

# Modelling the potential impact on HIV transmission of a rectal microbicide used by men who have sex with men and the effects of condom substitution

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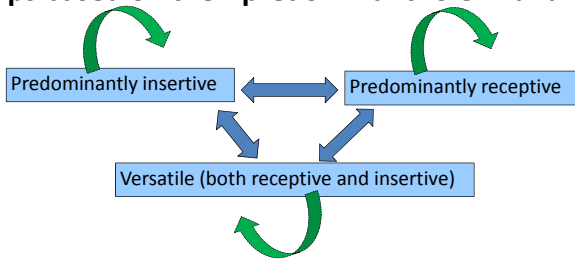
## Background:

- In India and Peru the HIV epidemic remains concentrated in high-risk groups including men who have sex with men (MSM).
- Given the challenges of condom use, interest has grown on the potential role of a rectal microbicide for MSM.
- There are no previous estimates of the likely public health impact of a rectal microbicide in any low- or middle-income country.

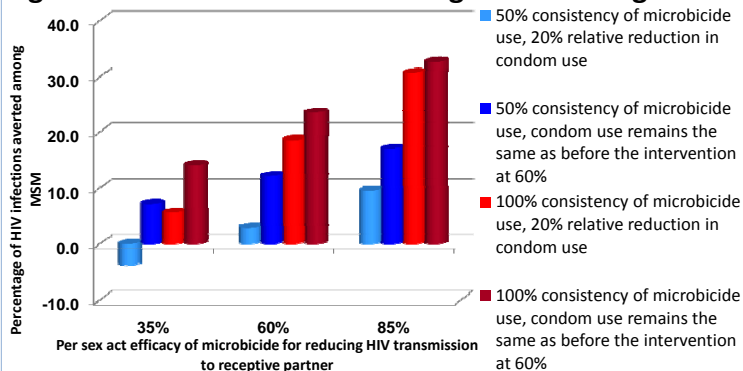
## Methods:

- Detailed epidemiological and behavioural data from Bangalore, India, and Lima, Peru, were used to parameterise and fit a deterministic compartmental model.
- The joint transmission dynamics of HIV, syphilis and herpes were simulated between three behavioural subgroups of MSM.
- Potential evolution of the HIV epidemic was investigated with and without a 5-year microbicide intervention.
- It was assumed that 30% of the total MSM population would be reached by the intervention and various scenarios of efficacy and consistency of use were explored, including reduced condom use.

**Figure 1: The MSM population is subdivided into 3 groups based on their predominant role in anal sex**

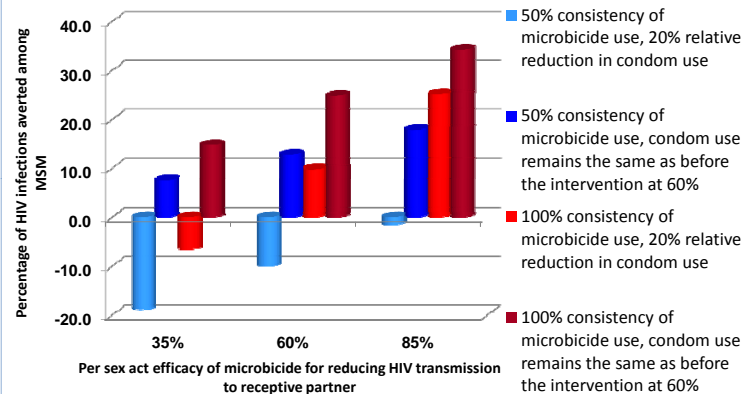


**Figure 2: Infections averted among MSM in Bangalore**



(Where consistency of microbicide use is defined as the percentage of non-condom protected MSM anal sex acts in which microbicide is used.)

**Figure 3: Infections averted among MSM in Lima**



## Results:

- Figures 2 and 3 illustrate that an 85% HIV-efficacious microbicide used by 30% of MSM in half of non-condom-protected anal sex acts could avert over 17% of HIV infections among MSM in both settings over 5 years, if condom use remains at pre-microbicide levels.
- If 20% fewer sex acts are condom-protected after microbicide introduction, then impact lessens, and HIV infections are predicted to increase among MSM in Lima.

## Conclusions:

- This study highlights the importance of pursuing further research and investment for developing rectal microbicides.
- The public health benefit from an effective rectal microbicide could be considerable if used consistently, but condom use must be maintained in order to avoid potentially increasing risk.

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 • **Data:** Bangalore data were collected as part of the monitoring and evaluation of Avahan, the India AIDS initiative, funded by the Bill & Melinda Gates Foundation, and the Lima data were from the sentinel surveillance and supplemented with data from HPTN 039