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Assessing Puerto Rico After Hurricane Maria: Two Stories of Response Efforts

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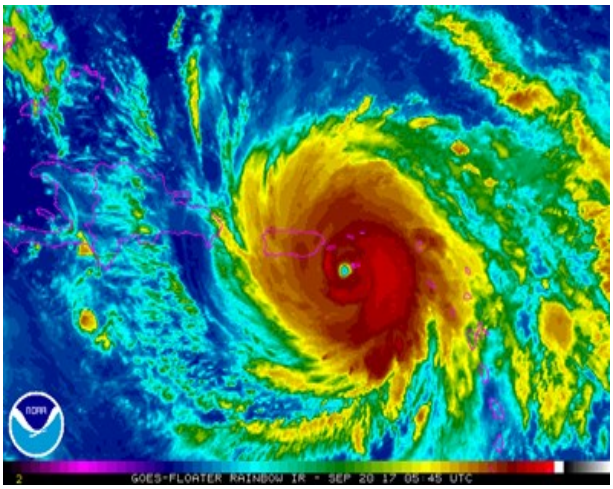

On September 20, 2017 just one week after Hurricane Irma skirted the coast of Puerto Rico (PR) Hurricane Maria made direct landfall. This storm, the strongest to hit Puerto Rico in 80 years, devastated the island leaving most without power and with limited food and water. There was widespread destruction of homes, damage to hospitals and schools and heavy flooding. The days and weeks that followed have been a time of recovery and a significant number of responders have been deployed to PR from the US to help with power restoration, delivery of medical and food supplies, transportation of water to regions with no potable water, construction, security and much more.

Dr. Andrew Cannons, the Laboratory Director for the Bureau of Public Health Laboratories-Tampa and Federico

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Gordon, a clinical laboratory scientist with the Moffitt Cancer Center with family in Puerto Rico, are two individuals from the Tampa area who traveled to PR to offer their assistance post Maria. Below are the accounts of their experiences.

Assessment of the PR Public Health Laboratories (PRPHL) after Hurricane Maria—Dr. Andrew Cannons

The PRPHL has been operational for many years. It provides laboratory services supporting numerous programs within the Department of Health, including water and milk programs and various disease control programs including tuberculosis (TB), human immunodeficiency virus (HIV) and sexually transmitted diseases. It also provides reference microbiological testing services, including parasitology, rabies testing, and influenza testing. There are three satellite laboratories within the organization of the PRPHL located in the cities of Arecibo, Mayaguez and Ponce. They provide limited, but important local services such as water and milk bacteriological testing.

In October 2017, at the request of the US Centers for Disease Control and Prevention (CDC), the Association of Public Health Laboratories (APHL) organized a team consisting of representatives from three APHL member laboratories, including BPHL-Tampa, to assess the Puerto Rico Department of Health Laboratories in the aftermath of Hurricane Maria. The APHL Team visited the main Public Health laboratory (PRPHL) to assess the current status of laboratory activities, identify requirements to restore essential testing services and determine long-term needs of the laboratories. The APHL team also visited the regional laboratories in Arecibo and Mayaguez to perform site assessments.

The APHL team learned the most significant impact of the storm was the lack of power which affected not only the day-to-day life of the inhabitants, but also caused major problems for the laboratories. The PRPHL and regional laboratories at Arecibo and Mayaguez lost valuable reagents and specimens because they did not have reliable backup power from generators. In addition, most of the PRPHL did not have generators, which meant no air conditioning or lighting for staff and no testing capabilities

A generator supplied by FEMA was installed and was operational at main Public Health Laboratory on October 24, the day the APHL team arrived. This powered the lights and air conditioning for the laboratorians, but it was producing too much voltage and consequently equipment could not be turned on. As of December 2017, there was still a lack of consistent power to maintain reagents and operate testing instruments. The regional laboratory at Arecibo also had generator power restored

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the day of the APHL team visit. Laboratory operations were set to resume once reagents were ordered and delivered.

In November 2017, 50 percent of Puerto Rico had full power restored, but the status of power to all the laboratories was still unknown. Once power is restored, the laboratories were instructed to conduct an assessment to ensure testing equipment is working per specifications, and reagents received before restoring essential testing services.

Both PRPHL and the regional laboratory at Mayaguez had severe roof damage from the hurricane resulting in substantial water damage when it rained. The water leaks can cause damage to equipment and make the laboratories unsafe, and also increase the risk of mold growth which can affect air quality of the buildings.

Six weeks after the hurricane there was still no testing in the PRPHL, and the status of testing at the regional laboratories at that time was unknown. It is also unknown when full testing services will be restored. Some essential testing (e.g. TB, influenza, Leptospirosis) is being conducted by other labs including CDC, some TB testing is being performed by Florida Department of Health Bureau of Public Health Laboratories. However, it should be noted that other essential testing, such as newborn screening and arboviruses, is being conducted in facilities that had proper backup generator power resources and in buildings not damaged by the hurricane.

Medical disaster relief in Puerto Rico – a personal account by Federico Gordon, JR.

It had been over two months since Hurricane Maria hit and though aid continued to be delivered to the island and conditions slowly improved, most basic services like electricity and water were still not fully operational as of November 10, 2017. My wife, who was born in Puerto Rico, has family that was without electricity. When my wife, an ARNP, heard about the need for basic medical relief, we decided to help.

My wife and I organized a response team that consisted of an ARNP medical provider (my wife), a public health educator, a street medic, a lactation consultant with previous disaster relief experience and myself, a clinical lab scientist. Our goal was to mobilize medical and disaster relief efforts in collaboration with Mutual Disaster Relief by formulating a response team to visit impacted communities to provide immediate access to health care, clean water, and electricity. Local friends and family connected us with key individuals who were instrumental in helping us execute our plan.

I was not prepared for the display of destruction caused by Hurricane Maria. Forty-five days after Hurricane Maria, approximately 50% of Puerto Rico had power, and

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access to running water was scarce in some areas. These conditions have significantly compromised the public health infrastructure of Puerto Rico. Lack of power required to operate vital wastewater and potable water treatment facilities significantly increases the risk of raw sewage, bacteria and other contaminants permeating into the drinking water sources of an already aging water system. The consumption of unclean water has led to several deaths associated with the bacterial infection leptospirosis, and other waterborne illnesses, as reported by the Puerto Rico Department of Health.[2]

Sixty-three of 68 hospitals were functioning on generator power for electricity, significantly limiting medical services.[3] Community Health Centers (CHCs) were also affected by the storm, with 10 of the 93 (11%) CHC sites reported closed as of October 20 (four weeks after the hurricane); it is unclear how many remain closed currently.[4] Further complications include evacuation of medical personnel, limited office hours for those facilities that were open, low supply of prescription medications, unemployment and rising costs required to sustain daily living and medical compliance.

There was a distinct change in the landscape since I last visited my wife's family a few years ago. The lush green vegetation that was so characteristic of this tropical island had been replaced by downed power lines and debris from abandoned homes destroyed by the storm. This was a common sight as we drove into the more rural areas farther from San Juan.

Traffic lights were inoperative in Vega Baja and many surrounding communities. Most open restaurants were very loud because of the use of generators which sounded like huge lawnmowers. The lights from these businesses also seemed to serve as the street lights for the neighboring roads. It began to get dark around 6pm, and one realized how much they missed streetlights after noticing how dark the streets became.

Working with local church groups and community leaders, our team provided medical aid to close to 100 residents in Canovanas and over 300 in Vega Baja over the next five days. We arrived on November 3, 2017, and set up pop-up clinics that provided free medical care to

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residents of five district areas. Each person was given an acute care form to record their vital signs, health history, medications, allergies, physical exam, diagnosis, diagnostics, and instructions for any follow up care. We provided trauma/injury care, prescriptions, supplies (insect repellent and over the counter medications), specialized care for breastfeeding mothers, infants and children. We also provided public health education for self-care and family care after a natural disaster, including information on mosquito control, water purification and safe water consumption, handwashing, water-borne infectious disease prevention, mold control and safe and healthy food consumption.

After scheduled hours, extended health care services were provided to the bedridden and homebound residents identified by community leaders in three districts. Community needs were identified and documented by the site coordinator, then the items were purchased and provided within 2-3 days.

My role consisted of operations/logistics, triage, setup, transportation, performing and acquiring point of care testing supplies for whole blood glucose, urine chemistry and flu testing during pop up clinic hours and home visits. Based on presenting symptoms and medical history, we performed 120 whole blood glucose tests, 10 urine chemistry dipsticks and 5 influenza A & B tests. Prior to performing point of care testing, instrument controls were performed per manufacturer guidelines on the FreeStyle glucometer and influenza kits for validity and reliability. No controls were available for urine dipsticks or the Contour brand glucometer but under the circumstances it was more important to perform the urine and glucose screening tests than not test at all.

As people approached me for testing, I had the opportunity to listen to their stories of desperation and loss. Many had lost everything. Their homes were uninhabitable.

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Schools had not reopened. Some were unable to work or had lost their jobs. Most were traumatized. I held their hands as I listened and tried to focus on the positives.

Despite the terrible conditions, most patient glucose results were within normal limits. Fasting patients often had results around 80 mg/dL. Patients testing below 90 mg/dL were encouraged to eat and were given glucose tablets if needed. Patients testing above 130 mg/dl were encouraged to make an appointment with their physician to confirm the elevated glucose screening result. Urine dipstick chemistry testing was normal except for one patient who had 2+glucosuria due to blood glucose of 371. Influenza screening tests were all negative for influenza A&B.

The connections created and, although sometimes difficult, the stories shared spoke to the resilience of people in Puerto Rico. I saw open, appreciative, and proud people adapting to their situation; taking it a day at a time in hopes that soon a sense of normalcy would return. In the meantime, communities were banding together to share their resources to meet basic needs for food, shelter and transportation.

This was a life changing experience where one is reminded of the power of one…one person, one idea, one action can be the beginning of changing the lives of many.

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Photos Courtesy of:
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Editor - Betty Wheeler

Biosafety risk assessment and lab biosafety training

The Bureau of Public Health Laboratories biosafety outreach officers (BOOs) are currently offering a course in biosafety risk assessment and laboratory biosafety to clinical laboratory institutions. The training consists of two sessions that are approximately one hour each and offered at your facility with no charge to the facility. The first session discusses biosafety risk assessment and the second session focuses on biosafety in the clinical laboratory. We also offer a one hour combined biosafety and risk assessment presentation for those facilities that have limited time for training.

Biosafety risk assessment is a systematic process of evaluating the potential risks involved in a laboratory procedure and determining the measures needed to manage any gaps or risks identified. The BOOs have created standard operating procedures and resource documents to assist clinical hospital laboratories in biosafety risk assessment and laboratory biosafety. This session will train clinical laboratory personnel on how to use these documents to perform risk assessments in their laboratory.

The second session is for anyone who works in the laboratory or is responsible for a safe working environment. Topics include general laboratory biosafety, the use of biological safety cabinets (BSCs), choosing correct personal protective equipment, proper use and removal of gloves, and spill cleanup. This training awards Florida clinical laboratory and nursing continuing education credits.

For more information or to schedule training, contact Ed Kopp at 813-233-2260 (Edgar.Kopp@flhealth.gov) or Lylah Seaton at 904-791-1569

Chemical Threat (CT) Preparedness Training

The CT laboratory coordinators continue to reach out to the health and medical community by offering training for CT preparedness at hospitals and county health departments (CHDs). This training covers chemical terrorism awareness and the collection of clinical specimens after a chemical terrorism event. Hospital and CHD staff play an important role in the response to a chemical exposure event when clinical specimens are collected for analysis. For your convenience and to increase participation, this training can be presented at your facility. Each course lasts approximately one hour. Florida clinical laboratory and nursing continuing education credits will be offered. Training manuals, "hands-on" exercise materials, and CT preparedness kits will be provided. This training is recommended for physicians, nurses, epidemiologists, emergency department personnel, phlebotomists, hospital and health department laboratory personnel and others who may collect clinical specimens. Contact the CT laboratory coordinators in your region for more information (see the Bureau of Public Health Laboratories Directory for contact information).

Laboratory Response Network (LRN) Training—Biological Defense

The Bureau of Public Health Laboratories is currently offering an LRN sentinel laboratory training course at no cost to you at your facility. This training follows the American Society for Microbiology (ASM) Sentinel Level Clinical Laboratory Protocols for Suspected Biological Threat Agents and Emerging Infectious Diseases. Scheduling the training at your facility is a relatively easy process. Determine when you would like to have the training and how many people will be attending. A time will be set up that is convenient for all. The training materials are provided, as well as the biodefense reference manuals for your laboratory.

The training syllabus includes: an overview of the LRN; Biosafety risk assessment and biosafety for the clinical laboratory; the ASM protocols for ruling out potential bioterrorism agents and how to refer a sample to the state LRN Public Health Reference Laboratory when a bioterrorism agent cannot be ruled out; and an introduction to the CDC Select Agent Program.

This class awards Florida clinical laboratory continuing education credits based on five hours of instruction. Please contact Betty Wheeler at 904-791-1568 (Betty.Wheeler@FLhealth.gov) to schedule a class for your facility.

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