

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/rwin20>

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To cite this article: Nazifa Rafa, Sayed Mohammad Nazim Uddin & Chad Staddon (2020) Exploring challenges in safe water availability and accessibility in preventing COVID-19 in refugee settlements, Water International, 45:7-8, 710-715, DOI: [10.1080/02508060.2020.1803018](https://doi.org/10.1080/02508060.2020.1803018)

To link to this article: <https://doi.org/10.1080/02508060.2020.1803018>



Published online: 14 Aug 2020.



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COMMENTARY



Exploring challenges in safe water availability and accessibility in preventing COVID-19 in refugee settlements

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ARTICLE HISTORY Received 24 July 2020; Accepted 27 July 2020

Introduction

The new coronavirus disease (COVID-19) has been declared as a pandemic, attributed to its high infectivity and transmission ability. As COVID-19 becomes widespread around the world, its impact will be experienced disproportionately, with the world's most vulnerable populations, like refugees, facing the worst of it. Currently, there are approximately 25 million refugees in the world (Volkin, 2020). Fear and caution surround refugee settlements, which tend to be severely congested, around the world as outbreaks have already broken out in many of them (Volkin, 2020).

Proper hygiene practices such as routine handwashing with soap and social distancing are the key COVID-19 prevention strategies, with the main concern to follow both measures in the context of refugee settlements. Adopting a practice of handwashing that lasts at least 20 seconds for 8–10 times per day is being recommended, with appropriate soap and drying facilities. The total amount of water required per person per day therefore can amount to 8 to 10 litres if washed under running water (Staddon et al., 2020). Thus, the control of the spread of the virus is closely related to water and hygiene, which is difficult to manage in refugee settlements, which are less than adequate and without proper access to health, water, or sanitation facilities. As it is, billions of people in the world lack access to safe and sufficient water, and thus exercise sanitation and handwashing practices that are unsatisfactory. Refugee settlements are appropriate examples that contain populations afflicted with issues of availability and accessibility to safe water. UNHCR (2000) suggests a water quantity of more than 20 litres/person/day within a distance of 200 m between refugee dwellings and water points. In addition, it also recommends that no functional hand pump or well be used by more than 250 people. For households, more than 95% of them should collect their drinking water from protected water sources (piped, protected springs, tap stands, handpumps with aprons and sanitary seals), and at least 85% of households should be using narrow-necked containers or covered containers with a tap, with a 10 litres/person potable water storage capacity. These guidelines are hardly maintained because of water-related challenges. This commentary attempts to draw attention to the water-related challenges areas may face in the prevention of COVID-19 with regards to refugee settlements.

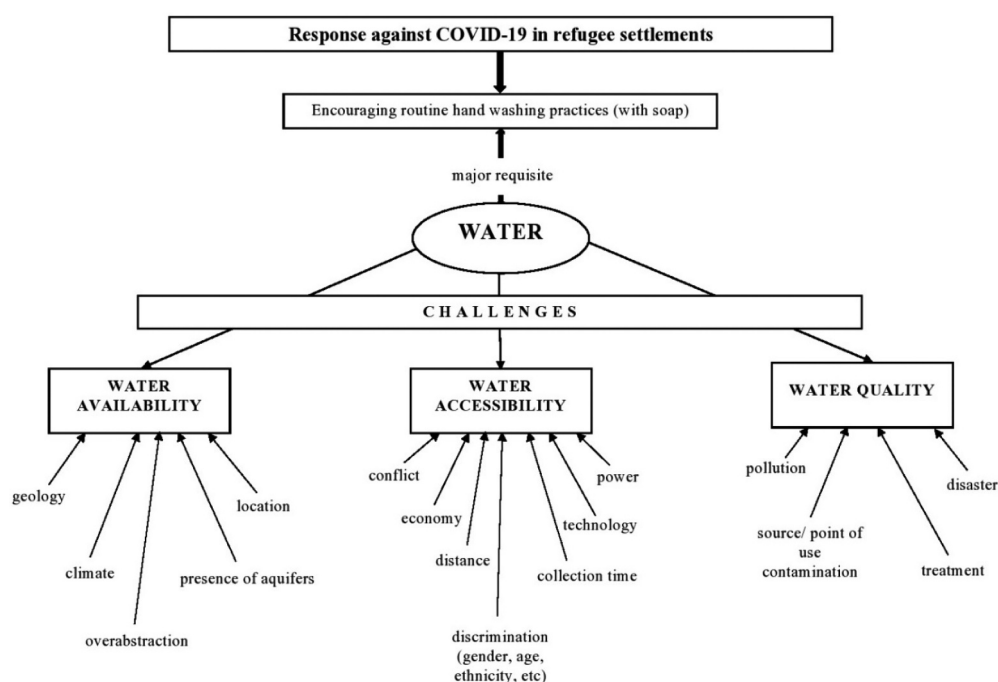


Figure 1. Challenges in safe water availability and accessibility in preventing COVID-19 in refugee settlements.

Water-related challenges in refugee settlements

Relevant articles and case studies have been reviewed to identify the major water-related challenges, and the findings have been summarized in [Figure 1](#). As mentioned, one of the most notable measures for the prevention of COVID-19 is frequent handwashing, where one of the major requisites is water. The water-related challenges that could serve as a barrier to achieving the best forms of prevention strategies arise from water availability, accessibility, and quality.

Challenge: water availability

The rise in demand for water for food production, industries, and the growing population has led to a growing scarcity of fresh water in many parts of the world. Surface water and groundwater are being depleted at a rate faster than they can be replenished, exhausting aquifers and the base flows of rivers. Consequently, governments, corporations, and communities are occupied with ensuring the future availability and sustainability of water supplies for their citizens.

Regardless, ensuring the availability of adequate amounts of water in refugee settings are key to the protection of these marginalized peoples. While the right to drinking water applies to all humans, guaranteeing this right is especially significant in the context of refugees because of the population's vulnerability and reliance on external help. However, the availability of adequate water to sustain refugees is a challenge in these

times of water stress, particularly when the host countries' nationals themselves do not receive enough water for their day-to-day activities or livelihoods.

Water availability is heavily dependent on the climate, geology, and location. Extended periods of low levels of rainfall and high temperature lead to water deficits. Consequently, most arid environments experience increased frequency of droughts compared to tropical regions. For example, in Chad and Darfur, there are huge demands for water from both refugees and local communities due to the regions being arid and having scarce water resources, giving rise to conflicts between refugees and host communities (Cronin et al., 2008). Over abstraction of water also induces water scarcity. In Lebanon, groundwater exhaustion had already been a major concern even before the migration of Syrian refugees, but the influx of refugees has led to further stress (Gassert et al., 2013).

Soil structure determines the degree of infiltration, and thus the availability of water below and above ground. Sandy soil tends to allow more infiltration of water compared to clayey soil due to its increased diameter and larger pore space. Permeable rocks can lead to less surface water but lead to the formation of aquifers, which are sources of clean water. Many regions do not possess aquifers and may thus have to turn to surface water or other alternatives, which are often unsafe to use and thus expensive to purify. For example, two of the areas Rohingya refugee camps have been built in Cox's Bazar are Teknaf and Ukhiya. While Ukhiya enjoys the benefit of several groundwater resources, Teknaf has none due to the presence of hard impermeable rocks (UNHCR, AUW & Oxfam, 2020). As a result, water scarcity is far more marked in the Rohingya refugee camps in Teknaf due to the absence of groundwater sources. The concern is whether the existing water sources in Bangladesh will be able to supply water to both its growing national and growing refugee populations to prevent COVID-19 infections.

The case of the 60,000 deaths of Rwandan refugees in the Democratic People's Republic of Congo in the summer of 1994 due to the vicious cycle of water shortage, and thus, cholera (UNHCR, 2003), already provides evidence for how water availability is closely linked with prevention of diseases. The concern of meeting the growing water needs of refugee settlements is alarming, even more so in the face of COVID-19.

Challenge: water accessibility

The availability of an adequate amount of water alone does not guarantee that the water will reach the people. Water accessibility is found to be heavily influenced by socioeconomic factors, such as gross national income (GNI), female primary completion rate, agriculture, growth of rural population, and governance indicators, such as political stability, control of corruption, or regulatory quality (Gomez et al., 2019). Often, the gross domestic product (GDP) is the major determinant of how committed countries are to develop and expand their water supply infrastructures as GDP also decides the technical capacities of the country. Water access for medical community centres for Saharawi refugees in Algerian desert face issues pertaining to the non-availability of food-grade water tanks for the institutions, the use of small containers as the main water supply, poor maintenance, and insufficient chlorine levels for microbiological decontamination (Vivar et al., 2016).

Refugee groups may also experience hindrances in their attempts to access water from host communities or from within their own communities due to social hierarchies, gender, age, etc. As the demand for water increases in times for water stress, there is

usually a rise in conflicts among the groups competing for them, which can quickly become an issue about territorial rights and political power and give rise to discrimination. In addition, accessibility to water can be worsened by long distances between water points and dwellings, as well as long water collection time due to the low ratio of functional water sources available and the number of residents. In the Moria camp, the largest refugee camp in Europe, one water point is shared by 1,300 people, which can make the practice of frequent handwashing very challenging (Courrier d'Europe, 2020). NGOs are the only actors struggling to provide the camp with basic water and sanitation facilities. However, due to the hostility from some of the native inhabitants who are calling for relocating the refugees to other EU states, most of the NGOs have abandoned the camp, leaving the residents of Moria in a crisis.

Moreover, 70% to 80% of refugee groups are made of women and children who bear the burden of water collecting activities. Issues of distance and water collection time have been experienced in the Kutupalong camp for Rohingyas in Ukhia, where mostly women and young girls experienced the burden of collecting water (Akhter, 2020). As preventive measures such as handwashing for COVID-19 becomes more enforced, the water demand is expected to increase, which increases the burden of water collection on women and young girls.

Challenge: water quality

Water quality is essential to secure the good health of consumers. Inadequate water quality can have both immediate effects, usually associated with gastrointestinal diseases attributed to microbial contamination, or long term health ailments due to the continuous consumption of water containing harmful levels of contaminants like fluoride and iodine. For Saharawi refugees, even though the access and quality of water have improved significantly over the years, improved water quality controls, ensuring access to treated water for all, expansion of distribution networks, and adequate storage systems and maintenance are some of the issues that need to be addressed as many still drink and use water that has high levels of fluoride and that has been stored in tanks that have a high risk of microbial contamination (Vivar et al., 2016).

Despite the presence of plentiful water, pollution and/or contamination, such as by untreated sewage and wastewater from households, or after a natural disaster like a flood or cyclone can make the water unsafe to use. In Rohingya refugee camps, latrines facilities and waste disposals are sometimes too close to water sources (Akhter, 2020), which significantly affects the quality of water. A recent study has revealed faecal coliform and *E. coli* contamination in water samples derived from tube wells and from stored household sources in Rohingya refugee camps, suggesting during contamination having occurred during collection, transportation, and storage of water due to lack of knowledge of personal and domestic hygiene (Mahmud et al., 2019). The presence of faecal coliforms and *E. coli* denote the presence of enteric pathogens, therefore breakouts of water-borne diseases like cholera, bloody diarrhoea, typhoid, and hepatitis E have been the major concern in refugee camps worldwide.

Water treatment facilities need to be increased and improved. Improving the microbiological and chemical quality of household water by on-site or point-of-use treatment

and safe storage in improved vessels can reduce waterborne diseases and long term illnesses in refugee settlements (Vivar et al., 2016).

The importance of considering the quality of water and its resulting effect on the health of refugees lies in the fact that the immunocompromised are far more susceptible to COVID-19. Waterborne diseases caused by unsafe water supplies can considerably weaken the immune system. Therefore, the guarantee of safe water both at source and at point of use is necessary to tackle COVID-19, not only to prevent infections by COVID-19 itself but also to prevent the weakening of the immune system by waterborne diseases that may make refugees susceptible to COVID-19 infection.

Conclusion

The humanitarian community and the governments of nations are working closely and proactively to address preparation and response for COVID-19 across the refugee settlements their nations are hosting. Isolation has been attempted at various refugee settlements around the world. However, measures relating to encouraging frequent handwashing practices by making safe and adequate water accessible still remain a matter of alarm and concern due to the water-related challenges discussed in this commentary, which compound the COVID-19 crisis. It is crucial to address the water-based needs of refugee populations first as placing attention towards water-based needs will be beneficial in the long-term by inhibiting the outbreaks of other waterborne diseases in refugee settlements. Overcoming the challenges of accessibility and availability of safe water is thus, paramount in the response against COVID-19 in refugee settlements.

Disclosure statement

No potential conflict of interest was reported by the authors.

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