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Creating The Healthiest Nation: Water and Health Equity

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THE CLEAN WATER ACT

The Clean Water Act establishes the regulations for pollutant discharges into U.S. waters and sets quality standards for surface waters. The Clean Water Act is designed to control sources of pollution, including sewage treatment plants, industrial discharges, stormwater runoff and animal waste lagoons. Lack of such adequate protections can lead to increased contaminants, such as microorganisms, nitrates, heavy metals, and organic chemicals. These contaminants have been linked to gastrointestinal illnesses, cancer, kidney damage and harm to the nervous and reproductive systems. Those most susceptible to water pollution include infants, young children, pregnant people, the elderly and the immunocompromised.

Safe, accessible water is essential to health. Communities across the United States rely on all levels of government to provide clean water and properly treated wastewater. Communities need clean water not only for drinking, but also for recreation, bathing, cooking, and cleaning as well as cultural uses. Unfortunately, our nation's environmental health system does not meet these demands for all people.

Various challenges that contribute to inequities in water access include: out-of-date or inadequate policies and regulations at different levels of government; limited federal funding for water infrastructure; and difficulties with workforce development and retention. These problems significantly affect our nation's health, especially that of populations such as children, older adults, communities of lower wealth, and communities of color, including Black, Brown, Hispanic, and Indigenous populations.

SYSTEMIC RACISM SHAPES PUBLIC WATER ACCESS

While public water and sanitation services are hailed as one of public health's greatest accomplishments, access is still not universal or equitable. Through Jim Crow laws, residential segregation practices and differential pricing structures, systemic racism has shaped the provision of public water access in the U.S. Additionally, historical and structural practices such as inequitable funding, selective enforcement of drinking water standards, and inequitable distribution of community political advocacy and power have led to disproportionate access to safe drinking water.ⁱ

Jim Crow

The Jim Crow era (1877–1954) institutionalized laws and social standards rooted in racism with the specific aim of disenfranchising Black people. The oppressive era continues to impact American culture, institutions, systems, and practices, including the provision of public water and sewerage.^{ii,iii}

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Historically, Black neighborhoods obtained access to water and sanitation services roughly five to 10 years after White neighborhoods. This variability in access is more notable for suburban and rural neighborhoods, as cities often had to extend service to all inhabitants, Black and White, to appropriately manage waterborne disease outbreaks.ⁱⁱⁱ

Residential Segregation and Access

The emergence of more pronounced racial segregation patterns in the mid-20th century, guided by practices such as redlining, exclusionary zoning, and discriminatory lending practices, bolstered municipal decisions to restrict service and access to majority-Black communities and neighborhoods.^{iv}

Affordability Crisis

Increasing costs for water utilities can create barriers to water access as utilities raise water rates, especially in economically distressed cities with declining populations. In cases when residents are offered the opportunity to connect to water utilities, the price is unaffordable. Those who cannot afford the rising costs may face water shut offs, house foreclosures, or property liens.^{iv,iv}

The impacts of the rising cost of water bills disproportionately affect Black communities. For example, in Baltimore and Cleveland, both majority-Black cities, liens of \$350 and \$300 respectively were placed on homes for unpaid water bills, contributing to overall declines in Black homeownership.^{iv}

Inequitable Access and Disparate Health Outcomes

In the U.S., about 1.6 million residents do not have access to running water or complete plumbing in their homes (living without a toilet, tub, or shower).^v There are several communities that disproportionately experience this lack of access including: American Indians and Alaska Natives, Hispanic populations living in the rural Southwest, Black Americans in the rural South, those living in Appalachia, migrant and seasonal farmworkers and communities of lower wealth.^{vi,vii}

While safe drinking water continues to be a significant issue for many Americans, American Indians in rural or reservation areas are particularly affected. An estimated 6.5% of American Indian homes are without safe and adequate water and sanitation sources compared to less than 1% of the general U.S. population that



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WATER, HEALTH EQUITY AND ENVIRONMENTAL JUSTICE

Environmental justice communities are composed of marginalized racial/ethnic, low-income/poor, rural, immigrant/refugee and indigenous populations that live in areas disproportionately burdened by environmental hazards, unhealthy land uses, psychosocial stressors and historical traumas, all of which drive environmental health disparities.ⁱ Communities that experience disproportionate access to safe and clean water sources and/or undue exposure to polluted waters and as a result, experience negative health impacts, are combatting environmental injustice. Flint, Michigan, and Newark, New Jersey are among the many examples of communities that experience water contamination issues linked to discrimination and environmental racism.ⁱⁱ Many environmental justice organizations and partnerships, such as the Environmental Justice Coalition for Water,ⁱⁱⁱ are focusing their work on water to advance health equity and social justice.

- i. American Public Health Association. (2019 November 5). Addressing environmental justice to achieve health equity (policy statement). Retrieved from <https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2020/01/14/addressing-environmental-justice-to-achieve-health-equity#:~:text=%5B27%E2%80%939329%5D%20By%20eliminating,and%20improved%20health%20care%20access.>
- ii. Fedinick, K.P., Taylor, S., and Roberts, M. (2019 September). Watered Down Justice. Retrieved from <https://www.nrdc.org/sites/default/files/watered-down-justice-report.pdf>
- iii. Environmental Justice Coalition for Water. (2022). <https://ejcw.org/>

lacks access.^{viii} Of particular significance, approximately 1 in 20 American Indian and Alaska Native households, mostly rural, lack working indoor plumbing.^{ix} Inadequate access to clean water and sanitation on reservations has been linked to higher mortality rates and health issues such as cancer, ulcers, stomach issues and pneumonia.^x

Migrant and seasonal farmworkers also experience high rates of inadequate access to drinking water and basic sanitation, which can negatively impact health outcomes. Although findings from the 2015–2016 National Agricultural Workers Survey suggest that over 90% of surveyed farmworkers had access to water for hand-washing, drinking, and toilets, workers who were either undocumented or hired by piece rate were significantly less likely to have the same access.^{xi} Restricted access to water for drinking, basic sanitation and hygiene can contribute to the spread of intestinal parasites and bacterial and viral disease.^{xi}

Many rural communities of color and lower wealth do not have access to municipal wastewater systems. They are required to pay for and install their own systems onsite, which amplifies barriers to water and sanitation access.^x These basic plumbing issues can lead to sewage overflows in yards, streams or houses which can cause health-threatening waterborne diseases, such as gastroenteritis and infectious hepatitis.^{x,xii}

WATER SOURCE CONTAMINATION

Drinking water can become contaminated and harm human health in various ways. Pollution, poor maintenance, and lack of investment in water infrastructure and water management can negatively affect water quality and safety. Water contamination can come from point sources, such as sewage treatment plant discharges, and from nonpoint sources, such as agricultural runoff.

LEAD/LEAD POISONING

Incidences of lead in drinking water have increased due to corroding water system infrastructure. Lead exposure is linked to developmental and neurological damage and disproportionately affects children, pregnant people, low-wealth communities, and communities of color. People living in older housing and those served by delivery systems with lead pipes are most at risk for ingesting significant amounts of lead through their drinking water.^{xiii}

LEGIONELLA/LEGIONNAIRES' DISEASE

Legionella bacterium is commonly found in lakes and rivers and can be a cause of concern when found in building water systems, like shower heads, hot tubs, or cooling towers. People can develop a form of pneumonia known as Legionnaires' disease, as well as Pontiac fever, when they breathe contaminated water, often through droplets of water from large building air conditioning systems or from water used for showering.^{xiv,xv}

Nine out of 10 outbreaks can be avoided by effective water management.^{xvi} *Legionella*-contaminated drinking water can be the result of inadequate and aging water systems and water stagnation. Most healthy people do not get sick when exposed to the bacteria. However, those who are older, are current or past smokers, and have weakened immune systems may be more likely to get sick.^{xiv}

PFAS

Most people have been exposed to per- and polyfluoroalkyl substances or PFAS, a large class of human-made persistent chemicals which resist decay and accumulate over time.^{xv,xvii,xviii} PFAS are commonly found in industry and consumer products and pass through wastewater treatment plants. They are used in military and industrial sites, and at airports. Released PFAS from these sources contaminates water via surface water runoff and stormwater discharge and leakage. The chemicals also leach into groundwater to contaminate surface water and drinking water wells.^{xvii,xix}

Many studies suggest links between PFAS and fetal and childhood developmental delays, decreased fertility, cancer, and many other harmful health effects.^{xx} Infants and children in particular are disproportionately impacted by these hazards due to their smaller body weight and hand-to-mouth contact with PFAS-contaminated food and dust.^{xxi} People who work at or live near military sites, airports, industrial sites, and wastewater treatment plants are at higher risk of exposure to PFAS through drinking water. These contamination sources are often located in communities of lower wealth.^{xxi}

AGRICULTURAL RUNOFF

Agricultural runoff is water that leaves farm fields. Polluted agricultural runoff is a leading cause of pollution in our waterways, groundwater sources, and drinking water.^{xxii} Agricultural activities that lead to an increase in contaminated runoff include poorly managed animal feeding operations, overgrazing, overworking the land, and ineffective application of pesticides and fertilizer (including the application of large quantities that cannot fully be absorbed by crops).^{xxiii}

Nutrients, such as nitrogen and phosphorus, are crucial for agriculture. However, they can also cause algal blooms, which can render water unusable for fishing, recreation and drinking, and can kill fish.^{xxiii} Nitrate exposure from fertilizers in runoff has been linked to many negative health outcomes including cancer. Farm workers, rural communities and communities served by private water wells are especially at risk for harmful health effects from nitrate.^{xxiv}

CLIMATE CHANGE

Climate change is predicted to significantly reduce water access and increase flooding, which elevates the risk of water-related diseases and deaths.^{xxv} Frequent droughts may lead to dangerous effects, such as dust storms and an increased risk of drought-related infectious disease and pathogens.^{xxvi,xxvii}

Increased flooding can overwhelm a region's drainage and wastewater treatment systems and harm the health of people, animals, and plants. Sewer overflows are anticipated to increase, and the aging water infrastructure may not be able to withstand the extreme participation, leading to the leaching of sewage into the ground.^{xxviii} After flooding, people may be exposed to health hazards such as mold and contaminated drinking water in their homes or businesses.^{xxix}

Groups most affected by the impacts of climate change on drinking water include communities of color, rural communities of lower wealth, migrant farm workers and people who are homeless. Such populations currently have unequal access to ad-



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PRIVATE WELLS

About one in nine U.S. residents gets drinking water from private wells, yet private wells are not regulated by federal and, oftentimes, state laws.ⁱ A study released in 2009 by the U.S. Geological Survey found that nearly a quarter of over 1,350 private wells sampled had at least one contaminant that exceeded Environmental Protection Agency drinking water standards.ⁱⁱ Private wells are especially susceptible to contamination by chemicals such as nitrates, arsenic and radon, which can be harmful to health and are linked to cancer.ⁱⁱⁱ Exposure to the contaminants can result in gastrointestinal illness, neurological disorders and reproductive problems.^{iv} According to a study conducted in Wake County, North Carolina, African American neighborhoods that were historically excluded from municipal services in Southern towns remain excluded from nearby community water services. Instead, they receive poorer-quality drinking water from private wells. Residents of these neighborhoods may face an increased risk of gastrointestinal illnesses requiring emergency care.^v

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- ii. DeSimone, L.A., Hamilton, P.A., & Gilliom, R.J. (2009). *Quality of water from domestic wells in principal aquifers of the United States, 1991-2004, Overview of major findings*: U.S. Geological Survey Circular 1332, 48.
- iii. U.S. Environmental Protection Agency. (2018, February 23). *Potential Well Water Contaminants and Their Impacts*. Retrieved from: <https://www.epa.gov/privatewells/potential-well-water-contaminants-and-their-impacts>
- iv. Centers for Disease Control and Prevention. (2015, July 2). *Overview of Water-related Diseases and Contaminants in Private Wells*. Retrieved from: <https://www.cdc.gov/healthywater/drinking/private/wells/diseases.html>
- v. Stillo, F. & MacDonald Gibson, J. (2017). *Exposure to Contaminated Drinking Water and Health Disparities in North Carolina*. American Journal of Public Health. 107, 180-185. <https://doi.org/10.2105/AJPH.2016.303482>

equate water infrastructure, among other accessibility issues. The health effects of contaminated water also disproportionately impact children, pregnant people, and the elderly.^{xxviii,xxx}

IMPACTED GROUPS

Poor Water Quality Affects Some More Than Others

POPULATION	TYPES OF VULNERABILITIES
 COMMUNITIES OF COLOR	• Structural racism • Inadequate infrastructure • Health disparities • Language barrier in communities where English is a second language
 CHILDREN	• Breathe more air and drink more water per body weight than adults • Developing organs and low immunity • Dependent on adults • More time spent outdoors • Play on the floor and put hands and objects in their mouths
 OLDER ADULTS	• Low immunity • Pre-existing conditions • Limited mobility
 COMMUNITIES OF LOWER WEALTH	• Limited resources and means to evacuate • Inadequate infrastructure

Other groups that experience disproportionate health impacts of poor water quality include: pregnant women; immigrant groups; the uninsured; occupational groups, such as workers exposed to extreme weather; and people with disabilities, pre-existing or chronic medical conditions.

RECOMMENDATIONS

Federal agencies

- Develop a national water action plan to address racial and health inequities, climate change and coordination efforts.^{xv}
- Provide necessary capacity-building support through funding or technical assistance to local health and environmental departments to anticipate, recognize, evaluate, and remediate high-risk infrastructure and contamination sources.^{xv}
- Enact federal legislation asserting the right to affordable and clean water.^{iv}
- Establish and fund a permanent nationwide water and sewer assistance program for low-income households, as one component of a comprehensive approach to ensuring affordability.
- Establish a national water affordability clearinghouse to receive and disseminate information and technical support with respect to ensuring that water, wastewater, and stormwater services are affordable to all persons regardless of income.

Federal, state and local agencies

- Acknowledge the role of systemic racism in creating water access inequities and institutionalize racial equity in policies and programs.^{xxxi}
- Ensure adequate investment in water infrastructure: An estimated \$1 trillion in the next 25 years needs to be invested in water infrastructure just to maintain today's water service levels.^{xxxii}

- Review, update and systematically enforce primary drinking water standards at all levels of government.^{xv}
- Identify and promote innovative water efficiency programs^{xv} and mobilize waterfront restoration to promote co-benefits such as better water quality, access to green space and improved public health.^{viii} These programs could better prepare the nation for major impacts of climate change.
- Encourage collaboration among health departments and health care providers. Coordinate primary prevention interventions between health agencies and health care providers and establish an evaluation system to monitor environmental hazards.^{xxxiii}
- Partner with affected communities, especially those disproportionately impacted by water infrastructure issues, to address accessibility barriers and expand affordability programs^{viii} and other specific funding opportunities for these groups.
- Ensure community participation and agency transparency in identifying related water and health challenges and creating meaningful, long-term solutions.^{xxxiv}
- Increase accessibility of water and health information, activities, policies, and programs by considering appropriate language translation and technological access in communities.^{xxxv}
- Support Tribal governments in the protection of source water.^{viii}
- Pass legislation to establish affordable and clean water as a human right, such as in California.^{iv}
- Increase the share of water infrastructure funding allocated as grants to economically disadvantaged communities and other environmental justice communities.
- Increase technical assistance to help communities access available funding and reduce costs.

Local agencies

- Upgrade community water and wastewater treatment systems.
- Prioritize investments in remediation where the water or wastewater infrastructure poses health risks.

CONCLUSION

Safe, accessible water and sanitation are human rights that we all need to achieve our highest level of health. Yet some groups of people in the U.S., including communities of color and of lower wealth, are less likely to have these rights than others. This places them at higher risk for serious health conditions, such as neurological disorders, gastrointestinal disease, decreased fertility and cancer. All levels of government and public health organizations must use a racial and health equity lens to ensure the safety and quality of our water infrastructure for all people across our nation.



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