**HIV Prevention Literature Review II:**

**Key Populations in High-, Low-, and Middle-income countries**

**Draft 3**

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**Acronyms & abbreviations**

aHR Adjusted hazard ratio

ANC Antenatal care

aOR Adjusted odds ratio

ASRH Adolescent sexual and reproductive health

AIDS Acquired immunodeficiency syndrome

ART Antiretroviral treatment

ARV Antiretroviral

BCC Behaviour change communication

CCT Conditional cash transfer

FSW Female sex worker

GBV Gender-based violence

HAART Highly active antiretroviral treatment

HIV Human immunodeficiency virus

HCT HIV counseling and testing

HR Hazard ratio

IDU Injecting drug user

IGA Income-generating activity

IPV Intimate partner violence

IRR Incidence rate ratio

LMIC low- and middle-income countries

MSM Men who have sex with men

OR Odds ratio

PEP Post-exposure prophylaxis

PMTCT Prevention of mother-to-child transmission

PrEP Pre-exposure prophylaxis

PWID Person/people who injects drugs

RCT Randomised controlled trial

RR Risk ratio

SRH Sexual and reproductive health

STI Sexually transmitted infection

TasP Treatment as prevention

UNAIDS Joint United Nations Programme on HIV/AIDS

VMMC Voluntary medical male circumcision

WHO World Health Organization

# Executive Summary

Key populations are defined by the World Health Organization as “groups who, due to specific higher-risk behaviours, are at increased risk of HIV irrespective of the epidemic type or local context”. As many as 40-50% of all HIV infections among adults worldwide may be attributable to key populations, and in most epidemic contexts they have much greater risk of HIV than do other populations. In addition to being disproportionately affected by HIV, key populations also share common ground in experiencing stigma, discrimination, lack of HIV prevention services, barriers to healthcare access, violence, and violations of human rights, including by those who are called to help and protect (such as police and healthcare workers).

The objective of this literature review was to review the evidence for interventions which address HIV risk among key populations in high-, middle-, and low-income countries. HIV risk was construed broadly to include issues of access to HIV prevention, testing, treatment, and care services; uptake of these services; access to healthcare generally; peer counseling and support; behavior change for high-risk behaviors; stigma and discrimination; and issues of advocacy and policy. This review focuses on four key populations: sex workers, men who have sex with men (MSM), transgender people, and people who inject drugs (PWID).

In total, 112 articles and reports were reviewed, and are presented in this report according to key population. Many studies addressed multiple key populations, as key populations were found to overlap to a significant degree (for example, MSM who inject drugs, or transgender people who sell sex). This review also addresses young key populations, and the linkages between trauma and abuse during childhood and risky behaviors during adulthood.

Sex workers: Sex work may account for as many as 15% of HIV infections among girls and women worldwide, and an even greater share in sub-Saharan Africa. HIV prevention interventions have been in place for sex workers for three decades. Successful interventions have typically been multi-dimensional and focused on multiple levels of risk, although condom promotion and provision and STI treatment have been central components of virtually all interventions. Community empowerment of sex workers has also been a fundamental component of many interventions, notably India’s large Sonagachi and Avahan projects. In spite of the successes of sex worker interventions, sex workers remain at high HIV risk in many contexts, and recent focus within the HIV prevention community has turned to structural approaches and in particular efforts towards the full decriminalization of sex work globally. Sex workers continue to face high levels of violence, are disproportionately at risk of drug use, and face many other violations of their human rights including by law enforcement officials and healthcare providers.

Men who have sex with men (MSM): Data on MSM are often lacking due to the difficulty of recruiting and studying often marginalized and hidden MSM populations, and HIV prevalence among MSM populations varies widely. MSM continue to have high incidence of HIV in many high-income countries despite widespread availability of prevention services. Long-standing prevention interventions such as condom promotion and peer outreach continue to be important, and new prevention modalities are also becoming available. In particular, WHO has recently released guidelines recommending that PrEP be available (within a comprehensive HIV prevention package) to all MSM. MSM continue to face high rates of stigma in accessing health services and ART, particularly in Africa.

Transgender people: Transgender women are known to have extremely high risk of HIV, with one global pooled analysis showing HIV prevalence of 19%. They also face particularly high rates of stigma, discrimination, violence, and mental health problems. Research of transgender populations remains scarce, particularly for transgender men.

People who inject drugs (PWID): PWID face very high rates of HIV infection, particularly in eastern Europe and central Asia, and other key populations (sex workers and MSM) are disproportionately likely to be injecting drug users. HIV prevention interventions (opioid substitution, needle and syringe exchange programs, and ART) are available in many countries worldwide, although evidence for the impact of these measures on HIV incidence remains largely lacking.

Young key populations: Many members of key populations are also youth (under 25 years), or initiated drug use, sex work, or (for males) sex with other males during adolescence. Although global estimates of HIV burden among young key populations are not available, data from specific contexts shows very high HIV risk as well as riskier sexual and drug use behaviors compared to older populations. There are specific legal issues which apply to adolescent key populations, especially in situations in which risk behaviors are criminalized for those under 18 years.

The findings from this review demonstrate that a number of HIV prevention interventions can positively impact HIV risk among key populations, particularly sex workers, MSM, and PWID. Less is known about effective interventions for transgender people and young key populations. There is strong consensus in the HIV prevention community that the human rights of key populations must be addressed for HIV prevention to be effective, and strong evidence that stigma and discrimination are hindering key populations’ access to HIV prevention, care, and treatment services. Perhaps less attention has been given to the ways that risky behaviors overlap, and particularly how childhood trauma, violence, and drug and alcohol abuse may dispose people towards behaviors and life choices which may increase HIV risk. Addressing the intersecting risks highlighted in this review may require interventions that go beyond standard HIV prevention approaches to addressing these underlying traumas and sources of vulnerability.

# Introduction

Key populations play a central role in most, if not all, HIV epidemics (World Health Organization, 2014). According to the World Health Organization’s 2014 *Consolidated Guidelines on HIV Prevention, Diagnosis, Treatment and Care for Key Populations,* key populations are defined as “groups who, due to specific higher-risk behaviours, are at increased risk of HIV irrespective of the epidemic type or local context” (see Table 1). This report focuses on five key populations: sex workers, men who have sex with men (MSM), transgender people, people who inject drugs (PWID), and people in prisons and other closed settings. This review will address the first four populations, but will not address people in prisons and other closed settings. This review will also address young key populations.

Table 1: Key population definitions and preferred terminology

|  |  |
| --- | --- |
| **Term** | Definition |
| **Key populations** | Defined groups who, due to specific higher-risk behaviours, are at increased risk of HIV irrespective of the epidemic type or local context |
| **Vulnerable populations** | Groups of people who are particularly vulnerable to HIV infection in certain situations or contexts but not affected by HIV uniformly across all countries and epidemics (e.g. adolescents, orphans, street children, people with disabilities and migrant and mobile workers) |
| **Men who have sex with men (MSM)** | All men who engage in sexual and/or romantic relations with other men |
| **People who inject drugs (PWID)** | People who inject psychotropic (or psychoactive) substances for non-medical purposes, including but not limited opioids, amphetamine-type stimulants, cocaine, hypo-sedatives, and hallucinogens |
| **People who use drugs** | People who use psychotropic substances through any route of administration, including injection, oral, inhalation, transmucosal (sublingual, rectal, intranasal) or transdermal |
| **Sex workers** | Female, male and transgender adults (18 years of age and above) who receive money or goods in exchange for sexual services, either regularly or occasionally; sex work is consensual sex between adults |
| **Transgender** | People whose gender identity and expression does not conform to the norms and expectations traditionally associated with the sex assigned to them at birth, including transgender women (male to female) and transgender men (female to male) |

Source: *Consolidated Guidelines on HIV Prevention, Diagnosis, Treatment and Care for Key Populations* (World Health Organization 2014)

While accurate estimates of HIV in key populations are lacking in many contexts, the World Health Organization (WHO) estimates that as many as 40-50% of all HIV infections among adults worldwide may be attributable to key populations (members of these populations and their sexual partners) (World Health Organization, 2011). Baggaley and colleagues write that, “In all epidemic contexts, HIV incidence remains high or is increasing among key populations” (Baggaley, Armstrong, Dodd, Ngoksin, & Krug, 2015, p. 85). WHO’s comprehensive 2014 guidance offers 20 recommendations for HIV prevention for key populations, which in many cases include access to the same prevention, care, and treatment services as for the general population (the full recommendations are reproduced in Annex 1). Several recommendations are new or notable:

* *New recommendation:* Pre-exposure prophylaxis (PrEP) is recommended for MSM, as part of a comprehensive HIV prevention package
* PrEP should be considered for the uninfected partner in serodiscordant couples, when such couples can be identified and when additional HIV prevention choices are needed
* Injecting drug users should have access to sterile injecting equipment through needle and syringe programs; those who are opioid dependent should have access to opioid substitution therapy
* Routine screening and management of mental health disorders (depression and psychosocial stress) should be provided for members of key populations living with HIV

A number of PrEP studies are currently in progress among sex workers, MSM, transgender women, and PWID, including formulations which do not require daily pill taking and which may increase acceptability and adherence (Pettifor et al., 2015). None of the trials to date have targeted adolescents (aged 10-19) or sex workers, although sex workers and other key populations have been represented in some of the completed trials (see Annex 2).

In addition to being disproportionately affected by HIV, key populations also share common ground in experiencing stigma, discrimination, lack of HIV prevention services, barriers to healthcare access, violence, and violations of human rights, including by those who are called to help and protect (such as police and healthcare workers). These realities are echoed in every article and report included in this review. The research included in this review universally adopts a human rights approach to key populations, and WHO stipulates human rights as the first “guiding principle” in its guidelines for HIV prevention, treatment, and care for key populations. In addition, the WHO guidelines list as guiding principles: access to quality health care for key populations as a human right; access to justice and freedom from arbitrary arrest and detention, torture, and cruel, inhuman and degrading treatment; acceptability of services such that HIV interventions must be respectful, acceptable, appropriate and affordable to recipients; the building of health literacy among key populations and service providers; and integrated service provision which addresses multiple co-morbidities as well as poor social situations (World Health Organization, 2014).

Two further observations about the available data are offered here by means of introduction to this review. First, that there is a great emphasis in the literature on contexts and correlates of risk among key populations, perhaps more so than on successful interventions for these populations, and compared to other areas of HIV prevention science such as HIV prevention for youth in the general population. Much of the research presented in this review is qualitative, and indeed much of the research of stigma, discrimination, barriers to healthcare and other contexts of risk has been undertaken with qualitative methods, which may be better suited to understanding complex phenomena and hidden or marginalized populations. Second is the observation that key populations overlap to a significant degree (for example, MSM who inject drugs, or transgender people who sell sex). The intersections between these populations and behaviors will be evident in the findings which follow.

# Objectives

The objective of this literature review was to review the evidence for interventions which address HIV risk among key populations in high-, middle-, and low-income countries. HIV risk was construed broadly to include issues of access to HIV prevention, testing, treatment, and care services; uptake of these services; access to healthcare generally; peer counseling and support; behavior change for high-risk behaviors; stigma and discrimination; and issues of advocacy and policy.

The central research question addressed by this review is: *What interventions and approaches are most successful in reaching key populations with HIV prevention, care and support services?*

# Methods

A search was carried out using Google Scholar and combinations of the search terms ‘review *or* meta-analysis’, ‘MSM’, ‘sex worker’, ‘IDU *or* PWID *or* injecting drug user *or* person who injects drugs *or* people who inject drugs’, ‘key population *or* most-at-risk population’, ‘HIV’, ‘psycho-social’, ‘treatment’, ‘access to services’, ‘youth *or* adolescent *or* children’, ‘stigma’, and ‘discrimination’.

The review focused on articles published between January 2006 and October 2015. In some cases, earlier articles were also included due to their seminal nature. Given the large amount of literature available, as well as recent advances in prevention technologies and understandings of key populations, more recent studies were prioritized. The reference lists of included articles, particularly reviews and meta-analyses, were also searched. Conference presentations and gray literature (such as program reports) were included in cases in which the data had not appeared in the peer-reviewed literature. Reviews, meta-analyses, and commentaries related to key populations were also included. Studies which used modeling to estimate the impact of various interventions or combinations of interventions on HIV transmission within key populations, and from key populations to the general population, were not included.

HIV prevention interventions for key populations may be classified according to the following modalities or approaches:

1. Health systems and facility-based approaches
2. Community-based provider-led approaches
3. Health behavior change communication approaches
4. Integrated and multi-sectoral socio-economic approaches

For most key populations, interventions were identified for each of these four modalities, and interventions often integrated more than one approach. However, the findings presented below and in the Table of Sources (Annex 3) will be organized not according to these modalities, but according to key population: sex workers, MSM, transgender people, PWID, and young key populations. A final section will address children of key populations and the inter-generational nature of vulnerability and risk.

## Sex workers

This review includes 34 articles addressing HIV risk among female, male, and transgender sex workers: 12 reviews and meta-analyses, and 22 evaluations of interventions or of risk factors faced by sex workers (9 of them qualitative research). Although the boundary between sex work and transactional sex can be somewhat blurry, they are recognized as distinct in the literature (Dunkle, Wingood, Camp, & DiClemente, 2010). All articles reviewed here address self-identified sex workers, rather than women or men who may exchange sex for goods or money (transactional sex). Transactional sex was addressed in the first literature review in the series on young people.

### Global epidemiology and risk

Globally, 15% of HIV infections among women and girls are estimated to be attributable to sex work (Prüss-Ustün et al., 2013), and HIV prevalence among female sex workers (FSW) has been found to be very high compared to women of reproductive age in the general population (Baral et al., 2012). Sub-Saharan Africa accounts for 92% of all deaths from HIV/AIDS among FSW globally (Prüss-Ustün et al., 2013) and the pooled HIV prevalence among FSW in this region has been found to be 37% (Baral et al., 2012). In very high-prevalence HIV epidemics, such as those in southern Africa, sex workers bear a particularly high burden of HIV. For example, a respondent-driven sample of FSW in Swaziland found HIV prevalence of 70% (Baral, Ketende, et al., 2014b).

Sex work is acknowledged to be “extremely dangerous” and sex workers (who may be female, male, or transgender) are exposed to “serious harms” including drug use, disease, violence, discrimination, debt, criminalization, and exploitation, including child prostitution and trafficking (Rekart, 2005 2123). Sex workers are placed at heightened risk of HIV infection through high numbers of sexual partners (who have an increased likelihood of having concurrent partners or being HIV-positive), lack of condom use, increased risk of STIs, and shared injection equipment for sex workers who also inject drugs (Baral et al., 2012). Structural risk factors are also posited to place sex workers at heightened risk for HIV infection, including lack of access to health services including STI and HIV treatment, and legal and regulatory policies regarding sex work (Baral et al., 2012). Poverty, stigma and discrimination, gender inequality, violence, and social exclusion also limit sex workers’ access to health care (Baral et al., 2012). According to UNAIDS estimates, in nearly half of countries with available data, 80% or more of sex workers used a condom with last client, but fewer than half of sex workers worldwide have adequate access to HIV prevention programs (UNAIDS, 2010). Most countries in the world do not have a national plan to address the needs of sex workers (Laga, Galavotti, Sundaramon, & Moodie, 2010).

### History and effectiveness of sex worker interventions

HIV prevention interventions for sex workers have been in existence for nearly three decades. Thailand’s pioneering 100% condom campaign for FSW resulted in an increase in condom usage during commercial sex from 14% to over 90% during the period 1989 to 1994, while STI transmission decreased by over 85% (Rojanapithayakorn & Hanenberg, 1996). Thailand’s approach involved community mobilization, education, STI tracing in clients, and an emphasis on condom availability and 100% usage of condoms by FSW (Bekker et al., 2015). This approach was replicated in Cambodia beginning in 1998, and elsewhere (Bekker et al., 2015). More recently, Thailand’s policy has been accused of doing harm by “inadvertently pushing more marginalized sex workers underground through police raids, surveillance, and mandatory testing, re-creating barriers to violence prevention and condom negotiation” (Shannon & Csete, 2010, p. 574). Furthermore, 1 in 10 FSW in Thailand remain HIV-positive, and Thai FSWs have 10 times the odds of being HIV infected compared to other Thai women, suggesting that a condom-centered approach alone may not be enough the remove risk (Baral et al., 2012).

India’s Avahan and Sonagachi projects are also well known, and have focused on structural approaches as well as reducing individual risk behavior. The Sonagachi HIV/AIDS Program (SHIP) has been operating in Kolkata since 1991 and has achieved high rates of condom use among sex workers (90% by 1999) as well as comparatively low HIV prevalence (11%) among sex workers, lower than other major urban centers in India (Jana, Basu, Rotheram-Borus, & Newman, 2004). SHIP has defined HIV as an “occupational health problem” for FSW and emphasized community empowerment, anti-stigma campaigns, and addressing the policy environment, as well as high levels of condom use and detection and treatment of sexually transmitted infections (STIs).

In the early 2000s, the SHIP approach was adapted by a town in West Bengal, India, which was compared to a control town in a quasi-experimental trial. The control town received an STI clinic, condom promotion, and peer education, and in both towns approximately 100 FSW were randomly selected to participate in the trial. At 15-month follow-up, overall condom use had increased significantly among FSW in the intervention arm compared to the control arm, and the proportion of participants reporting consistent condom use had also increased (Basu et al., 2004). A further analysis found significant increases, in intervention arm compared to control arm, in knowledge of STIs and HIV, skills for workplace autonomy and negotiation, opinion that sex work is valid work, social support, and financial security (Swendeman, Basu, Das, Jana, & Rotheram-Borus, 2009). A later qualitative investigation which drew on in-depth interviews with FSW (and participants in SHIP) concluded that SHIP’s brothel-based approach has been successful in reducing HIV risk among FSW because brothel madams supported SHIP, and because brothels allow for the provision of services and promote community empowerment of FSW (Ghose, Swendeman, & George, 2011).

Avahan, a comprehensive HIV prevention program for most-at-risk populations in high-prevalence states in India (including sex workers, MSM, transgender people, IDU, and truck drivers), has been operating in India since 2005, and operating at scale in six Indian states since 2007, reaching over 80% of the target population (Laga et al., 2010). Avahan offers peer education, social marketing and free distribution of condoms, distribution of clean needles and syringes, and clinical STI treatment, reaching over 200,000 sex workers, 60,000 MSM, 20,000 PWID, and 5 million high-risk men (Laga et al., 2010). Like SHIP, Avahan is fundamentally a community empowerment initiative, led and owned by sex workers (Laga et al., 2010). The Ashodaya Samithi collective, an intervention in Mysore, India support by Avahan, was evaluated using two cross-sectional surveys of FSW, carried out at intervention initiation and 30 months later (Reza-Paul et al., 2008). At 30-month follow-up, condom use at last sex had increased with occasional clients, repeat clients, and regular partners. STIs (syphilis, trichomonas, chlamydia, and gonorrhea) had declined, and although HIV prevalence was stable (26% at baseline and 24% at follow-up), detuned assay testing provided evidence of a decline in recent HIV infections. A later qualitative study of Ashodaya Samithi found that over 5-year follow-up, incidence of reported violence by FSW decreased by 84%, although reported violence by intimate partners paradoxically increased somewhat {RezaPaul:2015kn}. An evaluation across all 6 states in which Avahan operates used multi-level modeling to estimate the impact of the program on population HIV prevalence (Ng et al., 2011). Greater program intensity (operationalized as amount of Avahan grant per PLHIV in the population) was significantly associated with lower HIV prevalence in three states but not in three others. Avahan was estimated to have averted over 100,000 new HIV infections from 2003 to 2008.

A brothel-based community empowerment approach was evaluated among FSW in the Dominican Republic (Kerrigan et al., 2006). In Santo Domingo, an intervention was implemented which included community solidarity and brothel self-regulation. In Puerto Plata, the intervention included community solidarity combined with government policy (penalizing brothel management for failing to enforce 100% condom usage). In both sites, the following four activities took place. First, quarterly workshops and monthly meetings were held with sex workers and brothel owners and managers, in order to encourage a sense of solidarity and collective commitment towards HIV and STI prevention. Second, brothel owners were asked to display posters promoting 100% condom use and to keep condoms well-stocked and available in a glass bowl in the establishment. Third, the project strengthened compliance with Ministry of Health guidelines which required monthly STI checks at government clinics. Fourth, adherence to the previous three activities was monitored, and brothel owners were informed of their performance as well as any STI diagnoses among their establishment’s sex workers (anonymously). Certificates were given to brothels that complied with all parts of the intervention. In addition, in Puerto Plata a fifth element was added, of informing brothel owners at a special meeting that regional government policy required condom use between sex workers and clients. After one year, in Santo Domingo, condom use with new clients increased, while in Puerto Plata, condom use with regular partners increased and STI prevalence was reduced. These findings suggest that although both approaches showed impact, policy-level interventions can play a critical role.

An intervention in a slum of Nairobi, Kenya is unique in the literature reviewed, in that it resulted not only in decreased risk for FSW, but in significant numbers of FSW leaving sex work entirely (Odek et al., 2009). FSW received micro-enterprise services including a loan of up to approximately USD$200. At 2-year follow-up, 63% of participants had operational businesses and 45% reported having left sex work. For all participants, average number of sexual partners declined, and condom use remained high with casual partners/clients and increased somewhat with regular partners.

A 2008 systematic review of HIV/STI prevention interventions for FSW in low and middle income countries found that a combination of sexual risk reduction, condom promotion and improved access to STI treatment was generally effective in reducing incidence or prevalence of HIV and STIs in Africa (16 studies), Asia (8 studies) and Latin America (5 studies) (Shahmanesh, Patel, Mabey, & Cowan, 2008). The exception was several RCTs which tested STI treatment strategies and did not show an HIV prevention effect (Celum et al., 2008; Manhart & Holmes, 2005).

### Combination prevention

Several recent reviews and meta-analyses have taken stock of the evidence for effective HIV prevention interventions among sex workers. A recent review of HIV prevention for FSW concluded that while effective interventions exist, they have “not been taken to scale or adequately resourced in most parts of the world” (Bekker et al., 2015, p. 72). A review of interventions for sex workers in sub-Saharan Africa noted “limited progress in the implementation, evaluation, and scale-up of sex worker interventions compared to Asia” (Chersich et al., 2013, p. 4). While many sex worker interventions across the last three decades have addressed multiple levels of risk, there is now widespread consensus that true combination prevention should include biomedical, behavioural, and structural interventions (Bekker et al., 2015). Bekker and colleagues conclude that effective interventions include condom promotion, prevention and treatment of STIs, HIV counselling and testing, gender-based violence prevention, and economic and community empowerment (Bekker et al., 2015, p. 73).

Globally, reported condom use during sex work is high and increasing, and condoms have shown greater success among sex workers than in any other population (Bekker et al., 2015, p. 74). Chersich et al. (2013) also note that while condom promotion and provision is a mainstay of HIV prevention interventions for sex workers, few studies have provided data on whether increased condom use has decreased HIV transmission. Several studies have shown that peer-mediated condom promotion was particularly effective, although one study in South Africa found that a peer-to-peer approach had adverse effects (Chersich et al., 2013). Several HIV prevention interventions for FSW in Africa have shown effectiveness of offering services for management of symptomatic STIs, STI screening, and/or periodic presumptive antibiotic treatment for asymptomatic infections (Chersich et al., 2013).

Recent HIV prevention technologies (PrEP, TasP, and microbicides) may have great potential for sex workers, but have not yet been evaluated in these populations (Bekker et al., 2015). In fact, PrEP trials for were designed for FSWs in Cambodia and Cameroon in the mid-2000s, but were halted due to controversy over the ethics of conducting such research in these populations (Beyrer et al., 2015). No recent PrEP trials have specifically targeted FSWs, although the FEM-PrEP study (carried out in Kenya, South Africa, and Tanzania) did assess whether participants had recently exchanged sex for money or gifts, and found no significant relationship between this behavior and HIV incidence or PrEP adherence (Bekker et al., 2015). PrEP trials have so far shown somewhat disappointing results, although available data suggest this has been largely due to poor adherence and that high adherence confers some protection (Bekker et al., 2015). (See Annex 2 for data on all PrEP trials to date.) A PrEP demonstration project for FSW called SAPPH-Ire is currently ongoing in Zimbabwe (Bekker et al., 2015). Post-exposure prophylaxis (PEP) for FSW has been evaluated in one trial (in Nairobi, Kenya) but was not associated with reduce HIV incidence (Izulla et al., 2013), and is not felt to be scalable or practical for SW (Bekker et al., 2015).

### Case study: Peer education HIV prevention interventions in India & South Africa

In a 2009 article, Cornish and Campbell examined why peer education HIV prevention interventions have succeeded in some contexts and failed in others. They posit that peer education should be considered an “intervention-in-context” (Cornish & Campbell, 2009, p. 123), meaning that context is highly relevant to the impact of this type of intervention. Using ethnographic methods, Cornish and Campbell specifically examine the context and outcomes of the highly successful Sonagachi sex worker peer education program in India, and the Summertown Project in a mining community outside Johannesburg, South Africa, which similarly targeted female sex workers with peer education but had more disappointing results. The projects were similar in that they both targeted sex workers who were socially marginalized and living in conditions of extreme poverty.

The success of the Sonagachi Project, which began in 1993, has already been described above. Peer educators (themselves sex workers) educate other sex workers about HIV transmission and prevention, promote consistent condom use, and encourage their peers to attend the project’s sexual health clinic. Through the project, sex workers have also been empowered to address the social environment of the Sonagachi District in Kolkata where they live and work, and to create better working and living conditions. The project has worked to reduce exploitation and violence against sex workers, and has supported sex workers in upholding their rights vis-à-vis pimps, customers, and landladies. The project has also offered sex workers micro-loans and a savings co-op, and support for their children to attend school. In short, sex workers have been empowered to gain greater control over their whole lives, and not just their sexual health.

The Summertown Project had three aims to reduce HIV risk among sex workers in the high-risk context of a South African gold mining community: aggressive syndromic management of STIs, peer education, and multi-stakeholder management. A group of enthusiastic peer educators (themselves sex workers) was mobilized, following detailed guidance for setting up a peer education project that had been developed in neighboring Zimbabwe. Peer educators received training in holding high-profile public meetings, using drama and singing for health promotion, and in conducting one-on-one counseling. They also engaged in many of the same activities as did Sonagachi peer educators, such as promoting and distributing condoms and attempting to help sex workers resolve disputes. The project was managed by a group of stakeholders which included representatives from the provincial health department, the gold mining industry, and mineworker trade unions, academics, funders, and other influential individuals. Disappointingly, after 3 years, no impact was seen on STI risk. Furthermore, the project failed in its goals of empowering sex workers and becoming self-sustaining. Sex workers were often suspicious of the peer educators and their motives, and some lacked the ability to adopt the risk reduction measures advocated by the peer educators. Rather than being owned by the sex workers themselves, decision-making for the project remained in the hands of the stakeholders, who failed to become a cohesive group capable of sustaining the project.

Cornish and Campbell identify and discuss in detail other critical differences between the projects, only some of which will be described here. In Sonagachi District a certain basic code of conduct was in existence prior to the start of the project, which was recognized by sex workers, pimps, and brothel owners, and which formed a basis for sex workers to organize to protect their rights and interests. In Summertown sex workers worked independently and competitively and had only weak social ties with each other, and there was no precedent for sex workers to organize or believe that they had rights which should be protected. The role and remuneration of peer educators also varied between the two projects. In Sonagachi, peer educators received a small salary as well as social status. In Summertown, peer educators were unpaid, and as noted, were often treated with skepticism and lack of trust by other sex workers. Cornish and Campbell also note that while sex worker’s health and empowerment was the very *raison d’etre* of the Sonagachi Project, sex worker interests were always somewhat peripheral to the Summertown Project, which was founded with the primary objective of protecting the sexual health of mineworkers. These factors do much to explain why a similar approach had such drastically different outcomes in these two very different contexts.

### Community empowerment and calls for legal and policy reform

Community empowerment has been defined as a “process by which sex workers take collective ownership of programmes to achieve the most effective HIV outcomes and address social and structural barriers to their overall health and human rights”, and also involves promoting sex work as a legitimate occupation or livelihood and seeking legal protection and status for sex work (Kerrigan et al., 2015, p. 173). Community empowerment does not prescribe specific intervention activities, and can include various HIV prevention, treatment, and care and support activities, as well as structural components such as access to legal services and socioeconomic opportunities (Kerrigan et al., 2015). While it has long been endorsed by UNAIDS, large-scale implementation of this approach has been “scarce” (Kerrigan et al., 2015). Kerrigan and colleagues find in a systematic review and meta-analysis of community empowerment approaches that only Avahan has been evaluated with HIV as an endpoint (HIV prevalence and not incidence), and that five evaluations of Avahan show significant reduction in HIV (OR = 0.670, p = 0.0047). A number of other studies found impact on STIs (8 studies) and condom use (10 studies). Kerrigan et al. also note that evaluation of community empowerment approaches has generally employed “weak” study design, and thus “our ability to draw causal inferences and firmly establish the effectiveness of community empowerment is restricted” (Kerrigan et al., 2015, p. 175).

This approach is understood to be incompatible with a rescue or rehabilitation response to sex work, or an understanding of sex workers as victimized and sex work as inherently violent (Kerrigan et al., 2015). Sex work has increasingly come to be seen through a human and labor rights paradigm, with sex workers’ heightened HIV risk viewed as a consequence not only of lack of vital services but also of structural issues such as “social, legal, and economic injustices” (P. Das & Horton, 2015). A 2014 Lancet series on sex work and HIV unequivocally called on governments to decriminalize sex work, and called for “accepting and embracing” sex work (P. Das & Horton, 2015, p. 4). Based on the literature reviewed, this view has become nearly universal among researchers of sex work within public health. There is widespread consensus that criminalizing sex work (including the “Swedish model” employed by Sweden and Norway, which criminalizes buying but not selling sex) does not prevent trafficking or reduce sex work (Strathdee, Crago, Butler, Bekker, & Beyrer, 2015) but increases and enables violence against SW by clients, pimps or managers, and police (Shannon & Csete, 2010). (Sex work is currently criminalized in some form in over 100 countries (Ahmed, Kaplan, Symington, & Kismodi, 2011)). The International Labour Office (a United Nations agency) has normalized sex work under its “international labour standard”, and called for sex workers to have the same entitlements as other informal workers (International Labour Office, 2010).

Such calls for policy and legal reform are framed as a structural approach to the risk and harm experienced by sex workers, and may be in part a response to disappointment with the success of other prevention approaches to date. Shannon and colleagues (2015) conclude, “behavioral and biomedical interventions among FSWs alone have had only modest effects on the reduction of HIV at the population level, which has led to calls for combination HIV prevention that includes structural interventions (Shannon et al., 2015, p. 56). Baral et al. (2012) note that in spite of India’s large and well-resourced sex worker programs, Indian FSWs continue to have 50 times the odds of HIV infection compared to other Indian women. Similarly, in spite of Ghana’s great success in increasing coverage of sex worker prevention programs across three decades (reaching >40,000 FSW with a national program in 2013), FSW in Ghana continue to have 10 times the risk of HIV infection compared to the general population (Wondergem et al., 2015).

### Sex work and violence

Of course, infection with STIs including HIV is far from the only risk faced by sex workers. Sex workers in many contexts have been found to experience very high rates of violence. In a systematic review of violence against sex workers globally, Deering and colleagues (2014) report that across 28 studies, 45% to 75% of sex workers report ever experiencing violence in the workplace (mostly perpetrated by clients). Deering et al. also note the linkages between drug and alcohol abuse and violence (Deering et al., 2014). In Swaziland, 39% of sex workers in a respondent-drive sample reported being raped at least once, while 17% reported being raped 6 or more times (Baral, Ketende, et al., 2014b). Young sex workers in Ghana felt that violence and rape by clients were the greatest risks they faced (Onyango et al., 2015). In Vancouver, a majority of FSW (including transgender women) who used illicit drugs and engaged in street-level sex reported violence over an 18-month study, including physical violence, rape, and client-perpetrated violence (Shannon et al., 2009). Both of these populations, as well as many other sex worker populations across the globe, have also reported widespread, institutionalized violence and harassment perpetrated by law enforcement officials (Decker et al., 2015), and that such abuse negatively impacts their safety and ability to carry and use condoms with clients. Among FSW in Vancouver, quantitative analysis showed that experience of violence was associated with police actions including prior assault by police, confiscation of drug paraphernalia by police, and moving working areas away from main streets due to police (Shannon et al., 2009).

Decker and colleagues (2015) chronicle the vast catalogue of human rights violations experienced by sex workers, including homicide; violence (physical and sexual) from law enforcement, clients, and intimate partners; unlawful arrest and detention; discrimination in accessing health services; and forced HIV testing. They conclude that such abuses are particularly prevalent where sex work is criminalized through punitive laws and that such laws constitute a human right violation in and of themselves (Decker et al., 2015). Policy reform (including decriminalization of sex work), and sex work empowerment are seen as the two mutually reinforcing strategies to achieve HIV prevention and the protection of sex worker human rights (Decker et al., 2015).

Another view, difficult to document in the literature, is that sex work remains a highly dangerous activity no matter what prevention, support, and protection services are offered, and that sex workers continue to experience high rates of violence even in settings in which sex work is legalized and their rights are ostensibly protected (Farley, 2004). Sweden and Norway have chosen to pursue a unique path of “demand reduction” through criminalizing the purchase but not the sale of sex, with the position that prostitution is inherently a form of gendered exploitation and violence against women, harmful not only to women but to society. In contrast, sex work is legal under specific conditions in some countries and localities (Hungary, Austria, the state of Nevada in the United States, Senegal, and the city of Tijuana in Mexico) and fully decriminalized in a smaller number of locations (New Zealand and the province of New South Wales, Australia) (Decker et al., 2015). Debate continues over the impact of sex work/prostitution policies in these “natural experiments”. In Sweden, the number of men buying sex is reported to have decreased by 40% after buying sex was criminalized in 1999 (Kousmanen, 2011). In New Zealand, the number of sex workers is reported to have remained unchanged (despite fears that it might increase) after the 2003 decriminalization of sex work (Abel, Fitzgerald, & Brunton, 2009).

### Trafficking and sexual exploitation

The number of sex workers who have been trafficked is contested, although according to one estimate 4.5 million people worldwide are victims of forced sexual exploitation (International Labour Office, 2012). Advocates of de-criminalization of sex work argue that anti-trafficking efforts increase risk of violence and HIV for sex workers, creating “conflict” between HIV prevention and anti-trafficking programs. According to Steen et al., “so-called raid and rescue actions and related police responses destabilise sex worker communities and drive sex workers underground, increasing vulnerability and risk for all sex workers, disrupting HIV and STI prevention efforts, impeding access to services, and severing relations with service providers” (Steen, Jana, Reza-Paul, & Richter, 2015, p. 96).

Children and adolescents who sell sex are a population of particularly concern. According to international law (in particular the Convention on the Rights of the Child), children younger than 18 years who sell sex are considered sexually exploited children (McClure, Chandler, & Bissell, 2015). Up to 40% of female sex workers began selling sex before the age of 18, but as of 2011 no public health interventions had “addressed the increased hazards and HIV risk faced by adolescent female sex workers” (Silverman, 2011).

### Drug use among sex workers

Studies from across the globe have consistently shown high rates of drug and alcohol use, including injecting drugs, among sex workers. A systematic review and ecological analysis of FSW in Europe found that injecting drugs was the most significant individual-level risk factor for HIV acquisition, with injecting drug use and HIV highest in eastern Europe (Platt et al., 2013). HIV prevalence was found to be low (<1%) among FSW who did not inject drugs and among FSW in Western Europe, where injecting drug use is less common. In the Netherlands, HIV prevalence was reported to be 13.6% among FSW who injected drugs and 1.5% among those who did not (van Veen, Götz, van Leeuwen, Prins, & van de Laar, 2008). In several countries of Eastern Europe, HIV prevalence among FSW exceeded 5%, and in some populations of FSW, injecting drug was reported by more than 50% of FSW (Platt et al., 2013). In Canada, a study of Aboriginal women in Vancouver found that 41% had used heroin in the past 6 months and 64% reported daily crack use (Bingham, Leo, Zhang, Montaner, & Shannon, 2014). A study of the same cohort illuminated the intersections between drug use, intimate partner violence (IPV), and sex work (Shannon et al., 2008). Many drug-using FSWs (who were also majority Aboriginal) reported that their intimate partners were drug users who supplied drugs and then pressured them to engage in sex work to pay for the drug use of both partners; women’s opiate-dependency also compelled them to sell sex.

Drug and alcohol use has been found to negatively impact condom use (Onyango et al., 2015; Strathdee et al., 2013). To date only intervention addressing the dual risks of sex work and injecting drug use has been evaluated (Strathdee et al., 2013). In an RCT in Mexico, FSW were offered four brief sessions to promote condom use and reduce the sharing of needles and syringes. In Tijuana, an interactive intervention was offered, while in Juarez, a didactic intervention was offered. HIV and STI incidence decreased by more than 50% (in intervention compared to control arm) in both cities at 12-month follow-up, while the interactive intervention reduced receptive needle-sharing more than the didactic intervention. In Tijuana but not Juarez, women reported significant increases in access to syringes and condoms.

### Access to healthcare and HIV treatment

A number of studies have documented the barriers to healthcare and HIV treatment for sex workers, which are often rooted in social stigma experienced by sex workers and discrimination shown by health care workers. The extent of this stigma and discrimination, as well as health outcomes, seems to vary widely by context. A systematic review and meta-analysis (Mountain et al., 2014) found that 38% of HIV+ FSW were currently on ART, and that rates of ART uptake, attrition, and adherence were similar among FSW compared to women in general populations, as were treatment outcomes. In the Dominican Republic, sex workers were found to have high retention in HIV care, although there was a significant relationship between FSW’s perceptions of HIV service providers and retention in care (Zulliger et al., 2015).

In contrast, several studies in sub-Saharan Africa have shown poorer access to care and ART adherence among sex workers. In Benin, FSWs were found to have significantly poorer ART adherence than individuals in the general population (Diabaté et al., 2011). Similarly, FSWs in Zimbabwe were found to have low initiation of ART, and reported in focus group discussions (FGDs) that they were demeaned and humiliated by healthcare workers (even being told that they were “wasting drugs”), and also lacked time and money to pursue treatment (Mtetwa, Busza, Chidiya, Mungofa, & Cowan, 2013). Sex workers (female, male, and transgendered) in 6 urban sites in east and southern Africa also reported negative interactions with healthcare workers, with experiences at private clinics and dedicated sex worker clinics being more positive (Scorgie et al., 2013).

In India, key-informant interviews and FGDs with FSW identified barriers to ART access that were individual-level, social/family-level, and at the level of healthcare system (Chakrapani, Newman, Shunmugam, Kurian, & Dubrow, 2009). FSW feared adverse consequences if they disclosed their HIV status, and perceived dual stigma and discrimination related to both their status as sex workers and as HIV-positive. They also reported lack of family support, negative experiences with health care providers, and lack of adequate health services including psychosocial services.

### Male sex workers

Although most sex workers globally are female, male sex workers are at particularly high risk of HIV, with one global meta-analysis finding that HIV prevalence among male sex workers was 15% compared to 5% among female sex workers (Operario, Soma, & Underhill, 2008). Men who sell sex may not identify as sex workers, and mostly offer sex to men regardless of their sexual orientation (Baral, Friedman, et al., 2014a). For the period 2009 to 2013, seven countries reported HIV prevalence of 20% or more among male sex workers, while the median HIV prevalence among male sex workers in ten European countries was 9%, far higher than that among men in the general population (UNAIDS, 2014). Available data show that male sex workers have higher HIV risk, compared to other MSM, in some contexts but not in others (Baral, Friedman, et al., 2014a). MSM may be particularly likely to sell sex compared to other populations. An internet-based survey of over 24,000 MSM in 17 Latin American countries found that 7% reported being paid for sex in the past 12 months, and this was associated with higher country-level unemployment (Oldenburg et al., 2015). In turn, transactional sex was significantly associated with self-reported HIV and STI infection, as well as intimate partner violence.

## Men who have sex with men

This review includes 18 articles addressing HIV risk among men who have sex with men (MSM): 6 reviews and meta-analyses (one addressing qualitative research) and 12 evaluations of interventions or of risk factors faced by MSM (2 of them qualitative research).

### Global epidemiology and risk

Despite evidence that MSM are disproportionately infected with HIV in many different epidemic contexts, MSM are not adequately represented in HIV surveillance systems or adequately served by prevention and care programs (Baral, Sifakis, Cleghorn, & Beyrer, 2007). Available data suggest that globally HIV prevalence among MSM varies from 3.0% in the Middle East to 25.4% in the Caribbean (Beyrer et al., 2012). In Asia, HIV prevalence among MSM of >10% is found in many cities in China, Taiwan, Indian, Myanmar, and Thailand (van Griensven & de Lind van Wijngaarden, 2010). A recent study of more than 12,000 MSM in 12 cities across India found weighted HIV prevalence of 7.0% (with a range of 1.7% to 13.1%) (Solomon et al., 2015). In Latin America, MSM have 30 times greater odds of HIV infection than do men in the general population (Oldenburg et al., 2015). In 2007, Baral et al. concluded that MSM were difficult to recruit and study in many low- and middle-income countries, in part because sex between men was criminalized in 85 countries; this has probably not changed significantly in the intervening years (Baral et al., 2007). More recently, Beyrer et al. (2012) note that in many countries (particularly in the Middle East, north Africa, and sub-Saharan Africa), very few data are available on HIV among MSM.

Meanwhile, in many high-income countries HIV incidence is on the increase among MSM in spite of being in decline in the rest of the population (Beyrer et al., 2012). In a 2012 review, data on incidence from 15 countries showed no evidence of HIV incidence decline among MSM, with China and Thailand showing increasing HIV incidence and one study in Kenya (the only such data available from Africa) showing annual HIV incidence of more than 20% (Beyrer et al., 2012). HIV infections among MSM in the United States are estimated to have increased at 8% per year during the 2000s (Beyrer et al., 2012). HIV epidemics among MSM seem to be growing or sustained at very high rates even in the presence of conditions for effective HIV prevention. In 2012, Beyrer and colleagues stated, “HIV prevalence rates in these men seem to have increased in the HAART era, both in settings where HIV epidemics are newly described or emerging and in settings where MSM have access to a broad range of HIV services, civil liberties, and organised and visible community structures” (Beyrer et al., 2012, p. 372).

Specific risk factors for MSM include receptive anal intercourse, high numbers of sexual partners, high likelihoods of partners being HIV-infected and with high viral load, and risk behaviors such as injection drug use and use of amphetamine-type stimulants (Beyrer et al., 2012). Per-act HIV transmission risk of unprotected receptive anal intercourse was shown to be 1.4% in a meta-analysis, although available data show substantial variation in infectiousness depending on factors such as viral load of infected partner (Baggaley, White, & Boily, 2010). Based on data from 50 low- and middle-income countries (LMIC), Beyrer et al. (2012) described four different epidemic scenarios involving MSM transmission. In the first epidemic scenario, which is typical of South America as well as high-income countries, the primary mode of HIV transmission is through male-to-male sexual contact and HIV prevalence among MSM is generally over 10% and is an order of magnitude greater than in the general population. In the second epidemic scenario, which characterizes Eastern Europe and Central Asia, the HIV epidemic is predominantly driven by injecting drug use. In epidemic scenario three, which is predominant in sub-Saharan Africa and particularly east and southern Africa, most HIV transmission is heterosexual and the ratio of HIV prevalence in MSM and IDU populations, compared to HIV prevalence in the general population, is well under 10. In the fourth epidemic scenario, which is seen in much of South, Southeast, and Northeast Asia, neither MSM transmission, IDU transmission, or heterosexual transmission predominates, and the proportion of men reporting same-sex behavior is higher than in the first scenario (Beyrer et al., 2010).

### Effectiveness of HIV prevention interventions

In a 2015 review, Strömdahl and colleagues reviewed 24 HIV prevention interventions for MSM in Europe, assigning each a grade according to the Highest Attainable Standard of Evidence (HASTE) framework. Four interventions were assigned the highest HASTE grade (1): condom use, peer outreach, peer-led groups, and treatment as prevention (TasP). Four interventions were assigned grade 2a (probable recommendation): VCT, condom-compatible lubricant, PEP, and individual counseling for HIV-positive MSM. These recommendations were developed for the European setting, and may not be feasible in lower-resource settings. For example, country guidelines on when to initiate HIV treatment (i.e. at what CD4 threshhold) vary, as does actual treatment availability, which could constrain the effectiveness of TasP as a prevention strategy. Current WHO guidelines are that PEP “should be available to all eligible people from key populations on a voluntary basis after “possible exposure to HIV” (World Health Organization, 2014), although these guidelines do not specify how this should be applied to MSM who may face frequent exposure. PEP’s effectiveness is also limited by low demand (Stromdahl et al., 2015). PrEP has been shown to be effective for MSM in the iPrEX trial, reducing HIV incidence by 44% (see Annex 2), and as noted, WHO has recently released guidelines recommending that PrEP be available (within a comprehensive HIV prevention package) to all MSM. The availability of PrEP in resource-constrained settings remains to be seen.

Before availability of these biomedical prevention interventions, earlier reviews had assessed the effectiveness of behavioral prevention modalities for MSM. In a 2005 systematic review and meta-analysis, behavioral interventions were significantly associated with a decrease in unprotected anal intercourse (OR = 0.77), decrease in number of sexual partners (OR = 0.85), and increase in condom use during anal intercourse (OR = 1.61) (Herbst et al., 2005). A systematic review and meta-analysis of the prevention impact of HIV testing, relying solely on data from the United States (including MSM), found that high-risk sexual behavior was reduced for those testing HIV-positive, but not for those testing negative (Marks, Crepaz, Senterfitt, & Janssen, 2005). However, other studies among MSM (also in the United States) have shown increased condom use and decrease in number of sexual partners following HIV diagnosis (Stromdahl et al., 2015). A systematic review of qualitative evidence for HIV testing among MSM found that testing is motivated by the uncertainty of not knowing one’s HIV status, as well as a sense of responsibility towards oneself and one’s partner (Lorenc et al., 2011).

A recent RCT in two cities in Russia and Hungary was successful in decreasing HIV risk, using a social network approach (Amirkhanian et al., 2015). MSM who received HIV prevention information from a peer through a social network reported significantly less unprotected anal intercourse with all types of sexual partners, as well as lower HIV/STI incidence, compared to control. Another innovative HIV prevention strategy for MSM which is currently being explored is conditional cash transfers, which have been successfully employed to mitigate HIV risk in other contexts. An exploratory study measured the potential for conditional cash transfers for MSM and male sex workers (MSW) in Mexico City between the ages of 18 and 25. Men were asked whether they would accept monthly HIV prevention talks (for a cash incentive) and quarterly STI testing (with a cash incentive dependent on testing STI-free). On average, MSM said they would participate in such a program for $288 per person per year, and MSW, for $156 per year (both amounts assuming STI-negative status) (Galárraga, Sosa-Rubí, Infante, Gertler, & Bertozzi, 2013).

### Case study: Community-based HIV prevention for MSM in South Africa

In 2012, a community-based HIV prevention intervention was piloted among MSM in five predominantly black African townships in greater Cape town, South Africa (Batist, Brown, Scheibe, Baral, & Bekker, 2013). The goals of the project were to disseminate HIV-prevention information and supplies, promote the use of condoms, and increase uptake of HIV services. The intervention included three components. First, MSM were invited to regular small group meetings, held every 1 to 2 weeks, where they received training on use of condoms and lubricant, and where discussions about HIV prevention strategies were held. Participants were encouraged to take ownership of these meetings, and were given condoms, lubricant, and HIV prevention information. Second, the intervention facilitated community-based activities which aimed to provide opportunities for MSM “group bonding”. These activities included sports, dance competitions, drag pageants, and debates, and HIV prevention discussions were also integrated into these activities. Third, activities brought together two or more different MSM groups at least once per month, and were designed to promote knowledge sharing and socialization between MSM from different townships.

In each township one MSM community leader was chosen to participate in the planning and facilitation of the intervention, disseminate HIV prevention information, and provide healthcare referrals to other MSM in the community. Each community leader received two days of training, including training on effective communication and encouraging healthy social norms. Participants were recruited through peer outreach workers and venue-based contact, and were surveyed at baseline. Participation was relatively low, with only 60% of MSM who consented to participate in the intervention attending one or more activity, and only 28% attending at least half of scheduled activities. Qualitative interviews and focus group discussions with men who participated held at the conclusion of the 6-month pilot demonstrated that the intervention activities were effective in disseminating HIV prevention information, condoms, and lubricant to MSM. Participants also reported receiving social support, feeling less socially isolated, and improved self-esteem as a result of the intervention.

### Drug use among MSM

Amphetamine-type stimulants have been linked to serodiscordant unprotected anal intercourse, while drug use has also been linked to serodiscordant sex as well as sex with injecting drug users and higher numbers of sexual partners (Beyrer et al., 2012). A recent study of more than 12,000 MSM in India found that injecting drug use was significantly associated with recent HIV infection (Solomon et al., 2015). In southwest China, MSM who also had sex with women were more likely to report illicit drug use, as well as multiple male partners (Dai et al., 2015).

### Stigma and access to HIV services

MSM face significant barriers to access for healthcare and HIV treatment, particularly in Africa. In Cameroon, MSM reported in over a hundred in-depth interviews that they commonly experienced discrimination and physical violence when seeking HIV services in healthcare settings (Cange et al., 2015).

One study evaluated the effectiveness of various methods of referring MSM and male injecting drug users to HIV counseling and testing (HCT) in four states in Nigeria (Adebajo et al., 2015). Some study participants were referred to health facilities by key opinion leaders, some were referred to mobile HCT teams by key opinion leaders, and some were offered HCT through peers using mobile units. Uptake of HCT through the first method was very low, but the third method had the highest uptake and identified the highest proportion of new HIV diagnoses. The authors conclude that training key populations to provide HCT to peers is a “high-impact approach”. Another study in Nigeria evaluated the acceptability and impact of TasP among HIV-positive MSM (the TRUST cohort) (Charurat et al., 2015). More than half (55%) of the MSM eligible for TasP elected to start ART, and after 6 months on ART, 80% had an undetectable viral load. Starting TasP was positively and significantly associated with having disclosed one’s sexual orientation to healthcare providers, suggesting the importance of a non-stigmatizing, supportive environment in healthcare settings. Furthermore, a majority of those who elected not to start TasP reported as a motivation not wanting to be contacted by healthcare providers.

The effects of stigma may or may not be similar among MSM in various contexts. In Lesotho, social stigma was positively associated with depression among MSM as well as being HIV-positive (Stahlman et al., 2015). A study of stigma against MSM in Europe had surprising findings. An internet-based survey collected data on over 170,000 MSM in 38 European countries, and linked these data to country-level data on stigma against MSM (Pachankis et al., 2015). MSM in high-stigma countries reported significantly fewer sexual risk behaviors (non-steady sexual partners) as well as a lower risk of HIV infection (aOR = 0.68), compared to MSM in lower stigma countries. The authors concluded that this was due to MSM in higher-stigma countries having restricted contact with other MSM, although they also noted that MSM in higher-stigma countries were more likely to have inadequate knowledge of HIV and other risk factors including not having tested and not using condoms at last sex.

### Legal and policy issues

Some studies have also linked restricted access to HIV services for MSM and other key populations to the policy environment to. A review of policies in Burkina Faso and Togo (which also utilized key-informant interviews) concluded that significant barriers to services existed for sex workers and MSM, and laws criminalizing these populations resulted in harassment, arrests, and lack of policies supportive of their HIV prevention needs (Duvall et al., 2015). A study in Nigeria assessed changes in stigma, avoidance of healthcare, and HIV clinical outcomes in the TRUST cohort of HIV-positive MSM before and after the January 2014 passage of the Same-Sex Marriage Prohibition Act in Nigeria, which further criminalized same-sex relationships (Schwartz et al., 2015). Members of the TRUST cohort reported more fear of seeking healthcare and avoidance of healthcare after passage of the law, compared to data collected before passage of the law. However, loss to follow-up and actual reports of avoiding healthcare did not increase significantly.

## Transgender people

This review includes 7 articles addressing HIV risk among transgender people: 3 reviews and meta-analyses and 4 evaluations of risk factors faced by transgender people (2 of them qualitative research). No studies of interventions for transgender people were identified.

Several reviews and meta-analyses have reviewed HIV risk among transgender people, while also noting the lack of data on this population. A 2008 systematic review and meta-analysis reviewed 25 studies on sex workers with data from 14 countries, and found that pooled HIV prevalence was much higher among transgender female sex workers (27%) compared to transgender women not engaged in sex work (15%), male sex workers (15%) and female sex workers (5%) (Operario et al., 2008). A 2013 systematic review and meta-analysis reviewed 39 studies of transgender women from 15 countries, all of them in the Americas, Asia-Pacific, and Europe, and with male-predominant HIV epidemics (Baral et al., 2013). In pooled analysis, transgender women had HIV prevalence of 19% (22% in high-income countries compared to 18% in low- and middle-income countries), and 49 times the odds of HIV infection compared to adults in the general population. A 2015 review focused on transgender women sex workers and identified only six studies, none of which focused exclusively on this population (Poteat et al., 2014). The review noted that transgender women sex workers face disproportionate risk of HIV and unique risk factors including illicit hormones and silicone injections, need for gender affirmation, high-risk male partners, and systemic discrimination and violence.

Available research has primarily focused on transgender women rather than transgender men, and revealed the significant stigma, discrimination, violence, and mental health problems faced by transgender women. In a study of transgender women in Argentina, 41% reported avoiding seeking healthcare because of their transgender identity, and avoidance was significantly associated with prior experience of police violence and discrimination by healthcare workers (Socias et al., 2014). In India, *kothis* (MSM whose gender expression is feminine) and *aravanis* (transgender women, also known as *hijra*) were found to face significant stigma and discrimination which hindered their access to ART at the individual, social/family, and healthcare system level (Chakrapani, Newman, Shunmugam, & Dubrow, 2011). *Kothis* and *aravanis* reported in FGDs that they kept their same-sex attraction and HIV status secret from their families and social networks, as they feared serious consequences including being rejected by their families, evicted from their homes, social isolation, and loss of income. They also feared being maltreated and stigmatized within healthcare settings. In a study of transgender women in the United States with a history of sex work, more than half of participants (51%) were scored as depressed, one third (34%) had attempted suicide, half (50%) reported being physically assaulted, and more than a third (38%) reported being raped or sexually assaulted before the age of 18 (Nemoto, Bödeker, & Iwamoto, 2011).

## People who inject drugs (PWID)

This review includes 14 articles addressing HIV risk among people who inject drugs (PWID): 6 reviews and meta-analyses, and 8 evaluations of interventions or of risk factors faced by PWID (2 of them qualitative research). A number of these studies have already been discussed due to the overlap of PWID with other key populations, and will not be repeated in this section.

Worldwide, 15.9 million people worldwide inject drugs, and 3 million PWID are HIV-positive, with the largest populations in eastern Europe, east and southeast Asia, and Latin America. (Mathers et al., 2008). According to 2007 estimates, HIV prevalence among PWID varies from 0.01% to 72.1%, with prevalence of 20-40% in 5 countries, and above 40% in 9 countries (Mathers et al., 2008).

Best-practice HIV prevention interventions for PWID include opioid substitution, needle and syringe exchange programs, and ART (Strathdee et al., 2010). The evidence for such approaches is complex, with many studies showing only “modest associations” between needle-sharing and HIV incidence (Degenhardt et al., 2010). For example, needle and syringe programs (NSPs) in Vancouver, Canada have been widely studied, and early research showed that attendance at NSPs was positively associated with HIV incidence. More recent analysis has concluded that frequent NSP attendees had higher-risk profiles, including cocaine injection, but nevertheless that there was a “failure” of NSPs to prevent an outbreak of HIV among PWID (Hyshka, Strathdee, Wood, & Kerr, 2012). A 2010 systematic review of HIV prevention, treatment, and care services for PWID found that NSPs are available in 82 countries, although availability varies widely from over 200 needle/syringes per PWID per year in Australasia to 0.1 in sub-Saharan Africa (Mathers et al., 2010). Opioid substitution therapy was available in 70 countries, while the percent of PWID receiving ART varied from less than 1% to 100%.

In many parts of the world, sex workers and MSM are disproportionately likely to be injecting drug users. The principal mode of HIV transmission in eastern Europe and central Asia is needle sharing among PWID, and MSM who are also PWIDs often have the highest burden of HIV (Baral et al., 2007). Drug use may be forced on sex workers by pimps and managers as a means of control (Rusakova, Rakhmetova, & Strathdee, 2015). To date only one HIV prevention intervention for FSW who inject drugs has been empirically tested (in Mexico, see Strathdee et al. 2013) and no interventions have been tested in eastern Europe or southeast Asia, where rates of injecting drug use among FSW are generally very high. One study of FSW in two Russian cities found that 67% reported alcohol binging, and 48% reported injecting drugs the day before (Odinokova, Rusakova, Urada, Silverman, & Raj, 2014).

Blankenship and colleagues (2015) examine the particular HIV risk of women who use injecting drugs, which they argue has been largely ignored by the literature. They argue that women are placed at risk through bearing primary responsibility for family caretaking and having limited options for income generation which often leads them to engage in sex work; through risk of physical, sexual, and intimate partner violence; through limited power in sexual interactions; and through harmful gender norms which reinforce all of these dynamics of risk (Blankenship, Reinhard, Sherman, & El-Bassel, 2015). A review of IPV and HIV risk for “drug-involved” women (not necessarily drug-injecting women) also found a bi-directional relationship between IPV and HIV risk, which the authors concluded may be mediated by a history of childhood sexual abuse and post-traumatic stress disorder (El-Bassel, Gilbert, Witte, Wu, & Chang, 2011).

A qualitative study of female and male PWID in Ghana examined sharing of needles/syringes, and found that most reported sharing behavior, and all reported sharing with intimate partners (Messersmith et al., 2015). Most also reported sexual risk behaviors such as multiple partners and lack of condom use, and 3 in 10 women reported exchanging sex for money in the past year, while 3 in 20 men reported buying sex in the past year.

ART for PWID lags behind that of other groups, particularly in low- and middle-income countries (LMIC). In LMIC, five nations (China, Vietnam, Russia, Ukraine, and Malaysia) account for 47% of all HIV-infected PWID. In these five countries, PWID account for 67% of all HIV infections, but only 25% of those receiving ART (Wolfe, Carrieri, & Shepard, 2010).

### Case studies: Harm reduction for PWID

Case studies of effective harm reduction interventions for PWID were not easy to identify, perhaps because many interventions for PWID (such as needle and syringe programs and detoxification centers) are implemented by Ministries of Health and other government bodies, and thus not documented in the academic literature or program reports. The government of Mexico has a national program which offers syringe exchange in nine states, and also offers mobile clinics, condoms, rapid HIV testing, education materials, and syringe exchange to high-risk neighborhoods along the Mexico-United States border (Moreno, Licea, & Ajenjo, 2010). Mexico has also adopted harm reduction in national policies, including loosening laws to deregulate possession of small amounts of drugs, and offering opioid-substitution treatment.

Two networks oriented towards harm reduction for PWID were identified in sub-Saharan Africa, the Kenya Network of People who Use Drugs (established June 2012)[[1]](#footnote-1) and the Tanzanian Network of People who Use Drugs (established January 2013)[[2]](#footnote-2). Both networks were established to promote a harm reduction approach for drug users, including influencing policy, promoting the human rights and protection of people who use drugs, and combating stigma and discrimination.1 In Tanzania, there has been controversy over whether the objective of the network is to promote harm reduction, or recovery from drug addiction. When the Tanzanian Network of People who Use Drugs (TaNPUD) decided to describe itself as “a group completely recovered from addiction”, the International Network of People who Use Drugs (INPUD) reacted with alarm. INPUD informed TaNPUD that “this is not within the values of INPUD”, then disassociated itself from TaNPUD and immediately set up a new network called the Real Activist Community which fully embraced harm reduction.[[3]](#footnote-3)

## Young key populations

This review includes 4 articles specifically addressing young key populations (aged under 25 years): 3 reviews and meta-analyses, and 1 evaluation of risk factors among young transgender female youth. No studies of interventions for young key populations were identified.

Many individuals initiate injecting drug use, sex work, or (for males) sex with other males during adolescence (Baggaley et al., 2015). Comprehensive global estimates of HIV risk among young key populations are not available (Baggaley et al., 2015), although WHO’s recent guidelines on HIV in key populations (World Health Organization, 2014) recognized the importance of HIV transmission in this group by specifically addressing adolescent and young key populations for the first time. Region-specific estimates suggest that young key populations are at very high risk of HIV. In Asia, 95% of HIV incidence in young people is estimated to occur in young key populations (Commission on AIDS in Asia, 2008). In the United States, 93% of all diagnosed HIV infections among adolescent males 13 to 19 years are due to male-to-male sexual contact (US Centers for Disease Control and Prevention, 2012). Also in the United States, HIV prevalence among transgender youth has been found to be significantly higher than among other adolescents and young adults (Baggaley et al., 2015). Young MSM are at increased risk of depressive symptoms, anxiety disorders, suicidal ideation and attempts, and PTSD, compared to their peers, and these factors can impact HIV risk and adherence to ART (Pettifor et al., 2015).

Young PWID (aged 18-29) in the US have been found to be more likely to inject daily than other age cohorts (US Centers for Disease Control, 2014). Young female PWID have riskier injecting behaviors and more sexual partners compared to males and are disproportionately at risk of intimate partner violence and violence from police and sex trade clients, homelessness, mental health disorders, and high suicide risk (Pettifor et al., 2015). A study of drug-using youth living on the streets in Vancouver Canada found extremely high rates of lifetime violence and abuse: 74% had been physically abused, 32% had been sexually abused, 87% had been emotionally abused, 85% had been physically neglected, and 93% had been emotionally neglected (Stoltz et al., 2007). Past experience of sexual abuse as well as emotional abuse was independently associated with engagement in sex work.

HIV programming and resources, as well as policy and legal environments, often do not match the specific risk behaviors which account for most HIV transmission among youth and do not address young key populations. For example, in Asia over 90% of HIV resources address the needs of “low-risk youth” (Commission on AIDS in Asia, 2008). Furthermore, there are often policy and legal barriers to adolescent key populations accessing HIV prevention, treatment, and care interventions and services (Baggaley et al., 2015). In sub-Saharan Africa, 14 countries do not give individuals under the age of 18 the right to consent to an HIV test (World Health Organization, 2013). Young key populations may also face high levels of social exclusion and marginalization, and stigma, discrimination, and violence (Baggaley et al., 2015). In many contexts health services do not serve the needs of young key populations, creating further barriers to their access to HIV services (Baggaley et al., 2015). The recent WHO guidelines for key populations call for a full package of HIV prevention interventions (including harm reduction for substance users), and structural approaches including decriminalization of key population behaviors (World Health Organization, 2014).

A 2015 review identified 26 articles which addressed ART and retention in care for young key populations and behaviorally infected youth and adolescents, but none addressed young people who were sex workers, transgender, or prisoners, and all studies were from North America (Lall, Lim, Khairuddin, & Kamarulzaman, 2015). This review also found that adherence to ART of young key populations was influenced by factors including social isolation, minority status, imprisonment, housing instability, and depression and drug use. A 2014 review of young key populations in Asia Pacific found 37 articles which addressed HIV prevention interventions for these populations, and found that condom use was generally low or inconsistent among MSM, transgender, sex workers (with clients) (Schunter, Cheng, & Kendall, 2014). Lack of condom use was associated with lower education and economic hardship, lower perceptions of risk, and for young FSW, sexual coercion, forced sex, and trafficking.

Globally, transgender adolescent females who sell (or have sold) sex may have four times the risk of HIV infection compared to other adolescents (Operario et al., 2008). A qualitative study of young FSW in Kumasi, Ghana found that they had largely entered sex work before the age of 18 (one-third before the age of 15), and that they felt that younger SW faced greater risks than did older SW in terms of unsafe sex, exploitation, and abuse (Onyango et al., 2015). In Asia, younger sex workers, particularly those who have been trafficked, have also been found to be less likely to use condoms in Asia and to be at greater risk of violence (Schunter et al., 2014). Among Aboriginal sex workers in Vancouver, Canada, the median age of entering sex work was 16, nearly half reported experiencing childhood sexual violence, and more than half reported experiencing childhood physical violence (Bingham et al., 2014). Transgender female youth have been found to be particularly at risk of entering sex work. In a study of transgender female youth in Chicago and Los Angeles, United States, two-thirds of participants had engaged in sex work (over one third in the past 3 months), and those who had engaged in sex work were nearly 4 times as likely to reporting being HIV-positive (23% HIV prevalence compared to 6% HIV prevalence among those who had never engaged in sex work) (Wilson et al., 2009). Sex work was associated in multivariate analysis with lower education status, homelessness, use of street drugs, and (surprisingly) higher perceived social support.

In a commentary in *JAIDS* special issue on young key populations, Conner (2015) addresses the legal and policy issues pertaining to adolescents aged 10 to 17 years who sell sex and engage drugs, noting that public health community has not advocated for the same guidelines for adolescents aged 10-17 as for older populations out of fear of transgressing international law. Conner also notes that international law protects children and adolescents under the age of 18 from arrest, prosecution, and detention. Conner calls for approaches for adolescents aged 10-17 which are voluntary, utilize peer-based outreach, and permit alternatives to parental consent for HIV testing, treatment and care, opioid substitution therapy, safe abortions, antiretroviral therapy, and “gender-affirming care” and hormone treatment for transgender adolescents (Conner, 2015, p. 78). In addition, Conner advocates that government agencies and ethical review boards waive mandatory reporting of illegal behaviors for this population, to allow for research and the provision of health services. Pettifor and colleagues similarly argue, in the same *JAIDS* issue, that parental permission laws hinder effective HIV prevention as they prevent minors from accessing prevention and care services (Pettifor et al., 2015).

## Childhood trauma and adult risk behaviors

Although this review identified only one study which specifically addressed children of key populations, multiple studies in this review provided evidence of the relationship between childhood trauma or adverse experiences, and risk behaviors as adults. This research may be relevant to children of key populations, to young key populations, and to adult key populations.

A study of FSWs in Vancouver, Canada provided evidence of how children of sex workers might face additional risk. Aboriginal FSWs in Vancouver were twice as likely as other FSW to be involved in “generational sex work” (defined as having a close family member currently or previously engaged in street-based sex work), and generational sex work was significantly associated with HIV risk (Bingham et al., 2014). Aboriginal FSW were more than twice as likely to report generational sex work as were other FSW (32% vs. 14%), and were also more likely to be HIV-positive (34% vs. 24%). For Aboriginal women, generational sex work was significantly and independently associated with risk of HIV infection (OR = 3.01).

Similar research among a cohort of Aboriginal people who use drugs (injection and non-injection) in two urban centers in British Columbia found that nearly half (48%) reported ever having experienced sexual abuse and that sexual abuse was associated with having had over 20 lifetime sexual partners, to have ever been paid for sex, and to have ever overdosed (Pearce et al., 2008). An innovative study of US and Canadian workers compared current circumstances and prior life experiences among three types of low-income service workers: sex workers, food and beverage servers, and hairstylists. Sex work (but not other types of work) was found to be independently associated with childhood poverty, abuse, and family instability, as well as adult drug use (McCarthy, Benoit, & Jansson, 2014). In a study of over 24,000 MSM in Latin America, having sold sex was significantly associated with a history of childhood sexual abuse (Oldenburg et al., 2015).

Quite apart from HIV risk, numerous studies have found linkages between childhood abuse and later engagement in high-risk behaviors include high-risk sexual behaviors (Lalor & McElvaney, 2010). A “systematic review of reviews” found that survivors of childhood sexual abuse are “significantly at risk of a wide range of medical, psychological, behavioral, and sexual disorders” (Maniglio, 2009).

This research suggests that for members of key populations who engage in high-risk behaviors, there may be linkages between childhood abuse and trauma and adult vulnerabilities and risky choices. While this perspective certainly will not apply to all members of key populations, it does suggest that members of key populations who engage in high-risk behaviors may have additional co-morbidities (particularly regarding mental health) which may require particular psychosocial support and interventions.

# Recommendations

There is evidence that a number of HIV prevention interventions can positively impact HIV risk among key populations, particularly sex workers, MSM, and PWID. Less is known about effective interventions for transgender people and young key populations. There is strong consensus in the HIV prevention community that the human rights of key populations must be addressed for HIV prevention to be effective, and strong evidence that stigma and discrimination are hindering key populations’ access to HIV prevention, care, and treatment services.

Perhaps less attention has been given to the ways that risky behaviors overlap, and particularly how childhood trauma, violence, and drug and alcohol abuse may dispose people towards behaviors and life choices which may increase HIV risk. Virtually absent in the literature is a primary prevention approach which seeks to prevent the adoption of high-risk behaviors such as sex work, drug use, and multiple sexual partnerships. Rather, the overwhelming emphasis in the literature and in internationally recognized best practices is on harm reduction, namely reducing risk for individuals who continue to engage in sex work, injecting drug use, and risky sex with multiple partners.

A primary prevention approach, on the other hand, might attempt to interrupt the pathway from trauma and abuse to risky sexual and drug use behaviors. Targeted interventions could provide psychosocial support and counseling to girls and young women (as well as boys and young men) with certain well-recognized risk factors, such as childhood trauma and abuse. Such interventions have the potential to change the trajectories of children and young adults, so that they never become members of key population groups such as sex workers and injecting drug users, in need of harm reduction. While such approaches have not been pursued by the HIV prevention community, much less subjected to rigorous evaluation, perhaps it is time to consider the mandates of prevention and health promotion more broadly. While harm reduction measures have had some success in reducing HIV incidence, there is ample evidence that they have failed to adequately protect many key populations, much less remove risk of other serious harms such as violence. Addressing the intersecting risks highlighted in this review may require interventions that go beyond standard HIV prevention approaches to address underlying traumas and sources of vulnerability.

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# Annex 1: WHO recommendations concerning key populations

Source: *Consolidated Guidelines on HIV Prevention, Diagnosis, Treatment and Care for Key Populations* (World Health Organization 2014)

HEALTH SECTOR INTERVENTIONS

**HIV prevention**

1. The correct and consistent use of condoms with **condom-compatible lubricants** is recommended for all key populations to prevent sexual transmission of HIV and sexually transmitted infections (STIs).
2. Among men who have sex with men, **pre-exposure prophylaxis (PrEP)** is recommended as an additional HIV prevention choice within a comprehensive HIV prevention package. (NEW RECOMMENDATION)
3. Where serodiscordant couples can be identified and where additional HIV prevention choices for them are needed, daily oral **PrEP** (specifically tenofovir or the combination of tenofovir and emtricitabine) may be considered as a possible additional intervention for the uninfected partner.
4. **Post-exposure prophylaxis (PEP)** should be available to all eligible people from key populations on a voluntary basis after possible exposure to HIV.
5. **Voluntary medical male circumcision (VMMC)** is recommended as an additional, important strategy for the prevention of heterosexually acquired HIV infection in men, particularly in settings with hyperendemic and generalized HIV epidemics and low prevalence of male circumcision.

**Harm reduction for people who use drugs**

1. All people from key populations who inject drugs should have access to sterile injecting equipment through **needle and syringe programmes.**
2. All people from key populations who are dependent on opioids should be offered and have access to **opioid substitution therapy.**
3. All people from key populations with harmful alcohol or other substance use should have access to **evidence-based interventions,** including brief psychosocial interventions involving assessment, specific feedback and advice.
4. People likely to witness an opioid overdose should have **access to naloxone** and be instructed in its use for emergency management of suspected opioid overdose. (NEW RECOMMENDATION)

**HIV testing and counseling (HTC)**

1. **Voluntary HTC** should be routinely offered to all key populations both in the community and in clinical settings. **Community-based HIV testing and counselling for key populations,** linked to prevention, care and treatment services, is recommended, in addition to provider- initiated testing and counselling.

**HIV treatment and care**

1. Key populations living with HIV should have the same access to **antiretroviral therapy (ART)** and to ART management as other populations.
2. All pregnant women from key populations should have the same access to services for **prevention of mother-to-child transmission (PMTCT)** and follow the same recommendations as women in other populations.

**Prevention and management of coinfections and co-morbidities**

1. Key populations should have the same access to **tuberculosis (TB) prevention, screening and treatment** services as other populations at risk of or living with HIV.
2. Key populations should have the same access to **hepatitis B and C prevention, screening and treatment** services as other populations at risk of or living with HIV.
3. Routine screening and management of **mental health** disorders (depression and psychosocial stress) should be provided for people from key populations living with HIV in order to optimize health outcomes and improve their adherence to ART. Management can range from co-counselling for HIV and depression to appropriate medical therapies.

**Sexual and reproductive health**

1. **Screening, diagnosis and treatment of sexually transmitted infections** should be offered routinely as part of comprehensive HIV prevention and care for key populations.
2. People from key populations, **including those living with HIV, should be able to** experience full, pleasurable sex lives and have access to a range of **reproductive options.**
3. **Abortion laws and services** should protect the health and human rights of all women, including those from key populations.
4. It is important to offer **cervical cancer screening** to all women from key populations.
5. It is important that all women from key populations have the same support and access to services related to **conception and pregnancy care,** as women from other groups.

CRITICAL ENABLERS

1. **Laws, policies and practices** should be **reviewed** and, where necessary, revised by policy- makers and government leaders, with meaningful engagement of stakeholders from key population groups, to allow and support the implementation and scale-up of health-care services for key populations.
2. Countries should work towards implementing and enforcing **antidiscrimination and protective laws,** derived from human rights standards, to eliminate stigma, discrimination and violence against people from key populations.
3. **Health services** should be made **available, accessible and acceptable** to key populations, based on the principles of medical ethics, avoidance of stigma, non-discrimination and the right to health.
4. Programmes should work toward implementing a package of interventions to **enhance community empowerment** among key populations.
5. **Violence** against people from key populations should be prevented and addressed in partnership with key population-led organizations. All violence against people from key populations should be monitored and reported, and redress mechanisms should be established to provide justice.

# Annex 2: Completed pre-exposure prophylaxis (PrEP) RCTs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Trial name (year of study publication)**  ***Location*** | **Study population** | **Other sub-populations\*** | **Design & intervention** | **% relative reduction in HIV incidence** | **Adherence\*\*** |
| CAPRISA 004 (2010)  *KwaZulu Natal, South Africa* | women | youth (18-24): 65%  SW: 2% | RCT, TDF vaginal gel vs. placebo | **39%**  95% CI = 6 - 60%  *p = 0.017* | applicator count: 72%  blood plasma: 51%  seroconverted: 61%  did not seroconvert: 59% |
| iPrEX (2010)  *US, Brazil, Peru, Ecuador, Thailand, South Africa* | MSM & transgender women | youth (18-24): 46%  transgender women: 1%  SW: 41% | RCT, TVD vs. placebo | **44%**  95% CI = 15 - 63%  *p = 0.005* | self-report: 95%  pill count: 89-95%  seroconverted: 9%  did not seroconvert: 51% |
| FEM-PrEP (2012)  *Kenya, South Africa, Tanzania* | women | youth (18-24): 57%  SW: 13% | RCT, TVD (Truvada) vs. placebo | stopped for futility | self-report: 95%  pill count: 88%  seroconverted: 15-26%  did not seroconvert: 24-37% |
| Partners PrEP (2012)  *Kenya, Uganda* | sero-discordant couples | youth (18-24): 11% | RCT, TDF vs. TVD vs. placebo | **TDF: 67%**  95% CI = 44 - 81%  *p < 0.001*  **TVD: 75%**  95% CI = 55 - 87%  *p < 0.001* | pill count: 97%  seroconverted: 31%  did not seroconvert: 82% |
| TDF2 (2012)  *Botswana* | men and women | youth 18-20: 2%  young adults 21-29: 89% | RCT, TVD vs. placebo | **62%**  95% CI = 22 - 83%  *p = 0.03* | pill count (TVD arm): 84%  self-report (TVD arm): 94%  seroconverted: 50%  did not seroconvert: 81% |
| Bangkok Tenofovir Study (2013)  *Thailand* | PWID | MSM: 5% | RCT, TDF (tenofovir) tablet vs. placebo | **49%**  95% CI = 10 - 72%  *p = 0.01* | drug diaries: 84%  blood plasma: 66%  seroconverted: 39%  did not seroconvert: 67% |

*Source:* Information in this table taken from Pettifor et al., 2015

\* Sub-populations may not be mutually exclusive.

\*\*Adherence rates among those who did and did not sero-convert are based on detection of TDF/TVD in blood plasma, with the exception of FEM-PrEP (based on applicator count).

# Annex 3: Table of Sources

*Notes:* **Bold type indicates significant results.** Gray cells indicate qualitative research. The term “Africa” is used (for brevity) to refer to sub-Saharan Africa.

## All key populations

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Citation** | **Design & population** | **Outcome of interest** | **Country or region** | **Findings** | **Notes** |
| **Meta-analyses & reviews [1]** | | | | | |
| Platt et al. 2013 | Review & synthesis | HIV | Europe | Exhaustive World Bank report on key populations (SW, MSM, PWID) in Western Europe, Eastern Europe, and Central Asia, addressing rising HIV incidence in Europe, risk factors and transmission patterns, and HIV prevention responses. |  |

## Sex workers

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Citation** | **Design & population** | **Outcome of interest** | **Country or region** | **Findings** | **Notes** |
| **Meta-analyses & reviews [11]** | | | | | |
| Bekker et al. 2015 | Systematic review | HIV prevalence & incidence, STI treatment | Global | Reviews 69 articles and reports (1990-2014) of interventions that have an effect on HIV in the FSW or general population (as data on FSW specifically were often not available). Combination prevention packages which include biomedical, behavioral, and structural interventions are needed. |  |
| Decker et al. 2015 | Review | Human rights violations | Global | Reviewed >800 studies and reports (2009-2014) of human rights violations against sex workers and implications for HIV risk. Such violations include homicide, violence (physical and sexual) from law enforcement, clients, and intimate partners, unlawful arrest and detention, discrimination in accessing health services, and forced HIV testing, and were particularly prevalent where sex work was criminalized through punitive law. |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Kerrigan et al. 2015 | Systematic review & metal-analysis | HIV infection, STI infection, condom use with clients | LMIC | Reviewed 22 articles (2003-2013) of community empowerment approaches for addressing HIV among SW, representing 7 projects in 3 countries (India, Brazil, & Dominican Republic); 13 articles addressed Avahan, & 17 addressed India. All projects included community-led peer education for HIV prevention, condom distribution, and promotion of periodic STI screening. Only 1 project (in Brazil) included male and transgender SW. Evaluation designs were generally “weak”, and with the exception of one RCT (see Basu et al. 2004) and one longitudinal study (see Lippman et al. 2012), all study designs were cross-sectional or serial cross-sectional. The authors conclude that “our ability to draw causal inferences and firmly establish the effectiveness of community empowerment is restricted”. In meta-analysis, community-empowerment based projects were found to be significantly associated with reductions in HIV (OR = 0.680, p = 0.0047); all data came from 5 studies of Avahan which measured HIV prevalence and not incidence. STI incidence was measured by a longitudinal study in Brazil, with no significant reduction found. Eight studies measured STI prevalence cross-sectionally and found decreased odds of gonorrhea (7/8 studies, p = 0.011), chlamydia (7/8 studies, p = 0.036), and high-titre syphilis (7/8 studies, p < 0.0001). Ten studies showed increased in condom use (p < 0.0001). |  |
| Poteat et al. 2015 | Review | HIV risk among transgender women SW | Global | Reviewed 6 studies which addressed HIV risk for transgender women sex workers (TSW); none focused exclusively on this population. TSW face disproportionate risk of HIV and unique risk factors including illicit hormones and silicone injections, need for gender affirmation, high-risk male partners, and systemic discrimination and violence. |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Deering et al. 2014 | Systematic review | Violence (prevalence & correlates) | Global | Reviewed 28 studies with data on correlates of violence among SW plus 14 with estimates of violence against SW (male, female, and transgender). Across studies, 45% to 75% of SW reported ever experience of violence in the workplace (mostly by clients). The following factors were associated with violence: policing practices (arrest, violence, or coercion) (4 studies); “outside” sex work (4 studies); increased economic pressure (4 studies); gender inequality (4 studies); individual, relationship, or collective power (4 studies); social stigmatization (1 study); mobility, trafficking, or forced labor; and individual-level factors such as drug and alcohol abuse and number of sexual partners. |  |
| Mountain et al. 2014 | Systematic review & meta-analysis | ART uptake, attrition, adherence, & outcomes among HIV+ FSW | Global | Reviewed 39 studies of 21 different FSW populations. 38% of HIV+ FSW were currently on ART. Ever use of ART but not current use was higher in high-income compared to LMIC. Rates of ART uptake, attrition, adherence, and outcomes were similar among FSW compared to women in general populations. |  |
| Chersich et al. 2013 | Review | HIV prevention interventions | Africa | Reviewed 38 articles describing 26 studies (2000-2011). Nearly all interventions included condom promotion or provision, although few studies provided data on whether increased condom use decreased HIV transmission. Several studies assessed condom promotion/provision as part of combination prevention packages, and linked increasing condom use to declining STI incidence/ prevalence in observational cohorts. Several studies suggested that peer-mediated condom promotion was particularly effective; one study did not find this. Data on whether HIV testing impacted sexual behavior were limited and inconclusive. |  |
| Platt et al. 2013 | Systematic review & ecological analysis | HIV & STI prevalence | Europe | Reviewed 73 articles and reports addressing FSW in Europe. Injecting drugs is “primary individual-level risk factor for HIV among FSW in Europe”, with HIV prevalence <1% among FSW who do not inject drugs, and HIV among FSW and PWID highest in E Europe. |  |

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| Baral et al. 2012 | Systematic review & meta-analysis | HIV prevalence | LMIC | Reviewed 102 articles and reports published 2007-2011 (n = 99,878 FSW in 50 LMIC). Overall HIV prevalence among FSW 11.8% with highest prevalence in SSA. Overall HIV prevalence among FSW compared to all women or reproductive age in all LMIC was OR = 13.5, with highest ORs in Asia and SSA. |  |
| Operario et al. 2008 | Systematic review & meta-analysis | Sex work & HIV status among transgender women | Global | Reviewed 25 studies (1980-2007) from 14 countries. Meta-analysis showed that HIV prevalence was 27% in transgender female SW, 15% in transgender women not engaged in SW, 15% in male SW, and 5% in female SW. |  |
| Shahmanesh et al. 2008 | Systematic review | HIV/STI prevention interventions | LMIC | Reviewed 28 studies since beginning of HIV epidemic with RCT or quasi-experimental design from LMIC in Africa (16 studies), Asia (8 studies) and Latin America (5 studies). Intervention locations included dedicated SW clinics (11), brothels (7), communities (7), motels (1), and truck stops (1). Four placebo-controlled RCTs tested the vaginal microbicide nonoxinol-9, and all found flat results or increased risk of HIV. **Four RCTs tested STI treatment strategies for SW, but only one found positive impact on HIV or STI incidence. Two quasi-experimental design studies which tested STI treatment found reductions in STIs. Four cohort studies examined impact of STI screening, peer education, and condom promotion, and all found a reduction in HIV or STI incidence. Four studies with pre/post designs examined similar interventions and three found declines in bacterial STI prevalence**; one study found increases in bacterial STI prevalence despite increased condom use. |  |

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| **Studies [23]** | | | | | |
| Duvall et al. 2015 | Key-informant interviews & policy review | Access to HIV services | Burkina Faso & Togo | Country policies in Burkina Faso and Togo were reviewed using a policy analysis tool for MSM, transgender, and SW populations, and 28 key-informant interviews explored policies for key populations. Significant barriers to availability and accessibility of services for MSM and SW were identified in both countries, in particular laws criminalizing MSM/SW which result in harassment and arrests of MSM/SW, and lack of policies supportive of MSM/SW and their HIV prevention needs. |  |
| Onyango et al. 2015 | In-depth interviews, FGDs,  48 FSW | Vulnerabilities of FSW | Ghana (Kumasi) | 23 in-depth interviews and 4 FGDs carried out with total of 48 FSW aged 18-20 who had been involved in sex work >2 years. One third had started sex work before age 15. While most expressed intentions for consistent condom use with clients, higher payment, drug/alcohol use, fear of violence, and police harassment negatively impacted condom use behaviors. Abuse and exploitation by police were common, and they felt violence and rape by clients were their greatest risks, particularly for young FSW. |  |
| Wondergem et al. 2015 | Historical review | STI prevalence, condom use, intervention coverage | Ghana | Historical review of HIV prevention interventions for FSW in Ghana. Coverage of such interventions increased dramatically between 1987 and 2013, with >40,000 FSW reached with a national program in 2013. Condom usage and HIV testing among FSW also increased in this time, and the prevalence of gonorrhea and chlamydia decreased. FSW continue to have 10 times the risk of HIV compared to the general population. |  |
| Zulliger et al. 2015 | Cross-sectional,  268 HIV+ FSW | Retention in ART care | Dominican Republic | Retention in HIV care among HIV+ FSW was high (92% reported 6-month attendance), and FSW with more positive perceptions of HIV service providers were more likely to be retained in care (aOR = 1.17, 95% CI = 1.09-1.25) |  |

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| Bingham et al. 2014 | Cross-sectional,  225 street-based FSW | HIV prevalence and HIV risk factors | Vancouver, Canada | Of the 107 Aboriginal women, 41% had used heroin in past 6 months and 64% reported daily crack use. Aboriginal women first exchanged sex for money at median age 16, 52% reported experiencing childhood physical violence, and 49% reported experiencing childhood sexual violence. Aboriginal FSW were more than twice as likely to report inter-generational sex work compared to other FSW in the study (having a close family member who had engaged in street-based SW, 32% vs. 14%). Aboriginal FSW were significantly more likely to be HIV+ (34% vs. 24%, p. = 0.025), and inter-generational sex work was independently associated with HIV infection (OR = 3.01, 95% CI = 1.67-4.58) for Aboriginal but not non-Aboriginal FSW. |  |
| McCarthy et al. 2014 | Cross-sectional,  595 workers (including 212 FSW) | Negative life experiences | United States & Canada  (2 cities) | The immediate circumstances and prior life experiences of workers in 3 types of low-income service work were evaluated: sex work, food and beverage serving, and barbering/hairstyling. Sex work was found to be independently associated with childhood poverty, abuse, and family instability, as well as adult drug use. |  |
| Mtetwa et al. 2013 | 3 FGDs | Barriers to ART | Zimbabwe | Qualitative study to investigate why fewer than half of HIV-diagnosed FSW initiated ART (14% only attended more than one appointment). In 3 FGDs, FSWs reported that they were demeaned and humiliated by health workers, and also lacked time and money to pursue treatment. |  |
| Scorgie et al. 2013 | In-depth interviews & FGDs with female, male, & transgender SW | Access to health care | Kenya, Zimbabwe, Uganda, & South Africa (6 urban sites) | Trained sex workers conducted in-depth interviews (55) and FGDs (12) with a total of 106 female, 26 male and 4 transgender sex workers in 6 urban sites. Participants reported negative interactions with healthcare workers and unmet health needs including diagnosis and treatment of STIs and insufficient access to condoms and lubricant. Experiences were more positive at private clinics (which were preferred if resources permitted) and specialized SW clinics (available in southern Africa). |  |

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| Strathdee et al. 2013 | RCT,  584 FSW-IDU | HIV risk behaviors | Mexico (Tijuana & Juarez) | FSW in Tijuana and Juarez who also injected drugs were offered four brief sessions with either an interactive or didactic intervention to promote safer sex and reduce needle/syringe sharing. At 12-month follow-up, HIV/STI incidence had decreased >50% in the intervention vs. control arm in both Tijuana (aRR = 0.38, 95% CI = 0.16-0.89) and Juarez (aRR = 0.44, 95% CI = 0.19-0.99). Women receiving the interactive intervention reduced receptive needle-sharing more women receiving the didactic intervention (85% vs. 71%, p = 0.04). In Tijuana, receptive needle-sharing declined by 95% in both study arms. In Tijuana but not Juarez, women reported significant increases in access to syringes and condoms. |  |
| Reza-Paul et al. 2012 | Observational, ethnographic research & project monitoring data | Violence experienced by FSW | India (Mysore) | Ashodaya Samithi collective: Community-led structural intervention for FSW was found to influence violence experienced by FSW. **Over 5-year follow-up, incidence of reported violence by FSW decreased by 84%.** Violence by police decreased after a safe space for FSW meetings was established, and advocacy was undertaken. Violence by clients decreased after working with owners of SW venues. Reported violence by intimate partners increased, perhaps as reaction to SW’s increased empowerment. |  |
| Diabaté et al. 2011́ | Prospective observational,  53 HIV+ FSW & 318 PLHIV from gen. pop. | ART adherence | Benin | At 1-year follow-up, FSW were significantly more likely to have poor ART adherence compared to individuals in the general population (19.3% vs. 7.5%, p < 0.0001) and crude mortality was nearly 4 times as high among FSW (4.65 vs. 1.11 per 100 person-years) |  |
| Ghose et al., 2011 | In-depth interviews (55) with FSW | HIV risk | India | Sonagachi HIV/AIDS Program (SHIP): In-depth interviews were conducted with 55 participants in SHIP and indicated that brothels reduced HIV risk among SW by: 1) serving as SHIP intervention sites, 2) being operated by madams who promoted SHIP, 3) standardizing sex work and economic transactions & 4) promoting community empowerment. |  |

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| Ng et al. 2011 | Cross-sectional, modeling | HIV prevalence | India  (6 states) | Avahan: Used multi-level model to estimate the association between intervention intensity and population HIV prevalence trends, taking into account underlying epidemic dynamics. Greater intensity of Avahan (amount of grant per PLHIV in population) was significantly associated with lower HIV prevalence in three states (Andhra Pradesh, Karnataka, and Maharashtra, p = 0.004, 0004 and 0.008 respectively) and not in three others (Tamil Nadu, Manipur, and Nagaland, p = 0.06, 0.62, and 0.67, respectively). Avahan was estimated to have averted over 100,000 new HIV infections from 2003 to 2008. |  |
| Chakrapani et al. 2009 | Key-informant interviews (2) & FGDs (3) with HIV+ FSW | Barriers to ART access | India (Chennai) | 3 FGDs were conducted with HIV+ FSW, as well as 4 key-informant interviews with FSW who were community leaders. Barriers to ART access were individual-level, social/family-level, and at level of healthcare system. FSW feared adverse consequences if they disclosed their HIV status, particularly related to stigma and discrimination against SW and PLHIV. They also reported lack of family support, negative experiences with health care providers, and lack of adequate health services including psychosocial services. |  |
| Cornish & Campbell 2009 | Ethnographic case studies | Peer education for HIV prevention | India (Kolkata) & South Africa (Johannes-burg) | Ethnographic case studies of two peer education HIV prevention interventions are compared to identify factors which led to success in one case (Sonagachi Project in Kolkata, India) and disappointing results in another case (Summertown Project in a mining community outside Johannesburg, South Africa). |  |
| Shannon et al. 2009 | Prospective observational, 237 drug-using FSW (inclusive of transgender women) | GBV | Vancouver, Canada | Participants were FSW (inclusive of transgender women) who used illicit drugs and engaged in street-level sex work. Over 18-month follow-up, 57% experienced GBV (physical violence, rape, and/or client-perpetrated violence). In multivariate analysis, violence was associated with homelessness, inability to access drug treatment, servicing clients in cars or open spaces, and police actions (prior assault by police, confiscation of drug paraphernalia, and moving work away from main streets due to police). | See also Shannon et al. 2008 |

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| Swendeman et al. 2009 | Quasi-experimental, 216 FSW in 2 clusters (towns) | 21 measures of effective HIV prevention programming | India  (West Bengal) | As a further analysis of the intervention reported in Basu et al. 2004, 21 additional measures were analyzed pre- and post-intervention in the intervention and control communities. **Significant increases were seen, in intervention compared to control arms, in knowledge of STIs and HIV, skills for workplace autonomy and negotiation, opinion that sex work is valid work, social support, and financial security**, but not in having disclosed SW profession, having other income, political participation (voting), or taking loans. |  |
| Odek et al. 2008 | Observational & prospective, 227 FSW | Sexual risk behaviors, engagement in SW | Kenya (Nairobi slum) | Micro-enterprise services including one loan of <$200/person were added to a peer-mediated HIV intervention at request of FSW. **At 2-year follow-up, 63% had operational businesses and 45% reported having left SW. Mean number of partners reduced from 3.26 weekly to 1.84 weekly (p < 0.001); this change was attributable to decline in regular partners and not casual partners. Condom use remained high with casual partners/clients (>90%) and increased somewhat with regular partners (79% to 94%).** |  |
| Reza-Paul et al. 2008 | Repeat cross-sectional,  429 FSW | STI prevalence, condom use | India (Mysore) | Ashodaya Samithi collective: Two cross-sectional surveys among random samples of FSW were conducted 30 months apart with majority (88%) street-based FSW. **Increases were seen in condom use at last sex with occasional clients (65% vs. 90%, p < 0.0001), repeat clients (53% vs. 66%, p < 0.001), and regular partners (7% vs. 30%, p < 0.001). Decreases in syphilis, trichomonas, and chlamydia were seen (all p < 0.001) as well as gonorrhea (p = 0.03). HIV prevalence was stable (26% vs. 24%) although detuned assay testing provided evidence of a decline in recent HIV infections.** |  |

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| Shannon et al. 2008 | FGDs,  46 drug-using FSW | HIV prevention & harm reduction | Vancouver, Canada | FGDs were held with 46 women in “survival sex work” who were also drug users. Mean age of women was 34 and 57% identified as being Aboriginal. Many women reported that their intimate partners were drug users and acted as pimps, with males supplying drugs and women engaging in sex work to pay for both partners’ drug habit. Women also reported the frequent nature of violence and victimization by clients. Many women were opiate-dependent and reported a need to sell sex to maintain this habit. |  |
| Kerrigan et al. 2006 | Cross-sectional pre/post design,  ~400 FSW | STI prevalence, sexual risk behaviors | Dominican Republic | Two intervention approaches were implemented among 68 brothels in two cities: community solidarity and brothel self-regulation in Santo Domingo, and solidarity combined with government policy (penalizing brothel management for failing to enforce 100% condom usage) in Puerto Plata. **In Santo Domingo, condom use with new clients increased (75% to 94%, OR = 4.21, 95% CI = 1.55-11.43). In Puerto Plata, condom use with regular partners increased (13% to 29%, OR = 2.97, 95% CI = 1.33-6.66), and STI prevalence was reduced (29% to 16%, OR = 0.50, 95% CI = 0.32-0.78)**, suggesting critical role of policy. |  |
| Basu et al. 2004 | Quasi-experimental, 216 FSW in 2 clusters (towns) | Condom use | India  (West Bengal) | Two towns in West Bengal were randomized to receive either the Sonagachi Project empowerment intervention or standard care of STD clinic, condom promotion, and peer education. In each town, ~100 FSW were randomly selected to participate. In 15-month follow-up, overall condom use increased significantly in the intervention vs. control arm (39% vs. 11%) and the proportion of consistent condom users increased 25% in intervention arm vs. 16% decrease in control arm. | See also Swendeman et al. 2009 |
| Jana et al. 2004 | Project description | HIV risk behaviors | India (Calcutta) | Sonagachi Project: Describes the Sonagachi Project, a community intervention program to reduce HIV risk among SW. The project defined HIV as an “occupational health problem” and included community-, group-, and individual-level interventions. |  |

## Men who have sex with men (MSM)

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| **Citation** | **Design & population** | **Outcome of interest** | **Country or region** | **Findings** | **Notes** |
| **Meta-analyses & reviews [6]** | | | | | |
| Strömdahl et al., 2015 | Systematic review | Efficacy of HIV prevention interventions | Europe | Reviewed 24 HIV prevention interventions for MSM and assigned interventions a grade according to the Highest Attainable Standard of Evidence (HASTE) framework. Four interventions were assigned the highest HASTE grade (1): condom use, peer outreach, peer-led groups, and TasP. Four interventions were assigned grade 2a (probable recommendation): VCT, condom-compatible lubricant, PEP, and individual counseling for HIV+ MSM. |  |
| Beyrer et al. 2012 | Review | HIV prevalence, incidence, risk factors, and molecular epidemiology of HIV | Global | Reviewed 132 articles and reports published 2007-2011 and based on these data modeled dynamics of HIV transmission among MSM using agent-based simulation. High probability of HIV transmission in receptive anal intercourse was found to have a central role in explaining high HIV burden in MSM, and MSM networks display high clustering as well as high rates of re-infection with HIV. |  |
| Lorenc et al. 2011 | Systematic review of qualitative evidence | HIV testing | Global | Reviewed 17 studies (1996-2011) of HIV testing among MSM. Testing is motivated by uncertainty of not knowing HIV status, and a sense of responsibility towards oneself and one’s partner. Barriers to testing include fear of HIV+ test and stigma from other MSM or the wider culture. |  |
| Beyrer et al. 2010 | Systematic review | HIV prevalence | LMIC | Reviewed 133 HIV prevalence studies (2000-2009) from 50 LMIC countries and identified 4 epidemic scenarios: 1) settings where MSM are the predominant contributor to HIV cases; 2) settings where HIV transmission among MSM occurs in the context of epidemics driven by IDU; 3) settings where HIV transmission among MSM occurs in the context of well-established HIV transmission among heterosexuals; and 4) settings where both sexual and IDU modes contribute significantly to HIV transmission. |  |

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| Baral et al. 2007 | Systematic review & meta-analysis | HIV prevalence | Low- and middle-income countries | Reviewed 83 articles and reports published 2000-2006 (n = 63,538 in 38 LMIC). In countries with very low prevalence of HIV (<0.5%), MSM had OR of HIV infection (compared to general population) of 58.4; in countries with low HIV prevalence (0.5-1.0%), OR = 14.4; in countries with medium (1.1-5%) and high (>5%) prevalence of HIV, OR = 9.6. The same measures for low- and middle-income countries were OR = 7.8 and OR = 23.4 (respectively). By region, ORs were 33.3 in the Americas, 18.7 for Asia, 1.3 for Europe, and 3.8 for Africa. |  |
| Herbst et al. 2005 | Review & meta-analysis | Sexual risk behavior, biological outcomes | Global | Reviewed 33 studies/65 reports (through 2003) of HIV prevention interventions designed to reduce sexual risk behavior of MSM. Meta-analysis showed that **behavioral interventions were significantly associated with a decrease in unprotected anal intercourse (OR = 0.77, 95% CI = 0.65-0.92), decrease in number of sexual partners (OR = 0.85, 95% CI = 0.61-0.94), and increase in condom use during anal intercourse (OR = 1.61, 95% CI = 1.16-2.22).** |  |
| **Studies [12]** | | | | | |
| Adebajo et al. 2015 | Cross-sectional,  ~32,000 MSM & male PWID | HCT uptake & new HIV diagnoses | Nigeria  (4 states) | Three strategies were used to refer MSM and male PWID (M-MARPs) to HCT: S1) referrals to health facilities from key opinion leaders, S2) referrals to mobile HCT teams from key opinion leaders, S3) HCT offered through peers with mobile units. Uptake of HCT was as follows: S1: 1988, S2: 14,726, S3: 14,895. **S3 identified the highest proportion of new HIV diagnoses and MSM & PWID reached through S3 were much more likely to uptake HCT compared to S1 (aOR = 9.21, 95% CI = 5.57-15.23 and aOR = 20.9, 95% CI = 17.33-25.21, respectively).** Conclusion: “Training M-MARPs to provide HCT is a high-impact approach”. |  |

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| Amirkhanian et al. 2015 | RCT,  626 MSM | HIV/STI incidence & sexual behavior | Russia & Hungary | Networks of MSM were recruited sociocentrically (through 18 “seeds”) in St. Petersburg, Russia and Budapest, Hungary. These 18 networks (mean n=35) were randomized to receive a social network intervention (network leaders trained to convey HIV prevention advice to network members) or standard HIV/STI testing & counseling. **Over 12-month follow-up, intervention arm showed less unprotected anal intercourse with non-main partner (p = 0.04), multiple partners (p.002), and overall (p = 0.04), compared to control. HIV/STI incidence was 9% vs. 15% in control** (p-value not given). |  |
| Cange et al. 2015 | In-depth interviews & FGDs,  MSM | Barriers to HIV services & healthcare access | Cameroon | 100 in-depth interviews and a number (n=?) of FGDs were undertaken with MSM in 5 sites in Cameroon. 40 transcripts were analyzed in this study. Three themes emerged: 1) MSM seeking HIV services commonly experience discrimination and physical violence in healthcare settings; 2) few respondents use services provided by ministry of health and local NGOs, but those who did reported limited clinical and cultural competence of staff; 3) lack of social support and access to healthcare were considerable sources of stress and discouraged them from seeking HIV prevention, care, & treatment services. |  |
| Charurat et al. 2015 | Prospective observational, 186 HIV+ MSM | Acceptability of TasP | Nigeria | TRUST study: 186 HIV+ MSM were enrolled into a combination HIV prevention and treatment study. The 128 who were ART-naïve at study initiation were offered TasP, and 70 (55%) started TasP with average time between HIV testing and ART initiation of 77 days. After 6-months on ART, 80% had undetectable viral load (<200 copies/mL). MSM who started TasP were more likely to have disclosed to family members and health care providers about being MSM (77% vs. 50%, p = 0.02 and 71% vs. 48%, p = 0.02, respectively). In multivariate analysis, disclosure to healthcare provider but not family remained significant (at p <0.05). Of 59 who did not start TasP, 37 did not want to be contacted by health care providers, 9 denied their HIV status, 4 were concerned about side effects of TasP. | See also Schwartz et al. 2015 |
| Dai et al. 2015 | Cross-sectional,  1345 MSM | HIV risk behaviors | China  (3 provinces in southwest) | Self-administered questionnaire administered to MSM; male SWs excluded. Men who have sex with men and women (n=159) were more likely to have multiple male partners, and use illicit drugs, than men who have sex with men only (n=1186) in multivariate analysis. |  |
| Duvall et al. 2015 | Key-informant interviews & policy review | Access to HIV services | Burkina Faso & Togo | *See study description in Section 9.2 above.* |  |
| Oldenburg et al. 2015 | Cross-sectional, ~24,000 MSM | HIV risk factors | Latin America  (17 countries) | Respondents were recruited from one of the largest internet sites for men seeking social or sexual interaction with other men; 24,051 MSM responded from 17 Latin American countries. 7.2% reported being paid for sex in past 12 months, and this was associated with higher country-level unemployment in multivariate model. Transactional sex was significantly associated with self-reported HIV & STI infection, childhood sexual abuse history, IPV, and sexual compulsivity. |  |
| Pachankis et al. 2015 | Cross-sectional, ~174,000 MSM | HIV prevalence & stigma against MSM | Europe  (38 countries) | Data from the European MSM Internet Survey (EMIS) were analyzed to assess relationship between country-level stigma against MSM and HIV risk behaviors and HIV status. MSM in high-stigma countries had fewer non-steady sexual partners (aOR = 0.74, 95% CI = 0.67-0.83) and lower odds of diagnosed HIV (aOR = 0.68, 95% CI = 0.57-0.82), perhaps because their contact with other MSM is retricted. MSM in high-stigma countries also higher odds of inadequate HIV-related knowledge, not testing for HIV/STIs, not using condoms at last sex, and not discussing sexual behavior during HIV testing (range of aORs: 1.14-1.52). |  |

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| Schwartz et al. 2015 | Observational cohort study, 707 MSM | Stigma and access to healthcare | Nigeria (Abuja) | Assessed changes in stigma, avoidance of healthcare, and HIV clinical outcomes among MSM in TRUST cohort before (“prelaw”) and after (“postlaw”) passage of January 2014 Same-Sex Marriage Prohibition Act in Nigeria (which further criminalized same-sex relationships). Increases prelaw to postlaw were reported in lifetime experience of fear of seeking health care (25% vs. 38%, p < 0.0001) and avoidance of healthcare (20% vs. 28%, p = 0.001), although loss to follow-up from the TRUST study and incident health care avoidance did not increase significantly. | See also Charurat et al. 2015 |
| Stahlman et al. 2015 | Cross-sectional,  530 MSM | HIV risk, stigma, social stigma, depression | Lesotho | Structural equation modeling was used to assess linkages between HIV risk, stigma, social stigma, and depression among MSM recruited through respondent-driven sampling. Depression was positively associated with social stigma and negatively associated with social cohesion. Social stigma was associated with being HIV+, although this was not mediated by depression or condom use. |  |
| Batist et al. 2013 | Mixed methods,  5 FGDs with 36 MSM,  5 in-depth interviews with community leaders | Social support, distribution of prevention supplies | South Africa (Cape Town) | A pilot study was conducted of a community-based HIV prevention intervention for MSM in 5 predominantly black African townships outside Cape Town, South Africa. 98 MSM consented to participate in the intervention, but only 59 (60%) attended at least one activity. 28 (28%) attended at least half of scheduled activities. 5 FGDs were held with 36 participants to assess impact of intervention. Men reported receiving social support, feeling less socially isolated, and improved self-esteem as a result of the intervention. In addition, intervention activities were effective in disseminating HIV prevention information, condoms, and lubricant to MSM. |  |

## Transgender people

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| **Citation** | **Design & population** | **Outcome of interest** | **Country or region** | **Findings** | **Notes** |
| **Meta-analyses & reviews [3]** | | | | | |
| Poteat et al. 2015 | Review | HIV risk among transgender women SW | Global | *See study description in Section 9.2 above.* |  |
| Baral et al. 2013 | Systematic review & meta-analysis | HIV prevalence in transgender women | Global | Reviewed 39 studies (2000-2011) from 15 countries; all available studies were from male-predominant HIV epidemics in the Americas, Asia-Pacific, and Europe. Meta-analysis found pooled HIV prevalence of 19%, and higher in high-income compared to LMIC 22% vs. 18%). Transgender women had 49 times the odds of HIV infection compared to adults 15-49 in the 15 countries examined. |  |
| Operario et al. 2008 | Systematic review & meta-analysis | Sex work & HIV status among transgender women | Global | *See study description in Section 9.2 above.* |  |
| **Studies [4]** | | | | | |
| Duvall et al. 2015 | Key-informant interviews & policy review | Access to HIV services | Burkina Faso & Togo | *See study description in Section 9.2 above.* |  |
| Socias et al. 2014 | Cross-sectional,  452 transgender women | Healthcare avoidance | Argentina (nation-wide) | 40.7% of study participants reported avoiding seeking healthcare because of their transgender identity, and were significantly more likely to do so if they had been exposed to police violence (aOR 2.2, 95% CI = 1.26-3.83) and had experienced discrimination by healthcare workers (aOR = 3.36, 95% CI = 1.25-.5.70). |  |

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| Chakrapani et al. 2011 | Key-informant interviews (4) & FGDs (6),  HIV+ *kothis* and *aravanis* | Barriers to ART access | India | 3 FGDs were conducted with *kothis* (MSM whose gender expression is feminine) and 3 FGDs with *aravanis* (transgender women, also known as *hijra*), as well as 4 key-informant interviews with leaders of agencies that work with these populations. Barriers to ART access were individual-level, social/family-level, and at level of healthcare system. Many kothis and aravanis kept their same-sex attraction and HIV-status secret from families and social networks, fearing serious adverse consequences (such as rejection by family, eviction from home, social isolation, and loss of income) due to prejudice against MSM. Maltreatment and stigma were also feared within healthcare settings. | See also Chakrapani et al. 2009 |
| Nemoto et al. 2011 | Cross-sectional,  573 transgender women / FSW | Violence & social support | United States (San Francisco) | Interviews were carried out using a structured questionnaire with transgender women with a history of sex work. More than half of participants (51%) were scored as depressed, one third (34%) had attempted suicide, half (50%) reported being physically assaulted, and more than a third (38%) reported being raped or sexually assaulted before the age of 18. |  |

## People who inject drugs (PWID)

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| **Citation** | **Design & population** | **Outcome of interest** | **Country or region** | **Findings** | **Notes** |
| **Meta-analyses & reviews [6]** | | | | | |
| Hyshka et al. 2012 | Review | NEP use &  HIV incidence among PWID in Vancouver | Vancouver | Analysis of 15 years of data about NEPs in Vancouver, Canada. Earlier research had shown an HIV outbreak in the mid-1990s in spite of a high-volume NEP, and also that frequent NEP attendees were more likely to be HIV+ than less frequent attendees. This review finds that frequent NEP attendees in Vancouver have higher-risk profiles, that NEP attendance is not casually associated with HIV incidence, and that various factors including high prevalence of cocaine injecting contributed to “failure of the NEP to prevent the outbreak” |  |
| El-Bassel et al. 2011 | Review | IPV & HIV risk for drug-involved women | Global | IPV and HIV risk disproportionately affect drug-involved women, and a bi-directional relationship between IPV and HIV risk among drug-involved women is observed, which may be mediated by a history of childhood sexual abuse and post-traumatic stress disorder. |  |
| Degenhardt et al. 2010 | Review & modeling study | HIV incidence | Global | Modeled synergistic impact of combination approaches to HIV prevention for PWID (opioid substitution treatment, NSP, and ART). |  |
| Mathers et al. 2010 | Systematic review | HIV prevention, treatment, and care services | Global | Reviewed studies from 2004-2009 and estimated service availability to PWID. NSPs available in 82 countries, varying from >202 needle-syringes/PWID/year (Australasia) to 0.1 (sub-Saharan Africa). OST available in 70 countries. Percent of HIV+ PWIDs receiving ART varied from <1% to 100%. |  |
| Strathdee et al. 2010 | Review & modeling study | HIV incidence | Global | Systematically reviewed 25 reports of determinants of HIV infection in PWID (2000-2009), then modeled changes in risk environments in regions with “severe” IDU-driven HIV epidemics. Modeling produced estimates of HIV infections that could be averted through increased coverage of opioid substitution, NSP, and ART. |  |

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| Mathers et al. 2008 | Systematic review | HIV prevalence & injecting drug use | Global | Reviewed all available studies of injecting drug use and HIV prevalence among PWID. Injecting drug use was documented in 148 countries and territories and population prevalence of IDU varied from 0.02% to 5.21% with a value of 0.363% across all countries (or 15.9 million people in 148 countries). HIV prevalence among PWID varied from 0.01% to 72.1%, was 20-40% in 5 countries, and >40% in 9 countries. Globally, 3 million PWID were estimated to be HIV+, with the largest populations in eastern Europe, east and southeast Asia, and Latin America. |  |
| **Studies [8]** | | | | | |
| Adebajo et al. 2015 | ~32,000 MSM & male PWID | HCT uptake & new HIV diagnoses | Nigeria  (4 states) | *See study description in Section 9.3 above.* |  |
| Amirkhanian et al. 2015 | RCT,  626 MSM | HIV/STI incidence & sexual behavior | Russia & Hungary | Networks of MSM were recruited sociocentrically (through 18 “seeds”) in St. Petersburg, Russia and Budapest, Hungary. These 18 networks (mean n=35) were randomized to receive a social network intervention (network leaders trained to convey HIV prevention advice to network members) or standard HIV/STI testing & counseling. **Over 12-month follow-up, intervention arm showed less unprotected anal intercourse with non-main partner (p = 0.04), multiple partners (p.002), and overall (p = 0.04), compared to control. HIV/STI incidence was 9% vs. 15% in control** (p-value not given). |  |
| Dai et al. 2015 | 1345 MSM | HIV risk behaviors | China | *See study description in Section 9.3 above.* |  |
| Messersmith et al. 2015 | In-depth interviews with 30 PWID | HIV risk behaviors | Ghana (Kumasi) | In-depth interviews were conducted with 30 PWID (20 men and 10 women). Most reported sharing needles/syringes, and all said they shared needles/syringes with intimate partners. Most also reported sexual risk behaviors such as multiple partners and lack of condom use. Three women reported exchanging sex for money and 3 men reported buying sex in past year. |  |

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| Odinokova et al. 2014 | Cross-sectional,  896 FSW aged 15+ | Police sexual coercion against FSW | Russia  (Orenburg & St. Petersburg) | 896 FSWs aged 15+ were recruited via time-location and convenience sampling and administered a survey on violence during sex work and substance use. 69% reported past year binge alcohol use, and 48% reported IDU the day before. 64% reported ever being raped during sex work, and 38% reported police coercion in past 12 months. Police sexual coercion was significantly associated with current IDU (aOR = 2.09, 95% CI = 1.45-3.02), past year binge alcohol use (aOR = 1.46, 95% CI = 1.03-2.07), selling sex on the streets (aOR = 7.81, 95% CI 4.53-13.48), and rape during sex work (aOR = 2.04, 95% CI = 1.43-2.92). |  |
| Shannon et al. 2009 | Drug-using FSW | GBV | Vancouver, Canada | *See study description in Section 9.2 above.* |  |
| Shannon et al. 2007 | Drug-using FSW | HIV prevention & harm reduction | Vancouver, Canada | *See study description in Section 9.2 above.* |  |
| Strathdee et al. 2013 | Drug-injecting FSW | HIV risk behaviors | Mexico | *See study description in Section 9.2 above.* |  |

## Young key populations

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| **Citation** | **Design & population** | **Outcome of interest** | **Country or region** | **Findings** | **Notes** |
| **Meta-analyses & reviews [3]** | | | | | |
| Lall et al. 2015 | Review | HIV risk, ART and retention in care | Global | Reviewed 26 articles (1999-2014) which addressed young key populations and behaviorally infected youth and adolescents. All studies were from North America. None addressed young people who were sex workers, transgender, or prisoners. Adherence to ART of young key populations was found to be influenced by age; healthcare access; vulnerabilities such as social isolation, minority status, imprisonment, and housing instability; and depression and drug use. |  |
| Pettifor et al. 2015 | Review | HIV prevention, particularly PrEP | Global | Reviewed available data on HIV prevention interventions for young key populations, particularly PrEP. |  |
| Schunter et al. 2014 | Review | HIV interventions | Asia Pacific | Reviewed 37 articles which addressed HIV prevention interventions for young key populations in Asia Pacific (only 1 article was found which addressed treatment). In most studies, condom use among MSM, transgender, and SW/clients was low or inconsistent, and lack of use was associated with younger age, lower education, lower perceptions of risk, economic hardship, and for FSW sexual coercion, forced sex, and trafficking. |  |
| **Study [1]** | | | | | |
| Wilson et al. 2009 | Cross-sectional,  151 transgender female youth | HIV risk behaviors, sex work | United States (Chicago & Los Angeles) | Examined HIV risk behaviors and life experiences of transgender female youth aged 15-24 (snowball sampled). Most participants were ethnic minorities (95% non-White), 52% had ever been in the correctional system, 67% had ever engaged in SW (35% in past 3 months), and 19% self-reported being HIV+ (23% among those who had ever engaged in sex work, 6% of those who never engaged in sex work). Sex work was associated in multivariate analysis with lower education status, homelessness, use of street drugs, and perceived social support (the last surprising association not addressed by the authors). |  |

1. http://idpc.net/alerts/2012/07/kenya-network-of-people-who-use-drugs-now-officially-established [↑](#footnote-ref-1)
2. http://www.talkingdrugs.org/launch-of-first-ever-tanzanian-network-of-people-who-use-drugs [↑](#footnote-ref-2)
3. http://www.inpud.net/ReACT\_Launch\_Tanzania\_June2014.pdf [↑](#footnote-ref-3)