

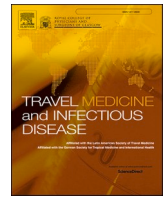


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Risk of monkeypox outbreak in Nepal

Dear Editor,

Monkeypox is a zoonotic disease, which is caused by large DNA *Monkeypox virus*, a type of orthopox virus, which is similar to the causative agent of small pox i.e., *Variola virus* of Poxviridae family. Symptoms are similar to small pox but are milder in nature and major difference is lymphadenopathy which is seen in monkeypox. Incubation period is generally 7–14 days but can extend up to 21 days. Symptoms of monkeypox infection includes fever, headache, back and muscle aches, chills, swollen lymph nodes and exhaustion. Infected human, animals and contaminated objects transmit disease via direct contact and virus can cross placental barrier [1]. It was first discovered in 1958 in monkeys kept for research and later it was reported in human in 1970 in the Democratic Republic of Congo [1]. It was endemic to around 12 countries of Western and Central African countries, often in proximity to tropical rainforests, and outbreak in other countries was rare [2]. But since the first case of monkeypox reported in UK on May 7, 2022, an unexpected number of cases are being reported from different countries in Europe, and Americas and Australia [1]. Although first case of UK was travel linked to Nigeria, there are several unusual cases with no travel history and linked with previous cases, such outbreaks are of scientific, public health and social concern [3]. World Health Organization (WHO) declared monkeypox disease as ‘moderate risk’ and expected it unlikely to become a pandemic. However on May 30, 2022, Nigeria confirmed the first death from monkeypox and confirmed 21 out of 66 suspected cases whereas a death of 9 people in Congo has been reported in 2022. As of May 26, 2022 there are 26 confirmed cases in Canada, 10 in United States of America, 218 in 16 countries of Europe including United Kingdom, two in Australia and one case in United Arab Emirates (UAE) (Asia) [2].

After confirmed case in UAE [2], there is high a risk of outbreak in south Asian countries such as Nepal. A large number migrant workers are in UAE and every day there is movement of people between Nepal and UAE. In 11 months of 2021, 65,000 Nepalese travelled to UAE on visit visa and additionally 19,632 went to work. A large number of international workers traveling from UAE, increased activities and movement of people due to local election, and presence of wild animals including monkey in almost every temple and park of Kathmandu might contribute to the outbreak of monkeypox in Nepal. Although there is no reported case of monkeypox in India, Nepal shouldn't turn its blind eye on the possibilities of disease entry from India due to its open border. Although the first case was reported in a student returning from China [4], the first surge of COVID-19 in Nepal was primarily associated with seasonal labor migrants crossing the Indian border [5], and COVID-19 incidence in Nepal is significantly correlated with the incidence in India [6].

If monkeypox cases are reported in the future, it will be very difficult to control due to lack of patient tracking system, self-medication

practice, social stigma, and lack of timely diagnosis of the disease. Moreover, the social stigma associated with new diseases make people hesitate to refer to hospital so as to keep it secret from being isolated in the society. For instance, people with HIV are not easily welcomed by the society and they have to go through social trauma. Stigma and discrimination are likely occurred in monkeypox as well as it is reported to be transmitted via sexual intercourse and also large cases are seen in gay men [7].

Even if disease is controlled in humans, it may remain in rodents and monkey and could burst out at any time. Proper implementation of healthcare policy and program is major issue in Nepal where, weak healthcare system, poor sanitation and hygiene, low literacy rate are often obstacle in public health programs [5].

National public health laboratory in Kathmandu, Nepal has already been upgraded and its laboratory protocol has been standardized as per WHO guideline with the technical assistance of WHO. Diagnostic tool like, whole genomic sequencing has also been started in this laboratory recently and is capable of diagnosis of monkeypox as well but primers and probes needs to be imported. Besides from this laboratory, other are not as per WHO standard and timely diagnosis will be difficult if large number of suspected cases are reported in the country.

Although there are several challenges, there is always an opportunity to improve public health care system. Several news channels, online, government social media and newspapers are spreading the news of monkeypox, sign and symptoms, and its prevention and control strategies. The Ministry of Health and Population has already provided free hotline number (1115) to report in case there is febrile condition with rashes and pox like lesion in face, hands and legs. Government should establish the help desk with health professionals in every international border and each passenger should be checked for fever and presence of pox like lesions in the body. Passengers with such condition should be isolated, quarantined and travel history should be tracked and special attention should be given to the passengers coming from outbreak countries. All health professionals, especially dermatologist should be more concerned about this disease and need to provide basic information to their patients. All the central, provincial and local level governments should be alert, coordinate data sharing, and be prepared for outbreak of monkeypox in Nepal. Each individual should be cautious and unnecessary contact with other people should be avoided and should contact or visit nearby hospital in case of febrile condition along with pox like lesions.

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Authors' contributions

Both authors contributed equally and approved the final manuscript.

Declaration of competing interest

There is nothing to declare.

References

- [1] León-Figueroa DA, Bonilla-Aldana DK, Pachar M, Romani L, Saldaña-Cumpa HM, Anchay-Zuloeta C, et al. The never-ending global emergence of viral zoonoses after COVID-19? The rising concern of monkeypox in Europe, North America and beyond. *Trav Med Infect Dis* 2022;49:102362. <https://doi.org/10.1016/J.TMAID.2022.102362>.
- [2] WHO. Multi-country monkeypox outbreak in non-endemic countries. Update, <https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON388>. [Accessed 31 May 2022].
- [3] Zumla A, Valdoleiros SR, Haider N, Asogun D, Ntoumi F, Petersen E, et al. Monkeypox outbreaks outside endemic regions: scientific and social priorities. *Lancet Infect Dis* 2022. [https://doi.org/10.1016/S1473-3099\(22\)00354-1](https://doi.org/10.1016/S1473-3099(22)00354-1). 0.
- [4] Bastola A, Sah R, Rodriguez-Morales AJ, Lal BK, Jha R, Ojha HC, et al. The first 2019 novel coronavirus case in Nepal. *Lancet Infect Dis* 2020;20:279–80. [https://doi.org/10.1016/S1473-3099\(20\)30067-0](https://doi.org/10.1016/S1473-3099(20)30067-0).
- [5] Pantha B, Acharya S, Joshi HR, Vaidya NK. Inter-provincial disparity of COVID-19 transmission and control in Nepal. *Sci Rep* 2021;11:1–16. <https://doi.org/10.1038/s41598-021-92253-5>. 111 2021.
- [6] Kamat A, Sah A. Early detection of COVID-19 waves from cases in a neighboring country with an open border. *Front Public Health* 2021;9:739738. <https://doi.org/10.3389/FPUBH.2021.739738/PDF>.
- [7] Murugesu JA. Monkeypox on the rise. *New Sci* 2022;254:7. [https://doi.org/10.1016/S0262-4079\(22\)00913-7](https://doi.org/10.1016/S0262-4079(22)00913-7).

Deepak Subedi*

Paklihawa Campus, Institute of Agriculture and Animal Science, Tribhuvan University, Rupandehi, 32900, Nepal

Krishna Prasad Acharya

Animal Quarantine Office, Budhanilkantha, Kathmandu, 44600, Nepal

E-mail address: kriaasedu@gmail.com

* Corresponding author.

E-mail address: subedideepu26@gmail.com (D. Subedi).