

Service Availability and Readiness Assessment of Health Facilities in Mina and Arafat during the 2017 Hajj

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تقييم استعداد المنشآت الصحية وتوفير الخدمات أثناء موسم الحج

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ملخص البحث (Abstract):

المقدمة أجرى المركز العالمي لطب الحشود أول تقييم لتوفر الخدمات والاستعدادات في المرافق الصحية التابعة لوزارة الصحة في الأماكن المقدسة (منى وعرفات) خلال موسم حج ١٤٣٧ هـ والذي يهدف إلى تقييم توافر الخدمة، والجاهزية، والتحقق من جودة البيانات في المرافق الصحية في الحج لتسهيل التخطيط واتخاذ القرارات. يصف هذا التقرير نتائج التقييم الثاني والذي أجري خلال موسم حج ١٤٣٨ هـ المنهجية نفذ هذا التقييم بأسلوب الدراسة المستعرضة لتوافر الخدمة والاستعداد لتقديمها في المرافق الصحية التابعة لوزارة الصحة في منى وعرفات. استُمد استبيان الدراسة من أداة جمع بيانات قياسية/معيارية لمنظمة الصحة العالمية، والتي تم تعديلها بما يتماشى مع سياق الحج. تم جمع البيانات في أغسطس وسبتمبر ٢٠١٧ م. النتائج أظهرت النتائج أن غالبية المرافق الصحية لديها الأجهزة والمرافق الأساسية اللازمة لتقديم الخدمات الصحية الأساسية خلال الحج. بعد اعتماد وتطبيق معايير جديدة لتوزيع الممارسين الصحيين عام ١٤٣٨، ارتفعت نسبة الممارسين الصحيين الأساسيين (الأطباء والتمريض) من ٣٤٪ في عام ١٤٣٧ هـ إلى ٤٦٪ في عام ١٤٣٨ هـ إضافة إلى ذلك، كان هناك انخفاض بنسبة ٣٥٪ في متوسط عبء العمل (عدد الاستشارات اليومية / طبيب) في منى وعرفات. وزاد متوسط الوقت الذي قضاه الحاج مع الطبيب خلال الزيارات في مراكز الرعاية الصحية الأولية من ١,٣٥ دقيقة في عام ١٤٣٧ هـ إلى ٢,٣٨ دقيقة في عام ١٤٣٨ هـ الخاتمة سيمثل هذا التقييم لمرافق الرعاية الصحية في الحج قاعدة لتعزيز تقديم الخدمات والأساس للتخطيط والإدارة. إجمالاً، تم تعزيز كثافة وتوزيع الموارد الصحية وبعض مجالات الاستعداد للخدمات خلال موسم الحج ١٤٣٨ هـ هناك حاجة للبناء على هذه النتائج الإيجابية لتحسين معايير توزيع الممارسين الصحيين. ومن بين الاحتياجات الإضافية لاستدامة تعزيز النظام الصحي: برامج التدريب المناسبة، تحسين وتطوير البنية التحتية و تطوير نظم الرصد والمراقبة.

Background The Global Center for Mass Gatherings Medicine (GCMGM) conducted the first Service Availability and Readiness Assessment (SARA) of Ministry of Health (MOH) health facilities in the Holy Places (Mina and Arafat) during the 1437 Hajj. The goal of SARA is to assess service availability, readiness, and to conduct data verification in Hajj health facilities for planning and decision making. This report describes the results of 2nd SARA, which was conducted during the 1438Hajj. Methods The assessment was a cross-sectional survey of service availability and the readiness to provide services in MOH health facilities in Mina and Arafat. The survey questionnaire was derived from a standard set of the World Health Organization (WHO) SARA data collection tool, which was modified in line with the Hajj context. Data collection was conducted in August-September 2017. Results The results showed that the majority of health facilities had the required basic amenities and equipment during Hajj. With the adoption of new standards for the distribution of

Health Care Workers, the percentage of core providers (doctors and nurses) increased from 34% in 1437H to 46% in 1438H. Additionally, there was a corresponding 35% reduction in average workload (Number of daily consultations/doctor), in Mina and Arafat. The average time spent with the doctor during outpatient visits in the PHCs increased marginally from 1.35 minutes in 1437H to 2.38 minutes in 1438H. Conclusion This SARA of healthcare facilities in the Hajj serves as a platform for strengthening service delivery and foundation for planning and management. Overall, the density and distribution of health resources and some service readiness domains strengthened during the 1438 Hajj. There is need to build on these gains to improve the standards for allocation of HCWs. Appropriate training programmes, improved infrastructural development and enhanced surveillance systems are additional needs for sustainable health system strengthening

Introduction

The Hajj is among the largest annual religious mass gatherings (MGs) globally. In 2017, 2,352,122 pilgrims, including 1,752,014 international pilgrims, performed the Muslim pilgrimage in Makkah Kingdom of Saudi Arabia (KSA). The main Hajj rituals are performed within 7-8 days in the city of Makkah and the Holy Places (Mina, Muzdalifah and Arafat). However, extended stays in KSA are not uncommon among international pilgrims due to flight delays and other logistics reasons.

A variety of health risks are reported among pilgrims during the MG. The significant elderly Hajj population with the accompanied high chronic diseases burden and the strenuous Hajj rites are principal risk factors for non-communicable diseases (NCDs), heat illnesses, trauma and certain infectious diseases complications among pilgrims. It is not uncommon for critically ill pilgrims needing specialised services to travel from their countries for the Hajj, either to access the free health services provided by KSA authorities or to fulfil the obligatory Islamic religious rites whenever a rare opportunity presents itself once in their life time. Notwithstanding, increased pilgrims morbidity correspondingly accelerates the demand for health services.

The Saudi Ministry of Health (MOH) provides and regulates health service delivery for pilgrims at the Hajj. [1] In 2017, the MOH deployed 29,262 health personnel and provided free health services to all pilgrims through 126 health facilities in the Hajj areas. In addition, private hospitals in Makkah provided healthcare services for pilgrims. However, without appropriate health insurance coverage for international pilgrims, out-of-pocket payment for health services in private hospitals potentially hindered access to care in these facilities. Non-MOH government hospitals, such as National Guard hospital and Security Guard hospital, which operate in the Hajj areas, also provided health services but coverage was limited to their own personnel during the Hajj. Furthermore, around 60% of countries sending pilgrims to the Hajj provide essentially primary healthcare services for their own pilgrims through clinics that are operated by their medical missions [1] Even for these countries, the demand for health services often exceeds the capacity of their medical missions, in terms of access to care and availability of specialised health services. [4] More so, the operations of foreign medical missions are limited to Makkah, since they are not licensed to operate clinics in the Holy Places.

Considering the significant investments in the Hajj health system, periodic health system performance monitoring is warranted. This may involve estimating how health system inputs, such as workforce and infrastructure, interacts with processes to produce output measures, such as accessibility of care and readiness to deliver services. [6, 7] The development of an effective monitoring and evaluation system is vital to achieving this goal. Such a system would

facilitate the detection of health system changes following the implementation of key interventions as prerequisite for measuring progress in health system strengthening. The literature on health system performance monitoring at international MGs is scanty.[8] This is partly because most international MGs, such as the Olympics and FIFA World Cup are quadrennial events that are held in different countries/cities globally and as such the health infrastructure and human resources utilised during an event is either withdrawn or incorporated into the national health system, soon after the event.

In 2 consecutive years (2016 & 2017), the Global Center for Mass Gatherings Medicine (World Health Organization Collaborating Center for Mass Gatherings), MOH Riyadh KSA conducted the service availability and readiness assessment (SARA) of MOH health facilities in Mina and Arafat to generate evidence base for annual health system review and to guide health sector decision making and planning. This paper describes the methods and findings of the 2017 Hajj SARA to highlight health system strengths and gaps and to make recommendations for their improvement.

Research aims

In 2 consecutive years (2016 & 2017), the Global Center for Mass Gatherings Medicine (World Health Organization Collaborating Center for Mass Gatherings), MOH Riyadh KSA conducted the service availability and readiness assessment (SARA) of MOH health facilities in Mina and Arafat to generate evidence base for annual health system review and to guide health sector decision making and planning. This paper describes the methods and findings of the 2017 Hajj SARA to highlight health system strengths and gaps and to make recommendations for their improvement.

Research methodology

Study design

The SARA was a cross-sectional survey of MOH health facilities in Mina and Arafat. The WHO core SARA instrument was modified based on the Hajj context to exclude mostly the maternal and child health component and to introduce some tracer items for management of common health risks at the Hajj, such as heat illnesses, which were not covered in the original instrument.[9] The modified tool was piloted in one primary health center (PHC) and readjusted accordingly. Field data was collected from all (8) hospitals and about half (55/101) of PHCs from August- September 2017. An assessment team consisting of trained MOH personnel visited each health facility to complete the survey. In each health facility, the team held interviews with the medical director, conducted on-site inspections and reviewed documents/guidelines to complete appropriate sections of the SARA questionnaire. Specific data, such as number of hospitals and PHCs, number of core health workers deployed for Hajj and number of outpatient visits were retrieved from the appropriate MOH databases.

The modified SARA tool consisted of three main domains: the service availability domain described the physical presence of essential components of service delivery, which was measured by the health infrastructure index (facility density and inpatient bed density), health workforce index (core health worker density) and service utilization index (outpatient consultation/doctor). The general service readiness domain described the capacity of the hospitals and PHCs to provide general health services and it was defined by the availability of tracer items for basic amenities and equipment, standard precautions for infection prevention, diagnostic capacity and essential medicines. The service-specific readiness domain described the capacity of hospitals to provide certain specific health services, which were

quantifiable with the aid of tracer items for trained staff, guidelines, selected relevant procedures and specialised diagnostic capacity.

Data Analysis

The data was cleaned and entered into the Statistical Package for the Social Science (SPSS) and then analysed using descriptive statistics. The availability and readiness scores and indices were initially calculated based on relevant standard definitions in the original WHO SARA instrument. Then, certain SARA variables were compared with other MOH health service statistical data to explore facility-distinct variations in availability and readiness indices. Relevant graphs and charts were produced in Microsoft Excel.

Results and discussion

Result

The result of the SARA is discussed using three main themes namely Service Availability Index, General Service Readiness Index and Service Specific Readiness Index. Each of these is summarized as follows:

Service Availability Index

Generally, the MOH operated 109 health facilities (8 hospitals and 101 PHCs) in the Holy Places during the 2017 Hajj. Thus the facility density (number of health facilities/10,000 population) was slightly less than 1/4 (23.5%) of the expected standard facility density. Based on surface area, the facility density was 6.6 km² in Mina and 3.5 km² in Arafat. The in-patient bed density (number of in-patient beds/10,000 population) was 28.8% of the expected standard in-patient bed density. In addition, the core health workforce density (number of core health workers/10,000 population) was about half (54%) of the expected standard human resource density (Figure 2). From facility distinct data analysis, the average number of daily out-patient consultation/doctor was 291 in Mina PHCs and 317 in Arafat PHCs (Figures 3 & 4). This translates to an estimated average consultation length (based on a 12 hour shift duty schedule for MOH doctors during Hajj) of 2.47 minutes and 2.27 minutes in Mina and Arafat respectively.

Figure 2: Service availability index in the Holy Places during the 2017 Hajj

Location of facility	Pilgrims population (p)	Number of health facilities (n)	Facility density (d) =n/p X 10,000		Facility density /square kilometer	Number of core health workers (c)	Human resources density (d) =c/p X 10,000		Number of in-patient bed (i)	Inpatient bed density (d) =i/p X 10,000	
			Hajj	WHO standard			Hajj	WHO standard		Hajj	WHO standard
Mina		48			6.6						
Muzdalifah		6									
Arafat		55			3.5						
Total Holy Places	2,300,000	109	0.47	2		2863	12.44	23	1676	7.2	25

Eight tracer items were assessed to estimate the availability of specialist services. All hospitals had coronary, critical care, medical and surgical units. A fewer proportion of hospitals had haemodialysis (87.5%), orthopaedic (62.5%), burns (50%) and obstetrics and gynaecology (50%).

Figure 3: Number of daily consultations/doctor in MOH PHCs in Mina during 2017 Hajj

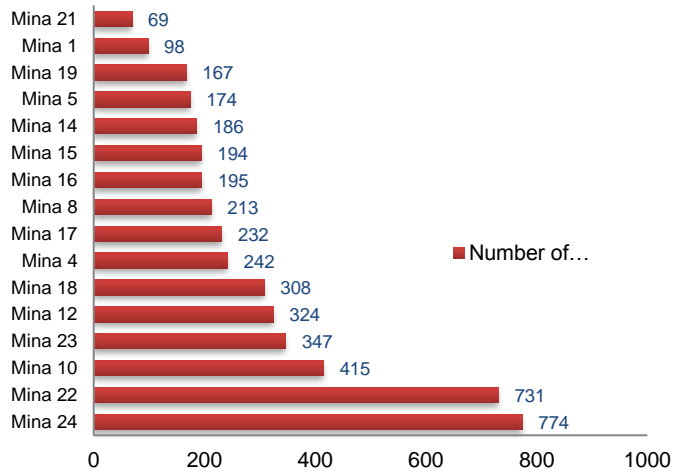
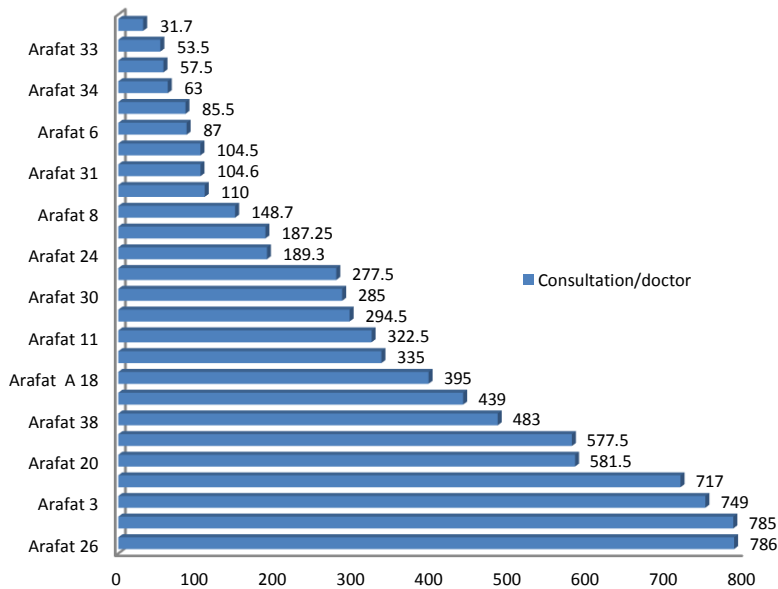


Figure 4: Number of daily consultations/doctor in MOH PHCs in Arafat during 2017 Hajj



General Service Readiness Indices

The readiness to deliver general health services was estimated from the availability of tracer items for basic amenities, basic equipment, infection control capacity and diagnostic capacity (Figures 5, 6 & 7). Overall, 5 of 7 tracer items for basic amenities were available in all hospitals. However, only 25% of hospitals had consulting rooms with auditory and visual privacy. Fewer PHCs had access to email or internet (43.1%), a functional cellular phone (76.9%) and a functional computer (32.7%). In addition, just over half of PHCs had consulting rooms with auditory and visual privacy (56.1%) and access to ambulance/emergency services (53.1%). The tracer items for basic equipment and infection control capacity were available in all hospitals and nearly all PHCs (96.8% and 97.6% respectively). In the diagnostic capacity

domain, all hospitals had the assessed tracer items, except HIV testing capability which was available in only 25% of hospitals. In comparison, fewer proportions of PHCs had access to haemoglobin assay (50%), HIV testing (48%) and urinalysis (10%).

Figure 5: Proportion (%) of hospitals and PHCs with basic amenities during 2018 Hajj

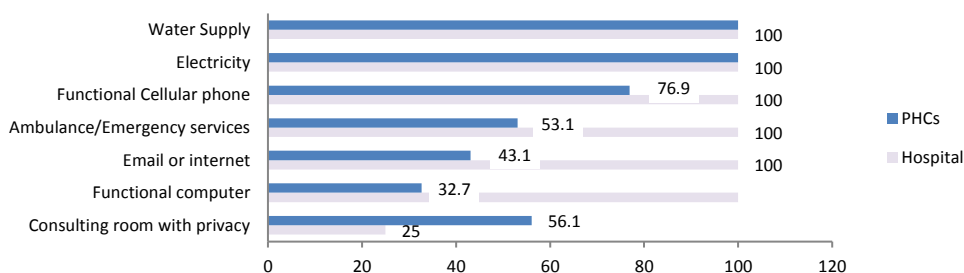


Figure 6: Proportion (%) of hospitals and PHCs with basic equipment during 2018 Hajj

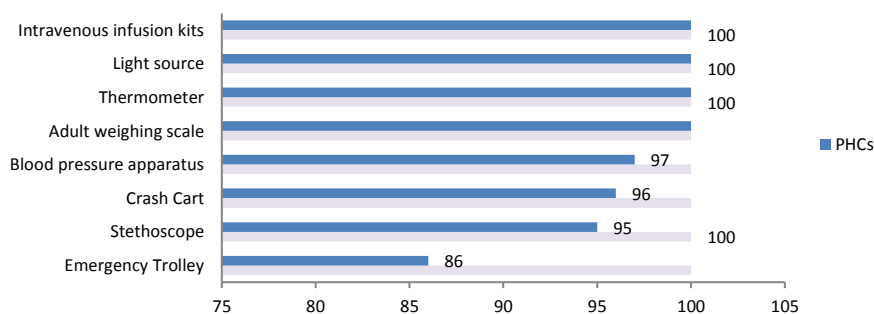
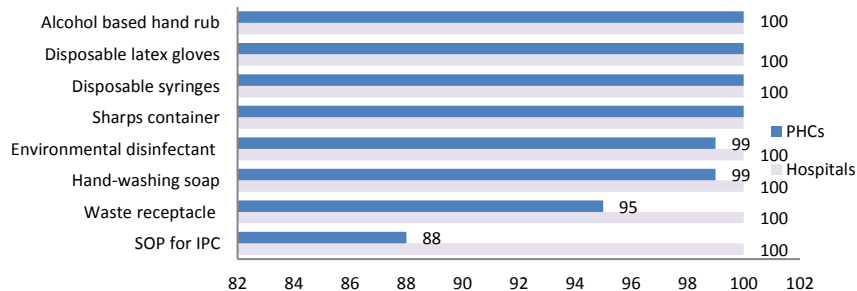


Figure 7: Proportion (%) of hospitals and PHCs with tracer items for infection control during 2018 Hajj



Service Specific Readiness Indices

The readiness of health facilities to deliver specific services was assessed based on the capacity of hospitals to diagnose and manage eight health conditions that were identified as markers for the common health risks at the Hajj. All hospitals had the capacity to diagnose and manage TB, heat stroke, diabetes, cardiovascular diseases, food poisoning, altered consciousness and acute respiratory illnesses, such as Middle East Respiratory Syndrome (MERS) and Influenza H1N1. However, only half (4 hospitals) could diagnose and manage major trauma. On average, the majority of hospitals had conducted training within the previous 1 year (89.2%) and had guidelines (79.68%) for the diagnosis and management of the health conditions. A significant proportion (62.5%) of hospitals completed appropriate notification forms for TB and the majority could conduct sputum microscopy (100%) and sputum culture (62.5%). However, no hospital had

Xpert/MTB/RIF testing capability. The majority of hospitals had isolation services (100%), fit test and seal checks for HCWs (87.5%) and completed appropriate notification forms (75%) for acute respiratory infections. All hospitals had X-rays and ultrasound scan, but computed tomography (CT) Scan and magnetic resonance imaging (MRI) were available in 75% and 25% of hospitals respectively. The tracer item for heat stroke management procedures (cooling beds) was found in all hospitals during the assessment (Figure 8).

Figure 8: Service specific readiness in 8 MOH hospitals during the 2017 Hajj

Specific Measures	Diagnosis and management (%)	Training in diagnosis and management (%)	Availability of guidelines for diagnosis and management (%)	Procedures/Laboratory capacity availability (%)
TB	100	100	100	<ul style="list-style-type: none"> • Sputum microscopy 100 • Sputum culture 25 • Xpert/MTB/RIF 0 • Notification 62.5
Heat stroke	100	100	100	<ul style="list-style-type: none"> • Thermometer 100 • Serum electrolytes 100 • Cooling beds/ 100
Diabetes	100	N/A	87.5	<ul style="list-style-type: none"> • Fasting blood sugar 87.5 • HbA1c 25
Cardiovascular diseases (hypertension, congestive cardiac failure)	100	87.5	87.5	<ul style="list-style-type: none"> • Troponin and cardiac enzymes 75 • Lipid profile 75 • ECG 100
Acute respiratory illnesses like MERS, H1N1,SARS	100	100	87.5	<ul style="list-style-type: none"> • RT-PCR 50 • Serology 25 • X-ray 100 • Isolation services 100 • Fit test, seal check 87.5 • Notification 75
Trauma	<ul style="list-style-type: none"> • Major trauma =50 • Minor trauma=100 	62.5	75	<ul style="list-style-type: none"> • X-ray 100 • Ultrasound Scan 100 • CT Scan 75 • MRI 12.5
Food poisoning	100	87.5	100	<ul style="list-style-type: none"> • Stool culture 87.5 • Serology for Salmonella 62.5 • Notification 75
Altered level of consciousness	100	87.5	100	<ul style="list-style-type: none"> • Glasgow coma scale 100 • Toxicology Screening 37.5 • Lumbar puncture 87.5 • Medical imaging 87.5

Discussions

This survey explores the availability of health services and the readiness of MOH health facilities in Mina and Arafat to deliver these services. The majority of hospitals and PHCs had adequate capacity for general and specific service delivery, but there were significant variation in the patient-to-physician ratio across PHCs.

The assessment showed that standardised SARA indicators potentially have limited application in the Hajj context. For instance, the Hajj health facility density was about one-quarter of the recommended WHO standard health facility density. This implies that the existing number of health facilities (109) in the Holy Places would increase by four-fold to attain the recommended WHO standards. Currently, the average distance between the health facilities is about 150 metres in Mina and 280 metres in Arafat. Thus pilgrims performing their Hajj rites in slow moving crowds are more likely to find the nearest PHC and access care in Mina than in Arafat, despite evidence of a higher health facility density in Arafat (Figure 2). Based on the estimated distance between these Hajj health facilities, the immediate interventions should not necessarily favour the provision of more health facilities; it should seek to address the capacity gaps within the existing health facilities. Given that population-based SARA indicators, such as health facility density, were developed for a far-broad geographically located general population, there is need for the development of appropriate benchmarks that would guide health system monitoring during Hajj, and indeed other mass gatherings.

The patient-to-physician ratio varied significantly across PHCs in Mina and Arafat during the 2017 Hajj. In particular, the health workforce index was 54% of the WHO recommended standards. Due to concerns over the limited application of population-based standards in the Hajj contexts, the utilization of core health workers in PHCs was estimated from the daily outpatient consultations per physician. The assessment showed significant variation in the number of daily consultations per physician in Arafat (31.7-786) and Mina (69-774) PHCs. With an estimated average number of daily consultations per physician of 291 and 371 in Mina and Arafat respectively, correcting the variability in patient-to-physician ratio across PHCs may contribute to balancing the workload, without necessarily impacting on the average workload. By deduction, the estimated average consultation lengths were significantly shorter than the 10-20 minutes consultation lengths that are reported in PHCs in non-mass gatherings settings [10, 11]. The shortened consultation length estimated in this assessment may be attributed to the increased demand for health services at the Hajj. The size of the Hajj population and its significant elderly demography (a proxy for those with chronic diseases), the need for pilgrims with pre-existing health conditions to replace prescription drugs and the increased risks of communicable diseases outbreak and transmission potentially increases the demand for health services during the mass gathering. Regardless, the consequences of a shortened consultation length in outpatient clinics could be similar across settings and include decreased patient satisfaction, congested emergency rooms and non-adherence to treatment [12]. This informs the need for the development of a standard for the deployment of HCWs during Hajj to strengthen the core health workforce capacity and to balance the workload across health facilities during the MG.

The assessment showed that a proportion of the health facilities lacked consulting rooms with auditory and visual privacy. Apparently, the design of these seasonal health facilities hindered the provision of out-patient services in an environment that guaranteed privacy for patients during clinical consultations. Under such circumstances, patients may feel uncomfortable sharing relevant personal information with their doctors or care givers. This may also hinder effective health service delivery, since providers may be wary of conducting appropriate medical examinations, given

the lack of privacy in consulting rooms. Resolving these privacy concerns, although subject to extensive renovation of the infrastructures, could contribute to strengthening the quality of health services within the Hajj health system.

The majority of health facilities had basic and specialised diagnostic services at on-site or off-site locations. The availability of essential diagnostic services in seasonal (temporary) hospitals and PHCs attest to the readiness of MOH health facilities to provide quality services for pilgrims. However, there is need to strengthen certain capacity areas, especially those that address the most common health needs at the Hajj. For instance, there is need to scale-up the proportion of health facilities that manages major trauma, since historical evidence suggests that pilgrims are more vulnerable to trauma from crowd-related incidents and structural failures in these areas. Basic diagnostic services, such as urinalysis, blood sugar and HIV test kits should be provided at the point of care in PHCs to expedite the diagnostic process and case management of specific health conditions and to prevent unwarranted referral of cases to hospitals. It is often rationalized that religious mass gatherings, unlike sporting MGs do not necessarily propagate the spread of sexually transmitted diseases. However, sharing of sharp objects by some pilgrims during the “head shaving” ritual is a potential risk factor for the transmission of HIV and Hepatitis B and C during Hajj. Since it is unlikely that individuals who are infected with HIV during Hajj may test positive with available HIV test kits before the end of the Hajj (window period), provision of HIV testing and care services may be seemingly unjustified. However, pilgrims arriving from HIV/AIDS high prevalent countries, who are living with the disease, may need re-supply of their antiretroviral medications or develop complications that warrant a clinic visit during the pilgrimage. In addition to these reasons for ensuring accessible services, HCWs involved in Hajj should have unfettered access to post exposure prophylaxis for HIV and Hepatitis B, when the need arises. Furthermore, a proportion of pilgrims arrive for the Hajj from TB endemic countries with undiagnosed active TB disease [13]. Currently, Xpert MTB/RIF is the recommended first line TB diagnostic test due to its high sensitivity, quick processing time and rifampicin resistance detection capability[14]. Expedited laboratory processes are particularly needed in the Hajj context due to the wider public health benefits of limiting the spread of pathogens among pilgrims and protecting global health security. Therefore, the MOH ought to provide Xpert MTB/RIF diagnostic services in TB laboratories in the Hajj areas to speed up the TB diagnostic process to promptly detect active TB disease, identify potential multi-drug resistant TB (MDR-TB) cases, and aid the timely implementation of appropriate control measures.

This assessment was conducted in MOH seasonal health facilities in the Holy places. However, health services are also provided by country health missions, private health facilities, and MOH and non-MOH governmental hospitals in Makkah. Thus, the findings of this assessment do not necessarily provide a comprehensive overview of the existing Hajj health service availability and readiness indices. However, the temporal nature of the health facilities where the current assessment was conducted potentially compromise long-term planning and management. Hence, by prioritizing the seasonal health facilities in the initial assessments, an attempt has been made at focusing on one of the most vulnerable areas within the limit of available Hajj resources. Since health services for pilgrims are exclusively provided by the MOH in Mina and Arafat and all pilgrims move from one area to another to perform the rituals simultaneously, the choice of MOH health facilities and the total Hajj population as a proxy for assessing service availability and readiness in the Holy Places is rationalised.

Summary and conclusion

Conclusion

This SARA is among the foremost health system assessments for Hajj. The majority of health services were available and most MOH health facilities had the capacity to deliver basic and specialised health services. However, some essential capacity areas, such as health workforce deployment, basic amenities and diagnostic capability require strengthening. The poor applicability of original SARA indicators in the Hajj contexts provides the basis for the development or adoption of new indicators for monitoring the Hajj health systems. Future SARA should be extended to other health facilities, including health missions' clinics to provide holistic evidence and to describe how the differences and similarities that exist might impact on health service delivery at the Hajj. Additionally, there is need for the design of appropriate research studies to explore the relationship between service availability and readiness domain characteristics and the quality of health services within the Hajj health system.

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