WHO SAGE Working Group on Smallpox & Monkeypox Vaccines

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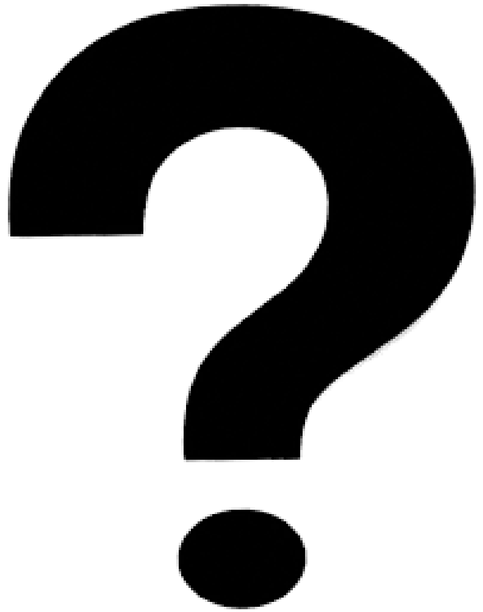
Priority knowledge gaps for monkeypox vaccines?

- Clinical efficacy/effectiveness
- Schedule
- Other populations
- Behavioural insights
- Deployment strategies

Clinical Efficacy & Effectiveness – Knowledge Gaps

- What is the predicted/anticipated clinical efficacy of different vaccines?
- Efficacy for preventive7PrEP vaccination of different at-risk groups?
- Clinical efficacy of 1-dose schedule of MVA-BN in humans? As a preventive/PrEP vaccination? As PEP? Compared to 2 doses of MVA-BN.
- Effectiveness for prevention/PrEP in groups at high risk of exposure, including household contacts of non-infected persons at high risk?
- For post-exposure prophylaxis/PEP of contacts (different groups, e.g. family, sexual)?
- Effectiveness of vaccines in preventing monkeypox for different modes of exposure:
  - skin-to-skin contact
  - respiratory exposure (e.g. face-to-face (droplet), aerosolized)
  - exposure through sexual activities
  - different forms of mucosal exposure including mouth-to-mouth (e.g. kissing), exposure of eyes, anal/rectal mucosal exposure
  - Exposure through contact with fomites, e.g. bedding, objects, frequently touched surfaces
  - Household exposure where mode of exposure is not known.
- Modelling: How various scenarios for efficacy will affect vaccine effectiveness and impact? Is herd immunity possible? At what levels of coverage?



Schedule – Knowledge Gaps

- How many weeks after completing a vaccination series (1 or 2 doses) until considered protected?
- How long does protection last?
- For breakthrough cases, does vaccination reduce severity of disease?
- What is the evidence for PEP to be limited to 4-14 days post exposure? With delays in detection/confirmation of cases is this a practical strategy?
- Dose sparing studies: Can ACAM2000 or LC16 be used as 2nd dose for MVA-BN vaccinated (i.e. to free up MVA-BN doses for those who ACAM2000 & LCI are contraindicated)? Could this enhance safety & effectiveness of ACAM2000?
- Fractional doses?
- If previously SPX vaccinated, is 1 dose of MVA-BN sufficient as a booster? Does this apply to persons vaccinated before eradication? When would booster doses of LC16 or ACAM2000 be required?
- If vaccine supply is limited, what is the public health impact of MVA-BN 2 doses vs MVA-BN 1 dose with delayed 2nd dose/extended schedule? How much later can the 2nd dose be offered?

Knowledge Gaps

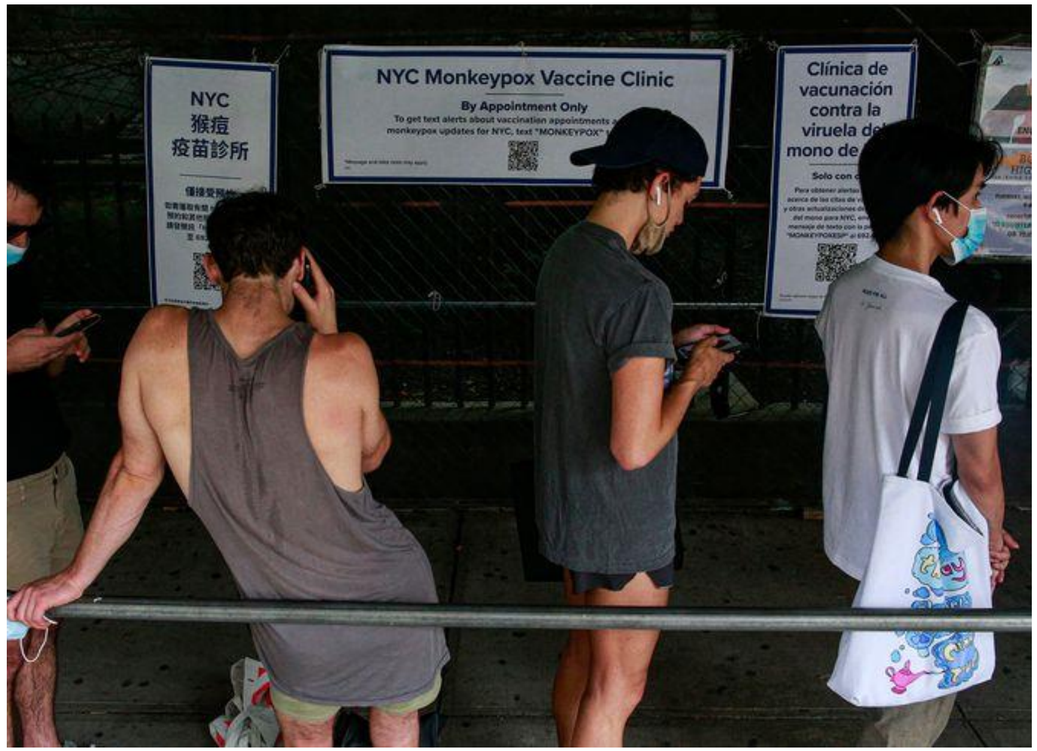
Other Populations

- Safety of MVA in broader range of immune compromised groups, including poorly/inadequately treated HIV infection?
- At scale safety of vaccination in HIV+ individuals who are well controlled?
- Safety during pregnancy, safety in children?

Behavioral Insights

- KAPB surveys: Beliefs about vaccine effectiveness, safety, relevance?
- Willingness to limit high risk activity while waiting for immune response time and/ or second dose?
- Willingness of individuals to delay their second dose so that others may have a first dose?

Deployment Strategies – Knowledge Gaps



People wait in line to receive the monkeypox vaccine in Brooklyn.
Kena Betancur / AFP via Getty Images

- What is the overall goal of the vaccination programmes in various countries and globally?
- Can vaccines interrupt/reduce transmission?
- If vaccine supply is limited, should PEP be prioritized over preventive vaccination? Or should supply first be offered 'preventively' to those at highest risk of exposure ? e.g. sexual health clinic attendees with STIs. Which strategy will contribute more to stop outbreak?
- Value of behavioural interventions: behavioural interventions and condom use + vaccine vs vaccine alone (minimal behavioural intervention)?
- In which context can ring vaccination of contacts be an effective strategy?
- If person who is recovered from MPX is identified as a contact, should they be vaccinated (PEP)?
- Vaccination delivery to high risk populations without generating stigma?
- Outbreak response & preventive strategies in rural areas where zoonotic transmission occurs? Effectiveness of community vaccination? Eligibility criteria depending on vaccine(s) used? Age groups? Occupational risk or activity based (e.g. HWs, hunting)?