Potential benefits of **screening for gonorrhea** in two urban centers: exploratory mathematical modeling analysis

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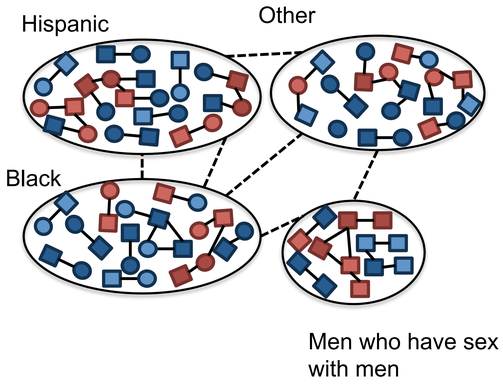
Background

How do local epidemiological patterns influence the estimated impact of gonorrhea screening interventions in the United States?

- San Francisco and Baltimore represent high-burden areas for gonorrhea, with distinct epidemiologic profiles
- The study presents exploratory analyses of potential screening impact in presence of idealized interventions
- In San Francisco, infection burden is concentrated among men who have sex with men (MSM)
- In Baltimore most cases are among heterosexuals

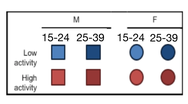
Methods

- **Model framework:** Compartmental deterministic metapopulation model, simulating gonorrhea transmission in the United States (Tuite 2018 STD)
- **Demography:** Population 15-39 years, with heterosexual population presented by race/ethnicity and MSM as a separate group (figure below)
- **Natural history:** Susceptible - Infectious – susceptible by symptom status
- **Calibration:** Calibrated to city-specific data for 2010-2015 in Bayesian framework



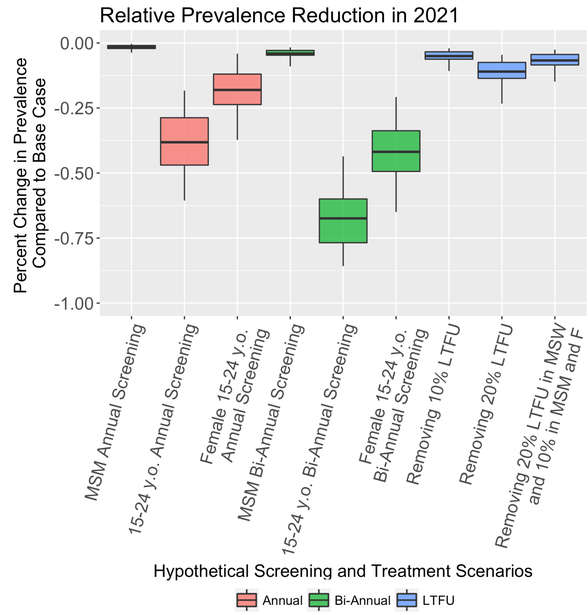
Key features in the analyses

- We explored the impact of targeted screening interventions (annually and semi-annually) added to the current screening estimates
- Baseline levels of screening calibrated to city-level data
- We also examined interventions that reduce loss to follow-up (LTFU)
- All interventions applied for 5-year screening interventions and the results were evaluated in 2021 as total population prevalence reductions relative to baseline
- We did not consider emergence of antimicrobial resistance nor did we consider resource constraints in this analysis



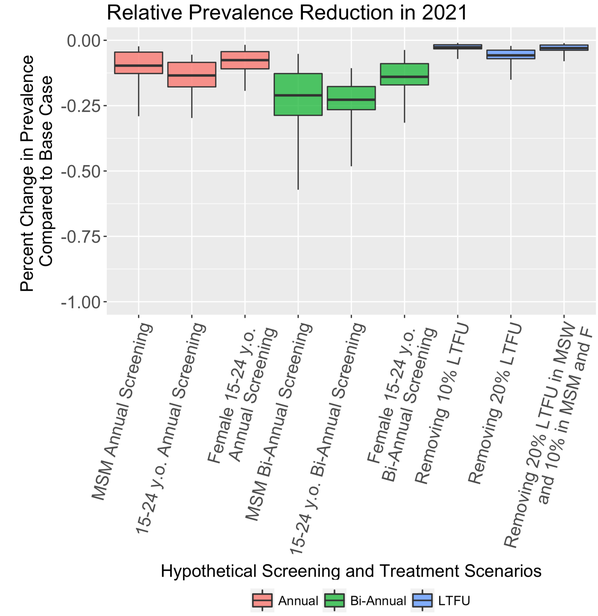
Results

Baltimore



- If there is on average 10-20% LTFU at baseline, removing this via improved follow up could reduce prevalence by average 5-11% relative to baseline
- Largest impact estimated from screening everyone <25 years, and women <25 years

San Francisco



- If there is on average 10-20% LTFU at baseline, removing this could reduce prevalence by average 3-6% relative to baseline
- Largest impact estimated from screening MSM (15-39 years) and screening of everyone <25 years

Conclusions

- When there is large LTFU, better follow-up may lower gonorrhea burden
- Screening young people (everyone <25 years old) had an impact in both cities with young women and MSM being the subpopulations of greatest importance in Baltimore and San Francisco, respectively
- Absence of local prevalence data result in uncertainty in estimates of gonorrhea burden in the subpopulations