



Indicators of Environmental Health Disparities: Age-adjusted Hypertension

About the Indicators of Environmental Health Disparities

EPA's indicators of environmental health disparities aim to illustrate disparities in key environmental and public health conditions across race/ethnicity and socioeconomic status, as well as the relationship between these health outcomes and the work of EPA programs. This project was created in direct response to EPA's [2022-2026 Strategic Plan](#). These indicators are intended solely as an informational tool and are not intended to be the basis for agency decision making. EPA does not, consistent with applicable laws, distribute governmental benefits or burdens based on race, color, national origin, or sex.

Background Information

Cardiovascular disease (CVD) refers to any disease involving the heart and blood vessels, like coronary heart disease and stroke.¹ One in three Americans has a heart or blood vessel disease and CVD has been the leading cause of death in the U.S. all but one year since 1900.^{1,2} Hypertension, a type of CVD that is characterized by a prolonged increase in blood pressure, is a major risk factor for other CVD conditions like coronary heart disease, coronary (ischemic) heart attack, and stroke. Risk factors for hypertension include obesity, physical inactivity, and high sodium consumption.² Traditional risk factors for CVD, like male sex, older age, increased blood pressure, high cholesterol, and smoking, account for about 50 percent of cardiac events.³ There are also known environmental exposures that act independently or in conjunction with established risk factors to impact CVD and hypertension.

Lead exposure can lead to both cardiovascular effects and cardiovascular-related mortality. There is consistent evidence to show that lead exposure increases hypertension and cardiovascular mortality, with more limited information on lead relating to changes in heart rate variability and the development of atherosclerosis (the buildup of fats, cholesterol and other substances in and on the artery walls).⁴ Air pollution exposure has also been found to contribute to the development of CVD and hypertension and exacerbate existing CVD conditions.³ Evidence is particularly strong for short-term and long-term exposures to fine particulate matter, or particulate matter with a diameter of less than 2.5 micrometers (also known as PM_{2.5}).⁵ The relationship between other criteria air pollutants and CVD is still being investigated.⁶

In addition, the effects of greenhouse gas emissions and climate change may cause or worsen certain illnesses and health conditions. Even short-term exposures to greenhouse gases such as carbon dioxide or ozone have been linked to cardiovascular health effects. Climate-related changes to weather and heat can worsen air quality by impacting ozone and particulate matter concentrations, wildfires, and allergens.⁷ People with conditions such as hypertension are particularly vulnerable to these effects.⁸

Certain populations remain at a disproportionate risk for exposure and negative health outcomes. Those at increased risk of exposure to air pollution include non-white and low-income populations, as well as those who live or work in urban and industrial areas.¹ Exposure to ambient airborne particulate matter could be associated with increased hospitalizations and mortality among older individuals, largely due to cardiopulmonary and cardiovascular disease.⁹

Figure 1. Age-adjusted Hypertension by Race and Ethnicity
Percent

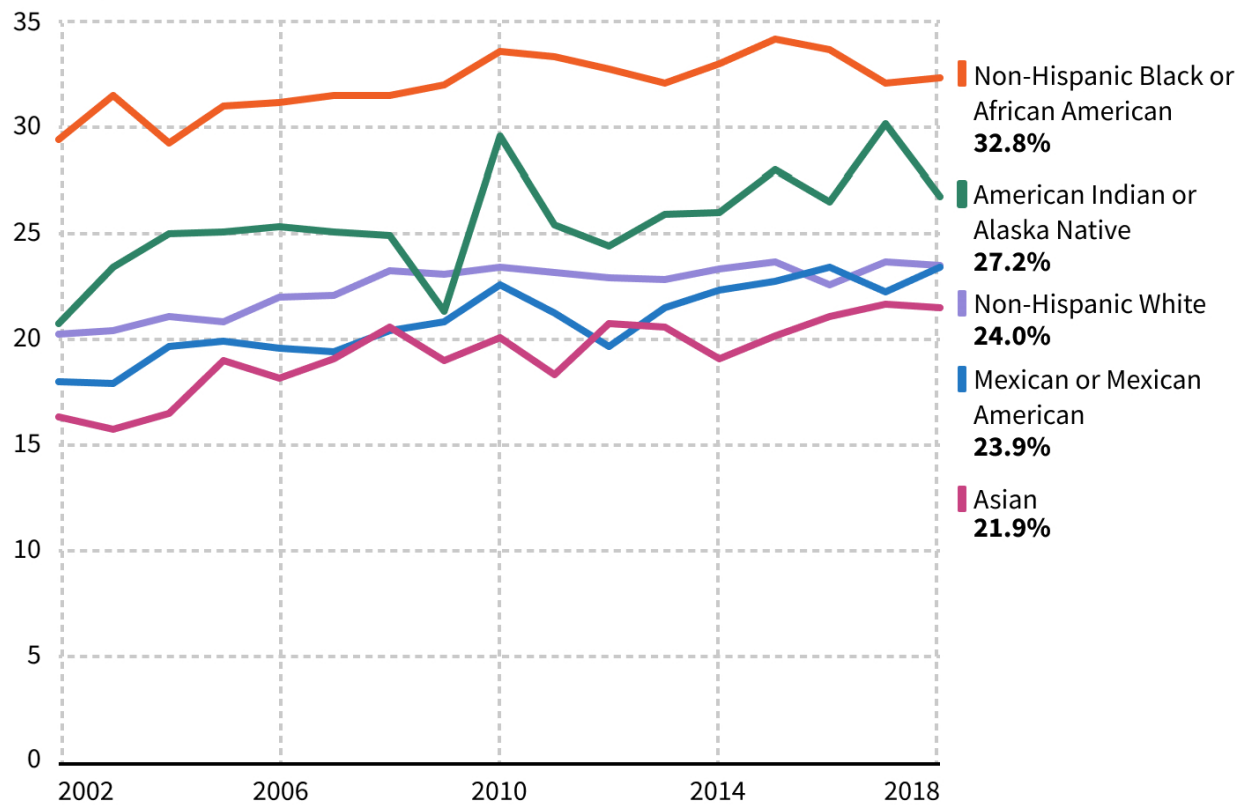
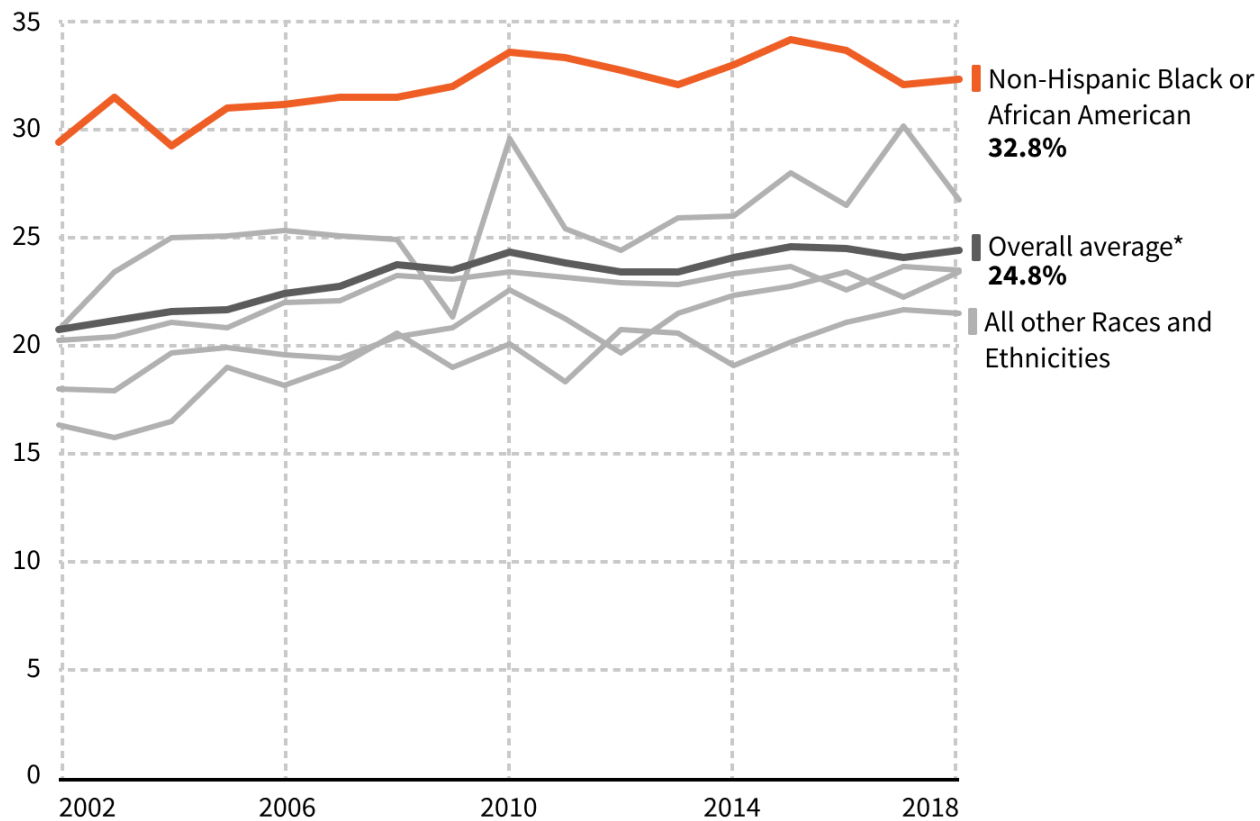
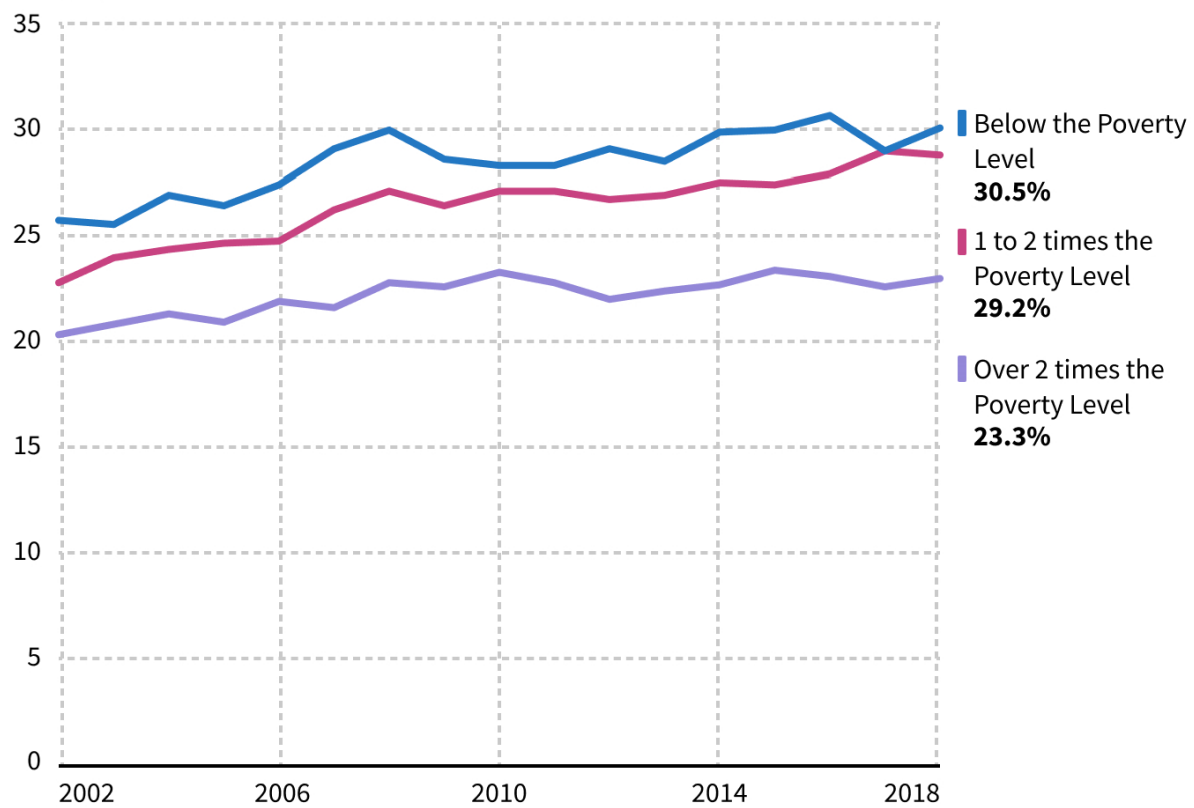


Figure 2. Disparities in Age-adjusted Hypertension by Race and Ethnicity
Percent



*The “overall average” line includes other racial and ethnic groups not shown in the other charts.

Figure 3. Age-adjusted Hypertension by Poverty Level
Percent



What these charts show

These charts show the age-adjusted rates of hypertension in adults in the U.S. from 2002 to 2018, measured in percent.

- On average, there were 24.8% of adults in the U.S. in 2018 who experienced hypertension (Figure 2), but this number varies based on socioeconomic groups and racial and ethnic backgrounds (Figure 1).
- Across race/ethnicity, non-Hispanic Black or African Americans have the highest rates of hypertension with 32.8% in 2018 (Figure 2).
- Since 2002, adults in households below the poverty level¹⁰ have consistently had the highest rates of hypertension (30.5% in 2018), followed by adults in households between 1 and 2 times the poverty level (29.2% in 2018), followed by adults in households over 2 times the poverty level (23.3% in 2018) (Figure 3).
- In all groups, the rate of hypertension has been increasing since 2002 (Figure 1).

This data was collected by the Centers for Disease Control and Prevention's (CDC's) National Center for Health Statistics (NCHS) through the National Health Interview Survey (NHIS). For more information on how data is collected, see the technical documentation.

What these charts do not show

These charts do not show why there are higher numbers of cases of hypertension for certain socioeconomic and racial and ethnic groups. While analyzing the number of cases by socioeconomic and racial and ethnic groups is useful for determining those who may be most vulnerable and impacted by hypertension, these graphs do not suggest that socioeconomic level or race and ethnicity *cause* hypertension. Instead, there are many factors that may influence the number of cases of hypertension in a specific population, some of which may be related to systemic inequities, including underlying health issues, proximity to industrial sources of air pollution, poor nutrition due to limited access to healthy food, and stress. These are known to be higher in lower income communities as well as for certain racial and ethnic groups.¹¹ Further exacerbating these disparities, some racial/ethnic and socioeconomic groups have been found to be more vulnerable to the health impacts of climate change than others.¹²

Relevant EPA Activities

The EPA conducts a variety of research, funding, and regulatory actions that contribute to mitigating the risk of CVD and hypertension due to environmental exposure. While regulatory actions by federal and state agencies have broadly improved air quality, an important focus has been placed on improving the risk of CVD and hypertension in areas with higher levels of pollution. These activities include:

- **Regulating criteria air pollutants and their precursors:** Under the Clean Air Act, the EPA sets the National Ambient Air Quality Standards (NAAQS) for [criteria air pollutants](#) and works with state and local air quality management agencies to meet those standards. In 2024, the EPA [strengthened](#) the NAAQS for particulate matter below 2.5 micrometers in diameter (PM_{2.5}) from 12.0 to 9.0 micrograms per cubic meter as the primary annual standard, continuing to protect Americans from harmful levels of pollution. The EPA also sets, reviews, and implements [standards](#) for lead pollution. For further information about the enforcement of these regulations, see EPA's webpage on [Air Enforcement](#).
- **Reducing lead exposure:** Offices across EPA are engaged in activities to reduce lead exposure. In October 2024, EPA announced the [finalized improvements to the Lead and Copper Rule](#) to better

protect communities from lead in drinking water. The proposed rule would require the vast majority of water systems to replace lead service lines in the U.S. within 10 years. EPA is also investing \$15 billion through the Bipartisan Infrastructure Law to identify and replace lead service lines around the nation. The Bipartisan Infrastructure Law also dedicates \$11.7 billion to projects that improve drinking water quality, including reducing lead in drinking water. To address lead in air pollution, the EPA is now working on proposing and promoting [regulatory standards](#) to address lead emissions from aircraft engines under the Clean Air Act. The EPA also released the [Environmental Justice Toolkit](#) for Lead Paint Enforcement Programs to help address toxic lead exposure in communities, especially those with high levels of lead pollution. Finally, the EPA is taking steps to improve both [Superfund](#) and [Brownfields](#) sites to reduce lead exposure at contaminated properties.

- **Providing resources to communities to improve air quality:** Although the primary ways that the EPA addresses particulate matter (PM) emissions is through regulatory action, through the [Inflation Reduction Act](#) and Bipartisan Infrastructure Law, the EPA is leading a number of grant programs also aimed at reducing air pollution and greenhouse gases, with a focus on low-income and disadvantaged communities:¹³
 - Through the Bipartisan Infrastructure Law, the EPA [Clean School Bus Program](#) provides \$5 billion over five years to replace existing school buses with zero-emission school buses.
 - EPA is distributed \$5 billion dollars in [Climate Pollution Reduction Grants](#) to reduce emissions of greenhouse gases and other harmful air pollutants
 - The [Environmental and Climate Justice Grant Programs](#) is providing \$3 billion for environmental and climate justice activities to benefit disadvantaged communities, including activities that reduce pollution and improve air quality.
 - The EPA is providing funding for [grants](#) to monitor and reduce greenhouse gas emissions and other air pollutants at [schools](#) in low-income and disadvantaged communities.
 - The [Clean Ports Program](#) funds zero-emission port equipment and infrastructure to help address the public health and environmental impacts of air pollution on surrounding communities.
 - The [2024 Clean Heavy-Duty Vehicles Grant Program](#) is working towards replacing non-zero emission Class 6 and Class 7 vehicles (such as school buses, delivery trucks, utility trucks) with zero-emission models to reduce air pollution.
- **Developing public education tools:** The EPA has several public education tools available to access data on air pollution. In partnership with other agencies, the EPA contributes data to [AirNow](#), a website that provides Air Quality Index (AQI) data on city, state, and national levels. People can use AirNow to determine how clean or polluted their outdoor air is and to [take action](#) to protect their health.
- **Understanding and addressing climate change:** Climate change poses many threats to the health and well-being of all Americans; as such, understanding and addressing climate change is critical to EPA's mission of protecting human health and the environment. EPA tracks and reports [greenhouse gas emissions](#), produces and leverages [sound science](#), manages [grant programs](#) aimed at tackling climate pollution and advancing environmental justice, and produces [reports](#) on climate impacts, vulnerability, and health. For more general information about climate change, visit EPA's [climate change webpage](#), and for more information on climate change and human health impacts, visit EPA's Climate [change and human health webpage](#).

These activities represent only a small sampling of the actions the EPA is taking to reduce the impact of environmental factors on CVD and hypertension. For further information on indicators related to environmental and human health, explore EPA's [*Report on the Environment*](#).

References

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- 4) U.S. EPA. Integrated Science Assessment (ISA) for Lead (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-23/375, 2024.
- 5) U.S. EPA. Integrated Science Assessment (ISA) for Particulate Matter (Final Report, Dec 2019). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-19/188, 2019.
- 6) U.S. EPA. Health effects of ozone in the general population. U.S. EPA. Published on March 21, 2016. Accessed June 6, 2024. <https://www.epa.gov/ozone-pollution-and-your-patients-health/health-effects-ozone-general-population>.
- 7) US EPA. Climate Change Impact on Health. US EPA. Last Updated May 15, 2024. <https://www.epa.gov/climateimpacts/climate-change-impacts-health>.
- 8) US EPA. Climate Change and the Health of People with Chronic Medical Conditions. US EPA. Last Updated December 27, 2023. Accessed July 19, 2024. <https://www.epa.gov/climateimpacts/climate-change-and-health-people-chronic-medical-conditions>.
- 9) U.S. EPA. Integrated Science Assessment (ISA) for ozone and related photochemical oxidants. U.S. Environmental Protection Agency, Washington, DC, EPA 600/R-20/012.
- 10) Following the Office of Management and Budget's (OMB) [Statistical Policy Directive 14](#), the Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. The official poverty thresholds do not vary geographically, but they are updated for inflation using the Consumer Price Index (CPI-U). For more information, see: [How the Census Bureau Measures Poverty](#).
- 11) US EPA. Research on Health Effects from Air Pollution. US EPA. Published October 28, 2020. Accessed June 6, 2024. <https://www.epa.gov/air-research/research-health-effects-air-pollution>.
- 12) U.S. EPA. Climate Change and the Health of Socially Vulnerable People. U.S. EPA. Last Updated July 16, 2014. Accessed July 19, 2024. <https://www.epa.gov/climateimpacts/climate-change-and-health-socially-vulnerable-people>.
- 13) Most EPA grant programs identify 'disadvantaged communities' using the White House Council on Environmental Quality's Climate and Economic Justice Screening Tool (CEJST) and/or EPA's EJScreen Supplemental Indexes, in addition to any statutorily required factors. For projects funded through the Inflation Reduction Act, EPA defined disadvantaged by a specific set of criteria that expressly reflects the Agency's efforts to distribute funds based on race-neutral criteria. For more information on this criteria, see [this webpage](#).

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