



Monkeypox

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Key facts

To better understand public health terms included in this Disease Tool (e.g. What is a case definition? or What is an infectious agent?), consult our page on [Key concepts on epidemiology](#).

Importance

Monkeypox is a rare zoonotic disease first discovered in monkeys and in humans in 1970 in the Democratic Republic of Congo. It mostly occurs in Central and Western African countries often close to tropical rainforests. However, it can be exported as happened in recent years in the United States, the United Kingdom, Israel and Singapore.

Monkeypox is a serious disease. Studies of monkeypox in Central Africa, where many people live in remote areas and are medically underserved, showed that the disease killed 1—10 per cent of people infected.

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Case definition

A **case definition** is a set of uniform criteria used to define a disease for public health surveillance. It enables public health officials to classify and count cases consistently.

*The following are standard case definitions to allow national health authorities to interpret data in an international context. However, during an outbreak case definitions may be adapted to the local context and the Red Cross Red Crescent should use those agreed/established by national health authorities. NB: Consider that during community surveillance, **volunteers** should use broad (simplified) case definitions to recognize most or all possible cases and encourage them to seek care. Other actors such as **healthcare workers or investigators** studying the cause of a disease, on the other hand, can use more specific case definitions that may require laboratory confirmation.*

Clinical criteria: particular rash, fever (subjective or measured temperature of over 99.3° F [over 37.4° C]), other clinical signs and symptoms (chills and/or sweats, headache, backache, lymphadenopathy, sore throat, cough, shortness of breath).

Epidemiologic criteria: exposure to an exotic or wild mammalian pet with clinical signs of illness (e.g. conjunctivitis, respiratory symptoms, and/or rash) OR exposure to an exotic or wild mammalian pet with or without clinical signs of illness that has been in contact with either a mammalian pet or a human with monkeypox OR exposure to a suspect, probable, or confirmed human case of monkeypox.

Laboratory criteria: isolation of monkeypox virus in culture OR demonstration of monkeypox virus DNA

by polymerase chain reaction (PCR) testing of a clinical specimen OR demonstration of virus morphologically consistent with an orthopoxvirus by electron microscopy in the absence of exposure to another orthopoxvirus OR demonstration of presence of orthopoxvirus in tissue using immunohistochemical testing methods in the absence of exposure to another orthopoxvirus.

Case classification

Suspect case: meets one of the epidemiologic criteria AND fever or unexplained rash AND two or more other signs or symptoms with onset of first sign or symptom less than 21 days after last exposure meeting epidemiologic criteria.

Probable case: meets one of the epidemiologic criteria AND fever AND vesicular-pustular rash with onset of first sign or symptom less than 21 days after last exposure meeting epidemiologic criteria OR if rash is present but the type is not described, demonstrates elevated levels of IgM antibodies reactive with orthopoxvirus between at least days 7 to 56 after rash onset.

Confirmed case: meets one of the laboratory criteria.

WHO case definition source of information:

<https://www.who.int/emergencies/outbreak-toolkit/disease-outbreak-toolboxes/monkeypox-outbreak-toolbox>

Risk factors

- People in close contact with infected animals (including the animal's blood and other bodily fluids).
- Eating inadequately cooked meat of infected animals.
- No proper sanitation and hygiene measures.
- Caregivers and healthcare workers in close contact with infected people when infection control precautions are not strictly practised.

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Attack rate (AR)

The **attack rate** is the risk of getting a disease during a specific time period (such as during an outbreak).

Attack rates will vary from one outbreak to another. In case of an outbreak, consult the latest information provided by health authorities.

3—28 per cent in recent outbreaks among close contacts.

Groups at increased risk of severe illness (most vulnerable)

- Infection is more severe and mortality is higher among children and young adults.
- Immunosuppressed persons such as those receiving chemotherapy, transplant recipients or HIV carriers.
- People with chronic diseases such as renal disease, cancer, chronic lung or liver disease and diabetes.

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Infectious agent

Infectious agents are bacteria, viruses, fungi, prions and parasites. A disease caused by an infectious agent or its toxic products is defined as an infectious disease.

Monkeypox virus.

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Reservoir / host

A **reservoir of infection** is a living organism or material in or on which an infectious agent lives and/or usually multiplies. Reservoirs include humans, animals and the environment.

A **susceptible host** is a person at risk of being infected. The level of susceptibility depends on age, sex, ethnicity and genetic factors, specific immunity also depends on other factors that affect an individual's ability to resist infection or to limit its ability to cause infection.

A **zoonotic disease** or **zoonosis** is an infectious disease that has jumped from a non-human animal to humans.

Zoonotic disease: The natural reservoir of *monkeypox viruses* is not identified. Hosts include many animals such as rope squirrels, tree squirrels, Gambian rats, striped mice, dormice, prairie dogs and primates.

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How disease is spread (modes of transmission)

Categorisation of **modes of transmission** varies from one agency to another. In addition, some infectious agents can be transmitted by more than one mode. A list of modes of transmission can be found in the key concepts to serve as guidance to better understand the diseases included in this website.

- **Contact transmission:** Primarily transmitted to people through direct contact with the blood, body fluids, or cutaneous or mucosal lesions of infected animals (monkey, prairie dogs, rats, squirrels, and others), during bite or scratch. Human-to-human transmission is limited but can happen by contact with body fluids, skin lesions or contaminated objects (e.g. bedding) of an infected person.
- **Vehicle-borne transmission:** Eating inadequately cooked meat of infected animals is a possible risk factor.
- **Droplet spread:** Human-to-human transmission is also possible via respiratory droplets usually requiring prolonged face-to-face contact.

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Incubation period

This time from when infection occurs to the onset of symptoms is called the **incubation period**. It is a range of days and it can be different for each disease.

6—16 days (range 5—21 days).

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Period of infectiousness

Period of infectiousness is the time interval during which an infected person can transmit the infection to other susceptible persons.

First week of rash.

Clinical signs and symptoms

- The clinical presentation is similar to the eradicated disease smallpox.
- The invasion period (0—5 days) is characterized by fever, intense headache, swelling of the lymph nodes, back pain, muscle ache and an intense lack of energy.
- The skin eruption period (within one to three days after the appearance of fever) where the various stages of the rash appear, often begins on the face and then spreads elsewhere on the body. The face (in 95 per cent of cases), and palms of the hands and soles of the feet (in 75 per cent of cases) are most affected. Evolution of the rash from maculopapules (lesions with a flat base) to vesicles (small fluid-filled blisters), pustules, followed by crusts occurs in approximately ten days which may last up to three weeks.
- Some patients develop severe swollen lymph nodes before the appearance of the rash, which is a distinctive feature of monkeypox compared to other similar diseases.
- Although the clinical manifestation of monkeypox is milder than that of smallpox, the disease can kill up to 11 per cent of infected people. Complications are respiratory distress, secondary bacterial infections and encephalitis.

Other diseases with similar clinical signs and symptoms

Smallpox, varicella (chickenpox), measles, bacterial skin infections, scabies, syphilis and medication-associated allergies.

Diagnosis

- Serology: IgM and IgG antibodies detection by enzyme-linked immunosorbent assay (ELISA).

- Antigen detection tests.
- Polymerase chain reaction (PCR).
- Virus isolation by cell culture.

Vaccine or treatment

Please refer to the appropriate local or international guidelines for clinical management. All clinical management including the administration of a treatment or vaccine should be conducted by a health professional.

- There are no specific treatments or vaccines available for monkeypox infection.
- Because monkeypox virus is closely related to the virus that causes smallpox, the smallpox vaccine can protect from getting monkeypox. Experts also believe that vaccination after a monkeypox exposure may help prevent the disease or make it less severe, if given soon after exposure. A new generation vaccine has been approved for prevention of smallpox and monkeypox since 2018. Following the worldwide eradication of smallpox, the smallpox vaccine is not available to the general public, but vaccine stockpiles are maintained by several countries and the World Health Organization (WHO).
- Pre-exposure smallpox vaccination for high-risk groups (e.g. public health workers investigating the outbreak, animal control or veterinarian workers, healthcare and laboratory workers, close contacts without contraindications) has been effective.
- Post-exposure smallpox vaccination (within four days of initial exposure to monkeypox) can be discussed in outbreak areas.

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Immunity

There are two types of immunity:

- **Active immunity** results when exposure to an agent triggers the immune system to produce antibodies to that disease.
- **Passive immunity** is provided when a person is given antibodies to a disease rather than producing them through his or her own immune system.

Past data suggest that the smallpox vaccine is at least 85 per cent effective in preventing monkeypox.

Which interventions are most effective for prevention and control?

The following is a list of activities considered for Red Cross Red Crescent volunteers to take part in. It is not an exhaustive list of all prevention and control activities for the specific disease.

- Communicate risks about the disease or epidemic, not only to share information on prevention and mitigation measures, but also to encourage informed decision-making, positive behaviour change and

maintenance of trust in the Red Cross Red Crescent response. This includes the identification of rumours and misinformation around disease—frequent during health emergencies—to manage them appropriately. Volunteers should use the most context-appropriate communication techniques (ranging from social media to face-to-face interactions).

- Community education and engagement activities to encourage the adoption of protective behaviours:
 - Avoiding hunting and eating small bush mammals. Meat should be appropriately cooked prior to consumption.
 - Avoiding contact with a sick or dead animal, their meat or blood.
 - Avoiding contact with a person infected with monkeypox.
- When caring for or visiting sick people:
 - Handwashing with soap
 - Wearing gloves as personal protective equipment
- Authorities may establish measures such as limiting or banning the movement of suspect animals, application of quarantine or discarding potentially infected animals.
- Rapid detection of cases and encouragement of early health-seeking behaviours at healthcare centres.
- Social mobilization for pre- or post-exposure smallpox vaccination, if required.

Epidemic characteristics and RCRC indicators and targets

The first table below includes data that should be gathered from health authorities and relevant non-governmental actors to understand the progress and characteristics of the epidemic in the specific country and area of intervention. The second table includes a list of suggested indicators that can be used for monitoring and evaluating Red Cross Red Crescent activities; wording of indicators may be adapted to specific contexts. Target values for a specific indicator can vary widely from one context to another and therefore managers should define them based on the specific population, area of intervention and programmatic capacity. Exceptionally, some indicators in this website may include target values when these are globally agreed as a standard; e.g. 80 per cent of individuals who slept under an insecticide-treated net (ITN) the previous night—the normative World Health Organization benchmark for universal coverage with ITNs.

| Epidemic characteristics and progression |
|---|
| Suspected cases per week (disaggregate by age, sex) |
| Confirmed cases per week (disaggregate by age, sex) |
| Case fatality rate |

Indicators for Red Cross Red Crescent activities

Number of volunteers trained on a specific topic (e.g. Epidemic Control for Volunteers (ECV); Community-based surveillance (CBS); (WASH) training; CBHFA training, etc.)

Numerator: Number of volunteers trained

Source of information: Training attendance sheets

Suspect cases detected by volunteers who were encouraged to seek healthcare and who arrived at a health facility (*NB. This indicator requires the implementation of a system in collaboration with the health facility, whereby health workers specifically asked the patient how they heard about the service*)

Numerator: Monkeypox suspect cases detected by volunteers in a determined period preceding this survey (e.g. two weeks) for whom advice or treatment was sought from a health facility

Denominator: Total number of people who are monkeypox suspect cases in the same period preceding the survey

Source of information: Survey

Percentage of people recognizing at least one transmission route and at least one measure for preventing it

Numerator: Total number of people who cited at least one transmission route and at least one measure for preventing it during the survey

Denominator: Total number of people surveyed

Source of information: Survey

Percentage of people who know the cause, symptoms, treatment or preventive measures

Numerator: Number of people who cite the cause, symptoms, treatment or preventive measures

Denominator: Number of people surveyed

See also:

- For Community Engagement and Accountability (CEA) indicators for activities accompanying ECV actions, please refer to the IFRC CEA toolkit (Tool 7.1: Template CEA logframe, activities and indicators) at: <https://www.ifrc.org/document/cea-toolkit>

Impact on other sectors

| Sector | Link to the disease |
|----------------------|---|
| WASH | The transmission can be reduced by proper hygiene and sanitation measures, especially when in contact with infected people. |
| Food security | Avoiding hunting and eating small bush mammals decreases the risk of infection. |

| Sector | Link to the disease |
|--|---|
| Nutrition | Malnutrition increases the risk for severe monkeypox infection. |
| Shelter and settlements (including household items) | Living in close neighbourhood to small bush mammals in endemic areas with potentially infected animals increases the risk for transmission of the <i>monkeypox virus</i> . |
| Psychosocial support and mental health | Like every disease, monkeypox can have several negative impacts on psychological, social and emotional aspects of a person's life, apart from its physical effects only. Psychological reactions may include fear of social stigma, anxiety, social withdrawal, among others. |
| Education | Schools play an important role in educating children not to touch sick animals, which could transmit monkeypox. As young people are at increased risk for a severe disease this is even more important. Children may be at risk of losing out on education if staying at home because of illness. |
| Livelihoods | Illness leads to reduction in productivity as people may not be able to work due to disease. This can lead to a loss of income due to the reduction in work activity and to the diversion of resources to seek medical treatment. |

Resources:

Resources for community-based health action:

- WHO: [Public health advice for Men who have sex with Men on the recent outbreak of Monkey Pox](#)
- IFRC: [Community-based surveillance tools](#)

Resources for clinical action:

- WHO: [Clinical management and IPC for Monkey Pox \(interim guidelines June 2022\)](#)
- WHO: [Recovering from Monkeypox at home infographic](#)

Resources for CEA, RCCE & anti-stigma:

- WHO: [Risk communication and community engagement for monkeypox outbreaks: Interim guidance](#)
- ECDC/WHO: [RCCE during monkeypox outbreak in Europe](#)
- SSHAP: [RCCE Strategies for monkeypox response](#)
- US CDC: [Reducing stigma in monkeypox communication and community engagement](#)