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Chapter

Water, Sanitation, and Hygiene (WASH) and Infection Prevention and Control (IPC) in Primary Healthcare Facilities in Jordan in the Context of COVID-19

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Abstract

Water, Sanitation, and Hygiene (WASH) and Infection prevention and control (IPC) are essential for preventing and containing outbreaks of disease. Nowadays, infection prevention is getting more attention due to the COVID-19 pandemic. The assessment of WASH/IPC indicators in the health sector is a major step in the preparation and management of such a pandemic. A facility-wide WASH and IPC assessment is the cornerstone for designing, developing, and implementing specific WASH and IPC activities at healthcare facilities. This type of assessment helps to identify and prioritize surveillance and prevention activities at the facility and provide healthcare policy makers at all levels with the evidence to strengthen WASH services and infection control policies, practices, and resources in health facilities. Moreover, this helps to motivate facilities to intensify efforts where needed to prevent, respond to, and control the spread of COVID-19. An assessment was conducted in primary healthcare facilities in Jordan to identify the strengths and gaps in the WASH and IPC practices, activities, and resources and to identify areas for quality improvement. This report demonstrates the results of a nationwide assessment of 33 healthcare centres. The assessment included eight domains (areas) pertaining to WASH/IPC with more than 150 indicators. The assessment tools were developed and adapted from the Water and Sanitation for Health Facility Improvement Tool (WASH FIT), the Infection Prevention and Control (IPC) Assessment Framework (IPCAF), Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care, the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) tool, and COVID-19 Technical Guidance by WHO. The assessment revealed some deficiencies in basic WASH/IPC indicators such as lack of clear guidelines that support the management of health centres in planning and leadership, shortfalls in the budget needed to strengthen the infrastructure of WASH/IPC, inconsistent or under-provisioned training and education programmes for the development of staff skills to lead, plan, manage, and improve WASH/IPC at their facilities. Moreover, the report identified the unmet WASH/IPC needs at centres that should be addressed by policy makers and stakeholders as soon as possible for further steps of consideration in policy development. The report ends with specific recommendations to improve WASH/IPC services and practices.

Keywords: water, sanitation, hygiene, infection control

1. Introduction

1.1 Infection prevention and control (IPC)

Infection prevention and control (IPC) is a scientific approach and practical solution designed to prevent harm caused by infection to patients and health workers. In health facilities, IPC cannot be met without water, sanitation, and hygiene (WASH) services that provide the basis for adequate IPC. In the context of COVID-19, poor or inadequate WASH and IPC services and practices lead to transmission of the infection from healthcare facilities to communities and exacerbate the outbreak and spread of infections. The World Health Organization (WHO) in collaboration with the United Nations Children's Fund (UNICEF) 2015 Report underlined the importance of adequate WASH in healthcare facilities for the prevention of infections and spread of disease and for protecting staff and patients' health, dignity, and privacy [1]. WASH services strengthen the resilience of healthcare systems to prevent disease outbreaks, allowing effective responses to emergencies (including natural disasters and outbreaks), and bringing emergencies under control when they occur.

IPC has an immense role in reducing disease transmission generally and in healthcare facilities specifically; this fact has been well established in many studies. Madge et al. (1992) concluded that several IPC measures significantly reduced the incidence of nosocomial respiratory syncytial virus in the sample groups they observed [2]. According to Ershova et al. (2018), in middle-income countries, the employment of the IPC programme was highly effective in preventing nosocomial infection and in reducing antibiotic resistance [3]. Conducting evaluation studies for IPC in healthcare facilities helps find gaps and mistakes that should be corrected for the IPC programme to be more efficient and effective. In Jordan, this type of evaluation is seldom carried out. A survey of nosocomial IPC capacity among radiographers in Jordan reported moderate knowledge of IPC practices and that future training and improvement are needed [4]. Another study was conducted among nurses from 9 different hospitals in Jordan regarding safe injection handling. The study recommended focused and effective infection control educational programmes in Jordanian hospitals [5].

1.2 Water, sanitation, and hygiene (WASH)

WASH is the acronym of Water, Sanitation, and Hygiene. It has a major impact on public health and its importance is recognized globally. In 2015 members of the United Nations agreed on 17 Sustainable Development Goals; these goals require urgent actions from all countries [6]. The first two targets in SDG 6 (Ensure availability and sustainable management of water and sanitation for all) are focused on the availability of clean affordable water and proper conditions of sanitation and hygiene [7].

Proper WASH conditions are essential for the protection of human health during all types of disease outbreaks including the ongoing COVID-19 pandemic. According to WHO, routinely applied WASH and waste management in homes, communities, schools, marketplaces, and healthcare facilities help to prevent the viral transmission that causes COVID-19 [8]. Prüss et al. (2002) have estimated the global disease burden from water, sanitation, and hygiene to be 4.0 per cent of all deaths and 5.7 per cent of the total disease burden (in DALYs) [9].

According to Khader (2017), despite the major advancement Jordan has made in IPC by providing access to drinking water and improving sanitation and health waste management, several areas are yet to be improved in the Jordanian healthcare setting. Also, it is advisable to establish and implement a WASH monitoring system for the healthcare system [10].

1.3 Water

Water is essential to humans, not only for nourishment but also for better sanitation and hygiene. Each year, about 3,000 children under the age of 5 years old die from diarrhoeal disease resulting from lack of safe drinking water, hygiene, and sanitation; it also causes death to more than 829,000 humans each year [11]. The availability and quality of water are very strong factors in public health. According to the UNICEF, 663 million people do not have access to clean drinking water and nearly 60 million people use untreated water from unsafe sources like rivers [12, 13]. Jordan is ranked as the world's-second most-water scarce country with 100 m³ per person, 400 m³ less than the severe water scarcity threshold, and more than 50 per cent receive water once every week [12]. Regarding COVID-19, clean water is very crucial in controlling the pandemic as about 1.8 billion people globally use fecal contaminated water; this water can serve as an alternative route of infection [14]. The Hospital Water Supply as a Source of Nosocomial Infections study by Anaissie et al. (2002) mentioned that an estimated number of 1,400 annual deaths in the United States due to waterborne nosocomial lung infections caused by *Pseudomonas aeruginosa* alone [15]. A recently published article in *Infection Control and Hospital Epidemiology* by Stuckey et al. (2020) reviewed the National Health care Safety Network annual reports from 4929 hospitals in the United States. They reported that 1 in 10 hospitals did not have a water management programme and some hospitals did not include some basic practices like water temperature and disinfectant monitoring [16]. Hospitals in Low- and middle-income countries suffer from water shortage. Chawla et al. (2016) reported in their study, a systematic review that included 22 hospital in the LMICs area providing surgical services, that more than one-third of the hospital did not have a reliable water source. They recommended that both governments and non-governmental organizations should direct more effort to enhance the water infrastructure of hospitals [17].

1.4 Medical waste and sanitation facilities

Medical waste is a dangerous pollutant that may contain viruses, bacteria, chemical substances, and even radioactive waste. It must not be taken for granted as it can act as a source of infection and limit the efforts in controlling an outbreak, not to mention its environmental impact. Since the beginning of COVID-19 pandemic medical waste has increased significantly and managing it became more difficult [18]. It is important to evaluate waste management for an accurate infection prevention assessment. In Jordan, less than 78 per cent of sanitation systems are managed safely and one-third of schools have basic sanitation services [12]. Several studies found that viral materials of the SARS-COV2 virus (RNA) can be found in human waste like blood and stool [19–21]. A recent study by Chen et al. (2020) tested human waste for SARS-COV2 viral shedding and found that fecal samples of COVID-19 patients remained positive for the virus after the pharyngeal swabs turned negative; this means that a patient that tests negative might excrete the virus by fecal route. The study also suggests that the fecal-oral transmission may be another way for this virus to be transmitted. Wastewater epidemiology is a relatively new discipline and it was mainly used to detect drugs in wastewater to

estimate drug use in a population. However, it is now applied to detect pathogens including SARS-COV2 as the first report of its detection in an Australian study by Ahmed et al. (2020) was followed by a number of studies that all recommended a safe wastewater management to help fighting the pandemic [22].

1.5 Hygiene

Hygiene is a term used to describe the behaviors performed to achieve a level of cleanliness that can lead to good health and provide a range of infection prevention. It includes practices like hands and face washing, douching with water and soap, and other personal hygiene etiquettes. Good hygiene practices have an immense effect on public health. A simple act like hand washing can reduce the risk of foodborne diseases that spread by hand, and can reduce the mortality of diarrhoeal associated diseases by 50 per cent [23]. Hand hygiene has a great impact in preventing nosocomial infections especially multidrug-resistant infections. Yet, studies estimated global compliance with hand hygiene in healthcare to be only around 40 per cent [24]. Przekwas and Chen (2020) have mentioned that, besides hand washing, washing the face is also recommended to prevent COVID-19 transmission as they stated that the virus may accumulate in some areas of the face and can then be inhaled [25]. Using the WHO methodology, a recent study in Tanzania compared hospitals that received WASH training and hospitals that did not receive it. It was shown that the compliance rate of hand hygiene was significantly higher among hospitals with the WASH training programme [26].

1.6 Assessment tools

Different studies have used different assessment tools. Recommendations on the suitability of different tools were made after the studies. A study was conducted by Tomczyk et al. (2020) to assess the WHO IPCAF at acute healthcare facilities in 46 counties. The study concluded that this is a necessary tool, and is effective for the improvement of IPC in health facilities [27]. Aghdassi et al. (2020) used the WHO IPCAF in their assessment and have stated in their paper that it was a useful tool that can detect shortfalls even in high-income settings at acute health facilities [28]. Maina et al. (2019) have reported in their paper, which examined WASH-FIT and WASH-FAST tools, that WASH-FIT is the tool of choice to assess WASH in smaller facilities. On the one hand, WASH-FAST is more suitable for hospitals at regional level [29]. On the other, a comprehensive study assessing different tools for WASH assessment has reported that none of the tools that they studied was comprehensive and concrete enough for assessing healthcare facility WASH activities [30].

2. Objectives

A facility-wide WASH and IPC assessment is the cornerstone for designing, developing, and implementing specific WASH and IPC activities at healthcare facilities. This type of assessment helps identify and prioritize surveillance and prevention activities at the facility, based on the risk of acquiring and transmitting infections in the facility [1, 23, 31]. This report will provide healthcare policy makers at the national, district, and facility levels with the evidence and the action plans needed to strengthen WASH services and infection control policies, practices, and resources in health facilities and to motivate facilities to intensify efforts where needed to prevent, respond to, and control the spread of COVID-19. This report identifies areas for quality improvement in primary healthcare facilities, including

strengthening WASH and IPC policies and standards that will lead to lower infection rates, better health outcomes for patients and improved safety and morale. It also identifies the strengths and gaps in the WASH and IPC practices, activities, and resources in the primary healthcare facilities in Jordan in the context of COVID-19.

3. Methods

A national assessment of WASH and IPC in primary healthcare facilities, including primary health centres and comprehensive health centres, was conducted in Jordan during the period October–November 2020. A multistage cluster-sampling technique proportional to the size of the facility was used for the selection of health centres. A sampling frame of all MoH health centres was obtained from the MoH and stratified according to region (North, Middle, and South), facility type (primary health centres and comprehensive centres). A random sample of health centres was selected from each stratum. A total of 11 primary healthcare centres and 22 comprehensive centres were selected.

A comprehensive assessment tool was developed for healthcare centres based on the review and adaptation of several tools, mainly the Water and Sanitation for Health Facility Improvement Tool (WASH FIT) [32]. WASH FIT covers four broad domains and comprises 65 indicators, aiming to achieve minimum standards for maintaining a safe and clean environment. WASH FIT is primarily designed for use in primary healthcare facilities that provide outpatient services. The assessment tools developed included more indicators and standards from other tools such as: ‘The Infection Prevention and Control Assessment Framework’ (IPCAF) [33]; the Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care [34]; The Systems for Improved Access to Pharmaceuticals and Services (SIAPS) tool, and the coronavirus disease (COVID-19) technical guidance by WHO [8].

The health centre assessment tool covered eight broad areas (Domains): (1) Water, (2) Medical waste and sanitation facilities, (3) Hygiene, (4) Management, (5) Infection prevention and control programme, (6) Training and education, (7) Evaluation and feedback, and (8) COVID-19 precautionary measures. The Hygiene domain covered areas related to hand hygiene and facility environment, cleanliness and disinfection. The Infection prevention and control programme area was divided into subareas including (a) Basic indicators, (b) Guidelines in IPC unit, (c) Training and education for the Infection Prevention and Control Unit, (d) Healthcare associated infection monitoring, (e) Monitoring/auditing of infection control practices and outcomes, (f) Personal protective equipment, and (g) Availability of hygiene materials. Evaluation and feedback covered subareas including (a) Basic Indicators, (b) Respiratory safety, (c) Environmental cleaning, and (d) Sterilization of Reusable Devices.

Each area/subarea included indicators and targets for achieving minimum standards for maintaining a safe and clean environment. These standards are based on global standards as set out in the WHO Essential environmental health standards in health care [35] and the WHO Guidelines on core components of infection prevention and control programmes at the national and acute healthcare facility level [33]. The assessment tool included WASH-FIT indicators in addition to other indicators identified from available tools. Indicators were adapted to Jordan’s needs and local priorities and/or national standards in order to meet quality improvement cycles and mechanisms implemented to improve quality of care. Indicators that are not relevant were removed. Additional indicators were added as necessary to represent levels of services.

A committed team with leadership skills and who are familiar with and trained on WASH and IPC was formed. The assessment team was composed of 12 assessors who were divided into three teams; one team for each region. The team had support

from the MoH leadership and from facility's administration. A training workshop was held to train the assessment team on the assessment process, data collection, and use of assessment tools. During the workshop, the assessment team members were made aware of the assessment tools and their roles and responsibilities.

The assessment teams planned their visits to the health centres with the senior facility manager. During the facility visit, the assessment team worked with the facility team including those who have in-depth understanding and knowledge of WASH and IPC activities at the facility level to fill the assessment tool. If there were no professionals in charge of WASH and IPC or there was not yet an IPC programme established, the tool was completed by the team with the consultation with the senior facility manager. The IPC team consulted with other relevant teams in the facility to respond to questions accurately.

A comprehensive assessment of the facility was conducted using the agreed list of indicators and each indicator was recorded as whether it meets, partially meets, or does not meet, the minimum standards. The assessment forms were reviewed by supervisors to ensure all information is clear and correct and all members of the team agree on the findings of each assessment. As part of the assessment, hygiene promotion materials, WASH and IPC guidelines and budget were reviewed and observed.

The percentage of indicators, which meet or partially meet the standards, was calculated for each facility. The overall facility score (the percentage of all indicators meeting the standards) was calculated to make comparisons over time when future assessments are conducted. The mean percentages over all facilities were calculated. Data were described using means and percentages.

4. Results

4.1 Health centres' characteristics

A total of 33 healthcare centres were assessed using WASH and IPC assessment tools. One-third of these centres (n = 11, 33.3 per cent) were primary healthcare centres and 22 (66.7 per cent) were comprehensive health centres. Of all assessed health centres, 39.4 per cent were in the North of Jordan, 33.3 per cent in the Middle and 27.3 per cent in the South of the country.

Table 1 shows the characteristics and capacity of the 33 assessed health centres in Jordan. Primary healthcare centres were more consistent in the number of the medical staff they have than comprehensive healthcare centres; the median number of medical staff in each category was two for most specialties, while the median number of medical staff in the comprehensive healthcare centres ranged from two to six.

4.2 The WASH and IPC indicators

Table 2 shows the mean percentage of WASH and IPC indicators over health centres that met the targets for each assessed area in both the primary and comprehensive healthcare centres. Each assessed area has a different number of indicators. The mean percentages of indicators that met the targets considerably varied among various WASH/IPC areas and type of health centres.

Almost 61.7 per cent of water indicators in all health centres (64.9 per cent in comprehensive health centres and 55.2 per cent in primary centres) met the targets. However, only half of the medical waste and sanitation indicators (49.1 per cent) met the target. Almost two-thirds of hand hygiene indicators (64.2 per cent) and

Number	Primary healthcare centre			Comprehensive healthcare centre			Total		
	Min.	Max.	Median	Min.	Max.	Median	Min.	Max.	Median
Doctors	1	6	2	2	25	6	1	25	5
Nurses	0	8	2	1	8	3	0	8	3
Midwives	0	6	2	1	6	2	0	6	2
Lab technicians	0	4	1	1	11	3	0	11	2
Radiology technicians	0	0	0	0	5	2	0	5	1
Pharmacists	1	6	2	1	9	3	1	9	3
Ambulance	0	0	0	0	1	0	0	1	0
MoH health technicians/inspectors	0	2	0	0	8	0.5	0	8	0

Table 1.
The characteristics and capacity of the 33 assessed health centres in Jordan.

environmental cleanliness and disinfection indicators (65.0 per cent) met the target. Only 41.8 per cent of management indicators (27.3 per cent in primary centres and 49.1 per cent in comprehensive centres) met the targets. While two-thirds of indicators pertaining to guidelines in IPC unit met the target, only 40.3 per cent of basic indicators of IPC programming, 38.4 per cent of indicators of the training and education for the Infection Prevention and Control Unit, and 43.4 per cent of the targets for healthcare-associated infection monitoring indicators were met. Moreover, 66.3 per cent of ‘Monitoring/auditing of infection control practices and outcomes’ indicators, 62.6 per cent of ‘Personal protective equipment’ indicators, 55.8 per cent of the ‘Availability of hygiene materials’ indicators, 44.7 per cent of the ‘Training and education’ indicators, 38.8 per cent of the ‘Respiratory safety’ indicators, and 48.5 per cent of the ‘Environmental cleaning’ indicators met the targets. The mean percentages of ‘COVID-19 precautionary measures’ indicators (49.7 per cent) that met the target were relatively low in both types of healthcare centres.

As expected, the mean percentages of indicators that had met the targets were higher for comprehensive healthcare centres than that for primary centres in all assessed WASH/IPC areas. For example, the mean percentage of ‘respiratory safety’ indicators in primary healthcare centres (14.5 per cent) was much lower than the mean percentage of ‘respiratory safety’ indicators in comprehensive healthcare centres (50.9 per cent).

4.3 Water indicators

The percentage of primary healthcare centres that met the target for most water indicators were lower than comprehensive care centres, except for a few indicators, as demonstrated in **Table 3**. The percentage of health centres that met water indicators varied between 21.2 per cent and 100 per cent. Improved drinking-water supply and the availability of hot water was weak in both primary and comprehensive healthcare centres. Less than two-thirds of centres had clean drinking-water available and accessible to all at all times and in all locations, had drinking-water safely stored in a clean bucket/tank with cover and tap, had water tanks cleaned annually, had an emergency water tank available, and had hot water available in the health centres. On the other hand, meeting the target for indicators related to the availability and functionality of water supply was high in both types of healthcare centres, and even higher in primary care centres, reaching 100 per cent.

Area	Number of indicators assessed	Type of health centre				Total (N = 33)	
		Primary (N = 11)		Comprehensive (N = 22)		Mean %	SD
		Mean %	SD	Mean %	SD		
Water	14	55.2	15.7	64.9	20.2	61.7	19.1
Medical waste and sanitation	16	39.2	20.2	54.0	24.3	49.1	23.8
Hygiene							
Hand hygiene	5	54.5	37.0	69.1	27.4	64.2	31.1
Environmental cleanliness and disinfection	11	61.2	19.5	66.9	12.4	65.0	15.1
Management	10	27.3	28.0	49.1	31.3	41.8	31.6
Infection prevention and control programme							
Basic indicators	7	29.9	30.3	45.5	30.4	40.3	30.8
Guidelines in IPC unit	12	48.5	39.4	77.3	29.3	67.7	35.2
Training and education for the Infection Prevention and Control Unit	3	30.3	37.9	42.4	41.4	38.4	40.1
Healthcare-associated infection monitoring	3	24.2	36.8	53.0	33.6	43.4	36.8
Monitoring/auditing of infection control practices and outcomes	8	51.1	32.3	73.9	16.3	66.3	24.9
Personal protective equipment	9	46.5	24.8	70.7	21.3	62.6	25.0
Availability of hygiene materials	5	52.7	33.8	57.3	29.8	55.8	30.7
Training and education	4	34.1	35.8	50.0	40.1	44.7	38.9
Evaluation and feedback							
Basic indicators	2	63.6	45.2	77.3	33.5	72.7	37.7
Respiratory safety	5	14.5	20.2	50.9	34.2	38.8	34.6
Environmental cleaning	2	31.8	33.7	56.8	41.7	48.5	40.5
Sterilization of reusable devices	2	81.8	33.7	100	0.0	93.9	20.8
COVID-19 precautionary measures	17	42.8	23.1	53.2	19.9	49.7	21.3

Table 2.
The mean percentage of indicators that met the targets in each assessed area.

Fortunately, the percentage of healthcare centres that fully met the target was greater than the percentage of centres that partially met the target for almost all the indicators related to water.

4.4 Medical waste and sanitation

The targets for many indicators related to toilet provision were met by very few primary healthcare centres and relatively few comprehensive healthcare centres. In addition to the low percentage of centres that met targets for indicators pertaining to the number, functionality, and monitoring of toilets, there were few, if any, toilets that serve people with special needs, or toilets designed to meet menstrual hygiene needs. The difference in the percentage of centres that met the targets for

Water	Primary centres (N = 11)				Comprehensive (N = 22)				Total (N = 33)			
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
	2	18.2	1	9.1	4	18.2	6	27.3	6	18.2	7	21.2
Water services available at all times and of sufficient quantity for all uses	2	18.2	5	45.5	2	9.1	17	77.3	4	12.1	22	66.7
A clean drinking-water is available and accessible for staff, patients and healthcare providers at all times and in all locations/wards	2	18.2	5	45.5	6	27.3	14	63.6	8	24.2	19	57.6
Drinking-water is safely stored in a clean bucket/tank with cover and tap	5	45.5	5	45.5	7	31.8	14	63.6	12	36.4	19	57.6
Water tanks are cleaned annually	0	0.0	4	36.4	0	0.0	10	45.5	0	0.0	14	42.4
Emergency water tank is available	0	0.0	2	18.2	0	0.0	13	59.1	0	0.0	15	45.5
All water end points (i.e., taps) in the health centre are connected to an available and functioning water supply	0	0.0	10	90.9	5	22.7	17	77.3	5	15.2	27	81.8
Water services are available throughout the year (i.e., not affected by seasonality, climate change-related extreme events or other constraints)	0	0.0	11	100	0	0.0	22	100	0	0.0	33	100
Water storage is sufficient to meet the needs of the health centre for two days	0	0.0	11	100	0	0.0	21	95.5	0	0.0	32	97.0
Water is treated and collected for drinking with standards that meet WHO performance standards	0	0.0	8	72.7	3	13.6	15	68.2	3	9.1	23	69.7
Drinking-water has appropriate chlorine residual (0.2 mg/L or 0.5 mg/L in emergencies) or 0 <i>E. coli</i> /100 ml and is not turbid	0	0.0	7	63.6	3	13.6	17	77.3	3	9.1	24	72.7
The health centre water supply is regulated according to national water quality standards	0	0.0	9	81.8	0	0.0	21	95.5	0	0.0	30	90.9
Hot water is available in the health centre	4	36.4	3	27.3	13	59.1	4	18.2	17	51.5	7	21.2
Water heating indicator is available	0	0.0	4	36.4	0	0.0	9	40.9	0	0.0	13	39.4

Table 3.
 Percentage of health centres that meet the target for each indicator of 'Water' according to the type of health Centre.

indicators pertaining to toilets was obvious between comprehensive and primary healthcare centres (**Table 4**).

Some targets were met by most primary and comprehensive healthcare centres, such as wastewater management (72.7 per cent and 77.3 per cent, respectively), and

disposal of domestic waste (90.9 per cent and 100 per cent, respectively). However, the percentage of primary centres that met the target for indicators like sorting of waste and the availability of a trained liaison officer for waste management were higher than comprehensive healthcare centres.

4.5 Hygiene

4.5.1 Hand hygiene

Hand hygiene indicators were generally good at both the primary and the comprehensive healthcare centres; there were more centres that fully met the target than centres that partially met the target (**Table 5**). Over 70 per cent of healthcare centres were reported to have functioning and adequately available hand-hygiene stations that were supplied with water and soap. However, almost half of the centres had clearly displayed sign boards for hand hygiene (posters), had functioning hand-hygiene stations in waste disposal areas, and had regular hand-hygiene compliance activities.

4.5.2 Environmental cleanliness and disinfection

The target for many indicators for cleanliness and disinfection were met by most healthcare centres (**Table 6**). The percentage of primary healthcare centres that met the target was close to the percentage for comprehensive healthcare centres, but were quite different for centres that partially met the target. Two indicators —‘record of cleaning’ and ‘laundry facilities’—were met by few centres only, and one-third of healthcare centres provide at least two pairs of gloves, apron, and boots for each cleaning and waste disposal staff member.

4.6 Management

Less than half of healthcare centres met the target for indicators related to the management of WASH, except for the availability of ‘a dedicated WASH or IPC coordinator’ and ‘a written job description that is clear and legible for all staff’ which were achieved by 57.6 per cent of centres. An annual planned budget for the centre that includes WASH infrastructure and service was available at 15.2 per cent of centres only, with none of the primary healthcare centres having completely met the target. However, there was a higher percentage of healthcare centres that completely met the target than those that partially met the target, except for few indicators in the primary healthcare centres like the availability of an annual budget, a protocol for operation and maintenance, and the availability of cleaners and WASH maintenance staff (**Table 7**).

4.7 Infection prevention and control programme

4.7.1 Basic indicators

One-third of primary healthcare centres (36.4 per cent) and two-thirds of comprehensive healthcare centres (63.6 per cent) have an IPC programme. Nonetheless, an IPC team or focal person was not available at most healthcare centres (**Table 8**). IPC objectives were clearly defined in 42.4 per cent of the health centres. Although the leadership in most healthcare centres shows full commitment to support the IPC programme in the centre, most centres lack the ability to support an appropriate

Medical waste and sanitation	Primary centres (N = 11)				Comprehensive (N = 22)				Total (N = 33)			
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
Number of available and usable toilets in the health centre for patients	1	9.1	5	45.5	2	9.1	16	72.7	3	9.1	21	63.6
Toilets are clearly separated for staff and patients	4	36.4	2	18.2	6	27.3	12	54.5	10	30.3	14	42.4
Toilets are clearly separated for male and female	2	18.2	1	9.1	3	13.6	14	63.6	5	15.2	15	45.5
At least one toilet provides the means to meet menstrual hygiene needs	1	9.1	3	27.3	2	9.1	11	50.0	3	9.1	14	42.4
At least one toilet meets the needs of people with special needs (reduced mobility)	0	0.0	0	0.0	2	9.1	10	45.5	2	6.1	10	30.3
Functioning hand-hygiene stations within 5 metres of the toilets	0	0.0	4	36.4	2	9.1	8	36.4	2	6.1	12	36.4
Record of toilet cleaning is visible and signed by the cleaners each day	5	45.5	1	9.1	6	27.3	6	27.3	11	33.3	7	21.2
Wastewater is safely managed through the use of on-site treatment (i.e., septic tank, followed by drainage pit) or sent to a functioning sewer system	1	9.1	8	72.7	1	4.5	17	77.3	2	6.1	25	75.8
Greywater (i.e., rainwater or wash water) drainage system is in place that diverts water away from the health centre (i.e., no standing water) and also protects nearby households	0	0.0	3	27.3	2	9.1	4	18.2	2	6.1	7	21.2
Toilets are adequately lit, including at night	2	18.2	7	63.6	5	22.7	15	68.2	7	21.2	22	66.7
A trained liaison officer is responsible for the management of healthcare waste in the health centre	2	18.2	6	54.5	7	31.8	10	45.5	9	27.3	16	48.5
There are functional waste collection containers in close proximity to all waste generation points for non-infectious (general) waste, infectious waste, and sharps waste	4	36.4	5	45.5	9	40.9	13	59.1	13	39.4	18	54.5
Wastes are correctly sorted at all waste generation points	1	9.1	9	81.8	5	22.7	14	63.6	6	18.2	23	69.7
Functional burial pit/fenced waste dump or municipal pick-up available for disposal domestic waste	0	0.0	10	90.9	0	0.0	22	100	0	0.0	32	97.0
Protocol or standard operating procedure (SOP) for safe	2	18.2	2	18.2	2	9.1	13	59.1	4	12.1	15	45.5

Medical waste and sanitation	Primary centres (N = 11)		Comprehensive (N = 22)				Total (N = 33)					
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
management of healthcare waste clearly visible and legible												
Appropriate protective equipment for all staff in charge of waste treatment and disposal	6	54.5	3	27.3	10	45.5	5	22.7	16	48.5	8	24.2

Table 4.
Percentage of health centres that meet the target for each indicator of “medical waste and sanitation” according to the type of health Centre.

Hand hygiene	Primary centres (N = 11)		Comprehensive (N = 22)				Total (N = 33)					
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
Functioning hand-hygiene stations are adequately available at all care points	2	18.2	8	72.7	2	9.1	20	90.9	4	12.1	28	84.8
Functioning hand-hygiene stations are adequately available at all care points and supplied with water, liquid soap, or alcohol-based hand rub	1	9.1	8	72.7	4	18.2	18	81.8	5	15.2	26	78.8
There are sign boards for hand hygiene (posters) clearly displayed in an understandable manner in key areas	4	36.4	5	45.5	5	22.7	13	59.1	9	27.3	18	54.5
Functioning hand-hygiene stations are available in waste disposal areas	2	18.2	4	36.4	1	4.5	12	54.5	3	9.1	16	48.5
Hand-hygiene compliance activities are undertaken regularly	1	9.1	5	45.5	5	22.7	13	59.1	6	18.2	18	54.5

Table 5.
Percentage of health centres that meet the target for each indicator of ‘hand hygiene’ according to the type of health Centre.

IPC system, such as a microbiological laboratory (33.3 per cent) or an early-detection system (15.2 per cent).

4.7.2 Guidelines in IPC unit

A higher percentage of comprehensive healthcare centres met the targets compared to primary healthcare centres for all indicators of the IPC guideline (**Table 9**). Almost 48.5 per cent of health centres have policies and procedures for disease

Environmental cleanliness and disinfection in the health centre	Primary centres (N = 11)				Comprehensive (N = 22)				Total (N = 33)			
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
The exterior of the health centre is well-fenced, kept generally clean (free from solid waste, stagnant water, no animal and human feces in or around the health centre premises, etc.)	2	18.2	8	72.7	0	0.0	21	95.5	2	6.1	29	87.9
There is a container assembly area managed by the municipality	0	0.0	10	90.9	0	0.0	19	86.4	0	0.0	29	87.9
General lighting sufficiently powered and adequate to ensure safe provision of health care including at night (mark if not applicable)	5	45.5	6	54.5	5	22.7	16	72.7	10	30.3	22	66.7
Floors and work surfaces are clean	1	9.1	10	90.9	1	4.5	20	90.9	2	6.1	30	90.9
Appropriate and well-maintained materials for cleaning (i.e., detergent, mops, buckets, etc.) are available	3	27.3	8	72.7	2	9.1	19	86.4	5	15.2	27	81.8
At least two pairs of household cleaning gloves, one pair of overalls or apron, and boots in a good state are available for each cleaning and waste disposal staff member	2	18.2	4	36.4	3	13.6	7	31.8	5	15.2	11	33.3
At least one member of staff can demonstrate the correct procedures for cleaning and disinfection and apply them as required to maintain clean and safe rooms	1	9.1	8	72.7	2	9.1	14	63.6	3	9.1	22	66.7
A mechanism exists to track supply of IPC-related materials (such as gloves and protective equipment) to identify stock-outs	1	9.1	7	63.6	1	4.5	15	68.2	2	6.1	22	66.7
Record of cleaning is visible and signed by the cleaners each day	1	9.1	1	9.1	2	9.1	5	22.7	3	9.1	6	18.2
Health centre's laundry is available to wash linen from patient beds between each patient	0	0.0	2	18.2	2	9.1	7	31.8	2	6.1	9	27.3
The health centre has sufficient natural ventilation and, where the climate allows, large opening windows, skylights and other vents to optimize natural ventilation	1	9.1	10	90.9	3	13.6	19	86.4	4	12.1	29	87.9

Table 6. Percentage of health centres that meet the target for each indicator of 'environmental cleanliness and disinfection in the health Centre' according to the type of health Centre.

outbreak management and a preparedness system, 45.5 per cent have policies and procedures for antibiotic usage, 48.5 per cent of health centres had trained healthcare workers on the new or updated IPC guidelines, and 57.6 per cent of

Management	Primary centres (N = 11)		Comprehensive (N = 22)				Total (N = 33)					
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
WASH FIT or other quality improvement/management plan for the health centre is in place, implemented and regularly monitored	1	9.1	3	27.3	3	13.6	10	45.5	4	12.1	13	39.4
An annual planned budget for the centre is available and includes funding for WASH infrastructure, services, personnel and the continuous procurement of WASH items	2	18.2	0	0.0	4	18.2	5	22.7	6	18.2	5	15.2
An up-to-date diagram of the health centre management structure is clearly visible and legible	0	0.0	4	36.4	2	9.1	12	54.5	2	6.1	16	48.5
Adequate cleaning and WASH maintenance staff are available	7	63.6	3	27.3	9	40.9	12	54.5	16	48.5	15	45.5
There is a protocol for operation and maintenance, including procurement of WASH supplies, that is visible, legible and implemented	3	27.3	1	9.1	1	4.5	8	36.4	4	12.1	9	27.3
Regular department-based audits are undertaken to assess the availability of hand rub, soap, single-use towels and other hygiene resources	4	36.4	4	36.4	3	13.6	12	54.5	7	21.2	16	48.5
New healthcare personnel receive IPC training as part of their orientation programme	3	27.3	2	18.2	2	9.1	13	59.1	5	15.2	15	45.5
Healthcare staff are trained on WASH/IPC each year (at least)	2	18.2	2	18.2	4	18.2	9	40.9	6	18.2	11	33.3
The health centre has a dedicated WASH or IPC coordinator	0	0.0	6	54.5	0	0.0	13	59.1	0	0.0	19	57.6
All staff have a job description written clearly and legibly, including WASH-related responsibilities, and are regularly appraised on their performance	1	9.1	5	45.5	1	4.5	14	63.6	2	6.1	19	57.6

Table 7.

Percentage of health centres that meet the target for each indicator of 'management' according to the type of health Centre.

health centres regularly monitor the implementation of at least some of the IPC guidelines in the health centre.

Further, there was a large difference between the percentage of primary healthcare centre and comprehensive healthcare centres that met the target for the following indicators: the availability of policies and procedures for transmission-based precautions (45.5 per cent versus 86.4 per cent), policies and procedures for prevention of infection during treatment (36.4 per cent versus 77.3 per cent), and

Infection prevention and control programme: Basic indicators	Primary centres (N = 11)				Comprehensive (N = 22)				Total (N = 33)			
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
Have an IPC programme at the health centre	0	0.0	4	36.4	4	18.2	14	63.6	4	12.1	18	54.5
The health centre has a full-time ICP team or a specialist	3	27.3	3	27.3	10	45.5	7	31.8	13	39.4	10	30.3
IPC team or the focal person have dedicated time for IPC activities	1	9.1	2	18.2	8	36.4	10	45.5	9	27.3	12	36.4
IPC objectives are clearly defined in the health centre	2	18.2	2	18.2	6	27.3	12	54.5	8	24.2	14	42.4
Does the senior leadership team in the health centre show clear commitment and support for the IPC programme?	0	0.0	7	63.6	0	0.0	16	72.7	0	0.0	23	69.7
Does the health centre have microbiological laboratory support (either on or off site) for routine day-to-day use?	1	9.1	3	27.3	1	4.5	8	36.4	2	6.1	11	33.3
The health centre has an early-detection system and deals with potentially contagious individuals at early meeting points	0	0.0	2	18.2	0	0.0	3	13.6	0	0.0	5	15.2

Table 8.

Percentage of health centres that meet the target for each indicator of 'infection prevention and control programme: Basic indicators' according to the type of health Centre.

monitoring the implementation of at least some of the IPC guidelines (27.3 per cent versus 72.7 per cent).

4.7.3 Training and education for the infection prevention and control unit

Although 60.6 per cent of health centres have an employee who leads the IPC training, healthcare workers, cleaners or other workers receiving training in IPC is reported by few centres (27.3 per cent); primary (18.2 per cent) or comprehensive (31.8 per cent). However, some centres were reported to have partially met the target; about one-third of centres met the target for receiving training regarding IPC for healthcare workers (39.4 per cent) and cleaners (33.3 per cent) (Table 10).

4.7.4 Healthcare-associated infection monitoring

Surveillance was mainly conducted for epidemic-prone infections, as indicated by almost two-thirds of healthcare centres (60.6 per cent). Furthermore, surveillance for colonization or infections caused by multidrug-resistant pathogens was conducted by about one-fifth of healthcare centres (21.2 per cent), and about a half of them (48.5 per cent) conducted surveillance for infections that may affect healthcare workers in clinical, laboratory, or other settings, like the hepatitis virus (Table 11).

Guidelines in IPC unit	Primary centres (N = 11)				Comprehensive (N = 22)				Total (N = 33)			
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
The health centre has policies and procedures for standard precautions	0	0.0	7	63.6	0	0.0	19	86.4	0	0.0	26	78.8
The health centre has policies and procedures for hand hygiene	0	0.0	8	72.7	0	0.0	19	86.4	0	0.0	27	81.8
The health centre has policies and procedures for transmission-based precautions	0	0.0	5	45.5	0	0.0	19	86.4	0	0.0	24	72.7
The health centre has policies and procedures for outbreak management and preparedness system	0	0.0	4	36.4	0	0.0	12	54.5	0	0.0	16	48.5
The health centre has policies and procedures for prevention of infection during treatment	0	0.0	4	36.4	0	0.0	17	77.3	0	0.0	21	63.6
The health centre has policies and procedures for disinfection and sterilization	0	0.0	6	54.5	0	0.0	19	86.4	0	0.0	25	75.8
The health centre has policies and procedures for healthcare worker protection and safety	0	0.0	6	54.5	0	0.0	19	86.4	0	0.0	25	75.8
The health centre has policies and procedures for injection safety	0	0.0	8	72.7	0	0.0	20	90.9	0	0.0	28	84.8
The health centre has policies and procedures for waste management	0	0.0	7	63.6	0	0.0	19	86.4	0	0.0	26	78.8
The health centre has policies and procedures for antibiotic usage	0	0.0	3	27.3	0	0.0	12	54.5	0	0.0	15	45.5
Healthcare workers receive specific training related to new or updated IPC guidelines introduced in the health centre	0	0.0	3	27.3	0	0.0	13	59.1	0	0.0	16	48.5
The implementation of at least some of the IPC guidelines in the health centre are regularly monitored	0	0.0	3	27.3	0	0.0	16	72.7	0	0.0	19	57.6

Table 9.

Percentage of health centres that meet the target for each indicator of 'guidelines in IPC unit' according to the type of health Centre.

4.7.5 Monitoring/auditing of infection control practices and outcomes

The targets for some infection control practices were well met by most comprehensive healthcare centres. For instance, monitoring of cleaning and disinfection was performed in 100 per cent of comprehensive healthcare centres and monitoring alcohol-based hand rub was performed in 95.5 per cent of them. In contrast, a low percentage of primary healthcare centres met the target for any indicator, except for disinfection and alcohol-based hand rub monitoring indicators, which were at 81.8 per cent each (Table 12).

Training and education for the Infection Prevention and Control Unit	Primary centres (N = 11)		Comprehensive (N = 22)				Total (N = 33)					
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
There are personnel with the IPC expertise (in IPC and/or infectious diseases) who lead IPC training	0	0.0	6	54.5	0	0.0	14	63.6	0	0.0	20	60.6
The number of times healthcare workers receive training regarding IPC in the health centre	3	27.3	2	18.2	10	45.5	7	31.8	13	39.4	9	27.3
Number of times cleaners and other personnel directly involved in patient care receive training regarding IPC in the health centre	4	36.4	2	18.2	7	31.8	7	31.8	11	33.3	9	27.3

Table 10.
 Percentage of health centres that meet the target for each indicator of 'training and education for the infection prevention and control unit' according to the type of health Centre.

Healthcare-associated infection monitoring	Primary centres (N = 11)		Comprehensive (N = 22)				Total (N = 33)					
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
Surveillance is conducted for colonization or infections caused by multidrug-resistant pathogens based on the local epidemiological situation	0	0.0	2	18.2	0	0.0	5	22.7	0	0.0	7	21.2
Surveillance is conducted for epidemic-prone infections, e.g., norovirus, influenza, tuberculosis (TB), severe acute respiratory syndrome (SARS), and COVID-19	0	0.0	4	36.4	0	0.0	16	72.7	0	0.0	20	60.6
Surveillance is conducted for infections that may affect healthcare workers in clinical, laboratory, or other settings, e.g., hepatitis B or C, human immunodeficiency virus (HIV), and influenza	0	0.0	2	18.2	0	0.0	14	63.6	0	0.0	16	48.5

Table 11.
 Percentage of health centres that meet the target for each indicator of 'healthcare-associated infection monitoring' according to the type of health Centre.

Monitoring of transmission-based precautions to prevent the spread of multidrug-resistant organisms (MDRO) was conducted by about one-quarter of primary healthcare centres (27.3 per cent) and one-fifth of comprehensive healthcare centres (22.7 per cent).

4.7.6 Personal protective equipment

There was a considerable wide range of difference for PPE indicators in the percentage of healthcare centres that met the target. Some indicators such as 'HCP

Monitoring/auditing of infection control practices and outcomes	Primary centres (N = 11)				Comprehensive (N = 22)				Total (N = 33)			
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
Hand-hygiene compliance (using the WHO hand-hygiene observation tool or equivalent) is monitored regularly	0	0.0	2	18.2	0	0.0	12	54.5	0	0.0	14	42.4
Transmission-based precautions and isolation to prevent the spread of multidrug-resistant organisms (MDRO) are monitored regularly	0	0.0	3	27.3	0	0.0	5	22.7	0	0.0	8	24.2
Cleaning of the health centre is monitored regularly	0	0.0	7	63.6	0	0.0	22	100	0	0.0	29	87.9
Disinfection and sterilization of medical equipment/instruments are monitored regularly	0	0.0	9	81.8	0	0.0	22	100	0	0.0	31	93.9
Consumption/usage of alcohol-based hand rub or soap is monitored regularly	0	0.0	9	81.8	0	0.0	21	95.5	0	0.0	30	90.9
Waste management is monitored regularly in the health centre	0	0.0	6	54.5	0	0.0	18	81.8	0	0.0	24	72.7
Monitoring and feedback of IPC processes and indicators are performed in a “blame-free” institutional culture aimed at improvement and behavioral change	0	0.0	2	18.2	0	0.0	10	45.5	0	0.0	12	36.4
For all employees, there is an easily available, up-to-date list of reportable diseases (to the MoH)	0	0.0	7	63.6	0	0.0	20	90.9	0	0.0	27	81.8

Table 12.

Percentage of health centres that meet the target for each indicator of ‘monitoring/auditing of infection control practices and outcomes’ according to the type of health Centre.

do not wear the same gown for the care of more than one patient’ and ‘wearing protection for the mouth, nose, and eyes during procedures that are likely to generate splashes or sprays of blood or other body fluids’ were met by 36.4 per cent and 39.4 per cent of centres, respectively. Comparatively, other indicators, such as ‘wearing gloves’ and ‘replacing gloves after each patient’ were met by 90.9 per cent and 81.8 per cent of centres, respectively, as illustrated in **Table 13**. A higher percentage of comprehensive healthcare centres met the target compared to primary healthcare centres for all indicators.

4.7.7 Availability of hygiene materials

As seen in **Table 14** only one-quarter of healthcare centres (24.2 per cent) reported the availability of a single-use towels at each sink. However, most healthcare centres of both types reported the availability of soap at each sink (81.8 per cent). Alcohol-based hand rub was available in 57.6 per cent of health centres. On the other hand, less than half of centres (42.4 per cent) have a dedicated budget

Personal protective equipment	Primary centres (N = 11)				Comprehensive (N = 22)				Total (N = 33)			
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
Healthcare providers (HCP) that use personal protective equipment (PPE) receive training on how to use them properly	0	0.0	2	18.2	0	0.0	14	63.6	0	0.0	16	48.5
Compliance in using PPE is routinely reviewed and monitored	0	0.0	2	18.2	0	0.0	13	59.1	0	0.0	15	45.5
Suitable and sufficient PPE is easily accessible by healthcare providers	0	0.0	5	45.5	0	0.0	14	63.6	0	0.0	19	57.6
HCP wear gloves for potential contact with blood, body fluids, mucous membranes, non-intact skin, or contaminated equipment	0	0.0	9	81.8	0	0.0	21	95.5	0	0.0	30	90.9
HCP do not wear the same pair of gloves for the care of more than one patient	0	0.0	9	81.8	0	0.0	18	81.8	0	0.0	27	81.8
HCP wear proper gowns to protect skin and clothing during procedures or activities where contact with blood or body fluids is anticipated	0	0.0	6	54.5	0	0.0	19	86.4	0	0.0	25	75.8
HCP do not wear the same gown for the care of more than one patient	0	0.0	1	9.1	0	0.0	11	50.0	0	0.0	12	36.4
HCP wear mouth, nose, and eye protection during procedures that are likely to generate splashes or sprays of blood or other body fluids	0	0.0	4	36.4	0	0.0	9	40.9	0	0.0	13	39.4

Table 13.
 Percentage of health centres that meet the target for each indicator of ‘personal protective equipment’ according to the type of health Centre.

for the procurement of hand-hygiene products (e.g., alcohol-based hand rubs) or any other way to ensure its availability.

4.8 Training and education

The targets for two training indicators are met by one-third of healthcare centres (33.3 per cent): receiving ‘training regarding hand hygiene’ and ‘training assessors to verify compliance with hand hygiene’. The target for the other two indicators are met by more than half of centres: ‘instructions on hand hygiene’ (54.5 per cent), and ‘safe injection training’ (57.6 per cent). In addition, comprehensive healthcare centres met the target at a higher percentage—partially or completely—than primary healthcare centres (Table 15).

4.9 Evaluation and feedback

4.9.1 Basic indicators and respiratory safety

Most healthcare centres reported that hand hygiene is performed correctly (84.8 per cent) and regular reviews are done to assess the availability of hand-hygiene

Availability of hygiene materials	Primary centres (N = 11)				Comprehensive (N = 22)				Total (N = 33)			
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
Alcohol-based hand rub is available in the health centre	5	45.5	6	54.5	9	40.9	13	59.1	14	42.4	19	57.6
Liquid soap is available at each sink	2	18.2	9	81.8	3	13.6	18	81.8	5	15.2	27	81.8
Single-use towels are available at each sink	4	36.4	2	18.2	11	50.0	6	27.3	15	45.5	8	24.2
There is a dedicated budget for the procurement of hand-hygiene products (e.g., alcohol-based hand rubs) or any other way to ensure its availability	0	0.0	5	45.5	0	0.0	9	40.9	0	0.0	14	42.4
Supplies needed for adherence to hand hygiene (e.g., soap, water, paper towels, alcohol-based hand rubs) are readily available to healthcare providers in patient-care areas	0	0.0	7	63.6	0	0.0	17	77.3	0	0.0	24	72.7

Table 14.

Percentage of health centres that meet the target for each indicator of 'availability of hygiene materials' according to the type of health Centre.

Training and education	Primary centres (N = 11)				Comprehensive (N = 22)				Total (N = 33)			
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
Healthcare workers receive training regarding hand hygiene in the health centre	1	9.1	3	27.3	12	54.5	8	36.4	13	39.4	11	33.3
Posters or instructions on hand hygiene in health care are displayed to all healthcare workers	2	18.2	6	54.5	6	27.3	12	54.5	8	24.2	18	54.5
There is a system in place to train assessors to verify compliance with hand hygiene	1	9.1	2	18.2	6	27.3	9	40.9	7	21.2	11	33.3
Healthcare providers who prepare and/or administer parenteral drugs receive training in safe injection practices	1	9.1	4	36.4	4	18.2	15	68.2	5	15.2	19	57.6

Table 15.

Percentage of health centres that meet the target for each indicator of 'training and education' according to the type of health Centre.

materials (60.6 per cent), as shown in **Table 16**. One-quarter of centres reported that they review the availability of hand-hygiene materials (24.2 per cent), but not regularly.

Evaluation and feedback: Basic indicators and respiratory safety	Primary centres (N = 11)				Comprehensive (N = 22)				Total (N = 33)			
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
Hand hygiene is performed in the health centre correctly	0	0.0	8	72.7	0	0.0	20	90.9	0	0.0	28	84.8
At department level, regular reviews are conducted (at least annually) in order to assess the availability of soaps, hand sanitizers, single-use towels, and other hand-hygiene resources	2	18.2	6	54.5	6	27.3	14	63.6	8	24.2	20	60.6
The health centre has policies and procedures for dealing with people who exhibit signs and symptoms of respiratory infections, starting from the point of admission to the health centre and continuing for the duration of the follow up	0	0.0	2	18.2	0	0.0	11	50.0	0	0.0	13	39.4
Face masks are offered upon admission to the health centre to cough patients and other people with symptoms, at least, during periods of increased respiratory tract infection in the community	0	0.0	1	9.1	0	0.0	5	22.7	0	0.0	6	18.2
Space is provided in waiting rooms, and people with symptoms of respiratory infections are encouraged to sit as far away from others as possible	0	0.0	0	0.0	0	0.0	14	63.6	0	0.0	14	42.4
The health centre educates healthcare providers on the importance of infection prevention measures to contain respiratory secretions to prevent the spread of respiratory diseases	0	0.0	2	18.2	0	0.0	16	72.7	0	0.0	18	54.5
Signboards and posters are displayed on entrances with instructions for patients with symptoms of respiratory infection in order to practice respiratory hygiene/cough etiquette (covering the mouth/nose when coughing or sneezing, using and disposing of tissues), and perform hand hygiene	0	0.0	3	27.3	0	0.0	10	45.5	0	0.0	13	39.4

Table 16. Percentage of health centres that meet the target for each indicator of 'evaluation and feedback: Basic indicators and respiratory safety' according to the type of health Centre.

Less than half of healthcare centres met the target for indicators related to respiratory safety, except for educating healthcare providers on the importance of infection prevention measures, which was met by 54.5 per cent of the centres. This overall low percentage of meeting the target was attributed to the low percentage of primary healthcare centres that met the target, which was lower than 20 per cent

for most indicators, as demonstrated. It is noteworthy to mention that none of the primary healthcare centres met the target for providing space in waiting rooms or encourage people with symptoms of respiratory infections to sit apart from others. However, the target for this indicator was met by 63.6 per cent of comprehensive healthcare centres.

4.9.2 Environmental cleaning and sterilization of reusable devices

About two-thirds of healthcare centres (63.6 per cent) met the target for using disinfectants according to manufacturer's instructions, and one-third (33.3 per cent) met the target for wearing PPE by staff involved in cleaning. However, cleaning of devices and packaging after cleaning were properly done by all comprehensive healthcare centre (100 per cent) and 81.8 per cent of primary healthcare centres (Table 17).

4.10 COVID-19 precautionary measures

The percentage of healthcare centres that met the target, partially or completely, varied widely among the different COVID-19 precautionary measures (Table 18). A low percentage of centres met the targets for some indicators, like emergency training of staff, or checking the temperature and breathing of staff or patients before entering the centre (18.2 per cent, each). On the other hand, a high percentage of centres met the targets for other indicators, like the requirements of washing hands frequently (81.8 per cent) or wearing masks (93.9 per cent). More comprehensive healthcare centres, compared to primary centres, met the targets for all

Evaluation and feedback: Environmental cleaning and sterilization of reusable devices	Primary centres (N = 11)		Comprehensive (N = 22)				Total (N = 33)					
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
Cleaners and disinfectants are used in accordance with manufacturers' instructions (e.g., dilution, storage, shelf-life, contact time)	0	0.0	6	54.5	0	0.0	15	68.2	0	0.0	21	63.6
HCP engaged in cleaning wear appropriate PPE to prevent exposure to infectious agents or chemicals (PPE can include gloves, gowns, masks, and eye protection)	0	0.0	1	9.1	0	0.0	10	45.5	0	0.0	11	33.3
Devices are thoroughly cleaned according to manufacturers' instructions and visually inspected for residual dirt prior to sterilization	0	0.0	9	81.8	0	0.0	22	100	0	0.0	31	93.9
After cleaning, the tools are packaged appropriately for sterilization	0	0.0	9	81.8	0	0.0	22	100	0	0.0	31	93.9
The health centre has an emergency team	2	18.2	3	27.3	6	27.3	6	27.3	8	24.2	9	27.3

Table 17.

Percentage of health centres that meet the target for each indicator of 'evaluation and feedback: Environmental cleaning and sterilization of reusable devices' according to the type of health Centre.

COVID-19 precautionary measures	Primary centres (N = 11)				Comprehensive (N = 22)				Total (N = 33)			
	Partially meet target		Meet target		Partially meet target		Meet target		Partially meet target		Meet target	
	n	%	n	%	n	%	n	%	n	%	n	%
All health-centre staff are trained in the emergency programme	2	18.2	1	9.1	6	27.3	5	22.7	8	24.2	6	18.2
Health workers receive special training regarding COVID-19	0	0.0	4	36.4	0	0.0	12	54.5	0	0.0	16	48.5
All employees are asked to distance themselves from the rest of the staff, unless treating patients requires closer proximity	3	27.3	6	54.5	6	27.3	16	72.7	9	27.3	22	66.7
All employees are required to wash their hands frequently	3	27.3	7	63.6	2	9.1	20	90.9	5	15.2	27	81.8
All employees are required to adhere to wearing masks at all times	1	9.1	10	90.9	1	4.5	21	95.5	2	6.1	31	93.9
Health workers in the health centre receive regular tests for COVID-19	3	27.3	4	36.4	10	45.5	7	31.8	13	39.4	11	33.3
Patient appointment times are staggered and distances maintained, as a response to COVID-19 outbreak	5	45.5	3	27.3	13	59.1	5	22.7	18	54.5	8	24.2
Patients are required to wear a mask when they are in the health centre	2	18.2	7	63.6	4	18.2	18	81.8	6	18.2	25	75.8
Patients are required to maintain distance throughout their stay in the health centre	2	18.2	7	63.6	3	13.6	18	81.8	5	15.2	25	75.8
Temperature and breathing problems are checked for all patients before entering the health centre	1	9.1	3	27.3	3	13.6	3	13.6	4	12.1	6	18.2
Temperature and breathing problems are checked for all healthcare workers before entering the health centre	1	9.1	3	27.3	3	13.6	3	13.6	4	12.1	6	18.2
Medical staff treating COVID-19 permitted to socialize with the rest of the health-centre staff	1	9.1	4	36.4	6	27.3	12	54.5	7	21.2	16	48.5
Instructions given to health-centre staff with COVID-19 symptoms, like fever and coughing	4	36.4	6	54.5	7	31.8	12	54.5	11	33.3	18	54.5
There is a monitoring and registration record for all workers infected with the virus	0	0.0	4	36.4	0	0.0	9	40.9	0	0.0	13	39.4
All cases with COVID-19 are transferred to the hospital assigned to treat them.	0	0.0	4	36.4	0	0.0	16	72.7	0	0.0	20	60.6
All cases of COVID-19 are reported to the Ministry of Health	0	0.0	4	36.4	0	0.0	16	72.7	0	0.0	20	60.6

Table 18. Percentage of health centres that meet the target for each indicator of 'COVID-19 precautionary measures' according to the type of health Centre.

indicators of COVID-19 precautionary measures, except for regular testing for COVID-19 and distancing and spacing the timings of appointments. However, these two indicators were met by only one-third (33.3 per cent) and one-quarter of healthcare centres (24.2 per cent), respectively. Moreover, three out of four healthcare centres (75.8 per cent) reported asking patients to wear masks and maintain distances, as shown in **Table 18**. It is interesting that only 60.6 per cent of healthcare centres reported COVID-19 cases to the Ministry of Health.

5. Conclusions

Based on the findings of this assessment, we could identify health facilities that fully met the targets and those that partially met or did not meet the targets. A wide range of performance was noted, and clear differences between facilities in meeting the targets were observed. Thus, healthcare policy makers are urged to develop WASH and IPC national policies and guidelines that set targets for all public and private healthcare facilities in the country. It is essential that healthcare providers in Jordan translate local and national IPC policies into their daily and regular practice. However, IPC policies should be enforced during the COVID-19 pandemic to control the spread of the virus. Developing and implementing a national IPC Action Plan (2021–2024) will assist the integration of IPC practices into the Jordanian healthcare system, which also identify, amend, and correct non-compliance practices with IPC standards. The action plan should be supervised by a national IPC unit, affiliated with, or as part of, the Ministry of Health.

Furthermore, stakeholders and policy makers are urged to institute a quality surveillance system through which standard precautions and transmission-based precautions can be implemented. This surveillance system assists healthcare facilities across Jordan to manage infections through early detection of patients with infectious diseases, immediate implementation of containment measures including the use of PPE and isolation; and measures required to control the spread of COVID-19.

The implementation of the surveillance system and WASH/IPC standards are possible only through capacity building with proper training that is carried out, based on international recommendations, like the WHO recommended procedures for PPE and WASH, for example.

Digital health solutions to enhance healthcare providers' skills and knowledge on WASH and IPC policies could be promising during the COVID-19 pandemic. Such digital health solutions can be designed to train healthcare providers to demonstrate evidence-based practices of infection control and to promote hygiene messages among patients to protect themselves and their families. However, the optimum benefits of precautionary measures and the sustainability of WASH and IPC targets are not achieved without the serious commitments from leaders and managers from all levels (national, provincial, and organizational). Skilful health management is necessary to officially mandate WASH and IPC practices and to provide and maintain necessary human and financial resources to conduct IPC activities. Moreover, medical leadership are expected to show tangible support and act as role models to drive a patient-safety culture, supporting WASH and IPC and all relevant subsequent actions.

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