ECDC Risk assessment
Monkeypox multi-country outbreak

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IUSTI webinar 25 May 2022 – Steps forward – 2022 – The Monkeypox Threat

Situation update - overview

UK

- 7 May - 1 confirmed case imported from Nigeria
- 13 May - family cluster (2 confirmed cases + 1 clinically compatible case); no known travel or epi links
- 15 May - 4 confirmed cases among MSM; GUM clinics

All confirmed cases West African clade of monkeypox virus by PCR

Portugal

- 12 May – alert in EpiPulse STI about cases with atypical rush among MSM in Lisbon; 18 May - 14 MPX confirmed cases in Portugal

EU/EEA

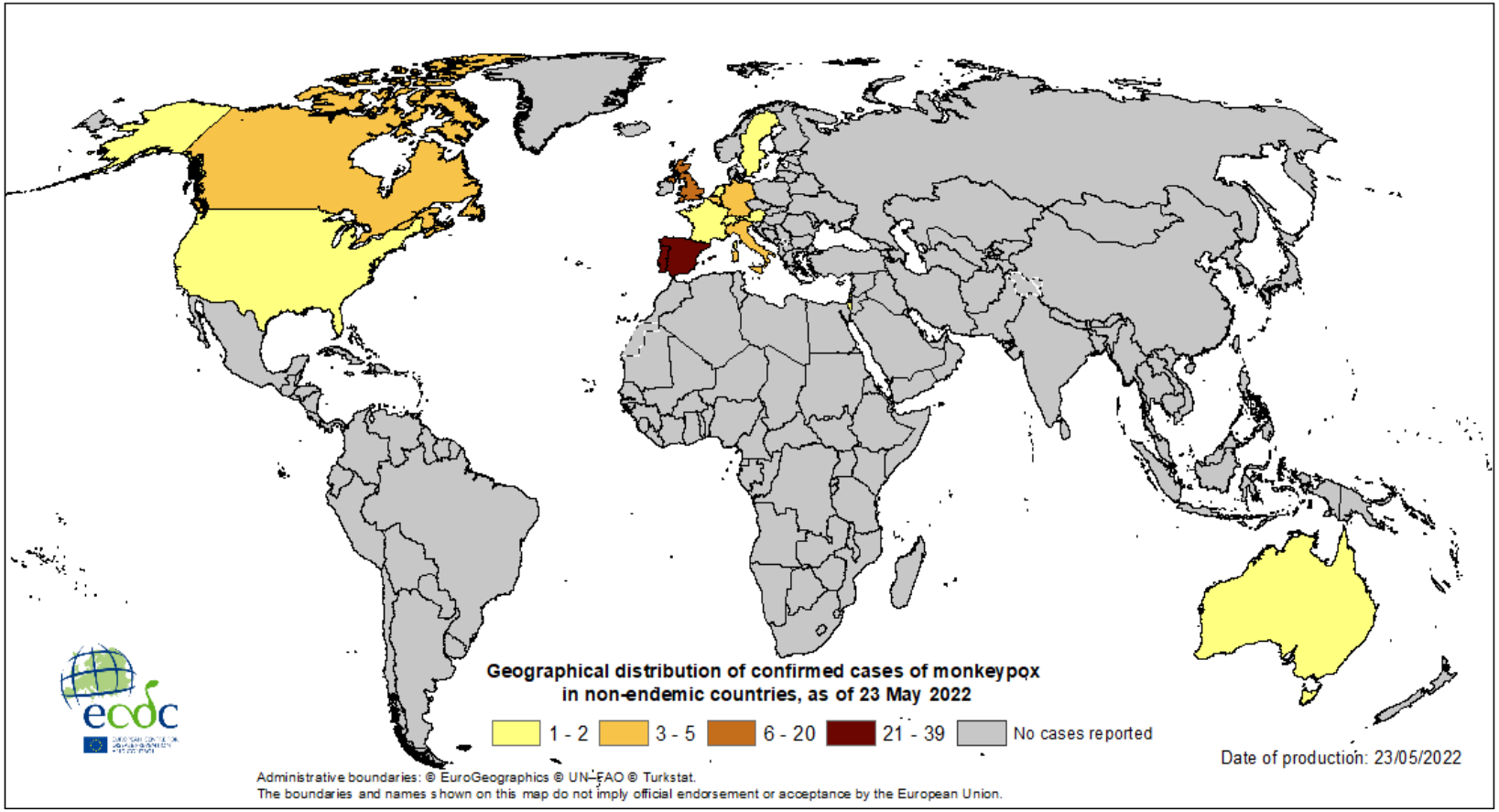
- As of 24 May - 98 confirmed cases - Austria, Belgium, Denmark, France, Germany, Italy , Netherlands, Portugal, Spain, Sweden

Outside EU/EEA

- As of 24 May – 68 confirmed cases reported from Australia, Canada, Israel, the UK, the US, Switzerland

Geographical distribution of confirmed cases of monkeypox in non-endemic countries, as of 23 May 2022

24 May: 166 cases worldwide in non-endemic countries



For EU/EEA: majority of cases in young men, self-identifying as MSM. Several reported a recent travel history to another European country. Where information is available, most cases described as mild.

Disease background

- MPXV identified as human pathogen in **1970** in DRC; currently most prevalent orthopoxvirus in humans
- **In endemic areas, animal to human transmission** (bites, direct contact). Two clades of MPXV:
  - West African <1% CFR and Congo Basin >10% CFR;
- **2003**, US outbreak with 81 human cases after contact with infected animals (ex Ghana), no human-to-human transmission
- **2017,** Nigeria, the largest documented outbreak with West African clade (146 suspected, 42 confirmed cases)
- **2018**, first human host transfer outside Africa with several unlinked travel-related cases (Israel, the UK, Singapore).

Transmission of MPXV between humans

Transmission described prior to 2022,

- respiratory droplets during direct and prolonged face-to-face contact
- direct contact with body fluids of an infected person, contact of mucosa or non-intact skin with open rash lesions
- contact with contaminated objects, e.g. bedding or clothing.

Sexual transmission hypothesised,

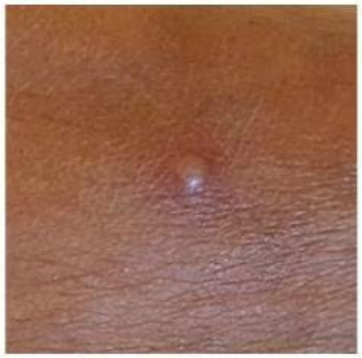
- *Ogoina et al.* (Nigeria, 2017) "[…] sexual transmission is plausible in some of these patients through close skin to skin contact during sexual intercourse or by transmission via genital secretions."
- *Described* for vaccinia virus* from smallpox vaccine recipients (vaccination site not covered by bandage) to sexual partners: Shao H et al (Washington, 2010 *M to F);* McLaughlin J et al (Alaska, 2006 *M to F),* Shao H et al (California, 2012 *M to M to M).*

*Orthopoxviruses: vaccinia (smallpox vaccine), variola (smallpox), monkeypox, and cowpox

Disease characteristics

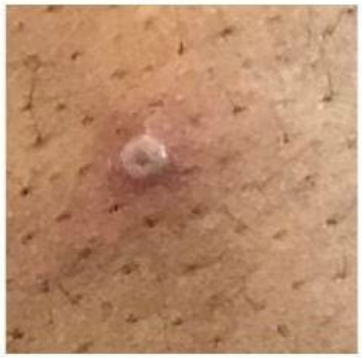
- **Incubation period** (from previous outbreaks): 6 to 13 days (range 5-21 days)
- **Clinical picture** (this outbreak)
  - Not textbook! localised rash in anogenital area, some with disseminated rash (not many lesions)
  - Painful lymphadenopathy, prodrom
- **Diagnosis**: RT-PCR of scabs, swabs and aspirated lesion fluid specimens
- **Treatment**: symptomatic and supportive, antivirals
- **Vaccine**: previous vaccination against smallpox provides (up to 85%) cross-protection; vaccines exist with non-replicative viruses (MVA-BN) authorised for smallpox by EMA smallpox and MPX by FDA)

Images of individual monkeypox lesions



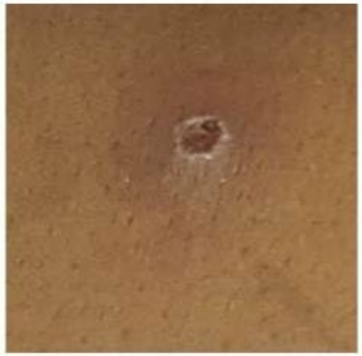
a) early vesicle, 3mm diameter

b) small pustule, 2mm diameter

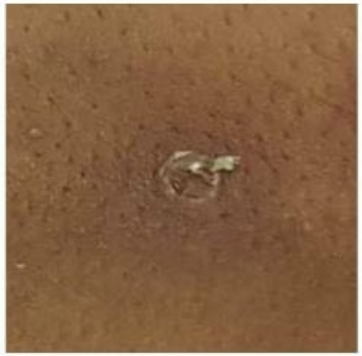


c) umbilicated pustule, 3-4mm diameter

d) ulcerated lesion, 5mm diameter



e) crusting of a mature lesion



f) partially removed scab

Source: Monkeypox cases confirmed in England – latest updates - GOV.UK (www.gov.uk)

Summary of risk assessed by ECDC for the different population categories

	Persons with multiple sexual partners, including some MSM	Broader population	Health professionals			
			HCWs		Laboratory personnel	
			Proper PPE	Unprotected exposure	Proper procedure and PPE	Unprotected exposure
Probability	High	Very low	Very low	High	Very low	High
Impact	Low	Low	Low	Low	Low	Moderate
Overall risk	**Moderate**	**Low**	**Low**	**Moderate**	**Low**	**High**

The risk may be higher for certain people in some of the above categories, particularly very young children, pregnant women, elderly, or immunocompromised persons.

Source: ECDC Monkeypox multi-country outbreak (europa.eu)

ECDC risk assessment: Substances of human origin Spill-over to animals

Low risk of transmission through substances of human origin (SoHo)

- No cases of transmission documented for SoHo
- Monkeypox virus likely transmissible through SoHo
  - Mother-to-child transmission during pregnancy
  - Viremia in humans
  - Presence of virus in blood, tissues, organs of animals
  - MPXV in semen, vaginal fluids?

Very low risk of spill-over to animals in Europe

- Rodents, particularly species of the family of Sciuridae (squirrels) likely suitable hosts
- Transmission from humans to (pet) animals theoretically possible
- Spill-over event, if transmitted to wildlife, could potentially lead to disease becoming an endemic zoonosis

Options for response

The current priorities for countries should be:

- **Identification, isolation and contact tracing** of MPX cases.
- **Reporting newly identified cases and their characteristics** to EpiPulse and the European Surveillance System (TESSy) (TESSy reporting under implementation).

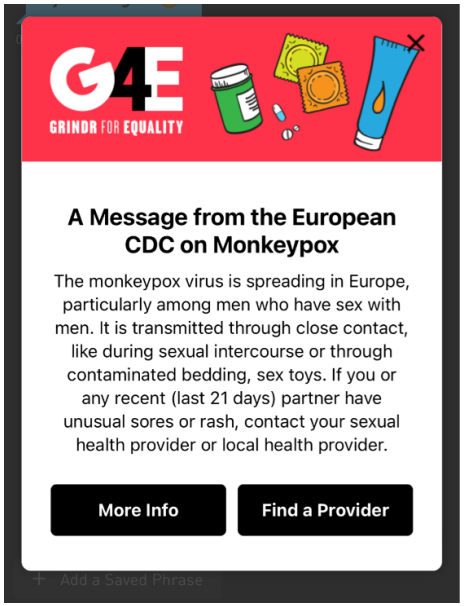
Laboratory diagnostics and sequencing

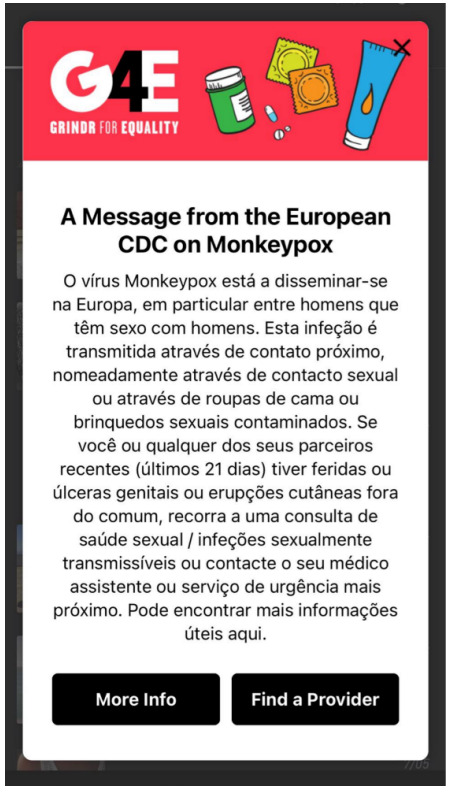
- Review in-house molecular diagnostic testing capacities for MPXV
  - including surge capacity related to reagents, consumables and available trained staff
- Countries with limited experience encouraged to refer specimens for confirmatory testing
- Sequencing of poxvirus DNA in samples can validate detection specificity and assist in understanding transmission patterns
- EVD-LabNet coordinating protocol sharing, confirmatory testing support, sequencing support (ECDC.Microbiology@ecdc.europa.eu)

Vaccination and antivirals

- Vaccine availability should be reviewed (type, doses and authorisation status)
- Smallpox vaccine can be used for post-exposure prophylaxis (PEP) of close contacts at increased risk for severe disease, best effect if within 4 days of exposure.
- Assessment for need of PEP smallpox vaccination
  - Type of contact, timing, risk factors, available vaccine, doses ↦ risk/benefit assessment
- Antivirals are a potential treatment option for severe cases
  - Tecovirimat EMA-authorised, brincidofovir

Risk communication and community engagement





HORNET

Alerts in several languages already on apps !

Knowledge gaps/limitations

- No comprehensive data on severity of illness, transmission dynamics or effective response measures for the current outbreak
- Under-detection of cases still very likely
- Lack of sequencing results to understand transmission chains/dynamics
- More accurate information on risk associated with different types of contacts
- Information on current residual cross-protection of smallpox vaccination, efficacy data and safety for children, pregnant, immunocompromised
- Efficacy and safety data on available antiviral agents and common treatment protocol.

Consulted external experts

European Food Safety Authority (EFSA): Ernesto Liebana (BIOHAW Unit). **European Medicines Agency (EMA):** Marco Cavaleri, Eugenia Di Meco. **World Health Organization (WHO):** Richard Pebody, Cristiana Salvi (Regional Office for Europe) Antons Mozalevskis (Headquarter).
Public health experts from EU/EEA countries: Belgium: Cécile van de Konijnenburg (SPF Santé Publique - FOD Volksgezondheid). **France:** Emilie Chazelle, Alexandra Mailles (Santé Publique France). **Portugal**: Paula Vasconcelos, Teresa Fernandes, Ana Firme, Margarida Tavares, Mariana Perez Duque, Sofia Ribeiro, Pedro Casaca, Tiago Manuel Soto, Graça Freitas, (Direção-Geral da Saúde – Ministry of Health), Kamal Mansinho (Centro Hospitalar Lisboa Ocidental/Hospital de Egas Moniz and Institute of Hygiene and Tropical Medicine/New University of Lisbon), Jorge Machado (National Institute of Health, Department Infectious Diseases). **Sweden**: Britta Björkholm, Sara Bengtsson Andreas Bråve, Erik Sturegård, Åsa Szekely Björndal (Public Health Agency of Sweden). **Germany**: Christina Frank, Klaus, Jansen, Uwe Koppe, Lars Schaade, for the RKI monkeypox Team (Robert Koch Institute, RKI). **Italy**: Flavia Riccardo, Barbara Suligoi, Anna Teresa Palamara, Patrizio Pezzotti, Paola Stefanelli, Giulietta Venturi, Silvio Brusaffero (Istituto Superiore di Sanità, ISS), Francesco Maraglino, Federica Ferraro, Giovanni Rezza, Anna Caraglia (Ministero della Salute).
Subject Matter Experts (SME) and representatives of Civil Society from EU/EEA countries and the United Kingdom: Daniel Simões (Coalition PLUS), Christos Krasidis (AIDS Action Europe, Freelance), Will Nutland (The Love Tank CIC and The London School of Hygiene & Tropical Medicine - LSHTM), Helen Roberts (UK Department for Environment, Food and Rural Affairs, Defra and EFSA Animal Health and Welfare Panel member), Rajul Patel (Solent NHS Trust).

Thank you for your attention

Special thanks to colleagues in endemic countries!

In photo, staff from Niger Delta University Teaching Hospital

BACKUP SLIDES

Surveillance and EU/EEA reporting

- An interim case definition is proposed for case reporting
- ECDC in liaison with WHO asks countries to report newly-identified cases in the line listing document in EpiPulse [access only to nominated users].
- Reporting in TESSy will be implemented shortly by ECDC.

Interim case definition

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 1st March 2022

Interim case definition

Probable case

(1) A person with an unexplained rash* on any part of their body

AND one or more other symptom(s) of monkeypox infection** with symptom onset since 1st March 2022

AND one of the following:

- has a positive laboratory test result on orthopoxvirus 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 generalised or localised maculopapular or vesiculopustular rash with centrifugal spread, with lesions showing umbilication or scabbing, lymphadenopathy and one or more other MPX-compatible symptoms**.

* 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 characterise the rash: 'unexplained localised or generalised maculopapular or vesiculopustular rash potentially with umbilication or scabbing'.
**Fever (usually high >38.5°C), headache, back ache, fatigue, lymphadenopathy (localised or generalised).
Patients who fulfil the criteria for probable cases should be tested with a monkeypox virus specific PCR assay or an orthopoxvirus specific PCR assay which is then confirmed through sequencing. If negative, these patients should be excluded.

Contact tracing/partner notification

- Contact tracing of newly identified MPX cases should be performed carefully and exhaustively
- Involvement of sexual health services, who are experienced in partner notification for STI
- Awareness-raising activities in MSM communities will support effective contact tracing
- Contact tracing should pay particular attention to identifying immunocompromised contacts

Management of contacts of an MPX case

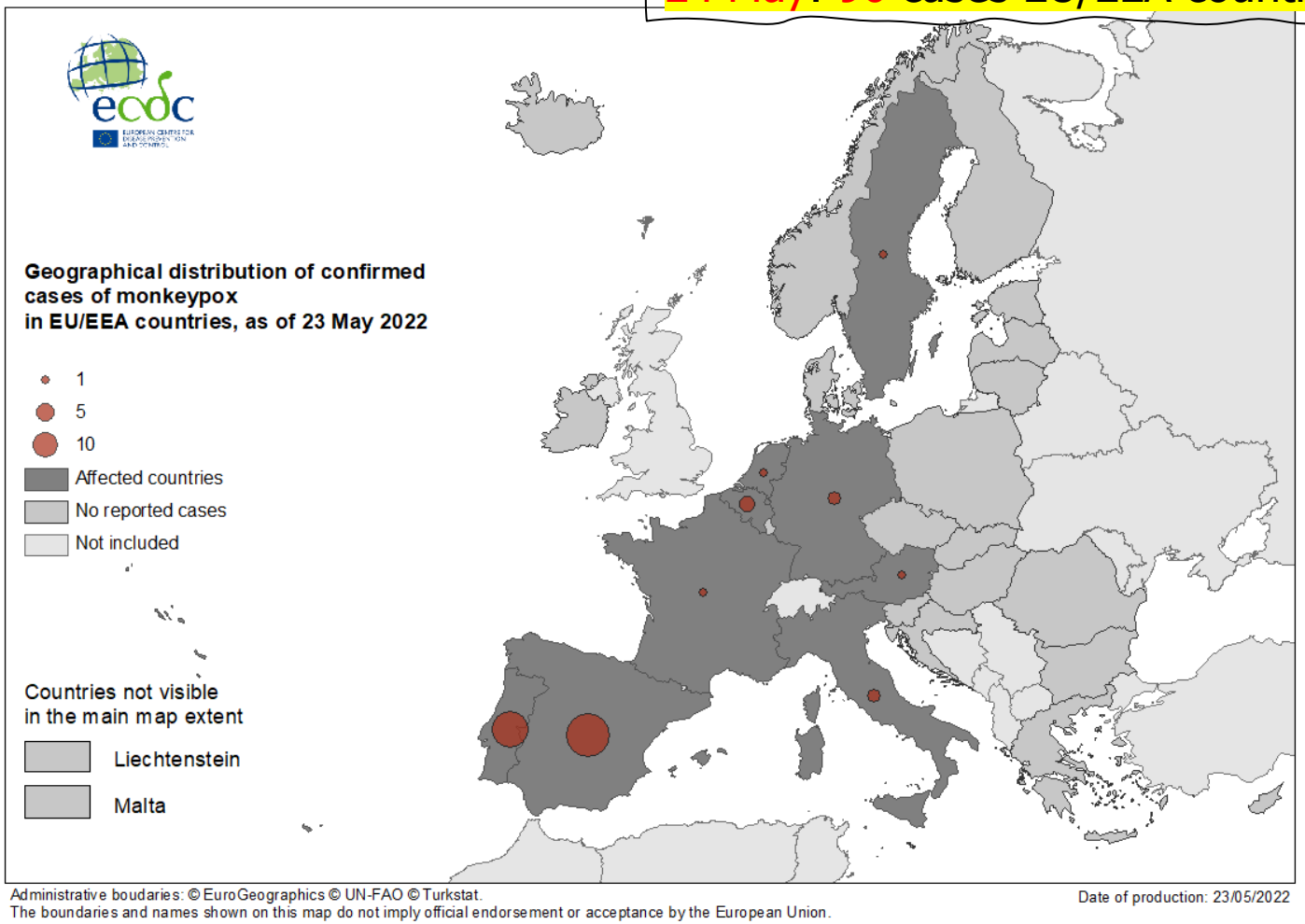
Type of contact	Description	Management guidance
Close contact	• Sexual partner • Person(s) living in same household, or similar setting (e.g camping, overnight sleeping etc) • Person(s) sharing clothing, bedding, utensils etc, while the patient had a rash • Person(s) sharing the same closed workspace/office for long periods of time • Caregivers of MPX case, while symptomatic • HCW who had contact with MPX case (lesions or prolonged face-to-face contact) without appropriate PPE • HCW or other person who suffered a sharps injury or was exposed to MPX case body fluids or aerosol generating procedure without PPE • Laboratory staff suffering exposure to occupational accident with virus-containing sample (splash, sharp or aerosol exposure etc) • Co-passenger seated one -two seats distance around case while they were symptomatic, in airplane, bus or train ≥ 8 hours duration	• Careful benefit/risk assessment for the need for PEP smallpox vaccination • Self-monitor for fever or other MPX symptoms (headache, back ache etc) or new unexplained rash for 21 days from last exposure. In that case self-isolate and abstain from sexual activity until MPX is excluded. • Careful hand hygiene and respiratory etiquette. • Abstain from sexual activity and avoid close physical contact for 21 days or until MPX is excluded. • Avoid contact with mammal pets for 21 days or until MPX is excluded
All other contacts	• Brief social interactions • Work colleagues not sharing same office • Persons sharing fitness equipment or sharing the same sauna or bath, without sexual contact • Social encounters/ acquaintances • HCW contact with appropriate PPE	• Depending on the certainty of contact, some of these contacts may be asked to self-monitor for fever or other MPX symptoms (headache, back ache etc) or new unexplained rash for 21 days from last exposure.

Risk communication and community engagement

- Proactive risk communication and multiple community engagement activities should be carried out to increase awareness, provide updates and guidance to those at increased risk and the wider public
- Risk communication messages should stress that MPXV is spread through close contact between people, especially in the same household, potentially including the sexual route.
- A balance should be kept between informing those most at risk but also communicating that the virus does not spread easily between people the risk to the broader population is low.

Geographical distribution of confirmed cases of MPX in EU/EEA countries, as of 23 May 2022 (11:00)

24 May: 96 cases EU/EEA countries



Austria (1 c)
Belgium (4 c)
France (1 c, 3 s)
Germany (3 c)
Italy (3 c)
Netherlands (1 c)
Portugal (23 c)
Spain (30 c, 39 s)
Sweden (1 c)

c confirmed; s suspected