



**MONASH**  
University



**MSHC**  
MELBOURNE SEXUAL HEALTH CENTRE  
Part of **AlfredHealth**

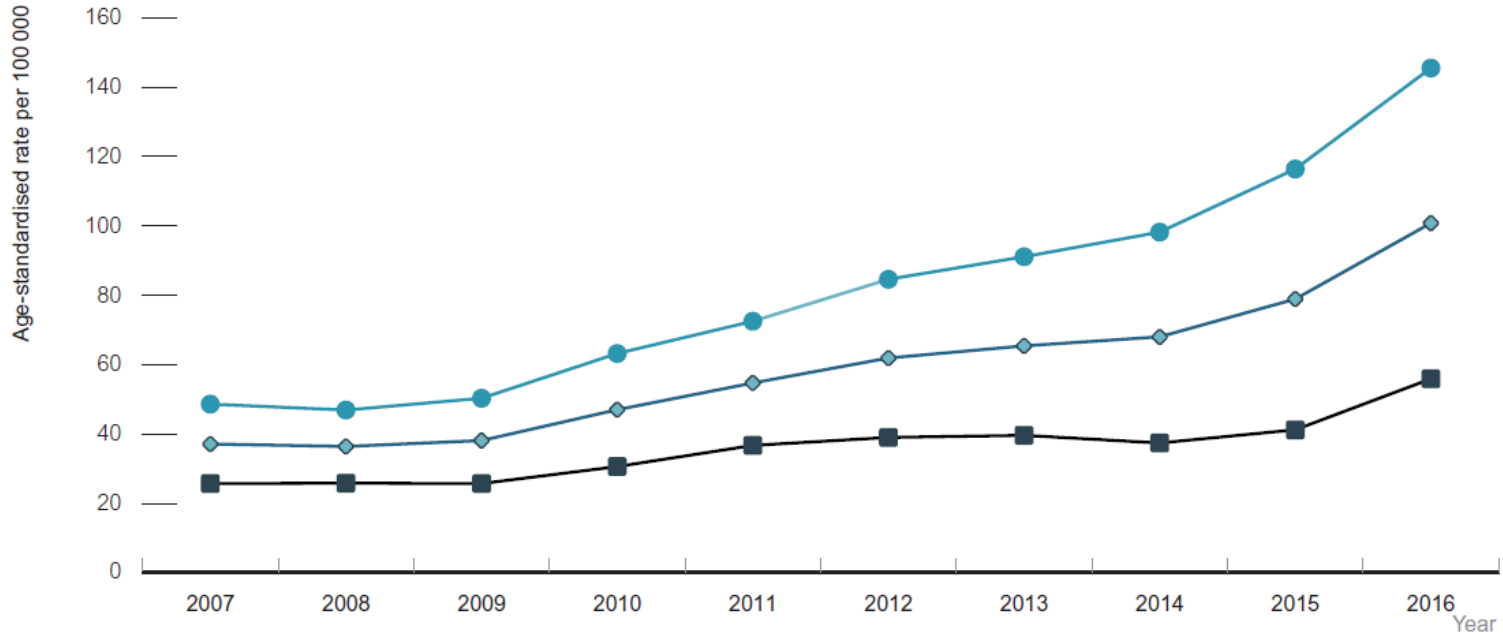
**Evidence for a new paradigm of gonorrhoea transmission.  
Concordance of gonorrhoea infections by anatomic site in  
same-sex male couples.  
A cross-sectional observational study.**

Vincent J. Cornelisse, Deborah Williamson, Lei Zhang, Marcus Y. Chen,  
Catriona S. Bradshaw, Jennifer Hoy, Eric P. F. Chow, Christopher K. Fairley

 [DrVinCornelisse](#)

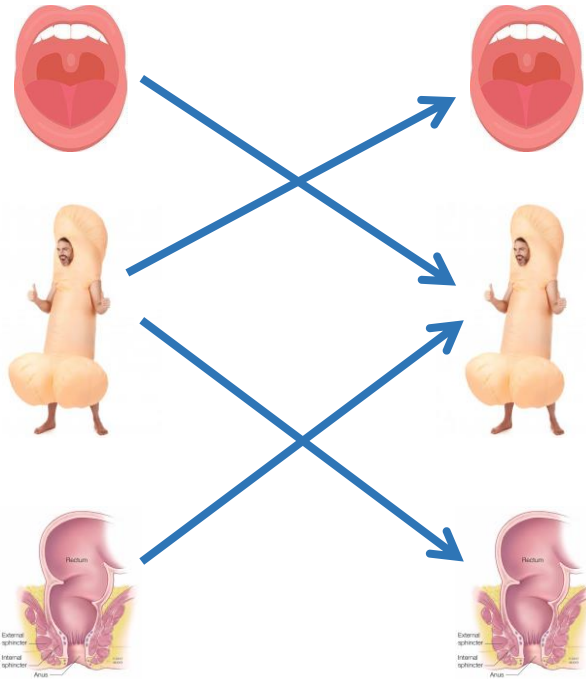


Figure 3.2.1 Gonorrhoea notification rate per 100 000 population, 2007–2016, by sex



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
● Male	48.6	46.9	50.3	63.2	72.5	84.6	91.1	98.2	116.4	145.5
■ Female	25.7	25.8	25.7	30.6	36.7	39.0	39.6	37.4	41.2	55.9
◆ Total	37.1	36.4	38.1	47.0	54.7	61.9	65.4	68.0	78.9	100.8

# Conventional paradigm of gonorrhoea transmission



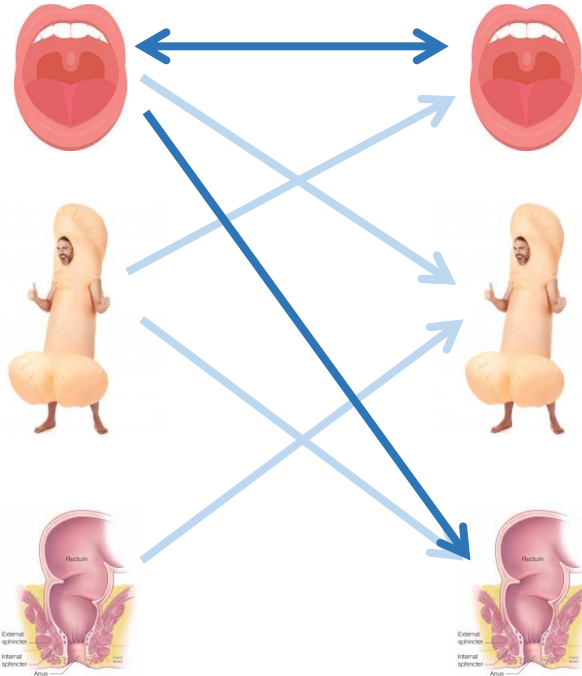
**Conventional paradigm:** The penis plays a “central” role in the transmission of gonorrhoea between men.

## Problem:

To sustain high prevalence, gonorrhoea needs an asymptomatic reservoir.

In the vast majority of cases, the penis is obviously symptomatic within days of exposure.

# New paradigm of gonorrhoea transmission



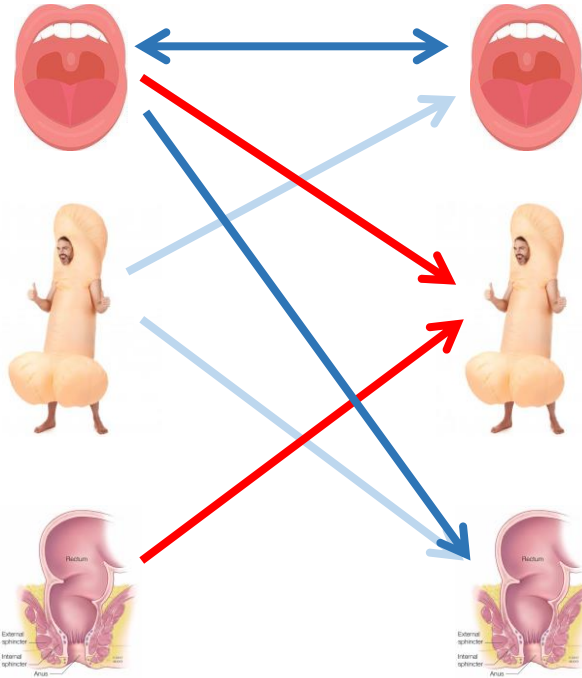
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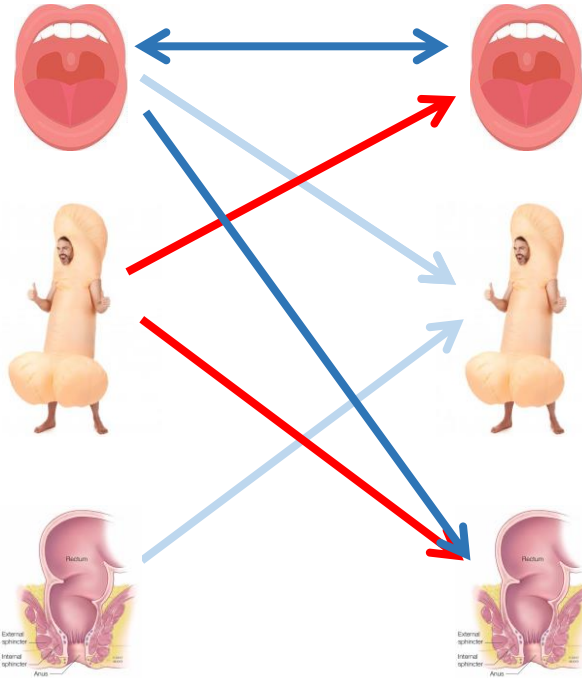
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# New paradigm of gonorrhoea transmission



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# Our Aim

To analyse gonorrhoea diagnosis data from male couples to examine whether gonorrhoea concordance by anatomic site supports the conventional or new paradigm.

# Methods

- Cross-sectional retrospective analysis of clinic data.
- Data period: 25<sup>th</sup> March 2015 to 29<sup>th</sup> June 2017
- Included all men who attended the clinic together with their male partner.
- Excluded couples with incomplete testing for gonorrhoea by NAAT  
(anal swab, throat swab, first pass urine)
- For couples where both partners had gonorrhoea culture samples available, we conducted whole genome sequencing to assess whether the gonorrhoea from the two partners was phylogenetically related.

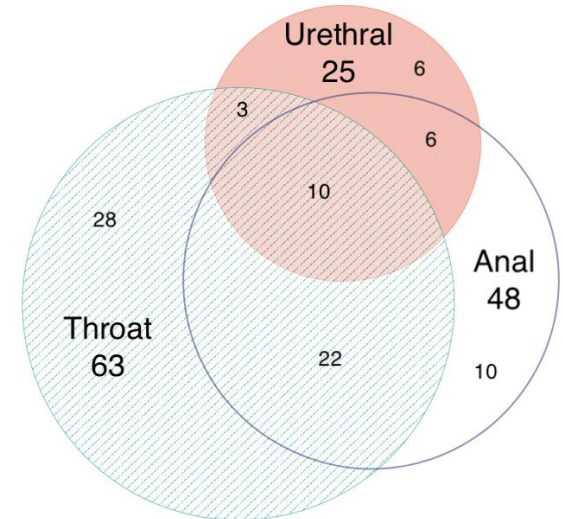


# Included couples

- 417 couples (834 men) presented to the clinic together on the same day.
- 315 couples (630 men) had complete testing for gonorrhoea.
- In 60 couples (120 men) at least one partner tested positive for gonorrhoea, and form the basis for this analysis.

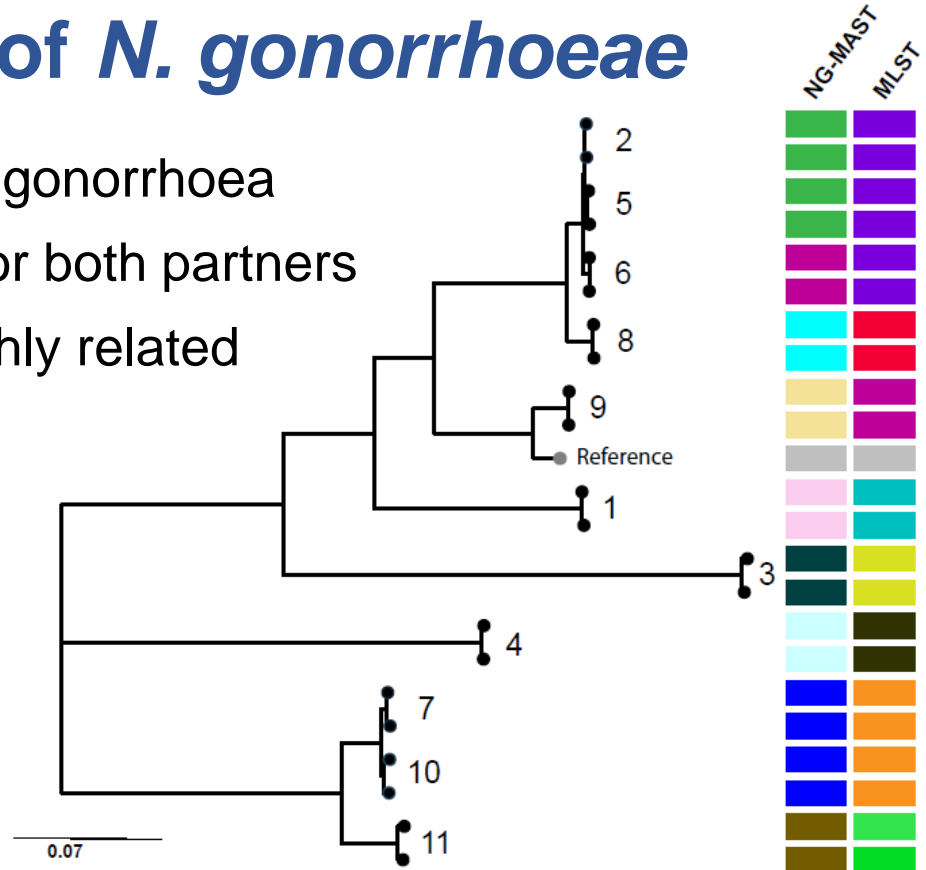
## Included men:

- Median age 30 (IQR 25-36)
- 85 men had gonorrhoea (see Venn)



# Genomic relatedness of *N. gonorrhoeae*

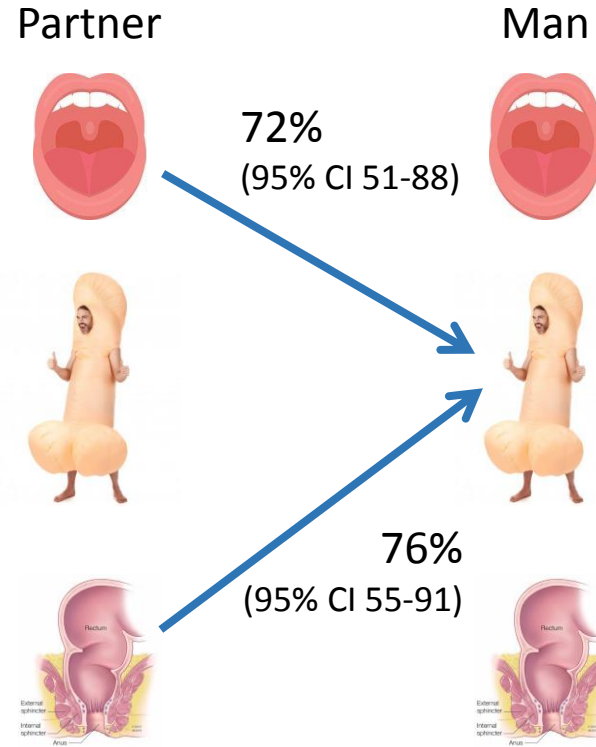
- In 25 couples, both partners had gonorrhoea
- In 11 couples, culture available for both partners
- In all 11 couples, gonorrhoea highly related



# Urethral gonorrhoea

Background rates:

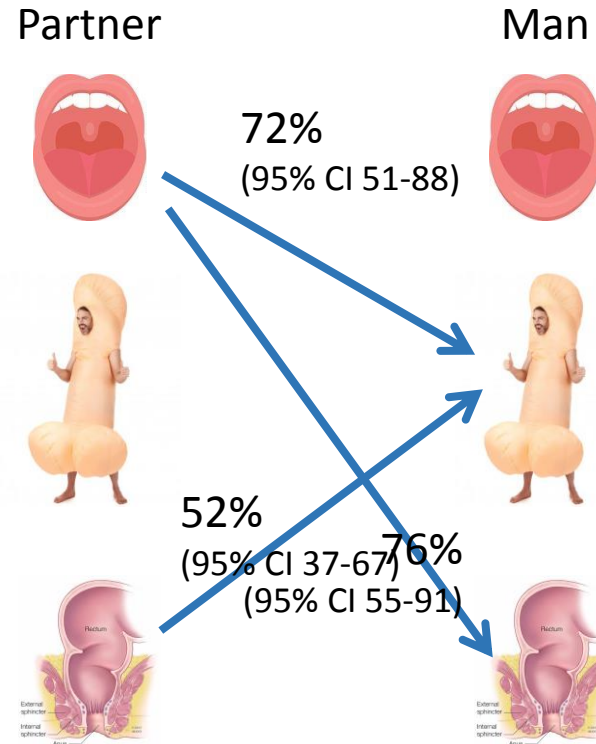
- Throat: 10.0% (95% CI 8 to 13)
- Anus: 8% (95% CI 6 to 10)



# Throat-anus gonorrhoea

Background rates:

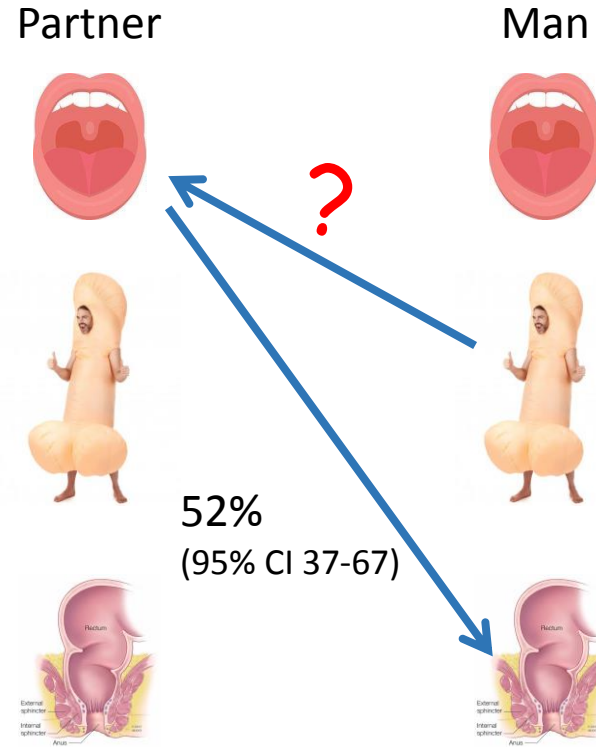
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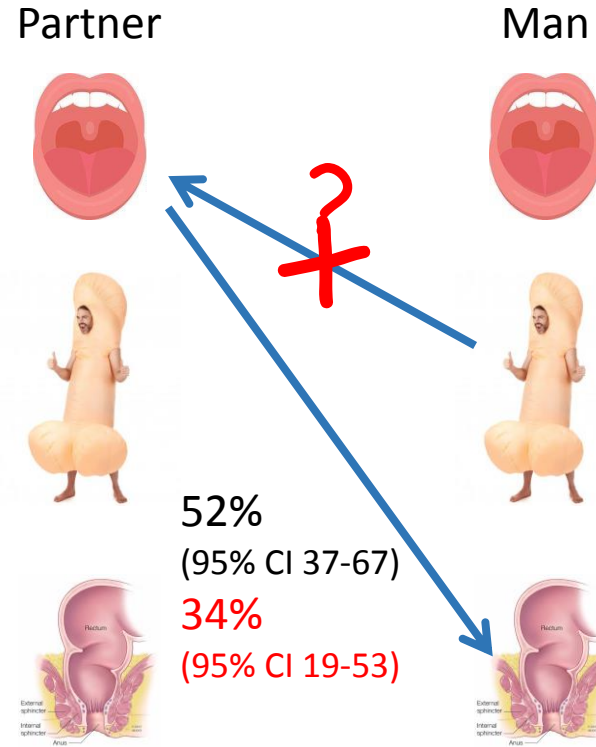
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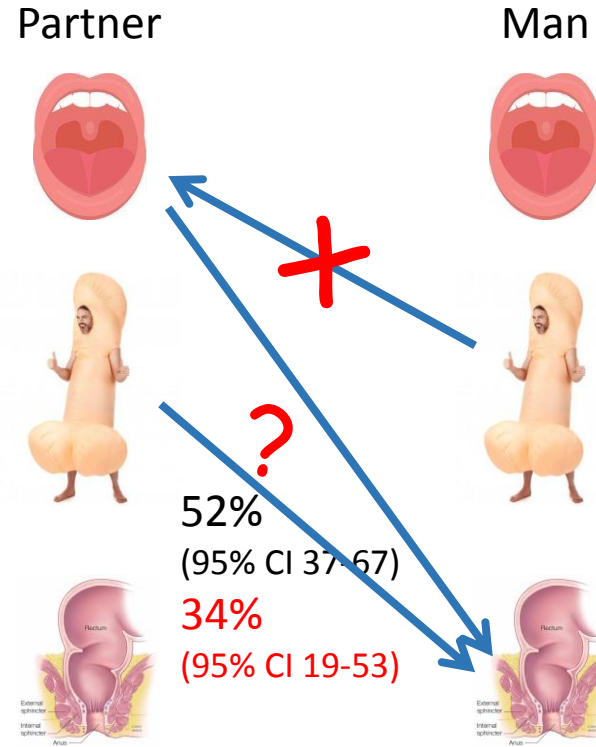
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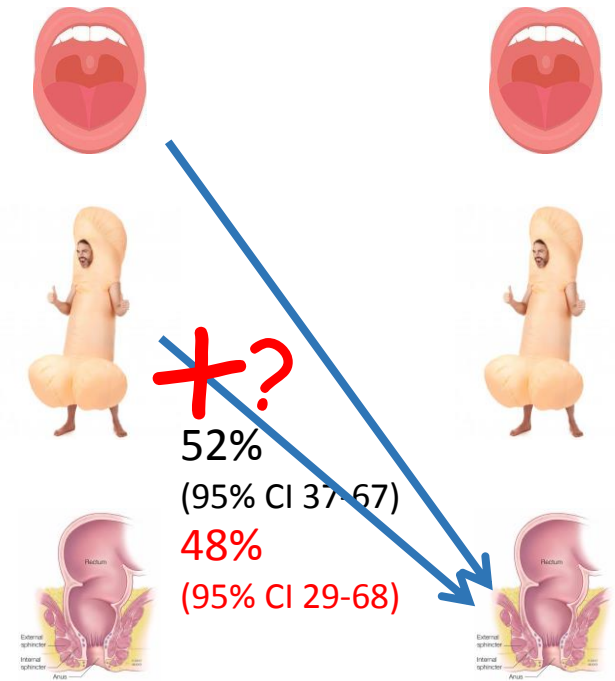
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Partner

Man





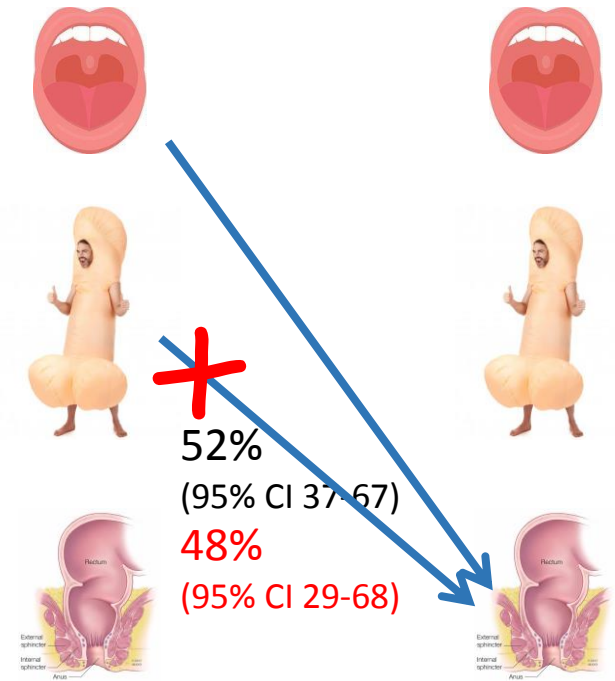
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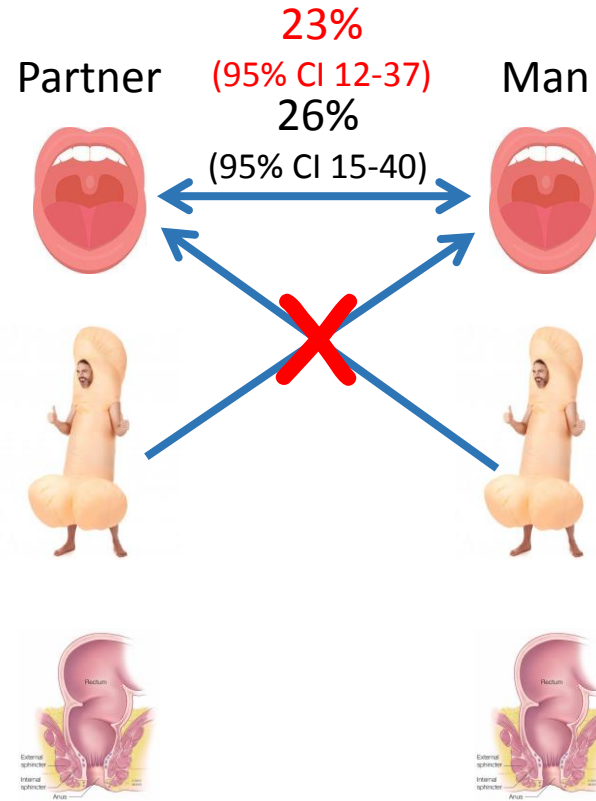
Man

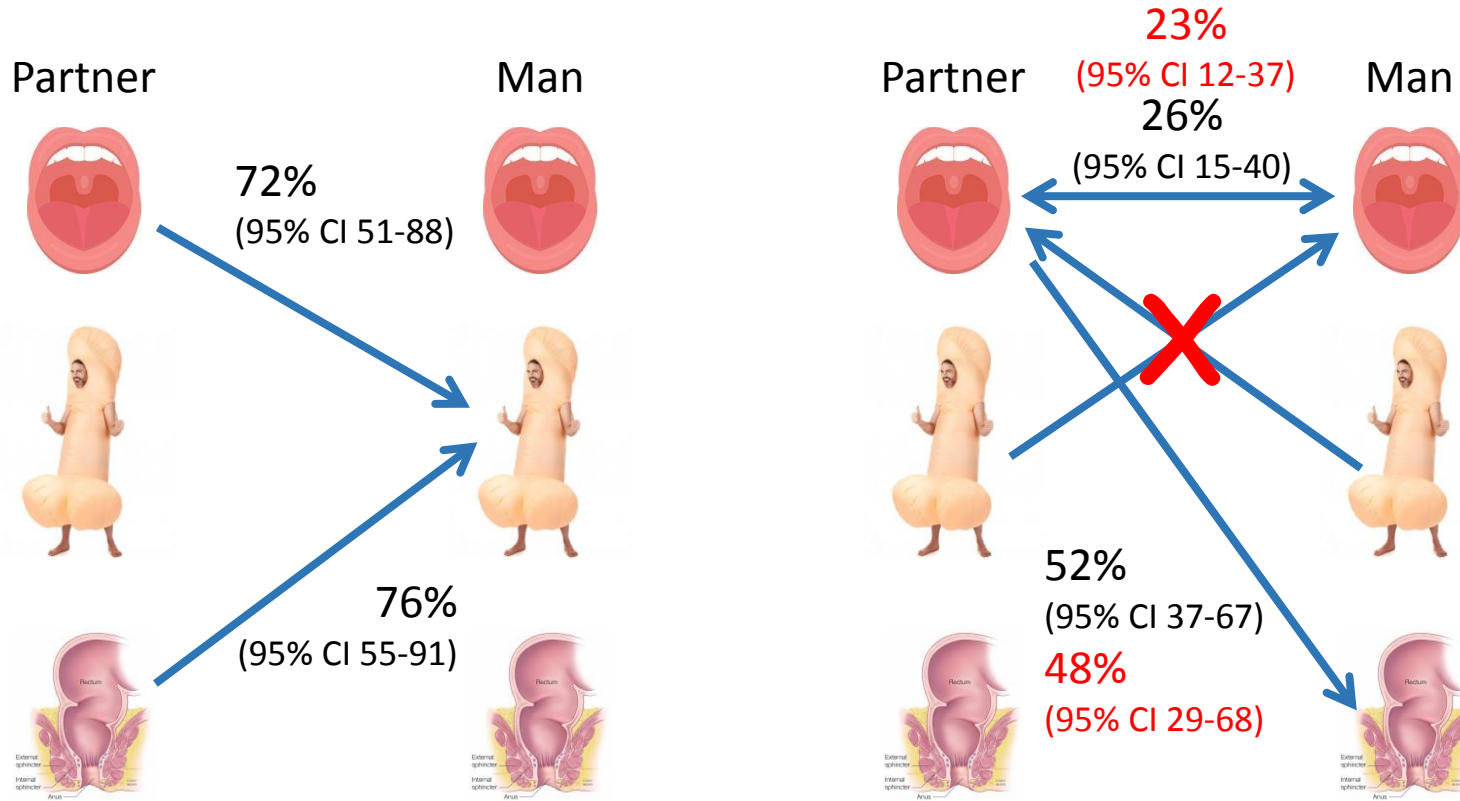


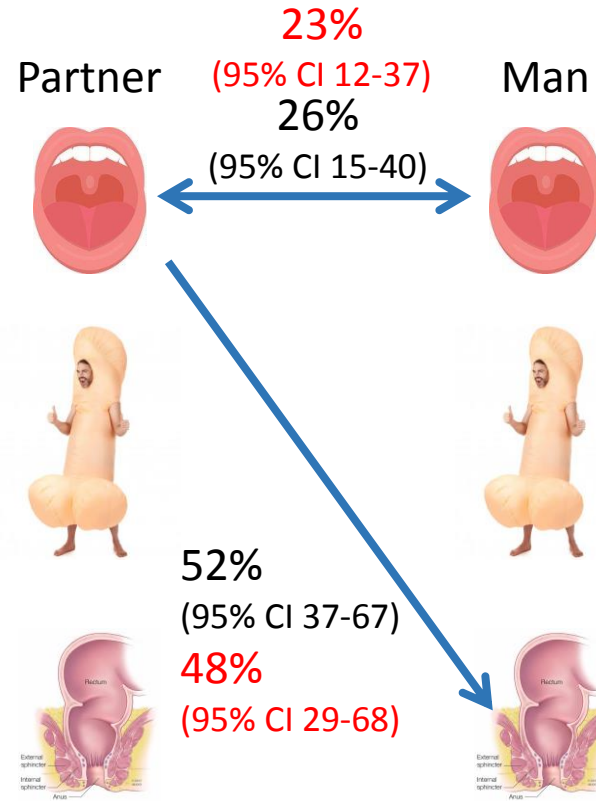
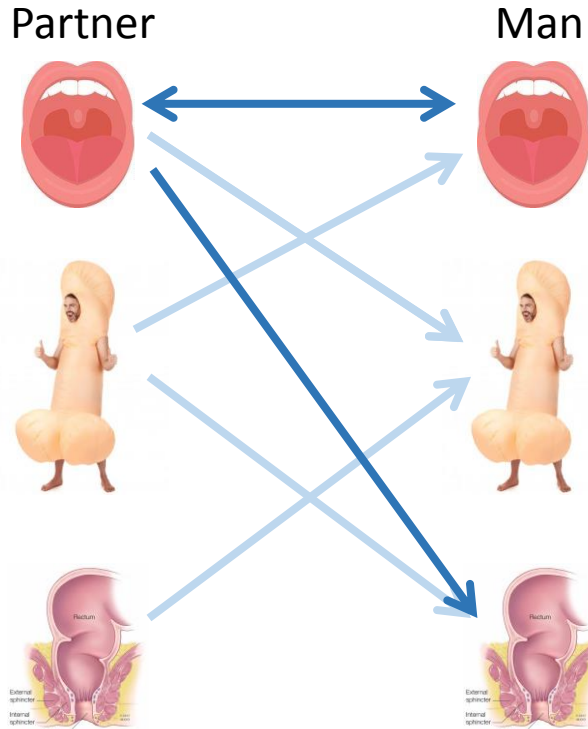
# Throat-throat gonorrhoea

Background rates:

- Throat: 10.0% (95% CI 8 to 13)
- Anus: 8% (95% CI 6 to 10)

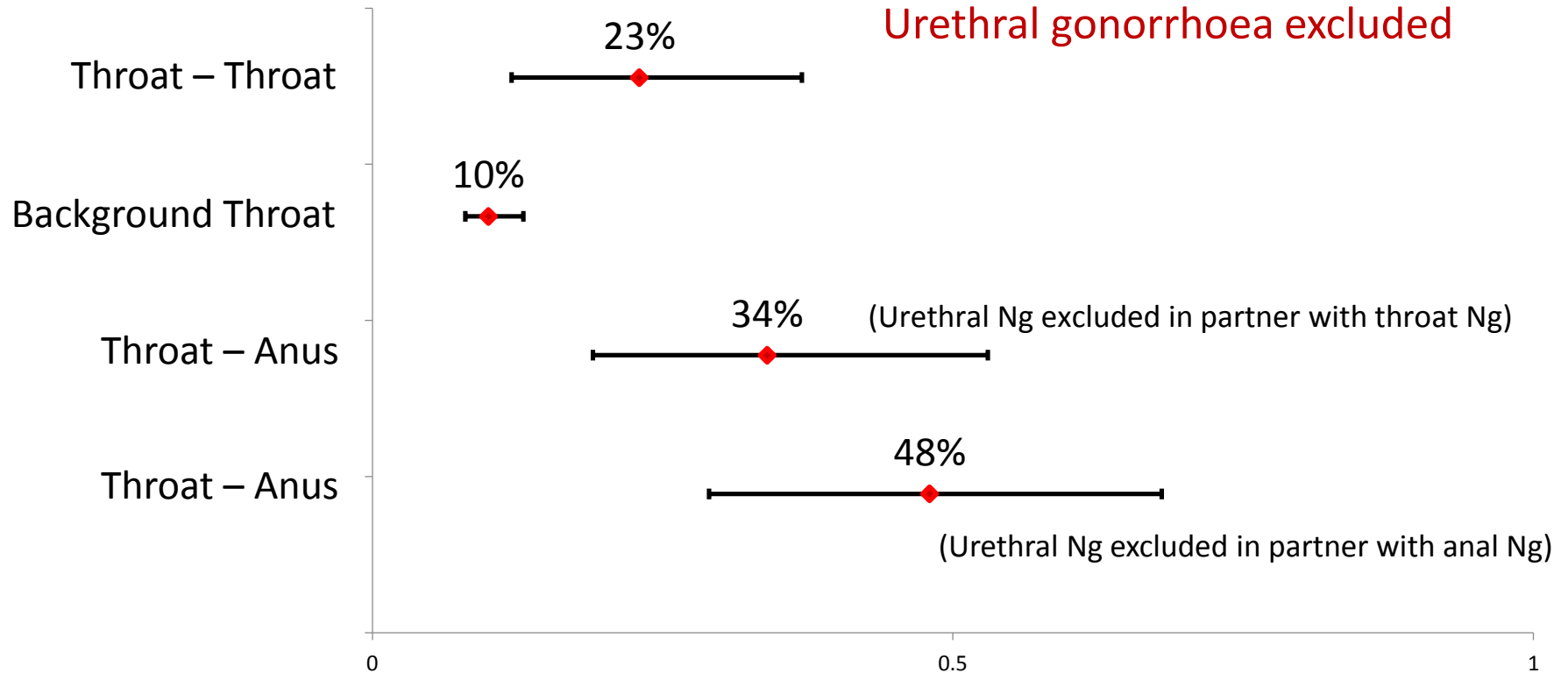






# Conclusions

- In the absence of urethral infection, throat/throat concordance of gonorrhoea was common (23%) as was throat/anus concordance (48%).
- These percentages and the lower ends of their 95% confidence intervals are higher than would be expected to occur by chance (about 8-10%), given overall gonorrhoea positivity among the 630 men of 10% for throat and 8% for anal gonorrhoea.
- These data are not consistent with current thinking on gonorrhoea transmission between men, but are consistent with a new paradigm of gonorrhoea transmission, where the a man's throat plays a central role in transmission to all three anatomic sites in his partners, presumably through infected saliva.





Juan Hidalgo



