



Post-Hurricane Maria Surveillance for Infectious Diseases in the Veterans Affairs San Juan Medical Center, Puerto Rico



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BACKGROUND

On September 20, 2017 Category 4 Hurricane Maria made landfall in Puerto Rico, causing widespread flooding, power outages, and lack of water service. Given the potential for infectious disease outbreaks, the Department of Veterans Affairs (VA) and Centers for Disease Control and Prevention (CDC) established enhanced surveillance to actively monitor priority infections at VA facilities.

METHODS

We queried VA data sources from August 27, 2017 – February 3, 2018. Pre-storm dates were included to establish baselines. We tracked trends in infectious disease ICD-10 syndrome groupings (respiratory illness/pneumonia, influenza-like illness (ILI), gastrointestinal illness, conjunctivitis, rash-like illness, jaundice) as a percent of total emergency department (ED) visits. We calculated the total number of laboratory tests performed, and percent positive per week, for influenza, hepatitis A, dengue (DENV), Zika (ZIKV), leptospirosis, and chikungunya (CHIKV). Specimens with negative nucleic acid testing results for ZIKV in serum and urine, and with non-negative ZIKV IgM Antibody Capture Enzyme-Linked Immunosorbent Assay (ELISA) were sent to CDC for confirmation by plaque-reduction neutralization testing (PRNT) for Zika and dengue viruses.

RESULTS

- ILI increased from 9.3% to 12.6% during the surveillance period (peak epi week 52: 15.7%) (Figure 1), while other ICD-10 based syndromes remained relatively stable.
- Weekly influenza testing increased shortly after landfall averaging 105 rapid influenza tests per week (epi weeks 41-4) (Figure 2).
- Influenza positivity increased in epi weeks 41 and 42 (7%), dropping in the following weeks, and peaked at 15% in epi week 2 (Figure 3).
- 17 acute infections were detected:
 - 2 positive leptospirosis DNA,
 - 1 positive CHIKV RNA, and 5 patients were positive for CHIV IgM
 - 1 positive hepatitis A IgM,
 - 1 was confirmed positive for ZIKV by PRNT
 - 7 were confirmed positive for DENV by PRNT
- 3 patients were equivocal for DENV IgM.
- Of the remaining ZIKV patients with positive, equivalent, or indeterminate IgM results tested for PRNT confirmation, 17 were confirmed as having had recent flavivirus (unable to specify which virus), and 1 was negative for both ZIKV and DENV.

Figure 1 ICD-10 Syndrome-Based Surveillance, San Juan VA Medical Center, Epi weeks 2017-35 through 2018-5

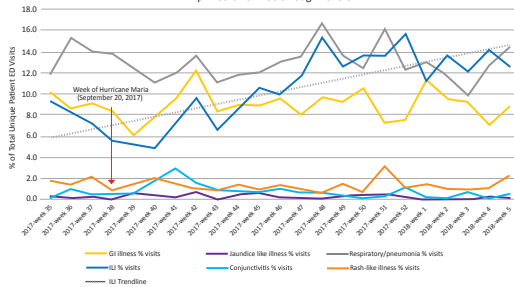


Figure 2 Laboratory Tests Performed by Week, San Juan VA Medical Center, Epi weeks 2017-35 through 2018-5

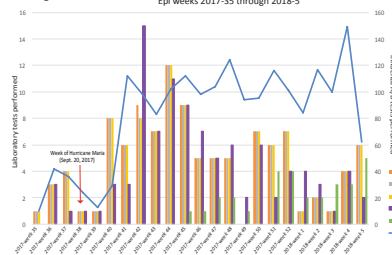
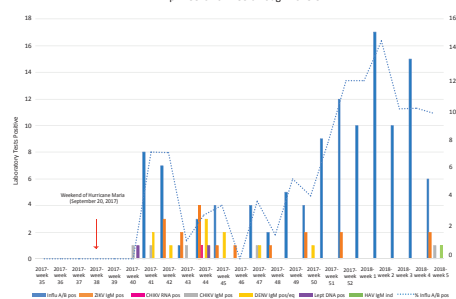


Figure 3 Positive Laboratory Tests, San Juan VA Medical Center, Epi weeks 2017-35 through 2018-5



LIMITATIONS

- Our syndrome groupings for rash-like illness, conjunctivitis and jaundice included some ICD-10 codes that may have been inclusive for non-infectious illnesses.
- We did not include ED chief complaint or inpatient discharge diagnosis data. These additional elements may have provided additional, more specific information.
- We limited the infectious diseases we monitored through laboratory testing, for example, we did not monitor for specific foodborne illnesses such as Salmonella or respiratory infections such as tuberculosis.

CONCLUSIONS

- We quickly established a simple surveillance system to monitor trends in priority infectious diseases.
- Increases in ILI, weekly influenza testing volume, and percent positive of influenza tests coincided with onset of influenza season.
- Diseases of public health importance, including dengue, Zika, hepatitis A, chikungunya, and leptospirosis were identified through laboratory-based surveillance.
- The impact of Maria on VA healthcare operations, including clinic closures, power outages, and disrupted care seeking patterns limited this system. However, the timeliness and flexibility of this surveillance system provides a model for disease monitoring following future natural disasters.

Disclaimer: The views expressed in this poster are those of the authors and do not necessarily reflect the position or policy of the Departments of Veterans Affairs and Health and Human Services or the United States government.