Broken Promises: Examining the Impacts of Water Insecurity in Indigenous Communities Across Canada

Nicole Li

Abstract

As the stewards of the traditional lands of Canada, Indigenous communities - including the First Nation, Métis, and Inuit - have been historically marginalized in society. To this day, many of these communities face drinking water advisories and lack adequate access to clean water sources. The five types of water advisories issued are water quality advisory (WQA), boil water advisory (BWA), do not consume (DNC), do not use (DNU), and conserve (CONSV). This paper will explore the detrimental impacts of this water scarcity, which affects the communities' physical and mental health. The lack of clean water threatens the practice of Indigenous traditions and customs: many cultures believe that humans hold a responsibility to protect water, as it is considered to be a living entity. To address this crisis, Indigenous voices must be empowered and amplified throughout policy-making processes. This is particularly important due to the mistrust and suspicion Indigenous communities harbor towards the government, largely resulting from Canada's colonial history.

Introduction

Along with one of the largest renewable and freshwater supplies in the world, Canada also has a high water consumption rate. The total per capita consumption of water - including usage for residential, commercial, and industrial purposes - provided by public utilities per day averaged 401 liters per Canadian in 2021, equivalent to almost 106 gallons of water (Statistics Canada, 2023). Despite having abundant access to this natural resource, many Indigenous communities in Canada continue to suffer from the lack of access to clean, safe drinking water. The three main groups of Indigenous communities in Canada facing water inequality are the First Nation, Métis, and the Inuit peoples. Many reserves have drinking water advisories (DWA), public health messages that warn residents about health risks present in their water supply (Indigenous Services Canada, 2021). These warnings typically manifest in five types: water quality advisory (WQA), boil water advisory (BWA), do not consume (DNC), do not use (DNU), and conserve (CONSV). In October 2024, there were still 32 long-term drinking water advisories (LTDWA) enacted across 30 Indigenous communities, despite the federal government's initial promise to lift all LTDWA by March 2021(Aiello & Aiello, 2020; Indigenous and Northern Affairs Canada, 2024). The historical data of the number of LTDWA lifted or added can be seen in the graph below.

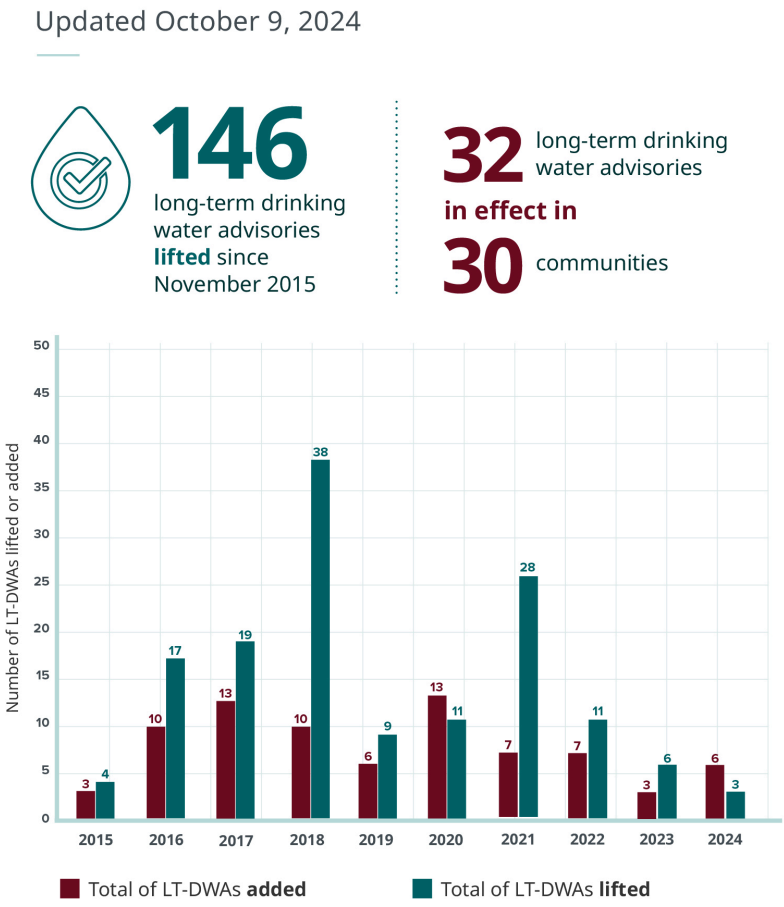

Figure 1. Graph displaying the number of LTDWA added and lifted from 2015 to 2024.

The continual lack of access to clean water has been detrimental to the physical and mental health of these communities. Common diseases associated with poor water quality include gastrointestinal infections and eczema, along with worsened mental health conditions (Adams et al., 2019; Wutich et al., 2020; Ansloos & Cooper, 2023). In addition, water plays a crucial and sacred role in Indigenous communities. According to the Native Women's Association of Canada (n.d.), many cultures regard water as a living entity and believe that humans have an innate responsibility to care for it. Evidently, lack of access to safe water is an infringement on Indigenous communities' physical, psychological, and spiritual health. Notably, these challenges are uniquely experienced by Indigenous peoples due to Canada's colonial history that forced these communities to live on unsustainable reserve lands far from urban cities (White et al., 2012). As a study from Western University notes, the remote nature of reserves complicates the development of sustainable water systems, with this problem further exacerbated by the marginalization of Indigenous peoples (White et al., 2012). This paper will analyze the physical health implications of water insecurity and its threat to the communities' psychological state and cultural traditions in Canada.

Challenges in Safe Water Supply

Communities generally rely on two major water sources: surface water (eg. lakes and rivers) and groundwater (eg. wells) (Indian and Northern Affairs Canada, 2003). However, the quality and quantity of raw water is susceptible to change. For instance, less water will be available during drier periods and the turbidity - a measurement of water clarity - of the water varies from time to time (Goldman & Wetzel, n.d.). Surface waters are particularly prone to chemical and bacteriological contaminations caused by wildlife and human activities (Indian and Northern Affairs Canada, 2003). Additionally, as the population of these communities continues to grow, some water systems are also placed under strain to meet quantity demands (Indian and Northern Affairs Canada, 2003). Given the vulnerability of water sources, reliable water treatment systems are imperative to ensuring Indigenous communities' access to clean water. Current challenges that prohibit the stability of water systems include their premature aging and a lack of funding to train certified water operators and retain them in the communities (Bradford et al., 2016). For example, water safety concerns remain prevalent in potable water dispensing units (PWDU), which are small-scale water treatment systems that allow residents to retrieve water with containers (Chaulk & Picco, 2010). Specifically, there is significant mistrust in the safety of the PWDU system in the Inuit Black Tickle community located in Labrador. The presence of animal activity, typically involving beavers and muskrats, around the system's surface water source, Martin's Pond, makes it susceptible to contamination (Hanrahan et al., 2014). In fact, the wells in the community are contaminated by wild animals' feces and urine, with E. coli present in two out of seven wells (Hanrahan et al., 2014). Meanwhile, the PWDU does not serve as a reliable source given its inability to consistently operate due to a lack of funding (Hanrahan et al., 2014).

Physical Implications

The water sources on reserves pose direct threats to the well-being of the communities because they contain heavy metals, such as manganese and iron, as well as biological contaminants, like Escherichia coli (E. coli) (Bharadwaj & Bradford, 2018; Swampy & Black, 2021). In fact, water-borne infections are 26 times higher in Indigenous communities than the

national average (Swampy & Black, 2021). At the same time, individuals living on reserve land are 90 times more likely to have zero access to running water compared to their non-Indigenous counterparts (Swampy & Black, 2021). The aftermath of consuming unclean water has severe health consequences: common diseases associated with poor water quality include gastrointestinal infections (i.e. giardia), eczema, and skin cancer (Bradford et al., 2016). Others include obesity, diabetes, hypertension, and liver and heart diseases that come with substituting water with less healthy drinking options (Bradford et al., 2016).

A substantial portion of clean water Indigenous communities access is disinfected by chlorine. Although chlorination reduces the risk of water-borne disease, many side effects come with this process (Government of Canada, 2020). First Nations communities experiencing over-chlorination in their waters reported an increased number of skin diseases (Bradford et al., 2016). Excessive levels of chlorine in drinking water can result in dry skin along with eye, nose, and skin irritation (Bharadwaj & Bradford, 2018). Furthermore, the by-products of disinfectants pose a threat to the quality of the treated water due to their carcinogenic properties (Hanrahan et al., 2014). In fact, water samples from the PWDU in the Black Tickle community contain by-products such as Trihalomethanes and Haloacetic acids, which can increase the risk of developing cancer (Hanrahan et al., 2014). Given that chlorine reacts with decaying organic matter to form the disinfection by-products, their production also indicates the presence of organic materials, such as animal manure, in the water before disinfection (Government of Canada, 2023). Aside from these harmful impacts, chlorination also induces a pungent smell in the disinfected waters. According to a study conducted by researchers at the University of Waterloo, the primary reason community members avoided consuming tap water was due to its chlorine smell (Ratelle et al., 2022).

As an alternative to replacing contaminated water, bottled beverages have become popular in communities to execute daily tasks like cooking, drinking, bathing, and brushing teeth (Belouizdad, 2023). However, bottled water may not be a sustainable water solution for Indigenous communities. Recently, a research team at Columbia University discovered that one liter of bottled water contained, on average, 240,000 tiny pieces of plastic, with 90% of them being nanoplastic (Contie, 2024). Although more studies are required to confirm the adverse effects of microplastics on human health, researchers do identify cause for concern. If ingested, these tiny particles can invade cells and tissues in major organs, which interrupts the cellular process and deposits endocrine-disrupting chemicals, such as phthalates, bisphenols, and heavy metals (LaMotte, 2024). Simultaneously, there is an increasing dependency on sweetened beverages such as pop drinks due to the high cost of bottled water. The regular intake of sweetened beverages caused an alarmingly high rate of diabetes among First Nation and Inuit communities (Bradford et al., 2016). In Black Tickle, some parents added Kool-Aid into the waters of their children to obscure the unnatural color of the unclean waters (Hanrahan et al., 2014).

Psychological & Spiritual Well Being

When examining the health effects of water insecurity, it is important not to overlook the psychological impacts that coincide with physical harm. As a life necessity, water insecurity disrupts daily life and causes emotional distress, anger, shame, and stigma (Adams et al., 2019). The lack of clean water and ineffective water treatment has induced high levels of stress among Indigenous communities, creating substantial uncertainties and worries (Wutich et al., 2020). Community members worry about whether there will be enough water for the day, how

they must retrieve water for tomorrow, and how much money they need to spend on bottled water. The ongoing stress has resulted in residents struggling with anxiety, depression, and obsessive-compulsive disorder (OCD) (Hanrahan et al., 2014; Bradford et al., 2016; Bharadwaj & Bradford, 2018; Adams et al., 2019). In addition, individuals remain dubious about the safety of the treated waters, unsure whether their family will become ill from consumption (Wutich et al., 2020). A case study conducted at the University of Saskatchewan examines the psychological and cultural impacts of water insecurity in eight Indigenous communities in Saskatchewan (Bharadwaj & Bradford, 2018). They determined that the continuous stress contributed to relationship difficulties and heightened tensions in the community. In particular, the high levels of anxiety arise from the fear of the adverse health effects of water treatment, especially due to the high levels of chlorine in the water (Bharadwaj & Bradford, 2018).

Indigenous peoples experience the harms of water insecurity on multiple dimensions, especially due to their intimate relationship with water. Water is a critical aspect of Indigenous culture, as it is viewed as pure, medicinal, and life-giving and as a source of healing in some communities (Bharadwaj & Bradford, 2018; Wutich et al., 2020). However, a lack of access to clean water prohibits communities from performing water ceremonies, rain dances, or continuing traditional teachings - as the water is perceived to be toxic (Bharadwaj & Bradford, 2018). Consequently, the inability to engage in meaningful cultural practices increases the risk of developing mental illnesses. Stress and anxiety were the most saliently reported psychological impacts of water insecurity in the Six Nations of the Grand River (Bharadwaj & Bradford, 2018). Specifically, women in the community have heightened risks of postpartum depression. The Six Nations utilize traditional medicines during postpartum to help recover, such as sitz baths (Bharadwaj & Bradford, 2018). However, these practices involve the usage of substantial amounts of clean water, which may not be available in the community. While recovering, women also experience “mom guilt,” where they feel that they are failing to fulfill their role as a caregiver. Ultimately, contaminated waters severely undermine the well-being of the nation, especially new mothers (Sultana et al., 2022). While understanding the adverse effects water insecurity imposes on cultural practices, it is important to note that Indigenous communities are a diverse group of people. Therefore, each community will experience this cultural and spiritual shift differently.

Conclusion: Pathways for Change

The water crisis poses multifaceted challenges to Indigenous peoples that stem beyond physical harm, impacting their psychological well-being and impeding their traditional cultural practices. Communities experiencing a lack of access to clean water are vulnerable to various health risks such as water-borne diseases and exposure to chemical by-products. Simultaneously, individuals constantly live in a highly anxious environment that potentially results in mental health concerns. Their mental well-being may be further deteriorated due to a lack of meaningful engagement with their culture, given that unclean water prohibits them from carrying out traditional practices. Therefore, plans to address water insecurity in Indigenous communities must ensure that water treatment systems are reliable and culturally appropriate. A key aspect of this includes full transparency of the treatment methods, such as the chemicals and technologies used in the disinfection process.

Despite failing to meet its promise of lifting all water advisories by 2021, the Government of Canada passed Bill C-61 in December 2023 in an effort to address the ongoing water insecurity (Indigenous Services Canada, 2024). Also known as the First Nations Clean Water

Act, this bill acknowledges the rights of the First Nation to self-govern water management on their lands. As a result, the government is accountable to financially fund the communities during the development of water infrastructures and services (Indigenous Services Canada, 2024). Despite this progress, there are several shortcomings in Bill C-61. The proposed legislation does not detail any requirements for the Canadian government to protect source water, which is critical to ensure there is enough quality water for the communities. Additionally, the bill only ensures that communities have sufficient water to meet the limited demands of "drinking, cooking, sanitation, hygienic, safety, fire protection, and emergency management" (Joynt & Leonard, 2024). This fails to account for other instances of water usage that are critical to Indigenous communities, such as those for rain dances and water ceremonies. Moreover, Bill C-61 only mandates the Canadian government to use its "best efforts" to fund water projects on First Nation lands, which remains a potential loophole that the government can exploit (Joynt & Leonard, 2024). To avoid further challenges, the Government of Canada should actively work with First Nation communities to build a timeline for water infrastructure and service projects, including the estimated costs of construction, maintenance, and sustainability to ensure transparency in the funding commitment. While Bill C-61 marks a step forward in addressing water insecurity in First Nation lands, the federal government should also seek to address the same crisis present in Inuit and Métis communities, ensuring to include Indigenous peoples in legislative actions. Ultimately, the type of treatment systems utilized should be tailored to the communities' specific needs. As such, future research can further examine how Indigenous communities may experience the impacts of water insecurity differently due to their cultural and geographic variations.

References

Adams, E. A., Stoler, J., & Adams, Y. (2019). Water insecurity and urban poverty in the Global South: Implications for health and human biology. *American Journal of Human Biology*, *32*(1). https://doi.org/10.1002/ajhb.23368

Aiello, R., & Aiello, R. (2020, December 2). Feds break promise to eliminate all drinking water advisories in 2021, vow work will continue. *CTVNews*. https://www.ctvnews.ca/politics/feds-break-promise-to-eliminate-all-drinking-water-advisories-in-2021-vow-work-will-continue-1.5213658

Ansloos, J., & Cooper, A. (2023). Is suicide a water justice issue? Investigating Long-Term Drinking Water Advisories and Suicide in First Nations in Canada. *International Journal of Environmental Research and Public Health*, *20*(5), 4045. https://doi.org/10.3390/ijerph20054045

Belouizdad, S. (2023, November 22). *The water conundrum and Indigenous communities in Canada*. Macdonald-Laurier Institute. https://macdonaldlaurier.ca/the-water-conundrum/#:~:text=In%20fact%2C%20over%2017%2C600%20people,hydration%2C%20cooking%20and%20personal%20hygiene

Bharadwaj, L., & Bradford, L. (2018). *Indigenous water poverty: Impacts beyond physical health*. University of Saskatchewan Pressbooks. https://openpress.usask.ca/northernhealthcare/chapter/chapter-4-indigenous-water-poverty-impacts-beyond-physical-health/

Bradford, L. E. A., Bharadwaj, L. A., Okpalauwaekwe, U., & Waldner, C. L. (2016). Drinking water quality in Indigenous communities in Canada and health outcomes: a scoping review. *International Journal of Circumpolar Health*, *75*(1), 32336. https://doi.org/10.3402/ijch.v75.32336

Chaulk, M., & Picco, B. (2010). *Drinking Water Safety Initiative*. Government of Newfoundland and Labrador. https://www.gov.nl.ca/ecc/files/waterres-training-drinking-water-workshop-05-bob-picco-mike-chaulk.pdf

Contie, V. (2024, January 23). *Plastic particles in bottled water*. National Institutes of Health. https://www.nih.gov/news-events/nih-research-matters/plastic-particles-bottled-water#:~:text=The%20researchers%20found%20that%2C%20on,mostly%20focused%20on%20larger%20microplastics

Goldman, C. R., & Wetzel, R. G. (n.d.). *Turbidity* [Report]. Government of Northwest Territories. https://www.gov.nt.ca/ecc/sites/ecc/files/turbidity.pdf

Government of Canada. (2020, February 17). *Chlorine in drinking water in First Nations communities*. https://www.sac-isc.gc.ca/eng/1580937848045/1580937869384

Government of Canada. (2023, July 6). *Disinfection by-products in drinking water*. https://www.sac-isc.gc.ca/eng/1563307885242/1563307933110

Hanrahan, M. C., Sarkar, A., & Hudson, A. M. (2014, August 4). *Water insecurity in Indigenous Canada: A case study of Illness, Neglect, and urgency*. https://journals.library.mun.ca/index.php/IMFE/article/view/1107

Indian and Northern Affairs Canada. (2003). *NATIONAL ASSESSMENT OF WATER AND WASTEWATER SYSTEMS IN FIRST NATIONS COMMUNITIES*. https://www.sac-isc.gc.ca/DAM/DAM-ISC-SAC/DAM-WTR/STAGING/texte-text/watw_1100100016374_eng.pdf

Indigenous and Northern Affairs Canada. (2024, October 11). *Ending long-term drinking water advisories*. https://www.sac-isc.gc.ca/eng/1506514143353/1533317130660

Indigenous Services Canada. (2021, February 19). *About drinking water advisories*. https://www.sac-isc.gc.ca/eng/1538160229321/1538160276874

Indigenous Services Canada. (2024, March 22). Statement on World Water Day 2024 – Water for Peace. *Canada.ca*. https://www.canada.ca/en/indigenous-services-canada/news/2024/03/statement-on-world-water-day-2024--water-for-peace.html

Joynt, C., & Leonard, C. (2024, January 26). *Canada introduces Bill C-61: First Nations Clean Water Act - JFK Law - Canada*. JFK Law. https://jfklaw.ca/canada-introduces-bill-c-61-first-nations-clean-water-act/

LaMotte, S. (2024, March 22). *Bottled water packed with nanoplastics, study finds*. CNN. https://www.cnn.com/2024/01/08/health/bottled-water-nanoplastics-study-wellness/index.html

Native Women's Association of Canada. (n.d.). *Water is a Source of Life*. https://nwac.ca/policy/water-is-a-source-of-life#:~:text=In%20many%20indigenous%20cultures%2C%20water,protect%20and%20care%20for%20it

Ratelle, M., Spring, A., Laird, B. D., Andrew, L., Simmons, D., Scully, A., & Skinner, K. (2022). Drinking water perception and consumption in Canadian subarctic Indigenous communities and the importance for public health. *FACETS*, *7*, 343–359. https://doi.org/10.1139/facets-2021-0094

Statistics Canada. (2023, November 14). *The Daily — Survey of Drinking Water Plants, 2021*. https://www150.statcan.gc.ca/n1/daily-quotidien/231114/dq231114d-eng.htm

Sultana, A., Wilson, J., Martin-Hill, D., Davis-Hill, L., & Homer, J. (2022). Assessing the impact of water insecurity on maternal mental health at six Nations of the Grand River. *Frontiers in Water*, *4*. https://doi.org/10.3389/frwa.2022.834080

Swampy, M., & Black, K. (2021, May 7). *Tip of the iceberg: The true state of drinking water advisories in First Nations*. UCalgary News. https://ucalgary.ca/news/tip-iceberg-true-state-drinking-water-advisories-first-nations#:~:text=The%20number%20of%20water%2Dborne,non%2DIndigenous%20people%20in%20Canada

White, J. P., Murphy, L., & Spence, N. (2012). Water and Indigenous Peoples: Canada's paradox. *International Indigenous Policy Journal*, *3*(3). https://doi.org/10.18584/iipj.2012.3.3.3

Wutich, A., Brewis, A., & Tsai, A. (2020). Water and mental health. *Wiley Interdisciplinary Reviews Water*, *7*(5). https://doi.org/10.1002/wat2.1461