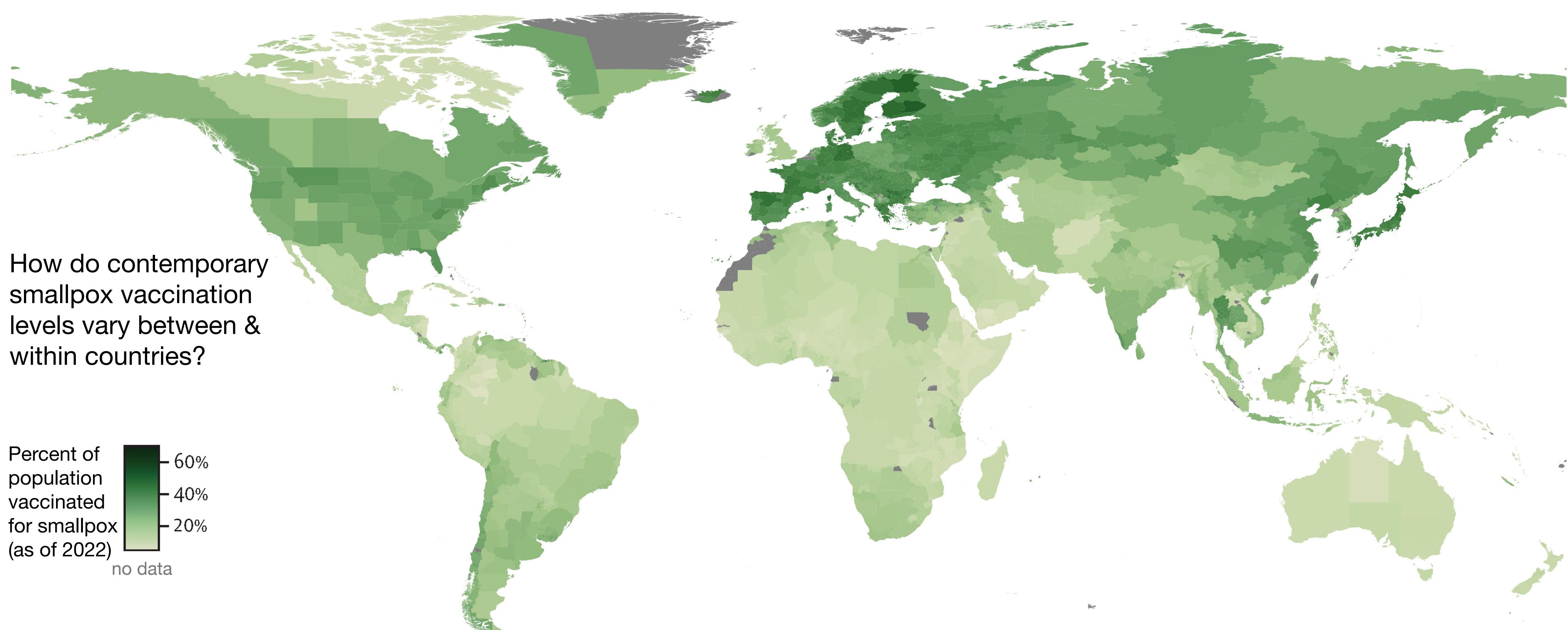


The global landscape of smallpox vaccination history

Implications for current and future orthopoxvirus susceptibility

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Demography drives contemporary smallpox vaccination heterogeneity

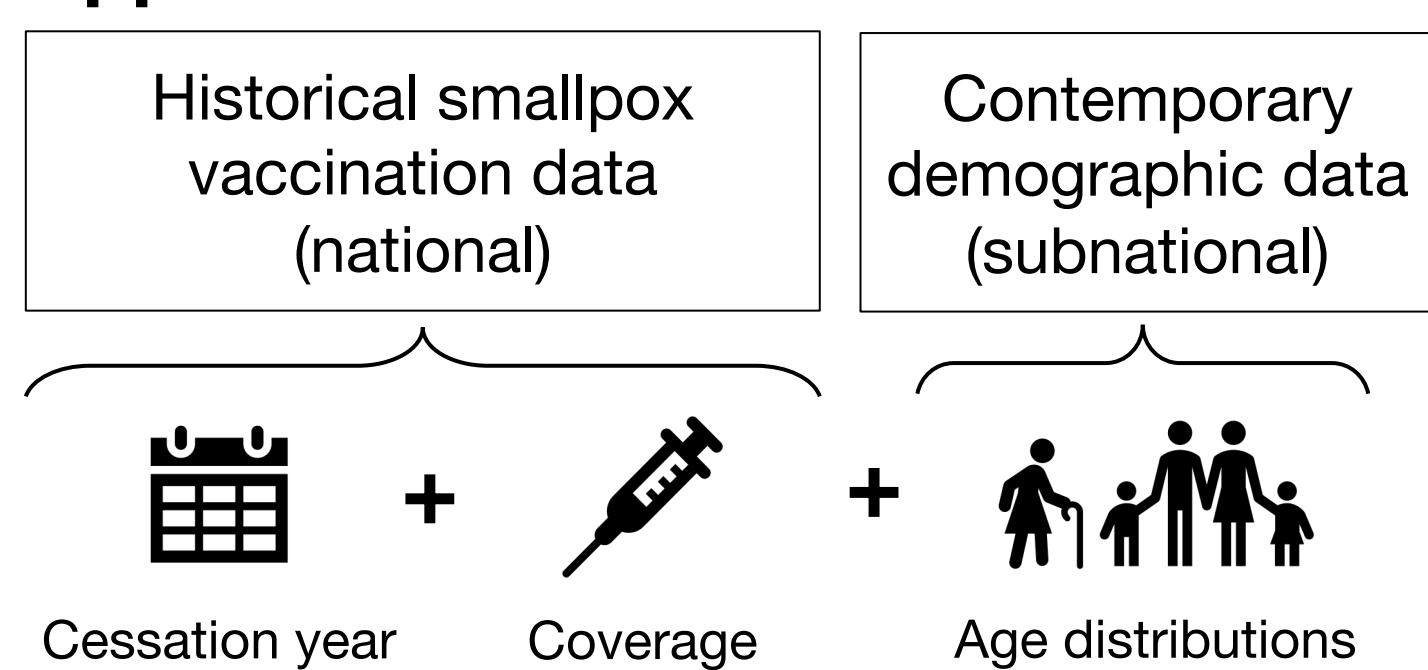
Younger populations are less vaccinated & at greater risk of orthopoxvirus infection

Methods

Motivation

- Historical smallpox vaccination efforts were **heterogeneous** leaving a modern **patchwork** of long-lasting **protection**
- This protection is relevant today due to:
 - Ongoing mpox outbreaks
 - Increasing orthopoxvirus spillover
 - Possibility of smallpox bioterrorism
- We characterized **contemporary** levels of population vaccination against smallpox

Approach

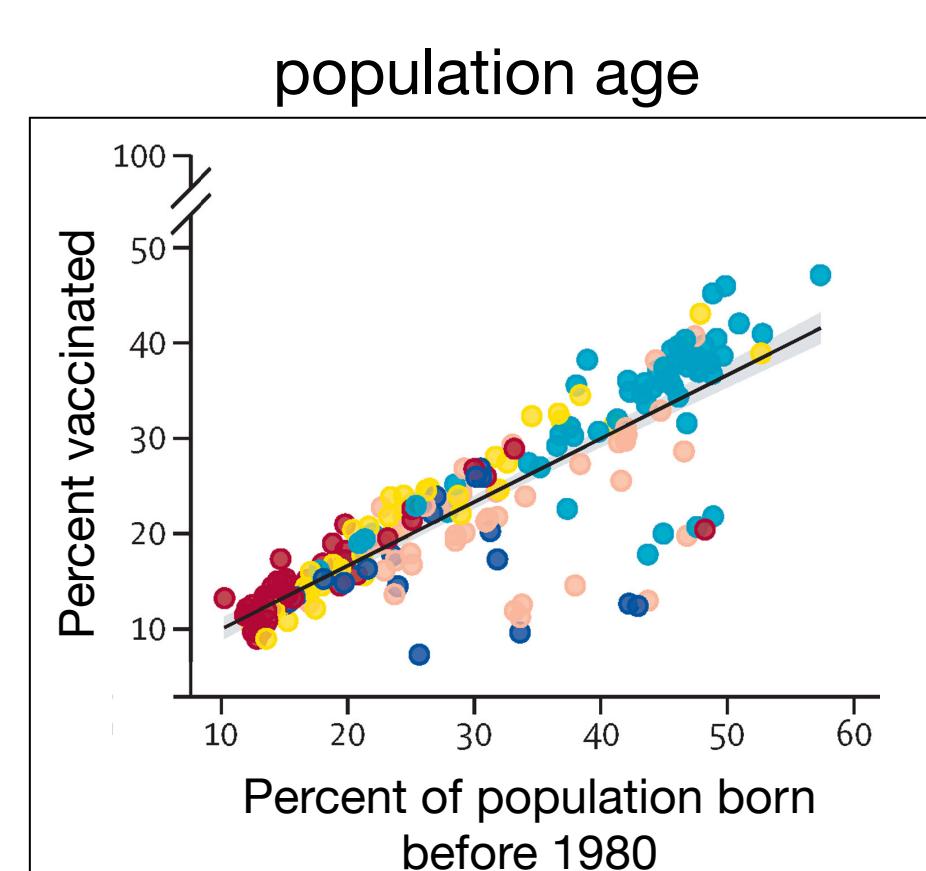


Due to limited data & small expected effects, we did not consider:

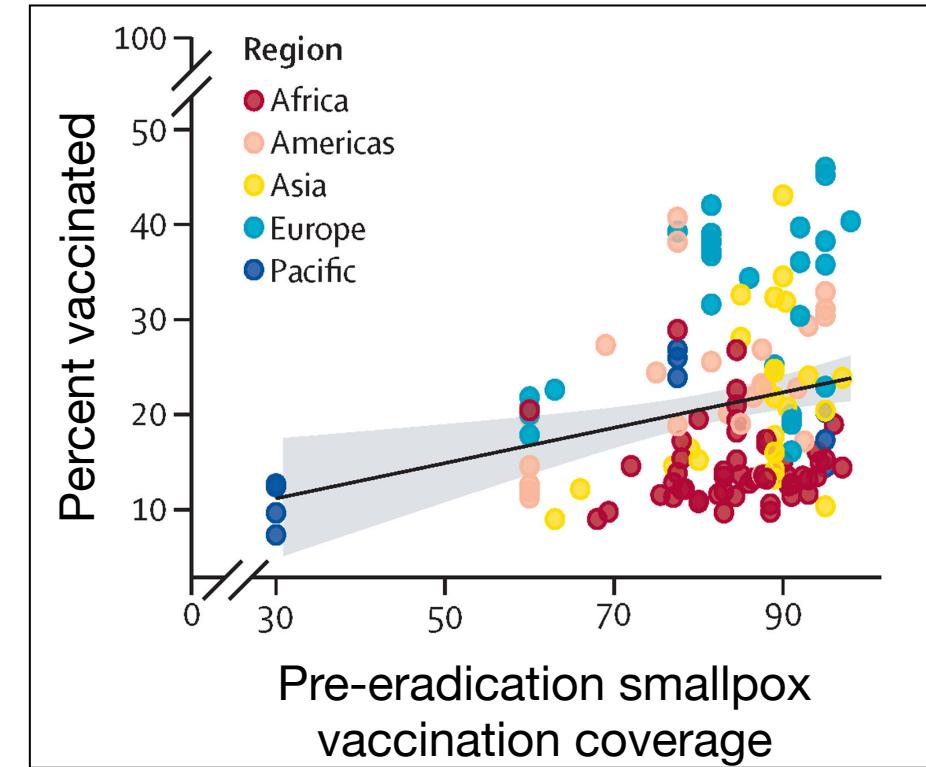
- Natural immunity
- Military vaccinations

Drivers of heterogeneity

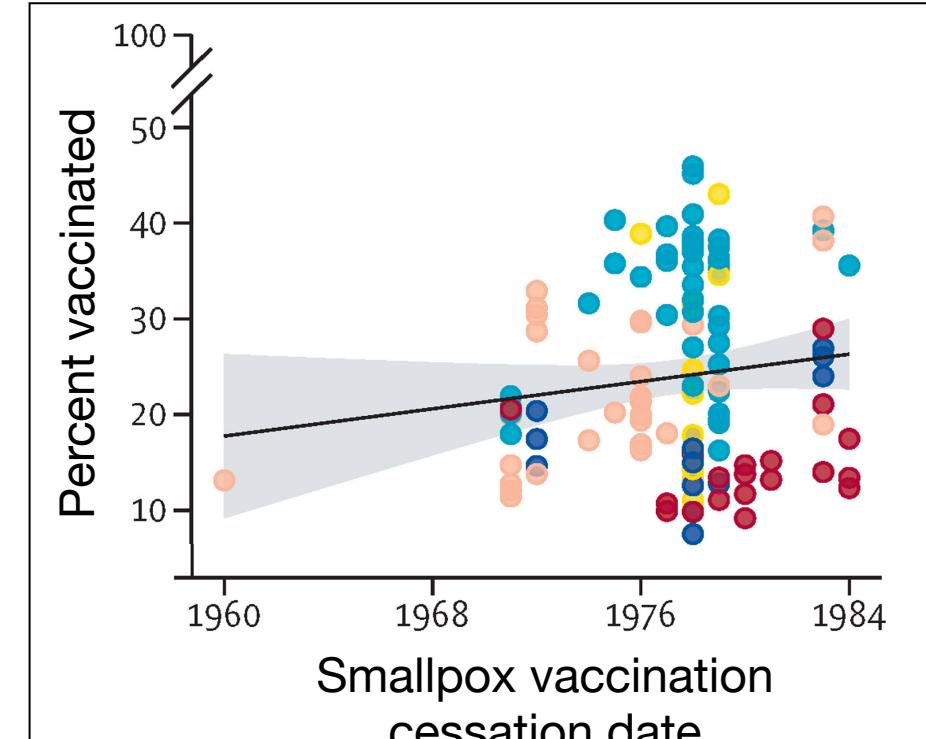
How is contemporary vaccination associated with...



vaccination coverage

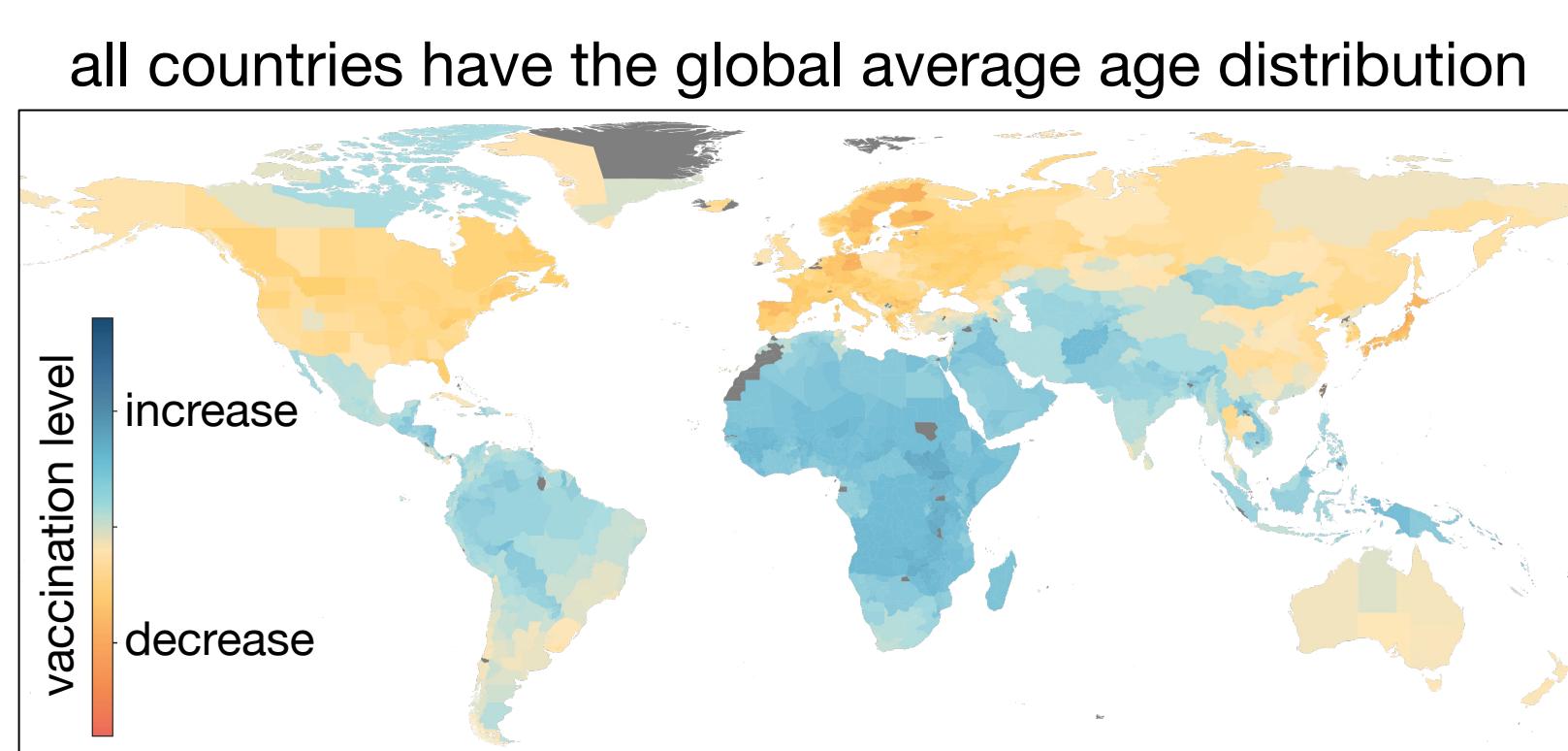


vaccination timing

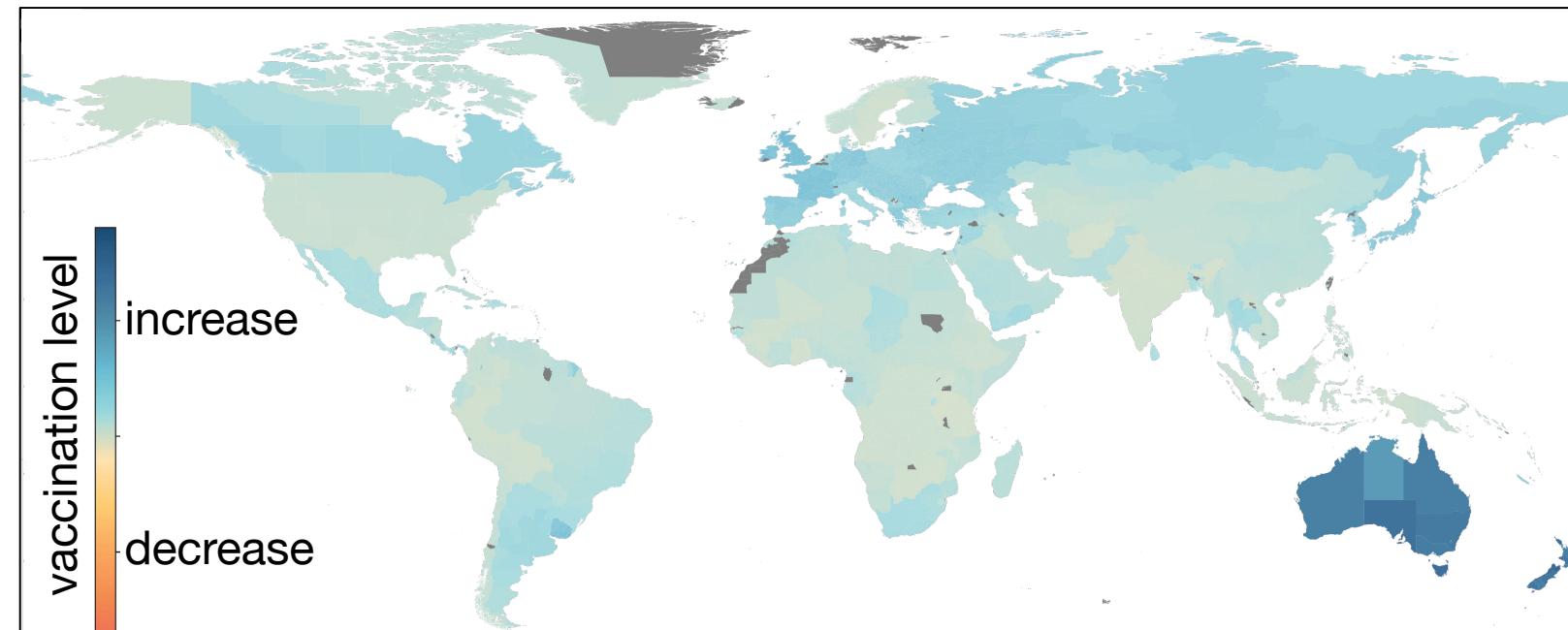


Hypothetical scenarios

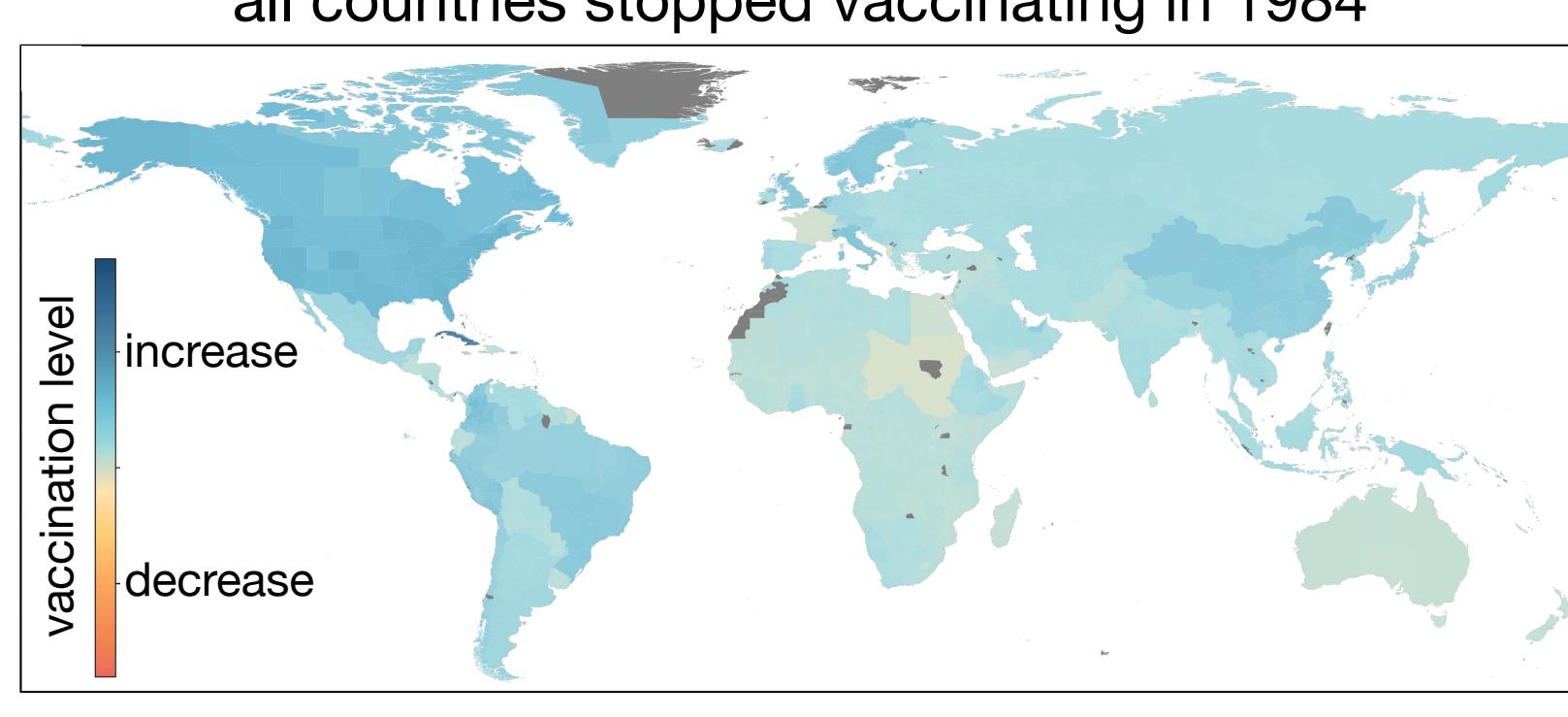
How do predicted contemporary vaccination levels change if...



all countries have the global average age distribution



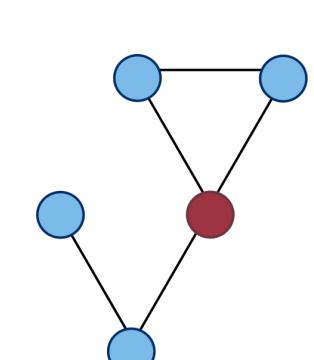
all countries reached 100% vaccination coverage



all countries stopped vaccinating in 1984

Takeaways

- There is currently **substantial global protection** against orthopoxviruses
- But **significant geographic heterogeneity** in protection, driven by demographic differences
- Our estimates can be used to
 - Assess current & future risk
 - Allocate vaccine supplies
 - Predict transmission dynamics



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ESTIMATES

