

Conclusions The role of primary infection decreased as the HIV epidemic matured but could still account for a large fraction of new infections, especially if RRHIV/PI is above 10. Early on, its contribution depended on parameters of primary infections. Later on, its contribution also depended on the renewal of high-risk susceptible population, which fuels HIV incidence.

01-S11.02 DETERMINANTS OF TIME TRENDS IN HIV PREVALENCE IN THE YOUNG ANTENATAL POPULATION OF KARNATAKA DISTRICTS

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Background In 2003, the Bill & Melinda Gates Foundation initiated a focused HIV prevention program (India AIDS Initiative: Avahan) among high-risk and bridge groups. We studied determinants of time trends in HIV prevalence among young (<25 years) antenatal (ANC) women caused by these intensive prevention intervention (IPI) program compared to non-intensive intervention (Non-IPI) program.

Methods Random intercept multilevel models were developed using logistic regression (xtmelogit command) to examine effects of IPI, program and district level variables on HIV prevalence among young ANC women. Data from annual sentinel surveillance of ANC women were used as individual level characteristics. Selected program and socio-demographic variables at district level were included as distal variables. Interaction between time and intensity of program intervention was assessed.

Results HIV prevalence in young ANC women decreased steadily from 1.4% to 0.77% from 2003 to 2007, and increased to 0.83% in 2008 (Adjusted OR (AOR)=0.59, (95% CI):0.45% to 0.77%). Rural (AOR=0.87, 95% CI: 0.76% to 0.99%) and literate women (AOR=0.76,95% CI:0.66% to 0.87%) had lower risk of HIV compared to urban and illiterate women respectively. Presence of major truck halt points (AOR=1.57,95% CI: 1.17% to 2.12%) in the district was associated with high risk of HIV. Higher age at marriage was associated with lower risk of HIV (AOR=0.85,95% CI: 0.78% to 0.93%). There was significant interaction between time and intensity of intervention. In the years 2006 and 2007, Non-IPI districts had a significantly higher risk of HIV compared to IPI districts (AOR2006=1.86, 95% CI: 1.18% to 2.93% and AOR 2007=2.25, 95% CI: 1.39% to 3.62%) respectively. Among the program variables regular contact with high risk group was associated with slightly reduced risk of HIV (AOR=0.998, 95% CI: 0.996% to 0.999%) see Abstract O1-S11.02 table 1.

Conclusion HIV prevalence in ANC population declined significantly in IPI districts from 2003 to 2008 compared to non-IPI districts in Karnataka. IPI had a definite impact on reduction of HIV prevalence in general population during 2006 and 2007. This coincides with the maturity of IPI during 2006 and 2007 along with the initiation of NACP-III in 2007. Learning from IPI might have influenced National AIDS Control Program-III implementation in non-IPI districts in Karnataka leading to similar effects in IPI and non-IPI districts in 2008. Improving female literacy and increasing the age at marriage would help favour reduction of HIV.

Abstract O1-S11.02 Table 1 Determinants of time trends in HIV prevalence in the young antenatal population of Karnataka districts

Individual/district level characteristics	Null model AOR (95% CI)	Random intercept model: % high risk group persons contacted regularly AOR (95% CI)
Fixed part of the model		
Constant	0.009 (0.0080 to 0.0114)	0.528 (0.097 to 2.8782)
Individual characteristics		
Year—2003 (Reference)		
2004		0.992 (0.7854 to 1.2521)
2005		0.804 (0.6287 to 1.0288)
2006		0.585 (0.4458 to 0.7681)
2007		0.418 (0.3109 to 0.562)
2008		0.585 (0.4475 to 0.7649)
Locality—Urban (Reference)		
Rural		0.867 (0.7581 to 0.9915)
Type of site—District headquarter (Reference)		
First referral unit—rural		0.784 (0.6904 to 0.8907)
Literacy—Illiterate (reference)		
Literate		0.759 (0.6622 to 0.871)
Type of intervention—IPI (reference)		
Non-IPI		0.871 (0.5578 to 1.361)
Programme variable		
% Contacted regularly		0.998 (0.9959 to 0.9999)
District level variables		
Mean age at marriage for girls (years)		0.848 (0.7773 to 0.9261)
Major truck halt points		1.573 (1.166 to 2.1212)
Interaction		
Year 2004 and Non-IPI		1.101 (0.7184 to 1.6887)
Year 2005 and Non-IPI		1.443 (0.929 to 2.2427)
Year 2006 and Non-IPI		1.856 (1.1769 to 2.9253)
Year 2007 and Non-IPI		2.245 (1.3902 to 3.6249)
Year 2008 and Non-IPI		1.098 (0.6477 to 1.8601)
Random part of the model		
District-level variance: total	0.1333 (0.0642 to 0.2767)	0.072 (0.0337 to 0.1530)

01-S11.03 HOW MANY INFECTIONS ARE AVERTED BY BEHAVIOUR CHANGE AFTER EARLY HIV DIAGNOSIS & COUNSELLING OF MSM? ESTIMATES FROM A STOCHASTIC INDIVIDUAL-BASED MODEL

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Background A recent paper (Fox et al HIV Medicine 2009) reported that MSM in the UK significantly reduced their transmission-risk behaviour following HIV diagnosis and suggested that this could be effective in averting transmission during the highly-infectious primary infection stage. However, cost-effectiveness analysis is required to inform policy-making. To assess the effectiveness of early HIV diagnosis in MSM as a prevention strategy we quantified its potential impact in terms of transmission HIV events averted.

Methods We developed an individual-based stochastic transmission model to calculate the number of HIV-transmission events expected to occur from a cohort of recently-diagnosed MSM with and without the changes in behaviour that occurred post-diagnosis and counselling. The model incorporates different types of sex-act, patterns of condom use, and distinguishes between regular and casual partners.

Results In the 12 weeks post-diagnosis, for a large majority of respondents there was a reduction in the expected number of casual partners who would be infected: 76% of participants eliminated risk of onward transmission entirely. However, a small proportion still presented a transmission risk. Overall, reductions in HIV transmission risk behaviour post-diagnosis would have reduced estimated secondary transmission during primary HIV infection (PHI) from been 33 (23–37) to 12 (6–14)—a reduction of 62% (32%–83%). Diagnosis after PHI produces a more modest reduction in transmission by missing the high-infectivity period.

Conclusions Diagnosis of PHI can produce a large proportionate reduction in HIV-transmission events by reducing transmission-risk behaviour. Due to the high infectivity but short duration of primary infection, even short-term behaviour change can significantly reduce transmission. Later diagnosis is less effective, whilst early diagnosis requires frequent or highly-targeted testing. Whilst further work is required to determine the costs of different testing strategies, our quantification of the number of infections averted is an essential component of an assessment of the cost-effectiveness of strategies to increase early diagnoses of HIV infection.

01-S11.04 TARGETING THE USE OF HIV RNA SCREENING TO MAXIMISE YIELD AND MINIMISE COST: NYC HEALTH DEPARTMENT STD CLINICS, 2008–2010

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Background Nucleic acid amplification testing (NAAT) is an important tool for identifying acute HIV infection (AHI), a period of high infectivity when antibody is undetectable. NAAT pooling methods (pNAAT) help contain the costs of screening for AHI. In 2008 NYC STD clinics began routine pNAAT screening for all rapid antibody negative specimens; it was standard of care in all nine clinics by 2009. A pattern of risk factors among AHI cases detected during universal screening suggested the feasibility of using targeted screening to maximise the yield of AHI cases detected while minimising costs of screening.

Methods Using medical record data, we reviewed cases of AHI diagnosed in nine NYC STD clinics for 2008–2009. From these we developed targeting criteria for AHI screening, and compared yields and costs before and after targeting was implemented.

Results Targeted screening began in May 2010 and included the following risk criteria: MSM, females who have had sex with MSM,

sex with an injection drug user, exchange sex for money or drugs, shared injection drug works, or recent victim of sexual assault. Prior, 42 696 specimens were screened by pNAAT from June through December 2009, yielding 23 AHI cases (5.4 cases/10 000 specimens). Of these cases, there were 21 males, including 15 who have sex with men (MSM) (71%, 15/21), 1 female, and 1 transgender. The mean age for patients was 30 years; racial/ethnic breakdown was: 57% Black, 39% Hispanic, 13% white, 4% other. Subsequently, 5280 specimens were screened by pNAAT from June through December 2010, representing an 88% decrease in testing compared to the same period during the previous year. A total of 18 AHI cases (34.1/10 000 specimens) were detected; all were MSM. The mean age was 29 years and racial/ethnic breakdown was: 44% Black, 28% Hispanic, 28% white, 5% Asian. Cost data are provided in Abstract O1-S11.04 table 1.

Abstract O1-S11.04 Table 1 Cost effectiveness of targeted AHI screening

	Universal	Targeted
Average pooled AHI specimens per month	5700	770
Annual cost of pooled AHI screening	\$650 000	\$91 296
Annual yield	33	35
Average total cost per month	\$54 167	\$7608
Average cost per AHI case identified	\$19 697	\$2608

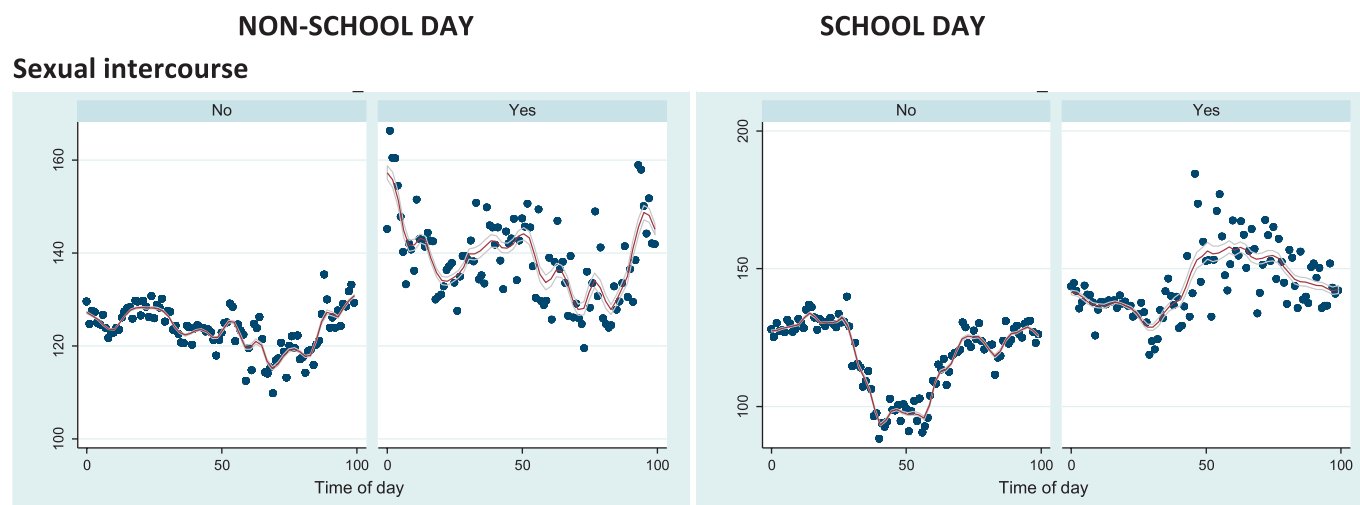
Conclusion AHI screening increases case detection compared to using antibody tests alone. After initial investment in the effort, we were able to cut the cost per case identified by over sevenfold. This approach may make AHI screening more feasible/affordable in settings with patients at very high risk of newly-acquiring HIV.

01-S11.05 ADOLESCENT SEXUAL INTERCOURSE AND NEIGHBOURHOOD SOCIAL DISORDER

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Background Little is known about how and where an adolescent lives and spends time relates to her health-related behaviours. Social disorder, or where crime occurs, is associated with various health outcomes but few have considered its association with adolescent



Abstract O1-S11.05 Figure 1 Average 200 m crime counts by time of day/day of week and self-reported sexual intercourse in the last 30 days.