

019.3 PARTNER SERVICES FOR GONORRHEA CAN DECREASE NEW HIV AMONG MSM IN KING COUNTY, WASHINGTON: A MATHEMATICAL MODELING STUDY

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Background Partner services (PS) for bacterial STIs has potential to increase STI treatment among infected sex partners and HIV testing among people diagnosed with STIs and their partners. The population-level impact of PS on gonorrhea and HIV incidence has not been estimated.

Methods Calibrated to King County's MSM population, our compartmental gonorrhea-HIV coinfection model captures sexual mixing, gonorrhea and HIV transmission, and scale-up of antiretroviral therapy (ART), pre-exposure prophylaxis (PrEP), and routine STI screening. We assessed incremental impact of PS over 5 and 20 years, and compared gonorrhea and HIV incidence and prevalence without PS, with PS, and with PS that integrates promotion of HIV testing (PS+HIV). In the absence of PS, we assumed that 10%, 10%, and 95% of rectal, pharyngeal, and urethral gonorrhea were treated and 63% of MSM receiving gonorrhea treatment also received HIV testing. With PS, 40% of treated cases received PS, increasing the proportion of partners treated for gonorrhea and tested for HIV by 4%, 4%, and 38% at each site. PS+HIV increased the proportion of gonorrhea-infected MSM tested for HIV to 83%.

Results After 5 and 20 years, PS modestly changed rectal, pharyngeal, and urethral gonorrhea incidence and prevalence (<7%). After 5 years, HIV prevalence decreased 0.1% with PS and 0.5% with PS+HIV. HIV incidence decreased 6.0% (from 187.1 to 176.0 per 100,000 persons) with PS and 14.7% (187.1 to 159.6/100,000) with PS+HIV. After 20 years, HIV prevalence decreased 3.2% with PS and 5.6% with PS+HIV. PS reduced incidence 23.3% (75.2 to 57.7/100,000) and PS+HIV 37.7% (75.2 to 46.9/100,000).

Conclusion Moderate gonorrhea PS coverage had modest impact on gonorrhea, given high rates of STI testing and treatment in King County. However, long-term PS+HIV increased HIV testing opportunities and substantially reduced HIV incidence. PS+HIV is a potential approach for prioritizing HIV testing in high ART and PrEP coverage settings.

Disclosure No significant relationships.

019.4 MOLECULAR EPIDEMIOLOGY OF HIV AMONG FOREIGN-BORN RESIDENTS OF KING COUNTY, WASHINGTON, USA, USING HIV SURVEILLANCE DATA

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Background In King County, one-third of HIV diagnoses occur among foreign-born individuals, a 50% increase since 2010. The extent to which these infections are locally acquired is

unclear, but has important implications for HIV prevention and incidence estimation.

Methods Using HIV surveillance (2010–2018) and partner services (PS) (2010–2016) data from Public Health–Seattle & King County, HIV-1 *pol* gene sequences from routine drug resistance testing were linked to demographic, clinical, and epidemiological information. We identified genetic similarity clusters of 2+ individuals using TN93 pairwise genetic distance with a 0.02 threshold. Belonging to a cluster is suggestive of local transmission, therefore correlates of clustering were identified using logistic regression, adjusted for early infection (CD4 >500 cells/mm at diagnosis). We also calculated the proportion of foreign-born cases with a negative HIV test in the U.S. before diagnosis.

Results From 2010–2018, 2,521 people were diagnosed with HIV in King County: 663 (26%) occurred among foreign-born individuals, primarily from Latin America (N=232), sub-Saharan Africa (SSA) (N=214), and Asia (N=98). Among individuals with a PS interview (75% Latin American, 56% SSA, 69% Asian-born), HIV testing histories suggest that 40% of Latin American, 19% of SSA, and 36% of Asian-born individuals likely acquired HIV locally. Individuals with non-B HIV subtypes similarly varied by region of birth: 2% of US, 5% of Latin American, 93% of SSA, and 46% of Asian-born people. Among 1,754 individuals with an available sequence (70% of U.S. versus 63% of foreign-born), 1,092 (62%) clustered in 304 genetically similar clusters. Odds of clustering, compared to US-born, was 0.44 (95%CI: 0.31,0.60) among Latin American, 0.08 (95%CI: 0.05,0.14) among SSA, and 0.40 (95%CI: 0.24,0.66) among Asian-born.

Conclusion Our results suggest that local HIV acquisition occurs least frequently among SSA-born, followed by Asian-born and Latin American immigrants. Incident estimates that include all diagnoses among foreign-born people may overestimate HIV incidence.

Disclosure No significant relationships.

019.5 THE INFLUENCE OF RISK GROUP TURNOVER IN STI/HIV EPIDEMICS: MECHANISTIC INSIGHTS FROM TRANSMISSION MODELING

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Background Heterogeneity in the risks of STI/HIV acquisition and transmission are central to core group theory. We examined the influence of population turnover among risk groups on group-specific STI prevalence and the contribution of unmet needs among the core group to onward transmission.

Methods We developed an analytical approach to modeling risk group turnover that leverages demographic data and ensures constant relative risk group size. A deterministic model of STI transmission without disease-attributable mortality incorporated this turnover approach with three risk groups, including: a core group with the highest rates of partner change, a multiple-partnerships group, and a low-risk group. We varied the duration within the core group (3 to 33 years) via turnover among all groups and duration of infectiousness (5 years to lifetime) via a uniform treatment rate. We then compared the influence of turnover on group-specific STI prevalence at different treatment rates. We also calibrated to