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## Correspondence

**Middle East countries preparedness for Monkeypox outbreak: A call to action**

Dear Editor,

On July 23, 2022, the World Health Organization (WHO) declared monkeypox (MPX) a global public health emergency. Since then, countries in the Middle East and Latin America have taken measures to prevent the spread of MPX, such as mandatory screening for all tourists arriving at ports and airports. The epidemic has been seen as a significant challenge for Middle Eastern countries, prompting them to tighten mitigation measures and take other steps to prevent spread of the epidemic [1,2]. MPX is more prevalent in lesbian, gay, bisexual, and transgender people. Most cases involve sexual transmission, males in their thirties, immunocompromised individuals, and children are most vulnerable. However, this is not a sexually transmitted disease (STD) because it can be transmitted by non-sexual routes, including direct or indirect contact with bodily fluids or lesions of monkeypox virus (MPXV) infected persons, contaminated surfaces or materials such as skin-to-skin contact or sharing bedding [3]. It is a zoonotic disease that can also be transmitted from animals to people. MPX disease symptoms are rashes on face and extremities; fever; inguinal lymphadenopathy, weakness, fatigue, headache, and in some cases, genital and anal lesions [4]. The fatality rates range from 1% to 11%, and those who survive often suffer from visible scars and their sequelae.

The Middle East is an area that has confirmed cases of MPX, albeit these cases are much less common than those diagnosed in Europe and the Americas. As of August 29, 2022, more than 47652 confirmed cases from 99 countries and 13 deaths have been reported globally, with only 249 cases reported in the Middle Eastern countries [5]. A possible explanation for the low incidence of MPX in the Middle East is that it has not been documented in any of these nations in the past. Islam is the dominant religion in the majority of Middle Eastern nations. It is possible that the low number of MPX cases can be attributed to the fact that same-sex couples (such as Gay) are outlawed in Islam. Currently, there are no specific treatments for MPX and supportive care is given to alleviate symptoms, although advances are being made to find out appropriate treatment options [6]. Vaccinations based on the vaccinia virus are available, including JYNNEOSTM, ACAM2000®, and Aventis Pasteur Smallpox Vaccine (APSV) [7]. To some extent, immunity to the MPXV and alleviation of symptoms can result from prior smallpox immunization. Vaccination with the vaccinia virus has been found to be 85% effective against monkeypox. In severe cases, antiviral drugs such as tecovirimat, brincidofovir, and cidofovir are more effective than the smallpox vaccine. Brincidofovir, an oral analogue of intravenous cidofovir, has an enhanced safety profile [8]. Vaccinia Immune Globulin (VIG) is an FDA-approved hyperimmune globulin for treating complications of vaccinia vaccination. Pre-exposure prophylaxis (PrEP) is recommended for those at high risk of contracting MPX due to occupational exposure to the virus [9], and post-exposure prophylaxis (PEP) is recommended for contacts of confirmed cases including ring

vaccination [6]. Due to the pandemic potential of MPXV, ring vaccination might help to break the transmission chain and control the illness by immunizing high-risk populations [10]. In France, two doses of JYNNEOSTM, 28 days apart, have been advised for contact-confirmed cases of PEP [11].

The emergence of any global public health emergency of international concern and/or pandemic threat requires immediate outbreak response and adopt proactive measures for its timely prevention before spreading further through individuals and community at society, national and international levels. The current upsurge of confirmed MPX cases throughout different regions of the world has made all countries to take precautions to prevent the disease from its adverse impacts. Despite the small number of confirmed cases in the Middle East countries, certain recommendations are put forward that can serve as barriers, give solutions for limiting the MPX outbreaks, and to raise people's awareness. Importantly, local governments should inform people on monkeypox's common symptoms, such as fever, chills, swollen lymph nodes, exhaustion, skin rash, muscle pain, and headache. More importantly, general practitioners, physicians, and health employees should be educated on MPX. Frontline healthcare workers should take part in short-term emergency training courses so that they will be able to accurately diagnose, manage, and treat cases that might appear suddenly and to adopt appropriate personal safety measures to lessen the possibility of getting infected and becoming a source of further virus transmission and spread. Most importantly, the impact of MPX on people should not be underestimated simply because on average, its negative impact on populations is less than that of other infectious diseases [3]. However, messages sent to the public should not cause fear and anxiety which could be more damaging than the disease itself. On the other hand, psychological impacts of MPX, such as fear and anxiety on people should be reduced [12–14]. Above all, based on a global call and in agreement with the points as mentioned above, an article published by Lancet which suggested that countries, particularly countries where cases of MPX have recently been reported, need to enhance their public health preparedness, update case definitions with emergence of new data, apply prevention and control measures while taking benefits from the recent experience in fighting against the ongoing COVID-19 pandemic, and increase case identification [15].

There are substantial benefits to proper disease management and prevention from data collection in comprehensive surveillance programs. Governments and policymakers should increase public awareness on monkeypox and develop educational initiatives for medical professionals and general public to help control the present outbreak. The Middle Eastern countries must strengthen their public health and surveillance capacities for effective data collection, tracking, preparation, mitigation, and proper responses to monkeypox. Early screening helps to detect unknown or suspected people, particularly in the lesbian,

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gay, bisexual, and transgender (LGBT) communities. With an increasing number of reported cases of monkeypox around the world, it is important to find out why there have been so few confirmed cases in the Middle Eastern countries. Research facilities are needed to be strengthened for this disease that has been considered earlier as a neglected and/or rare disease. High collaborative efforts are required to be promoted to discover effective vaccines and therapeutics against MPX to counteract this global health emergency timely, and to alleviate any possibility for another MPXV pandemic amid the ongoing COVID-19 pandemic.

### Ethical approval

Not applicable. All data presented in the study has been collected from open-source platforms with proper citation and/or from media sources.

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SKA conceived and designed this paper. SKA, SHH, RMO, SOA, and RAE, wrote the manuscript. SKA, RAE, SOA, RMO, SHH, NAA, AQA and KD revised the manuscript. The author(s) read and approved the final manuscript.

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### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### References

- [1] C. Wenham, M. Eccleston-Turner, Monkeypox as a PHEIC: Implications for Global Health Governance, *Lancet*, London, England, 2022.
- [2] P. Patel, Monkeypox is declared as a global health emergency. Are we prepared? *Natl J Community Med* 13 (2022) 417–418.
- [3] S.K. Ahmed, E.A.A. Rashad, M.G. Mohamed, R.K. Ravi, R.A. Essa, S.O. Abdulqadir, A.A. Khdir, The global human monkeypox outbreak in 2022: an overview, *Int. J. Surg.* 104 (2022), 106794, <https://doi.org/10.1016/j.ijvs.2022.106794>.
- [4] N.L. Bragazzi, J.D. Kong, N. Mahroum, C. Tsigalou, R. Khamisy-Farah, M. Converti, J. Wu, Epidemiological trends and clinical features of the ongoing monkeypox epidemic: a preliminary pooled data analysis and literature review, *J. Med. Virol.* (2022), <https://doi.org/10.1002/jmv.27931>.
- [5] Centers for Disease Control and Prevention CDC, Monkeypox Outbreak Global Map, Atlanta, GA US Dep Heal Hum Serv CDC, 2022, 2022, <https://www.cdc.gov/poxvirus/monkeypox/response/2022/world-map.html>. August 13, 2022.
- [6] S. Chakraborty, D. Chandran, R.K. Mohapatra, M. Alagawany, N.A. El-Shall, A. K. Sharma, C. Chakraborty, K. Dhama, Clinical management, antiviral drugs and immunotherapeutics for treating monkeypox. An update on current knowledge and futuristic prospects, *Int. J. Surg.* (2022), 106847.

- [7] J.G. Rizk, G. Lippi, B.M. Henry, D.N. Forthal, Y. Rizk, Prevention and treatment of monkeypox, *Drugs* (2022) 1–7.
- [8] G. Chittick, M. Morrison, T. Brundage, W.G. Nichols, Short-term clinical safety profile of brincidofovir: a favorable benefit-risk proposition in the treatment of smallpox, *Antivir. Res.* 143 (2017) 269–277.
- [9] Centers for Disease Control and Prevention CDC, Monitoring and Risk Assessment for Persons Exposed in the Community, Centers Dis Control Prev, 2022. <https://www.cdc.gov/poxvirus/monkeypox/clinicians/monitoring.html>. August 13, 2022.
- [10] R. Sah, A. Abdelaal, A. Asija, S. Basnyat, Y.R. Sedhai, S. Ghimire, S. Sah, K. Bonilla-Aldana, A.J. Rodriguez-Morales, Monkeypox virus containment: the application of ring vaccination and possible challenges, *J. Trav. Med.* 29 (6) (2022), taac085, <https://doi.org/10.1093/jtm/taac085>.
- [11] L.B.L. Nguyen, J. Ghosn, C. Durier, C. Tachot, E. Tartour, A. Touati, T. Simon, B. Autran, I.O. Perez, E. Telford, A prospective national cohort evaluating ring MVA vaccination as post-exposure prophylaxis for monkeypox, *Nat. Med.* (2022), <https://doi.org/10.1038/d41591-022-00077-1>.
- [12] S.K. Ahmed, A.A. Saied, R.K. Ravi, M.G. Mohammed, S.H. Hussein, R.A. Essa, et al., The 2022 monkeypox outbreak and associated psychiatric morbidities-Correspondence, *Int J Surg (London, England)* (2022) 106913, <https://doi.org/10.1016/j.ijvs.2022.106913>.
- [13] S.K. Ahmed, S.O. Abdulqadir, S.H. Hussein, Z.K. Ahmed, R.A. Essa, A.A. Khdir, A. Q. Abdulla, Timely mental health care for the 2022 novel monkeypox outbreak is urgently needed, *Ann Med Surg* 82 (2022) 104579.
- [14] Ahmed, S.K., Abdulqadir, S.O., Omar, R.M., Hussein, S.H., M-Amin, H.I., Chandran, D., Sharma, A.K., Dhama, K., Ahmed, Z.K., Essa, R.A., Abdulla, A.Q. and Khdir, A.A., 2022. Study of knowledge, attitude and anxiety in Kurdistan-region of Iraqi population during the monkeypox outbreak in 2022: An online cross-sectional study. 2022 doi:10.21203/rs.3.rs-1961934/v2.
- [15] T. Lancet, Monkeypox: a global wake-up call, *Lancet (London, England)* 400 (2022) 337.

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