Sex differences in the risk of *Mycobacterium tuberculosis* infection: a systematic review and meta-analysis of population-based immunoreactivity surveys



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# WHY THE STUDY?

Men have 1.7-times higher tuberculosis incidence than women, but it is not known to what extent this is driven by greater exposure to *Mycobacterium tuberculosis* infection



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# WHAT WE DID

We did a systematic review and meta-analysis to identify community representative surveys where people were tested for *Mycobacterium tuberculosis* immunoreactivity done in high TB incidence countries between January 1993 and December 2022.

### HOW WE ANALYSED

We extracted data on the prevalence of *Mycobacterium tuberculosis* immunoreactivity by age group and sex, and fitted multi-level regression models to investigate how prevalence and annual risk of conversion from negative to positive – indicating exposure – varied by age and sex.

#### WHAT WE FOUND

We included data from nearly half-a-million participants in 81 surveys representing all global regions. From adolescence onwards, men experienced considerably higher immunoreactivity conversion compared to women, resulting in a higher cumulative prevalence. For example, by age 40 and older, adult men had 1.28 times higher prevalence compared to women. Trends were similar across all global regions.

# WHAT THIS MEANS

Men have higher *Mycobacterium tuberculosis* immunoreactivity risk than women, which is likely to be a key driver of the sex differences in global tuberculosis morbidity and mortality.

This difference could be due to higher exposure through social and behavioural differences in time spent in congregate indoor spaces where tuberculosis transmission occurs, further amplified by longer duration of infectiousness in men, and age-assortative and sex-assortative mixing.

Public health interventions addressing men's determinants of *M tuberculosis* exposure will be crucial to ending the tuberculosis epidemic.





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