





Current knowledge about Mpox (formerly Monkeypox): (as of May 2023)



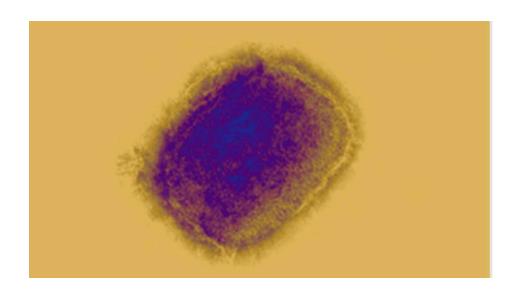
Dr Ch. Martin CHU Saint-Pierre, Brussels

SCIENTIFIC SEMINAR ON INFECTIOUS DISEASES

Brussels, 11 May 2023

Outline

- Origin and reservoir
- . Before 2022
- . 2022 Outbreak
- . Clinical
- . Diagnosis
- . Treatment and prevention

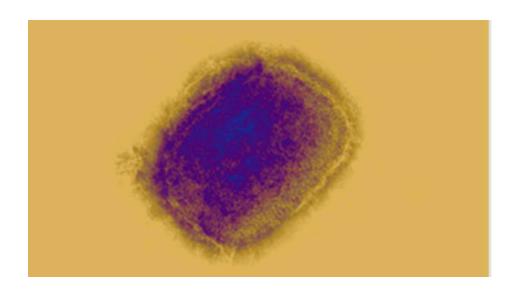






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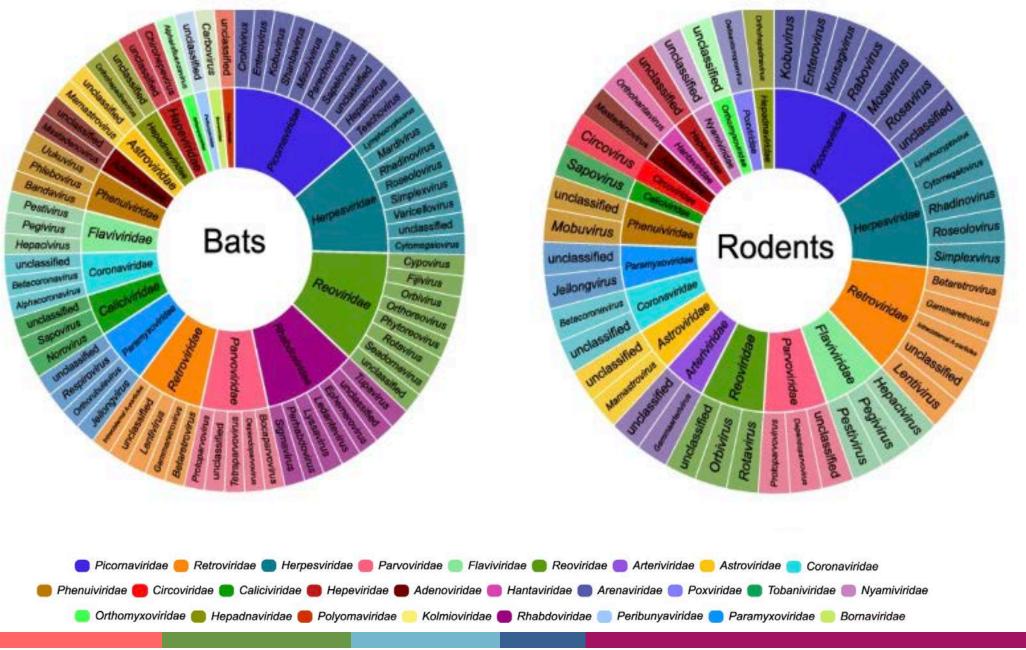


Where does Mpox come from?

- MPXV was first identified in a colony of Asian monkeys in a Copenhagen, Denmark, laboratory in 1958
- Actually only been isolated from a wild monkey—in Africa—once
- Reservoir: probably rodents
- Zoonosis, occasionally spilling over into the human population

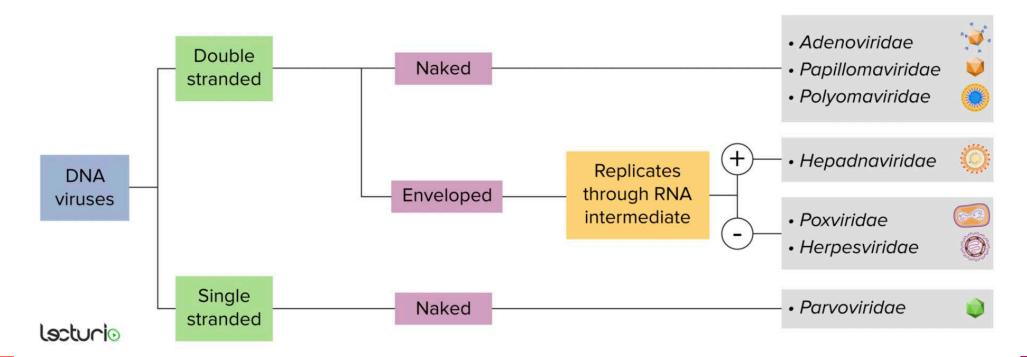






Poxviruses

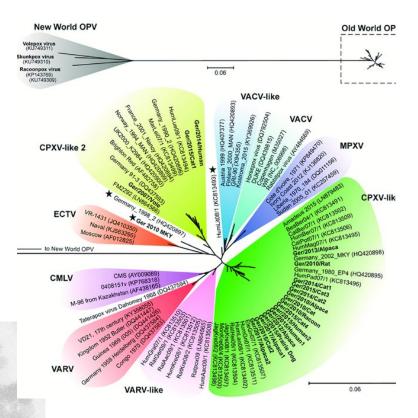
- Poxviruses are large DNA viruses that infect a diverse array of hosts
- Orthopoxviruses are enveloped, double-stranded DNA viruses with a genome encoding ~200 genes
- Include the human pathogens variola virus (VARV), which causes smallpox, and the mpox virus (MPXV) as well as the vaccinia virus (VACV).











3 clades of Monkeypox virus: West African (2-3) and Congo Basin (1)

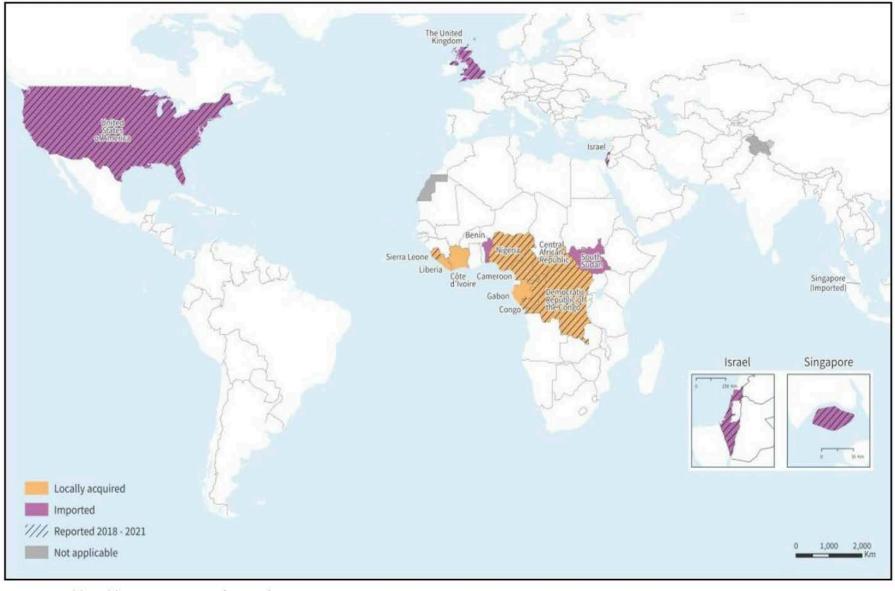
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FIGURE. Reported confirmed human mpox cases — worldwide, 1970–2021



Source: World Health Organization as of December 6, 2022.

RESEARCH ARTICLE

The changing epidemiology of human monkeypox—A potential threat? A systematic review

Eveline M. Bunge¹, Bernard Hoet²*, Liddy Chen³, Florian Lienert², Heinz Weidenthaler⁴, Lorraine R. Baer⁵, Robert Steffen^{6,7}

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GOPEN ACCESS

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STATES

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Colorized transmission electron micrograph of monkeypox particles (orange) found within an infected cell (brown) cultured in the laboratory. National Institute of Allegy and Infectious Diseases

RESEARCH ARTICLE

"Our study shows a gradual increase in monkeypox cases, particularly in the highly endemic DRC, a spread to other countries and an increase in the median age from young children to young adults. These findings may be related to the cessation of smallpox vaccination, which provided some cross-protection against monkeypox, leading to increased human-to-human transmission. The appearance of outbreaks outside Africa underlines the global importance of the disease. »

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ian Nordic AG, Zug, merica, 4 Bavarian Nordic nited States of America, on Travelers' Health, enetics and kas, United States of



Citation: Bunge EM, Hoet B, Chen I Weidenthaler H, Baer LR, et al. (202 changing epidemiology of human r potential threat? A systematic revie

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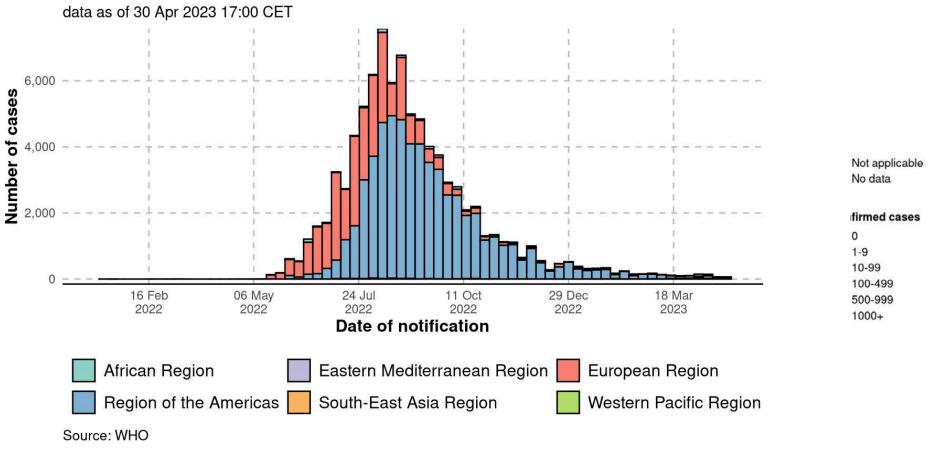




2022-23 Mpox (Monkeypox) Outbreak:



Epidemic curve shown for cases reported up to 30 Apr 2023 to avoid showing incomplete weeks of data.



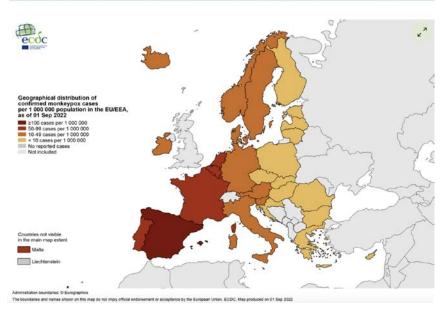
The 10 most affected countries globally are: United States of America (n = 30,154), Brazil (n = 10,915), Spain (n = 7,549), France (n = 4,144), Colombia (n = 4,090), Mexico (n = 3,965), Peru (n = 3,800), The United Kingdom (n = 3,741), Germany (n = 3,692), and Canada (n = 1,484). Together, these countries account for 84.2% of the cases reported globally.

Epidemiological update as of 4 April



- 21 170 cases reported in 29 EU/EEA countries
 - 86 913 cases globally
- 98% male
- 65% aged 18-40 years
- Primarily MSM
- 1.2% required hospitalisation
- 6 deaths
- 8 cases admitted to ICU
- 38% HIV-positive
- Decreasing trend globally. Highest numbers reported from the Americas, Western Pacific

Geographical distribution of confirmed monkeypox cases per 1 000 000 population in the EU/EEA since the start of the outbreak, and as of 1 September 2022

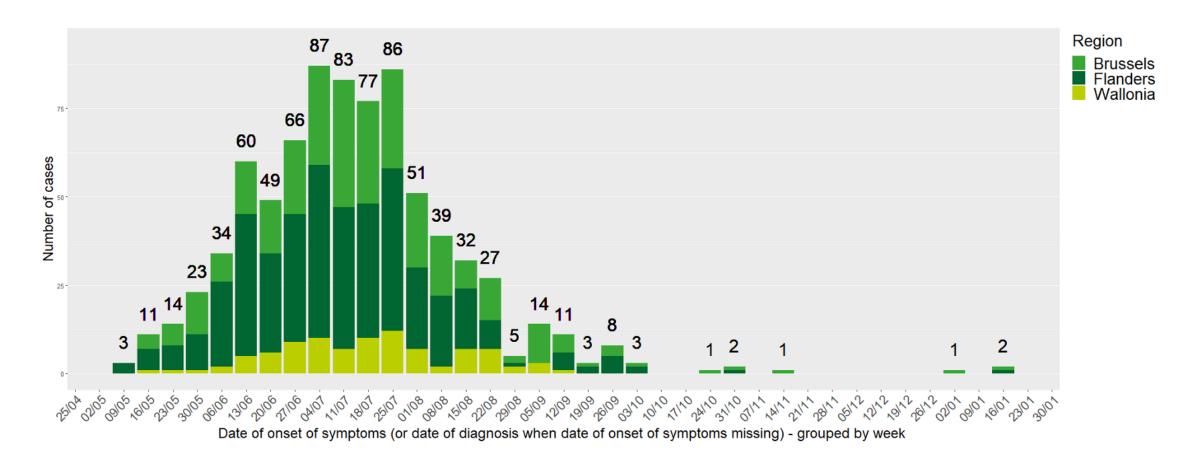






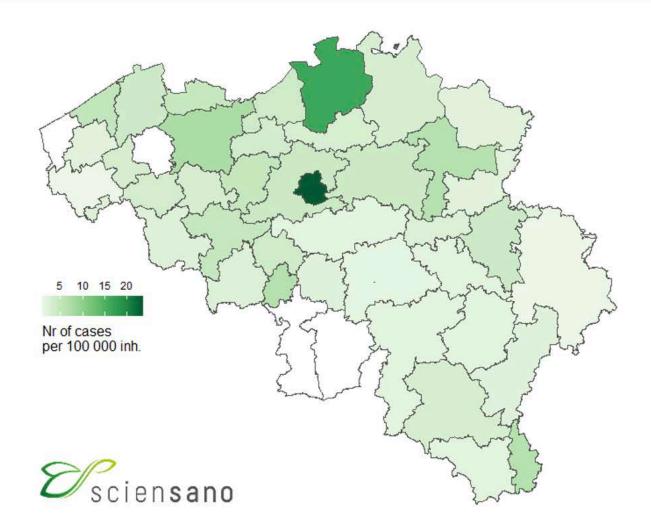
In Belgium

Epicurve





Cumulative incidence per district

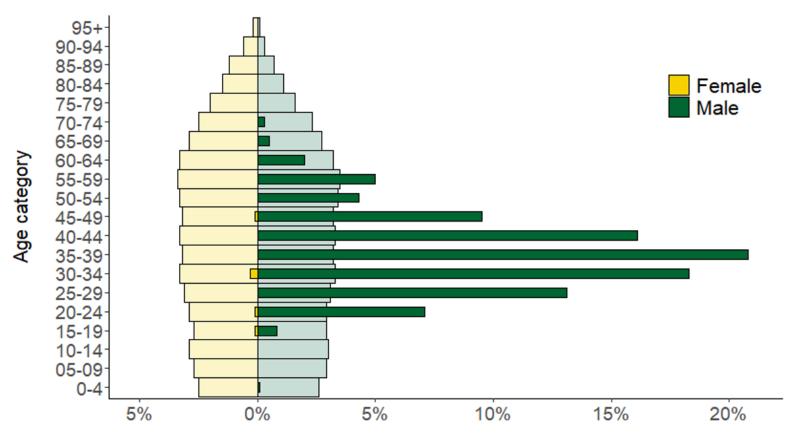




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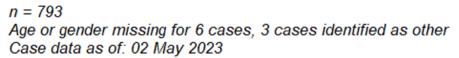
Highest incidence in BXL ,followed by Antwerp, Ghent, Hasselt, La

Demographics: age & sex

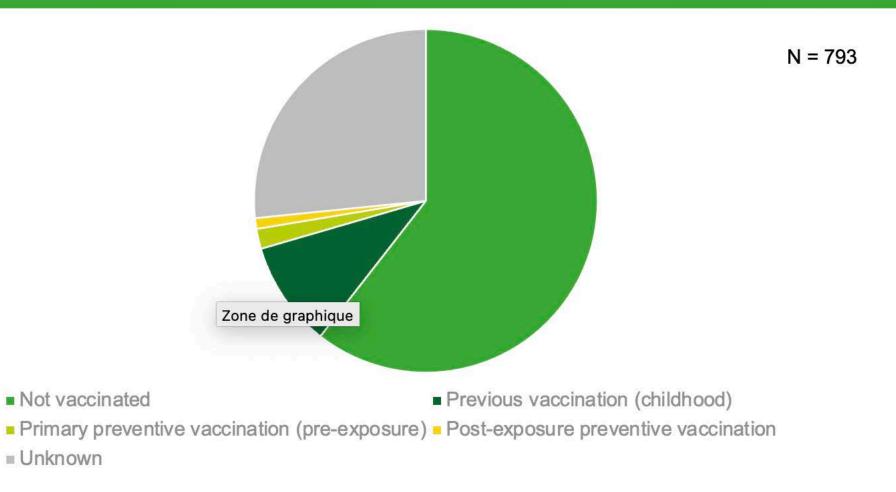








Vaccination status of cases





Unknown

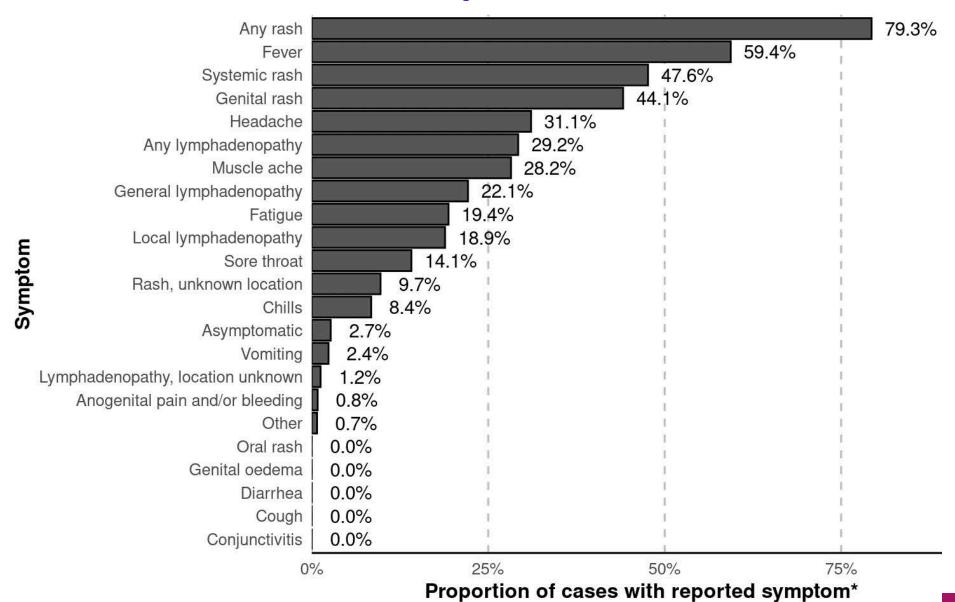
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Clinical presentation





CHU Saint-Pierre



Mpox skin lesions







Genital herpes
Chickenpox
HIV primary infection
Syphilis
LGV (Chlamydia trachomatis)
Chancroid
Impetigo
Furunculosis, folliculitis, eczema,







Mpox genital and anal lesions













Perianal, anal and rectal lesions.

A. Anal and perianal lesions, day 6. B, C. rectal and anal lesions in a single individual D. Perianal ulcers. E. Anal lesions, PCR positive

F. Umbilicated perianal lesion day 3. PCR positive G. Umbilicated perianal lesions day 3. PCR positive H. Perianal ulcer. day 2. PCR positive UMC Sint-Pieter

Thornhill J N Engl J Med 2022; 387:679-69

Mpox oral and perioral lesions













Severity of disease

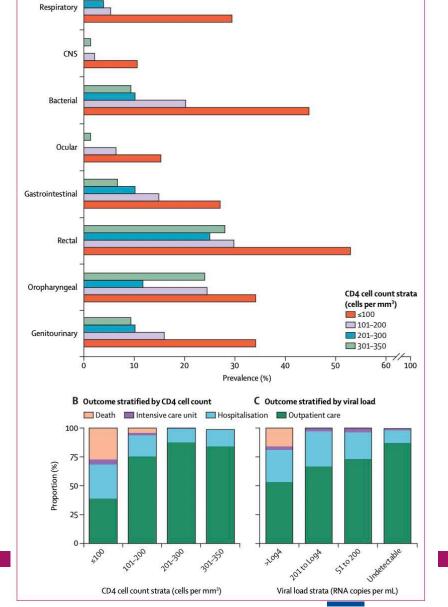
- 6% were hospitalized at time of notification
 - 71% for treatment/pain relief
 - 22% reason unknown
 - 7 % for isolation
- 2 patients deceased
 - severe underlying health condition



Complications

Mpox in people with advanced HIV infection: a global case series





A Complications stratified by CD4 cell count

Dermatological





Annals of Internal Medicine

OBSERVATIONS: BRIEF RESEARCH REPORTS

Detection of Monkouper Virus in Aparactal Swahe From

Asymptomatic I Transmitted Info "A remarkable spectrum" of presentations of mpox in the current epidemic, ranging from symptoms like a single cold and pustules to diffuse skin rashes and extremely painful anogenital or oropharyngeal lesions."

"Very subtleted in ical oppers entations are possible, very florid clinical de Block, Hilde Smet, Sandra Coppens, Fien Vanroye, Joachim Jakob Bugert, Philipp Girl, Sabine Zange, presentations are possible ensuanted and serve thing in between."

den Bossche, Kevin K, Ariën, Antonio Mauro Rezende, Koen Vercauteren & & Marian Van Esbroeck

for the ITM Monkeypox study group

Nature Medicine (2022) Cite this article

Medical News & Perspectives

Reports of Asymptomatic Monkeypox Suggest That, at the Very Least, Some Infections Go Unnoticed

Jennifer Abbasi





Outline

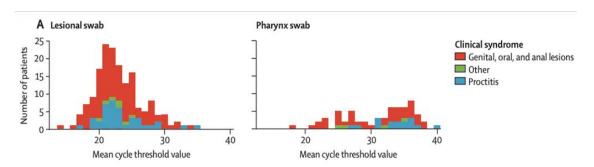
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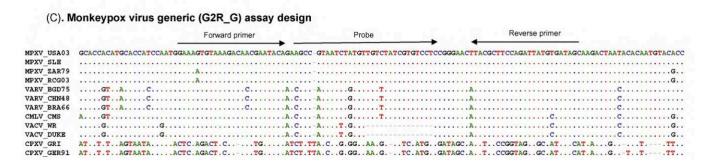




Diagnosis

- Serology: cross-reaction between OPXV
- Viral culture: not recommended (BSL3)
- RT-PCR: first in-house RT-PCR assays (confirmed in KUL or ITM)
 - either with a generic MPXV target
 - either with an orthopoxV target
- Now commercial tests are available





doi:10.1016/j.jviromet.2010.07.012





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Antiviral therapy

- Tecovirimat, brincidofovir, and cidofovir have shown promising results
- During the 2022 multinational Mpox outbreak, tecovirimat, an antiviral medication approved for the treatment of smallpox, was used as an investigational treatment for severe mpox. However, efficacy and optimal treatment duration are still being investigated

- Atovaquone, mefloquine, and molnupiravir exhibit anti-MPXV activity
- Whereas mefloquine was suggested to inhibit viral entry, atovaquone and molnupiravir targeted post-entry process
- Combining atovaquone with tecovirimat enhanced the anti-MPXV effect of tecovirimat.



Mpox vaccination

- Cross-reaction between OPXV → smallpox vaccination
- Since July 2022, the third-generation non-replicating smallpox live attenuated vaccine Imvanex[®] (Live Modified Vaccinia Virus Ankara Bavarian Nordic or MVA-BN) has been authorised by the EMA for protection against mpox in adults





Mpox vaccination (2)

- As of 3 March 2023, > 300 000 vaccine doses have been administered in 25 EU/EEA countries
- The limited evidence available indicates that the vaccine provides protection against MPXV (duration?)
- Infection can still appear after one vaccine dose, but illness appears less clinically severe, and hospitalisations are reduced
- The evidence indicates that 2 doses provide highest VE; therefore vaccination with 2 doses should be considered for all eligible individuals
- Preliminary evidence indicated no difference in protection between subcutaneous and intradermal administration routes
- Vaccination is an important complementary intervention to other measures including testing, contact tracing, case isolation, risk communication, and behaviour change



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Vaccination against Monkeypox

- Previously received smallpox vaccine
 - Stopped in 1976 in Belgium
- Post-exposure preventive vaccination
 Start: beginning of June 2022
- Primary preventive vaccination

Start Belgium: beginning of August 2022 (criteria loosened over time)

(France: mid July 2022)



Vaccination up to now (1/2)

Over 8000 doses administered

- 80% Primary Preventive Vaccination
- 14% Post- exposure Preventive Vaccination



Vaccination up to now (2/2)

- Gender (known in 60%)
 - Among those 98% men

- Age group (known in 52%)
 - Among those 92% between 25 59 yo

- Target group (known in 45%)
 - Among those 99% MSM
 1% in HCW



Future?

Cluster in France



17 cases between 1/1 2023 and 23/3 2023 (14 since 1/3)

Centre-Val de Loire

All MSM

Aged 24-56

No hospitalisations

Vaccination:

- 6 cases not vaccinated
- 1 case only had 1st gen smallpox vaccine in childhood
- 5 cases received 1st gen smallpox vaccine + 1 dose 3rd gen vaccine in 2022
- 5 cases received 2 doses 3rd gen vaccine in 2022

https://www.santepubliquefrance.fr/les-actualites/2023/variole-du-singe-point-de-situation-en-france-au-23-mars-2023





Future?



Signaleringsoverleg, Vertrouwelijk

Jaargang 2023, week 17

27 april 2023

Binnenlandse signalen

· 3881 Herinfectie met Mpox in Nederland

Binnenlandse signalen

3881 Herinfectie met Mpox in Nederland

Clinical Infectious Diseases

BRIEF REPORT

A case of mpox reinfection

Stefano Musumeci* ¹, MD; Iris Najjar* ^{2,3}, MD; Emmanuelle Boffi El Amari ⁷, MD; Manuel Schibler ^{2,4}, MD; Frédérique Jacquerioz ^{3,5,6}, MD, MPH; Sabine Yerly ⁴, MS; Adriana Renzoni, PhD⁴; Alexandra Calmy ¹, MD, PhD; Laurent Kaiser ^{2,3,4}, MD, PhD





Future?

- Level of preparedness for an epidemic: depending on our prevention and response capacities
- Scientific gaps
- Future challenges
 - funding
 - destigmatizing this illness
 - ensure effective outreach, vaccine acceptance and uptake among those most at risk, incl. vulnerable populations
 - HIV/STI risk profile and prevention (Prep access!)
 - immunosuppressed patients
 - empowering communities at risk to protect themselves from mpox















Thank you very much!