

# Multi-country Monkeypox outbreaks: The world needs to be prepared and ready for emerging and re-emerging infectious diseases everywhere.

Dr. Talisuna gives an overview on Monkeypox.



## Background

Monkeypox is a rare, viral, zoonotic orthopoxvirus disease that has a similar but milder disease presentation like the eradicated Smallpox in humans. It is usually a self-limiting disease, with case-fatality ratio of 3-6%.<sup>1</sup> Monkeypox has primarily been occurring in the tropical rain forests in West and Central Africa.<sup>1</sup> The primary animal reservoir is still not known but it has been detected in a range of small mammal species, particularly rodents, and monkeys. Animal species in which evidence of the monkeypox virus has been found include *C. gambianus* (the Gambian pouched rat), different squirrel species of the genus *Funisciurus* and *Heliosciurus*, *G. kelleni* (African dormice) and various species of non-human primates.<sup>1,2</sup>

Monkeypox is an emerging disease which has become the most prevalent orthopoxvirus since the global eradication of

smallpox that was declared by the World Health Assembly in 1980.<sup>3-5</sup> This is partly because smallpox vaccination which was cross-protective for other orthopoxviruses was discontinued at the time. Consequently, younger people no longer have vaccine-induced immunity.<sup>4,5</sup>

Human monkeypox was first identified in humans in 1970 in the Democratic Republic of Congo which remains the country that routinely reports the highest number of cases (>1,000) annually since 2005.<sup>6,7</sup> Other countries that have reported human cases since 1970 include Sierra Leone, Liberia, Cote d'Ivoire, Nigeria, Cameroon, Gabon, Republic of Congo, Central African Republic and Sudan (in an area that is now South Sudan).<sup>7</sup> Since late 2016 there have been increasing reports of monkeypox cases from countries that have not seen any for the past

40 years.<sup>7,8</sup>

Clinical recognition, particularly differential diagnosis with other rash and fever illnesses such as chickenpox, laboratory-based diagnosis and prevention remain critical challenges in endemic areas. Two distinct clades or subtypes have been identified. It is believed that infection with a West African strain of monkeypox virus causes a less severe infection, fewer deaths, and lower rates of human-to-human transmission as compared to outbreaks involving Central African strains.<sup>7</sup> The incubation period of monkeypox is 6-16 days (range 5–21). The infection can be divided into two periods: (1) invasion period (0-5 days) characterized by fever, intense headache, lymphadenopathy (swelling of the lymph node), back pain, myalgia (muscle ache) and an intense asthenia (lack of energy); and (2) skin eruption period (1-3 days after appearance of fever) where the various stages of the rash

appear, often beginning on the face and then spreading elsewhere on the body. The most distinguishing symptom of monkeypox is lymphadenopathy. The face (in 95% of cases), and palms of the hands and soles of the feet (in 75% of cases) are most affected by the rash. Evolution of the rash from maculo-papules (lesions with flat bases) to vesicles (small fluid-filled blisters), pustules, followed by crusts occurs in approximately 10 days. Three weeks might be necessary before the complete disappearance of the crusts.<sup>1,7</sup>

Varicella (chickenpox) is often confused with monkeypox but can be distinguished from monkeypox and smallpox by its much more superficial lesions, their presence more on the trunk than on the face and extremities, and by the development of successive crops of lesions in the same area. Fever and rashes occur simultaneously in chickenpox and develop more rapidly; with death being a rare complication. Co-infection with both, varicella and monkeypox virus, has been reported. However, the frequency of this phenomenon, relationship and impact between the viruses' pathogenesis and epidemiology is not clear.<sup>9</sup>

Since May 2022, several non-endemic countries in four WHO regions have reported monkeypox cases. Rare cases of monkeypox in other countries are usually linked to travel to endemic countries. However, most of the current cases do not have any history of travel to endemic countries. Therefore, the current outbreaks are unusual and different from previous travel-related outbreaks.<sup>8</sup>

## Monkeypox is a zoonosis

MonkeyPox is part of the Orthopoxvirus genus which includes variola virus (smallpox) and cowpox virus. There are two main strains, one more virulent and transmissible (Congo Basin clade) than the other (West African clade). The less virulent West African clade has been identified among the current cases. The reservoir host is still unknown, although rodents are suspected to play a part in endemic settings.<sup>1</sup>

## Recognising MonkeyPox

Monkeypox is usually a self-limited disease and typically lasts 2 to 4 weeks. It may be severe in children, pregnant women or persons with immune suppression due to other health conditions. Typical symptoms include fever, headache, muscle aches, backache, lack of energy, swollen lymph nodes and a skin rash or lesions. Swelling of the lymph nodes is a distinctive feature of monkeypox compared to other diseases that may initially appear similar (chickenpox, measles). The skin eruption begins within 1 to 3 days after fever onset. The rash often begins on the face, then spreads to other parts of the body. The rash evolves from macules (lesions with a flat base) to papules (slightly raised firm lesions), vesicles (lesions filled with clear fluid), pustules (lesions filled with

yellowish fluid), and crusts which dry up and fall off. The case fatality ratio has been reported to be around 3% in the African setting, with most deaths occurring in younger age groups.<sup>1</sup>

## Modes of transmission

A person with monkeypox remains infectious while they have symptoms, normally for between 2 and 4 weeks. Monkeypox virus is transmitted from one person to another by close contact with lesions, body fluids and contaminated materials such as bedding, clothing or eating utensils. Ulcers, lesions or sores in the mouth can also be infectious, meaning the virus can spread through saliva. People who closely interact with someone who is infectious, including health workers, household members and sexual partners are at greater risk of infection. Transmission can also occur via the placenta from mother to the foetus (which can lead to congenital monkeypox) or during close contact during and after birth.<sup>1</sup>

## Diagnosis

If monkeypox is suspected, health workers should collect a lesion sample and transport it safely to a laboratory with appropriate capability. Optimal diagnostic samples for monkeypox are from skin lesions, the roof or fluid from vesicles and pustules and dry crusts. Lesion samples must be stored in a dry, sterile tube and kept cold.<sup>1,7</sup>

Protecting yourself and others

Avoid close contact with people who have suspected or confirmed Monkeypox. When caring for a person with Monkeypox, encourage them to cover any lesions with a light bandage or clothing. Wear a medical mask and ask the patient to wear one as well. Avoid skin-to-skin contact and use disposable gloves, clean hands regularly with soap and water or an alcohol-based hand rub, especially after contact with patients or contaminated materials such as beddings, clothing or eating utensils. Wash clothes, towels, bedsheets and eating utensils with warm water and detergent. Wear a mask when handling any clothes or bedding and clean and disinfect any contaminated surfaces and dispose of contaminated waste.<sup>1,7</sup>

## Mitigating spread

Any person with suspected or confirmed Monkeypox should be isolated until their lesions have crusted and the scabs have fallen off. As soon as a suspected case is identified, contact tracing should be initiated. Contacts should be monitored daily for the onset of symptoms for a period of 21 days. Asymptomatic contacts should not donate blood, cells, tissue, organs, breast milk, or semen while they are under symptom surveillance. Asymptomatic contacts can continue daily activities such as work and school (i.e., no quarantine is necessary). Health workers who have unprotected exposures (i.e., not wearing appropriate PPE)

to patients with Monkeypox or contaminated materials do not need to be excluded from work if asymptomatic, but should undergo active surveillance for symptoms, at least twice daily for 21 days following the exposure.<sup>1,7</sup>

## Clinical care and therapeutics

**Skin care:** Wash skin lesions with soap and water or povidone-iodine solution. Treat secondary bacterial infections with topical or oral antibiotics as needed.

**Eye care:** Prevent corneal scarring and visual impairment with vitamin A supplementation where needed. Administer protective eye pads and ophthalmic antibiotics or antivirals as needed.

**Mouth care:** Wash mouth with warm clean salted water. Use oral analgesic medication to minimize mucosal pain from mouth sores and encourage food and fluid intake.<sup>1,7</sup>

Tecovirimat, an antiviral, has been approved for the treatment of Monkeypox by the European Medicines Agency (EMA) in January 2022.<sup>10</sup> However, it is not yet widely available. Provide Vitamin A supplements according to standard recommendations, especially for children as it plays an important role in all stages of wound healing and eye health.

## Vaccines

At the present time, the original smallpox vaccines are no longer available to the general public. Research has yielded several safer vaccines for smallpox. In 2019, one new vaccine was approved for the prevention of smallpox and Monkeypox.<sup>1,7</sup> Availability of this two-dose vaccine remains limited. Member States may want to consider vaccination of close contacts as post-exposure prophylaxis or pre-exposure vaccination of laboratory personnel and health workers.<sup>1,7</sup>

## WHO actions

WHO and partners are working with Member States to understand the source and characteristics of the current multi-country outbreaks to raise awareness of the Monkeypox symptoms and protective measures. WHO has also developed surveillance case definitions and new guidance for laboratory testing for the current Monkeypox outbreak in non-endemic countries. Public health investigations are ongoing, including extensive case finding and contact tracing, laboratory investigation, clinical management and isolation provided with supportive care. Genomic sequencing has been undertaken to determine the monkeypox virus clade(s) in this outbreak. Vaccination for Monkeypox is being deployed in some countries to manage close contacts, such as health workers and the WHO is convening experts to discuss recommendations on vaccination.<sup>7</sup>

On 23 June 2022, the Director-General (DG)



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of WHO convened the first meeting of the Emergency Committee under Article 48 of the IHR (IHR-EC) regarding Monkeypox.<sup>11</sup> While the experts at the first IHR-EC were concerned about the outbreak, they agreed by consensus that at that time the event did not constitute a Public Health Emergency of International Concern-PHEIC.<sup>12</sup> Under the WHO IHR (2005), a Public Health Emergency of International Concern (PHEIC) is a formal declaration by the WHO DG of "an extraordinary event which is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response", formulated when a situation arises that is "serious, sudden, unusual, or unexpected", which "carries implications for public health beyond the affected state's national border" and "may require immediate international action."<sup>11</sup> However, the experts recommended that this decision should be reviewed in one month's time.

At the time of writing this paper, the WHO DG has called for the convening of a second meeting of the IHR-EC on Monkeypox to take place on 21 July 2022. The objectives of this meeting are to: 1) Provide views to the WHO DG on whether the event constitutes a public health emergency of international concern, pursuant to Articles 1, 12, 48, and 49 of the IHR, and 2) Provide views to the DG on the proposed potential Temporary Recommendations, pursuant to Articles 1, 12, 48, and 49 of the IHR.<sup>11</sup> A WHO statement giving an account of the consultation and its conclusions, will be posted on the WHO public website (Monkeypox IHR Emergency Committee (who.int)).

## Summing up

Infectious diseases continue to greatly impact the livelihoods and economies of communities and countries. This impact has been demonstrated by the numerous infectious disease outbreaks-plague, yellow fever, influenza, Ebola, and COVID-19 to mention a few. To address infectious diseases and other health problems, in 1948, following the second World War, the World Health Organization (WHO) was established. WHO has led multiple campaigns to eradicate (stopping transmission globally)

specific infectious diseases. One of the most notable efforts was the vaccination campaign against smallpox, a highly infectious viral disease that was eradicated by 1980. The smallpox campaign led to optimism in the ability to combat and control infectious diseases worldwide.

However, despite this great achievement, infectious diseases still pose a considerable threat today, accounting for at least a quarter of the global mortality or an estimated ~15 million deaths per year-the majority of them children less than 5 years of old, in low to middle incomes countries in Africa.

From the H1N1 pandemic of 1918, to the devastating 2013-2016 West Africa Ebola Virus Disease outbreak, to the ongoing COVID-19 pandemic and the current multi-country monkeypox outbreaks, epidemics and pandemics continue to have devastating social and economic impacts. These epidemics and pandemics have clearly demonstrated that we cannot predict with certainty which pathogen will cause the next one or where it will occur, nor how dire the effects will be. But if humans, animals, the environment and infectious disease pathogens coexist, epidemics and pandemics will continue to occur. What is urgently required is for all countries and all communities, irrespective of where they are located, to be prepared and ready to prevent, timely detect and promptly mount an effective response to mitigate their impacts. This is the only sure way to protect and save the lives of vulnerable populations, protect our health care workers and save national economies from collapsing.

**Editors note: The Director General of WHO following the second meeting of IHR committee on Thursday, 21 July 2022 determined that the multi-country outbreak of monkey pox constitutes a PHEIC**

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