

Rolling out new biomedical HIV prevention tools: what can be learned from Avahan, the India AIDS initiative?

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Abstract. More than 30 years after HIV was first identified as a disease, with disastrous consequences for many subpopulations in most countries and for entire populations in some African countries, it continues to occupy centre stage among the world's many global health challenges. Prevention still remains the primary long-term focus. New biomedical tools such as pre-exposure prophylaxis (PrEP) and treatment hold great promise for select groups such as key populations (KPs) who are critical to transmission dynamics, and serodiscordant couples. Programs delivering these new tools will need to layer them over existing services, with potential modifications for increased and sustained engagement between health services and beneficiaries owing to the nature of the interventions. Avahan, an HIV prevention intervention for KPs in six states in India, achieved population-level impact with conventional prevention programming, which, however, required high program–beneficiary engagement. Avahan's implementation strategy included articulating clear service definitions and denominator-based targets; establishing routine data systems with regular, multilevel supervision that allowed for cross-learning across the program; and developing a cadre of frontline workers through KP peer outreach workers who addressed structural issues and provided viable and sustainable mechanisms for sustained interaction between health services and KPs. This basic prevention implementation infrastructure was used to expand clinical services over time. Many of the lessons from programs such as Avahan can be applied to KP programs that are expanding service scope, including PrEP and treatment.

Additional keywords: interventions, key populations, peer outreach, programs, syphilis.

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Introduction

Recent advances in biomedical HIV prevention research, such as pre-exposure prophylaxis (PrEP) and antiretroviral-based treatment, have brought new tools to HIV prevention.^{1,2} However, they also pose significant challenges, including understanding the utility and limitations of these advances in the context of existing programs and prevention tools, the strategic allocation of scarce resources and translating findings into effective, scaled programs.^{1–3} Programs should (1) address the need for adherence by the individual to the product and a high degree of interaction with the health system; and (2) for optimal cost-effectiveness, focus on subpopulations at higher risk such as serodiscordant couples or key populations (KPs): female sex workers (FSWs), men who have sex with men (MSM), transgender persons (TGs) and persons who inject drugs

(PWID).^{4–7} PrEP implementation, which currently entails quarterly HIV testing, will require regular contact between healthy adults and the health system, with regular testing for HIV and monitoring for adverse effects. Accomplishing the behaviour change in both providers and PrEP recipients for this regular follow-up will be a challenge, one magnified by the current limited access of KPs to health services in many settings. This poor coverage is due to many factors, including inadequate HIV program budgets, a disproportionate focus on scaling up AIDS treatment, the constrained legal and policy environment for these populations, lack of leadership, limited epidemiologic data, violence, stigma and discrimination.^{8–11} Nonetheless, unless programs develop the ability to deliver HIV preventive services to KPs at scale and with high coverage, the potential impact of any prevention modality is likely to be minimal.

Given that scale and coverage are critical to any intervention success, in this paper, we briefly discuss the intervention approaches used to achieve scale, high coverage and impact by Avahan, an HIV prevention program targeting KPs in India. We then provide examples of how this basic prevention infrastructure was used to deliver sexually transmissible infection (STI) services and expand service scope in biobehavioural interventions and structural interventions, both within the project and through referral. Finally, through these examples, we discuss some aspects of Avahan's implementation experience that might be applicable to other settings and other biobehavioural interventions.

Avahan and the Indian context

A brief overview of Avahan

The first phase of Avahan (2003–2009) was intended to rapidly scale up known HIV prevention interventions with an incorporated community mobilisation approach in the six states of India with the highest HIV prevalence at the time, aiming to achieve >80% coverage of KPs (FSWs, high-risk MSM and TGs, and PWID) and bridge groups (men at risk) collectively with other funders, principally the Government of India.^{12,13} Each funder focussed on distinct geographic areas in order to maximise KP coverage and avoid redundancy, though there were some differences in the intervention definitions, delivery and management processes. Avahan's multicomponent prevention package addressed both proximal and distal determinants of risk (Fig. 1). In the four southern states where Avahan worked, programs for KPs were implemented in 70 districts. KP programs were managed and technically supported by six lead implementing partners who subgranted to 116 local nongovernment organisations (NGOs).¹⁴ By the end of Phase 1, these local NGOs were implementing HIV prevention interventions for ~220 000 FSWs and 80 000 high-risk MSM and TGs.¹⁴ Three years after the project started, >75% of the eventual total of STI clinics and drop-in centres (safe spaces) had been established, and ~85% of the final total of frontline peer outreach workers were trained and active. After 5 years, the project was consistently meeting, on a monthly basis, over 85% of mapped and enumerated FSWs, and 65% of high-risk MSM and TGs.¹⁴ Two modelling assessments using different methodologies estimated that the Avahan intervention averted a significant number of HIV infections. Pickles and colleagues estimated 202 000 infections were averted in the first 4 years and 606 000 infections over 10 years.¹⁵ Ng and colleagues estimated that 100 200 infections were averted over 5 years.¹⁶

The Indian context

In 2003, India had several characteristics that facilitated and informed Avahan's scale-up. From a policy and strategy perspective, under the National AIDS Control Program II (2000–2006), KPs were a recognised programming priority, and the government and other donors supported a package of well articulated targeted interventions, although the resource commitment was relatively small and there were significant implementation issues related to low coverage, diffuse target group focus and service quality.^{17,18} From a strategic information perspective, the government supported routine

sentinel site HIV surveillance in KP interventions, starting in 1998 for FSWs and PWID, and in 2000 for MSM; established nationwide and state-level behavioural surveillance surveys in 2001, which included FSWs, clients of FSWs, MSM and PWID; and conducted a large-scale, high-level FSW size estimation exercise during National AIDS Control Program II.^{19–21} From a capacity perspective, HIV prevention programming for FSWs and their clients had been funded for several years before 2003 in the four southern states where Avahan worked.¹⁷ As a result, both the State AIDS Control Societies and several NGOs in these states were experienced in HIV prevention programming and had working relationships on implementation issues such as funding, reporting, condom provision and health referrals. MSM and TG programming in these states was more recent and more limited.¹⁷ From a community mobilisation perspective, India has an extensive history of successful participatory development approaches, ranging from longstanding production cooperatives to large self-help group movements.²² The Sonagachi project in Kolkata, West Bengal, is a globally recognised model of a community-led FSW intervention resulting in both HIV risk reduction and improved social outcomes.²³

HIV prevention interventions among FSWs, MSM and TGs, however, were hampered by legal issues, pervasive stigma and discrimination, including from health providers and by social stratification. FSWs are of low social status, tend to have low levels of literacy and limited economic options, are often the sole supporters of children, and face violence from pimps, madams, partners and clients, as well as extortion or violence from the police.^{24,25} Although the commercial exchange of sex between consenting heterosexual adults is not illegal in India, police extort and arrest FSWs, invoking the Immoral Trafficking Prevention Act or, more frequently, 'public nuisance' laws.²⁵ The context for MSM and TG programming had similar constraints. The Indian Penal Code (Section 377) makes sexual relations between men a criminal offence. There is widespread social intolerance of MSM and TGs, who experience violence from police, family and society.²⁶ Most MSM do not self-identify as such and, because of cultural pressure for marriage, a large percentage are married and interact with both MSM and heterosexual sexual networks.²⁷

Implementation approach to Avahan's scale-up

Working in a setting with the many enablers described above and with adequate funding, Avahan was able to scale up KP programs through three broad design approaches. First, to support community ownership and social norm change, a progressively participatory approach was implemented whereby KPs were encouraged and capacitated to shape, refine and implement the program.²² Second, to support management and performance measurement, a common minimum program was developed to set minimum standards, which were periodically and iteratively improved and expanded. Routine data collection systems were established to aggregate and consolidate indicators at every level, from the frontline workers through to KP-program contact points to district, stage and central levels. This enabled frontline workers and NGOs to monitor their own performance, and enabled foundation staff and lead partners to drill down from national

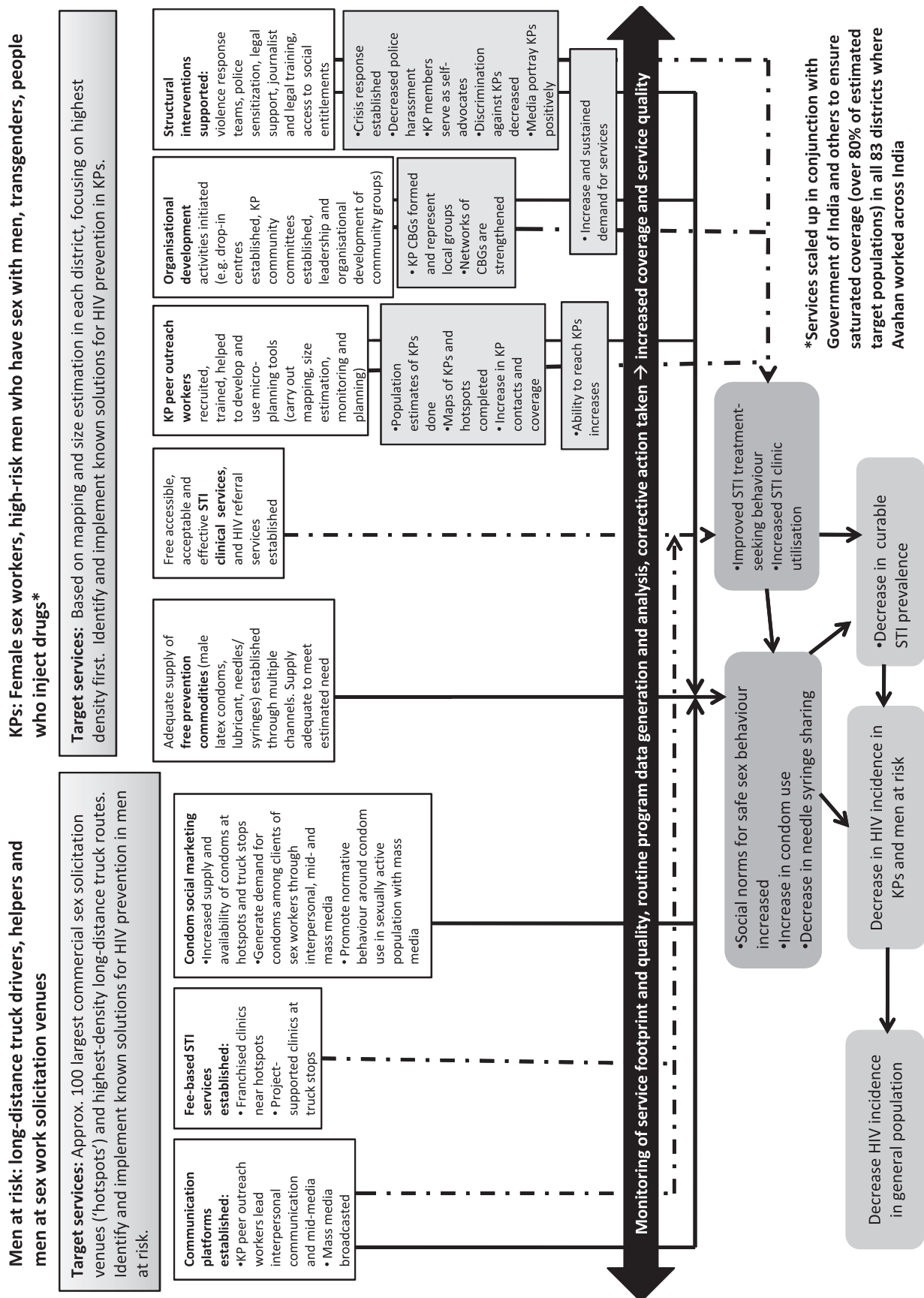


Fig. 1. Avahan project logic model. Sexual health services were scaled up in conjunction with the government of India and others to ensure saturated coverage (over 80% of estimated target populations) in all 83 districts where Avahan worked across India. KP, key population; STI, sexually transmissible infection; CBG, community-based group.

to district levels to NGO level to analyse comparative performance. Supervision systems were built that required periodic, scheduled meetings to review the data at every level from frontline workers through to various levels of NGO staff to foundation officers (Table 1).^{13,28,29} Third, to ensure geographic scale and coverage, there was a clear staged focus where the emphasis was on simultaneous geographic roll-out by (a) first creating a physical footprint with (b) a parallel focus on iterative service quality improvement and then (c) layering of additional services over time (Table 2).²⁸

Although these implementation approaches represent, for the most part, well articulated management techniques, as applied in Avahan, they comprehensively addressed criteria for management

excellence, as outlined in the Baldrige framework. Their rigorous application was an important factor for the scale-up of the program.³⁰ Of note, KP peer outreach workers were compensated and made responsible for outreach service delivery and outreach management. Microplanning tools were developed for their use, coupled with clear targets, and they were given authority and responsibility for meeting the targets, resulting in a marked increase in the number of KPs contacted monthly by KP peer outreach workers, a narrowing in the condom distribution gap (the difference between the estimated number of condoms needed by sex workers, based on reported client numbers, and the number of condoms distributed) and increased clinic utilisation.^{22,31–34}

Table 1. Avahan's organisation for supervision and capacity-building

STI, sexually transmissible infection; TB, tuberculosis; NGO, nongovernmental organisation; CMP, common minimum program; KP, key population; FSW, female sex worker; MSM, men who have sex with men; TGs, transgender people

Level	Management and implementer ^A	Supervision staffing structure and supervisory system ^B	Illustrative capacity-building structure for STIs
Central	Foundation staff, capacity-building or cross-cutting partners: <ul style="list-style-type: none"> Clinical services (STI, counselling, TB) Interpersonal communication Advocacy Media relations Monitoring Community mobilisation 	Central management: <ul style="list-style-type: none"> State-level manager for 1–2 states Semiannual or annual formal review meetings individually with all lead partners Frequent informal engagement 	Clinical services capacity-building Across Avahan: <ul style="list-style-type: none"> Develop guidelines and standards Operations research Support to lead implementing partners: <ul style="list-style-type: none"> Train and support STI technical managers of lead implementing partners Regular technical support Monitor quality (site visits, review of program data)
State level	Lead implementing partners: nine total (six for four southern states, one for two north-eastern states, and two for men at risk)	State-level management: <ul style="list-style-type: none"> Program managers: one manager for 3–5 NGOs Technical managers (outreach and behaviour change, clinical services, monitoring, advocacy, community mobilisation) to meet oversight frequency per CMP Monthly field visits/meetings with NGOs Quarterly reviews with NGOs 	State-level lead implementing partner: <ul style="list-style-type: none"> Train and support NGO clinic staff Supervision based on standards and quality monitoring tools
District level	Local NGOs: 134 total (116 in four southern states)	Implementing NGO <ul style="list-style-type: none"> Field officer NGO or district or sub-district level Staff outreach worker (one for 5–7 peer outreach workers) who have weekly meetings with KP peer outreach workers Monthly meetings with all NGO staff and KP peer outreach workers 	NGO clinic staff: <ul style="list-style-type: none"> Provide STI services Coordinate with outreach efforts Report service statistics
Hot-spot level	KP peer outreach workers 5893 total (5810 in four southern states)	KP peer outreach workers <ul style="list-style-type: none"> One peer outreach worker for ~50 KP community members with daily field presence Weekly meetings with staff outreach supervisor 	Peer outreach workers and staff supervisors: <ul style="list-style-type: none"> Follow-up with community on STI clinic visits and adherence
KP community level	~220 000 FSWs, ~80 000 high-risk MSM and TGs	Community and self-help groups and community committees involved in supervision later in program	KP community members: <ul style="list-style-type: none"> Participate on clinic committee

^AValues are from March 2009, the end of Avahan Phase 1.

^BPeriodicity of supervisory meetings at every level. Meetings were used to solve problems around monitoring data.

Table 2. Stages of Avahan Phase 1 scale-up: goals and activities, monitoring areas and associated indicators
 DIC, drop-in centres; KP, key population; STI, sexually transmissible infection; NGO, nongovernment organisation; TB, tuberculosis

Goals and activities		Areas monitored and indicators	
Start-up			
Deciding where and what: <ul style="list-style-type: none">• Mapping and size estimates• Needs assessment• Establishing hard and soft infrastructure:• Clinic and community safe spaces established (DICs)• Staff and KP peer outreach worker recruitment and training• Commodity and monitoring systems established	Create the physical and virtual footprint <ul style="list-style-type: none">• Informs prioritisation of locations and budget decisions• Involves KP community members in assessment and location choice• Begins introduction of the NGO and services to the KP community	Size estimate of target population Infrastructure (hard) <ul style="list-style-type: none">• Districts and towns working in• DICs established• STI service centres established Infrastructure (soft) <ul style="list-style-type: none">• Staff recruited and trained• KP peer outreach workers recruited and trained Condoms distributed People seeking STI services	<ul style="list-style-type: none">• Population size estimate of female sex workers, and high-risk men who have sex with men and transgender people• Number of intervention districts or towns• Number and type of project sites (DICs, STI centres, offices)• Number of intervention-related project staff• Number of active, paid KP peer outreach workers• Number of condoms distributed and sold• Number of individuals receiving STI services• Ratio of KPs to KP peer outreach workers
Roll-out of basic services			
Matching individuals with services <ul style="list-style-type: none">• Street maps, social network maps• Typology and degree of risk assessed• Microplanning at KP peer outreach worker level	Increase service reach <ul style="list-style-type: none">• Social network and street mapping help to define actual service delivery and personalise outreach• Microplanning tailors services to highest risk and least served. Starts building management and leadership skills in KP community• Monitoring focus on quality helps ensure sustained service uptake	KP peer outreach worker-managed outreach and engagement Program outreach coverage Condom coverage (based on estimated need and corrected for wastage) STI service utilisation Reported behaviour change KP community involvement in services	<ul style="list-style-type: none">• Proportion of outreach contacts made by KP peer outreach workers• Proportion of KP peer outreach workers utilising STI services^A• Proportion of estimated KP population followed by the program• Proportion of estimated KP population contacted by the services monthly• Proportion of monthly risky sexual acts covered through known condom distribution• Proportion of estimated KP population who ever attended a clinic• Proportion of estimated KP population reporting condom use during last sex act with a client• Proportion of members of program services committee (STI clinics and DICs) who are from KP community^B• Proportion of members of program committees (STI clinics and DICs) who attend the meetings in a month^B
Improving service uptake and quality <ul style="list-style-type: none">• Refine monitoring system to focus on quality and the highest risk or least served• Refine intervention reach through updated mapping and size estimates			
Expand scope			
Ensuring other health needs are met <ul style="list-style-type: none">• Mapping other services in geographic area• Additional training for KP peer outreach workers• Establish linkages to other clinical services	Increase community engagement with program and with HIV prevention <ul style="list-style-type: none">• Addresses barriers to service uptake and generates demand• Increased community ownership of services in KP community	Link with other HIV-related services Address underlying vulnerabilities	<ul style="list-style-type: none">• Number of KP individuals referred for HIV testing• Number of KP individuals verbally screened for TB, sent for TB testing, diagnosed with TB or on TB treatment• Proportion of reported incidents of rights violations against KPs addressed within 24 h• Number of KP individuals who have been assisted by the program to get a government identity card^C• Proportion of KP individuals who are members of a community group^B
Addressing underlying vulnerabilities <ul style="list-style-type: none">• Violence response• Local advocacy• Access to entitlements			

^AThis indicator was used to gauge the extent to which KP peer outreach workers were acting as role models. Other efforts were undertaken to ensure that STI testing and treatment were not coercive, mandatory or incentivised in any way.

^BThis indicator was a rough gauge of participation. Because it was important to inform the strength of participation, additional methods were added, including participatory monitoring methods adapted for scale that both informed and improved the program.

^CThis turned out not to be a useful indicator because the government system functions to process applications in specific months. Additionally, access to social entitlements was not uniformly implemented across NGOs and lead implementing partners. Furthermore, there was no denominator of KP members without specific social entitlements so there was no way to monitor coverage.

Experience with STI clinical services and expanding service scope

After establishing STI service delivery across the program, this existing implementation infrastructure was used to scale syphilis screening and treatment, strengthen referral for HIV testing and counselling, and align services with government guidelines. This experience may offer potential lessons for the implementation of new biobehavioural tools and is discussed below. (Not discussed below is the experience in utilising this infrastructure to implement community-based verbal screening for tuberculosis symptoms and linkage with the national tuberculosis program to identify active cases.³⁵)

STI service delivery

STI management was an essential component of the Avahan prevention package (Fig. 1). In order to make STI services as accessible as possible with cost considerations in mind, four main delivery models were used across the project, depending on the density of the KPs. These included (1) static clinics that were colocated with the NGOs and, for the most part, staffed and managed by them; (2) satellite and mobile clinics, and health camps, again staffed and managed by the NGOs; (3) preferred providers (private providers contracted and trained by the NGOs to provide services); and (4) government clinics, often supported by local NGOs with supplies or with staff during specific hours.³⁶ The models, informed with input from the community, often had flexible timings to meet community needs, such as health camps in the evenings and during festivals, preferred providers who worked evenings, and services in bar-based settings just before work hours began. 'Project-owned' clinics (Types 1 and 2 above) constituted most of services and were places where the quality of services and the quality of reporting data could be most easily ensured.

Syphilis screening and management

Syphilis screening and management were part of the initial standardised guidelines and algorithms specified in the STI Clinic Operational Guidelines and Standards for STI clinical services in Avahan clinics.³⁷ However, in many of the project-owned clinics, syphilis screening was not initiated because the infrastructure requirements and staff skills for drawing blood, laboratory testing, quality assurance and control, universal precautions and laboratory commodity management were significantly beyond the expertise and experience of most implementing NGOs. In addition, much of the management attention at the beginning of the project was focussed on project start-up, including coordination with outreach teams, improving the quality of syndrome management and increasing clinic utilisation. Where syphilis screening was started, the initial strategy was to offer onsite or offsite screening with onsite phlebotomy using nontreponemal tests such as rapid plasma reagin (RPR), with confirmation of positive results by treponemal tests at an offsite laboratory. However, the operational complexities, particularly for offsite screening, the long waiting period for results and fear of venipuncture by KPs resulted in low uptake of syphilis screening and significant losses in follow-up where testing was offered.^{38,39}

In 2007, after the results of the first round of the cross-sectional biobehavioural evaluation survey indicated a high prevalence of syphilis among KPs, there was a project-wide effort to expand syphilis screening and treatment across the entire program.¹⁹ Communication materials were developed that described the process and benefits of syphilis testing, and differentiated it from HIV testing. Using the supervision and capacity-building infrastructure outlined in Table 1, the KP peer outreach workers were trained to communicate about syphilis testing and treatment. The KPs were motivated for syphilis screening by the peer outreach workers and community volunteers during routine outreach activities and by healthcare providers during clinic visits. Healthcare providers were also trained in management of anaphylactic reactions resulting from use of injectable penicillin for treatment of syphilis, a major concern in the medical community in India. To address the operational complexities of drawing blood and offsite testing, a rapid treponemal, point-of-care (POC) syphilis test was introduced at sites where RPR testing was not available or feasible. Algorithms were developed for use of this POC test, as the initial screening method; for those testing positive, offsite RPR testing was recommended for prognostic titres and future screening. A study showed that the rates of syphilis screening increased (from 14.3% to 63.1% per quarter) after introduction of POC at FSW sites in Mumbai, a large city.³⁹ Based on routine monitoring data, however, despite the efforts of the program, screening coverage remained low at 22%. There was under-reporting of syphilis testing data from two sources: outreach efforts through health camps and the inability to link syphilis data records to clinic records through the unique ID when merging the record. This data loss could have been minimised through a better designed and standardised use protocol at the beginning of the program and, in this particular case, by ensuring that syphilis screening data were recorded in the clinical records rather than being a separate report.³⁸

External quality assurance for onsite RPR tests was established through tie-ups with referral laboratories, with 100% of positive and 5–10% of negative samples retested either on an ongoing basis or periodically. External quality assurance for POC tests was conducted at select sites in three states by retesting intravenous blood samples at reference laboratories and by proficiency panel testing. Initial results showed poor concordance between POC testing and reference laboratory results. Investigations revealed that clinic staff were not following procedures correctly; after a refresher training, repeat proficiency panel testing improved significantly (internal project documents). POC testing greatly improved access to laboratory results for KPs, and external quality assurance was a critical component of training and supportive supervision of health personnel performing these tests. However, ensuring the quality of testing was a significant problem, especially in towns and remote sites lacking a local accredited reference laboratory, or which had difficulty transporting samples or managing costs.

HIV testing and counselling

STI management interventions and referral support to government facilities for HIV counselling, testing and treatment were interventions initiated from the beginning of

the project. In 2007 primary HIV care services were introduced at the Avahan clinics, with new guidelines and additional components to the common minimum program. Clinic staff were trained to provide chemoprophylaxis and care for opportunistic infections, and counselling for positive prevention using the capacity building oversight structure described for STIs in Table 1.^{40,41} In order to increase uptake of HIV testing and counselling, KPs were encouraged to be tested for HIV and were accompanied to HIV testing and counselling centres if requested. NGOs were charged with sensitising local HIV testing and counselling centres to special issues related to KPs and monitoring them for this aspect of quality. Data from the cross-sectional bi-behavioural surveys done in 2005–2007 (Round I) and 2009–2010 (Round II) showed that for FSWs overall in the four southern states, ever having had an HIV test increased from 35% to 73% and having been tested in the last year increased from 25% to 60%. For high-risk MSM and TGs in three southern states (Karnataka excluded; Round II was performed in 2012) ever having an HIV test increased from 30% to 80% and being tested in the last year increased from 20% to 64%.⁴²

Aligning Avahan programs with government services

In 2009, in preparation for the eventual transition of the Avahan program to government funding, Avahan programs aligned with National AIDS Control Organisation guidelines and the explicit targets for KP interventions and antiretroviral therapy (ART) scale-up. As a result, HIV testing and counselling efforts expanded to meet the goal of twice-yearly referrals to HIV testing centres, linked, as necessary, to facilities for treatment, care and support.^{21,43} Activities to increase KP access to HIV testing, treatment, care, and support were incorporated into the common minimum program, and Avahan interventions partnered with government ART programs. Referral metrics were incorporated into KP peer outreach worker microplanning tools, and providers in STI clinics offered referrals for HIV. To address the numerous constraints in accessing HIV testing and treatment (stigma, mismatch between KP availability and timings of ART services, limited awareness of the value of HIV testing and ART availability, disclosure, the importance of ensuring there was no coercion, and support structures and groups for HIV-positive KPs), several initiatives were established. Consenting HIV-positive KPs who disclosed their status to the counsellor and KP peer outreach worker received an accompanied referral; educational efforts were undertaken by KP peer outreach workers and clinic staff to explain the rationale for testing and details of ART centre procedures. Avahan Phase 2 data show that the total number of HIV tests in KPs increased from 62 546 in 2009 to 247 633 in 2012 (the data are not for individuals, as people were referred twice yearly).

Transitioning Avahan to the government of India

As part of transitioning the Avahan project to the government of India and aligning the program components with the government, funding for most project-owned STI services was stopped and clients were transitioned to preferred providers or government clinics.⁴⁴ To manage this transition

of STI clinical services to government clinics, several activities occurred: (1) KPs were encouraged to access services at these facilities by KP peer outreach workers who cited the advantages of having various services (STI consultation, syphilis screening, HIV testing and counselling, tuberculosis screening and treatment, and other health services) offered at a single location; (2) 'Know your doctor' campaigns (meetings between community members and public-sector healthcare providers) were conducted; (3) several public-sector campaigns for KPs helped increase their confidence about using government services; (4) through capacity-building workshops and interactions with the community at the NGO office, public-sector healthcare providers were sensitised to the needs of KPs, and the requirement for providing nonstigmatising services and maintaining privacy and confidentiality; (5) a community member was placed at some large government hospitals to help KPs access the requisite services at the hospital; and (6) the NGO assisted government sites that provided routine STI check-ups for KPs on predetermined days, by supplying colour-coded prepackaged STI treatment kits used in the project, and by placing a nurse or counsellor to assist the public sector physician. From a structural perspective, under National AIDS Control Program III KP community members were *ex officio* members of the District AIDS Prevention Control Unit, where sharing the KP community's experiences of accessing public sector health facilities was a routine agenda item at the monthly meetings.⁴⁵ Monitoring data for the 24 months after transition showed that clinic attendance rates appeared stable.⁴⁴

Addressing other structural issues

As noted earlier, KPs often live and work in settings with widespread stigma, pervasive violence and limited individual or collective agency (the belief that they can take decisions and act for themselves). In 2006, a community-led crisis response system was implemented to address the immediate need to respond to extortion, harassment and violence against KPs by police and clients, including legal literacy training for KPs and police, and improved dialogue with police.⁴⁶ This experience strengthened the collective power of KPs in the program and led to other structural interventions whereby communities gained government ID cards, and sought to address discrimination, to gain access for their children to schools and to improve norms in their work environment.^{25,47–49}

As part of the Avahan evaluation, multiple rounds of cross-sectional surveys were conducted in selected districts among KPs to provide data on the outcomes of the program.⁵⁰ Given the sensitivities of KPs, especially about collection of data pertaining to stigmatised sexual behaviours and biological samples, meaningful community engagement was embedded in survey implementation to ensure that targeted communities were encouraged to voice their concerns, and processes were developed to minimise harm and address power dynamics. These activities built upon and strengthened the community committee structure established for drop-in centres and clinics, and sought to increase the agency of the KP communities. Besides helping to build trust, these community preparation activities increased the communities' understanding of the

Table 3. Biobehavioural interventions in nongovernment organisation (NGO) or community-based organisation (CBO) services, and clinic-based service

Illustrative activities are core to the service delivery model of the organisation; services that are not necessarily core ('reach activities') require additional support to ensure quality. KP, key population; QA, quality assurance; QC, quality control; ARV, antiretroviral

Activity	NGO or CBO-based service	Clinic-based service
Community education	Core activity: Community activity during outreach. Clinical input into communication material and initial training	Reach activity: Links to NGOs and CBOs to ensure that the community does education and get feedback on community misconceptions
Individual counselling and referral	Core activity: KP peer outreach workers during routine outreach	Reach activity: Links to community groups for peer outreach; links to clinical services for referrals
Individual follow-up and tracing	Core activity: KP peer outreach workers during routine outreach. Need links to NGO-based services to identify individuals needing follow-up	Reach activity: Need to establish mechanism for outreach and follow-up that does not violate confidentiality
Laboratory testing	Reach activity: Point-of-care diagnostics possible in settings without laboratories. Training, supervision and quality assurance necessary	Core activity: Necessary; laboratory or laboratory linkages are probably already established as part of clinic operations. Point-of-care testing preferred
Laboratory quality QA and QC	Reach activity: Need to establish QA and QC links with established service	Core activity: Necessary; probably already established as part of clinic operations
Drug provision	Reach activity: Licensed provider or legal authority to prescribe drugs and ARVs	Core activity: Clinic probably has licensed provider and legal authority to prescribe drugs including ARVs
Drug storage, procurement, management and forecasting	Reach activity: Need to establish secure mechanism to store drug supplies and an appropriate commodity management system that feeds into a reliable procurement system to have adequate stock to anticipate client needs	Core activity: Clinic probably has a pharmacy with necessary storage facilities and appropriate commodity management systems. Forecasting may change with increased links to KPs
Ongoing assessment of respect of clinical services for KPs	Core activity: Participate in community committee on clinical services	Reach activity: Establish mechanisms to get feedback from community on service provision

surveys, created a venue to raise questions and concerns, facilitated dialogue within the KP community and between community and survey teams, and helped the dissemination of results by creating community ownership of the findings for improving programs.

What from Avahan's experience can be applied elsewhere?

Key lessons that would be applicable to KPs programs elsewhere include the following:

1. Given the importance of geographic scale and high coverage for impact, the implementation gap for prevention programs for KPs is a major shortcoming of the global response to HIV.⁵¹ Therefore, it is important that the implementation of new prevention tools does not detract or undermine other elements of ongoing prevention and does not divert prevention resources from KP sites that have no prevention activities at all.⁵²
2. It is essential to build and foster a mobilised community and establish community mechanisms that can work with the program to solve problems; provide critical inputs pertaining to strengths and challenges with access and utilisation, and the community-friendliness of these interventions; disseminate accurate information and correct misconceptions; support the norm of adherence and regular testing; help deliver services; and organise to address stigma, discrimination and violence. All of the Avahan examples above relied on a strong community to both inform and scale up the intervention. An engaged, mobilised community was essential to Avahan's success and to the layering on of additional services and program changes over time. The utilisation of government services by the community after the transition of Avahan was ideal but would probably not have been possible without a strong community with enough experience to know what to expect in terms of service quality, and enough agency to monitor and report perceived deficiencies in quality to authorities. In the first 2 years of Avahan, from lead partners down, community mobilisation and enabling environment costs represented 14.9% of total economic costs.⁵³
3. Having a capacity-building, supervision and data collection system that is flexible enough to absorb new lessons, changes and additions to an initial core definition of the program allows the program to adapt. The supervision and review system should be able identify local innovations, and the program should foster interactions across the partners to ensure that useful local innovations and adaptations to a changing environment are shared widely and, if sound, are adopted program-wide.
4. Building in extra time and support to organisations being asked to implement services that are not core to their business (Table 3) maximises the chances for success. For

example, in Avahan, most contracted NGOs did not have a history of providing clinical services or laboratory tests; as a result, establishing quality services took time and effort, as illustrated by the syphilis screening experience. On the other hand, close linkage between the NGO clinical service and the outreach services, which is an NGO strength, allowed for direct community input into the acceptability and accessibility of services, and for weekly planning to identify individuals who had not come to services, ensuring high coverage.

More than 30 years after HIV was first identified, it still continues to occupy centre stage in many countries. New biobehavioural prevention tools such as PrEP offer promise but to have an impact, they require high coverage with sustained, high-quality engagement between health services and select subpopulations. Some of the practices instituted in programs such as Avahan can be relevant in effectively rolling out these new biobehavioural interventions in KPs.

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References

- Hankins CA, Dybul MR. The promise of pre-exposure prophylaxis with antiretroviral drugs to prevent HIV transmission: a review. *Curr Opin HIV AIDS* 2013; 8: 50–8. doi:10.1097/COH.0b013e32835b809d
- Person AK, Hicks CB. Pre-exposure prophylaxis – one more tool for HIV prevention. *Curr HIV Res* 2012; 10: 117–22. doi:10.2174/157016212799937254
- Schwartländer B, Stover J, Hallett T, Atun R, Avila C, Gouws E, *et al.* Towards an improved investment approach for an effective response to HIV/AIDS. *Lancet* 2011; 377: 2031–41. doi:10.1016/S0140-6736(11)60702-2
- Gomez GB, Borquez A, Caceres CF, Segura ER, Grant RM, Garnett GP, *et al.* The potential impact of pre-exposure prophylaxis for HIV prevention among men who have sex with men and transwomen in Lima, Peru: a mathematical modelling study. *PLoS Med* 2012; 9: e1001323. doi:10.1371/journal.pmed.1001323
- Hallett TB, Baeten JM, Heffron R, Barnabas R, de Bruyn G, Cremin I, *et al.* Optimal uses of antiretrovirals for prevention in HIV-1 serodiscordant heterosexual couples in South Africa: a modelling study. *PLoS Med* 2011; 8: e1001123. doi:10.1371/journal.pmed.1001123
- Cremin I, Alsallaq R, Dybul M, Piot P, Garnett G, Hallett TB. The new role of antiretrovirals in combination HIV prevention: a mathematical modelling analysis. *AIDS* 2013; 27: 447–58. doi:10.1097/QAD.0b013e32835ca2dd
- Walensky RP, Park JE, Wood R, Freedberg KA, Scott CA, Bekker LG, *et al.* The cost-effectiveness of pre-exposure prophylaxis for HIV infection in South African women. *Clin Infect Dis* 2012; 54: 1504–13. doi:10.1093/cid/cis225
- Bertozi SM, Laga M, Bautista-Arredondo S, Coutinho A. Making HIV prevention programmes work. *Lancet* 2008; 372: 831–44. doi:10.1016/S0140-6736(08)60889-2
- Baral S, Beyrer C, Muessig K, Poteat T, Wirtz AL, Decker MR, *et al.* Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis. *Lancet Infect Dis* 2012; 12: 538–49. doi:10.1016/S1473-3099(12)70066-X
- Beyrer C, Sullivan PS, Sanchez J, Dowdy D, Altman D, Trapence G, *et al.* A call to action for comprehensive HIV services for men who have sex with men. *Lancet* 2012; 380: 424–38. doi:10.1016/S0140-6736(12)61022-8
- Amico P, Gobet B, Avila-Figueroa C, Aran C, De Lay P. Pattern and levels of spending allocated to HIV prevention programs in low- and middle-income countries. *BMC Public Health* 2012; 12: 221. doi:10.1186/1471-2458-12-221
- Chandrasekaran P, Dallabetta G, Loo V, Mills S, Saidel T, Adhikary R, *et al.* Evaluation design for large-scale HIV prevention programmes: the case of Avahan, the India AIDS initiative. *AIDS* 2008; 22: S1–15. doi:10.1097/01.aids.0000343760.70078.89
- Avahan, the India AIDS initiative: the business of HIV prevention at scale. New Delhi: Bill & Melinda Gates Foundation; 2008.
- Verma R, Shekhar A, Khobragade S, Adhikary R, George B, Ramesh BM, *et al.* Scale-up and coverage of Avahan: a large-scale HIV-prevention programme among female sex workers and men who have sex with men in four Indian states. *Sex Transm Infect* 2010; 86: i76–82. doi:10.1136/sti.2009.039115
- Pickles M, Foss AM, Vickerman P, Deering K, Verma S, Demers E, *et al.* Interim modelling analysis to validate reported increases in condom use and assess HIV infections averted among female sex workers and clients in southern India following a targeted HIV prevention programme. *Sex Transm Infect* 2010; 86: i33–43. doi:10.1136/sti.2009.038950
- Ng M, Gakidou E, Levin-Rector A, Khera A, Murray CJ, Dandona L. Assessment of population-level effect of Avahan, an HIV-prevention initiative in India. *Lancet* 2011; 378: 1643–52. doi:10.1016/S0140-6736(11)61390-1
- Chandrasekaran P, Dallabetta G, Loo V, Rao S, Gayle H, Alexander A. Containing HIV/AIDS in India: the unfinished agenda. *Lancet Infect Dis* 2006; 6: 508–21. doi:10.1016/S1473-3099(06)70551-5
- Options Consulting, Development Fund for International Development. Evaluation of HIV/AIDS targeted interventions in reduction of HIV transmission in five states in India – draft national level report. London, UK: Options Consulting; 2003.
- National Behavioural Surveillance Survey 2006: executive summary. New Delhi: National AIDS Control Organisation, Ministry of Health and Family Welfare, Government of India; 2006.
- HIV sentinel surveillance and HIV estimation in India 2007: a technical brief. New Delhi: National AIDS Control Organization, Ministry of Health and Family Welfare, Government of India; 2008.
- Strategy and implementation plan: national AIDS control programme Phase III (2006–2011). New Delhi: National AIDS Control Organisation, Ministry of Health and Family Welfare, Government of India; 2006.
- Wheeler T, Kiran U, Dallabetta G, Jayaram M, Chandrasekaran P, Tangri A, *et al.* Learning about scale, measurement and community mobilisation: reflections on the implementation of the Avahan HIV/AIDS initiative in India. *J Epidemiol Community Health* 2012; 66: ii16–25. doi:10.1136/jech-2012-201081
- Jana S, Basu I, Rotheram-Borus MJ, Newman PA. The Sonagachi project: a sustainable community intervention program. *AIDS Educ Prev* 2004; 16: 405–14. doi:10.1521/acap.16.5.405.48734
- Dandona R, Dandona L, Kumar GA, Gutierrez JP, McPherson S, Samuels F, *et al.* Demography and sex work characteristics of female sex workers in India. *BMC Int Health Hum Rights* 2006; 6: 5. doi:10.1186/1472-698X-6-5
- Biradavolu MR, Burris S, George A, Jena A, Blankenship KM. Can sex workers regulate police? Learning from an HIV prevention project for sex workers in southern India. *Soc Sci Med* 2009; 68: 1541–7. doi:10.1016/j.socscimed.2009.01.040

- 26 Chakrapani V, Newman PA, Shunmugam M, McLuckie A, Melwin F. Structural violence against Kothi-identified men who have sex with men in Chennai, India: a qualitative investigation. *AIDS Educ Prev* 2007; 19: 346–64. doi:[10.1521/aeap.2007.19.4.346](https://doi.org/10.1521/aeap.2007.19.4.346)
- 27 Dandona L, Dandona R, Gutierrez JP, Kumar GA, McPherson S, Bertozzi SM. Sex behaviour of men who have sex with men and risk of HIV in Andhra Pradesh, India. *AIDS* 2005; 19: 611–9. doi:[10.1097/01.aids.0000163938.01188.e4](https://doi.org/10.1097/01.aids.0000163938.01188.e4)
- 28 Avahan, India AIDS initiative. Common minimum program: essential for scale-up, flexible for varying contexts, standardized for monitoring. New Delhi: Bill & Melinda Gates Foundation; 2011.
- 29 Use it or lose it: how Avahan used data to shape its HIV prevention efforts in India. New Delhi: Bill & Melinda Gates Foundation; 2008.
- 30 Mabuchi S, Singh S, Bishnu R, Bennett S. Management characteristics of successful public health programs: 'Avahan' HIV prevention program in India. *Int J Health Plann Manage* 2013; 28: 333–45. doi:[10.1002/hpm.2153](https://doi.org/10.1002/hpm.2153)
- 31 Gurung A, Narayanan P, Prabhakar P, Das A, Ranebennur V, Tucker S, *et al.* Large-scale STI services in Avahan improve utilization and treatment seeking behaviour amongst high-risk groups in India: an analysis of clinical records from six states. *BMC Public Health* 2011; 11: S10. doi:[10.1186/1471-2458-11-S6-S10](https://doi.org/10.1186/1471-2458-11-S6-S10)
- 32 Mogasale V, Wi TC, Das A, Kane S, Singh AK, George B, *et al.* Quality assurance and quality improvement using supportive supervision in a large-scale STI intervention with sex workers, men who have sex with men/transgenders and injecting-drug users in India. *Sex Transm Infect* 2010; 86: i83–8. doi:[10.1136/sti.2009.038364](https://doi.org/10.1136/sti.2009.038364)
- 33 Managing HIV. Prevention from the ground up: peer led outreach at scale in India. The experience of Avahan. New Delhi: Bill & Melinda Gates Foundation; 2009.
- 34 Micro-planning in peer led outreach programs: a handbook. New Delhi: Bill & Melinda Gates Foundation; 2013.
- 35 Kane S, Dewan PK, Gupta D, Wi T, Das A, Singh A, *et al.* Large-scale public-private partnership for improving TB-HIV services for high-risk groups in India. *Int J Tuberc Lung Dis* 2010; 14: 1066–8.
- 36 Treat and prevent: Avahan's experience in scaling up STI services to groups at high risk of HIV infection in India. New Delhi: Bill & Melinda Gates Foundation; 2010.
- 37 Clinic operational guidelines & standards: comprehensive STI services for sex workers in Avahan-supported clinics in India. New Delhi: Family Health International. Available online at: <http://www.indiahiv.org/Documents/Avahan%20COGS.pdf> [verified May 2014].
- 38 Parthasarathy MR, Narayanan P, Das A, Gurung A, Prabhakar P, Wi T. Integrating syphilis screening in a large-scale HIV prevention program for key populations: the Avahan experience from India. *J Infect Dev Ctries* 2013; 7: 484–8. doi:[10.3855/jidc.2810](https://doi.org/10.3855/jidc.2810)
- 39 Gupte S, Daly C, Agarwal V, Gaikwad SB, George B. Introduction of rapid tests for large-scale syphilis screening among female, male, and transgender sex workers in Mumbai, India. *Sex Transm Dis* 2011; 38: 499–502.
- 40 Guidelines and standards for counseling high risk groups in clinic settings. New Delhi: Family Health International; 2009.
- 41 Primary HIV/AIDS care and support manual for clinics providing HIV prevention services for high risk groups. New Delhi: Christian Medical College Vellore and Family Health International; 2009.
- 42 National summary report: India (July 2011), Integrated behavioural and biological assessment (IBBA), round 2 (2009–2010). New Delhi: Indian Council of Medical Research and FHI 360; 2011.
- 43 Bennett S, Singh S, Ozawa S, Tran N, Kang JS. Sustainability of donor programs: evaluating and informing the transition of a large HIV prevention program in India to local ownership. *Global Health Action* 2011; 4: 7360.
- 44 Sgaier SK, Ramakrishnan A, Dhirga N, Wadhvani A, Alexander A, Bennett S, *et al.* How the Avahan HIV prevention program transitioned from the Gates Foundation to the government of India. *Health Aff (Millwood)* 2013; 32: 1265–73. doi:[10.1377/hlthaff.2012.0646](https://doi.org/10.1377/hlthaff.2012.0646)
- 45 Operational guidelines: district AIDS prevention and control units (DAPCU). New Delhi: National AIDS Control Organisation; 2012.
- 46 Community led crisis response systems: a handbook. New Delhi: Bill & Melinda Gates Foundation; 2013.
- 47 Reza-Paul S, Lorway R, O'Brien N, Lazarus L, Jain J, Bhagya M, *et al.* Sex worker-led structural interventions in India: a case study on addressing violence in HIV prevention through the Ashodaya Samithi collective in Mysore. *Indian J Med Res* 2012; 135: 98–106. doi:[10.4103/0971-5916.93431](https://doi.org/10.4103/0971-5916.93431)
- 48 Gurnani V, Beattie TS, Bhattacharjee P, Mohan HL, Maddur S, Washington R, *et al.* An integrated structural intervention to reduce vulnerability to HIV and sexually transmitted infections among female sex workers in Karnataka state, south India. *BMC Public Health* 2011; 11: 755. doi:[10.1186/1471-2458-11-755](https://doi.org/10.1186/1471-2458-11-755)
- 49 Saggurti N, Mishra R, Proddutoor L, Tucker S, Kovvali D, Prabhakar P, *et al.* Community collectivization and its association with selected outcomes among female sex workers and high-risk men who have sex with men/transgenders in Andhra Pradesh, India. *AIDS Care* 2013; 25: S55–66. doi:[10.1080/09540121.2012.749334](https://doi.org/10.1080/09540121.2012.749334)
- 50 Saidel T, Adhikary R, Mainkar M, Dale J, Loo V, Rahman M, *et al.* Baseline integrated behavioural and biological assessment among most at-risk populations in six high-prevalence states of India: design and implementation challenges. *AIDS* 2008; 22: S17–34. doi:[10.1097/01.aids.0000343761.77702.04](https://doi.org/10.1097/01.aids.0000343761.77702.04)
- 51 Laga M. Effect of HIV prevention in key populations: evidence accumulates, time to implement. *Lancet Global Health* 2013; 1: e243–4. doi:[10.1016/S2214-109X\(13\)70096-2](https://doi.org/10.1016/S2214-109X(13)70096-2)
- 52 Steen R, Hontelez JA, Veraart A, White RG, de Vlas SJ. Looking upstream to prevent HIV transmission: can interventions with sex workers alter the course of HIV epidemics in Africa as they did in Asia? *AIDS* 2014; 28: 891–9. doi:[10.1097/QAD.0000000000000176](https://doi.org/10.1097/QAD.0000000000000176)
- 53 Chandrashekar S, Guinness L, Kumaranayake L, Reddy B, Govindraj Y, Vickerman P, *et al.* The effects of scale on the costs of targeted HIV prevention interventions among female and male sex workers, men who have sex with men and transgenders in India. *Sex Transm Infect* 2010; 86: i89–94. doi:[10.1136/sti.2009.038547](https://doi.org/10.1136/sti.2009.038547)