

# Meeting summary

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**R&D**Blueprint

Powering research  
to prevent epidemics

# Conclusions, day 1

Need to take a broad view of monkeypox in context of emerging infectious diseases and pandemic preparedness. Health equity issues and world connectedness as critical for keeping everybody healthy

In addition to helping to coordinate the research agenda, WHO is developing science-based strategies to address the monkeypox situation

Monkeypox incidence has increased since smallpox vaccination stopped. Vaccinia vaccine effective, transmissibility << Smallpox, animal reservoir needs better definition, at least 2 clades

Currently endemic in 9 African countries, with >600 non-endemic cases since 13 May in 26 countries. Sexual transmission, initial cases MSM. Endemic 66 deaths/1405 cases since 1/1/22.

Transmission: close contact, via lesions, maternal-fetal, animal-human (role of saliva, semen)

In DRC, transmission most commonly from rodent/monkey (often via hunting, trapping, food), un-(smallpox)-vaccinated people at greatest risk. Clinical picture: number of cutaneous lesions correlates with degree of systemic illness. Lymphadenopathy in 90%. Blindness. Recommend use of vaccines.

CAR: intermittent outbreaks, increased since 2018. often with animal source identified. >95% of interhuman contacts were intrahousehold, 65.7 interhuman cases recognized human case source. 96.7% of confirmed cases born after 1979. Fever, genital lesions, pruritus, adenopathy, sore throat, ulcers, cough. Case fatality 7.5% (9.6% in children). Complications: bronchopneumonia, septicemia, dehydration, cutaneous sequelae

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Nigeria: after early 1970s, re-emerged in 2017-18. Spread initially within household, 118 confirmed/276 suspected cases, 7 deaths, mostly urban. Median age 29, all <54 years old. 30% has link to people with similar lesions. HIV was risk factor for death. No obvious seasonality. One repeat infection 10 months later. In 2022, 88 confirmed cases

One-health priority: prevent human animal transmission including spillover from humans to new animal species. Animal reservoirs not well understood: naked-tailed tree shrew, rope squirrels, target rat, giant pouched rat, NHPs, pets (prairie dog/hamsters) with various habitats. Education in one-health context can protect against many pathogens.

Chickenpox can mimic monkeypox and is important in the differential diagnosis of monkeypox

# Conclusions, day 1

EU cases reported since 18 May: 373 cases (242 in Spain/Portugal). Majority young men (MSM), almost no travel history to endemic countries. Most presented with genital/perigenital lesions. Of 91 studied, 6 (33%) HIV+, 3 (4%) hospitalized, 4 (8%) HCW. Portugal study 18/19 MSM, 14/26 HIV, 14/16 multiple partners, 3/27 hospitalized.

Spain: clinical, epi criteria for diagnosis. Investigations: isolation in Vero E6, PCR, sequencing (W African clade).

UK: 190 confirmed cases in UK. 3 distinct events. Earliest in April, most starting May 2022.

Europe clinical summary: Many cases are mild, though some are hospitalized. Frequent but not exclusive evidence for sexual transmission.

Social science considerations can play a critical role in messaging and in interrupting transmission, reducing stigmatization and misinformation, and improving access to care

# Conclusions, day 1

Diagnostics: direct demonstration (e.g., culture, EM, IHC), molecular (PCR, sequencing), immunological (IgM, IgG). Samples: lesions, oropharyngeal, plasma/serum, other research specimens. Many assays are becoming available, including with regulatory endorsements. Key needs are for validation of new assays, sample types, including positive controls. Equity in availability of diagnostics is a challenge.

Sero-epidemiology: confounding by previous vaccination or exposure. Need to account for 2 virus forms (mature & extracellular). Peptide microarray assays can distinguish seroresponses to different poxviruses, but not yet validated or generally available. CDC makes orthopoxvirus serology testing available.

Challenge of BSL-3 for sample processing- can be addressed by lysis buffer

Animal models: for potential animal rule use, NHP (cyno) model using Zaire strain dose with 90% severe disease, Severity but not skin disease was dose dependent. PRNT assays to bridge to humans. Animal models showed efficacy of vaccines and antivirals.