Palau's current and future capacity for disaster management.

David Rykken*
Paul Heiderscheidt**
Gregory Dever***
Stevenson Kuartei****
Pearl Maramoto*****

Administrator, Hospital Preparedness Program, Ministry of Health, Republic of Palau; *Medical Director, Hospital & Public Health Preparedness Programs, MOH ROP; ***Bioterrorism Hospital Preparedness Coordinator, MOH, ROP, Director, Bureau of Hospital & Clinical Services, MOH ROP;**Public Health Preparedness Coordinator, MOH ROP, Director, Bureau of Public Health, MOH ROP.*****Administrator, Public Health Preparedness Program, MOH ROP. Contact: David Rykken, Ministry of Health, P.O. Box 6027, Koror, Republic of Palau, 96940. E-mail: hprep@palau-health.net*

Abstract:
Despite the challenges of geographic isolation, a small population and limited financial resources, the Republic of Palau has been able to significantly improve its ability to address disasters through establishing an emergency health program funded by US Federal Grants. The ability to prevent and respond to ordinary emergencies and disasters has been bolstered by creating electronic Public Health and Hospital Emergency Operations Plans, improving and creating hospital surge capacity infrastructure in all units beyond recommended minimums, initiating a database of volunteers with disaster response related skills, creating pharmacy caches, developing a national HAZAMT team, teaching critical incident stress debriefing skills, creating and expanding communications networks, improving the pre-hospital care system, conducting active disease surveillance, and improving the scope and quality of lab services. New policies and procedures are implemented and sustained through an active education system incorporating drills, exercises and didactic teaching sessions. These improvements are being made in accordance with local and international legal standards. (PHD, 2005 Vol 12 No 1 Pages 99 - 104)

Introduction

The Republic of Palau is isolated geographically, has a population of 20,00 people and limited medical capabilities. An assessment of Palau's Health Disaster Plan conducted in February 2000 by the Center for Disease Control and Prevention's Pacific Emergency Health Initiative (CDC/PEHI) found that extensive upgrades in education, equipment, supplies, infrastructure, coordination and the plan itself was needed.[1,2] In particular, prehospital patient care was identified as inadequate3. Fortunately, Palau has been able to improve its capacity for disasters despite these challenges through concerted local efforts and timely U.S. federal grant funding and technical assistance. The Palau Ministries of Health and Justice, Palau Community College (PCC), and the Palau Chapter of the Red Cross are the local components that have initiated the process. Health Resources and Services Administrations' (HRSA) Hospital Preparedness and CDC's Cooperative Agreements are the current external funding sources driving local emergency preparedness development. Providing technical assistance and training since 2000 is CDC's PEHI[4], which has also partially funded the PCC-based Pacific Center for Emergency Health[5,6]. PCC's HRSA funded Palau Area Health Education Center (AHEC) has been a local interface along with the Ministry of Health in coordinating external technical assistance and training[7].

Surge Capacity Equipment and Infrastructure

Renovations currently underway in the emergency room (ER) of Belau National Hospital (BNH) will increase the hospital's ER capacity by 8 beds as well as provide such needed equipment as gurneys, ventilators, automatic vital sign machines, pulse oximeters, defibrillators and various diagnostic equipment for the extra ER bays. There will be new triage, laceration and isolation rooms plus a decontamination area outside the ER. The enlargements and improved patient flow allows for an expanded surge capacity, including ICU capacity within the ER. With these upgrades to the ER (and related upgrades to the Operating Room, and Intensive Care Unit), BNH will be able to stabilize up to 20 severely

injured patients simultaneously.
The isolation ward was renovated and two new negative pressure rooms were added. Plans are in place for a screening / decontamination room outside of the isolation ward that can be used for bio and chemical weapons victims. BHN can currently maintain, in negative pressure isolation, at least four suspected cases of a highly infectious disease (e.g., small pox, pneumonic plague, SARS, Influenza and hemorrhagic fevers). Soon, BNH will able to support the initial evaluation and treatment of at least 10 adult and pediatric patients at a time in negative pressure isolation.

The expanded ER and Isolation Room beds at BNH exceeds the population based surge capacity standards for Chemical, Biological or Radiological weapon attack on a population of 20,000.[8]

Electronic Emergency Operations Plans

Central to the effort of developing plans and management tools to help deal with disasters is BNH's new Hospital Emergency Operation Plan. This plan was developed concurrently and is fully integrated with the Ministry of Health's Public Health Emergency Operations Plan. Both plans have an electronic format, navigable with hyperlinks that allow a simple and intuitive way to rapidly access to information compared to paper based plans. The electronic plan format was conceived by CDC/ PEHI and adapted extensively to local requirements by the Ministry of Health (MOH) Emergency Health Section. The Hospital plan includes guidance on the formation of pharmaceutical caches, identifying and putting to work volunteers from the community, addressing the influx of patients escaping disaster scenes, assessing off-site areas to increase hospital bed capacity, and providing patient decontamination at BNH. These plans, developed in conjunction with communitee stakeholders, will ensure the protection of children, elderly, and those with special needs.

Surge Capacity

The U.S. is a major partner with Palau in providing external rapid assistance in the face of disasters as Palau's partner in the Compact of Free Association Treaty arrangement. Palau is currently negotiating MOU's with the US government which would ensure access to DMAT, MASH, and DMORT assets in the event of a disaster. MOUs are being negotiated for rapid evacuation of select mass casualties to distant tertiary care centers.

Most human medical resources are already at work full time in Palau, making for a limited pool of additional workers to call on in the event of a disaster. What additional resources do exist are being identified. Additional medical capacity has been added as a result of the CDC/PEHI team training more than 100 police, fireman and public health staff in an eighty hour First Responder course that includes triage, AED, CPR and First Aid training.

Soon, BNH will have trained more than 200 patient care personnel in the following courses: ACLS, Mass casualty triage and AED course, Pediatric Advanced Life Support, Primary Trauma Care, CISD and crisis counselor training, training and drills in the Incident Command System, First Aid/CPR and pharmacy technician training. Sustainability has been integrated into this effort by identifying key local personnel to be certified trainers for these courses. This training was and will be done primarily in partnership with CDC-PEHI, the John A Burns School of Medicine and CDC-Cooperative Agreement, HRSA Cooperative Agreement and the Palau Area Health Education Center grant funds.

A training coordinator is being hired to organize and train BNH staff in subject matters directly related to mass casualty incidents caused by explosive, chemical or biological agents using competency based curriculum. These courses will include: illness and disease management for healthcare professionals, event recognition, triage, and decontamination. Training will focus on post trauma rehabilitation and radiology as well as improving the ER, OR and ICU with a focus on Pediatrics and vulnerable populations. All education and training activities will be later used in exercises and drills. These activities will be complementary to those funded under the CDC cooperative agreement.

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Palau has also recently enacted a public law that will allow rapid and reliable credentialing and monitoring of disaster relief personnel through the formation of a nationally recognized Medical Licensing Board. There already exists a statute to provide medico-legal protection for visiting medical personnel providing care in Palau.

Pharmacy

Currently there are three pharmacies in Palau: Belau National Hospital Pharmacy and two private pharmacies. Pharmaceutical supply for BNH is unreliable. There is little reserve, and shortages of common drugs are routine. The stocks of pharmaceutical supplies in the two

private pharmacies are limited and not prepared for surge events. As a result of this insecurity of supplies within the Republic of Palau, the MOH created a local cache to protect all health care personnel for 3 days in the event of a disaster. A plan to ensure the proper organization, staffing, security, and logistics of the distribution and delivery of this cache is under development. Agreements were made between BNH and the two smaller private pharmacies to cooperate in times of emergency in order to address pharmaceutical surge capacity needs. With the assistance of the CDC/PEHI team and the CDC Cooperative Agreement Program, the MOH Emergency Preparedness Program developed and formalized the plan, protocols and MOUs to obtain US Strategic National Stockpile (SNS) caches of drugs and supplies on an emergency basis. This will provide the pharmaceutical security needs to address emergency surge events.

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In conjunction with the Bureau of Public Health, BNH will develop a community wide prophylaxis plan that is compatible with other existing state immunization or prophylaxis plans for the distribution of this cache.[9]

HAZMAT DECON

A Republic of Palau HAZMAT team consisting of 22 certified Hazmat technicians from the Ministry of Justice (MOJ), Environmental Quality and Protection Board and the Ministry of Health was created using HRSA Cooperative Agreement Grant funds. Personnel have been trained and certified according to US standards. A Hazmat plan has been developed and improved through five HAZAMT drills held to date. The Republic of Palau HAZMAT team is responsible for supervising patient decontamination at BNH or in the field. BNH is in the process of developing hospital SOPs for this process. BNH has constructed portable and fixed decon sites within the facility. Patient decontamination training and equipment for outlying dispensaries is being planned.

Palau will soon possess enough PPE to protect all health care personnel responding to a biological, chemical and radiological event. Furthermore Palau will posses sufficient numbers of fixed and/or portable decontamination facilities for managing all adult and pediatric victims.

The Palau HAZAMT Team has already proven its regional usefulness. After the February 2004 typhoon Sudal in Yap State, Federated States of Micronesia, Palau sent environmental health workers to help with Hazmat and sanitation needs. The Director of Health Services in Yap State noted that this one of the most beneficial contributions to the clean up and return to normalcy for the Yap islands.[10]

Infection Control

Infectious Disease control measures and Universal Precautions processes improved dramatically in the last year at BNH. Staff have been training hospital workers in proper gowning and de-gowning procedures. The Ministry has estimated the number of pre-packaged PPEs that would be needed to treat 10 SARS patients for 10 days in ICU care and acquired, stored, and created a system of inventory/maintenance for this PPE equipment.

The Infection Control and Prevention Committee (IPCC) updated the IPCC manual and will be offering continuing medical education on universal /standard precaution techniques to doctors, nurses, and maintenance personnel. Surveillance on universal precaution techniques and the overall cleanliness of the hospital environment is on going.

Mental Health

The Bureau of Public Health manages community and outpatient primary care activities as well as hospital-based behavioral health programs. Although the Bureaus of Public Health and Hospital and Clinical Services have their separate nursing staffs, MOH physicians work for both Bureaus. Therefore, the Bureau of Hospital and Clinical Services relies on Division of Behavioral Health doctors and nurses to provide acute and longer-term psychosocial mental health services at BNH. The goal of these psychosocial interventions is rapid return to functioning and return to the community, as opposed to diagnosis, treatment and referral.

The Behavioral Health Disaster Plan has been integrated into the Hospital Emergency Operations Plan. It includes descriptions of acute group or one-on-one psychological interventions; longer-term interventions for people directly impacted, their families, the "worried well", and responding health care workers; a list of behavioral health staff trained in incident stress management; appropriate mental health messages to the population affected by a terrorist attack.

Future directions for Behavioral Health Disaster planning include behavioral health issues related to quarantine and evacuation, death notification and risk

communication.

Communications

A Communications Plan is under development in conjunction with the Ministries of Justice and Commerce and Trade and the Palau National Communications Corporation to assure communications redundancy throughout Palau and the region.

Currently, there is a mixture of communications platforms available in Palau.[11] These platforms have variable reliability and coverage, with occasional Republic-wide outages. Handheld VHF radios and Short Wave HF radio continue to be the most reliable communications tools in the austere environments created by disasters.

The BNH ER contains VHF and HF radios which are linked to the National Emergency Management Office, the Fire Department's three ambulances and the hospital's two mobile Public Health medical units. This VHF/HF system has been expanded with 25 new VHF handheld radios and 3 base stations going to the Ministry of Justice, plus 40 new VHF handheld and 4 base stations reserved for the MOH. New antennas and repeaters have been installed. The VHF/HF system is the primary source of communication between BNH and the Ambulance service as well as a redundant system when cell or landline phone systems are inoperable. 24 emergently activated cell phones are being acquired for communications redundancy. Two new HF radios will be put in the dispensaries as a back up to the phone, cell and VHF systems. There are HF radios in the outer islands and some state offices that are used for emergencies. Staff will be trained how to use the communication equipment on an ongoing basis during drills and daily operations.

The surveillance for nosocomial infection will also be part of the on-going surveillance once the system is fully established. These tools, and the system that employs them, is being developed by an epidemiologist

Emergency Medical System

Palau has one ambulance system in Koror, which is managed by the Ministry of Justice. This system includes 3 ambulances and eight ambulance technicians who are also the Bureau of Public Safety's entire fire department. BNH is interested in the development of a nation-wide EMS system that is appropriate for Palau's population, geography, resources, and needs.

Palau has made much progress in developing the EMS system with the help of CDC/PEHI. Ministry of Justice staff has been targeted to receive CDC/PEHI and MOH sponsored First Responder, HAZWOPER, Primary Trauma Care and Mass Casualty courses. Two First Responder graduates have been certified as instructors and given additional experience in prehospital care through an EMT exchange program sponsored by CDC/PEHI and Henry County Fire Department (HCFD) in the United States. EMT trainers from Guam have also come to Palau to supervise EMT training activities.

This training is the extent of improved pre-hospital medical care for Palau. A fully realized EMS system or a program for pre-hospital care medical direction has yet to be established

Laboratory Services

There are three medical laboratories (ML) in Palau: one at the BNH medical laboratory (BNHML) and two smaller private ones. None of these MLs have the equipment or facilities to serve as a reference laboratory for biological, chemical or radiological samples. The Pacific Island Health Officers Association (PIHOA) is organizing collective CDC-CA resources to establish a regional public health laboratory on Guam that will also serve as a referral laboratory for BNH in the event of a biological, chemical or radiological incident. BNH will establish procedures for coordinating with public health to ensure a seamless screening, testing and reporting hierarchy for weapons of mass destruction samples.

BNH has improved its laboratory capacity and practices in general by hiring a lab trainer who has given trainings in blood safety, microbiology, and continuous quality improvement as well as parasitology and bioterrorism agents. Significant improvement has been achieved in the areas of quality assurance, medical laboratory health and safety, and blood safety.

BNH conducted a formal needs assessment of Palau's local ML capacity in both the public and private sector to find how these local MLs can cooperate with BNHML to provide surge capacity needs during a bioterrorist event. Discussion is underway to formalize existing relationships between the local MLs and BNHML that might be useful in responding to emergency events.

Innovative solutions still need to be explored to assure an adequate budget for reagents and supplies, machine maintenance and repair, training, worker protection issues, rotating stockpiles and back-up systems within the BNHML and the private laboratories.

Syndromic Surveillance

The Bureau of Public Health has traditionally been responsible for gathering epidemiological data within Palau, including within BNH. BNH has been working with Public Health to involve hospital and emergency room-based syndromic surveillance tools that will act

as an early warning system to alert the Ministry of bioterrorism events. The surveillance for nosocomial infection will also be part of the on-going surveillance once the system is fully established. These tools, and the system that employs them, is being developed by an epidemiologist hired for this purpose using CDC and HRSA Cooperative Agreement (CA) grant funds.

The Infection Control Panel conducts weekly surveillance on the availability of cleaning/hand washing supplies, proper disposal of hospital waste, universal precaution procedure adherence and the overall cleanliness in the hospital and the 4 dispensaries. BNH is developing a central office for all reportable diseases as well as a surveillance program. The current Hospital Information System is inadequate for BNH or Public Health syndromic surveillance needs. To address this, the BNH and Public Health Preparedness Programs will jointly collaborate in upgrading of the MOH HIS system with HRSA and CDC funding.

Large-scale exercises/drills will attempt to address scenarios affecting adults and children. Palau will use an all hazards approach with a focus on likely events, such as a typhoon or plane crash.

Exercises/drills

The Hospital Preparedness team, in coordination with Public Health, has conducted multiple disaster drills. Highlights include a National level tabletop exercise involving in a mock airplane crash, a 10-day drill using the Incident Command System to respond to the 9th Pacific Arts Festival[12,13], participation in Hawaii's region-wide Strategic National Stockpile drill and a hospital mass casualty/patient decontamination drill[14].

For FY05, the Hospital Preparedness team, coordinating with Public Health, will conduct multiple emergency notification phone tree activation exercises, 3 tabletop drills, 3 internal BT-disaster drills, and at least one National Disaster Drill to be coordinated with the National Emergency Management Office. Key to the learning process will be the post-incident analysis meeting to assess the success of the exercise/event with a view to addressing observed shortfalls.

Large-scale exercises/drills will attempt to address scenarios affecting adults and children. Palau will use an all hazards approach with a focus on likely events, such as a typhoon or plane crash. Exercises/drills will challenge management and response operations and test plans for hospital surge capacity (staff, beds, equipment). The exercises and drills will also test risk communication plans. Acute psychosocial interventions and psycho-educational briefings will be incorporated in exercise scenarios. Behavioral health professionals for adults and children will participate. BNH, dispensaries, private clinics, community health centers, emergency medical services, laboratories, and public health will also be involved in exercises.

Conclusion

Palau has been focusing on building infrastructure, conducting training, gaining experience through drills, creating legally supportable policies and procedures, and using the growing maturity of its healthcare workforce to increase its disaster management capacity. By strengthening the primary care system's routine function, Palau has also strengthened its capacity to deal with daily emergencies and larger disasters both locally and in the region. A fully functional, multi-agency supported per-hospital Emergency Medical System should be a priority for future development.

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Neither man or woman can be worth anything until they have discovered that they are fools
(William Lamb Vicount Melbourne)