

# The potential impact of a vaccine on the prevalence of gonorrhoea among urban MSM in Australia

## Authors:

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## Background:

With gonorrhoea treatment under threat due to the emergence of antimicrobial resistance, there is renewed focus on development of a vaccine. We used a mathematical model of *Neisseria gonorrhoeae* transmission among men who have sex with men (MSM) to investigate the potential impact of a gonorrhoea vaccine on gonorrhoea prevalence.

## Methods:

We developed an individual-based, anatomical site-specific model of *N. gonorrhoeae* transmission in an urban MSM population in Australia. We assume a vaccine is offered to individuals who undertake STI testing. The model was run 1000 times for each scenario and the impact on population prevalence was tracked over time for each run. We also investigated the case where the vaccine is assumed to be not protective against infection at the pharynx.

## Results:

If vaccination uptake is 30% of those testing for STI, and the vaccine reduces susceptibility to and transmissibility of infection by 50% for a period of two years on average, gonorrhoea prevalence among MSM is predicted to decline from 13.6% (IQR: 11.9 – 15.6) at baseline to 2.1% (IQR: 1.2 – 3.3) within 5 years. However, the decline is considerably smaller if the vaccine does not protect against pharyngeal infection, with prevalence only declining to 12.1% (IQR: 10.4 – 14.0) within 5 years.

## Conclusion:

As pharyngeal gonorrhoea is an important driver of *N. gonorrhoeae* transmission among MSM, a gonorrhoea vaccine will likely need to be effective at the pharynx in order to substantially reduce prevalence in this population.

## Disclosure of Interest Statement:

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