

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

Pennsylvania Climate Change Advisory Committee
April 30th, 2020

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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

Last Updated: Tuesday, 26 August, 2003, 14:54 GMT 15:54 UK

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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.



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- Middle East
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- UK
- England

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2003: Britain swelters in record heat

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

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



Europe on NBCNEWS.com

Britain gets through its hottest July day ever

July 2006

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

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theguardian

2010

World feeling the heat as 17 countries experience record temperatures

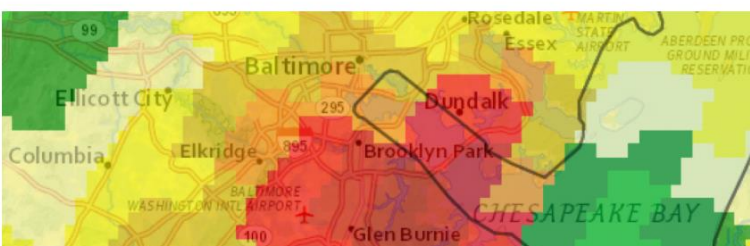
2010 sees record highs in Russia, Belarus and Ukraine but also many African, Middle Eastern and Latin American countries



Weather Service: BWI witnessed “between a 500 year and 1,000 year rainfall”

August 12, 2014

By Jason Samenow August 14, 2014



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USA TODAY

SPORTS LIFE MONEY TECH TRAVEL OPINION 84° CROSSWORDS WA

May 2018

Rain that caused deadly Md. flood event

July 31, 2016

Doyle Rice, USA TODAY Published 2:18 p.m. ET Aug 1, 2016 | Updated 6:06 p.m. ET



See the path of destruction left by a major flood in historic downtown Ellicott City, Maryland. Rushing waters took the lives of two people after tearing away streets and ripping apart buildings.



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DISASTERS · May 28th

Ellicott City, Baltimore region devastated by 'once-every-1,000-years flood'

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



Global vs Our Backyard



Source: Google image

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



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

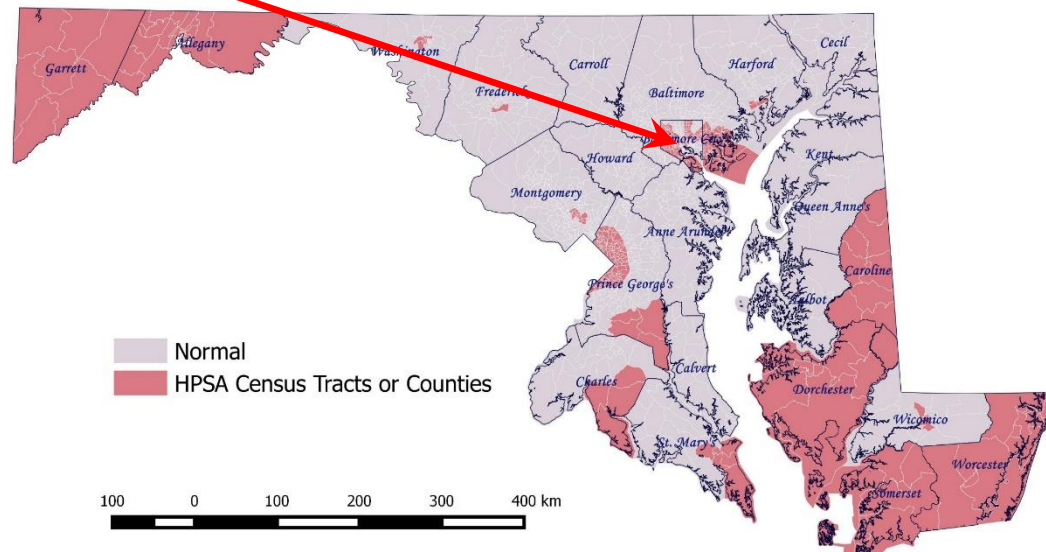
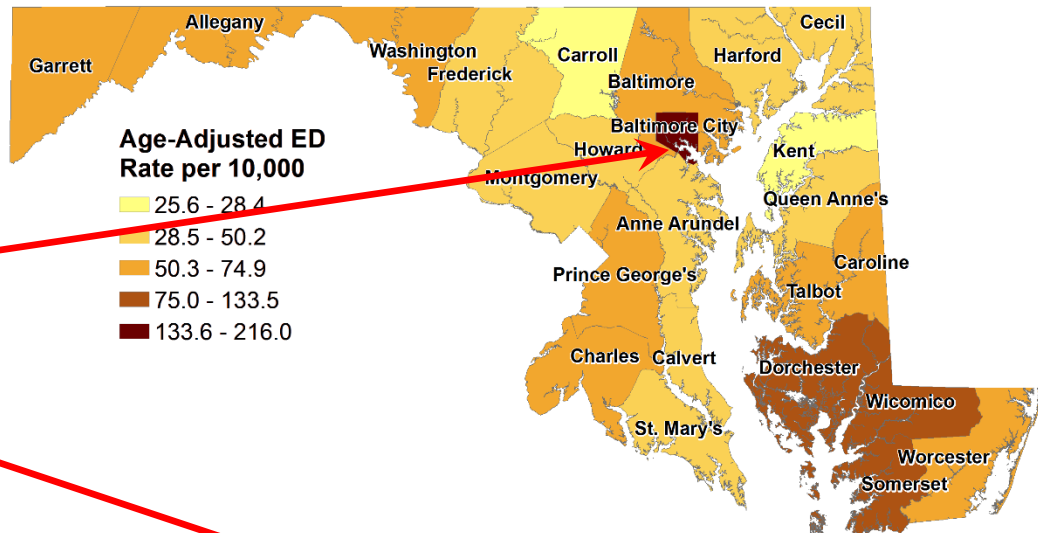
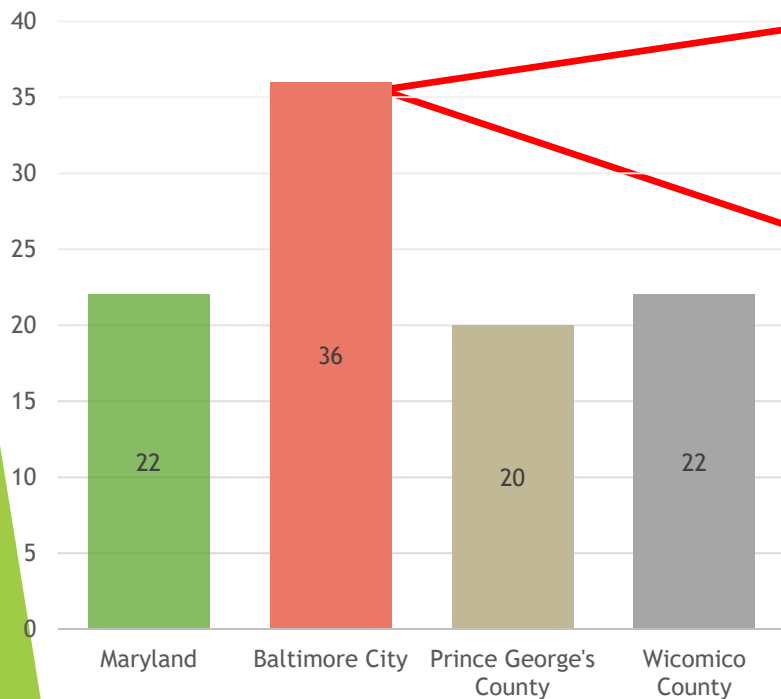
RESEARCH

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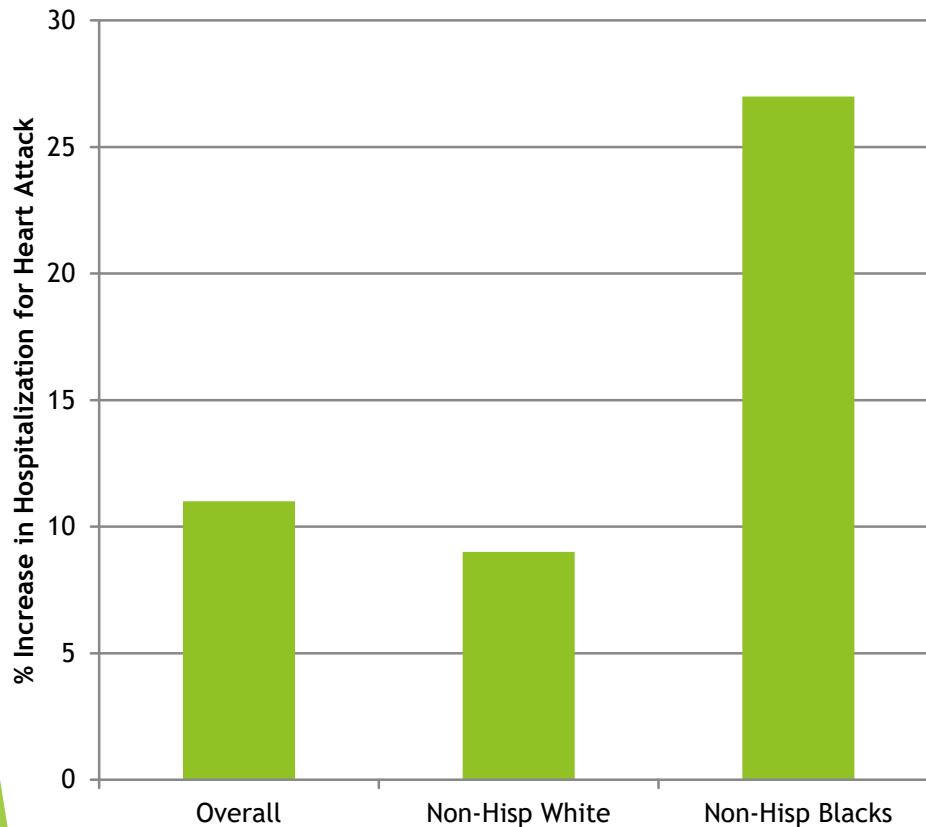
Exposure to extreme heat and precipitation events associated with increased risk of hospitalization for asthma in Maryland, U.S.A.

Sutyajeet Soneja¹, Chengsheng Jiang¹, Jared Fisher², Crystal Romeo Upperman¹, Clifford M and Amir Sapkota^{1*}



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Extreme Heat Events and Risk of Hospitalization for Heart Attack



Journal of Exposure Science and Environmental Epidemiology (2017) 27, 276–280
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www.nature.com/jes

ORIGINAL ARTICLE

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

Jared A. Fisher^{1,2}, Chengsheng Jiang¹, Sutyajeet I. Soneja¹, Clifford Mitchell³, Robin C. Puett^{1,2} and Amir Sapkota¹

Heat Wave Affecting People Around Baltimore

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

Filed Under: [Heat Wave](#)

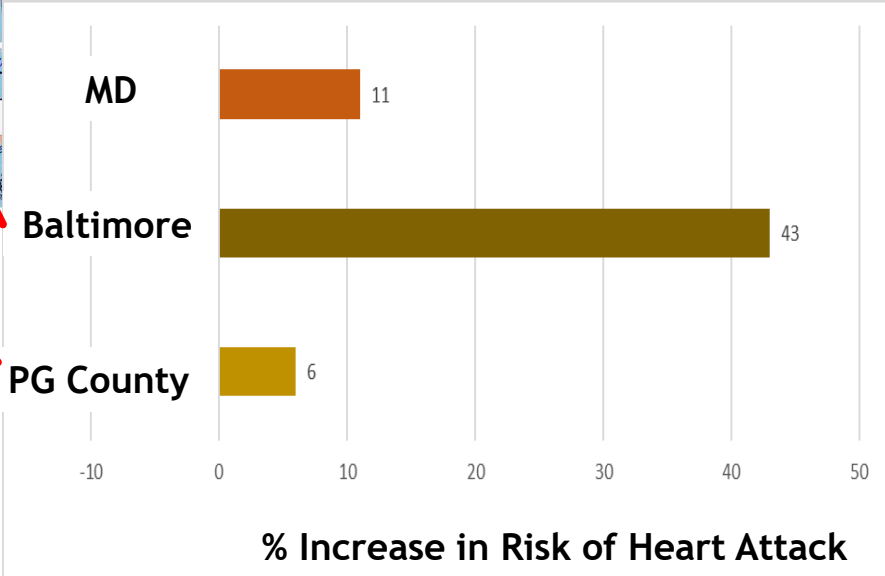
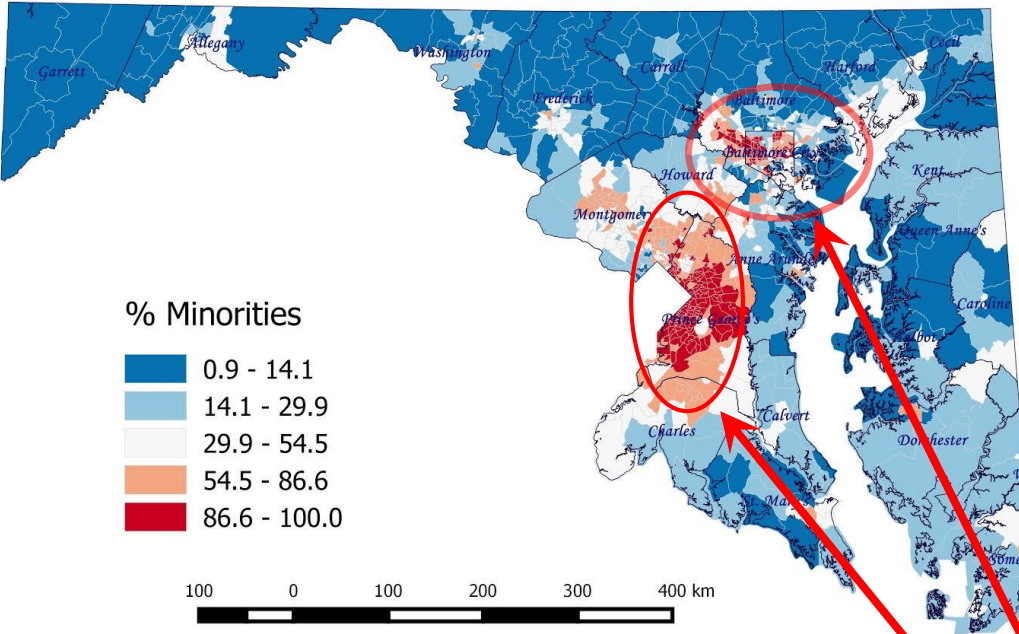


BALTIMORE (WJZ) — The [extreme](#) heat has doctors worried that some people may not take it seriously. The moment you step outside, you feel the heat.

Ava-joye Burnett explains why the [heat](#) mixed with the humidity could be a deadly combination.

Fisher et al. Journal of Exp Sci and Env. Epidemiology 2016

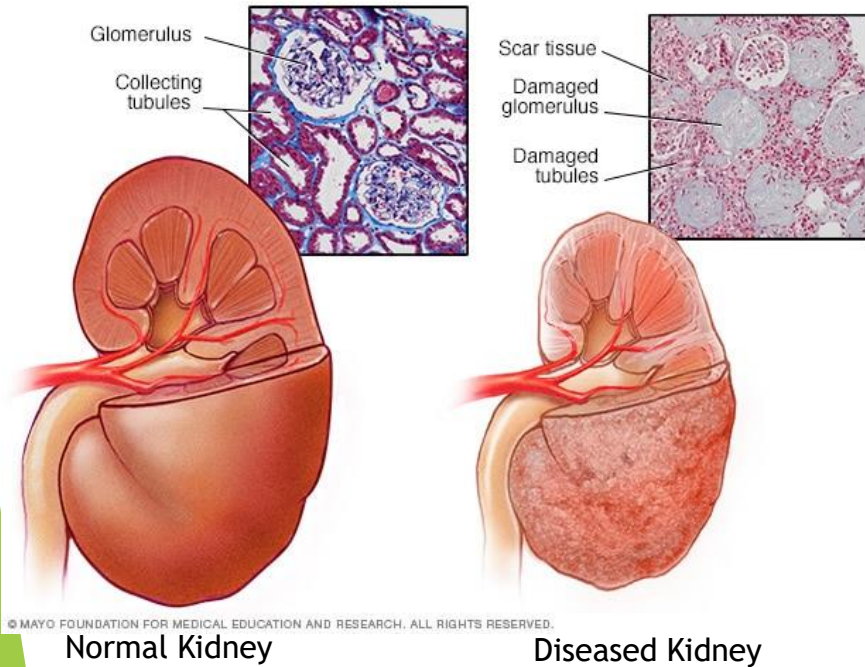
Is the risk of EHE related heart attack higher in counties with higher proportion of minority population?



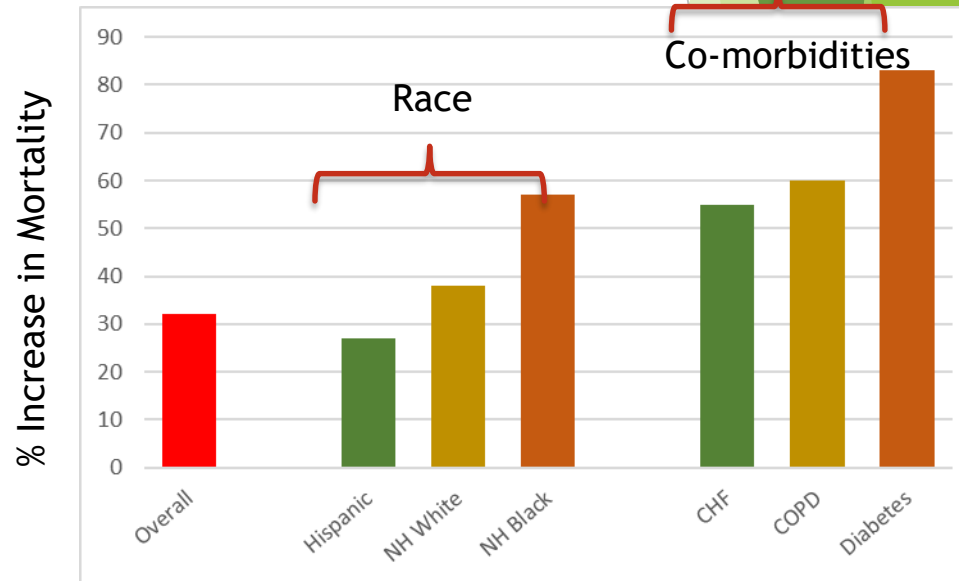
Original Investigation | Nephrology

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 Usvyat, PhD; Frank W. Maddux, MD; Patrick Kinney, ScD; Amir Sapkota, PhD



Risk of Mortality from Extreme Heat Among End-Stage Renal Disease Patients

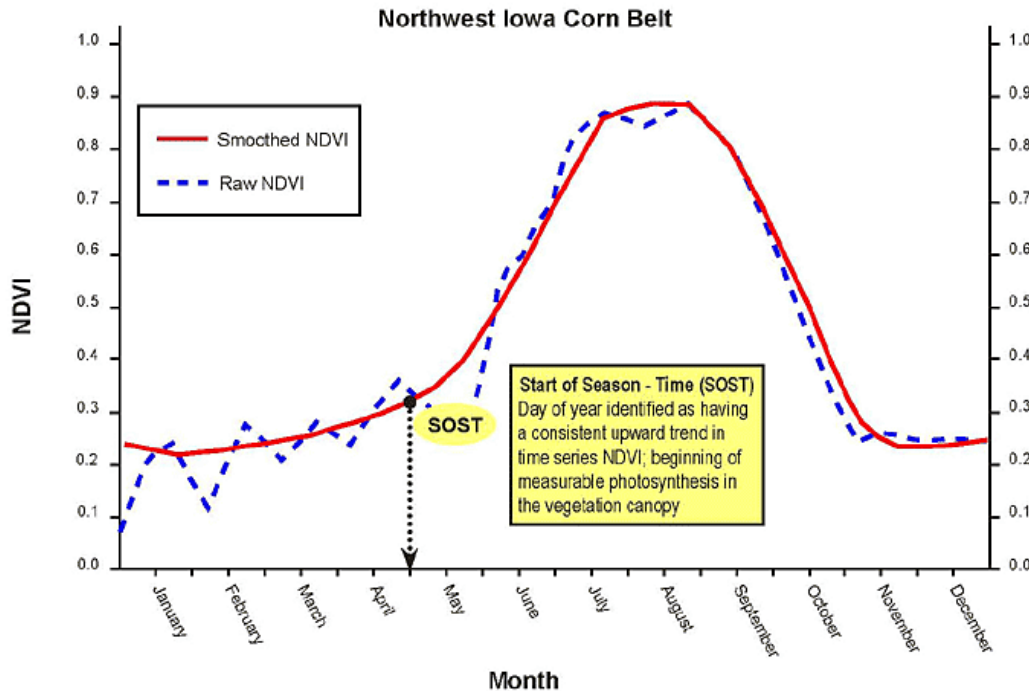


▶ Plant Phenology - Nature's Calendar

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

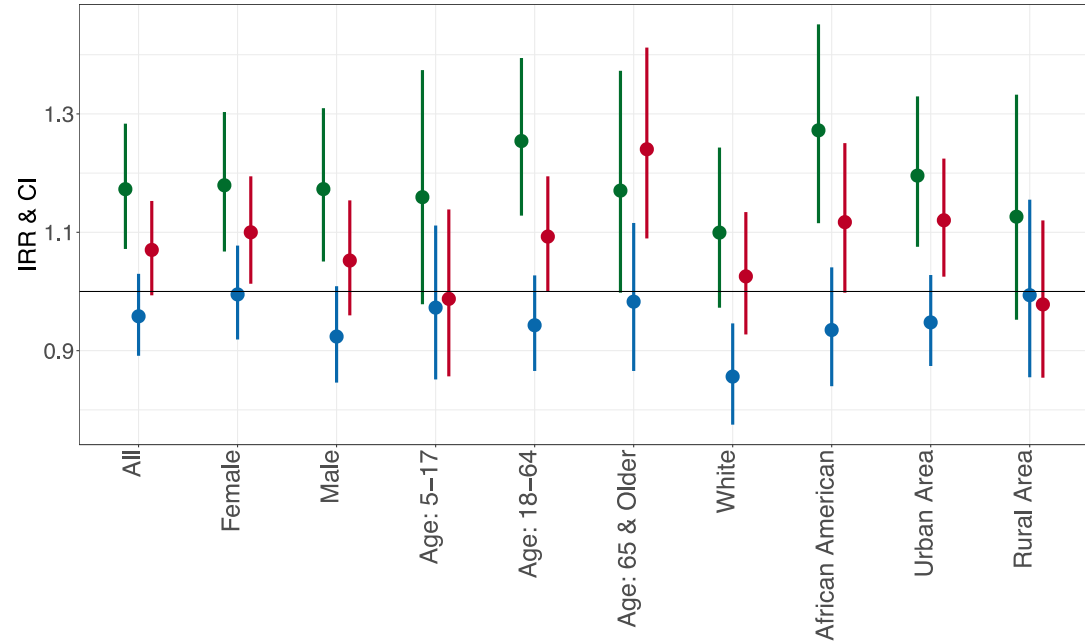
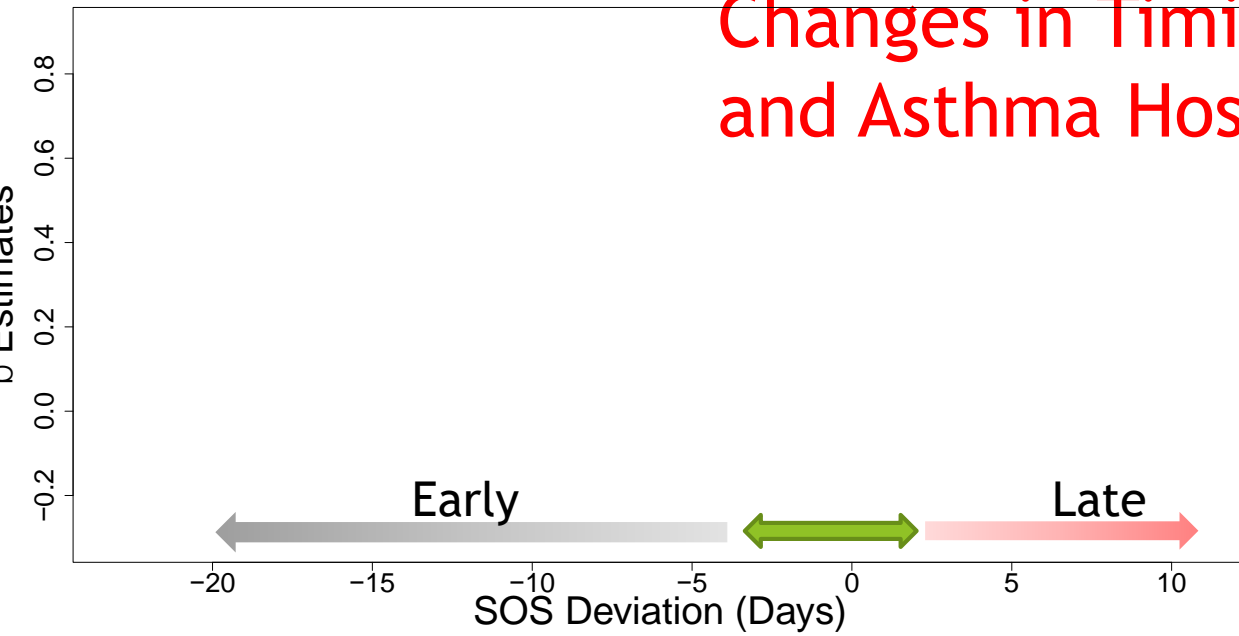
▶ Most sensitive indicator of ecological response to our changing climate.

Start of Season (Onset of Greening)



<http://phenology.cr.usgs.gov/overview.php>
http://phenology.cr.usgs.gov/methods_metrics.php

Changes in Timing of Spring Onset and Asthma Hospitalization in MD



◆ 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

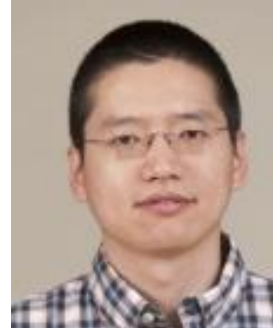
Funding: CDC's Climate-Ready States & Cities Initiative



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