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## Editorial

## Advancing the global health security agenda in light of the 2015 annual Hajj pilgrimage and other mass gatherings



In the second week of September 2015, health ministers from across the world converged in Seoul, Korea for the 2<sup>nd</sup> high level deliberations on Global Health Security Agenda (GHSA). This was yet another attempt to galvanize a unified response to infectious diseases that threaten global health security.<sup>1,2</sup> This event coincided with the arrival in Saudi Arabia of nearly 1.5 million pilgrims from over 180 countries who will participate in the 2015 annual Hajj pilgrimage.<sup>2–5</sup> amidst the ongoing global transmission of three viral infections associated with high morbidity and mortality rates with epidemic potential, the Ebola virus (EBOV), Middle East respiratory Syndrome coronavirus (MERS-CoV) and avian influenza virus A (H5N1).<sup>6–8</sup> The detection in July 2015 of Ebola virus from dead body swab of a 17 year old boy in Liberia after the declaration of Liberia being Ebola Free in May 2015, and the detection of Ebola virus in the dead body of an elderly woman in Sierra Leone as the country awaits countdown to being declared Ebola free, indicate current knowledge gaps of the natural history and pathogenesis.

The recent large outbreak of MERS-CoV in hospitals in Seoul, Korea and subsequent spillover to China was unprecedented as the largest outbreak outside the Middle East.<sup>9</sup> This event illustrated that unless a high degree of awareness and vigilance with effective surveillance and infection control measures are in place, transmission of MERS-CoV can occur in the home countries can occur upon return of an infected pilgrim. These are all complex challenges that detection of even one case can overwhelm any health systems and adversely affect the economic security of affected countries. Although the comprehensive Hajj Health Care and Emergency Management system of Saudi Arabia is well positioned to cope with known types of threats and related case management<sup>10</sup>, they are unlikely to detect any incubating transmissions that occurred among pilgrims that remain asymptomatic during the pilgrims stay in KSA.

Although current GHSA is yet to specifically highlight mass gathering preparedness as a strategic priority even in countries with high participant contribution to mass gatherings, the 12 Global Health Security Agenda action packages and the strategies to minimize the implications of mass gathering on public health are similar. The risk of infectious disease transmission during a mass gathering is the same or even more as the risk of transmission that prevails in any one of the home or host countries of mass gathering participants. During the world health Assembly 67, a side event took place to launch the lancet series on Mass Gathering Medicine in May 21, 2014 (Figure 1). Mass-gatherings



**Figure 1.** World health Assembly 67 side event “launch of the lancet series on Mass Gathering Medicine” May 21, 2014, showing from the left to right: Prof. Ziad Memish, Dr. Richard Horton, Dr. Ala Alwan, HE Eng. Adel M. Fakeih, Dr. Margaret Chan, HE Remigiusz A. Henczel, Dr. Brian McCloskey.

are held for various purposes including religious rituals, sports activities, or festivals and therefore the demographics, risks, and the intensity of activities vary. Further, the risks are exacerbated during mass gatherings such as the Hajj for airborne, droplet, and body fluid-related transmission due to the absence of social distancing among participants; increased susceptibility due to stress, lack of sleep, and changing nutritional factors during peak events; disruption of medications among persons with chronic debilitating diseases; and participation in some of the rituals such as animal sacrifices or the practice of scalp hair shaving practices by self-help groups using unsterile blades rather than in regulated barber shops. Given that two-thirds of the emerging diseases are zoonotic, human-animal interaction during some mass gatherings such as the Hajj further increases the risk, and Saudi Arabia imports sacrificial animals from 6 countries. Thus, except for vaccine preventable diseases, perfection of disease control strategies in one or few countries alone including in the host country may not offer blanket protection from all types of disease transmission dynamics for epidemic prone disease agents present in any one of the countries. The impact of these challenges on public health during

mass gatherings can be minimized by two strategies. First, each of the countries that participate in a mass gathering should have alert systems in place to identify diseases of transmission-potential during a mass gathering, control measures in place to avoid the exportation of such risks, and reduce the participation of individuals at risk increased risk for disease acquisition. For GHSA<sup>1</sup>, this relates to adequate syndromic- and agent-based surveillance, laboratory enhancements, and reporting systems and risk communication managed by adequately trained workforce including one epidemiologist for a population of 200,000. Furthermore, countries participating in mass gatherings should have public emergency preparedness in response mode and adequate surge capacity to be able to respond to potential emergencies from participants returning from mass gatherings. Existence of a public health emergency operations center with sufficient pool of response manpower and medical countermeasures available will be critical. This can only be functional if relevant a national public health preparedness policies and authorities are in place to coordinate a response with diverse organizational entities such as the ministries of aviation, defense, interior, and health.

Of note, moving from challenges to disease detection opportunities, it is worth noting that mass gatherings provide an unexploited opportunity as an one-stop surveillance venue to monitor emerging disease threats or existing threats of significance in multiple countries. Health examinations and specimen collection is routine for Hajj pilgrims prior to departure in their home countries and arrival airports in Saudi Arabia conduct health screenings. Additional surveillance programs using rapid detection tests can be implemented in home and host countries of mass gatherings. Furthermore, the Hajj emergency health management system operates a network of health facilities with electronic data management systems that can conduct syndromic- and agent-based surveillance on symptomatic individuals who seek care (about 500,000 pilgrims on average during each Hajj) (10)-deliverables that correspond well with the objectives outlined in the GHSA<sup>1</sup>.

In summary, it is imperative that opportunities presented by the GHSA in the first round of 17 countries chosen for immediate implementation by the U.S. Government<sup>1</sup>, and future beneficiary countries of the GHSA prioritize and program funding and activities that specifically address mass gathering preparedness in addition to sustained routine activities. We now have the knowledge that the world did not have during the 1957 Hajj and influenza transmission. As the search for vaccines and treatment continue for these novel challenges, first and foremost priority for the global community is to minimize the effects of emerging threats during mass gatherings would be to activate public health emergency management capacities before, during and after these mass gatherings of significance. Mass gatherings offer opportunities to implement, test, and assess GHSA objectives in its entirety and can contribute significantly to health security of individuals, nations, and the world.

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