Addressing Challenges to Public Health Data Connectivity in Disaster Research

Jennifer Horney, PhD, MPH, CPH
University of Delaware
Why is a new approach needed?

Typical approach to disaster research

- Disaster-specific case studies with small sample sizes
- Lack standard variables that can be compared across disasters, over time and in different geographic locations
- Data collection can be expensive, time consuming, and place burdens on individuals / systems during response and recovery
- Limited ability to enhance resilience to future disasters of a different type, scale, or location
### Stronger, more frequent storms

- Harvey (2017) - Texas: 1538.7 mm (60.58 in)
- Lane (2018) - Hawaii: 1321 mm (52.02 in)
- Imelda (2019) - Texas: 1096 mm (43.15 in)
- Florence (2018) - N. Carolina: 912.6 mm (35.93 in)

https://www.wpc.ncep.noaa.gov/tropical/rain/tcmaxima.html
Residents of environmental justice neighborhoods have excess risks of exposure to chronic pollution, emergency spills, and high-impact natural disasters.
## Limitations of Health Data in Disaster Research

<table>
<thead>
<tr>
<th>Timeliness</th>
<th>Completeness</th>
<th>Data Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Room Data from GA:</td>
<td>Public health communicable disease data in Texas</td>
<td>• More “open” data</td>
</tr>
<tr>
<td>• Triage to reporting 33 – 45 hours</td>
<td>• 19% - 27% complete on first submission following surge capacity funding and staffing</td>
<td>• Less frequently hyperlinked to other data sources for context</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lack metadata needed to evaluate datasets</td>
</tr>
</tbody>
</table>
# Limitations of Health Data in Disaster Research

<table>
<thead>
<tr>
<th>Data Stovepipes</th>
<th>Data Protections</th>
<th>Lack of Interdisciplinary Understanding of Data</th>
</tr>
</thead>
</table>
| Time to linkage for national and state data to clinical registry data  
  • > 2 years for most state datasets in Australia | Precision Medicine Initiative (PMI)  
  • Links data on genes, the environment, and lifestyle to disease prevention and treatment while protecting privacy  
  • + targeted therapeutics  
  • - privacy concerns | • Algal blooms detection through remote sensing can prevent 400 gastrointestinal illnesses  
  • Understanding Chicago’s Urban Heat Island |
Exposure Data

- Satellite-based tropical cyclone intensity
- These types of data are agnostic to other vulnerabilities…
Exposure Data

- Also agnostic to other vulnerabilities
- More value when viewed in combination / spatial layers (industrial land use, land cover, or social vulnerabilities)
Mental distress by county

The map below presents estimates of the number of those who report frequent mental distress (14 to 30 mentally unhealthy days in the past 30 days). Figures are the most recent available, aggregated over 2003-2009.

Addressing Emerging Issues with PRAMS

- 2009-2010: Influenza supplement
- 2015: E-cigarette/hookah supplement
- 2016: Zika U.S. states supplement
- 2016: Zika Postpartum Emergency Response (ZPER)
- 2017: Marijuana & drug use supplement
- 2018-2019: STD surveillance
- 2019: Opoid supplement
- 2019: Opioid supplement

Baseline Data
Outcome Data

- To improve understanding of the causes and circumstances of deaths and injuries

- May not be reportable conditions
Study Design

• Use designations like the NOAA Coastal Hazard Zone to select “treated” counties

• Compare resident perceptions of resilience in counties impacted by a disaster and compare to those not impacted
The need to add rapid response...

- Research protocols in place (IRB)
- Baseline data to accurately attribute impacts to disasters
- Mutually beneficial partnerships that include stakeholders, residents, researchers, and practice partners
- Interdisciplinary understanding of data
Northeast Neighborhood, Wilmington, DE

- Site Inventories
- Participatory Design Workshops
- Development of Plans that Retrofit Vacant Lots
- Performance Evaluation: How much is the environmental and public health improved?
Foster trust, translate research, build resilience to future disasters

• Foster trust through community engagement by valuing local knowledge with “data”
  - Resilience is one aspect – economic development, recreation, value of sense of place / oral history

• Across all phases of the disaster cycle (i.e., preparedness, response, and recovery)

• Building community capacity and resilience to future disasters
Challenges remain

• Demonstrating return on investment to build out solutions (not just models)
• Finding funding for research translation and implementation
• Concerns about green gentrification
Questions?

Jennifer A. Horney, PhD, MPH, CPH
Professor and Founding Director, Program in Epidemiology
Core Faculty, Disaster Research Center
University of Delaware
horney@udel.edu