Evidence for Silent Mpox Transmission in Healthy Nigerian Adults

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BACKGROUND

- Mpox has re-emerged with sustained human-to-human transmission globally, yet its burden in endemic African settings remains poorly defined.
- Cessation of routine smallpox vaccination has created increasingly immunologically naïve populations, while residual vaccinia-derived immunity may still shape susceptibility and transmission.
- Surveillance in West Africa relies largely on clinically detected cases, leaving subclinical or unrecognized mpox exposure insufficiently characterized.
- Limited integrated serological and genomic data constrain understanding of population immunity, transmission intensity, and preparedness needs.

METHODS

- Healthy Nigerian adults from two cohorts (n=176; paired follow-up n=153; ~9-month follow-up to 2023).
- Longitudinal sampling with ~9-month follow-up (2021–2023).
- Six-antigen MPXV IgG multiplex (Luminex) with magnitude–breadth scoring.
- Seropositivity: ≥4 antigens; recent exposure: ≥2-fold rise across ≥4 antigens.
- Stratified by birth cohort and cohort type.
- Integrated Nigerian MPXV genomic analysis (105 sequences) to contextualize transmission.

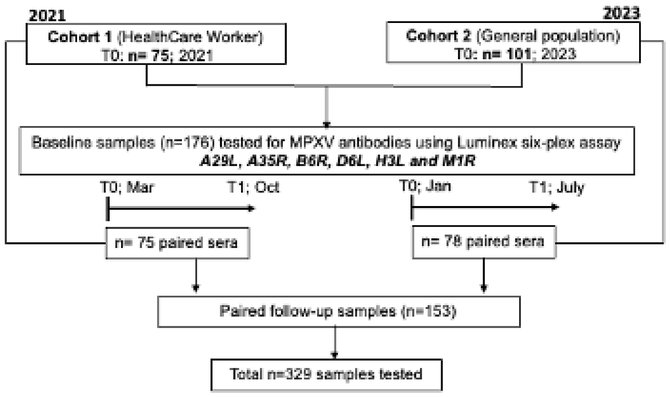


Figure 1. Study design and sampling across two Nigerian cohorts. Baseline and ~9-month follow-up sera (2021–2023) tested using a six-plex MPXV IgG assay.

Serological evidence in healthy Nigerian adults suggests ongoing, under-recognized mpox transmission despite no reported disease, with heterogeneous exposure histories highlighting gaps in surveillance and diagnostics.

RESULTS

- 13.6% (24/176) were MPXV-seropositive at baseline; predominantly born before 1980.
- Magnitude-breadth responses were ~2× higher in pre-1980 vs post-1980 cohorts, consistent with residual smallpox immunity.

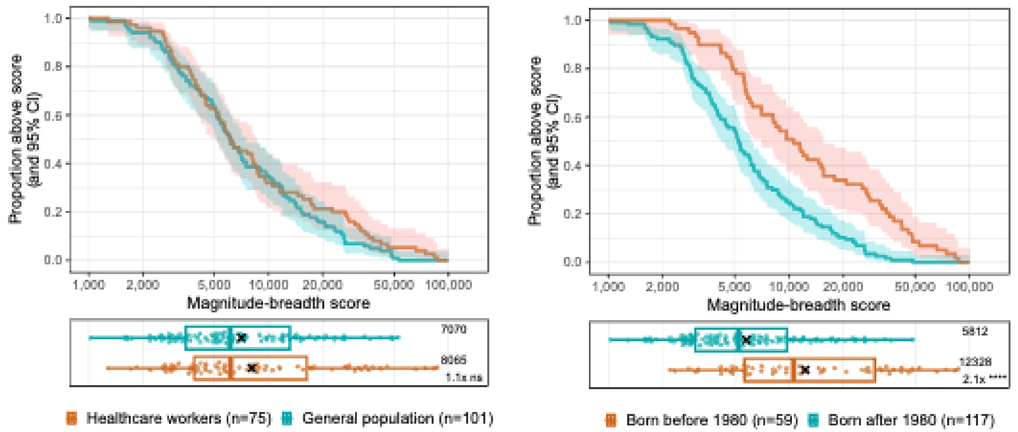


Figure 2. MPXV antibody magnitude–breadth responses by cohort. Distribution of cumulative IgG responses across antigens in healthcare workers and community participants and birth-cohort (born before or after 1980)

- Evidence of recent exposure in 3% (5/153) over ~9-month follow-up without reported illness.
- Boosting strongest to B6R, M1R, and A35R antigens, with marked individual heterogeneity.

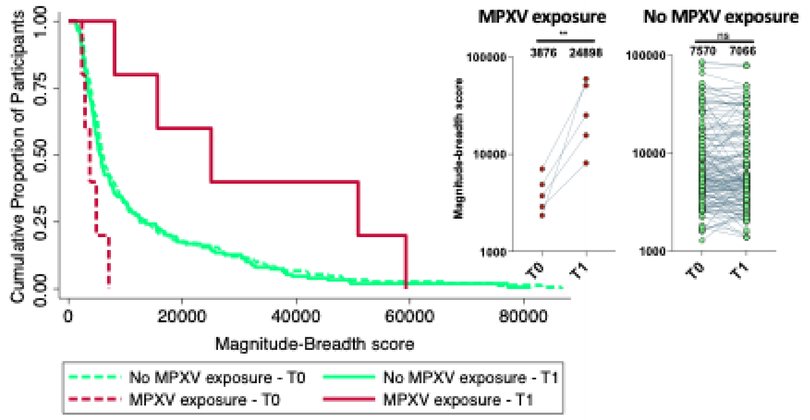


Figure 3. Evidence of recent exposure. Subset of participants show ≥2-fold increases in magnitude-breadth over ~9 months without reported illness.

RESULTS (continued)

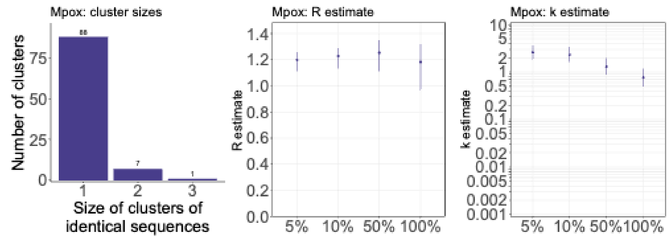


Figure 4. Genomic transmission patterns. Nigerian MPXV genomic analysis shows slow epidemic growth and small transmission clusters with frequent dead-end chains.

- Genomic analyses indicate slow epidemic growth with frequent dead-end transmission chains, consistent with partial population immunity.

DISCUSSION & CONCLUSIONS

- Residual smallpox-derived immunity remains detectable in older adults and continues to shape population susceptibility to mpox.
- Serological boosting in a small subset of healthy participants supports low-level, under-recognized exposure without reported illness.
- Genomic analyses of ~105 Nigerian MPXV genomes show slow epidemic growth, small transmission clusters, and frequent dead-end chains, consistent with partially immune populations.
- Together, serological and genomic data indicate that mpox transmission in Nigeria is likely sustained at low levels but incompletely captured by case-based surveillance.
- Integrated serology and genomics are needed to better define burden, detect silent transmission, and guide targeted vaccination and preparedness strategies in endemic settings.

PLAIN LANGUAGE SUMMARY

We found evidence that some healthy adults in Nigeria had been exposed to mpox even though they did not report being sick. This suggests the virus may spread quietly at low levels and that better surveillance is needed to detect and prevent transmission.

REFERENCES

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ACKNOWLEDGEMENT