

prevention program for core and bridge population groups across 4 Southern and 2 Northeastern states in India representing approximately 80% of India's HIV burden in 2002. Avahan offered a standardised package of known and proven prevention interventions to high-risk groups and bridge populations in the geographic areas most affected by the epidemic. The program reached 220 000 female sex workers; 80 000 High risk MSM; 18 000 Injecting drug users and 5 million men at risk. By December 2008, Avahan had achieved significant scale and coverage with over 75% of total denominator including FSW and high risk MSM contacted monthly through outreach. The presentation will include the challenges at the start of the program, Avahan approaches to rapid scale up while leveraging data to ensure focus on highest at risk through provision of a standardised package of services (known as the Common Minimum Program).

S7.2 MEASUREMENT AND COMMUNITY MOBILISATION DO NOT HAVE TO BE MUTUALLY EXCLUSIVE: PRELIMINARY ANALYSIS FROM A SCALED PROGRAMME

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Community mobilisation approaches within the HIV/AIDS landscape have rarely operated at a significant scale, or been designed with the conceptual and technical clarity necessary to be measured effectively. Measurement of community mobilisation by necessity has been undertaken through innovative qualitative approaches but these have often lacked the rigour or complementary qualitative methods to provide adequate analysis on the association with outcomes or the path to generating HIV/AIDS outcomes. Avahan may provide new insights into community mobilisation and structural interventions as an effective and replicable approach within comprehensive HIV prevention programming. The experience of retrofitting measurement into a "living" programme and developing measurement indicators and tools to work at scale provide practical examples of what can be done. The Avahan logic model, proposed measurement approach and some preliminary analysis of risk reduction and sustainability outcomes as a result of community mobilisation and structural interventions will be presented.

S7.3 IMPACT OF THE AVAHAN INTERVENTION ON HIV/STI TRANSMISSION AMONGST HIGH AND LOW-RISK GROUPS: AN INTERIM MODELLING ASSESSMENT

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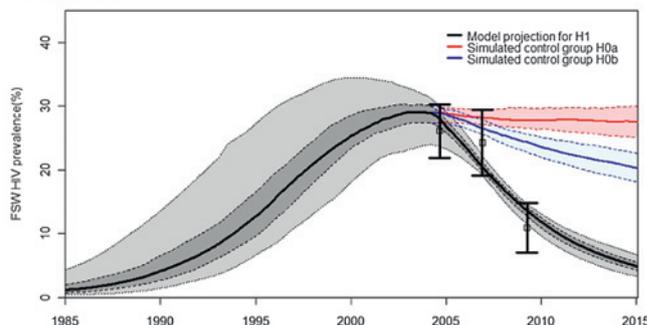
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Objective To estimate the potential HIV-impact of Avahan, the India AIDS Initiative, among targeted high-risk groups (including female sex workers (FSWs), their clients and men who have sex with men (MSM)) and the general population in different districts of Karnataka, Andhra Pradesh, Tamil Nadu and Maharashtra.

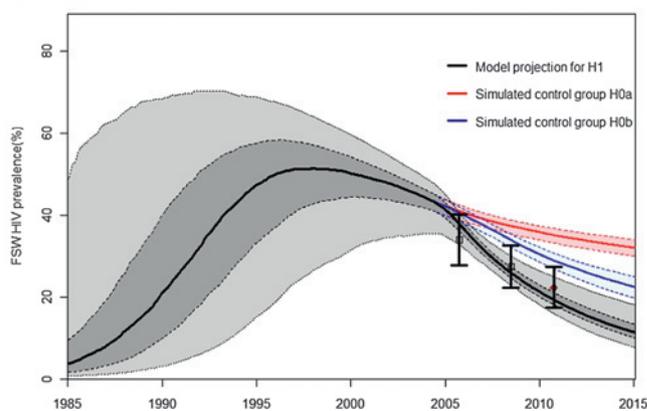
Design Impact evaluation involving mathematical modelling using detailed serial cross-sectional surveys on sexual behaviour and STI/HIV prevalence (IBBA) among targeted high-risk groups and the general population.

Methods A bespoke detailed deterministic model, parameterised with district specific IBBA data, was used to simulate HIV/HSV-2/syphilis transmission in high-risk groups and the general population in different districts. Latin hypercube sampling within a Bayesian framework was used to identify multiple parameter sets that reproduced multiple rounds of HIV prevalence data among FSWs, MSM and clients in all districts and the general population for some districts. The framework was used to test which of two hypotheses (H1 and H2) for time trends in consistent condom use (CCU)

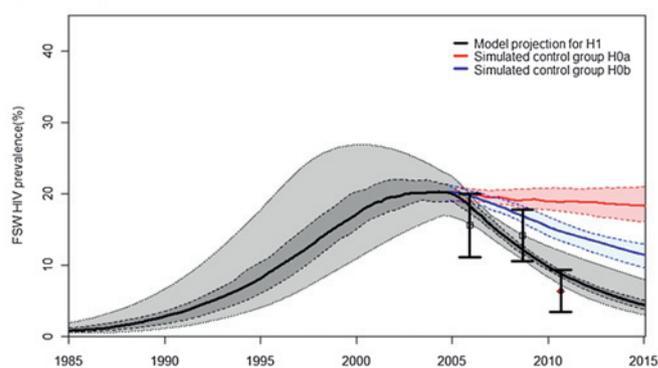
A) Mysore



B) Belgaum



C) Bellary



Abstract S7.3 Figure 1 Predicted FSW HIV prevalence over time for the most likely hypothesis (H1) and the two null hypotheses H0a and H0b used to simulate control groups (constant or slowly increasing condom use since start of Avahan) in A) Mysore, B) Belgaum, and C) Bellary districts. Shown on the graphs are the mean (dark lines black, blue and red) and the 75% credibility intervals (shaded area) for each hypothesis. The paler grey area represents the 95% credibility intervals. Also shown is the available IBBA survey prevalence data (mean and 95% CI).

among FSWs derived from independent data sources, was more consistent with observed HIV trends, and if these trends could have occurred without post-Avahan increases in CCU (two null hypotheses were assumed—one being more (H0b) and less conservative(H0a)). The most likely CCU hypothesis was used to predict the intervention impact on HIV prevalence/incidence and HIV infections prevented.

Results Using the most likely CCU hypothesis for each district (H1), results so far suggest that the increase in condom use post-Avahan may have resulted in between 21 and 45% of new HIV infections being averted among FSWs in Mysore, Belgaum and Bellary respectively from 2004 to 2007. Similar results were obtained for clients but the absolute number averted was 2–8 fold more. Model projections (Abstract S7.3 figure 1) suggest that this has resulted the large decrease in HIV prevalence observed in these districts, and that this would not have occurred in the absence of Avahan. The syphilis treatment component alone prevented <9 and 13% of new HIV infections over 1 and 10 years. Impact projections for the general population and additional districts will be presented.

Conclusions These Bayesian modelling results, combined with observed HIV prevalence trends and evidence of successful implementation and scale-up of Avahan, provides plausible evidence that Avahan has reduced HIV transmission to a large extent among high-risk groups.

S7.4 COST-EFFECTIVENESS OF TARGETED HIV PREVENTIONS FOR FEMALE SEX WORKERS: AN ECONOMIC EVALUATION OF THE AVAHAN PROGRAMME IN SOUTHERN INDIA

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Objective(s) The aim of the presentation paper is to assess the cost-effectiveness of HIV prevention interventions for female sex workers in India, in the context of large-scale programme effort, the Avahan Programme.

Design/methods We estimate cost-effectiveness using comprehensive measurements of cost; and, impact estimates based on dynamical transmission models of HIV and STI transmission that are fitted to observed prevalence trends. Our primary outcome measure is incremental cost per DALY averted (ICER) for the HIV prevention programme compared to a “do-nothing” base case.

Results In 2007, the implementing NGO cost per person reached at least once in a year ranges from US\$47 to US\$154. When all costs are taken into account (including expertise enhancement, management and contracting costs), the cost per person reached increases to US\$112 to US\$ 213, depending on location and year. Median incremental costs per infection averted range from US\$ 876 (370, 3040) to US\$2574 (1344, 7132). Median incremental costs per DALY averted range from US\$49 (20171) in to US\$ 143 (74, 388). These costs per DALY may increase as results from other states are included.

Conclusions This study presents robust evidence that demonstrates that HIV prevention interventions targeted at high risk vulnerable groups can achieve substantial reductions in HIV infections at an acceptable cost in a concentrated epidemic setting. Moreover, we

demonstrate cost-effectiveness in the context of a programme that is delivering HIV prevention at scale. However, the achievement of cost-effectiveness varies by setting. Our findings suggest that those responsible for HIV programmes should therefore consider funding targeted HIV prevention programmes at high risk groups in India and beyond, but should take into account setting specific drivers of the HIV epidemic.

Symposium 8: The global public health challenge of untreatable multidrug-resistant *Neisseria gonorrhoeae* “superbug” (MDR-GC)

S8.1 LESSONS LEARNT FROM GLOBAL HIV DRUG RESISTANCE INITIATIVE: IMPLICATIONS FOR MDR-GC

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The WHO, in collaboration with the Bill and Melinda Gates Foundation and the International AIDS Society developed the Global HIV Drug Resistance Network. It is comprised of a network of countries and accredited laboratories. The Network serves as an advisory and evaluation function to the WHO HIV drug resistance team and countries implementing the strategy. Surveillance of HIV drug resistance is critical because it helps to detect the circulation of resistance strains and directs measures to preserve programme effectiveness.

This presentation will explore how lessons learnt from the HIV drug resistance initiative could be applied to slow the spread of MDR-GC.

S8.2 SYNERGY: PUBLIC HEALTH, CLINICIANS, LABORATORIES AND MANAGEMENT GUIDELINES

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There is growing concern that the increasing prevalence of AMR in *N gonorrhoeae* will compromise effective treatment and disease control efforts. Early warning systems and the creation of, public health, clinical and laboratory networks are critical to detect the emergence of resistance and treatment failures.

Using specific examples to illustrate best practises, this presentation will focus on mechanisms to:

Enable adequate, timely AMR surveillance to inform treatment guidelines;

Establish a strategy to rapidly detect patients with gonococcal infections who experience a clinical and/or microbiological treatment failure especially with recommended cephalosporin or azithromycin therapy; and

Promote effective public health and clinical management of patients and their sexual partners.

S8.3 RESEARCH AND TRAINING NEEDS

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Establishing treatment guidelines, improving capacity to monitor antimicrobial susceptibility, and adequate supply of quality medications are key strategies to slow the spread of resistant gonorrhoea. Advances in the public health and clinical management of