

## Review

# Revitalizing the HIV response in Pakistan: A systematic review and policy implications



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## ABSTRACT

**Background:** We sought to describe the epidemiology of HIV in Pakistan and prioritize interventions to improve the effectiveness and efficiency of the response to HIV.

**Methods:** We conducted a systematic review of the epidemiology of HIV in Pakistan. Data sources included PUBMED and EMBASE and unpublished reports from public, non-governmental organizations and provincial and national stakeholders. We focused on findings from the last 5 years and only evaluated data before 2005 on at risk groups where there were insufficient data published after 2005. A population attributable risk analysis was conducted to estimate the burden of HIV among most at risk populations (people who inject drugs, female sex workers, male sex workers, *Hijra* or transgender sex workers and men who have sex with men).

**Results:** Pakistan has a concentrated epidemic of HIV-1 among most at risk populations with very low prevalence rates in the general population (0.04%). The majority of current HIV infections are estimated to occur among four at risk populations, despite their accounting for under 2% of all adults. Injecting drug users accounted for 36.4% of HIV cases – the largest share of infections in any one group. Female, male and transgender sex workers accounted for 24%, 12% and 17.5% respectively, a cumulative population attributable risk of 53.5% of all infections occurring among sex workers.

**Conclusion:** Pakistan must continue to invest in targeted, evidence-based interventions to prevent the spread of HIV and curb the epidemic trajectory in Pakistan. A comprehensive range of services should include needle and syringe exchange, opiate substitution therapy for people who inject drugs, outreach and engagement with injecting drug users, *Hijra* community as well as male and female sex workers and their clients and improved linkage between services and voluntary counseling, testing and anti-retroviral therapy.

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## Introduction

The Islamic Republic of Pakistan is the sixth most populated country in the world, with some 176 million citizens, 94% of whom reside in four Provinces – Punjab, Sindh, Khyber Pakhtunkhwa and Baluchistan. The remaining 6% reside in the northern regions of the country including – Jammu Azad Kashmir, the Federally Administered Tribal Areas, Gilgit-Baltistan and the Islamabad Capital Territory. Political, humanitarian and social challenges have complicated Pakistan's recent HIV prevention efforts. In 2010, an

amendment to the Constitution ([National Assembly of Pakistan, 2010](#)) devolved key social sectors to the Provinces, including the Ministry of Health and the National AIDS Program. Further, more than half of health care services in Pakistan are delivered through the private sector where HIV prevention, treatment and care standards remain unclear.

Religion forms the crux of social and political life in Pakistan. Under Islamic codes, any form of sex other than between married couples is *haram* (forbidden). Sex between men and sex work are culturally sanctioned and illegal in Pakistan ([UNDP, 2010](#)). Same sex behavior is not uncommon, but is both stigmatized and criminalized ([UNDP, 2010](#)). *Hijra* or (male to female) transgender has been an integral part of the traditional culture. However, *Hijra* risk behaviors, sexual networks, and relationships with the wider community, are understudied and little understood.

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Pakistan has seen substantial labor migration to the Gulf States and, to a lesser extent, other regions, in search of economic opportunities. Returning labor migrants constitute a large proportion of those currently receiving HIV treatment (NACP, 2008), since mandatory screening and case detection are common in destination countries.

Male circumcision is virtually universal in Pakistan, and this has likely limited further heterosexual spread of HIV infection. HIV has remained highly concentrated in people who inject drugs (PWID), *Hijra* and male sex workers, but scale-up of prevention efforts for these populations has proved to be challenging. There is a plan to pilot opioid substitution therapy (OST) in 2013 after many years of advocacy, yet recent interruptions to the work of Non-Governmental Organizations (NGO) in delivering harm reduction and needle and syringe exchange may have had adverse effects (NACP, 2008).

Pakistan, like many countries with a concentrated epidemic, now faces a policy dilemma: how to sustain and expand targeted prevention and care for those actually at risk of HIV infection in the context of declining donor aid. Implementing an effective and efficient response to reduce new HIV infections is urgently required, but this will take political will, sustained public health effort and appropriate resource reallocation. However, since HIV remains concentrated in a few groups and settings, relatively modest investments in the right programs could have a major impact on Pakistan's epidemic.

Our objective is to describe the current epidemiology of HIV in Pakistan and, drawing on global learning, to determine the priority actions for evidence-based public policy to improve the efficiency and effectiveness of the HIV response.

## Methods

### *Search strategy and eligibility criteria*

We conducted a systematic review of the published and unpublished literature on the epidemiology of HIV in Pakistan (Beyrer, Singh, Ambrosio, & Semini (2012)). Systematic searches of databases PUBMED and EMBASE were conducted from inception to March 8th 2011 and updated to December 1st 2011, to identify eligible articles using appropriate MESH terms for Pakistan and HIV. There were no language restrictions. To identify additional published or unpublished articles we solicited data from the National AIDS Control Program of Pakistan and from local partners, including the Provincial AIDS Control Program [Sindh] and the HIV AIDS Surveillance Project. We also electronically solicited articles from all four provincial partners, UNAIDS, the World Bank, UNICEF, UNODC, UNFPA, UNIFEM and USAID and Non-Governmental Organizations representing people who inject drugs, migrants, and people living with HIV/AIDS. Finally, we conducted stakeholder meetings in March 2011 to inform the review and triangulate data from several sources. Although our search did not have any date restriction, we focused on findings from the last 5 years and only evaluated data before 2005 on at risk groups for which there were insufficient data after 2005. We registered to receive electronic notifications from PUBMED to December 2011 to identify any additional relevant studies.

To estimate the burden of HIV we included studies that reported on prevalence odds of HIV or AIDS measured by biological tests. Population based surveys that estimated the relative population size of these at risk groups were also included. Studies that evaluated the shared risks of HIV, Hepatitis C, and Tuberculosis were reviewed to understand their contextual role in the HIV epidemic and to identify any shared risk factors. We allowed for the inclusion of all quantitative studies irrespective of design (controlled or

uncontrolled). Qualitative studies and case reports of <30 participants were also reviewed.

### *Data abstraction*

We extracted data from eligible studies into a preformatted Excel spreadsheet. This collated details on the source of the study, the year the study was conducted, the province and city and the population under study (people who inject drugs (PWID), men who have sex with men (MSM), male (MSW), female (FSW) and *Hijra* (HSW) sex workers). Two independent reviewers (MA and SS) reviewed titles and abstracts determining their eligibility for inclusion in the review. We cross checked published papers with those provided by stakeholders to avoid duplication. Two reviewers independently extracted data on included studies. Any discrepancies between the reviewers were resolved by consensus or adjudication by a third reviewer (CB).

### *Study quality or risk of bias*

We anticipated that randomized controlled trials or prospective or retrospective cohort studies would be unlikely, therefore the cross sectional studies or surveys were evaluated for their validity. To assess quality and risk of bias we extracted information when available on sample size, sampling methods, recruitment, whether the survey was piloted and the proportion of non-responders. We did not assign any numerical grade for quality but reported on these elements. Cross sectional prevalence estimates can provide reliable estimates of population size of different at risk groups and the prevalence of HIV among these groups.

### *Statistical analysis*

We conducted a population attributable risk analysis for PWID, FSW, MSW, HSW using available epidemiologic surveillance data on at risk populations, size estimates for these populations from the HIV AIDS Surveillance Project (HASP) and an estimated general population prevalence of 0.1% of reproductive aged adults (Table 1). Since population based estimates of the proportion of anal sex between MSM was not available for Pakistan, we used conservative estimates of this behavior from similar epidemics in the Middle East and North African (Mumtaz et al., 2010). We also used the best available estimates of HIV from a RDS study of MSM in Karachi (Khanani, Somani, Khan, Naseeb, & Ali, 2010) to estimate the attributable risk and population attributable risk of HIV behavior outside the context of sex work.

### *Grading the strength of epidemiologic evidence and recommendations*

We assigned strength of evidence grades to our key epidemiological findings and policy recommendations using an adaptation of the GRADE approach (Guyatt et al., 2008). Our assessment was based on the domains of *study quality or risk of bias*, the *consistency* of evidence across geographic areas and different studies, the *directness* of the evidence to the relevant populations and *questions*, and the *precision* of the estimates. The additional domains evaluated included the *strength of the association* (magnitude of effect) and *publication bias, impact of plausible confounders and dose-response of the association*. Similarly our policy recommendations were assigned evidence grades based on whether they were obtained from randomized controlled trials or reasonable modeling approaches in similar contexts and addressed these at risk populations. Since most estimates of prevalence were from cross sectional studies, we did not downgrade the strength of evidence on the basis of study design.

Evidence obtained from high quality studies, which was consistent across studies, and was precise, was graded as *high* (estimate likely reflects true effect and is unlikely to be changed by future studies). The strength of evidence was downgraded to *moderate* if the evidence was imprecise, but obtained from reasonable quality studies and the findings were reasonably consistent. These estimates likely reflect true effect and are unlikely to be changed by future studies, although the precision of the estimates may vary. If the evidence was primarily derived from low quality studies, inconsistent from study to study and was imprecise, we assigned a *low* strength of evidence. These estimates were unlikely to reflect true effect and could be substantially changed by future studies. Evidence was graded as *insufficient* when there was insufficient evidence on the finding.

## Findings

The initial search of PUBMED and EMBASE identified 445 citations. After taking out duplicate studies 321 titles and abstracts were reviewed for inclusion in the systematic review. We received 59 studies and reports from local stakeholders and partners. Some 97 studies provided quantitative data and were evaluated for this review. The population attributable risk analysis is shown in Table 1. The key epidemiological findings are summarized in Table 2.

### Epidemiology of HIV

Population attributable risk analysis: Pakistan has an increasingly concentrated epidemic of HIV-1, with evidence of high rates of infection among PWID and sex workers but low general population

**Table 1**  
Population attributable risk of HIV among risk populations in Pakistan.

Population	HIV prevalence, % <sup>a</sup>	Prevalence risk ratio <sup>c</sup>	Attributable risk, %	Prevalence of exposure in population, per 1000 adult males <sup>b</sup>	Population attributable risk, %
IDU	27.2	68	98.5	3.7	36.4
FSW	0.6	1.5	33.3	7.2	24
MSW	1.6	4	75	1.6	12
HSW	5.2	13	92.3	1.9	17.5
MSM	10.9 <sup>d</sup>	27.3	96.3	1.0 <sup>e</sup>	9.6

<sup>a</sup> Unweighted HIV prevalence from NACP (2012).

<sup>b</sup> Population size estimates for all core groups except MSM from NACP (2012).

<sup>c</sup> Prevalence risk ratio estimated based on baseline risk of HIV in Pakistan = 0.046% from antenatal surveillance study among pregnant women (NACP, 2012).

<sup>d</sup> HIV prevalence for MSM estimated from Khanani et al. (2010) a cross-sectional RDS sample of MSM in Karachi.

<sup>e</sup> Data on prevalence of male-to-male sex behavior unavailable from NACP and extrapolated from a data synthesis of Middle East and North Africa at conservative estimate of 1/1000, Mumtaz et al. (2010). Note: Attributable risk and population attributable risk may sum up to >100% because of shared risk factors.

**Table 2**  
Key epidemiological findings on HIV in Pakistan.

Key epidemiological findings	Strength of evidence
A concentrated HIV epidemic is prevalent among specific populations (injecting drug users, Hijra sex workers, male sex workers and female sex workers) in the major urban cities, with some provincial heterogeneity and evidence of self sustaining transmission	Moderate
Relatively limited overlap exists of the sexual networks among these core populations	Low
Female sex workers are at risk for STIs but report low prevalence rates of HIV because heterosexual transmission of HIV is likely terminal in a setting with the majority of males being circumcised	Moderate
Several routine antenatal surveillance studies among pregnant women in health care settings reported very low rates of HIV among the general population	Moderate
There is limited access to VCT and linkages to care for risk groups and, subsequently, there are broken referral chains	Low
HIV positive migrants returning from the Gulf States and their wives are a substantial proportion of those receiving treatment in certain Provinces such as the Khyber Pakhtunkhwa, which need to be scaled up to accommodate risk populations	Low
The proportion of risk populations receiving ART is low. It is estimated that there are 98,000 people living with HIV in Pakistan in 2009 (UNAIDS, 2010). The estimated number of adults (15+) in need of ART in 2010 was 20,000 [range of 14,000–47,000].	Moderate
The epidemic of HIV is concentrated in the urban centers. Data on rural transmission of HIV are limited, although with rapid urbanization and population mobility the boundaries between urban, suburban and rural areas are increasingly blurred in Pakistan.	Moderate
Although high rates of Hepatitis B and Hepatitis C are reported in the blood supply, the overall contribution of contaminated blood supply to the burden of the HIV epidemic in Pakistan remains unsubstantiated.	Low

rates of HIV <1/1000. In all, the majority of current HIV infections are estimated to occur among four at risk groups despite their accounting for under 2% of all adults (NACP, 2008). PWID account for 36.4% of HIV – the largest share of infections for any one group. Female, Male and Hijra sex workers account for 24%, 12% and 17.5% respectively, with a cumulative population attributable risk of 53.5% of all infections occurring among sex workers. Since clients of sex workers are under-sampled, this undoubtedly reflects an over-estimate of the proportion of HIV infections among sex workers. Nevertheless, this remains a highly concentrated epidemic.

HIV infection rates among PWID in the 2011 surveillance round were particularly alarming, revealing an entrenched and rapidly spreading epidemic across Provinces. Notwithstanding variations in the cities sampled over surveillance rounds, HIV rates among PWID in Pakistan doubled between 2005 and 2008 to 20.8% (95% CI 19.4–22.3) nationwide (NACP, 2008; Strathdee et al., 2010) and was reported at 27.2% in the latest national survey (NACP, 2008). Based on mapping and subsequent size estimations, it was estimated that there were 91,000 PWID in 2007, but this number may have grown, the average age has declined over time and injecting practices seem to have spread to new sites (NACP, 2012). In 2011, about 39% of nearly 5000 PWID interviewed reported sharing syringe/needles ranging from 4% to 72% across cities. The United Nations Office of Drug and Crime (UNODC) estimate that over 99% of PWID are male. Approximately 35–50% were married (NACP, 2012; Nai Zindagi, 2008).

The epidemic among PWID is highly heterogenous with diverse risk factors. The rates of concomitant HCVs are as low as 8% in Abbottabad in Khyber Pakhtunkhwa (Kuo et al., 2006) to as high as 75% in Quetta and 92.9% in Lahore in Punjab (Platt et al., 2009). Several surveys have reported high rates of sexual encounters (>50%) with

women in the last 12 months (Bokhari et al., 2007), although overlap with other risk groups such as sex workers is relatively lower. While most data comes from male PWID, there has been evidence of HIV among female PWID, with their pattern of drug consumption being pharmaceuticals rather than heroin. However, females are likely to be a very small proportion of PWID with UNODC estimates of 0.2% in 2008 (Bergstrom et al., 2010). Almost three-quarters of PWID surveyed (71.5%) reported injecting between two to three times a day (NACP, 2012).

Another recent study, which assessed the provision of condoms to PWID in different cities, reported that prevalence of HIV in intervention cities remained unchanged in Faisalabad, Punjab (13%) and Quetta (10%) but increased in Karachi (26–30%) (NACP, 2012). Knowledge and use of HIV prevention services by PWID reached 44% in 2011 (NACP, 2012). Approximately 14% of PWID reported having sex with a FSW in the last six months and 15% had sold/exchanged sex for money in the same period (NACP, 2012). Coverage of sterile syringes for intervention cities reached 30% compared to only 13% nationwide in 2007 (Khan & Khan, 2011).

There is also an emerging epidemic among the *Hijra* (Rajabali, Khan, Warraich, Khanani, & Ali, 2008). HIV prevalence among HSW has significantly increased between national surveillance rounds, rising from 0.82% (95% CI 0.4–1.3) in 2005 to 6.35% (95% CI 5.0–7.7) in 2008 (NACP, 2008). The latest surveys in 2011, continue to report prevalence rates of 5.2% among HSW (NACP, 2012). There were wide provincial variations with the highest rates of HIV reported among HSW in Larkana, Sindh at 27.6% [95% CI 21.4–33.9] and the lowest prevalence reported among HSW in Peshawar, Khyber Pakhtunkhwa [1.24%, 95% CI, 0–2.95]. There were an estimated 43,000 HSW nationwide in 2007, the majority of whom were located in Punjab and Sindh.

In a recent cross-sectional survey in Karachi, only 40% of clients of HSW reported using condoms during their last sexual encounter (Siddiqui et al., 2011). Another recent study of 2694 male sex workers (Hijra and non Hijra) from eight cities in Pakistan, reported high volumes of sex acts – an average of 31 receptive sex acts in the previous month (Shaw et al., 2011). Approximately one fifth of participants reported using condoms during their last sexual encounter (Shaw et al., 2011). Little is known about the risk and health-seeking behaviors of Hijra who are not engaged in sex work (NACP, 2008). We noted a lack of civil society organizations targeting Hijras.

The fourth round of surveillance reports HIV prevalence rates at 1.6% among MSW (NACP, 2012). This suggests increasing HIV prevalence rates among this group. These were reported at 0.45% (95% CI 0.2–0.9) in 2005 and 0.75% (95% CI 0.3–1.5) in 2008 (NACP, 2008). The estimated size of the male sex worker population is 63,000, somewhat larger than the *Hijra* but less than the FSW population (NACP, 2008). Although a small study reported that over one fifth of male and transgender sex workers had sex with PWID clients Collumbien, Chow, Qureshi, Rabbani, and Hawkes (2008), we did not find consistent evidence of overlapping networks among these populations.

FSW constitute the largest at risk population in Pakistan. HIV rates have remained low since data have been available from 2005 onwards. A slight increase was documented in a special round of surveillance in 2009–2010, with prevalence rates ranging from 0.99% in Lahore to 2.24% in Karachi (Abbas, 2010), while 0.6% prevalence was reported in the latest round of surveys, with significant variations across Provinces. Larkana and Karachi in Sindh reported the highest prevalence of HIV among FSW with 1.9% each (NACP, 2012). The national estimate of the number of FSW was 136,000 (NACP, 2008), noting that this might underestimate the size of the population given the hidden and illegal nature of sex work (Emmanuel et al., 2010).

The typology of female sex work, determined by place and mode of soliciting clients, shares risk factors for HIV and sexually transmitted infections (STI). Traditionally, brothel-based sex workers operate in stable locations, licensed for entertainment, known by clients and brokers and managed by a ‘madam’ or other individual (FHI, 2009; Emmanuel & Fatima, 2008; NACP, 2012). Sexual transactions occur at a venue chosen by the FSW or the client (NACP, 2012). Home-based sex work includes FSW who live with their families. They work part-time and rely on network operators for clients and for arranging where the sexual activity takes place (NACP, 2012). Similar to the global trend, the profile and typology of FSW is changing in Pakistan. Currently brothel-based sex work represents only about 2% of all sex work (NACP, 2012), while the number of FSW operating independently, in hotels, beauty parlors and other venues, or contacting clients through mobile phones, is increasing. These groups have not been sufficiently included in national surveillance and their risks are little understood. FSW report an average of three clients per day and a per month average of 50+/-37.2 clients. More independent sex work appears to bring benefits in term of money management, but also increases the risk of arrest and violence (NACP, 2012). The 2011 surveillance round indicates that condom use with clients was generally very low; only 20.6% reported consistent condom use with non-paying clients and 50% reported using a condom during their last vaginal intercourse (NACP, 2012). The risks of HIV for FSW, combined with relatively low HIV infection rates in this group, likely reflect the very low rates of HIV among their male clients who are unlikely to be either PWID or MSM.

Data on MSM outside the context of sex work have not been collected in national surveys. One multi-site study in Sindh, with varying sample size, shows HIV prevalence rates ranging from 0% to 17.8% among MSM (Khanani et al., 2010; Sindh AIDS Control Program, 2011). The HIV rates are similar to those reported among South Asian MSM (Hernandez et al., 2006). Since both MSW and HSW populations are substantial in number, their client pools are also likely to be substantial.

General population samples in several major urban centers in Pakistan suggest sustained low rates of HIV infection with below 0.1% of reproductive age adults (UNGASS, 2010). A recent seroprevalence study among approximately 26,500 pregnant women in nine districts across the country found only 12 confirmed cases of HIV, giving a prevalence of 0.04% (NACP, 2012). Similarly, in 2008–9, there were no HIV infections detected either among 2983 pregnant women tested at Lady Wallington Hospital in Lahore or among 2589 pregnant women at the Pakistan Institute of Medical Sciences in Islamabad (Shabbir, Uzma, & Abbass, 2010). The great majority of Pakistani women have a single lifetime sex partner thus further limiting transmission at network levels (Shabbir et al., 2010).

It is unlikely, based on current evidence, that Pakistan will face a generalized epidemic. However, there are determinants and settings of HIV-related vulnerability in the country other than those identified above. Most reported HIV infections among women have occurred through sexual contact with spouses, including among spouses of migrants, PWID, those with multiple sexual contacts or with other risk factors (Khanani et al., 2010; Nai Zindagi, 2008). This is subsequently linked to most of the cases of mother-to-child transmission. HIV in prisons also ranges from 1% to 4% across Punjab and Sindh, though these figures cannot be generalized to the estimated 150,000 prisoners in the country (Safdar, Mehmood, & Abbas, 2009; Kazi et al., 2010). Lastly, localized iatrogenic epidemics have been documented in largely rural communities involving a mix of risk factors, including un-sterilized therapeutic injections: Pakistan reports among the highest rate of therapeutic injections in the world (NACP, 2008).

Around 5000 cases of HIV infection have been reported in the country. This is an enormous under-estimate of likely HIV

infections. Migrant laborers returning to Pakistan after HIV diagnoses in other countries constitute a large number of such reported cases (NACP, 2008), demonstrating the reporting bias. WHO/UNAIDS estimates that there were likely to be 98,000 people living with HIV in Pakistan by 2009 (UNGASS, 2010).

#### *Response to the HIV Epidemic*

Pakistan has made strides over the last decade in its response to HIV and AIDS. Since 2005 this has included active surveillance, considerable research, both government and non-governmental prevention and care activities, and HIV treatment. However, there remain substantial gaps in understanding epidemic dynamics as well as in access and coverage of voluntary counseling and testing (VCT), HIV prevention and treatment, and treatment and care for substance misusers. More generally, there is work to be done in optimizing services for those in need.

In 2010–11 Pakistan saw a marked decline in external funding and a decreasing donor focus on HIV specific support and this has resulted in the disruption of services for PWID and other at risk populations. US 43 million dollar Global Fund Round 9 funding has been awarded to Pakistan to provide comprehensive harm reduction services to PWID in 24 districts of the two largest Provinces – Punjab and Sindh – as well as community and home-based care for people living with HIV across all Provinces over five years (The Global Fund to Fight Aids Tuberculosis and Malaria, 2012). Effective and efficient implementation of good quality harm reduction services at required levels of coverage is needed urgently to prevent further spread of the epidemic and optimize the use of scarce resources.

A second concern for Pakistan is the 2010 decision to devolve health sector functions to the provincial level (Moriani, 2012). This process may impact upon HIV programs through the potential loss of central level surveillance, planning, programming, procurement, normative guidance and resource allocation. Reassuringly however, the Provincial AIDS Control Programs in the Departments of Health have subsequently assumed greater responsibility for some of these functions, while the role and scope of the National AIDS Control Program is being redefined following international legal agreements, such as on the Global Fund. In 2012 the five-year provincial AIDS strategies were developed and local funding increased in the Punjab and Sindh from around 20% to 40% of overall needs, particularly for HIV-related harm, risk reduction and anti-retroviral therapy (ART).

#### *Harm and risk reduction for at risk populations*

Since the first HIV outbreak in Sindh in 2003–4, national and international actors responded swiftly to evidence of a concentrated HIV epidemic among PWID. By mid 2010, 60% of the total AIDS-related resources were allocated for prevention and more than 50% of these resources funded harm reduction programs (UNAIDS NASA 2011). By the mid 2000s, needle syringe exchange programs (NSEP) were being implemented in large cities and annual funding of around USD 10 million through the 'Enhanced AIDS Control Programme', monies focused on PWID as well as on sex work through World Bank, DFID and Government funding (Khan & Khan, 2010). Harm and risk reduction measures, implemented through provision of 'one stop shop' services to the key populations (PWID and sex workers) included NSEP, treatment of problem drug use, condoms, prevention and treatment of STI, primary health care including referral for Hepatitis and Tuberculosis (TB), prevention education through outreach, and peer and social support. VCT and referral to anti-retroviral therapy (ART) were also part of the package.

#### *Insufficient coverage, intensity and scale up of interventions*

Evidence has shown that saturation with sterile needles through NSEP is a key requirement to curtail new HIV infections among PWID (Altice, Kamarulzaman, Soriano, Schechter, & Friedland, 2010). Drug treatment, and particularly OST with methadone, buprenorphine, or suboxone, is an evidence-based approach to prevention for those HIV negative PWID, and a critical component of medically assisted therapy supporting ART adherence for HIV positive PWID (Altice et al., 2010). VCT – the very much needed link in the chain of continuum of services to ensure awareness of HIV status and access treatment and care – is part of the package of services along with access to high quality Highly Active Antiretroviral Therapy (HAART) both as treatment and prevention.

By 2009, only seven of 22 cities with populations of over 200,000 had interventions for PWID corresponding to about 30% coverage in major cities and about 13% nationwide for all urban and rural locations. Syringe coverage varied between 24% and 87% in intervention cities (Khan & Khan, 2010). Outreach is critical yet NGOs have limited number of outreach workers, relying instead on fixed and costly drop-in centers (Khan & Khan, 2010).

Following lengthy discussions with health, narcotic control and drug regulatory authorities, OST with buprenorphine was to be piloted in the city of Rawalpindi, Punjab. As of early 2012, however, changes in government decision-makers had delayed action on this. Only licensed psychiatrists can provide OST in Pakistan, a severe restriction on access. The adoption of OST is a critical and strategic opportunity to ensure that drug treatment services are linked to both VCT and to ART. Those drug users stabilized on OST have much better treatment outcomes, and referral links will potentially improve access and adherence to ART (Altice et al., 2010).

The significant variations in implementation capacities of NGOs and community-based organizations to engage with at risk populations determine the ability to implement scaled-up programmes. NGOs, such as Nai Zindagi, Pakistan Society, Al-Najat and others will likely continue to play key roles in outreach and service provision given their grassroots connectivity to marginalized PWID.

NGOs for the *Hijra* community do not exist at the same level. However unlike PWID, the *Hijra* communities themselves have organized and articulated social structures and community leaders. The key outreach need for *Hijra* is thus for the health authorities and HIV programs to reach out to indigenous *Hijra* community structures and engage them in the HIV response. The longstanding and traditional social capital of this community is an untapped resource. Social capital appears to be markedly lower for sex workers and their clients, as both the number and capacity of the organizations working with sex workers is limited. However NGO capacity is likely to expand with the start up of the Global Fund R-9 regional grant award for MSM and *Hijra*. Currently, there is insufficient evidence to assess the relative uptake and provision of VCT throughout the country's health system or by NGOs for specific risk and vulnerable populations, although this appears to be limited.

HIV treatment gaps are a major concern as those most in need – PWID, *Hijra* and sex workers living with HIV – still have limited access. The registered number in treatment centers is currently less than 5000, of whom some 2300 persons are currently receiving ART through the public sector. A national policy has been adopted of initiating ART at CD4 levels below 350 or for a clinical indication and there is availability of high quality ART at major medical centers in key cities such as Islamabad, Lahore, Karachi and Peshawar. However, it is estimated that less than 1% of HIV positive pregnant mothers receive ART (UNGASS, 2010). Despite substantive efforts to target PWID with harm reduction and prevention packages, including VCT, it is estimated that fewer than 1% of PWID in need of ARVs were on this treatment before 2010 (Strathdee et al., 2010).

These very low levels for at risk populations are increasingly being understood to have critical prevention as well as treatment impact, since untreated HIV leads to greater infectivity (Cohen, Chen, & McCauley, 2011). Despite the consistent high prevalence of HIV, there are several barriers for PWID to gain access to both prevention and treatment services. For example, there can be a requirement for PWID to be drug free in order to receive ART and this creates a significant barrier for treatment.

### A targeted and integrated model for Pakistan

It is challenging to engage with and provide health care services for PWID, *Hijra*, and female and male sex workers. However, HIV is concentrated among these groups. The recent HPTN 052 trial showed a 96% efficacy in reduction of transmission in HIV discordant couples (Cohen et al., 2011). An evidence-based approach for PWID which is truly comprehensive and includes NSEP, ART and OST, has the potential to rapidly bring down HIV rates by more than 40% (Strathdee et al., 2010). While surveillance must be maintained in other populations to detect wider spread, Pakistan has the potential to control further HIV spread and with relatively modest investment to provide services for those living with HIV. This could be focused on comprehensive services for at risk populations and implemented locally.

The key policy recommendations for achieving this are outlined in Table 3.

Fig. 1 shows an integrated model for HIV service delivery. Prevention services such as NSEP for PWID and peer outreach for *Hijra* are the entry points for these populations into a continuum of prevention, treatment and care. A key next step is improving links between outreach services and VCT through approaches including mobile testing services, point-of-care rapid screening, VCT provided at NSEP sites and at *Hijra* and sex work friendly clinic sites. VCT is the key step for moving forward in this continuum.

HIV testing remains a serious challenge to HIV prevention. VCT is the gateway to knowing one's status, treatment and prevention services. It is also the cornerstone of AIDS care. VCT is a public and not simply an NGO function. VCT needs to be made available to those at risk and to their wives and other partners. Three potential models for VCT services for most at risk populations include full integration, stand alone services and hybrid models which combine elements of each (Beyrer et al., 2011).

Full integration is where services for at-risk populations are integrated into mainstream HIV programs. This requires active efforts to reduce stigma and discrimination in service delivery. Health care worker training to work with at risk populations will be essential in Pakistan where integrated models are considered. All levels of staff need this training, including security guards, intake clerks and other non-medical staff who may discourage people

from seeking care. Levels of stigma may also vary between at risk populations in integrated HIV testing settings. A person seeking ART may have no reason to disclose past or current sex work or sexual contacts; there is little benefit to disclosure and possible potential harm. PWID may be unable to hide their substance use history from providers, they may need management of both HIV status and substance use, and quality clinical care may be dependent on disclosure.

Stand-alone HIV service delivery is currently a topic of considerable debate. These services may help protect from some forms of discrimination but may also increase stigma. Peer educators and social workers are an integral part of the provision of care to ensure respectful and rights-based services. But peer services cannot encompass ART management. Striking a balance between stand-alone services as being protective and the potential for ongoing discrimination will be a challenge and may work for some and not others.

Hybrid models will likely vary markedly by the type of services provided, most notably for prevention, VCT and ART. Community-based organizations in Pakistan have had some success in providing outreach and bringing beneficiaries into VCT, care and support. Hybrid models, where prevention is done through community groups linked to integrated but socially marginalized-friendly treatment programs, may be an optimal approach for Pakistan. Here both sets of services exist or could be established and public programs could be open to collaborating with community-based service providers.

The disconnect between prevention and access to care bears testimony to weak linkages between programs. Passive referral for treatment is unlikely to be effective for marginalized populations. PWID, *Hijra* and sex workers will likely need skilled outreach and peer advocates to negotiate treatment access and provide psychosocial support to ensure adherence to treatment. In addition, health care worker sensitization and training will likely be required to improve the quality of services for these populations and encourage their participation, adherence and engagement in prevention. Sensitization training may also be required for security and police forces to ensure that PWID, *Hijra* and sex workers are not harassed or turned back when seeking health care.

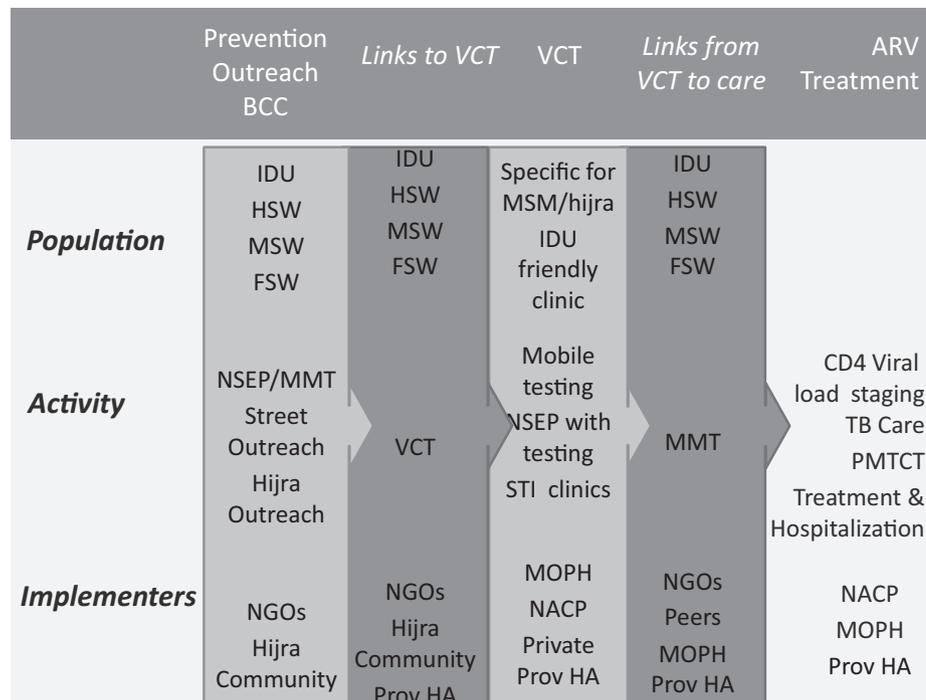
Most PWID and MSW in Pakistan are young men. A significant proportion of both groups report being married. The wives of PWID are likely to be the largest group of women in Pakistan at risk for HIV infection but they are an under-served population. There are low rates of HIV infection amongst the general population of women of reproductive age and as a result there is no universal testing strategy for pregnant women, making the targeting of VCT to women at increased risk highly appropriate. This will likely require health workers, NGO and peer networks of men at risk to encourage couples' counseling and couples-based VCT for drug users. This would yield benefits both for women at risk and for prevention of mother-to-child transmission.

In the context of changing global and local financial landscape and shrinking HIV resources, coupled with challenges posed by the devolution of policy and management responsibility to the provincial level in Pakistan, the HIV response must intensify and reallocate resources and efforts accordingly. Of foremost importance is addressing the upward surge in the epidemic among PWID. Second is the need to focus on those with multiple sexual contacts, particularly in the context of sex work and providing services targeting *Hijra*. A third priority is ensuring that young men, women and children in various situations of vulnerability can access critical prevention, treatment, care and support services.

Our review has certain limitations. We conducted this study at a time when World Bank funding was suspended in Pakistan. We were unable to assess the impact of decline in donor funding on the provision of services. A policy analysis of evidence based

**Table 3**  
Key policy recommendations for HIV in Pakistan.

Key policy recommendations
<ul style="list-style-type: none"> <li>● Increase outreach, coverage and active engagement with IDU, <i>hijra</i> community, and male and female sex workers and their clients</li> <li>● Markedly expand VCT services for those at most risk, in settings and contexts where IDU, HSW and MSW will use the services and receive quality counseling and onward referrals</li> <li>● Markedly improve linkages from outreach and VCT to ART and care</li> <li>● Markedly improve linkages for HIV+ and HIV- IDU into evidence-based drug treatment services, including OST, wherever available</li> <li>● Expand targeting VCT and linkages to ART and care for the female partners (wives) of IDU and other populations – a population of women at substantial risk and vulnerability for infection and lack of access to services</li> <li>● Renew vigorous national commitment to blood and blood products safety, and to universal precautions in both public and private sector health care services</li> </ul>



BCC: Behavior Change Communication; OST: Opiate Substitution Therapy; NSEP: Needle and Syringe Exchange Program; ProvHA: Provincial Health Authority

Fig. 1. Integrated model for HIV services delivery for HIV prevention, treatment, and care in Pakistan.

interventions may offer additional insight into the political feasibility of scaling up interventions. (Buse, Lalji, Mayhew, Imran, & Hawkes, 2009). Data on the use of prevention services were not available at the time of this review. A recent paper in this journal provides some insight into this issue (Khan & Khan, 2011). Better estimates of service use amongst at risk groups are needed once these services have resumed. Future research should include high quality cost-effectiveness studies and intervention efficacy assessments at the provincial levels using rigorous designs. More precise estimates of HIV among populations that have been excluded from assessment such as MSM and the wives of PWID should also be conducted.

## Conclusions

Pakistan has had two decades of progressively evolving experience in the response to HIV. In the current funding climate, it will be vital for countries and donors to create and maintain highly targeted and cost-efficient programs for concentrated epidemics. This requires political will, refocusing of programs and reallocation of resources to populations in most need. The public health and social justice imperatives for this are clear.

Great strides can be made by focusing and targeting the response through integrated HIV service models that engage and empower key populations through the continuum of prevention, VCT, treatment and care. Integrated service models at required coverage and intensity of risk and harm reduction (in particular saturation with NSEP) with linkages to HIV testing and to treatment and care are urgently required to ensure effective and efficient response and to impact the HIV epidemic trajectory in Pakistan. These models need to be adapted to the socio-cultural context and local HIV transmission dynamics at provincial and district level.

Each of the four provinces presents nuanced features of localized HIV transmission dynamics. An in-depth understanding of these localized epidemics should inform the implementation of locally

developed and integrated HIV prevention services. Increased and long-term funding will also be crucial to ensure effective and efficient implementation and sustainability of action at local level. This is of critical importance given that donor resources for AIDS programs are declining.

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