

RAPID RISK ASSESSMENT

Public health risks related to communicable diseases during the 2018 Hajj, Saudi Arabia, 19–24 August 2018

2 August 2018

Main conclusions and options for response

This year, the Hajj takes place between 19 and 24 August. This document assesses the potential risk of outbreaks/transmission of communicable diseases during the 2018 Hajj.

Due to the vaccination requirements for travelling to Mecca, Saudi Arabia, and the preparedness plans put in place by the host country addressing the management of health hazards during and after the Hajj, the overall risk for EU/EEA citizens of becoming infected with a contagious disease during the 2018 Hajj in Saudi Arabia is considered to be low.

The risk of communicable disease outbreaks is highest for food- and waterborne diseases and respiratory illnesses, but the risk is not considered higher than can generally be expected for international mass gatherings of this size. MERS-CoV activity continues to be reported in the Arabian Peninsula, specifically from Saudi Arabia, and therefore imported cases may be detected in Europe following the Hajj. The risk of transmission of other vaccine-preventable and vector-borne diseases is considered to be low.

The national health authorities in countries from where Muslims embark on the Hajj pilgrimage to Mecca should apply appropriate strategies for the prevention and control of communicable diseases before, during and after the completion of the Hajj.

Advice for those travelling to the Hajj

Prior to travelling

- Seek advice from healthcare providers on vaccination visa and entry requirements for Saudi Arabia; follow recommendations issued by the [ministry of health of Saudi Arabia](#) [33] and [WHO](#) [64].
- Ensure you are up to date with routine vaccinations, including boosters as recommended in your EU country of residence. See [ECDC vaccine schedule site](#) [65].

During the Hajj

- Pay attention to personal, food and water hygiene to decrease the risk of gastrointestinal illnesses.
- Practise respiratory hygiene and cough etiquette to reduce the risk of respiratory infections.
- Visit only licensed barbers for shaving.

- Avoid close contact with animals, particularly camels, when visiting farms, markets, or barn areas.
- Only use antibiotics according to the advice of a certified health professional.

After the Hajj

- If you have symptoms suggestive of gastrointestinal, respiratory or any other type of infection upon return, make sure you mention your travel history to your healthcare provider.
- Due to the continuing reports of MERS-CoV disease in Saudi Arabia, seek immediate medical advice if you have a fever (38 °C and over), cough or difficulty in breathing.
- Report your travel history and previous hospitalisation to your healthcare provider if you require hospitalisation within one year of travel to another country (or if hospitalised in another country), to ensure that the possible acquisition of antimicrobial-resistant (AMR) bacteria is considered and that appropriate measures can be implemented in accordance with national guidelines to prevent the spread of AMR.

Based on the general risks during mass gathering events, and in accordance with the internal procedures applied for those events, ECDC will conduct enhanced epidemic intelligence surveillance for communicable diseases between 12 and 31 August 2018.

Source and date of request

ECDC internal decision, 14 July 2018.

Public health issue

International mass gatherings can pose a risk for communicable disease outbreaks and global spread of infectious diseases. The aim of this document is to assess the potential health risks related to communicable diseases and other health threats for EU/EEA citizens during their stay in Saudi Arabia for the Hajj pilgrimage between 19 and 24 August 2018.

Consulted experts

ECDC experts: Jordi Borrell, Chiara de Bellegarde de Saint Lary, Edoardo Colzani, Ida Czumbel, Margot Einöder-Moreno, Alice Friaux, Kaja Kaasik-Aaslav, Anke Kohlenberg, Grazina Mirinavičiute, Thomas Mollet, Pasi Penttinen, Emmanouela Sdoná, Bertrand Sudre, Johanna Takkinen and Klaus Weist.

External experts: Dipti Patel, NaTHNaC; Patricia Schlagenhauf, Collaborating Centre for Travellers' Health, EuroTravNet/GeoSentinel Site Director.

World Health Organization experts contributed to this risk assessment. Although experts from WHO reviewed the risk assessment, the views expressed in this document do not necessarily represent the views of WHO.

Disclaimer

ECDC issued this outbreak assessment document in accordance with Article 10 of Decision No 1082/13/EC and Article 7(1) of Regulation (EC) No 853/2004 establishing a European Centre for Disease Prevention and Control (ECDC).

In the framework of ECDC's mandate, the specific purpose of an ECDC rapid risk assessment is to present different options on a certain matter, with their respective advantages and disadvantages. The responsibility on the choice of which option to pursue and which actions to take, including the adoption of mandatory rules or guidelines, lies exclusively with EU/EEA Member States. In its activities, ECDC strives to ensure its independence, high scientific quality, transparency and efficiency.

This report was written under the coordination of an internal response team at ECDC. All data published in this rapid risk assessment are correct to the best of our knowledge on 1 August 2018. Maps and figures published do not represent a statement on the part of ECDC or its partners on the legal or border status of the countries and territories shown.

Event background information

More than one and a half million pilgrims from all over the world travel every year to Saudi Arabia for the Hajj. In August 2017, 1 752 014 foreign and 600 108 domestic pilgrims took the Hajj. In 2017, most of the foreign pilgrims arrived by air (94%), while only five percent crossed the land border; one per cent came by sea [1].

In 2016, the Hajj took place between 10 and 15 September, resulting in an increase in travel patterns from the EU/EEA during the month preceding the Hajj (Figure 1). According to IATA data, in August and September 2016, more than 200 000 travellers from EU/EEA countries travelled to Saudi Arabia. The majority of the travellers originated from the United Kingdom (41%), Germany (14%) and France (13%).

Figure 1. Number of travellers from EU/EEA to Saudi Arabia, by month, 2016



Source: IATA

Risks associated with infectious diseases in relation to the 2018 Hajj

This document assesses the following public health risks:

- Risks associated with the importation of communicable diseases to the Hajj
- Risks associated with transmission of communicable diseases during the Hajj
- Risks associated with exporting infectious diseases upon returning from the Hajj.

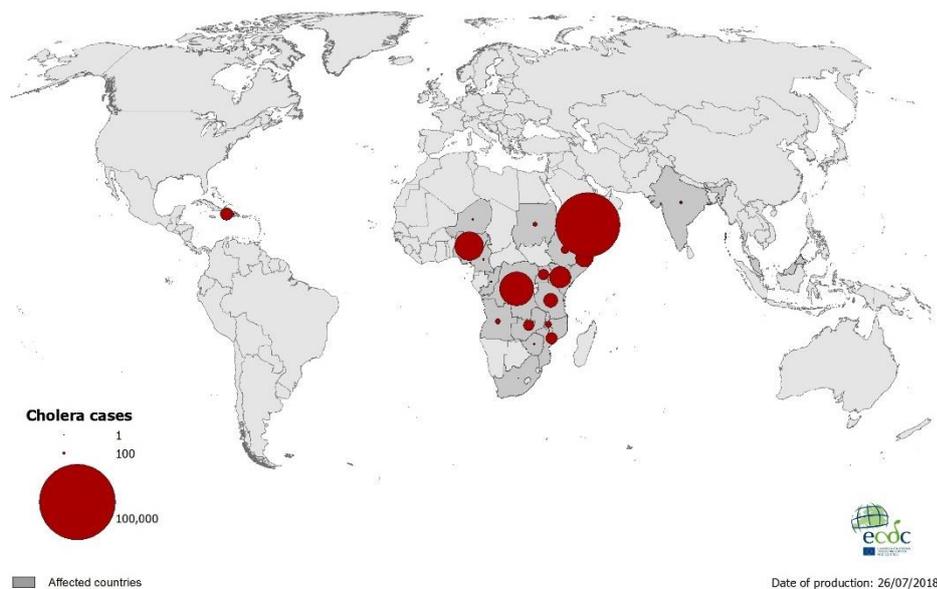
Risk for importation of communicable diseases to the Hajj

The risk of importation of communicable disease to Saudi Arabia by pilgrims participating to the Hajj relates to ongoing endemic infections and outbreaks in the country of origin of pilgrims.

The following outbreaks should be considered of relevance:

- Cholera outbreaks are currently occurring in many countries especially in the Horn of Africa and the Gulf of Aden, including Yemen, Somalia, and Ethiopia. Outbreaks are also reported in the Democratic Republic of the Congo, Kenya, Tanzania and Nigeria [2,3].

Map 1. Geographical distribution of cholera cases detected worldwide in the past six months, as of 18 July 2018



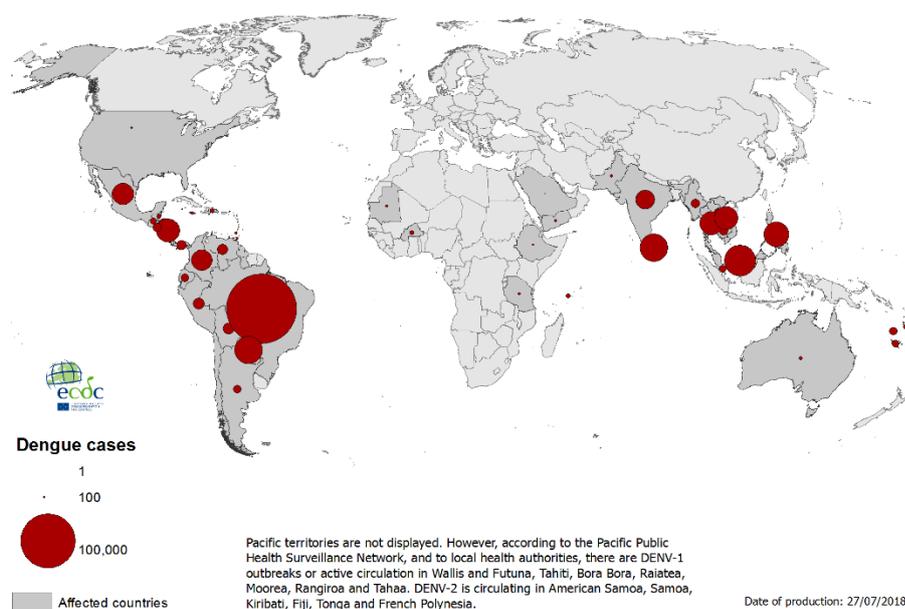
- As of 3 July 2018, Poliomyelitis, with wild poliovirus cases has been reported in Afghanistan (eight cases) and Pakistan (three cases). Circulating vaccine-derived poliovirus type 2 was reported in: Nigeria (one case), the Democratic Republic of Congo (seven cases), Somalia (four cases: circulating vaccine-derived poliovirus type 2 and 3); circulating vaccine-derived poliovirus type 1 was identified in Papua New Guinea (one case) [4]. Although Nigeria has not reported cases of wild poliovirus in the last two years, it is still regarded as an endemic country [5].
- Yellow fever, chikungunya, and dengue are associated with ongoing outbreaks in many countries. This increases the possibility of the introduction of these viruses through viraemic travelers [6,7]. ECDC monitors these global outbreaks through open source event-based surveillance; the list of countries below may not be exhaustive.

Dengue is endemic in many countries and has been reported in over 128 countries [8]. Reporting of arbovirus infections can differ across countries in relation of their surveillance system. It should be noted that underreporting of arboviruses is considered to occur in sub-Saharan Africa.

Yellow fever is endemic in tropical and subtropical areas of Africa and Central and South America (including Trinidad) [9]. Between 12 September 2017 and 3 June 2018, 1 903 suspected yellow fever cases, including 47 deaths, were reported in Nigeria [10]. Between July 2017 and week 19-2018, the ministry of health in Brazil reported 1 266 confirmed human cases of yellow fever, including 415 deaths [11].

Dengue is found in tropical and subtropical climates worldwide, mostly in urban and semi-urban areas [12]. Cases of dengue have recently been reported in the Americas, south-east Asia and the Pacific Island nations [13].

Map 2. Geographical distribution of dengue cases detected worldwide in the past six months, as of 18 July 2018



- Chikungunya mostly occurs in Africa, Asia and the Indian subcontinent, in tropical and subtropical areas where *Aedes aegypti* and *Aedes albopictus* is found. Chikungunya virus has become a frequent cause of travel-associated febrile illness, and returning viraemic travellers can be the source of autochthonous transmission in areas suitable for arbovirus transmission [14].

Map 3. Geographical distribution of Chikungunya cases detected worldwide in the past six months, as of 18 July 2018



- Seasonal influenza: currently circulating in the southern hemisphere and tropical and subtropical areas countries [15].
- Measles: outbreaks are ongoing in Europe, Africa, Americas and Asia. [16,10].
- Meningococcal disease: according to enhanced surveillance from 23 countries, a total of 29 827 suspected meningitis cases (including 2 276 deaths) was reported in 2017 [17]. This represents an increased number of cases compared with 2016 when there were 18 178 suspected cases. The highest rates of meningitis are reported from the extended meningitis belt of sub-Saharan Africa, stretching from Senegal in the west to Ethiopia in the east, covering 26 countries. According to a recent study, the meningococcal carriage among Hajj pilgrims ranged from 0 to 27% (2007–2016), with serogroup B being the most prevalent [18]. An outbreak of serogroup W-135 meningococcal disease occurred during the 2000 Hajj; of the 253 cases identified in Saudi Arabia, 161 (64%) had serogroup identification [19].
- Lassa fever is known to be endemic in Benin, Ghana, Guinea, Liberia, Mali, Sierra Leone, and Nigeria. Sporadic cases can also be detected in other West African countries [20]. In 2018, Nigeria reported 2 042

cases, 444 of which were confirmed [10]. In 2018, Liberia reported 20 confirmed cases out of 123 suspected cases; of these confirmed cases, 13 deaths were reported. Sierra Leone reported 16 confirmed cases, including six deaths.

- Crimean Congo haemorrhagic fever (CCHF) is endemic in countries in the Eastern Mediterranean Region of WHO, including Iran, Iraq, Kuwait, Oman, Pakistan, Saudi Arabia, Sudan and the United Arab Emirates [21]. In 2018, an upsurge of CCHF cases has been reported in Afghanistan with 125 cases, including 18 deaths [10]. As of 7 July, Iraq reported eight cases, including six deaths in 2018 [22]. According to media reports, Iran experienced 34 cases (including three deaths) between April and June 2018 [23]. In Turkey, CCHF cases are reported on an annual basis: in 2016, 432 cases were notified; in 2017, 343 cases (including 16 deaths) were reported [24]. According to media quoting national authorities, around 300 cases are expected for 2018 [25]. In 2018, Russia reported 62 cases between January and June. In 2016 and 2017, 162 and 79 cases, respectively, were reported for the year [26].
- Diphtheria: According to WHO, a diphtheria outbreak in Yemen that began in 2017 has reached 1 904 suspected cases, including 98 deaths, as of 8 July 2018. An outbreak is also ongoing in Bangladesh, with 7 888 suspected cases, including 55 deaths [27]. In the Region of the Americas in 2018, three countries – Colombia, Haiti and the Venezuela – reported diphtheria cases, compared with four countries (Brazil, the Dominican Republic, Haiti and Venezuela) in 2017 [28].

Risk of transmission during the Hajj

The risk of local transmission of communicable diseases during the Hajj is increased in places of pilgrimage because of overcrowding, the presence of at-risk populations such as elderly and polymorbid participants, and the possible breaches of food-hygiene standards.

Meningococcal diseases

The transmission of meningococcal meningitis is facilitated by crowded environments [29]; transmission has occasionally occurred during the Hajj.

The risk of importation of meningococcal meningitis is increased during the seasonal peaks in the countries of the African meningitis belt, several of which are home to large Muslim populations.

Food- and waterborne diseases

Gastrointestinal illnesses during mass gathering events, including the Hajj, are a possible health threat. This is due to possible breaches of food hygiene standards, shortage of clean water, the presence of mildly ill and asymptomatic carriers of pathogenic bacteria and viruses, and the preparation of large numbers of meals that may be inappropriately stored by pilgrims. There are several studies describing the incidence and aetiology of traveller's diarrhoea during the Hajj [30-32].

Hajj pilgrims are not allowed to bring fresh food into Saudi Arabia. Only properly canned or sealed food or food stored in containers with easy access for inspection is allowed in small quantities, sufficient for one person for the duration of the trip [33].

Malaria

Malaria is a widespread parasitic disease in tropical areas, and it is likely that a significant number of pilgrims host the parasite. Outbreaks of malaria have occurred during the Hajj in the past [34].

Saudi Arabia is currently at the pre-elimination phase of malaria, and local transmission of malaria has only been reported in villages along the border with Yemen [35,36]. Therefore, the risk of transmission in relation to the Hajj is very low.

Arboviruses

Aedes aegypti mosquitoes have not been detected in areas where the Hajj is taking place. However, *Ae. aegypti* is present in surrounding cities, for example Jeddah [37]. A recent literature review identified that dengue outbreaks have regularly occurred in Saudi Arabia since the 1990s [38,39]. Therefore, there is a possibility of an outbreak associated with arboviruses transmitted by *Ae. aegypti* [40].

Recent dengue cases were detected in July 2018 in Al-Taif governorate, Mecca Region [41]. On 6 July 2018, French authorities used the EU Early Warning and Response System (EWRS) to report two DENV-3 (dengue virus type 3) infections in two siblings returning from Saudi Arabia on 16 June 2018 after a pilgrimage to Mecca and Medina. Both patients developed a dengue-like syndrome on 17 June.

Alkhurma haemorrhagic fever (AHF) is a tick-borne disease found in Saudi Arabia and in Egypt. In Saudi Arabia, outbreaks have been reported from Jeddah and Mecca (see <https://www.cdc.gov/vhf/alkhurma/outbreaks/distribution-map.html>). According to media reports, quoting local

authorities, a recent outbreak occurred in Jeddah in April 2018 [42]. The virus is transmitted by ticks, following contact with livestock, including sheep. The risk of AHF is probably low, but it should be considered as a differential diagnosis for viral haemorrhagic fevers.

Tuberculosis

It is difficult to assess the transmission of tuberculosis during the Hajj due to the long incubation period. However, based on the origin of the pilgrims, many of whom come from areas where tuberculosis is endemic, a risk for the spread of tuberculosis exists. Contributing factors are overcrowding, and co-morbidities which make pilgrims susceptible to infection or reactivation of latent tuberculosis. There is evidence indicating a significant risk of getting infected during the Hajj [43].

Blood-borne pathogens

At the end of Hajj, men shave their heads. If contaminated barber blades are used, transmission of blood-borne pathogens, such as hepatitis B, hepatitis C, and HIV cannot be excluded. At the Hajj, licensed barbers are tested for blood-borne pathogens. They are also required to use disposable, single-use blades, while unlicensed barbers might use nonsterile blades. Male pilgrims are advised to visit licensed barbers [44].

Risk of exportation of infectious diseases related to the Hajj

Returning pilgrims could be affected by the communicable diseases mentioned above and could thus trigger a local chain of transmission in their home countries. For vector-borne diseases, there must be a competent, active vector population in the home country. In studies performed among European Hajj returnees in recent years, many pilgrims tested positive for influenza viruses [45-47].

Two conditions associated with nosocomial transmission are of particular relevance in the context of the Hajj: infection with MERS-CoV, and infection with, or carriage of, antimicrobial-resistant bacterial strains.

Middle East respiratory syndrome

Although no cases of MERS-CoV infection have been associated with Hajj events since the discovery of the virus in September 2012, the disease still raises concerns because of MERS outbreaks in Saudi Arabia linked to camel contact and transmission in healthcare settings continue [48]. At the end of June 2018, 2 229 laboratory-confirmed cases of MERS-CoV, including 791 associated deaths (case-fatality rate: 35.5%) were reported globally; the majority of these cases were reported from Saudi Arabia: 1 853 cases (including 717 related deaths, case-fatality rate 38.7%) [49]. Many of the primary cases reported direct camel contact or consumption of raw camel milk, while the secondary cases mostly occurred in healthcare settings. During March 2018, a hospital outbreak was detected in Riyadh, Saudi Arabia [50].

While camel contact is unlikely during participation in the Hajj, hospitalised pilgrims may become exposed to MERS-CoV. Nonetheless, since MERS-CoV infection has never been reported in a Hajj pilgrim, despite intensive surveillance among returnees, the probability of a returning pilgrim being infected with MERS-CoV is very low. Transmission in home countries after travelling to a MERS-CoV-affected country has been documented in several instances, e.g. in the UK [51], France [52], and South Korea [53], albeit not in the context of the Hajj. Therefore, the probability of limited transmission in EU Member States following importation can be considered low, but not negligible, especially in healthcare settings.

Antimicrobial resistance and healthcare-associated infections

High rates of antimicrobial resistance (AMR) in gram-negative and gram-positive bacteria [54] are reported from the eastern Mediterranean region. Increasing resistance in gram-negative bacteria has been reported for Saudi Arabia; this includes increases of carbapenemase-producing Enterobacteriaceae and carbapenem-resistant *Acinetobacter baumannii*, as well as hospital outbreaks of multidrug-resistant bacteria (MDR bacteria) [55-57]. Over-the-counter use of antibiotics without prescription, heavy international travel due to the pilgrimage, a large population of expatriates, and challenges with adherence to infection control measures (such as hand hygiene) in hospitals have been identified as local risk factors contributing to the emergence of AMR [58].

A recent systematic review showed a high prevalence and/or high risk of acquisition of MDR bacteria in pilgrims during the Hajj [59]. Factors promoting the acquisition of MDR bacteria during the Hajj include crowding; lack of effective food, water and personal hygiene measures; and the acquisition of respiratory and gastrointestinal infections with subsequent antimicrobial use and healthcare exposure [59]. Pilgrims who acquire MDR bacteria abroad and return to their home countries represent a potential reservoir for onward transmission of MDR bacteria in the community and hospitals.

ECDC threat assessment for the EU

The Hajj is one of the world's largest annual mass gathering events and may result in the importation and transmission of infectious diseases related to the crowded conditions during the pilgrimage. This may contribute to the international spread of diseases and the amplification of infectious disease outbreaks.

Despite a few outbreaks that have previously affected the EU after the Hajj, the Hajj poses a low risk for the importation and spread of communicable disease in the EU, thanks to the strict precautionary measures taken by Saudi Arabia.

Conclusions and options for response

ECDC monitors current outbreaks worldwide and published the results in the weekly [Communicable Diseases Threat Report](#) [7]. In addition, ECDC steps up its epidemic intelligence activities during and after the Hajj to detect possible events that could pose a public health threat to the EU/EEA Member States.

In the event of a public health emergency of international health concern (PHEIC), or in the case of any disease outbreak subject to notification under the International Health Regulations 2005, the health authorities in Saudi Arabia – following consultation with WHO – will undertake additional preventive precautions necessary to avoid the spread of infection during and after the pilgrimage (in the pilgrim's country of origin).

General precautions

For each Hajj season, the Saudi Arabian ministry of health publishes a list of [health requirements for the Hajj](#) that includes vaccination requirements and recommendations (see Annex) [33].

Before the event, pilgrims should ensure that they meet the visa requirements, receive the required and recommended vaccines, as well as routine immunisations including booster doses recommended in their home country. The national health authorities of the countries of origin of Hajj pilgrims should have appropriate strategies in place aimed at the prevention and control of communicable diseases before, during, and after the completion of the Hajj. The current international collaboration in planning vaccination campaigns, developing visa quotas, arranging rapid repatriation, and managing health hazards at the Hajj are crucial steps in this process. Returning pilgrims should be vigilant for symptoms of acute respiratory illness with fever and cough during the first two weeks after their return. Returning pilgrims experiencing such symptoms should seek immediate medical attention and inform health attendants of their recent travel to Hajj in order to detect and manage the diseases associated with those symptoms (e.g. MERS-CoV, influenza). Influenza infections occur frequently, and early detection of influenza is important to enable the appropriate management of the disease, including antiviral treatment, minimised contact with others, strict cough etiquette, and respiratory hygiene. Health facilities should ensure that appropriate arrangements are in place for testing returning pilgrims who present with symptoms suggestive of MERS-CoV.

Specific recommendations (WHO, and ministry of health Saudi Arabia)

General public health recommendations

Prevention of respiratory illness and MERS-CoV infection. The Saudi ministry of health advises all pilgrims to comply with public health recommendations to prevent the spread of respiratory infectious disease [33], including the following:

- Washing hands with soap and water or using a disinfectant, especially after coughing and sneezing, after using toilets, before handling and consuming food, after touching animals
- Practise respiratory hygiene and cough etiquette to reduce the risk of respiratory infections. Using disposable tissues when coughing or sneezing and dispose of it in the wastebasket
- Trying as much as possible to avoid hand contact with the eyes, nose and mouth
- Wearing masks, especially when in crowded places
- Avoiding direct contact with the persons who appear ill with cough, sneeze, expectoration, vomiting, or diarrhoea, not sharing their personal belongings, and maintaining good personal hygiene
- Avoiding close contact with animals, particularly camels, when visiting farms, markets, or barn areas
- Avoiding consumption of raw camel products including milk and meat that has not been properly cooked.

Prevention of food-borne infections. The most important measures to prevent gastrointestinal illnesses are to drink safe water (chlorinate or boil water before consumption), use appropriate food hygiene, wash hands regularly with water and soap, eat thoroughly cooked food, carefully wash fruits and vegetables with bottled or chlorinated water before peeling and before consumption. Avoiding consumption of raw seafood products.

Health education. Health authorities in countries of origin should provide pilgrims with information on infectious disease symptoms, including significant changes of body temperature, modes of transmission, complications, and means of prevention. All pilgrims should be advised to drink plenty of clean water, preferably bottled, chlorinated or boiled and cooled, to avoid dehydration. This is particularly important for children and older pilgrims. Consumption of salt-containing food and drink, unless contraindicated, will also be helpful.

Recommendations for specific diseases

- **Yellow fever:** pilgrims arriving from countries or areas at risk of yellow fever transmission (see list in the Annex) and pilgrims having transited for more than 12 hours through an airport of a country with risk of yellow fever transmission, are required to present a valid International Certificate of Vaccination or Prophylaxis (ICVP) documenting yellow fever vaccination at entry in Saudi Arabia. Since July 2016, the ICVP for yellow fever is valid for life, starting 10 days after the vaccination date.
- **Meningococcal disease:** pilgrims are required to carry a certificate of vaccination against meningococcal disease. Adults and children aged two years and over should be vaccinated with the tetravalent (ACYW135) vaccine no less than 10 days before arrival. Polysaccharide ACWY vaccine should have been administered no more than three years, and conjugate ACWY vaccine no more than five years, before arrival. Pilgrims from the meningitis belt in sub-Saharan Africa (see Annex) will receive chemoprophylaxis at their port of entry to lower the rate of meningococcal carriage [33,60]. Tetravalent ACWY vaccines do not protect against all invasive serogroups, such as MenB and MenX. While no major MenB or MenX outbreaks have been reported in Saudi Arabia, these serogroups have been known to have caused disease among pilgrims and the Saudi population and were isolated from pilgrims in carriage studies [61]. Hajj pilgrims may consider vaccination against MenB, although not required at port of entry, based on therapeutic indications of available vaccines, and on HCP assessment.
- **Poliomyelitis:** pilgrims arriving from countries with circulating wild polio virus type 1 or circulating vaccine-derived polio virus with potential risk of international spread should provide a proof of receipt of a dose of oral polio vaccine (OPV), or inactivated polio vaccine (IPV), within the previous 12 months and at least four weeks prior to departure. They will also receive one dose of OPV at all border points on arrival in Saudi Arabia (see Annex).
- **Seasonal influenza:** Seasonal influenza vaccination with the most recently available vaccine (2017/18 vaccine in the northern hemisphere and 2018 vaccine in the southern hemisphere) is recommended for pilgrims prior to arrival [62].
- **Cholera:** since 2012, the ministry of health of Saudi Arabia has instructed the public health staff at ports of entry to be observant of pilgrims coming from areas with ongoing cholera outbreaks. Emphasis is on early detection of cases and timely provision of treatment at Hajj premises once pilgrims have passed the ports of entry [63].
- **MERS-CoV:** WHO does not recommend travel restrictions and has updated its travel recommendations for pilgrims [64].
- **Dengue and chikungunya** virus diseases: pilgrims should practise insect bite avoidance measures. [33].
- **Malaria:** the ministry of health of Saudi Arabia and WHO do not recommend malaria prevention measures, including chemoprophylaxis, in the cities of Mecca and Medina [33,36].
- **Measles:** outbreaks continue to occur globally. There is a risk of spread and sustained transmission in areas with susceptible populations. It is strongly recommended that non-immune pilgrims attending the Hajj are vaccinated in accordance with the national schedule prior to their travel, e.g. two doses of measles-containing vaccine [32,33].

Recommendation for routine immunisations

The ministry of health of Saudi Arabia recommends pilgrims to be up-to-date on routine immunisations. WHO recommendations are available for childhood and for life-long protection against diphtheria, tetanus, pertussis, polio, hepatitis B, *haemophilus influenzae* type b, pneumococcal and rotavirus (infants only) infections, measles, mumps, rubella, typhoid, yellow fever and rabies [33]. The WHO position papers also provide travel recommendations. It is strongly recommended that non-immune pilgrims initiate, and ideally complete, their immunisations prior to travelling and, for those who did not complete a primary course or for whom a booster is routinely recommended, that they complete the schedule upon return to their home country.

Additional ECDC recommendations

Pilgrims should only use antibiotics when prescribed by a certified health professional. They should be advised to always follow their healthworker's advice when using antibiotics, and not share or use leftover antibiotics.

If pilgrims require hospitalisation within one year after returning from the Hajj and/or another country (or if hospitalised in another country), they should report their travel history and previous hospitalisations to their healthcare provider in order to consider the possible acquisition of antimicrobial-resistant (AMR) bacteria or MERS-CoV; this makes it possible to implement appropriate control measures in accordance with national guidelines.

Food-borne infections. The most important measures to prevent gastrointestinal illnesses are the use of adequate sanitation, safe water (chlorinate or boil water before consumption) and appropriate food hygiene, regular hand washing with soap, eating thoroughly cooked food, carefully washing fruits and vegetables with bottled or chlorinated water before consumption, and avoiding consumption of raw seafood products. Another available measure to prevent food- and waterborne diseases is vaccination against hepatitis A and typhoid fever. In the EU/EEA, hepatitis A vaccines are available as stand-alone vaccinations or in combination with HBV antigen or typhoid antigen. Typhoid vaccine is also available as stand-alone vaccine.

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Annex. Health requirements for travellers to Saudi Arabia for pilgrimage to Mecca (2018/1439H Hajj)

Source: Ministry of health, Saudi Arabia. Health requirements for travellers to Saudi Arabia for pilgrimage to Makkah* (2018/1439H Hajj). Riyadh: Ministry of health; 2018 [cited 2018 17 July]. Available from: <http://www.moh.gov.sa/en/hajj/pages/healthregulations.aspx>

Disease/conditions of special importance during Hajj and Umrah

Yellow fever

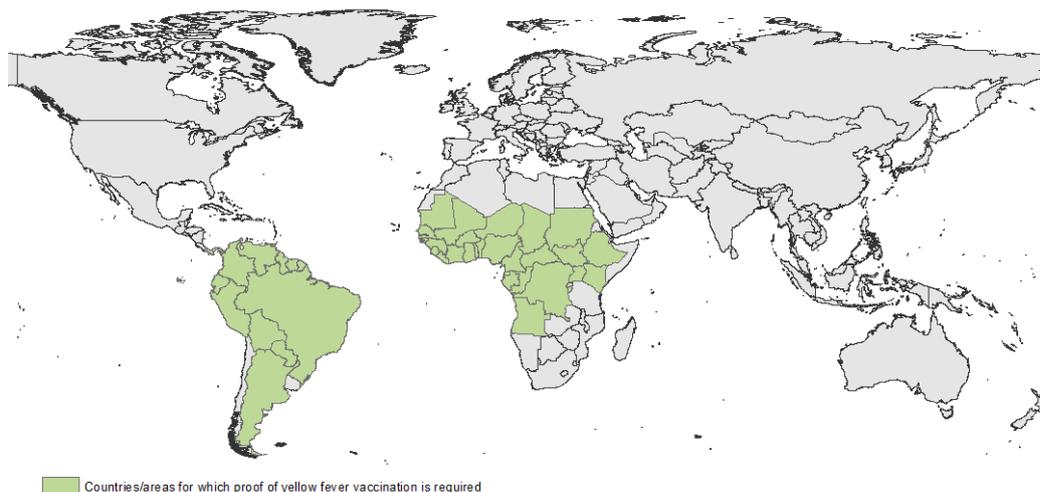
The ministry of health in the Kingdom of Saudi Arabia requires that all travelers arriving from countries or areas at risk of yellow fever transmission (see below) must present a valid yellow fever vaccination certificate. The yellow fever vaccination certificate is valid for life starting 10 days after vaccination.

Countries/areas at risk of yellow fever transmission, as per the WHO International Travel and Health guidelines, are:

- **Africa:** Angola, Benin, Burkina Faso, Burundi, Cameroon, the Central African Republic, Chad, Congo, Côte d'Ivoire, the Democratic Republic of the Congo, Equatorial Guinea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Sudan, the Republic of South Sudan, Togo, and Uganda.
- **Americas:** Argentina, the Bolivarian Republic of Venezuela, Brazil, Colombia, Ecuador, French Guiana, Guyana, Panama, Paraguay, Peru, the Plurinational State of Bolivia, Surinam, and Trinidad and Tobago.

Aircrafts, ships, and other means of transportation arriving from countries affected with yellow fever are required to present a valid certificate of disinsection. They may be subjected to inspection as a condition of granting free pratique (including permission to enter a port, to embark or disembark, and to discharge or load cargo or stores).

Annex Figure 1. Countries/areas for which yellow fever vaccination proof is requested before entering Saudi Arabia



Source: ECDC illustration adapted from WHO [36] and the ministry of health of Saudi Arabia [33]

Meningococcal meningitis

Visitors arriving for Umrah, Hajj or for seasonal work in Hajj zones, are required to submit a valid vaccination certificate with a tetravalent (ACYW135) meningococcal vaccine administered no less than 10 days prior to arrival to Saudi Arabia.

Vaccination with ONE of the following vaccines is acceptable:

- Tetravalent (ACYW135) polysaccharide vaccine within the last 3 years.
- Tetravalent (ACYW135) conjugate vaccine within the last 5 years.

Current scientific evidence suggests that conjugate vaccines are safe and effective for those above 55 years of age.

* Arabic name for Mecca

If the vaccine type is not indicated in the certificate, the certificate will be valid for 3 years.

Vaccination with tetravalent (ACYW135) conjugate vaccine is also required for:

- Domestic pilgrims.
- Residents of the two holy cities (Makkah and Medina).
- Any person who may get in contact with pilgrims including personnel in healthcare settings.

The ministry of health in the Kingdom of Saudi Arabia may opt to administer prophylactic antibiotics to some travelers to at the points of entry if deemed necessary.

Poliomyelitis

Travelers arriving from countries with circulating wild or vaccine-derived poliovirus (cVDPV2) and from countries at risk of polio reintroduction are required to submit a valid polio vaccination certificate.

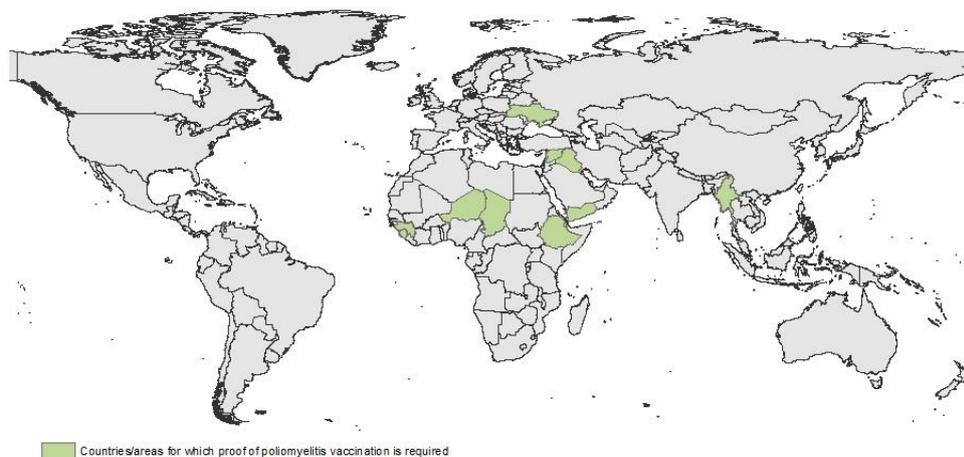
For travelers arriving from Afghanistan, Nigeria, Pakistan, Myanmar, Ethiopia, Somalia, the Republic of South Sudan, the Syrian Arab Republic, and Yemen should present proof of vaccination with one of the following vaccines:

- At least one dose of bivalent oral polio vaccine (OPV) within the previous 12 months and administered at least 4 weeks prior to arrival.
- At least one dose of inactivated polio vaccine (IPV) within the previous 12 months and administered at least 4 weeks prior to arrival.

For all travelers arriving from the Democratic Republic of the Congo a proof of receipt of at least 1 dose of inactivated polio vaccine (IPV) within the previous 12 months and administered at least 4 weeks prior to arrival.

Travelers arriving from Afghanistan, Nigeria, Pakistan, Myanmar, Ethiopia, Somalia, the Republic of South Sudan, the Syrian Arab Republic, and Yemen will also receive one dose of OPV at the border points on arrival into Saudi Arabia.

Annex Figure 2. Countries/areas for which poliomyelitis vaccination proof is requested before entering Saudi Arabia



Seasonal influenza

The ministry of health in the Kingdom of Saudi Arabia recommends that all pilgrims are vaccinated against seasonal influenza.

Influenza vaccination is particularly important for pregnant women, children less than 5 years of age, adults over 65 years of age and individuals with specific health conditions such as obesity, bronchial asthma, chronic heart or lung diseases, HIV/AIDS and immune suppression.

Countries are encouraged to secure adequate quantities of the most recent influenza vaccine to be administered to those intending to perform Hajj. For this year’s Hajj, the southern hemisphere vaccine is expected to be available before Hajj and the ministry of health in the Kingdom of Saudi Arabia recommends all pilgrims to receive this vaccine at least 10 days prior to commencing hajj.

Middle East respiratory syndrome coronavirus (MERS-CoV) and other respiratory infections

Efforts to prevent MERS-CoV infections during Hajj and Umrah have been successful. However, other viral respiratory tract infections are common. The ministry of health recommends all pilgrims to comply with following:

- Wash hands with soap and water or a disinfectant, especially after coughing and sneezing, after using toilets, before handling and consuming food, and after touching animals.
- Use disposable tissues when coughing or sneezing and dispose of used tissues in a wastebasket.
- Wear regular masks when in crowded places.
- Avoid close contact with people who appear ill and avoid sharing their personal belongings. e) Avoid contact with camels in farms, markets, or barn.
- Avoid drinking raw milk or eating meat that has not been thoroughly cooked.

Dengue fever

The ministry of health in the Kingdom of Saudi Arabia requires that aircrafts, ships, and other means of transportation coming from countries affected by dengue fever to submit a certificate indicating that disinsection measures have been undertaken.

The ministry of health in the Kingdom of Saudi Arabia recommends pilgrims to take necessary measures to avoid mosquito bites which include sleeping in air-conditioned rooms/tents and using insect repellents.

Food- and waterborne diseases

Authorities in Saudi Arabia permit entry of food in small quantities in properly canned or sealed containers only. The ministry of health in the Kingdom of Saudi Arabia recommends all pilgrims to observe the following:

- Wash hands before and after eating and after going to the toilet.
- Thoroughly clean and wash fresh vegetables and fruit.
- Avoid eating improperly stored food.

Heat-related conditions

The ministry of health in the Kingdom of Saudi Arabia recommends all pilgrims, especially older individuals, to avoid direct sun exposure while performing rituals and to drink sufficient amount of fluids. Countries are requested to provide education on health-related illness to their pilgrims prior to travel. Medications that can exacerbate dehydration (e.g. diuretics) or interfere with heat exchange may need adjustment by treating physicians.

International disease outbreak response

In the case of a public health emergency of international health concern, or in the case of any event subject to notification under the International Health Regulations (2005), the health authorities in Kingdom of Saudi Arabia will undertake all additional necessary measures in consultation with the WHO.

Hajj medical missions

The ministry of health in the Kingdom of Saudi Arabia requires the medical missions accompanying the pilgrims to comply with the following technical requirements:

- The mission should have at least 1 physician per 1 000 pilgrims accompanying the mission and at least 20% of the accompanying physicians in the medical mission should be public health physicians.
- Medical missions should have a valid medical waste contract with a certified local company that covers the entire Hajj season.
- Medical mission clinics should include at least one infectious diseases isolation room that meets MoH standards.
- The medical mission shall commit to reporting notifiable infectious diseases to the Saudi Arabian Health System using approved reporting methods.

Physical ability and health education

Pilgrims and relevant officials in countries of origin are encouraged to consider the physical ability and health conditions of individuals applying for Hajj and Umrah. Those with severe medical conditions such as terminal cancers, advanced cardiac, respiratory, liver, or kidney diseases, and senility are exempt from these religious duties.

Health authorities in countries of origin are requested to provide basic health education to pilgrims prior to travel. This may include food safety, heat-exhaustion, and means of preventing infectious diseases.

The ministry of health in the Kingdom of Saudi Arabia recommends all pilgrims to update their immunization status against vaccine-preventable diseases. This includes vaccination against diphtheria, tetanus, pertussis, polio, measles, varicella and mumps.