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REVIEW

# Meningococcal disease in the Middle East and Africa: Findings and updates from the Global Meningococcal Initiative



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**KEYWORDS**

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Global Meningococcal  
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Vaccination;  
Middle East;  
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**Summary** The Global Meningococcal Initiative (GMI) has recently considered current issues in Middle Eastern and African countries, and produced two recommendations: (i) that vaccination of attendees should be considered for some types of mass-gathering events, as some countries mandate for the Hajj, and (ii) vaccination of people with human immunodeficiency virus should be used routinely, because of increased meningococcal disease (MD) risk. Differences exist between Middle Eastern and African countries regarding case and syndrome definitions, surveillance, and epidemiologic data gaps. Sentinel surveillance provides an overview of trends and prevalence of different capsular groups supporting vaccine selection and planning, whereas cost-effectiveness decisions require comprehensive disease burden data, ideally counting every case. Surveillance data showed importance of serogroup B MD in North Africa and serogroup W expansion in Turkey and South Africa. Success of MenAfriVac<sup>®</sup> in the African “meningitis belt” was reviewed; the GMI believes similar benefits may follow development of a low-cost meningococcal pentavalent vaccine, currently in phase 1 clinical trial, by 2022. The importance of carriage and herd protection for controlling invasive MD and the importance of advocacy and awareness campaigns were also highlighted.

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## Introduction

*Neisseria meningitidis* is a leading causative agent of bacterial meningitis and septicemia, particularly in children <5 years old and young adults,<sup>1</sup> and is estimated to cause 500,000 cases and 50,000 deaths globally each year.<sup>2</sup> Of 12 recognized serogroups, six (A, B, C, W, X, and Y) are responsible for nearly all meningococcal disease (MD) globally.<sup>3</sup> It has been reported that MD causes substantial morbidity, with case-fatality ratios ranging between ~10 and 20%.<sup>4–6</sup> Most regions of Europe and North America have low MD incidence rates (e.g. ~0.14 per 100,000 US population, 2014), associated predominantly with serogroups B (MenB), C (MenC), and Y (MenY).<sup>7,8</sup> In contrast, the “meningitis belt” of sub-Saharan Africa has historically reported frequent epidemics of MD, but the incidence had fallen 10-fold by 2013, following the introduction of the serogroup A (MenA) vaccine in 2010; cases of MenC, W, and X are also reported in this region.<sup>8,9</sup> The World Health Organization (WHO) has reported 26,029 meningitis cases in the African meningitis belt in 2016 with 2080 deaths—an overall case-fatality ratio of 8.0%.<sup>10</sup> Only half of the laboratory-confirmed cases were caused by meningococci, while for the great majority of the samples the causative organism was not identified.

The Global Meningococcal Initiative (GMI) was established in 2009 with a goal to prevent the occurrence of MD worldwide through education, research, cooperation, and vaccination. The GMI consists of more than 70 scientists, clinicians, and public health officials globally with expertise in MD immunology, epidemiology, microbiology, public health, and vaccinology. Six global and regional GMI roundtable meetings have been held since its inception, leading to research and publications, including global and regional recommendations for MD. The objective of this regional meeting was to gain a better understanding of MD in the Middle East, North Africa, and sub-Saharan Africa. This article summarizes the discussions that took place at the meeting and outlines regional recommendations for the control and prevention of MD, based on available data and regional expert opinion.

## Overview

The current regional roundtable meeting, the first to be convened for the Middle East, North Africa, and sub-Saharan Africa, was held in Lisbon, Portugal, on October 17–18, 2016. The aim of the meeting was to gain an understanding on the current MD situation in this region and to provide recommendations specific to the region. Members from countries outside the region were also invited to share their experience and specific knowledge gained from their surveillance, immunization, and outbreak programs. Regional experts did not attend from every Middle East, North Africa, and sub-Saharan Africa nation; therefore, the current article focuses on the locations represented at the Lisbon GMI Roundtable Meeting.

## Objectives

The specific objectives of the meeting were to provide an update on surveillance, epidemiology, prevention, and control strategies from the Middle East, North Africa, and sub-Saharan Africa and an update from other regions and countries across the globe; discuss the issues faced regarding surveillance, prevention, and control strategies with a focus on current barriers to implementation; share lessons learned and experience gained from immunization programs used across the globe; highlight the importance of conjugate vaccines and their impact; examine the health economic aspects of meningococcal vaccination strategies; emphasize the critical need for disease awareness and advocacy for invasive MD prevention and control; and determine future GMI outputs.

## Meningococcal vaccines

### Meningococcal plain polysaccharide and conjugate vaccines

The first session of the meeting focused on meningococcal vaccines (those currently available and those that

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