Creating The Healthiest Nation: 
Water and Health Equity

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. 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Various challenges that contribute to inequities in water access include: lack of coordination; out-of-date or inadequate policies and regulations; and limited funding for water infrastructure and related workforce development and retention.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.

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.
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, 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 lacks access.vii Of particular significance, 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. 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.ix Many environmental justice organizations and partnerships, such as the Environmental Justice Coalition for Water,ix are focusing their work on water to advance health equity and social justice.


approximately 1 in 20 American Indian and Alaska Native households, mostly rural, lack working indoor plumbing.\textsuperscript{x} 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.\textsuperscript{v}

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.\textsuperscript{xi} Restricted access to water for drinking, basic sanitation and hygiene can contribute to the spread of intestinal parasites and bacterial and viral disease.\textsuperscript{xii}

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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{xiv,xv}

Nine out of 10 outbreaks can be avoided by effective water management.\textsuperscript{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.\textsuperscript{xv}

**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.\textsuperscript{xv,xvi,xvii} 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.\textsuperscript{xvii,xviii}

Many studies suggest links between PFAS and fetal and childhood developmental delays, decreased fertility, cancer, and many other harmful health effects.\textsuperscript{xvii} 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.\textsuperscript{xix} 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.\textsuperscript{xx}
**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.\textsuperscript{xxi} 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).\textsuperscript{xxii}

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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{xxv} Frequent droughts may lead to dangerous effects, such as dust storms and an increased risk of drought-related infectious disease and pathogens.\textsuperscript{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.\textsuperscript{xxviii} After flooding, people may be exposed to health hazards such as mold and contaminated drinking water in their homes or businesses.\textsuperscript{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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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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{iii} Exposure to the contaminants can result in gastrointestinal illness, neurological disorders and reproductive problems.\textsuperscript{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.\textsuperscript{v}

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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**

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

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.xxv
- 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

**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.xxxv
- Identify and promote innovative water efficiency programsxxv and mobilize waterfront restoration to promote co-benefits such as better water quality, access to green space and improved public health.xxxviii 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.

Partner with affected communities, especially those disproportionately impacted by water infrastructure issues, to address accessibility barriers and expand affordability programs 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.

Increase accessibility of water and health information, activities, policies, and programs by considering appropriate language translation and technological access in communities.

Support Tribal governments in the protection of source water.

Pass legislation to establish affordable and clean water as a human right, such as in California.

**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.

**REFERENCES**


