

## Public health management of mass gatherings: the Saudi Arabian experience with MERS-CoV

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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 a community, state or nation”.<sup>1,2</sup> To the extent possible, planning for these events should be conducted centrally, by both the health and non-health sectors, and should begin well in advance.

Mass gatherings can have good and bad long-term effects on the health sectors of host countries. They offer an opportunity to improve health service delivery, enhance health promotion and strengthen public health systems,<sup>3</sup> but they can also overwhelm health services.

As the largest annual mass gathering in the world, the *hajj* or pilgrimage to Mecca overburdens Saudi Arabia's health system because 2 to 3 million Muslim pilgrims from more than 180 countries converge on the country's holiest sites. During the 2013 *hajj* season, 1 205 880 pilgrims visited hospitals and health centres in the country and 4015 were admitted to specialized units. In the holy sites, 25 hospitals provided a total of 5250 beds for acute care patients and more than 22 500 health practitioners and health ministry staff were on duty during the entire three weeks of *hajj*. In addition, 459 cardiac catheterizations, 22 open heart surgeries, 106 endoscopies and 1624 haemodialyses were performed.<sup>4</sup>

Accidents such as crush injuries and cardiovascular events have traditionally been the most common causes of morbidity and mortality resulting from mass gatherings.<sup>5</sup> However, globalization and travel have given rise to larger, more frequent cross-border mass events that facilitate the spread of communicable diseases, particularly emerging infectious diseases.<sup>6</sup> Fortunately, this spread can be controlled through effective vigilance and planning. For example, during the 2009 pandemic, robust surveillance and effective infectious disease control strategies prevented A(H1N1)pdm09

from spreading widely during *hajj*.<sup>7</sup> More recently, Saudi Arabia reported the highest number of confirmed cases of infection with Middle East respiratory syndrome coronavirus (MERS-CoV) and has collaborated with other countries to identify the sources of infection and transmission and take appropriate action. In addition, the country has adopted a surveillance system and strategy to prevent viral transmission among pilgrims. Notably, apart from one recent unconfirmed case, no other cases of MERS-CoV infection were reported in the 6.5 million pilgrims who took part in the *hajj* in 2012 and 2013. Among pilgrims returning home, a lack of adequate surveillance systems in resource-limited countries can make it hard to identify pathogens with long incubation periods, such as MERS-CoV.

Building on decades of experience, in October 2010 the Saudi Arabian health ministry established the Global Center for Mass Gathering Medicine, subsequently endorsed by health ministers of the League of Arab States. WHO's Executive Board soon mandated a strategy for mass gatherings and established a framework to address the health challenges these entail.

The scientific and practical methods applied in mass gathering medicine, as the field is called, were examined during the Second International Conference on Mass Gathering Medicine in Riyadh, Saudi Arabia, in September 2013. The conference highlighted the importance of research and of drawing on the experience of states and regional and international organizations to control accidents and diseases during mass gatherings. The resulting Riyadh declaration calls for cooperation and information exchange between the Global Centre for Mass Gathering Medicine and other WHO collaborating centres and between states, international organizations and scientific centres, with due observance of patient confidentiality and medical ethics. It also states that

global developments in the control of MERS-CoV transmission should be followed to inform arrangements for the *hajj* and other mass gatherings. Finally, it calls for the coordination of policies and procedures to better define the nature, methods and scope of mass gathering medicine and to launch media and educational campaigns for increasing awareness of the field. The conference acknowledged the media's role in conveying accurate and unbiased health information and underscored the importance of relying on reputable sources; ensuring balanced, non-alarmist coverage based on scientific facts and mindful of public health ethics; and establishing benchmarks for the resources needed during mass gatherings.

The complex public health challenges posed by mass gatherings are best addressed through mutual trust and equitable partnerships and collaborations. In a globalized world, such collaborations inevitably extend beyond national and regional borders and hence require a fine balance between respect for national sovereignty, public health ethics and global health security priorities.<sup>8,9</sup> ■

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