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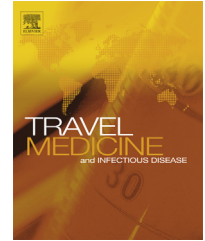
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EDITORIAL

Hajj, Umrah, and other mass gatherings: Which pathogens do you expect? Beware of the tree that hides the forest!



For centuries, Muslim pilgrims have converged in Mecca, Saudi Arabia, for the Hajj to participate in a series of sacred rituals at least once in their life. With more than 1.5 billion Muslims scattered in 183 countries worldwide, Hajj has become the largest annually recurring mass gathering event with more than 2.5 million participants, mostly middle aged or older, many with co-morbidities [1]. As for other mass gatherings, Hajj' hazards are classified as non-communicable (stampede, cardiovascular) and communicable. Almost a decade after the first pandemic of the 21st century caused by the SARS coronavirus, the identification of the novel MERS coronavirus in Saudi Arabia, in June 2012, has raised considerable concern about possible globalization. The *Neisseria meningitidis* W135 outbreak at the outset of the 21st century was an example of the epidemiological "amplifying chamber" that the Hajj has become.

In this issue of Travel Medicine and Infectious Disease, there are four articles addressing important scientific, medical and public health topics related to the Hajj pilgrimage and how to mitigate the risk for infectious diseases including methods such as the use of alcohol-based hand gel sanitizer or face masks.

Meningococcal disease, respiratory tract infections, blood-borne, diarrheal and zoonotic diseases are all frequently encountered infectious problems for the pilgrims. Pneumonia is the most common cause of infection followed by upper respiratory tract infection, gastroenteritis, skin infections and sepsis [2]. Responsible for almost 60% of the total, respiratory infections are the most prominent infections occurring during Hajj and are a common cause of severe sepsis and septic shock, necessitating intensive care. With an approximate 20% fatality rate, complications resulting from pneumonia are responsible for the second (after cardiovascular disease accounting for >40%) largest number of deaths during Hajj [3]. In 2014, one million Hajj' pilgrims will experience respiratory symptoms. Accordingly, dissemination of viral or bacterial

respiratory pathogens secondary to symptomatic infections or carriage emphasizes the need for international cooperation and strategies to minimize this risk.

Of course the most lingering question obviously is: how to prevent epidemic transmission and possible globalization of frightening microbes such as SARS and MERS coronaviruses, pandemic influenza, viral hemorrhagic fever viruses? Undoubtedly during the next Hajj, in October 2014, most attention will be focused on MERS coronavirus and Ebola.

Thirty months after the first cases, less than a thousand human cases of MERS coronavirus infections have been laboratory-confirmed with a 30% fatality rate. None of these cases has occurred in Hajj pilgrims and no upsurge of the number of cases occurred during Hajj and Umrah in 2012 and 2013 [4,5].

However, we need to remember and to convey to the public the message that bacterial infections will be caused by *Haemophilus influenzae*, *Klebsiella pneumoniae*, and *Streptococcus pneumoniae*, and that the vast majority of viral respiratory infections will be due to seasonal influenza viruses, rhinoviruses and coronaviruses distinct from the MERS coronavirus.

We must remember that aside from the highly publicized exotic and emerging pathogens, we must be alert to the circulation of common pathogens, which silently cause much more casualties than the exotic newcomers which occupy the forefront of the stage and get all the headlines.

The last decade has witnessed a great number of emerging or re-emerging infections. As countermeasures, consortium-based research projects and networks have considerably improved the capacity for detection in routine diagnostic laboratories and to monitor in a timely manner the unpredictable dissemination of emerging pathogens [6].

Surprisingly, similar standardized approaches were much less frequently developed for "classic" pathogens. The challenge is to combine the detection of the epidemic pathogen together with the detection of other microbes

constituting differential diagnoses. Although diagnostic may appear as a trivial problem that is already being solved, the real-life situation is less glamorous. Laboratory tests allowing the direct and rapid detection of various micro-organisms potentially causing a similar syndrome are sometimes available from commercial companies but are unaffordable for broad utilisation in low income countries. In addition shortages are frequent at the peak of the crisis [7,8]. The rapid production of properly validated assays that can be used on common real-time PCR cyclers at an affordable cost is far from taken for granted although the proof of concept has been validated through the European Virus Archive, a EU-funded infrastructure [9] (www.european-virus-archive.com).

It is obvious that improving our capacities for response is an essential goal. Pathogen preparedness and response programs are priority. Efforts must be balanced between rare emerging pathogens on one hand and common classic pathogens on the other hand. The tree must not hide the forest!

Conflict of interest

None.

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