International Journal of Infectious Diseases 123 (2022) 210–211

Contents lists available at ScienceDirect

International Journal of Infectious Diseases

journal homepage: www.elsevier.com/locate/ijid

Infectious diseases threats at the Arba'een – a neglected but one of the largest annually recurring mass gathering religious events

Shuja Shafi[1,*], Esam Azhar[2,3], Seif Al-Abri[4,5], Avinash Sharma[6], Nizar Merali[7], Jaffar A Al-Tawfiq[4,8,9,10], Sherif A El-Kafrawy[2,3], Alimuddin Zumla[11,12], Shui Shan Lee[4,13]

[1] Mass Gatherings and Global Health Network, London, United Kingdom
[2] Special Infectious Agents Unit BSL-3, King Fahd Medical Research Center, King Abdulaziz University, Jeddah, 21589, Saudi Arabia
[3] Department of Medical Laboratory Sciences, Faculty of Applied Medical Sciences, King Abdulaziz University, Jeddah, 21589, Saudi Arabia
[4] International Society for Infectious Diseases
[5] Directorate General for Disease Surveillance and Control, Ministry of Health, P.O. Box 393, 100, Muscat, Oman
[6] DBT-National Centre for Cell Science, Pune, India
[7] General Practice Direct, Harrow HA2 0RQ, London, United Kingdom
[8] Infectious Disease Unit, Specialty Internal Medicine, Johns Hopkins Aramco Healthcare, Dhahran, Saudi Arabia
[9] Indiana University School of Medicine, Indianapolis, USA
[10] Infectious Disease Division, Johns Hopkins University School of Medicine, Baltimore, MD, USA
[11] Division of Infection and Immunity, University College London, United Kingdom
[12] NIHR Biomedical Research Centre, UCL Hospitals NHS Foundation Trust, London, United Kingdom
[13] Stanley Ho Centre for Emerging Infectious Diseases, The Chinese University of Hong Kong, Hong Kong, China

ARTICLE INFO

Keywords:
Mass gathering
Infectious diseases outbreaks
Religious events

EDITORIAL

Mass gathering religious, sporting and festival events are known to pose major public health challenges worldwide (Shafi et al., 2016; Al Rabeeah et al., 2012; Blumberg et al., 2016; Memish et al., 2019). Recent focus of these challenges has been on the importation, transmission, and globalisation of a range of emerging and re-emerging infectious diseases threats including Monkeypox, COVID-19, Influenza and antibiotic resistance (Aggrawal et al., 2020; Goumballa et al., 2022; Zumla et al., 2022; Petersen et al., 2022; Al-Ansari et al., 2021). All mass gathering religious events involve large numbers of pilgrims living and interacting together performing religious rites in crowded conditions, exposing themselves and the local population to various bacterial and viral infections. Every year the Kingdom of Saudi Arabia (KSA) hosts the Hajj pilgrimage, one of the largest religious mass gatherings held on an annual basis where up to 2 million people from over 180 countries, and one million local pilgrims assemble in the holy cities of Makkah and Madinah (Shafi et al., 2016; Memish et al., 2019). The Kumbh Mela is held every four years and is the largest religious mass gatherings in the world attracting over 120 million pilgrims (Aggrawal et al., 2020). The nature and degree of threats to global and host country health security of each individual religious mass gathering varies and depends on the number of pilgrims, the frequency of religious events and proportion of local versus international pilgrims, countries of origin and pre-event public health preparations. The latter includes adherence to the latest recommended WHO health risk assessments for mass gathering events, host country travel advice including immunisations, available healthcare facilities and services provided to pilgrims.

Whilst the Hajj pilgrimage has been the focus of attention of global public health bodies and has generated intense academic discourse for the past decade (Sweileh, 2022) due to a global remit of origin of pilgrims and the emerging threats of new zoonotic pathogens including MERS-CoV and SARS-CoV-2, other large annually recurring mass gathering religious events have received less attention but could potentially pose significant threats to global health security. The Grand Magal of Touba in Senegal, for example, attracts millions of pilgrims, the public health issues of which have recently been highlighted (Petersen et al., 2022; Goumballa et al., 2022). On 16th -17th September 2022, the Shiite religious pil-

* Correspondence: Dr Shuja Shafi.
E-mail addresses: msshafi12@gmail.com (S. Shafi), eazhar@kau.edu.sa (E. Azhar), salabri@gmail.com (S. Al-Abri), avinash.nccs@gmail.com (A. Sharma), nizarmerali@nhs.net (N. Merali), jaltawfi@yahoo.com (J.A. Al-Tawfiq), saelkfrawy@kau.edu.sa (S.A. El-Kafrawy), a.zumla@ucl.ac.uk (A. Zumla), sslee@cuhk.edu.hk (S.S. Lee).

https://doi.org/10.1016/j.ijid.2022.09.010

grimage Arba'een, the largest annually recurring regional religious event, will take place and over 20 million pilgrims from the Middle East, particularly from Iran and within Iraq and other countries such as Turkey, Nigeria and India will travel to Iraq. The pilgrimage is marked by long walks of up to 80 kilometres from the holy city of Najaf to Karbala by pilgrims from all age groups and ethnicities, different walks of life, with elderlies pushed in armchairs, and children carried by families (Karampourian et al., 2018; Lami et al., 2019). During the Arba'een, pilgrims are provided with free accommodation, food, and drinks by volunteers along the walking routes.

To date, the Arba'een has remained relatively neglected by global public health authorities due to its regional Middle East focus and frequent interruptions to attendance for pilgrims from outside Iraq. Whilst accurate data are unavailable in the literature, the annual numbers and flow of pilgrims for the Arba'een have been interrupted several times over the years due to political instability, safety and security issues. Since the Iraq war ended over two decades ago in 2003 the Arba'een has continued to attract a growing number of pilgrims from outside Iraq (Al-Ansari et al., 2021). The tens of millions pilgrims impose a substantial burden on Iraq's already fragile and non-resilient health infrastructure. Public health surveillance and control measure for infectious diseases constitute significant challenges during the Arba'een due to high population density, pilgrims' relatively low perception and lack of awareness of health risks (Hamdanieh et al., 2021; Karampourian et al., 2018; Lami et al., 2019)

The potential risk of infectious diseases outbreaks at the Arba'een could be extraordinary, and the range of conditions may include not just COVID-19 but also Monkeypox, meningococcal diseases, and other respiratory tract infections (Al-Ansari et al., 2021; Petersen et al., 2022; Zumla et al, 2022). Mass gathering religious events also impose a high burden on health services of host countries due to the repeated occurrence of traumatic and crush injuries, large loads of non-communicable diseases, co-morbidities, and heat-related disorders (Shafi Shafi et al., 2016; Memish et al., 2019). As with other mass gathering religious events, accurate evidence-based data on the burden of communicable and non-communicable diseases at the Arba'een are generally not available. These are required for supporting the development of effective prevention, surveillance, and management programmes for controlling infectious diseases and related public health conditions, implementing a system of real-time monitoring of diseases and morbidity patterns, utilising modern information-sharing platforms for rapid decision-making. The evidence base is also essential to promulgate WHO event-based planning and prevention guidelines for all future mass gathering religious pilgrimages (Petersen et al., 2022; Zumla et al., 2022). It is the responsibility of the host countries, public health professionals and academics to share information and experiences at mass gathering religious events in support of the development and implementation of effective and responsive systems, which are essential for ensuring that all pilgrims have a healthy and spiritually rewarding experience.

Declaration of Competing Interest

All authors declare no conflicts of interest.

Acknowledgements

Sir Alimuddin Zumla is co-principal investigator of The Pan-African Network on Emerging and Re-Emerging Infections (PANDORA-ID-NET, CANTAM-3, and EACCR-3) funded by the European and Developing Countries Clinical Trials Partnership, supported by the EU Horizon 2020 Framework Programme. Sir Alimuddin Zumla is in receipt of an UK-NIHR Senior Investigator award and is a Mahathir Science Award and EU-EDCTP Pascoal Mocumbi Prize Laureate.

References

Aggrawal V, Dikid T, Jain SK, Pandey A, Khasnobis P, Choudhary S, et al. Disease surveillance during a large religious mass gathering in India: The Prayagraj Kumbh 2019 experience. Int J Infect Dis 2020;101:167–73. doi:10.1016/j.ijid.2020.09.1424.

Al-Ansari F, Mirzaei M, Al-Ansari B, Al-Ansari MB, Abdulzahra MS, Rashid H, et al. Health Risks, Preventive Behaviours and Respiratory Illnesses at the 2019 Arbaeen: Implications for COVID-19 and Other Pandemics. Int J Environ Res Public Health 2021;18(6):3287. doi:10.3390/ijerph18063287.

Al Rabeeah A, Memish ZA, Zumla A, Shafi S, McCloskey B, Moolla A, et al. Mass gatherings medicine and global health security. Lancet 2012;380(9836):3–4. doi:10.1016/S0140-6736(12)61073-3.

Blumberg L, Regmi J, Endricks T, McCloskey B, Petersen E, Zumla A, et al. Hosting of mass gathering sporting events during the 2013-2016 Ebola virus outbreak in West Africa: experience from three African countries. Int J Infect Dis 2016;47:38–41. doi:10.1016/j.ijid.2016.06.011.

Goumballa N, Hoang VT, Diouf FS, Mbaye B, Parola P, Sokhna C, et al. Risk factors for symptoms of infection and the acquisition of pathogens among pilgrims at the Grand Magal of Touba, 2017-2021. Travel Med Infect Dis 2022;49. doi:10.1016/j.tmaid.2022.102418.

Hamdanieh L, Ostadtaghizadeh A. Arbaeen in the Context of the COVID-19 Pandemic. Disaster Med Public Health Prep 2021;15(4):e16. doi:10.1017/dmp.2020.362.

Karampourian A, Ghomian Z, Khorasani-Zavareh D. Exploring challenges of health system preparedness for communicable diseases in Arbaeen mass gathering: a qualitative study. F1000Res 2018;7:1448. doi:10.12688/f1000research.15290.1.

Lami F, Hameed I, Jewad AW, Khader Y, Amiri M. Real-Time Surveillance of Infectious Diseases and Other Health Conditions during Iraq's Arbaeenia Mass Gathering: Cross-Sectional Study. JMIR Public Health Surveill 2019;5:e14510. doi:10.2196/14510.

Memish ZA, Steffen R, White P, Dar O, Azhar EI, Sharma A, et al. Mass gatherings medicine: public health issues arising from mass gathering religious and sporting events. Lancet 2019;393(10185):2073–84. doi:10.1016/S0140-6736(19)30501-X.

Petersen E, Asogun D, Ntoumi F, Zumla A. Infection control at mass religious gatherings. BMJ 2022;378. doi:10.1136/bmj-2022-072884.

Shafi S, Dar O, Khan M, Khan M, Azhar EI, McCloskey B, et al. The annual Hajj pilgrimage-minimizing the risk of ill health in pilgrims from Europe and opportunity for driving the best prevention and health promotion guidelines. Int J Infect Dis 2016;47:79–82. doi:10.1016/j.ijid.2016.06.013.

Sweileh WM. Health-related research publications on religious mass gatherings of Muslims: a bibliometric analysis (1980-2020). Trop Dis Travel Med Vaccines 2022;8:1. doi:10.1186/s40794-021-00158-y.

Zumla A, Traore T, Amao L, Ntoumi F, Sharma A, Azhar EI, et al. Reducing the threat of epidemic-prone infections at mass gathering religious events. Lancet 2022;400(10346):80–2. doi:10.1016/S0140-6736(22)01194-1.