MCC STS Phase I Update: Human Health

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Public Health: Areas of Concern

Source: U.S. Centers for Disease Control and Prevention
MCC STS Report: Public Health Section

• Direct Impacts of Climate and Weather on Health in Maine
• Ecosystem-Mitigated Impacts of Climate Change in Maine
• Health Impacts Mediated Through Human Institutions
• Vulnerability
• Resilience, Adaptations
Direct Impacts of Climate and Weather

- Heat- and Cold-Related Illnesses
- Floods and Storms
  - Extreme precipitation events
    → Injuries
    → Waterborne disease outbreaks
    → Displacement, mental health effects
- Winter / wind storms
  → Injuries
  → Power outages: CO poisonings, foodborne illnesses, effects on healthcare infrastructure
  → Displacement, mental health effects

Data Needs:
- Projected number of extreme heat/cold days
- Projected measures of extreme precip events
Direct Impacts: Heat and Cold

Number of Heat and Cold-Related Hospitalizations
Maine 2001-2014
Direct Impacts: Heat and Cold

• Vectorborne diseases
  • Tick-borne diseases
  • Mosquito-borne diseases
• Food- and water-borne diseases
  • Vibrios
  • Harmful Algal Blooms
• Air Quality
  • Ozone
  • Particulate Matter – wildfire smoke, secondary creation from ozone/heat
  • Pollen, other aeroallergens

**Data Needs:**
- Projected number of degree days??
- Modeled pollen data?
Ecosystem-Mitigated Impacts: Vectorborne Diseases

Number of Tickborne Disease Cases
Maine 2001-2018

DIAGNOSIS
- Anaplasmosis
- Babesiosis
- Lyme

Number

Year

Ecosystem-Mitigated Impacts: Vectorborne Diseases

Accumulation of 1,240 degree-days >6°C. Orange/white = tick eggs hatch. 2040-49 assumes 1°C warming (Elias 2019). Figure: Sean Birkel, Climate Change Institute.
Ecosystem-Mitigated Impacts: Vectorborne Diseases

Record summer (June-July-August) precipitation in 2009 corresponded with record-setting abundance of the mosquito vector of EEEv in Maine.
Ecosystem-Mitigated Impacts: Air Quality

**Particulate Matter (PM)**

Percent of Days with Daily Average Particulate Matter (PM2.5) Concentration over 35.0 Micrograms per Cubic Meter by County, Maine 1999-2014 (Type of Data: Monitors Only)

**Ozone**

Number of Days with Maximum 8-hour Average Ozone Concentration over 0.075 Parts per Million by County, Maine 1999-2014 (Type of Data: Monitors Only)
Ecosystem-Mitigated Impacts: Air Quality

Pollen
Health Impacts Mediated Through Human Institutions

• Occupational health
  • Heat stress/stroke
  • Heat exhaustion/work capacity loss
  • Other occupational issues
• Mental health
• Violence and conflict?
Vulnerability

- Varies depending on exposure/outcome
- Low-income Mainers
- Kids & older adults
- Tribes
- Those with less social engagement/access to community resources
  - Those experiencing homelessness
  - Socially isolated
  - Refugees
  - Limited/no access to healthcare/insurance
  - Etc.
Resilience, Adaptations

• **Resilience**
  • Community-driven planning
  • Vulnerable and impacted groups included
  • Developing institutional readiness

• **Adaptation**
  • Individual, local, and state-level
  • Developing comprehensive response plans
  • “Climate-proofing” healthcare infrastructure
  • Improving surveillance
  • Improving wastewater management

→ Important to ensure that mitigation and adaptation steps recommended by other groups take public health into account – co-benefits vs. added harm
Climate Migration?

• Where does this belong?
Questions?

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Maine CDC has received funding from U.S. CDC’s Climate and Health/BRACE Program since 2010

~$250,000 per year

Work has focused on heat-related illness and vectorborne diseases