Risk Assessment Group

CONSULTATIVE SIGNAL ASSESSMENT
PRIMARY RISK ASSESSMENT
EVIDENCE BASED RISK ASSESSMENT
PUBLIC HEALTH EVENT ASSESSMENT

MONKEYPOX MULTI-COUNTRY OUTBREAK, MAY 2022

Date of the signal	Date of the PRA	Signal provider	Experts consultation	Method
07/05/2022: first case (imported) 17/05/2022: cases in second country	17/05/2022 – final 20/05/2022	UK/ECDC/ Portugal	**Permanent experts:** Caroline Boulouffe (AViQ), Wouter Dhaeze (AZG), Uwe Ehrentreich (COCOM), Naïma Hammami (AZG), Nicolas Ledent (COCOM), Tinne Lernout (Sciensano), Patrick Smits (AZG), Cecile van de Konijnenburg (FOD), Dirk Wildemeersch (AZG) **Specific experts :** Sabine Allard (UZ Brussel), Nathalie Ausselet (CHU UCL Namur), Leïla Belkhir (St Luc UCL), Isabel Brosius (ITG), Bénédicte Delaere (CHU UCL Namur), Agnes Libois (CHU-St Pierre), Ula Maniewski (ITG), Charlotte Martin (CHU-St Pierre), Christelle Meuris (ULiège), Carole Schirvel (CHIREC), Patrick Soentjens (ITG), Dominique Van Beckhoven (Sciensano), Dorien Van den Bossche (ITG), Marjan Van Esbroeck (ITG), Steven Van Gucht (Sciensano), Marc Van Ranst (UZ Leuven), Koen Vercauteren (ITG), Erika Vlieghe (UZ Antwerpen)	**E-mail consultation 17/05/2022** **Meeting 20/05/2022**
Date of update	**Closing date**			
24/05/2022				

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Signal	The United Kingdom reported cases of monkeypox on three different occasions in the past weeks. On 7 May 2022, a case of monkeypox was confirmed in London in an individual who had travelled to Nigeria. On 14 May two additional confirmed cases, and one suspected case, all from the same household (parents and a two-week old baby), were reported, with no link to the first case and no travel history. On 15 May, four other cases were identified among men who have sex with other men (MSM) attending Sexual Health Services, three in London and one linked case in the north-east of England. These cases do not have any connections with the cases announced on May 14th, or on May 7th, and have no travel history. All cases were infection by the West African clade. On 12 May 2022, a post in EpiPulse by the OCP of microbiology of the STI network reported several (20) MSM presenting to an STI clinic in Lisbon, Portugal with symptoms compatible with monkeypox. Three of them have meanwhile been confirmed to be monkeypox. Following the alert, more cases have been reported in other countries (see Annex 1).

Description	
Cause known?	*Monkeypox* is a sylvatic zoonosis with incidental human infections that usually occur sporadically in forested parts of Central and West Africa. It is caused by the monkeypox virus (MPXV) which belongs to the orthopoxvirus family (which also includes the Variola virus). There are two genetically distinct variants of MPXV: the Congo Basin (Central African) clade and the West African clade. Human-to-human transmission is limited, with the longest documented chain of transmission being six generations. It can be transmitted through contact with bodily fluids, lesions on the skin or on internal mucosal surfaces, such as in the mouth or throat, respiratory droplets and contaminated objects. Possible transmission through aerosols cannot be excluded. The incubation period (time from infection to symptoms) for monkeypox (MPX) is usually 7−14 days but can range from 5−21 days. MPX is not considered contagious during its incubation period, but transmission 2 days (or more) before the start of the symptoms cannot be excluded and should be further studied. Previous household attack rates (i.e., rates of persons living with an infected person and developing symptoms of MPXV infection) of 3%–11% have been reported (50% in an outbreak in DRC).
Unexpected/unusual	Human monkeypox is rare outside Africa. It has been reported on several occasions, but limited to very few cases, with a link to travel or a travel-related case. It was reported for the first time in 2003 when a MPX outbreak occurred in the United States, linked to prairie dogs infected by rodents imported from Ghana. In September 2018, three individual patients were diagnosed in the United Kingdom; two had recently travelled to Nigeria, and the third case was a healthcare worker caring for one of the cases. Another imported case was identified in the UK in December 2019, and another in May 2021; this last case led to two further cases in family members. In October 2018, Israel also reported an imported MPXcase from Nigeria and in May 2019, another case imported from Nigeria was reported by Singapore. Never before a case of MPX with no direct travel link to an endemic area was reported outside Africa and it is therefore highly unusual. Also transmission among

	the MSM community has never been reported before. UKHSA classified the event as 'unusual for the area, season or population'.
Severity	Human MPX often begins with a combination of fever, headache, chills, exhaustion, asthenia, lymph node swelling, back pain and muscle aches. Commonly, within one to three days after onset of fever, the patient develops a rash, which tends to first appear on the face and then spreads to other parts of the body, including hands and feet. The cutaneous lesions often first present as macules, evolving successively to papules, vesicles, pustules, crusts and scabs (see pictures in Annex 2). The number of lesions may range from a few to thousands. Cutaneous lesions generally all appear at the same stage which is a hallmark characteristic of smallpox and MPX, and distinguishes them from chickenpox. However, based on clinical information for the cases in the UK and in Portugal, the clinical presentation seems atypical, with cutaneous lesions more predominant in the genital area (perianal), and not all at the same stage. More ulcerations have also been reported, possibly because of the place of the lesions. For most people, MPX is a self-limited disease, typically lasting two to four weeks and resulting in complete recovery, but in some cases, MPX can be more severe, requiring hospitalization. Illness severity is influenced by the route of infection. The West African clade appears to cause less severe disease compared to the Congo Basin clade. In Africa, the case-fatality rate of MPX ranges from 1% to 10%.
Dissemination Low	On the 19/5, a first confirmed case of MPX has been reported in Belgium, in a man, HIV positive, presenting with fever and papules on 10/05. He had unprotected sex with several men in Lisbon between 6 and 8 May. The regular partner of the man also developed symptoms on 19/5 (flu-like illness and cutaneous lesions), test results are pending. Since the index case had multiple unprotected (unidentifiable) sexual contacts at a Gay festival (Darklands, 6,000 participants) 2 days before presenting symptoms and due to international links between MSM communities, more cases can be expected in the coming days/weeks. On 20/05, a third case was identified in Leuven, in a MSM who also attended the Darklands festival and presented at the emergency ward with cutaneous lesions on 19/5. More suspected cases are under investigation. The likelihood for further spread in Belgium outside the MSM community is estimated to be low because of the moderate transmissibility of the virus. However, infections among close contacts could occur.
Risk of (inter)national spread High	Since cases have been reported in at several countries (UK, EU countries and others), mostly among MSM, and in the context of the highly interconnected sexual networks among MSM, together with the start of the MSM events season with large number of participants (including the Belgian Pride the weekend of 21/05 in Brussels), it can be expected that there will be more cases reported in other countries.
Preparedness and response	
Preparedness	Laboratory capacity for the diagnosis of MPX is available both at the Institute of Tropical Medicine (ITM) and UZ Leuven/Rega institute. Samples (swabs for PCR testing) can be sent to one of the laboratories, after taking contact with a microbiologist of the lab[1]. For biosafety reasons (BSL3 level), the specimens need to be disinfected at the outside and sent under UN2814 label in a triple package

[1] Clinical biologist ITM: 03 345 56 52

	(sample in secondary container and a tertiary container) by a courier with an ADR license. Vaccination of high-risk contacts (HRC) is possible with the smallpox vaccine or a recent specific vaccine against MPX. Both vaccines are available (or can be purchased) in Belgium. The Belgian Army has a stock of ACAM 2000®, that can be requested by the FOD/SPF Public Health. Or the vaccine Imvanex® (MVA-BN vaccine could be ordered by FOD/SPF (contacts Tinatin Shubladze and Stephane Martin: tish@bavarian-nordic.com; stma@bavarian-nordic.com). Contacts have been taken with the company, and coordination at European level of the availability of the vaccine is ongoing (within HERA). Tecovirimat SIGA was recently approved by EMA for treatment of orthopoxviruses (including MPX), but it is not available in Belgium yet. Studies using a variety of animal species have shown that Tecovirimat is effective in treating orthopoxvirus-induced disease, but data on its effectiveness in treating human cases of monkeypox are not available. Human clinical trials indicated the drug was safe and tolerable with only minor side effects. Treatment with Tecovorimat could be considered for immunocompromised patients if available.
Specific control measures (surveillance, control, communication)	HIV reference centers in Belgium (n=12) have been contacted on May 17, with a request to report suspected cases. Up to 19th of May, seven centers reported not having had cases so far, and one center (ITM) reported 2 cases (see above).
Public health impact	
Public health impact in Belgium Low	This event is characterized by an unusually high frequency of human-to-human transmission of MPXV, without link to previously identified cases (indicating community transmission). Therefore more cases are expected to occur worldwide and in Belgium. The overall public health impact in Belgium can be considered low. The risk of transmission is estimated to be high for MSM, especially in case of multiple sexual partners and participation to events with a lot of people. Events like the Belgian Pride are particularly at risk for transmission. Non MSM having multiple partners are also at risk. Transmission outside the MSM community is expected to be very low but not excluded.
Recommendations (surveillance, control, communication)	Case definition: this will be according to the ECDC proposal, expected by 23 May. Raise awareness and inform health care professionals that could see suspected cases: HIV reference centers for PrEP, STI clinics, GPs, emergency wards, infectiologists and dermatologists. Provide clear guidance on the management of suspected and confirmed cases (see actions). The following samples are recommended to be taken: - Swab of the vesicles (in a dry tube), or crusts if in a later stage; - Swab of the throat. In case of a confirmed case, extensive contact tracing will be needed to identify the source of infection. In a first step, sexual and household partners of a case will be considered as High-Risk Contact, as well as health care professionals who took care of a case without personal protective equipment (PPE). HRC should self-monitor their symptoms and limit close contacts (including sexual relations) for a period of 21 days. Particular attention is needed for HRC in contact with young children, pregnant women and immunocompromised persons. In a follow-up meeting next week, a more detailed classification of contacts (and measures) will be discussed, taking into

account ECDC recommendations (expected by 23/05). An advice of the High Health Council should be requested regarding the value of vaccination for HRC.

Communication should be set up in two steps. An urgent communication is needed before the upcoming Belgian Pride, specifically to the organisers of the event and more broadly risk groups (through existing networks). While waiting for correct information of GPs, people with symptoms will be recommended to go to an emergency ward of a hospital. All emergency services should be informed on the hospitals with an infectiologist specialist on duty (list of Yellow Fever hospitals on Wanda.be, to be completed if relevant). GPs should receive basic information asap too. In a second step, more detailed guidelines should be developed for suspected cases. The involvement of GPs as first point of contact on the middle term should be investigated. The possibility to provide access for GPs to a teleconsult with an infectiologist should be explored, as well as the organisations of online webinars.

The targeted groups at higher risk should also include e.g. sex workers and transgender.

Actions

- Urgently inform GPs and Emergency wards and hospitals in general on the procedure for the upcoming days → FOD/SPF (through HTSC) and regional authorities.
- Urgently inform the organizers of the Belgian Pride, and more generally the MSM community as well as other risk groups (spread by Sensoa, Plateforme prevention sida, SidaSol, Alias, Espace P, Violett…) → Regional authorities with input for content by RAG.
- Contact the organizers of the Darkland event and request them to inform the participants of the risk that occurred.
- Short communication to the general public. Especially MSM that engage in casual sex, or individuals engaging with multiple sexual partners or having casual sex, should be particularly vigilant → FOD/SPF with input for content by RAG.
- In a second step, provide more detailed guidance on the management of (suspected) cases, to HIV reference centers for HIV-positive patients & PrEP users, STI clinics, GPs, emergency wards, infectiologists, and other clinicians who might be seeing suspected cases (dermatologists, urologists, gastro-enterologists, paediatricians…) → FOD/SPF with input from Sciensano/RAG (after follow-up meeting).
  - When and where to refer patients;
  - Testing: procedures for sampling and transport (with pictures), contact information of laboratories with testing capacity;
  - Treatment and other care (infection control measures);
  - Reporting of the cases to the regional public health authorities.
- Create a specific webpage on the Scienanso website to gather information for health professionals → Sciensano
- Request an advice of the High Health Council regarding vaccination of high-risk contacts → RMG

UPDATE 24/05/2022

Epidemiological situation

On 24/05, a total of 6 confirmed cases have been reported and 1 probable (no PCR test performed yet). All cases are in MSM up to now. The first case reported could genomically be linked to the outbreak in Portugal, with further spread to his partner. All the other cases identified could be linked to one single event. More cases can still be expected.

At European level, cases have been reported in 10 EU countries: Austria, Belgium, Denmark, France, Germany, Italy, Portugal, Spain, Sweden and The Netherlands. Outside the EU/EEA, (suspected) cases have been reported in Argentina, Australia, Canada, Israel, the United Kingdom, the United States and Switzerland. The predominance of cases among MSM and the nature and the nature of the lesions in several cases, suggest transmission occurred during sexual intercourse.

The **risk evaluation** remains the same: high risk of transmission in people having multiple sex partners, including some MSM groups, and very low risk in the broader general population. However, the individual risk for very young children, pregnant women, elderly or immunocompromised individuals among close contacts of MPX cases may be high due to higher impact of the disease in these groups. There is also a risk for health care workers taking care of suspected cases and patients, since transmission to HCW has been documented in the past. ECDC assessed the risk of transmission to HCWs wearing appropriate personal protective equipment (disposable gown, disposable gloves, FFP2 mask and eye splash protection) to be very low, and in case of unprotected close contact with a case (e.g., contact face-to-face for prolonged time, contact with open lesions without gloves, intubation or other invasive medical procedure without mask) as moderate, equivalent to that of a close contact.

Because of a potential risk of human-to-animal transmission in Europe, ECDC recommends close intersectoral collaboration between human and veterinary public health authorities working in a “One Health” perspective to manage exposed pets and prevent the disease from being transmitted in wildlife.

Case definition

The following case definition is globally in line with ECDC’s proposal, except some small differences, and the extra category of a possible case.

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 with symptom onset since 1st March 2022.

Probable case

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 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.

Possible case

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*.

Possible cases should be tested to confirm or exclude MPX. Pending a test result, the same measures apply to a possible case as to a probable and confirmed case.

*Fever (usually high >38.5°C), headache, back ache, fatigue, lymphadenopathy (localised or generalised).

Measures for a case

- Newly identified cases of MPX (confirmed and probable) should undergo a medical assessment for severity and risk factors (e.g., underlying conditions or medications affecting immune competence, untreated HIV infection etc.). High-risk MPX cases may require hospitalisation and/or treatment with antivirals, when available. Early vaccination of cases (between 4 and 10 days after exposure) could also be considered when available, to decrease the risk of severe disease. The advice of the NITAG is awaited to decide on this. Individuals at high risk for severe disease include infants and young children, pregnant women, elderly and severely immunocompromised persons.
- Cases should remain in strict isolation from the start of the symptoms until full healing of the skin lesions (with falling off of the crusts, which indicates the end of infectiousness). This consists of the same isolation and hygiene measures as for COVID-19: cases should stay at home; leaving the house is only allowed for essential reasons (medical appointment and shopping for food items if nobody else can take care of this), wearing a surgical face mask and covering the skin lesions (e.g. long sleeves and pants). When at home, cases should remain in their own room and use designated household items (clothes, bed linen, towels, eating utensils), which should not be shared with other members of the household. When in contact with other persons, a medical face mask should we worn. Physical contact should be strictly avoided until the crusts fall off, including sexual activities. Condoms alone cannot provide full protection against MPX, as contact with skin lesions is involved for its transmission.
- Contact should also be avoided with any mammal pets, and in particular pet rodents (mice, rats, hamsters, gerbils, guinea pigs, squirrels etc).

Classification of contacts

Very-high-risk contacts

- Sexual partner(s);
- Person(s) with prolonged skin to skin contact while the patient had a rash.

High-risk contacts

- 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;
- 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 persons 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) without PPE;
- Co-passenger seated one -two seats distance around a case who was symptomatic, in airplane, bus or train ≥ 3[2] hours duration.

All other contacts (including social interactions, work colleagues, persons sharing fitness equipment etc.) are considered low risk contacts, and no measures are needed.

Measures for contacts

All high-risk contacts

- Self-monitoring for symptoms (fever, head ache, rash or other skin lesions…) during a period of 21 days from the last day of exposure (= day 0). If isolation from the case is not possible, the 21 days period starts after the healing of the skin lesions (= last day of isolation of the case). In case of symptoms, contact a physician (by phone) to confirm or exclude the diagnosis and follow measures for cases until MPX is excluded.
- Abstain from sexual activity and strictly avoid close physical contact for 21 days, especially with young children, pregnant women and immunocompromised persons.
- Avoid coming in contact with mammal pets for 21 days.
- Smallpox vaccine can be used for post-exposure prophylaxis (PEP) of close contacts at high risk for severe disease, when available.
- Close contacts should be deferred from blood, organ or bone marrow donations for minimum 21 days from the last day of exposure.

Very-high-risk contact

- In addition to the above measures, very-high-risk contacts are recommended to wear a surgical mask for all contacts with other people. If the person is in contact with small children (e.g in child care), pregnant women or immunocompromised persons, the very HRC should remain in quarantine for 21 days.

Preventive measures

- When screening suspected cases or caring for a MPX patient, handling contaminated material (clothes, bedlinen, etc.) or laboratory specimens, appropriate personal protective equipment (PPE) should be used: gloves, water resistant gown, FFP2 mask and eye splash protection.
- All measures for contact and droplet isolation (including use of PPE as described above) should be taken for hospitalised patients.

[2] This time period is set arbitrarily because there is no scientific evidence to guide the decision. It might be adapted if new information is available.

Other recommendations

- Smallpox vaccine could be considered for 1) post-exposure prophylaxis (PEP) of close contacts at increased risk for severe disease (if administered within the first four days after exposure to a confirmed MPX case), 2) prophylactic vaccination of certain health professionals responding to this outbreak (vaccination against smallpox was ended in Belgium around 1975) and 3) to control clusters in specific settings. The 3rd generation smallpox vaccine ImvanexTM is not available yet in Europe. While pending ongoing discussions at EU level (HERA) for the allocation of vaccines to Member States, and while waiting for the advice on the use of vaccination from the Belgian National Immunization Technical Advisory Group (NITAG) (which is urgently needed), a small stock of Imvanex© should be purchased in Belgium to be used for health care professionals at high risk after exposure (no use of PPE) and at risk of severe disease.
- At this moment, the capacity for diagnostic testing (by two laboratories, ITM and UZ Leuven) is sufficient to respond to the requests. If the number of tests (> 200-300/day) would increase substantially, a rapid upscaling of the capacity seems feasible. Sciensano (ex-Coda) has a real-time PCR for orthopoxviruses, that could be validated for MPXV. The BE Defense Rapid deployable outbreak team also disposes of a validated MPX PCR test if needed. And several other laboratories expressed their interest in developing the capacity. The bottleneck will however be the transport of samples, which currently needs to be done by a courier with an ADR license, which is a very small number. It should be investigated if the ADR license is really necessary and if tubes with inactivation medium could be used instead of dry tubes for the samples, which would require less strict safety measures. Both topics are being looked at by ITM.
- As long as the test capacity is sufficient, it is recommended to test HRC presenting with symptoms to confirm the diagnosis. This should be done with a throat swab if there are no skin lesions yet, and with a swab of the lesions in a later stage of the disease. If the capacity would not be sufficient anymore, HRC with suspected symptoms can be classified as probable cases, without testing.

The following persons participated to this updated advice:

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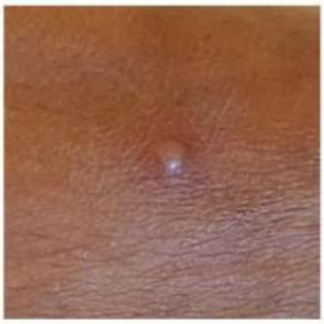
ANNEX 1: CASES REPORTED BY COUNTRY

20/05/2022
Source: ECDC

Since the disease was first detected on 7 May 2022 in the United Kingdom, a total of nine cases have been confirmed in the United Kingdom. Eight of the nine cases have no travel history and have no relation to the travel related case confirmed on 7 May.
A further 27 cases have been confirmed since 18 May in Belgium (2), France (1), Germany (1), Italy (1), Portugal (14), Spain (7), and Sweden (1). Portugal has reported another 20 suspected cases, and Spain has reported another 23 suspected cases which are awaiting laboratory confirmation. The US reported one confirmed and one probable case, Canada 2 confirmed cases and 17 suspected and one case was confirmed in Australia.
In total, since 14 May, there have been 38 non-travel related cases of monkeypox worldwide, with 27 in EU/EEA countries. The majority of cases are in young men, self-identifying as men who have sex with men (MSM). There have been no deaths, and two hospitalisations for reasons other than isolation were reported worldwide. Health authorities across counties have stated that further cases are expected.

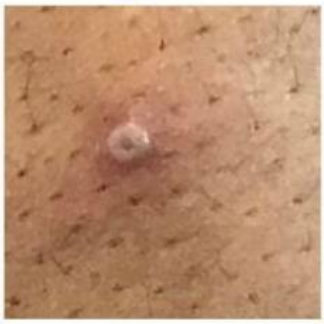
ANNEX 2: IMAGES OF INDIVUDAL MONKEYPOX LESIONS

Source: UK Health Security Agency, https://www.gov.uk/guidance/monkeypox



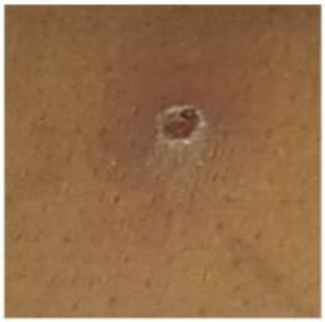
a) early vesicle, 3mm diameter

b) small pustule, 2mm diameter

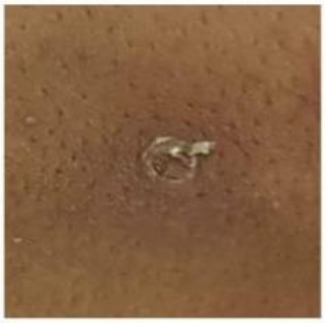


c) umbilicated pustule, 3-4mm diameter

d) ulcerated lesion, 5mm diameter



e) crusting of a mature lesion



f) partially removed scab