

## Aftermath of Typhoon Haiyan: The Imminent Epidemic of Waterborne Illnesses in Leyte, Philippines

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Our small medical team composed of 2 doctors, 1 nurse, and a communications expert arrived in Manila 11 days after Super Typhoon Haiyan hit landfall. The Philippines is one of the largest archipelagos in the world—composed of more than 7000 islands, most of which are small and uninhabitable. Leyte, one of the larger islands, is located in the southern region and is home to one of the most densely populated cities: Tacloban.

Filipinos are accustomed to natural disasters of all sorts, mainly because of its emplacement in the Pacific Ring of Fire, or on top of a large tectonic plate fault line that delineates the Pacific region. The Philippine government has various levels of emergency measures in place, both nationally and locally. The governmental early-warning system works; most of the residents in various municipalities on the island heeded these warnings, and timely evacuations saved many lives. However, many people still face peril and disease at this time. It is unknown why, but many residents of Tacloban did not adhere to such warnings. They remained, and experienced winds in excess of 322 kph, and a tidal surge, which in some areas reached elevations of 9 m. The devastation was cataclysmic and too harsh to even exaggerate.

Three years ago I was a first responder in Port-au-Prince, Haiti, arriving within the first week after the devastating earthquake. The physical devastation I witnessed in Tacloban was horrifically and tragically worse (not deeming the destruction in Haiti less than epic).

### ARRIVAL IN THE PHILIPPINES

On arrival in Manila, our team immediately boarded a commercial airliner headed for Tacloban Airport. We were accompanied by Philippine and US military personnel, as well as a bustling and growing group of volunteers from various nongovernmental organizations (NGOs) from around the world. During the primary days of any disaster, chaos is inevitable. The first priority of any organization is to secure the safety

of those who survived. The universal motivator of anyone who volunteers is an inclination to simply help others. Although most governments have emergency disaster plans intact, a large enough storm can overpower even the most prepared cities. In Tacloban, several key municipal leaders were swept away by the storm.

The immediate postdisaster phase generates peritraumatic shock in many survivors; they typically exhibit signs of confusion and the lack of a clear command and control. Coupled with this is the shock of the volunteer. Everything is different. First is the devastation itself: buildings are leveled, trees are felled, and corpses of various species are scattered on the ground among stagnant water, tangled wreckage, and overturned cars and trucks. Most things are not where they are supposed to be, and everything is out of position. Beyond the newness of a place—the heat, the people, the smells, the food, the language—is an obliterated house, a car perched in a tree, and a large fishing boat half a mile inland. All of this derangement is most disorienting, giving one a small sense of the forces and energies that only a few days earlier turned everything normal into oblivion.

### ARRIVAL IN TACLOBAN

We deplaned, gathered our gear, and spoke to several members of various NGOs. Every team had at least 1 person who spoke English. Without this common language, cooperation among the disparate collection of people from around the globe would have been nearly impossible. The Department of Health had set up a post for all arrivals to register, but no one was stationed there. Therefore, we made our way to the nearest hospital, Remedios Trinidad Romualdez Hospital (founded and funded by the private sector), hitching a ride with another small medical team, headed by an emergency department physician from the United States.

Communication was difficult. Cell phones did not work. People gathered information using pen or pencil

and paper and relied on those they trusted the most. Disasters quickly bring everyone back to the basics: food, water, shelter, and the value of people physically around you. The entire experience was made more poignant because, whether victim or volunteer, interdependence was immediate: the victim needed a wound repaired, the volunteer needed directions; the victim needed antibiotics, the volunteer needed sugar for coffee; both needed shelter, both needed food, and both needed water.

Early on our first full day in Tacloban, we went to the Department of Health, which was headquartered at Eastern Visayas Regional Medical Center (EVRMC) to discuss where we might be most useful. The director shared a list of the top 5 illnesses with us, in rank order, presenting to the main hospital: upper respiratory infection, typhoon-related injuries, animal bites, acute gastroenteritis (AGE), and bronchial asthma. Below this list we observed the following notice: Casualties (as of 9 AM, November 17, 2013) in Leyte; dead, 2583; injured, 10 002.

The information provided indicated that the most human casualties occurred in Tacloban City, where 696 people were reported dead and 2800 injured. The fewest casualties were in Ormoc, which had 31 dead and 1779 injured. Several factors accounted for this variation, including elevation, total population, population density, and the protective effect of a well-placed mountain. One factor that could be controlled was the public emergency response: evacuating entire villages proved to be enormously successful, mitigating injury and limiting deaths in many of the smaller villages.

### OPPORTUNITY FOR PUBLIC HEALTH RESPONSE

Currently, an opportunity exists for a public health response to prevent further illness and death by anticipating the emergence of waterborne illnesses that lead to infectious diarrhea by viruses, parasites, and bacteria. The stagnant water and the damaged water and sewage infrastructure inevitably will lead to a vertiginous increase in postdisaster dehydration.

Dehydration is deadly and remains the second leading killer of children aged 4 years and younger worldwide. The children of Leyte already have been deprived of clean water. Also, on our second day, temperatures rose above 100° F (37.8° C). Before children even become infected with a waterborne illness, they are already mildly dehydrated in this environment. Even more troubling is the looming specter of cholera, a scourge of humanity for thousands of years. It remains endemic in Leyte. Cholera is the worst of all infectious diarrheas. Untreated, cholera can take a life within hours, with death rates of more than 30%, and even higher for the

very young, weak, and old.<sup>1,2</sup> Timely and proper treatment can reduce death rates to less than 3%.<sup>3-5</sup>

A coordinated and swift health and wellness response can prevent the same sort of disaster that occurred in Haiti after the devastating 2010 earthquake, where thousands of people died due to cholera, which unfortunately was introduced by foreign relief workers.<sup>6</sup>

Acute gastroenteritis will soon make it to the top of Leyte's Department of Health list. The following actions are what the local, national, and international community can do to assist:

1. Distribute clean water so that individuals are not tapping into the current contaminated water systems.
2. Urgently attend to the water and sewage infrastructure.
3. Institute an educational and awareness campaign.
4. Prepare and equip medical staff and volunteers with proven and effective treatment for dehydration as a result of infectious diarrhea, ie, oral rehydration therapy (ORT) and zinc supplements.

The timely use of ORT and zinc significantly reduces the death rates of cholera to less than 1%. Few medical interventions are this effective and predictable. A coordinated response by governmental, NGOs, and the Philippine private sector can save thousands of lives. We must act now.

### About the Author

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