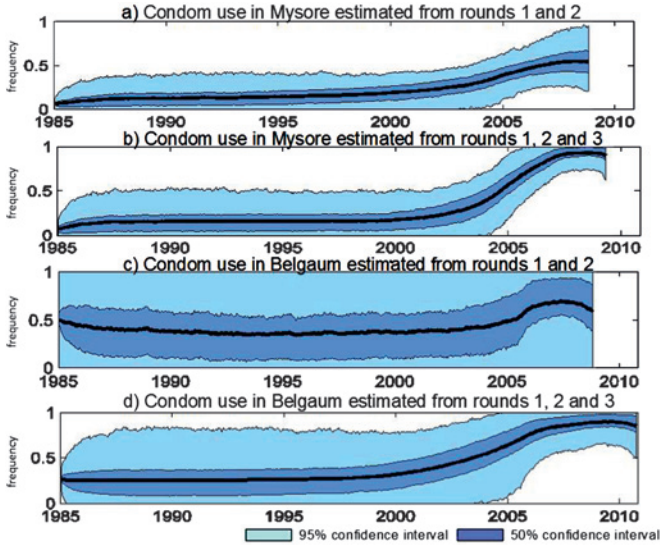
Background Considerable efforts have been invested to evaluate the impact of the Avahan project, the India AIDS initiative, targeted to high risk groups. One measure of impact is the number of HIV infections prevented (PF) due to increases in condom use between FSWs and clients following the start of Avahan. PF estimates hinge on knowledge of the frequency of condom use over time. As there is no data on condom use prior to the first round of data collection post-Avahan, these trends must be estimated indirectly. We aim, using a Bayesian framework and Monte Carlo Markov Chains (MCMC) methodology, to determine if the trends in HIV prevalence among FSWs and clients can be used to infer changes in condom use between FSW and clients before and after the start of Avahan.

Methods We used serial rounds of cross-sectional behavioural and biological survey (IBBA) data and a deterministic compartmental model of HIV transmission among FSW/clients in Mysore and Belgaum districts coupled with Bayesian inference procedures. Condom use was modelled as the fraction of FSW commercial sex acts protected by condoms. IBBA data was used to specify the model prior parameter distributions and estimate HIV prevalence at three time points among FWS, at one time point among their clients. The Particle MCMC algorithm was used to explore the posterior density of our complex parameter distribution, and to derive estimates of the evolution of condom use over time using either 2 or 3 rounds of HIV prevalence data among FSW.

Results For both districts, the results reveal a clear increase in condom use around the start of Avahan in 2004 (Abstract P1-S6.06 figure 1). Abstract P1-S6.06 figure 1 suggests condom use before the intervention (jan 1994) was lower in Mysore (15.7%, 95% CI 0 to 48%) than in Belgaum (19%, 95% CI 0 to 58%). In both districts, post intervention condom use stabilised at values above 80% (95% CI Mysore 65 to 100% and Belgaum 50 to 100%). Lastly, Abstract P1-S6.06 figure 1 A),C) vs B),D) show the information gained by using 3 rounds of data instead of 2.



Abstract P1-S6.06 Figure 1 A) Condom use in Mysore estimated from rounds 1 and 2. B) Condom use in Mysore estimated from rounds 1, 2 and 3. C) Condom use in Belgaum estimated from rounds 1 and 2. D) Condom use in Belgaum estimated from rounds 1, 2 and 3.

Conclusions This is the first application of Particle MCMC in an intervention monitoring context. Our results consolidate previous back projections suggesting that condom use significantly increased since the start of Avahan, which sheds additional light on the potential intervention impact. This study illustrates the use of flexible Bayesian inference methodology to estimate time-varying parameters. It also informs the design of prevalence surveys for intervention monitoring.

P1-S6.07 ECOLOGICAL ANALYSIS OF THE FACTORS INFLUENCING CHANGES IN HIV PREVALENCE OVER TIME AMONG FSW FOLLOWING A TARGETED INTERVENTION

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Background Avahan is a large scale intervention that targets high-risk groups, including female sex workers (FSW), in many epidemiologically heterogeneous districts in southern India. Changes in HIV prevalence post intervention may depend on setting and intervention characteristics. We conducted an ecological analysis to identify which factors were associated with greater changes in FSW HIV prevalence after Avahan start in 2004.

Methods All variables were derived from two serial rounds (R1, R2) of cross-sectional FSW surveys, conducted ~3–4 years apart, from 24 districts of 4 Southern Indian states. We examined the

Abstract P1-S6.07 Table 1 Results of univariate analysis between the difference in FSW HIV prevalence (R2-R1) and different independent variables for each class of factors

Types of independent variables	N	Coefficient of correlation (r) (if pv <0.1)	p value
Intervention factors			
Difference* in consistent condom use (CCU) by FSW with occasional clients	27	–	ns
Difference in Syphilis (Tp) prevalence	23	0.36	0.06
Difference in HSV-2 prevalence (D.FSW HSV2)	27	0.45	0.03
Difference in gonorrhoea or Chlamydia prevalence	27	–	ns
Difference in the fraction tested for HIV	27	–	ns
%FSW contacted by NGO at R1	27	–	ns
%FSW who visited NGO clinic at R1	27	–	ns
%FSW who received condom from NGO at R1	27	–	ns
Baseline contextual factors (mainly at R1)			
R1 FSW HIV prevalence	27	−0.53	<0.01
R1 Syphilis (Tp) prevalence	27	−0.41	0.03
R1 HSV-2 prevalence	27	−0.55	<0.01
R1 Gonorrhoea or Chlamydia prevalence	27	–	ns
R1 % of FSW ever been asked for anal intercourse (R1 AI)	27	−0.34	0.08
R1 weekly client number per FSW	27	–	ns
R1 % FSW who are brothel based	26	–	ns
R1 % FSW tested for HIV	27	–	ns
Estimated CCU by FSW with occasional clients in 1998†	20	–	ns
Estimated increase in CCU with occasional clients before R1†	21	–	ns
Design factors (related to conduct of surveys)			
Date of R1	27	–	ns
Time between R1 and R2	27	–	ns
Difference in response rate between survey rounds (R2−R1)	27	−0.39	0.06
Contextual changes (difference between survey round (R2−R1))			
Differences in weekly client number per FSW	27	–	ns
Difference in the % FSW ever asked for AI	27	0.35	0.08
Different in the fraction of FSW who are literate	27	–	ns
Difference in the fraction of married FSW	27	–	ns
Difference in % FSW brothel based	26	–	ns
Difference in mean duration of sex work for FSW	27	–	ns

*Difference between rounds (R2−R1).
†Adapted from Lowndes*et al* STI (2009).

association between the difference in FSW HIV prevalence between rounds (R2−R1)(D.FSW HIV) and different classes of factors (Abstract P1-S6.07 table 1). Intervention factors included differences between rounds in consistent condom use (CCU) with occasional clients, difference in STI prevalence, or fraction of FSW in contact with the intervention at R1, and others (see Abstract P1-S6.07 table 1). Baseline contextual factors included FSW HIV or STI prevalence, fraction of FSW ever asked for anal intercourse (AI), weekly client number per FSW etc at R1, estimates of CCU in 1998, and increase in CCU before R1. Design factors (date of R1, time between R2−R1, differences in response rate between R2 and R1), and differences in contextual factors between rounds as listed Abstract P1-S6.07 table 1 were also explored. Pearson correlations, univariate and multiple linear regression analysis were performed.

Results In univariate analyses, D.FSW HIV prevalence was negatively associated with R1 FSW HIV prevalence (r=−0.53), R1 HSV-2 and Tp prevalence, difference in response rate, % asked for AI at R1 (Abstract P1-S6.07 table 1). D.FSW HIV prevalence was positively associated with differences in syphilis (r=0.36) or in HSV-2 prevalence or in % asked for AI. In multivariate analysis, R1.FSW HIV prevalence (slope=−0.57) and estimated CCU in 1998 (slope=0.29) (R=0.73), or R1.FSW HIV (slope=0.19) and D. FSW HSV-2 (slope=−0.83) prevalence (R=0.66) were significantly associated with D.FSW HIV prevalence ($p<0.01$).

Conclusion Contemporary time trends in HIV prevalence are influenced by epidemic stages and historical condom use for many years. HIV prevalence is more (less) likely to decline after effective interventions introduced in mature (early) epidemics. R2 was conducted too early after R1 to expect large decline in HIV. Without control group, mathematical modelling is required to simulate counterfactuals and estimate intervention impact.

Epidemiology poster session 6: Preventive intervention: Screening

P1-S6.08 A MULTIFACETED INTERVENTION TO INCREASE CHLAMYDIA TESTING IN AUSTRALIAN GENERAL PRACTICE

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Background The Australian Government has funded the Australian Chlamydia Control Effectiveness Pilot (ACCEPt), a randomised controlled trial of a chlamydia testing intervention to assess the feasibility, acceptability and cost-effectiveness of chlamydia testing in general practice clinics. There are well documented barriers to increased chlamydia testing in general practice including time, cost, and clinicians' knowledge and awareness of chlamydia. If an intervention is to successfully increase chlamydia testing, it must minimise these barriers and take the uniqueness of each general practice into consideration. This paper describes the chlamydia testing intervention being implemented in ACCEPt.

Methods Clinics in the intervention group are being provided with a multifaceted evidence-based intervention designed to increase annual chlamydia testing for sexually active 16−29 year olds. The intervention includes: a computer alert prompting GPs to test; incentive payments for GPs and practice nurses to conduct testing; an annual recall system involving SMS, phone or mail reminders; a comprehensive education pack; and regular feedback on testing performance. The intervention will be in place for up to 4 years, and will be tailored to the resources and needs of each clinic. Prior to implementation, clinic staff are engaged and given the opportunity to identify methods for improving chlamydia testing within their clinic, using an evidence-based practice assessment tool.

Results To date, 69 clinics in 24 areas have been recruited across three Australian states. Four of these areas (9 clinics) have been randomised: two areas (7 clinics) are in the intervention group, and two areas (2 clinics) in the control group. The intervention has been customised to each clinic with two thirds of clinics receiving the computer alert, 4 clinics using SMS reminders for recall, others using a mail recall and some using practice nurses to initiate chlamydia testing. Where possible, doctors and practice nurses have been given one on one education and training about chlamydia and pelvic inflammatory disease.

Conclusions Given that each Australian general practice is unique, it is vital that the intervention is tailored to individual clinic needs to achieve sustainable system changes. This enables maximum staff engagement to ensure the effective uptake of increased chlamydia screening in the Australian general practice setting.

P1-S6.09 AN AUDIT OF MANAGEMENT OF PRENATAL SYPHILIS SEROLOGY IN THE STI CLINIC, CALGARY, AB, CANADA

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Background Outbreaks of syphilis have been occurring across Canada since 2001, with the province of Alberta having the 2nd highest incidence in 2007. As a result, there has been a national increase in the number of reported congenital cases. Current Canadian guidelines recommend performing syphilis serology at the 1st prenatal visit with rescreening at 28−32 weeks gestation, and at delivery in high-risk women. In our center, any positive syphilis serology is referred to the Calgary STI Clinic for staging and treatment recommendations. This is an internal audit of positive prenatal syphilis serologies from 2009 to 2010.

Methods Charts from pregnant women with a positive prenatal syphilis serology, defined as a positive or indeterminate syphilis EIA, from 1 January 2009 to 31 December 2010 were retrospectively reviewed. Syphilis staging was performed by the Medical Director according to national criteria.

Results 48 charts were reviewed: 9 were staged as biological false positives, 22 were previously adequately treated women with low or negative RPR titres not suggestive of reinfection, 13 were late latent (LL) treated with 7.2 μ of benzathine penicillin (PCN), and 4 were early latent (EL) treated with 2.4 μ of benzathine PCN. The mean number of days it took from receipt of a positive serology to contacting the patient were 9.8, 10.2, 2.3, and 1.8, respectively. The mean time to 1st dose of PCN was 8.8 for EL and 17.8 for LL (see Abstract P1-S6.09 table 1). There was 1 case of congenital syphilis in an infant whose mother presented in labour with no prenatal care-her RPR was 1:256. 1 woman with an RPR titre of 1:128 was treated with benzathine PCN 1 week before her estimated date of delivery. She went into preterm labour the afternoon post-injection; it is unclear whether or not the injection induced preterm labour. Her twins were treated with iv PCN with no adverse outcomes.

Abstract P1-S6.09 Table 1

Syphilis Stage= (N)/48	Range (days) from Start of Investigation to First Contact	Mean Number of Days to First Contact	Mean Number of Days to 1st Dose
Biological False Positives=9	1−29	9.8	N/A
Previously Treated=22	1−31	10.2	N/A
Early Latent=4	0−4	1.8	8.8
Late Latent=13	0−7	2.3	17.8 (5.2 if outliers removed)*

*3 patients were difficult to contact or noncompliant, taking 44, 54, and 68 days.