Climate Justice and Public Health

John Balbus, MD, MPH

Senior Advisor for Public Health
Director, NIEHS-WHO Collaborating Centre for Environmental Health Sciences
National Institute of Environmental Health Sciences

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In a warming world, if you’re cold, someone else is hot

http://www.washingtonpost.com/blogs/wonkblog/wp/2015/02/19/a-beautiful-view-of-the-polar-vortex-from-18000-feet/
Climate change is global.
Climate change impacts are local.
Climate change: threats as well as opportunities
Projected Temperature Change of Hottest Days

![Projected Temperature Change of Hottest Days](map.png)
Projected Change in Heavy Precipitation Events

Projected Change in Heavy Precipitation Events

Rapid Emissions Reductions (RCP 2.6)

Continued Emissions Increases (RCP 8.5)

Future Change Multiplier

1 2 3 4 5 6 7
Past and Projected Changes in Global Sea Level

- Proxy Records
- Tide Gauge Data
- Satellite Data

Sea Level Change (feet)

Year

1800 1850 1900 1950 2000 2050 2100

-1 0 1 2 3 4 5 6 7

6.6 ft
4 ft
1 ft
0.66 ft

Projected Changes:
- 1 ft by 2035
- 1.5 ft by 2100

Historical Changes:
- 0.66 ft by 1850
- 1 ft by 2000

Future Projections:
- 4 ft by 2100

Figure 3: Map of Coastal North Carolina and Sea Level Rise (Source: Poulter and, Halpin 2008).
Extreme events trend upwards in US since 1980
Impact of Climate Change on Human Health

- Injuries, fatalities, mental health impacts
- Asthma, cardiovascular disease
- Heat-related illness and death, cardiovascular failure
- Malaria, dengue, encephalitis, hantavirus, Rift Valley fever, Lyme disease, chikungunya, West Nile virus
- Forced migration, civil conflict, mental health impacts
- Respiratory allergies, asthma
- Extreme heat
- Air pollution
- Changes in vector ecology
- Increasing allergens
- Water and food supply impacts
- Water quality impacts
- Malnutrition, diarrheal disease
- Cholera, cryptosporidiosis, campylobacter, leptospirosis, harmful algal blooms

Slide courtesy of Dr. George Luber, CDC
The 3 elements of vulnerability:

- Exposure
- Sensitivity
- Adaptive capacity
North Carolina Extreme Heat Vulnerability

Source: nrdc.org
Vulnerability of NYC neighborhoods to chemical hazards and extreme events
Outdoor workers and heat stress - high exposures

TABLE. Number, percentage, and estimated average annualized rate of occupational heat-related deaths among crop workers, by selected characteristics — United States, 1992–2006

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No.</th>
<th>(%)</th>
<th>Total no. of workers</th>
<th>Rate</th>
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<tbody>
<tr>
<td>Total</td>
<td>68</td>
<td>(100)</td>
<td>17,227,000</td>
<td>0.30</td>
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<tr>
<td>Industry category</td>
<td></td>
<td></td>
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<tr>
<td>Crop production</td>
<td>52</td>
<td>(76)</td>
<td>14,454,000</td>
<td>0.30</td>
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<tr>
<td>Vegetable and melon farming</td>
<td>15</td>
<td>(22)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Fruit and tree nut farming</td>
<td>11</td>
<td>(16)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Other crops**</td>
<td>19</td>
<td>(28)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Other/Unspecified</td>
<td>7</td>
<td>(10)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Support activities</td>
<td>16</td>
<td>(24)</td>
<td>2,716,000</td>
<td>0.50</td>
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<td>Age group (yrs)</td>
<td></td>
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<tr>
<td>20–34</td>
<td>16</td>
<td>(24)</td>
<td>4,616,000</td>
<td>0.35</td>
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<tr>
<td>35–54</td>
<td>37</td>
<td>(54)</td>
<td>6,907,000</td>
<td>0.54</td>
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<tr>
<td>≥55</td>
<td>15</td>
<td>(22)</td>
<td>4,588,000</td>
<td>0.33</td>
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<td>Region of birth</td>
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<tr>
<td>Mexico/Central and South America</td>
<td>27</td>
<td>(40)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Other regions outside United States</td>
<td>10</td>
<td>(15)</td>
<td>—</td>
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<tr>
<td>Unknown</td>
<td>31</td>
<td>(46)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Month of injury</td>
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<tr>
<td>June</td>
<td>11</td>
<td>(18)</td>
<td>19,487,000</td>
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<tr>
<td>July</td>
<td>40</td>
<td>(59)</td>
<td>20,143,000</td>
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<tr>
<td>August</td>
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<td>(18)</td>
<td>19,064,000</td>
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<td>Other months</td>
<td>5</td>
<td>(7)</td>
<td>—</td>
<td>—</td>
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<td>Time of incident</td>
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<tr>
<td>Before 1:00 p.m.</td>
<td>13</td>
<td>(19)</td>
<td>17,227,000</td>
<td>0.08</td>
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<tr>
<td>After 1:00 p.m.</td>
<td>46</td>
<td>(68)</td>
<td>17,227,000</td>
<td>0.27</td>
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<tr>
<td>Unknown</td>
<td>9</td>
<td>(13)</td>
<td>—</td>
<td>—</td>
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<tr>
<td>State of injury</td>
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<td></td>
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<tr>
<td>California</td>
<td>20</td>
<td>(29)</td>
<td>4,041,000</td>
<td>0.48</td>
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<tr>
<td>Florida</td>
<td>6</td>
<td>(9)</td>
<td>838,000</td>
<td>0.74</td>
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<tr>
<td>North Carolina</td>
<td>13</td>
<td>(19)</td>
<td>551,000</td>
<td>2.36</td>
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<tr>
<td>Other states</td>
<td>28</td>
<td>(43)</td>
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</table>

* Per 100,000 workers.
† Percentages for certain characteristics might not add to 100 because of rounding.
§ Annual national average estimates (totalled for 15 years) of employed civilians aged ≥15 years, based on the Current Population Survey. Monthly total number of workers are monthly national average estimates. State total number of workers are annual state average estimates. Numbers are rounded to thousands.
¶ Labor force data not available.
** Includes crops such as cotton, tobacco, sugarcane, and hay; excludes oilseeds and grains.
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5724a1.htm
Heat: mortality in NYC linked to lack of air conditioning

Klein Rosenthal et al., 2014
Health disparities contribute to climate vulnerability

- Deaths and hospitalizations increase with heat in people with:
  - Cardiovascular diseases
  - Diabetes
  - Respiratory Diseases
  - Psychiatric

- Rates of diseases are associated with race and poverty
  - Stroke and cardiovascular mortality
  - Diabetes
  - Asthma
  - "Mentally unhealthy days"

Reducing health disparities: part of the climate justice agenda
Transformation is coming... equity must be part of it
Green Jobs, Sustainable, Healthy Communities
Summary

- Climate justice, health disparities, sustainable communities are all tightly linked

- Climate change brings significant threats but can also force transformative positive change for health

- New tools, assessments, and data resources can help communities protect and promote health
Thank you!

http://www.niehs.nih.gov/geh
http://www.globalchange.gov/what-we-do/link-climate-health