Climate Change, Extreme Events, and Impaired Health: Maryland Perspectives

Pennsylvania Climate Change Advisory Committee
April 30th, 2020

Amir Sapkota, PhD
Professor
University of Maryland School of Public Health
amirsap@umd.edu
Outline

- Background
  - Climate Change and Extreme Weather Events

- Maryland Climate and Health Profile Report
  - Asthma
  - Myocardial Infarction
  - End Stage Renal Disease

- Climate change, plant phenology & allergic disease

- Concluding Thoughts
Corpses prompt French soul searching

By Clare Murphy
BBC News Online

Those shifting makeshift coffins into temporary morgues in Paris wear masks to protect them from the smell of the bodies of the elderly victims of France's heatwave.

2003: Britain swelters in record heat

Britain has recorded its hottest day ever as the temperature soared to 38.1°C (100.6°F) in Gravesend, Kent.

The record has actually been broken twice today. The first place to beat the previous record of 37.1°C.

Britain gets through its hottest July day ever

July 2006

Europe swelters; officials enact plans fearing repeat of deadly '03 summer

2010 sees record highs in Russia, Belarus and Ukraine but also many African, Middle Eastern and Latin American countries
Maryland Gov. Larry Hogan late Sunday night declared a state of emergency in what he called a “once-every-1,000-years flood.”
Extreme Weather Events (EHEs): Signs of Changing Climate

- May include
  - Extreme heat
  - Extreme cold
  - Torrential downpours,
  - Draught, hurricanes,

- Becoming more common, more intense & longer lasting

- This trend will likely continue in response to changing climate

- Strongest evidence?
  - Around us

Photo: Tony Gutierrez/Associated Press, Bill Feig
Maryland Climate and Health Profile Report
April, 2016

Maryland Institute for Applied Environmental Health
University of Maryland School of Public Health
College Park

Prepared for the
Maryland Department of Health and Mental Hygiene

http://phpa.dhmh.maryland.gov/OEHFP/EH/Shared%20Documents/Climate%20Change/MD_climate_and_health_FullReport_04182016%20Final.pdf

RESEARCH TEAM

Maryland Institute of Applied Environmental Health University of Maryland, College Park

Amir Sapkota, PhD
Associate Professor

Chengsheng Jiang, PhD
Research Assistant Professor

Suresh Setty, PhD
Postdoctoral Fellow

Crystal Romeo Upperman, MPA
Program Manager

Jared Fisher, MPH
Graduate Student

Maryland Department of Health and Mental Hygiene

Clifford S. Mitchell, MS, MD, MPH
Director, Environmental Health Bureau

Contributors

Ann Liu, PhD
Chief Epidemiologist, Environmental Health Bureau

Rachel Hess Mutinda, MSW
Environmental Health Bureau
Maryland Department of Health and Mental Hygiene

Nancy Servatius, PhD
Outreach Coordinator, Environmental Health Bureau Maryland Department of Health and Mental Hygiene

Jed Miller, MD, MPH
Medical Advisor, Science Services Administration Maryland Department of Environment

Steven Davis
Program Officer
Centers for Disease Control and Prevention

Xin-Zhong Liang, PhD
Professor, Department of Atmospheric and Ocean Sciences
University of Maryland, College Park
Exposure to extreme heat and precipitation events associated with increased risk of hospitalization for asthma in Maryland, U.S.A.

Maryland
Baltimore City
Prince George's County
Wicomico County

Age-Adjusted ED Rate per 10,000

- 25.6 - 28.4
- 28.5 - 50.2
- 50.3 - 74.9
- 75.0 - 133.5
- 133.6 - 216.0

Sutapa Soneja, Chengsheng Jiang, Jared Fisher, Crystal Romeo Upperman, Clifford A. and Amir Sapkota

Source: HPSA data updated on May 2016 and downloaded from https://datawarehouse.hrsa.gov/data/datadownload.aspx?PlainContent_rID=0/ED_8L_dd_topic_nl_0
Extreme Heat Events and Risk of Hospitalization for Heart Attack

Heat Wave Affecting People Around Baltimore

June 12, 2017 11:42 PM By Ava-joye Burnett

Filed Under: Heat Wave

Baltimore (WJZ) — The extreme heat has doctors worried that some people may not take it seriously. The moment you step outside, you feel the heat.

Ava-joye Burnett explains why the heat and humidity could be a deadly combination.


Summertime extreme heat events and increased risk of acute myocardial infarction hospitalizations

Jared A. Fisher1, Chengsheng Jiang1, Suryaajeet I. Soneja1, Clifford Mitchell2, Robin C. Puett1,2 and Amir Sapkota3
Is the risk of EHE related heart attack higher in counties with higher proportion of minority population?
Association of Extreme Heat Events With Hospital Admission or Mortality Among Patients With End-Stage Renal Disease

Richard V. Remigio, MPhil, MS; Chengsheng Jiang, PhD; Jochen Raimann, MD, PhD, MPH; Peter Kotanko, MD; Len Usuyat, PhD; Frank W. Maddux, MD; Patrick Kinney, ScD; Amir Sapkota, PhD
Plant Phenology - Nature’s Calendar

- Timing of seed germination
- Timing of leafing
- Timing of particular flower blooming
- Growing season length

Most sensitive indicator of ecological response to our changing climate.
Start of Season (Onset of Greening)

http://phenology.cr.usgs.gov/overview.php
Changes in Timing of Spring Onset and Asthma Hospitalization in MD

- Early
- Late

SOS Deviation (Days)

Estimates

IRR & CI

Very Early VS Normal • Early VS Normal • Later VS Normal
Vulnerability

- Disproportionate exposure to risk
- Unusually sensitive to that risk
- Lack capacity to adapt

Health Domain:
- Chronic diseases, Infants and young children, Elderly, Health care shortage zone

Social Domain:
- Certain ethnic groups, Minority populations, Linguistically isolated, Refugees, Economically disadvantaged

Psychological Domain:
- Mental health disorders, Substance abuse

Summary

➢ Extreme weather events are adversely impacting health of our communities

➢ The adverse health impact experienced by Marylanders is not equally distributed across geographic areas or population groups.

➢ The impact at local level will be exacerbated by existing disparities, individual sensitivity, preexisting conditions, and capacity to adapt.

➢ Planning is critical for building resilience. Must engage local stakeholders: planners, community leaders, faith groups, community health workers, citizen groups and non-profits.
Acknowledgements

Funding: CDC's Climate-Ready States & Cities Initiative