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Cyclone Pam, Vanuatu: A Case Study

A. Introduction: One of the strongest cyclones on record to make landfall in the South Pacific region struck Vanuatu in 2015. Remarkably, in spite of the cyclone's path of destruction, there were only 11 deaths. Disaster preparedness, activation of an early warning system, swift tactical operations and the response by the Government of Vanuatu, its Ministry of Health and partners as well as the resilience of Ni-Vanuatu people were critical in keeping the death toll low.

B. Facts of the Case: On March 13, 2015, Cyclone Pam, a category 5 storm with sustained winds of 160 and gusts up to 320 miles per hour struck Vanuatu, an archipelago of more than 80 islands in the South Pacific that is home to 270,000 people (at least 54,000 of which are children).¹ The cyclone affected between 166,600 and 188,000 people—60-70% of Vanuatu's population and neighboring countries. At least 65,000 people needed emergency shelter². Winds and tidewater at 13 feet damaged or destroyed 17,000 buildings including homes, schools and medical clinics. This was more than 70% of Vanuatu's health facilities and 50% of schools. Cyclone Pam damaged or destroyed water sources, 95% of the crops in the fields that families needed for food and banana and coconut plantations that were a vital source of income³. The total economic value of the effects caused by Cyclone Pam is estimated to be approximately \$449.4 million. Of this, \$270.9 million is attributable to damage and \$178.5 million is attributable to loss. Destruction totaled close to 65% of Vanuatu's gross domestic product⁴.

C. Epidemiological aspects of the event: Surely the loss of more than 70% of Vanuatu's health clinics negatively impacted morbidity, mortality and cost both directly and indirectly. An early-warning disease surveillance system designed to quickly detect outbreaks was put in place. Rapid diagnostic tests for malaria were administered and PCR tests were given to a cohort of 3009 people from three of the islands to test for an increase in incidence and none were found⁵. Given the severity of the disaster, Vanuatu suffered from a lack of food and safe water sources as well as poor sanitation and the relative risk for disease was high, including respiratory illnesses and other waterborne and mosquito-borne diseases such as typhoid and dengue fever. Most worrisome were the increasing number of reports of acute diarrheal disease, particularly in children⁶. In addition to the use of water tanks and filters, 190,000 water purification tablets were distributed as part of the risk mitigation and public health strategy. Post disaster recovery called for expansion of routine childhood immunizations and reproductive health services including maternal health/family planning, response to sexual violence, and adolescent sexual reproductive health services and information⁷. The World Health Organization and Vanuatu's Ministry of Health assessed needs and estimated the cost of coordinating emergency recovery and health response at \$300M⁸.

D. Management of the event: The public health response to Cyclone Pam before, during and after the disaster was extremely rapid, coordinated and effective. First responders included the United Nations Disaster Assessment and Coordination team, the World Health Organization, the Ministry of Health of Vanuatu, and disaster relief partner World Vision, a global humanitarian organization tackling causes of poverty and injustice⁹. Development partners helped Vanuatu communities prepare by getting to the islands in advance to help them protect their houses, informing villages at risk of where evacuation centers were located, pre-positioning shelter kits, water, food, kitchen and hygiene supplies, and more. In the aftermath of the cyclone, relief efforts prioritized restoring clean water through

rehabilitation of water sources, distribution of water tanks and filters, developing community gardens to grow food, rebuilding communal kitchens with better ventilation to reduce respiratory infections, and getting schools and health care clinics back up and running.

E. Communications of the event: Vanuatu's National Warning Centre sent thirty eight (38) different SMS comprehensive warnings, categorized by color according to threat levels to Vanuatu's 160,000 mobile phone users for a total of more than six million messages received across the country in the days leading up and during the cyclone¹⁰. The numerous communications sent by the Warning Centre were mission critical for residents and those with mobile phones receiving them directly were empowered to provide regular updates and real-time information to others within villages on the storm's approach, necessary actions to take, and let them know when it was safe to come out from sheltering. In the earliest stages of recovery efforts, communication around health priorities including disease surveillance, health promotion, vaccination programs and other preventive measures against outbreaks to prevent the spread of disease was paramount.

F. Summary: The Government of Vanuatu, through its World Bank-supported National Warning Centre as well as its partnerships with organizations such as World Vision have made major investments in disaster preparedness and recovery with life saving returns. It is estimated that every \$1 invested in emergency warning systems saves between \$4 and \$40 in disaster recovery¹¹. However, it is important to remember that Vanuatu is still considered the world's most disaster at-risk country¹². According to experts, in the next 50 years, it has a 50% chance of experiencing a loss exceeding \$330M dollars with more than 725 casualties and a 10% chance of experiencing a loss exceeding \$540M with more than 2,150 casualties¹³. It is not a matter of whether the next disaster will strike Vanuatu, it's when it will happen. Earnest efforts and investments must continue in order for the island nation to improve its monitoring and analysis of natural hazards as well as to enhance its early warning systems. Vanuatu's built environment for shelter infrastructure and access to food and clean water must be prioritized so as to mitigate food insecurity, malnutrition and the spread of disease due to contaminated water and poor sanitation, all significant global public health challenges.

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