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## Themed Paper – Original Research

# Water (in)security and American Indian health: social and environmental justice implications for policy, practice, and research



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## ABSTRACT

**Objectives:** The objectives of this research were to examine the relationship between water insecurity and Indigenous health and highlight the social and environmental justice implications water insecurity has for practice, policy, and research with Indigenous communities.

**Study design:** A literature search design was used.

**Methods:** A review of the concepts of water insecurity within an Indigenous context is described through three illustrative case studies.

**Results:** For Indigenous people, water takes on a much greater significance as it is connected to the culture, identity, and livelihoods of Indigenous communities. Although a vast range of determinants influence Indigenous health, water continues to be an integral component of Indigenous health globally.

**Conclusions:** Water is a finite resource, and it is anticipated that water insecurity will grow as water resources are stressed and become scarcer globally. Having safe sustainable water resources by itself will not necessarily result in significant health improvements as there are many other factors involved. However, safe, sustainable water resources are a necessity for health, and health equity is a prerequisite for social and environmental justice for Indigenous people.

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## Introduction

Since the early days of European colonization, social and environmental forces have largely determined the course of Indigenous health in what is now known as the United States (US). Postcolonial contact brought numerous exposure to new diseases, unprecedented levels of violence, cultural

disruption, and environmental displacement and degradation that devastated Indigenous populations and adversely affected American Indian and Alaska Native (AI/AN) health.<sup>1–3</sup> Today, 5.2 million people, or 1.7% of the US population, identify as AI/AN. These numbers include individuals affiliated with 566 federally recognized tribes residing in 35 states, as well as several tribes and Indigenous communities

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that are not federally recognized.<sup>4,5</sup> There is considerable diversity among AI/AN groups, including differences in history, language, culture, spirituality, social organization, and tribal governance. Available health data also show that rates of disease and mortality are unequal and can vary greatly among subsets of the AI/AN population. Disparities in disease and mortality are especially evident when surveying regional differences in health which reflect diverse socio-economic, environmental, and social conditions that influence AI/AN health and well-being.<sup>3,6–8</sup> Although a vast range of determinants influence health, water security continues to be an integral component of AI/AN health and well-being within the US.

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## AI/AN health

Before European contact, AI/AN people had unconditional sovereignty and governed themselves and their health care. Diet and exercise were determined by the land and local water systems that encouraged the consumption of whole foods and physical activity through activities of daily living. Although the health of Indigenous people was not perfect during this time, historical evidence suggests that Indigenous groups experienced a level of health that was similar to other societies across the globe.<sup>1,2,9</sup> Following European occupation, the Indigenous population decreased rapidly due to the depredations of colonization. Infectious diseases, such as smallpox, typhoid fever, and tuberculosis, were introduced and were a major contributor to increased morbidity and mortality and environmental dispossession and displacement.<sup>1</sup> In addition, as tribes entered into treaties with the US government, reservations were established which created fixed geographic boundaries for the first time in AI history.<sup>10</sup> The reservation state has limited customary migration practices of Indigenous people in the US, which were once vital strategies for achieving water security as water resources changed in the environment.<sup>10,11</sup>

The current health status of AIs/ANs continues to be poorer than that of many other Americans.<sup>1,12,13</sup> AI/AN patterns of morbidity and mortality show the burdens of both infectious and chronic diseases.<sup>12,14</sup> This health status is associated with wide-ranging socio-economic disadvantage and the complicated interplay of social and environmental determinants of health. With the advancement of medicine and the recent eradication of many infectious diseases, many AI/AN health disparities have developed into chronic health conditions. Increasingly, these chronic conditions pose complex challenges to public health in the form of diabetes, cancer, heart disease, and obesity.<sup>12</sup>

### Health disparities

Although the overall health status of Americans has seen notable advances during the last few decades, health disparities endure between AIs and other groups in the US, with few improvements realized thus far in the 21st century.<sup>3,15</sup> Compared with white Americans, AIs disproportionately experience an earlier onset of disease(s), a high prevalence and risk for obesity and hepatitis, shorter life spans, and a

higher risk of behavioral health issues, including suicide and substance use.<sup>4,7,8,12</sup> The leading causes of death for AIs/ANs are heart disease and stroke, cancer, unintentional injuries, diabetes, and chronic liver disease.<sup>12,14</sup> AI/AN adults are also twice as likely as their white counterparts to be diagnosed with diabetes and have an infant death rate 60% higher than the rate for white Americans.<sup>12</sup>

AI/AN health disparities are partially explained by unequal access to health services. Barriers to health care can include cultural considerations such as differences in language, beliefs, and customs and an overall lack of an AI/AN healthcare workforce. Other common barriers to health care for AIs/ANs include geographic isolation, limited health insurance, and low socio-economic resources.<sup>4,12</sup> Although the Indian Health Service (IHS) in the US is responsible for providing health services to all federally enrolled AIs/ANs, nearly half of AIs/ANs do not live within IHS service areas, which limits access to care for thousands of AIs/ANs.<sup>7</sup> The IHS has also been habitually underfunded; with per capita expenditures far less than the national average.<sup>16,17</sup> Outside the IHS, when AIs/ANs are able to get health services, they typically have less access to care and receive a lower quality of care than other Americans.<sup>15</sup>

### Environmental impacts

Many of the health conditions faced by AI/AN communities are related to poverty, lifestyle, genetics, and insufficient healthcare systems. In many instances, these health conditions worsen with exposure to environmental hazards and are a significant barrier to improving AI/AN health. Environmental hazards affect not only the direct environment but also the health, culture, and reproductive capabilities of the Indigenous communities they border.<sup>18</sup> Environmental exposures for AIs/ANs include living in remote and isolated communities that expose residents to extreme climates, severe geography, disease-carrying pests and rodents, and hazardous industry.<sup>18–22</sup> Owing to subsistence lifestyles, spiritual traditions, and other social and cultural behaviors, Indigenous communities can have compounded exposures to environmental contaminants through their use of natural resources which result in disparate health impacts.<sup>18,21,23,24</sup> Exposure to environmental hazards has increased tribal communities' contact with dangerous chemicals and conditions that are connected to both acute and chronic health issues, which have influenced the social, cultural, and economic fabric of communities.<sup>18,21,25</sup>

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## Indigenous water (in)security in the US

Universally, water is an important natural resource that includes saltwater, fresh water, and groundwater habitats that extend across the US in coastal and inland regions. Safe and sustainable water resources are an essential element of healthy communities and are necessary for economic and community development.<sup>26</sup> Water insecurity is considered an insufficient level, or uncertain access in either quality or quantity, of the water required to maintain an active and healthy lifestyle and environment.<sup>27,28</sup> Water scarcity and the inequitable distribution of water cause particular concern for

the availability and accessibility of safe water sources for disadvantaged, marginalized, and poor communities in the US.<sup>26</sup> These communities often include many AI/AN groups who are often politically disenfranchised; are reliant on subsistence living practices; and participate in farming, recreational, and traditional activities that rely on water sources in and around their tribal lands.<sup>10,29</sup>

For instance, although safe drinking water is an ongoing issue for many Americans, it is a particularly significant issue for AIs living in rural or reservation areas. Approximately 6.5% of AI homes lack safe and adequate water sources and/or waste disposal facilities, compared to less than 1% of the general US population.<sup>30</sup> Research with Indigenous communities shows that inadequate and unsafe water resources (i.e. polluted) have been linked to a variety of health conditions, including cancer, renal issues,<sup>20</sup> reproductive health concerns,<sup>18,20</sup> skin conditions, and diabetes.<sup>25</sup> For example, in New Mexico, Arizona, and South Dakota, radiation from uranium mining tailings has contaminated water resources in the Navajo Nation.<sup>31</sup> Uranium mining significantly depleted an already limited water supply and contaminated the remainder of the tribe's water resources with uranium runoff.<sup>32</sup> Such environmental impacts extend beyond the uranium mining sites and have degraded the surrounding environment by contaminating the soil, plant life, and water, as well as negatively impacting the livestock who still presently eat and drink contaminated plants and water.<sup>33</sup> Similarly in a study among rural ANs, higher respiratory and skin infection rates were associated with a lack of access to in-home water service—a disparity that could be addressed through sanitation water infrastructure improvements.<sup>34</sup> AI/AN families with satisfactory environmental living circumstances, including access to safe water and sewerage systems, require fewer health services and place less stress on the IHS and other local healthcare organizations. The lack of adequate and safe water resources is a significant factor in the ongoing health disparities experienced by many AI/AN communities.<sup>30</sup> Environmental health challenges related to water for AIs/ANs continue to include a lack of sanitation and waste disposal services, unsafe water resources, housing shortages, and the use of substandard housing.<sup>30</sup> When planning to renovate or develop new housing, tribes must not only consider cost but also flood risks, water shortages, and aging community infrastructure.<sup>35</sup> Many AIs/ANs continue to have ongoing concerns about the contamination and degradation of water in their communities which are ultimately changing native ecosystems, altering traditional ways of living, and impacting Indigenous health and well-being.<sup>29,36</sup>

Beyond the biological and physiological need for safe sustainable water, water is central to the identity, spirituality, and culture of AI/AN people. Indigenous peoples' understanding of water is based on intimate knowledge, respect, and relationship with the environment. In times of water insecurity, their relationship with the environment has been a necessary and important endeavor. Water is sacred to AI/AN people and connects them to their lands and to the earth.<sup>10,37,38</sup> Before the establishment of reservations, access to water was a key determinate in the location of tribal settlements and influenced nomadic lifestyles. Many tribes have customs and ceremonies that honor water through

namesake, social and cultural activities, and traditional beliefs.<sup>39</sup> Water is used during purification and blessing rituals and is respected as a traditional food by many tribes. Universally, 'Water is Life' is a common saying among AIs and other Indigenous peoples to signify that water is the lifeblood of the earth and the people.<sup>10,37,38,40,41</sup>

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### **Distinct communities, diverse experiences, and 'water is Life'**

"We are the people who live by the water, pray by these waters, travel by the waters, and eat and drink from these waters. We are related to those who live in the water. To poison the waters is to show disrespect for creation. To honor and protect the waters is our responsibility as people of the land" (<sup>42</sup> p55).

McGregor and Whitaker<sup>43</sup> state that water insecurity is more than just an environmental issue, but a matter of cultural survival for Indigenous people. Recent events have shown that environmental changes in water are an ongoing concern for Indigenous people globally. Beyond the US, Indigenous people in Canada,<sup>44</sup> Bolivia,<sup>45</sup> Ecuador,<sup>46</sup> and the Amazon,<sup>47</sup> to name a few, are contending with unprecedented changes to their environments which are affecting their relationship and interactions with water in their communities. Recent events on tribal lands and ongoing debates about climate change and its impact on Indigenous communities have drawn international attention.<sup>20,23,39,48–50</sup> During this critical point in time, it is imperative that we consider the social and environmental justice impacts of water (in)security as it is a considerable threat to the public health of Indigenous communities that can also negatively affect a range of social and cultural conditions.<sup>27,51,52</sup>

The following three cases serve as contemporary exemplars of the complexity of water (in)security in the US, which is the home territory of this author. Each case highlights the multifaceted ways water insecurity can affect tribal communities and the diversity of Indigenous communities represented in the US.

#### ***The Kickapoo tribe of Kansas: environmental contamination***

Since their time in the Great Lakes region, the Kickapoo have experienced the seizure of land, the reversal of treaty rights, forced relocation and removal, and most recently, increased exposure to the hazards and insufficiencies that often accompany environmental change. Water quality concerns combined with climate change and recent droughts in the region have continued to expose the Tribe's susceptibilities to environmental change. Similar to other AI tribes, the Kickapoo have historically had limited resources, been politically marginalized, and had limited power to make a considerable change in their environmental circumstances. For over three decades, the Kickapoo tribe has been publicly and politically voicing their concerns about water on their reservation. However, they have received minimal governmental support to address water insecurity for their people. Tribal members continue to be concerned whether the water that has sustained their people for generations is safe and whether there will be enough water for the next generation of Kickapoo.<sup>39</sup>

Such sentiments reflect the Kickapoos' belief that those who apply unsafe fertilizers to crops along the Delaware River, who litter and spoil resources, and who do not appropriately manage pollutants or water resources lack respect for the water and ultimately lack respect for the River and the people who rely on it. The Kickapoo community sees their ongoing struggle with water quality issues connected to upstream water use by outside interests, particularly by farmers, that border their reservation and the larger Delaware River Basin. Many of the Kickapoos believe that upstream activity along the river has potentially contaminated the river, the fish, and possibly even the people.<sup>39</sup> Although national, local, and tribal water policies attempt to maintain the integrity of water resources, vulnerability to water contamination is an ongoing concern in Indigenous communities.

### ***Newtok, Alaska: climate change***

Evidence from Indigenous communities in the Circumpolar North shows that climate change is adversely influencing water and wastewater infrastructures, water quality, and the availability of water sources.<sup>34,53,54</sup> To some degree, flooding and erosion affects 184 out of 213, or 86%, of AN villages.<sup>49,55</sup> One such village is the small coastal Yupik community of Newtok located in Western Alaska. The Yupik people have resided along coastal areas in Alaska for thousands of years and relied on subsistence hunting and fishing traditions.<sup>54,56,57</sup> Internationally, Newtok is known for their recent efforts to relocate because of rapid erosion and frequent flooding related to climate change. Severe flooding has contributed to contaminated drinking water and exposure to sewage waste that threatens the health and well-being of the community.<sup>54,57</sup> Although erosion has continually been an issue in this region, it is getting worse due to warming temperatures and record low sea ice.<sup>49,56–58</sup> During extreme weather events, Newtok can lose 10–20 feet of tundra.<sup>49,54</sup> Projections from the US Federal Emergency Management Agency estimate that erosion will overwhelm the community's drinking water source by 2018, their school by 2020, and their airport by 2022.<sup>54,59</sup> Yupik community members are concerned that they will lose their native language, traditions, and culture if their community must disperse and relocate as their traditional lands erode. Although Newtok was successful in securing funding for their relocation, the project has been delayed because of a range of local, state, and federal issues.<sup>49,54,56,57,60</sup>

### ***The Standing Rock Sioux Tribe, North Dakota: environmental violence***

Lee<sup>55</sup> states that environmental violence includes (a) physical conflict between people(s) over natural resources; (b) environmental policies that are harmful or hostile to people; (c) secondary injury or harm from nature as a result of human degradation of the earth; and (d) direct damage to the environment by humans that threatens survival. In North Dakota, environmental violence was demonstrated in 2016 as members of the Standing Rock Sioux Tribe, alongside allies, stood in opposition to the construction of the Dakota Access Pipeline (DAPL). Opponents of DAPL say that the project to

transport crude oil nearly 1850 km threatens sacred lands and regional water resources.<sup>48,61–63</sup> Tribal leaders state that the US Army Corps of Engineers' preliminary decision to permit the pipeline to be within a half-mile of the Standing Rock reservation was decided without consultation of tribal leaders and devoid of a study of its environmental impacts. The Tribe also believes that the DAPL project violates federal law and tribal treaties with the US Government.<sup>63</sup> Local responses to the activists (i.e. water protectors) included the use of a paramilitary police force that aggressively interacted (i.e. using rubber bullets, tear gas, dogs, and water cannons) with activists who were attempting to prevent the construction of the pipeline. During his first week as President, Donald Trump signed an executive memorandum that expedited approvals for the DAPL. The pipeline was completed in mid-2017 and is currently commercially operational.<sup>64–66</sup> Such acts exhibit direct environmental violence against Indigenous people trying to protect their land and water from environmental degradation and contamination associated with fossil fuel extraction.

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## **Implications for policy, practice, and research**

Whether manmade or naturally occurring, water insecurity is growing and poses a significant threat to public health. Attention to the environmental impacts of water insecurity is particularly important when considering Indigenous communities, who are often most adversely impacted by environmental change, and often have limited resources to respond to change in place.<sup>67</sup> As water insecurities grow, it is not a matter of if, but when, AIs/ANs and other Indigenous people will experience water insecurity in their communities. Given Indigenous people's profound cultural connection to water and their disproportionate experience of water insecurity, there is a need for further exploration of water and its connection to the health and well-being of Indigenous people.

### **Policy**

Water is political, and water justice is but a piece of the larger social and environmental justice movement.<sup>22,28,39,68</sup> Historically, federal water policy in the US has prioritized the use of water for economic purposes, at the expense of communities and the environment.<sup>68</sup> Western views of water as a commodity to be bought, sold, and controlled add to the complexity of how water is used, distributed, and regulated in the US.<sup>39</sup> The economic power of water policy has created an inequitable distribution of water resources in the US that primarily affects low-income and historically underrepresented racial and ethnic communities. For AIs/ANs, challenges to social and environmental justice are complicated by tribes' unique political status as sovereign nations and their contentious history of land and water dispossession with the federal government.

The protection of tribal sovereignty and treaty rights through the support of Indigenous activism and alliance building is necessary to ensure treaty trust responsibilities, which are critical to water-related environmental and social justice. These rights must be protected during displacement,

relocation, or climigration. As tribal relationships are central to our cultural identity, tribes should decide how and when their community might relocate to ensure that socio-cultural traditions remain unbroken.<sup>36</sup> In addition, subsistence rights and the customary communal rights to water resources must also be acknowledged by policymakers, stakeholders, and other officials, whereas we recognize that the decisions we make today will impact the next seven generations to come when modifying and implementing policy.<sup>69</sup> This may mean that we participate in consciousness-raising dialogs both within and outside (i.e. policymakers at all levels) communities and lobby for preventative measures<sup>67</sup> that are proactive rather than reactive to environmental change events. Ultimately, policy development and execution must not occur in a vacuum, but in consortium with tribal nations to guarantee suitability and relevance in achieving Indigenous water security now and in the future.

### Practice

The complexity of the water (in)security necessitates practice responses that are multifaceted, flexible, culturally responsive, and interdisciplinary.<sup>28,70</sup> At a macro level, we must continue to support and engage our communities in mobilization against anthropogenic environmental change that is harmful to Indigenous people. Water-planning efforts must consider long-range impacts that could affect future generations and should be shared with non-Indigenous groups to foster a better understanding of the importance of water to Indigenous people.<sup>38</sup> Integration of interdisciplinary responses at the local, regional, and global levels that center on culturally grounded environmental interactions can be transformative by creating unprecedented solutions. For instance, practitioners need to address environmental violence and its impact on the physical and mental health of AI/AN people, including its effect on indigeneity and cultural identity. Local accounts on social media and through news outlets described the physical violence endured by the water protectors at Standing Rock that included being struck by water cannons and rubber bullets. The bodily wounds of the water protectors may have been physically visible; however, the spiritual and mental burden of what it means to be assaulted on your ancestral lands while protecting water and your way of life is untold. Public health practitioners, with support from other helping professions such as social work and medicine, could develop coordinated responses to environmental change that better address water-related emotional distress that is connected to environmental violence, contamination, and climate change.

### Research

Water is not only a physical element but also a cultural element.<sup>54,71</sup> For AI/AN people, water is inherently connected to our health and well-being, and research needs to account for the cultural values connected to water. In addition, research must be collaborative, be mutually beneficial, and have a fundamental goal of effecting social change to advance environmental and social justice. These values are

reflected in community-based participatory research that has been successful in partnering with tribal communities to address environmental change issues.<sup>29,39,70,72</sup> Globally, there is a need for greater understanding of the contributing factors and daily experiences of water insecurity, as well as factors that promote household water security.<sup>27,28,54,73</sup> Although studies have begun to document many of the health outcomes linked to AI/AN water insecurity, less is understood about how these conditions affect daily life, including household approaches for obtaining and using water, and the cultural responses that occur around these practices.<sup>54</sup> We must also continue to document how communities are adapting to water insecurities. This includes expanding on recent work about water insecurity to better understand how communities are adapting to address environmental changes that may result in the face of climate change, population growth, industrialization, globalization, and political uncertainty.<sup>73</sup>

### Conclusion

Water is a finite resource, and it is anticipated that water insecurity will grow as water resources are stressed and become scarcer globally.<sup>26</sup> For AI/AN people, water takes on a much greater significance as it is connected to the culture, identity, and livelihoods of their communities.<sup>39</sup> In the US, challenges associated with climate change, decreasing groundwater supplies, fragmentation of land, contamination, and pollution and the depletion of natural environments add to the complexity of guaranteeing safe, sustainable water resources for all people. Challenges related to water resources are especially significant for AI/AN communities, who are often most vulnerable to environmental change and have limited resources to respond to circumstances in place.<sup>36,51,74</sup> Environmental justice and water security in the US will continue to be an important issue for Indigenous people as climate change and environmental hazards continue to stress and threaten AI/AN communities. Having safe and sustainable water resources by itself will not necessarily result in significant health improvements as there are many other factors involved. However, safe and sustainable water resources are a necessity for health, and health equity is a prerequisite for social and environmental justice for Indigenous people. By working in consortium with AIs/ANs, scholars and practitioners have the opportunity to diversify and enhance the conventional dialog on water and contribute to improved policy, practice, and research that address issues of water insecurity and promote Indigenous health and well-being globally.

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