problems of our society ... it is anticipated that these will be more demand by needy children for shelter and care...” PHD, 1995;2(1):56.
The End of Poverty: Economic Possibilities for Our Time

Jeffrey D. Sachs

416 pages
ISBN-10: 0143036580 (pbk.)

In a world of over six billion people with about one-third living on less than U.S. $2.00 per day, understanding global economic development and the policies that support or retard it is no longer an exercise for a few erudite academics. The author, Jeffrey Sachs, PhD, Director of the Earth Institute at Columbia University, is considered one of the hundred most influential leaders of our time. Dr. Sachs has offered a very approachable analysis of the stages of economic development that countries face, and the role and structure of development aid and other forces in moving that process forward.

The book is engaging in that it is truly interdisciplinary, drawing on history, technological advancement, anthropology, political science and macro-economics to make his cogent arguments. While he challenges the commonly held beliefs about foreign aid and economic development, his work is enticing because after years of experience as an economic advisor to governments throughout the world, his arguments backed by careful analysis are difficult to refute.

The first section of the book presents a “Global Family Portrait.” Sachs describes a ladder of economic development from the destitute in drought ravaged Malawi, to factory workers in Bangladesh, to rising service industries and middle class in India, to the growing affluence in China. He then provides an historical perspective leaning on diffusion of technology, geographical differences and patterns of war and colonization to describe variations in economic advancement. Using in-depth examples from Poland, China, India, the Philippines, and elsewhere, Sachs shows us how economies progress or fail. A chapter on Africa and the emergence of epidemic disease inextricably links health and overall economic development. Sachs then turns from analysis to solutions and provides a “global compact to end poverty.” This is a detailed road map for a global program to lift the poorest countries onto the first step of the economic development ladder. He provides a careful cost analysis and discusses among other things; donors, debt, corruption, environmental stewardship, and health. His analysis is linked to forwarding the Millenium Development Goals.

Finally, Sachs debunks several common myths about foreign aid and efficacy. His analysis of U.S. lending to sub-Saharan Africa in 2002 demonstrates that for every $3, after administrative costs and debt service, only 6 cents reached an individual in the recipient countries. He argues it is very difficult to measure the social and economic impact of programs that provide such remarkably paltry levels of funding.

Foreign aid for economic development has never had a well developed constituency at the local level in the United States. Jeffrey Sachs’s book is a call to arms. It is an effort to bring the difficult issues of global economic development to the forefront and to stimulate discussion outside of the usual intergovernmental circles. It may take more than a single book to create a ground swell of support for global economic development, however, as Sachs states, “this book is about the rich and powerful facing basic truths about the impoverished and weak.” As we forge a future together, The End of Poverty is required reading for all of us.

Reviewer:
Allen L. Hixon, MD, Associate Professor, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, Mililani, Hawai‘i.
Global Health Leadership and Management

Editors:
William H. Foege
Nils M.P. Daulaire
Robert E. Black
Clarence E. Pearson

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In the increasing environment of globalization and the real threats of SARS, HIV/AIDS and other emerging illnesses, there is a pressing need for the systematic development of global health leaders. While this has been the purview of the World Health Organization (WHO), Centers for Disease Control and Prevention (CDC) and discrete academic public health programs, there has been little general awareness of the need to develop a cadre of global health practitioners, advocates, thinkers, and leaders. This text, thoughtfully prepared by William Foege (Bill and Melinda Gates Foundation), Nils Daulaire (Global Health Council), Robert Black (Johns Hopkins, Bloomberg School of Public Health) and Clarence Pearson (WHO) attempts to bridge the gap between the traditional approaches to global health, that of tropical medicine/clinical practice, and the new science of leadership and international program management. The beauty of this book lies not in its organization, but in the variety of perspectives elaborated by the very senior experts who have contributed the essays.

The text is loosely divided into five sometimes overlapping sections dealing with global health challenges and health policy, strategies and pathways, networks and change, learning from past experiences, and managing teams. Examples of the diversity of contributors include an opening chapter on philanthropy by: Melinda Gates of the Bill and Melinda Gates Foundation; Ray Gilmartin, CEO of Merck, describes the need for corporate citizenship in global health; and Lee Jong Wook, former Director General of the WHO, discusses policy advances that have grown out of the HIV/AIDS epidemic and smallpox eradication campaign.

In the opening section on identifying challenges, William D. Novelli, Executive Director of the American Association of Retired Persons (AARP), discusses the costs associated with long term care and specifically caring for the elderly with multiple chronic illnesses. He calls for more sophisticated mechanisms to coordinate care and speaks to the benefits to society of having a population of healthy elders.

Later, in the section on new strategies and solutions, Harlan Cleveland writes about equity and global health. He makes a call for “generalist” or “transformational” leaders. He bases his thesis on the idea that only about 10% of health improvement will come from health technology and management. Nearly half will come from preventive and personal behaviors and the remaining half from the environment of human life. He posits that these broader categories make current leadership pyramids obsolete. He concludes that “crisis is normal, tensions can be promising, and complexity is fun.”

In one of the concluding chapters, William Roper and Janet Porter review the Public Health Leadership Institute movement developed by the CDC in 1991 and continuing with state, regional, and national programs to the present. They review the approach, and methodology including adult learning methods, reflection vs. action,
residential and distance modalities, and time frame with a goal of seeking “sustained improvement in leadership effectiveness.” They conclude with a review of the CDC, United States Agency for International Development, and several non-governmental organizations’ efforts to create leadership training programs in developing countries.

The individual essays can be digested quite well out of sequence and do not necessarily build on each other to an effective conclusion. The authors of each chapter are noteworthy provide glimpses of brilliance and represent the most experienced health leaders of our day. Their collective wisdom and anecdotal advice, although often quite general, make worthwhile reading.

This book will make a useful addition to international development and public health curricula. It should be noted by anyone broadly interested in global health programming. The most useful contribution of Global Health Leadership and Management is in elaborating the perspectives of various non-governmental stakeholders from the pharmaceutical industry, trade associations and academic world, as well as foundations, and non-profit groups.

Reviewer: Allen L. Hixon, MD, Associate Professor, Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai‘i at Manoa, Mililani, Honolulu, Hawai‘i.

13 years ago in Pacific Health Dialog, A. Emberson-Bain was quoted as saying, "A key concept in management and leadership is the notion of need to place people, not economic growth, first." PHD 1995;2(1):141.
Abstracts from the Pasifika Medical Association Annual Conference - Tonga 2005

Well Child Health in Aotearoa – Nurses making a difference
Alisi Tameifuna

The Well Child service is a screening, surveillance, education and support service offered to all New Zealand children and their family from birth to five years. It assists families to improve and protect their children’s health. However, health statistics show that Pacific children in New Zealand are still lacking behind. The relationship between social and environmental factors and health is no where more evident that in urban communities.

As a Well Child Nurse working with Pacific communities in South Auckland, the opportunity to make a difference for our children and their families is greatly increased by our ability to understand and communicate in their first language. Southseas Healthcare Nurses represent different Pacific nations and all speak more than one language. Delivering a service with cultural and clinical expertise is one of the differences that we make to the well-being of our Pacific communities.

I am proud of myself I am a Tongan and I am working for Southseas Health Care since 2000 years, I speak Tongan and I deliver the service in Tongan language to the Tongan community, that one of the differences from the Plunket and Southseas Health Care do have our own social worker to help the families with their social issues e.g., housing, family support, immigration issues, etc Southseas Health Care do the Well Child Check to their home until the children turn 5 years old, because some our mothers going to work and the grandparents look after the children and they can’t take them to the clinic and some they can’t drive so we pick up that cap as long the children don’t missed the well child check healthcare.

Translating NCD Research Evidence to Policy and Effective Interventions
For Kakai Pasifiki and Non-Communicable Diseases
Ate Moala
Public Health Medicine Specialist, Vice-President, Pasifika Medical Association

Despite the availability of best research evidence, the global epidemic of chronic diseases (including diabetes, cardiovascular diseases) continues to disproportionately incapacitate Kakai Pasifiki and their families. This escalating epidemic is threatening the future of Pacific generations. Kakai Pasifiki suffer severely and die prematurely from NCDs complications. Fanau Pasifiki are over-represented among those who are at risk (obesity, poverty and physical inactivity) of developing diabetes and cardiovascular disease.

The best NCD research findings from molecular, epidemiological, sociological, economic, community and political levels have not been effectively translated to health policy and service provision in Aotearoa. Therefore the current health inequalities for Kakai Pasifiki in Aotearoa will worsen.

Leadership is urgently required to address the plight of Kakai Pasifiki in Aotearoa. Discussion will focus on:
- What kind of leadership is required to coordinate Pacific NCD research, policy and interventions across all sectors?
- What are the gaps in NCD research for Kakai Pasifiki and Pacific communities?
- How can we ensure that research findings are translated into effective health policy and sustainable service provision that will lead to better health outcomes for Kakai Pasifiki?

Hepatitis B screening in Auckland – Pacific Peoples participation and epidemiology
Herman Bullen Finau

Aim
To describe the process around the recruitment, participation and distribution of Hepatitis B infection
(HBsAg, HBeAg, ALT, AFP) among Pacific people in Auckland between November 1998 and May 2003 in response to a Hepatitis B screening programme conducted by the Northern Region Health Consortium.

Methodology
Retrospective analysis of Hepatitis B database - laboratory and coverage data.

Results
Under the oversight of a consortium of District Health Board, Maori and Pacific providers, with delivery via mainstream and ethnic specific primary care providers, a total of 89,839 people in Auckland and Northland were screened over a two year period from 2000-2002. Overall coverage of the targeted populations (Maori, Asian and Pacific aged 15 years and over) was 25% with Pacific the highest at 33%. A total of 32,700 Pacific people were screened with 99% (32,426) resident in Auckland. For individual Pacific populations, screening coverage was highest for Tongans - 50% of eligible Tongans were screened. Approximately 35% of Pacific people were non-immune, 57% immune and 8%(2642) hepatitis B carriers. However there were marked Pacific ethnic differences – 13% of Tongans were carriers; 43% of Samoans were non immune. Among carriers, people aged 15 to 29 years (36%) and Tongans were more likely to be HBeAg positive (27%).

Conclusions
Differences between Pacific ethnic recruitment models are highlighted, demonstrating the need for funders and planners to understand Pacific community dynamics particularly when mobilisation and behavioural change is required.

Roadside Sampling for a Traffic Related Injuries Case-Control study in Fiji
Berlin Kafoa
School of Public Health and Primary Care, Fiji School of Medicine, Private Mail Bag, Suva, Fiji. b.kafoa@fsm.ac.fj

In 2002 nearly 1.2 million people worldwide died as a result of a road traffic crash. This represents an average of 3242 persons dying each day around the world. In addition to these deaths, between 20 million and 50 million people globally are estimated to be injured or disabled every year. In the Pacific the burden of injury is still unclear.

The Traffic Related Injuries in the Pacific Project (TRIP)* intends to shed some light on the profile of injuries in the Pacific by doing a situational analysis of injuries in Fiji, Samoa and Palau. Apart from this, the primary objective of the project is to undertake in-depth epidemiological analyses of road traffic injury in Fiji. To do this, a population-based cross-sectional survey of motor vehicle drivers in Viti Levu will be carried out to investigate driver- and vehicle-related characteristics and estimate the prevalence of potential risk and protective factors.

The paper discusses the methodological aspects of this survey including the approach to selection of eligible roads for sampling. Based on a systematic approach, 50 roadside surveys will be conducted at randomly selected sites and times over a 12-month period to represent driving on Fiji roads. The criteria for the selection of eligible roads and the randomization of selected road survey sites for a South Pacific Island Nation are described and discussed in detail for possible use in other Pacific Island settings. The paper also describes the role of different stakeholders and their contribution to the development and planning of the roadside surveys. This multisectoral effort may help health professionals in the Pacific coordinate their prevention efforts with regards to road safety interventions.

[* TRIP is funded by the Wellcome Trust, UK, and the Health Research Council of New Zealand.]

When Size Matters: Results from the Auckland High School Heart Survey (AHHS).
David Schaaf, Robert Scragg.
Patricia Metcalf, Colin Tukuitonga
University of Auckland, Auckland, WHO, Geneva.

Differences between Pacific ethnic recruitment models are highlighted, demonstrating the need for funders and planners to understand Pacific community dynamics particularly when mobilisation and behavioural change is required.
The Auckland High Heart Survey (AHHS) is an epidemiological survey designed to determine the prevalence of risk factors for cardiovascular disease in an adolescent high school population in New Zealand. The aims of the study were to determine cardiovascular risk factor levels in, and compare the cardiovascular and diabetes risk factor levels between, Pacific and European students and the main Pacific communities (Samoan, Cook Islands, Tongan, and Niuean). The study specifically aimed to determine ethnic-specific differences in lifestyle, intermediate and outcome variables that have been established as cardiovascular risks.

It was a school-based cross-sectional survey of 2,549 adolescent students, across 10 Auckland High Schools. A cluster sampling technique was used to obtain the target of 1000 Pacific participants.

The AHHS study results showed that demographic variables were strongly associated with both intermediate and outcome variables. The findings showed that there were significant ethnic variations between the four main ethnic groups (Pacific, Maori, Asian and European) in risk factors for cardiovascular disease.

Pacific participants had the highest BMI and PBF. Pacific participants had the lowest levels of PWC{subscript}170. With regard to outcome variables, Pacific adolescents had lower levels of TC, HDLC and LDLC compared to Europeans. However, Pacific participants had higher levels of TC:HDLC, FG, TG and DPB.

Some significant differences were also found between the Pacific ethnic groups. With regard to outcome variables Tongan participants had lower TC, LDL and TC:HDLC but significantly higher levels of TG. Cook Islands participants were more likely to smoke daily and drink alcohol weekly.

The AHHS study was also able to identify the determinant that explains ethnic differences in outcome variables. BMI was the most significant variable in determining the ethnic differences in outcome variables. Results showed that Pacific participants had the highest BMI levels of all the ethnic groups, followed by Maori. Television watching was the one lifestyle risk factor that was positively associated with BMI. The most effective variable in terms of decreasing mean difference in BMI was PWC.

These results support interventions against obesity in Pacific Youth.

Kaliloa: a Tongan Strategy for Tongan Child Health

Eseta Finau
Co-ordinator Pacific SIDS Program
Pacific Health Section
School of Population Health
University of Auckland

“Kaliloa” comes from the term “Kali”, which is a native wooden pillow or headrest. It literally means a “long wooden pillow” or the “community pillow”. It is likened to the mother’s or father’s extended arm on which a child rests their heads while formative dialogues takes place and eventually followed by co-sleeping. This paper has explored the degree in which the concept of “Kaliloa” is understood and used amongst some Tongans living in Auckland. It has looked at ways in which “Kaliloa” can be used and promoted in the New Zealand environment. The study has involved interviewing community leaders and a focus group of young Tongan mothers to assess their knowledge and practice of “Kaliloa”.

This qualitative approach to research found that community elders totally endorsed “Kaliloa” as appropriate Tongan parenting and acknowledged that they are the products of this practice. On the other hand, young Tongan mothers were not familiar with the concept but understood the term “Mohe Ofi” which is often used interchangeably with “Kaliloa”. This paper makes recommendations on how the concept can be developed further in New Zealand and how it can become part of the delivery of effective Tongan child health services.

The Mechanism of Cell Death in Pancreatic Islet beta-cells & Diabetic Animal Models

Dr ‘Etuate Lui Saafi*
Proteomics & Biomedicine Research Group,
School of Biological Sciences,
Thomas Building, Private Bag 92019,
The University of Auckland.
Telephone: +64 9 3737599 Ext: 82172;
Email: e.saafi@auckland.ac.nz.

Diabetes is undeniably a 21st Century epidemic on the rise worldwide. WHO statistics show that in 2000, 177 million people worldwide had been diagnosed with diabetes with a projected 300 million sufferers by 2025. New Zealand
is closely following the same global trend with a current estimate of 118,000 diagnosed diabetics, and a forecast of 145,000 sufferers by 2011 accompanied by a similar proportion of undiagnosed cases. Maori and Pacific Island peoples are worst affected. Hence, communities such as Mangere, Rotorua, Northland and Manurewa have the highest incidence of diabetes and related morbidity, and mortality in New Zealand. A similar trend of epidemic proportions has also been observed within indigenous Pacific Island communities. In diabetes, the pancreas does not produce sufficient amounts of insulin and / or fails to utilize the insulin released by the pancreas (insulin resistance) during metabolism. The pancreatic islet B-cells which produce insulin are often completely (Type 1 Diabetes) or partially destroyed (Type 2 Diabetes) leading to hyperglycemia and other downstream diabetes-associated complications in life. 

Here, we present an ultrastructural analysis of the nature of the mechanism of cell death that occurs at the pancreatic islet B-cell level using: (i) a RINm5F B-cell model and (ii) also within the pancreas and heart of a Streptozotocin-induced diabetic animal model. The knowledge derived from this work is a useful tool in the investigation of the mechanism of B-cell death in the pancreatic islet of actual patients with diabetes.

**References**


**OBESITY PREVENTION IN PACIFIC COMMUNITIES (OPIC) STUDY: Obesity risk factors and church attendance for Pacific adolescents in Auckland, New Zealand.**

*Fa’asila Savila (On behalf of the Auckland OPIC Research Team)*

**Research Fellow**

Pacific Health

School of Population Health

University of Auckland

**Background**

Surveys show that about 33% of Pacific children and about 61% of adolescents are overweight or obese. Studies in the past, aimed at enhancing the health of Pacific people in New Zealand, have implemented health promotion programmes in Pacific churches. However, it is unknown whether church attendance is related to health behaviours and obesity. Churches are one of the main settings proposed for the OPIC obesity intervention.

**Aim**

Investigate the associations between risk factors (behaviours) for overweight and church attendance in adolescents.

**Method**

A baseline, cross-sectional survey of about 3,000 students from high schools in South Auckland. Information on church attendance, food and nutrition behaviours, TV watching, physical activity, and home and church environments was collected electronically using Personal Data Assistants (PDAs). Anthropometry measurements included weight, height, waist circumference and bio-impedance.

Results will be presented on possible associations between church attendance and lifestyle behaviours that are related to obesity. These results will determine the influence of church attendance on behaviours relating to obesity (nutrition and physical activity), and quantify the potential for obesity intervention programs in Pacific churches.

**Sociocultural factors influencing the food choices and eating patterns of indigenous Fijian females aged 15-16 years.**

*Ms Gade Waqa*1

*Fiji School of Medicine, Tamavua Campus, Private Bag, Suva, Fiji. Email: g.waqa@fsm.ac.fj*

1 Post-graduate student Fiji School of Medicine Fiji, and Fiji co-ordinator for OPIC.

2 Senior Research Fellow, School of Psychology, Deakin University, Australia

**Paper presentation.**

The global increase in obesity may predict an increase in Non Communicable Diseases such as Diabetes and Heart Diseases. More than 40% of Forms 3 and 5 Fijian students are obese. Obesity studies have investigated patterns of eating and physical activity. Few studies have addressed sociocultural factors that impact on
Obesogenic patterns of eating and physical activity. The Obesity Prevention in Communities (OPIC) project aims to reduce or prevent obesity among youth aged 13-18 years in Fiji, Tonga, NZ and Australia. The sociocultural component of OPIC explores social and cultural factors that may either promote or protect against obesity. The sociocultural studies explore values, attitudes, ideas about and explanations for patterns of eating and physical activity and ideal body image, from the perspective of youth.

In the first of three phases, sociocultural data were collected via semistructured interviews that were conducted by interviewers of the same sex as participants and who spoke the same first-language. Interview data were analysed collaboratively by local and European researchers.

This paper reports on food choices from the perspective of indigenous Fijian females aged 15-16 years (N=8). It discusses key sociocultural influences identified by participants and their perceived control over eating patterns. The paper demonstrates how these sociocultural factors informed the Fiji action plan and associated social marketing campaign.

**OBESITY PREVENTION IN PACIFIC COMMUNITIES (OPIC) STUDY: Risk factors associated with overweight and obesity among adolescents.**

*Gavin Faeamani (On behalf of the Auckland OPIC Research Team)*

Research Fellow, Pacific Health, School of Population Health, University of Auckland.

**Background**

The prevalence of being overweight and obese is increasing worldwide to a high level that is now becoming an epidemic. More than half the adult population in New Zealand are either overweight or obese. Lower socioeconomic groups such as the Pacific island people have a higher prevalence for obesity compared to the general population. Overweight and obesity is a major problem for young Pacific island populations. The National Children Nutrition Survey (NCNS) reported that 21.3% of New Zealand school children aged between 5 and 14 years old are overweight and 9.8% were obese. Overweight/obese levels were the highest for Pacific island children at 62%.

**Aim**

To study risk factors associated with overweight and obesity among adolescents (13-18 years old) enrolled in South Auckland high schools, New Zealand.

**Method**

Baseline cross-sectional survey of about 3000 students at high schools in South Auckland. Information on lifestyle risk factors is being collected using personal diary assistants (PDA's). Variables included personal identity, demographics, nutrition, physical activities, health and well being. Anthropometric measurement variables are weight, height, waist circumference and bio-impedance. Associations between lifestyle and obesity will be analysed.

**Conclusion**

The study will identify risk factors for obesity in adolescents aged 13 – 18 years. It will determine if the obesity risk factors identified in the NCNS of children aged 5 – 14 years also occur in older children. These risk factors include not eating breakfast before school, consumption of sugary drinks, watching TV, and decreased physical activity.

**These risk factors include not eating breakfast before school, consumption of sugary drinks, watching TV, and decreased physical activity.**

**Between Two Worlds: The Plight of Older Tongans**

*Glennis Mafi, MB ChB Dip Obst Dip Paed, FRNZCGP*

Clinical Manager Langimalie Clinic, 29 Hill St, Onehunga, Auckland. glennis@tonganhealth.com

Along with most of the rest of the world the Tongan population is also an aging one. But Tongan elders face the added problem of major changes in their traditional care-givers – their younger family members. Increasingly Tongans have migrated to Pacific rim countries – New Zealand, Australia and the United States of America. Older Tongans are torn between their homeland, where they feel warm and comfortable, and their children and grandchildren who may be in several different countries.

Langimalie Clinic in Auckland is the only Tongan specific primary health clinic in New Zealand and is the preferred clinic for many of these older Tongans. It is noted that many of them have a range of serious, mainly life-style related diseases, and that their care is often fragmented and inadequate.

As part of a Post-graduate Diploma of Geriatrics, (University of Auckland), Dr Mafi looked at health issues for older Tongans in Auckland using interviews and focus groups. This paper presents those findings and raises issues for Tongan health professionals in Tonga and New Zealand to consider. How can we assist our
people to age healthily; how can we ensure that their chronic diseases are managed consistently and well even when they travel; how can we assist families to provide good care for their aging relatives? This paper will touch on epidemiological, medical and political aspects of aging. Though concentrating on Tongans, it is thought that much of what is presented will apply to other Pacific Island groups. (246 words)

**New Zealand Smoking Cessation and The Pacific Connection**

**Background**

Haikiu H. Baiabe

Project Manager, Pacific Islands Heartbeat, The National Heart Foundation of New Zealand

Smoking Cessation training in brief intervention for Pacific and non-Pacific health professionals is a new and specific initiative for the Pacific Community in New Zealand and recently this has been extended to six Pacific Island countries.

Pacific people are faced with tobacco-related health issues that need culturally-relevant and specific initiatives to address them adequately. The high smoking prevalence among Pacific peoples in New Zealand and in the Islands is an issue of great concern. Based on current trends, the probability of these figures escalating is expected, particularly among Pacific female teenagers in New Zealand.

Support from the New Zealand Government to provide a specific Smoking Cessation Training programme for Pacific and non-Pacific health professionals helping Pacific clients and smokers in Aotearoa is timely and the inclusion of some Pacific Island nations is culturally responsive.

**The Pacific Islands focus**

Smoking Cessation training has been trialled in Tonga and the Cook Islands. Samoa, Vanuatu, Tuvalu and the Solomon Islands are the next focus over a two-year period.

**Objective**

To provide relevant training for Pacific and non-Pacific health professionals and community health workers in smoking cessation and brief intervention.

**The future**

Certain issues that will impact the effectiveness and cultural relevance of cessation for the Pacific Community in the long term include:

- The development of a national tobacco control strategy for Pacific people in New Zealand
- Cessation services by Pacific providers in New Zealand
- Referral services
- Smokefree environment
- Relevant and comprehensive cessation and tobacco control activities in the Pacific Islands.

**Sociocultural Factors Influencing Gender Differences in the Physical Activities of Tongan and indigenous Fijian youth.**

Helen Mavoa

Email: helen.mavoa@deakin.edu.au
Helen Mavoa, School of Psychology, Deakin University, 221 Burwood Highway, Vic 3125, Australia.

Tilema Cama

Gade Waqa

Senior Research Fellow, Deakin University, Australia.
Tonga co-ordinator, OPIC project. Fiji co-ordinator, OPIC project. NB Awaiting confirmation of co-authorship.

**Paper presentation**

The global increase in obesity may predict an increase in noncommunicable diseases such as Diabetes and Heart Diseases. The prevalence of obesity in Fiji and Tonga is high. While obesity studies have investigated patterns of eating and physical activity, few studies have addressed underlying sociocultural factors. The Obesity Prevention in Communities (OPIC) project aims to reduce or prevent obesity among youth aged 13-18 years in Fiji, Tonga, NZ and Australia by identifying the prevalence of obesity, developing community-specific interventions and assessing their effectiveness. The sociocultural component of OPIC explores social and cultural factors that may either promote or protect against obesity, from the perspective of youth.

In the first of three phases, sociocultural data relating to values, attitudes, ideas about and explanations for eating and physical activity patterns and ideal body size were collected via semistructured interviews. Interviewers were the same sex and spoke the same first-language as participants. Interview data were co-analysed by local and European researchers.

This paper presents gender differences in physical activities reported by indigenous Fijians and Tongans, aged 13-18 years and participants’ explanations for

**As predicted,**
Tongan and Fijian boys reported more opportunities for physical activity than did girls, especially outside school hours.
these gendered patterns. As predicted, Tongan and Fijian boys reported more opportunities for physical activity than did girls, especially outside school hours. There were similarities and differences in the explanations provided by Tongans and indigenous Fijians. Participants’ explanations for gender differences in physical activity reflected differences in gender roles. These gender differences informed physical activities within the OPIC action plans in Fiji and Tonga.

Non-Communicable Disease
Hilda Fa’asalele, Plunket, Pacific Services Development Manager

The health of Pacific peoples will determine their future progress. Ironically, compared with most New Zealand children, Pacific children experience an increased risk of poor health with a higher incidence of respiratory infections, meningococcal disease, and infectious diseases such as measles, all are potentially avoidable conditions.

The findings of many research projects demonstrate the need for education about the importance of primary health care, together with community resources to support families in the context of infant health care initiatives. Improving well child service uptake through education however may not be sufficient with the more widespread issues of deprivation and social equity needing to be addressed.

This year (2005), the Fiji Ministry of Health in recognition of the growing injury burden, added a new component on Accident and Injury in its current National Non-Communicable Diseases (NCD) Strategic Plan. Coincidently, the collaboration between the Fiji Ministry of Health, Fiji School of Medicine, and University of Auckland on the TRIP project saw the timely development of a new injury surveillance instrument that is currently being trialed prospectively within the Fiji health system.

Iris Wainiqolo,
School of Public Health and Primary Care, Fiji School of Medicine, Private Bag, Suva, Fiji
i.wainiqolo@fsm.ac.fj
Berlin Kafa,
Robyn McIntyre,
Rod Jackson,
Shanthi Ameratunga

Many stakeholders within Fiji collect injury data. The Ministry of Health is one such body that has been collecting injury data, which are presented in Annual reports in ICD Coding format. A review of these Annual Reports between 1988 and 1994 showed that Injury and Poisoning ranked within the top five causes of disease and death and accounted for 7-8% of total morbidity and mortality for Fiji. According to global estimates, the burden of injury is expected to rise and present an increasingly significant threat to the health of populations. This issue has only been highlighted in recent years as a ‘silent’ epidemic needing public health action.

[The Wellcome Trust (UK) and the Health Research Council of NZ fund the Traffic-Related Injury in the Pacific (TRIP) Project.]

Pacific alcohol drinkers in New Zealand: A comparison of the alcohol drinking patterns and related harms of New Zealand born versus Pacific born drinkers.
John Huakau
SHORE (Centre for Social and Health Outcomes Research and Evaluation)
Massey University, PO Box 6137, Wellesley Street, Auckland New Zealand. Ph +64 9 366 6136 or +64 9 414 0800 Ext 41348 or Ext41341, Fax +64 9 366 5149.
Email: j.t.huakau@massey.ac.nz

Aims:
To investigate if differences exist in the alcohol drinking patterns and related harms of New Zealand born versus Pacific born drinkers.
patterns of Pacific peoples resident in New Zealand because of their place of birth and to investigate if alcohol drinking patterns change with length of time that a Pacific person has been resident in New Zealand.

Methods:
Alcohol consumption measures (proportion of drinkers, annual quantity and frequency and typical occasion amounts and various reported alcohol harms) were extracted from the Pacific Drugs and Alcohol Consumption Survey 2003 database. These measures were stratified by place of birth (New Zealand or the Pacific). Those born in the Pacific were further stratified by their length of time in New Zealand. The patterns of alcohol consumption of New Zealand born and Pacific born were analysed by age and gender.

Results:
Pacific born females were less likely drink alcohol than New Zealand born females. Pacific born drinkers consumed similar amounts on a typical drinking occasion and annually as New Zealand counterparts. Frequency of drinking was similar also. However there were some differences in the above measures between various gender and age groups.

References:
Pacific Research & Development Services and SHORE/Whariki.


Improving oral health for Pacific people- the role of the Fiji School of Medicine from a training and education perspective.
Jonacani Tuisuva
Senior Lecturer
School of Oral Health
Fiji School of Medicine

Education and training of oral health personnel determines the role they will play in the community on graduation. The type of training must address the needs of the community in relation to the oral health problems, within the socioeconomic and political realities. This should translate to reengineering training to make it more applicable to the requirements of the consumer. This paper will present pathways taken to improve oral health for the countries that send their students to the Fiji School of Medicine. In particular it will elaborate on the structure and the content of the academic program, community and preventive aspects of the training, human resource, strategies and research in our endeavor to fulfill our mission of making the training program more relevant to the needs of the community and the skills necessary to tackle oral health issues.

Pacific Everyday Communities (EDC) in Auckland (April 2002 – June 2005)
Kaleti Moala-Mafi
Senior Public Education Advisor, Child Youth & Family,
National Office, Wellington, New Zealand

Everyday Communities is a very successful ethnic specific programme targeting the 7 ethnic Pacific communities in Auckland. The programme had two main components, Media and Community strands, and it holistically focussed on ‘well being and safety’ of our Pacific families.

Community awareness and its ownership were created through the media, community participation in forums and public events and its (community) ownership measured by the initiatives that were developed from the programme.

Everyday Communities was mostly driven by the Pacific community with the support of CYF and other agencies. The key findings from the community evaluations moulded the delivery of the messages as the programme progressed. This programme acknowledged the cultural dynamics of Pacific families, generational and language diversity within the groups and the sensitivity of these issues in the community. The programme also highlighted that people should seek help within their own or extended families, friends, churches, community services or Government agencies.

Community awareness and its ownership were created through the media, community participation in forums and public events and its (community) ownership measured by the initiatives that were developed from the programme. These were also key-indicators of the success of this programme.
Everyday Communities was robustly evaluated by BRC Marketing & Social Research and Independent Pacific Research and Evaluation and will be expanded to Pacific communities in Wellington and Christchurch in the new few years.

ONE SIZE DOES NOT FIT ALL – THE MEASUREMENT OF THE BODY FATNESS OF CHILDREN IN NEW ZEALAND BY BIOIMPEDANCE

K Puniani, EC Rush TaPasefika PHO
31 East Tamaki Rd, Papatoetoe and Faculty of Health & Environmental Science, Auckland University of Technology.

The 1997 National Nutrition Survey showed that on average, adult New Zealanders are getting fatter by one gram each day. Through out the lifecycle access fat accumulation is associated with increase likelihood of diseases. But the definition of excess fat is not clear and techniques for measurement of fat in population surveys are limited. Body Mass Index (BMI) is the common measure of body size, which is the body weight (kg), divided by height in metres squared (m²). This is not a measure of fatness for an individual. In fact it has been shown that for the same weight and height there are differences in the body composition of adult Pacific Island, Maori and European people in New Zealand. For the same body size on average Maori and Pacific people have less fat mass (FM) and more fat free mass (FFM) than European. Thus, these differences were also expected to be found among children of Maori, European and Pacific ethnicities. In New Zealand, there is insufficient specific data available on the body composition of children of different ethnic groups. The aim of my study was to develop an appropriate measure of body fatness for Maori, Pacific and European children, aged 5-14 years using bioimpedance measurements validated by deuterium dilution.

How do cultural groups respond to Traffic-related injuries leading to death in Fiji?

Ms. Litiana Kuridrani [MBA,PGDip.Social Policy Admin, PG Diploma BA(HRM),BA Management / Sociology(double major), PG Cert PH, FNRNO] School of Public Health & Primary Care, Fiji School of Medicine, SUVA, Fiji Islands. l.kuridrani@fsm.ac.fj

David Thomas,
Shanthi Ameratunga

There is a growing recognition of traffic related injuries as the global public health concern. Recent projections suggest that injury is the leading cause of death and disability in middle and low-income countries. A very large number of high-income countries (HICs) have been estimating the cost of road traffic crashes over the past three decades. The methods used and costs allocated have generated a great deal of discussion and debate, in particular because of the difficulty of putting monetary values on pain and suffering (Mohan, 2002).

An estimate of the total national cost of road accidents will help governments realize the heavy economic losses incurred annually as described in the gross output method of accident costing and socio-economic aspects of road accident in developing countries, (Rod, 2003). Governments must try to reduce these losses by providing road safety improvements and should see expenditure on road safety as an investment and not as a cost.

According to the Land Transport Authority of Fiji report, 2003, there is evidence of the increased trend of traffic related accidents around the country.

Injuries are listed as one of the top five major causes of deaths and hospitalization of almost all Pacific island countries (Rod, ibid; p.19). Reliable information about the causes and consequences of road user injuries in Pacific countries is described as the “black hole” denying opportunities to prevent injuries or their consequences for those involved, their families and communities. (Rod et al, op cit).

According to the Land Transport Authority of Fiji report, 2003, there is evidence of the increased trend of traffic related accidents around the country. This is projecting the increased number of families that will be burdened by grief and sufferings of losing family members in traffic related deaths. Fiji on the whole will continue to face more socio-economic effects and implications of dealing with this as an important issue of concern.

This study is concerned with how families in Fiji share their responses to traffic related deaths. This is a qualitative study using grounded theory and it attempts to explore and describe the monetary costs of pain and sufferings, the perceptions and the depth of emotions, cultural expressions and meanings, the traditional coping mechanisms and the burden to the family having to lose a loved one and a breadwinner in traffic related deaths.

Can We Live On Luck Alone- What Are the Consequences of Gambling and Implications for Pacific Nations
Many people from the Pacific who have come to live in New Zealand or raised in a New Zealand environment have learned to gamble. The health consequences of gambling for Pacificans in New Zealand is increasingly becoming visible with major impacts on family relationships, health of children, dependence on social services and increasingly imprisonment.

Gambling and the promotion of the business luck to provide funding for governments, community groups and gambling providers is now a global health issue. The experience of New Zealand and the impact of gambling on Maori and Pacific peoples will be discussed so that Pacific nations can learn from our experience. Gambling in New Zealand is now recognized as a major public health issue alongside other communicable and non communicable diseases. The ill health effects of gambling and problem gambling need to be considering seriously in the Pacific before Pacific nations make gambling widespread and easily accessible to local people not just tourist.

Body Image Among Adolescents From Different Cultural Groups

Marita P. McCabe,
Lina A. Ricciardelli, Helen Mavoa,
David Mellor,
Professor Marita McCabe
School of Psychology, Deakin University, 221 Burwood Highway, Burwood, Victoria 3125, Australia

This paper reports on a series of qualitative and quantitative studies that our research team has conducted over the last ten years to evaluate the body image of Indigenous and Anglo Australian adolescent boys and girls as well as Fijian and Tongan adolescent males and females. Most past research on body image has focused on adolescent females from Western societies. This research has demonstrated that females desire a slim body, that the vast majority of adolescent females are dissatisfied with their body, and they are commonly adopting strategies to reduce their weight. Until recently we had little understanding of the body image of adolescent males. Our studies reported in this paper suggest that adolescent males from Western societies evidence lower levels of body dissatisfaction than adolescent females. Boys are primarily focused on reducing body fat and increasing the size of their muscles. Levels of dieting are lower than among adolescent females, but they are more likely to engage in strategies to increase their muscle size. In contrast to the above findings, our studies among Indigenous Australians indicate that adolescent females are less concerned about their bodies, and have a larger body ideal than their Anglo counterparts. Indigenous males, however, demonstrated similar levels of body image concerns to the Anglo adolescent males. Interview data with Fijian and Tonga adolescent males and females demonstrated quite different body image ideals from those found in Australian society. Body image ideals for females were substantially large, and there was less focus on attaining an ideal body form. Similar findings were obtained for adolescent males. Although there were substantial similarities in the attitudes toward the body in these two cultural groups, there were also differences, particularly in relation to perceived pressures to alter the size and shape of one’s body. The above findings will be discussed in terms of the impact of sociocultural body ideals within different cultures on the body image of adolescent males and females.

IT’S NOT THE DRINKING: IT’S HOW WE’RE DRINKING - Culture Change in New Zealand

“COLLECTIVE CREATION OF OUR FUTURE: The Plight of the Modern Pacificans”

Metua Faasisila
National Manager Pacific Programmes
ALAC - Alcohol Advisory Council of NZ
Level 13: 36 Customhouse Quay
PO Box 5023, Wellington
Ph: 64 4 917 0511
Fax: 64 4 473 0890
Email: m.faasisila@alac.org.nz

Alcohol is one of the most commonly used drugs in New Zealand. While many Pacific peoples in New Zealand do not drink, those who do, tend to binge drink. This binge-drinking pattern is when the most harm occurs whether from accidents, assaults, unwanted sexual situations or relationship difficulties. Moderate drinkers generate the majority of health and social costs during periods of intoxication.

Binge drinking is typical of the wider New Zealand culture of risky drinking which ALAC is addressing with its culture change programme, a full social marketing programme which incorporates all the strands required to achieve the desired change in behaviour across all population groups. It is focused on attitudes and behaviour and must ultimately result in behaviour change. It concentrates on the cause of the harm (drunkenness) rather than targeting the vast range of harms that result. The goal is to enable New Zealanders to drink in a way that shows they believe that it is never okay to get drunk.

Research shows only 57 percent of Pacific peoples drink compared to 80 percent of the general New Zealand
population. Of that 57 percent the average amount consumed on a typical occasion was nine to 10 drinks for men and six drinks for women.

While it may not be practical to uplift an entire programme and replicate it in the Pacific, the principles are unquestionably transferable as is the model, and most importantly the goal.

**Measurement of costs of the community-based interventions for the prevention of obesity in adolescents: OPIC project**

*Dr Marjory L Moodie*

Research Fellow
School of Population Health, The University of Melbourne
4/207 Bouverie Street, The University of Melbourne
Victoria 3010, Australia, Tel: 613 8344 0662
Fax: 613 9348 1174. Email: mmoodie@unimelb.edu.au

The overall aim of the Pacific Obesity Prevention in Communities (OPIC) project is to fill the evidence gap about community-based approaches to prevent adolescent obesity in Tonga, New Zealand, Fiji and Australia. Interventions around physical activity and nutrition will be implemented, and a series of analytical studies on the socio-cultural, economic and policy aspects of childhood obesity conducted. Whilst the economic component covers both costs and outcomes, this paper focuses on the costing methodology.

The costing entails different three components (costs associated with the delivery of the interventions, cost offsets and production effects), and will be undertaken in three discrete stages (identification, measurement and valuation). The costing exercise within the OPIC project is a huge task, which offers some unique challenges given its scale, multiple sites and comprehensive nature of the intervention action plans. Whilst a protocol will be used to avoid methodological confounding between sites, it needs to flexible enough to permit local adaptation. Costs will be defined from an economic rather than a financial perspective. As with the measurement of outcomes within clinical trials, the level of rigour employed in the cost measurement needs to be balanced by tractable data collection requirements. Intervention pathways will be complex and issues of attribution and joint costs are likely to arise. Intervention costs will be assessed against current practice in the control communities which may itself pose measurement issues. The cost offsets and production effects will be based on modeled data, and will include sensitivity analysis around any parameters subject to uncertainty.

**Obesity Prevention In Pacific Communities (Opic) Study In Aotearoa New Zealand.**

*Ofa Dewes (On behalf of the Auckland OPIC Research Team)*

OPIC Project Manager, Pacific Health
School of Population Health, University of Auckland

Background

Pacifcans today are being attacked by a global and rapidly escalating disease – OBESITY. 1 in 3 children in Aotearoa New Zealand is obese. Its prevalence in our communities demands an urgent call to attention, to arrest the Pacific spread. There is no evidence to support the best approach to obesity prevention for comprehensive, community-based programs in young populations.

Aim

The aim of the OPIC study is to develop and evaluate community based intervention against obesity in South Auckland high school students.

Method

An overview of the Auckland OPIC project will be given.

The 5 intervention strategies for obesity prevention in schools were developed at an Angelo Workshop in 2004. They are: increasing the proportion of students eating breakfast before school; decreasing consumption of sugary drinks; increasing the healthiness of school foods; decreasing time spent watching TV; and increasing physical activity at lunch time and after school.

A quasi-experimental design, with baseline and follow-up measures, is being used to evaluate the intervention.

Baseline data were collected from February to July 2005 from about 3,000 South Auckland high school students, aged 13-18 years. Students completed questionnaires on lifestyle, quality of life and anthropometric measurements of obesity were collected.

Follow up student interviews will be carried out over the next 3 years. During this time the intervention will extend to Pacific churches in the study area.

Conclusion

The study will generate crucial evidence to aid and guide decision-making as well as public and community health...
action on obesity prevention.

Plenary Session Proposal
The Western Pacific Regional Office of the World Health Organisation, in conjunction with the Centre for Mental Health Research, Policy & Service Development (The University of Auckland) would like to host a plenary session at the conference.

In keeping with the conference theme: Collective Creation of Our Future: The Plight of Modern Pacificans” this plenary will provide a forum to background and present a proposal around a Pacific Mental Health Network. Importantly, this session will serve as an opportunity for discussion and debate about this proposal and the shape and operation of such a Network.

A panel will conduct the session and be made up of:

Dr Xiangdong Wang
Regional Advisor on Mental Health,
Western Pacific Regional Office
World Health Organisation

Dr Colin Tuikuitonga
Coordinator
Primary Prevention of Chronic Diseases
World Health Organisation

Dr Frances Hughes
Director
Centre for Mental Health Research
Policy and Service Development
The University of Auckland

Dr Francis Agnew
Psychiatrist
Isa Lei, Pacific Mental Health Services,
Waitemata District Health Board,
Auckland, New Zealand

We are also hoping to engage Dr Mapa Puloka in this session.

It is intended that the session comprise two presentations:
1. Dr Wang backgrounding the need for a Regional Mental Health Network
2. Dr Hughes outlining a proposal for a Regional Mental Health Network

This will then be open discussion around this proposal facilitated by the Panel.

The limiting of presentations to just two is intended to allow more time for discussion.

Why the Pacific Needs a Mental Health Network
Dr. Xiangdong Wang
World Health Organization
Western Pacific Regional Office, P.O. Box 2932, United Nations Ave. 1000, Manila Philippines. Phone:+63 2 528 9858
Fax:+63 2 521 1036
Email:wangx@wpro.who.int

For a range of reasons, many nations struggle to provide mental health care and treatment, and to develop appropriate and adequate legislation and policies, facilities, services, and workforces. As well, mental health has a low profile and priority in many communities and there can be limited understanding of and knowledge about it. This paper provides a broad overview of the current situation in mental health in the Pacific region. While acknowledging the achievements in many countries, this overview highlights the wide range of areas where there is a need for urgent action through approaches that are innovative, sustainable over the long term, and that will bring about immediate improvements in mental health at country level and across the region as a whole.

A Regional Mental Health Network in the Pacific – A Draft Proposal
Dr. Frances Hughes
School of Nursing, Faculty of Medical and Health Sciences
The University of Auckland, 85 Park Road, Grafton
Private Bag 92019, Auckland 1, New Zealand
Phone: 64 9 373 7599 ext 89554
Fax: 64 9 367 7158 [Internal: 82658]
Email:f.hughes@auckland.ac.nz

Building on the situational analysis provided by Dr Wang, this paper looks at the practicalities of developing and improving mental health policy, legislation, services and workforces in the Pacific region. In particular it proposes the development of a Regional Mental Health Network. In broad terms a Network would be a vehicle for countries that share existing geographic, social, cultural and/or other relationships to work together to address common difficulties or issues. By working
together, Network countries would be able to draw on their collective experiences, knowledge, resources and efforts. They would also be able to draw on the support and assistance of a Secretariat and Strategic Partners (individuals or organizations who can provide relevant expertise, resources and support). Importantly, the Network would provide an opportunity to maximise available resources, reduce unnecessary duplication and fragmentation of activities, improve co-operation and collaboration and ultimately build sustainable national and regional capability and capacity in relation to mental health. However, to be successful the Network needs to adopt a form that is attractive to countries and appropriate to their situation and needs, and evolve in ways and at a pace that reflect members’ circumstances and capabilities. In respect of these issues this paper offers some possibilities but intends, in the main, to be the stimulus for discussion and input around the development of a Regional Mental Health Network.

‘Mahino Mitaki’ Complexities concerning Collectivising Ownership: the NIU National Pacific Gambling Project

Pefi Kingi
Maori and Pacific Health, The University of Auckland, BP Tamaki Campus, Auckland, NIU Development Inc, PO Box 74-177, Market Road, Newmarket, Auckland 09 529 1492 tel 027 2545 855 mob pefi.kingi@actrix.co.nz

Mahino mitaki e mafola, mitaki to fakafaahi ua… “Mahino mitaki” would denote that the status of a good is very clear, very smooth, extremely calm, or very clearly understood. This is not the case with the problem gambling of the modern Pacifican of Aotearoa New Zealand. The data is not mahino, nor the prevalence, preferred forms/venues/types of gambling, and the ethnic breakdowns are guesstimated at best. Who does what where when and how is not “mahino mitaki” at all. Although it suits Pacificans (me!) to cite them, some claims are disputed, such as one derived from a national study where Pacific peoples are six times most likely to become problem gamblers (Abbott & Vohlberg, 1991). In turn, the impacts of gambling on our children, youths, tau mamatua and disabled groups is even less mahino. NIU Development Inc holds a national contract for Pacific problem gambling, touted to be an emergent silent killer and serious contemporary illness in our Pacific Communities. The National Pacific Gambling Project aims to provide a primary public health programme[s] focused on prevention, promotion and protection. This paper will outline the Pacifican plight in this field, some of the challenges, complex issues, and some of the solutions collectivised along on the journey. This presentation is partly made on behalf of the National Coordinating Problem Gambling Pacific Group, a national group that maintains oversight of the National Pacific Gambling Project. We not only collectively need to become part of the solution, we also need to take respective responsibility for the problem gambling that occurs within our families, extended families, church families, village families, urban families, and wider Pacific community. Mobilising towards a collective voice has not been without its challenges; ownership of resources has been relatively uneasy, and, collective ownership of the problem is not “mahino mitaki” at all. Kia mahino mitaki e tau amaamanakiaga ki ai.

We not only collectively need to become part of the solution, we also need to take respective responsibility for the problem gambling that occurs within our families.

Rebecca Webb, Senior Analyst for Pacific Policy and Strategy. National Screening Unit, PO Box 5013, Wellington, New Zealand.

The National Screening Unit (NSU) has stewardship of the breast and cervical cancer screening programmes in New Zealand. A strategic goal is to increase the screening rates of New Zealand-based Pacific women by 2008 so they are nearer to those of Palagi women. Over the next 12 months the NSU is undertaking a project to develop a map book of Pacific women’s regional breast and cervical coverage and participation rates. Data relating to the number of eligible women for screening and their location, demographics, income, occupation, education and deprivation status will also be included.

We intend to undertake a quantitative analysis of this data using new statistical software that provides increased explanatory power, and combine this analysis with qualitative information and women’s stories contained in a longitudinal evaluation of health promotion currently being undertaken by the National Screening Unit. We will be seeking extensive dialogue relating to the project with contracted screening providers (including our Pacific specific providers), our regional Pacific screening worker forums, the NSU Pacific Advisory Group and other interested parties. The map book is intended for National Screening Unit, screening providers and the wider primary health sector to enhance targeted screening initiatives for New Zealand based Pacific women. It will also assist the NSU is setting the future direction of breast and cervical screening services for Pacific women in New Zealand.
Risk Factors for Obesity in New Zealand Children aged 5-14 years: results from the 2002 national children’s nutrition survey

Robert Scragg
Noela Wilson
David Schaaf
Eljon Fitzgerald
Jennifer Utter

School of Population Health, University of Auckland, Auckland University of Otago, Dunedin, Massey University, Palmerston North.

Aim:
Investigate lifestyle factors associated with increased body mass index (BMI) in children aged 5-14 years.

Methods:
National cross-sectional survey funded by the Ministry of Health, with multistage sampling, of 3048 children with BMI measurements, interviewed about food and activity patterns. Means, adjusted for age, sex and ethnicity, were weighted to the NZ population, with standard errors (se) corrected for clustered sampling. Obesity and overweight defined by Cole criteria.

Results:
The overall weighted prevalence of obesity was 9.9%, and of overweight 21.3%. Adjusted mean (se) BMI was lower in children who usually had breakfast before school compared with those who ate it sometimes or not at all (19.1 (0.1) v. 20.0 (0.3), p=0.0012). Children who bought most or some of their school food or drink from a local shop had a higher mean BMI than those who brought it only from home (20.0 (0.3) v. 19.0 (0.1), p=0.0009). BMI was linearly associated with frequency of carbonated soft-drink consumption, being 18.8 (0.1) for children who drank soft-drinks less than once per week, compared with 19.7 (0.2) for those who drank soft-drinks more than once a day (p=0.0014). Mean BMI increased with the number of daily hours watching TV, being 18.8 (0.1) in children who watched <1 hour, 19.2 (0.1) for watching 1 to <2 hours, and 19.6 (0.1) for watching >2 hours daily (p=0.0031).

Conclusion:
Food and inactivity patterns are associated with BMI in NZ children. Interventions targeted at these lifestyle patterns may help reduce the prevalence of obesity.

Abstract, to be presented as a paper at the 7th Annual Conference of Pasifika Medical Association of New Zealand (PMA) with Tonga Medical Association, August 21-23, 2005

The burden of Injury and road traffic crashes in Fiji: a review of routinely available vital statistics

Dr Robyn McIntyre
School of Public Health and Primary Care
Fiji School of Medicine, Private Bag, Suva, Fiji
r.mcintyre@ fsm.ac.fj
Berlin Kafoa,
Iris Wainiqolo,
Rodney Jackson,
Shanthi Ameratunga

Injury is a major cause of the global burden of death and disability measured in disability-adjusted life years, with road traffic crashes projected to rank the second leading cause in low-income countries by 2020. The burden of injury in developing nations generally, and Pacific nations specifically, is poorly described. The Traffic Related Injury in the Pacific (TRIP) project seeks to obtain information on injuries in Fiji, Samoa and Palau and more specific information on road traffic injuries in Fiji. As part of the TRIP Situational Analysis, injury statistics available from the Fiji Ministry of Health and Traffic Accident Statistics from the Fiji Police were reviewed to identify important epidemiological patterns and trends. The findings are presented and discussed including strengths and limitations of the data, and the opportunities to inform injury prevention efforts and policy.

TRIP is funded by the Wellcome Trust, UK, and the Health Research Council of New Zealand.

Road Traffic Injury is Violent Crime*

Rod Jackson
Epidemiologist, University of Auckland.

This presentation explores the parallels between two modern epidemics – road traffic injury and coronary heart disease – from an epidemiologist’s perspective. Both are major causes of death, disease and disability; both are almost entirely preventable; both have several major causes that we know quite a lot about; and the incidence of both vary significantly from country to country indicating the potential for prevention.

The prevention of coronary heart disease in western countries was the public health success story of the second half of the 20th century. Between the mid 1960s and 2000 coronary disease mortality fell by more than two-thirds in many countries, including New Zealand.
The lessons learned from coronary disease are likely to be applicable to road traffic injury in western countries where recent trends in injury rates are favourable.

However, epidemics of both coronary disease and road traffic injury are looming in the Pacific and elsewhere in the developing world and it is predicted that these two health problems will be in the top 5 global causes of death, disease and disability in 2020. Unless we find ways of exporting our successful interventions while not exporting the causes of these global threats to health (e.g. fast cars and alcohol, cigarettes and animal fat), we will be held criminally negligent by future generations for genocide.

**Southseas Hawaiiki Programme Care Model: Facilitation Model**  
Selu Ma’asi  
Social Worker, Southseas Healthcare, Papatoetoe

The core focus of this model is encompassing the whole well being of our Pasifika families. It is responsible for collaboration of our service and other providers to ensure all aspects are covered to meet the needs of our families and also working towards families being independence of the service and taking ownership of action plans.

- Incorporate Pasifika values and raising awareness
- Established relationships with providers and community
- Maintain our values and cultures through networks
- Promote participation or responsibilities of those who access service.

**Mission Statement**

“Working under the one mind in order to achieve together”

**How do we reach our families?**

**Intensive Home Visiting:**

- Home delivery service which benefit most our families who does not have a telephone or transport.

**Needs Assessment on Family:**

- Identify family needs and problems
- Identify family strengths
- Identify appropriate services and resources
- Allocation of appropriate Case Worker
- Development of Care Plan

**Implementation of Care Plan with family:**

- Building Rapport
- Development of individual care plan for family members who has special needs eg. Mental, Physical, Medical disability
- Ensure access to appropriate and available resources such as HNZ, WINZ, Budgeting Service, Schools (Pre Schools) etc.
- Link, Advocate and involve family to other key agencies

**Gambling Issues within the Tongan Community In Auckland**  
Sione Tu’itahi  
Pacific Manager, Auckland Regional Public Health Service

This paper will share the key findings of a 18-month research project which was conducted between December 2002-June 2004. This research project grew out of the concern of public health workers and their networks and some Pacific community leaders that Tongans were experiencing the hazards of gambling. Vaka Ola, the Pacific Team within the Auckland Regional Health Service (ARPHS) supported the formation of the research project. The findings shows that Tongan people in Auckland are deeply involved in the array of gambling opportunities such as Casino, Pokies, TAB and Lotto.

The perspective of those interviewed was that gambling was having a negative effect on Tongan people and Tongan culture. Gambling has become a major health and social issue in the Tongan community.

An important purpose of this study was to inform the public and policy makers about what is needed. Interventions must be developed within a public health framework, empower those who participate and be culturally informed and ethnically specific. Specific recommendations are addressed to the New Zealand Government, to Territorial Local Authorities; to Public Health Units; to Social and Health Service providers; to community leaders to the pastors of churches and to Tongan Academics and Professionals. Given the targeting of poorer and under resourced communities by the gambling industry, possible cultural congruence, lack of social and financial opportunities, the lack of education about the odds of winning and the hazards of gambling and existing addiction it would be surprising if gambling did not increase in the Tongan community and with it increases in the social problem. Intervention is
urgently required.

Health Burden of Emergencies or Mismanagement of Normality
Professor Sitaleki A. Finau
School of Public Health & Primary Care
Fiji School of Medicine, Suva, Fiji
Ph: (679) 3321933 Ext: 1915, Fax: (679) 3321107
Email: s.finau@fsm.ac.fj

Disaster risk management (including the prevention of exotic epidemics; and recovery from nuclear experimentation) is a major preoccupation of public health in the Pacific. These have attracted special allocations of the meager health resources of many countries.

This paper defines and discusses health burden emergencies and disasters. It argues that these risks are the results of mismanagement of normality and suggests that improved management will minimize risks and vulnerability, improve resiliencies, and integrate the destruction of the eco-system and ego-system.

It argues that these risks are the results of mismanagement of normality and suggests that improved management will minimize risks and vulnerability, improve resiliencies, and integrate the destruction of the eco-system and ego-system.

Home
Tasileta Teevale (On behalf of the Auckland OPIC Research Team)
Research Fellow, Pacific Health
School of Population Health, University of Auckland.

Background
In line with the conference theme ‘Collective Creation of our Future’, the socio-cultural study for the New Zealand arm of the OPIC project proposes to investigate the home setting of Pacific adolescents to explore the socio-cultural factors that may promote or prevent obesity in Pacific communities residing in Auckland New Zealand. The family core and within our homes is where the fundamental beginning of our collectivism and future lies.

Method
The OPIC study sample, with which this sub-study is affiliated, are adolescents. However, it is primarily caregivers who control the resources for adolescent lifestyles, for example, physical activity resources, primary food source, schooling and church activities and other social activities (for example, with friends).

Values about food, diet, physical activity and body image are influenced by parents and other caregivers. This is particularly true for Pacific families. In particular, the socio-cultural sub-study will describe the attitudes, beliefs and values that are related to food consumption, physical activity and body image. Questions related to the provision of food within the home and the influences of key significant persons within the home were answered by adolescents. Preliminary results will show how and where adolescents are attaining their food from, and what types of food are available within their homes. Adolescents were also asked about their perceptions of their body image and whether parents and other family members influenced healthy eating and physical activity habits.

Conclusion
These results have the potential to assist implementation of the obesity interventions in communities.

Pacific Everyday Communities Programme in South Auckland
Telusila Vea
Pacific Health Section, University of Auckland, Private Bag 92019, Auckland, Tel: (649) 3737599 ext 86951
The pilot of Everyday Communities in Pacific Communities (EDC) rolled out during the period April – May 2003. The programme was robustly evaluated through small focus groups and by BRC Marketing & Social Research. The results have led to the development of a revised strategy and a further round of EDC in the Auckland Pacific communities commencing April 2004 – April 2005.

The Pacific EDC Programme was initiated by Child Youth and Family (CYF) targeted the Pacific families residing in South Auckland. This programme was developed to raise awareness and understanding of child abuse, neglect and family violence among the Pacific people.

The report presents the main findings of an evaluation of EDC within the Tongan communities in South Auckland area, for the second round of activity in 2004.

The Northern Regional Pacific Mental Health and Addictions Plan 03/05 (NRPMHAP) and its Implementation.

Tevita Liku Hingano
Northern District Health Boards Support Agency Ltd (NDSA)
Pacific Regional Project Coordinator
Northern DHB Support Agency Limited
Level 3 630 Great South Road. Penrose.
Private Bag 92 522
Wellesley Street. Auckland
(09) 580-9102

Introduction
This paper is to present the Northern Regional Pacific Mental Health and Addictions Plan 03/05 priorities and its current development.

Background
It has taken considerable effort and commitment from key people and agencies to develop Pacific mental health to its current state in the Northern Region. In 2002, the first regional plan for Pacific Mental Health in the Northern Region was developed by the NDSA and the Northern DHBs. This Plan was aimed to inform Planners and Funders of the needs of Pacific mental health in the region by identifying priority areas for development. It was also a response to the need of a more coordinated planning and efficient resource utilisation. Most importantly, the plan was set out to try and improve the lives of consumers who are using mental health services in the region. The NRPMAP outlines the priorities and key areas for Pacific Mental Health development for the following 5 years. This Plan was presented and endorsed by the Northern DHBs.

Priorities
Identified priority areas by the NRPMHAP are:-
- Development of Pacific Primary Mental Health
- Improve access to mental health services
- Partnerships with inter-sectorial organisations, communities, family and service users
- Workforce development
  - Research and Information
  - Improve Quality

Subdural haemorrhages are most often caused by traumatic brain injury, where there is impact to the skull by a solid object at speed e.g. a motor vehicle accident, assault, or falling on a hard surface.

In September 2004, the Implementation Plan was developed. It details specific goals and objectives for each DHB and agencies to achieve in an identified timeframe. These goals and objectives are based on the priorities identified in the NRPMAP. Implementation is underway.

Fatal Subdural Haemorrhages in Pacificans
Timothy Touhuni Funaki and Assoc

A subdural haemorrhage (SDH) is the rupture and bleeding of a blood vessel within the membrane that encloses the brain. As the brain is only accustomed to a small amount of fluid surrounding it in the skull, the collection or pooling of blood from a SDH can increase the pressure on the brain, causing damage. Depending on the severity of the haemorrhage this can result in a deficit in brain function or death. Subdural haemorrhages are most often caused by traumatic brain injury, where there is impact to the skull by a solid object at speed e.g. a motor vehicle accident, assault, or falling on a hard surface. In New Zealand there is evidence that Pacificans and Maori are over-represented in traumatic brain injuries as compared to the NZ European population. However it is important to note that not all people with traumatic brain injury have SDHs (e.g. people with a gunshot wound to the skull). In this presentation I will provide a descriptive analysis of fatal subdural haemorrhages in Pacificans in comparison to other ethnic groups, using
data from autopsies performed at the Auckland City Mortuary. From these findings I hope to provide a better understanding of SDHs -and to a large extent traumatic brain Injury- in Pacificans.

13 years ago in Pacific Health Dialog, D. V. Fatiaki stated, “Instead of being confrontational or demanding human/individuals rights above all else, it would be more constructive to acknowledge that preventive measures reduce the spread and burden of diseases.” PHD, 1995;2(2):86.
Editorial Assistance

Shirley Prasad
Aisake Matawalu

A happy and healthy 2008 to one and all! This will probably be the best way to introduce the new team working on PHD or rather facing an exciting journey towards the development of Pacific Health Dialog, a journal solely committed to promoting the many broad disciplines of community health and clinical medicine particularly in the Pacific.

The dynamic team consists of Shirley Prasad and Aisake Matawalu, who have taken on the devotion to improve and fully support PHD’s growth within the region and beyond. Although Setita Naqelevuki is no longer with us, we nonetheless acknowledge and appreciate her efforts with the journal and wish her all the best in her future endeavors!

Taking on the reins was not an easy task but overtime commitment and dedication has paid off as we introduce you the ‘Developing Human Resources for Health in the Pacific’.

Of course this would not have been possible without our authors and reviewers and we are very thankful to them for their time, commitment and passion for PHD. Their investment in PHD is immeasurable which will reap common rewards that will act in the solidarity of the communities.

As we had mentioned in our earlier issues that back issues of PHD have been archived in our website, in this issue we would like to mention that we now have a new website address (http://www.hrcpacific.org/archives.html) and this was done mainly to avoid confusion with the organization’s name and also to familiarize staff with the updating of website.

While we have the content pages and various abstracts of each of the back issues featured online, we are working on means of protecting the journals and having them accessible to current subscribers only. This will mean that more individuals and organizations will have to tap into PHD in order to access the journals. Providing online security for the journals is our foremost priority and we are now exploring ways on how to support the matter. In the pipeline are ways to provide online payment mechanisms for purchasing the journal and this we anticipate will be achieved by the mid of the year.

Lastly, we would like to acknowledge the tireless effort provided by Susan Shinagawa, Guest co-Editor on this issue, and her fellow co-Editors from the University of Hawai’i Deparment of Family Medicine and Community Health -- Drs. Lee E. Buenconsejo-Lum, Allen L. Hixon, and Neal A. Palafox -- without whom this issue would not have been possible.

We look forward to setting a new standard for PHD in the Pacific!