

Monkeypox outbreak

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Recently, monkeypox has been reported in various parts of the world. It was first detected in 1958, when two outbreaks of a pox-like disease occurred in colonies of monkeys maintained for research. Though the source of the disease remains unknown, humans are infected by the virus which might be harboured in animals such as rodents and other non-human primates (monkeys) in the Africa region¹.

The first human case of monkeypox was reported in 1970. Prior to 2022, the disease had been reported in people from several central and western African countries. Earlier, almost all monkeypox cases in those living outside Africa were linked to international travel to countries where the disease commonly occurred or through imported animals¹. Such cases were reported in several continents across the globe. Monkeypox is primarily a zoonotic disease and the monkeypox virus belongs to a member of genus orthopoxvirus in the family Poxviridae. Based on mutation, scientific evidence shows that 'inheritance of the specific changes that occurred between 2017 and 2018 and then in the viruses from 2022 means that there has been sustained human to human transmission since at least 2017'².

According to the World Health Organization (WHO), at the end of July 2022, over 25,000 cases of monkeypox were reported from 83 countries, of which 76 had historically never reported the disease³. WHO declared the outbreak a Public Health Emergency of International Concern (PHEIC)⁴. Also, the monkeypox virus is structurally more stable than SARS-CoV-2 (ref. 5). The disease was reported in Spain, USA, Germany, UK, France, The Netherlands, Brazil, Canada, Portugal, Italy and India⁶. As of 11 August 2022, over 33,000 monkeypox cases have been reported globally. The US, with nearly 10,400 cases, accounted for about one-third of the total infections, and 41 countries in Europe reported over 17,500 cases⁷. As highlighted by WHO, most of those affected were men who had sex with other men, and the sexual encounter was the mode of transmission in 91.5% of cases with known routes of spread⁷.

Monkeypox symptoms usually start within three weeks of exposure to the virus. Those affected develop rashes near their genitals (penis, testicles, labia and vagina) or anus

(butthole) and in their hands, feet, chest, face or mouth. The rashes can initially resemble pimples or blisters and may be painful or itchy; they pass through more stages, including scabs before healing. Other symptoms include fever, chills, swollen lymph nodes, exhaustion, muscle ache and backache, headache and respiratory symptoms (e.g. sore throat, nasal congestion or cough). Some people develop flu-like symptoms before rashes.

Mode of disease transmission:

- (a) Direct close contact with persons affected by monkeypox rashes, scabs/body fluids and through respiratory secretions.
- (b) Touching objects, fabrics (clothing, bedding or towels) used by those affected, including handled surfaces.
- (c) Intimate direct contact includes oral, anal and vaginal sex, or touching the genitals or anus of a person with monkeypox.
- (d) Prolonged face-to-face contact, hugging, massage and kissing.
- (e) Touching fabrics and objects during sex that were used by a person with monkeypox and that have not been disinfected, such as bedding, towels, fetish gear and sex toys.
- (f) A pregnant woman can spread the virus to the foetus through the placenta.
- (g) From infected animals, either by being scratched or bitten by them or by preparing or eating meat from an infected animal.

In general, the illness typically lasts 2–4 weeks (i.e. any individual with monkeypox can spread it to others from when the symptoms begin until the rashes have fully healed, with the formation of a fresh layer of skin)¹.

Mutation does not conclusively prove sustained human-to-human transmission due to the following documentation of evidences^{8,9}:

- (1) Monkeypox genome sequence indicates that the virus has mutated in a short period of time.
- (2) Based on limited data from other poxviruses studies, the mutation rate for monkeypox is two per year. Many of the mutations now seen are due to the

action of a particular enzyme in the host (animals and humans) to prevent the virus from multiplying.

- (3) The large number of mutations clearly suggests that the virus mutates at a higher rate than what was earlier assumed; yet most of these mutations are likely to be inconsequential.

A total of monkeypox nine cases (four from Delhi and five from Kerala) were reported from India. More than 75 countries have reported outbreaks of this disease with confirmed cases crossing 25,000. Some of the countries numbers of cases are reported greater¹⁰. It is a zoonotic disease (i.e. a virus transmitted to humans from animals with symptoms similar to smallpox, although clinically less severe)¹. At present, various Governments are working on sourcing vaccines after its declaration as a PHEIC by WHO in July 2022. Also, are two genetic clades (Central African–Congo Basin clade and West African clade) have been in the population. WHO has categorized them into clade I (Central African), clade IIa and clade IIb (West African), with the latter referring primarily to the group of variants largely circulating in the 2022 global outbreak¹¹. However, no dedicated monkeypox vaccine is available so far. However, in India, the Indian Council of Medical Research has started the process of vaccination through the National Institute of Virology (NIV), Pune, which has isolated the virus strain from human samples. Also, scientific evidence reveals that the genomic sequence of the Indian strain has a 99.85% match with the West African strain circulating globally¹². In India, the disease could be prevented due to strict screening the travellers from other monkeypox-affected countries. The case fatality ratio of monkeypox has historically ranged from 0% to 11% in the general population and is higher among young children¹³.

Future studies are necessary to answer the following questions:

- (i) Can the virus spread when someone has no symptoms?
- (ii) How often is monkeypox spread through respiratory secretions, or when is a person with monkeypox symptoms

likely to spread the virus through respiratory secretions?

- (iii) Can monkeypox spread through semen, vaginal fluids, urine or faeces?
- (iv) What are the risks associated with disease spread among children and pregnant women in different parts of the world based on contact with infected adults or any other mode of transmission?
- (v) How is the virus circulation being maintained in nature and what are the exact reservoir(s).

Monkeypox is a rare disease caused by a viral infection. The symptoms are similar to smallpox, but milder and prove rarely fatal. The re-emergence in 2022 adopted more transmissibility to human host⁴. In the coming months, with increased travel by people previously constrained by the COVID-19 restrictions, the current disease outbreak could rapidly become uncontrolled, especially as its clinical presentation appears more subtle than the previous descriptions¹⁴. Monkeypox is now a major threat to global health security, requiring an urgent multi-disciplinary approach involving veterinarians, physicians, virologists and public health experts to fast-track the development of dia-

gnostic assays, vaccines, antivirals and other control strategies. Currently, the monkeypox-affected countries need to intensify surveillance and isolate suspected and confirmed cases to reduce the spread of the disease. This also leads to another question: what other viral diseases will surface in the world sooner or later? Prevention of monkeypox is possible through health awareness campaigns to educate the population. Global smallpox eradication declared by the World Health Assembly (WHA) on 8 May 1980 is well known¹⁵. In addition, due to the low fatality rate of monkeypox, mass vaccination is not compulsory, especially in developing countries like India.

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