Crossing Borders: One World, Global Health

Regional Partnerships for Communicable Disease Detection and Response in the US-Affiliated Pacific Islands

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The US-Affiliated Pacific Islands (USAPI) are composed of 3 US Territories (American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands) and 3 independent countries (the Federated States of Micronesia [FSM], the Republic of the Marshall Islands, and the Republic of Palau). These 3 countries are affiliated with the United States through Compacts of Free Association, which enable their citizens to travel to and live and work in the United States without visas or additional screening [1].

These island jurisdictions experience a number of endemic (tuberculosis, Hansen’s disease, enteric diseases such as hepatitis A) and introduced communicable disease threats. Since 2000, the region has experienced outbreaks of cholera (2000–2001 in FSM [2] and the Marshall Islands [3]), measles (2003 in the Marshall Islands [4]), and a number of emerging vector-borne disease outbreaks caused by dengue (2004 and 2011–2013 in FSM [5] and 2011–2012 in the Marshall Islands), Zika (FSM in 2007 [6]), and chikungunya viruses (FSM in 2013). The vulnerability to outbreaks in the US-affiliated and other Pacific islands is heightened by limited epidemiologic and laboratory surveillance capacity [7], travel patterns that facilitate disease translocation, geographic remoteness that may delay and limit external assistance, small populations with limited specialized human resources, and healthcare systems with limited surge and tertiary care capacity. Moreover, the introduction of new pathogens into immunologically naive island populations can result in high attack rates [6]. Increasing rates of noncommunicable diseases, including diabetes and associated conditions [8], further threaten the resiliency of these communities to communicable disease threats.

The World Health Organization (WHO), the Secretariat of the Pacific Community (SPC), and the US Centers for Disease Control and Prevention (CDC) each support national and territorial health authorities in the USAPI in strengthening detection and response capacity for communicable diseases. A key framework for coordinating technical assistance in the region is the Pacific Public Health Surveillance Network (PPHSN). This network was established in 1996 as a collaborative partnership between 22 Pacific Island countries and territories and technical assistance partners to strengthen communicable disease detection and response capacity [9]. SPC, WHO, and CDC representatives currently serve on the PPHSN Coordinating Body, along with members from Fiji National University and the Pacific Island Health Officers Association, and representatives from Pacific Island health ministries and departments.

The response to a dengue outbreak in the Republic of the Marshall Islands during 2011–2012 highlighted the benefits of enhanced regional coordination among PPHSN and other partners. In October 2011, dengue virus type 4 was detected by Marshall Islands Ministry of Health (MOH) physicians and laboratory staff. Early detection was enabled by clinical knowledge of dengue and the local availability of dengue rapid diagnostic tests pre-positioned by WHO in public health laboratories throughout the Pacific. Following notification of the CDC, WHO, and SPC, daily support conference calls were convened with Marshall Islands health authorities. At the request of the MOH, Hawaii-based CDC staff assumed a coordinating role to guide external partner assistance in support of the extensive MOH outbreak response efforts. A total of 33 formal coordination teleconferences were conducted during October 2011–February 2012. Through these teleconferences, interagency partnerships and assistance from the US Embassy in the Marshall Islands were engaged to coordinate additional support from the US Agency for International Development, US Department of State, US Department of Defense, US Department of Interior, Association of State and Territorial Health Officers, Hawaii State Department of Health, US Coast Guard, and Pacific Island Health Officers Association.

The coordinated international and interagency support enhanced the robust Marshall Islands government response to the outbreak. The MOH established dedicated hospital dengue wards, implemented enhanced epidemiologic and laboratory surveillance, and worked with other government agencies and community partners to reduce mosquito breeding sites and conduct community education for preventing and responding to dengue. CDC and WHO staff provided epidemiologic and entomologic technical assistance.
assistance and conducted dengue clinical management training. CDC provided reference laboratory testing. CDC, WHO, and SPC provided laboratory supplies, including dengue rapid diagnostic test kits. The US Naval Medical Research Unit 2 deployed a 5-person vector-control team, including personnel from Navy Environmental and Preventive Medicine Unit 6, to support Marshall Islands government pesticide application efforts. The vector-control team was later augmented by 3 Japan-based personnel from US Army Public Health Command Region–Pacific [10]. Epidemiologic investigation guided vector-control activities. US Coast Guard aircraft on unrelated missions transported the Department of Defense vector-control team from Hawaii to the Marshall Islands and assisted with transport of diagnostic specimens. The Hawaii Department of Health donated mosquito larvicide that was transported at no charge by United Airlines. The Association of State and Territorial Health Officials worked with a nongovernmental organization (Direct Relief USA) and one of its Corporate Alliance members (Merck & Co., Inc.) for the donation and shipment of insect repellents (valued at $100000) to the Marshall Islands and FSM (which was experiencing a discrete but concurrent dengue outbreak). Of the >1600 suspected dengue cases reported among persons in the Marshall Islands during this outbreak, 10% resulted in hospitalization and none were fatal.

Large disease outbreaks can quickly overwhelm the capacities of small Pacific island health departments, and coordination of external organizations and agencies can be a challenge to manage effectively. More than 15 external organizations and agencies were involved in the Marshall Islands dengue outbreak response and, because of the large number of partners, the Marshall Islands MOH requested CDC assistance to coordinate external partner support. The regular teleconference calls between the MOH outbreak response team and all external partners assured that gaps were identified and communicated, facilitated smooth and well-coordinated external partner response activities, and enabled timely external partner updates. Compared with other large disease outbreaks in the Pacific that lacked a dedicated external partner coordination mechanism, the external partner response in Marshall Islands was smooth, effective, and efficient and provides a model for future large outbreaks in the Pacific and beyond.

**Editorial comment (CB).** The vulnerability of island countries and territories to new pathogens has been recently highlighted by the translocation of chikungunya virus in the northern Pacific (FSM) and Caribbean and the introduction of Zika virus in French Polynesia. Regional coordination of technical assistance is an important approach to addressing the needs of island jurisdictions. In the featured case, interagency coordination among regional partners in support of the MOH enabled a broad and complementary array of resources to be deployed during a recent dengue outbreak without duplication of effort or deployment of unnecessary resources. This coordination allowed for providing epidemiology, surveillance, and laboratory resources specifically identified as needed to respond to the translocation of these vector-borne diseases in the region. Recent outbreaks of vector-borne disease in the Pacific and elsewhere also highlight the need for enhanced local capacity for mosquito surveillance and control. Partnerships such as the PPHSN can play a key role in supporting such capacity development by coordinating efforts among numerous partners. In the Pacific, PPHSN has supported coordination for public health capacity development through joint epidemiology training workshops and laboratory networking, and by exploring new training models for the region, including field epidemiology training.

Regional networks such as the PPHSN can facilitate enhanced coordination both during acute outbreak response and through ongoing public health capacity development activities.

**Notes**

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**References**


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