Joint ECDC-WHO Regional Office for Europe Monkeypox Surveillance Bulletin

3 August 2022

Contents

SURVEILLANCE SUMMARY

A total of 15926 cases of monkeypox have been identified through IHR mechanisms and official public resources up to 2 August 2022, 14:00, from 38 countries and areas throughout the European region. Case-based data were reported for 15624 cases from 32 countries and areas to ECDC and the WHO Regional Office for Europe through The European Surveillance System (TESSy), up to 2 August 2022, 10:00.

Of the 15624 cases reported in TESSy, 15524 were laboratory confirmed. Furthermore, where sequencing was available, 203 were confirmed to be of the West African clade. The earliest date of symptom onset was reported as 11 March 2022. The majority of cases were between 31 and 40 years-old (6349/15595 - 41%) and male (15439/15572 - 99.1%). Among cases with known HIV status, 36% (2690/7487) were HIV-positive. The majority of cases presented with a rash (9126/9626 - 94.8%) and systemic symptoms such as fever, fatigue, muscle pain, chills, or headache (6300/9626 - 65%). 399 cases were hospitalised (5.6%), of which 150 cases required clinical care. Three cases were admitted to ICU, among whom one was admitted to ICU for reasons unrelated to monkeypox infection. The two other cases admitted to ICU were reported to have died of monkeypox. Some (41) cases were reported to be health workers, however no occupational exposure has been reported.

INTRODUCTION

PURPOSE AND SCOPE

This report provides an overview of the total number of cases of monkeypox identified by ECDC and the WHO Regional Office for Europe through IHR mechanisms and official public resources and case-based data through The European Surveillance System (TESSy) up to 2 August 2022.

The first summary table and maps (first two tabs) describe the number of cases identified through the different platforms. The following figures and tables describe national case-based data for surveillance of monkeypox reported in TESSy from all the countries and areas of the WHO European Region, including the 24 countries of the European Union (EU) and the additional three countries of the European Economic Area (EEA).

Case Report Form Data are submitted through the case-based record type MPX to The European Surveillance System (TESSy) database hosted at ECDC.

CASE DEFINITION (WHO)

As of 24 June 2022

Cases of monkeypox should be reported to TESSy if they meet any of the WHO, ECDC or national case definitions.

Confirmed case

- Laboratory confirmed monkeypox virus by detection of unique sequences of viral DNA by real-time polymerase chain reaction (PCR)[1] and/or sequencing.

Probable case:

- A person meeting the case definition for a suspected case

AND One or more of the following:

- has an epidemiological link [prolonged[2] face-to-face exposure in close proximity, including health workers without appropriate PPE (gloves, gown, eye protection and respirator); direct physical contact with skin or skin lesions, including sexual contact; or contact with contaminated materials such as clothing, bedding or utensils] to a probable or confirmed case of monkeypox in the 21 days before symptom onset;
- has had multiple or anonymous sexual partners in the 21 days before symptom onset;
- has detectable levels of anti-orthopoxvirus (OPXV) IgM antibody[3] (during the period of 4 to 56 days after rash onset); or a four-fold rise in IgG antibody titre based on acute (up to day 5-7) and convalescent (day 21 onwards) samples; in the absence of a recent smallpox/monkeypox vaccination or other known exposure to OPXV;
- has a positive test result for orthopoxviral infection (e.g. OPXV-specific PCR without MPXV-specific PCR or sequencing) [1].

Suspected case

- A person of any age presenting since 01 January 2022 with an unexplained acute rash or one or more acute skin lesions

AND one or more of the following signs or symptoms:

- headache, acute onset of fever (>38.5°C), lymphadenopathy (swollen lymph nodes), myalgia (muscle pain/body aches), back pain, asthenia (profound weakness)

AND for which the following common causes of acute rash or skin lesions do not fully explain the clinical picture:

- varicella zoster, herpes zoster, measles, herpes simplex, bacterial skin infections, disseminated gonococcus infection, primary or secondary syphilis, chancroid, lymphogranuloma venereum, granuloma inguinale, molluscum contagiosum, allergic reaction (e.g., to plants); and any other locally relevant common causes of papular or vesicular rash.

N.B. It is not necessary to obtain negative laboratory results for listed common causes of rash illness in order to classify a case as suspected. Further, if suspicion of monkeypox infection is high due to either history and/or clinical presentation or possible exposure to a case, the identification of an alternate pathogen which causes rash illness should not preclude testing for MPXV, as coinfections have been identified.

Discarded case

- A suspected or probable case for which laboratory testing of lesion fluid, skin specimens or crusts by PCR and/or sequencing is negative for MPXV[1].
- Conversely, a retrospectively detected probable case for which lesion testing can no longer be adequately performed (i.e., after the crusts fall off) and no other specimen is found PCR-positive, would remain classified as a probable case.

---

1. PCR on a blood specimen may be unreliable and should also not be used alone as a first line diagnostic test. If blood PCR is negative and was the only test done, this is not sufficient to discard a case that otherwise meets the definition of a suspected for probable case. This applies regardless of whether the blood PCR was for OPXV or MPXV specific.

2. Evidence is currently lacking as to the duration of exposure necessary for infection by the respiratory route, including how it relates to the severity of the index case's disease. Characterization of this parameter is one of the goals of the case investigation form described below

3. Serology can be used for retrospective case classification for a probable case in specific circumstances such as when diagnostic testing through PCR of skin lesion specimens has not been possible, or in the context of research with standardized data collection. The primary diagnostic test for monkeypox diagnosis is PCR of skin lesion material or other specimen such as an oral or nasopharygeal swab as appropriate. Serology should not be used as a first line diagnostic test.

CASE DEFINITION (ECDC)

Cases of monkeypox should be reported to TESSy if they meet any of the WHO, ECDC or national case definitions.

Confirmed case :

- A person with a laboratory-confirmed monkeypox infection (1) monkeypox virus specific PCR assay positive result or (2) orthopoxvirus-specific PCR assay positive result which is then confirmed by nucleotide sequence determination of the detected virus as MPXV) with symptom onset since 1 March 2022.

Probable case :

(1) A person with an unexplained rash[1] on any part of their body AND one or more other symptom(s) of monkeypox infection[2] with symptom onset since 1 March 2022

AND one of the following:

- has a positive laboratory test result on orthopoxviral infection (e.g., orthopoxvirus-specific positive PCR without sequencing, electron microscopy, serology);
- has an epidemiological link to a confirmed or probable case of monkeypox in the 21 days before symptom onset;
- reports travel to MPX endemic countries in the 21 days before symptom onset;
- is a person (of any sexual orientation) who had multiple or anonymous sexual partners in the 21 days before symptom onset;
- is a man who has sex with men.

OR

(2) A person with an unexplained generalized or localized maculopapular or vesiculopustular rash with centrifugal spread, with lesions showing umbilication or scabbing, lymphadenopathy and one or more other MPX-compatible symptoms[2].

---

1. Since EU/EEA countries are just starting to identify cases and if testing capacity is sufficient, the above more sensitive case definition can be used. In countries with limited testing capacity for orthopoxviruses, the following description can be added to characterize the rash: 'unexplained localized or generalized maculopapular or vesiculopustular rash potentially with umbilication or scabbing'.
2. Fever (usually higher >38.5°C), headache, back ache, fatigue, lymphadenopathy (localized or generalized).

KEY INDICATORS

IHR SUMMARY

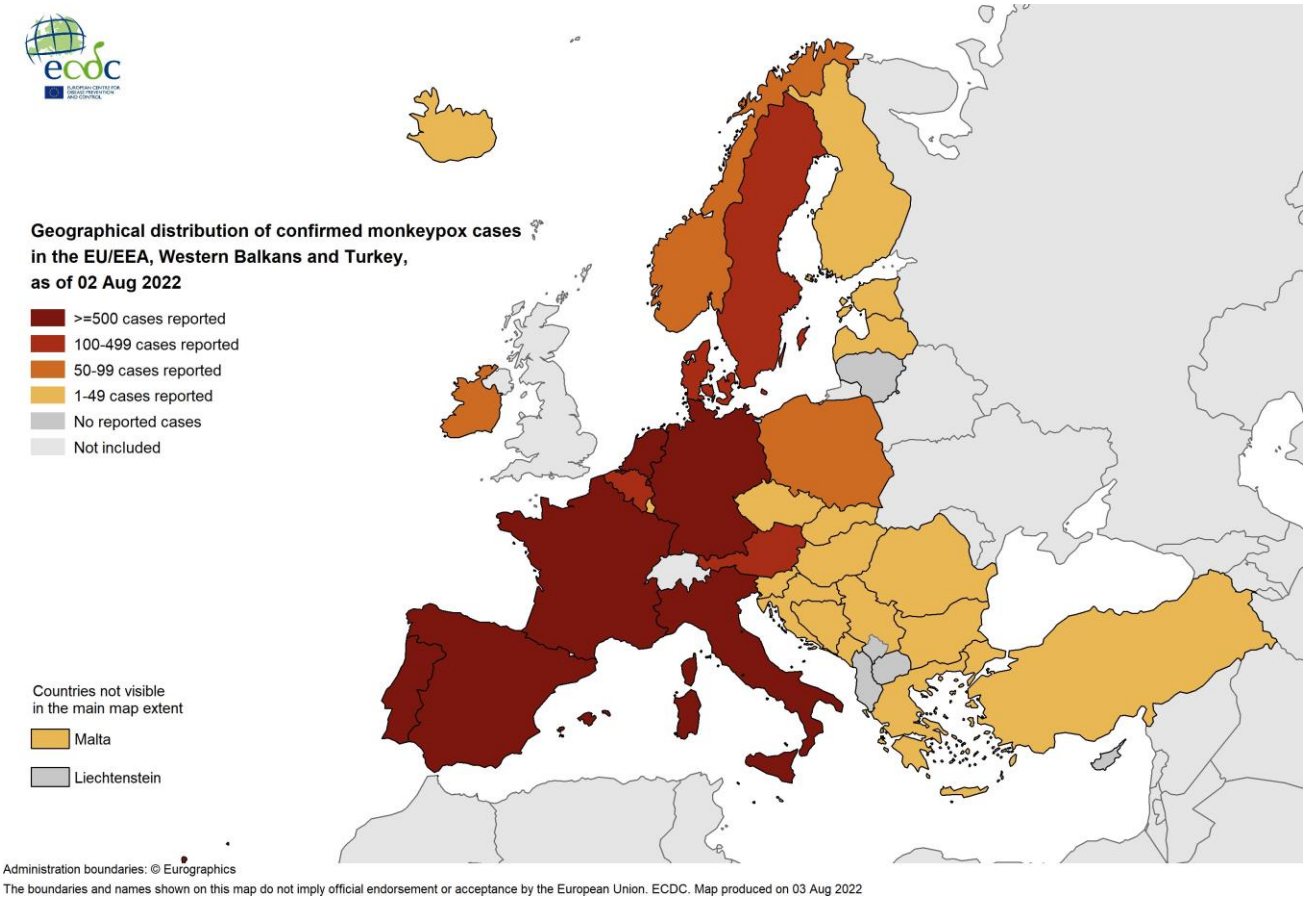
Table 1: Summary of number of cases of monkeypox identified through IHR mechanisms and official public resources and reported to TESSy, European Region, 2022

Country/Area	Number of cases identified through IHR and official public resources	Number of cases reported through TESSy
Spain	4577	4577
United Kingdom	2759	2724
Germany	2724	2724
France	2054	2054
Netherlands	927	927
Portugal	633	536
Italy	505	505
Belgium	482	482
Switzerland	272	270
Israel	146	0
Austria	135	135
Sweden	102	102
Denmark	101	100
Ireland	97	97
Poland	63	63
Norway	57	55
Hungary	42	42
Slovenia	37	37
Greece	33	33
Luxembourg	30	30
Czechia	25	25
Romania	22	22
Finland	20	20
Malta	17	17
Croatia	12	12
Serbia	10	0
Iceland	10	9
Estonia	8	8
Slovakia	6	6
Gibraltar	5	0
Bulgaria	4	4
Andorra	3	3
Latvia	3	3
Bosnia and Herzegovina	1	1
Georgia	1	1
Russian Federation	1	0
Türkiye	1	0
Montenegro	1	0
Total	15926	15624

MAPS

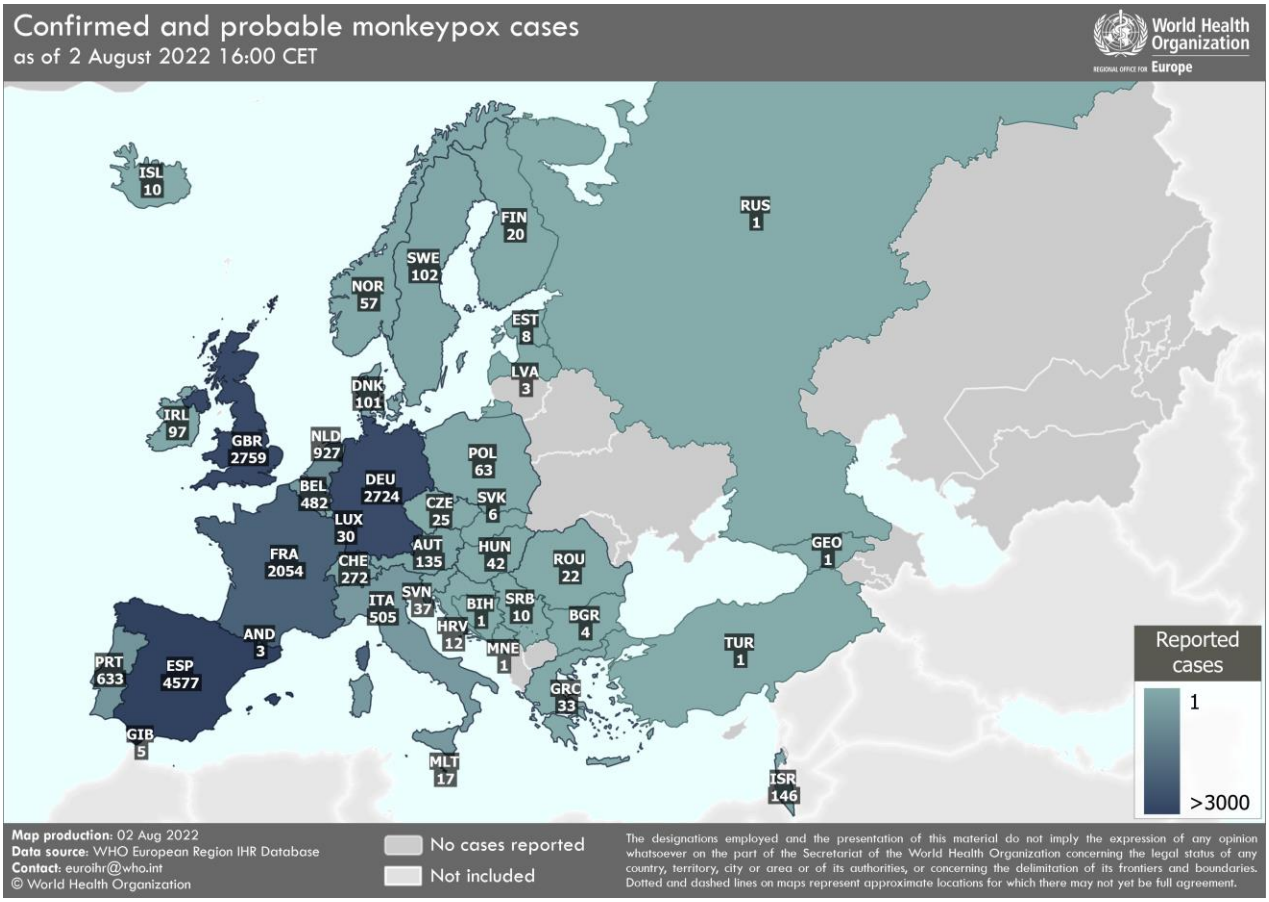
ECDC Map

Map Figure 1a: Distribution of cases of monkeypox, European Region, TESSy, 2022, ECDC borders



WHO-EURO Map

Map Figure 1b: Distribution of cases of monkeypox, European Region, TESSy, 2022, wHO EURO borders

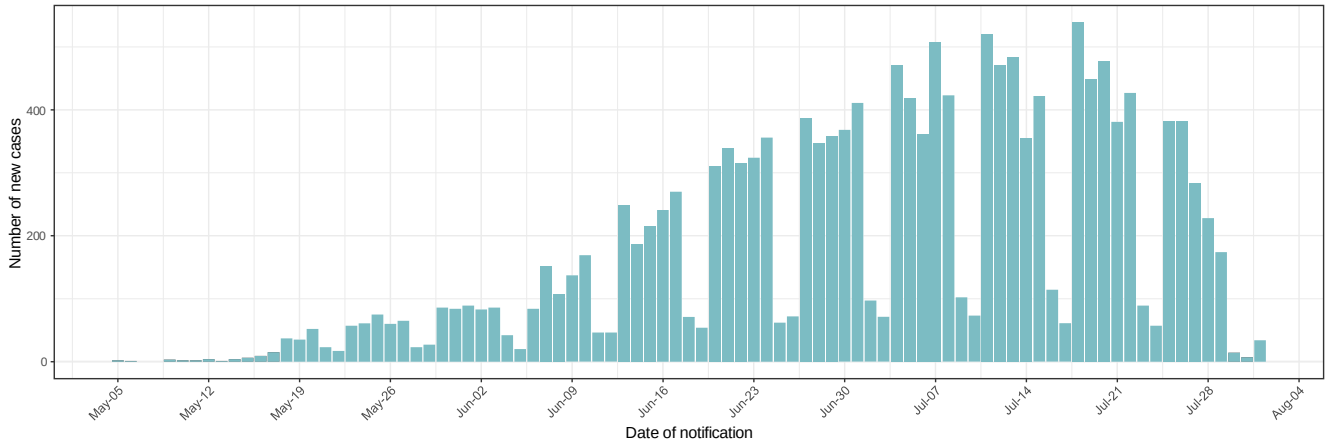


EPICURVES

Date of notification is defined as the date when the case report is notified for the first time to the place of notification, date of diagnosis is defined as the first date of clinical or laboratory diagnosis, and date of onset as the date of onset of any symptoms.

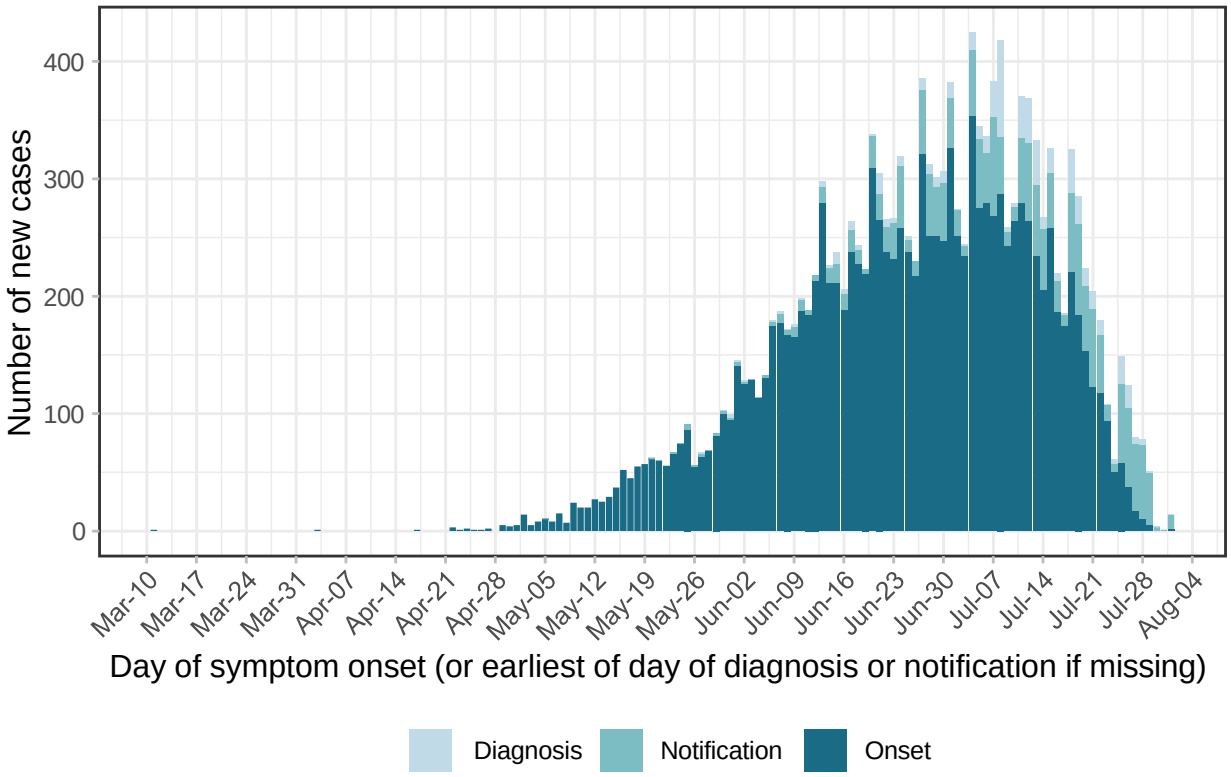
Overall by date of notification

Figure 1: Overall number of cases of monkeypox, per date of notification, European Region, TESSy, 2022



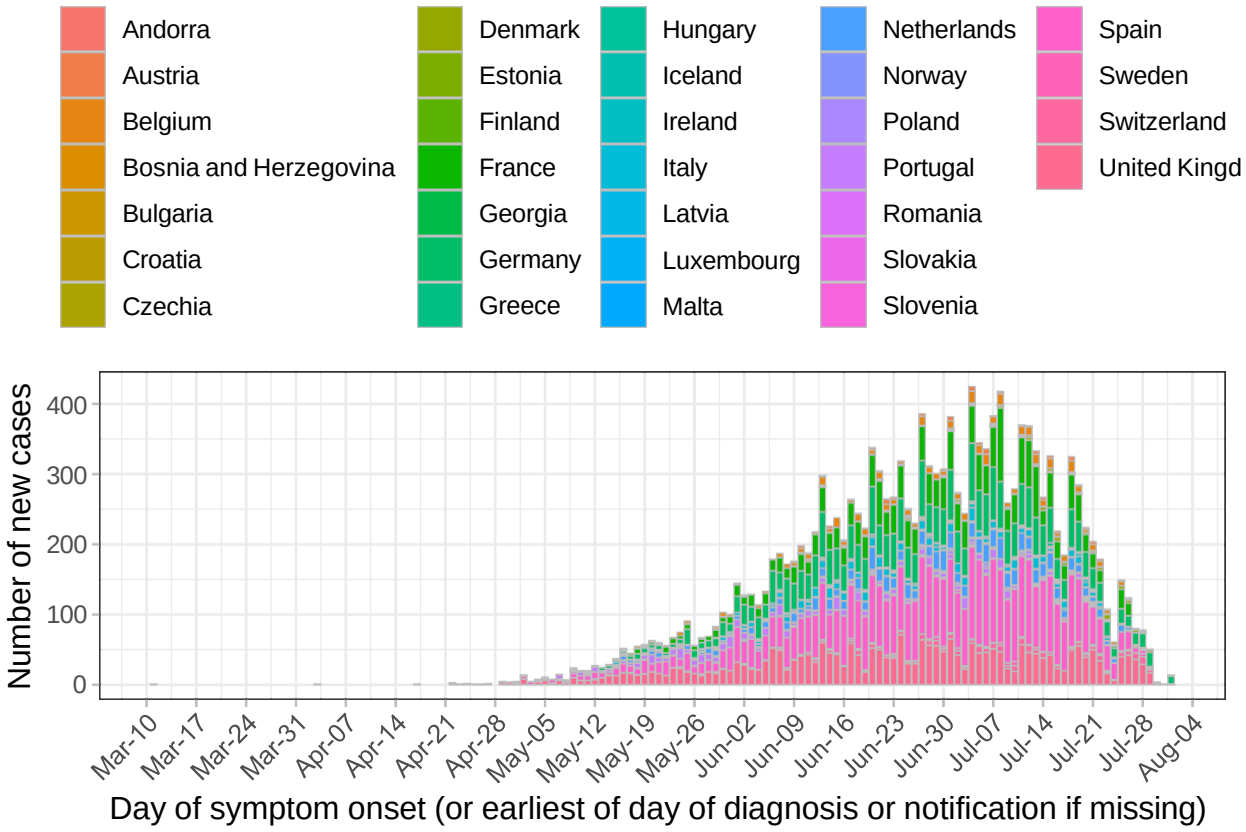
Overall by date of symptom onset

Figure 2: Overall number of cases of monkeypox, per date of symptom onset, European Region, TESSy, 2022



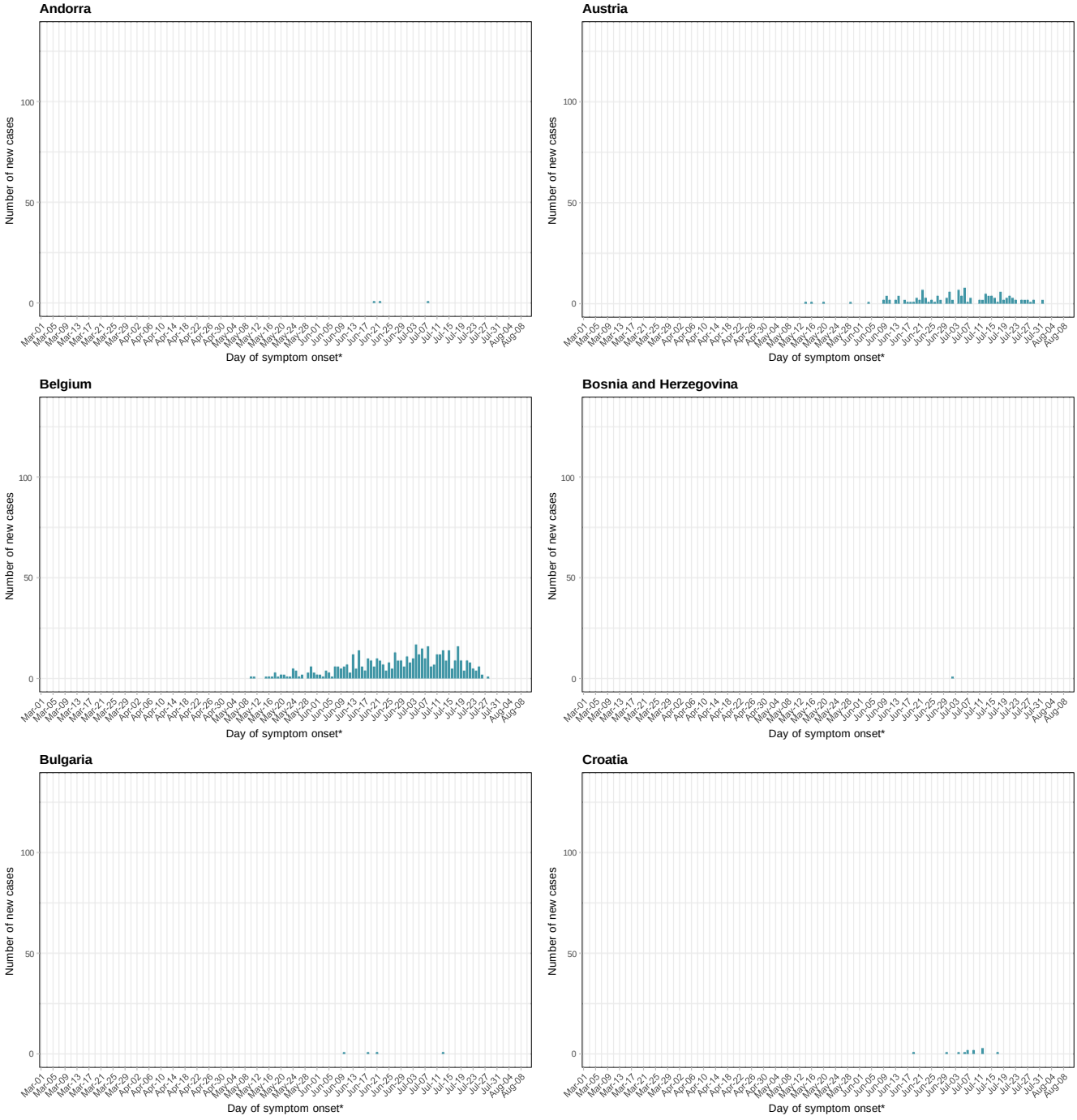
By date of onset and by country or area

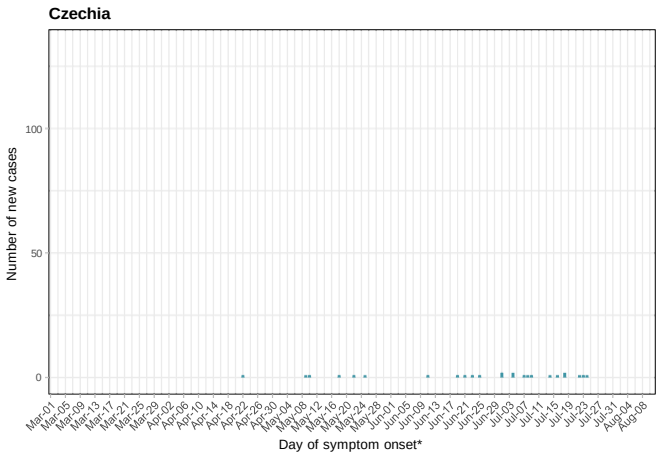
Figure 3: Number of cases of monkeypox, per day and per country/area of notification, European Region, TESSy, 2022

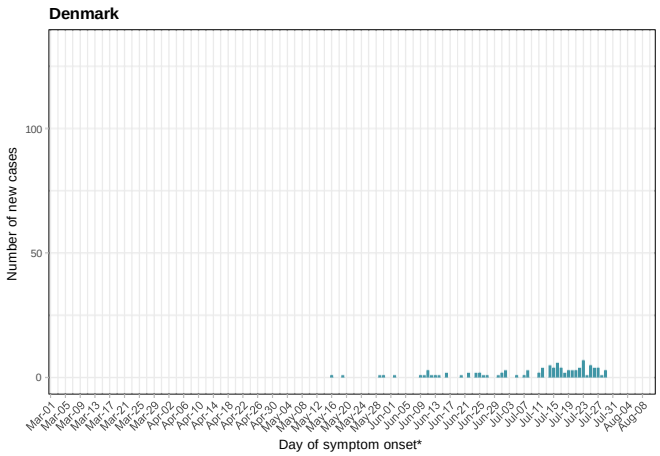


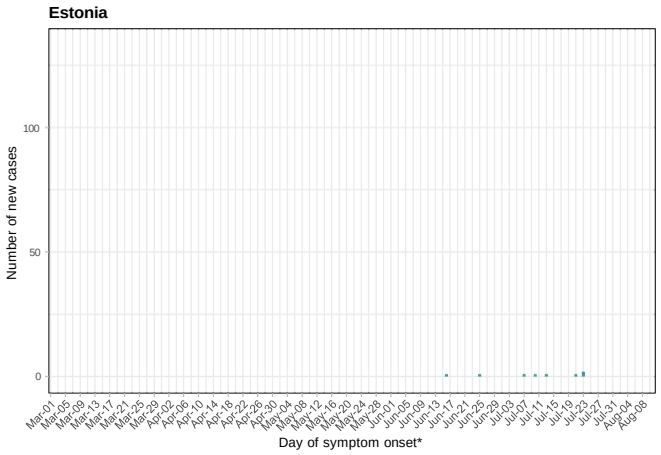
By date of onset and by country or area - country/area level

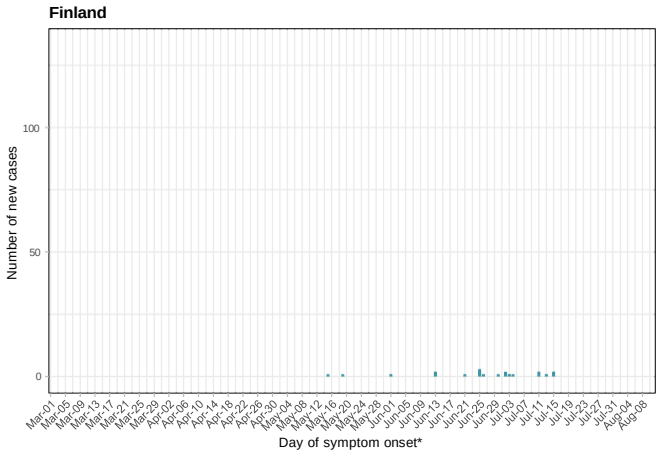
Figure 4: Number of cases of monkeypox, per day and per country/area of notification, European Region, TESSy, 2022

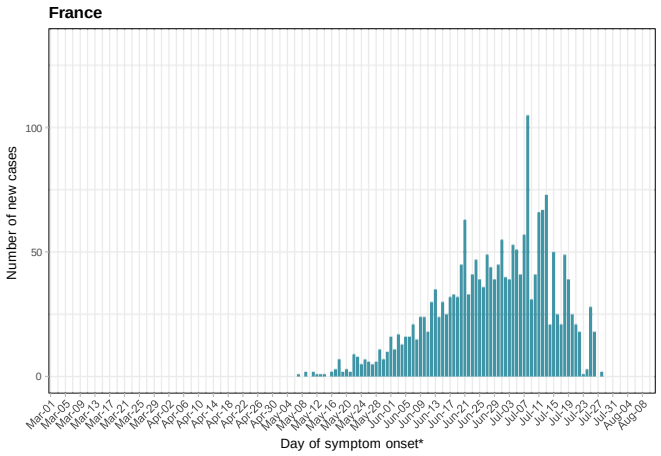


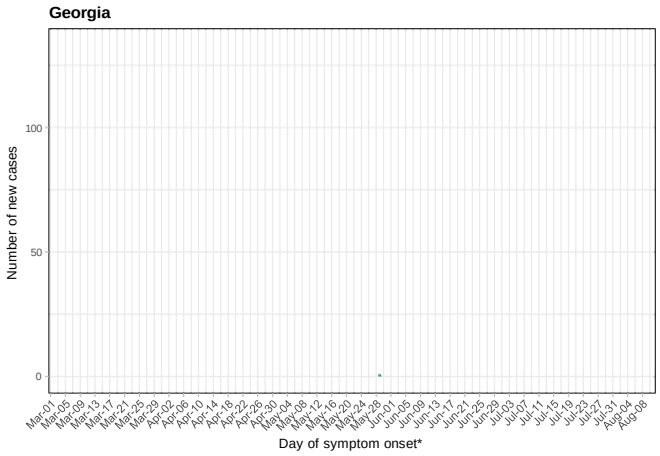

Czechia
Number of new cases
Day of symptom onset*

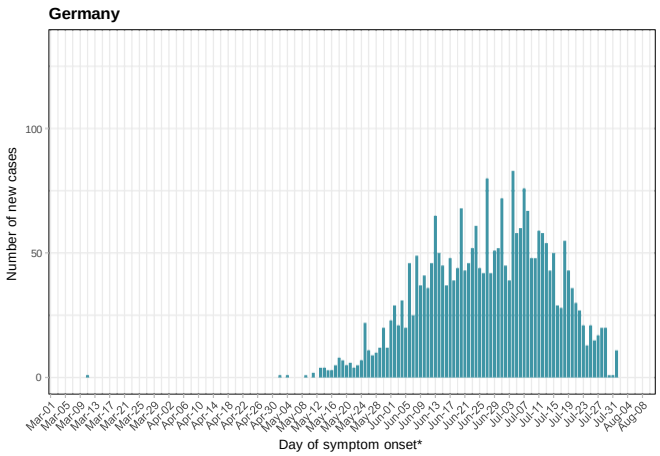

Denmark
Number of new cases
Day of symptom onset*

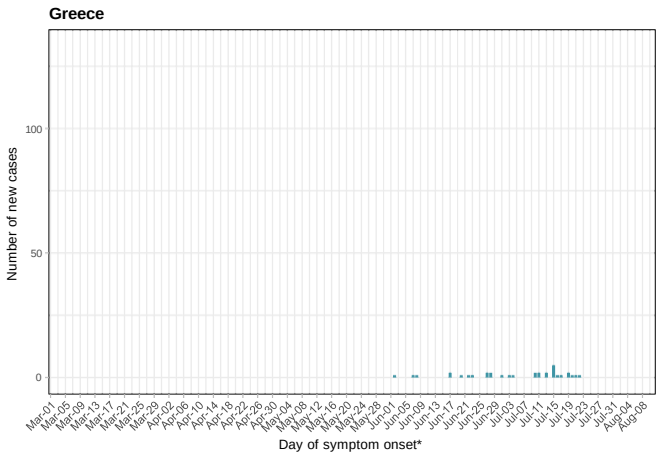

Estonia
Number of new cases
Day of symptom onset*

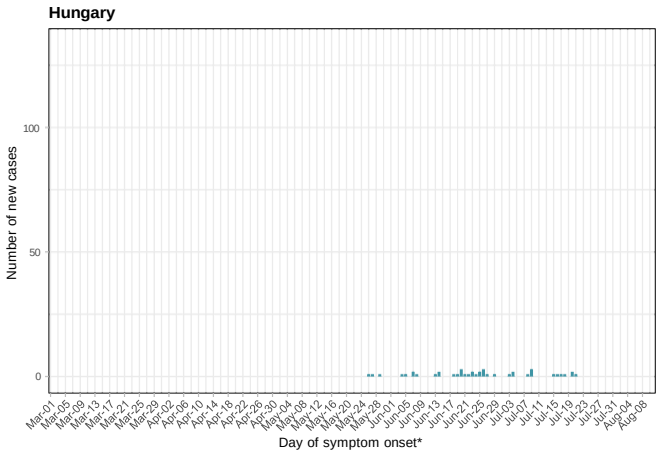

Finland
Number of new cases
Day of symptom onset*

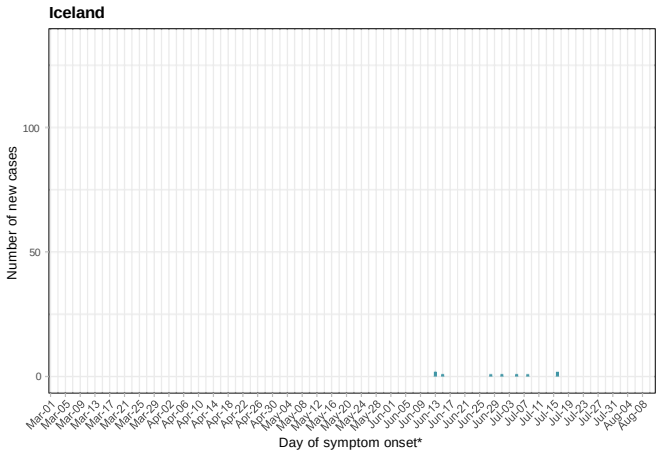

France
Number of new cases
Day of symptom onset*

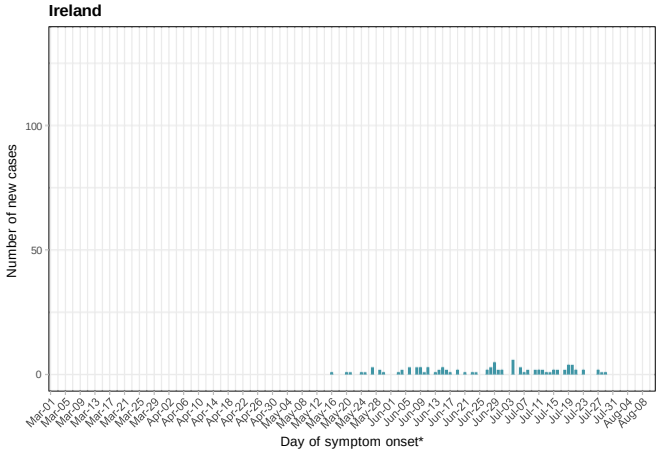

Georgia
Number of new cases
Day of symptom onset*

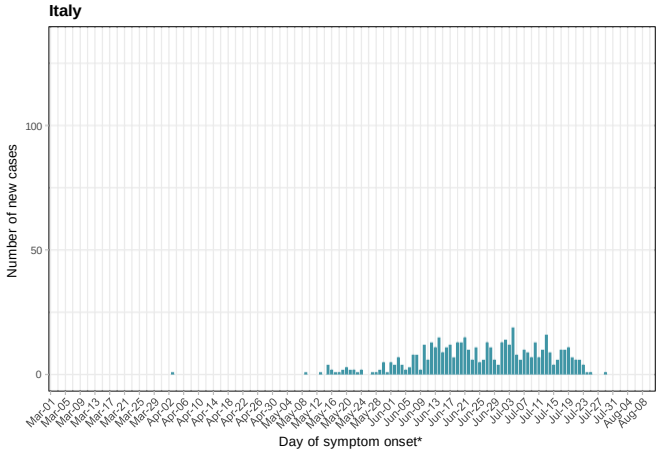

Germany
Number of new cases
Day of symptom onset*

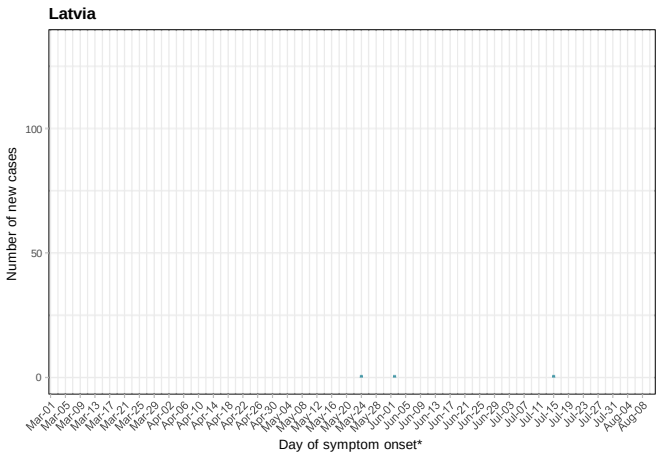

Greece
Number of new cases
Day of symptom onset*

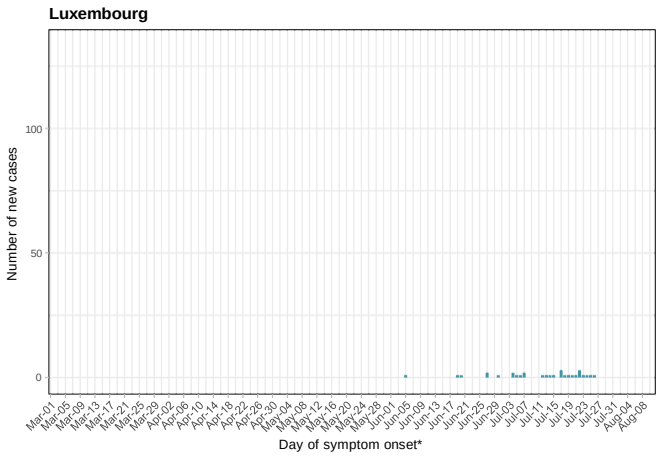

Hungary
Number of new cases
Day of symptom onset*

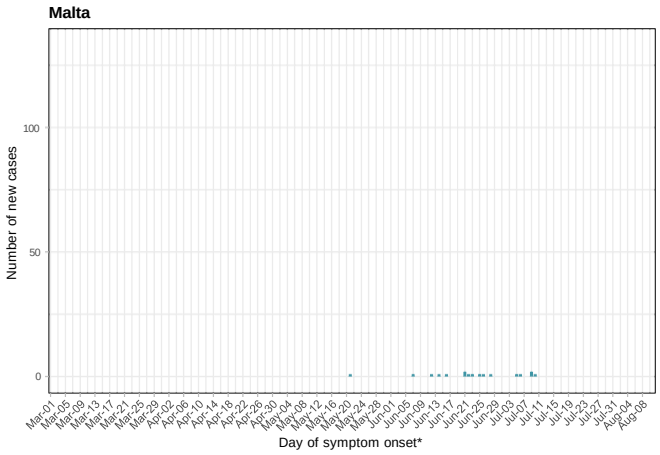

Iceland
Number of new cases
Day of symptom onset*

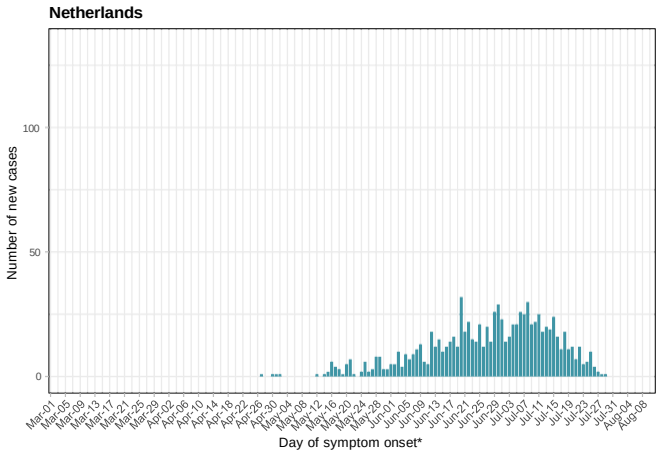

Ireland
Number of new cases
Day of symptom onset*

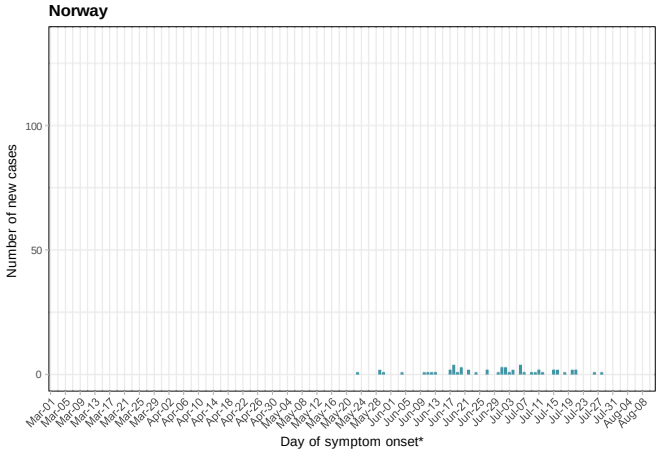

Italy
Number of new cases
Day of symptom onset*

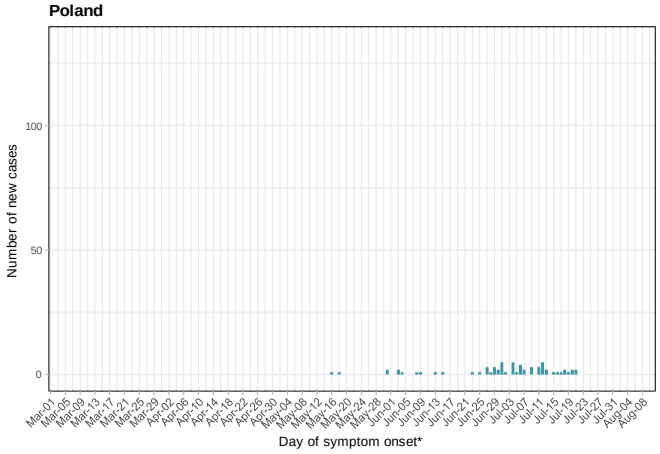

Latvia
Number of new cases
0
50
100
Day of symptom onset*

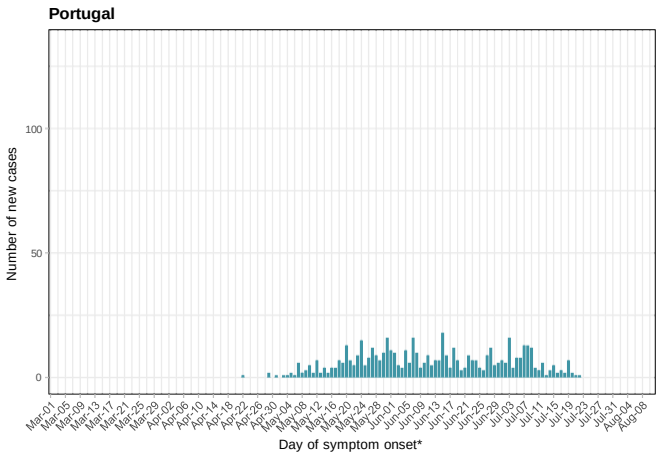

Luxembourg
Number of new cases
0
50
100
Day of symptom onset*

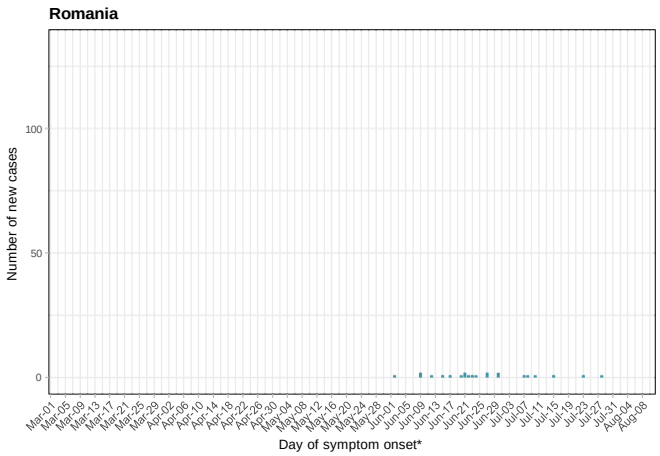

Malta
Number of new cases
0
50
100
Day of symptom onset*

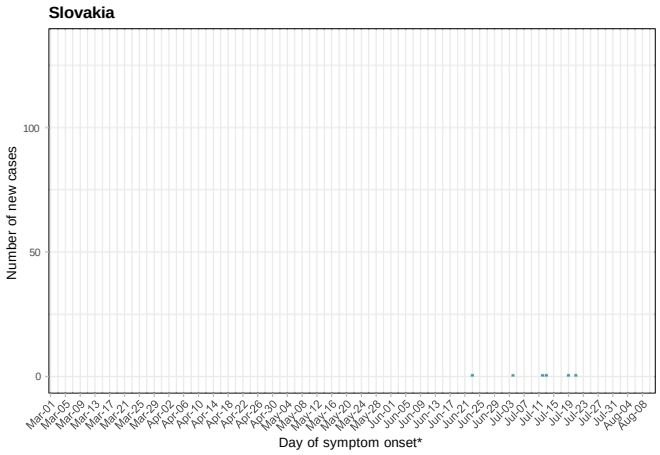

Netherlands
Number of new cases
0
50
100
Day of symptom onset*

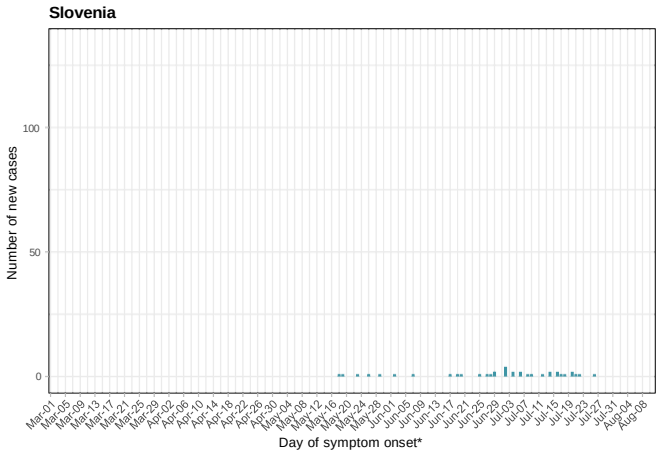

Norway
Number of new cases
0
50
100
Day of symptom onset*

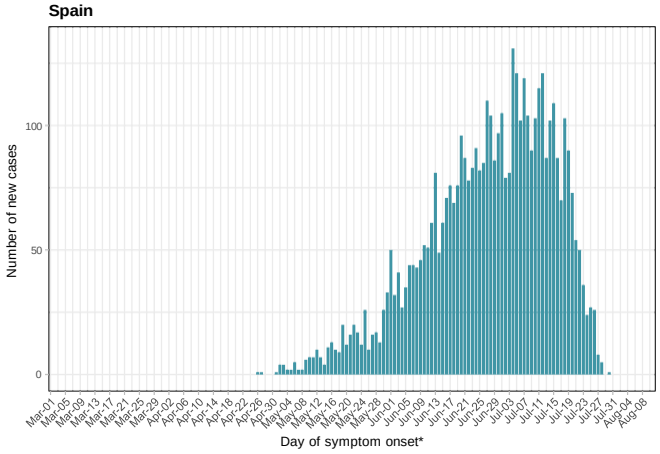

Poland
Number of new cases
0
50
100
Day of symptom onset*

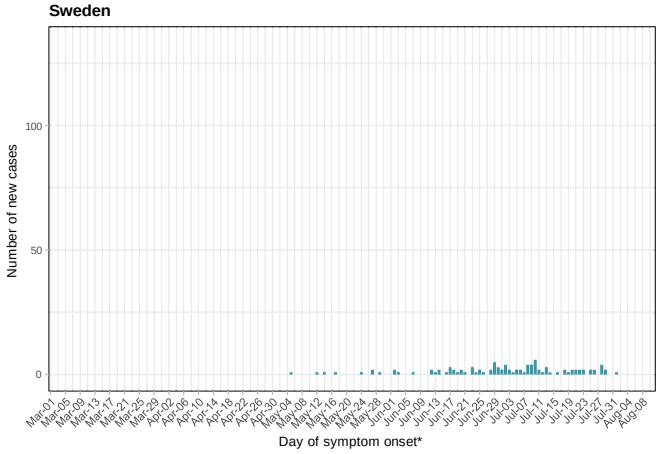

Portugal
Number of new cases
Day of symptom onset*

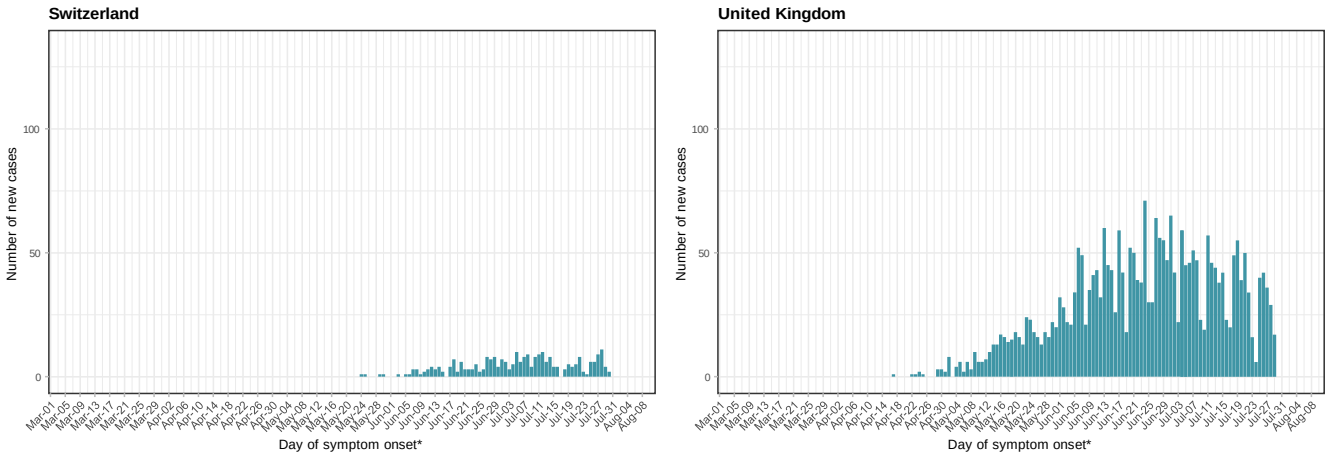

Romania
Number of new cases
Day of symptom onset*


Slovakia
Number of new cases
Day of symptom onset*


Slovenia
Number of new cases
Day of symptom onset*


Spain
Number of new cases
Day of symptom onset*


Sweden
Number of new cases
Day of symptom onset*



**Day of symptom onset or earliest of day of diagnosis or notification if missing*

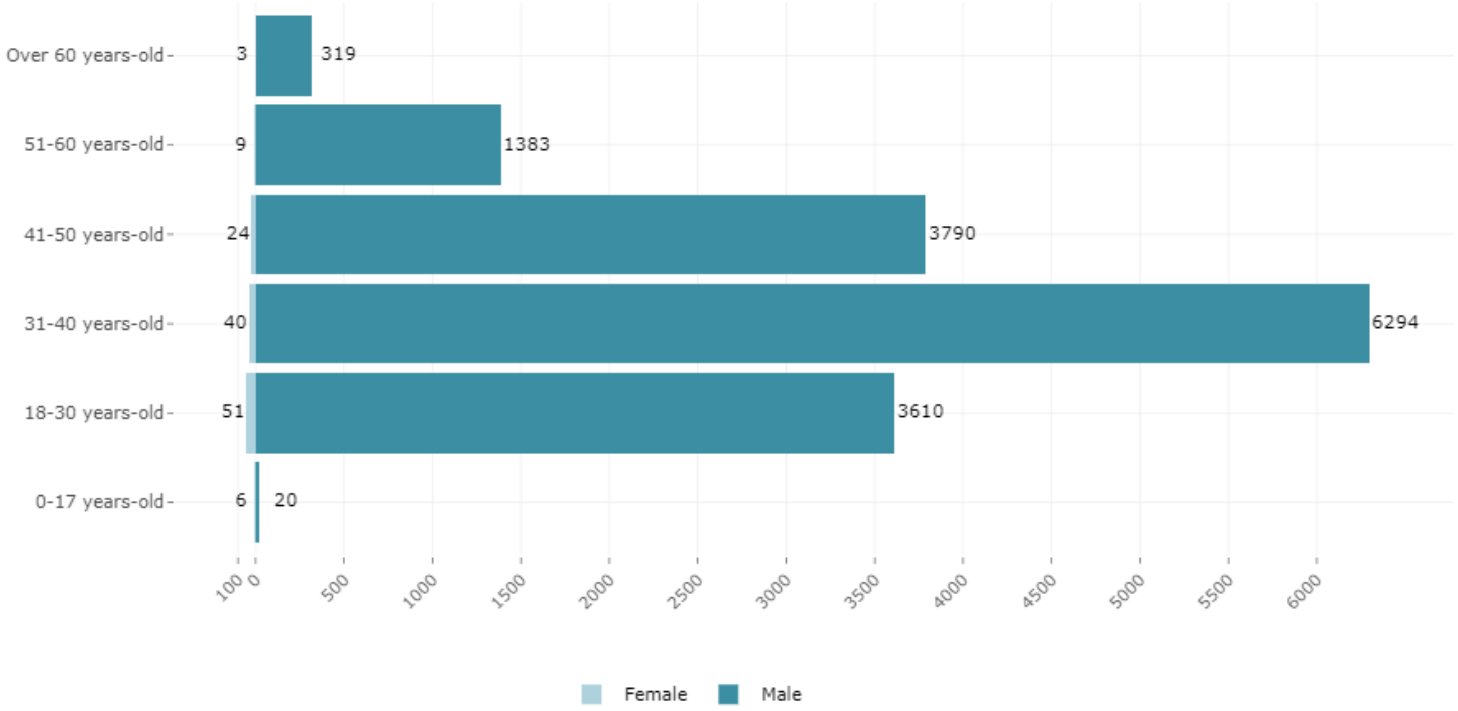
SUMMARY TABLE

Table 2: Summary of number of probable and confirmed cases of monkeypox by country/area, European Region, TESSy, 2022

Country	Confirmed cases	Probable cases	Unclassified cases	Total cases
Andorra	3	0	0	3
Austria	134	1	0	135
Belgium	481	1	0	482
Bosnia and Herzegovina	1	0	0	1
Bulgaria	4	0	0	4
Croatia	12	0	0	12
Czechia	25	0	0	25
Denmark	100	0	0	100
Estonia	8	0	0	8
Finland	20	0	0	20
France	2054	0	0	2054
Georgia	1	0	0	1
Germany	2724	0	0	2724
Greece	33	0	0	33
Hungary	42	0	0	42
Iceland	9	0	0	9
Ireland	97	0	0	97
Italy	505	0	0	505
Latvia	3	0	0	3
Luxembourg	30	0	0	30
Malta	17	0	0	17
Netherlands	927	0	0	927
Norway	55	0	0	55
Poland	52	11	0	63
Portugal	536	0	0	536
Romania	22	0	0	22
Slovakia	6	0	0	6
Slovenia	37	0	0	37
Spain	4577	0	0	4577
Sweden	102	0	0	102
Switzerland	270	0	0	270
United Kingdom	2637	87	0	2724
Total	15524	100	0	15624

DEMOGRAPHICS

Figure 6: Age and gender* distribution of cases of monkeypox, European Region, TESSy, 2022



Gender from 10 cases is reported as Other and these cases are not depicted on this graph. Information on gender is missing for 42 cases and information on age is missing for 29 cases.

**Gender is defined in the TESSy metadata as Female/Male/Other (e.g., transsexual)/Unknown. We acknowledge that this variable does not accurately capture the full spectrum of gender(s) and that the lack of distinction between sex and gender in the TESSy metadata so far prevents us from correctly identifying possible transgender cases.*

CLINICAL DESCRIPTION

The median time between symptom onset and diagnosis was 7 days.

Figure 7: Distribution of symptoms among those reporting at least one type of symptom (N=9626), European Region, TESSy, 2022

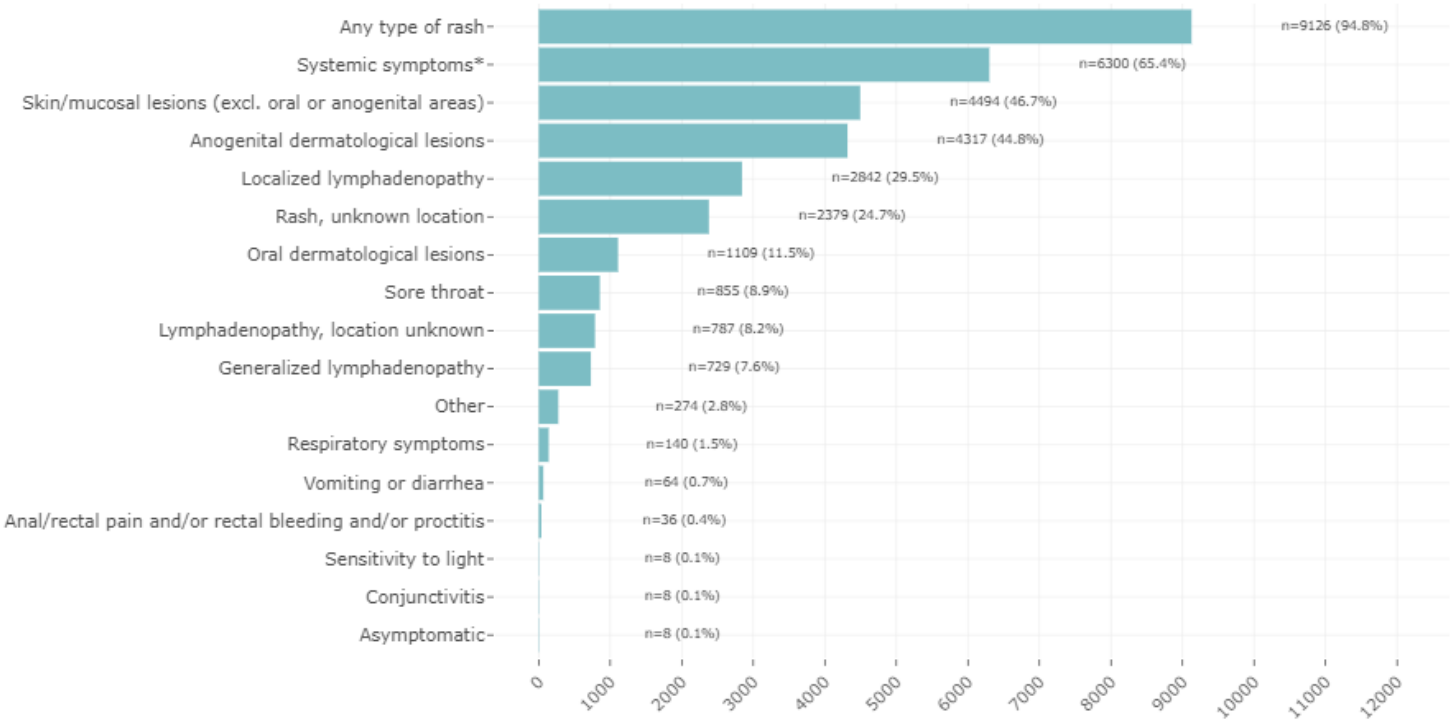


Table 3: Distribution of rash and systemic symptoms among those reporting at least one type of symptom (N=9626), European Region, TESSy, 2022

Any type of rash	Systemic Symptoms*	Count (%)
Absent	Absent	110 (1.1%)
Absent	Present	390 (4.1%)
Present	Absent	3216 (33.4%)
Present	Present	5910 (61.4%)
Total	-	9626 (100%)

**Fever, fatigue, muscle pain, chills, headache*

Detection of asymptomatic cases is dependent on testing guidelines which currently do not recommend testing asymptomatic persons

OUTCOME, HIV STATUS, HCW

Table 4: Summary of outcome, HIV status of cases, and cases of monkeypox among health workers, European Region, TESSy, 2022

	Yes	No	Total
Admitted to ICU*	3 (0.1%)	3436 (99.9%)	3439 (100%)
Hospitalized**	399 (5.6%)	6730 (94.4%)	7129 (100%)
Died	2 (0.0%)	10069 (100%)	10071 (100%)
HIV-Positive	2690 (35.9%)	4797 (64.1%)	7487 (100%)
Health worker	41 (2.2%)	1859 (97.8%)	1900 (100%)

**Includes cases hospitalized for isolation or treatment (76 cases were hospitalized for isolation purposes,150 required clinical care and 173 were hospitalized for unknown reasons).*

SEXUAL ORIENTATION

Sexual orientation in TESSy is defined according to the following non-mutually exclusive categories:

- Heterosexual
- MSM = MSM/homo or bisexual male
- Women who have sex with women
- Bisexual
- Other
- Unknown or undetermined

Sexual orientation is not necessarily representative of the gender of the person the case had sex with in the past 21 days nor does it imply sexual contact and sexual transmission.

We summarize here the sexual orientation that male cases identified with.

Table 5: Summary of reported sexual orientations among cases of monkeypox, European Region, TESSy, 2022

Sexual Orientation	Count (%)
MSM	6777 (43.4%)
Bisexual	75 (0.5%)
Heterosexual	150 (1.0%)
Unknown or undetermined	2021 (12.9%)
Missing	6601 (42.2%)
Total	15624 (100%)

MICROBIOLOGICAL ANALYSES

SPECIMEN TYPES

Table 6: Summary of specimen types with positive test result used for diagnosis of monkeypox, European Region, TESSy, 2022

Specimen type	Count
Lesion swab	499 (46.3%)
Oropharyngeal swab	245 (22.7%)
Rectal swab	176 (16.3%)
Lesion crust	78 (7.2%)
Genital swab	65 (6.0%)
Urine	12 (1.1%)
Serum	3 (0.3%)
Semen	0 (0.0%)
Total	1078 (100%)

PHYLOGENETICS

Phylogenetics of monkeypox virus

Whole genome sequences of MPXV were extracted from GISAID EpiPox and NCBI GenBank on 31 July 2022. NextClade [1] was used to assess the quality and poor-quality sequences were excluded, resulting in 600 sequences included in the phylogenetic analysis performed using ParSNP [2] with MT903344.1 as reference and visualized using Microreact [3].

There are two genetically distinct major clades described for MPXV, the Central African (Congo Basin) and West African clades (*Figure A*).

The 2022 outbreak sequences from Europe (Austria (3), Belgium (9), Czechia (1), Finland (3), France (6), Georgia (1), Germany (246), Hungary (1), Israel (1), Italy (10), Luxembourg (1), Netherlands (10), Portugal (34), Slovakia (1), Slovenia (7), Spain (7), Switzerland (3), and the United Kingdom (15)) are part of a distinct cluster within the West African clade and cluster together with 2022 MPXV sequences from Australia (1), Brazil (25), Canada (80), Ecuador (1), Mexico (2), Peru (8), South Africa (2), Taiwan (1), Thailand (1) and the United States (19) (*Figure B*). Eight 2022 sequences (India (4), Thailand (2) and United States (2)) do not cluster with the other 2022 outbreak sequences.

Figure A. Phylogenetic tree of monkeypox virus sequences as of 31 July 2022.

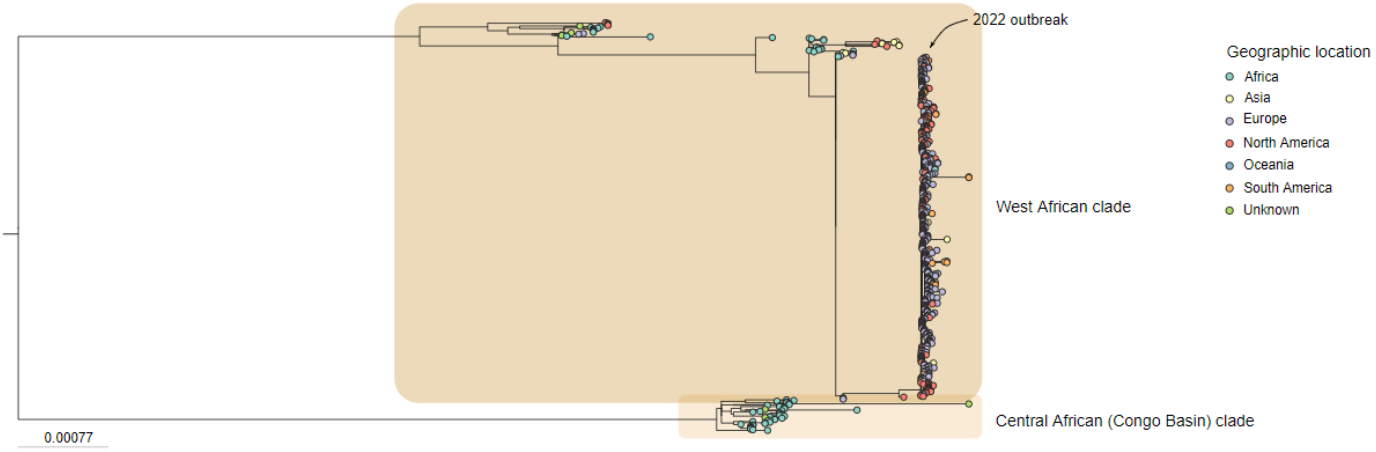
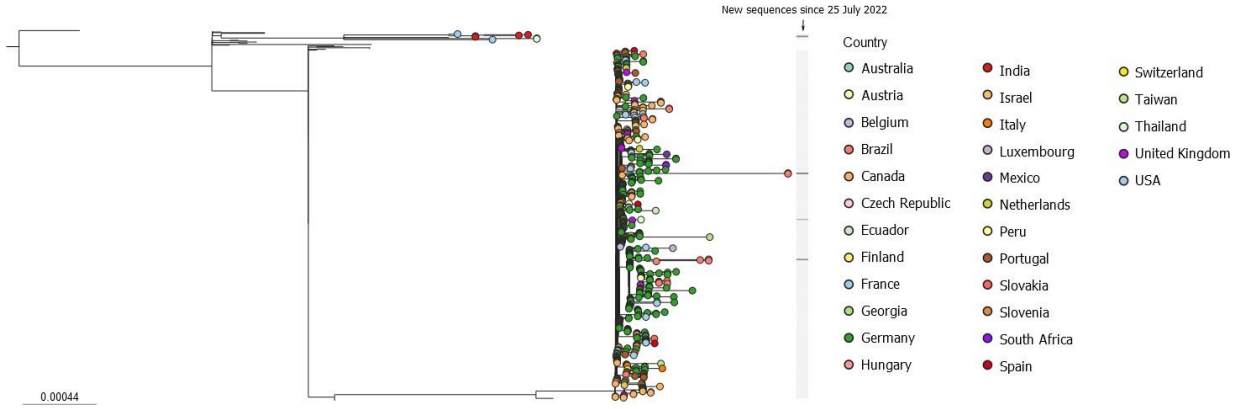


Figure B. Phylogenetic tree of monkeypox virus sequences from West African clade as of 31 July 2022. Sequences from 2022 are indicated with coloured circles and the binary heatmap shows new sequences uploaded to sequence databases after 25 July 2022.



[1] Aksamentov, I., Roemer, C., Hodcroft, E. B., & Neher, R. A., (2021). Nextclade: clade assignment, mutation calling and quality control for viral genomes. Journal of Open Source Software, 6(67), 3773, https://doi.org/10.21105/joss.03773

[2] Treangen TJ, Ondov BD, Koren S, Phillippy AM. The Harvest suite for rapid core-genome alignment and visualization of thousands of intraspecific microbial genomes. Genome Biology. 2014;15(524). Available at: https://genomebiology.biomedcentral.com/articles/10.1186/s13059-014-0524-x

[3] Argimón S, et al. Microreact: visualizing and sharing data for genomic epidemiology and phylogeography. Microbial Genomics. 2016;2(11). Available at: https://www.microbiologyresearch.org/content/journal/mgen/10.1099/mgen.0.000093

DISCLAIMERS AND ACKNOWLEDGMENTS

COPYRIGHT STATEMENT AND DISCLAIMERS

Users are advised to interpret all data with caution and be aware of their limitations. Case counts and their corresponding data may have weekly updates that include historical corrections as new information is collected and reported.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO or ECDC concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by WHO or ECDC in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by WHO and ECDC to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall WHO or ECDC be liable for damages arising from its use. Copyright, permissions and referencing The WHO Regional Office for Europe is responsible for the accuracy of the Russian translation.

Suggested citation: European Centre for Disease Prevention and Control/WHO Regional Office for Europe. Monkeypox, Joint Epidemiological overview, 03 August, 2022.

Tables and figures should be referenced: European Centre for Disease Prevention and Control/WHO Regional Office for Europe. Monkeypox, Joint Epidemiological overview, 03 August, 2022.

© World Health Organization 2022.

© European Centre for Disease Prevention and Control 2022.

Some rights reserved. This work is available under the Creative Commons Attribution- 4.0 International (CC BY-4.0 ; Creative Commons — Attribution 4.0 International — CC BY 4.0. In any use of this work, there should be no suggestion that WHO or ECDC endorse any specific organization, products or services. The use of the ECDC or WHO logo is not permitted. If you create a translation of this work, you should add the following disclaimer along with the suggested citation: "This translation was not created by the European Centre for Disease Prevention and Control (ECDC) or by the World Health Organization (WHO). ECDC and WHO are not responsible for the content or accuracy of this translation. The original English edition shall be the binding and authentic edition."

ACKNOWLEDGMENTS

We gratefully acknowledge the input of national public health staff involved in surveillance activities and data submission to TESSy, as well as the following authors from the originating laboratories responsible for obtaining the specimens, as well as the submitting laboratories where the genome data were generated and shared via GISAID, on which this research is based.

A full list of acknowledgements for the genome data used in this report can be found in the acknowledgements section of the web version of this report at https://monkeypoxreport.ecdc.europa.eu/.