LNS LUXEMBOURG

MICROBIOLOGY

Scientific briefing – Monkeypox update

26 July 2022

On 21 July 2022, the World Health Organization (WHO) declared that the ongoing outbreak of monkeypox consitutes a Public Health Emergency of International Concern (PHEIC).[1] With this, WHO aims to facilitate international coordination and political commitment while raising awareness, but they also acknowledge that there is a risk of stigmatisation of specific communities that should be addressed.

The outbreak was declared in May 2022, and so far 17 156 cases have been detected worldwide.[2] The main reporting countries are: Spain (3125), United States (2883), Germany (2352) and United Kingdom (2213), while other countries in the Greater Region reported fewer cases: France 1562 and Belgium 311.[2] According to the latest joint report by the European Centre for Disease Prevention and Control (ECDC) and WHO[3], to date, 8.1% of the cases in Europe were hospitalised, but only 0.1% required intensive care, and no deceases have been reported.[3]

In Luxembourg, 19 cases have been detected to date (Figure 1), and the positivity rate is currently at 32.8% (out of 58 patients). All cases are male, with a median age of 36 years old. Most were identified as imported cases from other European countries (e.g. Germany or Portugal), but more recently some autoctonous cases have also been observed.

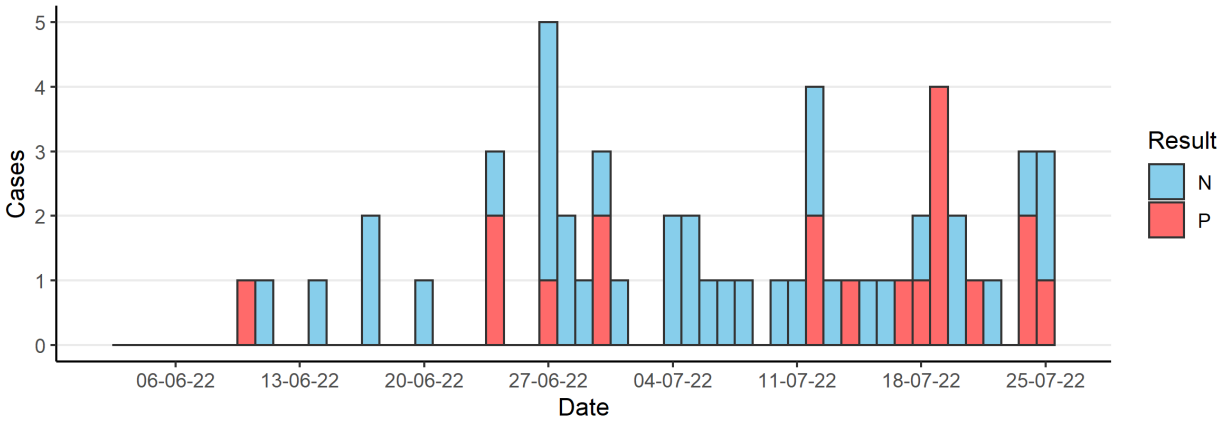

Figure 1. Epidemic curve of positive and negative cases tested in Luxembourg. Source: Laboratoire national de santé.

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In order to further define the detected positive cases, sequencing of the samples was performed. In those were the viral low was high enough to enable molecular characterisation, high similarity with other B.1. lineage samples from European countries was observed, but not between them, in agreement with the epidmeiological queries suggesting low autoctonous transmission (Figure 2).

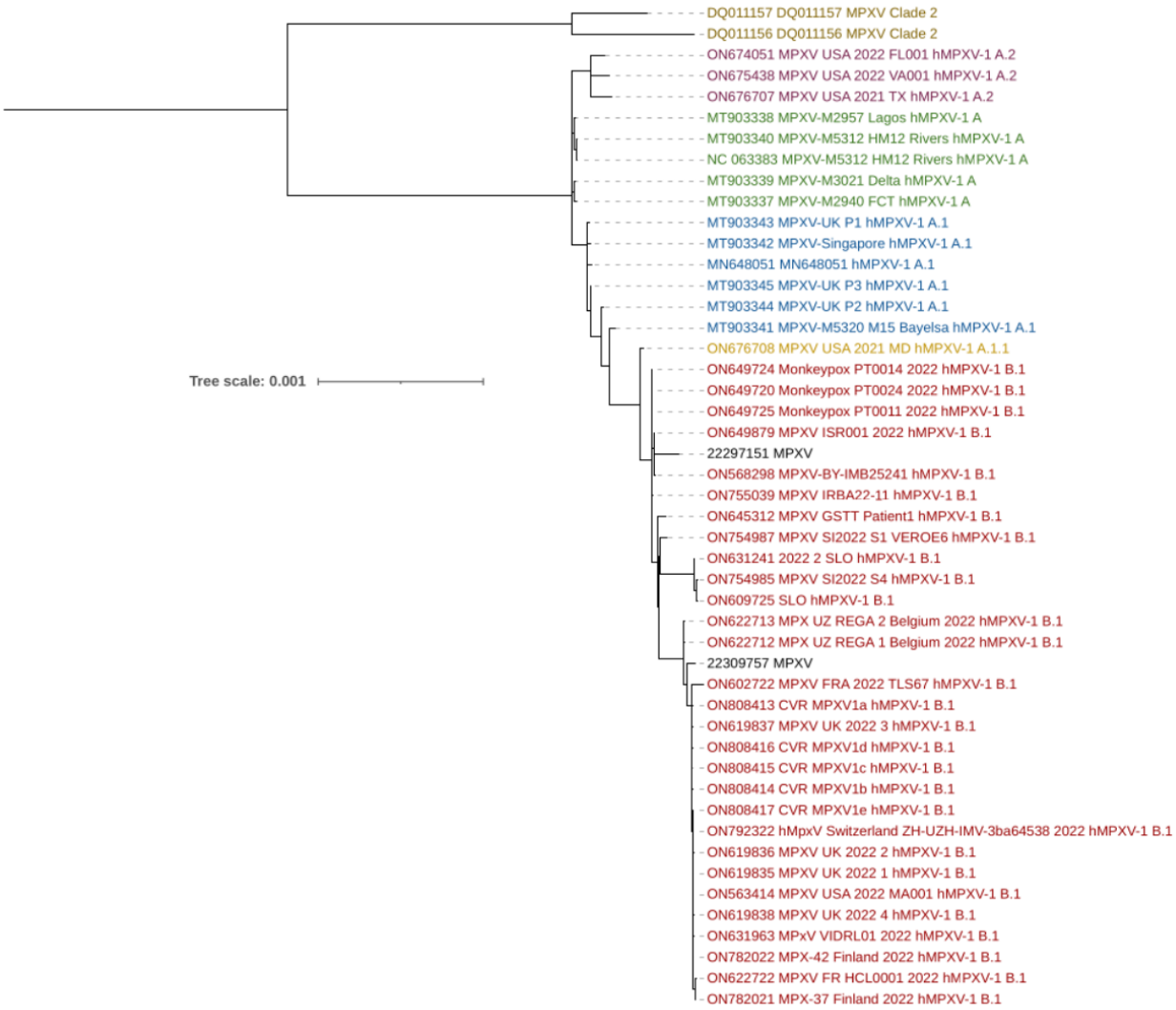

Figure 2. Phylogenetic tree of a subset of monkeypox sequences by maximum likelihood with TIM substitution model, including the successfully sequenced samples from Luxembourg (black) and other samples from the current and previous outbreaks. Source: GISAID.

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Laboratory diagnosis

The Microbiology Department at LNS has developed a diagnostic algorithm for molecular diagnostic test for monkeypox that allows reporting results within 24h of sample reception. Laboratory confirmation of monkeypox infection is based on nucleic acid amplification testing (NAAT), using real-time polymerase chain reaction (RT-PCR), for the detection of unique sequences of viral DNA (Figure 3).

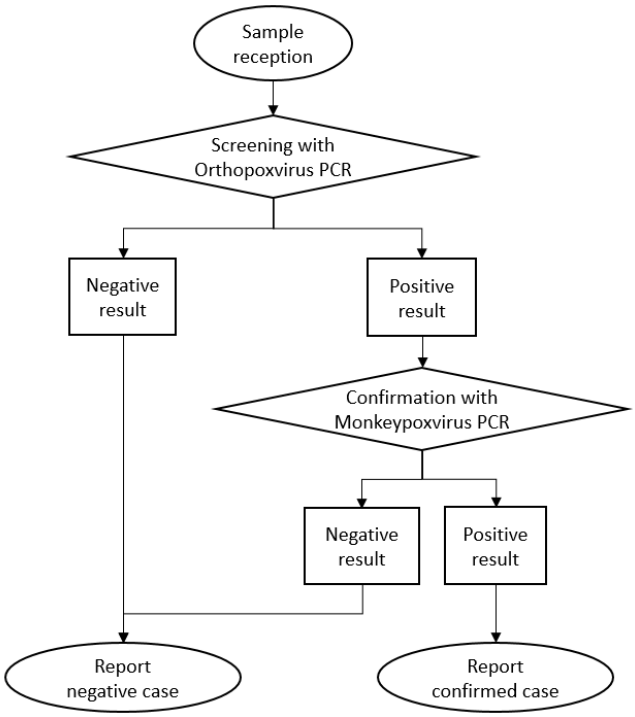

Figure 3. Testing workflow for suspected monkeypox samples at LNS.

For epidemiological purposes, the samples are sequenced using an untargeted metagenomics approach on Oxford Nanopore's GridION platform and results are communicated to Health authorities to provide more insight into how the virus spreads. Currently, only clinical samples with a Ct value below 20 are eligible for sequencing in order to increase the detection probability of MPXV-derived sequences.

Indications for testing

Given the wide range of rash illnesses (mainly varicella-herpes zoster, but also other herpes, molluscum contagiosum, syphilis, etc.), it could be challenging to conclude a clinical diagnosis without laboratory confirmation. Any individual meeting the clinical and epidemiological criteria for probable cases[3] is eligible for testing, and a further assessment of the likelihood of infection will be performed by the LNS (see test request form).[4]

Specimen collection, storage and shipment

Specimens from probable cases should be collected by health workers while observing standard precautions and handled with caution. Skin lesion materials (exudates, crusts or swabs of the lesion) are the recommended specimen type. It is also recommended to take several specimens from a single patient, but types of skin lesions should not be mixed in the same tube. Due to limited evidence on the stability of specimens, WHO recommends that specimens be stored refrigerated within an hour of collection and transported to the LNS-Microbiology laboratory as soon as possible. Dark, cool environments may be considered if refrigerated storage is not possible.[5] For shipment, triple packaging with appropriate labelling and documentation is needed. Finally, cleaning after working with potential monkeypox specimens can be done with common disinfectants, like household bleach or quaternary ammonium compounds.

Recommendations

The risk of infection during the current outbreak of monkeypox for the general European population is considered low, but moderate for people having multiple sexual partners.[6] The following precautions should be observed:

- Frequent hand and respiratory hygiene are always recommended, as they can help prevent many infectious diseases.
- The use of condoms helps prevent many sexually transmitted infections and is always encouraged, but it is not fully protective against monkeypox. Assessing the risk of specific situations is recommended to prevent the further spread of the virus.
- In case of experiencing related symptoms or having had a risk contact, health authorities should be contacted for further advice. Specific instructions for Luxembourg can be found on the following site: *Variole du singe - Recommendations sanitaires* (French).[7]

References

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