Drought and the Risk of Hospital Admissions and Mortality in western U.S. Older Adults from 2000 to 2013: a retrospective study

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Background: Drought and Health

• The UN refers to drought as, “The most far reaching of all natural disasters”
  • In 2011-2012 drought covered 65.5% of the U.S. and affected 150 million people
  • California just ended a 5-year extreme drought

What research done on drought and health?

Answer: Very Little! Almost a total absence of literature worldwide
Project Overview

• Modify a drought measure for health analysis
• Associations between drought and cardiovascular-, respiratory-disease, and total deaths
  • Older adults (age 65+) – Medicare population
• 618 U.S. counties in 22 western states (2000-2013)

Represents the largest epidemiological investigation of drought and health. First to investigate cardiovascular disease and mortality
Drought Characterization and Statistical Approach

- Used U.S. Drought Monitor
- 3 drought categories
  - Non-drought periods
  - Full drought periods
  - Worsening drought periods
    - Low-severity
    - High-severity
- Modeled health risks using a 2-stage Bayesian hierarchical model
  - Compared non-drought to either full or worsening drought periods (stratified by severity)
Percent Change in Health Risks During Drought Periods

**Mortality**: 1.55% (95% CI: 0.17, 2.95)

**Respiratory Hosp**: -1.99% (95% CI: -3.56, -0.38)

** Cardio Hosp. not significant, but show strong associations**
Health Risks Increase in Counties where Drought Occurs Less Frequently
Major Implications and Significance

- Drought exposure shows measurable and previously unidentified adverse health effects.
- The magnitude of risk increases in counties where drought is a rare exposure.
- With 46.2 million U.S. elderly, variations in drought can have major public health significance.
- The IPCC predicts increase in drought severity/duration under climate change.
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