The Lancet Countdown on Health and Climate Change

Policy brief for the United States of America

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LANCET COUNTDOWN: TRACKING PROGRESS ON HEALTH AND CLIMATE CHANGE

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The 2023 Lancet *Countdown Brief for the United States (U.S.) presents country-level data on the health impacts of climate change from the 2023 Global* Lancet *Countdown Report. Building on this evidence, it recommends opportunities for advancing health and equity through climate action. The U.S. Brief is supported by a diverse group of health experts from more than 80 organizations who recognize that an urgent, deliberate, and health-centered transition away from fossil fuels and towards a climate-resilient society is fundamental to a healthy, just, and equitable future.*

Introduction

Fossil fuel pollution and climate change have far-reaching and increasing impacts that threaten every aspect of physical and mental health for all communities in the U.S. and around the world.[1,2] Climate change intersects with income inequality and systemic racism to further exacerbate these harms, driving disproportionate impacts across the lifespan for low-wealth communities, people of color, Indigenous populations, and other susceptible populations.[3,4,5,i] As such, fossil fuel pollution and climate change are fundamental issues of economic, racial, and intergenerational justice.

Current climate change is principally driven by human-generated greenhouse gas (GHG) emissions produced primarily by the burning of fossil fuels (coal, oil, and gas) and other combustible fuel sources.[6] Air pollution from fossil fuel combustion and the climate change that results from GHG emissions cause and worsen numerous health conditions, from heart and lung diseases to neurological and kidney conditions, mental health disorders, allergies, infectious diseases (**Box 1**), pregnancy complications and poor birth outcomes, injuries, and death.[7]

Without urgent action to reduce GHG emissions and air pollution, communities across the U.S. will experience increased threats to health and well-being. The indicators from *the 2023 Report of the* Lancet *Countdown on Health and Climate Change* reveal concerning trends in the observed health impacts ofclimate change (**Table 1**),[2] highlighting the imperative to accelerate a just transition away from fossil fuels, and the profound opportunity to improve health and equity by taking climate action.

i) For a fuller discussion of how climate change intersects with and compounds multiple forms of systemic inequity and discrimination to disproportionately harm different marginalized communities and populations, please see the 2022 U.S. Brief.

The State of Climate Change and Health in the United States

The U.S. experienced an unprecedented number of devastating climate-driven events in 2023[8,9] including intense heat, wildfires, and flooding. These events led to myriad physical and mental health harms, premature death, and health system disruptions – the full extent of which are yet to be quantified. The summer of 2023 was the hottest on record,[10] in part due to human-caused climate change.[11] In Maricopa County, Arizona, for example, nearly 425 people are estimated to have died from heat-related causes between May and October[12] and hundreds of additional deaths remain under investigation. However, evidence indicates that the impact of such heat events on the local population could be significantly greater, as official statistics often severely underestimate the true mortality burden of heat,[13] and extreme heat has far-reaching health impacts beyond the immediate death toll.[7]

Extreme heat also fuels and compounds droughts,[14] (**Indicator 1.2.2**) which were especially severe in southern and midwestern states in 2023,[9,15] and wildfires (**Box 2**). In August 2023, the Hawaiian Firestorm destroyed the town of Lahaina on Maui Island in the deadliest U.S. wildfire in over a century.[9] Extreme storms are also becoming more frequent and intense due to climate change, and numerous severe storms struck the Central U.S. while Hurricane Idalia was the strongest hurricane the Florida Big Bend region had experienced in 125 years.[9] Unprecedented rainfall, including record-breaking events in Vermont and California, led to floods, landslides, and immense community disruption.[9]

Box 1. Locally acquired cases of malaria and dengue are appearing in parts of the U.S.

Climate change is increasing the likelihood that infectious diseases in the U.S. will spread to more geographies (**Indicator 1.3**, **Table 1**). Locally acquired cases of malaria and dengue – diseases transmitted by climate-sensitive mosquitoes – are re-appearing in parts of the U.S. Four states reported locally acquired cases of malaria in 2023, including the first known case in Arkansas since eradication, and the first cases in Texas and Maryland in nearly 30 and 40 years, respectively.[16–19] Locally acquired malaria cases were also reported in Florida.[20] Recently, locally acquired cases of dengue were reported in Arizona,[21] California,[22] Florida, and Texas.[23] While the total number of cases remains small, the trajectory will need to be monitored as conditions for disease spread become more favorable.

Box 2. Climate-intensified wildfires in Canada worsened air quality and harmed health across the U.S.

Air quality improved in the U.S. in recent decades, with major associated improvements in public health, in large part due to federal policies like the Clean Air Act.[24] These gains are now slowing and in some cases reversing due to climate change[25] – especially as it contributes to more frequent and intense wildfires.[26] Since 2016, wildfire smoke is estimated to have reversed around 25% of prior air quality progress in the U.S. and more than 50% of progress in some western and midwestern states.[27]

Wildfire smoke is more harmful to health than non-smoke particulate pollution.[28] Smoke is a significant contributor to worsening health trends,[29] including increased heart and lung diseases[30] and higher mortality,[31] and may disproportionately affect marginalized communities[32] and people with existing health conditions.[33]

The U.S. experienced record wildfire smoke exposures in 2023 (**Figure 1**). In June 2023, historic climate change-fueled wildfires in Canada exposed almost one-third of people in the U.S. – more than 100 million – to unhealthy air quality.[34] Nationally, emergency department visits for asthma were nearly 20% higher than expected during the smoke events,[35] with even greater increases in areas most affected by the smoke.[36,37] For instance, levels of fine particulate matter ($PM_{2.5}$) were more than 12 times higher than historical baselines in some parts of New York, with emergency department visits increasing two to three times above recent levels.[36]

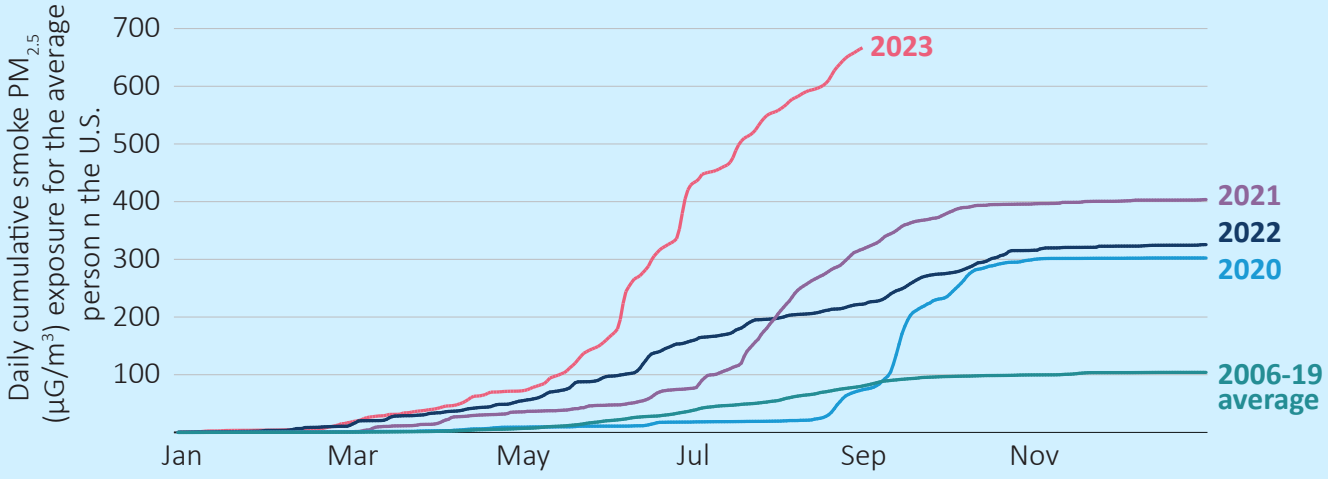


Figure 1. Daily cumulative smoke exposure for the average person in the U.S.

Figure adapted courtesy of Climate Central[38] using data from the Stanford Environmental Change and Human Outcomes Lab. While the figure depicts daily cumulative smoke exposure for the average person in the U.S., smoke exposure was unevenly distributed, with some populations significantly more exposed. Supporting citations can be found in the 2023 Lancet Countdown U.S. Brief.

All indicator data in the following table comes from the 2023 Report of the *Lancet* Countdown. For detailed information regarding the indicators and indicator methods, please see the 2023 Report of the *Lancet* Countdown Appendix. We thank the authors of the global *Lancet* Countdown Report for their work in developing the indicators and providing the regional analyses.

TABLE 1. NEW FINDINGS: KEY U.S.-SPECIFIC INDICATORS FROM THE 2023 LANCET COUNTDOWN REPORT

AIR POLLUTION
FOSSIL FUEL COMBUSTION IS CONTRIBUTING TO PREMATURE DEATHS

Indicator 3.2.1: In 2020, fossil fuel combustion accounted for approximately 41.5% of all premature deaths attributable to human-caused fine particulate matter ($PM_{2.5}$) in the U.S.*

Indicator 4.1.4: The monetized value of premature deaths from fine particulate matter ($PM_{2.5}$) in 2020** was estimated to be $151 billion.***

*Data for 2020 was previously presented in the 2022 U.S. Brief and is reported again here using updated methods.
** Based on an estimated 32,400 deaths from $PM_{2.5}$ in the U.S. in 2020.
***Using 2022 USD.

HEAT
CLIMATE CHANGE IS INCREASING EXPOSURE TO HOTTER TEMPERATURES

Indicator 1.1.1: 2022 was the warmest year ever recorded in the U.S. Average U.S. summer temperatures in 2022 were 2.3°F (1.3°C) warmer as compared to 1986-2005.

OLDER ADULTS AND INFANTS IN THE U.S. FACE INCREASING HEAT EXPOSURE*

Indicator 1.1.2: Adults over age 65 years experienced a 138% increase in total exposure to heatwaves** annually (172 million more person-days***) in 2013-2022 compared to the same demographic in 1986-2005, meaning that each older adult, on average, was exposed to an additional 2.8 heatwave days per year as compared to the historical baseline.

Indicator 1.1.2: U.S. infants under 1 year experienced a 61% increase in exposure to heatwaves** (19 million more person-days***), meaning that each infant, on average, was exposed to an additional 3.2 heatwave days per year from 2013-2022 compared to 1986-2005.

Indicator 1.1.2: In a scenario in which temperatures are kept to under 3.7°F (2°C) of heating, heatwave exposure for people over age 65 is projected to be 5 times greater by mid-century (2041-2060 average).

Indicator 1.1.5: Among adults 65 years and older, heat-related mortality is estimated to have increased 88% in 2018-2022 compared to 2000-2004. In the absence of climate change-induced temperature increases, heat-related mortality would have been expected to increase 25% across this period.****

Indicator 4.1.2: In 2022, the monetized value of these heat-related deaths in adults 65 years and older in the U.S. was estimated to be more than $11 billion.*****

*Older adults and infants are more susceptible to the adverse health impacts of extreme heat exposure (2022 U.S. Brief).
**Heatwave is defined as a period of two or more days where both the minimum and maximum temperatures are above the 95th percentile of the U.S. climatology (defined as the 1986–2005 baseline).
***Person-days refer to the cumulative number of days of heatwave that people were collectively exposed to (e.g., if 100 people were each exposed to 5 heatwave days, there would be 500 person-days of exposure).
****In a counterfactual scenario holding temperature constant and accounting for only population changes.
*****Based on an estimated 23,200 deaths in 2022 in the U.S. from heat-related mortality in adults 65 years and older.

INCREASING ECONOMIC BURDEN OF HEAT IN THE U.S.

Indicator 1.1.4: In 2022, heat exposure in the U.S. led to the loss of 2.9 billion potential labor hours, a 54% increase from the 1991-2000 average. The construction sector accounted for 43% of these losses, 33% in services, 14% in manufacturing, and 10% in agriculture.

Indicator 4.1.3: In 2022, the U.S. saw $81 billion in potential loss of income from reduced labor due to extreme heat. 45% of the losses occurred in the construction industry, 32% in the service sector, 15% in manufacturing, and 8% in agriculture.

URBAN CENTERS IN THE U.S. LACK ADEQUATE GREEN SPACE

Indicator 2.2.3: Green space promotes numerous health benefits and reduces heat exposure.[7,39] In a study of 49 U.S. urban centers, 25 were classified as having moderate or higher levels of greenness* in 2022. This was a decline from 30 urban centers with moderate or higher greenness in 2015.

*Green space, or "greenness", is an area covered by vegetation like grass or trees rather than human-made surfaces like asphalt, providing benefits to air quality and reducing urban heat and flooding. Greenness was estimated using a normalized difference vegetation index (NDVI), a satellite-based method.

INFECTIOUS DISEASE

CLIMATE CHANGE IS CONTRIBUTING TO THE EXPANSION OF CONDITIONS FOR INFECTIOUS DISEASE SPREAD

Indicator 1.3: The transmission season for *Plasmodium falciparum* and *Plasmodium vivax* – two parasites that cause malaria – lengthened by 39% and 33.7%, respectively, in U.S. lowland areas** in 2013–2022 compared to 1951–1960.

Indicator 1.3: The ability of *Ae. aegypti* – the mosquito that can carry the dengue virus – to transmit dengue had more than doubled in 2013–2022 compared to 1951–1960 in the U.S. (as defined by the basic reproductive number, R0*). It is now greater than 1, signifying the potential for the disease to spread.

Indicator 1.3: 9.3% of total U.S. coastline was suitable for *Vibrio* transmission at any one point in 2022. This was 44.4% higher than average suitability from 1982–2010.

*The transmission potential (R0) determines how likely one infection is to lead to another, or the transmissibility of a disease.
**Any part of the U.S. that is <1500 meters above sea level is considered lowland.

DROUGHT

THE AMOUNT OF U.S. LAND UNDER EXTREME DROUGHT IS INCREASING

Indicator 1.2.2: The amount of land classified as experiencing at least three months of extreme drought per year increased 22% from 1951 –1960 to 2013 –2022. In 2022, 11% of U.S. land area experienced over three months of extreme drought. Drought has numerous implications for health, including increased risk of infectious diseases, impaired sanitation, and threatened water security.[2,14]

SEA LEVEL RISE

SEA LEVEL RISE HAS IMPLICATIONS FOR HEALTH

Indicator 2.3.3: In 2022, 1.78 million people lived less than 3 feet above current sea levels. Sea level rise has implications for health, including impacts from flooding, contamination of drinking water, infectious diseases, and worse mental health.[2,7]

PROGRESS ON REDUCING GREENHOUSE GAS EMISSIONS

THE U.S. WAS THE SECOND-HIGHEST EMITTER OF CO_2 IN 2021

Indicator 4.2.5: In 2021, the U.S. was the second-highest emitter of CO_2 by both production- and consumption-based accounting,* contributing 13.4% and 16.0% of the world's production- and consumption-based CO_2 emissions, respectively.

Indicator 4.2.5: In 2021, the U.S was one of the five leading emitters of primary $PM_{2.5}$, by both production- and consumption-based accounting, contributing 2.9% of the world's production-based $PM_{2.5}$ emissions and 5.2% of the world's consumption-based $PM_{2.5}$ emissions.

*Consumption-based accounting assigns emissions to countries based on how they are consuming goods and services, independent of where in the world those emissions were actually produced.

TOTAL RENEWABLE ENERGY IS INCREASING BUT REMAINS MINIMAL

Indicator 3.1.1: Renewable energy* accounted for less than 3% of total energy supply in the U.S. in 2020, an increase over previous years. Coal use, while declining, accounted for 11% of total energy supply in 2020.

*The *Lancet* Countdown indicator uses data from the International Energy Agency (IEA) and defines renewable energy as wind and solar. The U.S. Energy Information Association (EIA) currently defines renewable energy as including hydroelectric and biomass, and thus reports a higher percentage of energy supply coming from renewable sources.[40]

ELECTRICITY-DRIVEN TRANSPORTATION IS MINIMAL BUT RISING

Indicator 3.1.3: The percentage of total electricity-driven transportation in the U.S. increased from 0.03% to 0.1% between 2015 and 2020. Since the Paris Agreement was adopted in 2015, fossil fuel usage as a percentage of total U.S. transport energy has remained steady at 93%.

FOSSIL FUEL COMPANY PRODUCTION STRATEGIES ARE OUT OF LINE WITH THE PARIS AGREEMENT AND U.S. CLIMATE TARGETS

Indicator 4.2.6: As of February 2023, ExxonMobil's planned operations would generate 55% more GHG emissions than would be compatible with their annual share of an "emissions budget" aligned with 1.5°C of average global heating in 2030. In 2040, expected emissions would rise to 217% more than a 1.5°C emissions budget.

U.S. BANKS ARE GLOBAL LEADERS IN FOSSIL FUEL SECTOR LENDING, WHILE GREEN SECTOR LENDING REACHED AN ALL-TIME HIGH IN 2021

Indicator 4.2.7: Between 2017-2021, four U.S. banks* (Citi, Bank of America, JP Morgan, Wells Fargo) lent more than $761 billion to the fossil fuel sector** (average of $152 billion per year), together accounting for 27% of worldwide bank lending to that industry.

Indicator 4.2.7: Between 2017-2021, three U.S. banks* (Citi, Bank of America, JP Morgan) lent more than $170 billion to the green sector (average of $34 billion per year). Their lending to the green sector steadily increased over the past 12 years, reaching an all-time high of $76 billion in 2021.

Indicator 4.2.7: Over the past 12 years, JP Morgan was the leading U.S. bank lender to the fossil fuel sector, lending 8.2 times more to the fossil fuel sector than to the green sector.***

* All global banks were ranked based on lending, and these were the U.S. banks in top rankings.
**Fossil fuel sector lending is defined as "being directed towards exploration, production, operations, and marketing activities in oil and gas."
***Green sector lending is self-identified by the issuer as funding a project or activity with an environmental or sustainability-oriented goal, such as renewables and energy efficiency, green building and infrastructure, agriculture and forestry (reforestation, land use), and other sustainability activities (clean water, waste management).

Strengthening Efforts to Address Climate Change and Ensure a Healthy, Equitable Future

The past year was one of climate progress in the U.S. In August 2022, the U.S. passed the Inflation Reduction Act (IRA) which, alongside the 2021 Bipartisan Infrastructure Law and the 2022 CHIPS and Science Act, is enabling potentially transformative investments in clean energy, electrification, community resilience, and environmental justice. These investments could dramatically reduce air pollution, limit the health impacts of climate change, and catalyze additional action (**Figure 2**). By 2030, the IRA is estimated to reduce economy-wide CO_2 emissions by 35 – 43% below 2005 levels, and reduce electric power sector emissions 49 – 83% below 2005 levels.[41,42] States around the country are also passing climate change legislation in energy, transportation, buildings, and other sectors.[43,44]

Despite these gains, the U.S. remains a leading contributor to global GHG and particulate air pollution emissions and has among the highest per capita CO_2 emissions in the world, surpassing China (**Indicator 4.2.5**, **Table 1**).[45] Accelerating towards zero emissions as rapidly as possible will result in immense health benefits through improved air quality and by limiting climate change, while every fraction of a degree of heating will worsen health outcomes and health inequities.[46,47]

This is a critical moment to secure and build on this recent progress. The health community can play a leading role, both in ensuring the IRA and other climate policies are successful in the face of political threats and in advancing the health- and equity-oriented implementation of climate policies.

Recommendations for Promoting Health and Equity through Climate Action

A rapid transition away from fossil fuels is needed to save lives, protect health and wellbeing, avoid the worst impacts of climate change, and maintain a healthy environment. The U.S. Brief highlights four priority areas for action.

1. **Take action to reduce air pollution, simultaneously reducing the health risks from fossil fuels and reducing GHG emissions.**

2. **Protect health from future climate change by ending fossil fuel exploration and extraction, rapidly phasing out fossil fuel use, and ending fossil fuel subsidies.**

3. **Make protecting and enhancing human health a central consideration in the transition to renewable, non-combustion energy.**

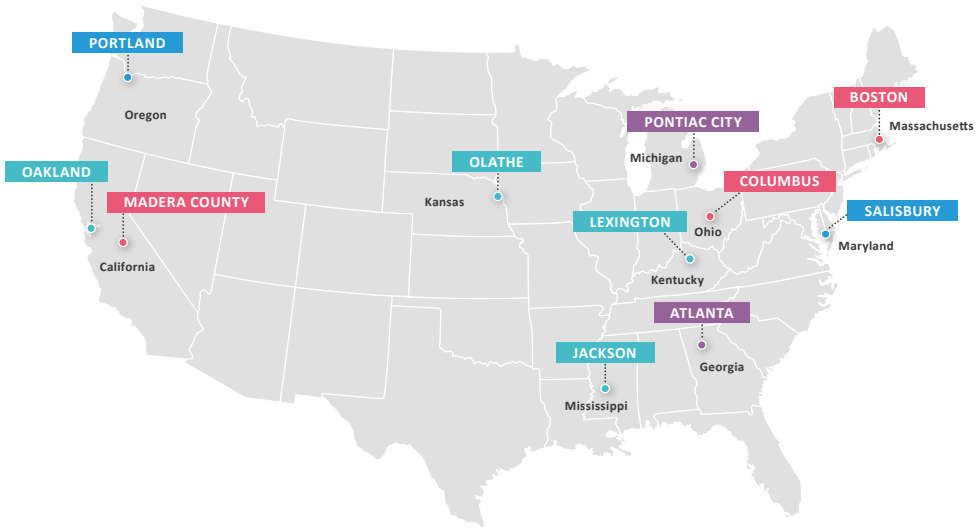
4. **Invest in adaptation to protect people's health from the harms of climate change.**

FIGURE 2: FEDERAL CLIMATE INVESTMENTS CAN PROMOTE HEALTH AND EQUITY

The U.S. is making historic investments in climate change action, notably through the passage of the Bipartisan Infrastructure Law (BIL) and the Inflation Reduction Act (IRA), which lay the groundwork for the energy transition needed to slow climate change and protect health. Additionally, the Justice40 Initiative was established with a goal of ensuring 40% of the benefits from climate and clean energy investment go to communities disproportionately burdened by pollution and disinvestment.[48] Even in the early stages of implementation, these investments are already promoting actions that benefit the climate and our health.

The **Urban and Community Forestry Program,**[49] authorized under the IRA, will invest more than $1 billion in the coming year to expand trees and green spaces in communities around the U.S. Trees and green spaces improve physical and mental health, provide local cooling and reduce the urban heat island effect, improve air and water quality, and support community resilience to extreme weather events.[7,39] As part of the Justice40 Initiative, investments will enhance equitable access to trees. This is important given the history of discriminatory housing policy, environmental racism, under-investment, and the disproportionate citing of fossil fuel, transportation, and industrial facilities that results in low-wealth communities and communities of color having higher levels of pollution, less access to green space, and signifi-cantly hotter temperatures. Oakland, California; Jackson, Mississippi; Olathe, Kansas; and Lexington, Kentucky are some of the over 300 projects in all 50 states that that will receive funding this year.

The **EPA's Clean School Bus Program,**[50] authorized under the BIL, includes a $5 billion investment to replace existing school buses with clean, zero-emission models. With the initial funding in August 2022, more than 2,300 buses will be replaced in school districts around the country. Over 90% of U.S. school buses run on diesel, which produces air pollution that is particularly dangerous for children and is associated with numerous health risks, including asthma and adverse impacts on cognitive development and academic performance.[51] Electric school buses reduce GHG emissions and air pollution and can improve student and community health. Atlanta, Georgia and Pontiac City, Michigan, are among 376 school districts purchasing electric school buses through this program, with further investments in the coming years.



The **Safe Streets for All Grant Program,**[52] authorized under the BIL, includes $5 billion for initiatives that prevent transportation-related deaths and injuries. This program incentivizes active travel infrastructure such as pedestrian walkways, high-visibility crosswalks, and bike lanes, benefiting physical and mental health and reducing air pollution and climate emissions. Portland, Oregon and Salisbury, Maryland, are among 37 of the first round of projects awarded in 2023. The BIL also allocated more than $7 billion to the **Surface Transportation Block Grant Program**[53] for projects such as pedestrian and bicycle facilities, safe routes to school, recreational trails and bike paths, and other active travel infrastructure that improves health and reduces emissions. Wisconsin alone funded 51 projects across the state, totaling $29.8 million.[54]

The IRA includes several mechanisms that enable non-profit hospitals and clinics to **access clean energy tax credits**. Health systems around the country are beginning to take advantage of these tax credits to decarbonize their facilities—including Valley Children's Hospital in California and Wexner Medical Center at Ohio State University[55]—reducing healthcare emissions and air pollution from fossil fuel combustion. Boston Medical Center Health System is accessing funding through the IRA's **Low Income Communities Bonus Credit56** to support patients in accessing the benefits of healthy and less expensive renewable energy.[57]

These examples highlight just a few of the many opportunities for climate investments to benefit health and, if in alignment with the Justice40 framework, equity. New grant programs currently rolling out under the IRA, including the **Environmental and Climate Justice Block Grants** and the **Neighborhood Access and Equity Grant Program**, among others, offer further opportunities to protect against the health risks from urban heat islands, extreme heat, wildfire events, drought, transportation pollution, and more. There is a need to support and maintain the implementation of these investments and ensure health and equity considerations are maximized throughout, including by ensuring that impacted communities are meaningfully engaged in the implementation of these programs.

1 Take action to reduce air pollution, simultaneously reducing the health risks from fossil fuels and reducing GHG emissions.

We must make every effort to safeguard against the established and severe health risks associated with fossil fuels. Air, water, soil, noise, and light pollution from fossil fuel extraction, production, transportation, and consumption processes contribute to health impacts, including asthma and other respiratory diseases, heart disease, some cancers, poor birth outcomes, cognitive effects, and premature death.[3,4,7,58,59]

Air pollution is a leading driver of fossil fuel-related health harms (**Indicator 3.2.1**, **Table 1**). Further action is needed to protect the health for all communities, especially those disproportionately burdened by air pollution due to historical and persistent systemic and structural inequities. This can include: strengthening clean air protections for all air pollutants, most critically, establishing more stringent rules for particulate matter ($PM_{2.5}$) and ozone levels in line with the best available evidence on health harms; strengthening measurement and reporting of inequities in air pollution exposure; and enhancing enforcement of air quality standards. Policies to limit exposure to fossil fuel air pollution, such as setback requirements for fossil fuel infrastructure, can also reduce mortality.[60]

Inequities in exposure to air pollution persist despite overall improvements in air quality in the U.S.[61–63] Unhealthy levels of air pollution and its associated health risks are disproportionately concentrated in communities of color, low-wealth communities, and historically redlined neighborhoods.[64–68] Reducing GHG emissions in line with policies like the IRA will not, on its own, reduce inequities in air pollution exposure.[69] Thus, explicit attention to the health equity impacts of pollution reduction strategies is needed to ensure these approaches do not maintain or deepen inequities even as overall emissions decline.[70] Enhancing funding for community air quality monitoring in under-resourced communities could, for example, significantly improve the implementation of targeted policies to enhance air quality and promote public health in these areas.

Because of the significant health risks of pollution across the fossil fuel life cycle, and the clear causal relationship with worsening climate change, policies that seek to reduce emissions while continuing the use of fossil fuels (e.g., through emissions control or carbon capture technology) will not have the same health benefits as policies that reduce the use of fossil fuels, and may have adverse health and health equity impacts.[7,71]

2 Protect health from future climate change by ending fossil fuel exploration and extraction, rapidly phasing out fossil fuel use, and ending fossil fuel subsidies.

Globally, fossil fuel projects currently in planning and in development could, if realized, emit GHG emissions far exceeding the limits consistent with a 1.5°C rise in global temperatures. The U.S. oil and gas sector is expected to make the most significant contribution between 2020-2050 (see for example **Indicator 4.2.6**, **Table 1**; **Figure 3**).[72,73] New fossil fuel development actively threatens the health of people in the U.S. and around the world. It is incompatible with achieving stated climate goals and is inconsistent with cost-effective pathways to achieve net-zero emissions by mid-century.[74]

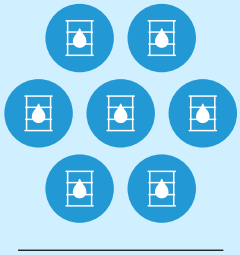
To protect humanity from the worst impacts of climate change, it is critical to phase out existing fossil fuel production and end investments in new fossil fuel infrastructure in a managed and equitable way.[73,75] This can include establishing ambitious and binding targets to phase out coal, oil, and gas production and use, including on public lands by 2035; prohibiting new and expanded fossil fuel infrastructure on public lands and waters; and phasing out U.S. exports of coal, oil, and gas, which reached a record high in 2023.[76] These policies can drive significant, near-term health improvements. For example, the closure of a coking coal plant in Pittsburgh significantly improved air quality and reduced heart-related emergency department visits by 42% a week after its shutdown.[77]

These actions must be accompanied by rapidly and substantially curbing investments in, and subsidies for, fossil fuels and other combustion sources of energy (**Figure 3**).[78,79] Investments by banks, retirement and pension funds, and other financing institutions are used to fund fossil fuel exploration and production (**Indicator 4.2.6**, **Table 1**; **Figure 3**), furthering dependence on polluting energy sources and contributing to worsening future climate change. These investments also undermine the energy transition by displacing finance that could support the scale, accessibility, and affordability of healthy, non-combustion renewable energy.

As part of its broader climate mitigation goals, the health sector must likewise reevaluate its financial strategies and align health investments with the sector's mission to protect health. This includes strategies such as divesting funds from fossil fuel-related companies or industries.

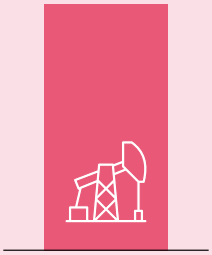
Additionally, it has been well documented that the fossil fuel industry uses its investments and lobbying to promote misinformation and delay policy and regulation that could address the health crisis from climate change and fossil fuel pollution.[80–83] Prior effective public health campaigns – notably on tobacco and lung cancer – successfully used media advocacy linked with local and state policy campaigns to explicitly counter industry influence and disinformation.[84,85] Similar strategies deployed in relation to the fossil fuel industry could inform the public about the health harms of fossil fuel pollution and climate change, and build the social and political will necessary to accelerate action on climate and health.

FIGURE 3: FOSSIL FUEL FINANCE BY THE NUMBERS



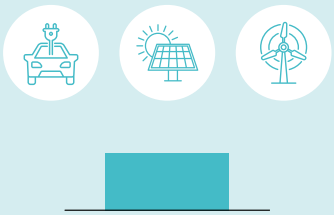
$20 Billion

Annual U.S. subsidies to the fossil fuel industry



$761 Billion

Lending to the **fossil fuel sector** by four leading U.S. banks between 2017-2021, accounting for 27% of all bank lending worldwide to that industry



$170 Billion

Lending to the **green sector** by three leading U.S. banks between 2017-2021, accounting for 14% of all bank lending worldwide to that industry

Supporting citations can be found in the 2023 Lancet Countdown U.S. Policy Brief

3 Make protecting and enhancing human health a central consideration in the transition to renewable, non-combustion energy.

Renewable energy, while rapidly increasing, remains a small share of the overall U.S. energy portfolio (Indicator 3.1.1, Indicator 3.1.3, Table 1). As the cost of renewables declines, it is economically feasible to transition to clean, healthy, non-combustion energy systems.[86,87] Additional investments and policy reforms are needed to ensure the potential health benefits of new climate investments are achieved and to accelerate a just and equitable transition (Box 3).

Financial incentives for renewable energy adoption must be accompanied by clear goals for transitioning away from fossil fuels, including firm, near-term timelines for zero-emission energy, transportation, and buildings; implementation of 100% clean, renewable electricity standards for utilities; and fossil fuel-free government procurement policies.[75] The speed of electrification of transportation and buildings will be a large determinant of the ability of the U.S. to make the transition to healthy energy. This will require large-scale investment in the development and deployment of new electrification infrastructure paired with strong regulatory and policy changes that expand transmission, reform permitting for clean energy, remove barriers to non-fossil fuel energy infrastructure, and expand incentives for – and equitable access to – electric vehicles and building technologies. Policies that help avoid fossil fuel use, such as energy efficiency standards and electrification standards for new construction, are also critical to ensure the efficiency and feasibility of the clean energy transition.[88]

Investments should prioritize and deliberately target GHG emission reductions that deliver the greatest and most immediate health benefits. For example, electrifying heavy-duty vehicles can reduce air pollution and generate large health benefits, particularly for historically marginalized communities.[89] Promoting safe, accessible, and active modes of transportation (e.g., walking, biking) also yields significant climate and health benefits.[90]

Electrification and energy efficiency in buildings and transportation can improve air quality and energy security, and thus improve health.

Current federal funding for climate and health research fails to meet urgent needs.[91] It is critical for federal agencies, such as the National Institutes of Health, National Science Foundation, Department of Energy, and others, to invest in research on all new energy technologies and the implications of their adoption for public health. This should include health impact and life cycle assessments for new technologies themselves and for various deployment scenarios. A notable focus should be on avoiding the substitution of fossil fuels with false solutions that harm health or increase health inequities and identifying ways to eliminate or minimize potential unintended health harms.[92] This will help ensure the adoption of actions that maximally reduce air pollution and GHG emissions.

4 Invest in adaptation to protect people's health from the harms of climate change.

Even with immediate action to reduce GHG emissions, there remains an urgent need to address the health impacts that are already being experienced and that will continue to rise in the coming decades.[98] Investing in adaptation and resilience today is critical to protect health and wellbeing. Increasingly frequent and severe climate events make it more challenging to protect people and recover from climate-related disasters, and accelerating climate disruption may exceed our capacity to effectively protect public health.

Solutions are available to improve community resilience and reduce the impacts of climate change on health, such as through urban greening, distributed community-based renewable energy, and emergency preparedness and response.[7] Yet, adaptation investments fall far behind what is needed to protect people from worsening climate-driven health hazards, both in the U.S.[39] and globally.[99] For example, while 2023 saw historic federal investments in climate change, none of this funding was specifically dedicated to state health agencies to carry out climate adaptation activities. This shortfall in funding is a barrier to implementing climate and health adaptation solutions.[100,101]

Substantially greater and timely investment is needed to scale up solutions across impacted communities and to build the capacity of communities and public health systems to take action on climate and health

Box 3: A just renewable energy transition for health equity.

Many communities rely on fossil fuels for economic and energy security. Provisions are needed to ensure that the energy transition, which can bring significant, immediate health benefits, is equitable and beneficial to all communities.[93]

Many families around the country experience energy insecurity[94–96] that harms their health directly and through multiple social and economic determinants of health. The cost of newly installed renewable energy is now below that of fossil fuels[97] and provides a feasible alternative for affordable, reliable, and accessible energy for all. Policymakers need to work alongside communities throughout the decision-making process to ensure policies meet the specific needs of impacted communities. Investments, including access to — and benefit from — hosting renewable energy generation, need to be directed toward the most impacted communities. Programs to support electrification and energy efficiency must be accessible and affordable to families, schools, health facilities, and other essential groups.

adaptation, including for instance through the CDC's Climate-Ready States and Cities Initiative.[102] Adaptation investments should target the most impacted communities and prioritize community-led solutions.

The U.S. also has a role to play in supporting adaptation globally through its contributions to global climate finance to support impacted countries in implementing climate mitigation and adaptation solutions. The U.S. must significantly scale up its contributions to climate finance, in line with global commitments and its contributions to historic emissions.[7,103]

Conclusion

There are many reasons for cautious hope as parts of the U.S. start to move toward a deliberate and rapid transition to healthy, clean, and renewable energy.[104] There is not only viability in the clean energy economy, but also vitality – improving health for all and advancing health equity – if this becomes core to decision-making. In parallel, there must be health protections to address the harmful impacts of climate change today and into the future.

Young people, in particular, have rallied around this imperative,[105–107] holding a transformative vision for the future that protects the health and well-being of current and future generations. The opportunity – and responsibility – in our current moment is to swiftly accelerate a health- and equity-centered transition to clean and healthy energy across every sector of society. The time is now.

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Organisations

THE LANCET COUNTDOWN

The *Lancet* Countdown: Tracking Progress on Health and Climate Change is a multi-disciplinary collaboration monitoring the links between health and climate change. It brings togethers lead researchers from 52 academic institutions and UN agencies in every continent, publishing annual updates of its findings to provide decision-makers with high-quality evidence-based recommendations. For its 2023 assessment, visit https://www.lancetcountdown.org/.

THE AMERICAN PUBLIC HEALTH ASSOCIATION

The American Public Health Association (APHA champions the health of all people and all communities. It strengthens the public health profession, promotes best practices, and shares 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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Figure 1: Daily cumulative smoke exposure for the average person in the U.S.- Courtesy of Climate Central using data from the Stanford Environmental Change and Human Outcomes Lab.

Figure 2: Federal climate investments can promote health and equity- Naomi S. Beyeler, PhD, MPH, MCP; Nova Tebbe MPA, MPH; Jonathan Patz, MD, MPH. Designed by Huck Strategies.

Figure 3: Fossil fuel finance by the numbers- Data from the 2023 *Lancet* Countdown Global Report. Designed by Huck Strategies.

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