

Smallpox vaccination in childhood could offer protection against monkeypox clade II viruses, study finds

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Credit: National Cancer Institute

A study by co-authors from the ECDC, WHO and national public health institutes in four European countries, and [published](#) in *Eurosurveillance*, has found that prior smallpox vaccination in childhood could protect against infections caused by monkeypox virus (MPXV) clade II in men. However, the estimated degree of protection varied among countries,

highlighting the need for further research to validate the study findings.

In light of the 2022–2023 outbreak of mpox in Europe that mainly affected certain groups with high-risk behavior among men who have sex with men, the study sought to determine the effectiveness of historical [smallpox](#) vaccination during childhood against laboratory-confirmed mpox, to inform vaccination efforts.

Case-based surveillance data were selected from countries that collected information on prior smallpox vaccination status of mpox cases and had available data on historical smallpox vaccination coverage, namely Denmark, France (mainland only), the Netherlands (mainland only) and Spain.

The study analyzed mpox cases born in these countries during the height of national smallpox vaccination campaigns (latest in 1971). Too few mpox cases in females were reported to adjust for sex in the analysis, so only cases recorded as male were included.

Vaccine effectiveness and corresponding 95% [confidence intervals](#) (CI) for each country were then estimated using [logistic regression](#) as per the Farrington screening method. A pooled estimate was then calculated using a random effects model.

Results and public health implications

Estimated historical smallpox coverage was high (80–90%) across all countries until the end of the 1960s, dropping off considerably during the last 10 years of vaccination programs.

Estimates of [vaccine effectiveness](#) of prior smallpox vaccination against mpox caused by MPXV clade II varied widely between countries, ranging from 42% in the Netherlands to 84% in Spain, possibly

reflecting different booster strategies. The pooled vaccine effectiveness estimate was 70% with a wide 95% confidence interval of 23–89%, indicating a high level of uncertainty.

The study findings suggest that historical childhood smallpox vaccination in a European setting could protect two-thirds of men against mpox caused by MPXV clade II. However, there was significant uncertainty in the results and variation between countries. The results of this study are therefore not sufficient to support differential smallpox vaccination to protect against mpox based on historical smallpox vaccination status or age.

The authors recommend that individuals with a high risk of exposure be offered mpox vaccination, regardless of vaccination history. With the recent surge of clade Ib mpox cases in several countries in central and East Africa, there is an urgent need to conduct similar studies on the effectiveness of the smallpox [vaccine](#) against the most recent circulating clade.

More information: Effectiveness of historical smallpox vaccination against mpox clade II in Denmark, France, the Netherlands and Spain, 2022, *Eurosurveillance* (2024). [DOI: 10.2807/1560-7917.ES.2024.29.34.2400139](#).
[www.eurosurveillance.org/conten... S.2024.29.34.2400139](#)

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