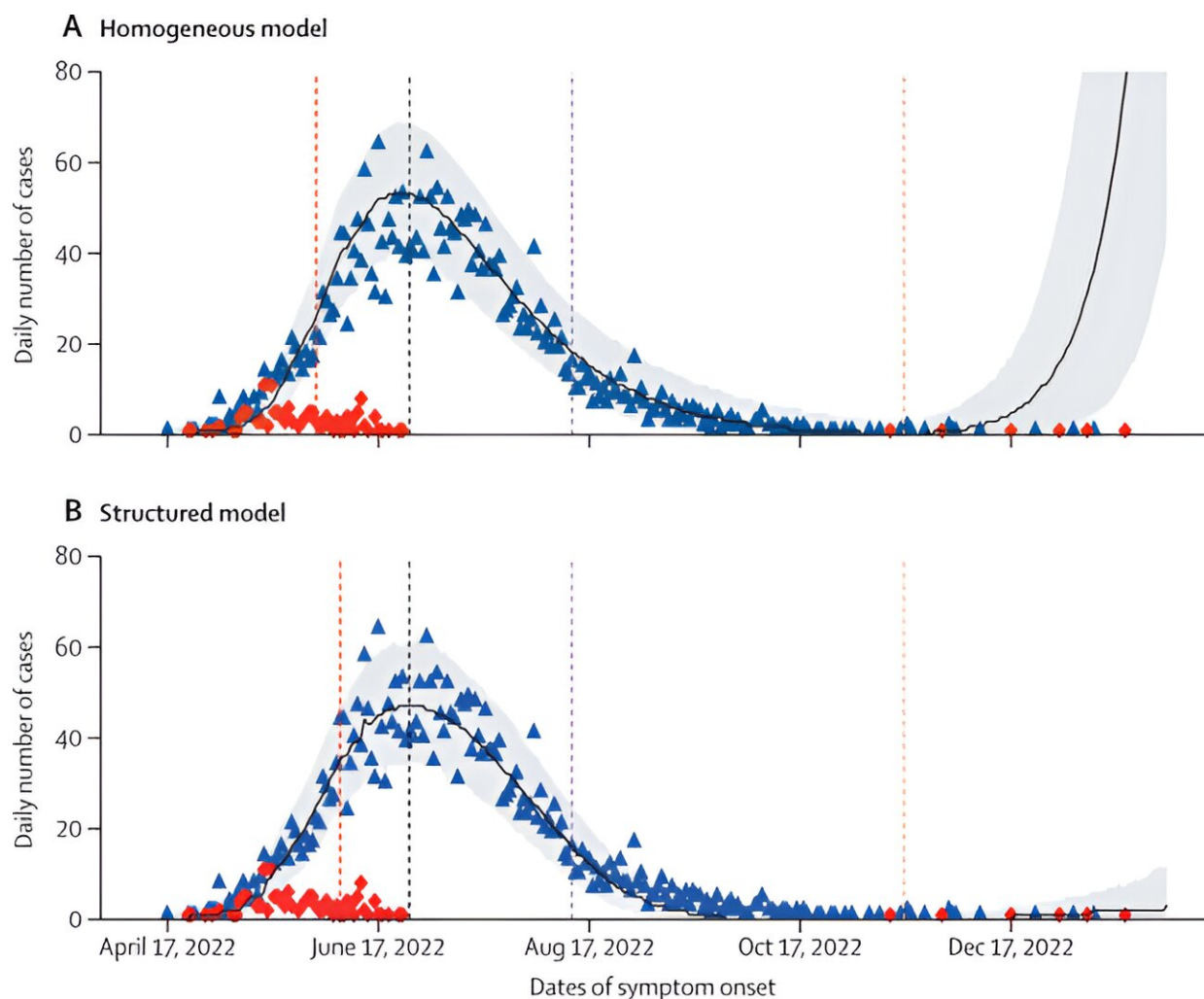


Study: Reductions in sexual mixing ended mpox outbreak in England, vaccination prevented resurgences in 2023

September 12 2023



Comparison of daily case data with our model projections for the 2022 mpox outbreak in England Daily case data (blue triangles) from the 2022 mpox

outbreak in England, and comparison with projections from our calibrated homogeneous model (A) and structured model (B). The new importation of cases is assumed to resume from Nov 16, 2022, with a mean of two cases per month. The red diamonds represent imported cases. The thick black line represents the median model projections and gray shading is their 95% CrI. The four vertical lines represent different timepoints when the following things occur: middle turning point of contact rate (red; June 2 for the homogeneous model and June 5 for the structured model), start of vaccination (black; June 27), the date up to which observational data are used for model calibration (purple; Aug 12), and the date up to which data were used for model validation, and from when the sexual contact rate reverts to pre-outbreak levels (pink; Nov 16). During the validation period (Aug 13 to Nov 16, 2022), the case data exceeded the 95% CrI of the projections of the structured model on only 23 of 95 days. The total number of cases reported was 361 and the model prediction was 240 (95% CrI 191–316). CrI=credible interval. Credit: *The Lancet Infectious Diseases* (2023). DOI: 10.1016/S1473-3099(23)00451-6

The rapid outbreak of mpox (formerly known as monkeypox) in 2022 likely resulted from high levels of sexual mixing among some gay, bisexual and other men who have sex with men (GBMSM), with the initial downturn in cases probably due to a reduction in sexual contacts among these men, according to new research led by the National Institute for Health and Care Research (NIHR) Health Protection Research Unit (HPRU) in Behavioral Science and Evaluation. The HPRU is a partnership between the University of Bristol and the UK Health Security Agency (UKHSA).

The [paper](#), published in [The Lancet Infectious Diseases](#) 11 September, also found that the scale-up in vaccination did not contribute much to the initial downturn in cases, although the very small number of cases in 2023 is likely due to sufficiently high vaccination coverage to prevent a widespread resurgence in cases.

The 2022 global mpox [outbreak](#) spread among GBMSM, with the World Health Organization (WHO) declaring the outbreak a Public Health Emergency of International Concern on 23 July 2022.

The paper describes the results of mathematical modeling to understand the epidemiological characteristics of the mpox outbreak in England, and what contributed to the outbreak ending, to help prevent and control future outbreaks.

The authors used anonymous data from more than 3,000 mpox cases in England between 1 May and 16 November 2022. Using multiple [data sources](#) from these cases as well as data on the number of vaccinations provided the authors carried out a number of detailed analyses of the English outbreak.

Mathematical modeling undertaken by the team estimated that most infections were among a small subgroup of GBMSM at higher risk for mpox, with the outbreak's initial decline probably due to a 45% reduction in the sexual partner rate and a 20% decrease in the time that people were infectious, resulting from improvements in diagnosis and isolation. These changes, partially resulting from UKHSA, NHS and community partners' extensive [health](#) promotion and awareness raising, prevented 165,896 infections by 16 November 2022.

Vaccination of GBMSM at high risk of mpox, which started on 27 June 2022, is estimated to have had less impact on the outbreak's initial decline, but may have prevented a resurgence in cases from January 2023.

Peter Vickerman, Professor of Infectious Disease Modeling from the Bristol Medical School's Population Health Sciences and NIHR Health Protection Research Unit (NIHR HPRU), and the paper's corresponding author, said, "Reductions in sexual risk behavior among GBMSM at high

risk of mpox, together with prompt diagnosis and isolation of people with mpox, can reduce the spread of an mpox outbreak to low levels."

Sema Mandal, Medical Consultant Epidemiologist in the UKHSA Blood Safety, Hepatitis, STI and HIV Division, and the UKHSA's senior author added "While the initial decline in cases was due to less sexual mixing, vaccination among GBMSM at highest risk of mpox has contributed to sustained low numbers of mpox cases and likely prevented a resurgence. Vaccination was key to reducing the severity of symptoms and preventing further transmission. It's important to remember that while mpox case numbers across England remain very low, we are not complacent and stand ready to respond to any significant rise in cases."

The authors highlight the need for more evidence on the protection provided by vaccination in terms of the strength of effect and duration of protection. This is especially important because of emerging evidence that new infections have been occurring among people that have been fully vaccinated.

More information: Xu-Sheng Zhang et al, Transmission dynamics and effect of control measures on the 2022 outbreak of mpox among gay, bisexual, and other men who have sex with men in England: a mathematical modelling study, *The Lancet Infectious Diseases* (2023). [DOI: 10.1016/S1473-3099\(23\)00451-6](https://doi.org/10.1016/S1473-3099(23)00451-6)

Provided by University of Bristol

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