

Status of piped water connection to public healthcare facilities in Cambodia



Technical
Paper

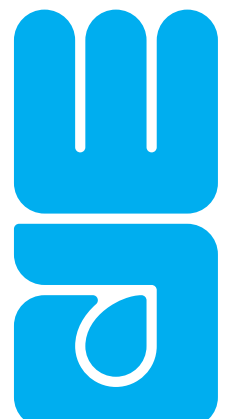
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Background

Water, sanitation and hygiene (WASH) facilities are essential components of providing quality health services. These basics are fundamental to preventing and controlling infection in healthcare settings, tackling antimicrobial resistance, and ensuring quality of care – a prerequisite of achieving universal health access and good health outcomes as a part of the Sustainable Development Goal 3. Additionally, during the 72th World Health Assembly, the WHA 72.7 Resolution on WASH in all healthcare facilities was adopted¹, which further signified the United Nations' member states' commitment to improve WASH in healthcare facilities.

The first few weeks are the most vulnerable time of a child's life. A Lancet study showed that children born in least developing countries are between 3 to 20 times more likely to obtain healthcare associated infections². In Cambodia, almost all mothers now give birth in a health care facility². Even though this is a positive sign, the lives of new mothers and babies are being put at risk of unnecessarily contracting infections due to unreliable supplies of safe water, lack of good hygiene and inadequate toilets in the health care facility. Evidently, Cambodia's Demographic and Health Survey 2014³ indicated 170 maternal deaths per 100,000 live births and 1 in 35 neonatal deaths in Cambodia.

Public healthcare facilities (HCFs) in Cambodia are categorized into national hospitals, provincial referral hospitals, referral hospitals, health centres and health posts. Cambodia's Health Strategic Plan 2016-2020 outlines the urgent need to address WASH related issues 'to enable provision of quality health services, improve hygiene and sanitation and maintain safety and security for both patients and health personnel'⁴.

A 2017 assessment of public healthcare facilities across 5 provinces in Cambodia found significant gaps in WASH. While most facilities had an improved water source on site, only 49% of the assessed health care facilities reported that the available water sources provided enough water for all purposes (drinking, personal hygiene, cleaning and laundry)⁵. Insufficient quantity and quality of water in healthcare facilities limits the provision of clean toilets and regular handwashing by staff and patients which leads to increased risk of infection.

To current knowledge, there is still limited understanding on water supply in Cambodia's public health care facilities, particularly the ones in provincial and operational district levels.

Introduction

WASH in healthcare facilities is a key strategic priority for WaterAid Cambodia. Since starting operations in 2014, WaterAid has been working closely with the Ministry of Health and partners to define roles and responsibilities for WASH in healthcare facilities and to advocate for a system level approach to improve WASH in HCFs. WaterAid has worked with the Cambodian Water Supply Association (CWA) to undertake this national assessment of piped water supplies to healthcare facilities. CWA is a local organization which aims to create and enable an environment of collaboration and learning among private water operators (PWOs) and stakeholders in the water sector. There are approximately 400 PWOs in Cambodia providing water supply services to more than one million people, of which 224 operators are members of CWA.

The objectives of the assessment were to:

1. Identify the PWOs who are serving and who are not serving the public HCFs in their coverage area, excluding national hospitals
2. Understand the water resources available in all public HCFs, excluding the national hospitals in Cambodia
3. Identify barriers which prevent public HCFs, excluding the national hospitals, from connecting with PWOs

To achieve these objectives, WaterAid and CWA's national assessment followed the following methodology:

1. Obtain a complete list of public HCFs in Cambodia from the Ministry of Health;
2. Obtain a list of all licensed piped water operators and their licensed area information from Ministry of Industry, Science, Technology and Innovation (MISTI);
3. Obtain the contact numbers of public HCFs from information published by National Social Security Fund and through Operational Districts;
4. Conduct phone interviews with PWOs to verify health care facilities under their coverage
5. Conduct phone interviews with representatives of each health care facility.

The assessment focused only on public HCFs in the provincial and Operational District level, as it is widely assumed that the national hospitals have adequate water supply in their premises. The data collection was conducted by CWA staff from February to March 2020. This technical paper presents a national summary of the results of the phone interviews with healthcare facility representatives. Separate provincial profiles will be made available for use in planning by Provincial Health Department, Provincial Department of Rural Development, Provincial Department of Industry Science Technology and Innovation, and PWOs in each province.

Limitations

Phone numbers collected the National Social Security Fund system were not always reachable. Therefore, data collectors had to contact the operational districts (OD) in order to obtain other phone numbers. Despite this effort, some health care facilities could not be reached or wrong numbers were given.

Assessment Findings

The following section presents key findings from the study at a national level which has informed WaterAid’s recommendations for national priorities.

Healthcare facility connection to piped water service

1503 public healthcare facilities were contacted for this survey. 293 water suppliers were found in this study while 224 are CWA’s members. The study found that 575 HCFs (38.3%) are currently connected to a piped water service compared with 779 HCFs (51.8%) which are not yet connected and therefore rely on other sources of water for basic cleaning and hygiene in the facility. Figure 1 shows these results.

Of the 575 HCFs which are connected to a piped water 459 of those (79.8% of the connected HCFs) are connected to a piped service by a private operator, 103 HCFs (17.9% of the connected HCFs) are connected to a service operated by a water supply authority and 13 HCFs (2.3% of the connected HCFs) are connected to a service operated by a non-governmental organization (NGO). Around 9.9% of HCF could be not reached on the phones and were under construction at the time of data collection.

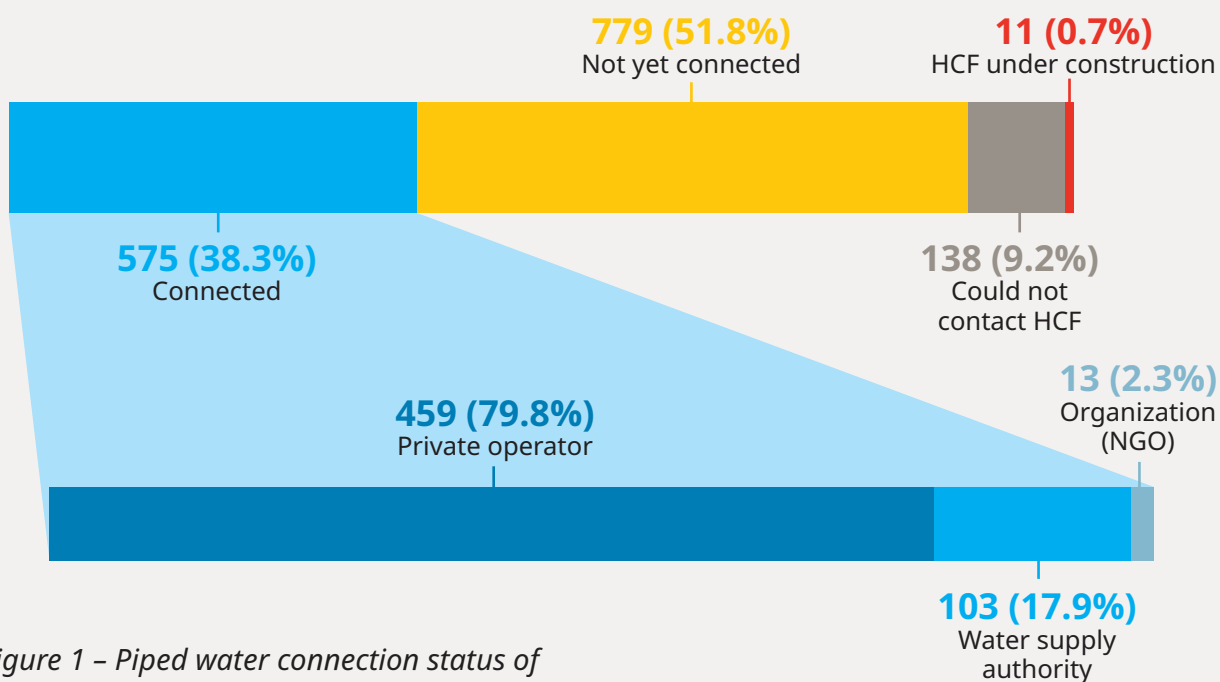


Figure 1 – Piped water connection status of healthcare facilities in Cambodia

While the average connection percentage among all public HCFs as shown in Figure 1 is 38.3%, there are wide variations in health care facility connection rates between provinces. The highest connection percentages are in Phnom Penh (75.9%), Pailin (75.0%) and Kandal (73.5%) provinces.

The lowest connection rates tended to be observed in the north and north-east of the country in Preah Vihear (2.0%), Ratanakiri (13.2%) and Stung Treng (16.7%) provinces. Figure 2 shows the provincial variation in connection rates visually, while Table 2 provides a more detailed list.

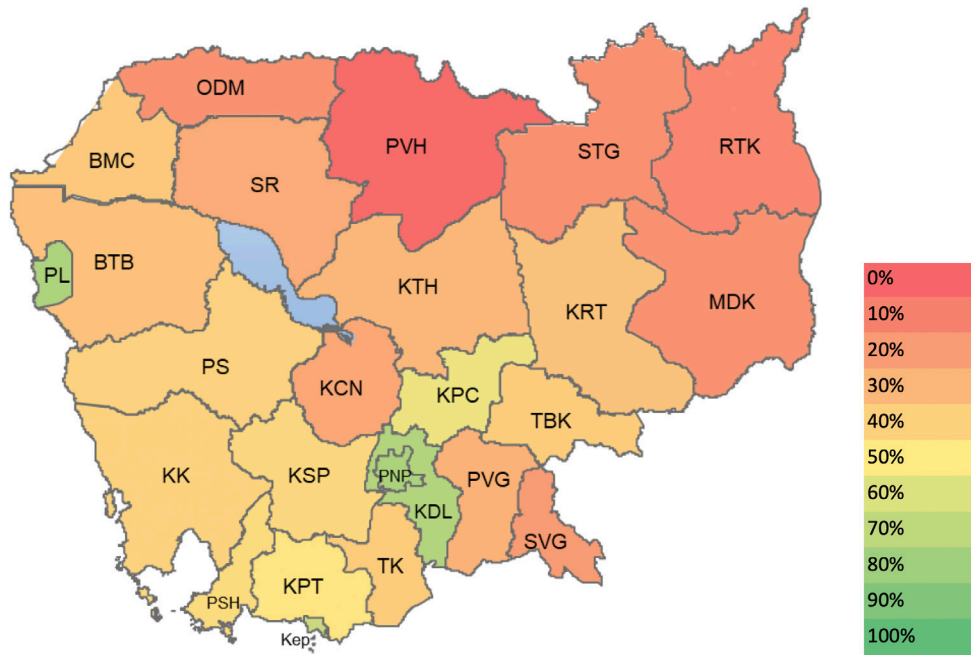


Figure 2 – Public Healthcare facilities connected to piped water by province

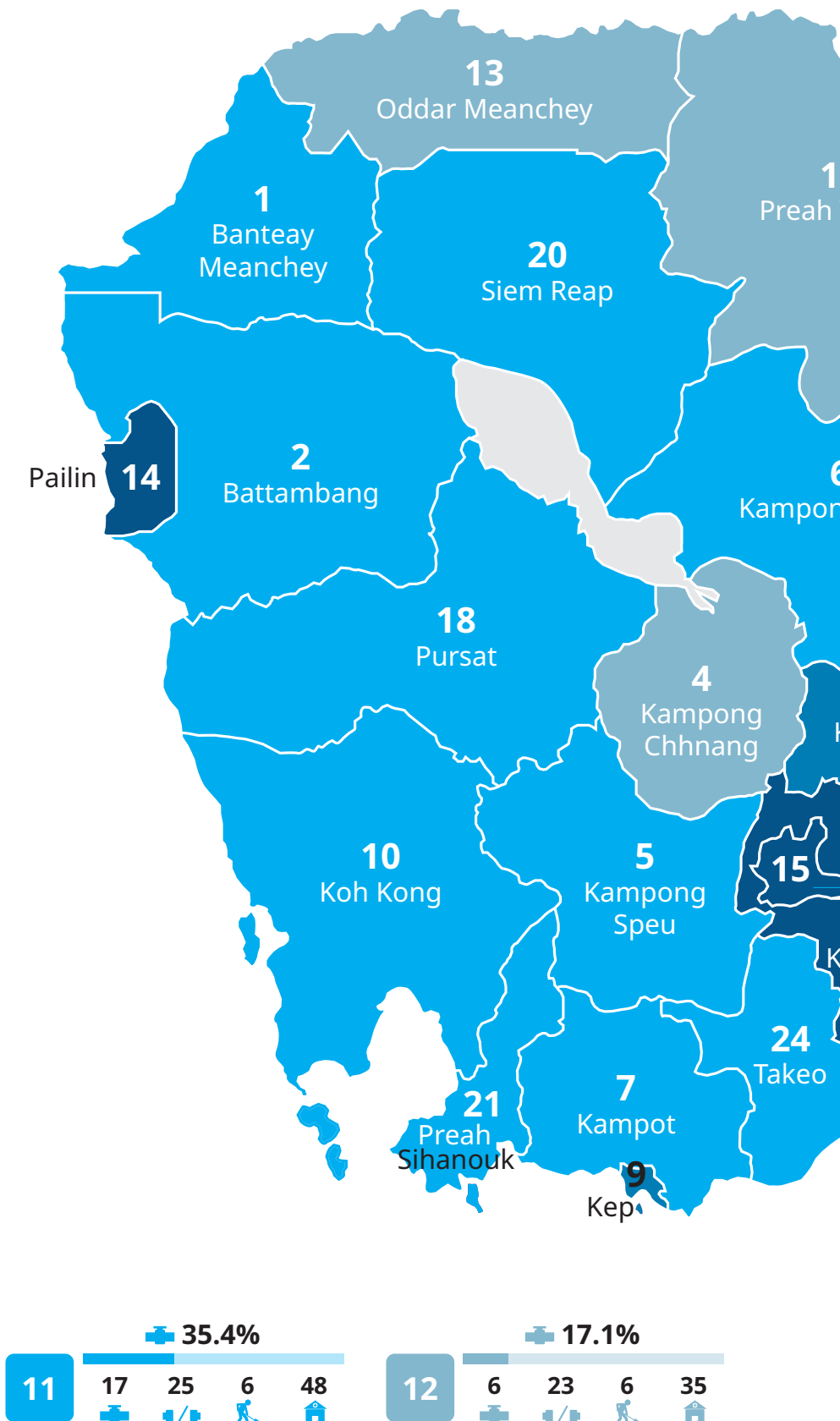
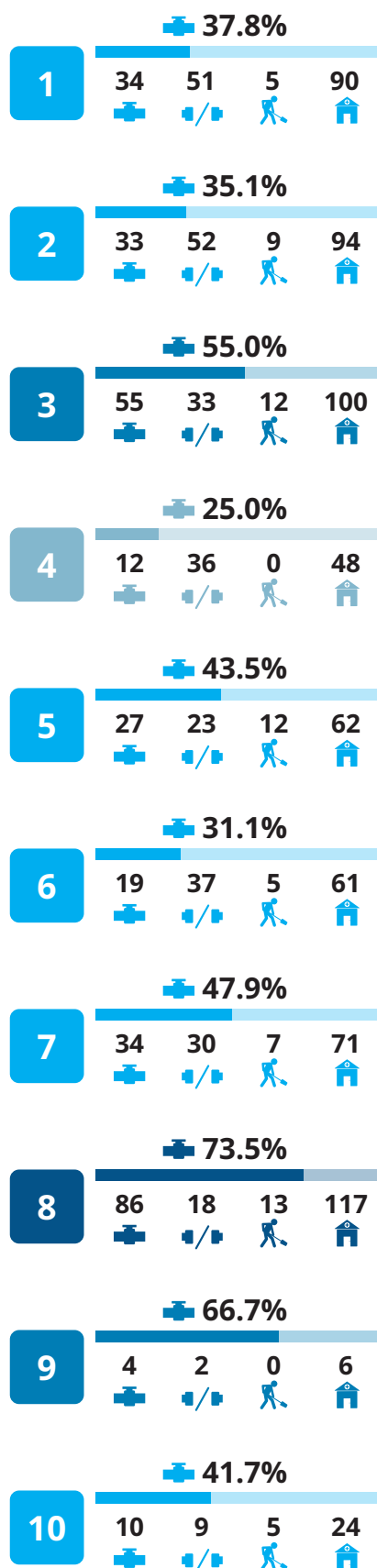


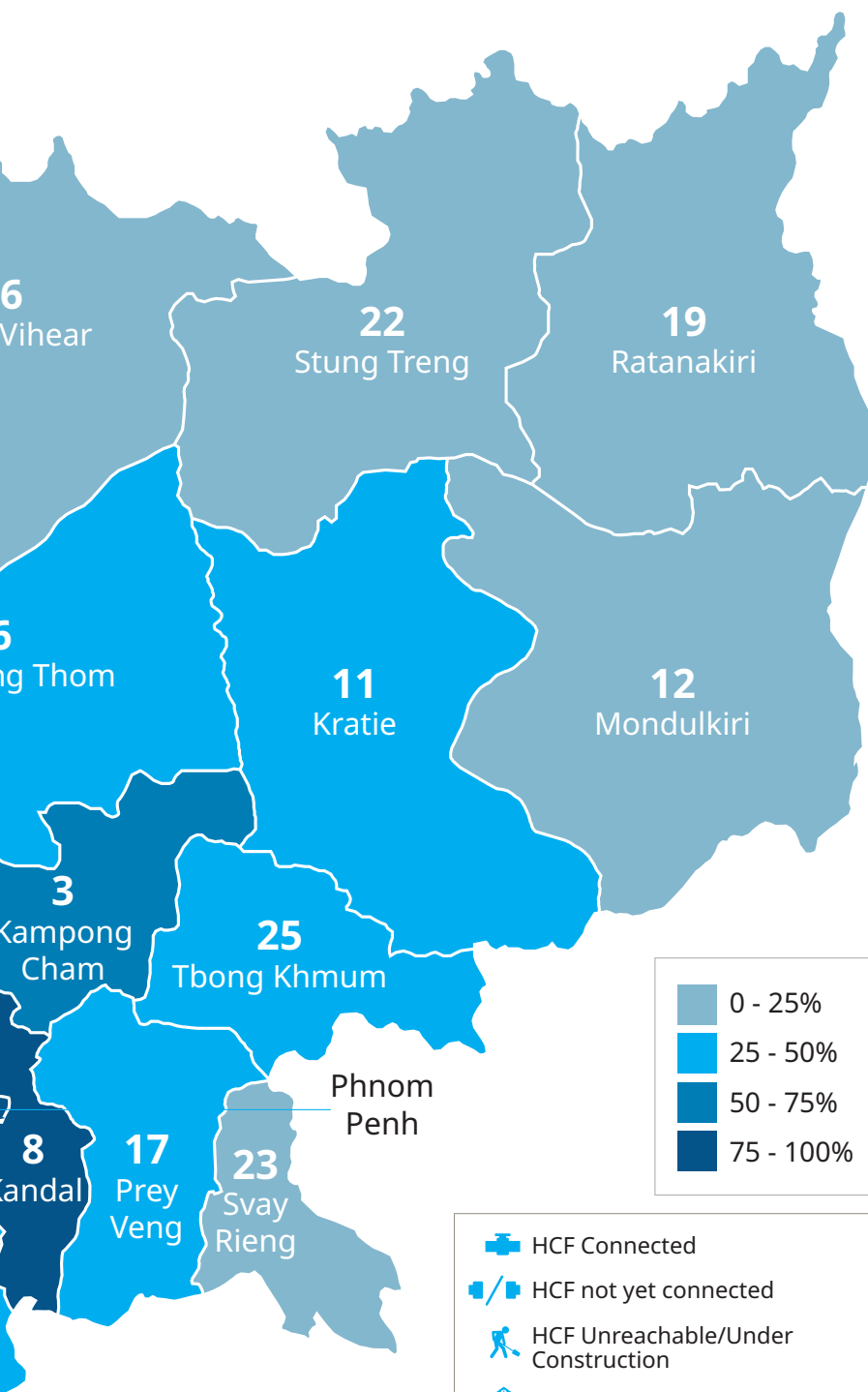
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Province	HCF Connected	HCF not yet connected	HCF Unreachable	Under Construction	Total HCFs of Each Province	Percentage of HCFs connected
Banteay Meanchey	34	51	5	0	90	37.8%
Battambang	33	52	9	0	94	35.1%
Kampong Cham	55	33	12	0	100	55.0%
Kampong Chhnang	12	36	0	0	48	25.0%
Kampong Speu	27	23	12	0	62	43.5%
Kampong Thom	19	37	5	0	61	31.1%
Kampot	34	30	7	0	71	47.9%
Kandal	86	18	13	0	117	73.5%
Kep	4	2		0	6	66.7%
Koh Kong	10	9	5	0	24	41.7%
Kratie	17	25	6	0	48	35.4%
Mondulkiri	6	23	6	0	35	17.1%
Ouddar Meanchey	7	33	0	0	40	17.5%
Pailin	6	0	1	1	8	75.0%
Phnom Penh	44	8	6	0	58	75.9%
Preah Vihear	1	49	0	0	50	2.0%
Prey Veng	38	79	15	0	132	28.8%
Pursat	21	18	6	6	51	41.2%
Ratanakiri	5	33	0	0	38	13.2%
Siem Reap	26	68	6	0	100	26.0%
Preah Sihanouk	8	8	2	0	18	44.4%
Stung Treng	4	13	5	2	24	16.7%
Svay Rieng	11	44	0	0	55	20.0%
Takeo	36	41	15	2	94	38.3%
Tboung Khmum	31	46	2	0	79	39.2%
Total	575	779	138	11	1503	38.3%

Table 2 - Status of public healthcare facility connection to piped water by province

Table 2 - Status of public healthcare facility connection to piped water by province





- HCF Connected
- HCF not yet connected
- HCF Unreachable/Under Construction
- Total HCFs of Each Province
- Percentage of HCFs connected

Province	Connected	Not yet connected	Unreachable/Under Construction	Total HCFs	Percentage Connected
15	44	8	6	58	75.9%
16	1	49	0	50	2.0%
17	38	79	15	132	28.8%
18	21	18	6	51	41.2%
19	5	33	0	38	13.2%
20	26	68	6	100	26.0%
21	8	8	2	18	44.4%
22	4	13	5	24	16.7%
23	11	44	0	55	20.0%
24	36	41	15	94	38.3%
25	31	46	2	79	39.2%

Province	Connected	Not yet connected	Unreachable/Under Construction	Total HCFs	Percentage Connected
13	7	33	0	40	17.5%

Province	Connected	Not yet connected	Unreachable/Under Construction	Total HCFs	Percentage Connected
14	6	0	1	8	75.0%

Availability of water supply in healthcare facilities

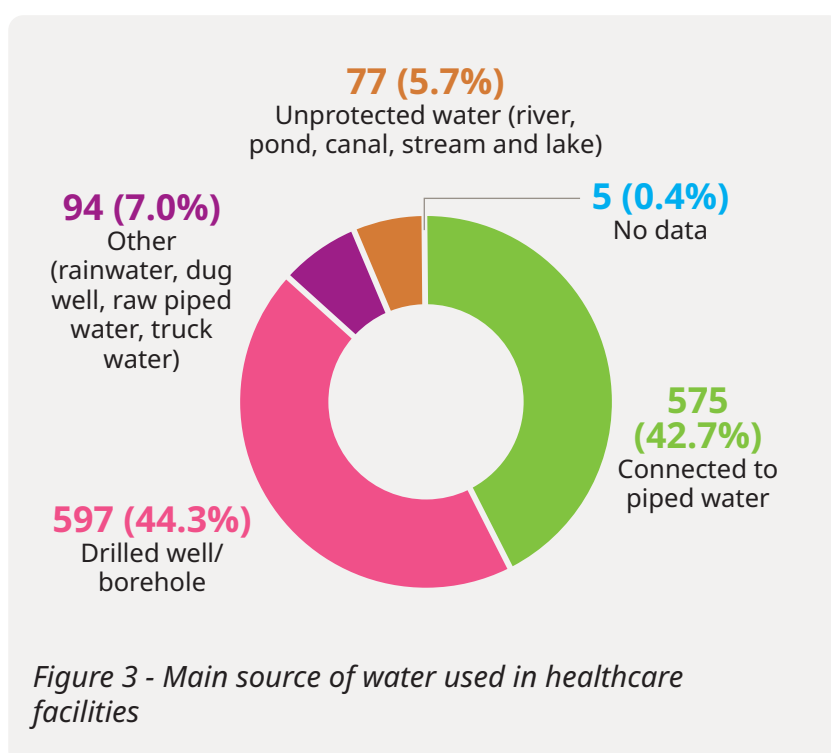
Given that fewer than half of public HCFs are connected to a piped water service, the study also investigated what sources of water HCFs were using for their water supply when not connected to a PWO source. Similar to the findings from the HCFs assessment in 2017, approximately 89% of all 1503 HCF have access to basic water supply on site.

When considering improved water sources⁶ - namely piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, and packaged or delivered water - 84% of HCF belong to this category. A further 138 HCFs (9.2%) could not be contacted, 11 HCFs (0.7%) were under construction, and the contacted persons in 11 HCFs (0.7%) did not know the water sources. Table 1 present the details of each indicators.

Indicators	Number of HCF	Percentage of total HCFs
HCF with water supply in the premises	1343	89.3%
HCF with improved water source ⁵ (excluding piped water)	691	45%
HCF with improved water source ⁵ (including piped water)	1266	84.2%
Missing HCF – Water source unknown	11	0.7%
HCF cannot be reached	138	9.2%
HCF under construction	11	0.7%

Table 1 Availability of water supplies in public HCF

As shown in Figure 3, among the 1503 HCFs in the study, the most common source of water reported in HCFs is from a drilled well or borehole (597 HCFs, 39.7%), followed by piped water (575 HCFs, 38.3%). Across the country a total of 77 public HCFs (5.7%) reported that their primary source of water is from an unprotected and unsafe source including rivers, ponds, canal, stream and lake. This is particularly concerning given the risk unclean water poses to infection prevention and control.



Satisfaction of healthcare facilities with piped water service



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The health care facilities that are connected to a piped water service were asked about their satisfaction with the service they receive (Figure 4). More than half of the connected HCFs reported being satisfied (296 HCFs, 51.5%) or very satisfied (15 HCFs, 2.6%) with their piped water service, while about one third expressed they felt their piped water service as being okay (188 HCFs, 32.7%). Among the HCFs that reported being dissatisfied (68 HCFs, 11.8%) or very dissatisfied (1 HCF, 0.2%) with their service nominated weak water pressure, poor water quality and insufficient quantity of water as their main reasons for dissatisfaction.

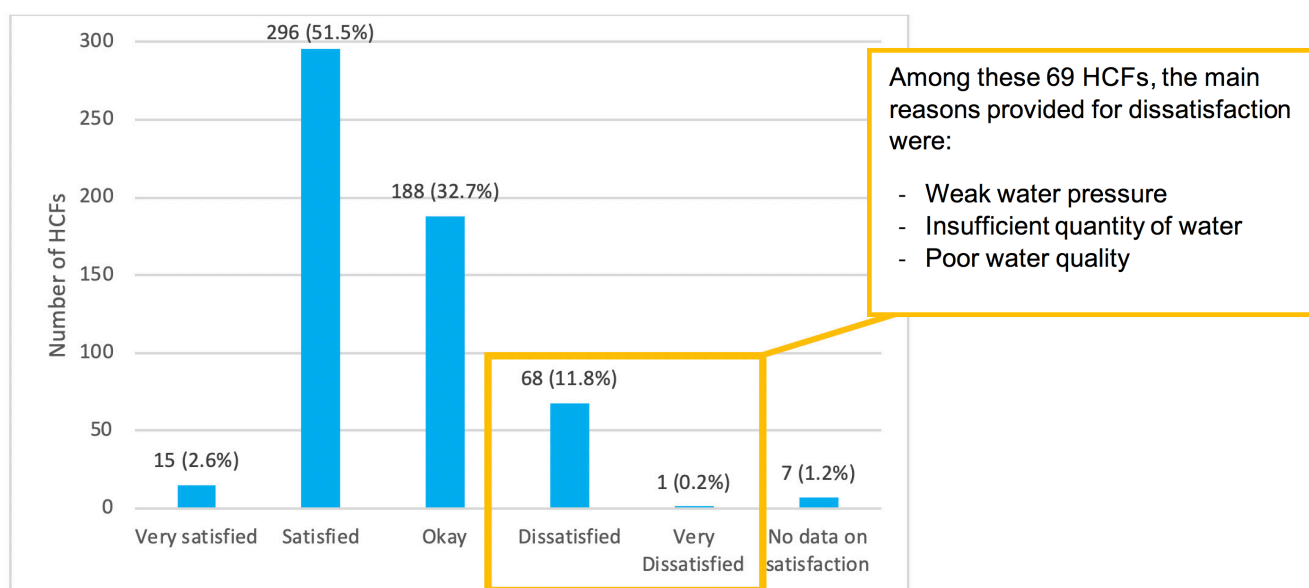


Figure 4 – Healthcare facility satisfaction with piped water service

Factors contributing to why HCFs are not yet connected to a PWO-run water supply

There were a range of reasons that HCFs reported for not yet being connected to a PWO water supply, which were broadly categorized into three main groups by the study investigators⁷:

- Issues with infrastructure and supply:** The majority of HCFs that are not yet connected indicated it was because the piped network is still too far away (392 responses, 50.3%) or there is no PWO in their area (258 responses, 33.1%).
- Issues with service quality:** many HCFs (54 responses, 6.8%) indicated that they weren't interested in connecting. Some responses specifically highlighted dissatisfaction with water quality (4 responses, 0.5%) or quantity (3 responses, 0.4%).
- Issues with health care facility management:** a lesser, but relevant, number of responses indicated issues from the HCF management side, notably that the HCF does not have a budget line for the piped water service (28 responses, 3.6%).

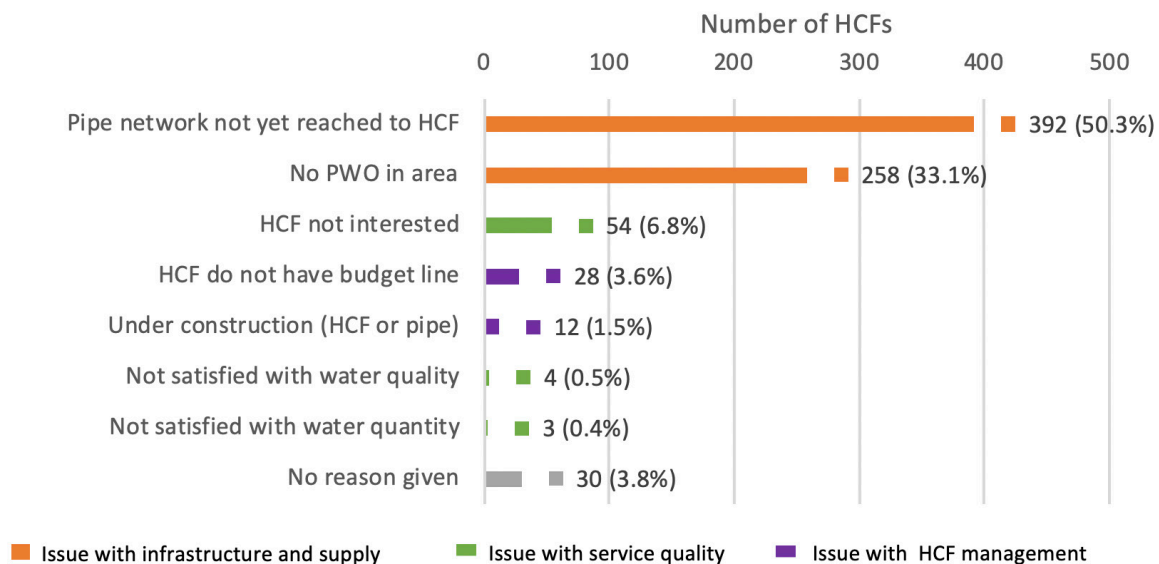


Figure 5 - Main reasons for healthcare facilities not yet connecting to piped water services

As shown in Figure 5 above, the most common reason provided by HCFs for not having connected yet is because the pipe network has not yet reached to the HCF. CWA also collected information on the distance from the HCFs which are not yet connected, to the nearest piped water network (Figure 6). Note that this excludes the 343 HCFs for which there is no piped water operator in the area, or which are under construction.

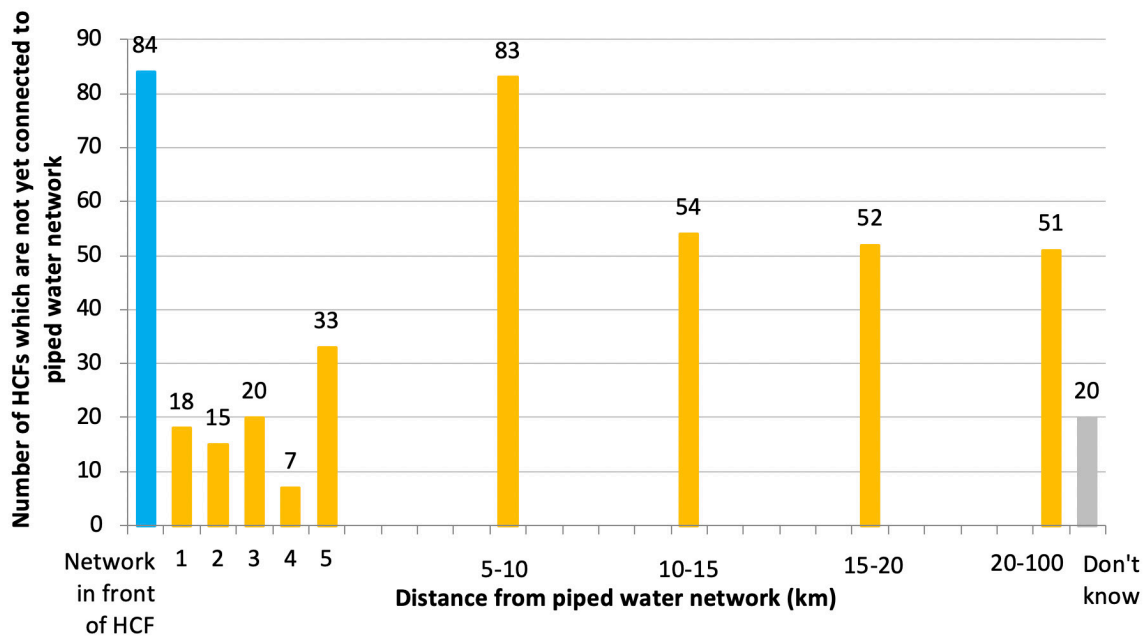
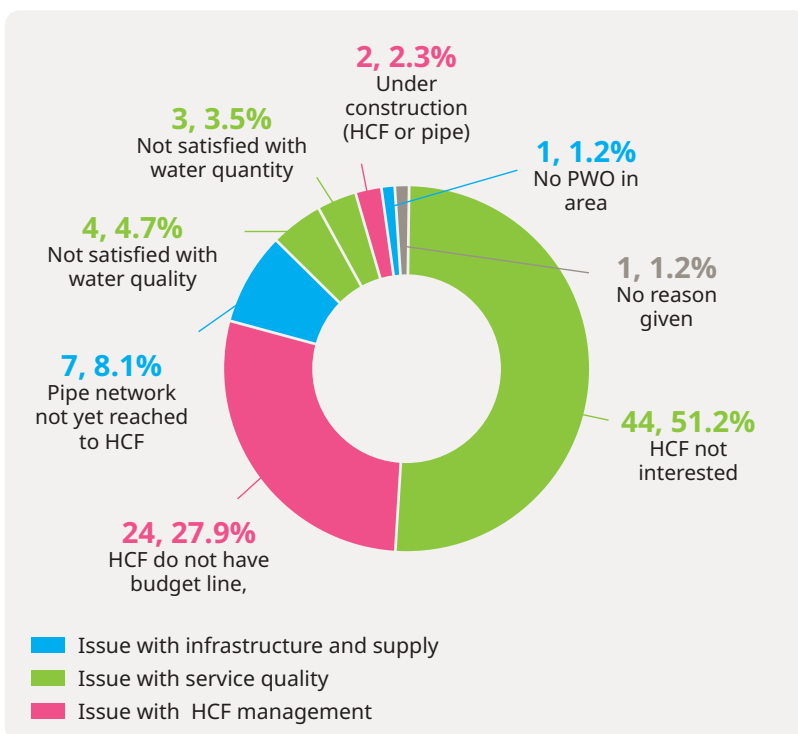


Figure 6 - Distance of piped water network from healthcare facilities yet to be connected (N=779)

Figure 6 shows that while hundreds of HCFs are still very far from a pipe network (240 HCFs are at least 5 km from their nearest pipe network), there are also many HCFs which are much closer to a network which have not yet connected. Of the 779 HCFs which have not yet connected, 84 HCFs (10.8% of HCFs not yet connected) have a pipe network in front of the HCF or on the opposite side of the road, and a further 93 HCFs (11.9% of HCFs not yet connected) are within 5 km of the nearest pipe network. This indicates that there are some ‘quick wins’ to be made to rapidly increase the number of HCFs connecting to and using piped water supplies.



Considering only the 84 HCFs which have a pipe in front of their HCF but have not yet connected (Figure 7), the data shows that satisfaction with service quality is the main reported reason that these HCFs have not yet connected, followed by HCF management reasons.⁸

Figure 7 - Main reasons for healthcare facilities not yet connecting to piped water services where a pipe exists in front of the facility

Recommendations

Short-term recommendations

There are several interventions which could significantly improve the number of HCFs connecting to and using piped water supplies in the short-term:

1. Design and implement an evidence-based campaign to demonstrate the value/importance of piped water for those HCFs which are not currently interested in connecting, especially those which already have a piped network in front of the HCF or nearby.
2. Design and implement a program which works to improve PWOs' understanding of the water supply needs and expectations of HCFs, improve communication between HCFs and PWOs, and respond to concerns and complaints about water supply service quality (water quality, water quantity, water pressure, price).
3. Alongside the above activities, implement a program to subsidize piped water connections for HCFs with limited budget but within existing private water operators' coverage areas.

Long-term recommendations

In the longer-term, the following interventions could improve the supply of safe water to healthcare facilities:

- A. Design and implement a program to support HCFs which are in areas without a piped water service to conduct Water and Sanitation Health Facility improvement tool⁹, a practical guide for improving quality of care through water, sanitation and hygiene in health care facilities to reduce risk to staff and patients posed by using unsafe water.
- B. Design and implement a program with Ministry of Industry, Science, Technology and Innovation (MISTI) to improve water quality and quantity of piped water services.
- C. Support closer collaboration between Ministry of Health and MISTI to develop and implement long-term plans to increase the number of HCFs connected to piped water and A
- D. Subsidise expansion of piped water networks to reach all HCFs, starting with those HCFs which are closest to the existing network
- E. Encourage more financial commitment from health care facilities to maintain piped water connection to their compound



- 1 WHA72.7 Resolution. Available at: apps.who.int/gb/ebwha/pdf_files/WHA72/A72_R7-en.pdf
- 2 Department of Planning & Health Information, Ministry of Health. 2016. The Third Health Strategic Plan 2016-2020 (HSP3). Cambodia.
- 3 Zaidi, A. K. M., Huskins, W. C., Thaver, D., Bhutta, Z. A., Abbas, Z., & Goldmann, D. A. (2005). Hospital-acquired neonatal infections in developing countries. *Lancet*, 365(9465), 1175-1188. [https://doi.org/10.1016/S0140-6736\(05\)71881-X](https://doi.org/10.1016/S0140-6736(05)71881-X)
- 4 National Institute of Statistics, Directorate General for Health, and ICF International, 2015. Cambodia Demographic and Health Survey 2014. Phnom Penh, Cambodia, and Rockville, Maryland, USA: National Institute of Statistics, Directorate General for Health, and ICF International.
- 5 National Institute of Public Health, Ministry of Health. 2017. Assessment of Water, Sanitation and Hygiene in public healthcare facilities in five provinces in Cambodia. Dr Ir Por.
- 6 Core questions and indicators for monitoring WASH in health care facilities in the Sustainable Development Goals. Geneva: World Health Organization and the United Nations Children's Fund (UNICEF), 2018. Licence: CC BY-NC-SA 3.0 IGO.
- 7 HCFs were able to provide multiple reasons for why they have not yet connected. While there are 779 HCFs that have not yet connected, the results, figure and percentages below refer to the 781 responses.
- 8 As per the previous section, some HCFs provided more than one reason. While there are 84 HCFs which have a pipe in front of the facility but have not yet connected, they provided 86 reasons.
- 9 https://www.washinhcf.org/wp-content/uploads/formidable/3/WASH-FIT-Cambodia-Case-Study_Final.pdfhttps://www.who.int/water_sanitation_health/publications/water-and-sanitation-for-health-facility-improvement-tool/en/

Annex: number of water supply operators in Cambodia

No	Name of Provinces	# of CWA Members	# of CWA Non-Members	# of Autonomous Water Authority	# of Public Water Supply	# of Water Supply Support by NGOs	# of Community Water Supply	Total of Water Supply
1	Kandal	33	10	0	0	0	0	43
2	Kep	1	1	0	0	0	0	2
3	Koh Kong	3	1	0	0	0	0	4
4	Kratie	16	0	0	1	0	0	17
5	Kampong Cham	24	10	0	1	1	0	36
6	Kampong Chhnang	9	0	0	0	0	0	9
7	Kampong Thom	8	2	0	1	0	0	11
8	Kampong Speu	21	0	0	0	0	0	21
9	Kampot	11	0	0	1	0	0	12
10	Takeo	24	0	0	1	0	0	25
11	Tboung Khmom	7	7	0	0	0	0	14
12	Banteay Meanchey	9	4	0	0	2	0	15
13	Pailin	3	1	0	0	0	0	4
14	Battambang	17	0	0	0	0	0	17
15	Pursat	7	0	0	1	1	0	9
16	Prey Veng	13	0	0	1	0	0	14
17	Preah Vihear	1	0	0	0	0	0	1
18	Preah Sihanouk	4	0	0	1	0	0	5
19	Phnom Penh	3	0	1	0	0	0	4
20	Mundolkiri	1	0	0	1	0	0	2
21	Ratanakiri	1	0	0	0	0	0	1
22	Stung Treng	0	0	0	1	1	1	3
23	Siem Reap	5	9	1	0	2	1	18
24	Svay Rieng	1	1	0	1	0	0	3
25	Otdar Meanchey	2	0	0	0	1	0	3
Total		224	46	2	11	8	2	293



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