THE IMPACTS OF CLIMATE CHANGE ON
HUMAN HEALTH
IN THE UNITED STATES:
A SCIENTIFIC ASSESSMENT

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Process and People

What was the process for development?

• Driven by the USGCRP Interagency Crosscutting Group on Climate Change and Human Health (CCHHG)

• Coordinated by the EPA

• Written by a team of ~100 Federal employees, contractors, and grantees from eight U.S. Federal agencies: HHS (NIH, CDC, NIOSH, ASPR, FDA, SAMHSA), NOAA, EPA, USDA, NASA, USGS, DOD (USUHS), VA

• Reviewed by the public and experts, including a committee of the National Academies of Sciences and the 13 Federal agencies of the USGCRP
Top Line Messages of the Report

• Climate change is a significant threat to the health of the American people.
• This assessment significantly advances what we know about the impacts of climate change on public health, and the confidence with which we know it.
• Climate change exacerbates some existing health threats and creates new public health challenges.
• Every American is vulnerable to the health impacts associated with climate change.
Climate change is a significant threat to the health of the American people.

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Climate change exacerbates some existing health threats and creates new public health challenges.

Every American is vulnerable to the health impacts associated with climate change.
# Scope of the Climate and Health Assessment

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FOOD SAFETY, NUTRITION, AND DISTRIBUTION

Farm to Table
The Potential Interactions of Rising CO₂ and Climate Change on Food Safety and Nutrition

- Temperature and precipitation extremes (like flooding) can increase pathogen load.
- Climate can also alter weed, insect, and fungal populations and increase pesticide use.
- Rising carbon dioxide can directly influence nutritional content of foods.
- Warmer temperatures can result in greater food spoilage.
- Extreme climate events can disrupt food distribution.
MENTAL HEALTH AND WELL-BEING

Impact of Climate Change on Physical, Mental, and Community Health

Medical and Physical Health
- Changes in fitness and activity level
- Heat-related illness
- Allergies
- Increased exposure to waterborne and vector-borne illness

Mental Health
- Stress, anxiety, depression, grief, sense of loss
- Strains on social relationships
- Substance abuse
- Post-traumatic stress disorder

Community Health
- Increased interpersonal aggression
- Increased violence and crime
- Increased social instability
- Decreased community cohesion
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Examples of where climate change exacerbates existing health threats

People in flood-prone regions are expected to be at greater risk

- Drowning
- Blunt trauma from falling debris or objects in floodwater
- Electrocution
- Falls, cuts, puncture wounds, sprains, burns, hypothermia, animal bites
- Motor vehicle accidents from wet, damaged, or obstructed roads
- Gastrointestinal illness; wound infections; skin, eye, ear, nose, and throat infections
- Preterm birth, low birth weight
- Post-traumatic stress disorder (PTSD), depression, and general anxiety

Hurricane-Induced Flood Effects in Eastern and Central United States

Composite map of floods associated with landfalling hurricanes over the past 31 years, based on stream gauge data
Climate change is projected to increase the frequency and intensity of large wildfires, with increased associated health risks:

- Exposure to smoke (carbon monoxide, ozone, toxic chemicals, fine and coarse particulate matter)
  - Acute and exacerbated respiratory problems, such as shortness of breath, asthma, and COPD
- Risk of cardiovascular disease and premature death
- Low infant birth weight
- Motor vehicle deaths and injuries
- Burns and injuries to first responders
- Post-traumatic stress disorder (PTSD), depression, and general anxiety

Projected percentage increases in weeks with risk of very large fires by mid-century (2041-2070) compared to the recent past (1971-2000)
Examples of where climate change creates **new** public health challenges

- **Shifts in the timing of threats**
  - Pollen season
  - Lyme & West Nile
  - Water-related pathogens & algal toxins

- **Shifts in the location of threats**
  - New vectorborne disease
Examples of where climate change creates **new** public health challenges

**Shifts in the timing of threats**

Between 1995 and 2011, the **duration** of the ragweed pollen season length has increased by as much as 27 days.

Increases in temperature and CO$_2$ result in earlier flowering, but also greater floral numbers, greater pollen production, and increased allergenicity.

Aeroallergen exposure contributes to:

- Asthma episodes
- Allergic rhinitis, sinusitis, conjunctivitis
- Urticaria (hives)
- Atopic dermatitis or eczema
- Anaphylaxis
Examples of where climate change creates new public health challenges

**Shifts in the location of threats**

Weather-related variables can determine geographic distributions of ticks

Low minimum temperatures can limit tick population survival

Declines in rainfall and humidity can also limit geographic distribution of blacklegged ticks

[Maps showing changes in Lyme Disease Case Report Distribution from 2001 to 2014]
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Populations of Concern

- People with disabilities
- Communities of Color, Low Income, Immigrants, and Limited English Proficiency Groups
- Children and pregnant women
- Older adults/elderly
- Indigenous peoples
- Occupational groups
- People with pre-existing medical conditions

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Multiple requests from public engagement opportunities for tailored communications materials
Climate and Health Resources

Resources Covered:

1. Climate change impacts website
2. Populations of Concern
   - Communication Materials
   - Factsheets
3. Clickable Map
4. Online Quiz
5. Lifestage Factsheet
6. Extreme Heat Guidebook
7. Other Resources
   - State Factsheets
   - EPA Reports
Climate Change Indicators in the United States

Report
EPA partners with other government agencies, academic institutions, and organizations to compile key indicators of the causes and effects of climate change. This report includes a six-page spread on what these indicators can tell us about climate change and health.

www.epa.gov/climate-indicators

State Climate Change Impacts

Factsheets
As our climate changes, every state will become warmer. But other impacts of climate change are likely to be very different from state to state. These fifty-four state factsheets present overviews of climate change impacts for each U.S. state and territory.

www.epa.gov/climate-impacts/climate-change-impacts-state

How Much Do You Know About the Health Impacts of Climate Change?

Online Quiz
A ten-question interactive online quiz challenges you and your friends on your climate and health knowledge, and lets you share your climate score on social media.


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How Will Climate Change Affect My Health?

Factsheet
Climate change can affect your health in different ways at different stages of life. This graphic shows the health impacts of climate change from infancy through older adulthood.

www.epa.gov/climate-impacts/climate-change-and-health-factsheet

Climate Change and Extreme Heat

Guidebook
Extreme heat events are expected to become more common, more severe, and longer lasting as our climate changes. Learn about extreme heat in a changing climate: Why is extreme heat on the rise? How might it affect you? What can you do before and during an extreme heat event to reduce your risk?

www.epa.gov/climate-change-extreme-heat-guidebook

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To view the full report:
health2016.globalchange.gov


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