Impact and cost-effectiveness of doxycycline post-exposure prophylaxis for sexually transmitted infections in Australian men who have sex with men

ACCEPTANCE CODE
EE66

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① Background & Objective

The optimal implementation of doxy-PEP in Australian GBMSM remains uncertain because broader eligibility may increase antimicrobial resistance and alter cost-effectiveness.

Objective: compare five targeted strategies with no doxy-PEP over 2025–2034 across epidemiological, resistance and economic outcomes.

② Model & Strategies

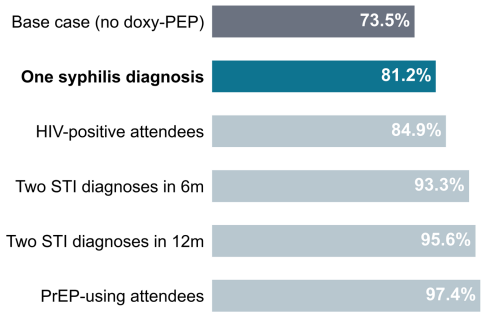
- Individual-based stochastic network model of gonorrhoea, chlamydia and syphilis.
- Calibrated to national data (900 independent simulations)
- 75% uptake · 80% adherence · within 72 hours · 6-month prescription.

Five targeting strategies

1. One syphilis diagnosis
2. Two STI diagnoses in 6 months
3. Two STI diagnoses in 12 months
4. HIV-positive attendees
5. PrEP-using attendees

③ Antimicrobial Resistance

HL TetR (proxy for doxycycline resistance) rose under every strategy; syphilis targeting added the fewest resistant infections (+955 vs +3,412 PrEP-wide).



④ Economic Findings

All five strategies were cost-saving.

The syphilis strategy had the highest BCR: 9.2 (95% UI 7.1–11.3).

Infections averted per prescription: 7.6 for syphilis targeting versus 2.1 for PrEP-wide eligibility.

⑤ Decision Trade-off

Syphilis-targeted

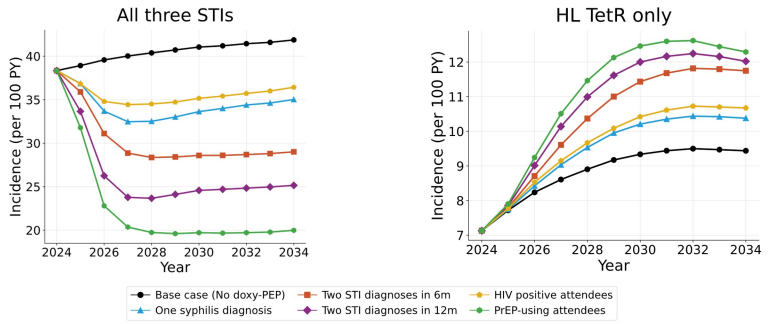
16.4% fewer STIs,+955 HL TetR infections, BCR 9.2

PrEP-using attendees

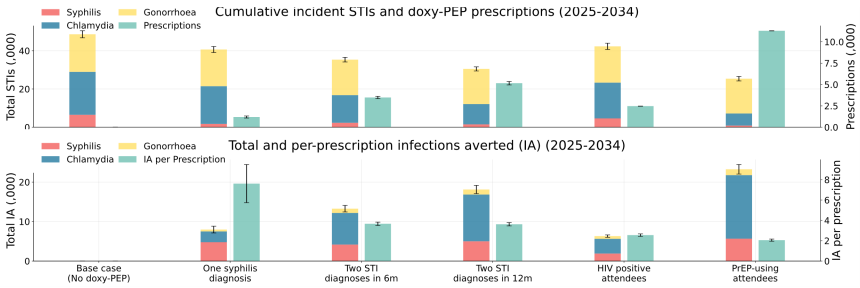
47.8% fewer STIs, +3,412 HL TetR infections, BCR 1.9

Interpretation: broader eligibility maximized infections averted, but reduced efficiency and increased the resistance burden.

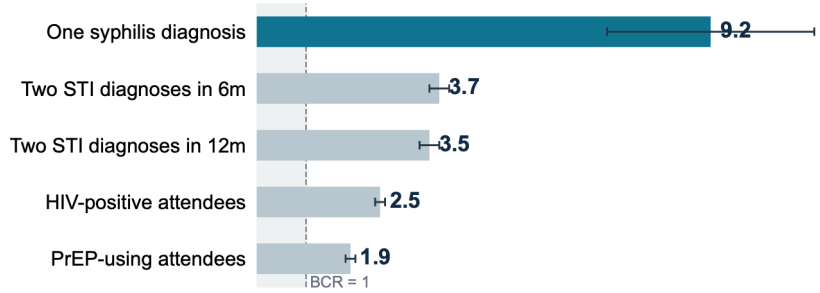
Incidence | STIs fell, tetracycline-resistant gonorrhoea rose



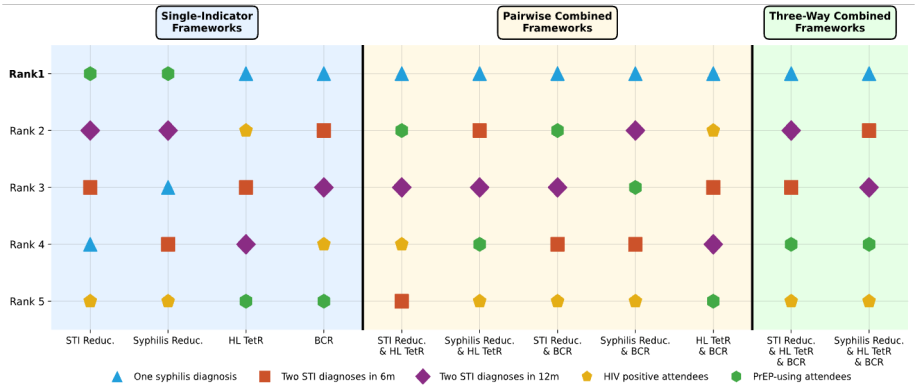
Cumulative Impact | 2025–2034 · 95% UI · n = 900



Benefit-Cost Ratios | All strategies were cost-saving



Multi-criteria Ranking | Eleven policy frameworks



Conclusion

Targeting GBMSM after a syphilis diagnosis provided the strongest overall balance of STI prevention, antimicrobial resistance and economic value. It reduced overall STIs by 16.4%, had the highest BCR (9.2), and ranked first in 9 of 11 policy frameworks.

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