

The Lancet Countdown on Health and Climate Change

Policy Brief for the United States of America

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The state of climate change and health in the United States

In the United States (U.S.), the human suffering and death during the COVID-19 pandemic demonstrate the harsh consequences that can occur when science is disregarded and responses to existing evidence are delayed, ineffective, and inequitable – or altogether absent. Importantly, the toll of the pandemic should be seen as a forewarning of the future; there will be far-reaching and accelerated health consequences of climate change if the U.S. fails to appropriately respond to the current evidence. Globally, greenhouse gas (GHG) emissions must be reduced by almost half over the next decade to keep global temperature rise to “well below 2°C”, requiring a 7.6% reduction in GHG emissions every year.¹

The U.S. also faces a long-overdue reckoning for centuries of systemic racism, which continues to drive many health inequities and injustices.² Climate change exacerbates the health consequences of both the COVID-19 pandemic and systemic racism ([see Appendix Compounding Crises Case Study](#)), especially against the backdrop of a neglected public health system. Climate change action, perhaps now more than ever, is a critical component for achieving optimal health and health equity in the U.S.

The effects of climate change worldwide and in the U.S. are undeniable and worsening, with wide-ranging impacts on health and the economy.³ Globally, the six warmest years in recorded history occurred between 2014-2019, with 2019 the second warmest.⁴ In the U.S., states like Alaska, Georgia, and North Carolina had record high temperatures in 2019.⁵

In 2019, older persons, or individuals over the age of 65, experienced over 102 million* more days of heatwave exposure in the U.S. compared with the 1986-2005 baseline.³ Eight out of the ten highest ranking years† of heatwave exposure among older adults, a population especially vulnerable to heat, have occurred since 2010 in the U.S.³ In the past two decades, heat-related mortality† for older persons has almost doubled, reaching a record high 19,000 deaths in 2018.³

The U.S. saw a total of 2 billion* potential hours of labor lost due to extreme heat across the service, manufacturing, agricultural, and construction sectors in 2019† (with 540 million* potential hours lost in construction alone), placing the 2015-2019 average 63%* higher

Throughout this brief, an asterisk () denotes newly published data for the U.S. from Watts et al (2020), and the most recent year of data available is presented. Please see the 2020 global Lancet Countdown report and Appendix for further details about these specific indicators.

† Estimate from an exposure-response function that utilized methods described by World Health Organization (see 2020 global Lancet Countdown Appendix for more details on Indicator 1.1.3).

than the 1990-1994 average.³ A conservative estimated total of \$45 billion dollars* of potential earnings were lost across these four sectors in 2015.^{3,9}

Climate change alters rainfall patterns and intensifies extreme weather events. In 2019, the U.S. had its second wettest year on record with many Midwestern and Central states logging unprecedented levels of rainfall.⁵ Fourteen weather and climate disasters in 2019 each caused damage of at least one billion dollars, not including health-related costs, and most of these events struck the Central states. Three flooding events along the Missouri, Mississippi, and Arkansas Rivers totaled over \$20 billion in damages ([see Appendix 2019 Floods Case Study](#)). These disasters had widespread health effects and may have exacerbated food insecurity ([see Appendix Promoting Food Security Case Study](#)).

Climate change, through drier weather and higher temperatures, can also increase the likelihood of wildfire events, as has been repeatedly exhibited in Western states. **Individuals in the U.S. experienced 1.85 billion* more person-days (one person experiencing one day) of exposure to high wildfire risk in 2016-2019 compared to 2001-2004, which is a 19%* increase.³** Wildfires generate dangerous particulate air pollution, with local and long-range health impacts (see 2018 and 2019 Briefs), and have contributed to a decline in U.S. air quality since 2016.⁶

While extreme weather events garner media attention, climate change has ripple effects on health in the U.S. that are often less obvious, such as worsening pollen levels, mental health, water-borne diseases (e.g., Vibrio- [see Appendix Climate Change and Vibrio Critical Insights](#)), and human migration and displacement.⁷ As the health harms and urgency grow, U.S. health professionals and researchers are engaging at the intersection of climate change and health like never before, as exemplified by a **nearly eight-fold increase*,†† in research publications on climate change and health between 2007 and 2019.³**

This fourth annual U.S. Policy Brief, supported by 70 institutions, organizations, and centers, uses data from the 2020 global Lancet Countdown report and supplemental sources to highlight the opportunities in the U.S. to respond to these threats. No one is immune to these health risks. While time is running out, there is still an opportunity for decisive action to lessen the severity of climate change impacts by prioritizing a healthy future for all.⁸

‡ Utilizes updated methodology and the addition of the construction sector compared to the 2019 U.S. Brief statistics (see 2020 global Lancet Countdown Appendix for more details on Indicator 1.1.4).

§ Conservative estimate as this assumes all work is performed in the shade (see 2020 global Lancet Countdown Appendix for more details on Indicator 4.1.3).

†† U.S. research articles are defined as those with a first author from a U.S. institution (see 2020 global Lancet Countdown Appendix for more details on Indicator 5.3).

Recommendations

The U.S. should rapidly and urgently implement the following recommendations in an equitable and just fashion so that every person can live with dignity and in good health.

1

Transition to healthy, sustainable agricultural practices: Implement agriculture policies and invest in programs that can foster improved health from a reduction in particulate air pollution and GHG emissions, such as reducing the need for nitrogen fertilizers.

2

Remove U.S. fossil fuels subsidies: Eliminate fossil fuel subsidies and reduce investments in new fossil fuel exploration and production.

3

Shift to zero-carbon electricity: Urgently transition to zero-carbon electricity generation by 2035 that is affordable for all.

4

Increase access to healthy transport options: Rapidly invest in enhanced active transport infrastructure and affordable, accessible zero-carbon public transportation, electric vehicles, and charging stations.

5

Strengthen the public health system: Increase and sustain investments in public health to protect against the accelerating health threats of climate change.

6

Invest in a healthy recovery from the COVID-19 pandemic: Implement a '*quadruple benefit*' COVID-19 recovery plan that works toward a stable climate, protects public health, promotes a sustainable economy, and creates an equitable society.

Climate change exacerbates health inequities and injustices

Climate change disproportionately harms those with the fewest resources and the least capacity to respond to threats, as explored in the 2019 Brief.⁹ These harms are further compounded by the impacts of both historic and current discriminatory practices that cause today's racial health inequities. For example, although redlining, a racist housing practice that targeted Black people, was outlawed in 1965, Black Americans in previously redlined areas continue to have higher rates of asthma and preterm births today.^{10,11}

These patterns of inequity have been made more apparent during the COVID-19 pandemic, with rates of infections in Black, Latinx, and American Indian/Alaskan Native people more than 2.5 times that in White, non-Latinx people.¹² Even today, urban redlined areas are almost universally hotter than neighboring areas¹³, due to factors like lack of tree cover ([see Appendix Urban Green Space Case Study](#)), and closer proximity to large roadways and industry – which increases exposure to air pollution.¹⁴

Agricultural interventions that address climate change offer broad health benefits

While often less recognized, U.S. agricultural practices are a leading contributor to particulate air pollution and GHG emissions, making agriculture an important mechanism to improve health and act on climate change. **The agriculture sector contributed to more than 12,000 premature deaths* in the U.S. in 2018 from the tiny, health-harming air pollution particles known as particulate matter 2.5 microns in size, or PM_{2.5}** (see Figure 1). The primary source of agricultural air pollution is ammonia, which combines with pollutants from combustive sources, such as vehicles and power plants, to create PM_{2.5}.

This ammonia arises largely from livestock, their manure, and the application of synthetic nitrogen fertilizer to cropland. In addition, agricultural production and the associated deforestation to create land for crops and livestock accounted for almost 12.5%^{††} of all U.S. GHG emissions in 2018.¹⁵ The agricultural sector is also the leading source of

two major GHGs, methane (CH₄) and nitrous oxide (N₂O), which are nearly 85 to 265 times** more potent than carbon dioxide (CO₂), respectively. Ultimately, supporting healthier and more climate-resilient U.S. agriculture that reduces air pollution and GHG emissions requires a systemic approach from production to consumption, along with recognition that agriculture is a climate change solution ([see Appendix Climate Action in Agriculture Critical Insight](#)). Interventions such as planting cover crops can help farmers reduce the need for nitrogen fertilizers, improve soil health, diversify production systems, and increase soil resilience to droughts and floods.¹⁶ Examples of initiatives that contribute to achieving desired goals include the U.S. Department of Agriculture's Conservation Stewardship Program and Whole Farm Revenue Protection initiative, and bipartisan bills like the Cover Crop Flexibility Act.

^{††}This number originates from methods used by the Environmental Defense Fund and includes additional GHG emissions related to agriculture (e.g., agricultural-related fossil fuels, electricity, fertilizer manufacturing and land use change related to agriculture) added to the 9.9% of direct agriculture emissions cited by the EPA.

^{**}Based on 20-year GWP potential.³⁶

TOTAL PREMATURE DEATHS FROM AIR POLLUTION BY SECTOR (2018)

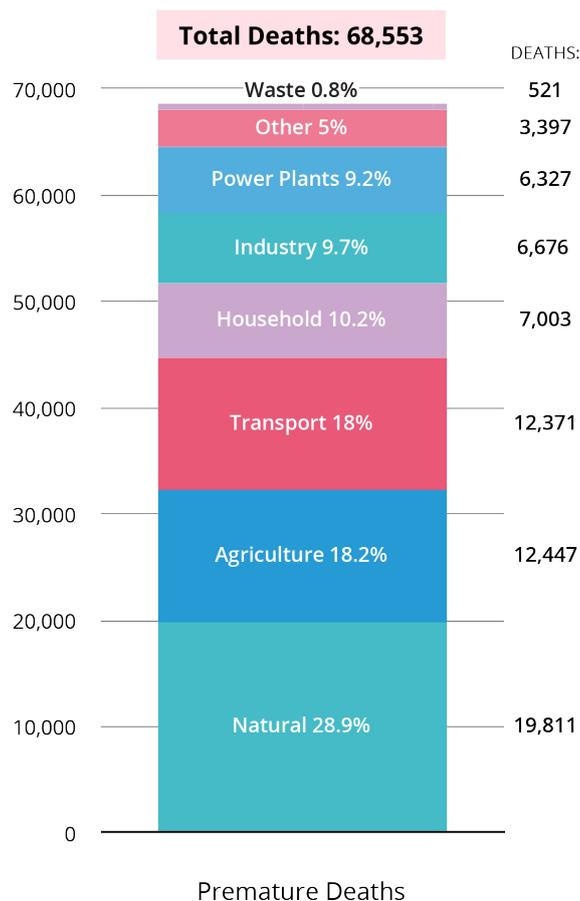


Figure 1: Premature deaths from ambient PM_{2.5} air pollution by sector in the U.S. in 2018.³

Note: Natural particulate air pollution includes natural sources like sand or sea salt.

Fossil fuels drive air pollution and climate change while U.S. subsidies effectively finance the adverse health consequences

The production and use of fossil fuels – coal, oil, and natural gas – generate air pollution that harms health and GHGs that drive climate change (Figure 2). A just and equitable transition away from fossil fuels that minimizes the health harms of climate change would also improve health and save lives immediately by reducing air pollution and providing other health benefits. However, current U.S. fossil fuel subsidies increase and lock in fossil fuel dependence, and in effect finance the adverse health consequences of fossil fuel production and use: illness, death, health care disruptions, and intensifying climate change impacts. In a 2015 self-review, the U.S. government identified 16 fossil fuel subsidies in the form of federal tax expenditures that

amounted to \$4 billion per year,¹⁹ and it committed to removing them by 2025.²⁰

Estimates vary widely depending on definitions, but current estimates of subsidies for extraction and production of fossil fuels total at least \$20 billion per year.²¹ Subsidies amplify profits for the fossil fuel industry and allow more extraction to occur than would otherwise be economically viable in the U.S.^{22,23} Furthermore, the continued expansion of fossil fuel production is inconsistent with the international Paris Agreement’s goal of keeping global warming to well below 2°C and pursuing efforts to limit warming to 1.5°C.²⁴

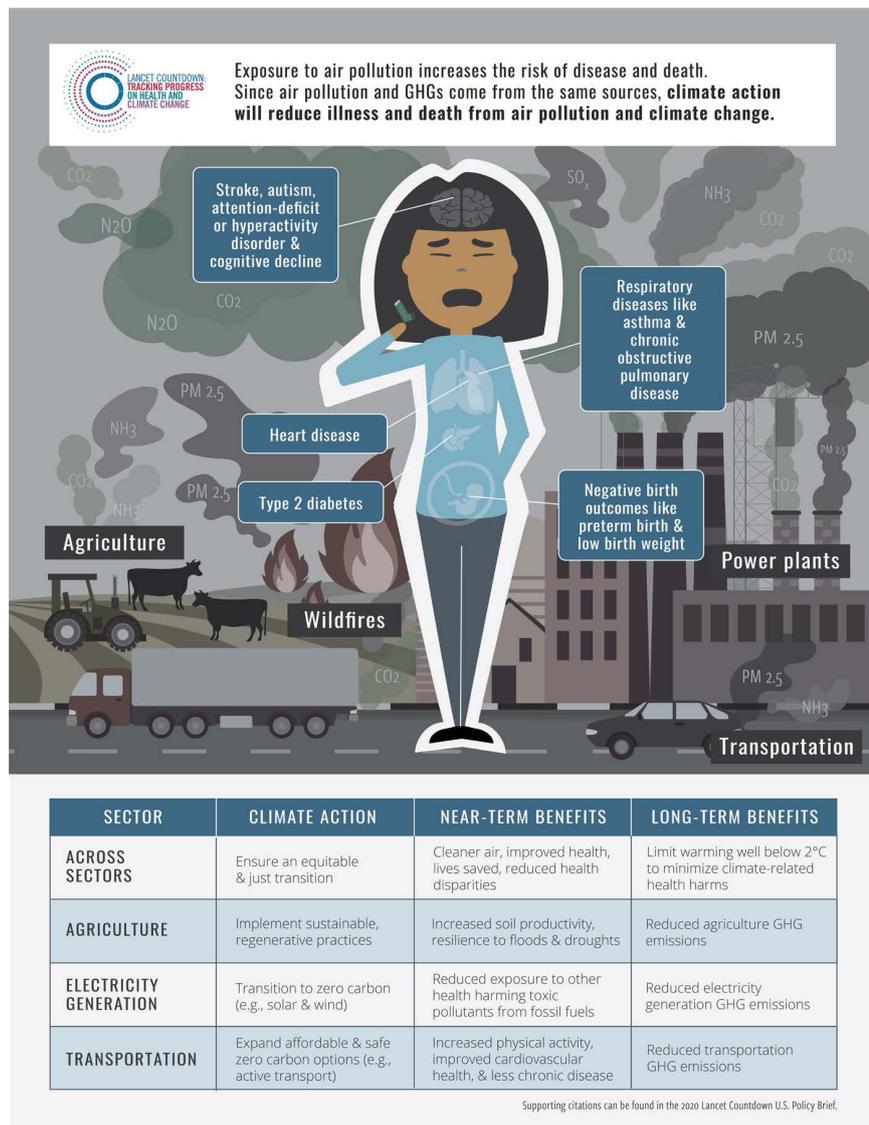


Figure 2: The relationship between air pollution, climate change and the near-term health benefits of climate action.^{17,18}

A transition to zero-carbon electricity generation will improve health and saves lives

The U.S. is making progress towards zero-carbon electricity generation: **low-carbon sources of electricity generation rose to a record high 35%* in 2017, and renewable sources (excluding hydroelectric) rose to nearly 9%*.**³ A transition to zero-carbon has been shown to be feasible by 2035, and a transition away from fossil fuels can save billions of dollars in health benefits alone.²⁵⁻²⁷ While everyone will benefit, this transition will especially protect vulnerable communities ([see Appendix Zero Carbon Energy Critical Insights](#)), and an equitable and just transition must ensure it is affordable for low-income communities.

However the majority of electricity in the U.S. is still generated from fossil fuels, and **in 2018 over 6,000 people* in the U.S. died prematurely from PM_{2.5} air pollution from power generation (Figure 1).**³ **Coal power plants continue to cause almost 90%* of these deaths, even as the share of coal in national power generation is falling steadily, from 53% in 1990 to 28% in 2018*.**³ Unfortunately, the decline in coal power generation in the U.S. is partly due to a shift towards natural gas, which still harms health and worsens climate change ([see Appendix Natural Gas Critical Insights](#)).

Transport systems for clean air, low emissions, and physical activity

Active transport (e.g., walking and cycling) improves air quality, mitigates climate change, and increases physical activity levels, as endorsed by the American Heart Association's policy statement.²⁸ Yet, only about 3% of commutes in 2019 occurred via walking or cycling, with the majority occurring in vehicles.²⁹

While the use of electricity for road transport increased by over 40 times* in the decade since 2007, just 0.06% of the energy used for road transport* in 2017 was electric.³ Thus, the vast majority of road transport energy came from fossil fuels, which, in addition to GHGs,

contributed to over 12,000 premature deaths* in the U.S. in 2018 from transport-related PM_{2.5} (Figure 1).³

An urgent transition to a zero-emission transportation system will lead to near-term health benefits and save 6,300 lives, prevent 93,000 asthma attacks, and generate \$185 billion from health and climate benefits each year by 2050.³⁰ In addition, affordable, more widely available zero-carbon public transit would promote physical activity as well as provide low-income households, youth, seniors, and persons with disabilities better access to resources.

Public health investments for climate-resilient communities

Public health spending is estimated to be between 1.5% and 3% of all U.S. health spending^{31–33} and this lack of investment has dire consequences for health – whether in responding to the COVID-19 pandemic or ameliorating the impacts of climate change. **In 2018-19, the U.S. spent nearly \$13 per person* on climate change adaptation in the health sector,**³ far less than what is needed to prevent the growing health impacts of climate change.

In order to respond to health threats, including those linked to climate

change, funding priorities need to better reflect the fact that public health is critically important and is indeed essential for a productive workforce, a healthy economy, and a thriving society. Climate change adaptation can occur through investments in resilient public health departments and programs that prevent adverse health impacts from occurring in the first place, such as climate disaster preparedness, surveillance, and early warning systems. Such investments are crucial to building resilient and equitable communities.

A healthy recovery from the COVID-19 pandemic

This year has been one of profound suffering and loss as the pandemic has taken a toll on both health and the economy. Yet, now is the time to take bold actions that address the connected health threats of climate change, the COVID-19 pandemic, and systemic racism. Climate change, health, equity, and economic objectives are not only mutually reinforcing but mutually dependent. The U.S. has an opportunity to re-imagine and invest in an equitable, just, and healthy future, featuring a clean energy economy with green jobs, protection for communities that are disproportionately affected, and strengthened resilience to future threats.

In March 2020, Congress passed the Coronavirus Aid, Relief and Economic Security Act (CARES Act), a \$2.2 trillion economic stimulus bill – the largest in U.S. history – with the intent to protect American

workers and small businesses from the economic fallout of COVID-19. Fossil fuel companies received billions from the CARES Act³⁴, on top of the yearly multi-billion dollar subsidies granted to the industry. Funds or subsidies to fossil fuel companies are bad investments from a health perspective and are unlikely to improve the market outlook for fossil fuel companies, especially as the price of renewable energy continues to drop.³⁵

With thoughtful reforms, stimulus programs and redirected fossil fuel subsidies could represent an enormous opportunity to duly invest in the required actions for climate change discussed throughout this policy brief that will equitably improve health and well-being. These policies, which will define society for decades, need to be pursued urgently since our current and future health and pursuit of equity depend on it.

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THE LANCET COUNTDOWN

The Lancet Countdown: Tracking Progress on Health and Climate Change is an international, multi-disciplinary collaboration that exists to monitor the links between public health and climate change. It brings together 38 academic institutions and UN agencies from every continent, drawing on the expertise of climate scientists, engineers, economists, political scientists, public health professionals, and doctors. Each year, the Lancet Countdown publishes an annual assessment of the state of climate change and human health, seeking to provide decision-makers with access to high-quality evidence-based policy guidance. For the full 2020 assessment, visit www.lancetcountdown.org/2020-report/.

THE AMERICAN PUBLIC HEALTH ASSOCIATION

The American Public Health Association (APHA) champions the health of all people and all communities. We strengthen the public health profession, promote best practices, and share the latest public health research and information. The APHA is the only organization that influences federal policy, has a nearly 150-year perspective, and brings together members from all fields of public health. In 2018, APHA also launched the Center for Climate, Health and Equity. With a long-standing commitment to climate as a health issue, APHA's Center applies principles of health equity to help shape climate policy, engagement, and action to justly address the needs of all communities regardless of age, geography, race, income, gender and more. APHA is the leading voice on the connection between climate and public health. Learn more at www.apha.org/climate.

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