



Contents lists available at ScienceDirect

Vaccine

journal homepage: [www.elsevier.com/locate/vaccine](http://www.elsevier.com/locate/vaccine)

## Review

## Prevention of meningococcal disease at mass gatherings: Lessons from the Hajj and Umrah

Saber Yezli<sup>a,\*</sup>, Philippe Gautret<sup>b</sup>, Abdullah M. Assiri<sup>c</sup>, Bradford D. Gessner<sup>d</sup>, Badriah Alotaibi<sup>a</sup>

<sup>a</sup> The Global Centre for Mass Gatherings Medicine, Ministry of Health, Riyadh, Saudi Arabia

<sup>b</sup> URMITE, Aix Marseille Université, UM63, CNRS 7278, IRD 198, INSERM 1095 – IHU Méditerranée Infection, Marseille, France

<sup>c</sup> Public Health Directorate, Ministry of Health, Riyadh, Saudi Arabia

<sup>d</sup> Agence de Medecine Preventive, Paris, France

## ARTICLE INFO

## Article history:

Received 8 February 2018

Received in revised form 23 April 2018

Accepted 11 June 2018

Available online xxx

## Keywords:

Meningococcal disease

Mass gatherings

Hajj

Outbreak

Vaccine

*Neisseria meningitidis*

## ABSTRACT

Meningococcal disease is a serious public health threat given the seriousness of the illness, its disabling sequelae and its potential for epidemic spread. The disease is a concern during mass gatherings which provide conditions that facilitate transmission of infectious agents including *Neisseria meningitidis*. Implementation of appropriate meningococcal disease preventive measures during at-risk mass gatherings is crucial to prevent illness and outbreaks which may result in significant morbidity and mortality as well as local and international spread of the disease. These preventive measures should be informed by comprehensive risk assessments of the disease at those events and may include the use of vaccination, chemoprophylaxis and health awareness and educational campaigns, supported by efficient disease surveillance and response systems. The Hajj and Umrah religious mass gatherings in the Kingdom of Saudi Arabia are examples of how the implementation of such preventive measures was successful in reducing the incidence of meningococcal disease during these events as well as controlling and preventing outbreaks. Lessons learned from the Hajj and Umrah experience can inform meningococcal disease preventive strategies for other mass gatherings worldwide.

© 2018 Elsevier Ltd. All rights reserved.

## Contents

1. Introduction	00
2. Meningococcal disease preventive measure at mass gatherings	00
2.1. Vaccination	00
2.2. Chemoprophylaxis	00
2.3. Disease surveillance	00
2.4. Health awareness, education and training	00
2.5. Other considerations	00
3. Summary	00
4. Conflict of interests	00
References	00

### 1. Introduction

The World Health Organization (WHO) defines mass gatherings as events attended by a sufficient number of people to strain the

planning and response resources of the community, state or nation hosting the event [1]. Mass gatherings can be either planned or spontaneous and recurrent or sporadic [2]. Examples include music festivals, funerals of religious or political figures, the Olympic Games, and the Hajj and Umrah pilgrimages. By their nature, mass gatherings involve the congregation of a large number of people in the same location at the same time, conditions that facilitate communicable diseases transmission. Reducing the risk of these

\* Corresponding author at: Global Centre for Mass Gatherings Medicine, Public Health Directorate, Ministry of Health, Riyadh, Saudi Arabia.

E-mail address: [saber.yezli@gmail.com](mailto:saber.yezli@gmail.com) (S. Yezli).

diseases at mass gatherings is crucial given the potential for rapid spread of infection in crowded conditions and for occurrence of large outbreaks leading to significant morbidity and mortality [3]. Prevention of infectious diseases at international mass gatherings is also important for global health security given the increased potential for worldwide spread of disease which may need reporting under the International Health Regulations (2005) (IHR) [2].

Meningococcal disease is an important public health threat during mass gatherings due to the seriousness of the disease, its disabling sequelae and the potential for epidemic spread. Prevention of meningococcal disease at mass gatherings may require measures beyond those routinely used to control the disease outside a mass gathering context. These strategies may include vaccination, targeted and/or mass chemoprophylaxis, health awareness and educational campaigns as well as having efficient disease surveillance and response systems. The Hajj and Umrah religious mass gatherings in the Kingdom of Saudi Arabia (KSA) are examples of where such interventions have successfully been used to reduce the incidence of the disease and to control and prevent outbreaks. Meningococcal disease was common during Hajj and Umrah and a number of outbreaks related to these events occurred in the past few decades including three major international outbreaks in 1987, 2000 and 2001 as well as a number of local outbreaks during the 1990s [3]. The implementation of strict preventive measures has prevented pilgrimage-associated meningococcal outbreaks since 2001 and no cases of the disease were recorded during Hajj or Umrah since 2006 [3,4]. In addition, such measures combined with the introduction of meningococcal vaccination in the childhood immunization program of the Kingdom, significantly reduced the incidence of the disease in Saudi Arabia on the whole [3,5]. As such, these prevention strategies could be used to direct best practices for the prevention of meningococcal disease at other mass gatherings, especially those with similar characteristics to the Hajj and Umrah.

While meningococcal disease and outbreaks have been reported in crowded settings such as colleges, universities and army barracks [6–9], there are few reports of the disease in mass gatherings other than Hajj and Umrah. In 2008, the European Youth Olympic Sports Festival was held in Spain and involved 1,500 athletes from 43 countries. A case of *Neisseria meningitidis* group B (MenB) was reported during the event, treated in a local hospital and made a full recovery. The case was reported to the Local Health Authority and the National Public Health authority of the patient's country. Prophylactic therapy was administered to the case's inner circle (28 athletes and officials) and surveillance of another 84 close contacts with temperature and symptom review was carried out daily. As athletes were travelling back to their countries within the incubation period of the bacterial meningitis, each country was notified first at the event by informing the Chef of the Missions and then by writing to the Secretary Generals of each National Olympic Committee attending [10]. Recently, in 2015, an outbreak of MenW occurred among unvaccinated scouts returning from the World Scout Jamboree that was held in Yamagushi, Japan [11]. Over 33,000 scouts from 162 countries gathered during a 12-day period. There were four confirmed cases in Scotland and two in Sweden and 1,954 contacts received chemoprophylaxis and/or vaccine. These reports demonstrate that the Hajj and Umrah are not the only mass gatherings with potential for meningococcal disease outbreaks. In this article we highlight the key considerations and measures that may be implemented to prevent and control meningococcal disease at mass gatherings drawing from the Hajj and Umrah experience.

## 2. Meningococcal disease preventive measure at mass gatherings

The implementation of strategies aimed at preventing meningococcal disease at a mass gathering should be informed by a thorough risk assessment for the disease and whether the disease is likely to occur or to be a threat to the event. Risk assessment for mass gatherings is a key component of mass gatherings preparedness and planning enabling the public health authorities to identify and assess the characteristics of mass gatherings which introduce or enhance particular threats including potential for infectious diseases [2]. The risk assessment process involves identification of hazards that have the potential to cause harm at mass gatherings and analysis and evaluation of the risks associated with those hazards so that prevention or control measures can be introduced to remove hazards or minimize the level of their risks at these events. Examples of risk assessments for meningococcal disease at mass gatherings including the recent 2016 and 2017 Hajj health risk assessments and that conducted in 2015 for the World Scout Jamboree [12]. If meningococcal disease occurs or is deemed a potential threat for the mass gathering a number of preventive strategies may be considered (Table 1).

**Table 1**  
Meningococcal disease preventive measures to be considered at mass gatherings.

Measures	Examples from Hajj and Umrah	Ref.
<i>Vaccination</i>		
To prevent disease	The quadrivalent A/C/W/Y vaccine is compulsory for all national and international pilgrims, resident of the holy cities, Hajj workers and those working at entry points to KSA or in direct contact with pilgrims	[22]
To control outbreaks	Mass vaccination with the bivalent A/C polysaccharide vaccine implemented in both Makkah and Jeddah following the 1992 MenA outbreaks among residents and Umrah visitors in these two cities	[19,20]
<i>Chemoprophylaxis</i>		
For contacts of cases	Ciprofloxacin chemoprophylaxis given to all household contacts of confirmed and suspected cases following the increase in MenA disease during the 1997 Umrah season	[4]
Mass chemoprophylaxis	Chemoprophylaxis is administered at KSA points of entry to pilgrims arriving from the Sub-Saharan meningitis belt	[22]
<i>Awareness and educational campaigns</i>		
	Educational and awareness campaigns regarding meningococcal disease were introduced following the 1987 and 1992 MenA outbreaks during the Hajj and Umrah	[4]
<i>Disease surveillance</i>		
	KSA has a functional disease notifiable surveillance system that is enhanced during Hajj for timely and effective detection and management of meningococcal disease cases	[31]
<i>Monitoring compliance with preventive measures</i>		
	Vaccination documents for pilgrims are checked at points of entry to KSA for Hajj to ensure meningococcal vaccination has been administered and the vaccination is valid	[4]
<i>Monitoring carriage state</i>		
	A number of <i>Neisseria meningitidis</i> carriage studies have been performed during Hajj and Umrah, especially following outbreaks	[32]

KSA; Kingdom of Saudi Arabia.

Download English Version:

<https://daneshyari.com/en/article/8485440>

Download Persian Version:

<https://daneshyari.com/article/8485440>

[Daneshyari.com](https://daneshyari.com)