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Hurricane Maria response in Puerto Rico: Developing app-based survey tools during disaster response and recovery

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Background: Hurricanes Irma and Maria affected the US Territory of Puerto Rico in 2017 causing catastrophic impacts and damages to key facilities and services. As part of the overall public health response activities, a Public Health Branch (PHB), operating under the Department of Health and Human Services Incident Response Coordination Team, conducted environmental assessments of health care facilities throughout Puerto Rico using standardized Infrastructure Capacity Assessment Tools (ICAT).

Methods: After determining a redundancy of efforts and the significant amount of time required for data entry, data cleaning, and analysis and reporting of key findings, the PHB, in collaboration with the Puerto Rico Planning Board's GIS group, developed an app-based survey, including information on operational status and structural damage. The Field Assessment Teams piloted the ICAT app from October 31, 2017 to November 18, 2017 in 76 clinics. Additionally, the development team created a dashboard allowing real-time field data to be viewed by response leadership.

Results: The pilot work indicates the ICAT app saved a minimum of 1 hour per survey (minimum of 72 hours per week) that was previously required for data entry and data cleaning and reduced the errors encountered during translation of paper survey information into the electronic database.

Conclusions: GIS capabilities of the app were deemed extremely relevant and important in multi-agency emergency response settings allowing partners visibility on daily assessment activities. The ICAT app piloted during the Hurricane Maria response demonstrated the feasibility of this tool during disaster response activities. Currently, the ICAT app is being expanded to a broader set of assessment tools, the Comprehensive Disaster Assessment and Readiness Tools (CDART), which will allow for decrease redundancy/duplication of efforts, decrease respondent fatigue, and increase efficiency and data quality while allowing for real-time presentation of key information to response leadership during the disaster response phase.

Figure 1: Dashboard indicating status of health care clinics in Puerto Rico post-Hurricane Maria

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Biography

Elizabeth Irvin-Barnwell graduated with a BS in Human Biology and Anthropology from Emory University and a PhD in Toxicology from the University of Georgia. She completed a post-doctoral fellowship in Epidemiology at the University of Georgia where she evaluated body burden levels of environmental contaminants during pregnancy in women living in Trujillo, Peru. She joined the Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry in February 2010 as an Epidemiologist with the Health Investigations Branch. While at CDC/ATSDR, she has served as the lead project officer for the Polycythemia Vera Cancer Cluster Investigation where she provided expert consultation, guidance, and oversight for more than 15 research projects, including epidemiological, toxicological, environmental and genetics studies. Currently, she is working as a Community Studies Team Lead in the Environmental Epidemiology Branch where she supervises a group of multi-disciplinary scientists working on a number of diverse projects.

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