The PrEP Care Continuum and HIV Racial Disparities among Men Who Have Sex with Men

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Abstract #857

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Background

HIV Disparities among MSM
- HIV prevalence 3-6 times higher among black MSM (BMSM) compared to white MSM (WMSM) in the United States.
- Constellation of factors, including worse linkage and retention to HIV prevention and care services, contribute to disparities.
- NHAS goal of reducing disparities by 15% (relative scale) by 2020.

The PrEP Care Continuum
- PrEP effective at HIV prevention, but success at reducing disparities depends on uptake, adherence, and retention rates.
- Several studies demonstrating significant gaps in PrEP care by race/ethnicity
- PrEP continuum have been proposed as an organizing framework for measuring and addressing PrEP-related gaps in care.
- Final goals are fully adherent PrEP use and retention in PrEP care for any MSM with bio-behavioral indications.

Study Aims
- To estimate HIV incidence reduction among BMSM given current estimates of BMSM metrics for each step of the PrEP continuum.
- To predict the additional impact of intervening on the continuum steps, individually and jointly, on HIV incidence for both BMSM and WMSM.

Methods

Network-Based Mathematical Model
- Extended our robust HIV transmission model for MSM in the United States.
- Network model for dynamics of main, casual, and one-off sexual partnerships using statistical framework of exponential random graph models (ERGMs).
- Probability of observing network, \( y \), is modeled as a exponential function of a set of predictors, \( g \), for edge formation that are estimated from egocentric network data.

\[
P(Y = y) = \frac{\exp\{g(x)\}}{K(\theta)}
\]
- Dynamic networks are simulated from the ERGM fit for each partnership type

Results

- Implementing PrEP given current estimated levels of awareness, access, prescription, adherence, and retention would reduce HIV incidence and prevalence for BMSM.
- Targeting PrEP awareness for BMSM as a single continuum step would have the largest impact on further reduction of HIV incidence for BMSM.
- Jointly targeted all continuum steps would be required to make a substantial impact on disparities. Figure shows HIV incidence/prevalence across relative scaling of BMSM PrEP parameters (1.0 = as observed). Dashed line = Reference (No PrEP) scenario.

Discussion

PrEP Can Reduce HIV Disparities
- Challenging to simultaneously increase population-level impact of interventions while also addressing health disparities.
- Despite current gaps in PrEP initiation and engagement of BMSM, PrEP could be a promising approach to reduce overall incidence and while also lowering disparities by race.
- Interventions to improve metrics at each step of the PrEP care continuum for BMSM could further reduce disparities.

Preprint

References

- Intrahost and interhost HIV transmission and progression simulated on top of evolving networks using the EpiModel modeling software (www.epimodel.org).
- PrEP indications simulated based on CDC guidelines for behavioral risk factors or STI diagnoses in the past 6 months.
- Reference parameters for continuum steps based on combination of BMSM Cohort studies (Kelley et al.) and the PrEP Demo Project (Liu et al.).