

A Legacy of Pollution

The Science and Health Effects of Pollutants in Environmental Justice Communities

Introduction

Environmental justice communities (communities of color, low-income communities, and/or Indigenous communities) have fought against a legacy of pollution for decades (1). Underserved communities have experienced, and continue to experience, disparities in access to clean air, water, and safe neighborhoods. These disparities make it more likely that underserved communities breathe, drink, and live in areas that are disproportionately burdened with environmental hazards and other sources of harm. Such long-standing inequities are the result of factors stemming from systemic racism including segregation, redlining, voter disenfranchisement, gerrymandering, and the lack of enforcement of environmental protections, access to health care centers, and other public health protections.

While some progress has been made to reduce pollution in underserved communities by grassroots organizations, local, state, and federal governments, and Congress – millions of people in the US and their families are exposed to hazardous pollutants on a daily basis. There is still a lot of work to do to ensure that everyone has equal access to clean air, water, and a clean and safe place to live, work, and play. Part of the solution is ensuring that decisionmakers listen and uplift the concerns of community members and incorporate robust science in their decisionmaking processes.

The science is clear that underserved communities are disproportionately affected by sources of pollution. Decades of scientific research has provided evidence that:

Facilities that maintain the production or storage of pollutants for long amounts of times (e.g., decades) are more likely to be sited near underserved communities than white and/or more affluent communities. Some of these sites contain the most hazardous chemicals known to humankind.

- Hazardous facilities have been disproportionately sited near underserved communities for decades, and often do not get prioritized for removal or cleanup.
 - Superfund site density is high across parts of Delaware, New Jersey, New York, and Pennsylvania. Black communities make-up 17.7% of the population in this area, far higher than the 9.52% make-up of Black communities in the contiguous US. Communities living in this Superfund dense area have a 17% greater risk of cancer as compared to the rest of the US (2).
 - Seventy-percent of the country's Superfund sites are located within one-mile of government assisted housing. As a result, an estimated 77,000 people live within one-mile of hazardous pollutants that pose serious risks to their health – tenants are predominantly people of color, children, the elderly, and disabled (3).
 - Communities of color on average wait up to four years longer than white communities for the federal government to clean up Superfund sites (4). Black communities,

- specifically, are less likely to receive designation of Superfund sites to the National Priorities List (5).
- Communities of color are disproportionately located in fence-line zones, the areas around facilities that store or produce hazardous materials, where individuals would be least likely to have the ability to escape from a toxic or flammable chemical emergency. A 2014 report found the percentage of Black communities in fence-line zones is 75% greater than for the US as a whole, while the percentage of Latinx communities in the fence-line zones is 60% greater than for the US as a whole (6).
 - Indigenous people in the Arctic are disproportionately affected by organic pollutants and heavy metals in their food. For example, studies have shown the Yupik people of St. Lawrence Island, Alaska have higher blood serum concentrations of polychlorinated biphenyls (PCBs) than the general US population because the Yupik's traditional food sources are disproportionately contaminated (7).
 - More than 600,000 Native Americans live within 10km of an abandoned hard rock mine (not including coal) in the Western US, placing individuals at-risk of being exposed to toxics such as arsenic, mercury, uranium, and other heavy metals with adverse health effects (8).
 - Abandoned coal mines can pose several health and safety risks including acid mine drainage that can contaminate nearby streams and drinking water, pipes and sewers that clog with runoff, as well as exposure to pollutants resulting in respiratory, metabolic, eye, skin, and circulatory diseases, and increased mortality (9). Communities that live near abandoned coal mines are majority low-income and communities of color (10).

Underserved communities are more likely than white and affluent communities to experience a lack of access to safe drinking water and wastewater services. A lack of equitable water systems is a public health concern and can lead to waterborne illnesses that can result in substantial harm or death.

- Race is still a significant predictor of access to clean water.
 - Indigenous people in the US are 19 times more likely than white households to lack access to indoor plumbing – and Latinx communities are twice as likely to lack access (11). From 2013-2017, over 1 million people in the US lacked access to clean water – Black communities were 35% more likely to lack access compared to white communities (12).
 - Public water systems that are continually out of compliance (i.e., 12 consecutive quarters) with the Safe Drinking Water Act are 40% more likely to serve communities of color according to EPA data from 2016-2019 (13). Potential health effects associated with these violations include cancer, developmental effects, compromised fertility, and nervous system effects.
 - Community water systems contaminated with high levels of nitrate (greater than 5 mg/L) - a drinking water contaminant associated with increased risk of bladder, thyroid, colon, and kidney cancer as well as birth defects and preterm birth - were twice as likely to be located in Latinx communities relative to other communities served by the same water system (14).
 - Across 50 municipalities in Illinois, 65% of Black and Latinx communities live in areas where 95% of pipes distributing water are made from lead (15). When exposed to lead through drinking water, individuals can experience harmful effects like increased blood pressure, decreased kidney function, and reproductive problems. Children are especially

at risk of severe harm since the accumulation of lead in the body increases the risk of neurodevelopmental issues (16).

There is a causal relationship between air pollution and respiratory diseases, including childhood asthma, non-asthma respiratory symptoms, impaired lung function, all-cause mortality, cardiovascular mortality, and cardiovascular morbidity (17). The health of underserved communities are disproportionately affected by air pollution (18, 19).

- Traffic emissions are a major source of air pollutants. The Environmental Protection Agency (EPA) estimates that on-road and off-road vehicles produced 80% of the carbon monoxide (CO), 26% of volatile organic compounds, and 49% of nitrogen oxide (NOx) pollution in the US (20).
 - Studies from Southern California, which has some of the worst air quality nationally, found that traffic emissions accounted for 85% of estimated cancer risks, and 70% of cumulative lifetime cancer risks were attributable to diesel particulates specifically (21).
 - A positive association between lung cancer and ambient and occupational exposure to traffic-related air pollution was found in a meta-analysis across 36 studies (22).
 - Underserved communities are located closer to heavy traffic and therefore are more exposed to vehicular emissions. Communities of color are 3.4 times more likely to be located in areas with high road densities as compared to white communities, and low-income communities are 1.5 times more likely to be located in such areas as compared to more affluent communities (23).
 - In the Northeast and mid-Atlantic, communities of color breathe on average 66% more fine particulate matter (PM_{2.5}) pollution originating from vehicles than white communities, and Latinx individuals breathe in 75% more on average (24).
 - Children of color are also disproportionately affected by pollution, especially air pollution, resulting in asthma. Across the country, 20.4% of Puerto Rican and 18.7% of Black children 0-17 years old are living with asthma, compared to 11.7% of white children (25).
 - In California, 33% of a child's overall daily exposure to black carbon pollution results from riding a bus to school (26). Equipping school buses with cleaner fuels and more stringer pollution control measures could result in 14 million fewer school absences, and such technology has shown that lung inflammation in children could be reduced up to 31% (27).

Conclusion

The above research represents a subset of scientific work providing evidence that the health of underserved communities is disproportionately affected by air and water pollution, and a lack of access to safe neighborhoods. The body of work cited in this fact sheet does not detail the exacerbated effects of legacy pollution expected as natural disasters, such as extreme floods and wildfires, intensify and become more frequent with climate change (28, 29). Congress and the federal government should act now to provide more resources to clean up long-standing sources of pollution that disproportionately affects underserved communities, and put policies in place to prevent sources of pollution from being sited in underserved communities.

Communities of color, low-income communities, and Indigenous communities have been disproportionately impacted by pollution for decades, and the past four years saw no progress from the

federal government. An unprecedented frequency of attacks on science-based decisions from the prior administration and diminished resources for underserved communities intensified long-standing risks from pollution (30). Additionally, resources for cleanup actions are in decline. For example, appropriations for the Superfund program have decreased more than a billion dollars from 1999-2020 and cleanups of the extremely hazardous sites has thus slowed, particularly in underserved communities (31). Without adequate resources or prioritization, pollution will continue to impact the people living in underserved communities in the US – their health, their culture, and their lives are at-risk.

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