

Dental Manpower Development in the Pacific: Case Study in the Republic of the Marshall Islands

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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 three Marshallese dentists, eight Marshallese preventive dental assistants, 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 Pages 57 - 65)

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.^a 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;^b 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),^c 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.^d 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 six. The 2005 caries rate among elementary students in Ebeye

was 80%,^e 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.

Table 1. Summary of the dental manpower development activities.

Type of Personnel	Training Activity	# Trained
Dentists	Tutoring and monitoring of student progress at the Fiji dental program. Enhanced opportunities during school holidays.	3
Dental Assistants	Development of a local training program.	8
Head Start / Elementary Teachers	In-service training and increased outreach.	200
Health Aides	Oral health component of training expanded with emphasis on disease prevention.	16

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 five-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 Marshallese 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.

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Methods of Instruction

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

Subject	Time	Teaching Method
Individual review with instructor after each lecture topic	1 hour/week	Individual
Effective tooth brushing (for the student and patient)	3 days	Group/Clinic
Prophylaxis	One week	Group/Clinic
Fluoride varnish applications (each student completes two applications under supervision)	One week	Group/Clinic
Development of posters and health education brochures in Marshallese	Two weeks	Group/Classroom
Home visits for fluoride varnish applications, toothpaste and brush distribution, and dental health education (each student completes 25 home visits, visiting each home twice)	3.5 months	Individual
Infection control and clinical assisting (after lecture, groups of students rotate through afternoon clinic)	One month	Individual/Clinic
Front desk and communication skills	Weekly	Individual/Group/Clinic
Public speaking (students are required to make class presentations and respond to questions)	Weekly	Group/Classroom

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 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.

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.

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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 two-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 three 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*.¹ 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

1 Administration for Children & Families Grant, Head Start Bureau, U.S. Department of Health and Human Services.

a manner sensitive and adaptable to local cultures, and well accepted by local people and governments.

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