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## Feature

## Mass gatherings and respiratory disease



Hasan Ammar/AP/Press Association Images

For more on MERS CoV transmission see [Articles Lancet](#) 2013; published online Sept 20. [http://dx.doi.org/10.1016/S0140-6736\(13\)61887-5](http://dx.doi.org/10.1016/S0140-6736(13)61887-5)

In mid-October, 2013, about 3·5 million pilgrims are expected to descend on Mecca, Saudi Arabia, to perform Hajj. Under the strictures of Islam, the rite is obligatory for all able-bodied Muslims at least once in their lifetimes. Hajj is the world's largest annual mass gathering; last year saw more than 1·7 million pilgrims arrive from abroad.

Many public health risks are associated with this mass gathering. Muslims live all over the world, but especially in poor nations, and many pilgrims are elderly. The Islamic calendar is 11 days shorter than the Gregorian calendar; Hajj moves backwards through the year, and can become aligned with peak influenza season in one of the hemispheres. This year, the threat of Middle East respiratory syndrome coronavirus (MERS-CoV) exists. As this piece went to press, more than 100 cases had been reported, with a fatality rate of nearly 50%. The virus could prove especially dangerous for people with suppressed immune systems or underlying health disorders. Thus the Saudi Arabian authorities have recommended that individuals older than 65 years and those with chronic diseases do not perform Hajj this year.

However, whether this recommendation will be assiduously followed is uncertain. Philippe Gautret (Hôpital Nord, Service des Maladies Infectieuses et Tropicales, Marseille, France) points out that preliminary findings of French pilgrims preparing for this year's Hajj suggest that they are disregarding the advice. "MERS-CoV has not yet pandemic potential since human-to-human transmission is limited", he added, "but we will have to carefully survey what happens in Saudi Arabia and in the home countries of international pilgrims".

"Saudi Arabia is very keen to prevent infections from spreading and to take care of pilgrims", adds Harunor Rashid (National Centre for Immunisation Research and Surveillance of Vaccine Preventable Diseases, Sydney University, Sydney, NSW, Australia). During the 2003 outbreak of severe acute respiratory syndrome (SARS), the state banned pilgrims from affected countries, introduced thermal imaging cameras at major airports, and established facilities to rapidly diagnose the virus; a SARS outbreak was not reported among pilgrims. Saudi Arabia also offers free health care for Hajjis, and employs about 20 000 health workers for the occasion. Every year it disseminates health recommendations to those contemplating making the journey. "We cannot prevent people from coming—the onus is on the countries of origin to enforce these recommendations", Ziad Memish, Saudi Arabia's Deputy Minister of Health, told *The Lancet Respiratory Medicine*.

Saudi Arabia does require that all pilgrims be vaccinated against meningococcal disease and those from endemic countries against polio and yellow fever. The influenza

vaccines are not sufficiently protective to warrant adding them to this list, notes Memish. Nevertheless, the virus is one of the largest health concerns for mass gathering attendees.

"In our samples, mostly Hajjis from the UK, at least 10% developed influenza confirmed by PCR", affirms Oxford University's Elizabeth Haworth. She estimates that half of returning pilgrims report some kind of respiratory symptoms (although data on the subject are scarce). These symptoms are partly attributable to dust and irritation, but for some people are more serious. "Respiratory infections are common during mass gatherings", said Gautret, "viruses are rapidly acquired, notably rhinovirus and influenza". Hospitals in Saudi Arabia report upsurges in pneumonia during Hajj. Moreover, some pilgrims contract an infection during Hajj, but only have symptoms when they return home.

Whether attendees are in danger of contracting tuberculosis is a moot point. At an event like the Olympics, where spectators congregate for a day or so before returning to their homes and hotels, the risk of infection is low. But at Hajj, people are accommodated in tents, living in close quarters to one another. In view of the lengthy incubation period of tuberculosis, confirmation of Hajj-related cases is difficult. However, contact-tracing has raised strong suspicions that the pilgrimage is a risk factor for the disease.

The risk of infection can be kept to a minimum by preventive measures: adherence to cough etiquette, effective food hygiene (700 000 goats are sacrificed during Hajj), and washing with soap and water. "The Ministry of Hajj is providing diagrams for pilgrims on how to wash—we have to ensure people are properly educated that prevention matters", said Haworth. She is involved in a trial that aims to test the efficacy of facemasks that are worn properly against masks that are casually worn. 2500 pilgrims at this year's Hajj are participating. "At the moment, there is conflicting or inconclusive evidence that masks do prevent respiratory infections, particularly flu", Haworth told *The Lancet Respiratory Medicine*. For example, masks are not useful when wet, and few people wear them while sleeping.

Memish stresses the importance of establishing mass gatherings, which he defines as "large numbers of people attending an event that is focused on specific sites for a finite time", as a medical specialty, and of encouraging collaboration between the organisers of such events. He has been instrumental in getting mass gathering medicine on the global health agenda, and in mid-September, Riyadh played host to the 2nd International Conference on Mass Gathering Medicine, Riyadh, Saudi Arabia. "It is a new field, but it is developing and gaining recognition", said Haworth.

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