

time demonstrating substantial mixing between high-risk bridge populations. Targeted prevention and intervention efforts can be aided by use of micro-level analyses.

### 020.2 SOCIAL NETWORKS OF STI PATIENTS HAVE HIGHER STI PREVALENCE THAN SOCIAL NETWORKS OF COMMUNITY CONTROLS

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**Background** Persons with sexually transmitted infections (STIs), including HIV, are more likely to have sexual partners with STIs. It is not known whether persons with STIs are more likely to have social contacts with STIs. We compared the prevalence of HIV and STIs in the social networks of STI patients to the social networks of community controls.

**Methods** The study was based at Kamuzu Central Hospital STI Unit from 2010–2012. Three groups of 45 “seeds” were enrolled: HIV-infected STI patients, HIV-uninfected STI patients, and community controls frequency matched on age, gender, and area. Seeds were asked to recruit < 5 “contacts.” HIV prevalence and STI prevalence among contacts were compared between arms using generalised estimating equations accounting for correlation by seed.

**Results** Mean number of contacts recruited was 1.3 for HIV-infected clinic seeds, 1.8 for HIV-uninfected clinic seeds, and 2.3 for community seeds (N = 243). The majority of contacts (89%) had never been in a sexual relationship with the recruiting seed. HIV prevalence was higher in HIV-infected clinic seeds’ contacts (31%) compared to community seeds’ contacts (11%) (p = 0.009), but not in HIV-uninfected clinic seeds’ contacts (10%) compared to community seeds’ contacts (11%) (p > 0.9). STI syndrome prevalence was higher in both HIV-infected clinic seeds’ contacts (18%) and HIV-uninfected clinic seeds’ contacts (26%) compared to community seeds’ contacts (8%) (p = 0.04). Differences between arms remained significant for both HIV and STI prevalence when analysis was restricted to non-sexual contacts.

**Conclusion** Seeds with HIV were more likely to have networks with higher HIV prevalence and seeds with STIs were more likely to have networks with higher STI prevalence, even among non-sexual contacts. Research is needed to understand the social and epidemiologic mechanisms underlying these findings. Social contact recruitment at an STI clinic is one promising way of identifying persons in need of HIV and STI services.

### 020.3 SEX IN SEATTLE: MECHANISTIC MODELING OF SEXUAL PARTNERSHIP DYNAMICS

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**Background** To devise sexually-transmitted disease (STD) surveillance and intervention strategies based on the importance of individuals or relationships in pathogen diffusion, mechanistic models of sexual partnerships are needed. We modelled heterosexual partnerships, chose functions and estimated parameters by re-analysing information from a 2003–04 random-digit dialling survey among Seattle residents.

**Methods** We created artificial populations having the joint distributions of age and gender from a recent U.S. census. We used partnership formation rates calculated from the complete histories of male and female survey participants with and without partners to determine stochastically at each time-step who in the population

was eligible to form new partnerships; these were matched according to age preferences from the National Health and Social Life Survey using the algorithm for which Shapley received the 2012 Nobel Prize in Economics. Similarly, we used durations from survival analyses of partnerships formed by survey participants to schedule the dissolution of new and reschedule the dissolution of existing partnerships when concurrent partners would replace existing ones.

**Results** Most modelled partnerships are short-lived, as are the gaps and overlaps between them. This finding matches those from several published studies. Heterosexual adolescents and young adults form and dissolve concurrent partnerships at approximately 0.1 and 10 times, respectively, the rates at which they form and dissolve exclusive ones. Consequently, concurrent partnerships are ephemeral relative to exclusive ones. We estimate that, by age 45 years, approximately 20% of men and women have had concurrent partners, but at any particular time, most have 0 or 1 partners.

**Conclusions** Few individuals have multiple partners at any time, but lifetime partner numbers increase with age at gender-specific rates. The risk of infection increases with the number of partners; thus, public health messages that refer to concurrent partners may not adequately address the STD risk associated with lifetime partner numbers.

### 020.4 DAILY VARIATION IN FEELINGS OF INTIMACY PREDICT INCIDENT STI WITHIN A PROSPECTIVE COHORT OF URBAN ADOLESCENT FEMALES

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**Background** Previous work has illustrated daily variation in feelings of intimacy, perceptions of partner concurrency (PPC) and STD risk perception (PRSTD), indicating these are dynamic attributes within adolescent romantic relationships. Our objective was to examine whether daily variations in these STI-associated feelings and perceptions predicted incident chlamydia and/or gonorrhoea infection.

**Methods** A clinic and community venue recruited cohort of females (N = 122), 16–19yrs at baseline, completed daily diaries on feelings and perceptions about each current sex partner on a Smartphone continuously for 18 months. Urine was tested for chlamydia and gonorrhoea quarterly. As means for feelings of trust, closeness and commitment were high in these relationships, data were coded to indicate any decrease in feelings from the previous day. PRSTD and PCC were reverse coded to indicate any increase. GEE was used to account for the correlation among repeated measures within relationships.

**Results** For each day there was a decrease in trust there was a 52% increase in the odds of being infected with an STI at follow-up [OR: 1.52, 95% CI: 1.20–1.91, p < 0.001]. For each day there was a decrease in closeness the odds of being infected with an STI at follow-up increased by 44% [OR: 1.44, 95% CI: 0.97–2.12, p = 0.067]. Neither an increase in PRSTD or PPC nor decrease in commitment was associated with an STI. An index was created to examine the cumulative effect of variation in feelings and perceptions and found evidence of co-variation. A change in an additional feeling or perception that day increased odds of an STI by 16% [OR: 1.16, 95% CI: 1.02–1.33, p = 0.027].

**Conclusions** A decrease in feelings of intimacy toward a partner may be a more sensitive indicator of STI risk than PRSTD, PPC or commitment. The next generation of interventions for youth will need strategies to address feelings of intimacy within adolescent romantic relationships.