Secondary Desk Review of WASH Needs in Sa'ada

June 2021

WASH Cluster
Water Sanitation Hygiene

REACH Informing more effective humanitarian action

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List of Acronyms

AFP	Acute flaccid paralysis
C4D	Cash for development
cVDPV	Circulating vaccine-derived poliovirus
HRP	Humanitarian Response Plan
IDP	Internally displaced person
IFA	Incomplete Freund's adjuvant
IMCI	Integrated management of childhood illnesses
MUAC	Mid-upper arm circumference
NPEV	Non-polio enterovirus
OPV3	Oral poliovirus vaccine
SOP	Standard operating procedures
SDR	Secondary desk review
UNICEF	United Nations Children's Fund
VDPV	Vaccine-derived poliovirus
WASH	Water, sanitation and hygiene
WHO	World Health Organization
WPV	Wild poliovirus
YWC	Yemen WASH Cluster

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INTRODUCTION

Sa'ada governorate is located in north-western Yemen and is estimated to have a population of 934,000 people.[1] It is one of the governorates most affected by both the current conflict and previous conflicts in Yemen, with the current conflict originating in the mountainous Houthi strongholds of Sa'ada governorate.[2] According to the 2021 Humanitarian Needs Overview (HNO)[1], Sa'ada governorate is home to an estimated 691,000 people in need of humanitarian assistance, with 20% of those people classified as facing a "catastrophic" severity of need. Sa'ada governorate hosts one of the largest populations of internally displaced persons (IDPs) out of all governorates in Yemen, with an estimated 104,000 people displaced (11% of the total population).

Despite these evident humanitarian needs, Sa'ada governorate is isolated by both mountainous terrain and protracted bureaucratic processes, making it difficult for humanitarian actors to deliver aid or carry out assessments. Until the 2021 HNO, there had been no large-scale water, sanitation and hygiene (WASH) needs assessment at the household level in Sa'ada governorate since 2018. Although sporadic WASH needs assessments have been conducted in support of humanitarian programming, the geographical and political isolation of the governorate makes consistent, systematic WASH needs assessments nearly impossible.

Household data from 2018 likely underestimates the current WASH needs in Sa'ada governorate, due to escalating crisis in the country over the past three years. Funding for the humanitarian response in Yemen has been significantly reduced since 2018; only 56.5% of the $3.38 billion humanitarian response plan (HRP) budget was funded in 2020[3], and only 54% of the budget for WASH aid was funded.[4] Furthermore, the 2020 COVID-19 pandemic has increased demand for health and WASH services to serve those affected by COVID-19, displaced people from areas where the disease is spreading, and has created new logistical challenges when delivering services.[5] Unprecedented floods in 2020 have also affected an estimated 500,000 people in Yemen, washing contaminated waste into water systems in some areas. Finally, WASH and other infrastructure has most likely been further damaged since the 2018 household assessment, as airstrikes have increased by 140% compared to 2019.[5]

Poliovirus has re-emerged in Yemen, with an outbreak declared in August 2020 following the identification of multiple cases in the Sa'ada governorate. Since January 2020, 33 circulating vaccine-derived poliovirus (cVDPV) cases have been reported,[6] spreading among a few select districts in Sa'ada governorate (Table 1). Surveillance of acute flaccid paralysis (AFP) is the gold standard for detecting cases of poliovirus.[7] However, with the temporary closure of Sana'a airport (September 9 – October 26, 2020), authorities have been unable to test new samples for poliovirus since June 2020. Due to the inability to properly monitor the spread of poliovirus, the most up-to-date information on the outbreak in Sa'ada governorate comes from surveillance data from January to June 2020.

Objective

Along with vaccine coverage, poor sanitation and hygiene are major risk factors related to transmission of poliovirus, due to the importance of the faecal-oral transmission route.[8] The objective of this report is to provide an updated WASH needs overview in Sa'ada governorate to inform the cVDPV outbreak response in Yemen. WASH needs data from the 2018 Household WASH Assessment will provide a detailed baseline, and WASH data from the 2021 HNO will provide insight into the current WASH needs in Sa'ada governorate. Other factors related to cVDPV will be summarized to provide context and identify priority districts for the response to the cVDPV outbreak in Sa'ada governorate.

[1] OCHA, "Yemen: Humanitarian Need Overview 2021," Humanitarian Data Exchange, 2021. https://data.humdata.org/dataset/yemen-humanitarian-needs-overview (accessed March 01, 2021).
[2] European Council on Foreign Relations, "Mapping the Yemen conflict" https://www.ecfr.eu/mena/yemen
[3] OCHA, Financial Tracking Services, "Yemen 2020," https://fts.unocha.org/appeals/925/flows
[4] Yemen WASH Cluster, "WASH HRP Funding Status," https://www.humanitarianresponse.info/en/operations/yemen/water-sanitation-hygiene
[5] ACAPS, "Yemen: CrisisInsight Impact Overview January to August 2020," 2020.
[6] GPEI, "Yemen – GPEI," 2020. http://polioeradication.org/where-we-work/polio-outbreak-countries/yemen/ (accessed May 15, 2021).
[7] GPEI, "Surveillance Indicators – GPEI." http://polioeradication.org/polio-today/polio-now/surveillance-indicators/ (accessed Oct. 01, 2020).
[8] O. M. Kew, R. W. Sutter, E. M. De Gourville, W. R. Dowdle, and M. A. Pallansch, "Vaccine-Derived Polioviruses and the Endgame Strategy for Global Polio Eradication *," 2005, doi: 10.1146/annurev.micro.58.030603.123625.

METHODS

Polio Outbreak

The findings reported in the polio outbreak section are informed by secondary analysis of AFP surveillance and oral polio vaccine (OPV3) coverage data from Yemen, provided by the World Health Organization (WHO) and Yemen Health Cluster. AFP surveillance data was used to find the total number of cases of cVDPV, non-polio enterovirus infections (NPEV), and poliovirus (WPV) infection in the districts of Sa'ada governorate. No new analysis was performed on OPV3 coverage data from 2019 and 2020, which was already aggregated to the district level.

WASH Needs

2018 Household WASH Needs Assessment

In 2018, the Yemen WASH Cluster (YWC) conducted 7609 household assessments (including 4,025 HC and 3,584 IDP households) in an effort to provide an overview of WASH needs, gaps and priorities in Yemen.[9] Assessments were conducted in pre-identified WASH priority districts with the aim of contributing to a more targeted and evidence-based humanitarian response. Samples sizes were calculated to provide generalizable findings with a 95% level of confidence and a 10% margin of error, at the district level and for each target population group.

Of the 7609 household WASH needs assessments, 587 were conducted in Sa'ada governorate and are included in this analysis. Approximately a third of those were conducted in the Al Hashwah (n=194), Kitaf wa Al Boqe'e (n=200) and Majz (n=193) districts, respectively. Al Hashwah and Majz districts were included in this targeted review because they had been prioritized for famine intervention by the YWC; Kitaf wa Al Boqe'e had been prioritized for both famine and cholera interventions. The WASH needs data collected in Sa'ada is used to describe the WASH situation in Sa'ada governorate. Several critical WASH indicators are assessed at the district and governorate level, disaggregating by household status where appropriate. This analysis was conducted using Excel and the results are available in in the annex (Table A1).

2021 WASH Humanitarian Needs Overview

In December 2020, the YWC conducted a secondary desk review (SDR) of all WASH needs assessments carried out in Yemen in 2020 to inform the severity score and people in need (PiN) calculations for the 2021 HNO. The SDR consolidates data from 145 individual assessments conducted by YWC partner organizations, and WASH data collected by the Integrated Food Security Phase Classification (IPC) team during their HNO assessment. Although no IPC data was collected in Sa'ada governorate, YWC partner assessments were conducted in 10 out of 15 districts in 2020. Assessments were included in the review if they were completed in Sa'ada in 2020 and reported on WASH needs.[10]

A total of 17 assessments conducted by YWC partner organizations were included, covering the districts of Qatabir, Razih, Shada'a, Haydan, Saqin, Majz, Sahar, As Safra and Al Hashwah and Kitaf wa Al Boqe'e. Data related to critical WASH indicators (listed in Table 1) was extracted from the reports and aggregated by district within Sa'ada. If an assessment was conducted in multiple districts, scores were assigned for each district that the assessment was conducted in. If a district had multiple assessments and therefore multiple severity scores, a weighted average was taken, with the weighting dependent on the reliability of the assessments. Assessments that were representative at the district level (and described sampling strategy used to ensure representativeness), were conducted at the household level and/or had a large sample size were weighted more heavily than non-representative assessments, assessments informed by key informants of focus group discussions, or assessments with small sample sizes. It is important to note that the majority of assessments cannot be considered representative

[9] WASH Cluster and REACH, "WASH Household Assessment: Water, Sanitation and Hygiene household level needs assessment in Yemen," 2018. Accessed: May 06, 2020. [Online]. Available: https://reliefweb.int/sites/reliefweb.int/files/resources/reach_yem_report_yem1802_november_2018_0.pdf.

[10] Only assessments which reported quantitative data for the selected WASH indicators are included in the SDR at this time. Data has been requested from partners who submitted assessments but did not report quantitative data.

of the entire district, as purposive sampling strategies were often employed to inform the programming of the organizations collecting the data.

Table 1 List of indicators included in SDR of 2020 WASH needs assessments in Sa'ada governorate

Indicator	Definition
W1	% households reported accessing an improved primary water source for drinking water
W2	% households reported access to sufficient quantity of water
W3	Average daily water usage (litre per person per day)
S1	% households reported use of improved sanitation facilities
S2	% households reported accessing clean and functional latrines
S3	% households who did not witness visible wastewater in the vicinity (30 meters) of their shelter in the last 30 days
S4	% households whose garbage was collected through public system
H1	% households reported having soap
H2	% households reported having access to handwashing facilities

Yemen WASH Cluster Partner Presence Monitoring (4W Matrix)

In this section, YWC Partners Presence Monitoring (4W Matrix)[11] data from January to December 2020 is summarized to illustrate the WASH response in Yemen. This data comprises self-reported response information; YWC partner organizations register their WASH-related interventions with the YWC, with methodological details such as location and number of beneficiaries. The 4W Matrix assesses WASH response in terms of target population (determined during the HRP) and coverage (% of target served) for five types of assistance: Sustained Water System (TA1); Sustained Sanitation (TA2); Emergency Water Support (TA3); Emergency Sanitation (TA4); and Emergency Hygiene Support (TA5). Table 4 shows the overall coverage of the cluster partner responses for the Sa'ada governorate in 2020, by district.

Limitations

The objective of this review is to provide a situation overview of WASH in Sa'ada governorate with the most up-to-date data possible, in order to inform the polio outbreak response. Specifically, this review aims to identify the districts in which further WASH assessments and interventions are most needed. Although we present the most recent polio and WASH data, an integrated WASH response could be prioritized in a variety of ways, and the recommendations made in the discussion are only one interpretation of the findings presented. Due to urgency of the current outbreak, districts with prevalent AFP or confirmed cases of cVDPV were given priority in this review. These districts include Kitaf wa Al Boqe'e, Majz, Sa'ada and Saqin. However, this prioritisation is based on outdated information on a disease that can spread quite rapidly. Consequently, it should be noted that some districts that perhaps should be prioritized might be under-represented in the findings of this assessment.

Due to the overwhelming lack of data, it could be argued that a more systematic approach is needed, where all districts undergo new rounds of polio surveillance and rapid WASH assessments in order to plan a response based on accurate and up-to-date information, or that priority should be to mobilize assessments in districts that have not had any assessments in recent years, including Baqim, Ghamr, Monabbih and Shada'a.

[11] YWC, "Yemen - WASH Cluster Partners Presence (4W) Jan - Dec 2020."

FINDINGS: POLIO OUTBREAK

Surveillance of AFP is the gold standard for detecting cases of poliovirus.[12] Since January 2020, 73 cases of AFP have been identified in Sa'ada governorate, making the governorate's AFP rate four times higher (0.16 cases/100,000 children under 15) than Yemen's national average (0.04 cases/100,000). However, due to weak surveillance, high levels of under-reporting, and extremely low immunization coverage, it is expected that the actual number of cases is significantly higher. This section is informed by analysis of the latest available AFP surveillance[13] and vaccine coverage data from the Sa'ada governorate.[14]

Of the AFP cases officially tested by the WHO, 14 were determined to be caused by cVDPV, 3 cases were caused by NPEV, and none were caused WPV infection (See Table 2). This evidence supports concerns that there is an outbreak of cVDPV in Sa'ada governorate.

Table 2 AFP cases in Sa'ada governorate which tested positive for cVDPV, NPEV, and WPV in 2020, by district.

Districts in Sa'ada governorate	cVDPV cases	NPEV cases	WPV cases	OPV3 Coverage[15]
As Safra	3	1	0	20%
Kitaf wa Al Boqe'e	5	0	0	23%
Majz	1	0	0	52%
Sa'ada	1	1	0	120%
Saqin	1	0	0	19%
Sahar	3	1	0	41%
Overall	**14**	**3**	**0**	**46%**

The outbreak in Sa'ada governorate is likely caused by a convergence of risk factors. Almost all children (99%) who get all the recommended doses of vaccine will be protected from polio.[16] If a population is seriously under-immunized, vaccine-derived poliovirus can begin to circulate in a community. Unfortunately, the coverage of oral polio vaccine (OPV3) in Sa'ada governorate is poor, hence the population immunity is likely weak. According to the vaccine coverage data, average district-wide coverage of OPV3 in Sa'ada governorate was only 36% of surviving infants from January – June 2020, with, in some districts, fewer than 15% of infants having been vaccinated. This is a severe drop in vaccinations compared to 2019, when 72% of surviving infants received OPV3. Among the districts where cases of cVDPV and NPEV were identified, the average rate of OPV3 coverage is 46% (Table 2). Compared to the other districts within Sa'ada governorate, OPV3 coverage is especially low in Bagim, Adh Dhahir, Al Hashwah, and Shada'a. Although the prolonged isolation of the governorate accounts for long-term deficiencies of OPV3 coverage in Sa'ada governorate, the decreased rate of vaccination in 2020 may be attributable to the COVID-19 pandemic[17]. Even when data from both 2019 and 2020 is considered, Sa'ada governorate has the lowest levels of OPV3 coverage of all the governorates in Yemen.

The WHO recently produced a risk profile for poliovirus infection throughout Yemen, using an index that combines the strength of polio surveillance, susceptibility of outbreak based on vaccine coverage, and demographic and environmental factors.[18] Every district in Sa'ada governorate received a high risk score (<50 out of 100), with the exception of Sa'ada district, which received a score of 56. Within Sa'ada governorate, Majz (risk score = 28) and Razih (risk score = 30) were at the highest risk of a polio outbreak, followed by Ghamr, Qatabir and Baqim (risk

[12] GPEI, "Surveillance Indicators – GPEI." (accessed Oct. 01, 2020)
[13] AFP data last updated in August 2020, provided by WHO.
[14] OPV3 data provided by the Yemen Health Cluster.
[15] Coverage rates represent the % of surviving infants vaccinated with OPV3 between January and June 2020. The percentage above 100% in Sa'ada district likely represents people who live outside the district but travel into the urban center for treatment.
[16] CDC, "Polio Vaccine Effectiveness and Duration of Protection."
[17] WHO, "At least 80 million children under one at risk of diseases such as diphtheria, measles and polio as COVID-19 disrupts routine vaccination efforts, warn Gavi, WHO and UNICEF" May 22, 2020.
[18] WHO, "Yemen: Polio Risk Assessment," 2019.

score = 32) (Figure 1). Twelve districts received a Polio Surveillance Score ≤7 out of 14, implying significant deficiencies in AFP surveillance systems in Sa'ada governorate even before the airport closure.

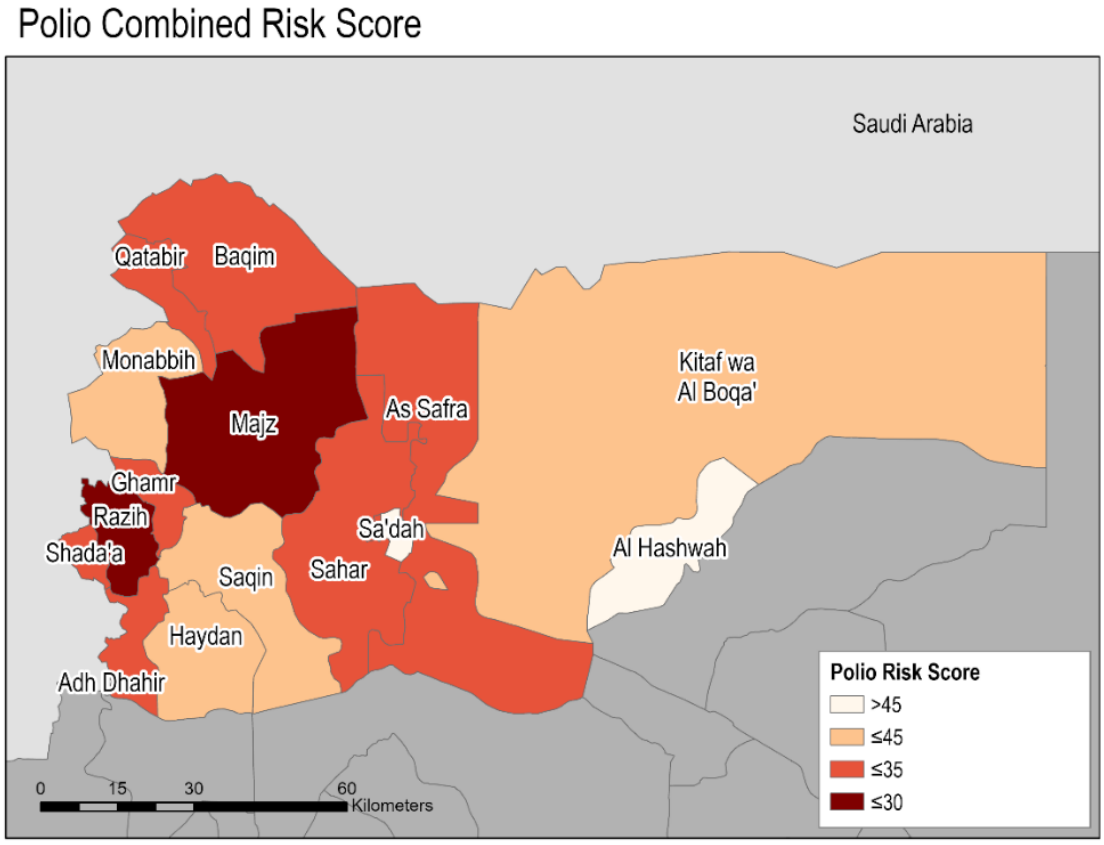

Figure 1: Map showing the Polio Risk Score per district in Sa'ada governorate, according to WHO index. Low score implies high risk.

FINDINGS: WASH NEEDS

2018 Household WASH Needs Assessment

Household Water Source

Approximately 46% of households in Sa'ada reported having an improved water source for drinking water in the 30 days prior to data collection (Figure 2). Households living in Majz were most likely to report using an improved main source (58%), followed by Al Hashwah (45%) and then Kitaf wa Al Boqe'e (37%). A greater proportion of host community households (51%) used an improved source than IDP households (41%).

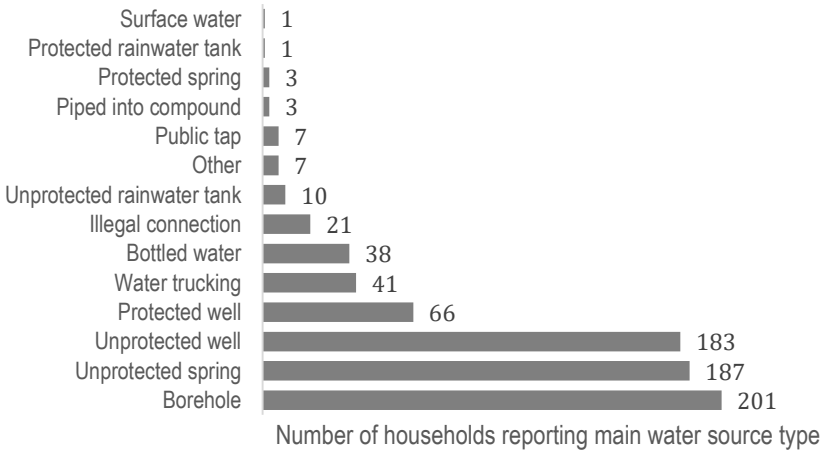

Figure 2: Number of households reporting use of each water source type as their main drinking water source in the 30 days prior to data collection

Only 22% of households in Sa'ada reported having a sufficient quantity of water: 31% of households in Al Hashwah; 23% of households in Majz; and 13% of households in Kitaf wa Al Boqe'e reported having sufficient water quantity. Households in Sa'ada accessed about **19 litres of water per person per day** (lpd), ranging from 14 lpd in Majz to 20 lpd in Al Hashwah. Water quantity use appeared to be similar between IDP and host community households.

The majority of households (55%) reported issues related to water quality (taste, odour, or appearance). Findings suggest little difference in reported water quality issues between IDP and host community households, with 54% of host community and 57% of IDP households reporting issues. Among the households that reported issues related to water quality, bad appearance was the most commonly reported issue (59%), followed by bad smell (30%) and bad taste (11%). Despite pervasive water quality issues, **only 13% of households reported treating their water**.

Sanitation

Although 37% of households reported that all members had access to sanitation facilities, only **17% of households reported having access to an improved sanitation facility**. Households in Kitaf wa Al Boqu'e and Majz reported relatively higher rates of access to improved sanitation facilities (21% of households in each), while only 8% of households living in Al Hashwah were found to access improved facilities. Overall, 29% of households reported sharing sanitation facilities with other households. Interestingly, findings suggest that host communities might share their sanitation facilities more commonly than IDP households, as 37% of host community households reportedly shared their sanitation facilities, compared to 20% of IDP households.

Hygiene

Only 8% of the assessed households had handwashing facilities; 43% had soap in the household. The proportion of households with access to handwashing facilities ranged from only 5% in Majz, to 10% in Kitaf wa Al Boqe'e. Handwashing facility coverage was similarly low in host and IDP communities – 90% and 94% of households reported having no handwashing facility, respectively. Of the households that lacked soap, most (72%) attributed this to **soap being too expensive** for the household to afford. Less than 1% of households that lacked soap attributed this to either soap being "unnecessary" or "not available at the local market".

Most households (85%) reported washing their hands when they are dirty, but only a minority reportedly wash their hands at other critical times (Figure 3). Poor hygiene practices may be a result of lack of awareness, as only 2% of households reported having received any hygiene promotion messaging or training in the year prior to data collection. This percentage is low amongst all assessed locations and groups.

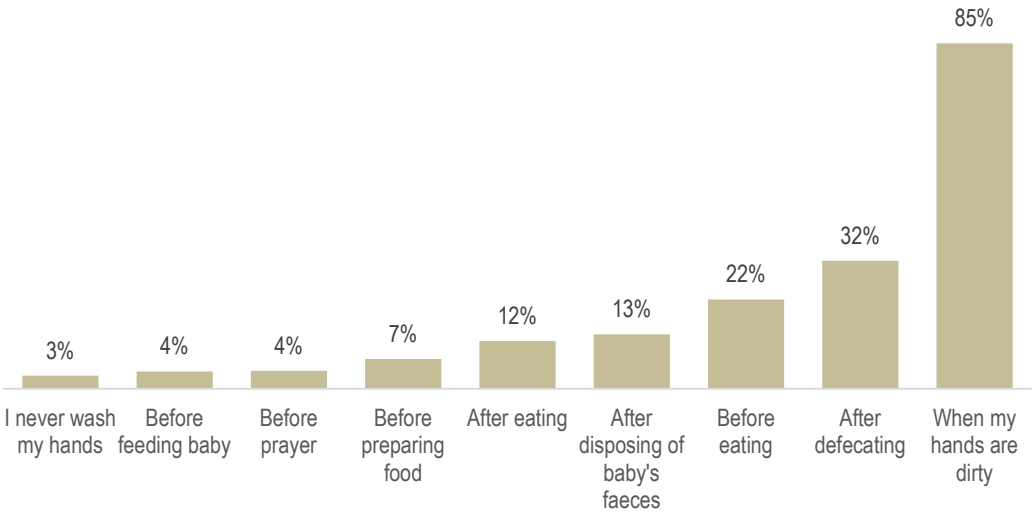

Figure 3: Proportion of households reporting washing hands at various critical times.

Waste Management

73% of households reported that there was visible wastewater in the vicinity (30 meters or less) of the house at some point in the 30 days prior to data collection. There were substantial differences in reporting on visible wastewater depending on district; only 55% of households in Kitaf wa Al Boqe'e reported the presence of visible wastewater in the past 30 days, compared to 75% in Al Hashwah and 88% in Majz. IDP households (31%) also reported visible wastewater more frequently than host community households (23%).

About **2% of households reportedly disposed of trash where it could be collected through the public system**, compared to 98% who burned or buried their trash, dumped trash in public spaces without a public pickup, or disposed of it in some "other" manner.

WASH Assistance

The overwhelming **majority of households (99%) reported not having received any type of WASH assistance** in the six months leading up to the assessment (second half of 2018). Two households reported having received chlorine tablets and hygiene kits.

2021 WASH Humanitarian Needs Overview

The WASH assessments included in the 2021 HNO show that there are significant data coverage gaps in Sa'ada governorate (Table 3). Generally, available data is sparse, likely due to the political and geographic isolation of the

district. This lack of data may also result from a lack of reporting, as many assessments carried out primary data collection, but did not report quantitative WASH needs results. Al Hashwah and Kitaf wa Al Boqe'e districts have the most complete WASH needs data and will be especially important to inform the poliovirus outbreak response, as the largest cluster of confirmed cases (n=5) is in Kitaf wa Al Boqe'e. Unfortunately, little data was available for As Safra or Sahar, the other two districts where multiple cases of cVDPV have been reported. No WASH needs assessments were carried out in Al Dhaler, Baqim, Ghamr, Monabbih or Sa'ada districts.

Table 1: WASH coverage in Sa'ada governorate by district, according to the assessments reviewed during the 2021 HNO.

	% households reported accessing an improved primary water source for drinking water	*% households reported access to sufficient quantity of water*	*Average daily water usage (litre per person per day)*	*% households reported use of improved sanitation facilities*	*% households reported accessing clean and functional latrines*	*% households who did not witness visible wastewater in the vicinity (30 meters) of their shelter in the last 30 days*	*% households whose garbage was collected through public system*	*% households reported having soap*	*% households reported having handwashing facilities*
	W1	***W2***	***W3***	***S1***	***S2***	***S3***	***S4***	***H1***	***H2***
Adh Dhahir									
Al Hashwah	16%	0%	12	59%	11%	27%	0%	24%	
As Safra			60						
Baqim									
Ghamr									
Haydan		0%	15			49%	0%		
Kitaf wa Al Boqe'e	16%	0%	12	59%	11%	27%	0%	24%	
Majz	82%	28%	20	63%	22%	63%			
Monabbih									
Qatabir	49%				30%				
Razih	35%		15		30%			49%	0%
Sa'ada									
Sahar			40						
Saqin	49%				30%				
Shada'a			40						
Grand Total	41%	7%	27	60%	22%	42%	0%	32%	0%

Household Water Sources

Access to an improved main drinking water source[19] (W1) varied among districts with data. Access ranges from 16% of households in Al Hashwah and Kitaf wa Al Boqe'e, to 82% in Majz. On average, **39% of households were found to have access to improved main water sources in Sa'ada governorate**. While less data is available for

[19] WHO defines an improved drinking water source is a source that, by nature of its construction, adequately protects the water from outside contamination, in particular from faecal matter. Common examples include piped household water connection, public standpipe, borehole, protected dug well, protected spring and rainwater collection.

the time it takes households to collect water (including queuing time), most assessments found that all households spend more than 30 minutes collecting water roundtrip. The amount of water used by households ranged from 12 litres per person per day (lpd) to 60 lpd. While it is recommended that households have access to at least 15 lpd in an emergency situation,[20] this quantity only covers basic drinking, cooking and hygiene needs. In order to encourage better hygiene practices and allow water to be used for productive purposes, substantially greater quantities are needed.

Sanitation

Overall, there is a **lack of data to assess the coverage of improved sanitation facilities in Sa'ada district**, with the indicator assessed only in Al Hashwah, Kitaf wa Al Boqe'e and Majz. However, the assessments in these districts indicate that the majority of households are using improved sanitation facility types,[21] ranging from 59% of households using an improved sanitation system in Al Hashwah and Kitaf wa Al Boqe'e, to 63% in Majz. Despite high coverage of improved sanitation facilities in Majz, Al Hashwah, and Kitaf wa al Boqe'e, the majority of sanitation facilities are either non-functioning or dirty in these and other districts. On average, only **20% of households in Sa'ada governorate were found to have access to functioning and clean sanitation facilities**. Latrine functionality and cleanliness have a significant effect on latrine use;[22] when latrines are dirty or non-functional, many people resort to unimproved sanitation options such as open defecation over using a dirty latrine.

Waste Management

Very little data on waste management practices was available in Sa'ada governorate. On average, 37% of households reported not having wastewater near (within 30 metres) their shelter in the 30 days prior to data collection, ranging from 27% of households in Al Hashwah and Kitaf wa Al Boqe'e, to 63% of people in Majz. The reported data suggests that **public garbage collection services are not available in Sa'ada governorate** (0% of households).

Hygiene

Hygiene data was only available in Razih, Al Hashwah, and Kitaf wa al Boqe'e. The minority of households reported that they had soap available, ranging from 24% of households in Al Hashwah and Kitaf wa Al Boqe'e to 49% in Razih. Data on the presence of a handwashing facility was only available in Razih, where **0% of households had access to handwashing facilities**.

WASH Assistance

According to the YWC Partners Presence Monitoring (4W Matrix) from January to December 2020, 16 organizations were providing WASH assistance in Sa'ada. Programs included the installation, rehabilitation and provision of operational support for water systems, provision of clean water through trucking, latrine construction and support, hygiene promotion, and capacity building for local WASH actors, among others.

The YWC 4W Matrix indicates that 73% of the Sustained Water System (TA1) assistance target was met in Sa'ada governorate January - December 2020. Emergency Water (TA3) coverage has been achieved in fewer districts, with only 49% of the target having been met in 2020.

With regard to the Sustained Sanitation (TA2) assistance target, much less progress has been made in Sa'ada governorate. Sustained sanitation assistance has reportedly only been provided in As Safra, Shada'a and Sa'ada districts, where an estimated 100%, 100% and 37% of the target has been achieved, respectively. Emergency Sanitation (TA4) assistance has been provided in a greater number of districts, with an average target coverage of 51%. However, this coverage is very dependent on district, with 100% coverage in Al Dhaher, Al Hashwah, As

[20] UNHCR, "Emergency Water Standard"

[21] According to the WHO, improved sanitation facilities include flush/pour flush to piped sewer, septic tank or pit latrine; composing toilet or pit latrine with slab. Unimproved sanitation facilities include pit latrines without a slab or platform, hanging latrines and bucket latrines.

[22] J. V. Garn et al., "The impact of sanitation interventions on latrine coverage and latrine use: A systematic review and meta-analysis," International Journal of Hygiene and Environmental Health, vol. 220, no. 2. 2017, doi: 10.1016/j.ijheh.2016.10 1.

Safra, Baqim, Ghamr and Haydan districts, and ≤5% coverage in Majz, Monabbih, Qatabir, Razih, Sa'ada, Sahar, Saqayn and Shada'a districts.

According to the YWC, the coverage of the Emergency Hygiene (TA5) target varies widely between districts of Sa'ada, ranging from 0% to 61%, with an overall average of 8% coverage.

Table 2 Overall coverage of the cluster partner responses for the Sa'ada governorate in 2020, by district

District	Sustained Water (TA1) Coverage	Sustained Sanitation (TA2) Coverage	Emergency Water (TA3) Coverage	Emergency Sanitation (TA4) Coverage	Emergency Hygiene (TA5) Coverage	Overall Coverage
Baqim	100%	-	8%	100%	0%	38%
Qatabir	71%	-	100%	100%	0%	35%
Monabbih	100%	100%	63%	100%	3%	83%
Ghamr	100%	-	100%	100%	0%	55%
Razih	100%	-	15%	100%	1%	49%
Shada'a	-	-	4%	100%	0%	4%
Al Dhaher	0%	-	0%	-	0%	0%
Haydan	100%	0%	0%	0%	36%	83%
Saqayn	14%	0%	-	0%	0%	13%
Majz	68%	0%	100%	2%	16%	68%
Sahar	55%	0%	100%	1%	0%	43%
As Safra	100%	37%	100%	-	61%	100%
Al Hashwah	20%	0%	0%	-	0%	11%
Kitaf wa Al Boqe'e	100%	0%	0%	0%	0%	100%
Sa'ada	100%	100%	100%	5%	2%	100%
Overall	**73%**	**26%**	**49%**	**51%**	**8%**	**52%**

DISCUSSION

This review consolidates secondary data on the polio outbreak and WASH conditions in Sa'ada governorate. The first conclusion of this review is that the humanitarian community lacks the necessary evidence to respond to such an outbreak effectively, especially in Sa'ada governorate. The most recent polio surveillance data available in Sa'ada is from August 2020, despite the fact that there is an ongoing outbreak and surveillance data is key to tracking and responding to the outbreak. WASH needs and coverage data is also outdated, with the latest representative data collected in 2018. Gathering more information about the situation on the ground is crucial to inform the current polio outbreak response, and to plan for future shocks.

From the information available, this review attempts to provide an updated WASH needs overview of the Sa'ada governorate. Overall, results from both the 2018 Household WASH Needs Assessment and the 2021 WASH HNO agree that WASH coverage in Sa'ada is low, and WASH related humanitarian need is high. The minority of households in Sa'ada use an improved main water source (46% in 2018, 41% in 2020) or have sufficient quantities of water (22% in 2018, 7% in 2020). Although most households report issues related to taste, smell or appearance of their water (55% in 2018), only 13% of households report regularly treating their drinking water.

Findings illustrate that the sanitation situation in Sa'ada is also largely insufficient. While the number of households reporting access to an improved sanitation facility increased from 17% in 2018 to 60% in 2020, only 22% of households reported that their sanitation facilities were clean and functional in 2020. Further, environmental sanitation poses a large issue in Sa'ada, with the majority of households reporting visible wastewater within 30 metres of their shelter in (73% in 2018, 58% in 2020). This may be a result of very low coverage of waste management services; virtually none of the assessed households reported that their trash was collected through a public service in either dataset (2% in 2018, 0% in 2020).

With regard to hygiene, findings suggest that households in Sa'ada largely lack handwashing facilities and access to soap. In 2018, only 8% of households reported that they had a handwashing facility in their shelter. While very little data was available on handwashing facilities in 2020, the only data reported shows that 0% of households have a handwashing facility in Razih district. Further, the majority of households reported not having soap in their households (57% in 2018, 68% in 2020).

Furthermore, WASH interventions seem to have only reached 52% of the total number of people in need of WASH assistance in Sa'ada governorate in 2020. The lowest coverage rates were found to be related to Emergency Hygiene (TA5) and Sustained Sanitation (TA2), where YWC programming only reached 8% and 26% of the targeted populations, respectively. Emergency Hygiene support (including hygiene awareness campaigns, soap distributions) and Sustained Sanitation support (including the building/rehabilitation of latrines) are both crucial to breaking the faecal-oral transmission routes for polio.

WASH for Integrated Polio Response

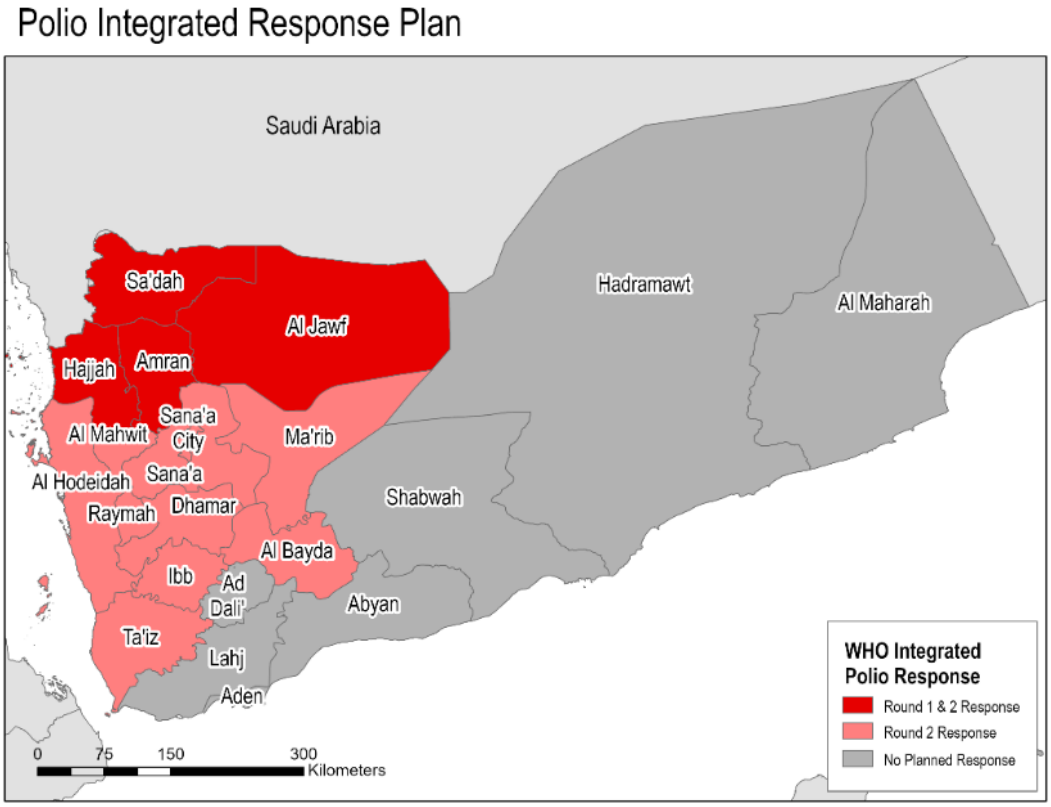

Figure 4 Governorates targeted during Round 1 and Round 2 of the WHO integrated poliovirus outbreak response

This report demonstrates low coverage of both WASH services and WASH needs information in Sa'ada governorate. Understanding WASH coverage and behaviours is a core part of an integrated polio response strategy, due to the importance of faecal-oral transmission routes for polio.[23] The inclusion of WASH is especially important due to the extremely low immunization coverage, poor response times, and the likelihood of the virus being in circulation before the outbreak was confirmed.[24] The findings of this review show that both WASH and polio vaccine coverage should be addressed in Sa'ada governorate in order to reduce polio

The findings of this review support the objectives of the ongoing response, as the WHO and UNICEF have proposed an integrated WASH and Health response to the poliovirus outbreak (Figure 4). The integrated response will address advocacy, communication and social mobilization, and robust immunization (as per global polio response SOPs), and will be mobilized in two rounds. The first round of the response will consist of a poliovirus vaccination campaign integrated with: measles vaccination in Sa'ada, Hajja and Amran; as well as WASH (hygiene items and water treatment), and micronutrient interventions and Integrated Management of Childhood Illnesses (IMCI) and maternal health services in Sa'ada, Amran, Al Jawf and Hajjah. Communication and community engagement will also be an integral component of the interventions. The second round of the response will include micronutrient supplementation including Vitamin-A, micronutrient powder, incomplete Freund's adjuvant (IFA) therapy and deworming and mid-upper arm circumference (MUAC) screening in the 13 governorates indicated in Figure 4, along with poliovirus vaccination in any governorates not included in round one.

Conclusion

This report echoes the common understanding that Sa'ada tends to be a data poor governorate due to its political and geographic isolation. Even in the midst of an active polio outbreak, health surveillance is rendered impossible

[23] Boot, Hein J et al. "Excretion of wild-type and vaccine-derived poliovirus in the feces of poliovirus receptor-transgenic mice." *Journal of virology* vol. 77,11 (2003): 6541-5. doi:10.1128/jvi.77.11.6541-6545.2003
[24] WHO, "Yemen cVDPV1 Outbreak." 2020.

due to fuel shortages and airport closures, seriously impeding the ability of the humanitarian sector to mobilize a rapid response. Representative WASH needs data has not been collected in three years, a period during which the WASH situation in Sa'ada has likely been considerably impacted by the escalating conflict, unprecedented flooding, and the COVID-19 pandemic.

In light of the current cVDPV outbreak, the low coverage of sufficient WASH infrastructure access, the uneven coverage of WASH programming across districts, and the overwhelming lack of WASH data, the YWC aims to mobilize rapid WASH assessments in Sa'ada governorate to inform an effective response. There are known cases of cVDPV in As Safra, Kitaf wa Al Boqe'e, Majz, Sa'ada, Saqin, Sahar districts; multiple cases have been reported in As Safra, Kitaf wa Al Boqe'e and Sahar. Although robust data exists for Kitaf wa Al Boqe'e, little is known of the WASH situation in As Safra and Sahar. **We therefore recommend that rapid WASH assessments be prioritized in As Safra and Sahar**. Neither district is targeted in the current plan for UNICEF's integrated response, but both are considered partially accessible for intervention (as opposed to fully accessible or inaccessible).

Sahar

In line with the SDR findings, Sahar should be the first district prioritized for rapid WASH needs assessments in response to the cVDPV outbreak. Sahar is at higher risk of polio outbreak compared to both the rest of Yemen and most districts in Sa'ada governorate (Figure 1). The district also has the second highest number of cases to Kitaf wa Al Boqe'e, with three identified cVDPV cases. Sahar has the largest number of AFP cases (26, compared to 14 in Kitaf wa Al Boqe'e), and ~70% of those cases have not had their stool sample tested for polioviruses. When considering prevalence of related illnesses and polio surveillance methods, WHO gave Sahar a surveillance score of 5 out of 14 – confirming that there is a serious lack of quality AFP surveillance. **The high number of AFP cases and low rate of testing could indicate that there are more unidentified cases of cVDPV in Sahar**, putting the district at high risk of outbreak spread.

Sahar is one of the districts in Sa'ada with the lowest WASH assistance coverage, with only 11% of humanitarian WASH assistance targets having been met in 2020.[19] **No sanitation or hygiene assistance was reported** by YWC partners in 2020 in Sahar, and partners providing assistance in sustained water systems only met 20% of their target. With the exception of one assessment conducted in 2020, no WASH needs assessment from Sahar has been submitted to the WASH cluster in the past two years, despite it having one of the largest district populations in Sa'ada.

As Safra

As Safra should also be prioritized for rapid WASH needs assessments. As Safra has the third largest number of both identified cVDPV (n=3) and AFP (n=12) cases. Like Sahar, As Safra is considered at high risk of a polio outbreak (Figure 3), and faces substantial challenges with regard to polio surveillance (WHO surveillance score = 6/14). Furthermore, findings highlight that OPV3 coverage in As Safra is especially poor; **only 55% of surviving infants were administered OPV3 in 2019, and vaccination rate fell to only 20% of surviving infants in 2020**. This makes As Safra's vaccination rate among the lowest in Sa'ada (Figure 1).

Only one WASH needs assessment was submitted to the WASH cluster in 2020, and it only reported on the household water quantity, not any other core indicators. Furthermore, the district has been prioritized by the humanitarian community for special programming due to cholera prevalence in the district.[20]

Other districts

The Sa'ada governorate is especially vulnerable to an outbreak of VDP; the district has low OPV3 coverage, poor WASH conditions and lacks the capacity to conduct sufficient AFP surveillance. Every district in Sa'ada governorate is designated "hard to reach,"[20] and systematic WASH needs assessment has not been carried out since 2018. These factors contribute to the urgent need to carry out high quality WASH needs assessments in Sa'ada. With unlimited resources, WASH needs ideally would be assessed in all districts of Sa'ada to properly understand the conditions of the cVDPV outbreak and the humanitarian situation in general. This report names Sahar and As Safra as priority districts for WASH assessment, but all districts are in need of more up-to-date WASH needs data.

ANNEX

Table A1: Household WASH Needs Assessment - 2018

Total number and percentage of households who reported each WASH indicator in the 2018 Household WASH Needs Assessment

	Al Hashwah		Kitaf wa Al Boqe'e		Majz		Host Community		IDP		Grand Total	
Access to an improved water source	88	(45%)	73	(37%)	111	(58%)	153	(51%)	119	(41%)	272	(46%)
Piped water on plot	4	(2%)	2	(1%)	12	(6%)	10	(3%)	8	(3%)	18	(3%)
Reports issues with water odour, taste or appearance	67	(35%)	81	(41%)	177	(92%)	161	(54%)	164	(57%)	325	(55%)
Treats water	28	(14%)	23	(12%)	28	(15%)	43	(14%)	36	(13%)	79	(13%)
Sufficient water quantity for needs	61	(31%)	25	(13%)	45	(23%)	71	(24%)	60	(21%)	131	(22%)
Average of Litres Water Per Person Per Day	22.4		19.6		14.5		19.2		18.5		18.9	
All HH members have access to latrine	51	(26%)	78	(39%)	90	(47%)	119	(40%)	100	(35%)	219	(37%)
Some HH members have access to latrine	58	(30%)	93	(47%)	81	(42%)	122	(41%)	110	(38%)	232	(40%)
No HH members have access to latrine	32	(16%)	29	(15%)	22	(11%)	40	(13%)	43	(15%)	83	(14%)
Shared latrine	29	(15%)	6	(3%)	135	(70%)	112	(37%)	58	(20%)	170	(29%)
Access to improved sanitation facilities	16	(8%)	42	(21%)	40	(21%)	51	(17%)	47	(16%)	98	(17%)
Visible wastewater within HH vicinity in past 30 days	146	(75%)	111	(56%)	170	(88%)	230	(77%)	197	(69%)	427	(73%)
Garbage collected through public system	1	(1%)	0	(0%)	12	(6%)	7	(2%)	6	(2%)	13	(2%)
Presence of handwashing facility	18	(9%)	20	(10%)	9	(5%)	31	(10%)	16	(6%)	47	(8%)
Presence of soap	92	(47%)	79	(40%)	83	(43%)	142	(47%)	112	(39%)	254	(43%)
Received hygiene education in past 6mos	4	(2%)	8	(4%)	2	(1%)	9	(3%)	5	(2%)	14	(2%)
Received latrine construction assistance in past 6mos	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Received waste disposal assistance in past 6mos	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Received free trucked water assistance in past 6mos	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Received water container in past 6mos	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)	0	(0%)
Received chlorine tablets in past 6mos	1	(1%)	1	(1%)	0	(0%)	2	(1%)	0	(0%)	2	(0%)
Received hygiene kit in past 6mos	0	(0%)	2	(1%)	0	(0%)	2	(1%)	0	(0%)	2	(0%)
Did not receive WASH assistance in past 6mos	193	(99%)	198	(99%)	193	(100%)	297	(99%)	287	(100%)	584	(99%)