

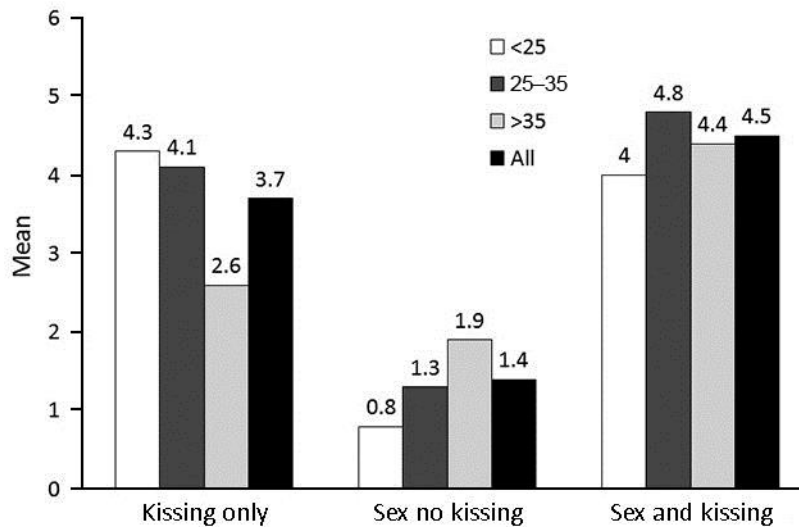
# Frequent Transmission of Gonorrhoea in Men Who Have Sex with Men

## Technical Appendix

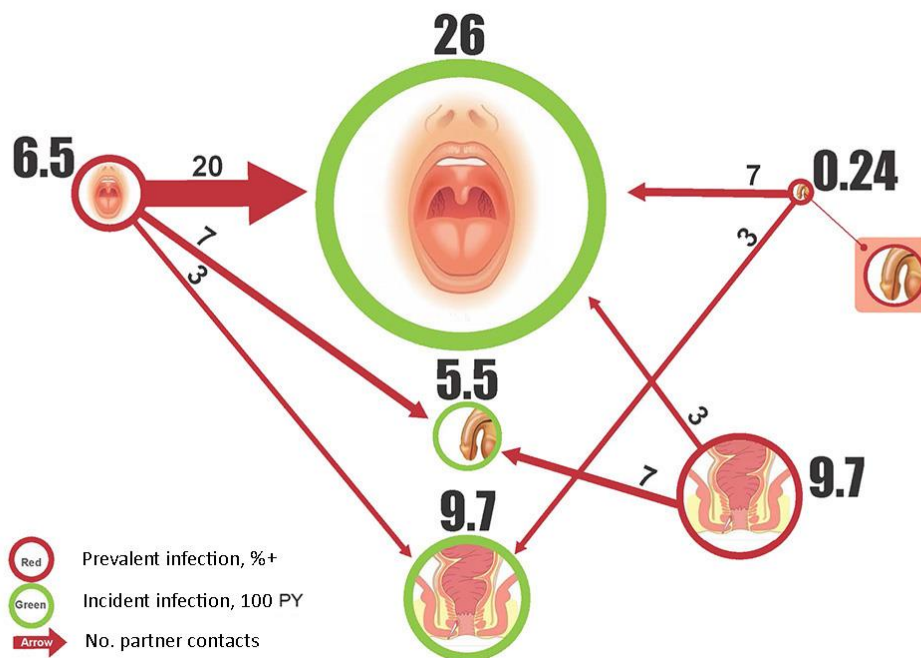
**Technical Appendix Table.** References referring to the throat as a transmission route for gonorrhoea between men\*

Transmission route	Comment	References
Throat-to-penis and anus-to-penis	Studies demonstrate that $\approx 1/3$ of urethral gonorrhoea in MSM is acquired from oral sex and $\approx 2/3$ from anal sex.	(1–3)
Throat-to-anus and anus-to-throat	A risk factor for anal gonorrhoea was receiving oro-anal sex. Incidence of pharyngeal gonorrhoea was higher in those who reported insertive oro-anal sex. Saliva is culture positive in a substantial proportion of throat-positive cases.	(3–7)
Throat-to-throat	The incidence of pharyngeal gonorrhoea was higher in men who reported tongue kissing. A case report in which kissing was the most likely explanation for transmission.	(4,8)

\*MSM, men who have sex with men.



**Technical Appendix Figure 1.** Kissing and sex partners among men who have sex with men (MSM) by age in previous 3 months. The results from a survey of 1,151 MSM attending Melbourne Sexual Health Centre in 2016. Kissing only refers to the mean number of tongue kissing partners without any sex (oral or anal). Sex no kissing refers to the mean number of sex partners in which there was no tongue kissing. Sex and kissing refers to the mean number of sex partners in which tongue kissing occurred.



**Technical Appendix Figure 2.** The prevalence and incidence of gonorrhea and sexual practices in men who have sex with men (MSM) by anatomic site. Prevalence data of pharyngeal and rectal gonorrhea and annual incidence of urethral gonorrhea from Barbee et al. (9). We estimated the incidence of pharyngeal and rectal gonorrhea and prevalence of urethral gonorrhea from various references (9–11). Red circles show the prevalence of gonorrhea at specific sites of potential sex partners. Green circles show site-specific incidence. The size of the circles is proportional to the prevalence (proportion positive) and incidence (per 100 person-years [PY]). The line thickness and numbers on the lines refer to the number of partners with this sexual exposure in a given year, considering an average of 10 sex partners a year (12). Our data on kissing-only partners indicates that it is about double the number of sex partners (i.e., 20 persons) (13). Prevalence of urethral gonorrhea was calculated by taking the incidence of 5.5 and assuming it was infectious for 1 week ( $5.5/52$ ) and assuming 10% were asymptomatic and persisted for 3 months untreated ( $[5.5 \times 0.1]/4$ ). Penis-to-penis and anus-to-anus transmission were assumed to be rare.

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