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Water, sanitation and hygiene in Jordan's healthcare facilities

Jordan's
healthcare
facilities

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Abstract

Purpose – The purpose of this paper is to determine water availability, sanitation and hygiene (WSH) services, and healthcare waste management in Jordan healthcare facilities.

Design/methodology/approach – In total, 19 hospitals (15 public and four private) were selected. The WSH services were assessed in hospitals using the WSH in health facilities assessment tool developed for this purpose.

Findings – All hospitals (100 percent) had a safe water source and most (84.2 percent) had functional water sources to provide enough water for users' needs. All hospitals had appropriate and sufficient gender separated toilets in the wards and 84.2 percent had the same in outpatient settings. Overall, 84.2 percent had sufficient and functioning handwashing basins with soap and water, and 79.0 percent had sufficient showers. Healthcare waste management was appropriately practiced in all hospitals.

Practical implications – Jordan hospital managers achieved major achievements providing access to drinking water and improved sanitation. However, there are still areas that need improvements, such as providing toilets for patients with special needs, establishing handwashing basins with water and soap near toilets, toilet maintenance and providing sufficient trolleys for collecting hazardous waste. Efforts are needed to integrate WSH service policies with existing national policies on environmental health in health facilities, establish national standards and targets for the various healthcare facilities to increase access and improve services.

Originality/value – There are limited WSH data on healthcare facilities and targets for basic coverage in healthcare facilities are also lacking. A new assessment tool was developed to generate core WSH indicators and to assess WSH services in Jordan's healthcare facilities. This tool can be used by a non-WSH specialist to quickly assess healthcare facility-related WSH services and sanitary hazards in other countries. This tool identified some areas that need improvements.

Keywords Jordan, Waste management, Water, Hygiene, Hospitals, Sanitation

Paper type Research paper

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Introduction

Inadequate water, sanitation and hygiene (WSH) in healthcare facilities have high impact on health. Healthcare associated infections are prevalent; about 15 percent of patients are estimated to develop one or more infections during a hospital stay (Allegranzi *et al.*, 2011). Prevalence varies between 5.7 and 19.1 percent in low- and middle-income countries (World Health Organization, 2016) and the risks associated with sepsis are 34 times greater in low resource settings (Oza *et al.*, 2015). Middle East healthcare associated infection data are limited and of low quality because most countries lack surveillance systems. A 4.7 percent nosocomial infection rate (McCormack and Barnes, 1983) was reported from a survey in one United Arab Emirates hospital and 8 percent was reported in one Saudi Arabian hospital (Balkhy *et al.*, 2006). In Iranian hospitals, the rate was between 1.3 and 10 percent (Askarian *et al.*, 2012; Balkhy *et al.*, 2006; Hashemi *et al.*, 2013).

Inadequate WSH services and waste disposal are crucial factors associated with high healthcare associated infection rates (Velleman *et al.*, 2014). However, there is limited knowledge on WSH's status in such settings. The World Health Organization (WHO) (2015) report underlined adequate WSH in healthcare facilities and their role preventing infections, and protecting staff and patients' health, dignity and privacy. The WSH status in Jordan's



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healthcare facilities is unknown. Extensive efforts are needed to examine WSH service availability in Jordan's healthcare facilities and other countries in the Eastern Mediterranean Region (EMR). Therefore, we aimed to determine healthcare WSH service availability and readiness and healthcare waste management services in Jordan's healthcare facilities and to determine how services are inspected and reported by the Ministry of Health (MoH).

Methods

Sampling and the assessment tool

In total, 19 hospitals (15 public and four private) were studied. Eight hospitals were in the north, seven in the middle and four in the south. For WSH service assessment, the research team developed the WSH in the health facilities assessment tool (Appendix), which included questions and items designed to assess WSH availability, adequacy and functionality. The tool was a short document that can be used by a non-WSH specialist to quickly assess healthcare facility-related WSH services and sanitary hazards, which can be used in any healthcare facility. The tool, also covering healthcare waste management, was developed by reviewing WHO (2008) document "Essential Environmental Health Standards in Healthcare" and surveys such as Service Availability and Readiness Assessment (SARA) (WHO, 2015), Service Delivery Indicator (SDI) survey (WHO, 2015) and the Service Provision Assessment (SPA) (WHO, 2015). Specifically, the tool was designed to assess:

- water source and quantity/quality in the healthcare facility for drinking, personal hygiene, medical activities, cleaning, laundry and cooking;
- toilets;
- handwashing stations with water and soap; and
- waste disposal system that involves having a plan for safely segregating, disposing and destroying waste.

To collect WSH information in hospital inspection systems, MoH representatives were asked about existing healthcare facilities inspection system; WSH indicators and values; national policy on WSH in healthcare facilities; mechanism to coordinate WSH between healthcare facilities and other relevant stakeholders; national standards on WSH in healthcare facilities and national bodies who are engaged in monitoring compliance with WSH standards.

Data collection

Informed verbal consent was taken from each health facility director before data collection. The hospitals were assessed by one observer who was trained to assess and use the tool. The assessor introduced himself to the hospital's director, explained the study's purpose and asked permission to conduct the assessment. The hospital director assigned a responsible person to accompany the assessor during the assessment.

Data management and analysis

Questionnaires were checked for error and completeness. During data analysis, facilities were reclassified to reflect their correct facility type. Continuous data were described using means and standard deviations and categorical variables used percentages. Data were analyzed using the Statistical Package for Social Sciences (SPSS, IBM, version 20).

Results

Hospital characteristics

Hospital beds ranged from 15 to 433 with a mean 138.4 beds per hospital. Total physicians ranged from 10 to 340 and nurses from 25 to 485. Median physicians and nurses were 50 and 200, respectively. All hospitals had a committee or a unit overseeing WSH.

Water source and its functionality

Public/municipal water was the main source in all hospitals. There was enough water for staff and patient needs including drinking and handwashing in 16 (84.2 percent) hospitals and most times in three (15.8 percent) hospitals.

Drinking water

Bottled water or tap water with filtration was the main source for staff, patients and visitors in most hospitals. Tap water with no filtration was the main source for patients in three hospitals (15.8 percent) and for visitors in four (21.1 percent); mainly in small hospitals. Drinking water facilities in hospitals ranged from 7 to 110. One hospital had no drinking water facilities and two had only one for visitors. Overall, 97 percent of all drinking water facilities were functional. Table I shows important measures regarding drinking water facilities in the hospitals. Overall, drinking water facilities for all users per 100 beds was 25 (34.2 in small and 22.2 in large hospitals). Drinking water facilities per 100 staff ranged from 2.3 to 14.1 with a mean 7.3 facilities. Drinking water facilities for patients per 100 beds ranged from 3.8 to 26.9 with a mean 12.4 facilities. Drinking water facilities for visitors per 100 beds ranged from 0 to 15.4 with a mean 6.4 facilities. Functioning drinking water facilities in hospitals ranged from 76.1 to 100 percent.

A disposable drinking vessel during the visit was used by people to drink water in 11 (57.9 percent) hospitals. In five hospitals (26.3 percent), people drank water directly from the faucet or hand pump spout and in two hospitals (10.5 percent), people shared a drinking vessel.

Water for other purposes

Water used for medical care was reported to be sufficient all the time in almost all hospitals. It was intermittent in one hospital. Water was either disinfected in 36.8 percent or filtered in 11 hospitals (57.9 percent). In most hospitals, water for food preparation or housekeeping or laundry was either filtered or disinfected.

Water facilities and services: important indicators

In summary, all healthcare facilities (100 percent) had a safe water sources and the majority had a functional water source all the time (84.2 percent), providing enough water for needs (Table II). Water was sufficient and available always for drinking, food preparation, personal hygiene, medical activities, cleaning and laundry in 94.7 percent of hospitals.

	Size of the hospital				Total	
	≤ 120 beds (9 hospitals)		> 120 beds (10 hospitals)		Range	Mean (SD)
	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)
Drinking water facilities per 100 staff	2.7-14.1	8.6 (4.0)	2.3-9.1	6.2 (2.3)	2.3-14.1	7.3 (3.3)
Drinking water facilities for patients per 100 beds	4.2-26.9	16.7 (7.5)	3.8-15.51	8.5 (3.6)	3.8-26.9	12.4 (7.0)
Drinking water facilities for visitors per 100 beds	0.0-15.4	7.0 (5.6)	2.3-8.1	5.9 (2.3)	0.0-15.4	6.4 (4.1)
Total drinking water facilities for all users per 100 beds		34.2		22.20		25.0
Functioning drinking water facilities (%)	76.1-100.0	97.3 (8.0)	80.0-100.0	96.6 (6.6)	76.1-100.0	97.0 (7.1)

Table I.
Drinking water
facilities in
selected hospitals

Toilets and handwashing facilities

Hospitals toilets for patients ranged from 10 to 126 (median = 50), from 4 to 110 for staff (median = 21), and from 0 to 24 for people with special needs (median = 9) (Table III). One hospital had no toilets for patients with special needs. The percentage that was functioning at the inspection was 89.6 percent. Among hospital toilets, 78.9 percent had handwashing basins with soap. Toilets, their functionality and handwashing basins, and soap in all hospitals are shown in Table III. Table IV shows important measures regarding toilet availability. Toilets for inpatients per 100 beds ranged from 10.8 to 119.4 with a median 26.5.

Latrines and their cleanliness

Latrines in three hospitals were pit type, an improved pit latrine in five hospitals, flush toilets in ten hospitals and a pour-flush toilet (one hospital). All or most toilets were clean at inspection. Toilets used by patients were all clean in seven (36.8 percent) hospitals, most were clean in ten (52.6 percent) and some were clean in two (10.2 percent). Not all toilets used by staff in seven (36.9 percent) hospitals were clean and not all toilets for patients with special needs were clean in ten hospitals.

Sanitation: important indicators

All hospital inpatients settings had improved and gender separated toilets (one per 20 users) and 84.2 percent had the same in outpatient settings (at least five toilets; one for male and one for female staff, one for male and female patients, and one for patients with special needs) (Table V).

Table II.
Water facilities
and services

Indicator	Size of the hospital					
	≤ 120 beds		> 120 beds		All hospitals	
	(N = 9)	(N = 10)	(N = 10)	(N = 10)	(N = 19)	(N = 19)
	n	%	n	%	N	%
The facility has a safe water source (improved water source)	9	100.0	10	100.0	19	100.0
The facility has a safe and functional water source (improved water source)	8	88.9	8	80.0	16	84.2
The facility has sufficient water that is available always for drinking, food preparation, personal hygiene, medical activities, cleaning and laundry	9	100.0	9	90.0	18	94.7

Table III.
Toilet functionality,
handwashing basins
and soap

Total number of toilets	Range	Median	Mean	Total	Functioning N (%)	Handwashing basins and soap N (%)
For patients	10-126	50	55.4	1,052	912 (86.7)	775 (73.7)
For staff	4-110	21	32.1	609	568 (93.3)	519 (85.2)
For people with special needs	0-24	9	9.8	187	175 (93.6)	164 (87.7)
Total for all users	18-260	81	97.3	1,848	1,655 (89.6)	1,458 (78.9)

Table IV.
Important measures
regarding toilets in
selected hospitals

	Range	Median	Mean (SD)
Toilets for inpatients per 100 bed	10.8-119.4	26.5	31.6 (25.0)
Toilets for outpatients per daily outpatients	1.5-60.0	3.7	14.1 (16.4)
Toilets per staff (inpatients setting)	3.7-80.0	10.8	17.4 (17.8)
Toilets per staff (outpatients setting)	0.0-40.8	14.3	17.1 (10.4)

Handwashing and showering facilities

Wards with > 20 beds and ≤ 20 beds had 30.3 (median = 35) and 21.2 (median = 16) washing facilities for patients, respectively. Mean handwashing facilities for staff in wards with > 20 beds and ≤ 20 beds were 15.6 and 14.5, respectively. Handwashing facilities for patients and staff were missing in wards with ≤ 20 beds in three hospitals. Showering facilities for patients ranged from 3 to 55 (median = 20) and for staff, they ranged from 0 to 30 with a median 11. Most facilities were functioning. One hospital had no showering facilities for staff.

Hygiene: important indicators

Overall, 84.2 percent had sufficient and functioning handwashing basins with soap and water, and 79.0 percent had sufficient showers (Table VI).

Wastewater

Wastewater disposal used the public sewage in 16 (84.2 percent) hospitals, on-site treatment plant in one and septic tanks in two hospitals (10.2 percent).

Healthcare waste

Healthcare waste segregation at generation is practiced in all hospitals. All had sufficient containers for healthcare waste, separate hazardous and non-hazardous healthcare waste collection, and separate storage area for hazardous and non-hazardous healthcare waste. Two hospitals did not have sufficient trolleys for internal hazardous healthcare waste collection.

Indicator	Hospital size		Hospital size		Total	
	≤120 beds		> 120 beds		Total	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
Sufficient improved and gender separated toilets in inpatients settings (one per 20 users)	9	100.0	10	100.0	19	100.0
Sufficient improved and gender separated toilets in outpatient settings (at least five toilets; one for male staff, one for female staff, one for male patients, for female patients, and one for patients with special needs)	6	66.7	10	100.0	16	84.2
All toilets have convenient handwashing facilities close by	7	77.8	8	80.0	15	79.0

Table V.
Hospitals that met the sanitation indicators according to hospital size

Indicator	Size of the hospital		Size of the hospital		Total	
	≤ 120 beds		> 120 beds		Total	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
There are sufficient and functioning handwashing basins with soap and water ^a available in the health facility	6	66.7	10	100.0	16	84.2
Sufficient showers ^b	7	77.8	8	80.0	15	79.0

Notes: ^aAt least two functioning handwashing basins with soap and water in all inpatient wards with more than 20 beds/at least one functioning handwashing basin with soap and water in all inpatient wards with 20 beds or less/at least five functioning handwashing basins in outpatient settings; ^bat least one shower is available for 40 patients and at least one shower for 40 staff in inpatient settings^c

Table VI.
Hospitals meeting hygiene indicators

All hospitals have a safe healthcare waste management policy, a committee/unit in charge and adequate healthcare waste training programs. Healthcare waste in on-site treatment facilities was not correctly operated and maintained in two hospitals.

WSH services coverage in the healthcare facilities inspection system

The existing healthcare facilities inspection system in Jordan includes WSH components such as water and healthcare waste, which includes sanitation for hospitals with wastewater treatments units only. However, the annual MoH report does not include WSH service data. Jordan's public hospitals have public health divisions that are responsible for environmental health services, namely: food safety; vector control; water quality; housekeeping and medical waste management. Large private hospitals have health, safety and environment divisions, which are responsible for environmental health services within the healthcare facilities. The WSH indicators reported routinely by the health facility inspection staff include: drinking water bacteriological quality (free residual chlorine and coliform presence/absence) and medical waste final treatment and disposal.

Discussion

Jordan's health system is a complex amalgam (three major sectors): public; private and donors. The public sector includes two major public programs that finance and deliver care; i.e.: MoH and Royal Medical Services. The main health service provider in Jordan is the public service, complemented by the private sector, international and charitable organizations, such as the United Nations Relief and Works Agency, non-government organizations and others. Universal basic WSH coverage in healthcare facilities by 2030 is a target that has been recommended for inclusion in the post-2015 UN Sustainable Development Goals. Global health initiatives, such as "Every Woman Every Child," the integrated "Global Action Plan against Pneumonia and Diarrhea" and care quality during childbirth highlights basic, universal healthcare facility WSH services (WHO, 2014). There are limited data on WSH in healthcare facilities. The three most common healthcare facility surveys with water and sanitation indicators are the SARA, SDI and SPA. However, water and sanitation indicator definitions, which vary between assessments, making it difficult to compare data from different sources, often fall short of WHO minimum standards, and do not cover important WSH aspects. Furthermore, most data do not account for reliability, quantity, safety or sanitation service functionality. Therefore, an assessment tool was developed specifically for assessing healthcare facility WSH services, which considered quality, quantity and functionality. Our assessment tool was designed to generate key WSH service core indicators, which can be used to provide objective information about whether a facility consistently meets basic or specific WSH services.

According to the 2014 UN-Water Global Analysis and Assessment of Sanitation and Drinking water (GLAAS) findings, only one quarter of countries have healthcare facility WSH policies implemented. In Jordan, there is a national healthcare facility WSH policy. However, there is a weak mechanism to coordinate WSH between healthcare facilities and other relevant stakeholders at local level. Other than technical guidelines for drinking water quality, national healthcare facility WSH standards are lacking. For water quality only, there is an appropriate national body that is engaged in monitoring compliance with healthcare facility WSH standards and officials are trained on the national standards on drinking water quality.

Targets for basic healthcare facility WSH coverage are also lacking. About half (52 percent) the 94 GLAAS countries do not have hygiene targets, 35 percent do not have targets for sanitation and 44 percent do not have water targets. These figures imply inadequate WSH policies in healthcare facilities. The WHO (2015) report reviewed information from 18 national and subnational sources on WSH service availability in

90 healthcare facilities from 54 low- and middle-income countries. The review showed that 38 percent did not have safe water sources, 19 percent did not have proper sanitation and 35 percent did not have water and soap for handwashing. Our Jordan survey showed that all healthcare facilities had a safe water source and most (84.2 percent) had functional water source all the time to provide enough water for needs. All hospitals had gender separated toilets in inpatients settings (one per 20 users) and 84.2 percent had the same in outpatient settings (at least five toilets; one for male and one for female staff, one for male and one for female patients, and one for patients with special needs). Overall, 84.2 percent of Jordan's hospitals had sufficient and functioning handwashing basins with soap and water, and 79.0 percent had sufficient showers.

Data from the EMR are limited. Healthcare facility WSH data are available in only four EMR countries (Afghanistan, Egypt, Morocco and Sudan). A subnational Integrated Management of Childhood Illness survey demonstrated 96 and 91 percent water coverage in Morocco and Sudan, respectively. Egypt's SPA national survey showed 88 percent water coverage and a subnational UNICEF survey in Afghanistan reported low water coverage (56 percent). Data on sanitation and hygiene coverage were only available from Afghanistan and Egypt. Hygiene coverage was moderate in both countries (72 and 71 percent, respectively), still far less than the required 100 percent coverage. Sanitation coverage was shown to be 91 percent in Afghanistan and 78 percent in Egypt.

The Patient Safety Friendly Hospital Initiative (Siddiqi *et al.*, 2012) included one hospital from Egypt, Jordan, Morocco, Pakistan, Sudan, Tunisia and Yemen. In the safe environment domain, this initiative showed that several hospitals were performing poorly. While many hospitals had a waste management system and staff adhered to certain regulations and procedures related to biological and hazardous waste disposal, none met the physical and infrastructural standards that ensure patient safety. In our survey, all hospitals were found to practice healthcare waste segregation at generation have sufficient containers for healthcare waste, separate hazardous and non-hazardous healthcare waste collection, and separate storage area for hazardous and non-hazardous healthcare waste. Two hospitals did not have sufficient trolleys for hazardous healthcare waste collection.

The WSH indicators that are reported routinely by Jordan's health facility inspection system staff include drinking water bacteriological quality (free residual chlorine and coliform presence) and final medical waste treatment and disposal. Water samples are collected routinely (according to the frequency mentioned in the relevant standard) from healthcare facilities by health inspectors and analyzed in the MoH water laboratories to ensure that water quality complies with Jordanian standards. Water storage tanks were inspected to ensure that they are clean and tightly covered. Sanitary inspections are carried out from source to storage to assess any potential contamination within the healthcare facilities. Information on water consumed is available in each healthcare facility. Only two hospitals have wastewater treatment plants; these are visited routinely and inspected. Samples from the final effluent are collected according to the relevant standard and analyzed at MoH Environmental Health Department laboratories to ensure quality follows the required criteria based on treated effluent final reuse. Where hospitals are in areas not served with public sewage networks, health inspectors request receipts that confirm sewage is transported via suction tankers to the nearest municipal wastewater treatment plants.

Jordan's hospitals have made major gains by providing access to drinking water and improved sanitation and in managing healthcare waste. However, there are still some areas needing improvement such as providing toilets for patients with special needs, establishing handwashing basins with water and soap near toilets, maintaining toilets and providing sufficient trolleys for hazardous healthcare waste collection. Efforts are needed to integrate WSH services policies alongside existing national environmental health policies in health facilities, establish national standards and targets for various healthcare facilities to

increase access and improve services, and develop effective mechanisms to ensure compliance with national standards. The WSH indicators might be used as criteria for accrediting healthcare facilities. There is a need to develop and implement WSH monitoring systems or at least support WSH services in routine healthcare service monitoring.

References

- Allegranzi, B., Bagheri, N.S., Combescure, C., Graafmans, W., Attar, H., Donaldson, L. and Pittet, D. (2011), "Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis", *Lancet*, Vol. 15 No. 377, pp. 228-241.
- Askarian, M., Yadollahi, M. and Assadian, O. (2012), "Point prevalence and risk factors of hospital acquired infections in a cluster of university affiliated hospitals in Shiraz, Iran", *Journal of Infection Control and Public Health*, Vol. 5 No. 2, pp. 169-176.
- Balkhy, H.H., Cunningham, G., Chew, F.K., Francis, C., Al Nakhli, D.J., Almuneef, M.A. and Memish, Z.A. (2006), "Hospital and community-acquired infections: a point prevalence and risk factors survey in a tertiary care center in Saudi Arabia", *International Journal of Infectious Diseases*, Vol. 10 No. 4, pp. 326-333.
- Hashemi, S.H., Esna-Ashari, F., Tavakoli, S. and Mamani, M. (2013), "The prevalence of antibiotic resistance of enterobacteriaceae strains isolated in community- and hospital-acquired infections in teaching hospitals of Hamadan, west of Iran", *Journal of Research in Health Sciences*, Vol. 13 No. 1, pp. 75-80.
- McCormack, J.G. and Barnes, M. (1983), "Nosocomial infections in a developing middle east hospital", *Infection Control*, Vol. 4 No. 5, pp. 391-395.
- Oza, S., Lawn, J.E., Hogan, D.R., Mathers, C. and Cousens, S.N. (2015), "Neonatal cause-of-death estimates for the early and late neonatal periods for 194 countries: 2000-2013", *Bulletin of the World Health Organization*, Vol. 93 No. 1, pp. 19-28.
- Siddiqi, S., Elasady, R., Khorshid, I., Fortune, T., Leotsakos, A., Letaief, M. and Qsoos, S. (2012), "Patient safety friendly hospital initiative: from evidence to action in seven developing country hospitals", *International Journal for Quality in Health Care*, Vol. 24 No. 2, pp. 144-151.
- Velleman, Y., Mason, E., Graham, W., Benova, L., Chopra, M., Campbell, O., Gordon, B., Wijesekera, S., Hounton, S., Esteves Mills, J., Curtis, V., Afsana, K., Boisson, S., Magoma, M., Cairncross, S. and Cumming, O. (2014), "From joint thinking to joint action: A call to action on improving water, sanitation, and hygiene for maternal and newborn Health", *PLoS Medicine*, Vol. 11 No. 12, p. e1001771.
- WHO (2008), *Essential Environmental Health Standards in Health Care*, World Health Organization, Geneva.
- WHO (2014), "UN-Water global analysis and assessment of sanitation and drinking-water (GLAAS) 2014 report", Investing in water and sanitation: increasing access, reducing in inequalities, World Health Organization, Geneva.
- World Health Organization (2016), "Health care-associated infections. Fact sheet", available at: www.who.int/gpsc/country_work/gpsc_ccisc_fact_sheet_en.pdf (accessed August 2016).
- World Health Organization (WHO) (2015), *Water, Sanitation and Hygiene in Health Care Facilities: Status in Low and Middle Income Countries and Way Forward*, World Health Organization, Geneva.

Further reading

- Health Statistics and Information Systems, WHO (2015) "Service availability and readiness assessment (SARA): an annual monitoring system for service delivery", Reference Manual, Version 2.2.

Appendix. Water, sanitation and hygiene (WSH) within healthcare facilities assessment questionnaire

Location (City): _____	
Type	<input type="checkbox"/> Hospital; Type: _____
Size	Total beds: [] Average outpatients/month: [] Total physicians: [] Total nurses: [] Total Inpatient staff: [] Total Outpatient staff: []

Does the healthcare facility have a unit or a committee or a person in charge of water, sanitation and hygiene? 1. no 2. unit 3. committee 4. person

Water

A. Source of water (Please ask the facility representative)

1. Public/municipal water 2. Well inside the facility 3. well outside the facility 4. Trucks

1. What is the main water source in the facility? (check the sources that are most commonly used) 5. Rain water 6. other (please specify) _____

2. Is the water source functional? (Does it provide enough water for the needs of the facility, including water for drinking and handwashing?) 1. Always 2. Most Times 3. Sometimes 4. Not functional

B. Drinking water

Water availability and adequacy (please observe and complete the table below)

	Total number of facilities	Number functioning at inspection time	Source of water drinking: 1. Tap water with no filtration 2. Tap water with filtration 3. Bottled water 4. Tap water and bottled water
Drinking water for staff			
Drinking water for patients			
Drinking water for visitors			

What vessel (cup, glass, etc.) do people use to drink water? 1. A disposable drinking vessel 2. A shared drinking vessel

3. Directly from the faucet or handpump spout 4. Other (please specify) _____

C. Water for other purposes (Please ask the facility representative and fill the table below)

Purpose	Availability 1. Sufficient all the time; 2. Sufficient most of the time; 3. Intermittent; 4. Not applicable	Quality 1. Disinfected; 2. Boiled; 3. Filtered; 4. other treatment (please specify); 5. Not treated; 6. Not applicable
Medical care		
Food preparation		
Housekeeping		
Laundry		

D. Management aspects (Please ask the facility representative and answer the questions below)

- Has water quality been tested in the last year? <input type="checkbox"/> 1. No <input type="checkbox"/> 2. Yes	
If water quality has been tested in the last year:	
- How often was water quality tested? <input type="checkbox"/> 1. Monthly <input type="checkbox"/> 2. Quarterly <input type="checkbox"/> 3. Yearly	
- What % of water samples met the national standards? [%]	
- By whom is water quality tested?	<input type="checkbox"/> 1. Healthcare facility staff <input type="checkbox"/> 2. MoH <input type="checkbox"/> 3. Other (please specify):
- Does the healthcare facility have a water safety plan? <input type="checkbox"/> 1. No <input type="checkbox"/> 2. Yes	

Sanitation and Hygiene

A. Sanitation and hand washing facilities

Availability and adequacy (please observe and complete the table below)

	Total number of toilets *				Number functioning at inspection time	Cleanness 1. All are clean 2. Most are clean 3. Some are clean 4. None is clean	Number of toilets with:		
	Inpatient		Outpatient				Hand washing basins in or next to toilet room	Hand washing basins having soap	hand washing basins having hot water
	Male	Female	Male	Female					
For Patients									
For Staff									
For people with special needs									

*For health centers fill the outpatients only. For hospitals fill both inpatient and outpatient

- What type of toilet facilities are there in the health facility?

1. pit latrine 2. improved pit latrine 3. flush toilet 4. pour-flush toilet 5. composting toilet

- Do the toilets provide privacy and security? 1. all 2. most 3. some 4. none

B. Hand washing for staff basic hand hygiene and showering facilities (hospitals only)

For hospitals only	Number of hand washing facilities		Number of showering facilities	Number of showering facilities functioning at inspection time
	Wards with more than 20 beds	Wards with less than 20 beds		
For patients				
For staff				

How wastewater is disposed of? 1. Public sewage system 2. On-site treatment plant
 3. Septic tank/soakaway pit 4. Other (please specify)

Healthcare waste

A. Healthcare waste (please observe and complete the table below)

Is healthcare waste segregation practiced at the point of generation? (e.g. sharps, non-sharps infectious waste, non-sharps noninfectious, etc.)	<input type="checkbox"/> 1. No	<input type="checkbox"/> 2. Yes
Are there sufficient containers for healthcare waste?	<input type="checkbox"/> 1. No	<input type="checkbox"/> 2. Yes
What is the average generation rate of healthcare waste? (Please use one of the following waste generation units: Kg/day or kg/bed/day or Kg/patient/day):	Amount :[] Unit:[]	
Are there separate collection of hazardous and non-hazardous healthcare wastes?	<input type="checkbox"/> 1. No	<input type="checkbox"/> 2. Yes
Are there separate storage area for storage of hazardous and nonhazardous healthcare waste?	<input type="checkbox"/> 1. No	<input type="checkbox"/> 2. Yes
Are there sufficient trolleys for internal collection of hazardous healthcare waste?	<input type="checkbox"/> 1. No	<input type="checkbox"/> 2. Yes

B. Management aspects (Please ask the facility representative and answer the questions below)

Does the hospital have a policy for the safe management of healthcare waste?	<input type="checkbox"/> 1. No	<input type="checkbox"/> 2. Yes		
Does the hospital have a committee/unit in charge of healthcare waste management?	<input type="checkbox"/> 1. No	<input type="checkbox"/> 2. unit	<input type="checkbox"/> 3. committee	<input type="checkbox"/> 4. person
Do you have adequate training programme on healthcare waste?	<input type="checkbox"/> 1. No	<input type="checkbox"/> 2. Yes		
How many staff are trained each year on healthcare waste?	[]/year			
Are healthcare waste on-site treatment facilities correctly operated and maintained?	<input type="checkbox"/> 1. No	<input type="checkbox"/> 2. Yes		

C. Treatment and disposal (Please ask the facility representative and answer the questions below)

How healthcare wastes are treated and disposed?						
On-site	<input type="checkbox"/> 1. No treatment	<input type="checkbox"/> 2. Incineration	<input type="checkbox"/> 3. Non-incineration technology (autoclave, microwave, etc.)	<input type="checkbox"/> 4. Burial	<input type="checkbox"/> 5. Open burning	<input type="checkbox"/> 6. Other treatment (please specify)
Off-site	<input type="checkbox"/> 1. No treatment	<input type="checkbox"/> 2. Incineration	<input type="checkbox"/> 3. Non-incineration technology (autoclave, microwave, etc.)	<input type="checkbox"/> 4. Burial	<input type="checkbox"/> 5. Open burning	<input type="checkbox"/> 6. Other treatment (please specify)

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