THREAT ASSESSMENT BRIEF

Detection of autochthonous transmission of monkeypox virus clade Ib in the EU/EEA

24 October 2025

Summary

This Threat Assessment Brief aims to assess the risk of autochthonous transmission of monkeypox virus (MPXV) clade Ib in EU/EEA countries in the context of male-to-male sexual transmission. It is intended for public health authorities in EU/EEA countries and is based on currently available evidence. It therefore carries considerable uncertainty. Recommendations how public health authorities can respond at the country level together with an overview of knowledge gaps in the context of MPXV clade Ib are also included.

Epidemiological situation

- On 10 October 2025, Spain reported its first locally acquired clade Ib mpox case. On 17 October, four additional clade Ib mpox cases were reported to ECDC among males without travel history by Italy (two), Portugal (one) and the Netherlands (one). All five cases had mild symptoms. Some of the individuals reported having sexual contact with another male.
- These recent cases, where there is no travel history, represent a different pattern of transmission and indicate that transmission may be occurring in sexual networks among men who have sex with men in several EU/EEA countries. The 30 clade I mpox cases reported in the EU/EEA previously were all imported or had clear links to imported cases.

Risk assessment

- Based on current evidence, the overall risk of MPXV clade Ib infection is assessed as moderate for men who have sex with men and low for the general population.
- It is likely that further cases are present among men who have sex with men in the EU/EEA but have not yet been detected. ECDC will continue to closely monitor and review this risk assessment should the situation evolve into a larger outbreak.

Recommendations

- EU/EEA countries should ensure laboratory testing is easily accessible, particularly in locations that serve men who have sex with men, and that clinicians and laboratories can report cases to public health authorities rapidly.
- Identifying clades should be done where individuals have been diagnosed with mpox, and clade I viruses should be sequenced as soon as possible.

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- Vaccination should be made available to all individuals at substantially higher risk of exposure to MPXV, in addition to other preventive measures. Public health professionals should advise individuals om groups at higher risk of infection to seek vaccination proactively.
- Contact tracing should be carried out after a case is identified, to enable control of onward transmission as well as to contribute data that will allow for an assessment of transmission dynamics.
- Public health authorities should continue risk communication activities around mpox and partner with civil society organisations that serve men who have sex with men to build trust in health services, provide advice on seeking medical assistance and improve vaccination coverage.

Epidemiological situation

On 10 October 2025, Spain reported its first locally acquired clade Ib mpox case. The male patient reported no travel history to a country with known transmission of clade Ib and was fully vaccinated in 2023 [1]. On 17 October, four additional clade Ib mpox cases were reported to ECDC among males without travel history by Italy (two), Portugal (one) and the Netherlands (one). Of these five reported cases without travel history, two mentioned having sex with men. Of the four cases with information on vaccination status, one was vaccinated. All individuals had mild symptoms, and none required hospitalisation. Symptom onset of these reported cases was between 16 September and 7 October 2025. These cases were all reported through event-based surveillance.

These recent cases, where there is no travel history, represent a different pattern of transmission of clade I infections in the EU/EEA and indicate that transmission may be occurring in sexual networks among men who have sex with men in several EU/EEA countries.

Transmission among gay, bisexual, and other men who have sex with men and their social networks has also been recently reported in California, USA after the detection of three unlinked clade I cases [2]. These individuals were hospitalised for medical care not limited to MPXV infection [2].

One additional imported case was reported from Belgium in October 2025 in a male patient who also reported having sex with men.

Other reported clade I cases in the EU/EEA have been imported or had clear links to imported cases. This includes 30 clade Ib mpox cases previously reported to ECDC through the European Surveillance System between 15 August 2024 and 21 October 2025. All individuals had travel history or links to travel-associated cases and onward transmission was mostly among their household contacts (children and other family members). Of the 29 cases with information available, seven were hospitalised for treatment with varying degrees of severity. All cases recovered and no deaths were reported.

Globally, imported clade I mpox cases have been reported by several countries outside Central Africa [3]. Wide community transmission of clade I has not been established in any country outside Africa, however limited transmission or clusters of cases have been reported in several countries [4].

An outbreak of MPXV clade IIb was detected in the EU/EEA in 2022, predominantly among men who have sex with men, with a total of 21 099 cases reported in 2022. A combination of changing behaviour, infection control strategies, increase of natural immunity through infections (especially among highly sexually active individuals), and targeted vaccination campaigns led to a sharp decline of the mpox outbreak in 2022, after which mpox cases remained at relatively stable levels in the EU/EEA (867 cases in 2023, 1 726 cases in 2024 and 1 655 cases so far in 2025, [5]. Between April and September 2025, the number of clade IIb mpox cases per month ranged from 126 to 222. Since May 2022, among cases with known gender, most (98%) were male.

ECDC risk assessment for the EU/EEA

This Threat Assessment Brief has been developed based on the currently available data at the time of publication and follows the ECDC Rapid Risk Assessment methodology, where the overall risk is determined by a combination of the likelihood of infection and its impact [6].

To assess the risk of MPXV clade Ib infections in the EU/EEA, ECDC considered the following:

- Immunological cross protection among pox viruses exists and is expected among clades of MPXV. Therefore, past infection with MPXV clade II and/or immunisation with the smallpox/mpox vaccine (particularly if a two-dose schedule was completed) is expected to reduce the likelihood of infection and disease severity. Vaccine effectiveness of two pre-exposure vaccine doses is estimated to be 82% (95% CI: 72–92), while even one PPV dose provides effectiveness of 76% (95% CI: 64–88). For post-exposure vaccination the vaccine effectiveness was estimated at 20% (95% CI: -24–65) [7].
- The clade I mpox cases imported into the EU/EEA since 2024 only resulted in limited onward transmission, mainly to household contacts, although evidence on the transmissibility of MPXV clade Ib is lacking, e.g. secondary attack rates by type/setting of exposure. In the clade IIb outbreak, less household transmission was seen, but the population affected was different with likely different household structures.

- Ongoing low-level circulation of clade IIb mpox cases among men who have sex with men has not resulted in a large outbreak since 2022 [4].
- In the EU/EEA, there are limited data on the severity of clade Ib mpox cases. Of 29 travel-associated cases reported so far with full information on hospitalisation, seven individuals were hospitalised for treatment with varying degrees of severity, but with good outcomes and no deaths. Due to the small sample size, and potential biases, no clear assessment of severity can be made at this point. Data from the clade II mpox outbreak in 2022/23 support a good outcome in most cases, with few fatalities in people with underlying conditions [8].
- Evidence from the African continent suggests that the case fatality ratio (CFR) for clade Ib mpox cases is less than 1% in several settings and this is expected to be even lower in the EU/EEA due to better case ascertainment, medical care and lower prevalence of untreated HIV infection [9].

What is the risk from MPXV clade Ib for men who have sex with men in the EU/EEA?

The likelihood of exposure to MPXV clade Ib among men who have sex with men in the EU/EEA is assessed as moderate in view of substantial uncertainty on the extent of transmission within the sexual networks of this population. In general, the likelihood of exposure is higher with a higher number of casual sexual partners, which is supported by historical data from the mpox outbreak in 2022/23. According to mathematical modelling, if an individual who first contracts the infection has a high number of sexual partners, this is considered a significant factor in whether there will be a potential outbreak (see Technical Annex, section 1) and [10].

The impact of MPXV clade Ib infection among men who have sex with men is assessed as low to moderate considering the uncertainty around severity. Severity may be worse among those living with HIV, particularly if inadequately treated. Therefore, the overall risk for men who have sex with men in the EU/EEA from MPXV clade Ib is assessed as moderate.

It is likely that further cases are present among men who have sex with men in the EU/EEA but have not yet been detected. ECDC will closely monitor the situation and, if necessary, revisit this risk assessment.

What is the risk from MPXV clade Ib for the general population in the EU/EEA?

The likelihood of exposure to MPXV clade Ib in the general population is assessed as very low. Mathematical modelling studies from the US and the United Kingdom suggest that household transmission is unlikely to result in large-scale outbreaks of MPXV clade Ib [11] [12]. People with underlying conditions including immunosuppression as well as potentially very young children and people over 65 years of age may experience more severe disease. In the large outbreak of MPXV clade IIb from 2022-23, few cases involved women and children and very few cases were documented through community transmission without sexual contact. Therefore, the overall risk from MPXV clade Ib for the general population is assessed as low.

ECDC recommendations

Continued case-based surveillance and investigation are needed to identify, manage and better understand clade Ib mpox cases or clusters in the EU/EEA, along with risk communication and community engagement activities and promoting vaccination.

Laboratory testing and reporting

EU/EEA countries should maintain their mpox event-based and indicator-based surveillance and testing capacity to enable prompt identification of cases and clusters.

Where it is possible that individuals may have the disease, they should be rapidly isolated until proven negative through testing, and if positive, until symptom resolution. Testing should be easily accessible to gay, bisexual, transgender people or other men who have sex with men, particularly in clinical settings such as sexual health clinics, HIV pre-exposure prophylaxis (PrEP) clinics, HIV clinics and low threshold services. Testing for mpox can be linked to testing for other sexually transmitted infections. It is important to rapidly report cases to public health authorities to detect a possible resurgence and focus public health interventions appropriately.

Countries should continue efforts to sequence all positive cases and ensure that sequences are deposited in public repositories (ENA, SRA, and/or GISAID EpiPox) or shared with ECDC through the EpiPulse platform or other means. National laboratories can obtain support on diagnostics, typing methods, and sequencing methods from the EU Reference Laboratory for Public Health on Emerging, Rodent-borne, and Zoonotic Viral Pathogens (EURL-PH-ERZV) [13].

Countries should report all cases of clade I infection to EpiPulse as soon as identified. Countries should collect as complete information as possible on cases including vaccination status, clade, previous mpox infection, travel history, HIV status, symptoms, severity, hospitalisation and outcomes and report this data promptly to the European Surveillance System. Countries can update already submitted data as new information becomes available to allow for better characterisation of cases in the EU/EEA including symptoms and outcomes.

Contact tracing and clinical management

Contact tracing can play a key role to prevent initial clade Ib mpox cases from causing larger outbreaks. Rapid identification of sexual partners and other contacts potentially exposed to MPXV will facilitate the prompt diagnosis of potential secondary cases and facilitate access to post-exposure vaccination. Individuals with mpox should be interviewed about their travel history, sexual partners and close contacts. Further details are available in previously published ECDC mpox contact tracing guidance [14].

Data on contact tracing contain important information regarding transmissibility, settings of infection and risk factors for transmission. The use of specialised contact tracing software (e.g. Go.Data [15]) that can efficiently handle case, contact and relationship data is recommended with the necessary data management procedures in place to preserve data confidentiality. ECDC can support countries with advice, training and practical assistance on contact tracing and data management, upon request to the EU Health Task Force [16].

Clinicians and other health professionals in EU/EEA countries should be made aware of the recent detection of locally acquired clade Ib mpox cases. They should use personal protective equipment (FFP2 mask, gloves and waterproof gown) when assessing or taking care of a patient with possible or confirmed mpox. Initial evidence from the African context suggests a higher prevalence of respiratory symptoms [17]. Further details are available in the ECDC rapid scientific advice on public health measures [18].

Risk communication and Community engagement

Public health authorities should raise awareness among gay, bisexual and other men who have sex with men of the possibility of mpox infection so that they are aware of possible symptoms and the need for vaccination and testing [19].

Particular efforts should be made to reach gay, bisexual and other men who have sex with men who have large numbers of sexual partners, those on HIV pre-exposure prophylaxis and those who are HIV-positive. People with untreated HIV are also at higher risk of developing severe mpox.

Public health authorities at national and sub-national levels should work closely with civil society and community-based organisations that serve men who have sex with men [20]. Public health authorities may also consider working with organisers of events and mass gatherings as well as owners of sex-on-premises venues.

Vaccination

Mpox vaccines can be given before or after exposure: primary preventive (pre-exposure) vaccination helps reduce the risk of infection, while post-exposure preventive vaccination lowers the risk of developing symptoms or severe disease.

Whenever individuals access healthcare services, healthcare workers should assess the risk for an individual for mpox infection and vaccination should be offered accordingly. Public health communication should advise individuals at higher risk of infection to seek vaccination proactively. Pre-exposure vaccine should be considered among other interventions for individuals at substantially higher risk of exposure to MPXV, according to an individual risk assessment, such as individuals identifying as gay, bisexual, or other men or transgender people who have sex with men. Post-exposure vaccination can be considered for close contacts of cases (i.e. sexual partners and individuals with other prolonged physical or high-risk contact).

Vaccination strategies for mpox in the EU/EEA have evolved since the 2022 clade IIb outbreak, when campaigns were launched using a third-generation non-replicating smallpox vaccine, Imvanex, authorised by the European Medicines Agency (EMA) to immunise against smallpox in adults and adolescents aged 12 years and older [21]. The vaccine effectiveness of two pre-exposure vaccine doses in adults is estimated at 82% (95% CI: 72–92), higher than one dose or when vaccination is offered as post-exposure vaccination [7].

Ensuring high mpox vaccine uptake among groups susceptible to infection is key to control and limit the extent of mpox outbreaks [22]. According to the Health Emergency Preparedness and Response Authority, the vaccine is expected to remain available and accessible in EU Member States. Several Member States have established national stockpiles of Imvanex under their national preparedness plan against smallpox. The Health Emergency Preparedness and Response Authority has organised joint procurements and signed framework contracts with the vaccine producer to ensure availability.

Additional information about vaccination strategies to consider is available in ECDC rapid scientific advice on public health measures for mpox (2024-2025) [23]. Further, ECDC has recently published a set of operational tools that provides public health authorities with the means to diagnose barriers and facilitators to vaccination, so that tailored strategies and interventions to improve vaccination acceptance and uptake can be designed [24]. The document is translated into all EU languages and can be used for promoting mpox vaccination.

Substances of human origin

The recommendations provided by ECDC in 2024 to prevent the transmission of MPXV through substances of human origin remain relevant [25].

Limitations

This assessment is undertaken based on the facts known to ECDC at the time of publication. Several gaps in our knowledge exist including:

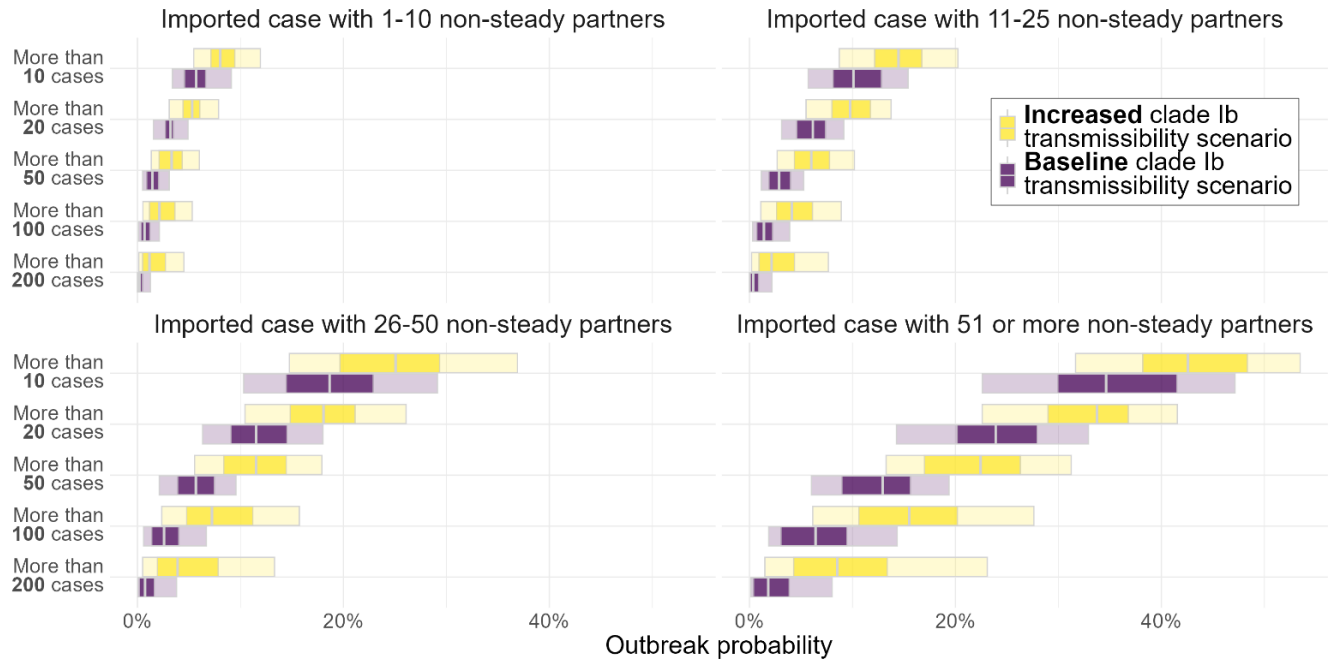
- Transmissibility of MPXV clade Ib compared to clade IIb: there is a need for clade-specific research in the EU/EEA context.
- The severity and differences of the clinical course of disease caused by MPXV clade Ib compared to clade IIb in the EU/EEA context, including the proportion of asymptomatic, mildly symptomatic MPXV clade Ib and which age groups are at high risk for severe disease. In addition, the prevalence of respiratory symptoms and risk of transmission should be studied in the EU/EEA context.
- Prevalence of protective immunity from past infection including an understanding of waning immunity.
- Efficacy and effectiveness data of the currently available MVA vaccine against MPXV clade Ib in comparison with clade II, including any degree of waning immunity following vaccination, including in immune-compromised populations and by administration route;
- The degree to which people who are vaccinated can have asymptomatic infection and the risk of onward transmission;
- There is a need to particularly study genomes from cases reported in the population of men who have sex with men to assess their phylogenetic characteristics.
- Behavioural insights about sexual contact patterns of men who have sex with men in EU/EEA, to better guide community engagement and other interventions.

Technical annex

1. Additional results from mathematical modelling

Within the sexual networks of men who have sex with men located in larger cities in the EU/EEA, ECDC mathematical modelling suggests that small outbreaks (10-100 cases) are probable if MPXV clade Ib is introduced in the sexual network of men who have sex with men[10]. In contrast, larger outbreaks (exceeding 200 cases) are substantially less probable, unless MPXV clade Ib is found to be more transmissible than clade II. The probability for outbreaks with 500 cases or more is estimated to be small. The outbreak probability strongly depends on the number of sexual partners of the individual who first contracts the MPXV clade Ib and who may then introduce it into a given sexual network of men who have sex with men.

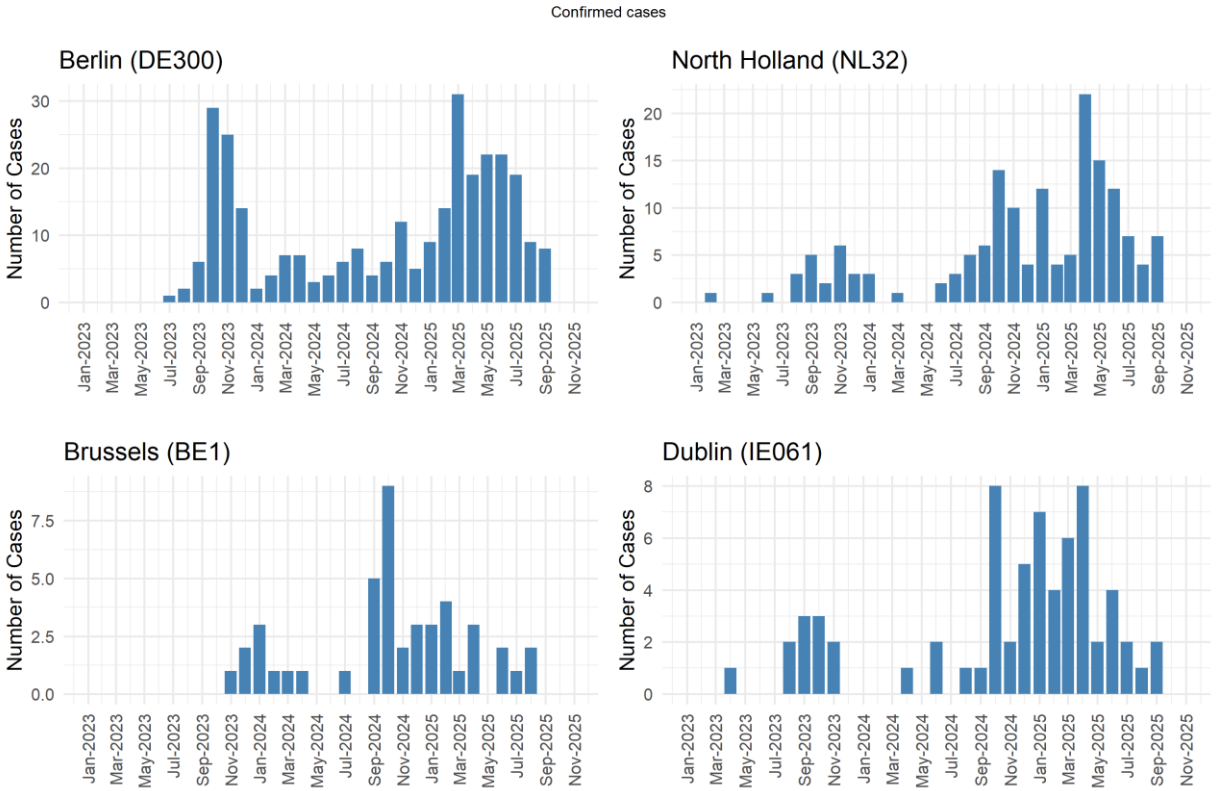
Figure 1. Probability of an MPXV clade Ib outbreak of varying sizes in a population of men who have sex with men of 10 000 individuals, starting with a single imported undetected case



The outbreak probability depends on the number of non-steady sexual partners of the imported case, as shown by the four different subplots. Results are shown for different cumulative incidence thresholds under two transmissibility scenarios: a baseline scenario assuming clade Ib is equally transmissible as clade II, and an increased transmissibility scenario assuming clade Ib is 15% more transmissible. Bars represent uncertainty due to different characteristics of the population of men who have sex with men across cities in the EU/EEA, including variation in sexual contact patterns and immunity levels due to mpox vaccine uptake and prior clade II infections. Dark and light bars show the 50% and 90% prediction intervals (PI), respectively; the grey line indicates the median [10].

Utilising the model in Figure 1 shows the estimated probability of MPXV clade Ib outbreaks in a larger city in the EU/EEA, starting from the introduction of one individual with an infection. As there is limited evidence on the transmissibility of MPXV clade Ib, two transmissibility scenarios are considered, and a higher transmissibility renders larger outbreaks more probable. The outbreak probability depends on the number of sexual contacts of the individual with an infection who introduces MPXV clade Ib, as shown by the four subplots. If the introduction occurs via an individual with 51 or more non-steady sexual partners, then the probability of a large outbreak is relatively high. To put the MPXV clade Ib outbreak sizes that were estimated by ECDC modelling into context in terms of actual reported cases, we present in Figure 2 the reported mpox clade II cases (clade II or clade not reported) in four urban regions since late 2022. In 2023, Berlin, Brussels, Dublin, and north Holland reported 87, 5, 12, and 22 cases, respectively. In 2024, the number of cases were 68, 26, 20, and 48. These regions are urban areas and were selected as examples because they have experienced sustained transmission of mpox since late 2022.

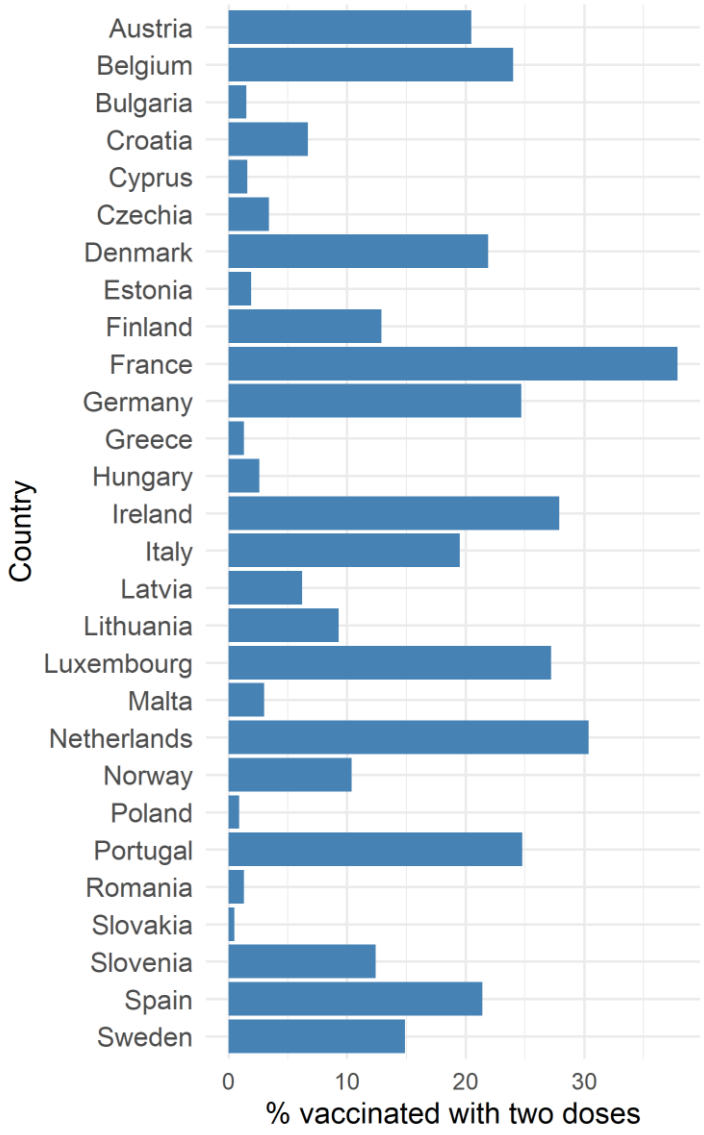
Figure 2. Number of confirmed mpox cases (clade II or clade not reported) for four urban regions in the EU/EEA since January 2023. Note the different y-axis scales



2. Estimates of vaccination uptake in the men who have sex with men population – EMIS survey

Results from the 2024 European men who have sex with men and trans people Internet Survey (EMIS) show that the proportion men who have sex with men responding to the survey who reported being fully vaccinated against mpox ranged from 0.5% to 37.9% with a EU/EEA country median of 11.4% [26]. Men were recruited to participate in the survey through online methods and may represent a more sexually active population.

Figure 3. Proportion of men who have sex with men who report being vaccinated with two doses against mpox, EMIS-2024



3. Vaccination effectiveness of the mpox vaccine

The vaccine effectiveness of two pre-exposure vaccine doses is estimated at 82% (95% CI: 72–92), while even one dose provides effectiveness of 76% (95% CI: 64–88). For post-exposure vaccination the vaccine effectiveness was estimated at 20% (95% CI: -24–65) [7]. Under the ECDC EMA Vaccine Monitoring Platform, two studies were conducted following the 2022 outbreak, with vaccine effectiveness of 84.1% and 89% with two doses respectively with different population groups included in the estimates [27] [28].

Most vaccine effectiveness estimates are derived from short follow-up time periods so there is a need to assess the effectiveness of the vaccination over time, including the long-term effectiveness of different approaches for vaccination used during the 2022 outbreak (cutaneous administration vs. intradermal fractional dose administration).

Mathematical modelling by ECDC and the United Kingdom suggests that a pre-emptive increase of the mpox vaccine uptake by 2.5 to 5 percentage points among men who have sex with men has a substantial impact on reducing the risk of large outbreaks, particularly when targeting the most sexually active individuals [10] [12].

Countries are encouraged to contribute to research projects to close existing knowledge gaps. EU initiatives such as the clinical trial international study on mpox booster vaccines led by the Public Health Agency of Sweden intend to consolidate further evidence around the mpox vaccine, including immune response and the safety of a booster dose administered either intradermally or subcutaneously [29].

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