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WASH AND COVID-19 LONGITUDINAL DATA COLLECTION

FINAL FINDINGS

JANUARY 2022

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Tetra Tech Contacts:

Morris Israel, Project Director
morris.israel@washpals.org

Jeff Albert, Deputy Project Director
jeff.albert@washpals.org

Lucia Henry, Project Manager
lucia.henry@tetratech.com

Tetra Tech
1320 N. Courthouse Road, Suite 600, Arlington, VA 22201
Tel: 703 387-2100, Fax: 703 414-5593
www.tetratech.com/intdev
www.globalwaters.org/washpals

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ACRONYMS AND ABBREVIATIONS

ACAPS	Assessment Capacities Project when initially formed. Now acronym serves as the official name.
B.C.	Before COVID-19
COVID-19	Coronavirus disease 2019
CTIS	COVID-19 Trends and Impact Survey
DRC	Democratic Republic of Congo
FB	Facebook
GLAAS	UN-Water Global Analysis and Assessment of Sanitation and Drinking-water
HP	High Priority
HWISE	The Household Water Insecurity Experiences Consortium
IFPRI	International Food Policy Research Institute
IBNET	International Benchmarking Network for Water and Sanitation Utilities
IMF	International Monetary Fund
INSTAT	National Institute of Statistics of Madagascar
IRC	International Reference Centre for Community Water Supply and Sanitation
JMP	WHO/UNICEF Joint Monitoring Programme
KII	Key Informant Interview
LSMS	Living Standards Measurement Study
MICS	Multiple Indicator Cluster Survey
RWSN	Rural Water Supply Network
SWA	Safe Water Alliance
SMS	Short message service
SSSP	Small-scale service provider
SIWI	Stockholm International Water Institute
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WASH	Water, Sanitation, and Hygiene
WASH-FIN	Water, Sanitation, and Hygiene Finance
WASHPaLS	Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability
WFP	World Food Programme
WHO	World Health Organization

EXECUTIVE SUMMARY

In 2020, the United States Agency for International Development (USAID) Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) project conducted a rapid assessment and forecasting analysis of the effects of the novel Coronavirus Disease 2019 (COVID-19) pandemic on access to water, sanitation, and hygiene (WASH) services and products in USAID high priority (HP) and strategy-aligned countries. In 2021, USAID tasked WASHPaLS with collecting and presenting available longitudinal data on the effects of COVID-19 on access to WASH services and products in USAID HP countries.

This task included the collation of available longitudinal data on the impacts of COVID-19 across three priority topics: WASH governance, WASH in households, and small-scale service providers (SSSPs). For each of the three topic areas, we identified indicators common across existing data collection initiatives (16 for governance, 12 for households, 14 for SSSPs). Secondary data collection consisted of aggregating existing, publicly available data that included any of the selected indicators, identified during an initial data scan. Primary data collection was used to fill gaps in the availability of data and consisted of quantitative household surveys for the WASH in households topic and mixed-method data collection for the governance and SSSP topics (informant interviews, online surveys).

This document represents the synthesis of the assessment carried out by the WASHPaLS team between March and December 2021. The top-line findings, by priority topic, are as follows:

GOVERNANCE

1. **Suspension of water tariffs or full government subsidization** of water access was reported among multiple sources at the national and/or sub-national level across 16 of 18 countries, lasting on average six months.
2. Few data sources identified measures for the **temporary reduction or exemption of water tariffs** and/or suspension or reduction of taxes on soap, soap products, or sanitizer.
3. The **prohibition of disconnecting water supplies in the case of non-payment** at the national level was reported in 11 of 18 countries.
4. **Government financial support** (e.g., subsidies or tax breaks) to service operators was reported in 12 of 18 countries.
5. More than half of all data sources reported the use of **guidelines/instructions for provision** of WASH services posted in public spaces.
6. Nearly all of the HP country governments supported **additional provision of WASH facilities** in public spaces and **distribution of hygiene products**.

WASH IN HOUSEHOLDS

7. Twenty months into the COVID-19 pandemic, 28 to 58 percent of respondents across the nine surveyed countries reported that it was more **difficult to get water**, due to access, affordability, or safety issues.
8. Twenty months into the COVID-19 pandemic, 46 to 70 percent of respondents across the nine surveyed countries are **water insecure**, with generally greater insecurity among rural respondents.
9. We observed minimal changes in **sanitation service levels** but did note an increase in **difficulty accessing pit emptying services** over the twenty months following the onset of the pandemic. The proportion of respondents reporting affordability as a constraint to pit

emptying increased in seven of the eight countries in which we collected primary household data two times.

10. Hygiene access: There were no reported difficulties in **accessing soap** across the 18 HP countries.

SMALL-SCALE SERVICE PROVIDERS

11. More than a third of service providers **increased coverage/connections** since the onset of the pandemic. Data were too variable to identify a trend in regards to change in production, consumption, or rationing.
12. **Collection ratios** (i.e., collection efficiency) appear to have decreased for a number of service providers (41 percent) since the onset of the pandemic. In addition, one quarter (28 percent) of service providers experienced **additional operational costs** incurred in relation to the COVID-19 pandemic.
13. Approximately one quarter of service providers (28 percent) received some form of **government or other financial support**.
14. One quarter of service providers (28 percent) reported **delaying certain investments or payments** due to COVID-19.

In the course of the activity, we documented challenges we faced in the collection and collation of secondary data. We observed that **WASH data still live in siloes.** There are numerous efforts to gather and showcase all publicly available data, but efforts are not yet complete or exhaustive, and further demand by funders, governments, and implementors is necessary. Additionally, **WASH indicators are still not harmonized.** Although JMP identified a set of core indicators in 2006, there remains inconsistency in question scope, structure and response options.

The onset of the pandemic accelerated the shift toward digital and remote data collection, though this method comes with its own challenges. We identified numerous examples of valuable resources that have already been developed to support mobile data collection, but it is unclear if they are being widely used. Remote data collection lacks in-person verification and mobile methods may still bias urban and wealthier participants. Survey length and character limits restrict the quantity and quality of data and there are geographical coverage and language constraints dependent on service and available resources. Small-scale service providers are difficult to survey via remote methods and competing priorities, a lack of incentives, and information request fatigue limits responses.

There are a few key opportunities to improve data collection efforts in the sector.

1. We need to adapt and advocate for the expansion of core questions and their adaptation to remote formats.
2. We must promote existing resources for optimization of mobile data collection.
3. We should encourage collaborations with “big data” institutions, which have the resources to continuously monitor WASH indicators in households, institutions, and markets at-scale.
4. We could consider supporting specific investment in data collection initiatives for service providers and generally, incentives for research participants.

1.0 INTRODUCTION

In 2020, the United States Agency for International Development (USAID) Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) project conducted a rapid assessment and forecasting analysis of the effects of the novel Coronavirus Disease 2019 (COVID-19) on access to water, sanitation, and hygiene (WASH) services and products. The assessment was conducted in six USAID high-priority countries (Democratic Republic of the Congo [DRC], Ghana, Kenya, Mozambique, Nepal, and Senegal) and one strategy-aligned country (Rwanda). The assessment evaluated WASH access in these seven countries and in general terms forecasted near-term trends to assist governments, donors, and implementers prepare an informed response to the WASH-related impacts of COVID-19. Findings demonstrated substantial short-term impacts on WASH services and providers, including economic impacts limiting individuals' access to WASH services, decreased levels of service, and financial stress on service providers due to reduced revenue collection and increased operating costs. However, there is insufficient systematic evidence on the long-term effects of COVID-19 on WASH services and products. Specifically, there is uncertainty regarding the amounts by which these services and products may diminish due to the economic and operational constraints faced by WASH service providers and product manufacturers and suppliers, as well as the amounts by which demand may drop due to declining consumer incomes and subsequent increased reliance on self-collection. Ongoing data collection on a broad range of parameters is necessary to better understand and respond to COVID-19-related WASH challenges and potential opportunities, such as increased awareness regarding the importance of hand hygiene to prevent the spread of disease.

To address the knowledge gaps in the long-term effects of COVID-19 on WASH services and products, WASHPaLS assessed ongoing changes in WASH sector performance and COVID-19 response activities in USAID's 18 high-priority (HP) countries[1] over a 10-month period in 2021, from March to December. Longitudinal data collection focused on the following three priority topics identified by USAID:

1. **WASH governance**, to identify and monitor WASH policy changes enacted in response to COVID-19, to understand how governments are responding to COVID-19-related challenges in ensuring sustainable and equitable access to safe water and improved sanitation.
2. **WASH in households**, to track household-level changes in WASH conditions—including effects of COVID-19 and efforts to mitigate COVID-19 impacts—to identify how household-level access to sustainable and equitable safe water and improved sanitation and hygiene is being affected in urban and rural settings.
3. **Small-scale service providers (SSSPs)**, to document the performance of SSSPs (with an emphasis on water suppliers), the direct and indirect challenges inflicted by COVID-19, and the results of both government and donor support programs. Our aim was to understand the direct effects of COVID-19 on small providers (as WASHPaLS previously identified this group of providers as high risk [USAID, 2020a]. The assessment team also examined the degrees to which government and donor assistance efforts mitigated these effects.

The focus of the assignment was the identification of quantitative secondary data sources, with the goal of providing a longer-term picture COVID-19 impacts on WASH access and behavior. We also conducted and analyzed primary data collected via short message service (SMS) and internet-based surveys to complement the secondary data. In Section 2, we present the methods used to identify data, develop standard indicators to use across all data sources, and collect data. In Section 3 we provide observations on government actions and impacts on SSSPs. In addition, we present trends from the

[1] USAID 18 HP countries in 2021 are Afghanistan, Democratic Republic of Congo (DRC), Ethiopia, Ghana, Haiti, India, Indonesia, Kenya, Liberia, Madagascar, Mali, Mozambique, Nepal, Nigeria, Senegal, South Sudan, Tanzania, Uganda.

household-level primary data collected through remote methods. In Section 4, we present challenges associated with collecting and collating WASH data remotely, and we conclude in Section 5 with recommendations on how the sector could adapt given the challenges.

2.0 METHODS

Our aim was to collect and present all available longitudinal data on the impacts of COVID-19 on WASH access. Following an initial scan of data, we identified indicators we felt could be consistently captured across survey instruments. We aggregated existing, publicly available data to fit these indicators, and conducted primary data collection to fill gaps in data as best we could. Primary data collection included a household SMS survey instrument and government and SSSP online surveys.

2.1 INITIAL SCAN FOR DATA SOURCES

A comprehensive scan for secondary data sources at the start of the assessment provided a global overview of publicly available data collection efforts since the onset of the COVID-19 pandemic for the three priority topics in the 18 HP countries. We complemented this scan by reaching out to key sector stakeholders (e.g., USAID missions, United Nations Children's Fund [UNICEF]) in each of the HP countries, as well as to relevant global stakeholders, such as the World Health Organization (WHO) /UNICEF Joint Monitoring Programme (JMP), UNICEF Multiple Indicator Cluster Survey (MICS) PLUS team, Stockholm International Water Institute (SIWI), and the International Reference Centre for Community Water Supply and Sanitation (IRC). The outreach aimed to identify any additional completed, ongoing, or future data collection efforts focused on WASH indicators and COVID-19. The team mapped the geographical scope and completed or planned number of data collection rounds for all identified data collection initiatives, and recorded indicators and respective survey questions related to WASH.

2.2 INDICATOR DEVELOPMENT

After a review of the data instruments identified in our initial scan, we selected 42 indicators that reflect high frequency with which the indicator appeared in identified datasets, inclusion in multiple survey rounds per instrument per country, and alignment of the indicator with global standards.

2.2.1 GOVERNANCE INDICATORS

We selected five main categories for WASH governance (

Table 1). In the comprehensive scan, we identified 11 initiatives that were collecting data on WASH-related government responses to COVID-19, covering governance, policy, and funding in the 18 HP countries. We then mapped government measures for ensuring sustainable and equitable access to safe water and sanitation services in response to COVID-19 against an established framework in 84 countries (UNICEF/SIWI, 2020). This framework also aligns closely with other sector frameworks, such as the Sanitation and Water for All (SWA) partnership-relevant categories of building blocks (Sanitation and Water for All, n.d.), UN-Water Global Analysis and Assessment of Sanitation and Drinking-water (GLAAS) assessment framework (WHO, 2019), and USAID's Water and Development Indicator Handbook (USAID, 2020b). We selected the 16 indicators that best aligned with government measures implemented in multiple countries (Table 1).

Table 1. Governance Indicators

1. New service policies, standards, and guidelines for WASH
1.a. Suspension of water tariffs, or free water program
1.b. Reduction in water tariffs
1.c. Prohibition of disconnecting water supplies in the case of non-payment
1.d. Waiver of reconnection fees
1.e. Policy for provision of public sanitation facilities
1.f. Suspension or reduction of taxes on soap, soap products, or sanitizer
2. Service provider support
2.a. Financial support (subsidies, tax breaks) to operators
3. Education and inclusion
3.a. Guidelines/instructions for provision of WASH services posted in public spaces
3.b. Gender sensitive approaches in access to WASH services
3.c. Vulnerability/disability-sensitive approaches in access to WASH services
4. New services delivered through government coordinated response
4.a. Additional water distribution through tankers/trucks to reach vulnerable populations
4.b. Additional distribution of hygiene products
4.c. Additional production of soap, soap components, or sanitizer
4.d. Additional provision of WASH facilities in public places
5. Financing
5.a. National budget allocation
5.b. New donor funding mobilization

2.2.2 HOUSEHOLD-LEVEL INDICATORS

We selected household indicators that aligned as closely as possible with the JMP indicators for water, sanitation, and hygiene, grouped by the following categories: *technology & service level, accessibility, availability, affordability,* and *behavior,* incorporating some into our own SMS surveys. For example, we included a question of time to fetch water to classify water access according to the JMP service ladder for water. We selected 12 household indicators across the WASH categories (Table 2).

Table 2. Household-level indicators

1. Water
1.a. Proportion of the population that uses at least an *improved* water source
1.b. Proportion of the population that uses at least *basic* drinking water services
1.c. Proportion of the population with water sources which are available when needed
1.d. Proportion of the population experiencing negative change in availability in technology and/or service
1.e. Proportion of the population experiencing negative change in affordability in technology and/or service

2. Sanitation
2.a. Proportion of the population that uses at least an *improved* sanitation facility
2.b. Proportion of the population that uses at least *basic* sanitation services
2.c. Proportion of the population experiencing change in availability of technology and/or emptying services
2.d. Proportion of the population experiencing change in affordability of technology and/or emptying services
3. Hygiene
3.a. Proportion of the population that has at least *basic* handwashing facility
3.b. Proportion of the population experiencing change in affordability of technology/products
3.c. Proportion of the population with increased attention to hygiene behavior

2.2.3 SMALL-SCALE SERVICE PROVIDER INDICATORS

For the preliminary mapping of SSSP indicators, we consulted a SMS-based household survey of over 2,100 respondents conducted as part of WASHPaLS analysis of pandemic economic shock effects on Ghanaian small water providers (USAID, 2020a) as well as the WASH-FIN/World Bank Stress Test report instruments in Mozambique (USAID, 2021) and Nepal (USAID, 2020c). We also used the International Benchmarking Network for Water and Sanitation Utilities (IBNET) framework of indicators (IBNET, 2005) for further categorization and refinement of indicator definitions for this topic. Ultimately, we selected 14 indicators relevant to water service providers (5), sanitation service providers (2), or both (7) (Table 3).

We defined SSSPs as "small, piped networks or other small systems with an emphasis on rural growth centers and rural areas." We aimed to include data from providers with less than 5,000 connections, because that is the Kenyan Water Services Regulatory Board's definition of a small provider. However, we included data from all providers who provided data, even if they served more than 5,000 connections given the limited number of responses received.[2]

Table 3. SSSPs Indicators.

1. Water Service Providers
1.a. Change in water coverage (connections/ beneficiaries served)
1.b. Change in water production
1.c. Change in water consumption
1.d. Change in continuity of service
1.e. Change in Percent Non-revenue Water (volume of water "lost" expressed as a percentage of net water supplied)
2. All Providers
2.a. Change in collection ratio (Cash income/billed revenue)
2.b. Additional cost related to COVID-19 policy or projects
2.c. Operating cost coverage ratio (Total monthly operational revenues/total monthly operating costs)

[2] Out of the 36 water service providers from which we received online responses, eight of them indicated they served 5,000 connections or more. We were unable to confirm the number of connections for seven of the 36 respondents.

2.d. Change in financial position (Month end cash balance and profit/loss pre-post pandemic onset)
2.e. COVID-19-related financial support [external]
2.f. Delaying investments or payments
2.g. Change in months of cash reserve for operation
3. Sanitation Service Providers
3.a. Change in service delivery (increase in emptying, treating, etc.)
3.b. Change in customer pricing

2.3 SECONDARY DATA COLLECTION

2.3.1 GOVERNANCE DATA

Secondary data sources related to governance included:

- UNICEF/Stockholm International Water Institute (SIWI): Overview of WASH COVID-19 Responses from Governments
- UNICEF: *Tracking the Situation of Children During COVID-19*
- World Bank: *Securing Water and Sanitation Services in Times of COVID-19*
- World Bank: *Social Protection and Jobs Responses to COVID-19*
- International Food Policy Research Institute (IFPRI): *COVID-19 Policy Response Portal*
- International Monetary Fund (IMF): *Policy Responses to COVID-19*
- University of Oxford: *COVID-19 Government Response Tracker*
- USAID: State Department: *The United States is Leading the Humanitarian and Health Assistance Response to COVID-19*
- WASHPaLS: *Country Deep-Dive (Kenya, Ghana, DRC, Mozambique, and Senegal)*
- WASHPaLS: *Assessing the Effects COVID-19 on Access to Water, Sanitation, and Hygiene in USAID High Priority and Strategy-Aligned Countries - Focus on Small Piped Providers in Ghana*
- ACAPS: *Secondary Impacts of COVID-19*

2.3.2 HOUSEHOLD-LEVEL DATA

We identified 23 WASH-focused data collection initiatives following the onset of the COVID-19 pandemic (March 2020) that covered at least one of the USAID HP countries. We were able to access data from 16 of the 23 for this assignment (

Table 4): six during our initial data scan and an additional 10 over the course of the study. There was variability in the number of instruments and rounds available per country; for example, there was a single instrument available for Haiti and seven for Ghana, India, Nepal, and Uganda, respectively (Figure 1).

Table 4. Secondary data sources for WASH in households included in the assessment

Instrument	Indicator develop-ment†	No. of countries covered	No. of rounds (cumulative)*	No. of indicators (max)*
University of Maryland and Facebook: *Global CTIS*	x	18	223**	1
Massachusetts Institute of Technology (MIT) and Facebook: *COVID-19 Survey*	x	11	65	1
WASHPaLS GeoPoll phone surveys 2020	x	10	19	12
IFPRI: *Gender-Responsive and Climate-Resilient Agriculture for Nutrition*	x	6	27	7
World Bank LSMS: *Supported High-Frequency Phone Surveys on COVID-19*	x	5	22	7
Performance Monitoring for Action (PMA): *COVID-19 Survey*	x	6	4	2
World Bank: *High Frequency Phone Survey* (non-LSMS)		6	16	2
UNICEF Child Family tracker survey, *Nepal*		1	8	5
WFP mVAM Survey: *COVID-19 Impact on Households in Nepal*		1	4	2
National Institute of Statistics of Madagascar: High Frequency Telephone Survey of Households		1	2	5
Aquaya: *Ghana Targeted Subsidy data collection study* [internal]		1	1	5
INSTAT: *Enquete Rapide Sur L'impact Du Covid-19 Sur La Situation Socio-Economique Des Enfants À Madagascar*		1	1	5
Indikator Perumahan dan Kesehatan Lingkungan: *Indonesia*			1	2
UN Habitat: Household Survey Nepal		1	1	2
UNICEF: *Community Rapid Assessment on COVID-19*		1	1	1
REACH: *COVID-19 Relief Effort for Afghan Communities and Households*		1	1	1

† These instruments labeled with an 'x' were included in the original mapping of indicators
* varies per country
** daily/weekly surveys, converted into monthly averages

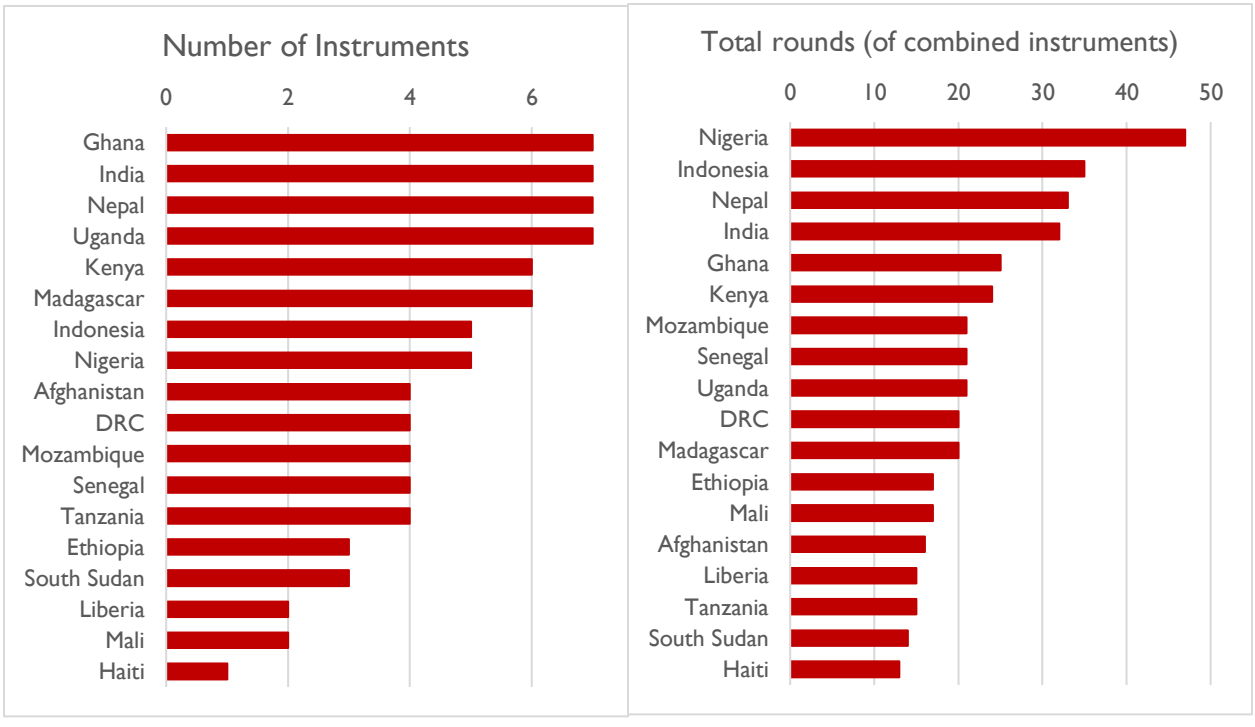

Figure 1. Number of data collection instruments and rounds of data collection per country

Publicly available datasets were available for a portion of the 16 data collection initiatives executed following onset of the COVID-19 pandemic; not all provided the complete datasets, data collection tools, and/or description of methods in the public domain. We methodically requested datasets, which proved successful for five of the 13 that were not publicly available.

Table 5. Availability of data and data collection instruments in public space

Type of data available	In public domain	Available on registration/request	Unable to obtain	Total
Aggregate data	15	1	0	16
Datasets	3	5	8	16
Data collection instruments	3	6	7	16

2.3.3 SMALL-SCALE SERVICE PROVIDER DATA

Secondary data sources for service providers included:

- WASHPaLS: *Assessing the Effects of COVID-19 on Access to Water, Sanitation, and Hygiene in USAID High Priority and Strategy-Aligned Countries - Synthesis Report*
- WASH-FIN: *Country documentation on stress test* (Mozambique, Nepal)
- Safe Water Network: *Keep The Water Flowing: Resiliency of the Safe Water Enterprise Model*

2.4 PRIMARY DATA COLLECTION

Our primary data collection was intended to fill gaps in the availability of secondary data sources across the HP countries, and consisted of both quantitative surveys of households and mixed-method data collection for governance and SSSPs:

2.4.1 GOVERNANCE

Primary data collection consisted of remote key informant interviews (KIIs) and an online survey in all countries. As part of initial outreach, we conducted remote KIIs with USAID and UNICEF staff in all 18 countries from April to July 2021, with the aim of collecting data on national-level responses, WASH policy, and budgets. An online survey in English and French with governance stakeholder contacts followed the KIIs in July and November. Of the 76 contacts we reached out to in July (Round 1), we received 11 successful survey responses (Table 6). For Round 2 in November, we revised our contact pool, given email bounces, suggestions of alternative contacts, or refusals to participate, we revised our contact pool to 71 stakeholders, from whom we received 11 responses. Since we only had one respondent complete the survey in both rounds, we had a total of 21 unique respondents across both rounds.

Table 6. Governance stakeholder survey responses for each round of outreach.

Round 1: July 2021		Round 2: November 2021	
Completed survey	11	Completed survey	1
		No response	10
No response	54	Complete survey	7
		No response	44
		No longer in position/suggested better person/email bounce	3
No longer in position/suggested better person/email bounce	11		
New outreach		Complete survey	3
		No response	3
Total Round 1	**76**	**Total Round 2**	**71**

2.4.2 HOUSEHOLDS

The team used GeoPoll,[3] a service provider previously contracted for remote data collection under WASHPaLS in August 2020, to administer the SMS household surveys. The first round of surveys took place between 22 and 28 July 2021 in Afghanistan, Ethiopia, Liberia, and Madagascar (n= 250 households per country). We selected the included countries based on the lack of available secondary data and ability of GeoPoll to administer the surveys. The second round took place between 8 and 22 November 2021 with expansion to DRC, Ghana, Kenya, Mozambique, and Tanzania (n= 500 households per country). Four of the additional countries included in the second round (DRC, Ghana, Kenya, and Mozambique) were surveyed under the WASHPaLS work in 2020, and were included to provide additional longitudinal data. We included Tanzania in the second round of data collection due to lack of available secondary data.

Table 7. Household survey locations and sample sizes.

Round 0: August 2020 [Previous WASHPaLS work]		**Round 1: July 2021**		**Round 2: November 2021**	
Country	*Sample size*	*Country*	*Sample size*	*Country*	*Sample size*
DRC	500			DRC	500
Ghana	500			Ghana	500
Kenya	500			Kenya	500
Mozambique	500			Mozambique	500
		Afghanistan	250	Afghanistan	500
		Ethiopia	250	Ethiopia	500
		Liberia	250	Liberia	500
		Madagascar	250	Madagascar	500
				Tanzania	500

In our SMS survey, we included a few questions related to a water security index developed by the Household Water Insecurity Experiences (HWISE) Consortium (ANNEX 1: METHODS FOR DETERMINING WATER INSECURITY VALUE).

2.4.3 SMALL-SCALE SERVICE PROVIDERS

Primary data collection consisted of remote key informant interviews and an online survey. We identified WASH service providers or associations via outreach to USAID mission and UNICEF staff in the 18 HP countries. The objective was to identify associations or networks that could provide information on the operational conditions of their membership. We also conducted interviews with an additional 12 key informants on the SSSP topic to enhance our search. Our final database included 167 service providers (96 water service providers and 71 sanitation service providers) across the 18 countries. Two rounds of short online surveys administered to English and French speaking service providers in July and November through a digital survey complemented the KIIs. Of the 128 contacts we reached out to in July, we had 27 successful survey responses (Tables 8 and 9). Given incomplete contact information, email bounces, suggestions of alternative contacts to reach out to, or refusals to participate, our contact pool for the second round reduced to 122 contacts, from whom we received 24 responses.

Table 8. Water service provider responses for each round of outreach.

Round 1: July 2021		**Round 2: November 2021**	
Completed survey	21	Completed survey	9
		No response	9
		No longer in position/suggested better person/email bounce	3
No response	56	Complete survey	4

[3] GeoPoll is a company specialized in remote, mobile-based data collection.

Round 1: July 2021		Round 2: November 2021	
		No response	52
No longer in position/suggested better person/email bounce	2		
Incomplete contact information	15		
New outreach		Complete survey	2
Total Round 1	**94**	**Total Round 2**	**79**

Table 9. Sanitation service provider survey responses for each round of outreach.

Round 1: July 2021		Round 2: November 2021	
Completed survey	6	Completed survey	2
		No response	4
No response	34	Complete survey	5
		No response	29
No longer in position/suggested better person/email bounce	9		
Incomplete contact information	19		
New outreach		Complete survey	2
		No response	1
Total Round 1	**68**	**Total Round 2**	**43**

The water service providers that responded covered 12 of the 18 countries, while the responsive sanitation service providers covered only 7 of the 18 countries. Although in several responses there was a discrepancy between the number of customers and number of connections reported, we believe the majority (22 out of 30 responses providing this information) were small-scale providers (i.e., providers with fewer than 5,000 connections).

2.5 DATA AGGREGATION

To support data analysis, we aggregated data at the national level for the various data sources. Where possible, we also conducted high-level data disaggregation for household data by location (rural/urban) and gender (male/female) based on survey characteristics. For SSSPs, we aggregated data at the survey level with monthly values over an extended time-period for applicable indicators.

2.6 LIMITED TRENDS ANALYSIS

We conducted a limited trends analyses for the household-level primary data collection only. The GeoPoll survey data consisted of two rounds of data collection in 2021, in addition to the initial round collected as part of the 2020 WASHPaLS COVID-19 deep dive (USAID, 2020a). Given the limited sample sizes, we did not conduct statistical testing of comparisons.

3.0 RESULTS

3.1 GOVERNANCE OBSERVATIONS

A total of 11 secondary data sources for this topic in addition to online surveys with stakeholders yielded 121 entries across the 18 HP countries (Table 10). We observed the following trends among the tracked data sources under the *new service policies, standards, and guidelines for WASH* category:

- **Suspension of water tariffs or full government subsidization** of water access was reported among multiple sources at the national and/or sub-national level across 16 countries (Afghanistan, DRC, Ethiopia, Ghana, Haiti, India, Indonesia, Kenya, Madagascar, Mali, Mozambique, Nepal, Nigeria, Senegal, Tanzania, Uganda). These measures were in force soon after the onset of the pandemic for an average period of six months. However, the number of data points was limited. We did not observe any clear trends for connection fee waivers.
- **Few data sources identified measures for the temporary reduction or exemption of water tariffs** and/or suspension or reduction of taxes on soap, soap products, or sanitizer.
- **Disconnecting water access due to non-payment** was prohibited at the national level in 11 countries (DRC, Ghana, Haiti, Indonesia, Kenya, Liberia, Madagascar, Mali, Mozambique, Senegal, Uganda) for an average of five months.

We observed the following trend among the data sources under the *service provider support* category:

- **Government financial support (e.g., subsidies or tax breaks) to service operators** occurred in 12 countries (Afghanistan, Ghana, Haiti, India, Kenya, Liberia, Madagascar, Mali, Mozambique, Nepal, Nigeria, Senegal) for an average period of seven months.

We observed the following trend among the data sources under the *education & inclusion* categories:

- More than half of all data sources reported the use of guidelines/instructions for **providing WASH services posted in public spaces**. In addition, more than half of the data sources reported the implementation of **gender sensitive** and **vulnerable/disability sensitive** approaches regarding access to WASH services. However, there is no systematic record keeping of this implementation.

Under the new services delivered through government coordinated response category, we observed:

- **Nearly all of the HP country governments supported additional provision** of WASH facilities in public spaces (all but Uganda) and distribution of hygiene products (all but Liberia and Uganda).

For the Financing category, the assessment timeline restricted the ability to analyze national budgets for all 18 HP countries and the extent to which government WASH budgets increased in response to the pandemic. Key informant interview responses suggest that national WASH budgets did not increase in the first year during the pandemic to address WASH-related measures. Only in a few countries did we find reported increases in national budget for WASH following the pandemic. Data from India indicated that the national budget WASH budget increased during the pandemic, though this may not be directly linked to the pandemic. Several key informants mentioned new donor funding for WASH services to address COVID-19, though we did not find robust data on this given the timeframe. The upcoming 2021-2022 GLAAS survey (delayed from 2020-2021) will provide data on the impact of COVID-19 on the WASH enabling environment including financial allocations for most, if not all, HP countries.

Table 10. Governance summary data

Indicator	No. countries where the measure was applied (% of HP countries)	No. affirmative responses (no. of data points)	Avg. no. months the measure was in place (no. of data points with time indication)
1. New service policies, standards, and guidelines for WASH			
1.a. Suspension or postponement of water tariffs, or free water program	16 (89%)	52 (n=85)	6 (n=40)
1.b. Reduction in water tariffs	4 (22%)	5 (n=39)	1 (n=5)
1.c. Prohibition of disconnecting water supplies in the case of non-payment	11 (67%)	31 (n=85)	5 (n=15)
1.d. Waiver of reconnection fees	9 (50%)	14 (n=82)	4 (n=7)
1.e. Policy for provision of public sanitation facilities	12 (67%)	24 (n=55)	4 (n=14)
1.f. Suspension or reduction of taxes on soap, soap products, or sanitizer	4 (22%)	4 (n=4)	*
2. Service provider support			
2.a. Financial support (subsidies, tax breaks) to operators	12 (67%)	24 (n=82)	*
3. Education and inclusion			
3.a. Guidelines/instructions for provision of WASH services posted in public spaces	16 (89%)	42 (n=70)	*
3.b. Gender sensitive approaches in access to WASH services	13 (72%)	19 (n=69)	*
3.c. Vulnerability/disability-sensitive approaches in access to WASH services	13 (72%)	20 (n=69)	*
4. New services delivered through government coordinated response			
4.a. Additional water distribution through tankers/trucks to reach vulnerable populations	14 (78%)	36 (n=80)	4 (n=10)
4.b. Additional distribution of hygiene products	16 (89%)	34 (n=72)	3 (n=4)
4.c. Additional production of soap, soap components, or sanitizer	9 (50%)	12 (n=34)	4 (n=3)
4.d. Additional provision of WASH facilities in public places	17 (94%)	53 (n=78)	5 (n=11)
5. Financing			
5.a. National budget allocation (increase)	6 (33%)	7 (39)	*
5.b. New donor funding mobilization	14 (78%)	26 (48)	*

* Don't know/No response

3.2 HOUSEHOLD-LEVEL TRENDS

This section presents key primary data results from the GeoPoll household surveys conducted in August 2020 (previous WASHPaLS work), July 2021 and November 2021. We make the assumption that pre-COVID-19 is before March 2020.

3.2.1 ACCESS TO WATER

We asked respondents about their water access both before and during the pandemic and have analyzed changes in source types for those respondents reporting difficulty accessing water due to the pandemic (**Error! Reference source not found.** – Kenya, and Mozambique, ANNEX 2: HEAT MAPS – WATER ACCESS – all). Given small sample sizes, it is difficult to discern trends. We were also unable to classify all sources by improved/unimproved due to uncertainty of whether well and springs were improved/unimproved. Based on the heat map (Figure 2), in Kenya there seem to be notably fewer water source changes 20 months after the onset of the COVID-19 pandemic. In Mozambique, the gains in piped connections reported last year were inverted back to losses.

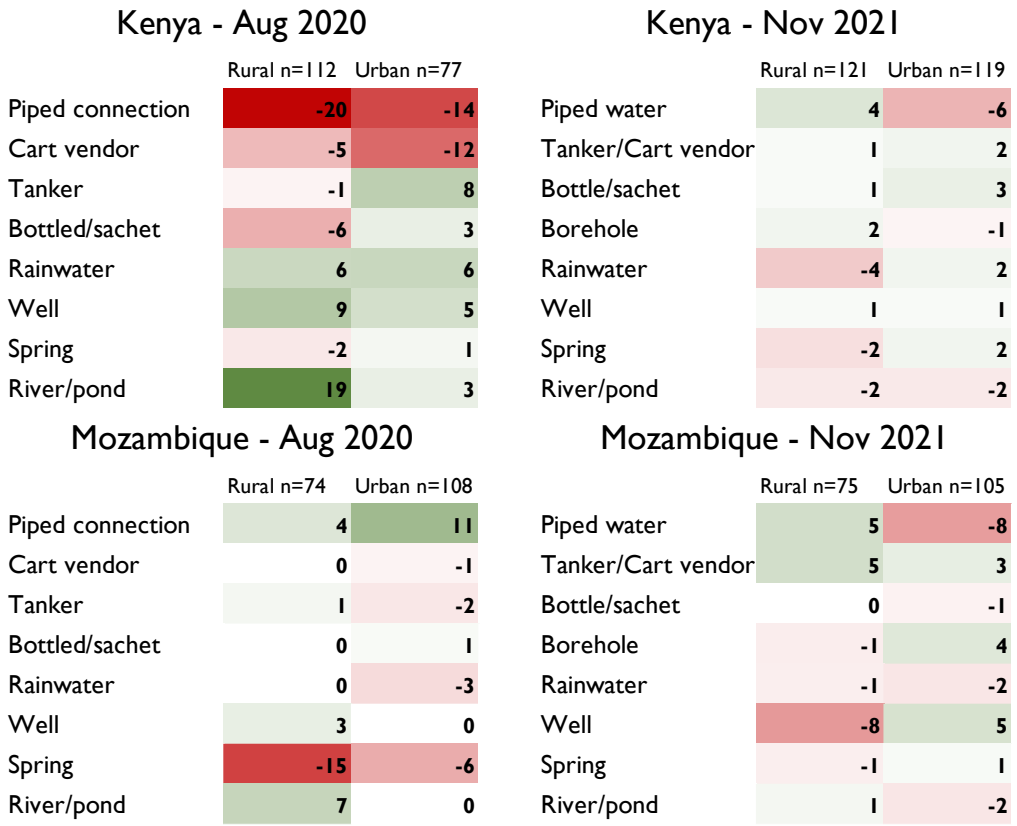

Figure 2. Select heat maps depicting percentage point changes in reported water service types before COVID-19 in August 2020* or July 2021, and November 2021 for selected countries (Source: GeoPoll household survey).

In August 2020, six months into the pandemic, 21 to 38 percent of respondents in four countries surveyed reported more difficulty accessing water compared to before COVID-19 (Figure 3). In July 2021, 16 months into the pandemic, 21 to 47 percent of respondents in four different countries reported more difficulty. By November 2021, 20 months into the pandemic, 29 to 58 percent of respondents in the same eight countries report difficulty accessing water compared to before COVID-19. Only in Mozambique do we not observe increased difficulty. Respondents most often cite difficulty with service access, which we classified as having responded to "How is it more difficult to get water?" with any of the following responses: nowhere to buy, harder to find, I must travel further to get it, fewer hours per day of service, and problems take longer to be fixed. In addition, households reported affordability (a function of either a price increase or reduced income/assets) as a barrier to accessing water between August 2020 and November 2021, though it is less pronounced of a challenge compared to accessibility. Affordability became an increasing problem; in the four countries initially surveyed in August 2020, when surveyed 20 months into the pandemic, between 25 and 39 percent of respondents reported more difficulty affording water compared to before COVID-19. For the remaining five countries surveyed 16-20 months after the onset of the pandemic, respondents mentioned affordability between 10 and 33 percent of the time.

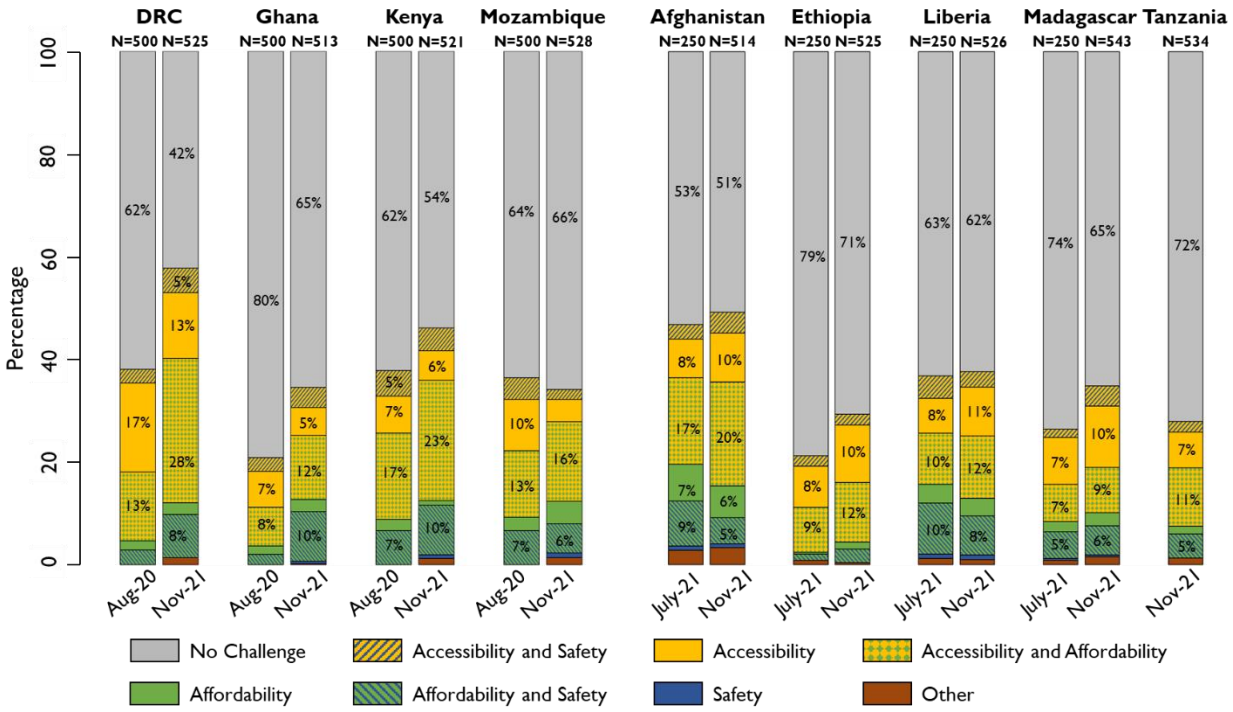

Figure 3. How is it more difficult to get water? If so, what has made it more difficult? Household accessibility and affordability of water since onset of COVID-19 pandemic; August 2020-November 2021 (left) and July 2021-November 2021(right) for selected countries (Source: GeoPoll household survey).

The percentage of respondents reporting that the pandemic made their water supply situation more difficult increased across all countries between survey waves except for Mozambique and Liberia (**Error! Reference source not found.**). In DRC, Ghana, and Kenya, we also note that safety (reporting a fear of waiting in a queue to collect water) was more of a concern in 2021 than in the first year of the pandemic. Sixteen to twenty months after the onset of the pandemic, 3 to 15 percent of respondents in the nine surveyed countries mentioned safety concerns as a barrier to obtaining water.

Based on the modified HWISE method to calculate household water insecurity (ANNEX 1: METHODS FOR DETERMINING WATER INSECURITY VALUE), between 46 and 70 percent of the surveyed respondents were water insecure (**Error! Reference source not found.**Figure 4). Sample sizes do not include the full surveyed responses due to answers of "don't know" for one or more question(s) in the calculation. In the four countries with two data points (July and November 2021), we observed increases in water insecurity among respondents.

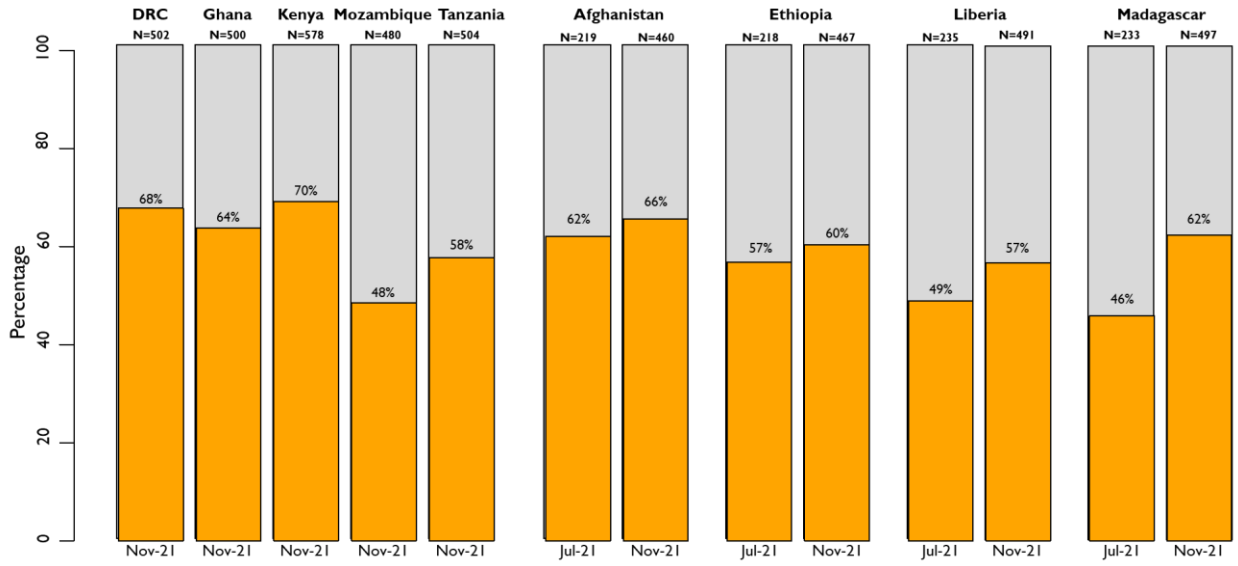

Figure 4. Calculated water insecurity since COVID-19 pandemic; November 2021 (left) and July 2021 and November 2021 (right) for selected countries (Source: GeoPoll household survey).

We disaggregated water insecurity by urban and rural (Figure 5). Although disaggregated sample sizes were small (between 17 and 419), and there was variability between the countries and rounds, rural respondents tended to report more water insecurity than urban respondents. Respondents in Kenya and Ethiopia were the exception, though the small sample size is notable in Ethiopia (n=17 in July 2021, n=48 in Nov 2021).

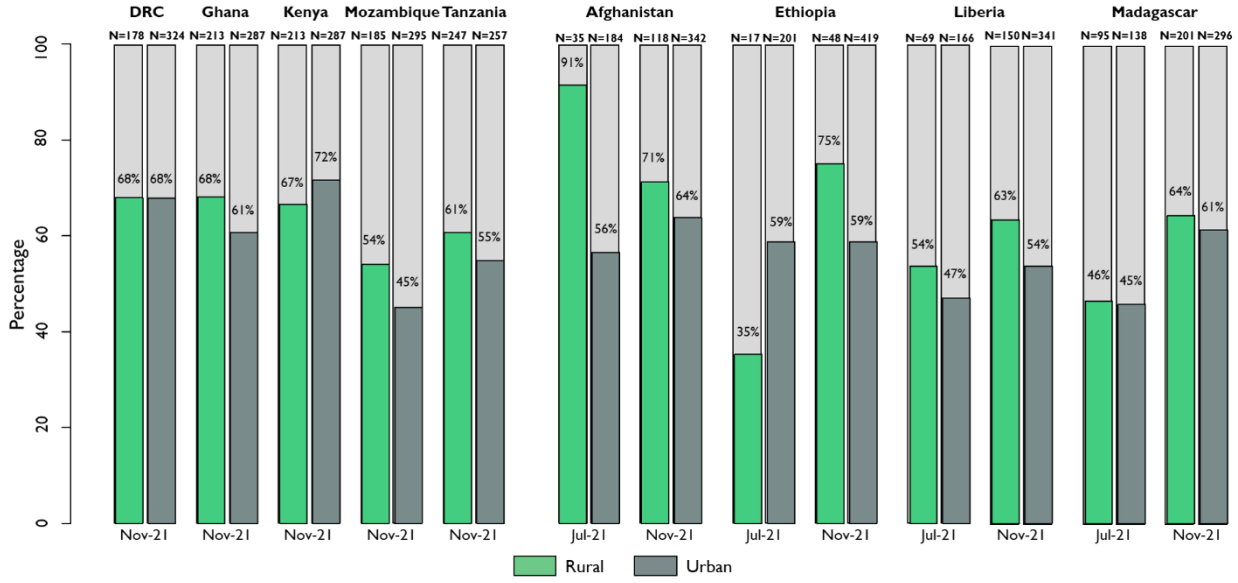

Figure 5. Calculated water insecurity since COVID-19 pandemic; rural and urban split November 2021 (left) and July 2021 and November 2021 (right) for selected countries (Source: GeoPoll household survey).

3.2.2 ACCESS TO SANITATION

The majority of households did not report major changes in access to sanitation six, 16 or 20 months following the onset of the COVID-19 pandemic (Figure 6). This figure shows sanitation service level asked of respondents before the onset of the pandemic, and at the time of the survey. For each country where we have two time points of data collection, the pre-pandemic sanitation and current sanitation are reflected. There is no clear trend for sanitation access, with the exception of small increases in open defecation in Afghanistan and Madagascar that could be attributed to recent political/security and drought-related events causing migration to places where access to toilets is limited. Further disaggregation or the development of heat maps similar to data on water access, may demonstrate more trends.

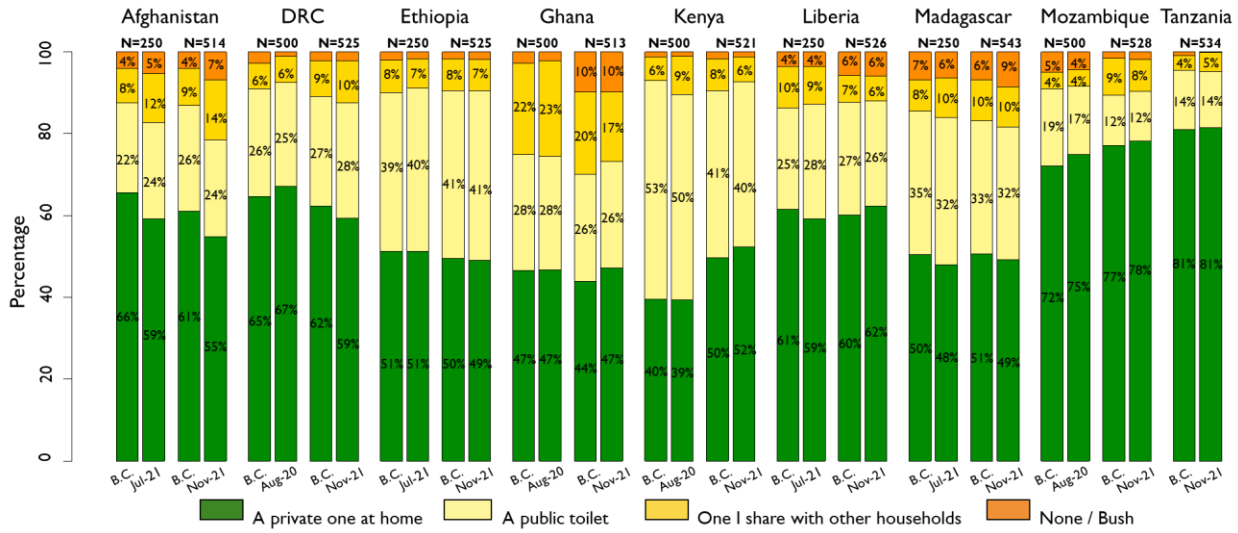

Figure 6. Household experience in access to sanitation service level compared to the pre-COVID-19 pandemic for selected countries (Source: GeoPoll household survey). B.C.=Before COVID-19.

Household access to pit emptying services was under pressure since the onset of the pandemic, and we observed some declines in those reporting "no trouble" accessing pit emptying services (Figure 7). The proportion reporting affordability as a constraint to pit emptying increased in seven of the eight countries where we have two time points. Concerns over the availability of the service increased in half of the countries (all of the four countries surveyed in August 2020), but decreased in the remaining four surveyed only in 2021 (July 2021 and November 2021). It is worth highlighting that the samples sizes for these comparisons were small, given that only households that reported having a private or shared facility with a slab responded to the question.

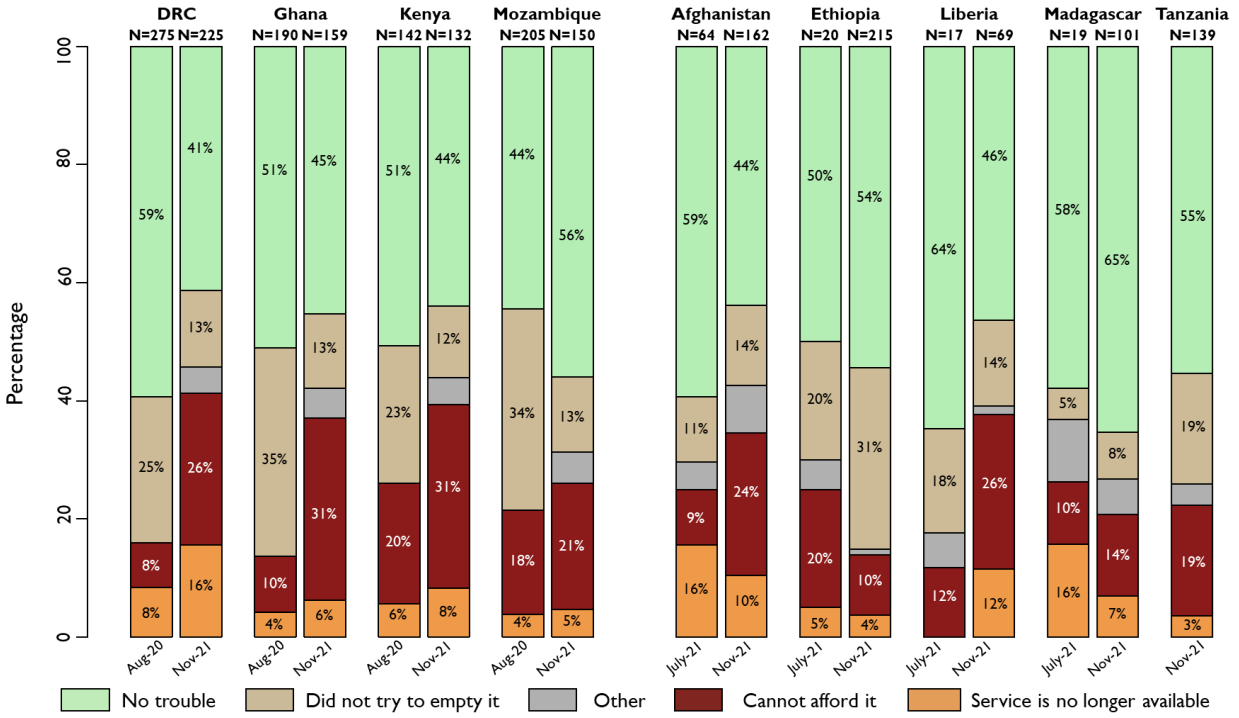

Figure 7. Since COVID-19 do you have trouble emptying your pit? Household views on access to pit emptying services during COVID-19 pandemic; August 2020-November 2021 (left) and July 2021-November 2021 (right) for selected countries (Source: GeoPoll household survey).

3.2.3 HYGIENE

In the initial survey in August 2020, in only two out of six countries surveyed (Kenya and Rwanda) did a majority of respondents report an increase in difficulty accessing soap six months into the pandemic; in the remainder, the fraction reporting increasing difficulty ranged from only 16 percent (in Senegal) to 35 percent (in DRC) (USAID, 2020a). In follow-up surveys 20 months after the onset of the pandemic, reports on soap access are similarly reassuring; in no country did a majority report that soap access got more difficult, and improvements in soap access reported in DRC, Ghana, Kenya, Mozambique, and Ethiopia (Figure 8). This may reflect improved supply chains and markets for hygiene products, or else an increase in soap valuation and handwashing behavior since the onset of the pandemic.

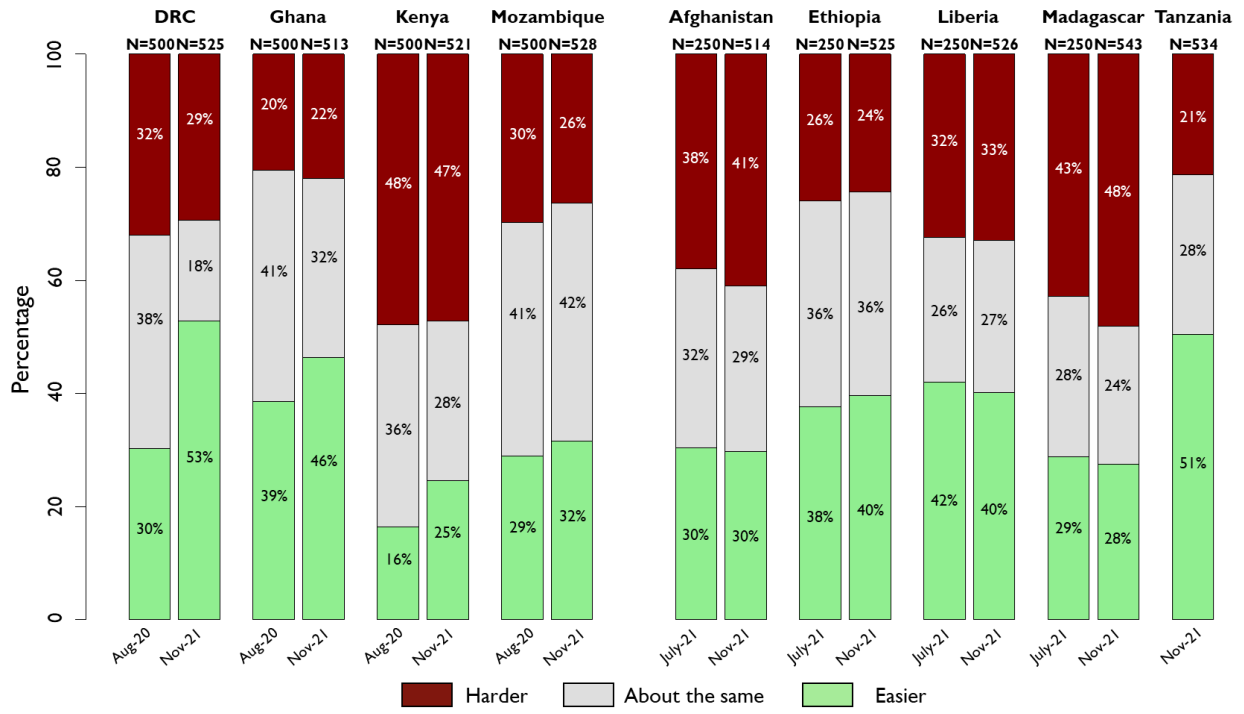

Figure 8. Since COVID-19, how easy is it to get soap? – Household experience in access to soap since COVID-19 pandemic; August 2020-November 2021 (left) and July 2021-November 2021 (right) for selected countries (Source: GeoPoll household survey).

3.3 SMALL-SCALE SERVICE PROVIDER OBSERVATIONS

The observations we include here make reference to service provider responses from both secondary and primary data collection. For service level indicators among water service providers, *change in coverage* (i.e., number of connections) indicates an upward trend (39 percent) across the countries, highlighting that many service providers actually expanded their networks during the pandemic. For *change in production* or *change in consumption* indicators, there are fewer data points available to confirm a similar upward trend. Results are mixed when indicators are disaggregated by country with more than three data points. For example, there was evidence of increased or reduced production of drinking water within the same country (e.g., Mozambique) or relatively modest increases in same direction (Ghana, Nepal, Nigeria). There was no clear data trend for the *continuity in service* (rationing) indicator.

There is a more pronounced trend for financial performance indicators for both water and sanitation service providers. *Collection ratios* (i.e., collection efficiency) decreased for a substantial number (41percent) of service providers since pandemic onset. This may be related to government policies for free water distribution, such as in Ghana and Uganda. One quarter (28 percent) of service providers experienced *additional operational costs incurred in relation to the COVID-19 pandemic.*

In terms of COVID-19-related *financial support,* approximately half of providers (55 percent) reported no change in financial support, and one-quarter (24 percent) reported they did not know about financial support. The remaining quarter of providers (21 percent) received some form of government or other support. Financial support covered a range of costs, such as lost revenue or incremental costs for COVID-19-related expenditures (cleaning, personal protective equipment, information campaigns, handwashing stations, and related supplies).

One quarter of SSSPs (28 percent) reported delaying certain investments or payments due to COVID-19. However, there is no clear indication from the data whether delayed investments or payments were due to cash flow, market constraints, or other reasons.

The SSSP data provided limited results for trend analysis for most related indicators. One hurdle we faced was obtaining complete survey responses from the service providers, as they either did not have the information easily accessible or did not record it at all (e.g., on billing and revenue ratio). See also Section 5 on challenges. In some instances, such as in Mozambique and Nepal, data came from robust secondary data sources, such as the WASH-FIN stress test exercises, and were more complete.

The sample size for sanitation service providers was too small to perform a formal quantitative trend analysis for any of the indicators. The indicator with the greatest response was COVID-19-related financial support, with 58 known responses. It is also important to note that changes in magnitude across indicators were not measured consistently. In addition, although the surveys recorded information on type of service provider (e.g., private, government, or user group), sample sizes were too small to conduct any disaggregated analysis.

Table 11. SSSP summary data

Indicator	Increase [+]	%	Decrease [-]	%	No change	%	DK/ NR*	Total	Water	Sani-tation
1.a. Change in water coverage (connections/ beneficiaries served)	24	39%	9	15%	10	16%	21	61	61	
1.b Change in water production	11	18%	10	16%	3	5%	37	61	61	
1.c. Change in water consumption	18	30%	13	21%	6	10%	24	61	61	
1.d. Change in continuity of service	9	15%	12	20%	12	20%	28	61	61	
1.e. Change in % Non-revenue Water (volume of water "lost" expressed as a percentage of net water supplied)	5	8%	6	10%	6	10%	44	61	61	
2.a. Change in collection ratio (Cash income/billed revenue)	5	7%	31	41%	4	5%	36	76	61	15
2.b. Additional cost related to COVID-19 policy or projects	21	28%	0	0%	15	20%	40	76	61	15
2.c. Operating cost coverage ratio (Total monthly operational revenues/total monthly operating costs)	7	9%	8	11%	0	0%	61	76	61	15
2.d. Change in financial position (Month end cash balance and profit/loss pre-post pandemic onset)	19	25%	16	21%	3	4%	38	76	61	15
2.e. COVID-19-related financial support	16	21%	0	0%	42	55%	18	76	61	15
2.f. Delaying investments or payments	21	28%	0	0%	24	32%	31	76	61	15
2.g. Change in months of cash reserve operation	7	9%	6	8%	16	21%	42	76	61	15
3.a Change in service delivery (increase in emptying, treating, etc.)	5	33%	4	27%	3	20%	3	15		15
3.b. Change in customer pricing	1	7%	3	20%	10	67%	1	15		15

* Don't know/No response

The REACH/RWSN 100M initiative is an ambitious rural water supply research project that ran a global survey in 2021 among rural water service providers which included questions on the impact of COVID-19 on service provider operations. The survey reached 358 participating service providers, including providers in all USAID HP countries except Afghanistan. However, the REACH/RWSN dataset was not available at the time of this report, and therefore we were unable to include it in our analysis for the selected HP countries; though we are able to examine general observations included in their summary report. Specifically, COVID-19 affected over a third of all rural water service providers included in the survey. Twenty-three percent of rural water services experienced decreased revenue collection, 16 percent experienced increased operational costs, and 23 percent experienced decreased funding

support. The most affected service providers were private operators, who most often did not charge for water services due to government mandates (38 percent). Service providers that reported moderate, low, or no impacts of COVID-19 were rarely (17 percent) providing services at no cost for the consumer. The proportion of providers reporting negative impacts varied only slightly between middle income countries and lower- and low-income countries.

4.0 CHALLENGES

Several challenges arose in this study for collecting and collating longitudinal WASH data across the three topics, as described below.

4.1 COLLATION OF PUBLICLY AVAILABLE DATA

WASH data still live in siloes. There are numerous efforts to make WASH data publicly available—the World Bank's Water Data Portal, USAID's Development Data Library, The Humanitarian Data Exchange, Aquaya's Project W—to name a few. But all of these efforts are far from succinct. It takes time to clean data, anonymize, and make it secure to share publicly. It also requires web hosting power. Most critically, it requires buy-in. Funders of work where data collection is involved are starting to require that data be submitted onto public platforms. But otherwise, this is not standard practice among the sector participants. In addition, data collection happening at the national or local level, rather than the international level, is even less likely to end up in one of these existing portals. For this activity, any data we gathered that was not a part of an international effort, was directly obtained through connections at a national level. Unless we can gain buy-in from more localized data collection efforts, those data will remain out of the public space.

WASH indicators are still not harmonized. Different survey instruments ask different questions with different response options to try to ultimately measure the same thing. Sometimes the differences in questions are subtle, though sometimes they vary greatly. This is not a new challenge. In 2014, Bartram et al. highlighted that survey instruments used common terms inconsistently, and that although JMP identified a set of core indicators, the questions in national surveys was not yet updated. They specifically raise the question that we found to be a challenge in this activity, seven years later, "Further harmonization of survey questions and classifications is needed for more accurate reporting of coverage and trends by facility class…Because household surveys are time-consuming and expensive, there is continuous pressure to reduce the number of questions in order to minimize respondent fatigue and associated loss of data quality; questions must therefore be harmonized to efficiently elicit a large amount of usable and comparable data."

Most discrepancies we found were among the household-level survey instruments. The lack of harmonization may partially be explained by the fact that the questions related to WASH were part of non-WASH or non-traditional surveys. Efforts to align questions and indicators with global standards may not have been a priority, even though some data initiatives aimed to use robust WASH monitoring frameworks.

4.2 COLLECTION OF REMOTE PRIMARY DATA

Even prior to the COVID-19 pandemic, data collection efforts were shifting to digital and remote systems. Remote-based surveys were conducted in high income countries for many years, but the practice is steadily increasing as low and lower-middle income countries become more digitized (Flowminder News, 2021; UNICEF, n.d.). With the onset of COVID-19, there was an increase in the desire to collect data remotely. For example, the COVID-19 pandemic spurred additional data demands that National Statistic Offices (NSOs) tried to meet. When collecting COVID-19-related data in low and lower-middle income countries, 49 percent of surveyed NSOs (n=125) reported using mobile phone data (United Nations Department of Economic and Social Affairs Statistics/World Bank, 2020). While there are numerous advantages to collecting data through remote methods (scale, cost-savings, adaptability, time requirements), there are also lots of challenges.

Extensive catalogues to support mobile data collection exist, but it is unclear if they are being used. Our activity is a perfect example of this concern. We are well-versed with primary data

collection, and yet did not utilize any number of existing tools as we were developing our methods or surveys. We used tools from a previous data collection activity, without verifying the origin of those tools. We did cross-check against JMP given the nature of the work, but that isn't a given for all data collection efforts. Services providing remote data collection (such as GeoPoll in the case of this activity) incorporates best practices, survey design is largely up to clients. Although as researchers we strive not to recreate the wheel and rely on prior evidence, we often do not seek out valuable resources as we develop activities. Here are a few examples of resources we identified after we had already conducted our remote data collection.

- Mobile Phone Panel Surveys in Developing Countries – a 131-page document produced by the World Bank on how to collect mobile phone data
- Mobile Phone Surveys for Understanding COVID-19 Impacts – World Bank Blog post that helps guide the reader on how to create a sample frame, make the sample as representative as possible, possible methods, and cost implications
- Best practices for conducting phone surveys – an Abdul Latif Jameel Poverty Action Lab blog post that includes consent, ethical review, engagement strategies, data security, software, and protocols
- Summary report: Remote data collection – Resource on the COVID-19 Hygiene Hub
- Remote Survey Toolkit – Lessons learned from 60 Decibels, a tech-enabled impact measurement company conducting phone-based surveys since 2014
- Using SMS- and IVR-based Surveys During COVID-19 – a USAID funded technical brief for Breakthrough Action to help guide survey collection

In addition to these resources, we are compelled to include our own observations of some of the key challenges to collecting mobile-based data.

Remote data collection lacks in-person verification. The COVID-19 pandemic also underscored the limitations of remote data collection, especially in relation to face-to-face data collection activities that allow for direct observations. WASH surveys administered remotely, such as during the COVID-19 pandemic, may be prone to bias where responses are solely based on self-reporting, rather than on direct observation. This is particularly challenging for WASH questions compared to other sectors. Without the ability to confirm if a water source such as a well or a spring are protected or not, we cannot accurately describe if a water source is basic or unimproved. This is also limiting for questions on sanitation, when often respondents do not know what type of hardware they may have under the toilet seat or whether their toilet slab is considered improved or unimproved. Related to hygiene, according to JMP in the case of the availability of a handwashing station, an observation should take place to confirm the presence of soap. Without that verification, we have to rely on the respondent's confirmation whether there is soap available or not. This concern is particularly relevant to additional questions related to hygiene, which are highly prone to reporting, recall and social desirability bias. It is not yet fully understood whether remote data collection efforts, such as MICS Plus, will be sufficiently compatible with the standard instruments (MICS, DHS, etc.).

Mobile methods may still bias urban and wealthier participants. Although phone usage has increased globally, including in low and lower-middle income countries, there is still a gap in mobile phone ownership.[4] One major concern with mobile data collection is the risk for under-representation in populations with reduced phone ownership or autonomy, such as rural women and the elderly.[5] In this activity, although GeoPoll strived to obtain residents evenly among male and female respondents,

[4] Spotlight: Access to Mobile Phones and the Internet Around the World; The Mobile Gender Gap Report 2021; Want to reach the world's poorest? Design for dumb phones

[5] Remote data collection for public health research in a COVID-19 era.

there were more male respondents overall. In addition, they attempted an even split among rural and urban areas, but we still had more urban respondents. We did not have the means to collect data on wealth, so it is hard to verify that there was even distribution among wealth quintiles among our participants. However, if we are unable to collect data from the poorest and most vulnerable, we could be underestimating the needs of those most in need.

Survey length and character limits restrict the quantity and quality of data. When collecting data through remote methods such as mobile phones or online surveys, the length of the survey must be considered in order to prevent drop off. If a survey is too long, participants are less likely to complete a survey. This can be the case with in-person data collection as well, but enumerators may be able to entice a participant to continue. In addition, SMS-based surveys have a limited number of text characters per question, which required adapting survey questions and answer options. In this activity, this limited our ability to follow standard questions of core WASH indicators or elaborate on or clarify what we were asking, as an enumerator might during an in-person survey.

Competing priorities and information request fatigue limit responses. Government, sector partners, and data owners were difficult to get a hold of as several countries experienced a peak in COVID-19 cases during the outreach phase of this activity. Government officials and other respondents likely had to respond to the surge in COVID-19 cases in their respective countries. Government officials and other relevant respondents also likely experienced "information request fatigue" as many research initiatives were undertaken during the COVID-19 pandemic. As researchers we often ask a lot of other participants to provide us with information and knowledge, partially since the data is not publicly available (Section 4.1). These frequent requests often come without incentives, as was the case with this activity. With competing priorities, information request fatigue, and no incentives, it is easy to understand why we have low response rates using these methods.

Small-scale service providers are difficult to access via remote methods. This may also be explained by "information request fatigue," in addition to language barriers, as smaller scale providers may be less likely to speak English or French, which were the languages of our survey instruments. It is also possible that small-scale providers may not be used to responding to detailed questions on operational performance and may not have relevant data available or accessible to share. This contrasts with larger utilities who typically record detailed data on operational performance indicators, though were not the focus on this activity.

Mobile methods are limited in terms of geographical coverage and language. Our remote surveys were available in English and French. However, we were unable to translate surveys into all local languages, which was particularly prohibitive among more geographically remote SSSPs, where there may be fewer individuals with English or French language skills. Similarly, mobile data collection methods are only available in select countries. The service we used to collect household primary data, GeoPoll, is only active in 12 of the 18 HP countries, excluding a number of countries where we found there to be limited household-level data, such as Haiti or South Sudan. This limited our ability to collect household data in countries where existing data was already sparse.

4.3 ISOLATING IMPACTS OF COVID-19 ON WASH

It is difficult to isolate the impacts of COVID-19 on WASH in changing contexts. Throughout the period of data collection, we observed political and climatic events in the HP countries that could confound any observed trends. For example, during this time Afghanistan went through political upheaval with the insurrection of the Taliban. Ethiopia has struggled with violence in the Tigray region. Madagascar witnessed an alleged assassination attempt on the president, in addition to a severe drought. Therefore, it is possible that some of the changes we see in our data could be due to alternative concerns aside from or in addition to the COVID-19 pandemic.

Overall, data availability limits the opportunity to examine the impacts of COVID-19 on WASH. We noted the limitations of publicly available data. For our primary data collection, resource constraints limited the number of countries where we collected household surveys and the number of surveys. Mobile surveys often have the ability to guarantee gender, geographic, and urban/rural distribution, but it is more costly and takes longer to administer. The sample size for most of our indicators was low, and prohibited statistical analysis.

5.0 RECOMMENDATIONS

The following recommendations should be considered for future WASH data initiatives.

- **Core questions**: Large international survey efforts such as MICS and DHS have many standard questions on WASH, but they are not always adopted by other large surveys. Existing standard questions on MICS and DHS are also limited to a small set of core indicators, such as *basic* and *improved* levels of water and sanitation. Other indicators generally do not have standard language, and organizations might not know which questions are most important to prioritize in order to capture standard indicators. Therefore, we recommend the development of an expanded set of core questions that can be applied sector-wide on WASH in households. It is also critical that these expanded core questions are compatible with various types of remote data collection methods, such as complying with the SMS character limitations noted above.
- **Harmonization**: Advocate for the harmonization of WASH survey instruments across the WASH sector, as well as for data sharing in the WASH sector and beyond. The aim of this advocacy is to increase the uptake and use of the data for planning, monitoring and accountability.
- **Promotion**: Promote existing resources on the optimization of mobile data collection across research organizations, universities, NSOs, and implementers. Numerous organizations have thoughtfully developed guides to support improved data collection methods, but they have very little value-add if they are not being utilized. Before developing data collection methods, we should be holding all of us in the research space accountable to follow already developed guidelines.
- **Collaborations**: Encourage collaborations with 'big data' organizations, such as Facebook or Google, who have the resources to continuously monitor WASH indicators in households, institutions, and markets at-scale. Monitoring WASH at-scale in these settings could provide more insights into similarities or discrepancies in access to WASH between urban and rural areas, low-income and high-income settings, genders, and education levels. Data collection efforts could also be expanded to include data related to both the supply and demand of WASH services, such as customer data or WASH supply chains.
- **Small-scale service provider data**: Consider supporting specific investments in data collection initiatives for SSSPs to overcome challenges of limited data. For example, WASH-FIN collected extensive data on service providers; a similar, simplified initiative could be a useful tool for service providers, financiers, and governments. Incentives may encourage small-scale service providers to participate in data collection efforts, though such programs must also acknowledge the potential for respondent bias. Incentives for all survey participants have the potential to increase stakeholder participation by compensating participants for their time for survey completion.
- **Additional settings**: Consider supporting longitudinal assessment of COVID-19 impacts on WASH services in institutions, such as in health care facilities and schools. These settings play a crucial role in infection and prevention control and were severely impacted by the COVID-19 pandemic.

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ANNEX 1: METHODS FOR DETERMINING WATER INSECURITY VALUE

To calculate a modified water security index, we used the following questions and scoring.

- In the past week, was there a day when you couldn't get enough water to meet your household's needs? [Reply of "Yes" scored 2 and "No" scored 0.]
- In the past month, how often did you worry you would not have enough water for all household needs? [Reply of "Never" scored 0, "Rarely" scored 1, "Sometimes" scored 2, and "Often" or "Always" both scored 3.]
- In the past month, how often have you had to change plans due to problems with your water situation? [Reply of "Never" scored 0, "Rarely" scored 1, "Sometimes" scored 2, and "Often" or "Always" both scored 3.]
- In the past month, have you skipped washing hands after dirty activities due to lack of water? [Reply of "Never" scored 0, "Rarely" scored 1, "Sometimes" scored 2, and "Often" or "Always" both scored 3.]

If the sum of a household's responses was 4 or greater, they were considered to be water insecure.

ANNEX 2: HEAT MAPS – WATER ACCESS

All heat maps depicting percentage point changes in reported water service types before COVID-19 in August 2020* or July 2021, and November 2021 for selected countries (Source: GeoPoll household survey).

Afghanistan - Jul 2021

	Rural n=25	Urban n=92
Piped water	-8	-10
Tanker/Cart vendor	12	2
Bottle/sachet	0	3
Borehole	0	3
Rainwater	0	-2
Well	4	1
Spring	-4	2
River/pond	-4	0

Afghanistan - Nov 2021

	Rural n=67	Urban n=186
Piped water	-9	-2
Tanker/Cart vendor	0	-1
Bottle/sachet	6	3
Borehole	3	1
Rainwater	0	2
Well	-1	-4
Spring	1	-1
River/pond	0	1

Ethiopia - Jul 2021

	Rural n=6	Urban n=47
Piped water	0	-2
Tanker/Cart vendor	0	-2
Bottle/sachet	0	-2
Borehole	0	2
Rainwater	0	2
Well	0	0
Spring	0	0
River/pond	0	2

Ethiopia - Nov 2021

	Rural n=25	Urban n=129
Piped water	16	-7
Tanker/Cart vendor	4	1
Bottle/sachet	8	7
Borehole	-8	-2
Rainwater	0	-2
Well	-16	1
Spring	0	0
River/pond	-4	2

Liberia - Jul 2021

	Rural n=31	Urban n=61
Piped water	-6	0
Tanker/Cart vendor	0	2
Bottle/sachet	13	7
Borehole	0	0
Rainwater	-3	0
Well	-6	-5
Spring	3	0
River/pond	0	-3

Liberia - Nov 2021

	Rural n=69	Urban n=129
Piped water	3	-3
Tanker/Cart vendor	0	-2
Bottle/sachet	-10	5
Borehole	12	-1
Rainwater	4	0
Well	-10	1
Spring	0	-1
River/pond	1	1

Madagascar - Jul 2021

	Rural n=28	Urban n=38
Piped water	0	-8
Tanker/Cart vendor	4	0
Bottle/sachet	-7	3
Borehole	0	5
Rainwater	0	0
Well	-4	0
Spring	7	3
River/pond	0	-3

Madagascar - Nov 2021

	Rural n=79	Urban n=110
Piped water	0	-6
Tanker/Cart vendor	-1	2
Bottle/sachet	0	1
Borehole	-1	1
Rainwater	1	1
Well	1	3
Spring	-5	-2
River/pond	5	1

DRC - Aug 2020

	Rural n=74	Urban n=108
Piped connection	0	0
Cart vendor	-9	2
Tanker	9	2
Bottled/sachet	-2	0
Rainwater	-2	0
Well	-2	2
Spring	2	-4
River/pond	3	-2

DRC - Nov 2021

	Rural n=107	Urban n=196
Piped water	2	-7
Tanker/Cart vendor	6	1
Bottle/sachet	0	5
Borehole	7	3
Rainwater	-2	3
Well	-6	4
Spring	-6	-9
River/pond	-1	1

Ghana - Aug 2020

	Rural n=50	Urban n=54
Piped connection	4	-2
Cart vendor	-2	6
Tanker	4	-4
Bottled/sachet	-14	-6
Rainwater	-4	-2
Well	6	2
Spring	2	0
River/pond	4	6

Ghana - Nov 2021

	Rural n=90	Urban n=87
Piped water	1	1
Tanker/Cart vendor	-1	1
Bottle/sachet	-4	5
Borehole	-3	-3
Rainwater	0	0
Well	4	-2
Spring	0	0
River/pond	3	-1

Kenya - Aug 2020

	Rural n=112	Urban n=77
Piped connection	-20	-14
Cart vendor	-5	-12
Tanker	-1	8
Bottled/sachet	-6	3
Rainwater	6	6
Well	9	5
Spring	-2	1
River/pond	19	3

Kenya - Nov 2021

	Rural n=121	Urban n=119
Piped water	4	-6
Tanker/Cart vendor	1	2
Bottle/sachet	1	3
Borehole	2	-1
Rainwater	-4	2
Well	1	1
Spring	-2	2
River/pond	-2	-2

Mozambique - Aug 2020

	Rural n=74	Urban n=108
Piped connection	4	11
Cart vendor	0	-1
Tanker	1	-2
Bottled/sachet	0	1
Rainwater	0	-3
Well	3	0
Spring	-15	-6
River/pond	7	0

Mozambique - Nov 2021

	Rural n=75	Urban n=105
Piped water	5	-8
Tanker/Cart vendor	5	3
Bottle/sachet	0	-1
Borehole	-1	4
Rainwater	-1	-2
Well	-8	5
Spring	-1	1
River/pond	1	-2

Tanzania - Nov 2021

	Rural n=112	Urban n=77
Piped water	-2	-8
Tanker/Cart vendor	14	5
Bottle/sachet	-1	2
Borehole	0	0
Rainwater	-4	-2
Well	-1	0
Spring	-3	0
River/pond	-2	3

U.S. Agency for International Development
1300 Pennsylvania Avenue, NW
Washington, DC 20523
www.usaid.gov