DISASTER AND DISPARITY:
Access to Federally Qualified Health Centers
and Superstorm Sandy

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The Health and Mental Health Effects of Superstorm Sandy in New Jersey
Disclosure

• Authors are long time researchers on physical and sociocultural factors in environmental health, and ecotoxicology.

• We have no financial relations, direct or indirect, with disaster relief agencies, cleanup agencies, or health providers.

• The study was funded by the CDC and our universities received support for 5% of our salaries over the two year period.
NEED FOR DISASTER PREPAREDNESS

- Disasters happen almost every day somewhere in the World
- With sea level rise, coastal flooding will increase in frequency and intensity
- Superstorm *Sandy* hit New Jersey on 29 October 2012
  - Advance warning of 4 days
  - Mandatory coastal evacuation orders from The Governor
  - 150 deaths, 2-3 million people without electricity
  - $70 billion in damages (only $15 billion in 1938)
  - Freezing weather followed storm
- Emergency facilities stressed and without power for 1-2+ week
Sandy struck the NJ coast perpendicularly
LANDFALL

- October 29, 2012
- The center of the storm made landfall just south of Atlantic City, N.J., around 8 p.m.
- It brought with it a record 4.2 m storm surge at the southern tip of Manhattan, breaking the mark of 3.0 m set in 1960's Hurricane Donna.

- ABC News
Cognitive dissonance

• Governor’s Mandatory “GET OUT” versus personal experience with Hurricane Irene in 2011
  • 2011 Negligible damage to coastal communities

• Competing Storm Models---
  • "maybe not as bad as predicted”
  • “Our models” not as dire as “European Model”
# Evacuation—Behavioral Risk Factor Survey

<table>
<thead>
<tr>
<th>Distribution of evacuations due to Sandy by time period (weighted percentage)</th>
<th>Estimated no. of evacuees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the storm</td>
<td>28.5% (25.3%–31.8%)</td>
</tr>
<tr>
<td>During the storm</td>
<td>25.4% (22.1%–28.6%)</td>
</tr>
<tr>
<td>After the storm</td>
<td>44.5% (40.8%–48.2%)</td>
</tr>
<tr>
<td>Not sure/refused to answer</td>
<td>1.6% (0.4%–2.9%)</td>
</tr>
</tbody>
</table>
Indicators

- Mortality—direct and delayed
- Emergency Department visits
- Hospitalizations & Re-hospitalizations
- Evacuations before, during, after
  - Phase I: Federally Qualified Health Center (Phase I)
    - CEO’s and Medical directors
    - Days of closure
    - Days to regain census and income
    - Lessons Learned
  - Phase II: FQHC 593 Patient interviews
    - Delays of needed Medical treatment (Phase II)
    - Brittle Medical conditions
NJ FQHCs Provide Comprehensive Care

One-Stop for Healthcare
- New Jersey’s Federally Qualified Health Centers (FQHCs) provide comprehensive, culturally sensitive, high quality primary medical, dental and behavioral health services for all ages.
- Services include prevention services as well as management of acute and chronic medical conditions.
- FQHCs offer services such as health education, care management, translation, eligibility assistance, transportation, and after hours coverage.

Access
- There are 20 FQHCs in New Jersey with 122 satellite sites located in all 21 counties of the State.
- NJ FQHCs provide healthcare services to over 464,000 New Jerseyans with more than 1.7 million visits annually.
- FQHCs are non-profit organizations governed by consumer-based Boards where at least 51% of the members must be patients of the health center.
- The majority of FQHC patients (85%) are either Medicaid enrollees or uninsured (56% Medicaid, 29% Uninsured).
- About 96% of patients have incomes at or below 200% of the Federal Poverty Level (FPL).  

Affordable
- Fees are based on patient’s ability to pay—FQHCs must offer a sliding fee discount and individuals are expected to pay what they can afford.
- Average cost per medical patient per year is $442; cost per dental patient per year is $334; and total cost per patient is $551 (as per 2013 data).
- Discounted medications are available either on site or through arrangement with a pharmacy.

Quality
- FQHCs follow strict standards with transparent and accountable quality outcomes reported annually to Health Resources and Services Administration (HRSA).
- 75% of NJ health centers are recognized as Patient-Centered Medical Homes (PCMH), a model of care coordination focused on continuous quality improvement and strengthening the primary care clinician-patient relationship.
- NJ FQHCs are using electronic Medical records to improve quality outcomes and deliver more personalized, coordinated and cost-effective care.

1 Low income patients are those patients that have incomes at or below 200% of the federal Poverty Level (FPL). As per 2015 Federal Poverty Guidelines, 200% of FPL is $47,700 for a family of four.
Federally Qualified Health Centers

- 20 Centers
  - 122 sites
    - 484,000 patients (5.4%)
      - 1.7 million patient visits

- NJ population 8.9 million
  - 5.4% of NJ population
  - 22,600 sq km

Red=Very heavy impact
Blue=heavy impact
Yellow-Moderate impact
Federally Qualified Health Centers

Sandy Impacted Levels:
- Not Classified
- 1
- 2
- 3
- 4
- 5
- 6
BRITTLE MEDICAL CONDITIONS

- Diabetes (insulin-dep)
- Asthma
- Arythmia
- Seizures
- Blood Clots
- Infections
- Cancer therapy
- HIV medication

- Electricity dependent
  - Dialysis
  - Nebulizer
  - Oxygen device
Two phases

• Phase I: interviews with CEO and Medical Directors
• Phase II: 593 patient interviews
• 7 sites represented
  • Medium
  • High
  • Very high impact
Phase I: CONCLUSIONS FROM ADMINSTRATOR INTERVIEWS:

- Early warning allowed Centers to protect vaccines
- Centers closed for 1-7 days – by state of emergency
- Two satellite sites physically destroyed
- Census Back to normal in 2 weeks to 3 months
- Electricity out for 0-14 days
- Most Centers had generators, but some ran out of oil
- Most satellite sites had no generators (too late to buy them)
CONCLUSIONS FROM ADMINISTRATOR INTERVIEWS:

MEDICAL

• Handling of Electronic Medical Records varied
• Patient schedules & records were printed out (but couldn’t be kept)
• Few problems reported for brittle medical conditions by doctors
• Problems with prescriptions, medications, or pharmacy
• Patients were often evacuated to new area (without their medications or prescriptions). Some never returned. This impacts bottom line
ETHNIC DIFFERENCES IN SANDY IMPACTS (n=593) for FQHC patients

<table>
<thead>
<tr>
<th></th>
<th>Hispanic/Latino</th>
<th>African American</th>
<th>Caucasian</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>% US Born</strong></td>
<td>9.8%</td>
<td>82.6%</td>
<td>79.9%</td>
</tr>
<tr>
<td><strong>Mean Years in US</strong></td>
<td>5.6 ± 0.6</td>
<td>19.9 ± 3.0</td>
<td>23.7 ± 3.1</td>
</tr>
<tr>
<td><strong>% Evacuated</strong></td>
<td>17.2%</td>
<td>12.4%</td>
<td>21.5%</td>
</tr>
<tr>
<td><strong>Mean days to return home (mean + SE days &amp; range)</strong></td>
<td>21.6 ± 6.1 1 - 190</td>
<td>20.8 ± 8.6 2 – 90</td>
<td>73.5 ± 22.4 4 – 425</td>
</tr>
<tr>
<td><strong>Mean days without power</strong></td>
<td>9.5 ± 0.7</td>
<td>8.1 ± 0.7</td>
<td>11.2 ± 1.8</td>
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</tbody>
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# MEDICAL EFFECTS BY ETHNICITY

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<th>Hispanic/Latino</th>
<th>African American</th>
<th>Caucasian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of Center visits (per year)</td>
<td>7.3 ± 0.8</td>
<td>5.7 ± 0.6</td>
<td>9.1 ± 2.6</td>
</tr>
<tr>
<td><strong>Self-identification of Medical Disruption</strong></td>
<td>9.3 %</td>
<td>11.7 %</td>
<td>3.9 %</td>
</tr>
<tr>
<td>Interruption of Medications</td>
<td>6.0 %</td>
<td>4.0 %</td>
<td>4.8 %</td>
</tr>
<tr>
<td><strong>Our Evaluation of Medical Need</strong></td>
<td>19.4%</td>
<td>19.3%</td>
<td>13.6%</td>
</tr>
</tbody>
</table>
Medical conditions listed by patients, and our evaluation of their need for medical services (doctor visit, ER visit, hospital, pharmacy)

<table>
<thead>
<tr>
<th>Medical Conditions</th>
<th>Conditions Listed</th>
<th>Number with Medical Need During Storm/Aftermath</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Listed Conditions</td>
<td>199</td>
<td>62</td>
<td>31%</td>
</tr>
<tr>
<td>Asthma</td>
<td>54</td>
<td>24</td>
<td>44%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>53</td>
<td>19</td>
<td>36%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>25</td>
<td>6</td>
<td>24%</td>
</tr>
<tr>
<td>Heart rhythms</td>
<td>20</td>
<td>13</td>
<td>65%</td>
</tr>
<tr>
<td>Kidney Disease</td>
<td>12</td>
<td>6</td>
<td>50%</td>
</tr>
<tr>
<td>Injury/musculoskeletal</td>
<td>8</td>
<td>3</td>
<td>37%</td>
</tr>
<tr>
<td>Seizures</td>
<td>5</td>
<td>3</td>
<td>60%</td>
</tr>
<tr>
<td>Depression</td>
<td>5</td>
<td>2</td>
<td>40%</td>
</tr>
<tr>
<td>Other conditions</td>
<td>32</td>
<td>10</td>
<td>31%</td>
</tr>
<tr>
<td>No Condition Listed</td>
<td>394</td>
<td>57</td>
<td>15%</td>
</tr>
</tbody>
</table>
Diabetes hospitalizations and ER visit rates in highly impacted areas only: 2012 vs. 2008 – 2011 combined

All NJ areas
PT2

Should we show this for ped asthma? I know it is negative, maybe I can reverse and do DM first then asthma.

Pauline Thomas; 13/07/2015
Disrupted Outpatient Medical Care in New Jersey
Rate per 1,000 ED Visits
October 22 - November 17, 2012
NJPIES CO and Gasoline Exposures by Date: Oct. - Dec. 2012

5 most frequent reasons for Sandy-related NJPIES calls in 2012 (n=489)

- 160 (32.13%)
- 160 (32.68%)
- 51 (10.42%)
- 46 (9.44%)
- 18 (3.69%)

Graph showing the frequency of cases by date and reason for call.
Dialysis Centers

• Many dialysis centers added a Sunday shift before Monday landfall
• 58% of dialysis patients received early dialysis
• “But three days is really pushing it,”
• Three dialysis chains reported
• 306 closed facilities Oct 30th.
• 19 closed on Oct 31
• 12 closed on Nov 1
• Only 4 closed on Nov 2
• Many operated on with generator power
LESSONS LEARNED

- Centers need redundant energy and staffing
- Provider/staff access just as serious as patient access
- Availability and maintenance of generators a priority
- Town-level preparedness as well as facility preparedness
- Obtain adequate mediation in advance
- Patients need to stockpile non-perishable food, water,
- and have redundant communications methods
Halpin 2013 “Impact of Superstorm Sandy on New Jersey Towns & Households”

• **ALICE**: *(Asset Limited, Income Constrained, Employed)*

• **Households with income below the ALICE Threshold** were disproportionately impacted by Superstorm Sandy,

• incurring 53% of residential expenses and receiving only 27% of resources.

• These families were negatively impacted by Superstorm Sandy across the state, even in areas where damage was not severe.
When it came to medical access, Superstorm Sandy was a great leveler.

- Community Emergency Closures caused more delay than provider closures.
- Wealthy communities washed away:
  - Lost electricity
  - State of Emergency
  - Private providers closed
  - Pharmacies closed
  - Evacuation
Resiliency and Sustainability

• Building “resiliency” was often heard

• “Sustaining preparedness” not so much
• All Centers had after action plans and lessons learned.
• Many purchased generators
• Preparedness has a way of decaying over time with some relatively short half life
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