A trends investigation of contributing factors to WASH-related diseases in Greater Idleb

November 2023 | Northwest Syria

Introduction

Since the start of the conflict in 2011, Northwest Syria (NWS) has experienced a general increase in WASH-related diseases* and experienced multiple outbreaks, including typhoid, polio, leishmaniasis, shigellosis, cholera, hepatitis A, dysentery, and other diarrhoeal diseases.[1]

Most recently, on 10 September 2022, the Syrian government declared a cholera outbreak following an increase in acute watery diarrhoea cases.[2] The outbreak has been linked to contaminated water from the Euphrates, a critical drinking water and crop irrigation source in Northern Syria.[3] Concerningly, the number of weekly cases in Autumn of 2023 consistently surpassed the pre-earthquake period, with 70% of these cases concentrated in Idleb.[4] Most cases have been reported in Dana.[5] Cases have mostly affected children under 5 years of age, who are more vulnerable to adverse outcomes of WASH-related diseases with potential long-term consequences for development.[6]

The World Health Organisation (WHO) has described the outbreak as an indicator of the NWS health context, reflecting the deteriorating WASH, health, shelter, livelihoods, and protection conditions.[7] Importantly, these conditions not only affect the risk of contracting cholera but also other WASH-related diseases.[1] However, the potential relationships between these conditions contributing to WASH-related disease spread in NWS as well as how these factors have changed following the 2022 cholera outbreak are currently not understood. This situation overview (SO) aims to contribute to bridging these information gaps through a two-part analysis:

Analysis Section I - Literature Review

Aims to identify factors contributing to WASH-related disease spread in the Northwest Syrian context through a literature review using the snowball method. The socio-ecological framework is applied to map out potential pathways between the identified factors and WASH-related disease exposure (presented in Analysis Section II). The pathways between factors are informed by the literature and the F-diagram.

Analysis Section II - Trends Analysis

Aims to identify whether some of the contributing factors identified in the literature review have changed since the 2022 cholera outbreak through a trends analysis of REACH data from July 2022 to July 2023 in 280 communities in Greater Idleb. The analysis is categorised into the root causes of WASH-related diseases identified in the literature review: Water Infrastructural Challenges, Sewage Infrastructural Challenges, Economic Crisis, and Health and Electricity Factors.

Key Messages

- According to WASH indicators collected by REACH, many factors contributing to WASH-related disease exposure have either remained unchanged or worsened since the cholera outbreak in September 2022. This includes the deterioration of sewage infrastructure and continued high reliance on unmonitored water sources.
- Over the past year, the WASH structural factors contributing to WASH-related diseases, including the sewage system and the affordability of WASH services and products, seem to have worsened. According to REACH-collected WASH indicators, the demand for functional WASH infrastructure was already significant before the cholera outbreak but has intensified since July 2022.
- The extensive challenges with the public WASH infrastructure in Greater Idleb lead communities to rely on private services which are expensive and often unmonitored. The high reliance on private WASH services also makes communities vulnerable to economic shocks.
- Unaffordability of WASH services and products has increased considerably as a result of significant price inflation related to the ongoing currency depreciation of the Turkish Lira (TRY) as well as worsening livelihoods opportunities restricting households' purchasing power.
- REACH data shows that the high reliance on private WASH infrastructure is associated with increased debt and at-risk coping strategies, such as reliance on unsafe sewage infrastructure including unsafe soak pits.

*WASH-related diseases are defined as diseases attributable to unsafe WASH. This SO will focus on diarrhoeal diseases, given the WHO estimates that the largest burden of disease resulting from unsafe WASH are diarrhoeal diseases.[8]

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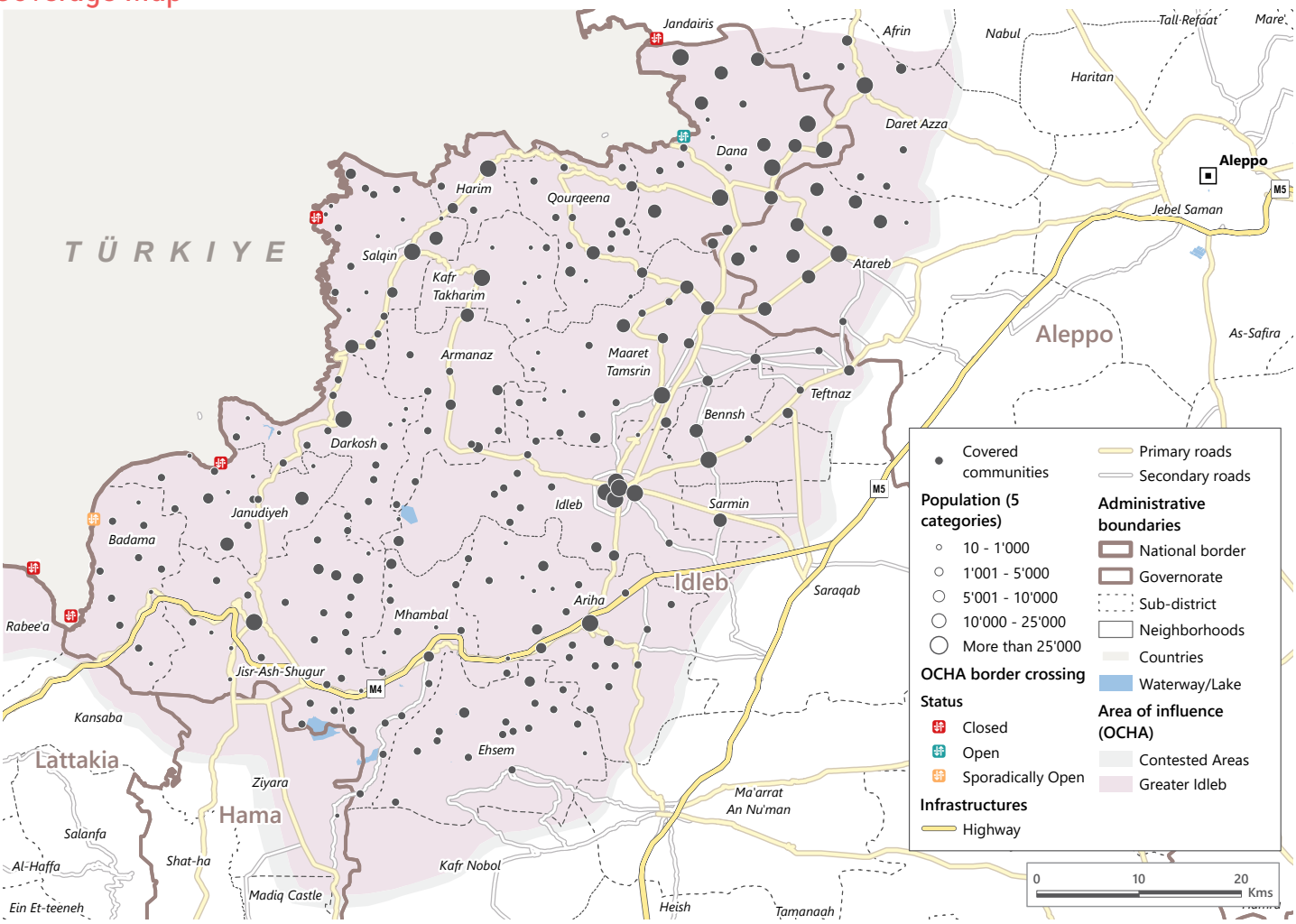
Coverage Map



Note on the map

This map shows the communities in Greater Idleb that have been included in the analysis. Each of the 280 included communities has been surveyed in the monthly HSOS research cycle between July 2022 and July 2023.

Methods

Methods: Literature review of factors contributing to WASH-related diseases in NWS

- **Snow-balling** – The literature review was based on references of references and electronic citation tracking. Snowballing does not follow a systematic protocol with pre-defined inclusion and exclusion criteria which is particularly beneficial for reviews of complex and heterogeneous evidence and where information on a specific location is scarce.[9] Consequently, given the complex nature of the spread of WASH-related diseases in a humanitarian context and the scarce systematic evidence in NWS, snowballing was chosen.
- **Socio-ecological framework** – is a multi-level conceptualisation of how factors from the societal level (e.g., economic and public policy factors) to individual factors (e.g., health behaviours and age) influence health and disease. The spread of WASH-related diseases is influenced by factors ranging from a societal to the individual level. The socio-ecological approach enables mapping of potential pathways between complex factors influencing WASH-related disease spread in NWS (see Fig. 1 for a simplified example).[10]
- **F-Diagram** – outlines the main oral-faecal transmission routes of WASH-related diseases. Transmission can occur via people's Fingers, Flies, Food and Fields (where open defecation is prevalent). It is used to inform the pathways between identified contributing factors and WASH-related disease exposure.[11]
- **Presentation** – The factors identified through the literature review and their potential interrelationships will be presented in "Pathway Diagrams" which categorise contributing factors into structural, community and household factors. Note that these diagrams will be integrated into Analysis Section 2.

Limitations: Literature review

The literature review focuses on core contributing structural factors identified in the literature and not environmental factors such as the role of climate-related water scarcity on WASH-related diseases.[1] Furthermore, the "Pathway Diagrams" present hypothesised pathways based on the literature and F-diagram and have not been individually tested and validated.

Figure 1 - Socio-ecological framework applied to WASH-related diseases

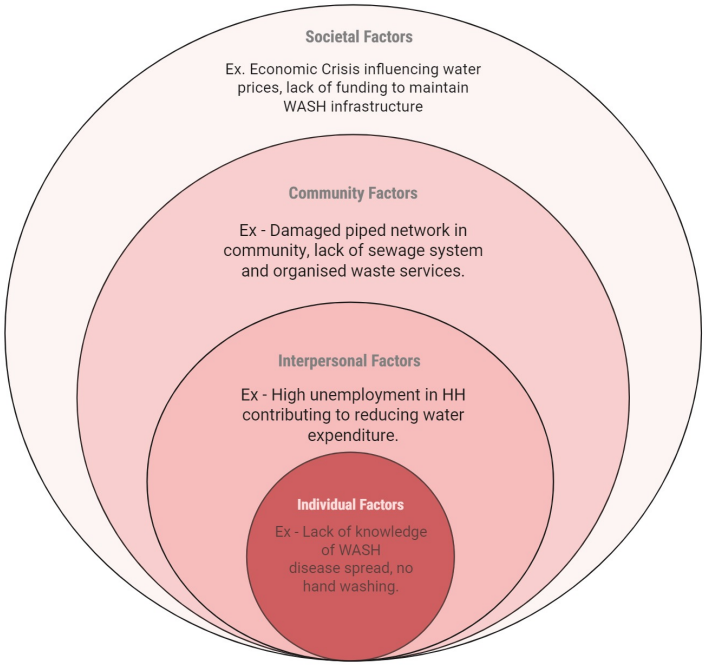
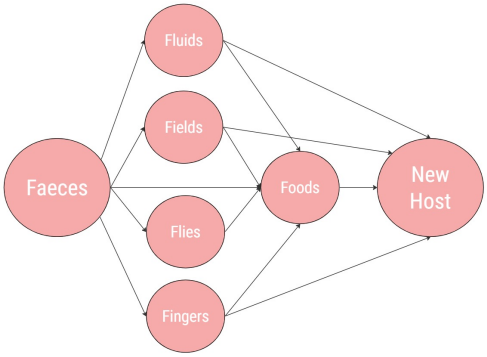


Figure 2 - F-diagram



Methods: Trends analysis of how factors contributing to WASH-related diseases have changed over the past year

- **Data sources –** includes the
  - **Humanitarian Situation Overview in Syria** [HSOS]**:** Monthly assessment interviewing 3-5 sector expert key informants (KIs) per community on the humanitarian situation in their communities. Data is used from each monthly round from July 2022 to July 2023 (HSOS outputs).
  - **Joint Market Monitoring Initiative** [JMMI] : Monthly market monitoring assessment interviewing vendors communities about product prices, availability and market functionality (JMMI outputs). Data is used from each monthly round from July 2022 to July 2023.
  - **Earthquake Rapid Needs Assessment** [RNA]: Interviewed KIs about the impacts of the earthquakes on 9-11 February 2023; 754 communities were assessed. (RNA data, Situation Overview).
- **Indicator selection** – Relevant indicators from REACH assessments have been identified based on the literature review.
- **Data analysis**: The selected indicators have been analysed through a trend analysis for 280 matched communities in Greater Idleb to identify any major changes from July 2022 to July 2023. Associations between indicators have been investigated where relevant. Finally, earthquake-related assessments are used as supporting evidence.

Limitations: Trends Analysis

- **Key-Informant (KI) methodology**: All assessments are based on structured interviews with KIs. Thus, findings are indicative of the humanitarian situation in assessed communities and not representative of the entire population.
- **Restricted coverage:** The presented analysis is only applicable for assessed communities in Greater Idleb.
- **Restricted to certain indicators:** The included assessments collectively cover multisectoral indicators of the humanitarian situation, however, they were not designed to investigate the WASH-related disease context specifically. Thus, whilst the assessments provide insights into factors contributing to these diseases, the SO cannot provide an exhaustive analysis of all contributing factors. For example, REACH does not collect data on wastewater management, although actors report poor wastewater management is likely linked to WASH-related disease spread.[12]
- **Limited health system and electricity factors:** The literature review identifies the Health System and Electricity Crisis as root causes contributing to WASH-related diseases. However, REACH does not collect extensive data on factors related to these root causes. Consequently, these factors are only briefly discussed (Health and Electricity Factors).
- **Unable to address the situation in camps** – REACH assessments reviewed in this SO include collective centres and informal sites within community boundaries, however, do not include camps. It is important to note that the factors involved with WASH-related disease spread are suspected to be more prevalent in camps, given crowding, overburdened WASH facilities, and poor housing, especially in the post-earthquake context.[13]

Analysis Section 1: Literature review of root causes of WASH-related diseases

NWS's vulnerability to WASH-related disease outbreaks, existed before the conflict, primarily due to water scarcity, mismanagement of water and sanitation, and inadequate access to reliable sewage systems and water treatment plants in remote areas.[14] This pre-existing WASH vulnerability has significantly worsened during the conflict. Before the conflict, 98% of urban residents and 92% of people in rural communities had reliable access to safe water. However, by 2022, it was estimated that two-thirds of Syrians no longer had reliable access to safe drinking water, leading households to spend up to a quarter of their income on water.[15]

Root causes contributing to WASH vulnerability during the conflict

The effects of the conflict on root causes of WASH vulnerability can broadly be categorised into these categories.[19]

1. WASH infrastructure disruption

WASH infrastructure, including the piped water network, water treatment plants, and sewage and wastewater systems, has been disrupted during the conflict. This has been caused by damage, including direct attacks related to the weaponisation of water during the conflict; displacement of technical professionals required to manage water and sanitation systems; restricted access to the fuel, and an ongoing electricity crisis which has led to the suspension of many water and sewage stations and treatment plants; as well as reduced funding to ensure repair and maintenance of WASH infrastructure.[1]

It is estimated that less than 50% of water and sanitation systems are functioning in all of Syria. Furthermore, it is estimated that 30-40% of technical staff required to manage water and sanitation systems have left the country or retired without being replaced.[16]

2. Economic crisis

NWS has experienced an escalating economic crisis since the onset of the conflict, with increased levels of food insecurity and rising prices of basic goods, including hygiene products, and reduced access to livelihoods.[24]

The average price of the Survival Minimum Expenditure Basket (SMEB)* in July 2023 had increased by over 300% since January 2021 (from TRY 827 to TRY 3,441).[25] This is mostly driven by the high depreciation of the Turkish lira (TRY) against the US dollar (USD). The TRY-USD exchange rate, monitored by the Joint Market Monitoring Initiative (JMMI), has increased by over 260% since January 2021.[26] The TRY was introduced in June 2020 after fears the Syrian Pound (SYP) would collapse. However, the TRY is now itself deteriorating against the USD which is having severe economic repercussions.[27]

The economic crisis has had significant effects on households' ability to purchase minimum expenditure items, including food, water, and hygiene items. As a result, food insecurity has been increasing with one in two people now considered food insecure and many households are unable to afford water and essential hygiene products.[22] This leads households to forego hygiene and/or resort to unsafe water sources, increasing the risk of WASH-related diseases. Furthermore, the population is at risk of adverse outcomes of WASH-related diseases due to the bi-directional interactions of such diseases with malnutrition.[23]

3. Health infrastructure disruption

The health system's ability to respond to infectious diseases has been compromised throughout the conflict. The re-emergence of polio in July 2013 in Syria has been linked to compromised health infrastructure including disease surveillance, laboratory testing, basic medical care, and vaccinations services.[20]

Furthermore, more than half of Syria's health facilities have been directly or indirectly damaged throughout the conflict, and a large proportion of health professionals have left the country.[21]

4. Escalating energy crisis

An accelerating energy shortage crisis in Syria has led to the shutdown of key water and sanitation infrastructure. Energy shortages have been identified as a root cause of water scarcity in Syria, leading water and sanitation stations to function sub-optimally.[17] Furthermore, energy shortages cause lower quality water, since water stations cope with energy shortages by bypassing water treatment to ensure quantity, rather than quality. As a result, households are at increased risk of being exposed to contaminated water.[18]

*The SMEB is an estimation of the costs of the minimum culturally-adjusted items needed for a household of 6 people to survive for one month.

Effects of the 6 February 2023 earthquakes on the root causes of WASH vulnerability

The full extent of the effects of the earthquakes on infrastructure and livelihoods in NWS is not fully understood. Existing reports suggest that the 2023 Earthquakes have compromised the aforementioned root causes of WASH-related diseases. As a result, actors have warned against the increased risk of WASH-related diseases, including the ongoing cholera outbreak.[28] Thus, from a public health perspective, the earthquakes can be conceptualised as a "shock", worsening factors contributing to the spread of WASH-related diseases.[29]

The earthquakes have been reported to have had the following effects on the root causes of WASH-related diseases:

WASH infrastructure has been damaged, and sanitation conditions are likely to have worsened because of crowding and displacement.[31]

Health infrastructure has been damaged, and health system functions disrupted, including disease surveillance systems, laboratory capacity and cholera treatment infrastructure.[30]

The economic crisis has continued to worsen, reflected in considerable food price increases related to the ongoing currency depreciation of the Turkish lira, which reached a record low in July 2023.[32]

The energy crisis has further worsened as a result of damage to electricity infrastructure and the worsening economic crisis.[33]

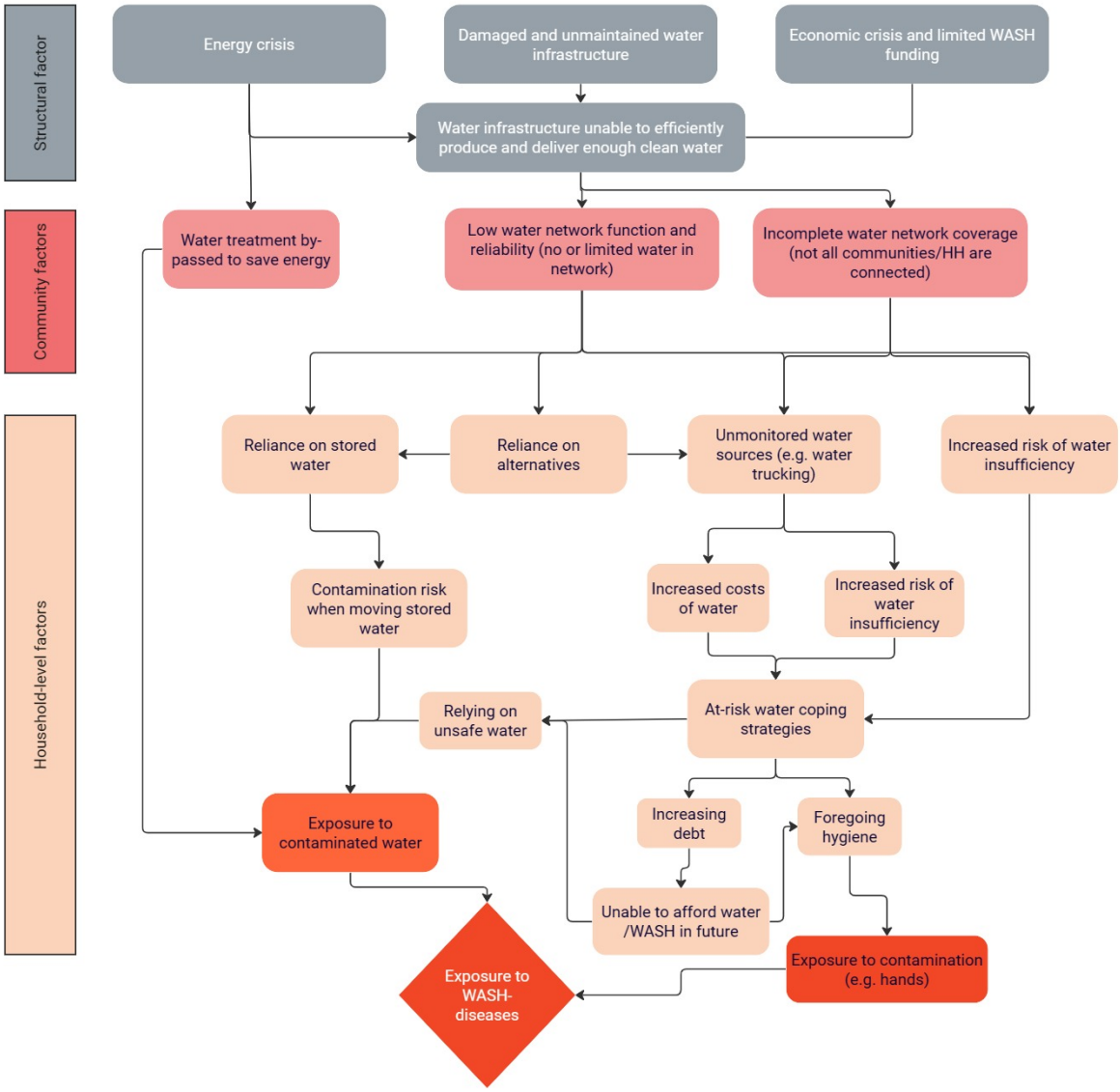
The detrimental effects of the earthquakes on the root causes of WASH-related diseases are exacerbated by a large humanitarian funding gap. OCHA already underlined a large funding gap in NWS in July 2022, with only 15% of the required funding available for the WASH cluster. As of 20 July 2023, only 13% of the funding required for the Syria Humanitarian Response Plan had been met.[34] Less aid has been able to enter NWS in 2023 due to funding shortages, earthquake-related border closures, and the temporary suspension of UN-coordinated aid in July 2023 as a result of uncertainty around the cross border resolution.[35]

Analysis Section 2: Trends analysis of changes in factors contributing to WASH-related diseases from July 2022 to July 2023*

Water infrastructural factors contributing to WASH-related diseases

Pathway diagram 1 shows a set of non-comprehensive pathways from water infrastructural problems to exposure to contaminated water. Damaged water infrastructure, inadequate WASH funding, and the growing energy crisis are considered structural causes of compromised water quantity and quality in NWS.[1] Energy shortages compromise water pumping and distribution from water stations. Furthermore, these shortages lead water stations to bypass the slow process of water purification and quality control to optimise water quantity to consumers.[36] Consequently, the quantity and quality of water available to households (HH) from the piped network is compromised. Critically, this reduced water network functionality and reliability are associated with water insufficiency as well as a shift to stored water and unmonitored water sources, such as water trucking.[37]

Pathway diagram 1: Pathways from water infrastructural challenges to WASH-related disease exposure



* Please note that data was not collected in February 2023 due to the Türkiye-Syria Earthquakes. This is reflected in the graphs by a dotted line.

Trends Analysis: Changes in water infrastructural factors from July 2022 to July 2023

Since the cholera outbreak, the indicators of the water infrastructural system have not changed considerably:

- **Piped network reliance:** Over the past year, KIs in very few communities have consistently reported that the community is primarily reliant on the piped water network for water (Fig 1.1 & 1.2). The low proportion of communities relying on the piped network is indicative of the poor and unreliable water infrastructure in NWS. Notably, the data for the assessed communities suggests that when the piped network reliability declines, communities shift to private water trucking which is associated with multiple risks (Risks).[HSOS]
- **Water network reliability:** Over the past year, KIs in about 50% of communities have consistently reported that no water is available from the network on any day during the week in the past 30 days (Fig. 1.3). Water reliability appears to have improved for some communities since KIs in slightly more communities report that water from the network is available every day (17% in July 2023 compared to 10% July 2022)(Fig. 1.4). However, KIs in 83% of all surveyed communities still report that households do not have access to water in the piped network every day.[HSOS]
- **Water quality**: KIs in more communities reported in July 2023 compared to July 2022 that the water in the network is chlorinated (86% compared to 76%).[HSOS] According to the Syrian Water Station Platform, only 81% of functional water stations in NWS are able to chlorinate their water.
- **Water network damage**: Damage to water networks was reported in over half of earthquake-affected communities.[RNA]

Indicators of the water infrastructure are, despite the small changes, still of concern. The low reliance on the piped network is likely related to the high proportion of suspended water stations, the energy crisis leading to temporary suspensions, and damage to water infrastructure. According to the Syrian Water Station Platform, only 61% of water stations were functional in NWS in July 2023.[38]

Figure 1.1: Primary drinking water source (2022-23)[HSOS]

KIs in % of assessed communities reporting primary reliance on given water source

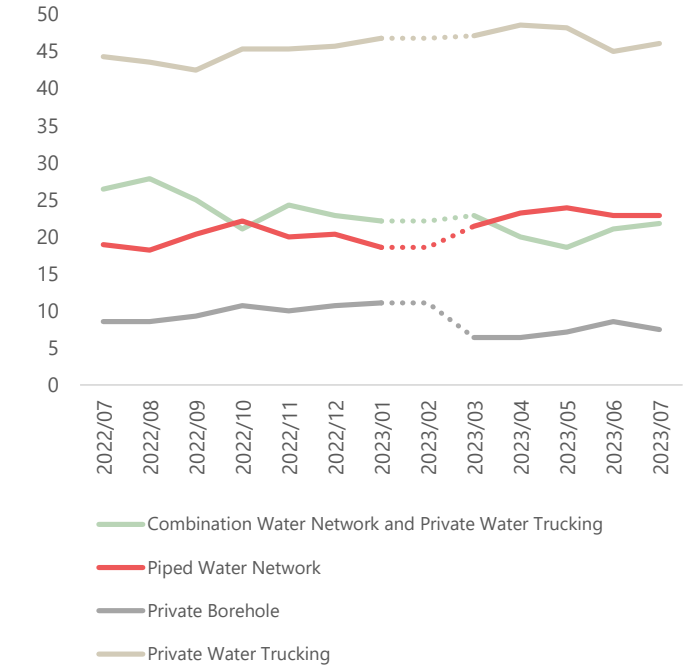


Figure 1.2: Primary drinking water source (July 2023)[HSOS]

KIs in % of assessed communities reporting primary reliance on given water source

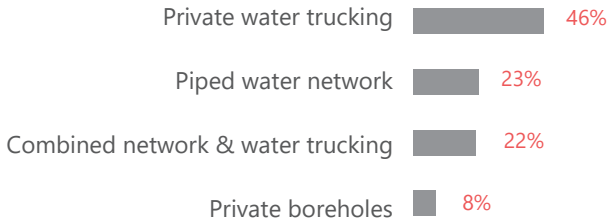


Figure 1.3: Piped water network reliability (2022-23)[HSOS]

KIs in % of assessed communities reporting number of days per week with water in the network

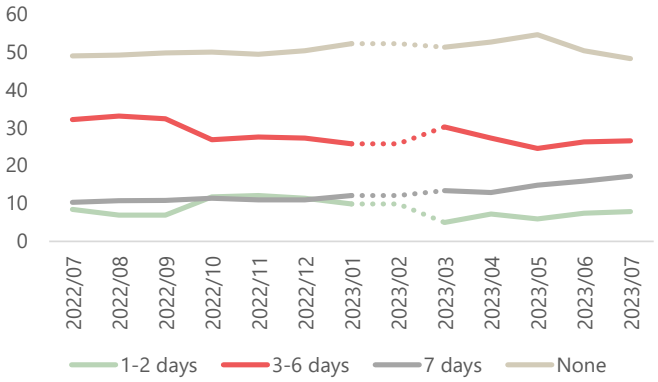
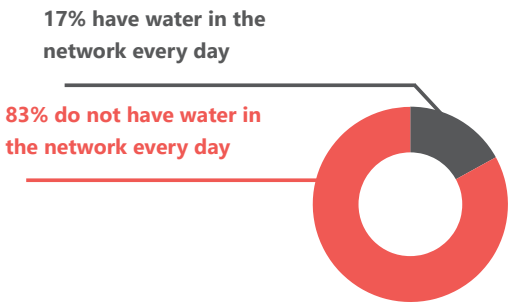


Figure 1.4: Water availability in the network (July 2023)[HSOS]

KIs in % of assessed communities reporting water in the network every day of the week



Interpretation: Risks associated with the water infrastructural challenges

Water infrastructural challenges predisposes HH in communities to water insufficiency and leads to the adoption of unsafe coping strategies

REACH data for the assessed communities underlines that low network reliability is associated with household-level water insufficiency. In communities where KIs report low network reliability (when water from the network is not available or limited), KIs are also more likely to report that there is not sufficient water for all HH in the community.[HSOS]

Over the past year, water insufficiency has consistently been reported by around half of surveyed communities (Fig. 1.6). KIs in more communities reported water insufficiency immediately following the earthquakes.[HSOS] This has since improved. However, KIs in 44% of communities in July 2023 reported that households in their communities are experiencing some level of water insufficiency despite earthquake-related aid.[RNA]

Water insufficiency may have worsened at the household level compared to before the cholera outbreak. After the earthquakes, KIs in more communities have been reporting that less than 80% of households in their community have sufficient water to meet their needs (Fig. 1.6). Furthermore, KIs in 33% of communities reported in July 2023 that drinking water was a key WASH need. KIs in more communities also reported a need for expansion of the water network (10% increase from July 2022)(Fig 1.5).[HSOS]

Water insufficiency may also have worsened at the household-level because the most commonly reported cause of water insufficiency, the costs of water, has increased.[JMMI, HSOS] The average monthly household expenditure on water has increased by ~90% since the onset of the cholera outbreak.[HSOS]

Importantly, as shown in Pathway Diagram 1, water insufficiency and unaffordability of water lead households to adopt unsafe water coping strategies. The most commonly reported HH coping strategies over the past year have consistently been "increasing spending on water" and "foregoing hygiene" (Fig. 1.7).

These coping strategies are either directly or indirectly associated with increased risk of exposure to WASH-related diseases. Hygiene behaviours, including handwashing, are critical in preventing WASH-related disease spread.[11] Similarly, receiving water on credit and reallocating resources to water are associated with increasing household debt and reduced purchasing power which affects the ability to purchase other essential products, including food and core hygiene items.[39] This is of concern because lack of hygiene products worsens sanitation conditions, whilst food insecurity is associated with a greater risk of adverse outcomes of WASH-related diseases, especially amongst children.[40]

Figure 1.5: WASH needs (July 2023)[HSOS]

KIs in the following proportion of assessed communities report that

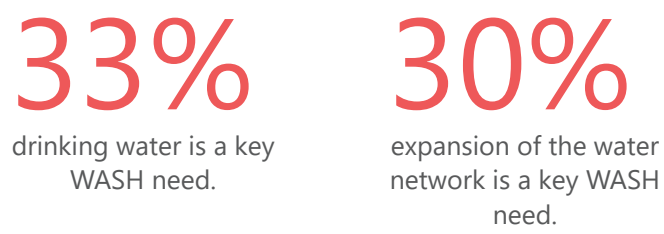


Figure 1.6: Water insufficiency (2022-2023)[HSOS]

KIs in % of assessed communities reporting proportion of HH with sufficient water in the past 30 days to cover needs.

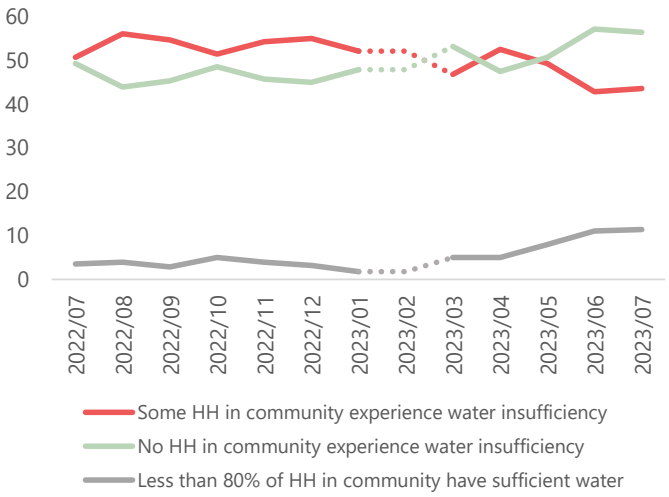


Figure 1.7: Water coping strategies (July 2023)[HSOS]

KIs in % of assessed communities with water insufficiency reporting most common water coping strategies used by HH.

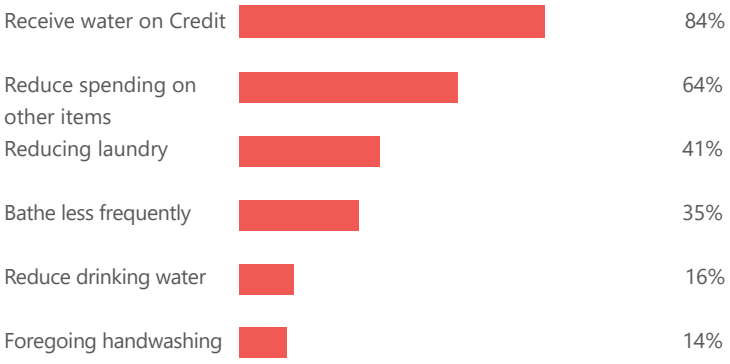


Table 1.1: Average monthly HH spending on water depending on water source (July 2023)[HSOS]

Primary Source of Drinking Water	TRY
Private borehole or well	318
Private water trucking	268
Combined network and private water trucking	188
Piped water network	126

Water infrastructural challenges predisposes communities to rely on private water trucking

REACH data for the assessed communities shows that problems with the piped network predisposes HH in communities to rely on alternative water sources, particularly private water trucking. Close to 70% of communities report that HH continue to rely fully or in part on private water trucking for drinking water.[HSOS]

The high reliance on private water trucking not only reflects the compromised water infrastructure in NWS, it is also of concern because private water trucking is unmonitored and has been associated with contamination in the past.[42]

Furthermore, REACH data for the assessed communities suggests that private water trucking is associated with additional risks:

- **Water insufficiency:** KIs in communities where HH are relying on private water trucking are more likely to report water insufficiency compared to communities relying on other water sources.[HSOS] This may be related to the high costs of trucking.[HSOS,JMMI] and water delivery to central locations reducing access for remote households.[43]
- **Economic repercussions:** KIs in communities relying on private water trucking are more likely to report higher monthly expenditure on water compared to KIs in communities relying on the piped network (Table 1.2).[HSOS] Furthermore, KIs in communities relying on private water trucking are also more likely to report financially costly water coping strategies, such as increasing household-level debt.[HSOS]

Critically, both water insufficiency and increasing household level debt are associated with unsafe coping strategies such as foregoing hygiene.[11,43]

Water infrastructural challenges predisposes HH in communities to exposure to lower quality water

The low reliance on the piped network and the low network reliability are associated with risks of exposure to lower quality water for communities in NWS.

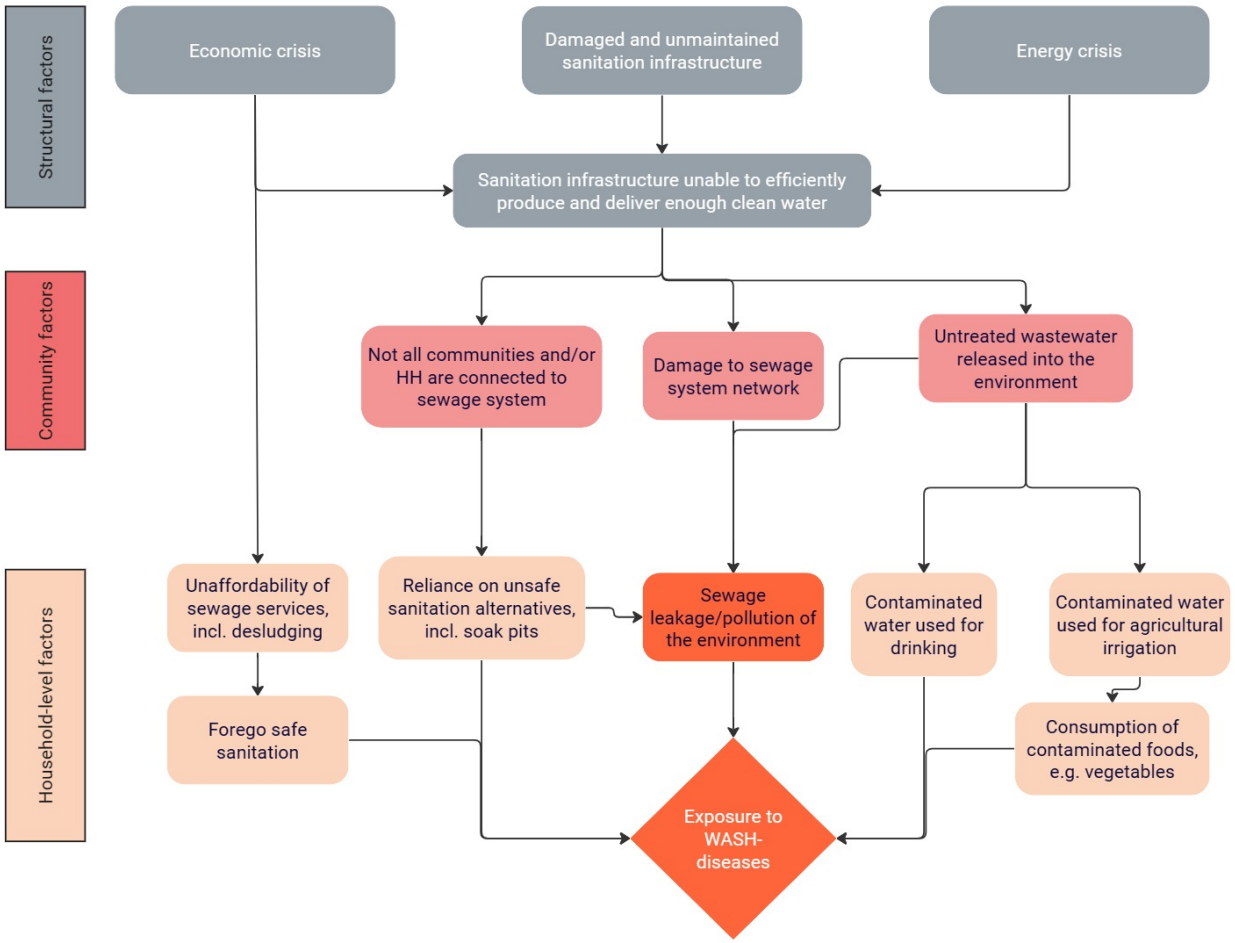
- **Most communities rely on unmonitored water sources:** The piped network is the only source of officially monitored and treated water in Syria.[1] Consequently, given less than a quarter of assessed communities rely on the piped network for water, many communities are relying on unmonitored sources of unknown quality.
- **Water stagnation in water network due to low network reliability:** Even water from the piped network may be of poor quality since water may stagnate in the water pipes when there is not enough electricity to pump sufficient water. Water stagnation in pipes is associated with increased microbial growth and worsened water quality. High temperatures during summer increase the risks of microbial contamination associated with water stagnation.[41]
- **By-passing of chlorination at water stations:** Only 81% of functioning water stations are able to chlorinate the water. Even the water stations that are able to chlorinate are likely to deliver poor-quality water since water stations have been reported to bypass the chlorination process to save electricity.[36]

The likelihood of exposure to poor quality of water is furthermore likely to be exacerbated by a high reliance on stored water and low reports of household-level water treatment strategies (HWT).[HSOS] In July 2023, KIs in fewer assessed communities (30%) report that households in their community use HWT such as chlorination, to improve the water quality compared to July 2022 (40%).[HSOS] KIs in only 25% of communities reported in July 2023 that households use chlorine tablets to improve water quality.

Sanitation infrastructural factors contributing to WASH-related diseases

Pathway diagram 2 shows a set of non-comprehensive pathways from sewage infrastructural challenges to exposure to water or environmental WASH-related disease contamination. Damaged and lack of funding for maintenance and establishment of sanitation infrastructure; the economic crisis increasing the unaffordability of sanitation services; and the energy crisis restricting the functionality of sanitation infrastructure are considered root causes.[1] These factors have been linked to increases in WASH-related diseases in NWS.[44] It is estimated that at least half of the sewage systems are not functional in all of Syria and 70% of sewage is discharged untreated due to both compromised and insufficient wastewater treatment plants. Communities are exposed to contaminated water through severed sewage pipes, mixing of drinking water and sanitation networks, and through use of wastewater for agricultural purposes.[45]

Pathway diagram 2: Pathways from sewage infrastructural challenges to WASH-related disease exposure



Trends Analysis: Changes in sanitation infrastructural factors over the past year

Since the cholera outbreak, the indicators of the already dire sewage infrastructure have worsened (See Fig. 2.1):

- **Sewage system connection**: In 38% of assessed communities, KIs reported in July 2023 that the community was not connected to the sewage system (compared to 31% in July 2022). Furthermore, KIs in 50% of communities report that not all households in the community have access to the sewage system in July 2023 compared to 43% in July 2022.[HSOS]
- **Sewage system problems:** Problems with sewage system infrastructure have continued to be the most commonly reported sanitation issues throughout the past year. In July 2023, KIs in 92% of communities reported at least one problem with sewage system infrastructure. Furthermore, KIs in 13% of communities report that the sewage system pollutes public areas (compared to 3% in July 2022).[HSOS]
- **Sewage system damage after earthquakes:** KIs in over 50% of surveyed earthquake-affected communities reported some damage to sanitation infrastructure caused by the earthquakes.[RNA]
- **Needs for sanitation infrastructure have increased:** Needs related to sanitation infrastructure have increased over the past year. KIs in 60% of communities report that WASH support is a top 3 need for households in the community in July 2023 compared to 36% in July 2023 (Table 2.1). The most commonly reported WASH priority need for both IDPs and residents is "getting access to a functioning sewage system". This was reported as a priority need by KIs in more communities in July 2023 compared to July 2022 (Table 2.2).
- **Priority needs have shifted:** Over the past year, the most commonly reported priority WASH needs have gradually shifted from getting access to hygiene products, such as diapers, to structurally improving water and sewage infrastructure.[HSOS] This may reflect a worsening sanitation context.

The number of communities where KIs report unsafe soak pits and lack of access to or problems with the sewage system have gradually increased, particularly following the earthquakes[HSOS] (Fig. 2.1). This may be caused by extensive damage to sanitation infrastructure.[RNA]

Table 2.1: WASH priority needs[HSOS]

KIs in % of assessed communities reporting that WASH support is a top priority need

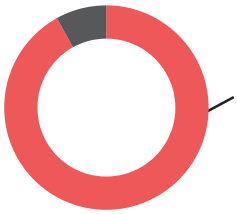
WASH Priority Needs	IDP	Residents
July 2022	35%	37%
July 2023	58%	62%

Sewage system challenges (July 2023)[HSOS]

KIs in the following proportion of assessed communities report:

38%
of communities are not connected to a sewage system.

50%
of communities connected to a sewage system report that not all households have access.



KIs in 93% of communities report **at least one problem** with the sewage system (July 2023).[HSOS]

Top WASH needs (July 2023)[HSOS]

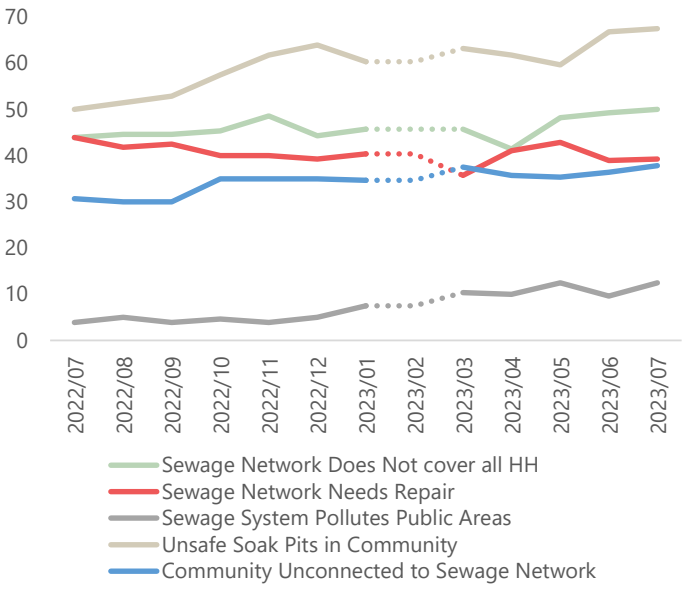
KIs in the following proportion of assessed communities report:

45%
expansion of the sewage system is a key WASH need.

44%
access to a functioning sewage system is a key WASH need.

Figure 2.1: Sanitation challenges (2022-23)[HSOS]

KIs in % of assessed communities reporting most common sanitation challenges in the community.



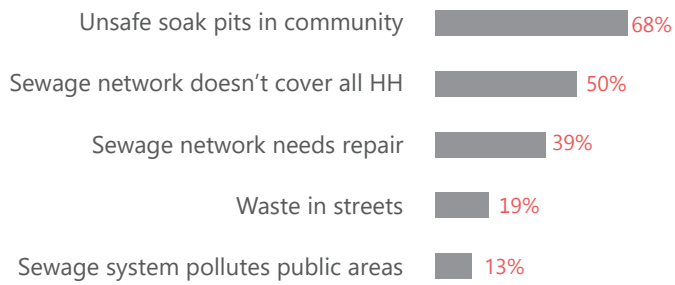
Interpretation: Risks associated with sanitation infrastructural factors

Sewage infrastructural challenges predispose HH in communities to rely on unsafe alternatives

The higher number of communities, where KIs report that no households are connected to the sewage system in July 2023 compared to July 2022 is of concern. Communities that are not connected to the sewage system typically resort to soak pits for sewage disposal purposes.[46] According to REACH data for the assessed communities, communities that are not connected to a sewage system are more commonly observed to report unsafe soak pits in their communities (reported by KIs in 85% of such communities in July 2023) compared to communities that are connected to the sewage system (36%).[HSOS] Critically, unsafe soak pits increase the risk of sewage contamination of the environment (Pathway Diagram 2).[46]

Figure 2.2: Most common sanitation challenges (July 2023)[HSOS]

KIs in % assessed communities reporting most common sanitation challenges in the community.



Sewage infrastructural challenges predispose communities to environmental contamination

The worsened sewage system indicators, reflected in the increased reports of unsafe soak pits, sewage pollution, and damage, may cause contamination of water sources and agricultural fields. The use of wastewater for agriculture and spillovers into agricultural fields are reportedly common in NWS.[47] Vendors have also been reported to use unmonitored water in their shops to keep vegetables and fruit fresh.[48] Consequently, consumers of fruits and vegetables are at risk of WASH-related disease exposure.

Sewage infrastructural challenges predispose communities water contamination

The continued deterioration of the sewage system over the past year has occurred in a context where a high proportion of communities rely on private water trucking, the piped network reliability is low, the use of household water treatment strategies are low, and sanitation products have increased in price. Although further area based assessments are needed to understand the risks at a community-level, the combination of these contributing factors means that the quality of water households receive is likely of poor quality.

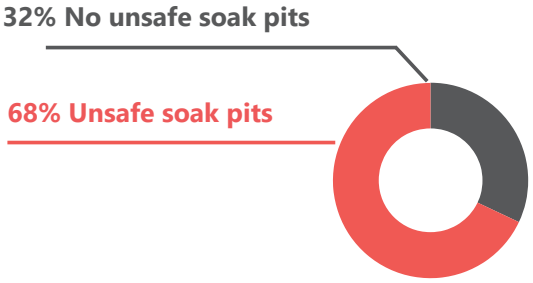
Table 2.2: Most commonly reported WASH support needs (July 2023)[HSOS]

KIs in % of assessed communities reporting the most important WASH support in the community.

Indicator	Residents	IDP
Expansion of the Sewage Network	45%	44%
Waste Removal Service	43%	44%
Functioning Sewage System	41%	42%
Drinking Water	34%	34%
Expansion of the Water Network	30%	28%

Figure 2.3: Unsafe soak pits in community[HSOS]

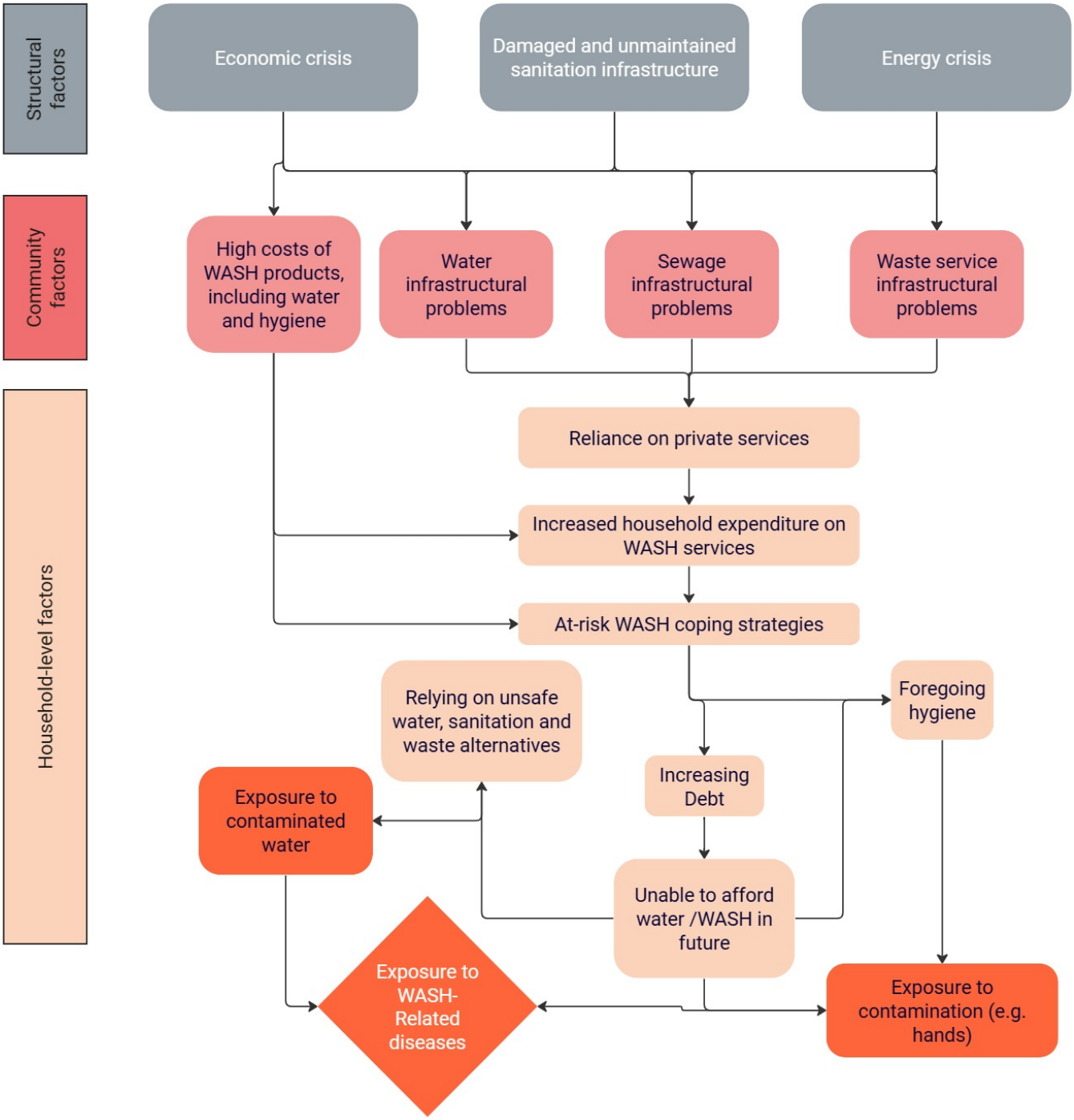
KIs in % of assessed communities reporting unsafe soak pits in their community



Economic crisis-related factors contributing to WASH-related diseases

Pathway diagram 3 shows a set of non-comprehensive pathways between the factors contributing to unaffordability of WASH services and exposure to WASH-related disease contamination. WASH infrastructural challenges cause households and communities to rely on private alternatives (see Water infrastructural challenges) and the economic crisis influences the cost of these services as well as WASH products. When safe water is unaffordable, households are forced to rely on unsafe, less-costly services, increase household-level debt, and/or reduce their spending on other essential items such as food. Humanitarian actors in NWS have previously raised concerns about the WASH-related disease risk associated with the high unaffordability of water. Furthermore, when WASH is unaffordable, households may forego hygiene and rely on unsafe sanitation alternatives such as soak pits or open defecation.[49]

Pathway diagram 3: Pathways from WASH unaffordability to WASH-related disease exposure



Trends Analysis: Changes in economic factors over the past year

Since the cholera outbreak, prices of all WASH-related items monitored by the JMMI have increased (See Fig. 3.1, 3.2 & Table 3.1)*:

- **General price increases related to currency depreciation:** Due to the growing economic crisis and related currency depreciation, all products, including WASH products and services, have become more expensive over the past year.[JMMI] The TRY-USD exchange rate has increased consistently over the past months. Between September 2022 and January 2023, the TRY-USD only increased less than 1% month-month according to the JMMI. In contrast, economic and political instability following the February earthquakes saw the Turkish Lira (TRY) reach a record low in July 2023.[50] Experts have also suggested that the continued devaluation of the TRY after the 2023 Turkish elections is related to suppressed inflation prior to the elections, which was caused by the central bank stabilising exchange rates by selling foreign exchange reserves in return for TRY.
- **Cost of water & hygiene:** The costs of water (+55%) and hygiene products (+57%) have increased more than all other components in the SMEB in the past year (table 3.1).[JMMI] Furthermore, since the cholera outbreak, the median monthly spending on water for a household of 6 has increased by 90%.[HSOS]
- **Costs of fuel:** The average prices of high quality and low quality fuel has increased by 39% and 64% respectively over the past year (Fig. 3.5). Furthermore, fuel is one of the most common products reported to be unavailable in NWS.[JMMI] 54% of surveyed shops reported that manually refined fuel was unavailable in July 2023. Fuel is critical for the functioning of water stations and pumps.
- **Affordability of WASH:** KIs have throughout the past year consistently reported that hygiene products and services related to water and sanitation are unaffordable to households in the community.[HSOS] The number of communities where KIs report that core hygiene items are unaffordable to the majority of the community increased from July 2022 to July 2023. This included soap (50% compared to 29% in July 2022), adult hygiene items (63% compared to 56%), child hygiene items (60% compared to 52%).

The unaffordability of WASH is further compounded by worsening livelihoods following the earthquakes. It is estimated that around 170,000 people in NWS lost their jobs following the earthquakes, affecting the livelihoods of 725,000 individuals.[51] REACH data for the assessed communities suggests that livelihoods may have worsened following the earthquakes.[HSOS]

- **Lack of employment opportunities:** KIs in more communities report a lack of employment opportunities (increase from 50 to 66%).
- **Reliance on humanitarian assistance & credit/loans**: KIs in more communities report that households rely on humanitarian assistance (an increase from 20% to 32%) or credit/loans (an increase from 34% to 44%) to meet their basic needs.

*JMMI data unless otherwise indicated

Water costs & expenditure[JMMI, HSOS]

Changes (%) from cholera outbreak (Sep-22) to July 2023

56%
Increase in the water prices in July 2023.

90%
Increase in the reported household level spending on water for a household of six.

Figure 3.1: Prices of SMEB components (TRY) (2022-23)[JMMI]

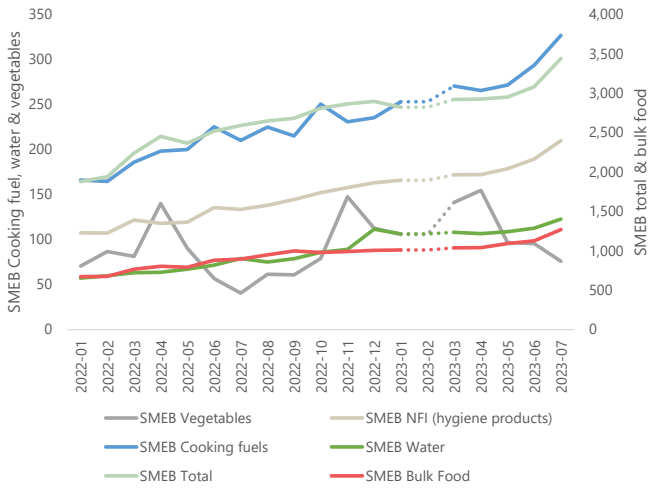
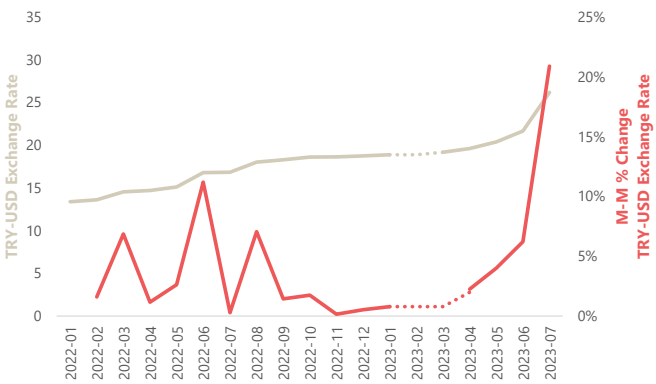


Table 3.1: Price change in core SMEB items[JMMI]

Item	% Change from July 2022 (12-months)	% Change from Jan 2023 (6-months)
SMEB Total	33%	22%
SMEB Bulk Food	42%	25%
SMEB Hygiene (NFI)	57%	27%
SMEB Water	55%	15%
TRY-USD Exchange Rate	55%	39%

Figure 3.2: TRY-USD exchange rate (2022-23)[JMMI]



Interpretation: Risks associated with economic-crisis related factors

The increasing unaffordability affects the majority of communities given the high reliance on private WASH services

The economic crisis and associated sharp increases in WASH services and products are of concern as many communities are reliant on private services due to WASH infrastructural problems (See Water & Sanitation). Studies have previously reported that private services have largely replaced decaying WASH infrastructure in Syria.[1] Consequently, access to WASH services is highly susceptible to economic shocks. As Figure 3.4 shows, few communities are reliant on public WASH services, and consequently resort to private alternatives.[HSOS]

The increasing unaffordability of WASH products predisposes households to unsafe coping strategies

The high unaffordability of WASH products and services predispose households to adopt unsafe coping strategies such as drinking water from unmonitored sources, increasing household-level debt and/or foregoing hygiene.[49]

The increasing unaffordability of fuel is compromising water stations and increase the risk of exposure to contaminated water

The continued price increases of fuel are of concern, since fuel is central to the functioning of water stations, including water pumping and purification.[1] Humanitarian actors have previously reported that the high costs of fuel compromise water station functioning and water stations bypass water treatment to save energy for pumping. Consequently, communities are at risk of receiving cointaminated water.[52]

The increasing unaffordability of WASH may interact with increasing food insecurity

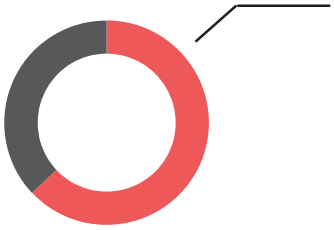
WASH-related diseases interact bi-directionally with malnutrition. These diseases cause diarrhoea which increases the risk of malnutrition, particularly among children, whilst malnutrition increases the risk of adverse outcomes of these dieases.[53] In Syria, WASH-related disease has previously been linked to increases in malnutrition.[1] The increasing unaffordability of WASH products and services as well as the general price increases are likely to predispose households to food insecurity and, thus, adverse outcomes of WASH-related diseases. Food insecurity may have increased following the earthquakes; KIs in 40% of assessed communities report relying on food from NGOs and/or friends/family compared to 30% before the earthquakes. KIs in over 80% of assessed communities continue to report that households rely on lower quality, less preferred foods to cope with food shortages[HSOS]. Similarly, KIs in a third of communities continue to report that HH reduce and/or skip meals to cope.

Price increases in the median price of fuel (Jul-2022 to Jul-23)[JMMI]

39%
High quality fuel

64%
Low quality fuel

Figure 3.3: Affordability of adult hygiene items (July 2023)[HSOS]



KIs in 63% of communities report **adult hygiene items** are unaffordable to the majority of the population.

Figure 3.4: Reliance on public WASH infrastructure (July 2023)[HSOS]

KIs in % of assessed communities reporting reliance on public WASH infrastructure.

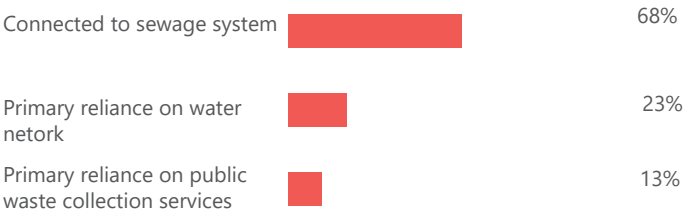
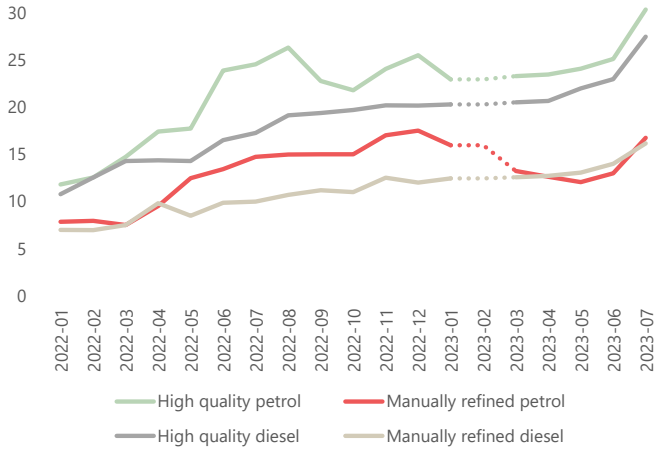
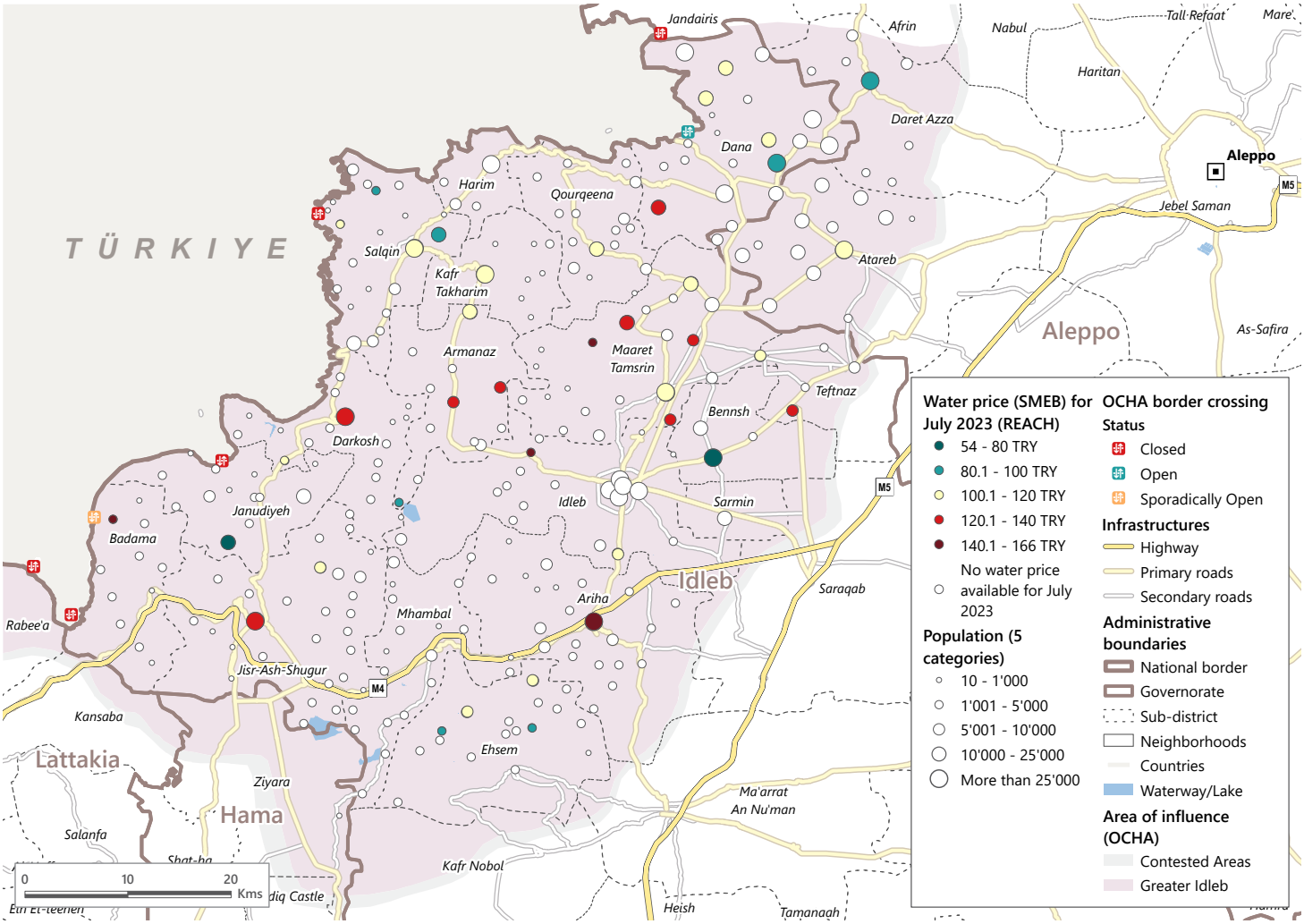


Figure 3.5: Fuel prices (TRY per litre) (2022-23)[HSOS]



Price of SMEB water component by sub-districts and communities (July 2023)JMMI



Note on the map

This map shows the price of the SMEB water components for communities in Greater Idleb included in this assessment (July 2023).

Health Care and Electricity Factors contributing to WASH-related diseases

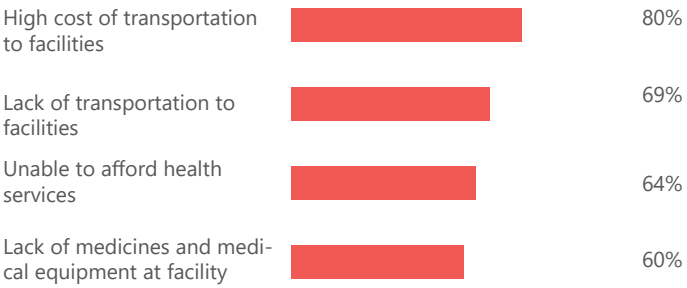
Health Factors

Barriers to accessing healthcare

KIs in all surveyed communities have consistently reported at least one barrier to healthcare over the past year. The most common barriers to healthcare have consistently been related to high costs of transport preventing access to healthcare, lack of transportation to healthcare facilities, and healthcare is unaffordable to many households in the community (See Fig. 4.1). As a result of these financial barriers, households may forego seeking healthcare.[56] In addition, KIs in 60% of communities report that there is a shortage of medicines and medical equipment at facilities and close to 20% of communities do not have access to healthcare in their community. This is of concern, as it is likely to hamper health facilities' ability to treat WASH-related diseases as well as ensure tracking and tracing to minimise spread.[57]

Figure 4.1: Most common healthcare barriers (July 2023)[HSOS]

KIs in % of assessed communities reporting healthcare barrier in the last 30 days

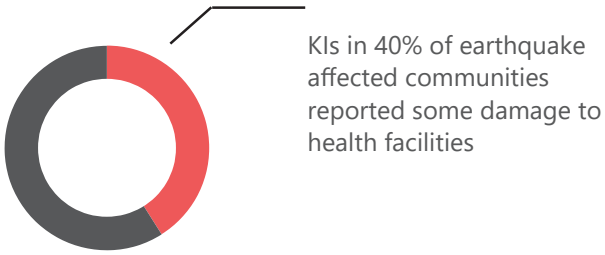


Potential compromised capacity to respond to outbreaks

The health system's capacity to respond to novel and existing disease outbreaks has further been worsened by the earthquakes. KIs in ~40% of earthquake-affected communities reported some damage to health facilities[RNA]. 55 health facilities were considerably damaged, and more were temporarily suspended in NWS following the earthquakes. Furthermore, KIs in more communities following the earthquakes reported health facilities lacking medicines and basic commodities.[HSOS] Vaccination and cholera treatment facilities were also interrupted following the earthquakes.[54] Although further assessments are needed to map out the effects of the earthquake on the health system's ability to respond to infectious diseases, existing data suggests that the earthquake has weakened an already strained health system.[55]

Figure 4.2: Damage to health facilities (July 2023)[HSOS]

KIs in % of assessed communities reporting damage to healthcare facilities in their community after earthquake[HSOS]

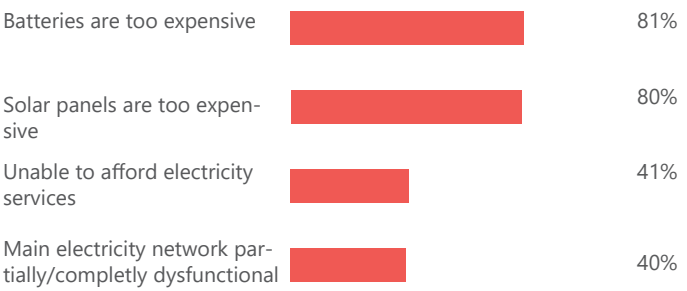


Energy Factors

The energy crisis in Syria has reportedly worsened over the past year due to the infrastructure damage caused by the earthquakes as well as the increasing costs of fuel needed for generators and solar panels.[58] Fuel prices have increased consistently over the past year (Fig. 3.5), with high quality diesel (+62%) and manually refined petrol (+60%) having experienced the highest price increases from July 2022 to July 2023.[JMMI] KIs in communities consistently report that the barriers to sufficient energy are related to the high costs and energy infrastructure not functioning.[HSOS] (Fig. 4.3). Whilst further area-based assessments are needed to understand how energy factors from the structural to community level influence risk of exposure to WASH-related diseases, the price increases in fuel and the unaffordability of energy are of concern given the importance of energy for ensuring safe water and sanitation.[59]

Figure 4.3: Most common energy barriers (July 2023)[HSOS]

KIs in % of assessed communities reporting energy barrier in the last 30 days



Conclusions & looking ahead

Although further studies are needed to understand how factors contributing to WASH-related diseases on a community level have changed, REACH data suggests that some factors have worsened on a regional level over the past year.

- **Water Infrastructure:** While REACH indicators of the water infrastructure do not suggest that the infrastructure has worsened over the past year, the data still suggests that the existing water infrastructure challenges affects the majority of assessed communities and are associated with multiple WASH-related disease risks. The water infrastructural challenges predisposes communities to rely on private alternatives that are costly, unmonitored and associated with increased risk of water insufficiency and, potentially, WASH-related disease exposure.
- **Sewage Infrastructure**: According to REACH data for the assessed communities, it is likely that the sewage infrastructure has worsened over the past year. As a result, communities are more likely to rely on unsafe alternatives and likely to be at greater risk of exposure to WASH-related diseases in July 2023 compared to before the cholera outbreak.
- **WASH Affordability:** The affordability of WASH-related services has worsened over the past year due to the ongoing economic crisis as well as worsening livelihoods restricting households' purchasing power. Livelihoods opportunities and income have been particularly affected following the earthquakes. Due to the WASH infrastructural challenges in NWS, communities are predisposed to rely on private services. As a result, households' ability to afford WASH-related items and services is susceptible to economic shocks, including the worsening economic crisis.
- **Vulnerable households are more at risk** – The reliance on private services is associated with increased debt and at-risk coping strategies, such as reliance on unsafe water sources and sewage infrastructure (e.g. unregulated soak pits). Without free and functional public WASH-infrastructure, economically vulnerable households are more likely to be exposed to WASH-related diseases as they are unable to afford WASH services and products.
- **Increased need for functional WASH infrastructure**: The data underlines that there has been a general shift from communities expressing a need for WASH products and supplies, to an increased need for functional WASH infrastructure since the cholera outbreak. Notably, due to the large WASH funding gap in NWS, the WASH infrastructure is likely to remain dysfunctional and/or worsen without additional funding allocated to improving the infrastructure.

Information gaps

Further research is needed to understand the specific risks associated with the compromised water and sanitation infrastructure at a household-level. At present, it is not understood how households cope with restricted access to safe WASH-infrastructure and the risks associated with WASH alternatives. Particularly, the WASH-related disease risk associated with sanitation infrastructure, alternative sanitation facilities and existing wastewater management are not very well understood. Furthermore, while REACH data for the assessed communities suggests that the unaffordability of WASH services and products has worsened, further research is necessary to understand how households cope with financial insecurity and how it affects their exposure to WASH-related diseases.

Looking ahead

The risk of exposure to WASH-related diseases is expected to persist or worsen in the coming months unless the root causes are addressed. For instance, issues with water infrastructure and the cost of water may continue to lead households to depend on alternative water sources that are unmonitored. Similarly, ongoing price inflation, alongside attacks on fuel and power stations, may further raise fuel prices.[60] This could affect the functionality of water stations, impacting both the cost and quality of water.[16] Additionally, the unaffordability of WASH products and services may worsen due to the ongoing economic crisis and reduced humanitarian aid in NWS.[32] Consequently, financially vulnerable households are likely to continue to be predisposed to unsafe WASH practices and employing harmful coping strategies.

Endnotes

1 Abbara et al. (2021). Weaponizing water as an instrument of war in Syria: Impact on diarrhoeal disease in Idlib and Aleppo governorates, 2011–2019. International Journal of Infectious Diseases, Sikder et al. (2018). Water, sanitation, and hygiene access in southern Syria: Analysis of survey data and recommendations for response. Conflict and Health, 12(1), 1–13; Saad et al. (2023) The cholera outbreak in northeast Syria: water, conflict and humanitarian challenges: Speaking of Medicine and Health; Tabor et al., (2023). Disruption to water supply and waterborne communicable diseases in northeast Syria: a spatiotemporal analysis. Conflict and Health

2 OCHA (2022). United Nations Resident and Humanitarian Coordinator in Syria, Imran Riza, statement on the outbreak of cholera in Syria, 12 September 2022.; WHO (2022, September). COVID-19, Monkeypox & Other Global Health Issues Virtual Press conference transcript

3 UN News. (2022, September 13). Syria: Cholera outbreak is 'serious threat' to whole Middle East | UN News.

4 New Arab. (2023, November), Cholera Outbreak in NWS spirals into catastrophe.

5 ACU (2023). Cholera Updates & Dashboard. World Health Organization (WHO), "Cholera Response Tracking Dashboard 2022–2023 Northwest Syria./

6 Russel & Azzopardi (2019). WASH: a basic human right and essential intervention for child health and development.

7 WHO. (2022, December 8). Cholera further exacerbates vulnerabilities in Syria; WHO (2022, September). COVID-19, Monkeypox & Other Global Health Issues Virtual Press conference transcript.

8 Prüss-Ustün et al., (2019). Burden of disease from inadequate water, sanitation and hygiene for selected adverse health outcomes: An updated analysis with a focus on low- and middle-income countries. International Journal of Hygiene and Environmental Health, 222(5), 765–777.; WHO. (2017). Diarrhoeal disease.

9 Greenhalgh, T., & Peacock, R. (2005). Effectiveness and efficiency of search methods in systematic reviews of complex evidence: audit of primary sources. BMJ (Clinical Research Ed.), 331(7524).,

10 UNICEF (2016). A Social and behaviour change agenda for inclusion and equity in education.; Center for Disease Control (2022). The Social-Ecological Model: A Framework for Prevention

11 Loughborough University, "The F-Diagram"; Emergency Wash. Tools & Methods: Hygiene Promotion in Emergencies.

12 WHO (2023) Whole of Syria Cholera Outbreak Situation Report No. 16. ; Tabor et al., (2023). Disruption to water supply and waterborne communicable diseases in northeast Syria: a spatiotemporal analysis. Conflict and Health.

13 CARE International. (2023). World Health Day: CARE underlines the increasing healthcare needs of people in the earthquake affected areas in Türkiye and northwest Syria

14 Tabor et al., (2023). Disruption to water supply and waterborne communicable diseases in northeast Syria: a spatiotemporal analysis. Conflict and Health

15 OCHA. (2022). 2022 Humanitarian Needs Overview: Syrian Arab Republic (February 2022) | ReliefWeb.

16 Lund, A. (2023.). Cholera in the Time of Assad: How Syria's Water Crisis Caused an Avoidable Outbreak

17 OCHA. (2022). 2022 Humanitarian Needs Overview: Syrian Arab Republic (February 2022) | ReliefWeb. ; Lund, A. (2023.). Cholera in the Time of Assad: How Syria's Water Crisis Caused an Avoidable Outbreak

18 Borgen Project. (2016). Water Quality in Syria During the Continued Conflict.; Lund, A. (2023.). Cholera in the Time of Assad: How Syria's Water Crisis Caused an Avoidable Outbreak ; Assistance Coordination Unit (2023, July). Meeting.

19 Abbara et al. (2021). Weaponizing water as an instrument of war in Syria: Impact on diarrhoeal disease in Idlib and Aleppo governorates, 2011–2019. International Journal of Infectious Diseases; Lund, A. (2023.). Cholera in the Time of Assad: How Syria's Water Crisis Caused an Avoidable Outbreak.

20 Sparrow et al. (2016). Cholera in the time of war: implications of weak surveillance in Syria for the WHO's preparedness—a comparison of two monitoring systems. BMJ Global Healt.

21 Lund, A. (2023.). Cholera in the Time of Assad: How Syria's Water Crisis Caused an Avoidable Outbreak.

22 WFP. (2023, March 14). Half of Syria's population faces hunger as conflict passes 12-year milestone and earthquakes deepen economic woes.; People in Need. (2023, March). A Harsh Reality: Millions in Northern Syria Lack Access to clean water

23 UNICEF. (2023). UNICEF warns of looming child nutrition crisis in Syria amid 12 years of conflict and deadly earthquakes.

24 International Rescue Committee (2022). Crisis in Syria: Economic crisis compounds over a decade of war. International Rescue Committee (2022)

25 REACH. Joint Market Monitoring Initiative Dashboard.

26 REACH (2023). Joint Market Monitoring Initiative (JMMI): Northern Syria

27 New Arab. (2023, May 26). Turkey's currency crisis is having domino effect in NW Syria.

28 UNICEF. (2023, March 8). WHO and UNICEF launch cholera vaccination campaign in northwest Syria amidst earthquake response. ; World Vision. (2023, February 10). World Vision warns of spiralling health crisis and spread of disease in Syria following earthquakes

29 Thu, K. M., Bernays, S., & Abimbola, S. (2022). A literature review exploring how health systems respond to acute shocks in fragile and conflict-affected countries. Conflict and Health, 16(1), 1–12.

30 WHO. (2023). Whole of Syria Earthquake Response Situation Report.

31 Care. (2023). World Health Day: CARE underlines the increasing healthcare needs of people in the earthquake affected areas in Türkiye and northwest Syria | CARE International.

32 The New Humanitarian (2023), Hunger crisis in northwest Syria compounded by quakes, inflation, and aid cuts. ; Reuters. (2023, July 18). Turkish lira hits record low ahead of rate decision.

33 VOA. (2023, August 11). Northwest Syria Struggles 6 Months on From Massive Quakes. CA-SYR. (2023, July). Northwest Syria Series Vol 2. Post-earthquake electricity recovery — CA-SYR.

34 OCHA. (2023, July 23). North-west Syria | Situation Reports. OCHA. (2023, May 31). Syrian Arab Republic: Critical funding gaps (As identified for the period of May: October 2023): Syrian Arab Republic | ReliefWeb.

35 The New Humanitarian (2023), Hunger crisis in northwest Syria compounded by quakes, inflation, and aid cuts.; World Food Programme. (2023). Hunger soars to 12-year high in Syria, WFP chief calls for urgent action

36 New Arab. (2023, November), Cholera Outbreak in NWS spirals into catastrophe. ; Lund, A. (2023.). Cholera in the Time of Assad: How Syria's Water Crisis Caused an Avoidable Outbreak;
37 OCHA. (2022). 2022 Humanitarian Needs Overview: Syrian Arab Republic (February 2022) ; NRC. (2023). Inside Syria's water crisis: A cholera outbreak in the making: Syrian Arab Republic
38 Syrian Water Resources Platform. (2023). Waterstations Database – Syrian Water Resources Platform.
39 OCHA (2022) , CRITICAL RESPONSE AND FUNDING REQUIREMENTS Response to the Water Crisis in Syria.
40 World Health Organisation. (2022, March 21). Drinking-water; OCHA. (2022). 2022 Humanitarian Needs Overview: Syrian Arab Republic (February 2022
41 Lautenschlager et al. (2010). Overnight stagnation of drinking water in household taps induces microbial growth and changes in community composition
42 Norwegian Refugee Council. (2023, January). Inside Syria's water crisis: A cholera outbreak in the making: Syrian Arab Republic
43 ECHO, (2022). New life in the village: easing water scarcity in Northwest Syria: Syrian Arab Republic.
44 MSF (2023). Inadequate water and sanitation pose health threats in Syria
45 Medair. (2022, November 18). Cholera: A new threat to health in Syria; UNICEF. (2022). Functioning sanitation services to protect families' health
46 World Vision (2022). WASH and Health Support to Communities Affected by Displacement (SCAD) in Syria in Idleb and Aleppo governorates
47 Enab Baladi (2021). Wastewater crop irrigation increases health and environmental risks in northern Syria.
48 August (2023). REACH Field Officer Meeting.
49 Eco-Business.com. (2022). Rising cost of living makes clean water a luxury in Syria; World Vision (2022). Water, Food and Fuel – a luxury for displaced Syrians like Talal*
50 CA-SYR. (2023). July 2023 Monthly Report — CA-SYR.
51 International Labour Organisation (2023, March). Over 725,000 people affected by loss of livelihoods after Syria earthquakes
52 Lund, A. (2023.). Cholera in the Time of Assad: How Syria's Water Crisis Caused an Avoidable Outbreak;
53 Guerrant et al. (1992). Diarrhea as a cause and an effect of malnutrition: diarrhea prevents catch-up growth and malnutrition increases diarrhea frequency and duration. The American Journal of Tropical Medicine and Hygiene, 47(1 Pt 2), 28–35.
54 MSF (2023, Mar). Northwest Syria: Providing healthcare amongst the rubble in Jindires; .
55 OCHA (2023) The earthquakes in February have further pushed the health system near the brink of collapse.; Carnegie Middle East Center (2023, July). Northwestern Syria in the Time of Cholera, Earthquakes, and Environmental Degradation; WHO (2023, February). Earthquakes as triggers for public health disasters: WHO and health systems' response
56 Amnesty (2022). Cuts in international aid create severe 'health crisis' in north-west Syria
57 OCHA (2023) The earthquakes in February have further pushed the health system near the brink of collapse. ; Tarnas et al (2023). Communicable diseases in northwest Syria in the context of protracted armed conflict and earthquakes
58 CA-SYR (2023) Post-Earthquake Electricity Recovery
59 OCHA (2023, Jan). Fuel Crisis in Syria (As of 15 January 2023); Lund, A. (2023.). Cholera in the Time of Assad: How Syria's Water Crisis Caused an Avoidable Outbreak;
60 Care (2023, October). Northwest Syria: Escalation of violence displaces over 20,000 people