



Health Equity

CLIMATE CHANGE IS HAZARDOUS TO OHIO CHILDREN'S HEALTH

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Climate change is hazardous to children's health. Heatwaves degrade air quality, exacerbating symptoms of asthma, one of the most common chronic childhood illnesses. Heavy rains and flooding can contaminate public water supplies with bacteria to which children are especially susceptible. Warmer average temperatures allow insect populations to multiply, and with them the incidence of insect-borne diseases like West Nile Virus. Here in Ohio, children are already being hurt by climate change, and the harm is projected to get worse.

In Ohio and throughout the Midwest, we will continue to experience hotter and more frequent heatwaves, heavier rains, declining air quality, increased flooding, and changes to our ecosystem that encourage the spread of disease. The results, according to the Environmental Protection Agency's (EPA) Midwest climate assessment, will include "substantial, yet avoidable, loss of life [and] worsened health conditions."¹ Children are especially at risk.² Negative health impacts can permanently affect their rapidly developing bodies.

This report explores the impacts already being felt here in Ohio, what we can expect in the future if we fail to fully address climate change, and policy solutions that Ohio decision-makers can implement right here and now to prevent the worst health impacts of climate change.

AIR QUALITY

Air pollutants from burning fossil fuels in power plants and motor vehicles—such as methane and carbon (the precursors for ozone, particulate matter and other toxic compounds)—drive global climate change while also directly harming health. Children are particularly vulnerable to respiratory harm caused by poor air quality. They breathe more air than adults do, when adjusting for body weight, so they take in a higher proportion of pollutants relative to their size.³ Active kids typically spend more time outside than adults do, exposing them to more outdoor contaminants. And the littlest ones spend much of their time on or close to the ground, where the heaviest airborne particles—for example, lead—are most concentrated.⁴

Warming temperatures further degrade air quality⁵ by increasing concentrations of ground-level ozone, as well as contributing to longer and more intense allergy seasons.⁶ Surface ozone can exacerbate asthma, a condition more common in children than adults and “a leading chronic illness among children and adolescents in the United States,” according to the Centers for Disease Control and Prevention (CDC).⁷

In Ohio, nearly 1 in 12 children have asthma, according to the American Lung Association’s 2019 State of the Air report.⁸ Six Ohio cities are among the 20 “most challenging places to live with asthma” identified in a 2018 report⁹ by the Asthma and Allergy Foundation. Ohio cities make up more than a quarter of that list—no other state comes close.



Byproducts from burning fossil fuels also contribute to low birth weight and premature birth, risk factors for infant mortality, a critical child health issue in Ohio.¹⁰ In addition, these pollutants harm the developing brain, even from prenatal exposure. They cause problems with development, learning, and intellectual potential, and can therefore hurt kids’ readiness for school and educational achievements, factors that contribute to substantial economic loss over a child’s lifetime.

Ozone can also be harmful to children before they are born. Ozone exposure during pregnancy is associated with increased risk of stillbirth.¹¹ One study found “approximately 8,000 stillbirths per year in the U.S. may be attributable to [ozone] exposure.”¹²

HEATWAVES

Extreme heat is the leading cause of weather-related death in the United States. Temperature increases due to climate change are already “associated with heat-related diseases...and death in the Midwest.”¹³ One EPA model predicts that by 2090 the region will experience an additional 2,000 temperature-related premature deaths per year—a greater increase than in any other region.¹⁴

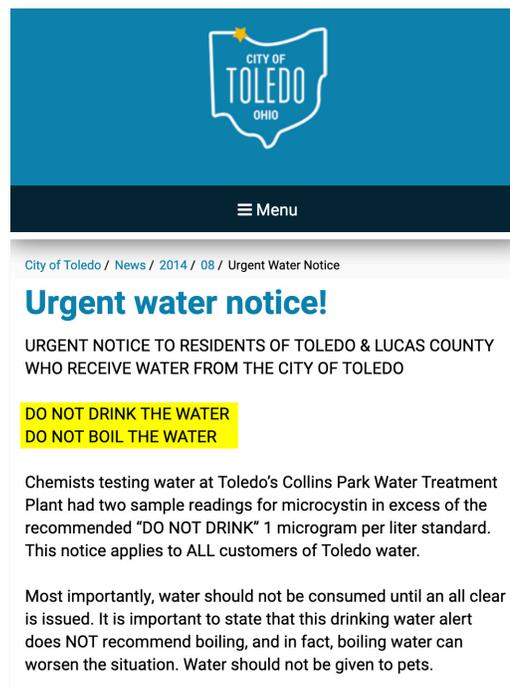
Children are at greater risk¹⁵ of getting sick or even dying due to extreme heat for a few reasons.¹⁶ Their bodies aren’t as good as adults’ at regulating their internal temperature; they typically spend more time outside than adults; and the youngest rely completely on others to keep them safe. The potentially life-threatening effects of extreme heat include dehydration, hyperthermia and fever, according to the U.S. Global Change Research Program.¹⁷ Extreme heat can also harm kidney function or cause kidney failure.¹⁸

Kids who live in cities are in double jeopardy. Heatwaves will be even more intense in urban areas, where asphalt, pavement and buildings radiate heat, and where cooling greenspace is limited. The result is a “heat island,” where air temperatures can be as much as 22 degrees higher than in surrounding rural areas.¹⁹ Those islands heat up a big proportion of Ohio: Urban areas cover a larger share of land here than in all but seven states.²⁰ Nearly a quarter of Ohio’s children²¹—more than half a million²²—live in the state’s 10 largest cities, where our heat islands are hottest.

WATER CONTAMINATION

The EPA's Midwest climate assessment predicts heavier rains and more frequent flooding as a result of climate change, as we are already starting to see.²³ Heavy rains strain Ohio's aging drinking water infrastructure which already has an estimated investment need of \$113.4 billion over the next 20 years.²⁴ For example, when heavy rains overwhelm sewer systems, stormwater runoff can contaminate water directly, flushing bacteria and other pathogens into local waterways or causing "infiltration" of groundwater into public water supply lines.²⁵ A team of researchers in Wisconsin found a significant association between increased rainfall and pediatric emergency room visits for gastrointestinal illness caused by exposure to pathogens in contaminated drinking water.²⁶

Heavy rains also wash agricultural fertilizer into our lakes; when coupled with warmer average water temperatures, this creates conditions in which harmful algal blooms thrive, threatening our water supply. In 2014, a bloom of toxic cyanobacteria in Lake Erie made tap water too dangerous to use for nearly half a million people in and around the city of Toledo.²⁷ The city's drinking water treatment infrastructure was likely overwhelmed by a high concentration of bacteria at intakes—structures at the bottom of the lake, where bacteria don't usually reach.²⁸ The bacteria were presumed driven there by "mixing events," such as major storms or heavy winds, conditions the EPA projects will occur more frequently due to climate change. Children are especially susceptible to illness caused by harmful algal blooms,²⁹ including nausea, vomiting, diarrhea, rashes, pneumonia and liver damage.³⁰



INFECTIOUS DISEASES

While climate change may lead to the extinction of some species, its effects will encourage the proliferation of others. Higher annual average temperatures—in particular, warmer winters—have been linked to increasing populations of black-legged deer ticks, the primary transmitters of Lyme disease.³¹ Their existence in Ohio had not even been confirmed until 2010.³² Every year since, the Ohio Department of Health has tracked increasing numbers of Lyme disease cases.³³ About one in five Ohioans infected were between the ages of five and 14. Short-term flu-like effects are the most common, though Lyme disease can also cause a range of symptoms, including irregular heartbeat, facial paralysis and meningitis.³⁴

Warmer winters have also been linked to increased incidence of West Nile Virus in the Ohio Valley,³⁵ likely because the disease's primary carriers, mosquitoes, reproduce more successfully in warmer climates,³⁶ according to the CDC. The Ohio Department of Health has tracked 1,044 cases of West Nile Virus, including 81 that were fatal, since its emergence in Ohio in 2001.³⁷ In children, West Nile Virus can have flu-like symptoms, and in a very small number of cases lead to encephalitis, or swelling of the brain, which can cause brain damage.³⁸

ABOUT ONE IN FIVE OHIOANS INFECTED WITH LYME DISEASE WERE BETWEEN THE AGES OF 5 AND 14

THE PROBLEMS

CLIMATE CHANGE IS HAZARDOUS TO OHIO CHILDREN’S HEALTH

Policy makers can act now to protect our littlest Ohioans

HEATWAVES & HIGHER ANNUAL TEMPERATURES			HEAVIER RAINS & FLOODING	
Urban “heat islands” get up to 22 degrees hotter than rural areas.	High temps increase ground-level ozone, worsen air quality and lengthen allergy seasons.	More deer ticks and mosquitoes	Overflowing sewer systems can introduce toxins into our water.	Increased fertilizer runoff from farms supercharges toxic bacteria in our water.
Can cause dehydration, hyperthermia / fever, kidney damage / failure.	Exacerbates asthma. Increases premature birth & lowers birth weight. Harms developing brains.	More Lyme disease and West Nile Virus.	Increases gastrointestinal illnesses.	Gastrointestinal illnesses Rashes Pneumonia Liver damage
More than adults, children spend time outside, rely on others for safety, and struggle to regulate internal body temperature.	Asthma is more common among children than adults. Kids breathe faster than adults, and ingest more pollutants per pound. Hurts kids’ readiness for school, educational achievements, contributing to economic loss over child’s lifetime.	One in five Ohioans infected with Lyme disease are between ages of five and 14. Children with West Nile experience flu-like systems and in some cases swelling of the brain & brain damage.	Increased rainfall linked to increased pediatric ER visits for gastro-intestinal illnesses.	Children are especially susceptible.

THE SOLUTIONS

STRATEGIES TO REDUCE NEGATIVE IMPACTS FROM CLIMATE CHANGE

- Reforest Ohio’s cities, particularly areas of concentrated poverty. Trees cool ground-level air.
- Restore Ohio’s wetlands and upgrade sewer infrastructure to absorb overflows.
- Provide farmers with resources and technical assistance for no-till farming.

LONG-TERM INVESTMENTS NEEDED TO CURB CLIMATE CHANGE

- Reduce greenhouse gas emissions by investing in the new energy economy—renewables, industrial efficiency, low-income home weatherization.
- Support adoption of national emission standards.
- Reduce air pollution from cars and trucks: Invest in public transit, bikeable, walkable streets, promote electric vehicles, and curb urban sprawl.

POLICY SOLUTIONS

Bold policy action to mitigate climate change is the only way to fully address these health impacts on Ohio's children. Recent reports warn we need to make a substantial dent in our greenhouse gas pollution, possibly as early as within the next 12 years, if we are to avoid the most severe consequences to our planet and people. Our work to reduce the causes of climate change must go hand in hand with actions and policies that protect children from the present-day effects of climate change.

REDUCE GREENHOUSE GAS EMISSIONS

The electric-power sector is by far the largest emitter of greenhouse gases in Ohio. Along with carbon dioxide from coal-fired power plants, methane emissions from oil and gas operations are also a grave concern. In fact, methane is far more potent as a heat-trapping source than carbon dioxide in the short run.³⁹ Common-sense limits on methane pollution, as well as clear and stable policy paths to decarbonize our electric grid can greatly reduce Ohio's contribution to global climate change.

Roughly a decade ago, the state of Ohio enacted clean energy standards for electric utilities. The standards were designed to reduce emissions while promoting a new energy economy and good jobs through investments in renewable energy and energy efficiency in homes, businesses and industry. These standards have been consistently under attack since 2013, and successfully undermined by extreme voices in the Ohio General Assembly and special interests entrenched in energy systems of the past.

Ohio is well positioned to be a leader in the clean energy technologies of today and tomorrow, given our spirit of innovation, adept manufacturing base and skilled workforce. But, state policy must attract and create a stable business environment for clean energy development so that businesses and industry want to invest in Ohio communities.

A recent review of more than 20 years' worth of data provided strong evidence that state-level emission-reduction standards are linked to improved respiratory health among children.⁴⁰ National emissions-reduction standards should be adopted for both carbon and methane pollution. But political sea changes have stalled both federal limits on electric-sector carbon pollution and on methane emissions coming from oil and gas operations. Ohio should be a leader in the absence of federal action and put its own standards in place.

REDUCE AIR POLLUTION FROM CARS AND TRUCKS

Ohio should invest heavily to grow a complete system of public transportation, bikeable, walkable streets, and electric vehicles in order to reduce transportation-related emissions. We should also replace aging diesel school and transit buses, heavy duty trucks, cargo handling equipment, and repower diesel engines in tug boats and locomotives. Ohio's 2020-21 budget includes roughly \$30 million a year for grants to help reduce diesel emissions by 400 tons, funded largely by one-time settlement funds from Volkswagen.⁴¹ This is a big step in the right direction. Still, much more can and should be done to reduce transportation-related air pollution. For example, dense mixed-use development can reduce sprawl and reliance on cars, while also encouraging active and healthier modes of transportation.

REFOREST OHIO'S CITIES

More than half a million children live in Ohio's cities, where they are disproportionately harmed by the heat island effect. Planting trees in urban areas can help cool ground-level air⁴² and counter increased temperatures, mitigating the risk of heat-related illness and death.⁴³ Because African American communities are concentrated in Ohio's cities,⁴⁴ reforestation targeting urban areas—along the lines of the Cleveland Tree Plan⁴⁵—could help close the health divide between black and white children in Ohio. And because many Ohio cities include several areas of concentrated poverty with limited resources, urban reforestation projects require public investments from the state.⁴⁶

PUT CARBON TO WORK FOR FARMERS

As stewards of millions of acres of Ohio's land, farmers can play an outsized role in reducing atmospheric carbon dioxide by using cover crops in unused farmlands to prevent soil erosion, return nutrients to the soil, and build soil health. Farmers can also set aside some farmlands to regenerate naturally and promote biodiversity. These methods trap carbon in the earth,⁴⁷ where it enriches soil and increases yields⁴⁸ over the long run.

As state policymakers consider best practices and policies that reduce farm field runoff, Ohio should put standards in place while providing resources and incentives to help farmers sequester carbon in farmed soils.

The newly-created H2Ohio⁴⁹ fund will mitigate the negative health impacts of climate change by investing in agricultural conservation programs and practices that reduce⁵⁰ nutrient loading into our waterways. Nutrient runoff, especially of phosphorus, causes harmful algal blooms. Funds can support the use of cover crops to increase carbon sequestration in the soil. Implementing natural features throughout watersheds to bolster climate preparedness will be critical for dealing with severe rains that are degrading our water quality.

RESTORE OHIO'S WETLANDS

Restoring Ohio's wetlands can help filter pollutants that manage to make it into our waterways, despite our best efforts to prevent them from doing so.⁵¹ Ohio's biennial operating budget includes substantial funding for the Ohio Department of Natural Resources to restore wetlands on the Lake Erie coast and in the western Lake Erie basin watershed.⁵² Additionally, the budget includes \$13 million for the Ohio EPA's continued efforts to restore Mentor Marsh, one of the largest natural marshes in Northeast Ohio.⁵³ Restoring native vegetation will be necessary to deal with increased rainfall and to filter out nutrients and pollutants before they can hinder public health and recreation.

BE PREPARED

Local decision-makers and elected leaders already recognize extreme weather events due to climate change require updates and improvements to disaster preparedness and relief plans. Disasters such as floods, devastating storms and tornadoes pose risks to children's physical and mental health, so children should receive special attention in disaster preparedness planning.⁵⁴ This should include preparation for surges in the need for pediatric care in the aftermath of natural disasters. The state should lead such efforts, providing both technical assistance and resources for local planning.

CHILDREN ARE ESPECIALLY VULNERABLE TO EXTREME WEATHER AND OTHER CONSEQUENCES OF CLIMATE CHANGE. SMART POLICY CAN PREVENT FURTHER CLIMATE CHANGE AND REDUCE ITS EFFECTS SO THE LITTLEST OHIOANS ARE KEPT SAFE TODAY AND IN THE FUTURE. OUR POLICYMAKERS CAN ACT NOW TO CLEAN UP OUR AIR, WATER, AND LAND AND REDUCE THE CONSEQUENCES OF CLIMATE CHANGE CAUSED BY HUMAN ACTIVITY.

ENDNOTES

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