

## Brief Report

### Umrah. An opportunity for mass gatherings health research

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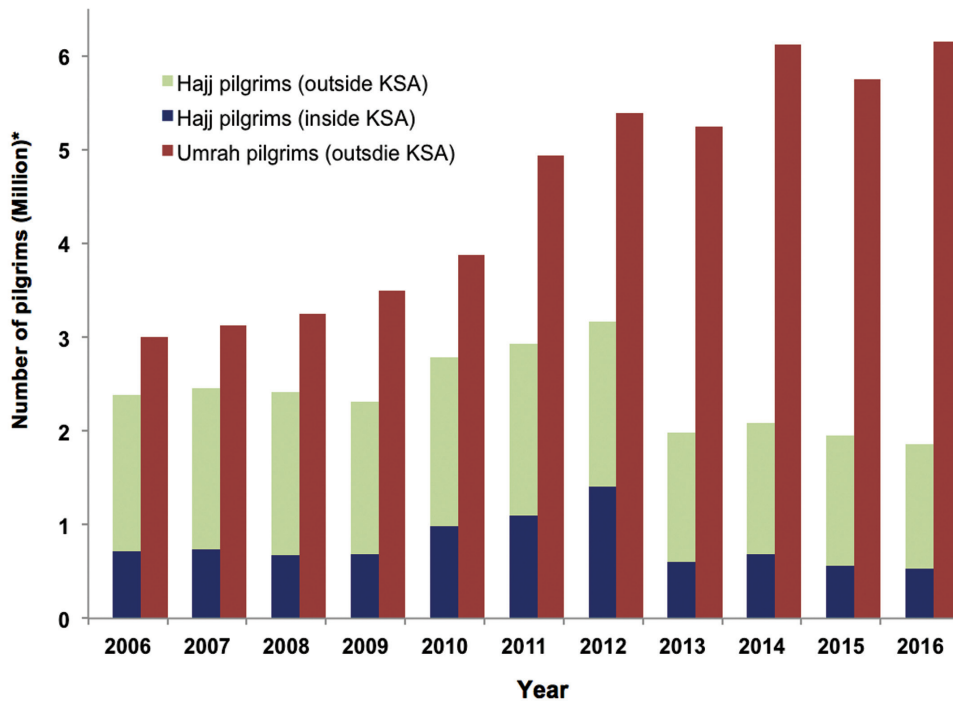
The Hajj and Umrah religious mass gatherings take place in the Kingdom of Saudi Arabia and are attended each year by over 10 million Muslim pilgrims from over 180 different countries. In accordance with the Saudi Vision 2030, the number of pilgrims is expected to increase significantly in the coming years to reach 30 million for Umrah visitors alone by 2030. Umrah offers a unique opportunity to study a mass gathering that received little scientific interest so far and to conduct health research in a flexible and research friendly environment. Health research initiatives into Hajj and Umrah should be encouraged so that knowledge and experiences generated could be used to optimize planning and delivery of effective public health services during these events as well as other mass gatherings worldwide.

*The Hajj and Umrah mass gatherings.* The World Health Organization (WHO) defines “mass gatherings” as events attended by a sufficient number of people to potentially strain the planning and response resources of the community, city or nation hosting the event.<sup>1</sup> Examples of such events include the “Hajj” and “Umrah” religious mass gatherings in the Kingdom of Saudi Arabia (KSA). The Hajj is one of the largest and most geographically, ethnically, and culturally diverse mass gatherings in the world, annually attended by more than 2 million pilgrims from over 180 different countries.<sup>2</sup> The number of pilgrims attending Hajj has been gradually increasing over the years but reduced in the years 2013-2015 (Figure 1) as limited permits were granted due to construction work to expand the Sacred Mosque. Once the expansion work will finish, the number of pilgrims attending Hajj is expected to more than double in the coming few years. The Hajj rituals officially start on the 8th day of the 12th month of the lunar Islamic calendar called “Dhul-Hijjah”, but most pilgrims arrive to Mecca few days or weeks earlier. As the lunar calendar lags behind the solar calendar by approximately 10 days every Gregorian year, Hajj

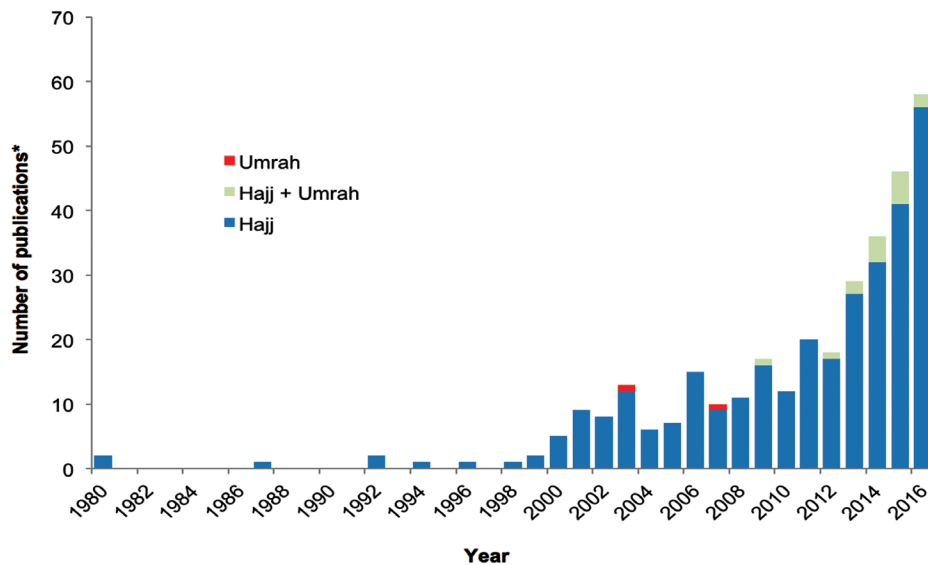
falls in different parts of the Gregorian calendar each year. Mecca is also the setting for the Umrah ritual, now performed almost all year-round. The Saudi investment in the expansion of the Two Holy Mosques and enhancement of public infrastructures and services, coupled with improved international travel, rendered Umrah very congested, especially in certain months such as the Holy month of Ramadan. The number of foreign Umrah visitors has increased significantly in the last decade, reaching over 6 million in 2016 (Figure 1). It is expected that the number of Umrah pilgrims from outside KSA to start routinely reaching over 1 million per month for many months of the year. In lines with the Saudi Vision 2030,<sup>3</sup> the Umrah is set to become a mass gathering of major importance and consequence for the Kingdom and internationally. According to the vision, by increasing capacity and improving quality of services offered to Umrah visitors, the number of foreign visitors performing Umrah is expected to reach 15 million annually by 2020 and 30 million by 2030. This means that by 2030, Saudi Arabia will be hosting each year nearly as many Umrah visitors as its own entire population. There are no accurate estimations of the yearly number of pilgrims performing Umrah from within the Kingdom as no specific permits are required to perform Umrah for those already in KSA. Unlike Hajj, most of the Umrah rituals take place within the Sacred Mosque in Mecca and can be performed within few hours. However, many international pilgrims tend to take advantage of the 2-week Umrah visa and stay for many days in Mecca and visit other Holy sites.

*Health research during the Hajj and Umrah mass gatherings.* Mass gatherings health is an emerging area of science that deals with all aspects of health during mass gatherings including the diverse health risks associated with these events<sup>4</sup> and ensuring the wellbeing of people attending them. These health risks include transmission of infectious disease, non-communicable disease, trauma and injuries (occupational or otherwise), environmental effects (such as, heat-related illnesses, dehydration, hypothermia), illnesses related to the use of drugs and alcohol and deliberate acts, such as terrorist attacks. Mass gatherings health research is essential to advance the collective knowledge in all areas of the discipline as well as for the development of effective evidence-based policies and planning to reduce the risks and effects of mass gatherings, associated health hazards and global security threats to public health.<sup>5</sup> Mass gatherings health research agendas should address all aspects of mass gatherings for optimal knowledge acquisition in this field, and major areas of research in the field have been proposed.<sup>5-7</sup> Applied and

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**Figure 1** - The number of Hajj and Umrah pilgrims (2006-2016).



**Figure 2** - Pubmed search results for yearly publications related to the Hajj or Umrah. Generated using the search terms "Hajj" or "Umrah" or "Umra"

translational research should be encouraged as they are particularly informative for mass gatherings organizers and public health decision makers.<sup>5</sup> Given that the field of mass gatherings health is in its infancy, many topics in this area are yet to be addressed by scientific research

including in the context of the Hajj and Umrah. **Figure 2** shows the number of scientific publications available in Pubmed relating to the Hajj or Umrah pilgrimages up to the year 2016. Although this is not an exhaustive list of all publications relate to these topics in the literature,

it is however an adequate proxy of the level and the type of scientific and academic interest in these mass gatherings. Some observations can be made: 1) research and academic interest in Hajj has been increasing since the year 2000, particularly after 2012. This could be partly due to increase awareness of mass gatherings health following the establishment of mass gatherings medicine as a formal discipline,<sup>8,9</sup> 2) in general, and also compared to Hajj, there was significantly less research devoted to the Umrah mass gathering. This may be partly due to the fact that Hajj is a much more publicized event internationally compared to Umrah; and 3) most research and publications into Hajj or Umrah were mainly focused on communicable diseases and to a lesser extent non-communicable illnesses. The above suggest that although there are encouraging signs that interest in mass gatherings health research into Hajj and Umrah is increasing, most of this research has been focused on Hajj and limited to important, but nevertheless confined areas of mass gatherings health.<sup>5,7</sup>

*Advantages of mass gatherings health research during Umrah.* Research during the Umrah pilgrimage should be encouraged and supported for a number of reasons: First, the pilgrimage is a fertile environment for mass gatherings health research in all aspects of the pilgrimage including those that are unique to the Umrah. Few studies explored this mass gathering; hence, the opportunities for basic, applied and translational research during Umrah are abundant.

Second, unlike Hajj, Umrah is an almost all-year round pilgrimage; hence, research could be planned and executed at any point during the year without the need to tailor the research projects towards specific dates in the calendar year. This allows repeatability and for a greater flexibility in conducting studies. For instance, research protocols could be amended and modified accordingly once they have started, studies could be extended as appropriate and data collection and sampling could be repeated for better quality, all relatively easily without major delays in the research timeline.

Third, although the rituals of Hajj and Umrah are not identical, some aspects of these rituals are similar. In addition, both pilgrimages are religious mass gatherings, hosted in the same Holy cities and have comparable pilgrims' demographics. Hence, many aspects of these mass gatherings are shared and researchers interested in investigating some features of mass gatherings health during Hajj, may do so effectively during Umrah.

Fourth, the Umrah mass gathering is a much friendlier research environment compared to Hajj. Unlike Hajj, Umrah has fewer restrictions regarding access to and freedom of movement in the Holy cities as well as more

opportunities for interaction with pilgrims in a more relaxed setting. In addition, access to public, research and health facilities and services including transport, communication networks, healthcare facilities and laboratories, which is crucial for health research, is easier during Umrah as these facilities and services are less likely to be congested, busy or unavailable compared to the Hajj season. Hence, for many types of research, it is easier and more convenient to perform them during Umrah compared to Hajj.

Fifth, although Umrah is considered a smaller and shorter mass gathering than Hajj, this is not always the case. The number of pilgrim attending Umrah has increased significantly in the last few years (**Figure 1**) and the number of pilgrims per calendar month during Umrah is expected to rival or even exceed the number of pilgrims during Hajj, especially in certain months of the year. In addition, although the Umrah rituals can be performed in few hours, most pilgrims attending Umrah, especially international pilgrims, tend to stay from few days to weeks in the Holy sites. These facts are particularly relevant for health studies that are sensitive to the size of the mass gathering and the time attendees spend at the location of the event. These include for instance studies investigating acquisition of pathogens and infectious diseases transmission during mass gatherings. Umrah can therefore be an appropriate event to conduct such studies.

In conclusion, research into mass gatherings health is important to the advance knowledge in this emerging field of science and to formulate robust and effective evidence-based public health policies and interventions for the optimum planning and management of mass gatherings. The Umrah mass gathering offers a unique opportunity to study a mass gathering that received little scientific attention. It also presents an opportunity to conduct research, including into many aspects of the Hajj, in a more flexible, less restrictive and a research friendly environment compared to Hajj. Mass gatherings health research in Hajj and Umrah should be encouraged in all areas of the discipline to extend beyond communicable and non-communicable diseases to other areas of mass gatherings health including topics such as crowd behavior, psychology and management, environmental and occupational health, health delivery and health systems. Research initiatives in Hajj and Umrah should be backed and supported by strong political will and facilitated by the Kingdom's authorities and organizations. In this context, the Global Centre for Mass Gatherings Medicine and its linked virtual network of other WHO Collaborating Centres for mass gatherings and academic and public health institutions,<sup>8</sup>

aims to play a key role. This in both facilitating health research for individuals and institutions interested in conducting studies during the Hajj and Umrah and in promoting knowledge acquisition and dissemination regarding health during these mass gatherings. Research initiatives into the Hajj and Umrah mass gatherings are important not only for their scientific merit, benefits to pilgrims and to global health security but also because knowledge, experiences and lessons generated from these mass gatherings could be exported and shared to optimize planning and delivery of effective public health services during other mass gatherings around the world.

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