Special Focus: Climate Change and Children

? DID YOU KNOW?

Diarrheal disease causes approximately 1.6 million deaths per year in children under the age of 5, making it the leading cause of child mortality globally.



Children are especially vulnerable to the health impacts of climate change, due to their developing brains and bodies, and their dependence on adult caregivers. Nearly 90% of global disease burden related to climate change is borne by children under 5 years of age, in both developed and developing countries.¹ Special consideration should be given to helping children and their families adapt to climate change impacts.

Why are children more vulnerable to climate change?²

- **Biological sensitivity:** The immature and developing nature of children's physiologic systems makes them more vulnerable to injury and illness from various exposures related to climate change. They have a proportionately higher intake of air, water and food relative to their size, which increases risks of some exposures through those pathways and makes them disproportionately exposed to elements and toxins in the environment.
- Social behaviors and environments: Children often spend more time outdoors and engaged in hand-to-mouth activities as part of their education, recreation and development, which can increase their risk of exposure to <u>air pollution</u>, <u>allergens</u>, <u>extreme heat</u> or waterborne pathogens from climate change.
- Limited adaptive capacity: On their own, children have fewer resources at their disposal to cope with climate change hazards. For example, means of evacuation in event of extreme weather or ability to access fresh, locally grown produce on their own. Biologic adaptive capacity is also more limited. For example, infants and young children are not able to regulate their body temperature as well as older children and adults, thus placing them at greater risk for heat-related illness.
- **Socioeconomic situation:** Similar to adaptive capacity, children are dependent on the socioeconomic position and resources of their family and community. Low-income children and children of color are more likely to experience existing health inequities that place them at greater risk for adverse impacts of climate change.

Heat-related illness³

- Due to their immature thermoregulatory systems, children are more vulnerable to heat stress, especially children under 1 year of age.
- Older children are also at risk: Among, high school athletes, heat illness is the leading cause of death and disability, with football players being the most at-risk subgroup.

FAST FACT:

In the U.S., boys age 5-9 are the most high-risk group for contracting Lyme disease.



• There are approximately 120,000 children farm laborers across the country, making them an often-hidden subpopulation at risk for heat illness.

Air quality⁴

- Because of their higher respiratory rate and amount of time spent doing outdoor activities, children are more vulnerable to ozone and <u>air quality</u> exposures than other groups. Ozone is a strong lung irritant and major component of smog that has been associated with increased risk of developing bronchitis, bronchiolitis, asthma, asthma exacerbations and ED admissions and pediatric ICU stays for asthma.
- <u>Wildfires</u>, which are increasing due to climate change, produce toxic smoke that can travel for thousands of miles and cause respiratory illness. In 2003, Southern California wildfires increased asthma admissions rates for 5-19 year olds by during and after the fire by 25% and 56%, respectively.
- Pollen <u>allergies</u> can also be affected: higher springtime temperatures increase the length of the allergy season, particularly in Northern regions. Increased carbon dioxide concentrations in the atmosphere may independently increase pollen production by ragweed, a common cause of seasonal allergies.

Infectious disease⁵

- Diarrheal disease causes approximately 1.6 million deaths per year in children under the age of 5, making it the leading cause of child mortality globally. Many factors, including climate, influence patterns of <u>infectious diseases</u> like Lyme disease, mosquito-borne illnesses like West Nile virus, and childhood diarrhea. Rising temperature has been linked to the northward spread of Lyme disease in the United States, putting more children at risk of this disease.
- Climate change is increasing the risk of several vector-borne diseases that influence children, including malaria, dengue fever, West Nile Virus, Lyme disease, Rocky Mountain spotted fever, Chagas disease and Chikungunya.
 - Malaria is a leading cause of global child mortality.
 - Dengue fever is the most rapidly spreading mosquito borne virus in the world and a majority of annual mortality is among children.
 - In the U.S., boys age 5-9 are the most high-risk group for contracting Lyme disease.

Extreme weather events⁶

- Children's unique needs place them at risk of injury or death, separation from or loss of caregivers, and mental health consequences following <u>weather disasters</u>.
 - Following Hurricanes Katrina and Rita, more than 5000 children were separated from their families and the last missing child was reunited with her family after 6 months.
 - Following storm and flood disasters, children are especially at risk for respiratory and diarrheal disease, related to things like indoor mold exposures and waterborne pathogens.
- Disasters can also harm children through devastation of the community resources on which they rely for their healthy mental and physical development, like schools and hospitals.

? DID YOU KNOW?

Heat illness is the leading cause of death and disability among high school athletes, with football players being the most atrisk group.





Food security⁷

- Agricultural productivity and food prices can be affected by extreme heat, drought, flood and rising sea levels. <u>Food</u> safety and processing is also impacted, leading to increased foodborne pathogens and associated illness.
- Rising atmospheric carbon dioxide concentration may alter the nutrient content of major crops like wheat and rice.
 - Studies have projected that climate change has caused a 7-20% increase in the number of malnourished children worldwide.

Mental health⁸

- Climate change significantly affects children's mental health and wellbeing.
 - ° To date, most research has focused on the impacts of severe weather events on children's mental health.
 - Children experience high rates of PTSD symptoms after natural disasters such as hurricanes and floods.
 - Children displaced by extreme events experience disruption in school, and have demonstrated school performance and behavior problems.
 - Providing safety, security and family reunification after a disaster is critical to preventing severe stress reactions.
 - Practitioners have also expressed concern about the levels of anxiety they are seeing in children and youth who understand that climate change will impact their future wellbeing.

What can physicians do to protect children's health in the era of climate change?

The following recommendations come directly from the <u>American Academy of</u> <u>Pediatrics</u>:⁹

- Work to promote medical educational opportunities regarding the effects of climate change on the environment and child health.
- Seek ways to reduce the carbon and environmental footprint of health facilities, including hospitals, medical offices, and transport services.
 - Increase energy efficiency
 - Incorporate renewable energy sources
 - Reduce waste
 - Promote public and active modes of transport (eg, walking, bicycling) during new construction or remodeling.





? DID YOU KNOW?

It is estimated that children need 4–6 months to recover academically when a severe weather event causes school displacement.

- Use existing anticipatory guidance as a framework for discussing climate change with families. For example, encouraging active modes of transport, reducing food waste and meat consumption, and improving home energy efficiency. Serve as a personal role model for practices that promote environmental sustainability.
- Educate children, families, and communities on emergency and disaster readiness. For guidance, see:
 - ^o American Academy of Pediatrics <u>Children and Disasters Web page</u>.
 - ° <u>www.ready.gov</u> and <u>https://www.ready.gov/es</u>(Spanish)
- Advocate for local, national, and international policies that reduce greenhouse gas emissions and for adaptation strategies that improve preparedness for anticipated climate-associated effects.
 - Educate elected officials on the risks climate change poses to child health; speak at public hearings; and provide expert testimony.
 - Help educate the public through letters to the editor and community engagement.
- Help to build a broader coalition across disciplines to address climate change at the local and national levels.
- Advocate for strategies on the part of government to improve climate change and health:
 - Promote energy efficiency and renewable energy production at the federal, state, and local levels while decreasing incentives for continued production and consumption of carbon-intensive fuels such as coal, oil, and gas.
 - Fund research, surveillance, reporting, and tracking of climate-associated health effects. Invest in prudent and vital preparations for public health care systems, anticipating climate change effects.
 - Support education and public awareness of the threats from climate change for public and children's health now and in the future.
 - Develop essential adaptation strategies and assist state and local governments, public health agencies, and health professionals in implementation of these strategies. The specific needs of children should be addressed in disaster preparedness and response.
 - Include the health sector in national and international policy-making meetings that address the threats of climate change.
 - Fund public transportation systems and support urban planning designs that incorporate walkability, open space, green building design, reduced dependence on automobile transit, and climate change resilience.



For More Information

- See the guide's sheets on specific climate impacts for more guidance on adaptation and mitigation strategies.
- American Academy of Pediatrics resources
 - Technical report on climate change and children's health http://pediatrics.aappublications.org/content/pediatrics/early/2015/10/2 1/peds.2015-3233.full.pdf
 - Policy statement on climate change and children's health http://pediatrics.aappublications.org/content/136/5/992
- CDC: Caring for Children in a Disaster http://www.cdc.gov/childrenindisasters/index.html

Citations

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