Results 927 household-heads were recruited (including 10 seeds). Full and small RDS-samples were largely representative of the total-population for most variables, but under-represented men who were younger, of higher socioeconomic status, and with unknown sexual activity and HIV status. RDS statistical inference methods failed to reduce these biases. Only 31–37% (depending on method and sample size) of RDS-estimates were closer to the true population proportions than the RDS-sample proportions. Only 50–74% of RDS bootstrap 95% CIs included the population proportion.
Conclusions RDS produced a generally representative sample of this well-connected non-hidden population. However, current RDS inference methods failed to reduce bias when it occurred. Whether RDS can collect the data required to reliably remove bias and measure precision during analysis is unresolved. As such, although RDS may be a feasible and cost-effective method for sampling hidden or hard-to-reach populations, RDS should still be regarded as a (potentially superior) form of convenience sample, and caution is required when interpreting findings from RDS studies.

S13.4 USE OF RESPONDENT-DRIVEN SAMPLING FOR MONITORING HIV BEHAVIOURS AMONG INJECTING DRUG USERS IN THE UNITED STATES

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Background Approximately 1.1 million persons in the United States are living with HIV and for 18.5% their infections are attributable to injection drug use. In 2009 there were an estimated 5063 new HIV diagnoses attributed to injection drug use. In 2002, CDC developed the National HIV Behavioural Surveillance System (NHBS) to help state and local health departments in areas with high AIDS prevalence monitor behaviours and use of prevention services in groups at highest risk for HIV infection, including injection drug users (IDU). NHBS uses a sampling method most appropriate for each group; respondent-driven sampling (RDS) was chosen as the method for NHBS-IDU. We describe implementation and key monitoring indicators from the first two rounds of NHBS-IDU.
Methods NHBS-IDU is implemented in more than 20 cities every 3 years using a standardised protocol for conducting surveys and HIV testing among persons who had injected drugs within the 12 months prior to interview. Data are analysed for each city independently and then aggregated and weighted to form national estimates.
Results During the first IDU cycle (NHBS-IDU1, conducted 2005–2006), a total of 13 519 persons in 23 cities were recruited to participate, which resulted in 11 471 persons included in the final dataset. A total of 10 901 persons received 34 038 coupons to recruit others; 13 115 (62%) coupons were returned (range by city: 52.2%–75.3%). Challenges to the underlying assumptions of RDS included a somewhat high (5%) proportion of participants who reported their recruiter was "a stranger" and limited geographic cross-recruitment, suggesting IDU networks were not linked. These issues were found for some cities and were addressed in the operational guidance for NHBS-IDU2, conducted during 2009. Data from NHBS are used to monitor national progress in HIV prevention for IDU; in NHBS-IDU1, an estimated 32.8% of IDU shared syringes, and 63.4% had unprotected vaginal sex; 66.3% had been tested for HIV, and 29.7% had participated in an HIV behavioural intervention.
Conclusions Use of RDS for NHBS-IDU has identified challenges in implementation and analysis that continue to further the development of this method for conducting behavioural surveillance among IDU in order to characterise the HIV epidemic in the USA.

S14 Research in progress: updates from American STD association developmental award recipients

S14.1 GENITAL AND ORAL HUMAN PAPILLOMAVIRUS IN ADOLESCENT MALES

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Background Human papillomavirus is a common STI which causes genital warts and cancers in males. Studies of HPV in adult males are underway, but the epidemiology and natural history of HPV in adolescent males has not been investigated. The purpose of this study is to describe genital and oral HPV infections in young men.
Methods A subset of young men was recruited from an ongoing study of the male adolescent penile and urethral microbiome and sexual behaviours. Participant consent and parental permission were obtained. This study was approved by the Institutional Review Board at Indiana University. Approximately every 3 months, genital swabs and an oral rinse sample were collected from each participant. Genital swabs were collected using saline wetted cotton swabs rubbed over the entire skin surface of the participant's glans penis, penile shaft, and scrotum. Participants provided oral samples by a swish and spit method using 15 ml of mouthwash. Samples were tested for HPV using the 37 HPV type Linear Array HPV Genotyping Test (Roche). Participants completed daily cell phone diary entries and quarterly surveys about their sexual behaviours. Descriptive statistical analysis was performed using SPSS.
Results A total of 34 adolescent males were recruited, ages 14–18 at enrolment (mean 15.8; SD 1.18). The racial/ethnic identity of participants was: 19 (55.9%) black, 12 (35.3%) white, and 3(8.8%) other. At the time of their first HPV sample collection, 19 participants (55.9%) reported ever having vaginal sex, 8 participants (23.5%) reported ever giving oral sex, 16 participants (47.1%) reported ever receiving oral sex, and 5 (14.7%) reported ever having anal sex. In their enrolment genital samples, HPV (high risk (HR) plus low risk (LR)) was detected in 13 of 34 participants (38.2%); HR types were detected in nine participants and LR types were detected in eight participants. Seven participants had >1 HPV type. HPV was detected in both sexually active participants and those denying prior sexual contact. One participant had trichomonas at enrolment; no participants had gonorrhoea or chlamydia. In the enrolment oral samples, HPV was detected in one participant (HPV 6).
Conclusions This study provides the first information about HPV genital and oral infections in adolescent males. Genital HPV can be detected in adolescent males, and is not predicted by prior vaginal or oral sex. Oral HPV was infrequently detected in this small sample.

S14.2 A STUDY OF AFRICAN AMERICAN AND LATINA WOMEN AND HUMAN PAPILLOMAVIRUS: LESSONS LEARNT

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Background African American and Latina women in the United States suffer from sexually transmitted infections at higher rates than white women. It is particularly important to prevent HPV in these groups as they also suffer disproportionately from cervical cancer. From 2006, a prophylactic HPV vaccine has been approved for use in girls and women aged 9–26 years. However, public health focus has been on young girls and teens. There are limited options

for young women over 19 years of age who have aged out of the Vaccines for Children entitlement program. The objectives of this study were to assess a sample of minority women who attend neighbourhood health centers to determine predictors of vaccination, and to assess for the presence of HPV infection in these women. Those without evidence of prior HPV infection may benefit from a prophylactic vaccine.

Methods Between April 2009 and April 2010, we enrolled a convenience sample of 100 African American and 100 Latina women who completed a computer-assisted personal interview. Participants were queried regarding: demographics, risk for sexually transmitted infections including drug or alcohol use, HPV vaccine willingness, knowledge, attitudes and beliefs, and vaccination status. Frequencies were calculated using SAS, version 9.2. Self-collected vaginal swab samples from 118 participants were tested for HPV using line probe assay.

Results Participants were poor with 113 (57%) having a household income of <$20 000; and at risk for HPV infection. One hundred twenty-one (61%) did not use condom at last sex. However, only 17/118 (14%) were positive for any HPV. Predictors of vaccination could not be determined because there was not sufficient outcome response variation. A vast majority 161 (80%) of participants had not received HPV vaccination, though a most 136 (68%) reported willingness.

Conclusions Three years after vaccine approval, the majority in a sample of vulnerable women had not been vaccinated despite their willingness. Public health campaigns have been successful at raising awareness and making vaccine acceptable, but may be less successful at providing the vaccine to vulnerable women. Strategies should focus on delivering vaccine to African American and Latina women in order to decrease cervical cancer disparities.

S14.3 EVALUATING THE INTERNET AS AN STD RISK ENVIRONMENT FOR TEENS: FINDINGS FROM THE COMMUNICATION, HEALTH, AND TEENS (CH@T) STUDY

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Background The CH@T study aims to identify/characterise a group of teens reporting meeting sex partners online and a group reporting meeting sex partners in-person (not online) and examine the differences between the 2 groups in sexual health risks.

Methods Youth aged 13–19 years (N=273) visiting a publicly-funded clinic completed a 20-min Audio-Computer Assisted Self-Interview. Included were global sexual behaviour questions (eg, oral/vaginal/anal sex experience, number of sex partners) and specific partnership history questions, including meeting partners online/offline. Participants were also tested for chlamydia/gonorrhea. Audio-Computer Assisted Self-Interview responses were anonymously linked to teens' biological STD results. A χ^2 test was performed to determine the association between meeting a sex partner online and current STD status.

Results Participants identified as female (89.4%) and heterosexual (80.7%). Nearly 9 in 10 (88.6%) reported oral, 97.8% vaginal, and 28.6% anal sex experience. Of those with biological STD data (n=267), 14.2% had a current STD infection. Of all teens, 15.4% (n=42) reported having sex with a partner originally met online (of these, > half [57.1%] met >1 partner). Compared with teens reporting only partners met in-person, teens reporting an online partner had significantly greater numbers of oral, vaginal, and anal sex partners. However, analyses indicated no association between having a current STD and reporting an online partner, χ^2 (1, N=267)=0.95, p=0.34.

Conclusions Theory-driven STD prevention and sexual health promotion interventions should be tailored to meet specific needs of young people seeking partners both online and offline. Sex-seeking, dating, and social networking websites may represent important intervention contexts.

S14.4 DETECTING CHLAMYDIAL AND GONOCOCCAL INFECTIONS THROUGH SOCIAL AND SEXUAL NETWORKS

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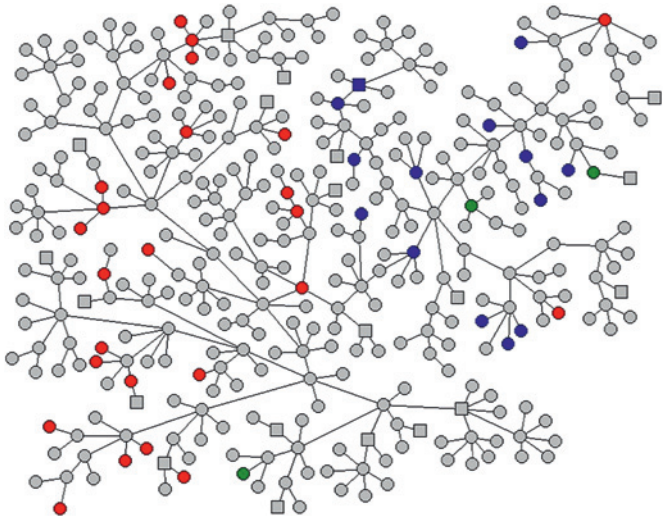
Background The overall goal of this ASTDA award was to adapt and evaluate Respondent-Driven Sampling (RDS) to enhance *Chlamydia trachomatis* (Ct) and *Neisseria gonorrhoeae* (GC) screening activities. Specifically, the aims were to develop and evaluate a programmatic approach using RDS as a method to prospectively screen for Ct/GC in networks of infected persons, to compare the prevalence of Ct/GC infections detected via current venue-based screening activities to the prevalence of infection detected using RDS as a referral mechanism, and to determine and compare the cost per infection detected via current screening activities to the cost per infection using RDS.

Methods Using two components of RDS, the systematic referral scheme and the dual incentive structure, we developed a program to refer social and sexual contacts for Ct/GC screening. Initial seed participants ages 15–24 were identified and asked to recruit their peers for screening, who in turn recruited their peers, and so on. Persons received incentive for their own participation ($10) in addition to incentive for participation of those they refer ($10). Participants could refer up to 5 social and sexual contacts. Participants provided a urine specimen for Ct/GC screening and completed a brief survey questionnaire.

Results Between December 2008 and March 2010, 66 initial seeds were recruited. Of the 66 seeds, 17 (25%) were successful in recruiting referrals. A total of 439 referrals were recruited, resulting in 7 networks initiated from an infected seed and 10 networks from a non-infected seed. The majority of referrals, 372 (85%), belonged to a single network (Abstract S14.4 figure 1). The remaining 67 referrals belonged to 16 networks ranging in size from 2 to 18 members. Across all networks, 67% of referrals were male and 33% were female. The overall prevalence of infection was 5.7% for Ct and 6.9% for GC among the referrals. This is compared to a prevalence of 12.2% for Ct and 1.5% for GC detected through venue-based screening in the same age demographic.



Abstract S14.4 Figure 1