



2022 Monkeypox Outbreak: Global Trends

World Health Organization

Produced on 23 September 2022

Key Figures



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1. Overview

This report provides a global overview of the monkeypox epidemiological situation as reported to WHO as of September 22 2022. The report focuses on laboratory confirmed cases¹ as defined by the WHO's working case definition published in the Surveillance, case investigation and contact tracing for monkeypox interim guidance (<https://www.who.int/publications/i/item/WHO-MPX-Surveillance-2022.2>). Note that countries may use their own case definitions separate from those outlined in the above document. This report should be considered in the context of other WHO information products associated with the 2022 monkeypox outbreak (<https://www.who.int/emergencies/situations/monkeypox-oubreak-2022>), and monkeypox in general (https://www.who.int/health-topics/monkeypox#tab=tab_1):

- The biweekly Situation Report (<https://www.who.int/publications/m/item/multi-country-outbreak-of-monkeypox--external-situation-report--2---25-july-2022>) provides a comprehensive update of the monkeypox situation and response activities across a variety of domains such as epidemiology, clinical management and communications, replacing the previous Disease Outbreak News format;
- This global epidemiological report provides in-depth epidemiological information about the monkeypox situation, based primarily on case report forms provided by Member States to WHO under Article 6 of the International Health Regulations (IHR 2005).

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Links to these products can be seen in more detail at the end of the report.

Since 1 January 2022, cases of monkeypox have been reported to WHO from **105 Member States across all 6 WHO regions**. As of September 22 2022 at 17h CEST, a total of **64,561 laboratory confirmed cases** and **3,154 probable cases**, including **26 deaths**, have been reported to WHO. Since 13 May 2022, a high proportion of these cases have been reported from countries without previously documented monkeypox transmission. This is the first time that cases and sustained chains of transmission have been reported in countries without direct or immediate epidemiological links to areas of West or Central Africa.

With the exception of countries² in West and Central Africa, the ongoing outbreak of monkeypox continues to primarily affect men who have sex with men who have reported recent sex with one or multiple partners. At present there is no signal suggesting sustained transmission beyond these networks.

Confirmation of one case of monkeypox, in a country, is considered an outbreak. The unexpected appearance of monkeypox in several regions in the initial absence of epidemiological links to areas in West and Central Africa, suggests that there may have been undetected transmission for some time.

WHO assesses the global risk as **Moderate**. Regionally, WHO assesses the risk in the **European Region and the Region of the Americas as High** and as **Moderate** in the **African Region, Eastern Mediterranean Region** and the **South-East Asia Region**. The risk in the **Western Pacific Region** is assessed as **Low-Moderate**. The IHR Emergency Committee on the multi-country outbreak of monkeypox held its second meeting on 21 July 2022 ([https://www.who.int/news/item/23-07-2022-second-meeting-of-the-international-health-regulations-\(2005\)-\(ihr\)-emergency-committee-regarding-the-multi-country-outbreak-of-monkeypox](https://www.who.int/news/item/23-07-2022-second-meeting-of-the-international-health-regulations-(2005)-(ihr)-emergency-committee-regarding-the-multi-country-outbreak-of-monkeypox)). Having considered the views of committee members and advisors as well as other factors in line with the International Health Regulations (2005), the WHO Director-General declared this outbreak a **public health emergency of international concern** and issued temporary recommendations in relation to the outbreak.

1. For the WHO European region, both confirmed and probable cases are included within confirmed case counts and detailed case data.
2. Throughout this document, any use of the word **country** should be considered shorthand for a **country, area, or territory**
3. All references to Kosovo should be understood to be in the context of the United Nations Security Council resolution 1244 (1999).

2. Global situation update

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The number of weekly¹ reported new cases globally has decreased by **18.7%** in **week 37 (12 Sep - 18 Sep) (n = 3,954 cases)** compared to **week 36 (05 Sep - 11 Sep) (n = 4,863 cases)**. The majority of cases reported in the past 4 weeks were notified from the Region of the Americas (81.4%) and the European Region (17.6%).

The 10 most affected countries globally are: **United States of America (n = 24,040), Brazil (n = 7,115), Spain (n = 7,083), France (n = 3,943), Germany (n = 3,590), The United Kingdom (n = 3,585), Peru (n = 2,221), Colombia (n = 1,653), Canada (n = 1,379), and Mexico (n = 1,366)**. Together, these countries account for **86.7%** of the cases reported globally.

In the past 7 days, **25** countries reported an increase in the weekly number of cases, with the highest increase reported in **Chile**. **32** countries have reported no new cases in the past 21 days.

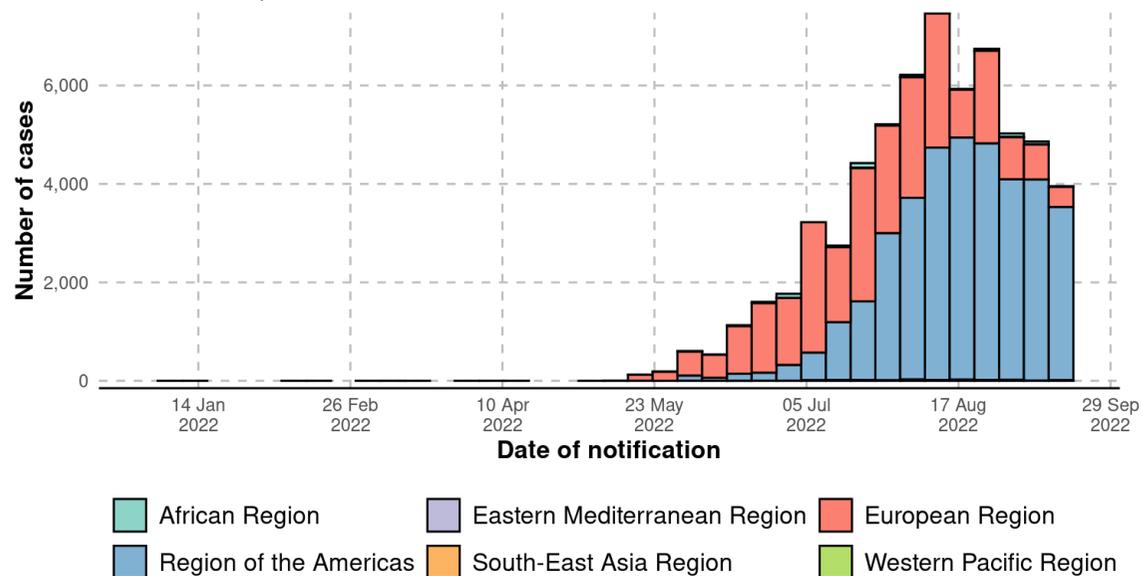
In the past 7 days, **1** country reported their first case. Countries which reported their first case in the past 7 days are: **Bahrain (16 September)**.

Global data are data collected by public sources. These data are largely aggregated cases that have been reported from open and official country sources. The below epidemic curve shows the aggregated number of cases by week according to the date of case reporting.

- 2.1. Epidemic curve (cases) 2.2. Epidemic curve (deaths)
- 2.3. Epidemic curve by WHO Region (cases) 2.4. Epidemic curve by WHO Region (deaths)
- 2.5. Epidemic curve - top 10 countries (cases) 2.6. Global Map
- 2.7. Table - Cases and deaths by WHO Region 2.8. Table - Cases and deaths by country
- 2.9. Table - African Region 2.10. Table - Region of the Americas
- 2.11. Table - Eastern Mediterranean Region 2.12. Table - European Region
- 2.13. Table - South-East Asia Region 2.14. Table - Western Pacific Region
- 2.15. Table - countries with last case reported 21 or more days ago 2.16. Epidemic curve by country

Epidemic curve shown for cases reported up to 18 Sep 2022 to avoid showing incomplete weeks of data.

data as of 18 Sep 2022 17:00 CEST



Source: WHO

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- Weekly reported cases, and weekly cases shown in the epidemic curve are aggregated according to international standard weeks, running from Monday to Sunday.

3. Detailed case data

Detailed case data are acquired via direct reporting of case based data via WHO Member States. Data from cases are reported¹ according to the WHO minimum dataset under the International Health Regulations (IHR 2005) Article 6, and subsequently aggregated and presented below. Note that completeness of records is variable, meaning denominators for each output may be different from one another. **All of the following is**

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derived from the detailed case data, and as a result, overall numbers may not be reflective of figures shown with aggregate case numbers. All detailed cases shown are confirmed cases, where the reporting date occurred after 01 January 2022.

1. Note that a small number of detailed case reports are constructed from official public reports about individual cases.

3.1. Reporting coverage

The detailed case dataset was last updated on September 21 2022. As of this date, the total number of detailed confirmed cases reported is 55,894, representing **91.4%** of all aggregated cases reported.

The table below indicate the reporting coverage between reported aggregated confirmed cases and detailed confirmed cases by countries and per region.

Note that for all tables below, in order to best align modes of reporting, total confirmed cases are shown as of:

1. The most recent Friday (16 September) for data in the **Region of the Americas**.
2. The most recent Tuesday (20 September) for data in the **European Region**.

Total cases shown fully as of 22 September are shown in the global trends section.

3.1.1. Table - Coverage by region

Monkeypox reporting completeness			
As of 22 Sep 2022 ¹			
	Total Confirmed Cases	Total Detailed Confirmed Cases ²	% Detailed Cases reported
Region of the Americas	36,089	31,542	87.4%
European Region	24,256	24,106	99.4%
African Region	588	173	29.4%

¹ Total confirmed cases shown as of date of last detailed case report for the WHO Region of the Americas and WHO European Region.

² Note that in rare cases total detailed cases may exceed total confirmed cases due to ongoing data cleaning issues

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Monkeypox reporting completeness

As of 22 Sep 2022¹

Western Pacific Region	173	24	13.9%
Eastern Mediterranean Region	53	40	75.5%
South-East Asia Region	21	9	42.9%

¹ Total confirmed cases shown as of date of last detailed case report for the WHO Region of the Americas and WHO European Region.

² Note that in rare cases total detailed cases may exceed total confirmed cases due to ongoing data cleaning issues

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3.2. Trends in cases

Trends in cases are shown for all submitted detailed cases. These are shown by:

1. Date of symptom onset
2. Date of lab or clinical diagnosis (if date of symptom onset is not available)
3. Date of reporting (if date of symptom onset and date of diagnosis are not available)

Note that reporting of detailed cases is subject to some delay. The epidemic curves shown are not right censored, and therefore trends in the most recent 1-3 weeks should be interpreted with caution. It should be additionally noted that date of report does not reflect the date of reporting to WHO, but rather reporting to national or regional authorities.

Delay between date of onset and date of report were calculated for all countries where reporting quality passed minimum quality checks. Delays were only shown when the time between onset and reporting was between -5 and 40 days.

- Median delay between onset and reporting was **6** days
- The interquartile range between onset and reporting was **3-9 days**.

3.2.1. Overall by date of symptom onset 3.2.2. By date of onset and by WHO region

3.2.3. By date of onset and by country (top 10 total cases)

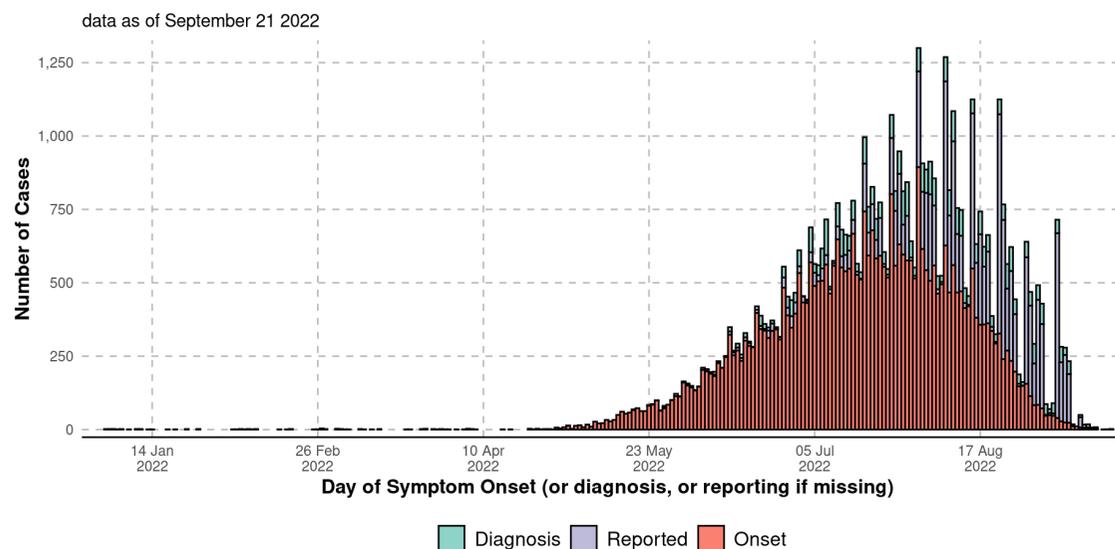
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3.2.4. By date of onset and by country (top 10 cases in the past 21 days)

3.2.5. By date of onset and by age group 3.2.6. By date of onset and by sexual orientation

3.2.7. Proportion of MSM and proportion of males by date of report 3.2.8. Reporting lags

3.2.9. By date of onset and by country/area/territory



Source: WHO

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3.3. Case profile (overall)

As shown below, and stated previously, the ongoing outbreak is largely developing in men who have sex with men (defined as homosexual or bisexual males in detailed case forms) networks. In the following analyses, we have re-coded men reported as bisexual as men who have sex with men. Note that reported sexual orientation does not necessarily reflect who the case has had recent sexual history with nor does it imply sexual activity. Generally, severity has been low, with few reported hospitalisations and deaths:

Key features of these cases are as follows:

- **97.4% (31752/32607)** of cases with available data are male, the median age is **35 years (IQR: 30 - 42)**.

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- Males between **18-44 years old** continue to be disproportionately affected by this outbreak as they account for **77.9%** of cases.
- Of all cases with available data, **2.6% (855/32607)** are female:
 - The majority of of these cases are reported from the **Region of the Americas (422/855; 49%)** and the **European Region (364/855; 43%)**
 - Of the cases where sexual orientation is reported, the majority are **Heterosexual (250/292; 86%)**.
 - The most commonly reported exposure setting is in a **household (74/180; 41%)**, and the most common form of transmission is via **sexual encounters (132/253; 52%)**
- Of the **33,847** cases where age was available, there were **299 (0.9%)** cases reported aged **0-17**, out of which **87 (0.3%)** were aged **0-4**:
 - The majority of cases aged 0-17 are reported from the **Region of the Americas (164 /299; 55%)**.
 - Of the cases aged 0-17, **16** have reported exposure in a school setting.
- Among cases with known data on sexual orientation, **90.9% (14145/15559)** identified as **men who have sex with men**. Of those identified as men who have sex with men, **418 / 14145 (3.0%)** were identified as bisexual men.
- Among those with known HIV status **46.0% (7,353/15,976)** were **HIV-positive**. Note that information on HIV status is not available for the majority of cases, and for those for which it is available, it is likely to be skewed towards those reporting positive HIV results.
- **418** cases were reported to be **health workers**. However, most were infected in the community and further investigation is ongoing to determine whether the remaining infection was due to occupational exposure.
- Of all reported types of transmission, a **sexual encounter** was reported most commonly, with **10,405 of 11,865 (87.7%)** of all reported transmission events.
- Of all settings in which cases were likely exposed, the most common was in **party setting with sexual contacts**, with **3,519 of 6,495 (54.2%)** of all likely exposure categories.

3.3.1. Demographic Information 3.3.2. Age-sex pyramid 3.3.3. Age-sex pyramid by region

3.3.4. Age-sex pyramid (Hospitalised cases) 3.3.5. Transmission type 3.3.6. Exposure settings

Note that the proportions shown below should be interpreted with caution. When considering some variables, it is **more likely that a yes response will be obtained when compared to a no response after consideration of true proportions of these factors**. This is most likely to be true for variables where

reported answers can only be *yes* or *no*, such as HIV status, health worker status, travel history, hospitalisation, ICU, and death.

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Case profiles			
As of September 21 2022			
	Reported values ¹		Unknown or Missing Value
	Yes	No	
Men who have sex with men	14145 (90.9%)	1414 (9.1%)	40317
HIV-Positive	7350 (46.0%)	8622 (54.0%)	39904
Health worker	418 (3.6%)	11093 (96.4%)	44365
Travel History	1352 (26.6%)	3736 (73.4%)	50788
Sexual Transmission	10401 (87.7%)	1460 (12.3%)	44015
Hospitalised ²	1709 (7.0%)	22553 (93.0%)	31614
ICU	19 (0.2%)	8254 (99.8%)	47603
Died	10 (0.0%)	21439 (100.0%)	34427

¹ Note given true proportions of variables, yes reporting may be common than no reporting

² May be hospitalised for isolation or medical treatment

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3.4. Case profile (excluding men who have sex with men)

The following outputs apply to cases that are **not men who have sex with men, and sexual orientation is known**. Other categories of sexual orientation that are reportable are:

- Heterosexual
- Lesbian (women who have sex with women)
- Other

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As stated above, men who have sex with men in this case refers to those who have a reported sexual orientation of men who have sex with men, and men reported as bisexual. As above, note that reported sexual orientation does not necessarily reflect persons who the case has had recent sexual history with nor does it imply sexual activity. Up until this point in time, the 2022 multi-country Monkeypox outbreak has been overwhelmingly concentrated in networks of men who have sex with men. For this reason, understanding events in which individuals of other sexual orientation have acquired monkeypox is important to monitor potential of sustained spillover into the general population.

- **76.0% (922/1213)** of cases with available data are male; the median age is **33 years (IQR: 27-41)**.
- Males between **18-44 years old** account for **60.6%** of cases.
- Among those with known HIV status **25.6% (280/1095)** were **HIV-positive**. Note that information on HIV status is not available for the majority of cases, and for those for which it is available, it is likely to be skewed towards those reporting positive HIV results.
- **52** cases were reported to be **health workers**. However, most were infected in the community and further investigation is ongoing to determine whether the remaining infection was due to occupational exposure.
- Of all reported types of transmission, **sexual encounter** was reported most commonly, with **266 of 420 (63.3%)** of all reported transmission events.
- Of all settings in which cases were likely exposed, the most common was in **party setting with sexual contacts**, with **53 of 174 (30.5%)** of all likely exposure categories.

3.4.1. Demographic Information 3.4.2. Age-sex pyramid 3.4.3. Transmission type

3.4.4. Exposure settings

Note that the proportions shown below should be interpreted with caution. When considering some variables, it is **more likely that a yes response will be obtained when compared to a no response after consideration of true proportions of these factors**. This is most likely to be true for variables where reported answers can only be *yes* or *no*, such as HIV status, health worker status, travel history, hospitalisation, ICU, and death.

Case profiles (excluding men who have sex with men)

As of September 21 2022

Reported values ¹	Unknown or Missing Value
------------------------------	--------------------------

¹ Note given true proportions of variables, yes reporting may be common than no reporting

² May be hospitalised for isolation or medical treatment

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Case profiles (excluding men who have sex with men)

As of September 21 2022

	Yes	No	
Men who have sex with men	0	1414 (100.0%)	0
HIV-Positive	280 (25.6%)	815 (74.4%)	319
Health worker	52 (5.6%)	870 (94.4%)	492
Travel History	92 (20.9%)	349 (79.1%)	973
Sexual Transmission	266 (63.3%)	154 (36.7%)	994
Hospitalised ²	115 (10.5%)	981 (89.5%)	318
ICU	3 (0.7%)	403 (99.3%)	1008
Died	2 (0.2%)	884 (99.8%)	528

¹ Note given true proportions of variables, yes reporting may be common than no reporting

² May be hospitalised for isolation or medical treatment

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3.5. Symptomatology

Although most cases in current outbreaks have presented with mild disease symptoms, monkeypox virus (MPXV) may cause severe disease in certain population groups (young children, pregnant women, immunosuppressed persons)

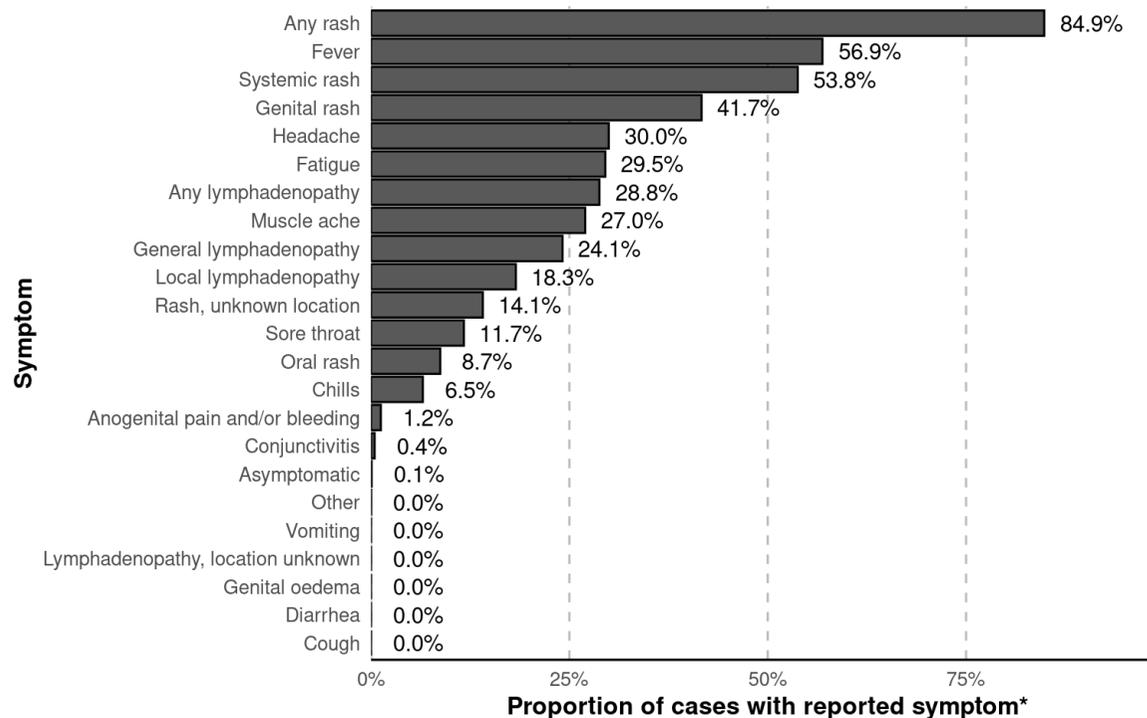
Among the cases who reported at least one symptom, the most common symptom is **any rash** and is reported in **85%** of cases with at least one reported symptom. Note that identifying true denominators for symptomatology is difficult due to a general lack of negative reporting and symptom definitions that may vary between countries' reporting systems.

A bar chart and table showing symptoms is shown below. Here *any rash* refers to one or more rash symptoms (systemic, oral, genital, or unknown location), and *any lymphadenopathy* refers to either general or local lymphadenopathy.

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3.5.1. Bar chart - Symptoms

3.5.2. Table - Symptoms



Source: WHO
 *22760 cases with at least one reported symptom from a country where at least two unique symptoms reported used as denominator

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4. In focus: West and Central Africa

Since 1970, human cases of monkeypox have been reported in 9 countries in the WHO African region: **Cameroon, Central African Republic, Congo, Côte d’Ivoire, Democratic Republic of the Congo, Gabon, Liberia, Nigeria, and Sierra Leone.** The true burden of monkeypox in these countries is not known. This section specifically focuses on those countries in the African region with a history of monkeypox, in order to highlight any differences in epidemiology between those countries and those within the ongoing 2022

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monkeypox outbreak without a history of monkeypox. Notably, while the ongoing 2022 monkeypox outbreak has been associated with Clade II of monkeypox virus, historically outbreaks have been driven by that and Clade I.

Historically, the sexual component of transmission in the countries above has been thought to contribute less to human to human transmission of monkeypox than has been observed in the ongoing global outbreak. It should also be noted that there is limited testing capacity for monkeypox in many of these countries, which has led to underascertainment of monkeypox cases.

In 2022, as of 22 Sep 2022, there have been **496 confirmed cases** of monkeypox reported in these countries and **10 deaths**. These represent **1%** and **38%** of global cases and deaths respectively. In addition, **173 (35% of all cases)** detailed cases have been reported to WHO.

Of those cases with detailed data:

- **110 male cases (64.3%)** and **61 female cases (35.7%)** have been reported
- The median age is **25 (IQR: 11 - 35)**.
- Of the **168** cases where age was available, there were **65 (38.7% of total)** cases reported aged **0-17**, out of which **21 (12.5% of total)** were aged **0-4**.
- There are currently no detailed cases for which transmission or exposure setting detail is available

Trends from these countries are shown below:

4.1. Epidemic curve by date of notification (cases)

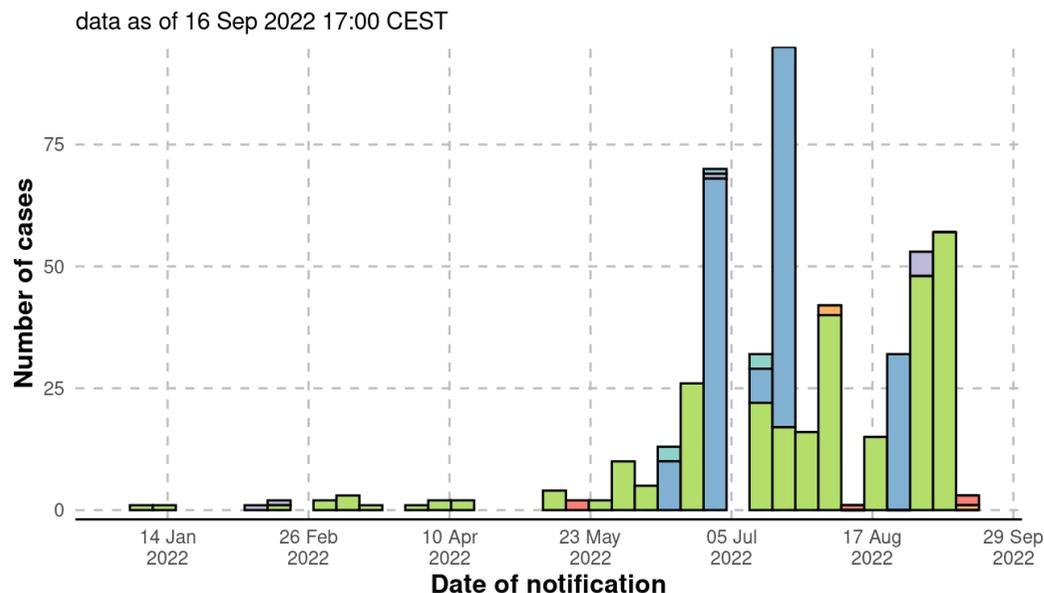
4.2. Epidemic curve by date of notification (deaths)

4.3. Epidemic curve by date of onset

4.4. Age-sex pyramid

Epidemic curve shown for cases reported up to 19 Sep 2022 to avoid showing incomplete weeks of data.

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Source: WHO

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5. Literature Summary & Epidemic Parameters

In order to promote a better understanding of the dynamics of the current monkeypox outbreak and to support forecasting work, WHO has undertaken an effort to extract epidemiological parameters, such as incubation period and generation interval, from the literature. The initial literature screening is performed and maintained by the Public Health Agency of Canada (PHAC). The overall search strategy is as follows:

- Inclusion criteria: monkeypox and monkeypox virus
- Study design:
 - Any study design including primary and secondary studies (both animal and human)
 - Guidelines and commentaries are not excluded but are not searched systematically.
- Publication language: no restriction for peer-reviewed articles, grey literature is focused on English

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- Publication date: from April 14, 2022
- Bibliographic databases and other sources searched:
 - PubMed Scopus
 - Pre-print servers: Europe PMC, arXiv and SSRN
 - WHO, PHAC, CDC, ECDC, UKHSA

The tables below provide an overview of the most relevant estimates for incubation period and generation interval extracted from the literature where the following criteria are met:

- Studies with a sample size greater than 5
- Clear estimate of the specific parameter

The epidemic parameter tables are updated once per week on Fridays. Please note that some of these sources are still undergoing the peer-review process, therefore readers are advised to exercise care when interpreting findings.

5.1. Parameters 5.2. Bibliography

Incubation Period

As of 12 Sep 2022

Reference	N	Mean ⁱ	95% CI		95% CrI		SD ⁱ	Median ⁱ	Range ⁱ min	Range ⁱ max	Distribution
			lower ⁱ	upper ⁱ	lower ⁱ	upper ⁱ					
Miura et al. [1]	18	8.5	-	-	6.6	10.9	-	-	-	-	Log-normal
Charniga et al. [2]	40	7.6	-	-	6.2	9.7	1.8	6.4	-	-	Log-normal
Rodríguez et al. [3]	45	-	-	-	-	-	-	-	-	-	-
Thornhill et al. [4]	23	-	-	-	-	-	-	7.0	3	20	-
Català et al. [5]	77	-	-	-	-	-	-	6.0	4	9	-

Source: PHAC

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Incubation Period

As of 12 Sep 2022

Reference	N	Mean ¹	95% CrI low ¹	95% CrI high ¹	SD ¹	Distribution
Tarín-Vicente et al. [6]	144	-	-	-	-	-
Guzzetta et al. [7]	30	9.1	6.5	10.9	-	Gamma
Mailhe et al. [8]	246	6.0	-	-	-	-
Moschese et al. [9]	32	11.0	-	-	-	-

¹ Units are in days

Source: PHAC

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Generation Interval

As of 12 Sep 2022

Reference	N	Mean ¹	95% CrI low ¹	95% CrI high ¹	SD ¹	Distribution
Guzzetta et al. [7]	16	12.5	7.5	17.3	-	Gamma

¹ Units are in days

Source: PHAC

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6. Disclaimers

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6.1. Data Overview and Visualizations

The WHO 2022 monkeypox global trends report aims to provide frequently updated data visualizations. Caution must be taken when interpreting all data presented, and differences between information products published by WHO, national public health authorities, and other sources using different inclusion criteria and different data cut-off times are to be expected. While steps are taken to ensure accuracy and reliability, all data are subject to continuous verification and change. All counts are subject to variations in case detection, definitions, laboratory testing, and reporting strategies between countries, states and territories.

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All references to Kosovo should be understood to be in the context of the United Nations Security Council resolution 1244 (1999).

A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

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7. Acknowledgements

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8. Useful links and documentation

8.1. Global

- 2022 Monkeypox outbreak homepage (<https://www.who.int/emergencies/situations/monkeypox-oubreak-2022>)
- About monkeypox (https://www.who.int/health-topics/monkeypox#tab=tab_1)
- Report from Second meeting of the IHR Emergency Committee regarding the multi-country outbreak of monkeypox ([https://www.who.int/news/item/23-07-2022-second-meeting-of-the-international-health-regulations-\(2005\)-\(ihr\)-emergency-committee-regarding-the-multi-country-outbreak-of-monkeypox](https://www.who.int/news/item/23-07-2022-second-meeting-of-the-international-health-regulations-(2005)-(ihr)-emergency-committee-regarding-the-multi-country-outbreak-of-monkeypox))
- Latest WHO monkeypox situation update (<https://www.who.int/publications/m/item/multi-country-outbreak-of-monkeypox--external-situation-report--2---25-july-2022>)
- WHO Monkeypox surveillance guidance (<https://www.who.int/publications/i/item/WHO-MPX-Surveillance-2022.2>)

8.2. Region of the Americas

- Region of the Americas Monkeypox homepage (<https://www.paho.org/en/monkeypox>)
- Region of the Americas cases dashboard (<https://shiny.pahobra.org/monkeypox/>)

8.3. Eastern Mediterranean Region

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- Eastern Mediterranean Region Monkeypox homepage
(<http://www.emro.who.int/monkeypox/index.html#:~:text=It%20is%20a%20zoonotic%20viral,a%20skin%20rash%20>)

8.4. European Region

- European Region Monkeypox homepage
(<https://www.who.int/europe/emergencies/situations/monkeypox>)
- Joint ECDC-WHO Regional Office for Europe Monkeypox Surveillance Bulletin
(<https://monkeypoxreport.ecdc.europa.eu/>)