The Lancet series on HIV and sex workers

**Facts about sex workers and the myths that help spread HIV**

**The Myth is...**

- Sex workers have higher burdens of HIV, although epidemics are reflective of, and impact on, surrounding adult populations.
- Sex work is not a real job.
- Criminalising sex work prevents HIV spread.
- Sex workers are all women.
- Transgender female sex workers face the same risk of HIV as male sex workers.
- Transgender female sex workers are the same risk of HIV as male sex workers.

**The Truth is...**

- The HIV burden reflects the situation among surrounding populations.
- Sex work is an occupation.
- Criminalising sex work hampers prevention.
- Sex workers may be male, non-transgender and from non-paying female partners.
- Transgender female sex workers have a lower risk of HIV compared to male sex workers.

**The Impact Being...**

- The myth is...  
  - Sex workers won’t use condoms.
- The impact being...  
  - Greater success in condom use among sex workers that are other affected populations.
- But the truth is...  
  - Policy harassment because transactions which jeopardise condom negotiation.

**HIV prevalence among sex workers worldwide**

- **WHO**

  - **Worldwide**
    - 9.2% (9.2%) (high risk)
    - 1.6% (1.6%) (low risk)

  - **Regional**
    - **Africa**
      - 3.0% (3.0%) (high risk)  
      - 1.1% (1.1%) (low risk)
    - **Asia**
      - 11.8% (11.8%) (high risk)  
      - 11.8% (11.8%) (low risk)
    - **Latin America**
      - 3.0% (3.0%) (high risk)  
      - 1.0% (1.0%) (low risk)
    - **Europe**
      - 3.2% (3.2%) (high risk)  
      - 1.7% (1.7%) (low risk)
    - **North America**
      - 1.7% (1.7%) (high risk)  
      - 1.7% (1.7%) (low risk)
    - **Oceania**
      - 0.6% (0.6%) (high risk)  
      - 0.6% (0.6%) (low risk)

**How much could HIV infections be averted?**

**HIV transmission**

- **Antiretroviral therapy**
  - 95% (95%) (high risk)  
  - 95% (95%) (low risk)

**Facts about sex workers and the myths that help spread HIV**

- Misconceptions about sex workers hinder effective HIV prevention programmes.
- Transgender female sex workers demonstrate about 2.5 times the risk of HIV compared to male sex workers.
- Male sex workers with state clients don’t identify as gay or bisexual and have female intimate partners.
- Men who have sex with men (MSM) are more likely to report sex work than any other group.

**Read the full series at www.thelancet.com/series/HIV-and-sex-workers**

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**Notes:**

- **Sexual identity in Brazil**
  - Entitling sex workers to labour rights.
  - One third of sex workers don’t identify as gay or bisexual and have male clients who don’t identify as gay.

- **HIV prevalence**
  - World: 9.2% (9.2%) (high risk)  
  - Africa: 3.0% (3.0%) (high risk)  
  - Asia: 11.8% (11.8%) (high risk)  
  - Latin America: 3.0% (3.0%) (high risk)  
  - Europe: 3.2% (3.2%) (high risk)  
  - North America: 1.7% (1.7%) (high risk)  
  - Oceania: 0.6% (0.6%) (high risk)

- **HIV transmission**
  - Antiretroviral therapy: 95% (95%) (high risk)  
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**The Lancet series on HIV and sex workers**

Sex workers have higher burdens of HIV, although epidemics are reflective of, and impact on, surrounding adult populations.
Bringing sex workers to the centre of the HIV response

The Series we publish today on HIV among sex workers is The Lancet’s third collaboration with Chris Beyrer (Johns Hopkins Bloomberg School of Public Health). Our common goal is to use a human-rights based approach to health to bring neglected key populations in the HIV epidemic to the centre of the AIDS response. Our first two Series concerned HIV among drug users (2010) and men who have sex with men (2012). We now turn our attention to HIV among sex workers. With heightened risks of HIV and other sexually transmitted infections, sex workers face substantial barriers in accessing prevention, treatment, and care services. Why? Because of stigma, discrimination, and criminalisation in the societies in which they live. These social, legal, and economic injustices contribute to their high risk of acquiring HIV. Often driven underground by fear, sex workers encounter or face the direct risk of violence and abuse daily. They remain underserved by the global HIV response. This Series aims to investigate the complex issues faced by sex workers worldwide (see Table for definitions of commonly used terms in this Series).

Despite seemingly intractable challenges, much can be done to support sex workers in their fight to protect themselves from the risk of HIV/AIDS. Several important messages resonate throughout the Series. First, in Africa. As our Series shows, countries with more than 50% of sex workers living with HIV are all in sub-Saharan Africa. 92% of all HIV/AIDS deaths attributed to sex work occur among African women. When we think of the challenges of HIV prevention and treatment among sex workers, African women must be our first concern. When thinking about the current rhetoric of “the end of AIDS”, the role of sex work can no longer be dismissed as marginal. Sex workers are central to African HIV epidemics. Their continued exclusion will undermine our goal of creating comprehensive and successful programmes to control HIV.

Second, is the undone work in research. It is unacceptable that none of the next generation of HIV prevention technologies and approaches (oral pre-exposure prophylaxis [PrEP], treatment as prevention, and vaginal microbicides) have been specifically evaluated among sex workers. 7 It is imperative to know what works, what sex workers want and will use, and how to scale up interventions. These gaps and deficiencies should be promptly addressed.

Third, diversity and gender. Sex workers are a culturally diverse group that include women, men, and transgender people. This Series reveals not only the commonalities (exposure to violence, sadly, is the most highly shared), but also unique risk factors that require specific priorities for each group. 8,9 For example, data suggest male sex workers and transgender women will need biomedical interventions (PrEP and rectal microbicides) 6 given the severity of HIV epidemics in men who have sex with men and the transmission dynamics between men.

Fourth, the impact of structural reform. Laws, policies, and practices can help or harm sex workers in their efforts to stay healthy while selling sex. Risk environments are crucially important for sex workers, since they constantly interact with police and the law. 6,9 Where sex work is legal, as in Amsterdam, the focus of policing is on reducing violence, protecting sex workers, and supporting effective HIV programming. 7 Such an enlightened response reduces sex workers’ vulnerability and risk to HIV, and should be followed elsewhere. This Series calls on governments to decriminalise

<table>
<thead>
<tr>
<th>Definition</th>
<th>Description</th>
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<tr>
<td><strong>Brothel</strong></td>
<td>Establishments specifically dedicated to sex work. Generally concentrated in certain urban districts due to zoning, discrimination, or circumstance. Frequently indoor environments where sex workers receive customers either as employees or on commission. Legal definitions of brothels vary.</td>
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<td><strong>Client</strong></td>
<td>Those who purchase sexual services.</td>
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<td><strong>Community empowerment</strong></td>
<td>Community empowerment is a process by which sex workers take collective ownership of programmes to achieve HIV outcomes and address social and structural barriers to their overall health and human rights. Community empowerment shifts power, responsibility, and control from those external to the community to the community itself.</td>
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<tr>
<td><strong>Third party</strong></td>
<td>Individuals who supervise, coordinate, or assist a sex worker’s labour for direct or indirect remuneration. May include brothel owners, managers, cooks, maids, receptionists, security, drivers, and webmasters. Sex workers can also be third parties if they supervise, coordinate, or support another sex worker’s work. Legal definitions of third parties vary.</td>
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<tr>
<td><strong>Decriminalisation of sex work</strong></td>
<td>The repeal of laws that criminalise certain acts, such that those acts are no longer crimes or subject to prosecution. Decriminalisation of sex work applies to laws that criminalise adult consensual sex and related activities, including laws criminalising sex work; buying, soliciting, or procuring; brothel-keeping and management of sex work; and vagrancy, loitering, and public nuisance that are also used to target sex workers or clients. For transgender sex workers, this includes decriminalisation of laws that prohibit cross-dressing or impersonation of another sex. For male sex workers, this refers to decriminalisation of laws that prohibit adult, same-sex consensual sex. Decriminalisation does not, however, repeal laws against trafficking, child sexual exploitation, or other forms of violence.</td>
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<tr>
<td><strong>Forced or mandatory rehabilitation for sex workers</strong></td>
<td>Forced rehabilitation occurs when a sex worker is confined and coerced into a programme ostensibly to stop selling sex. Mandatory rehabilitation is when a sex worker is mandated or required to undergo a programme aimed at exiting sex work, as a condition of receiving help (eg, access to health care or treatment), or to escape some form of sanction (eg, as an alternative sentence to prison).</td>
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Comment

There is no alternative if we wish to reduce the environment of risk faced by women, men, and transgender people worldwide.

Finally, the reality most people wish to ignore—that much of our challenge in addressing sex work and sex workers is the need to understand human sexual desires and needs, including our own. We might prefer to think that sex and money were unrelated, that sex was somehow immune from the transactions so common elsewhere in our lives. But why should this exception be so? And why should we condemn and criminalise the exchange of money for sex, especially if the severely adverse conditions we create for such exchange hurt women and men and often fatally so? The persistence and ubiquity of sex work suggests only that sex, and the human desire for sex, is a normal part of human societies. Sex work is part of the human story. Accepting and embracing sex work—supporting those engaged in sex work to protect their health and bodily integrity and autonomy—should be our humane, as well as our pragmatic, approach to the reality of our human lives. And to our common efforts to defeat AIDS.

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Dispelling myths about sex workers and HIV

Sex work might or might not be the oldest profession, but it has existed for millennia across all continents and cultures. Nevertheless, myths about sex work and sex workers persist (panel). These myths can denigrate, devalue, and marginalise sex workers. Some widely held and unsupported views hinder HIV responses, driving sex workers away from already scarce HIV prevention and treatment services. Here, we aim to dispel the most harmful of these myths with evidence-based literature.

The first myth is that all sex workers are women. Although most of the world’s sex workers are women, sex workers can be male or transgender people.1–3 As for women, a wide range of typologies and working environments for male sex workers exist, who can be homosexual, bisexual, or heterosexual. Transgender sex workers have heightened HIV risk and vulnerability, and often require different services from other sex workers.3,4 The second myth is that all sex workers are single. Many sex workers report intimate, stable, non-paying partnerships worldwide, and many are married.5 Women, men, and transgender people who sell sex do so for many reasons, including to support their intimate partners, children, and broader network of family and friends.

The third myth is that most sex workers do not want children and try to avoid pregnancy. In a study of street-based female sex workers in Moscow, Russia, more than 80% were mothers, of whom more than 95% reported selling sex to support their children.6 In Burkina Faso, Togo, and Swaziland, more than half of sex workers were reported to have at least one child.7 In Iringa, Tanzania, the status of being a mother was especially important to sex workers because they lacked the status of being a wife.8 A danger of the so-called low fertility myth is the denial of prevention of mother-to-child transmission services for HIV-positive pregnant sex workers—often on the grounds that unmarried or undeserving women should not receive them.

Fourth, all sex workers are imagined to be trafficked or coerced. Most sex workers are not trafficked. Human trafficking is specifically defined under international law. Many, but not all, Member States of the UN have ratified the convention.9 According to the Palermo Protocol,10 three conditions must exist for a person to be regarded as trafficked: act by a third party (ie, recruitment), means (ie, through force or deception), and purpose (ie, for forced labour). In the case of minors, only the first and third conditions need to be met. Most human trafficking is for labour exploitation.11 Of an estimated worldwide total of 21 million trafficked people, roughly 4·5 million (22%) are victims of forced sexual exploitation, compared with 68% for labour exploitation.12,13 The authors of a study in Cambodia reported that only 3·8% of sex workers were trafficked.14

The fifth myth is that sex workers do not and will not use condoms with clients. Sex—whether paid for or not—does not cause HIV infection. Penetrative sex is an HIV infection risk for sex workers and their clients when condoms are not used. However, in many settings, poor availability of condoms and water-based lubricants, police harassment and arrest of sex workers for carrying condoms, the use of condoms as evidence of sex work, and clients’ absence of knowledge about condoms and preference for sex without condoms are barriers to consistent condom use.15 When sex workers are taught how to use condoms and negotiate condom use with clients, they can consistently use them and experience significant reductions in HIV incidence. For example, 30 min, single-session behavioural interventions promoting condom use negotiation skills among female sex workers in Mexico successfully reduced HIV and sexually transmitted infection incidence by more than half.16,17

Sixth, sex work is illegal and therefore programmes cannot possibly be implemented. Sex work is legal or regulated in some regions; in others, it is criminalised. In some regions, the exchange of sex for money is legal, but surrounding activities, such as solicitation

Panel: Eight myths about sex workers and HIV

- All sex workers are women
- All sex workers are single
- Most sex workers do not want children and try to avoid pregnancy
- All sex workers are trafficked or coerced
- Sex workers do not and will not use condoms with clients
- Sex work is illegal and therefore programmes cannot possibly be implemented
- Sex work is not work
- Laws against selling sex, buying sex, or owning a brothel prevent trafficking and reduce sex work
in public, are illegal. In most jurisdictions where sex work is criminalised, sex workers are subject to penalty; in others (eg, Sweden), the client is. Illegality of sex work creates barriers to sex workers seeking HIV prevention and care due to fear of authorities and concerns about confidentiality.\textsuperscript{18} Services specifically designed for and with sex workers can overcome some of these concerns. Several successful interventions with strengthened community-led support and cohesive social environments are associated with sex workers’ willingness to engage in HIV prevention and care.\textsuperscript{19} Sex worker HIV prevention interventions can be successfully taken to scale, despite unfavourable laws and regulations.\textsuperscript{20,21}

The seventh myth is that sex work is not work. By definition, sex work requires consent. Sexual exploitation, sexual violence, and human trafficking include coercion, deceit, absence of consent, and loss of agency. Sex work is a contractual arrangement in which sexual services are negotiated through economic exchange. Under the International Labour Office’s new international labour standard,\textsuperscript{22} sex workers have the same entitlements as all other informal workers. In Brazil, sex workers can register their occupation and have the same rights as other workers (eg, pensions).

The final myth is that laws against selling sex, buying sex, or owning a brothel prevent trafficking and reduce sex work. No evidence suggests that criminalisation of sex work (such as Sweden’s approach that criminalises the buying of and profiting from sex, and the renting of housing to sex workers) reduces sex work. Rather, criminalisation of clients may be an important factor in displacing sex workers to less visible areas or venues.\textsuperscript{23-25} If criminalisation reduced sex work or its demand, an increase in sex work following their removal might be expected. However, the number of sex workers in New Zealand did not increase after decriminalisation of sex work in 2003.\textsuperscript{26}

Moreover, no evidence suggests that criminalisation of sex work reduces trafficking for sexual exploitation. The claim by some politicians that Sweden’s approach reduces trafficking is unsubstantiated.\textsuperscript{25} In fact, two evaluations reported that Sweden’s laws were a barrier to the prosecution of trafficking because clients who had previously assisted victims by alerting authorities now feared self-incrimination.\textsuperscript{23,27} Half of sex workers in a Swedish study said that getting help was more difficult after criminalisation.\textsuperscript{28} Antitrafficking advocates contend that criminalisation “drives the sex industry even more underground, which results in... significantly lower chances of identifying individuals who have been trafficked.”\textsuperscript{29}

An evidence-based approach to the literature calls for these myths to be dispelled, which is the first step towards a world where all sex workers—female, male, and transgender—can live without fear, harassment, arrest, stigma, and violence. In doing so, all sex workers could live with dignity and respect, and openly seek HIV prevention and treatment. Whether or not countries achieve an AIDS-free generation will depend to a large extent on their decision to embrace a rights-based approach to HIV prevention and treatment, which includes the recognition that sex workers’ rights are human rights.

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Trafficking, sex work, and HIV: efforts to resolve conflicts

Trafficking occurs in sex work as it does in other types of labour. However, the issue of trafficking in sex work has been singled out, its scale and potential for harm frequently mis-stated or exaggerated to bolster antiprostitution arguments, inflame public opinion, and justify repressive and counterproductive police action.\(^1\)\(^5\) Conflation of sex work with trafficking leads not only to difficulties with definition and harm to sex workers on the ground, but also to conflicts that undermine HIV prevention.

The UN definition of trafficking requires coercion and movement or harbouring of people for the aims of exploitation, and estimates of its prevalence vary widely.\(^1\) A useful operational definition of trafficking in sex work settings identifies two clear situations—either minors being exploited or adults being coerced against their will.\(^6\)\(^7\) Surveillance data from peer-based interventions using such criteria identified trafficking in only 4–10% of women entering sex work in Mysore and West Bengal, India.\(^6\)\(^7\) Nevertheless, there are many issues for those trafficked into child prostitution or coerced into sex work.\(^6\)\(^8\) Trafficking, in addition to being a gross violation of human rights, increases vulnerability to other forms of violence and HIV or sexually transmitted infection (STI) acquisition.\(^9\) The affected people, mostly women and girls, deserve appropriate interventions and services that are carefully designed to mitigate rather than exacerbate harm.\(^6\)\(^7\)\(^10\)

For most adult sex workers who choose their profession without coercion, the issue is quite different. In this case, it is the official response to trafficking, particularly police actions, which is most likely to increase vulnerability to violence or HIV acquisition.\(^4\) This represents the first level of conflict between HIV prevention and antitrafficking programmes (figure 1). Common 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. Such actions often fail to uphold human rights or improve the situation of sex workers who have been trafficked, and have not been critically assessed.\(^4\)\(^5\)

Solutions to the issue of trafficking and related violence in sex work have been described that seek to align antitrafficking efforts with HIV prevention.\(^6\)\(^7\) The self-regulatory board (SRB) developed by the Durbar Mahila Samanwya Committee (Sonagachi, India) and replicated by Ashodaya Samithi (Mysore, India) reports better antitrafficking and antiviolence results at every stage—identification, protection, case management, and follow-up—compared with the raid and rescue model.\(^6\)\(^7\) SRB approaches both build on and strengthen HIV and STI vulnerability, and linkage with HIV and STI services—rather than undermining them (figure 1).

The second level of conflict is higher and shows deep-seated contradictions in the attitudes and dealings of societies towards and with sex work.\(^1\) Intergovernmental and donor policies on sex work, HIV, and human trafficking often clash substantially, leading to situations in which activities in one area set back efforts in another. One example is forced large-scale brothel closures carried out as antitrafficking measures. In Goa, India, there was increased sex worker vulnerability after the destruction of Goa’s red-light district.\(^11\) In Cambodia, the Ministry of Interior’s antitrafficking policies undermined highly successful Ministry of Health interventions that had turned around a growing HIV epidemic.\(^12\)\(^13\) The conflicting national policies in this case were supported by US donor funds for both antitrafficking and HIV prevention activities.\(^12\)\(^13\)

There is less robust research on human trafficking in Africa—on issues related to either trafficking or

Figure 1: Antitrafficking models and HIV prevention targets: conflict or synergy?

STI=sexually transmitted infections.
antitrafficking responses—compared with Asia. Yet the facile and misleading conflation of sex work and trafficking, particularly around large sporting events in the African and international media, has been described.\(^1\) In addition, ideologically-driven as opposed to evidence-based donor policies that restrict funding in sex work settings could further undermine the generally weak response to HIV prevention in sex workers in Africa.\(^14,15\) Restrictive immigration laws coupled with punitive or exploitative law-enforcement practices increase migrant sex workers’ vulnerability.\(^15\)

Experience shows that it is feasible to address both HIV and human trafficking positively in sex work settings if prevention efforts are aligned with and committed to sex worker participation.\(^6,7\) This needs the dominant antitrafficking theory and methods to be rethought at local level, together with coherent policies among governments and donors that guide and support efforts in both HIV and human trafficking.

At programme level, the SRB experience—building on sex workers’ commitment to improve their living and working conditions—shows substantial advantages that can result from building an antitrafficking response on a strong community platform with developed peer networks. Identification of trafficking cases is vastly improved, as sex workers are best placed to identify underaged or coerced people in sex work areas. The Durbar Mahila Samanwaya Committee assists almost three times as many trafficked women and girls in West Bengal as all other agencies combined.\(^4\) Through careful case management, potential harm to those trafficked is minimised by the maintenance of confidentiality, removal from harm, careful placement, and follow-up. Importantly, SRBs show how real collaboration—with community, legal, health, police, and social services—can be operationalised and offers substantial advantages over conflict between agencies (figure 2).

In destination communities in which human trafficking, sex work, and HIV might overlap, interventions are clearly feasible and can be mutually enhancing. Other policies and programmes are needed to improve conditions and strengthen primary prevention in source communities and to improve post-intervention services for protection, health, social reintegration, and livelihoods.

At policy level, the clear imperative is to resolve conflicts and do no harm. The support and inclusion of sex worker communities as partners in human trafficking prevention fits well with HIV programme priorities and improves antitrafficking outcomes. The alignment of ministry and donor support for complementary responses at the local level—as is currently being attempted in Cambodia\(^16\)—is likewise crucial. The decriminalisation of sex work and its recognition as legitimate work would arguably set the stage for more comprehensive programmes to protect workers—whether migrant or local—support their human rights, and improve workplace safety.

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Responses to HIV in sexually exploited children or adolescents who sell sex

One of the crucial gaps in the current HIV response is that we are not reaching children and adolescents aged 10–17 years who sell sex, with life-saving prevention, treatment, protection, care, or support; by protection we refer to all child and social protection interventions that aim to protect rights and provide social and economic support. Under the Convention on the Rights of the Child (CRC)—the most widely ratified human rights treaty—and its Optional Protocol on the sale of children, child prostitution, and child pornography, adolescents younger than 18 years are protected from all forms of sexual exploitation and entitled to the right to health. Children are defined by the CRC as all persons aged younger than 18 years. Adolescents are defined by the UN as all persons aged 10–19 years. This Comment focuses on the HIV concerns of children and adolescents aged 10–17 years who are exploited in the sex industry through selling sex, and does not consider other forms of sexual exploitation. The term “sexually exploited children and adolescents aged 10–17 years who sell sex” describes the behaviour that renders this group at-risk of HIV and does not describe identity. Children younger than 18 years who sell sex, irrespective of the reason, are considered under international law to be sexually exploited children.

There are no accurate global estimates of the number of sexually exploited children and adolescents aged 10–17 years, nor of the subset of those who sell sex. However, many studies show that substantial percentages of sex workers in many countries began selling sex aged younger than 18 years. For example, in Ukraine, adolescent girls aged 10–19 years who sell sex comprise an estimated 20% of the female sex-worker population. Evidence also shows that this group is more vulnerable than older cohorts to health harms—including sexually transmitted infections, HIV, and violence. For example, in Ukraine in 2006, HIV prevalence among females aged 15–19 years selling sex exceeded 19%, compared to 1.4% in the general adult population. Also, in eight countries in eastern and southern Africa, median HIV prevalence among sex workers younger than 25 years is 11%. (figure).

Many factors specific to children and adolescents aged 10–17 years contribute to this vulnerability, including severe circumstances of initiation and involvement, such as physical force and lack of control over their situation and finances and an inability to negotiate condom use. Some studies show increased biological vulnerability to HIV in adolescent girls, which is linked to weaker mucosal immunity of the adolescent female genital tract. Other reasons are systemic—these include legal and policy barriers to access to sexual and reproductive health and rights (SRHR) and other services; frequent contact with uniformed services such as police; and lack of confidential and adolescent-friendly HIV services.

Health interventions that target sex workers aged 18 years and older generally do not address the specific needs of this group because of law and policy barriers. The interventions that do target the group often focus exclusively on the immediate removal of the child from the sex trade, rather than the provision of necessary SRHR and HIV treatment, prevention, and care.

Fear of police harassment or being sent to state institutions often prevents sexually exploited children and adolescents aged 10–17 years who sell sex from accessing services and support.
accessing HIV and other services. This prevention of access contributes to them being driven underground, becoming invisible, excluded, and more vulnerable.\(^1\)

Contradictory age-of-consent laws further muddy the waters—age of consent for marriage, consensual sex, and HIV testing and medical care can be different. Some countries allow children to consent to sex before adulthood but do not allow independent access to HIV testing before age 18 years.\(^1\)

Article 5 of the CRC acknowledges the evolving capacities of children. However, different approaches to their evolving capacities can result, for example, in 10–17 year olds being able to access contraceptives before the legal age of consent to sex. In this case health workers who provide such services are legally obliged to report underage sex to authorities.\(^1\)

We can move away from this inaccurate and false tension towards a new approach: one which recognises that all children and adolescents aged 10–17 years have a right to access information and rights-based health and other services which address their holistic needs. The CRC clearly articulates that children younger than 18 have a right to “the enjoyment of the highest attainable standard of health” (article 24) and that “the best interests of the child should guide all actions concerning them” (article 3)—the key underlying principle by which State Parties shall determine action for, with, and on behalf of children. The Committee on the CRC has further interpreted obligations of governments—that people younger than 18 years have a right to participate in decisions that affect them; be free from HIV and discrimination; and that children who are sexually exploited should be able to access comprehensive SRHR services.\(^1\)

In addition, the Convention restricts protective and judicial interventions against children and adolescents aged 10–17 years, through its due process and minimum intervention principles, which require that proceedings against children be used only where appropriate, as a measure of last resort, and that placements be undertaken for the shortest appropriate period of time and subject to periodic review (Article 37[b]–[d], Article 40).\(^1\) These provisions are critical, because at national level the continued existence of law-enforcement-based interventions for this group—such as involuntary rehabilitation and forced detention—clearly violate their rights and often further exposes them to health harms, including harassment, extortion, abuse, and rape.\(^1\)

Key programmatic HIV elements can make a difference for this group, namely safe and confidential access to all SRHR services and commodities, including services that are flexible, mobile, and involve peer outreach and education. These include: comprehensive sexual education; access to condoms, lubricant, contraception, and safe and confidential testing for sexually transmitted infections and HIV including testing through street and peer outreach; HIV treatment including prevention of vertical transmission and related care; treatment for opportunistic and co-infections; safe abortion and maternal care; post-rape and sexual violence medical services, such as postexposure prophylaxis; vaccinations for, eg, hepatitis and human papillomavirus; harm-reducing services for adolescents who inject drugs; and hormone replacement therapy for transgender adolescents. SRHR services can be interwoven with other voluntary services, including housing, education, job skills training, mental health services, reunification with families, legal services, and protection. Peer support is essential to allow children and adolescents aged 10–17 years to discuss their issues and create their own solutions. The evolving capacities of adolescents should be taken into account to determine the most appropriate interventions to support them. The needs of 10–13 year-olds, for example, might be quite different from those of 14–17 year-olds, many of whom could have been surviving outside a family setting for years, managing their day-to-day lives as de facto adults.

HIV and child protection communities can also join forces to draw attention to, and condemn, the abuses perpetrated by involuntary detention—in line with the clear recommendation of the Global Commission on HIV and the Law that such compulsory detention and rehabilitation centres should be shut down.\(^1\)

It is also important to focus the resources of the global community on addressing specific knowledge gaps: better strategic information so that programmes can be designed based on real estimates of the size of this group, with disaggregation by sex, age, geographical location, and their unique circumstances; and implementation science to show which approaches work best for this population, including those with overlapping vulnerabilities, such as those who also use drugs or are homosexual, bisexual, or transgender.
It is of course essential that evidence and rights-based efforts should be improved to protect children from all forms of sexual exploitation, including preventing them from ever getting involved in selling sex. It is crucial, however, that programmes and policies for sexually exploited children and adolescents aged 10–17 years who sell sex are not merely based on assumptions. Instead, policy makers, programmers, researchers, and youth organisations should work together to ensure that adolescents are involved at all levels of programme and policy design, implementation, and evaluation, so that the response is shaped by their realities, needs, and aspirations.

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15 Community consultations conducted by Youth LEAD, Youth Voices Count and HIV young leaders fund, 2013. UN IATT technical brief on young people who sell sex. 2014 (in press).
Sex workers who use drugs are particularly vulnerable to HIV and other bloodborne and sexually transmitted infections for several reasons. Sex workers who inject drugs can acquire HIV through unprotected sex or syringe sharing, with the latter conferring higher HIV transmission risk. Sex workers who are alcohol or drug dependent are more likely to engage in transactions while under the influence of substances and might earn less per transaction; when experiencing withdrawal symptoms they can feel more pressure to acquiesce to clients’ demands for unprotected sex, especially if offered more money or drugs. Sex workers’ intimate male partners and clients often engage in behaviours with high risk of HIV infection. In some cases, drug use is involuntary because pimps and managers coerce sex workers into drug use as a means of control. Sex workers who use drugs can be stigmatised in workplace venues where drug use is discouraged, displacing them to the street where control over condom and drug use is compromised and exposure to violence compounds HIV risks. Because sex work and drug use are illegal in most countries, sex workers who use drugs are more vulnerable to police harassment (eg, frequent arrest and syringe confiscation) or police misconduct (eg, bribes, extortion, blackmail, and physical and sexual abuse), which discourages them from seeking HIV prevention and treatment.

Injection drug use is associated with elevated HIV risks in sex workers. In 20 countries worldwide, HIV prevalence was higher in female injectors than male injectors. Across Europe, a linear relationship exists between HIV prevalence in female sex workers and increasing levels of injecting drug use. Of nine countries where HIV incidence increased by more than 25% between 2001 and 2011, six are in eastern Europe and central Asia, where injection drug use is the predominant risk factor. Similar to several countries in southeast Asia (eg, Vietnam and China), high proportions of sex workers inject drugs in eastern Europe and central Asia, but great heterogeneity exists between and within countries. In Russia, adult HIV prevalence is 0.8–1.4%, corresponding to 730,000–1,300,000 infections, and although most HIV cases are linked to injection drug use, sexual transmission is rising. History of drug injection is especially common in sex workers in Tolyatti, Irkutsk, Yekaterinburg, and St Petersburg in Russia, where 64% of female sex workers inject drugs.

Although numerous HIV prevention interventions for female sex workers exist, only has been empirically tested in those who inject drugs. In two Mexico–USA border cities, two brief 30 min interventions based on motivational interviewing successfully reduced the incidence of HIV and sexually transmitted infections by greater than 50% and sharing of injection equipment by greater than 95%. The study included 584 sex workers and follow-up was 1 year. Attractive features of this combination intervention were its brevity, harm reduction approach, use of promotoras (peer outreach workers), and involvement of local sex workers in the development of intervention components. The extent to which this approach is appropriate in other contexts, or could be combined with biomedical or structural interventions, has not been explored. For example, 67% of female sex workers in St Petersburg, Russia, report alcohol binging, which has been ignored in HIV prevention research.

Integrated intervention approaches are needed that are not narrowly focused on HIV prevention to the exclusion of other contextual factors that are important in the lives of sex workers who use drugs. These factors include the influence of intimate partners...
and children, ethno-cultural factors, mobility, history of violence, and sex workers’ personal attitudes towards sex work and substance use. For example, the needs of people who voluntarily began trading sex or using drugs differ greatly from those who were coerced. Sex workers with substance use histories have a high prevalence of physical and sexual abuse, which could compromise their use of HIV prevention interventions. Sex workers with dependent children might avoid drug treatment or HIV prevention and treatment for fear that their children could be apprehended. In Russia and other countries in eastern Europe and central Asia, high levels of police sexual abuse (subbotnik) and the requirement that drug users register for services are structural impediments that undermine engagement in HIV prevention and treatment. HIV prevention programmes for sex workers who use drugs should consider their unique needs for harm reduction and voluntary drug treatment. However, opioid substitution treatment is illegal in Russia and is almost universally unavailable across central Asia.

Although empowerment of sex workers has been pivotal to HIV prevention successes in many countries, such programmes have tended not to focus on sex workers who inject or use drugs, in part because they are even more marginalised. In view of the vulnerability of sex workers who are substance users and their unique needs, we contend that the principles of “nothing about us without us” should be accepted in the development, execution, interpretation, and dissemination of HIV research and prevention programming.

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We declare no competing interests.

Female sex workers (FSWs) bear a disproportionately large burden of HIV infection worldwide. Despite decades of research and programme activity, the epidemiology of HIV and the role that structural determinants have in mitigating or potentiating HIV epidemics and access to care for FSWs is poorly understood. We reviewed available published data for HIV prevalence and incidence, condom use, and structural determinants among this group. Only 87 (43%) of 204 unique studies reviewed explicitly examined structural determinants of HIV. Most studies were from Asia, with few from areas with a heavy burden of HIV such as sub-Saharan Africa, Russia, and eastern Europe. To further explore the potential effect of structural determinants on the course of epidemics, we used a deterministic transmission model to simulate potential HIV infections averted through structural changes in regions with concentrated and generalised epidemics, and high HIV prevalence among FSWs. This modelling suggested that elimination of sexual violence alone could avert 17% of HIV infections in Kenya (95% uncertainty interval [UI] 1–31) and 20% in Canada (95% UI 3–39) through its immediate and sustained effect on non-condom use) among FSWs and their clients in the next decade. In Kenya, scaling up of access to antiretroviral therapy among FSWs and their clients to meet WHO eligibility of a CD4 cell count of less than 500 cells per μL could avert 34% (95% UI 25–42) of infections and even modest coverage of sex worker-led outreach could avert 20% (95% UI 8–36) of infections in the next decade. Decriminalisation of sex work would have the greatest effect on the course of HIV epidemics across all settings, averting 33–46% of HIV infections in the next decade. Multipronged structural and community-led interventions are crucial to increase access to prevention and treatment and to promote human rights for FSWs worldwide.

Search strategy and selection criteria

We searched PubMed, EMBASE, Science Citation Index, BIOSIS Previews, PsycINFO, CINAHL, Social Sciences Citation Index, Sociological Abstracts, and CAB Direct (CAB Abstracts & Global Health) for peer reviewed reports published in any language from Jan 1, 2008, to Dec 31, 2013, assessing determinants of HIV infection or incidence, or condom use among female sex workers. The search terms used were “Sex work” OR “sex worker” OR “prostitute” OR “prostitution” OR “commercial sex worker” OR “sex workers” for sex work, “risk factor” OR “risk factors” OR “risk correlate” OR “risk determinant” OR predictor* OR risk* for risk or protective correlates, “Condom use” OR “non-condom use” OR “condom non-use” OR “unprotected sex” OR “condom refusal” OR “condom negotiation” OR “condoms utilization” OR “condoms/ utilization” OR “condoms/ utilization” for condom use, HIV* OR “human immunodeficiency virus” OR “HIV infections” OR AIDS* OR “acquired immunodeficiency syndrome” OR “acquired immune deficiency syndrome” OR “HIV/AIDS” for HIV. SMG and PD did initial screening and eight reviewers (SMG, PD, PM, K Shannon, K Rusakova, S Reza-Paul, J Lau, J Deering, M Pickles, M-C Boily) extracted data from relevant reports.

Introduction

Worldwide, sex workers are disproportionately affected by the HIV pandemic.1 The authors of a review of HIV burden in female sex workers (FSWs) in 50 low-income and middle-income countries reported an overall HIV prevalence of 11.8% (95% CI 11.6–12.0), with a pooled odds of HIV infection of 13.5 (10.0–18.1) compared with the general population of women of reproductive age.2 In many high-income countries and regions, such as Canada, the USA, and Europe, epidemics that initially escalated in people who inject drugs in the mid-1990s shifted to FSWs.3,4 In settings such as Russia and central and eastern Europe, the scarce data available suggests emerging or established epidemics among FSWs who inject drugs.5,6 Heterogeneity in HIV prevalence among FSWs varies substantially both across and within regions due to social, political, economic, and cultural factors; yet an understanding of how structural factors (eg, contextual factors external to the individual) shape HIV acquisition and transmission risks has only just begun to emerge.7

Sex workers—those who exchange sex for money—can be female, male, or transgender. Although most sex workers are female and patronised by male clients (sex buyers), sizeable populations of male and transgender sex workers are present in many settings.8 9 The work environment and community organisation of sex work varies substantially, including formal sex work establishments (eg, massage parlours, brothels, or other in-call venues), entertainment establishments (eg, bars and nightclubs), informal or out-call venues (eg, hotels, lodges, and saunas), and outdoor settings (eg, streets, parks, and markets). Sex workers might solicit clients...
Key messages

- Sex workers face a disproportionately large burden of HIV across concentrated and generalised epidemic settings, with substantial heterogeneity in HIV epidemics and structural determinants, as well as features that are very context specific.
- Fewer than half of epidemiological studies on HIV acquisition and transmission risk among female sex workers explicitly considered structural determinants.
- Epidemiology of HIV and structural determinants among female sex workers is disproportionately drawn from Asia, with large gaps in heavy burden regions of sub-Saharan Africa, Russia, and eastern Europe.
- In Canada and Kenya, where sexual violence has an immediate and sustained effect on non-condom use, elimination of violence by clients, police, and strangers could avert 17–20% of HIV infections among female sex workers and their clients over the next decade.
- Coverage of and access to prevention and treatment among female sex workers lag behind the general population and scale-up to optimal coverage of condoms and HIV care independently, both on-street and off-street (eg, self-advertisement online, in newspapers, or by phone or text), or might work for a manager or pimp. In some cases, sex workers might additionally work cooperatively in microbrothels (two or more sex workers working together).

Research and programmes in the past decade suggest that behavioural 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. For example, efforts to roll out antiretroviral therapy (ART) or distribute condoms to FSWs in settings where criminalisation and stigma deter access to condoms or health services continue to hamper HIV prevention, treatment, and care efforts. Growing interest has arisen in structural determinants of HIV risk and ecological models that account for these risks among FSWs and other key affected populations (eg, people who inject drugs and men who have sex with men). Social epidemiology efforts in sex work have increasingly considered both structure and biology (and behaviour) within a structural determinants framework (figure 1) to better delineate the complex interplay and heterogeneity of HIV acquisition and transmission, and, more aptly, predict epidemic trajectories and intervention targets.

Despite efforts to consider structural HIV determinants in programmes, social science, and epidemiological literature, the extent to which empirical work characterises the epidemiology of structural factors and HIV among FSWs worldwide, alongside behavioural and biological factors, has yet to be considered. We did a comprehensive search for recent published reports on HIV and FSWs (Jan 1, 2008, to Dec 31, 2013), and assessed the extent to which this literature regarded structural determinants in the mitigation or potentiation of HIV acquisition and transmission risk (panel 1). To further consider key structural factors from our report and available context-specific epidemiological, qualitative, and iterative dynamic effects.

Figure 1: Structural HIV determinants framework for sex work
Adapted with permission from Shannon and colleagues. ART=antiretroviral therapy. PWID=people who inject drugs. MSM=men who have sex with men.
Panel 1: Systematic review and modelling: measurement of structural determinants of HIV

Systematic review and modelling
The role that structural determinants have in HIV epidemics and access to care for female sex workers (FSWs) is poorly understood. We aimed to review available published data for HIV prevalence and incidence, condom use, and structural determinants among this group through a systematic search of published sources. We extracted details regarding study information (year, setting, study dates, and participants); study design (sample size, geographical location, type of study [longitudinal or cross-sectional], and whether pathways were explored through interaction or stratified analyses); specific outcomes of interest (HIV infection, HIV or sexually transmitted disease infection, or condom use); individual behavioural or biological partner or dyad factors, or structural factors (risks or protective). We recorded whether or not each study had aimed, a priori, to measure and analyse structural determinants of HIV. We then modelled key structural drivers from the systematic review to assess the population-level effect of structural changes using deterministic transmission dynamic models to simulate the course of HIV epidemics and potential HIV infections averted in regions with concentrated and generalised epidemics, and high HIV prevalence among FSWs (Canada, Kenya, and India). Full details of the search and modelling are presented in the appendix.

Structural determinants
To identify structural determinants, we mapped present epidemiological reports on a structural determinants framework for HIV and sex work\(^1\) (figure 1, table), and drew on earlier work by Diez Roux and Aiello\(^2\), Blanchard and Aral\(^3\), Rhodes and colleagues\(^4\), Ozers\(^5\), Straathdee\(^6\), and others. Structural determinants (risk or protective factors) operate at macrostructural (eg, social, economic, and health-related policies governing sex work; mobility and migration of sex workers and their clients; geography and sociopolitical transitions; and stigma and cultural norms), community organisation (eg, community empowerment, sex work collectivisation, or leadership), and work environment (eg, physical, social, policy, and economic features, such as venue-based policies, violence, policing, and managerial practices) levels. These various structural determinants can act iteratively and dynamically with interpersonal (eg, partner or dyad factors, such as condom use, types of sexual exchanges, and sexual networks), individual behavioural (eg, drug use or duration in sex work), and biological (eg, sexually transmitted disease co-infection) factors to confer or mitigate HIV acquisition and transmission risk among FSWs.

Inclusion and exclusion criteria
We included studies that examine multivariate risk or mitigating factors for HIV infection (or HIV or sexually transmitted infections) or (male) condom use among FSWs. We excluded studies that focused solely on adolescent (<18 years), transgender, or male sex workers, or transactional sex (exchange of sex for non-monetary goods). We excluded qualitative studies, non-primary research (eg, reviews, modelling studies, and commentaries), studies in which HIV infection, HIV or sexually transmitted infection, or condom use were not analysed as individual outcomes, studies that did not report multivariate analyses of the outcome, and those that did not report stratified results among FSWs.

Epidemiological data gaps, biases, and contexts
Our systematic review of available epidemiological literature (appendix) does not account for the vast empirical and theoretical social science and grey literature on factors that mitigate or potentiate epidemics among FSWs. Structural determinants that have not been well operationalised, such as stigma, support the increasing need for dialogue between epidemiologists, social scientists, and the community to ensure the diversity of the sex industry and FSWs’ lived experiences are shown. Despite efforts to review non-English language reports in Russia, China, Kenya, and India, other countries are not represented here.

Both the available evidence and our modelling of key structural factors identified elucidate the heterogeneous nature of epidemics among FSWs, including the dynamic interplay of structural, behavioural, and biomedical factors that are context specific and modified by variations in epidemic structure (eg, concentrated or generalised; figures 1, 2). As such, scarce or unavailable data (including longitudinal, qualitative, and grey literature) on key structural determinants parameters (eg, policing exposures in Kenya and India) and their evolution over time hindered our ability to consider some key contextual elements in the modelling of epidemic trajectories, which led to a potential underestimation of their effect on HIV risk structuring among FSWs. Of particular importance is the concerning dearth of epidemiological, qualitative, and grey literature on structural determinants of HIV among FSWs in high-burden countries of sub-Saharan Africa, given that this region has a substantial portion of the epidemic among FSWs worldwide. In addition, most of the available data are drawn from cross-sectional studies. In our modelling analysis, we show many different influences of structural determinants through recurrent dynamic stages and we highlight the gaps in epidemiological data on non-linear, dynamic, and iterative HIV transmission pathways, and the need for more complex, multilevel, and mixed methods studies. For example, data for Vancouver show that to tackle only one form of violence is probably insufficient to curb HIV acquisition and transmission risk, supporting the need for combined structural HIV interventions to both support FSWs’ rights and ensure access to biomedical interventions for prevention, treatment, and care.
(Continued from previous page)

Of note, our findings might overestimate the effect of structural interventions because we provided estimates of HIV infections averted if the longer-term excess risk associated with non-condom use was wholly eliminated immediately after implementation. In reality, a reduction in structural determinants (eg, violence or police harassment) and an increased ability of FSWs to negotiate condom use, for example, might occur slowly. In some instances, community empowerment might lead to a transient period of increased violence by clients or regular partners,25,26 which would reduce short-term intervention effect. Access, not just coverage, remains crucial for prevention and treatment; however, our modelling of antiretroviral therapy coverage does not take into account potential structural barriers to access to treatment, such as stigma.

and grey literature, we then modelled potential aversion of HIV infections through structural changes in three cities with high HIV prevalence among FSWs: two low-income and middle-income countries—one concentrated (India) and one generalised (Kenya) epidemic—and one high-income city with overlap with an epidemic of injecting drug use (Canada). These models allowed us to assess heterogeneity of epidemics and key structural determinants, and the potential effect of single and combined interventions (eg, structural changes) in different epidemic contexts.

**Structural determinants of HIV**

**Systematic review**

To consider the centrality of structural determinants in HIV epidemics among FSWs, we mapped present epidemiological reports on a structural determinants framework for HIV and sex work (figure 1). Of the 3214 relevant publications retrieved, 149 (73%) of 204 unique studies reported at least one structural determinant (table, appendix), but only 87 (43%) were designed a priori to examine one or more structural determinants of HIV, HIV and sexually transmitted infection (STI), or condom use. Of these, 81 (93%) were from low-income and middle-income countries, with most from Asia (35 from India and 13 from China), followed by Latin America and the Caribbean (14 studies). Few reports originated from heavy or increasing HIV burden settings of sub-Saharan Africa, Russia, or eastern Europe. Most studies documented associations between structural factors and condom use, rather than HIV (or HIV and STI) infection.

**Macrostructural factors**

Macrostructural factors increasingly play a central part in HIV epidemic structures among FSWs and operate in iterative pathways with other structural determinants and behavioural and biological factors. An increasing number of reports show how punitive laws and policies governing sex work, including criminalisation of some or all aspects of sex work, incarceration, demolition of red-light districts (due to punitive policy changes) and legal restrictions on where sex workers operate, elevate HIV acquisition and transmission risks.23,24 Criminalisation and punitive policies on sex work have been shown to enact stigma,25,26 increase food and economic insecurity,25,26 and residential instability (due to evictions)29 among FSWs, and have been associated with inconsistent condom use. Where FSWs have constrained rights and access to resources due to their status as sex workers and women, gender-based violence26,30 and sex trafficking (forced sexual labour)29,31 have been consistently linked to increased odds of HIV infection and condom non-use. By contrast, gender empowerment29 and higher education and literacy29,32 continue to mitigate HIV risk among FSWs.

Migration and mobility have particularly complex and non-linear effects on HIV risk pathways among FSWs, both mitigating and conferring HIV risk. Internal domestic and circular migration and mobility (eg, intraurban or intradistrict mobility, and short-term travel to sex-work hotspots)26–30 have been associated with enhanced HIV vulnerability, whereas long durations of mobility and international migration from non-endemic settings have been linked to high rates of condom use52 and low HIV prevalences.37 The complexity of migration and HIV is characterised by other geographical features and epidemic structures (eg, immigration or emigration to higher-prevalence settings and rural vs urban migration) that might confer or mitigate HIV risk among FSWs.

**Community organisation**

The role of community organisation in the reduction of HIV risk through increased condom use and lower HIV prevalence among FSWs at the population level is increasingly important. The available data for sex worker organisation is largely restricted to India,32,38–41 where substantial resource investments have been made in community empowerment efforts among sex workers as part of broader HIV prevention efforts. Aside from a few reports from China,42 Kenya,43 and Latin America,44,45 gaps in data for community empowerment up to now can be attributed in large part to scarcity of resources to assess grassroots sex worker efforts and macrostructural constraints of criminalisation and stigma that restrict the ability of FSWs to organise. Community organisation has been considered both as a broad process or intervention of community empowerment, as exemplified by Songachi and Avahan models in India,32,38–41 or as a specific component of community organisation (eg, sex work drop-in spaces or social cohesion). For example,
## Table: Structural drivers: mitigating and potentiating of HIV risk among female sex workers, 2008–13

<table>
<thead>
<tr>
<th>Macrostructural</th>
<th>Association with HIV (or HIV and STI) infection</th>
<th>Association with non-condom use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laws and policies governing sex work (eg, red-light district demolition due to legal changes and enforcement of criminal sanctions)</td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>Regulation of sex workers (eg, mandatory government registration)</td>
<td>–</td>
<td>Negative</td>
</tr>
<tr>
<td>Stigma (eg, sex work-related stigma or discrimination)</td>
<td>–</td>
<td>Positive</td>
</tr>
<tr>
<td>Food insecurity (eg, childhood malnourishment)</td>
<td>–</td>
<td>Positive</td>
</tr>
<tr>
<td>Economic insecurity due to restrictive laws or policies for women or sex workers</td>
<td>–</td>
<td>Positive</td>
</tr>
<tr>
<td>Migration and mobility patterns (eg, internal mobility, sex work at religious festivals, international migration, or mobility for sex work)</td>
<td>Positive or negative</td>
<td>Positive or negative</td>
</tr>
<tr>
<td>Residential instability (eg, evictions due to policies on sex work or women)</td>
<td>–</td>
<td>Positive</td>
</tr>
<tr>
<td>Geographical district, region, or country of residence (eg, residence in a higher-prevalence district or rural vs urban)</td>
<td>Positive</td>
<td>Positive or negative</td>
</tr>
<tr>
<td>Sex trafficking (eg, forced sexual labour)</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Historical gender-based violence (physical or sexual)</td>
<td>–</td>
<td>Positive</td>
</tr>
<tr>
<td>Foster care history</td>
<td>Positive</td>
<td>–</td>
</tr>
<tr>
<td>Gender empowerment</td>
<td>–</td>
<td>Negative</td>
</tr>
<tr>
<td>Higher education and literacy level</td>
<td>Positive or negative</td>
<td>Negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Community organisation</th>
<th>Association with HIV (or HIV and STI) infection</th>
<th>Association with non-condom use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community mobilisation</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Sex work collectivisation (eg, collective agency, social cohesion and mutual aid among sex workers, and collective identity)</td>
<td>–</td>
<td>Negative</td>
</tr>
<tr>
<td>Peer leadership, education, or outreach (eg, frequency of contact with coworkers)</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Sex work drop-in spaces</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Sex worker advocacy or outreach to police and government (eg, collective action)</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Other forms of social or community participation (eg, participation in non-sex worker community organisations or social networks)</td>
<td>–</td>
<td>Negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Social features of work environment</th>
<th>Association with HIV (or HIV and STI) infection</th>
<th>Association with non-condom use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical and sexual violence (perpetrated by clients, police, managers, and pimps)</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Local policing practices (eg, displacement, harassment, fines, arrest, incarceration, raids, and confiscation of condoms)</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Presence of management (eg, manager, pimp, or administrator)</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Supportive management practices (eg, owner or management support for condom use and HIV and STI prevention, and manager protection)</td>
<td>–</td>
<td>Negative</td>
</tr>
<tr>
<td>Peer norms and support (eg, peer or coworker support for condom use and HIV and STI prevention, and condom use norms)</td>
<td>–</td>
<td>Negative</td>
</tr>
<tr>
<td>Drug and alcohol use in workplace (eg, forced alcohol use or drug or alcohol use during sex with clients)</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Access to and control over social resources (eg, forms of government identification)</td>
<td>–</td>
<td>Negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical features of work environment</th>
<th>Association with HIV (or HIV and STI) infection</th>
<th>Association with non-condom use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex work venues</td>
<td>Positive or negative</td>
<td>Positive or negative</td>
</tr>
<tr>
<td>Access to or coverage of condoms (eg, free or subsidised condoms, condom availability and affordability, and community-level increase in harm reduction supplies)</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Access to or coverage of HIV care continuum (eg, HIV testing and treatment, and access to HIV-related care and interventions)</td>
<td>Positive or negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Access to or coverage of sexual and reproductive health care (eg, STI testing and treatment, and contraceptive use)</td>
<td>Positive or negative</td>
<td>Positive or negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Policy features of work environment</th>
<th>Association with HIV (or HIV and STI) infection</th>
<th>Association with non-condom use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venue-based policies (eg, 100% condom use, other venue condom use rules or policies, and supportive sexual health policies)</td>
<td>Negative</td>
<td>Negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Economic features of work environment</th>
<th>Association with HIV (or HIV and STI) infection</th>
<th>Association with non-condom use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty-related and economic pressures (including poor living conditions and homelessness), economic drivers of sex work (eg, children and debt)</td>
<td>Positive</td>
<td>Positive or negative</td>
</tr>
<tr>
<td>Economic incentive and client demand for non-condom use</td>
<td>Positive</td>
<td>Positive</td>
</tr>
<tr>
<td>Delay or refusal of payment for sex, or property stolen</td>
<td>–</td>
<td>Positive</td>
</tr>
<tr>
<td>Bribes or fines (by police or managers, eg, police accepted bribes or gifts, or sex workers had sex with police to avoid arrest)</td>
<td>–</td>
<td>Positive</td>
</tr>
<tr>
<td>Higher income, prices charged for services, and control over prices charged</td>
<td>Negative</td>
<td>Positive or negative</td>
</tr>
<tr>
<td>Other income sources and financial support</td>
<td>Negative</td>
<td>Negative</td>
</tr>
<tr>
<td>Under contract</td>
<td>–</td>
<td>Negative</td>
</tr>
</tbody>
</table>

The appendix lists all published studies retrieved (2008–13) in the report and references for this table. STI=sexually transmitted infection. –•=variable was not measured in any of the available published data.
substantial increases in condom use (and decreased STI prevalence) were noted after the Ashodaya sex work collective intervention in Mysore, India, which combined community mobilisation, sex worker-led outreach, sex worker advocacy to police and local government, and improved sexual health services tailored to sex workers.37

**Work environment**

The work environment consists of intersecting social, physical, policy, and economic features of places within which FSWs work (eg, venues, streets and public spaces, online, and other off-street self-advertising spaces).

The social features of work environments assessed in more than 100 publications are measured as both downstream products of and interactions with macrostructural factors (eg, laws and policies). Within criminalised environments, physical and sexual violence in the workplace, whether by clients, police, managers, pimps, or predators posing as clients, are among the most ubiquitous and influential determinants of HIV acquisition and transmission risk among FSWs, linked to inconsistent condom use, client condom refusal, condom use failure and breakage,22,24,26,28,33,43,46,48–57 and HIV infection.3,13,18–22 In addition to police abuse as a human rights violation, law enforcement strategies and local policing of sex work, including arrests and incarceration,26,38,41,45–55 raids,64 displacement,24 and confiscation of condoms or syringes,64,66 are key barriers to HIV prevention efforts among FSWs worldwide, which reduces or eliminates the ability to negotiate male condom use,34,51,61,64,66 and increases HIV prevalence and incidence.18,65,66

Physical features of the work environment (eg, venue characteristics or typology) are very context-specific and heterogeneous in structuring of HIV risk patterning in FSWs.24,26,47,55,57,63,67–75 Few investigators have examined the nuanced and intersecting influence of policy, social, and physical features of the work environment in the mitigation or conferment of HIV risk among FSWs. The authors of these studies examined how supportive venue-based policies30,32,76–81 or managerial practices (eg, client sign-in, safety mechanisms, or removal of violent clients)30,32,34,41,66 and physical features (eg, types or layout of venues) of sex work establishments are associated with increased condom use, often through synergistic effects with other social features of increased peer or sex worker support.13,34,35,41,51,53,76,81–85

Work environments for FSWs are shaped by economic features (eg, economic pressures, client financial incentives for non-condom use, refusal of payment, and bribes or fines by state agents [eg, police] to avoid arrest) resulting from macrostructural forces of poverty, laws, and access to resources and are associated with non-condom use and condom failure and breakage,22,24,26,46,67,87,93 and HIV infection among FSWs.24,51,63,70,74 Conversely, higher income and absence of economic dependence among FSWs mitigate HIV risks, including increased condom use65,66 and lower HIV prevalence.42,72,73,83,84

Suboptimum access to safe and appropriate condoms, sexual health care, HIV testing, and ART remain major shortfalls in the fight against the worldwide HIV epidemic among FSWs. Where FSWs report adequate access to condoms, sexual health care (eg, STI testing and contraceptives) and HIV care (eg, HIV testing, ART, and sex worker-tailored clinics), increases are noted in condom use and reduced condom breakage,24,48,64,44–46,67,79,83,84,93,95–99 and lower HIV prevalence.10,30,31 Condom coverage must include condom access (eg, free or subsidised condoms at the workplace, the ability to carry condoms while working, and contact with peer condom distribution), availability and affordability, linked to reduced HIV acquisition and transmission among FSWs.25,30,39,45,66,70,73,83,84,93,95,97–99,102–107

**Modelling HIV epidemics in female sex work**

We assessed the population-level effect of some of the structural drivers with deterministic transmission dynamic models to simulate the course of HIV epidemics and potential HIV infections averted through structural changes in regions with concentrated and generalised epidemics and high HIV prevalence among FSWs (appendix). Guided by our systematic review and context-specific epidemiological, qualitative, and grey literature, our modelling considers exposures to context-specific structural factors, which reflects the heterogeneity of epidemic structures in female sex work across settings. Our modelling elucidates the associations between key macrostructural factors (eg, law or policy changes), community organisation (eg, sex worker collectives or sex worker-led outreach), and intersecting social, physical, and policy features of the work environment (eg, safe vs unsafe work environments, time-varying exposure to police harassment, physical and sexual violence, and scale-up of ART coverage). These factors are associated with different partner or dyad HIV risks (eg, condom use, client condom refusal, and number of clients) and individual behavioural (eg, duration of sex work or alcohol or injection use) and biological (eg, STI co-infection rates) factors in each setting (figure 2, appendix). Our modelling, which focuses on sexual transmission, also factors in HIV infection from unsafe syringe sharing (Canada) and increased sexual risks through binge alcohol use (Kenya).

We assumed that FSWs can be repeatedly exposed to violence and police harassment at rates that are specific to each setting and work environment, and that the structural factors confer or mitigate HIV risk through their potential effect on condom use in the short and long term. The model accounts for changes in coverage and ART eligibility criteria146 and the documented increases in condom use over time for each setting (appendix). We explored the potential effect of scaling up of ART coverage to meet the WHO guidelines of offering ART at a CD4 cell count of less than 500 cells per μL for FSWs alone and for both FSWs and their clients. We calibrated the models and analysed them within a Bayesian framework with available data to define plausible uniform ranges around model
parameters. We used many sets of fitting parameters to reproduce the reported HIV prevalence in each setting to predict the effect of single and combined structural changes on the course of HIV epidemics from 2014 to 2021, through both immediate and sustained effect on condom use.

**Diversity and context**

**Case 1: Vancouver, Canada**

Vancouver provides a key example of a concentrated, high-prevalence epidemic among key populations. As elsewhere in North America, the epidemic in Vancouver first emerged in men who have sex with men in the 1980s. By the mid-1990s, an explosive HIV outbreak occurred in people who inject drugs, with HIV incidence peaking at around 18 cases per 100 person-years in 1996 and 1997, declining to fewer than three per 100 person-years in 2007 because of substantially improved coverage of syringe distribution, other harm reduction, and ART. The epidemic among street FSWs emerged alongside the epidemic among people who inject drugs, partly due to overlap between drug-using FSWs, clients, and non-paying partners. Because HIV incidence due to syringe sharing declined substantially, a temporal shift has occurred from illicit drug injection-acquired to sexually transmitted HIV infections in people who inject drugs and FSWs in the past 10 years. Alongside the HIV epidemic and decline of HIV within people who inject drugs, STI epidemics have continued to escalate, suggesting that sexual risks precipitate HIV transmission in key populations. Data for non-injecting FSWs previous to 2010 are scarce. Nevertheless, modelling suggests that overall HIV prevalence in FSWs might have peaked at around 18% in 2000 and declined to 12% in 2011 (figure 3), and that HIV transmission after 2002 seems to be due predominantly to sexual transmission and, to a lesser extent, unsafe injection practices. Many infections have been averted with increased access to the HIV care continuum (eg, HIV testing and ART) through government-sponsored treatment as prevention efforts, although suboptimal access still remains among women and other subpopulations of indigenous and migrant FSWs (Deering et al, unpublished). Despite the criminalised nature of sex work in Canada, in-call venues have existed for a long time in the form of...

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**Figure 2: Model of dynamic pathways between macrostructural (eg, law reforms) and social, policy, and physical features of the work environment (eg, access to safer work venues, violence, and policing) on HIV acquisition in female sex workers in Vancouver, Canada**

The flowchart represents the dynamic and iterative pathways between various structural conditions (eg, recent or non-recent exposure to police harassment or client physical violence, or a lifetime exposure to sexual violence), which vary by work environment (represented by the coloured boxes). Female sex workers (FSWs, PWID or non-PWID) are assumed to work in a given work environment for their lifetime. FSWs on the far left have not experienced any violence yet. FSWs can be repeatedly exposed to different violence events at a frequency specific to their work environment, orange arrows show the flow of FSWs between recent and non-recent exposure to violence. RR > 1 shows the increase in the rate of exposure to recent police harassment if recently exposed to client physical violence or vice versa (bold arrows). RR, > 1 denotes the increased risk of inconsistent condom use after a recent or non-recent exposure to the given form of violence or police harassment for the duration that they have been in that situation. PWID = people who inject drugs. IRR = incident rate ratio. RRc = inconsistent condom use risk ratio. SW = sex worker.
Criminalisation, policing, and violence in Canada

Within a criminalised environment, workplace sexual violence is very prevalent and seems to have a sustained negative effect on condom use (figures 2, 3). 30% of FSWs have experienced police harassment or workplace violence in formal indoor establishments compared with 70% in informal indoor or outdoor venues.19 The elimination of future exposure to sexual violence might only have a small effect (2% [95% UI 1–4] in 10 years) in view of the sustained negative effects on condom use negotiation. However, if support and resources were in place to address both immediate and sustained effects of historical sexual violence among FSWs (eg, peer support, counselling, and housing) on non-condom use, the elimination of client sexual violence alone could avert 20% (95% UI 3–39) of HIV infections among FSWs and their clients over the next decade (figure 3).

As described by sex workers (panel 2), police harassment (without arrest) can directly influence HIV acquisition risk by forcing FSWs to rush transactions with their clients, forgo condoms, or engage in risky sexual practices, or by displacement of FSWs to isolated or hidden venues, where they have less ability to control transactions (eg, client selection, types of sexual acts, or condom use).20 Police harassment without arrest (eg, raids, forced detainment, or coercion) is very prevalent in Vancouver—62% of FSWs report ever experiencing police harassment in their lifetimes and 40% do so within the past 6 months. Recent exposure to police harassment is estimated to increase the rate of client violence by 1.0–5.2 times21 due to reduced ability to screen clients and displacement to more isolated and hidden venues, thereby increasing FSWs’ risk of HIV acquisition (figure 2). Policing of sex work has allowed the criminal laws targeting sex work has allowed the

Figure 3: HIV prevalence and percentage of infections potentially averted in FSWs and their clients in the next 10 years through structural changes in Vancouver, Canada

(A) Predicted HIV prevalence in FSWs between 1985 and 2040. Squares show the empirical estimates (and 95% CIs) from the data, bold line shows the median (shaded area shows 95% CI) of the model predictions from the multivariate parameter fits. (B) Predicted fractions of new HIV infections that could be averted in FSWs and their clients from structural changes in 2014–24; vertical bars show 95% uncertainty intervals. Elimination of physical violence in formal indoor establishments compared with 70% in informal indoor or outdoor venues, thereby increasing FSWs’ risk of HIV acquisition (figure 2). Police harassment and physical violence alone have an immediate and transient effect on the reduction of condom use after a recent exposure to the violence, whereas sexual violence seems to negatively affect condom use in the short and long term (figure 2). Because of the dynamic and iterative effects of violence and policing, the independent addressing of police harassment or physical violence alone would have a negligible effect. However, elimination of both police harassment and sexual and physical violence coupled with support to address long-term effects of violence could avert 24% (95% UI 8–45) of HIV infections among FSWs and their clients in Vancouver in the next decade (figure 3) through its direct and sustained effect on condom use.

In Canada, a Supreme Court decision to strike down criminal laws targeting sex work has allowed the
government to potentially decriminalise sex work by the end of 2014, providing a unique opportunity to model the potential effect of law reforms on the HIV epidemic. Our modelling suggests that nearly 39% (95% UI 16–63) of infections could be averted among FSWs and their clients in the next decade by decriminalisation of sex work (figure 3) through immediate and sustained effects on violence, police harassment, and safe work environments, and associated condom use. These predictions represent the maximum effect that interventions reducing violence or police harassment or legislation can have because the complete elimination of violence or stigma could be challenging.

Case 2: Mombasa, Kenya

Kenya has a generalised epidemic of HIV, with prevalence remaining about 6–7% since 2007.126 FSWs have the highest HIV burden in Kenya, with an explosive HIV epidemic emerging in the 1980s among FSWs, peaking at 80% in 1983.107 HIV incidence declined substantially after the scale-up of HIV prevention and treatment for FSWs in Nairobi from an estimated 18 cases per 100 person-years in 1985 to fewer than five cases per 100 person-years in 2005.127 Estimates suggest that 29·3–47·0% of all Kenyan FSWs are living with HIV.119,127,128 Continued high HIV burden among FSWs and absence of sustained coverage of HIV prevention and care services tailored to FSWs is largely attributed to a dearth of strategies to mitigate structural determinants of HIV (eg, stigma, discrimination, violence, and criminalisation).116

Mombasa is an economic centre of Kenya’s Coast Province, with important tourism, port, rail, and industrial enterprises serving as a client base, and a large FSW population (appendix). An estimated 6% of the female population in Mombasa engaged in sex work in 2005.127 Estimates suggest that 29·3–47·0% of all Kenyan FSWs are living with HIV.119,127,128 Continued high HIV burden among FSWs and absence of sustained coverage of HIV prevention and care services tailored to FSWs is largely attributed to a dearth of strategies to mitigate structural determinants of HIV (eg, stigma, discrimination, violence, and criminalisation).116

Panel 2: Female sex workers’ voices from Kenya, India, and Canada: structural determinants and HIV

Direct and indirect effects of policing

Kenya

- “It was June, they [the police] found me on the street, took all my condoms I had and destroyed them.”109
- “It happened last week. The City Council Police told me I was dirtying the town with condoms and took all my condoms”
- “Sex workers fear harassment and intimidation by police, so they do not carry condoms” (peer outreach worker)109

Canada (Vancouver)

- “You know, you get all these asshole cops and security kicking us off… pushing us into darker and darker areas, you know. That has got to stop… and down here… they’ll [the police] pick you up… and make you do something for them just so you can stay there to work. And that’s more or less their turf…”120
- “We still have to hide any condoms we have onsite in case the police find them”

Violence by clients, police, strangers, intimate partners, and third parties

India (Karnataka)

- “My good friend used to come to the [sex work drop-in centre]… her boyfriend drinks alcohol and she was murdered by [him and his friends]. They put stones in her mouth, but she was not dead. Then they put rope around her neck and petrol on her and burned her and she is dead.”121
- “He [a goonda (or hired thug)] put handcuffs on me and told me I had to go to the police station, but he took me to a remote place instead. 12 members had sex with me and snatched my money and purse. I have bite marks on my chest [lifts sari to show marks].”121

Canada (Vancouver)

- “The goal is the same [working on high track versus skid row]. So whether you get out of there alive, the violence doesn’t matter.”122
- “I hear about so many women who have been infected with HIV during a bad date or been raped or molested…and these people, they get away with it.”120

Kenya (Mombasa)

- “A client may have skin sores all over the body and you only notice when he undresses and because of fear [of HIV or sexually transmitted infections] you mention it, but instead he beats you up and forces himself on you.”123

Stigma and denial of health services and antiretroviral therapy

Kenya (Mombasa)

- “When I fell sick and went to a health centre and they realised that I was a sex worker, they did not treat me like a human being… I was told that he had no time for me. So I left without getting treatment.”
- “[They [sex workers] fear that if tested positive they will be mistreated.”12

Safer work environments (with supportive management and venue policies, and sex worker and peer support)

India (Karnataka)

- “I hear and see mistreatment of sex workers by clients but I will throw them [violent clients] out of the lodge. I call the police patrol too, the mobile jeep, and get the client [out of there].”121

Canada (Vancouver)

- “[When violence happens onsite]… the staff have come and they’ve told him to leave, or they even got the police to get him to leave. They do that right away. It took four cops to get this guy to leave. Then they barred him [from the venue].”121
- “All I have to do is yell, and every girl in my building will be there, right? The guy gets scared and leaves. 16 girls show up at your door, banging on your door. He’s gonna go, right? People are remembered there too, right?”122

Kenya (Mombasa)

- “We still have to hide any condoms we have onsite in case the police find them”
Figure 4: HIV prevalence and percentage of infections potentially averted in FSWs and their clients in the next 10 years through structural changes in Mombasa, Kenya

(A) Predicted HIV prevalence in FSWs between 1985 and 2040. Squares show the empirical estimates (and 95% CIs) from the data; bold line shows the median (shaded area shows 95% CI) of the model predictions from the multivariate parameter fits. (B) Predicted fractions of new HIV infections that could be averted in FSWs and their clients (and 95% CIs) from the data; bold line shows the median (shaded area shows 95% CI) of the model predictions from the multivariate parameter fits.

Increased condom use, HIV prevalence (and incidence) among Mombasa FSWs declined from roughly 50% (18 cases per 100 person-years) in the mid-1990s to less than 30% (fewer than five cases per 100 person-years) in 2010–15 (figure 4).\cite{44,129}

Since 2006, ART has been provided to individuals with HIV for free in Kenya. Despite high coverage in the general Kenyan population (estimated at 83% of ART-eligible people in 2011; ie, roughly 40% of all HIV-positive people),\cite{129} about 20–30% of all HIV-positive FSWs were reportedly receiving ART based on a CD4 cell count of less than 200 cells per μL.\cite{129} Once on ART, much the same rates of retention and virological suppression were reported among FSWs compared with the general population of women, highlighting existing gaps in HIV testing and access to and initiation of ART. As described by sex workers (panel 2), denial of health care access, including ART refusal, is a major structural barrier to HIV prevention and care among FSWs in Kenya, as elsewhere in East Africa, and is associated with heavy criminalisation, stigma, and violence.\cite{12}

Scale-up of ART access to meet WHO guidelines of a CD4 cell count of less than 500 cells per μL for FSWs would have substantial effect (appendix), with the largest gains on the epidemic seen in ART scale-up for both FSWs and their clients, averting 34% (95% UI 25–42) of HIV infections over the next decade (figure 4), although evidence suggests that removal of structural barriers, including law reform and stigma, remain crucial.\cite{121} In addition to the critical need for ART access for FSWs, the ART prevention capacity, particularly in generalised epidemics, of infection avoidance among FSWs by enhanced ART coverage for clients remains pivotal.

Criminalisation and client, police, and stranger sexual violence in Kenya

Sex work is criminalised by both national laws and municipal bylaws in Kenya, with sex worker arrests for loitering for the purpose of selling sex, importuning, and indecent exposure, rather than for clients. Kenyan sex workers describe similar experiences to Vancouver—of how criminalisation compromises HIV prevention by rushed transactions due to fear of arrest, bribes, extortion, sexual coercion, and the forgoing of condoms, and the deterrence of sex workers from reporting violence to authorities (panel 2).\cite{122}

Sexual violence against FSWs by police, clients, or strangers is endemic in Kenya, with estimates in Mombasa ranging from 29% to 32% in 2007.\cite{29} Sexual violence is precipitated by macrostructural determinants, including stigma, criminalisation, and gendered cultural norms (panel 2).\cite{129} Modelling suggests that elimination of sexual violence could avert 17% (95% UI 1–31) of HIV infections among FSWs and their clients over the next 10 years, coupled with support to address long-term effects of historical sexual violence, due to its immediate and sustained effect on non-condom use (figure 4, appendix).

Work environments in Kenya

Sex work in Mombasa is most common within entertainment establishments (72% in bars or nightclubs), followed by homes (21%) and the street (7%).\cite{44} Sparse data exists for features of the work environment, although binge alcohol use is widespread in bars and associated with a reduced ability among FSWs to negotiate client condom use and condom breakage, heightened sexual violence, and HIV infection.\cite{29} Substance use in the coastal province is common, with 33% of FSWs estimated to binge drink and most (80%)...
Peer and sex worker-led interventions in Kenya

Mapping estimates suggest that large gaps exist in condom access for FSWs, with an estimated 25% of bars with condom dispensers and 29% accessed by peer outreach. Sex worker-led outreach can promote consistent condom use directly through enhanced condom coverage in venues and indirectly through peer education around condom negotiation with clients and shifting sex industry norms on condom use. Sex worker-led interventions are a key component of community empowerment, as shown in several low-income and middle-income countries. In Mombasa, peer or sex worker-led outreach implemented between 2000 and 2005 was associated with a more than threefold increase in consistent condom use, although coverage was less than 30%. Human rights violations and harassment of outreach workers have been reported in Mombasa, which could deter scale up in the absence of structural change (panel 2). Scaling up of sex worker-led outreach to even modest coverage could prevent 20% (95% UI 8–36) of HIV infections in the next 10 years (figure 4). Combined structural changes to decriminalise sex work could avert 33% (95% UI 13–53) of HIV infections among FSWs and their clients over the next 10 years through a combined effect on sexual violence, safer work environments, and increased condom use (figure 4).

Case 3: Bellary, India

South India is experiencing a predominately heterosexual HIV epidemic among FSWs. Although national adult HIV prevalence is less than 1%, India has the largest burden of HIV after South Africa and Nigeria, with an estimated 2.5 million people living with HIV. In the past decade, India has seen substantial progress in the curbing of HIV prevalence among FSWs, although substantial heterogeneity exists. FSWs remain 54-times more likely to be infected with HIV over their lifetime compared with the general population of women of reproductive age.

In response to a growing HIV epidemic among FSWs in 2003 in Karnataka and other high-prevalence states, the Bill & Melinda Gates’s Avahan, Indian AIDS initiative rapidly scaled up HIV prevention efforts. By 2008, more than 75% of the estimated target population (217 000 FSWs) in the 69 Avahan districts across four southern states were being contacted monthly.

Karnataka (population ~54 million) ranks in the top four Indian states for HIV epidemic severity. Bellary, a high-prevalence district (overall HIV prevalence of 1.2% in 2011) in central Karnataka has a predominately urban epidemic (population of Bellary ~2 million), concentrated among FSWs and men who have sex with men. Work environments vary substantially between districts, with home or independent-based and street-based sex work, and to a lesser extent, brothel-based work, with an increased use of phone or text communications and mobility. As in Mombasa, industries (mining and chalking) in urban Bellary provide a large client base. Avahan was initiated in Bellary in 2004 and substantial progress has been made (a reduction in HIV prevalence from 15.7% in 2005 to 6.4% in 2011; figure 5).

Alongside Avahan, a slower rollout of ART across India began in 2004, with eligibility criteria shifting from a CD4 cell count of up to 250–350 cells per μL in 2012 to meet international guidelines. By 2012, 19% of the 2.3 million adults with HIV in India were estimated to be on ART, with much variability in coverage. However, because referral for semi-annual HIV screening among FSWs is a key component of India’s targeted intervention programme, HIV screening among FSWs is higher than it is for the overall population, although linkage to and retention of ART could be lower.

Criminalisation, violence, and policing in India

Although buying or selling of sex is not illegal in India, the Indian Immoral Traffic Prevention Act, enacted in 1956, criminalises most aspects of sex work, including solicitation and living off the avails by third parties. Violence is common, although in Karnataka, structural and sex worker-led interventions (policy level, police or stakeholder engagement, and training) have reduced violence against FSWs. Prevalence of recent client physical and sexual violence in Bellary reduced from 35% to 9% between 2006 and 2008. Elimination of sexual and physical violence could avert a further 5% (95% UI 2–14) of HIV infections among FSWs and their clients over the next 10 years through its immediate effect on condom use (figure 5). Fear of condom confiscation due to recent arrest or intimidation is common and associated with a transient increased risk of non-condom use. Based on the large-scale
Community empowerment in India

After the Sonagachi model in Kolkata,10 the Avahan intervention in Karnataka and other states included structural and community empowerment components to address both macrostructural (eg, stigma) and work environment (eg, violence) determinants of HIV. Ashodaya, the first of the Avahan interventions, is now regarded as best practice.11,12 Avahan assessments suggest that the combined multicomponent structural and community empowerment intervention could have averted 33–62% of all infections in FSWs and 39–66% of all infections in clients within 5 years in Bellary10 through membership in sex work collectives, access to STI clinics and peer-led outreach, 24 h crisis lines and drop-in centres, and sex worker advocacy efforts directed towards local government and police (table).11

Policy and prevention implications

In our report, fewer than half the recent epidemiological studies on HIV acquisition and transmission risk among FSWs explicitly considered structural determinants, yet the literature underscores the centrality of structural determinants for this component of the worldwide HIV epidemic. Because sub-Saharan Africa has a substantial portion of the HIV epidemic among FSWs, and Russia and eastern Europe have growing (and in some cases rapidly expanding) HIV epidemics among FSWs, gaps in data for individual and structural determinants of HIV in these regions is concerning.

Our findings show the challenges in the prevention of HIV infections through structural factors that interact in many dynamic pathways (figures 1, 2, and 4). Science needs to move beyond binary and linear models to more complex, multilevel, and multimethod approaches that consider theoretical and structural contributions to HIV risk—alongside interpersonal, behavioural, and biological contributions—among FSWs to inform HIV prevention. Dialogue across social science and epidemiological research is needed. Several macrostructural features, including stigma,13–16 mobility, and migration17–19 are difficult to measure and require complex and dynamic methods to better delineate their role in the conferring or potentiating of HIV risk.

In two settings with severe epidemics of sexual violence (Canada and Kenya), the reduction or elimination of sexual violence and its short-term and long-term negative results could substantially avert HIV infections in the next 10 years. In Mombasa, sexual violence by clients, police, and strangers affected a third of FSWs, suggesting a crucial need for structural changes at the macro level (eg, laws, policies, and stigma) and in the work environments they engender. Safe work environments need to be promoted, with supportive managerial practices and venue-based policies shown to reduce inconsistent condom use and HIV incidence.20,21 including harm reduction policies to reduce alcohol binge use within entertainment establishments.22

Figure 5: HIV prevalence and percentage of infections potentially averted in female sex workers (FSWs) and their clients in the next 10 years through structural changes in Bellary, India

Panel A: Predicted HIV prevalence in FSWs between 1985 and 2040. Squares show the empirical estimates (and 95% CIs) from the data; bold line shows the median (shaded area shows 95% CI) of the model predictions from the multivariate parameter fits. (B) Predicted fractions of new HIV infections that could be averted in FSWs and their clients from structural changes in 2014–24; vertical bars show 95% uncertainty intervals. Elimination of ICU means an immediate and lasting reduction of 100% due to sexual or physical violence and condom confiscation, with no future exposure to this form of violence. *Increase in CD4 eligibility according to WHO guidelines means no future exposure to this form of violence. Elimination of ICU means an immediate and lasting reduction of 100% due to sexual or physical violence and condom confiscation, with no future exposure to this form of violence. **Increase in CD4 eligibility according to WHO guidelines means no future exposure to this form of violence. Elimination of ICU means an immediate and lasting reduction of 100% due to sexual or physical violence and condom confiscation, with no future exposure to this form of violence.

ICU=inconsistent condom use. ART=antiretroviral therapy.
In Vancouver, which has piloted some innovative venue-based models of safe work environments with supportive management policies and practices, full access to safer work environments could avert up to 37% of HIV infections among FSWs and their clients (figure 3), although scale-up and coverage is probably only feasible alongside macropolicy support. Furthermore, researchers have shown that even in criminalised contexts, FSWs’ engagement of police and other stakeholders (eg, managers, business owners, or government officials) can change work environments by the reduction or elimination of stigma, violence, and police harassment, and increase engagement in care.

Across both concentrated (India and Canada) and generalised (Kenya) epidemics, decriminalisation of sex work could have the largest effect on the course of the HIV epidemics, averting 33–46% of HIV infections over the next decade. Calls for removal of all legal restrictions targeting sex work have been supported by international policy bodies, including WHO, UNAIDS, UNDP, and the UN Population Fund, and a recent unanimous decision by the Supreme Court of Canada. Ultimately, evidence must drive government responses in law and policy revisions to ensure the health and human rights of sex workers.

In India, where the effect of structural interventions and community empowerment efforts (eg, Avahan) on the HIV epidemic has been well documented, further sex worker collectivisation could avert 6% (95% UI 4–14) of new infections in FSWs and their clients within 10 years (figure 5). Although this gain is modest, 25–35% of HIV infections have already been averted through combined structural and community empowerment efforts over the course of Avahan. By contrast, in Kenya, where structural constraints (eg, criminalisation, stigma, and gender inequities) have restricted the ability of FSWs to organise, even modest coverage of sex worker-led outreach could avert 20% (95% UI 8–36) of HIV infections in the next decade (figure 4).

Our review and modelling underscore the need for multicomponent and multipronged HIV prevention efforts that promote structural changes to ensure improved access to HIV prevention, treatment, and care. Based on the well-established role of ART for prevention, modelling data suggest that scale-up of ART coverage to meet WHO guidelines of a CD4 cell count of less than 500 cells per μL can make substantial gains in the reduction of morbidity and mortality, and a population-level effect on acquisition and transmission for FSWs and their clients. The largest gains are to be had in generalised epidemic settings; in Mombasa, Kenya, ART coverage for both clients and FSWs could avert 34% of infections in the next decade (figure 4). The full effect of ART scale-up will probably only be possible alongside structural changes to address macrodeterminants, community organisation, and work environment factors that influence FSWs’ abilities to engage in the HIV continuum of care (eg, voluntary testing and linkage to and retention of care).

Similarly, we noted that condom access (not just coverage) is a key issue, including availability of free or subsidised condoms in the workplace, the ability to carry condoms, and access to sex worker outreach distribution. In Kenya, where condoms are available in less than a third of bars and lodges, sex worker-led outreach models are critical, alongside supportive venue-based policies on and practices in condom use.

Finally, because little research has assessed HIV epidemic responses and the potentially substantial role of addressing HIV among FSWs and their clients (and other key populations) in generalised HIV in sub-Saharan Africa, our findings support the role of structural responses to sex work in the alteration of the course of HIV epidemics.

Conclusion
Macrostructural changes are urgently needed to laws and policies (eg, decriminalisation of sex work) and the work environment features (eg, reductions to policing and violence and safer work environments) they engender in order to stem HIV epidemics among FSWs and their clients across diverse epidemic settings. Coverage and equitable access to condoms, ART, and HIV prevention, treatment, and care lag unacceptably behind that of the general population. To generate substantial change among FSWs, scale-up needs to coincide with structural changes, sex worker-led interventions, and engagement through community empowerment. Further data for the many dynamic feedback loops between macrostructural, community organisation-related, and intersecting physical, social, economic, and policy features of work environments within the sex industry are very context specific and necessary to inform policy and programmatic changes. Our findings confirm calls for multipronged structural and community-led interventions, alongside biomedical interventions, that substantially reduce HIV burden and promote human rights for sex workers worldwide.

Contributors
KS conceptualised the report, was lead author, and oversaw all stages. M-CB devised and oversaw the modelling process, and M-CB and MRP did the modelling analysis and wrote corresponding methods, results, and interpretations, with support from KD in the early stages. SMG, PD, SAS, and KS devised the review stages. SMG and PD carried out the review process with all co-authors and SMG drafted the review methods. SMG, PD, PM, SR-P, MR, JL, SAS, and KS extracted and categorised the data for the systematic review with a standard data extraction form. PM and SR-P provided local context input and grey literature to inform the modelling. All authors provided input on interpretation of results and report writing.

Declaration of interests
We declare no competing interests.

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HIV and sex workers 2

Combination HIV prevention for female sex workers: what is the evidence?

Linda-Gail Bekker, Leigh Johnson, Frances Cowan, Cheryl Overs, Donela Besada, Sharon Hillier, Willard Cates Jr

Sex work occurs in many forms and sex workers of all genders have been affected by HIV epidemics worldwide. The determinants of HIV risk associated with sex work occur at several levels, including individual biological and behavioural, dyadic and network, and community and social environmental levels. Evidence indicates that effective HIV prevention packages for sex workers should include combinations of biomedical, behavioural, and structural interventions tailored to local contexts, and be led and implemented by sex worker communities. A model simulation based on the South African heterosexual epidemic suggests that condom promotion and distribution programmes in South Africa have already reduced HIV incidence in sex workers and their clients by more than 70%. Under optimistic model assumptions, oral pre-exposure prophylaxis together with test and treat programmes could further reduce HIV incidence in South African sex workers and their clients by up to 40% over a 10-year period. Combining these biomedical approaches with a prevention package, including behavioural and structural components as part of a community-driven approach, will help to reduce HIV infection in sex workers in different settings worldwide.

Introduction

The HIV epidemic continues to have a profound effect on female, male, and transgender sex workers. The median worldwide estimates show that female sex workers (FSWs) are 13.5 (95% CI 10.0–18.1) times more likely to be living with HIV than other women. 15% of female HIV infections in 2011 were attributed to sex workers, with the highest attributable fraction in sub-Saharan African populations (17.8%). Substantial proportions of new infections (10–32%) occurred as a result of sex work in West African countries. In Uganda, Swaziland, and Zambia, 7–11% of new infections could be due to sex work, sex-worker clients, and clients’ regular partners. The UNAIDS 2015 goal of zero infections and discrimination will need effective HIV prevention strategies for those who sell or barter for sex in every region.

Sex work is diverse and occurs in various contexts around the world. Although some women sell sex through formal structures such as brothels or other venues, others might work independently and solicit clients directly in public places or via cell phone or internet. Tailoring of an effective, safe HIV prevention package for FSWs to account for the contexts in which they work and the particular risks they face is needed.

Here, we have focused on prevention interventions for FSWs and have defined sex work as exchange of sex for money or goods. Prevention options for men (Baral and colleagues) and transgender persons who sell sex (Poteat and colleagues) are reviewed in this Series. HIV prevention for women is a continuing challenge, and is an area where biology, physiology, gender dynamics, and behaviour have made HIV prevention research challenging, particularly in the subset of women who sell sex. We assessed interventions in three categories: biological, behavioural, and structural. Effective HIV prevention approaches for FSWs exist but have not been taken to scale or adequately resourced in most parts of the world. Additionally, we explored complementary strategies that can be added to a combination prevention package tailored for FSWs. An existing ecological model was modified to visualise multi-level domains of HIV risk for FSWs (figure 1). We present within these multi-level risks the evidence for biological, behavioural, and structural prevention interventions (table 1). In this model, we recommend that social justice principles are fully incorporated. The model assumptions, oral pre-exposure prophylaxis together with test and treat programmes could further reduce HIV incidence in South African sex workers and their clients by up to 40% over a 10-year period. Combining these biomedical approaches with a prevention package, including behavioural and structural components as part of a community-driven approach, will help to reduce HIV infection in sex workers in different settings worldwide.

Key messages

- Effective HIV prevention approaches for female sex workers exist but have not been taken to scale or adequately resourced in most parts of the world.
- Prevention interventions should integrate principles of social justice and meaningfully include sex workers in programme design and implementation.
- Existing and effective prevention interventions include condom promotion, sexually transmitted infection prevention and treatment, HIV counselling and testing, gender-based violence prevention, and economic and community empowerment.
- Stigma and criminalisation form barriers to such interventions and a less punitive more enabling legal and medical environment is required.
- Modelling suggests that condom promotion may have already reduced incidence in sex workers and their clients by up to 70% in South Africa. Additional biomedical interventions such as pre-exposure prophylaxis or treatment as prevention could further reduce this by 40%.
- Both topical and oral pre-exposure prophylaxis have been proven to reduce HIV incidence in high-risk men and women. However, its effectiveness in sex workers has yet to be determined.
- Earlier initiation of antiretroviral therapy, with the requisite access to services is likely to benefit the health of sex workers and reduce HIV incidence in their clients and others sexual partners.
- New biomedical technologies must be additive to, and not replacements for, more established prevention modalities. Interventions that combine behavioural, biological, and structural factors have the potential to have the greatest effect on the health of sex workers, their clients, and the wider population.
integrated into any package of combination approaches and that FSWs are meaningfully included in all aspects of programme design and implementation. \(^{33,34,35}\) The prevention strategies enable FSWs to exert more control over their ability to prevent HIV. In addition to reducing infections in FSWs, these strategies will positively affect networks, communities, and country epidemics in different social, economic, and legal contexts. \(^{35,36}\) We modelled the effect of one such combination prevention package within the setting of the South African epidemic.

**Search strategy and selection criteria**

The literature review focused on HIV prevention programmes and interventions, and in particular those that focused on the female sex worker (FSW) population. This review included observational studies, randomised controlled trials, and consensus papers or programme reports from organisations, when they were peer reviewed. We undertook a targeted web-based search of reported literature from select sites including WHO and the Joint UN Programme on HIV AIDS (UNAIDS) to retrieve information regarding new policy guidelines on FSWs and the latest evidence regarding HIV prevention. Data from systematic reviews of HIV prevention interventions both in the female population and general population were included as often data and programmes specifically addressing FSWs were scarce. The review was restricted to articles and documents published in English since 1990, with a particular emphasis on newer publications beginning in 2000. PubMed and Google Scholar were searched in addition to hand searching the bibliographies of selected peer-reviewed articles. Key words for the search criteria included “HIV prevention”, “Female SWs”, “IDU”, “PREP”, “peer support programmes”, “PEP” and “STI treatment”, “ART”, “community participation”, “condom use”, “biomedical HIV prevention”.

Abstracts of retrieved articles were read and if they were pertinent to the research question, full texts were then retrieved. Due to the dearth of information specifically related to HIV prevention in the FSW population, inclusion criteria were broad to ensure a comprehensive understanding of HIV interventions available, even if they had not necessarily been tested in the specific population in question. As the fields of HIV prevention interventions are rapidly changing, with studies underway, the review was updated several times. Of the 2350 papers identified in the search, 69 were included that gave a broad range of interventions that have an effect on HIV prevention, either in the FSW population or general population. Those that did not directly measure HIV prevalence or incidence reduction but were reported to have a reduction on other factors (eg, STI treatment) known to be linked to HIV reduction were also included.

**Historical perspectives**

FSWs were a key affected population in the early decades of the HIV epidemic. \(^{37,38}\) HIV research with sex workers contributed to improved knowledge about host immunity in settings of recurrent infections \(^{39}\) and vaginal mucosal integrity during the first microbicides trials. \(^{40,41}\) Nonoxynol-9, a contraceptive product viewed as safe, was reported to be unsafe in sex work due to frequency of use and subsequent mucosal erosion. \(^{42}\)

In Thailand, the 100% condom campaign was more than condom distribution; community mobilisation, education, condom availability, consistent and universal use of condoms, sexually transmitted infection (STI) tracing in clients, and follow-up in brothels. \(^{21}\) This programme and subsequent programmes in Cambodia and elsewhere in Asia, showed marked population-level effects of interventions focused on safer sex practices in sex venues, including increasing condom use in sex workers and clients and reductions in other STIs in STI clinic attendees. \(^{43}\) Although HIV incidence was not directly measured in these programmes, ecological data suggest that they had significant effects on the trajectories of the Thai and Cambodian HIV epidemics. \(^{21}\) The appropriateness and sustainability of top-down structural interventions that did not stimulate community empowerment have been restricted over time and critiqued by the sex-worker rights movement. However, efforts to integrate the positive policy elements of these models with sex-worker participation and leadership have been successful in other settings such as in the Collective Commitment (Compromiso Colectivo) intervention in the Dominican Republic. \(^{25}\) Community-based combination prevention programmes in southeast Asia, Africa, and South America confirm that HIV can be controlled both within FSW networks and associated communities. \(^{27,28}\)
The first oral pre-exposure prophylaxis (PrEP) trials in FSWs in Cambodia in 2004 and in Cameroon in 2005 were halted after participant disquiet about trial provisions. This led to a code of Good Participatory Practice Guidelines and a benchmark for community engagement in large prevention trials. Recent prevention efficacy trials have not specifically included or excluded FSWs and so the safety and effectiveness of these newer modalities for FSWs remains unproven.

Existing prevention strategies

Existing prevention strategies include behavioural and structural approaches, and sexual and reproductive health services, including condoms, counselling, testing, and supportive linkage to care for newly diagnosed FSWs. The most effective strategies have been within community-based programmes, which have intervened on the drivers of HIV transmission in FSWs including condomless sex, STIs, gender-based violence, unsafe working environments, and poor service usage due to stigma and discrimination.

Condom provision

Sex worker projects worldwide show the feasibility of increasing condom use to decrease STI and HIV acquisition. In Santo Domingo, Dominican Republic, condom use and rejection of condomless sex increased because of workshops and meetings with sex workers, sex establishment owners and managers, and other employees, to strengthen collective commitment to prevention, particularly in supporting sex workers to use condoms with partners. These gatherings also focused on issues of trust and intimacy in condom use negotiation between sex workers and regular paying and non-paying partners.

Interventions such as motivational interviewing have improved condom use and harm reduction in FSWs who also inject drugs.

Greater success in uptake and adoption of condoms has been reported in sex-worker programmes than any other affected population. The latest UNAIDS report states that countries’ reported condom use at last commercial sex was high and improving: 44 countries reported higher median condom use at last sex in 2012 than in 2009 (85% vs 78%). Cost and access to condoms, and condom carriage used as evidence of sex work by police in some settings are examples of structural barriers that can undermine an effective intervention. Provision of water-based lubricant with condoms is also recommended, although less is known about the importance of the type of lubricant. Although the evidence for the preventive effect of female condoms is scarce, some studies have shown higher acceptability of female condoms in FSWs than other women. Furthermore, improving access to and reducing cost of female condoms and lubricant could increase overall condom usage. Condomless sex can be more lucrative for a FSW, resulting in greater risk-taking for financial reasons. To counter this issue, the role of cash transfers for HIV prevention in sex work is also being investigated. Cash transfer could operate on at least two levels: conditional on safer sex practices as contingency management, or as a way to reduce economic vulnerability thereby encouraging behaviours with social benefits.

In the Zomba cash-transfer trial in Malawi, adolescent girls who received transfer money were less likely to have older sexual partners and had less frequent sex, resulting in lower rates of HIV infection. In the RESPECT study, beneficiaries were given rewards every 4 months for remaining free of curable STIs. After 1 year, the study recorded a 25% drop in the incidence of

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**Table 1: Possible HIV prevention interventions that are supported by direct or indirect evidence in FSWs and the risk level at which they operate**

<table>
<thead>
<tr>
<th>Risk level</th>
<th>Type of intervention</th>
<th>Evidence in FSWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 3, 4</td>
<td>Structural</td>
<td>Direct</td>
</tr>
<tr>
<td>3, 4</td>
<td>Structural</td>
<td>Direct</td>
</tr>
<tr>
<td>2, 3, 4</td>
<td>Structural</td>
<td>Direct</td>
</tr>
<tr>
<td>1, 2</td>
<td>Structural</td>
<td>Direct</td>
</tr>
<tr>
<td>1</td>
<td>Biomedical, behavioural, structural</td>
<td>Direct</td>
</tr>
<tr>
<td>1, 2, 4</td>
<td>Biomedical, behavioural</td>
<td>Direct</td>
</tr>
<tr>
<td>1, 2, 3</td>
<td>Biomedical, behavioural</td>
<td>Indirect</td>
</tr>
<tr>
<td>1, 2, 3</td>
<td>Biomedical, behavioural</td>
<td>Indirect</td>
</tr>
<tr>
<td>1, 2, 3, 5</td>
<td>Biomedical, behavioural</td>
<td>Direct</td>
</tr>
<tr>
<td>1, 2, 4</td>
<td>Biomedical, structural, behavioural</td>
<td>Direct</td>
</tr>
<tr>
<td>1, 2, 3</td>
<td>Behavioural</td>
<td>Direct</td>
</tr>
</tbody>
</table>

STIs. A pilot study is underway to explore cash transfers in male sex workers in Mexico.45

Control of STIs
Bacterial and viral STIs can increase the efficiency of HIV transmission. Screening and treating FSWs for STIs could reduce HIV infections, although efficacy has been difficult to demonstrate.6 STI treatment might consist of active case finding and individual case management or periodic mass STI treatment (periodic presumptive treatment) regardless of diagnosis. Some empirical, uncontrolled, intervention studies in sex workers and community-based randomised controlled trials in general populations have been undertaken.6–51 Only one community-based trial (the Mwanza Trial) done in East Africa showed efficacy of individualised syndromic management of STIs against sexual transmission of HIV with a reduction of 38% in HIV incidence.45,52 More than 12,500 individuals in the region were recruited to this trial and it was estimated that there were about 1200 sex workers or bar workers in Mwanza town at this time.52 Where the burden of STIs is high, periodic presumptive treatment of curable STIs has been effective at reducing STIs but not HIV incidence in FSWs.53,54 WHO advises only temporary use of periodic presumptive treatment53,54 and periodic presumptive treatment has a greater effect on STI control in places where other aspects of control are poor and where FSWs have little access to preventive and curative services. Screening for asymptomatic STIs in FSWs can reduce STIs,55 but in settings where resources are scarce this is often not feasible. Syndromic management to reduce STI infection in FSW networks is problematic as most STIs are asymptomatic. This situation might be changing, however, as point-of-care STI diagnostics become more available and affordable.56 Clinical trials have not confirmed that herpes simplex virus (HSV) suppressive treatment would reduce the risk of HIV acquisition in HSV2-infected, HIV-uninfected women. No protective effect of acyclovir was reported, although some benefit was seen in a subset of women who took at least 90% of their antiviral doses.56,57 These studies were undertook in general populations with no specific enrolment of sex workers58 and in women who worked in venues such as bars and cafes in Tanzania where 26–61% of enrolled women reported recent sex in exchange for money.57 Poor adherence to bi-daily pills probably contributed to results. Similarly, for individuals co-infected with HIV and HSV2, treatment with daily acyclovir to suppress HSV2 did not reduce the risk of transmission of HIV to their partners.58

HIV testing and counselling
HIV testing underlies the implementation of nearly all other prevention approaches and serostatus knowledge is needed to tailor services to individual needs. However, mandatory testing could be counter-productive and violates rights—FSWs should be able to access HIV testing and counselling with the same privacy and protection as anyone else. WHO recommends at least annual voluntary testing for sex workers. In a review of 52 low-income and middle-income countries in 2010, the median percentage of FSWs who had tested for HIV in the last 12 months and knew their test results was 49% with wide variation across countries.59 Rates of HIV testing in sex workers throughout Africa are suboptimal with only 4% of sex workers surveyed in Somalia in 2008 ever-tested.60 Similarly, in Zimbabwe in 2011, where HIV prevalence in sex workers is about 50%, half of HIV-positive FSWs were aware of their status, only 30–40% of those eligible were accessing antiretroviral therapy (ART) and fewer than a quarter of those HIV-negative reported testing in the previous 6 months.61 Indications are that testing coverage in FSWs has improved in the era of ART access.62–64 Barriers to testing in FSWs are similar to those of the general population: poor awareness of services, distance to facilities, transportation costs, opportunity costs, time constraints, and fear of a positive result with resultant discrimination and loss of income.65–68 However, additional barriers unique to FSWs include fear of authorities, linked to sex work illegality, and confidentiality concerns, particularly status disclosure to other FSWs or potential clients.69,70 Several successful interventions have increased HIV counselling and testing in sex workers.71–73 Strengthened peer support and a supportive network are associated with the willingness of FSWs to engage in testing, care, treatment initiation, and adherence.70,72,73 Even when FSWs have access to health facilities, prejudice and poor quality of care are crucial determinants of their willingness to be tested.70,72 There are studies regarding the importance of affordable, sex-worker-friendly clinics, and their ability to attract and retain FSWs.74,75

Gender-based violence interventions
Violence against sex workers is not only widespread, but is also perpetrated, legitimised, and accepted by many, including law enforcement authorities, gatekeepers, managers, clients, and intimate partners.76 It undermines HIV prevention efforts and increases the vulnerability of sex workers to HIV transmission in several ways. Rape, forceful acceptance of condomless sex, sex with police to avoid arrest, and violence related to illicit drugs all could result in FSWs giving higher priority to their safety and survival than less immediate concerns such as HIV prevention.77 Interventions include sex-worker education on rights, community mobilisation to respond to violence and discrimination, practical warning systems in sex-work networks, sensitisation workshops with police and law enforcement authorities, and advocacy at community and policy level to promote human rights of sex workers.78 Some innovations include the sex-worker education programme devised by the Sex Workers Education and Advocacy Taskforce (SWEAT) in South Africa and the venue-level interventions identified by sex workers in...
Community empowerment

Meaningful involvement of sex-worker communities in the design and implementation of prevention programmes is crucial. Community empowerment reduces the vulnerability of sex workers by peer-led collective action and self-help activities including education, health services, and advocacy on issues such as violence and work conditions.\textsuperscript{44,45} Interventions in programmes such as Empower Thailand include sustained engagement with local sex workers to raise awareness about sex-worker rights, the establishment of safe spaces, the formation of collectives that define the services to be provided, and outreach and advocacy.\textsuperscript{46} Community empowerment is associated with reduction in HIV and STI prevalence and increased condom use.\textsuperscript{47} Importantly, community empowerment is feasible to implement and take to scale, is highly acceptable to FSWs, and is safe.\textsuperscript{48} Participation of

<table>
<thead>
<tr>
<th>Study</th>
<th>Population (median age)</th>
<th>Total number (women and transgender women)</th>
<th>Design and intervention</th>
<th>Relative reduction in HIV incidence ITT</th>
<th>Incidence reduction in women and transgender women</th>
<th>Definition of sex work or any associated risk behaviours at baseline</th>
<th>Percentage reporting at baseline</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partners PrEP (Kenya and Uganda) (systemic PrEP)\textsuperscript{94}</td>
<td>Heterosexual men and women serodiscordant (36)</td>
<td>4747 (2283)</td>
<td>1:1 Oral TDF, TVD, placebo for negative partner</td>
<td>TDF 67% (95% CI 44–81), TVD 75% (55–87)</td>
<td>TDF 68% (29–85), TVD 62% (19–82)</td>
<td>Sex work and transactional sex not asked, any sex with outside partner in the previous month</td>
<td>&lt;10% at baseline</td>
<td>Sub-analysis done in high-risk women. In subgroups of women with placebo group HIV incidence &lt;5.0%, efficacy estimates 64–84%.\textsuperscript{95}</td>
</tr>
<tr>
<td>TDF2 (Botswana) (systemic PrEP)\textsuperscript{96}</td>
<td>Negative heterosexual men and women (25)</td>
<td>1200 (548)</td>
<td>1:1 Oral TVD, placebo</td>
<td>62% (22–83)</td>
<td>49.4% (21.7 to 80.8; p=0.107)</td>
<td>Sex work and transactional sex not asked, asked whether &gt;1 sexual partner in the last month</td>
<td>&lt;20% at baseline</td>
<td>No stratified analysis in specific risk groups</td>
</tr>
<tr>
<td>The Bangkok Tenofor Study (Thailand) (systemic PrEP)\textsuperscript{97}</td>
<td>Negative women (31)</td>
<td>2413 (489)</td>
<td>1:1 Oral TDF, placebo</td>
<td>49% (10–72)</td>
<td>78.6% (68–96.7; p=0.03)</td>
<td>Asked whether any casual or sex work partners in the past 3 months, &gt;1 partner in the last 3 months</td>
<td>Baseline 38% overall (men twice as much as women); &gt;20% overall</td>
<td>No specific data on sex work in participants for stratified analysis</td>
</tr>
<tr>
<td>FEM-PrEP (Kenya, South Africa, Tanzania) (systemic PrEP)\textsuperscript{98}</td>
<td>Negative women (24)</td>
<td>2120 (2120)</td>
<td>1:1 Oral TVD, placebo</td>
<td>No reduction</td>
<td>No reduction</td>
<td>Asked whether sex exchanged for money and gifts in the last 4 weeks</td>
<td>12.6% at baseline</td>
<td>No significant relationship between transactional sex and HIV incidence or good adherence</td>
</tr>
<tr>
<td>Global iPrEx (USA, Brazil, Peru, Ecuador, Thailand, South Africa) (systemic PrEP)\textsuperscript{99}</td>
<td>Men and transgender women (27)</td>
<td>2499 (5029)</td>
<td>1:1 Oral TDF, TVD, placebo</td>
<td>44% (15–63; p=0.005)</td>
<td>Not done</td>
<td>Asked whether any transactional sex in the last 6 months</td>
<td>41% at baseline</td>
<td>Qualitative work in those who reported sex work has been undertaken and will be reported</td>
</tr>
<tr>
<td>VOICE (MTN 003) (Uganda, Zimbabwe, South Africa) (systemic and topical PrEP)\textsuperscript{100}</td>
<td>Negative women (25)</td>
<td>5029 (5029)</td>
<td>1:1 Oral TDF, TVD, TDF gel, placebo</td>
<td>No reduction</td>
<td>No reduction</td>
<td>Asked whether money, material goods, gifts, drugs, or shelter were received in exchange for vaginal or anal sex in the last year</td>
<td>61% at baseline</td>
<td>304 out of 4980 participants responded yes to this question at baseline. No separate analyses undertaken as numbers in each study group considered too small</td>
</tr>
<tr>
<td>CAPRISA 004 (KwaZulu Natal, South Africa) (topical PrEP)\textsuperscript{101}</td>
<td>Negative women (24)</td>
<td>889 (889)</td>
<td>1:1 Vaginal TDF gel coitally dependent, placebo</td>
<td>39% (6–60)</td>
<td>39% (6–60)</td>
<td>Asked whether money ever received in exchange for sex</td>
<td>19% at baseline</td>
<td>Sample too small to do separate analysis</td>
</tr>
<tr>
<td>HPTN 052 (USA, Brazil, Botswana, Zimbabwe, Malawi, Kenya, South Africa, India, Thailand) (TasP)\textsuperscript{102}</td>
<td>Men and women serodiscordant couples (32)</td>
<td>3526 (1962)</td>
<td>1:1 Immediate vs delayed ART for positive partner</td>
<td>96% in linked sexual transmissions</td>
<td>Gender insignificant predictor of linked transmission</td>
<td>Transactional sex and sex work not asked, asked whether &gt;1 partner in the last 3 months</td>
<td>&lt;5% reported at baseline</td>
<td>11 out of 39 transmission events occurred outside of the enrolled dyad</td>
</tr>
</tbody>
</table>

In RCTs where sex work was not asked, alternative associated risk behaviours have been listed. PrEP=pre-exposure prophylaxis. TasP=treatment as prevention. ITT=intention to treat. TDF=tenofovir. TVD=emtricitabine and tenofovir (Truvada). ART=antiretroviral therapy.
FSWs—most famously illustrated by the Sonagachi Project in Northern Kolkata, India—has documented increased condom use and decreased HIV prevalence not only in FSWs but also in bridge populations.27–29 The Sonagachi Project invested substantial effort to define the problem of HIV prevention as a community issue and to align the short-term and long-term rewards for condom use as being in the economic best interests of all stakeholders and the sex workers.93 This programme and others show that sex-worker health outcomes can be enhanced when programmes encourage a sense of shared identity and camaraderie in sex workers, and address concerns beyond HIV and sexual health, including violence, stigma, and discrimination.27–29 Gender-responsive economic strengthening activities including vocational training, education, and micro-financing within empowerment programmes could also give FSWs control over vital economic resources, and reduce FSW vulnerability to HIV.29

Prevention taken to scale
HIV prevention interventions can be successfully taken to scale with potential to reduce HIV prevalence in FSWs. One such programme is the Avahan programme launched in 2003 by The Bill & Melinda Gates Foundation in six Indian states. The programme aimed to reduce HIV transmission and the prevalence of STIs in vulnerable high-risk populations, notably FSWs. It promoted prevention education and services such as condom promotion, STI management, behaviour change communication, community mobilisation, and advocacy.31 An important aspect of the Avahan programme has been its coverage, with an 80% target met within 5 years, resulting in demonstrable increases in condom uptake, and decreases in STIs and HIV.28 An example of scale-up from Africa is the Zimbabwean Sisters with a Voice programme, which is also community empowerment based, and is now present in 36 sites around the country, although studies on the effect of this programme are awaited.27 Effective scale-up needs commitment and sustained resources.

However, it is possible that along with sustained resources, strategies that address determinants in addition to those listed above could be needed for maximum prevention effect.57–70 After the 100% Thai Condom campaign, for example, HIV prevalence levelled at about 10% in FSWs, ten times higher than the prevalence in Thai women from the general population.75

New prevention strategies
Combining the previous more established approaches with new, partially effective biomedical modalities is a potential new approach. In the last 3 years biomedical interventions that use antiretroviral drugs as prevention have become important. Antiretroviral drugs can protect uninfected individuals from acquiring infection (PrEP and post-exposure prophylaxis [PEP]), and can reduce infectiousness of infected partners (secondary prevention or treatment as prevention [TasP]). Pre-exposure and post-exposure antiretroviral drugs can be provided either as oral (systemic) tablets or vaginal or rectal (topical) gels or rings known as microbicides.32 The application of antiretroviral drugs for HIV prevention to FSW populations remains to be proven.

**PrEP**
Seven randomised controlled trials have examined antiretroviral drugs given to HIV-negative persons for HIV prevention (table 2).97–101 In four clinical trials including women from diverse geographical and risk settings, PrEP reduced HIV acquisition by 39–75%.97–100 None specifically enrolled FSWs, however in three of the trials,97,102,103 most of the women were unmarried, up to a quarter had many partners, and between 1–9% and 12% reported transactional sex at baseline. No significant relationship between transactional sex and HIV incidence or good adherence rate was noted in the FEM-PrEP study (J Headley, FHI 360, personal communication). The only other study in which transactional sex was reported was the Global iPrEx Study104 that included men who have sex with men—although all participants had to be born male, 29 (1%) reported their present

| Partners PrEP97 (systemic PrEP) | 81% | 86% (TDF), 90% (TVD), in patients with detectable levels |
| TDF2100 (systemic PrEP) | 79% | 78% excluding follow-up when patients had no PrEP refills |
| FEM-PrEP99 (systemic PrEP) | 35–38% at a single visit, 26% at two consecutive visits | Too low to assess efficacy |
| Global iPrEx97 (systemic PrEP) | 51% | 92% (95% CI 40–95) (TVD) |
| The Bangkok Tenofovir Study98 (Thailand) (systemic PrEP) | 66% | 74% in participants with detectable drug levels |
| Voice103 (systemic and topical PrEP) | <30% of samples, about 50% of women had no detectable levels | Too low to assess efficacy |
| CAPRISA 004105 (topical PrEP) | >2000 mg/mL TDF in vaginal fluid protective | 54% in the high adherers, >80% of sex acts covered with gel use |

**Table 3:** Completed PrEP (oral and topical) studies and protection estimates relative to adherence.

PrEP=pre-exposure prophylaxis. TDF=tenofovir. TVD=emtricitabine and tenofovir (Truvada).
identity as female (table 2). Due to limited representation, no randomised controlled trials have specifically undertaken an efficacy sub-analysis in sex workers. Consequently, any application to sex work is based on extrapolation from a general female population, and product safety and the effect of the conditions associated with the nature of sex work (eg, frequency of sex and therefore the frequency of dosing of coitally dependent agents) on PrEP effectiveness is unknown.

A strong dose–response relationship between adherence to PrEP pill-taking or gel-use and HIV protection was shown (table 3). No HIV protection was reported in the two trials in which adherence to PrEP was lowest. By contrast, in the Partners PrEP (discordant couples) and iPrEx (MSM) studies, case-control analyses suggested that those using PrEP consistently had greater than 90% reduction in HIV risk. The Partners PrEP study undertook an analysis in higher risk subgroups within the Partners PrEP Study, including groups of higher risk women. High risk was defined by criteria including viral load of partner, unprotected sex, and younger age. In these subgroups, PrEP had consistently higher efficacy for HIV-1 protection.

The most recent clinical trial of systemic PrEP included drug users in Thailand and had 2413 participants (about 20% were female). Participants were asked to report whether they had sexual intercourse with people other than their live-in partner including casual or sex work. This behaviour was reported in 38% of the participants (fewer women than men) at baseline (table 2). The HIV incidence reduction of 49% for those on PrEP is important because FSWs who inject drugs are often the most vulnerable (and marginalised) subgroup of FSWs. HIV prevalence in women engaging in both injection drug use and sex work is higher than in the general FSW population.

Women had the best adherence in this study. Combination prevention packages, including harm reduction strategies and PrEP for FSWs who inject drugs, are promising.

In studies where adherence was greatest, the positive findings support the biological effectiveness of PrEP for preventing HIV acquisition, but the trials with negative results suggest that PrEP was an unacceptable or unfeasible mode of prevention for some women. The reasons for this are unknown but some of the reported adherence barriers might be relevant to FSWs, including absence of support from family and partners. Whereas the possible role of low-risk perception by women might seem less relevant to FSWs, it is well known that intimate partners could present an unanticipated risk to FSWs, with data to show that FSWs are less likely to use condoms consistently with intimate partners. Acceptability studies (of hypothetical prevention products) have been done in FSWs and have shown favourable outcomes, but have also raised some concerns from sex workers, including STI risk, privacy, and cost.

Topical vaginal gel applied during sexual intercourse in the CAPRISA 004 study was protective and levels of protection correlated with adherence. About 20 (1·9% of all trial participants) were self-reported sex workers in this study (table 2), too small a number for subgroup analyses. Coital application could suit women having intermittent sexual intercourse better than the more regular encounters that occur in sex work. Coital application might be an appealing dosing strategy for sex work, because the gel can also lubricate. The maximum frequency of application that would be safe in this setting is still unknown. Host biological factors could alter the activity of topical biomedical interventions; an analysis of HIV risk in women in CAPRISA 004 showed that despite adequate levels of vaginal tenofovir, women with higher systemic or mucosal immune activation, such as might occur with STIs, were more likely to become infected with HIV than women without evidence of activation. Studies in Kenyan sex workers have shown that resistance to HIV infection could be attributed to a balance of immune quiescence and a focused innate antiviral response.

Additionally, complex questions regarding adherence and dual-protection remain. Demonstration projects that can assess the real-world effect of PrEP in sex workers beyond clinical trial settings are needed. This might include addressing concerns surrounding uptake, such as cost and side-effects, adherence barriers such as detention and reluctance to carry pills that could be stigmatising, and combining PrEP usage with condoms or other behavioural measures. PrEP is probably an important addition to HIV prevention in transgendered women.
FSWs in which the HIV transmission probability per sexual transaction is very high. Although PrEP as a user-controlled method might provide personal protection against HIV, STIs, and unwanted pregnancy for FSWs, remain a risk, especially if there is no option for condoms. The implications for other STIs and unintended pregnancy due to condom migration should be guarded against with the ancillary provision of information and sexual and reproductive health services. PrEP could be a potent additional choice for some FSWs, but not all. The challenge is to find ways that FSWs can identify suitability for themselves. In all clinical trials, condom usage increased and STI diagnoses decreased during the study, suggesting that PrEP could work synergistically with other prevention modalities; however, public awareness of PrEP could lead to increased demand for condomless commercial sex. PrEP should be part of a combination prevention package that is voluntary and includes condom promotion. As PrEP is introduced in sex-worker populations, community engagement, further behavioural and social science research, and careful programme monitoring and assessment will be needed. 

Important research areas are listed in table 4.

WHO and Centers for Disease Control and Prevention (CDC) have offered early guidance and have called for demonstration projects including all key affected populations. A variety of open-label and demonstration projects in women are ongoing or imminent and a confirmatory vaginal gel study is underway at present. Zimbabwe has approved a PrEP demonstration project in FSWs, SAPPH-Ire, which commenced in 2014 and will be nested within the already well-established Sisters with a Voice Program (table 5).

**PEP**

PEP is most commonly used for needle-stick incidents and, increasingly, for sexual assault. Non-occupational PEP for sexual prevention has not been scaled up worldwide. Reasons for this include user reluctance (the need to access care within 72 h and continue treatment for 28 days, and the side-effects), and inadequate services (the need for testing and scarcity of PEP starter packs on demand). PEP is probably not scalable, practical, or sustainable as a sole intervention for sex workers, although it has a role in sexual assault and other episodes of unanticipated condomless sex. In a study from Kenya, PEP was well accepted by urban FSWs with greater than 10% requesting PEP at least once during the year after its introduction. However, PEP use was not associated with reduced HIV acquisition in this study.

**Earlier treatment**

Earlier treatment of HIV-negative FSWs can improve clinical outcomes and reduce transmission of HIV to their HIV-negative sexual partners, including clients. HPTN 052, a randomised controlled trial in serodiscordant couples, showed a 96% reduction in HIV transmission from HIV-positive individuals, treated earlier and virally suppressed, when compared with those in whom treatment was deferred. Importantly, 11 (28%) of 39 infections occurred as a result of relationships outside of the treatment dyad. This study

<table>
<thead>
<tr>
<th>Clinical trials</th>
<th>Population</th>
<th>Design, product, and follow-up duration</th>
<th>Location</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>FACTS 001</td>
<td>2600 heterosexual women</td>
<td>Placebo RCT, 1% TDF gel, BAT 24</td>
<td>South Africa</td>
<td>Enrolling, 2015</td>
</tr>
<tr>
<td>ASPIRE</td>
<td>Heterosexual women</td>
<td>Placebo RCT, dapivirine vaginal ring</td>
<td>Zimbabwe, Malawi, South Africa</td>
<td>Fully enrolled, 2015</td>
</tr>
<tr>
<td>RING study</td>
<td>Heterosexual women</td>
<td>Placebo RCT, dapivirine vaginal ring</td>
<td>South Africa</td>
<td>Enrolling, 2016</td>
</tr>
<tr>
<td>FACTS 002</td>
<td>100 young women (aged 16-17)</td>
<td>Safety and acceptability, 1% TDF vaginal gel, BAT 24</td>
<td>South Africa</td>
<td>Under review</td>
</tr>
<tr>
<td>CHAMPS-SA PLUSPILLS PrEP</td>
<td>150 young men and women (aged 15-19)</td>
<td>Open label TVD oral</td>
<td>South Africa</td>
<td>Under review</td>
</tr>
</tbody>
</table>

**Follow-on and demonstration studies**

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>Design, product, and follow-up duration</th>
<th>Location</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partners PrEP (post-placebo phase)</td>
<td>4747 heterosexual HIV serodiscordant couples</td>
<td>Randomised daily oral TDF vs TVD (unblended), follow-up 12 months</td>
<td>Kenya, Uganda</td>
<td>Fully enrolled</td>
</tr>
<tr>
<td>CDC 494/TDF2 open-label extension</td>
<td>1219 heterosexual men and women</td>
<td>Open label TVD, 12 months follow-up</td>
<td>Botswana</td>
<td>Enrolling, results 2014</td>
</tr>
<tr>
<td>Partners Demonstration Project</td>
<td>1000 HIV serodiscordant couples</td>
<td>Open label, daily TVD oral as bridge to treatment in infected partner, follow-up 24 months</td>
<td>Kenya, Uganda</td>
<td>Enrolling, results 2014-15</td>
</tr>
<tr>
<td>CAPRISA 008</td>
<td></td>
<td>Open label, 1% TDF vaginal gel, BAT 24</td>
<td>South Africa</td>
<td>Results 2015</td>
</tr>
<tr>
<td>SAPPH-Ire FSW RCT</td>
<td>2800 FSWs</td>
<td>Open label, oral daily TVD</td>
<td>Zimbabwe</td>
<td>Enrolling</td>
</tr>
<tr>
<td>TAPS: Expanded use of ART for treatment and prevention for female sex workers in South Africa</td>
<td>400 FSWs for PrEP, 300 FSWs for ART</td>
<td>Open label, PREP for negative FSWs and immediate ART for FSWs living with HIV</td>
<td>South Africa</td>
<td>Enrolling</td>
</tr>
</tbody>
</table>

Table 5: Trials in progress and planned, and demonstration PrEP (oral and topical) projects in women and female sex workers
did not enrol sex workers nor enquire about transactional
sex, however these data suggest that encouraging HIV-
positive sex workers to voluntarily access effective,
comprehensive HIV services will improve personal
health prognosis and might protect clients from
acquiring HIV infection from sex workers (table 2).
Reduced HIV transmission could have indirect
prevention benefits within sex-worker networks.
Available information on ART coverage, retention,
adherence, and viral suppression in FSWs is restricted to
only a few research settings in sub-Saharan Africa,
North America, and Asia. These data suggest that FSWs
can attain high levels of adherence and viral suppression,
at least in the short term and in research settings. Some
adherence concerns have been raised. Information on
long-term outcomes and retention pre-ART are
particularly sparse. FSWs might delay or be denied
access to health care for reasons of stigma, cost, and
victimisation, which can hinder adequate treatment
outcomes, antenatal care, prevention of vertical HIV
during pregnancy, and the prevention of continuing
transmission to clients. HIV services, including ART, that are acceptable, effective, and accessible for all FSWs have well documented individual
and public health benefits.

Modelling HIV prevention strategies: network
level effect
The interventions described here have proven or
plausible potential to protect the individual FSW, but the
effect of these interventions at a network or community
level depends on the local epidemic and setting. To
assess the probable effect of some of these newer HIV
prevention strategies for FSWs, we developed a
mathematical model applied to South Africa. South
Africa has a severe HIV epidemic that is generalised and
driven mostly by heterosexual sex. Our objectives were to
gauge the extent to which commercial sex drives
heterosexual HIV transmission; the effect of past
changes in condom use on HIV incidence in FSWs and
their clients; and the potential future effect of promoting
oral or topical PrEP, and earlier ART to FSWs in
South Africa.

The change in HIV incidence in FSWs and their
clients over the period from mid-2015 to mid-2025 was assessed if new HIV prevention strategies were
promoted to FSWs, alone or in combination. HIV
prevention programmes include oral PrEP, topical PrEP
(microbicides), and early ART together with 6-monthly
HIV screening (a TasP strategy, in which all

percentage reductions in new HIV infections in sex workers and clients from 2015 to 2025
Percentage reductions in clients are calculated only for infections acquired during commercial sex (excluding
infections acquired from non-commercial sex partners). Box-and-whisker plots represent minimum,
25th percentile, median, 75th percentile, and maximum values from the 1000 parameter values in the uncertainty

Table 6: Commercial sex assumptions

<table>
<thead>
<tr>
<th>parameter</th>
<th>mean</th>
<th>SD*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of men who visit sex workers</td>
<td>35%</td>
<td>-</td>
</tr>
<tr>
<td>Scaling factor for male rate of visiting sex workers</td>
<td>3.50</td>
<td>1.50</td>
</tr>
<tr>
<td>Relative rate of visiting sex workers in married men</td>
<td>0.25</td>
<td>-</td>
</tr>
<tr>
<td>Annual number of clients per sex worker</td>
<td>750</td>
<td>-</td>
</tr>
<tr>
<td>Annual rate of retirement from sex work</td>
<td>0.33</td>
<td>0.10</td>
</tr>
<tr>
<td>Annual rate of PrEP uptake in sex workers</td>
<td>0.30</td>
<td>0.10</td>
</tr>
<tr>
<td>Average PrEP effectiveness</td>
<td>40%</td>
<td>24%</td>
</tr>
<tr>
<td>Reduction in condom use in women using PrEP</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Annual rate of microbicide uptake in sex workers</td>
<td>0.30</td>
<td>0.10</td>
</tr>
<tr>
<td>Average microbicide effectiveness</td>
<td>25%</td>
<td>13%</td>
</tr>
<tr>
<td>Reduction in condom use in women using microbicides</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Average time spent on PrEP and microbicides (years)</td>
<td>5</td>
<td>-</td>
</tr>
<tr>
<td>ART uptake in women with CD4 &gt;350 cells/µL</td>
<td>60%</td>
<td>16%</td>
</tr>
<tr>
<td>Reduction in infectiousness after ART initiation</td>
<td>80%</td>
<td>12%</td>
</tr>
</tbody>
</table>

*SDs are shown only for those parameters that are included in the uncertainty analysis. Gamma priors are used to
represent uncertainty around all parameters, except for those that are formatted as percentages (uncertainty is
represented using beta prior distributions). Further details in the appendix. Based on fitting model to sex worker
population size estimates. Pre-ART=pre-exposure prophylaxis. ART=antiretroviral therapy.
HIV-diagnosed sex workers were offered ART regardless of their CD4 count. Because of the uncertainty regarding rates of uptake, effectiveness, and risk compensation for the different prevention methods, an uncertainty analysis was done to assess the range of possible results. The distributions chosen to represent the uncertainty around each parameter are summarised in table 6; 1000 parameter combinations were randomly sampled from these distributions using Latin hypercube sampling. Assumed male rates of sex-worker contact and female rates of retirement from sex work were also included in the uncertainty analysis.

When fitted to South African data sources, our model suggested that in 1990 HIV transmission between FSWs and their clients accounted for 11% of heterosexual transmission in South Africa (IQR 8–14%). By 2010, this proportion had declined to 6% (IQR 5–8%). This was because transmission in high-risk groups accounted for a lower fraction of total transmission as the epidemic became more generalised, and condom use in FSWs and their clients increased more than in other relationship types. Increases in condom use accounted for a 65% reduction in the HIV incidence rate in clients in 2010 and a 76% reduction in HIV incidence rates in FSWs. Further details regarding the proportion of heterosexual transmission attributable to commercial sex and the effect of past increases in condom use are described in the appendix.

Oral and topical PrEP alone would have only a modest effect on HIV incidence in FSWs (figure 2). However, substantial variation occurs in the range of possible outcomes, with the assumed annual rate of PrEP uptake and PrEP effectiveness being the most important determinants of the percentage reduction in sex-worker HIV incidence over the 2015–25 period (figure 3A). Under pessimistic assumptions, if effectiveness was low (<10%) and sex workers using PrEP reduced their condom use by more than 10%, the net effect on HIV incidence in FSWs could be negative, although there would still be a positive effect on HIV incidence in clients if women using PrEP were tested regularly, because earlier diagnosis would reduce transmission potential. Under very optimistic assumptions (effectiveness >95% and rate of PrEP uptake >0.65 per person-year), PrEP could reduce HIV incidence in South African sex workers by 40% or more over the 2015–25 period (figure 3A). Further uncertainty analysis is presented in the appendix.

A TasP strategy in FSWs would have a moderate effect on HIV incidence rates in clients (but little effect in FSWs). It would reduce incidence in South African clients by 23% (IQR 19–28%) over the 2015–25 period (figure 2), which would provide an indirect prevention benefit to FSWs. The estimated effect was particularly sensitive to the assumed proportion of FSWs who chose early ART after diagnosis (before meeting standard eligibility criteria) and the assumed reduction in infectiousness after ART initiation (figure 3B). One reason why this intervention does not have a more substantial effect is that rates of HIV testing and ART initiation in South Africa are already high (the modelled proportion of HIV-positive sex workers receiving ART in 2015 is 60% before the introduction of the TasP strategy); if we assumed that no prevention or treatment strategies were available in South Africa before the TasP strategy, the predicted effect would be a 54% reduction in HIV incidence in clients (IQR 50–58%), with reductions as large as 70% if rates of early ART uptake and virological suppression were high.

Combining a TasP strategy with the provision of oral and topical PrEP, the model estimates a 25% reduction in HIV incidence in clients (IQR 19–32%) and an 11% reduction in HIV incidence in sex workers (IQR 7–15%) (figure 2). Further discussion of the model results and limitations are included in the appendix.
Combination prevention for FSWs: five intervention levels

Scale-up of potential interventions to mitigate HIV acquisition and transmission by FSWs includes factors other than the hierarchy of scientific evidence. Acceptability in the FSW community, cost, logistics, and potential side-effects are additional factors.155,156

The design of an FSW-tailored HIV prevention package needs an approach that recognises all levels of risk, and consists of biomedical, behavioural, and structural interventions (figure 1). The epidemic context (risk level 5) in which the sex work occurs is an important determinant of HIV risk, and the importance of sex-worker-focused interventions depends on this context.17 In South Africa we estimated that between 6% and 11% of adult HIV transmission is attributable to sex work, but in other regions where the HIV epidemic is more concentrated, FSW-specific interventions might be more important. For example, other models suggest that providing a topical gel to FSWs would reduce HIV incidence in the general population by only 9% in the US, where sex work is estimated to account for more than half of HIV infections in men.116 Previous modelling has shown that FSW interventions probably have less effect in mature epidemics than in early-stage epidemics.155,160 The effect of promoting PrEP to high-risk groups is highly dependent on sexual mixing patterns in the population and levels of heterogeneity in HIV risk.160 Our simulations suggest that TasP interventions could have less effect in settings where access to HIV testing and ART is already high.1 Other modelling studies suggest that a high background level of ART coverage will probably increase the cost per HIV infection prevented by PrEP.161 This implies that the benefit of promoting new prevention methods to FSWs is dependent on pre-existing levels of access to HIV prevention and treatment. Knowing the local epidemic and thus tailoring the response to it, is a fundamental step advocated by UNAIDS and increasingly adopted by national programmes.2 The need for continuing epidemiological monitoring and specific FSW surveillance in each country is essential.162

Any HIV prevention package must consider environmental or policy factors (risk level 4) that define the conditions in which sex is bought and sold.9 These factors include the capacity of FSWs to choose and use products to protect against STIs, unintended pregnancy, HIV, and other infections. Other contextual factors include the criminalisation of sex work, and policies that govern the conduct of sex work, which define the ability of FSWs to access safe work places and confidential services. Local laws and policy, and cultural factors affect the levels of discrimination associated with accessing HIV services or selling sex while living with HIV. The contrast between a legalised indoors environment (where women can access appropriate occupational health services and are safer from violence) and the illegal street-based environment (where women experience constant violence and have high rates of drug use and health problems) is stark when considering what interventions could operate at risk level 4. These factors can be subject to rapid change in any one setting. Improved working conditions, reduction in police brutality, and empowerment of FSWs have been described because of policy reform and decriminalisation of commercial sex in New Zealand and are well described in this Series.2,163,164

Community-based services and community advocacy, engagement, and mobilisation of the sex work community are essential (risk level 3). In conjunction with strong civil society and peer initiatives, these can reduce the stigma, discrimination, and marginalisation of FSWs, which are themselves determinants of risk. Participatory programmes that have behavioural and structural effects such as those seen in Sonagachi, Avahan, and other community-based programmes are examples.27–29,165 Our model suggests that condom distribution and HIV communication programmes have already had a substantial effect on HIV transmission between FSWs and their clients in South Africa. These programmes in combination are estimated to have reduced HIV incidence in FSWs by 76% and clients by 65% in 2010. Similar success could have been achieved in other regions where levels of condom use are already high. A model-based assessment of the Avahan programme in southern India suggests that since it began, increases in condom use have reduced new HIV infections by 48–67%,165 and similar reductions have been estimated when modelling the effect of Project SIDA in Benin, which has promoted condoms and STI screening in FSWs.166 In 2007, the median proportion of FSWs who reported condom use with their last client was high in all regions,166 suggesting that existing interventions in other regions might already have had an important effect on HIV incidence in FSWs and their clients, although this effect cannot be quantified in some settings due to scarce data on trends in condom use and HIV prevalence.

Network level factors (risk level 2) operate within social, sexual, and injection networks, and are poorly understood in the context of FSWs. Modelling studies have suggested that in some settings, prevention programmes that reach regular clients and managers could be important in reducing HIV incidence in FSWs, particularly when the average time spent in commercial sex is short.106 Additionally, effective interventions at this level are particularly relevant to STIs and needle and syringe safety. Compounding factors that apply at the community and network level include ethnic origin, migration, citizenship status, literacy, economic security, marital status, drug use, social capital, and education—all factors strongly associated with HIV acquisition in FSWs.
We have already described a number of biomedical and behavioural interventions that reduce HIV risk at the individual level (risk level 1). Biomedical interventions under development such as longer-acting vaginal rings, long-acting injectable PrEP, and products that combine antiretroviral agents, contraceptives, or other anti-STI medications could facilitate adherence and enhance the prevention package available to FSWs in the future. Rectal microbicides could be of importance in sex work associated with anal sex. A source of uncertainty when considering the potential effect of oral and topical PrEP is the probable extent of risk compensation. Increased unprotected sex is less likely to attenuate the protective value of PrEP when individuals recognise their risk, want to use PrEP, and are motivated to be adherent.\textsuperscript{110} Data from the Partners PrEP trial show that after unblinding, individuals receiving PrEP were marginally more likely to have unprotected sex with individuals other than their study partner.\textsuperscript{111} Some modelling studies have also raised this concern.\textsuperscript{120–122} High-quality social and behavioural preparedness research is needed to track trends in condom use, and incidence of STIs and unwanted pregnancies.\textsuperscript{173}

Tailored combination prevention for FSWs should take into account the type of sex work. Some of the modalities might be easier to implement in specific settings (eg, 100% condom promotion initially had an effect in establishment-based FSWs). Reaching the poorest and most marginalised sex workers (eg, those who work on the street or at truck stops) still presents formidable challenges for the future.

Conclusions

Reducing HIV transmissions associated with sex work by making sex work safer both for the workers themselves and their clients are important components in achieving prevention services for all. This review gives evidence of an impressive array of already existing prevention modalities that can be combined and applied to reduce risk of HIV acquisition in FSW populations worldwide. New biomedical technologies, including topical and oral antiretroviral-based PrEP and earlier antiretroviral TasP, must be additive to, and not replacements for, more established prevention modalities.\textsuperscript{123–126} We also emphasise the paucity of information on the effectiveness in FSWs, particularly of the newer modalities. The Sonagachi\textsuperscript{29} and Empower Thailand\textsuperscript{132} programmes have shown the importance of community-led initiatives to ensure increasing resources are directed at a transformative change in behaviour. These include individual interventions such as condom use, and structural interventions such as law reform, protective policing, and comprehensive and voluntary services.\textsuperscript{126–129} High levels of coverage and usage of services, and quality and sustainability, are critical to maximise the effect.\textsuperscript{131–134} Inadequate financing for FSW HIV prevention programming is a crucial reason why HIV prevention coverage remains so low.

Notwithstanding sex workers’ disproportionate risk of acquiring HIV, prevention programmes for sex workers account for a meagre share of HIV prevention funding worldwide.\textsuperscript{3,135} In most regions, national governments have allocated few national resources to prevent HIV in sex workers, with international donors funding most of the HIV prevention efforts for this group.\textsuperscript{13} Our model simulations suggest that condom promotion and distribution programmes in South Africa have already reduced HIV incidence in FSWs and their clients by more than 70%. Expansion of voluntary, effective early treatment together with PrEP could further reduce HIV incidence in South African FSWs and their clients. Careful, consultative addition of these approaches in tandem to a tailored prevention package for sex workers that recognises and supports safe workplaces and respectful communities will go far in eliminating HIV infections, eradicating discrimination, and ending AIDS deaths.

Contributors

L-GB had overall responsibility for the first draft, writing, design of figures and tables, and general reviews. LJ performed the modelling, and was responsible for the first draft of the modelling section, and general review and contribution to the manuscript and literature search. FC contributed to the first draft and general review of the manuscript, including the literature search and response to reviewers. CO contributed to the general review, editing of the manuscript, literature search, and response to reviewers. WC performed the initial literature search, updated the review, and contributed to the general review and response to reviewers. SH contributed to the overall review and editing of the manuscript, data collection, and response to reviewers. WC contributed to the first draft and general review, including the literature search and response to reviewers. All authors contributed to the overall design and approach, and approved the final manuscript.

Declarations of interests

We declare no competing interests.

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HIV and sex workers 3

A community empowerment approach to the HIV response among sex workers: effectiveness, challenges, and considerations for implementation and scale-up

Deanna Kerrigan, Caitlin E Kennedy, Ruth Morgan-Thomas, Susheena Reza-Paul, Peninah Mwangi, Kay Thi Win, Allison McFall, Virginia A Fonner, Jennifer Butler

A community empowerment-based response to HIV is 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. Community empowerment has increasingly gained recognition as a key approach for addressing HIV in sex workers, with its focus on addressing the broad context within which the heightened risk for infection takes place in these individuals. However, large-scale implementation of community empowerment-based approaches has been scarce. We undertook a comprehensive review of community empowerment approaches for addressing HIV in sex workers. Within this effort, we did a systematic review and meta-analysis of the effectiveness of community empowerment in sex workers in low-income and middle-income countries. We found that community empowerment-based approaches to addressing HIV among sex workers were significantly associated with reductions in HIV and other sexually transmitted infections, and with increases in consistent condom use with all clients. Despite the promise of a community-empowerment approach, we identified formidable structural barriers to implementation and scale-up at various levels. These barriers include regressive international discourses and funding constraints; national laws criminalising sex work; and intersecting social stigmas, discrimination, and violence. The evidence base for community empowerment in sex workers needs to be strengthened and diversified, including its role in aiding access to, and uptake of, combination interventions for HIV prevention. Furthermore, social and political change are needed regarding the recognition of sex work as work, both globally and locally, to encourage increased support for community empowerment responses to HIV.

Introduction

Since the beginning of the HIV epidemic, sex workers have been at a substantially increased risk for HIV infection. The disproportionate burden of disease in these individuals has been further emphasised with epidemiological data from several geographical settings and epidemic types.1 Despite the global expansion of access to care and treatment, sex workers with HIV continue to face many barriers to access of services2–10 and have poor treatment outcomes.11,12 These findings continue to face many barriers to access of services2–10 and have poor treatment outcomes.11,12 Sex work is criminalised in some form in 116 countries.13 In many settings, laws, policies, and local ordinances all serve to penalise and marginalise sex workers, and to exclude them from national HIV responses.14 Sex workers experience violations of their human and labour rights. They are also frequently exposed to intersecting social stigmas, discrimination, and violence related to their occupation, gender, socioeconomic position, and HIV status.15–17 Without addressing these powerful structural challenges, the HIV response in sex workers is likely to be ineffective and unsustainable.

Key messages

• A community empowerment-based HIV response is a process by which sex workers take collective ownership of programmes and services to achieve the most effective HIV responses and address social and structural barriers to their health and human rights.
• Community empowerment-based HIV prevention interventions in sex workers are associated with significant reductions in HIV and STI outcomes and increases in consistent condom use with clients. However, evaluation designs have been weak and geographically restricted. Community empowerment approaches to combination HIV prevention in sex workers are rare and should be expanded and assessed.
• Despite the promise of community empowerment approaches to address HIV in sex workers, formidable structural barriers to implementation and scale-up exist at various levels. These barriers include regressive international discourses and funding constraints; national laws criminalising sex work; intersecting stigmas; and discrimination and violence such as that linked to occupation, gender, socioeconomic status, and HIV.
• Results underscore the need for social and political change regarding the manner in which sex work is understood and addressed, including the need to decriminalise sex work and recognise sex work as work. To help achieve these changes, support for networks and community organisations led by sex workers are needed both globally and locally.
• There is a need to continue to expand and strengthen the evidence base for community empowerment in sex workers, including study designs focused on better capturing and measurement of the process and the effect of empowerment efforts across diverse settings, and further investments in the generation of sex-worker-led, practice-based evidence.
A community empowerment-based response to HIV is 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 health and human rights. These efforts are unique in that they are driven by the needs and priorities of sex workers themselves, coming together as a community.

Community empowerment in sex workers has been recognised as a UNAIDS Best Practice for more than a decade, and continues to underpin key UN policy documents regarding HIV in sex workers. Assessments done across various countries have shown community empowerment to be a promising approach to reduce HIV risk in sex workers. Results of mathematical modelling suggest that community empowerment efforts can significantly reduce HIV incidence in both sex workers and the general adult population across diverse HIV epidemic scenarios, and that these interventions are cost effective. Despite increasing encouraging evidence, government and donor investment in community empowerment-based approaches in sex workers has been low.

We undertook a comprehensive review of the implementation, effectiveness, and barriers and facilitators of community empowerment-based HIV prevention in sex workers. Within this review, we undertook a systematic review and meta-analysis of the effectiveness of community empowerment in sex workers for key HIV-related outcomes. Additionally, we present four case studies emphasising the social and structural challenges faced by sex workers across settings and their collective responses to reduce their risk for HIV infection and promote their overall health and human rights.

What is community empowerment?

Findings from our comprehensive review showed that community empowerment-based HIV responses differ from typical HIV prevention programming in several ways. First, community empowerment approaches do not merely consult sex workers, but rather are community-led, such that they are designed, implemented, and assessed by sex workers. Second, these approaches recognise sex work as work—ie, as a legitimate occupation or livelihood—and seek to promote and protect its legal status as such. Third, they do not aim to rehabilitate, rescue, or remove sex workers from their profession; instead, they are committed to ensuring the health and human rights of these individuals as workers and as human beings. Rather than classification of sex work as sexual violence, conflation of sex work with human trafficking, or framing of sex workers as victims or vectors of disease, a community empowerment response to HIV is based on sex workers’ experiences, insights, and leadership.

In practical terms, the process of community empowerment often begins with sex workers meeting in a safe space to share their experiences, prioritise shared needs, and problem solve to jointly address barriers to their health and wellbeing, including, but not limited to, their heightened risk for HIV. Community empowerment is a social movement in which sex workers come together as a community to develop internal cohesion, then mobilise their collective power and resources to articulate, and as necessary demand, their human rights and entitlements. In this process, sex-worker communities seek allies, including governmental and non-governmental groups, and challenge groups and individuals who inhibit progress to achieve social and policy change and expand access to quality HIV services. Formation of an organisation for sex-worker rights is often the outgrowth of a community empowerment process whose shape, speed, and focus varies by the sociopolitical, historical, and legal environment in which it takes place.
<table>
<thead>
<tr>
<th>Country Population Study design Outcomes Sample size Sampling</th>
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</thead>
<tbody>
<tr>
<td><strong>Sonagachi Project</strong></td>
</tr>
<tr>
<td>Basu et al, 2004 India Female sex workers Group randomised trial Condom use with all clients N=200 (100 per study group) Random selection of participants</td>
</tr>
<tr>
<td>Gangopadhyay et al, 2005 India Female sex workers Cross-sectional study Gonorrhoea; chlamydia N=342 (123 intervention, 169 control group) Involved a mix of random and non-random selection of participants</td>
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<tr>
<td><strong>Belgaum Integrated Rural Development Society (BIRDS)</strong></td>
</tr>
<tr>
<td>Halli et al, 2006 India Female sex workers Cross-sectional study Condom use with all clients N=1512 Random selection of participants</td>
</tr>
<tr>
<td><strong>Frontiers Prevention Project (FPP)</strong></td>
</tr>
<tr>
<td>Gutierrez et al, 2010 India Female sex workers Serial cross-sectional study Condom use with all clients N=3442 (round 1), N=2147 (round 2) Non-random selection of participants</td>
</tr>
<tr>
<td><strong>Avahan</strong></td>
</tr>
<tr>
<td>Adhikary et al, 2012 India Female sex workers Serial cross-sectional study HIV; high-titre syphilis; chlamydia; gonorrhoea; condom use with all clients, regular clients, and new clients N=7828 (round 1), N=7806 (round 2) Random selection of participants</td>
</tr>
<tr>
<td>Blanchard et al, 2013 India Female sex workers Cross-sectional study Condom use with regular clients N=4750 Random selection of participants</td>
</tr>
<tr>
<td>Blankenship et al, 2008 India Female sex workers Cross-sectional study Condom use with all clients, regular clients, and new clients N=812 Non-random selection of participants (respondent-driven sampling)</td>
</tr>
<tr>
<td>Boily et al, 2013 India Female sex workers Serial cross-sectional study HIV; chlamydia; gonorrhoea N=2284 (round 1), N=2378 (round 2), N=2359 (round 3) Random selection of participants</td>
</tr>
<tr>
<td>Deering et al, 2011 India Female sex workers Cross-sectional study Condom use with regular clients and new clients N=775 Random selection of participants</td>
</tr>
<tr>
<td>Erausquin et al, 2012 India Female sex workers Serial cross-sectional study Condom use with all clients N=794 (round 1), N=666 (round 2), N=813 (round 3) Random selection of participants</td>
</tr>
<tr>
<td>Guha et al, 2012 India Female sex workers Cross-sectional study Condom use with all clients N=9111 Random selection of participants</td>
</tr>
<tr>
<td>Mainkar et al, 2011 India Female sex workers Serial cross-sectional study HIV; high-titre syphilis; chlamydia; gonorrhoea; condom use with all clients, regular clients, and new clients N=2525 (round 1), N=2525 (round 2) Random selection of participants</td>
</tr>
<tr>
<td>Rachakolla et al, 2011 India Female sex workers Serial cross-sectional study HIV; condom use with all clients, regular clients, and new clients N=3271 (round 1), N=3225 (round 2) Random selection of participants</td>
</tr>
<tr>
<td>Ramakrishnan et al, 2010 India Female sex workers Cross-sectional study Condom use with regular clients and new clients N=9667 Random selection of participants</td>
</tr>
<tr>
<td>Ramesh et al, 2010 India Female sex workers Serial cross-sectional study HIV; high-titre syphilis; chlamydia; gonorrhoea; condom use with all clients, regular clients, and new clients N=2312 (round 1), N=2400 (round 2) (conventional cluster and time-location cluster sampling)</td>
</tr>
<tr>
<td>Reza-Paul et al, 2008 India Female sex workers Serial cross-sectional study HIV; high-titre syphilis; chlamydia; gonorrhoea; condom use with all clients, regular clients, and new clients N=429 (round 1), N=425 (round 2) (time-location cluster sampling)</td>
</tr>
<tr>
<td>Thilakavathi et al, 2011 India Female sex workers Serial cross-sectional study HIV; high-titre syphilis; chlamydia; gonorrhoea; condom use with all clients, regular clients, and new clients N=2032 (round 1), N=2006 (round 2) Random selection of participants</td>
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<tr>
<td><strong>Encontros</strong></td>
</tr>
<tr>
<td>Lippman et al, 2012 Brazil Female, male, and transvestite sex workers Prospective cohort study Chlamydia; gonorrhoea; condom use with regular clients and new clients N=420 Non-random selection of participants</td>
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</table>

(Table continues on next page)
Community empowerment in sex workers is thus an overall approach, rather than a set of specific intervention activities. Within the approach, various HIV prevention, treatment, and care and support strategies can be implemented. Specific intervention elements might include biomedical components (eg, counselling and testing for HIV and sexually transmitted infections [STIs], and linkages to care and treatment), behavioural components (eg, sex-worker-led outreach and community education, condom distribution), and structural components (eg, social cohesion and community mobilisation, access to justice, socioeconomic opportunities).29

**Is community empowerment effective?**

**Systematic review**

Our systematic review identified 5457 unique citations, of which 22 peer-reviewed articles met the inclusion criteria for having assessed the effectiveness of community empowerment-based interventions for HIV prevention in sex workers over the past 10 years, from Feb 1, 2003, to Jan 31, 2013 (table).30–51 The number of included publications more than doubled since our previous review (n=10), which included articles published between Jan 1, 1990, and Oct 15, 2010, mostly because of recent publications from the Avahan project in India. The 22 articles included in our present systematic review represented 30,325 sex-worker study participants from eight projects across three countries: India (17 articles), Brazil (four articles), and the Dominican Republic (one article; table).13 Of the 22 articles included, 13 were from the Avahan project in India. Although all projects included female sex workers, only one project from Brazil also included male and transgender sex workers.33,40 Most studies included both establishment-based and non-establishment-based sex workers.

Most studies incorporated or intensified community empowerment within existing programmes. The existing programmes all included traditional HIV prevention activities, including community-led peer education, condom distribution, and the promotion of periodic STI screening. The additional effect of community empowerment was subsequently assessed, above and beyond these traditional HIV prevention approaches, either by measurement of changes in outcomes over time as a community empowerment approach was added or intensified, or by comparison of varying levels of exposure to empowerment activities. However, the included programmes did vary in the specific nature of their activities, and in the extent to which they fully operationalised the ideals and principles of community empowerment, including ownership and project design and management by groups led by sex workers.

One randomised controlled trial34 done in West Bengal, India, had a high or uncertain risk of bias across all quality assessment items listed by the Cochrane Collaboration. With the exception of one longitudinal study from Brazil,33,40 the remaining studies all used cross-sectional or serial cross-sectional designs. Because the evidence base indicates fairly weak study designs, our ability to draw causal inferences and firmly establish the effectiveness of community empowerment is restricted.

**Meta-analysis**

In our meta-analysis, community-empowerment-based responses to HIV in sex workers were consistently associated with significant reductions in HIV and STIs, and increases in condom use.

HIV infection was measured in five articles.41,43,45,46,48 All articles were serial cross-sectional studies from the Avahan project in India, and all measured HIV prevalence, but not incidence. Findings from these studies showed a combined reduction in HIV prevalence in sex workers after the implementation of community empowerment.
| HIV: Boily et al, 2013 (Mysore) | 0.310 (0.159–0.568) |
| HIV: Boily et al, 2013 (Bellary) | 0.410 (0.181–0.927) |
| HIV: Boily et al, 2013 (Belgaum) | 0.290 (0.126–0.591) |
| HIV: Boily et al, 2013 (Shimoga) | 0.660 (0.310–1.161) |
| HIV: Thilakavathi et al, 2011 | 0.660 (0.385–0.986) |
| HIV: Rachakulla et al, 2011 | 0.680 (0.312–0.903) |
| HIV: Ramesh et al, 2010 | 0.810 (0.666–0.985) |
| HIV: Boily et al, 2013 (Bangalore Urban) | 0.860 (0.449–1.647) |
| HIV: Mainkar et al, 2011 | 1.290 (1.004–1.657) |
| HIV: combined result | 0.680 (0.520–0.888) |
| Gonorrhoea: Boily et al, 2013 (Mysore) | 0.220 (0.069–0.701) |
| Gonorrhoea: Boily et al, 2013 (Belgaum) | 0.240 (0.070–0.826) |
| Gonorrhoea: Boily et al, 2013 (Shimoga) | 0.290 (0.068–1.240) |
| Gonorrhoea: Boily et al, 2013 (Bellary) | 0.310 (0.109–0.882) |
| Gonorrhoea: Thilakavathi et al, 2011 | 0.500 (0.167–2.345) |
| Gonorrhoea: Kerrigan et al, 2006 (Puerto Plata) | 0.590 (0.239–0.945) |
| Gonorrhoea: Mainkar et al, 2011 | 0.660 (0.384–0.937) |
| Gonorrhoea: Kerrigan et al, 2006 (Santo Domingo) | 0.630 (0.168–3.357) |
| Gonorrhoea: Ramesh et al, 2010 | 0.630 (0.410–0.969) |
| Gonorrhoea: Boily et al, 2013 (Bangalore Urban) | 0.770 (0.328–1.808) |
| Gonorrhoea: Rachakulla et al, 2011 | 1.220 (0.680–2.189) |
| Gonorrhoea: Gagopadhyay et al, 2005 | 1.325 (0.543–3.232) |
| Gonorrhoea: combined result | 0.612 (0.456–0.821) |
| Chlamydia: Boily et al, 2013 (Belgaum) | 0.340 (0.153–0.755) |
| Chlamydia: Boily et al, 2013 (Shimoga) | 0.340 (0.118–0.977) |
| Chlamydia: Boily et al, 2013 (Mysore) | 0.380 (0.191–0.755) |
| Chlamydia: Kerrigan et al, 2006 (Santo Domingo) | 0.630 (0.343–1.153) |
| Chlamydia: Mainkar et al, 2011 | 0.650 (0.470–0.909) |
| Chlamydia: Kerrigan et al, 2006 (Puerto Plata) | 0.700 (0.381–1.285) |
| Chlamydia: Thilakavathi et al, 2011 | 0.700 (0.338–1.449) |
| Chlamydia: Boily et al, 2013 (Bellary) | 0.770 (0.252–2.356) |
| Chlamydia: Kerrigan et al, 2006 | 0.830 (0.620–1.110) |
| Chlamydia: Rachakulla et al, 2011 | 0.960 (0.614–1.500) |
| Chlamydia: Boily et al, 2013 (Bangalore Urban) | 1.760 (1.040–2.979) |
| Chlamydia: Gangapadhyay et al, 2005 | 3.075 (0.971–9.732) |
| Chlamydia: combined result | 0.747 (0.559–0.981) |
| Syphilis: Rachakulla et al, 2011 | 0.450 (0.222–0.910) |
| Syphilis: Ramesh et al, 2010 | 0.530 (0.367–0.755) |
| Syphilis: Mainkar et al, 2011 | 0.560 (0.351–0.891) |
| Syphilis: Thilakavathi et al, 2011 | 0.600 (0.195–1.849) |
| Syphilis: combined result | 0.531 (0.409–0.688) |
| Condom all clients: Kerrigan et al, 2006 | 1.148 (0.790–1.669) |
| Condom all clients: Erausquin et al, 2012 | 1.920 (1.499–2.459) |
| Condom all clients: Ramesh et al, 2010 | 2.302 (1.920–2.328) |
| Condom all clients: Rachakulla et al, 2011 | 3.280 (2.572–4.185) |
| Condom all clients: Thilakavathi et al, 2011 | 3.800 (2.788–5.179) |
| Condom all clients: Mainkar et al, 2011 | 5.100 (3.372–7.713) |
| Condom all clients: Deering et al, 2011 | 6.320 (2.750–14.771) |
| Condom all clients: Hall et al, 2006 | 14.804 (7.044–31.113) |
| Condom all clients: combined result | 3.273 (2.319–4.621) |
| Condom reg clients: Deering et al, 2011 | 1.070 (0.342–3.349) |
| Condom reg clients: Blanchard et al, 2013 | 1.959 (1.572–2.418) |
| Condom reg clients: Ramesh et al, 2010 | 2.712 (1.383–1.15) |
| Condom reg clients: Rachakulla et al, 2011 | 2.980 (2.099–3.789) |
| Condom reg clients: Thilakavathi et al, 2011 | 4.300 (2.177–5.927) |
| Condom reg clients: Mainkar et al, 2011 | 4.530 (2.972–6.905) |
| Condom reg clients: combined result | 2.901 (2.224–3.784) |
| Condom new clients: Ramesh et al, 2010 | 1.510 (1.283–1.780) |
| Condom new clients: Rachakulla et al, 2011 | 2.200 (1.736–2.788) |
| Condom new clients: Deering et al, 2011 | 2.300 (1.298–4.075) |
| Condom new clients: Mainkar et al, 2011 | 4.990 (2.918–8.382) |
| Condom new clients: combined result | 3.035 (1.895–4.861) |

**Figure 1:** Forest plot of the studies included in the meta-analysis of community empowerment approaches to address HIV among sex workers.
efforts (OR 0.680, 95% CI 0.520–0.888 [figure 1]; p=0.0047). Heterogeneity was high (I²=73–897).

STI incidence was measured in one longitudinal study done in Brazil.11,40 Although 55% of participants were lost to follow-up by study end, inverse probability weighting was used to minimise potential biases. The study showed a non-significant reduction in combined gonorrhoea and chlamydia prevalence from baseline to 12-month follow-up (crude odds ratio [OR] 0.46, 95% CI 0.2–1.3).11 Eight additional cross-sectional or serial cross-sectional articles10,32,33,41,44,46,49,52 were included in meta-analyses for STI infection. Combined results showed that community empowerment was associated with a significantly decreased odds of gonorrhoea (figure 1; seven studies; p=0.011), chlamydia (figure 1; seven studies; p=0.036), and hightitre syphilis (four studies; p<0.0001). Heterogeneity was high for meta-analyses of gonorrhoea (I²=32–511) and chlamydia (I²=61–045), but not for syphilis (I²=0), which also showed the strongest effect (the odds of syphilis were reduced by almost half with a community empowerment approach).

Condom use was measured in the one included randomised trial.33 This study, which was done in India, randomised two clusters: one to community empowerment and one to control. The regression coefficient β of condom use with clients over time in intervention participants compared with control participants. Condom use was also measured in the longitudinal study from Brazil.33 This study showed significant increases in consistent condom use in the past 30 days with regular clients (OR 1.9, 95% CI 1.1–3.3), but not with new clients (1.6, 0.9–2.8) when condom use was already high. We included eight additional cross-sectional or serial cross-sectional articles10,32,33,41,44,46,49,52 in meta-analyses for condom use. Combined results showed that community empowerment was associated with significantly heightened odds of consistent condom use with new clients (figure 1; six studies; p<0.0001), regular clients (figure 1; six studies; p<0.0001), and all clients (figure 1; eight studies; p<0.0001); heterogeneity was high for all condom use meta-analyses (I²=91–767 vs I²=80–480 vs I²=90–353).

How is community empowerment measured?

To date, most efforts to measure community empowerment have focused on the specific intervention activities undertaken, whereas less focus has been placed on the measurement of community empowerment as a social process. For example, most articles in our systematic review measured intervention exposure by assessment of whether participants had been contacted by a peer educator; had received condoms or other educational materials; had visited drop-in centres or health clinics; or had participated in group workshops, meetings, or other activities. Similarly, programme monitoring indicators reported in the 22 articles in the systematic review generally focused on the coverage and quality of clinical and community-based HIV services offered to sex workers, rather than documentation of the community empowerment process. However, the Avahan project implemented a more comprehensive monitoring plan of its community mobilisation programmes, including those with sex workers. The Community Ownership and Preparedness Index (COPI) was designed to document the progress of community mobilisation and the transition of responsibility to participating community groups, including sex-worker organisations.13,54 The parameters of the COPI include leadership, governance, decision making, resource mobilisation, networking, programme management, engagement with the state to secure rights and entitlements, and engagement with the wider society to reduce sex-work-related stigma.54

Some projects attempted to document the social process associated with community empowerment among sex workers with use of both individual indicators and aggregate measures. Of the 22 studies in our systematic review, two12,33 used single-item indicators to capture the social process stimulated by the community empowerment intervention, including constructs such as “collective efficacy” or “collective action”. Five10,32,33,46,49 of the 22 studies used more theoretically complex aggregate measures to assess the dynamic process of community empowerment, from the formation of internal community cohesion within the sex-worker community to the social and political participation of sex workers as a group, and, as a result, their broader social inclusion in society, including their access to health, social, and economic resources. Additionally, some projects documented the progression of sex-worker collectivisation and participation in sex-worker-led organisations.6,7 Finally,
in addition to development of collective resources and “power over” increased personal agency and “power within” have been included as important measures of the process of community empowerment.49

What are the barriers and facilitators to community empowerment?

Our comprehensive review identified 110 documents from both the peer-reviewed and practice-based evidence related to implementation of community-empowerment-based responses to HIV in sex workers across various settings. From this literature, we sought to identify the most salient barriers to implementation and scale-up at the global, state, and community levels (figure 2). Additionally, we sought to capture facilitating factors and innovative responses used by sex-worker programmes to overcome these challenges.

At the global level, international policies and funding mechanisms can help or hinder community empowerment. Policies that hinder the community empowerment process include the global raid-and-rescue discourse, in which non-sex workers characterise sex workers as passive victims needing rescue.51,52,53 These programmes often deny sex workers’ support in choosing their livelihoods and undermine the legitimacy of sex work as work. Additionally, this discourse often conflates consensual adult sex work with human trafficking. The US Government’s anti-prostitution pledge also hindered community empowerment processes by stipulating that organisations receiving money from the US President’s Emergency Plan for AIDS Relief should sign a pledge against prostitution. Reports suggested that the pledge harmed sex workers and promoted stigma and discrimination54 while reducing the effectiveness of HIV prevention programmes and services for sex workers.55 The pledge was ruled unconstitutional by the US Supreme Court in June, 2013. Although some international donors do advocate for community empowerment, they often still hold programmes accountable to management requirements that are difficult for members of or groups in the sex-worker community to maintain, thus restricting sex workers’ actual authority and decision-making power in development, implementation, and assessment of programmes.56

Factors also exist that aid community empowerment at the global level. For example, the Global Network of Sex Work Projects (NSWP) unites 160 sex-worker groups from 60 countries and stimulates dialogue and debate related to international policies and funding practices that affect the health and human rights of sex workers. Building on the recommendations of the recent report from the Global Commission on HIV and the Law,60 NSWP’s consensus statement calls for the full decriminalisation of sex work to promote and protect the human rights of sex workers, including reducing their increased risk for HIV.61 In just the past few years, several UN agencies and other international organisations have called for decriminalisation of sex work as an integral part of the HIV response for sex workers.59,62–64

At the national level, the state strongly influences the health and human rights of sex workers and their ability to implement community empowerment approaches. National laws criminalising sex work or activities related to sex work can impede sex workers’ ability to organise and increase stigma, discrimination, and violence in sex workers.58,65 Efforts to decriminalise sex work are active in many countries and some important successes have taken place in the area of national laws and policies related to sex work. For example in Brazil, the sex workers’ rights movement worked to secure sex work as a recognised occupation and sex workers are now legally entitled to claim crucial labour rights, such as pensions.66 Initiatives to involve the police in sensitivity trainings have also been successful.67 For example in India, because of police violence, sex workers from Ashodaya Samithi organised trainings for local law enforcement, which culminated in police officers joining sex workers in solidarity at a rally to protest a law detrimental to sex workers.67 The Avahan project created crisis intervention teams that began policing the police by having sex workers report and document police abuses, leading to decreased violence.68 Furthermore, sex workers have turned policies and injustices that hinder empowerment into reasons for community mobilisation that aid empowerment.69–72 For example, the murder of a transgender sex worker in Brazil led to a public demonstration to address sex-work-related violence, which was an important initial step in the development of group-level consciousness for further collective action to address health and human rights.73

At the community level, sex workers are frequently exposed to stigma, discrimination, and violence—often by law-enforcement officials, owners and managers, and sometimes by clients.59,63,73–76 They are also victims of socioeconomic exclusion;39,77 denial of health care;44,51,52,76 stigmatisation and discrimination by friends, family, neighbours, and social and religious institutions;44,76,77 and have difficulty accessing social entitlements.59,72,79 For these reasons, many individuals who practise sex work do so in secret and are unwilling to be recognised as sex workers.63,76 This stigma-fuelled denial of selling sex hampers community empowerment by the discouragement of some individuals from joining organisations that openly focus on sex workers. In places where sex work is illegal, sex workers might also avoid sex-work organisations for fear of police reprisal.64

Sex workers are diverse.75 They come from different socioeconomic, ethnic, and regional backgrounds. They are often mobile or undocumented migrants and they work in different venues and spaces, including brothels, bars, or on the street.59,64,73 Furthermore, social stratification is an issue among sex workers, as is competition for clients54,76 all of which can lead to
mistrust and disunity, impairing community empowerment efforts. Identification of common interests is a necessary but insufficient part of building social cohesion and creating collective action. The Sonagachi Project and the Sampada Gramin Mahila Sanstha/Veshya Anyay Mukti Parishad (SANGRAM/VAMP) initiative noted that community-led outreach and peer educators helped sex workers to identify shared experiences and needs, and aided community building.

In addition to building of social cohesion among sex workers, forging of relationships with potential allies and partners is crucial, especially because the stigma, discrimination, and disempowering circumstances faced by sex workers are driven by outside groups. Some initiatives have had great success working with powerful actors, such as brothel owners and managers, and influential local clubs and political groups, whereas others have found it more difficult, noting that outside groups have little incentive to join initiatives aimed at empowerment of sex workers. Promotion of social acceptance of sex workers by involvement of members of the larger community in sex-worker events, rallies, and other social mobilisation activities has also been linked to aiding community empowerment.

Across these different levels, development of an enabling environment for sex workers is key to facilitation of community empowerment. Such development involves giving voice to individuals affected by unequal social conditions and fostering the ability to challenge such conditions. Therefore, building of leadership and capacity among sex workers within community empowerment interventions is crucial. For example, the Sonagachi Project fostered capacity building by promoting a sense of equality between sex workers and project staff and adapting the project to serve the needs and priorities identified by sex workers themselves. Ashodaya Samithi fostered leadership by allowing sex workers to make key decisions in the creation of a health centre to serve their needs. Groups can also promote autonomy and leadership by networking with other sex-worker groups regionally, nationally, or internationally, and by linking with other movements, such as labour rights, women’s rights, and human rights. Although organisations led by non-sex workers, such as international non-governmental organisations (NGOs), can have important roles in community empowerment initiatives, particularly in the initial stages of community organising, some suggest their role should be supportive in nature, rather than directive, or else they too could inhibit the community empowerment process. Together, this literature suggests that the community empowerment process should be envisioned, shaped, and led by sex workers themselves if it is to be effective and sustainable in reducing sex workers’ risk for HIV and promoting and protecting their health and human rights.

Case studies
The four case studies presented below, from Kenya, Burma, India, and Brazil, describe key elements of the context, process, barriers and facilitators, and sustainability of community empowerment.

Kenya: “Now, some police have not bothered messing with the girls because they have their mother in Nairobi”
In bars outside Nairobi, Kenya, sex workers experienced persistent violence and HIV risk, yet the stigma surrounding HIV meant that sex workers rarely discussed HIV and were often ignorant of even the most basic facts about HIV transmission. The Bar Hostess Empowerment and Support Programme (BHESP) was founded in 2001, when a small group of bar hostesses and sex workers were organised and trained in HIV prevention and care. BHESP now has more than 3000 members with a network of 42 different local groups across four provinces in Kenya. Each of the local groups is independently formed and is unique in terms of location and client type.

BHESP activities include drop-in centres for health education and other HIV and STI services, community-led educators, care and support for sex workers with HIV, and opportunities for the mobilisation and capacity building of sex workers. Although BHESP’s initial focus was HIV, the women considered violence, sometimes murder, by police, managers, and some bar customers and clients of sex workers as a bigger and more immediate issue; to them, HIV was less of an immediate threat on a daily basis. BHESP confronts these abuses by going directly to the police and to the courts, by advocating against police brutality in public, and through mass media. Sex workers have now been trained as paralegals to educate their peers about their rights. Women are often arrested for loitering, carrying condoms, or dressing as if they had an “immoral purpose” regarding intent to sell sex.

Before establishment of the BHESP, women would often bribe the police or plead guilty and pay a fine. Now, the BHESP paralegals advise women to plead innocence and to take the case to court. Between January and June, 2013, 105 cases of violence and arbitrary arrest of sex workers were reported to BHESP. With the help of lawyers, BHESP won all these cases, which eventually went before the court.

Additionally, BHESP advocates for decriminalisation of sex work at the local level, city by city. BHESP monitors the number of cases of abuse and arrests that are reported through their hotline, whether cases go to court, and whether arrests have stopped or decreased as
a result of BHESP’s interventions. These active community empowerment interventions have resulted in decreases in police harassment of sex workers; police realise their actions are likely to result in an unnecessary confrontation with BHESP and possibly being taken to court.

Burma: “I came from the community, so I work for the community”

In 2004, some HIV programmes existed in Burma but none specifically for sex workers, despite high HIV prevalence in these individuals, including those who had worked in Thailand. The sex-worker community faced much stigma and dialogue about their health and rights was scarce. The Targeted Outreach Project (TOP) was started in Burma’s capital city, Yangon, and has now been implemented in 18 cities, reaching more than 62,000 sex workers per year. In Yangon, TOP established drop-in centres where sex workers could access free health care, without the stigma they often encountered from other health-care providers. The care, support, and other services provided at the centres are a holistic package, not solely focused on HIV or STIs. Importantly, community educators are sex workers from the communities that they serve. After establishment of the early drop-in-centres, TOP became more sophisticated and developed an approach that was inclusive of sex workers, the neighbouring community, the health department, and local authorities, engaging all partners from the outset. TOP had to overcome local opposition in some neighbourhoods to the establishment of drop-in-centres. In understanding of the stigma attached to sex work, TOP put on theatrical performances depicting the lives of sex workers to win over the neighbours.

TOP provides the technical and financial support needed to open new centres, but insists that local sex workers take responsibility and control over their own centres through empowerment, advocacy, and emotional support. TOP monitors the performance of centres, and does so in a way that is easy and accessible to sex workers. For example, for the monitoring of condom use by sex workers with clients at last sex, TOP has instituted a simple system using a coupon box with three different colours of coupons from which to choose. Red signifies no condom use during last sex, green means a condom was used, and yellow represents non-penetrative sex during last sexual encounter. When sex workers attend for any centre services, they choose the appropriate coupon colour and place it in the box. Coupons are then counted at the end of the month to establish the proportion of individuals using condoms. TOP continues to work towards their main goals: freedom from the stigma and violence sex workers consistently face, and affordable and accessible health services. The TOP programme recognises that sex workers will have different levels of interest in engaging in the programmes. However, they contend that all sex workers should be given the opportunity to actively participate in all levels of decision making.

India: from “for the community”, to “with the community”, to “by the community”

In 2004, researchers from the University of Manitoba did an assessment in sex workers in Karnataka, India, which emphasised the need for safe space, violence reduction, and basic health services. Credibility within the community was gained by development of a 12-week plan to rollout services. This initial phase involved a “for the community” approach driven by external agents. Soon, it was clear that the project needed to work “with the community”, involving sex workers in all aspects of the project, including decision making. This phase saw a high degree of community mobilisation in sex workers, including them assembling for public events and celebrations. Within 1 year of the assessment, an organisation of sex workers, Ashodaya Samithi (Dawn of Hope), was born with a democratically elected executive board. In the move from “us” researchers as external agents doing something for “them”, to researchers and the community working together, it became evident over time that the organisation of sex workers was ready to move to the next level of making changes by themselves or “by the community”. In its second year, Ashodaya was able to take on most of the core elements of the project. Within 3 years, more than 4000 sex workers had become members, monitoring showed a saturation in intervention coverage, and Integrated Biological and Behaviour Assessments (IBBA) showed progress in HIV outcomes, such as increased condom use and decreased STIs. The university group was not only playing a facilitator role but was bringing science to sex workers and deconstructing it in such a way that they were able to use it. Capture-recapture size estimation allowed the community to see that they had strength in numbers and that together they could form a constituency. The IBBA helped them understand that HIV is real, that there were sex workers among them who were HIV infected, and that protection is vital. Sex workers not only owned the data generated, but owned the response. By 2007, Ashodaya had started organised dissemination of its model through a community-to-community learning programme to help strengthen other sex-worker organisations. The programme offers technical assistance to various sex-worker groups and organisations as a national learning site. Soon it became a regional learning site, maturing into the Ashodaya Academy, which now offers technical assistance to sex-worker organisations in the Asia-Pacific region. Currently, through the European Commission, Ashodaya has been entrusted to build capacities for sex-worker projects in several countries in sub-Saharan Africa. Furthermore, NSWP has recognised the work of...
the Ashodaya Academy along with VAMP to provide assistance in development of the pan-Africa sex workers' academy. Today Ashodaya Samithi has more than 8000 members; it has a programme management unit that makes key decisions about programme delivery and a governing board comprised of community leaders. The community now runs all programmes and has an annual budget of more than US$2 million.

Brazil: “without shame, you have an occupation”

Davida, a sex-worker-led NGO, was established in 1992, in Rio de Janeiro, Brazil. The organisation was founded to promote the health of sex workers and their rights as citizens, to reduce stigma and violence, and to ensure an active role for sex workers in the creation of public policies. Davida, along with the Brazilian Network of Prostitutes founded in 1987, give voice and visibility to sex workers’ needs and priorities, including, but not limited to, HIV prevention. Their approach to health and rights promotion has always been focused on creation of political, social, and cultural change regarding the manner in which sex work was understood and regulated in Brazil. Through advocacy and grass-roots organising, the efforts of the national network led to important policy changes at the federal level. In 2002, sex work was officially recognised as an occupation in the Ministry of Labour’s Occupational Registry, entitling sex workers to social security and other workers benefits. Although the continued illegality of the premises where sex work takes place has made guaranteeing of full labour rights difficult, substantial progress has been made. Davida’s work also expanded in the sociocultural and media realms. Throughout the 1990s and early 2000s, Davida partnered with the Brazilian Ministry of Health on groundbreaking HIV prevention campaigns centred around encouragement of respect for the profession and fighting of stigma, such as the Maria Sem Vergonha (“Maria, without shame”: you have an occupation) public media campaign. In 2005, the organisation created its own fashion and clothing line called Daspu (“of the whores”) that received wide national and international recognition. However, in the past 5 years, national and international support (political and financial) has greatly decreased for the Brazilian sex-worker rights and community empowerment movement, and in turn, its actions have become more restricted in scope. In June, 2013, great controversy emerged in Brazil regarding human rights and HIV prevention in sex workers. The Brazilian Ministry of Health vetoed, and then later drastically changed, a rights-based anti-stigma HIV prevention campaign created in partnership between sex workers and the sexually transmitted disease (STD)/AIDS and viral hepatitis department of the Ministry of Health. First, the Ministry removed the most controversial poster, which stated, “I am happy being a sex worker (Eu sou feliz sendo prostituta)”. After additional political pressure, he vetoed the entire campaign, fired the Director of the STD/AIDS department and launched a drastically changed version of the campaign that focused exclusively on condom use and devoid of any mention of citizenship or rights. Several members of the STD/AIDS department resigned, while the Prostitutes Network and other civil society groups and researchers organised large-scale mobilisations and letters of protest in response to the government’s actions. These challenges signal the crucial importance of sustaining a community empowerment movement among sex workers with both national and international political and financial resources and ongoing collaborative partnerships.

What are the policy, programme, and research implications?

Our findings show the promise of community empowerment approaches in responding to the significantly increased risk of HIV infection in sex workers. However, results should be interpreted with caution because of the fairly weak research designs and low geographical variation of the studies in our nested meta-analysis. The heterogeneity recorded in the effects of community empowerment on specific HIV outcomes is expected in view of the nature of the approach. However, this heterogeneity further signals the appropriateness of an emphasis on the consistent trends noted regarding the effectiveness of community empowerment, rather than the degree of expected effect across settings.

Future studies are needed to more rigorously measure the effect of community empowerment approaches to HIV in sex workers across geographical and epidemic settings on both HIV and non-HIV outcomes. In particular, investigators need to assess the effect and process of community empowerment as a platform for combination HIV prevention interventions that integrate biomedical, behavioural, and structural elements. In settings such as sub-Saharan Africa, where the burden of HIV in sex workers is extremely high, opportunities might exist for cluster randomised controlled trials to establish with greater confidence the effects of community empowerment approaches in sex workers on HIV incidence. However, randomised controlled trials are by no means the only type of rigorous research needed moving forward.

Measurement of the community empowerment process needs to be improved with use of reliable aggregate measures that can be validated across settings. Such measures would assist in further documenting the complex social process of community empowerment and the various pathways through which it could lead to social and structural change. Qualitative and ethnographic research should also accompany the implementation of community empowerment approaches in sex workers to understand context-specific opportunities and challenges to implementation. Furthermore, the practice-based evidence generated by groups led by sex workers needs to be expanded.
Barriers remain in relation to the broad implementation of community empowerment-based responses to HIV. Our findings show that sex work is not yet widely understood as work or a legitimate occupation, and that sex workers continue to be portrayed as individuals who have made poor moral choices or who have been exploited. Whereas advances in thinking regarding the legitimacy of other marginalised populations, such as men who have sex with men and drug users, have taken place in recent years, the ability to reframe and create a new dialogue for sex work has encountered many challenges. Such difficulties might be partly due to the double standard faced by sex workers, who are often women, and who are considered to be in violation of various moral principles in terms of gender and sexuality norms. Divergent perspectives within the women’s movement on the issue of sex work have also played an important part in restriction of the ability of the sex workers’ rights movement to gain momentum on this issue, as have the few resources afforded to organisations and networks led by sex workers. Despite these barriers, sex-worker organisations have developed innovative and effective strategies to address the multi-level challenges they face in the implementation of community empowerment initiatives to promote their health and human rights. These efforts need increased financial and political support if they are to advance.

Community empowerment approaches in sex workers have had important successes tackling social and structural constraints to protective sexual behaviours and, as a result, reducing behavioural susceptibility to HIV in the context of sex work. New HIV prevention technologies and approaches, such as treatment as prevention, self-testing, pre-exposure prophylaxis, and microbicides are becoming increasingly available globally. As these technologies and approaches, such as treatment as prevention, self-testing, pre-exposure prophylaxis, and microbicides are becoming increasingly available globally, they provide an important opportunity for governments, donors, and NGOs to establish meaningful partnerships with sex-worker communities and organisations, and to integrate these initiatives into ongoing community empowerment efforts as one aspect of a combination package of services for sex workers.

Conclusions
The available evidence, although based on studies from a small number of projects and countries, shows that community empowerment holds great promise as an effective approach for reducing HIV risk in sex workers and that scale-up of these initiatives could contribute to curbing of the epidemic in sex workers and the general population. Our findings emphasise the deep-rooted paradigmatic challenges associated with expansion of community empowerment-based responses to HIV in sex workers. Increased support is needed from donors, governments, partner organisations, and other allies to enable sex-worker groups to effectively and sustainably overcome barriers to implementation and scale-up of a community empowerment approach.

Contributors
All authors participated in the conceptualisation, development, and writing of the manuscript. DK led conceptualisation of paper, design of analysis, and overall write up. CK led the systematic review and meta-analysis, tables and write-up. RM-T provided community-focused framing and feedback on all aspects of manuscript development. SR-P, KTW, and PW led the case studies on India, Burma, and Kenya, respectively. AM did searches for effectiveness, cost-effectiveness, and measurement, and led the associated write up. VF did searches for barriers and facilitators to implementation and scale-up and led the associated write up. AM and VAF extracted data for systematic review articles. JB was the senior author providing technical and conceptual feedback on all aspects of the manuscript particularly framing, language, sociopolitical context of findings and their implications. All authors reviewed and approved the final manuscript.

Declaration of interests
We declare no competing interests.

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HIV and sex workers 4

Human rights violations against sex workers: burden and effect on HIV

Michele R Decker, Anna-Louise Crago, Sandra K H Chu, Susan G Sherman, Meena S Seshu, Kholi Buthelezi, Mandep Dhaliwal, Chris Beyrer

We reviewed evidence from more than 800 studies and reports on the burden and HIV implications of human rights violations against sex workers. Published research documents widespread abuses of human rights perpetrated by both state and non-state actors. Such violations directly and indirectly increase HIV susceptibility, and undermine effective HIV-prevention and intervention efforts. Violations include homicide; physical and sexual violence, from law enforcement, clients, and intimate partners; unlawful arrest and detention; discrimination in accessing health services; and forced HIV testing. Abuses occur across all policy regimes, although most profoundly where sex work is criminalised through punitive law. Protection of sex workers is essential to respect, protect, and meet their human rights, and to improve their health and wellbeing. Research findings affirm the value of rights-based HIV responses for sex workers, and underscore the obligation of states to uphold the rights of this marginalised population.

Introduction

Sex workers are an established key population for HIV, with a high burden documented in female,1 male,2 and transgender sex workers. HIV prevention and treatment interventions for sex workers are cost effective and can reduce this burden, yet sex workers face substantial barriers in accessing prevention and treatment. Although not always described as human rights violations, social injustices including poor working conditions, violence, police harassment, and discrimination have long been regarded as barriers to HIV prevention and successful treatment for sex workers.3-6 These occurrences constitute violations of human rights, or abuse of the freedoms and dignities derived inherently on account of being human.4 The health and human rights framework has guided the global HIV response to an unprecedented degree in public health,7 partly because the HIV epidemic shows the cost of restrictions on human freedom and dignity.8 Sex workers’ human rights are rarely addressed within human rights conventions or declarations. All people are entitled to the fundamental rights and protections articulated by the Universal Declaration of Human Rights (1948), the International Covenant on Economic, Social and Cultural Rights (ICESCR; 1966), and the International Covenant on Civil and Political Rights (ICCPR; 1967). These rights are not abrogated by status as a sex worker.9

Search strategy and selection criteria


Key messages

• Sex workers are rarely addressed in international human rights law. Yet fundamental rights and protections set forth by international covenants and declarations are not abrogated by status as a sex worker—human rights laws apply to everyone.
• Published research documents widespread human rights violations against sex workers, perpetrated by both state and non-state actors. These violations increase HIV risk, and undermine effective HIV prevention and intervention. Violations include homicide; physical and sexual violence from law enforcement, clients, and intimate partners; unlawful arrest and detention; discrimination in accessing health services; and forced HIV testing.
• Substantial gaps exist in a rights-based response to HIV for sex workers. The effect of human rights violations on HIV demands a shift in global policies and practices. We must acknowledge, address, and prevent violence, abusive police practices, and other human rights violations, to ensure rights and achieve public health goals.
• Without addressing human rights violations among sex workers, merely providing HIV prevention and treatment services will remain an insufficient and misguided response. HIV responses for sex workers should ensure their human rights through active promotion of equality, and non-discrimination in accessing prevention and interventions across the full continuum of care.
• Human rights violations against sex workers are most profound in criminalised policy regimes. The solution requires reform not only to policy, but also its implementation, given evidence of abusive practices.
• Policy reform, sex worker mobilisation, and grass-roots organisation are essential and mutually-reinforcing strategies that have achieved success in health and human rights promotion for sex workers.
One of the only conventions to specifically address sex workers was the Convention on the Elimination of Discrimination Against Women (CEDAW; 1979), through a committee recommendation which emphasised sex workers’ vulnerability to violence because of marginalisation and criminalisation of sex work, and affirmed their need for equal protection against abuse. Historically, human rights bodies have been reluctant to address human rights violations against sex workers because of perceived morality concerns; however, UN guidelines and reports increasingly address human rights violations against sex workers. Sex workers and advocates use the human rights framework to assess their experiences and document rights violations, inspiring others, including the CEDAW committee and UN Special Rapporteurs to do the same.

### Human rights violations in sex workers and HIV implications

Many human rights abuses experienced by sex workers go unreported to police or other officials because of their sense of futility and fears of further violence. Violations of sex workers human rights can directly or indirectly increase their risk of HIV (panel 1 and table 1).

#### Panel 1: Sex workers speak about health and human rights

<table>
<thead>
<tr>
<th>Country</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>“If you have no money, they hold you in the police station for two days and force you to clean the station. Some policemen will only let you go if you have sex with them.” - Female sex worker</td>
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<tr>
<td>Serbia</td>
<td>“I was raped by the police and the prison officers, they cut my hair and beat me up badly.” - Female sex worker, Serbia</td>
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<td>Cambodia</td>
<td>“In the lockups police officers forcefully have sexual intercourse with me... we request them to use condoms but they disagree. Twice I was locked in police station, there 12 police officers beat me. They dragged me to the toilet and forcefully had sexual intercourse with me without using condom. When I requested them to use condom they threw [away] the condom that I had in my pocket.” - Transvestite Roma sex worker, Serbia</td>
</tr>
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<td>Nepal</td>
<td>“If we insist on payment after the sexual act, clients follow us, beat us and take the money back. We cannot do anything as we will be reported to the police. If we are reported to the police, we will be prosecuted.” - Female sex worker, Nepal</td>
</tr>
<tr>
<td>Tanzania</td>
<td>“[Police] came and asked for my bag. When I refused, they beat me, took my condoms and burned them and said I’m a bitch.” - Zambian sex worker living in Namibia</td>
</tr>
<tr>
<td>Tanzania</td>
<td>“After the arrest, I was always scared... There were times when I didn’t have a condom when I needed one, and I used a plastic bag.” - Female sex worker, USA</td>
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<tr>
<td>Cambodia</td>
<td>“What I heard from the women... some sex workers were arrested. It’s time for them to get ARV [antiretrovirals]. They asked police, in polite way, to get ARV treatment and they are not allowing them.” - Zambian sex worker living in Namibia</td>
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<tr>
<td>Namibia</td>
<td>“We work at the city centre itself, where we should not work [according to the police]. We are aware [of that]. But, if we go to another place, there are a lot of problems when it is night time, when it is in the late hours.” Interviewer: “What kind of problems?” “Well, the problems are you get beaten. They [clients] take away your money. They [clients] molest you.” - Female sex worker in Zambia</td>
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<td>Russia</td>
<td>“Most sex workers don’t know they have rights as citizens. ‘They know their work is illegal, so they live in fear of the police, of clients, of everybody who passes on the street. It means they cannot defend themselves or struggle for their rights.” - Russian sex worker</td>
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<tr>
<td>Kenya</td>
<td>“Another officer asked how a prostitute like me could be raped as I was used to all sizes. He told me in fact that man really scared me. He could have tested my ass too. He ended asking me if my ass is already opened. Never will I again go to report a case. I’d rather die.” - Female sex worker, Mombasa, Kenya</td>
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<td>Uganda</td>
<td>“I cannot go and tell a health worker that I have a genital problem when she doesn’t know about my work. I expect to be abused and I have fear.” - Female sex worker, Kampala, Uganda</td>
</tr>
</tbody>
</table>
Homicide
Sex workers are highly vulnerable to homicide, and have been explicitly targeted by serial killers in Canada, the USA, Iran, Namibia, and the UK. In the USA, the homicide rate of sex workers is 17 times that of the general population, and around 300 sex workers were murdered in Canada between 1985 and 2011. Around 300 sex workers were murdered in Canada between 1985 and 2011. These grave violations of human rights show a culmination of social marginalisation, an absence of equal access to police protection, and a climate of impunity towards violence against sex workers.

Police repression, extortion, and physical and sexual abuse
Street-level policing is the main means to address sex work. It is often intensified with crackdowns on sex work, which are often timed with political motivations. Police frequently harass sex workers, including name calling, and humiliating treatment such as transgender sex workers being defaced or stripped of their clothing. Severe physical violence such as beatings, public whippings, and shocking with electrical rods can occur in police detention.

### Table 1

<table>
<thead>
<tr>
<th>Homicide</th>
<th>Proportion of sex workers affected</th>
<th>Effect on HIV and safety</th>
<th>Type of human rights infringed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homicide</td>
<td>Rate among sex workers is 17 times that of the general population&lt;sup&gt;21&lt;/sup&gt;</td>
<td>-</td>
<td>Right to life (ICCPR, Article 6; ECHR, Article 2; ACHR, Article 4; ACHPR, Article 4)</td>
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<td></td>
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<td></td>
<td>Right to equality and non-discrimination (ICCPR, Articles 3 and 26; CEDAW, Article 2; ECHR, Article 14; ACHR, Article 24; ACHPR, Article 3)</td>
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<td></td>
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<td></td>
<td>Right to the highest attainable standard of health (ICESCR, Article 12; CEDAW, Article 12; ACHPR, Article 16)</td>
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<tr>
<td>Physical or sexual violence by police</td>
<td>Sexual violence 7–89%&lt;sup&gt;21–26&lt;/sup&gt;</td>
<td>Police-perpetrated sexual violence is often unprotected</td>
<td>Right to equality and non-discrimination (ICCPR, Articles 3 and 26; CEDAW, Article 2; ECHR, Article 14; ACHR, Article 24; ACHPR, Article 3)</td>
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<td></td>
<td>Physical violence 5–100%&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Police sexual violence significantly associated with accepting more money for unprotected sex, inconsistent condom use, STI symptoms, and STI/HIV infection</td>
<td>Right to equality and non-discrimination (ICCPR, Articles 3 and 26; CEDAW, Article 2; ECHR, Article 14; ACHR, Article 24; ACHPR, Article 3)</td>
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<td></td>
<td></td>
<td>Undermines sex workers’ ability to obtain protection from police</td>
<td>Right to security of person (ICCPR, Article 9; ECHR, Article 5; ACHR, Article 7; ACHPR, Article 6)</td>
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<td></td>
<td>Right to freedom from torture and cruel, inhumane and degrading treatment (ICCPR, Article 7; CAT, ECHR, Art. 3; ACHR, Article 5; ACHPR, Article 5)</td>
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<td></td>
<td>Right to Privacy (ICCPR, Article 17; ECHR, Article 8; ACHR, Article 11)</td>
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<tr>
<td>Arbitrary arrest and detention</td>
<td>4–75% report arrest; lawfulness unclear&lt;sup&gt;21,43–45&lt;/sup&gt;</td>
<td>Arrest and detention a context for police harassment, mistreatment, and physical and sexual violence&lt;sup&gt;21&lt;/sup&gt;</td>
<td>Right to equality and non-discrimination (ICCPR, Articles 3 and 26; CEDAW, Article 2; ECHR, Article 14; ACHR, Article 24; ACHPR, Article 3)</td>
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<td></td>
<td>23–29% experienced a police raid&lt;sup&gt;21–26&lt;/sup&gt;</td>
<td>Sexual abuse in detention and at the time of arrest can confer immediate HIV risk</td>
<td>Right to equality and non-discrimination (ICCPR, Articles 3 and 26; CEDAW, Article 2; ECHR, Article 14; ACHR, Article 24; ACHPR, Article 3)</td>
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<td>Fear of arrest is a barrier to HIV testing&lt;sup&gt;21&lt;/sup&gt;</td>
<td>Right to the highest attainable standard of health (ICESCR, Article 12; CEDAW, Article 12; ACHPR, Article 16)</td>
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<td></td>
<td>Where sex workers move underground to avoid police detection, greater risk for pressured into unprotected sex</td>
<td>Right to freedom from torture and cruel, inhumane, and degrading treatment (ICCPR, Article 7; CAT, ECHR, Art. 3; ACHR, Article 5; ACHPR, Article 5)</td>
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<td>Arrest, raids and imprisonment associated with unprotected sex&lt;sup&gt;21,29,43,47&lt;/sup&gt;, STI/HIV symptoms and infection&lt;sup&gt;21,29,39,47&lt;/sup&gt; and client-perpetrated violence&lt;sup&gt;41&lt;/sup&gt;</td>
<td>Right to life (ICCPR, Article 6; ECHR, Article 2; ACHR, Article 4; ACHPR, Article 4)</td>
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<td></td>
<td>Undermines sex workers’ ability to obtain protection from police</td>
<td>Right to privacy (ICCPR, Article 17; ECHR, Article 8; ACHR, Article 11)</td>
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<tr>
<td>Policing of condoms or syringes</td>
<td>7–80% report condom confiscation&lt;sup&gt;23,49&lt;/sup&gt;</td>
<td>Prompt unprotected sex&lt;sup&gt;12–14,46,48&lt;/sup&gt; and unsafe injection practices</td>
<td>Right to equality and non-discrimination (ICCPR, Articles 3 and 26; CEDAW, Article 2; ECHR, Article 14; ACHR, Article 24; ACHPR, Article 3)</td>
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<td></td>
<td>29–48% report syringe confiscation&lt;sup&gt;23,49&lt;/sup&gt;</td>
<td>Sex workers and their managers stop carrying or providing condoms&lt;sup&gt;12–14&lt;/sup&gt;</td>
<td>Right to freedom from unlawful interference (ICCPR, Article 17)</td>
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<td></td>
<td></td>
<td>Syringe confiscation associated with HIV&lt;sup&gt;21&lt;/sup&gt;</td>
<td>Right to freedom from unlawful interference (ICCPR, Article 17)</td>
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<td></td>
<td>Limited access to HIV prevention materials (eg, safer sex and harm reduction supplies) in places of detention</td>
<td>Right to freedom from torture and cruel, inhumane, and degrading treatment (ICCPR, Article 7; CAT, ECHR, Art. 3; ACHR, Article 5; ACHPR, Article 5)</td>
</tr>
<tr>
<td>Police extortion</td>
<td>Some form of extortion 12–100%&lt;sup&gt;23,32,48,84&lt;/sup&gt;</td>
<td>Can prompt sex workers to take on riskier clients or forms of sex&lt;sup&gt;12–14,46,48&lt;/sup&gt;</td>
<td>Right to work (ICESCR, Article 6; ACHR, Article 7; CEDAW, Article 11)</td>
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<td></td>
<td></td>
<td>Associated with inconsistent condom use and STI symptoms&lt;sup&gt;12–14&lt;/sup&gt;</td>
<td>Right to freedom from unlawful interference (ICCPR, Article 17)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Undermines sex workers’ ability to obtain protection from police</td>
<td>Right to freedom from unlawful interference (ICCPR, Article 17)</td>
</tr>
<tr>
<td>Impunity: Failure to investigate, police threats, violence and other impunity when sex workers report violence</td>
<td>39–100% feel that they cannot report violence to police&lt;sup&gt;23,43–45&lt;/sup&gt;</td>
<td>Enables police, clients to perpetrate physical and sexual violence against sex workers with impunity</td>
<td>Right to equality and non-discrimination (ICCPR, Articles 3 and 26; CEDAW, Article 2; ECHR, Article 14; ACHR, Article 24; ACHPR, Article 3)</td>
</tr>
</tbody>
</table>

(Table 1 continues on next page)
Male, female, and transgender sex workers report severe sexual violence, such as gang rape and forced unprotected sex by police officers, including incidents at the time of arrest and while being detained.72–74,20,29,30,31,37,38,44,48,49,50–53 Arrest can be a context for rape,72,22 with sex workers being driven far away for sexual assault, rather than the police station, on the pretext of arrest.72,74 Quantitative estimates vary widely; police-perpetrated sexual violence is reported by 7–89% of sex workers.22–26 Such abuse is significantly associated with prevalent sexually transmitted infections (STIs) and HIV.29 Police also coerce sex under threat of arrest, prolonged detention, or further violence.27,28,29,37,46,70 Such acts are often described as free services or services in exchange for release,22,23,28,39,70 a characterisation that trivialises the inherent power imbalances between police and sex workers. Where police wield the power of arrest, and where sexual acts occur under the threat of harm, they constitute sexual violence. In view of the power disparity between police and sex workers, sex workers also have little control over condom use.43,68 Police wield tremendous power over sex workers, particularly where sex work is criminalised. They leverage power through arrest and forced detention of sex workers. Police often disregard due process, and arrest sex workers without explanation,59,66,75 often on no legal grounds.70 Where quantified, between 4% and 75% of sex workers report arrest.23,26,27,29,30–32 Widespread arrest can occur during organised raids,20,76 often under the guise of antitrafficking,30 and accompanied by severe physical and sexual violence.76 Conditions of detention are often poor and include forced labour such as cleaning or groundskeeping work.17,22,44,66,70 Humiliation and public shaming are also methods of abuse against sex workers.17,44,67,70 Some have been forced to forgo antiretroviral therapy (ART), other medication, condoms, and harm-reduction materials while in detention.44,68

<table>
<thead>
<tr>
<th>Proportion of sex workers affected</th>
<th>Effect on HIV and safety</th>
<th>Type of human rights infringed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forced rehabilitation and detention</td>
<td>• No quantitative estimates identified</td>
<td>• Unhygienic conditions, lapses in medication and health services • Context for rape and physical violence</td>
</tr>
<tr>
<td>Physical and sexual violence by non-state actors</td>
<td>• 8–76% report physical or sexual abuse by clients26,29,30,31,32,40–42</td>
<td>• Client violence is associated with STI/ HIV77–80 • Client violence is often perpetrated when sex workers refuse unprotected sex or certain types of sex • Barrier to accessing health services50</td>
</tr>
<tr>
<td>Institutionalised discrimination: discrimination in access to health services and social services</td>
<td>• No quantitative estimates identified; qualitative data show the institutional nature of discrimination</td>
<td>• Discrimination in access to health services, HIV prevention and care, and social services undermines access to the cascade of testing, treatment, adherence, and viral suppression72,74,43,44,50–53 • Discriminatory or inaccessible shelter services renders sex workers vulnerable to violence and resulting HIV risk75–77</td>
</tr>
<tr>
<td>Forced HIV testing</td>
<td>• No quantitative estimates identified</td>
<td>• Can women discrimination and stigma • Drive sex workers away from health services • Can subject sex workers to criminalization if they test positive and to violence</td>
</tr>
</tbody>
</table>

Table 1: Human rights violations and their effect on HIV and safety
Police also abuse their power by extorting fines and information from sex workers, often under threat of arrest, physical violence, and gang rape.23,24,27 Where quantified, extortion affects an estimated 12–100% of sex workers.23,31,36–38,44 Financial extortion prompts sex workers to take on riskier clients or forms of sex to compensate,26 and has been shown to increase risk for inconsistent condom use and STI symptoms.26

Police repression is a complex system in which police exploit their powers where sex work is criminalised by policy and practice. The resulting climate of fear50 imparts a direct HIV risk—eg, police-perpetrated sexual violence is associated with STIs and HIV.25 Indirect HIV risk can also result, with sex workers being displaced towards isolated and dangerous settings to avoid police detection, effectively forcing them to trade their safety and wellbeing for relief from police interference.44,50 Police repression forces sex workers to move their work off main streets36 into lesser-known areas, prompting the risk for being imprisoned into unprotected sex by clients, violence, and other hazards. Other evidence links police arrest, raid, extortion, and sexual violence with client violence.26 Arrest and imprisonment are associated with unprotected sex,26 including that for which clients offer higher payment,26 and symptoms and infections of STIs and HIV.25,31,36–38. Fear of arrest can constitute a barrier to HIV testing,26 because sex workers often fear contact with any type of services for the possibility of police involvement.

Police interference in condoms and syringes

Condoms are an evidence-based HIV prevention method and a central component of global prevention strategies. Yet many sex workers fear carrying condoms,7 which can be used by police as evidence of sex work and even confiscated.22,23,26–30,46,49,63. Where quantified, between 7% and 80% of sex workers describe police confiscating, destroying, or using condoms as evidence against them,26,32 and more than a third describe not carrying condoms for fear of law enforcement.39 Being caught with condoms can prompt police extortion.19,46 Sex workers have few alternatives to unprotected sex when condoms are confiscated, or forgone for fear of harassment,19,46 and condom confiscation is associated with unprotected sex.25 Police condom confiscation can also make venue managers reluctant to provide condoms.41 Similarly, sex workers who inject drugs could have their syringes confiscated, even where syringe purchase is legal over the counter;27 in turn, syringe confiscation is associated with prevalent HIV.46 Syringe confiscation is also associated with police-perpetrated sexual violence, drawing attention to the potential for many interactive police threats to sex workers’ health and safety.27

Impunity and discrimination in access to justice

Police abuse clearly conveys discrimination in accessing the criminal justice system. Fear of stigma and discrimination are powerful barriers to reporting of crimes to the police.41 Sex workers who do seek justice can experience police inaction and resistance to taking reports of abuse.23,24,27 Police often uphold a harmful and discriminatory notion that sex workers cannot be raped,26,27 further undermining sex worker protection under laws against sexual violence. Even where sex work is legal, police can be unwilling to protect sex workers.29 Fear of being implicated in criminal activity can also impede sex workers’ comfort in reporting abuse to police.23,44 On the basis of the totality of these injustices, sex workers describe a profound sense of futility and an absence of protection from the criminal justice system.46

Forced rehabilitation and detention

Forced or mandatory rehabilitation and other detentions, often under the guise of antitrafficking, have been documented, particularly after raid and rescue operations.25,26,29. Forced rehabilitation is often implemented by the state or by non-governmental organisations (NGOs) including religious groups in collaboration with government. Sex workers have faced forced confinement, forced labour, forced STI and HIV testing, and poor treatment, including unhygienic conditions (in China, Cambodia, and India).29,30,70 They have been denied medication and medical services, including that for HIV,70 antenatal visits, and vitamin supplements during pregnancy.60 In some cases, rape and other physical violence occur during forced rehabilitation.17,20 In China, suspected sex workers have been detained for up to 2 years without trial in so-called re-education through labour centres.60

Violence from non-state actors

Non-state actors also feature prominently in human rights violations against sex workers. Physical and sexual abuse perpetrated by clients, and those posing as clients, is common, and often occurs during condom negotiation.23,25–27,30,31,34,46,53,57,73,81 Client-perpetrated physical and sexual violence, including forced anal sex,8 is associated with risk behaviours for STIs and HIV,25,33,47,72 and infection.75,86,95,72 Abuse is fuelled partly by the recognition of sex workers’ barriers to seeking justice, which enables perpetration of physical and sexual violence with impunity.51

Sex workers also suffer intimate partner violence,23,31,42 yet fear of police mistreatment can be a substantial barrier to reporting.83 Abusive intimate partners exploit the illegality of sex work, and might threaten to expose them to police as a tactic of control.11 Sex workers also suffer abuse through vigilante raids and violence by NGOs, religious groups, and private militias.

Unsafe working conditions and an absence of labour protection

The International Labour Organization’s guidance on HIV and the workplace is inclusive of sex workers, and emphasises workplace safety.50 Yet an absence of labour protections can expose sex workers to abusive and unsafe
conditions, with few options for redress.25 Fear of abuse from managers leaves sex workers with little control over their working conditions, including an inability to decline specific clients or sex acts, or to enforce condom use with clients. Criminalisation of third parties—ie, individuals other than sex workers and their clients, such as managers—can make it difficult to report labour abuses without losing employment.45 In most places, particularly where sex work occurs in the informal economy, sex workers do not have basic labour rights such as compensation for workplace injury, health insurance, or unionisation.

**Institutional discrimination: discrimination in access to health or welfare services**

Sex workers experience discrimination and denial of health services, including HIV testing and treatment.24,17,36 Confidentiality is not always assured,28 and many sex workers are reluctant to disclose their work,37 or face backlash when it is discovered.46 Stigma and fear of discrimination are formidable barriers to accessing of voluntary counseling and testing (VCT) and other care,23,35,51,52 or ART treatment and adherence.44,53 Sex workers are also subject to HIV-related discrimination, where seeking services, initiating ART, or otherwise being identified as positive could expose them as diseased with resultant loss of clients and thus income,32,53 and sex workers have been criminalised for being HIV positive. Sex workers who cannot present male partners have been denied STI treatment,56 as has been noted in denial of prevention of mother-to-child transmission (PMTCT) services. The presumption of sex work, or even extramarital or pre-marital sex, can be enough to reduce women’s access to health care. Institutional discrimination extends beyond health sector. In some settings, sex workers have been unable to obtain basic social services, including bank accounts and microfinancing support programmes.44,63 These discriminatory practices, particularly inaccessible shelter services, increase the risk for violence and HIV risk behaviour.51

**Mandatory and forced HIV testing and health examinations**

Sex workers are targeted for forcible and coercive HIV testing,98 including that in detention centres and affiliated health clinics.48 Mandatory HIV and STI screening is a common component of sex worker registration systems.83,90 Yet this approach fails on public health and human rights grounds where sex workers have little control over testing conditions, and are not always assured access to ART. Violations of patient confidentiality and criminalisation of HIV-positive sex workers are also reported in regimes of mandatory testing.22,91 Mandatory testing can become a way to discriminate against sex workers,26 and police can also use testing as a means of exploitation and harassment. Sex workers report forced STI testing in detention and the aftermath of police raids.22,75 Police can abuse the threat of forced testing as a means of extortion and a pretext for detaining or abusing them.22

**Policy approaches to sex work: human rights profiles**

Policy approaches to sex work are inclusive of codified laws and their implementation via policies and practices. Enforcement can occur through both valid means, and abusive and illegal practices. Table 2 describes the dominant policy approaches to sex work and their influence on human rights for sex workers. We do not cover all the possible intersecting laws, policies, and practices that affect sex workers but rather portray the dominant responses. Some are discussed in greater detail elsewhere.2,1

**Criminalisation of sex work through punitive law**

The dominant global response to sex work is criminalisation through punitive law, both criminal and administrative.9 Countries vary both in the extent of criminalisation and the specific aspects of sex work that are prohibited. Many laws directly criminalise the selling of sex. Others criminalise through prohibition of the purchase of sex or earning money from someone’s sex work. Many settings also criminalise sex work indirectly, through prohibitions of aspects of sex work such as communicating for the purposes of prostitution or being found in a brothel. Some countries such as the USA, with the exception of some parts of Nevada, have fully criminalised almost all aspects of sex work, such as selling sex, buying sex, earning money from someone’s sex work, and running a brothel. This approach criminalises not only sex workers, but also their clients and third parties such as managers or security.44 Sex work can also be criminalised under religious law, traditional law, or executive orders, or repressed via discriminatory targeting of other laws—eg, those pertaining to vagrancy, sodomy, drugs, or immigration.20 For example in Iran, after the 1979 Islamic Revolution, sex work was punishable by execution under Shari’a principles; with the establishment of the Islamic Penal Code (1991), sex workers in Iran now face punishment by death under adultery charges.97

Some countries criminalise only some aspects of sex work—ie, partial criminalisation. In Brazil for example, brothel-keeping is criminalised but individual sex work is not. Many countries combine prohibitions—eg, criminalisation of brothel-keeping and selling of sex—such as Russia and most countries in eastern Europe and central Asia.22,20

The Swedish so-called end demand criminalisation approach prohibits buying sex and earning money from someone’s sex work, and is increasingly popular on the basis of its client orientation. Yet despite the focus on clients, sex workers’ health and safety can suffer.9 Sex workers continue to face police harassment as a party to a crime, and fear reporting crimes.20 Safety dynamics are similar to those noted where selling sex is criminalised,
in that fears of arrest can rush negotiations with clients, and sex workers can be displaced into isolated and dangerous areas to evade client detection by police. In addition to adoption of legal sanctions against buying sex, nations such as South Africa, South Korea, and Lithuania have also maintained the criminalisation of selling sex, and South Korea has increased raids against sex workers.98

Human rights abuses are most profoundly felt under regimes of criminalisation, with both state and non-state actors perpetrating physical and sexual violence, harassment, and discriminatory practices.22,25,44,46,51,43,40,87

Sex workers who also use drugs often face escalating or exacerbated sentencing for one or both offenses. Criminalisation enables and institutionalises

<table>
<thead>
<tr>
<th>Full criminalisation</th>
<th>Partial criminalisation</th>
<th>Legalisation</th>
<th>Decriminalisation</th>
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<tbody>
<tr>
<td>Description</td>
<td>Criminal or punitive laws prohibit all of the following: selling of sex, and buying of sex or earning money from one’s sex work (ie, as a manager, sex workers working together, support staff, or a landlord renting a home to a sex worker), and might be included within broader laws on trafficking, such as those in South Korea</td>
<td>Criminal or punitive laws prohibit either one or two of the following: selling of sex, or buying of sex or earning money from someone’s sex work (ie, as a manager, sex workers working together, support staff, or a landlord renting a home to a sex worker)</td>
<td>Sex work is legal under specific conditions. Legalisation is most often accompanied by mandatory registration, health examinations, testing, and occasionally STI treatment. Regulation is often discriminatory and enforced through criminal law (eg, sometimes only targeting female sex workers)</td>
</tr>
<tr>
<td>National examples of policy climates</td>
<td>South Africa, Kenya, Uganda, Zimbabwe, South Korea, Bosnia-Herzegovina, India, Russia, and the USA</td>
<td>Sweden and Norway</td>
<td>Hungary, Austria, Nevada (USA), Senegal, and Tijuana (Mexico)</td>
</tr>
<tr>
<td>Health and human rights profile, and implications</td>
<td>The most severe and systematic rights violations occur within the contexts of punitive laws (full or partial criminalisation). Punitive laws, even when lawfully applied, impede sex workers’ ability to protect their health and safety, and create an antagonistic relationship with law enforcement. The resulting climate of impunity emboldens police, power, health sector, and non-state groups to abuse sex workers rights. In turn, sex workers are vulnerable to exploitation, and inhibited from seeking redress for abuses. Particularly where rule of law is weak, punitive laws often give cover to widespread abuses. Where sex work is criminalised rather than protected by law, discrimination against sex workers might be institutionalised not only by police, but also by groups in health and other sectors. Criminalisation and its concomitant impunity, institutional discrimination, and social marginalisation contribute to abuse, pose direct and indirect HIV risk, and impede access to prevention, services care, treatment, and support.</td>
<td>The most severe and systematic rights violations documented within the literature occur within the contexts of punitive laws (full or partial criminalisation). Notably, partial criminalisation creates harms similar to those of full criminalisation by impeding sex workers’ ability to protect their health and safety and creating an antagonistic relationship with law enforcement resulting in a climate of impunity. Client criminalisation is thought to have undermined sex worker safety and health, with rushed negotiations undermining condom use, displacement of sex workers to isolated locations to evade police detection, police harassment, and fear of police reporting.43 Discrimination can be institutionalised—eg, making receipt of medical care contingent on stopping sex work.46 As in other criminalised climates, the legal framework conceptualising the purchase of sex as an act of violence can undermine HIV prevention services as it is perceived as enabling a crime.48</td>
<td>Rights violations are documented in legalised environments. Poorly specified tolerance zones can enable arbitrary arrest47 and extortion, particularly where rule of law is weak. Mandatory HIV or STD testing is often a component of regulatory systems, although it is sometimes costly and does not always enable ART access. Physical and sexual violence by clients and police has been documented in regulatory environments, including in specified legal settings. Regulation can create a two-tiered system leaving some sex workers unprotected by the law.54 Police failure to investigate abuse has been documented. Discrimination in the health sector is documented, and sex workers living with HIV can be criminalised.50 The scarcity of legal protection against discrimination or abuse, and the costs and requirements of registration, often make legalisation an unappealing option for sex workers. Sex workers evade regulation, which raises questions about the utility of this approach in meeting public health and rights objectives.</td>
</tr>
<tr>
<td>Legal approach to trafficking or coerced sex work</td>
<td>Criminalises trafficking, coerced sex work, and sexual exploitation of minors</td>
<td>Criminalises trafficking, coerced sex work, and sexual exploitation of minors</td>
<td>Criminalises trafficking, coerced sex work, and sexual exploitation of minors</td>
</tr>
</tbody>
</table>

Table 2: Health and human rights profiles across policy climates

STD=sexually transmitted disease. ART=antiretroviral therapy.
discrimination against sex workers, undermines their access to justice, and gives cover and license to police and non-state actors to abuse their rights. It undermines sex workers’ ability to work safely and protect their health. Even when lawfully implemented, criminalisation can impede client screening and condom negotiation, prevent sex workers from working together or in known locations with safety features, pose an obstacle to hiring security personnel, and make it more difficult to gather evidence against those who coerce or exploit sex workers.\textsuperscript{73} Criminalisation, including regimes that do not criminalise selling sex directly, can prohibit state-support for sexual risk reduction programmes, condom distribution, and violence prevention with active sex workers.\textsuperscript{78}

**Legalisation of sex work**

Generally, where sex work is legalised, it is allowed under specified conditions and otherwise punishable by law. It is predicated on sex work regulation, often for infectious disease control or sex work containment, control, and taxation. Where sex work is legalised, as in Switzerland, Turkey, Hungary, and Tijuana in Mexico, it is often regulated through mandatory registration and mandatory health examinations and testing, and criminalised if not done within specific areas.\textsuperscript{74,82,90} Regulation is often discriminatory in policy or practice, and many sex workers attempt to evade it. Sex workers often forgo mandatory registration, yet operating outside the system limits their access to necessary HIV and STI services, as in Tijuana, Mexico.\textsuperscript{90} This resulting two-tier system draws attention to unintended public health consequences of legalisation. Registered and unregistered sex workers also differ substantially in their earnings, work locations, and drug-use patterns,\textsuperscript{90} which suggests underlying differences in HIV risk. Legalisation does not assure rights-based law enforcement practices. In Hungary, where sex work is legal within tolerance zones, reluctance to clearly designate and enforce those tolerance zones actually enabled police abuse of sex workers, including arbitrary arrest.\textsuperscript{73} Counter to goals of sex worker safety, legalisation also does not eliminate physical violence against sex workers, as shown in Switzerland.\textsuperscript{90} Similar evidence from Turkey is even more egregious in view of the police presence in brothels to ensure safety.\textsuperscript{84}

**Decriminalisation of sex work**

New Zealand and New South Wales in Australia are the only jurisdictions that operate under full decriminalisation—ie, where sex work is not penalised through punitive laws, and regulation is premised on worker health and safety, and comparable to that for similar forms of labour. Although New South Wales retains minor offenses—eg, prohibition of street solicitation in proximity to some buildings such as churches or schools—they are rarely used, thus the climate in practice remains one of decriminalisation. In New Zealand, the Prostitution Reform Act of 2003 decriminalised sex work through national law, and redirected funds from police enforcement to provide health and social services for sex workers.\textsuperscript{88} The reform is thought to have reduced violence to sex workers, and increased sex worker comfort in reporting abuse to police, although some safety issues persist.\textsuperscript{90} Decriminalisation also improved police attitudes towards sex workers, and prompted them to notify sex workers of potential attackers.\textsuperscript{88} Police liaisons designated to work with sex workers on abuse issues also improved safety.

**Gaps in the rights-based response to HIV for sex workers**

There are substantial gaps in implementation of the rights-based global HIV response recommended by UNAIDS.\textsuperscript{1} Abuses of human rights merit a swift response and prevention on human rights grounds alone. Moreover, they threaten success in responding to the HIV epidemic. International guidance asserts that criminalisation of sex work should not impede HIV prevention.\textsuperscript{15} Yet in practice, police abuse and punishment undermine sex workers’ access to and use of HIV prevention, testing, and treatment, and heighten the risk for physical and sexual violence. Many of the human rights violations identified represent gross misinterpretations of policy. Even where sex work is illegal, abusive policing practices including physical and sexual violence are unlawful, yet pervasive. Sex workers who experience sexual violence face cascading human rights violations when their access to justice is stymied by police tolerance for abuse, and the pervasive notion that sex workers cannot be raped. Conflation of sex work with sex trafficking undermines the rights of both groups (panel 2).

**Optimisation of HIV prevention and treatment through enhancement of human rights**

Sex workers’ safe and equal access to HIV testing and treatment are challenged by discrimination, denial of services, and humiliation and abuse; where such services are mandated, they are too frequent and invasive, and not supported by public health evidence. Policies and practices alike should enable sex workers to exercise their rights to non-discrimination in accessing testing and the life-saving treatment that now exists. Treatment is particularly crucial in settings where large populations of untreated individuals exist and health access is not assured. Investment in policies and programmes, including community engagement strategies which empower sex workers to enjoy their rights, contributes to improvement of HIV prevention outcomes,\textsuperscript{20} and probably intervention outcomes. Reform of legal frameworks to promote human rights for sex workers might also generate improvements in HIV outcomes. The psychosocial effect of human rights violations could also undermine treatment success. Although no quantitative estimates exist specific to sex workers, abuse and other stressful events compromise ART uptake, adherence,
and viral response. 104–106 Human rights violations could similarly undermine the success of other HIV status dependent interventions, such as pre-exposure oral or topical chemoprophylaxis. Three trials have shown efficacy for men, and two for women, 107–109 and evidence from injection drug-users affirms adherence and efficacy for women, 110 despite women’s low adherence to sex work, or the idea that sex work and trafficking are one in the same. This conflation deflects both international guidance and law that distinguishes these experiences. Transnational aid policy over the past decade fuelled this conflation and hampered meaningful, reasonable policy. The far-reaching 2003 US President’s Emergency Plan for AIDS Relief (PEPFAR) included a policy known as the antipropstitution loyalty oath (APLO), which required beneficiaries to explicitly oppose prostitution, its legalisation, and sex trafficking, in effect conflating the two. The APLO, coupled with the US Trafficking In Persons (TIP) Index which grades countries’ antitrafficking efforts, prompted conflationary laws, policies, and practices abroad with substantial harm to sex workers. Guatemala, South Korea, and Cambodia increased sex work criminalisation legislation after low-tier placement on the US TIP Index. Zambia launched a mass incarceration of young women suspected or considered at risk of selling sex. Cambodia’s large-scale antitrafficking police raids targeted sex workers without assessing trafficking status, and resulted in the arrest, detention, and widespread abuse of sex workers. 110 These interventions, predicated on the conflation of trafficking with sex work, enable severe human rights violations against sex workers and fail to assist individuals in trafficking situations by diverting resources.

Epidemiological research supports the distinction of trafficking and sex work. In broader samples of sex workers in India, Thailand, the US–Mexico border, and Nicaragua, an estimated 1.6–43% 112–115 report trafficking into the sex industry via force or coercion. Such occurrences are associated with sexual risk 116–118 and further physical and sexual abuse. 116,118,119 Limitations include inconsistencies in trafficking definitions across studies and in relation to national and international law, particularly with regard to minors. The assessment of coercion and trafficking of those already involved in sex work is a challenge. Nonetheless, this research shows the distinction of sex work and trafficking, in turn, conflation is inconsistent with the best available evidence.

The rights of sex workers and the elimination of trafficking need not be oppositional. Rather, they can and should be aligned. Sex workers are well positioned to identify those in trafficking situations. Where sex workers are free to access police without fear of arrest or interference, they will be able to share information about potential trafficking scenarios. By contrast, criminalisation of sex work can hamper trafficking interventions, and foster fear of police exploitation among both sex workers and trafficked people alike. Notably, sex workers are at risk of trafficking, and can be targeted for trafficking on the basis of a perceived absence of police protection where sex work is criminalised. 110 Research from Calcutta, India, draws attention to the promise of approaches that align sex worker rights with antitrafficking efforts. A sex worker-led programme successfully implemented a screening protocol that identified trafficked individuals and minors, and referred them for care and support. 110 This example provides guidance for interventions that uphold the distinction of trafficking and sex work rather than their conflation.

In 2013, the APLO was deemed unconstitutional by the US Supreme Court. Although other policies of conflation persist, this ruling should pave the way for a new era of policy and practice that upholds the rights of both sex workers and trafficked people. Its implementation remains to be seen, including its effect on practices at non-American, non-governmental organisations (NGOs). The Global Commission on HIV/AIDS and the Law recommends a rights-based approach that simultaneously respects and actively supports those voluntarily in sex work, and identifies, supports, and protects those forced or defrauded into sex work against their will. 110 Thus a rights-based approach to sex work does not undermine the rights of trafficked people, nor the fight to diminish trafficking, but rather strengthens it. 110–112,114

Panel 2: Trafficking and sex work: the need for rights to address the wrongs

Trafficking is a human rights abuse that is distinct from sex work. 1 Yet historically, the rights of trafficked individuals and sex workers have been pitted against one another, ultimately failing both. A primary issue has been the conflation of trafficking with sex work, or the idea that sex work and trafficking are one in the same. This conflation deflects both international guidance and law that distinguishes these experiences. Transnational aid policy over the past decade fuelled this conflation and hampered meaningful, reasonable policy. The far-reaching 2003 US President’s Emergency Plan for AIDS Relief (PEPFAR) included a policy known as the antipropstitution loyalty oath (APLO), which required beneficiaries to explicitly oppose prostitution, its legalisation, and sex trafficking, in effect conflating the two. The APLO, coupled with the US Trafficking In Persons (TIP) Index which grades countries’ antitrafficking efforts, prompted conflationary laws, policies, and practices abroad with substantial harm to sex workers. Guatemala, South Korea, and Cambodia increased sex work criminalisation legislation after low-tier placement on the US TIP Index. Zambia launched a mass incarceration of young women suspected or considered at risk of selling sex. Cambodia’s large-scale antitrafficking police raids targeted sex workers without assessing trafficking status, and resulted in the arrest, detention, and widespread abuse of sex workers. 110 These interventions, predicated on the conflation of trafficking with sex work, enable severe human rights violations against sex workers and fail to assist individuals in trafficking situations by diverting resources.

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The human rights framework for change

The health and human rights of sex workers should be urgently addressed, to achieve human rights goals and public health objectives. Two mutually reinforcing strategies can harness the human rights framework for change: policy reform, and changes to practice through sex worker empowerment and partnerships for change.

Policy reform

Human rights violations against sex workers occur across all policy regimes, particularly where there is poor rule of law. They are most egregious in climates of criminalisation. The UN High Commissioner on Human Rights, the United States Department of State’s Anti-Trafficking in Persons Report, and countries’ legislators are among the policy makers and authors who understate the severity of the rights violations against sex workers.
Rights and UNAIDS recommended decriminalisation to uphold sex workers’ human rights and health, as have the UN Special Rapporteur on Health and Human Rights, the UNAIDS Guidance Note on HIV and Sex Work, the Global Commission on HIV and the Law, and the UNDP. Sex workers, and national and international advocates, also call for decriminalisation premised on the importance of sex workers’ health and safety as a means to promote health and human rights. The Supreme Court of Canada recently reversed key provisions of the law governing sex work to improve sex workers’ rights to life, liberty, and security.

Aligning practice with human rights promotion
Policy reform through decriminalisation will be insufficient to ensure human rights for sex workers where they are ostracised, or do not have protection or dignity on the basis of other social vulnerabilities. Mistreatment of sex workers often results from not only sex work-related marginalisation, but also a host of additional social vulnerabilities, such as poverty, ethnic origin, migrant status, gender, gender identity, sexual orientation, and substance use. Abuse is often described as moral punishment, and therefore social transformation is required to ensure equitable treatment and change the widespread tolerance of abuse of sex workers.

Sex workers themselves are a powerful force in health and human rights promotion, even where sex work is criminalised. Community empowerment, grounded in sex worker insight and leadership, entails sex workers organising, sharing experiences in a safe space, and prioritising their own needs for human rights and health. Empowerment-based HIV prevention shows the effect and cost-effectiveness of sexual risk reduction and HIV prevention for sex workers. Yet the effect of sex worker empowerment extends far beyond these endpoints. It is central in reforming harmful practices, and shaping the broader social structure in which sex workers live and work. In addition to policy reform, gains achieved through community empowerment include rights promotion across health, social, and criminal justice sectors, including enabling sex workers to gain access to bank accounts, microfinance programmes, and health insurance, in addition to reductions in violence, and meaningful challenges to the social exclusion of sex workers and threats to their dignity (figure 1, figure 2).

Strategies span strategic litigation; civil disobedience; public education; training of police, judges, and health workers; and formal partnership with government bodies. Sex worker organising fosters resilience for sex workers, and transforms the social climate to one that recognises, rather than marginalises, this group. Community empowerment is threatened by criminalisation and abusive practices that prevent sex workers from gathering and organising safely. At a minimum, governments should allow sex work organisations to exist and thrive without interference. They should engage with sex worker organisations to develop, implement, and assess policy.

Dismantling the climate of impunity
The advancement of human rights for sex workers requires a reform of the culture of impunity. Both abuse by state actors, and systemic absence of response to sex workers reports of violence foster impunity that perpetuates violence, and conveys an acceptability of violence towards sex workers. Failure to hold perpetrators accountable is a policy of tolerance for abuse. Even in criminalised regimes, sex worker partnerships with legal and criminal justice sectors can have a substantial effect on impunity. In Poland and Andhra Pradesh, India, sex workers have led changes in partnership with police through training on sex worker rights, and establishing procedures for safe reporting of abuse. These partnerships exemplify meaningful steps towards dismantling impunity. Training for police and judges, and court accompaniment for sex workers charged with crimes can also provide access to justice for sex workers. In South Africa, sex workers can receive paralegal training on due process and sex worker rights, to ensure sex workers’ rights are upheld throughout the legal process. These examples again show the value of investing in sex worker organising and partnership with legal and criminal justice sectors to support health and human rights.

Improvement of the evidence base
Although recent advances are heartening, the epidemiological evidence base documenting human rights violations against sex workers, and the related effects on HIV implications, is weak. Small sample sizes limit the precision of estimates, and inconsistencies in definitions of human rights violations limit cross-setting comparisons. Most studies reviewed were cross-sectional, and temporality and causality were unclear. Perpetrators of physical and sexual violence are not always specified,
which masks the primary perpetrators of human rights abuses and provides little direction for intervention targets. The findings and limitations identified emphasise the need for rigorous and broadly general research across settings, to clarify the burden, determinants, and effect on HIV implications of human rights violations against sex workers. The global surveillance with sex workers as a key HIV risk population is an opportunity for human rights assessment. Community-based and biomedical HIV intervention assessments should integrate human rights outcomes and consider rights-related barriers to success. Sex workers should have meaningful roles in such efforts. Research with transgender and male sex workers is scarce. The effect of human rights violations on sex workers’ treatment-related outcomes, including access, adherence, and viral suppression, is unclear. The extent of human rights violations identified raises the issue of ethical obligations in research related to sex work. Internationally agreed-upon ethical guidelines for research with sex workers are absent. Present findings recommend the provision of violence-support and sex worker-support resources to sex worker participants in any type of research.

Conclusions and future directions
Fundamental, non-derogable rights, those that no government has the power to suspend under ICCPR, include the right to freedom from torture, cruel, inhuman, and degrading treatments or punishments; and the right to recognition before the law. These rights are not lost because one is a sex worker or is alleged to be selling sex, yet they have been violated in many countries, by governments, legal systems, and police practices. Impunity for sexual violence and other human rights violations, and the failure to investigate and prosecute these violations, is a state failure. If the police themselves not only fail to investigate human rights violations, but actually commit them through physical and sexual violence and degrading treatment, a further state failure has also occurred. In all such cases, the perpetrators and governments should be held accountable.

Evidence-based, rights-based policy reform should be synergised with sex worker input to respond to, protect, and promote their rights. Sustained human rights surveillance is essential. The Global Fund’s Technical Review Panel’s recent request for a human rights analysis as part of the proposal process is a concrete advancement. Human rights organisations and bodies have a duty to move beyond debates about the morality of sex work to work directly with sex workers to document, denounce, and redress the violations that they experience. At a state level, governments must address the fact that many of their laws and practices as implemented contradict not only human rights and health goals, but also human rights covenants and treaties to which they are signatories.

The effect of public health investments in evidence-based HIV prevention, care, and treatment is severely constrained where sex workers’ human rights are violated. International funders such as the Global Fund, PEPFAR, UK Department for International Development (DFID), the European Union, and others should partner with and fund sex workers’ organisations, to ensure that rights and health are at the core of their investments in HIV prevention and care programmes. Sex worker organising generates some of the most crucial and effective work on health and human rights, yet is severely underfunded. Less than 1% of funding on HIV prevention is spent on HIV and sex work, and even less is directed towards sex workers’ organisations.

Denial of basic rights on the basis of status, or assumed status, as a sex worker is inconsistent with the principles of human rights. Moreover, protection of the human rights of sex workers is not merely good public health practice or effective governance, it is a state obligation under international human rights law. The extent, severity, and effect of human rights violations against sex workers identified through this review, and by the UN Special Rapporteurs and the UN High Commissioner for Human Rights, should provide the mandate and courage necessary for meaningful reform.

Contributors
All authors participated in the conceptualisation, development, and writing of this Review. MRD, ALC, and CB led the conceptualisation, the design of the review and tables, and the overall write up. MRD led the literature review. SKHC led the review of human rights infringements. ALC, SKHC, SGS, MSS, KB, and MD provided input on policy influences and community-led efforts, and feedback on all aspects of manuscript development. All authors provided input on framing, language, and sociopolitical context of the findings and their implications.

Declaration of interests
We declare no competing interests.

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References
10 Godwin J. Sex work and the law in Asia and the Pacific: laws, HIV and human rights in the context of sex work. Bangkok: UNDP Asia-Pacific Regional Centre and UNFPA Asia Pacific Regional Office, in partnership with UNAIDS, Asia Pacific Network of Sex Workers. 2012.
Male sex workers who sell or exchange sex for money or goods encompass a very diverse population across and within countries worldwide. Information characterising their practices, contexts where they live, and their needs is limited, because these individuals are generally included as a subset of larger studies focused on gay men and other men who have sex with men (MSM) or even female sex workers. Male sex workers, irrespective of their sexual orientation, mostly offer sex to men and rarely identify as sex workers, using local or international terms instead. Growing evidence indicates a sustained or increasing burden of HIV among some male sex workers within the context of the slowing global HIV pandemic. Several synergistic facilitators could be potentiating HIV acquisition and transmission among male sex workers, including biological, behavioural, and structural determinants. Criminalisation and intersectional stigmas of same-sex practices, commercial sex, and HIV all augment risk for HIV and sexually transmitted infections among male sex workers and reduce the likelihood of these people accessing essential services. These contexts, taken together with complex sexual networks among male sex workers, define this group as a key population underserved by current HIV prevention, treatment, and care services. Dedicated efforts are needed to make those services available for the sake of both public health and human rights. Evidence-based and human rights-affirming services dedicated specifically to male sex workers are needed to improve health outcomes for these men and the people within their sexual networks.

Introduction
Men who sell sex for money or goods (male sex workers) are a very diverse population across regions and within countries worldwide. This group of men should be viewed as distinct from transgender women engaged in sex work because the transgender population have clearly different needs from those of gender-conforming men who sell sex. The sixth report in this Series on HIV and sex workers, by Poteat and colleagues,1 addresses transgender women. Unfortunately, male sex workers are generally included either as a subset in reports focused on men who have sex with men (MSM), as a subgroup in studies of sex workers in which women predominate, or as part of a male sex worker category that can include transgender women.3 Moreover, in most studies in which male sex work is analysed as a risk factor for HIV and sexually transmitted infections, researchers have focused on typically younger men with lower incomes who offer sex to older gay or bisexual men in exchange for food, gifts, drugs, shelter, or other means of economic support.

The HIV epidemics among gay men and other MSM are driven by a range of biological and structural factors that have been well characterised.4 The spread of HIV infection among men who sell sex to other men is occurring within that context, although with specific features that we aim to identify in this report. Moreover, communities of gay men and other MSM are emerging in an increasingly globalised world, where new forms of, and strategies for, male-offered commercial sex are becoming possible in urban centres and tourist destinations, including the wide reach and versatility facilitated by communication technologies.5 Taken together, these many complex factors challenge our understanding of HIV among male sex workers and our ability to provide meaningful HIV prevention and treatment services. Although clients of male sex workers include women, commercial heterosexual sex probably encompasses a small proportion of all commercial sex offered by men.

Key messages
• The burdens of HIV and health-related needs of men who sell sex are little studied, with most research done as part of studies of men who have sex with men, female sex workers, and transgender women
• Most clients of men who sell sex are other men; however, those male clients sometimes do not self-identify as gay or bisexual, and many have regular female partners
• Risks for HIV acquisition exist at many levels for male sex workers, including the efficient transmission of HIV in unprotected anal intercourse, high numbers of sexual partners, large and complex sexual networks, and compounded intersectional stigmas
• Criminalisation of sex work, same-sex practices, and HIV non-disclosure all represent barriers to safe commercial sex offered by men
• Improved access to condoms and condom-compatible lubricants is necessary and is a core strategy for HIV prevention, but it will not be sufficient to change the trajectory of sustained and growing HIV epidemics among male sex workers
• Combination HIV-prevention programmes for male sex workers should address not only the biological drivers of HIV infection, with antiretroviral prevention and treatment approaches, but also the social contexts in which male sex workers engage in selling sex
• Dedicated advocacy, funding, consistency of definitions for surveillance, and research initiatives for male sex workers are essential for the sake of not only public health but also social justice and human rights
Male sex workers or men who sell sex?

A few ethnographic studies have generated data characterising male sex workers in most parts of the world, and some important research was done in the mid-to-late 1990s. Although we might use the label male sex workers, the connotations of female sex work cannot be extrapolated directly to male sex work. In most traditional and modern societies, the existence of women who regularly offer sexual services is taken for granted, and these women are more likely to identify their activity as prostitution or, more recently, sex work. Historically, male commercial sex—selling sex either to women or to men—has been infrequently reported as a social occurrence because of a combination of low population-level demand and little social acceptability for this form of commercial sex. These factors could account partly for various characteristics of commercial sex offered by men that are distinct from female commercial sex. First, some male sex workers avoid recognising their practice as a regular income-generating activity and describe it as an informal activity, not offering services for various reasons (eg, as a last resort to deal with poverty or lack of opportunities) or because local culture endorses such relationships between older and younger men or across social classes. Importantly, other men who sell sex to men are not sexually attracted to men and do not identify as gay or bisexual. Some men who sell sex to men are attracted sexually to men and some identify themselves as gay or bisexual (or use local terms with similar meaning). They engage in commercial sex either because they need the income or because local culture endorses such relationships between older and younger men or across social classes. Therefore, in this report, we focus mainly on adult men who sell sex mostly to other men or to transgender women, age 18 years and older, and we do not include transgender individuals.

We obtained data characterising the burden of HIV among male sex workers both passively from country reports to UNAIDS and actively by reading peer-reviewed and non-peer-reviewed scientific literature. Moreover, the synthesis of information characterising men who sell sex leverages data from different regions of the world, describing the forms and contexts in which men (age 18 years and older) sell sex, risk factors for the acquisition and transmission of HIV (ranging from individual-level risk factors to structural drivers of HIV risk), and existing and potential future HIV prevention approaches for these men.

Epidemiology of HIV among male sex workers

In 2013, 27 of 192 countries reported data to the UN General Assembly Special Session (UNGASS) on HIV/AIDS for HIV prevalence among male sex workers, obtained between 2009 and 2013. Seven countries reported an HIV prevalence equal to or greater than 20%, in ten countries the prevalence of HIV was 10–20%, and in ten countries the HIV prevalence among male sex workers was less than 10%. In ten European countries, the median HIV prevalence among male sex workers, reported between 2007 and 2013, was 8–9%. Data were available from five African countries, presenting a median HIV prevalence of 12.5% among male sex workers. However, sample sizes were mostly very small, with the highest burden of HIV reported in Côte d’Ivoire in 2012 from a sample of 96 male sex workers. Between 2000 and 2012, reports with biologically measured HIV prevalence among male sex workers from 81 sites across 19 countries were published in peer-reviewed journals or as non-peer-reviewed reports, with clear descriptions of sampling methods (table 1; appendix pp 1–6).

Study findings consistently show the high burden of HIV among male sex workers in North America, with estimates ranging from 5% to 31% (table 1). Compared with MSM not engaged in sex work, North American male sex workers present either higher or equivalent burdens of HIV and sexually transmitted infections. This trend has been noted in other settings, with male sex workers reported to have a higher burden of HIV than other MSM, including studies completed across several countries, such as South Africa, Namibia, Tanzania, Nigeria, Vietnam, and El Salvador. Compared with
<table>
<thead>
<tr>
<th>Location</th>
<th>Groups included</th>
<th>Sampling method</th>
<th>Sample size (n)</th>
<th>Prevalence (%)</th>
</tr>
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<tr>
<td>Vuylsteke, 2012</td>
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<td>96</td>
<td>50·0%</td>
</tr>
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<td>273</td>
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<td>Performance evaluation</td>
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<td>Performance evaluation</td>
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<td>Probability-based sampling</td>
<td>2023</td>
<td>14·5%</td>
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<td>Narayanan, 2013</td>
<td>Male sex worker</td>
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<td>43·6%</td>
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<td>Community-based survey</td>
<td>250</td>
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<td>Hawkes, 2009</td>
<td>Male sex worker, Banthas</td>
<td>Respondent-driven sampling</td>
<td>93</td>
<td>0·0%</td>
</tr>
<tr>
<td>Bokhori, 2007</td>
<td>Male sex worker</td>
<td>Venue-based sampling or peer referral</td>
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<td>Altai, 2006</td>
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<td>195</td>
<td>0·5%</td>
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<tr>
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<td>0·4%</td>
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<td>Pham, 2012</td>
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<td>Male sex worker, Hanoi</td>
<td>Time-location sampling</td>
<td>200</td>
<td>5·6%</td>
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<tr>
<td>Hiep, 2012</td>
<td>Male sex worker, Ho Chi Minh</td>
<td>Time-location sampling</td>
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<td>China, Beijing</td>
<td>Money boy</td>
<td>205</td>
<td>0·5%</td>
</tr>
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<td>Chow, 2012</td>
<td>China, Chengdu</td>
<td>Money boy</td>
<td>120</td>
<td>4·2%</td>
</tr>
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<td>China, Chongqing</td>
<td>Money boy</td>
<td>47</td>
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</tr>
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<td>China, Chongqing</td>
<td>Money boy</td>
<td>71</td>
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<td>China, Chongqing</td>
<td>Money boy</td>
<td>54</td>
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<td>China, Chongqing</td>
<td>Money boy</td>
<td>190</td>
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<td>Zhang, 2012</td>
<td>China, Chongqing</td>
<td>Selling sex in past 6 months</td>
<td>449</td>
<td>14·4%</td>
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<td>China, Guangzhou</td>
<td>Money boy</td>
<td>151</td>
<td>11·3%</td>
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<tr>
<td>He, 2009</td>
<td>China, Guangzhou</td>
<td>Selling sex to males and females</td>
<td>409</td>
<td>6·2%</td>
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<td>Chow, 2012</td>
<td>China, Jining</td>
<td>Money boy</td>
<td>41</td>
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<td>Zhao, 2012</td>
<td>China, Shenzhen</td>
<td>Money boy</td>
<td>850</td>
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<td>418</td>
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<td>China, Shenzhen</td>
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<td>505</td>
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<td>Cai, 2009</td>
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<td>Money boy</td>
<td>394</td>
<td>5·3%</td>
</tr>
<tr>
<td>Chow, 2012</td>
<td>China, Tianjin</td>
<td>Money boy</td>
<td>89</td>
<td>6·7%</td>
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</table>

(Table 1 continues on next page)
female sex workers and men in general, the prevalence of HIV and sexually transmitted infections is consistently high among male sex workers. In Latin America, several studies have characterised the high prevalence and incidence of HIV among male sex workers. In Argentina, estimates of HIV prevalence among male sex workers are consistent at about 10%, although incidence of HIV ranges from 2·3 per 100 person-years to 6·1 per 100 person-years, highlighting the differential risk status of these men. Studies and surveillance to ascertain the incidence of HIV among male sex workers are important for us to better understand the complex dynamics of HIV acquisition and transmission among these men across different periods.

Reports of higher HIV prevalence in male sex workers than in other MSM are inconsistent across regions and possibly reflect several factors: different sex roles assumed by sex workers in specific countries; varying frequencies of condom use; diverse baseline prevalence among MSM, and discrepant levels of representativeness of those figures; and potential oversampling of younger men who have short cumulative HIV acquisition periods. In Sydney, Australia, HIV prevalence in male sex workers was reported to be 6·5%, much greater than recorded among female sex workers (0·4%) but less than in MSM not reporting sex work (23·9%). These differences probably reflect the differing risk levels among these diverse populations. Male sex workers reported more non-work sexual partners than did female sex workers, but they were less likely to report unprotected anal intercourse with non-paying partners than were other MSM.

<table>
<thead>
<tr>
<th>Location</th>
<th>Groups included</th>
<th>Sampling method</th>
<th>Sample size (n)</th>
<th>Prevalence (%)</th>
</tr>
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<td>Money boy</td>
<td>Respondent-driven sampling</td>
<td>95</td>
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<tr>
<td>Chow, 2012</td>
<td>China, city not reported</td>
<td>Money boy</td>
<td>Venue-based sampling or peer referral</td>
<td>118</td>
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<td>China, city not reported</td>
<td>Money boy</td>
<td>Peer referral</td>
<td>86</td>
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<td>Estcourt, 2000</td>
<td>Australia, Sydney</td>
<td>Male sex worker</td>
<td>Records from sexually transmitted infection clinics</td>
<td>94</td>
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<td>Vella, 2012</td>
<td>Australia, Victoria</td>
<td>Sex workers who are also men who have sex with men</td>
<td>Sentinel surveillance</td>
<td>700</td>
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<td>636</td>
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<td>Israel, Tel Aviv</td>
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<td>Internet-based sampling</td>
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<td>Canada, Vancouver</td>
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<td>Community-based survey</td>
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<td>USA, Atlanta</td>
<td>Male sex worker</td>
<td>Not original data</td>
<td>234</td>
</tr>
<tr>
<td>Resner, 2008</td>
<td>USA, Massachusetts</td>
<td>Male sex worker</td>
<td>Wide recruitment</td>
<td>32</td>
</tr>
<tr>
<td>Bacon, 2006</td>
<td>USA, San Francisco</td>
<td>Male sex worker</td>
<td>Street recruitment</td>
<td>154</td>
</tr>
<tr>
<td>Farias, 2011</td>
<td>Argentina, multi-city</td>
<td>Male sex worker</td>
<td>Venue-based sampling and peer referral</td>
<td>114</td>
</tr>
<tr>
<td>Tun, 2008</td>
<td>Brazil, Campinas</td>
<td>Male sex worker</td>
<td>Respondent-driven sampling</td>
<td>106</td>
</tr>
<tr>
<td>Bayer, 2010</td>
<td>Peru, Lima</td>
<td>Male sex worker, high socioeconomic status</td>
<td>Venue-based sampling</td>
<td>24</td>
</tr>
<tr>
<td>Bayer, 2010</td>
<td>Peru, Lima</td>
<td>Male sex worker, low socioeconomic status</td>
<td>Venue-based sampling</td>
<td>61</td>
</tr>
<tr>
<td>Valdenarama, 2007</td>
<td>Peru, Andes region</td>
<td>Male sex worker</td>
<td>Venue-based sampling</td>
<td>1206</td>
</tr>
<tr>
<td>Valdenarama, 2007</td>
<td>Peru, Coastal cities</td>
<td>Male sex worker</td>
<td>Venue-based sampling</td>
<td>1206</td>
</tr>
<tr>
<td>Valdenarama, 2007</td>
<td>Peru, Jungle cities</td>
<td>Male sex worker</td>
<td>Venue-based sampling</td>
<td>1206</td>
</tr>
<tr>
<td>Lama, 2006</td>
<td>Peru, city not specified</td>
<td>Work as a sex worker</td>
<td>Convenience sample</td>
<td>349</td>
</tr>
<tr>
<td>Montano, 2005</td>
<td>Uruguay, Montevideo</td>
<td>Male sex worker</td>
<td>Street-based recruitment</td>
<td>317</td>
</tr>
<tr>
<td>Parsons, 2007</td>
<td>Internet-based</td>
<td>Male escort</td>
<td>Internet-based recruitment</td>
<td>46</td>
</tr>
</tbody>
</table>

The appendix (p 7) contains a glossary of regional terms for male sex workers.

Table 1: HIV prevalence among samples of men who sell sex, 2000–12
and 7·0% for MSM not reporting sex work.\textsuperscript{30,32} Although money boys had more male partners than did MSM, they were also more likely to report consistent condom use, particularly for commercial sex. In Tel Aviv, a study of sex workers and other MSM further delineated divergent risks among these populations by investigating prevalence and sexual practices among male sex workers, high-risk MSM, and low-risk MSM.\textsuperscript{33} Knowledge of transmission of HIV and sexually transmitted infections, practices, and burden did not differ between groups. Among male sex workers, high-risk MSM, and low-risk MSM, the burden of sexually transmitted infections was 28·3%, 23·5%, and 10·3%, respectively, and the HIV burden was 5·6%, 9·2%, and 0%, respectively. Taken together, these data highlight the need for increased prospective surveillance of HIV and other sexually transmitted infections among male sex workers. Younger male sex workers might be more likely to be sampled, representing potentially higher HIV incidence with low population-level incidence. To support appropriate interpretation of comparisons of the burden of HIV among male sex workers with that of other MSM or even that of other men, age-stratified HIV incidence data are needed.

Limitations of HIV data-reporting systems

Data gathered by UNGASS and GARPR (Global AIDS Response Progress Reporting) have several limitations. Worldwide, the sample size reported to UNGASS ranges from a few people to thousands of participants, with data sources of varying quality. This broad representation complicates comparisons across countries or regions and interpretations of trends. For instance, fewer than ten participants were included in reports from diverse settings including Cape Verde, Cameroon, Algeria, Romania, and Kyrgyzstan. Moreover, many studies incorporated transgender women under the indicator of male sex workers, thus confounding interpretation further. For example, although Pakistan reported data specifically for the indicator of male sex workers, the study was focused almost exclusively on hijras (a third gender in India and Pakistan).\textsuperscript{34} UNGASS reports also have limited scope and not all regions report on male sex workers as a formal behavioural category: for instance, male sex workers are excluded as an official HIV risk-transmission category in North America. Thus, HIV epidemiological data specific to male sex workers are not reported routinely by existing surveillance programmes.\textsuperscript{35} Although the extramural peer-reviewed research we discuss here does not share the same biases as country-reported data, several methodological limitations hinder inferential conclusions drawn from these studies, including varying and sometimes rudimentary sampling strategies (pertinent data are generally derived from convenience samples with scant generalisability to the broader population of male sex workers) and the absence of a standard behavioural recall window (eg, life history vs past 3, 6, or 12 months). In both UNGASS reports and extramural research, issues surrounding definitions emerge: UNGASS defines sex work as “consensual sexual services offered by adults in return for cash or payment in kind”,\textsuperscript{36} which can be interpreted subjectively; however, extramural research variably includes other compensation, including drugs, food, and shelter, potentially conflating sex work with both drug–sex exchanges and survival sex. Moreover, the increasing trend of sex work transitioning from being street-based to internet-based further complicates identification, sampling, and assessment, limiting the scientific rigour of epidemiological research.\textsuperscript{37} With these caveats posed by the proportion of partners of different types and risk practices by partner types, epidemiological data suggest that, worldwide, male sex workers remain at very high risk for HIV acquisition and transmission, even compared with other high-risk populations.

HIV surveillance recommendations

Consistent application of surveillance definitions and methods is crucial to advance the knowledge base for male sex workers, including standardisation of definitional measures for male sex workers and delineation of male sex workers as a risk-transmission category in HIV/AIDS reporting. Therefore, we recommend five changes to data collection and reporting methods specific to male sex workers, to support country-led programming.

First, current surveillance definitions (ie, consensual sexual services between adults for cash or payment in kind in the past year) could be clarified to distinguish sex-for-cash not only from drug–sex exchanges but also from survival sex (ie, sex for food or shelter) and from less traditional benefits (eg, transport or entertainment), and potentially from more indirect sexual services (such as webcam performances) that might confound commercial sexual risks. Second, surveillance guidelines should specifically suggest distinguishing between lifetime sex work and current (past year) sex work, to facilitate better estimations of the prevalence of male sex workers in communities and of the associations between past sex work and current HIV-related health outcomes. Third, ensuring that risk-transmission categories encompass multiple options will allow for better distinctions between populations with intersecting risk behaviours (eg, male sex workers who are also MSM). Fourth, better quantification of risks specific to male sex workers could be achieved by assessing commercial sexual risk according to partner type and sex (eg, querying for non-commercial, paying, and paid sexual partnerships by partner sex and associated HIV risk behaviour). Finally, assessing career duration and sex work frequency (ie, number of paid sexual acts) might contribute to better understanding of dose-response associations between selling sex and HIV transmission risk and could provide useful context for optimum intervention delivery. Although this level of disaggregation might not be necessary for all agencies tracking the burden of HIV,
these indicators would support organisations and agencies focused on the implementation and evaluation of programmes supporting male sex workers.

**HIV acquisition and transmission risks**

Several approaches are available to assess determinants of risk and vulnerability to HIV in specific populations and contexts. The modified social ecological model consists of multiple layers of risks for HIV acquisition and transmission, ranging from individual-level features (such as biological and behavioural factors that promote HIV infection), characteristics of sexual networks, community-level determinants (including access to HIV-prevention services and potential barriers to those services), and national policies that increase or mitigate the potential coverage of HIV prevention, treatment, and care programmes for male sex workers.68 Syndemics theory69 facilitates understanding of how these disparities and consequent psychosocial health conditions further predispose male sex workers to increased HIV risk compared with other populations of MSM (table 2).30,41,46,51,54,55,57,70–79

The biological risks of HIV acquisition among male sex workers are shared with those of other MSM. These biological risks have been well characterised and include the efficient transmission of HIV during unprotected anal intercourse. Male sex workers have high numbers and frequencies of male partnerships, resulting in large and non-dense sexual networks, both of which have been established as risk factors for HIV among MSM. These risks have also been described among male sex workers in some countries, such as Nigeria and Kenya (figure 1).56,80 Across sub-Saharan Africa, consistent use of condoms is variable among male sex workers, with levels ranging from 36% in Kenya to more than 70% in Côte D’Ivoire.51,81 Southern and eastern Africa are among the few places in the world where HIV disproportionately affects women and where heterosexual male sex workers and female non-paying sexual partners and female clients might be at risk of either acquiring HIV or transmitting infection themselves.82 Similarly, the limited supply of condom-compatible lubricants in many low-income and middle-income countries might further increase risks among male sex workers.83 Several themes emerge across regions when reviewing HIV risks affecting individual male sex workers, including economic disparities, sexual and physical abuse, drug misuse, and low socioeconomic status, in

<table>
<thead>
<tr>
<th>Location</th>
<th>Study population</th>
<th>Sampling frame</th>
<th>Sample size (n)</th>
<th>Measure of association</th>
<th>Risk ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>MSM, PWID</td>
<td>Street recruitment</td>
<td>227</td>
<td>Odds ratio</td>
<td>1·67 (0·64–4·36)</td>
</tr>
<tr>
<td>Peru</td>
<td>MSM</td>
<td>Surveillance study</td>
<td>3280</td>
<td>Odds ratio</td>
<td>1·91 (1·31–2·79; adjusted) 1·89 (1·03–3·47)</td>
</tr>
<tr>
<td>China</td>
<td>MSM</td>
<td>Respondent-driven sampling</td>
<td>428</td>
<td>Odds ratio</td>
<td>2·2 (1·20–4·20)</td>
</tr>
<tr>
<td>Vietnam</td>
<td>MSM</td>
<td>Cross-sectional survey</td>
<td>599</td>
<td>Odds ratio</td>
<td>8·61 (1·20–61·69)</td>
</tr>
<tr>
<td>Malawi, Namibia, Botswana</td>
<td>MSM</td>
<td>Non-probability</td>
<td>537</td>
<td>Odds ratio</td>
<td>1·7 (1·0–2·70)</td>
</tr>
<tr>
<td>China</td>
<td>MSM</td>
<td>Cross-sectional survey</td>
<td>1692</td>
<td>Odds ratio</td>
<td>2·1 (1·0–3·80)</td>
</tr>
<tr>
<td>China</td>
<td>MSM</td>
<td>Snowball sampling</td>
<td>513</td>
<td>Odds ratio</td>
<td>6·43 (1·54–28·86)</td>
</tr>
<tr>
<td>South Africa</td>
<td>MSM</td>
<td>Venue-based sampling</td>
<td>542</td>
<td>Odds ratio</td>
<td>2·8 (1·0–8·3)</td>
</tr>
<tr>
<td>Tanzania</td>
<td>MSM</td>
<td>Respondent-driven sampling</td>
<td>509</td>
<td>Odds ratio</td>
<td>4·6 (1·0–21·4)</td>
</tr>
<tr>
<td>El Salvador</td>
<td>MSM</td>
<td>Respondent-driven sampling</td>
<td>596</td>
<td>Bivariate proportion</td>
<td>17·9 (7·8–29·9; p=0·006)</td>
</tr>
<tr>
<td>Israel</td>
<td>MSM, male sex workers</td>
<td>Venue-based sampling</td>
<td>283</td>
<td>Odds ratio</td>
<td>0·6 (0·1–12·4; male sex worker vs high-risk MSM)</td>
</tr>
<tr>
<td>Vietnam</td>
<td>MSM</td>
<td>Community-based survey</td>
<td>381</td>
<td>Prevalence ratio</td>
<td>1·56 (0·70–3·47)</td>
</tr>
<tr>
<td>China</td>
<td>MSM</td>
<td>Respondent-driven sampling</td>
<td>503</td>
<td>Odds ratio</td>
<td>2·3 (0·4–13·0)</td>
</tr>
<tr>
<td>Canada</td>
<td>MSM</td>
<td>Venue-based survey</td>
<td>3304</td>
<td>Crude odds ratio</td>
<td>1·7 (1·11–2·61)</td>
</tr>
<tr>
<td>USA</td>
<td>MSM, men who have sex with women</td>
<td>Respondent-driven sampling</td>
<td>2092</td>
<td>Odds ratio</td>
<td>0·79 (0·51–1·21)</td>
</tr>
<tr>
<td>China</td>
<td>MSM</td>
<td>Non-probability and respondent-driven sampling</td>
<td>250</td>
<td>Odds ratio</td>
<td>5·93 (1·92–18·69)</td>
</tr>
<tr>
<td>Ecuador</td>
<td>MSM</td>
<td>Respondent-driven sampling</td>
<td>416</td>
<td>Odds ratio</td>
<td>3·30 (1·20–8·60)</td>
</tr>
</tbody>
</table>

MSM=men who have sex with men. PWID=people who inject drugs.

Table 2: Commercial sex behaviours that are significant risk factors for HIV infection among men who have sex with men, 2000–12
addition to the occupation-related risks associated with commercial sex. In many places and contexts, some male sex workers report high levels of background adversities, including sexual and physical abuse, homelessness, and low educational attainment. Furthermore, male sex workers are more likely than other MSM to report racial and sexual minority statuses, which are associated with a higher likelihood of serodiscordant sexual partnerships in many high-income settings (eg, the USA and the UK). One of the most consistent and important findings among male sex workers is reporting of concurrent substance misuse, ranging from alcohol to injected drugs. In North America, substance misuse is associated with high-risk practices and low socioeconomic status among male sex workers. Alcohol use in Kenya, and misuse of injecting and non-injecting drugs in Asia, are both associated with high-risk sexual acts among male sex workers. Furthermore, among male sex workers in the USA who inject drugs, a higher number of male paying partners is associated with greater HIV prevalence. Similar findings have been described among male sex workers in several Latin American countries, including Mexico, Nicaragua, Argentina, and Peru, suggesting the consistent applicability of syndemic theory to male sex work. At the same time, data from Africa show that injecting drug use among male sex workers is very low (usually <3%).

In North America, occupational health risks among male sex workers include: conditions of economic necessity fomenting unprotected sex; sex with multiple partners; sexual role versatility, depending on client preferences; and sex with male, female, and transgender partners, and reciprocal sex exchange—ie, purchasing sex from other sex workers. The burden of prevalent and incident genital ulcerative diseases augments the high acquisition and transmission risks associated with unprotected anal intercourse. In some countries of Latin America and the Spanish-speaking Caribbean, sex workers are typically offered free medical check-ups at public health clinics. However, male sex workers are less willing to use these services than are female or transgender sex workers, because they generally do not regard these services as useful or free of charge (or might be unwilling to come forward) as sex workers; thus, access to periodic screening, prevention, and care services for sexually transmitted infections is diminished for this population. As a result, asymptomatic or minimally symptomatic sexually transmitted infections among these men are clinically significant, since condom use is less effective for prevention of such infections, compared with HIV. Similarly, for sub-Saharan Africa, high rates of human papillomavirus (HPV) and consequent anal papillomas are probably associated with increasing acquisition risks among male sex workers in coastal regions of Kenya.

Male sex workers are more likely to report having male partners who are older than themselves, a finding that is associated with high rates of HIV infection among African-American MSM. Although research into young people and adolescent men selling sex is scant, because of the complexities of obtaining appropriate informed consent and the inherent legal issues, many male sex workers across several regions report initiating sex work at young ages, sometimes under coercion or force. The high prevalence of HIV recorded among men in their late teens and early twenties in many regions suggests that the risks of acquiring HIV are probably relevant during adolescence for some of these individuals.

At the community level, risk might be mitigated by available HIV prevention, treatment, and care services if barriers to the uptake of those services are removed. The most important barrier is stigma, an obstacle that is often big enough to prevent male sex workers from accessing HIV prevention services. Stigma acts by devaluing, labelling, and stereotyping male sex work, resulting in these men suffering a loss of status, unfair and unjust treatment, and social isolation. Male sex workers can face intersecting stigmas: having sex with other men; engaging in illegal sexual activity; presumption of HIV infection or drug use; and differential socioeconomic status among racial minorities. The illegal nature of sex work in much of the world, coupled with the likelihood of male sexual partners, engenders an environment of multilayered marginalisation. Even in locales with high acceptance of sexual diversity, the commercial nature of sex work creates a milieu removed from traditional gay community norms, which—according to power dynamics—favours riskier sexual practices. In many places, although men from diverse backgrounds engage in commercial sex, society’s most
### Table 3

<table>
<thead>
<tr>
<th>Study location (country)</th>
<th>Sampling method</th>
<th>Male sex workers (n)</th>
<th>Underlying behaviour change theory</th>
<th>Prevention evaluation results</th>
<th>Findings and suggestions for further research or intervention development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simon, 1993&lt;sup&gt;19&lt;/sup&gt; New Orleans (USA)</td>
<td>Convenience (street)</td>
<td>211</td>
<td>Health belief model</td>
<td>NA</td>
<td>Risk-taking associated with economic dependency on sex work, high pleasure in sex work, and diminished control over the situation. Perception of severity of HIV not associated with risk behaviour. Increased perceived susceptibility and perceived benefit of condom use associated with increased risk-taking behaviour.</td>
</tr>
<tr>
<td>Ziersch, 2000&lt;sup&gt;20&lt;/sup&gt; London (UK)</td>
<td>Convenience (escort agencies)</td>
<td>88</td>
<td>Peer education and role-modelling</td>
<td>Inconclusive</td>
<td>Intervention increased referrals but failed to change knowledge of HIV and sexually transmitted infections and risk behaviour. Collective action (social transformatory model) might be more appropriate than peer-education model.</td>
</tr>
<tr>
<td>Lippman, 2010&lt;sup&gt;21&lt;/sup&gt; Corumba (Brazil)</td>
<td>Convenience (bars)</td>
<td>&gt;100</td>
<td>Peer education</td>
<td>Ineffective</td>
<td>Interventions previously provided have been discontinuous and diffuse in focus. Bar-based interventions need to be developed that are focused on behaviour and agency, not identity, and that build peer and managerial support.</td>
</tr>
<tr>
<td>Williams, 2006&lt;sup&gt;22&lt;/sup&gt; Houston (USA)</td>
<td>Targeted sampling (street)</td>
<td>399</td>
<td>Harm reduction; theory of reasoned action; social-cognitive theory, rational choice theory</td>
<td>Effective</td>
<td>Prevention activities among male sex workers must be brief; targeting HIV-positive individuals should be developed. Younger, heterosexual, HIV-negative male sex workers were least likely to complete the intervention. Interventions with social-cognitive theory and theory of reasoned action components were no more effective than basic harm reduction.</td>
</tr>
<tr>
<td>Reisner, 2008&lt;sup&gt;23&lt;/sup&gt; Boston (USA)</td>
<td>Convenience sampling</td>
<td>32</td>
<td>NA (formative)</td>
<td>NA</td>
<td>Intervention development activity using qualitative research indicated need for multipronged, incentivised, comprehensive risk counselling and services-type interventions that also attend to legal needs.</td>
</tr>
<tr>
<td>Padilla, 2008&lt;sup&gt;24&lt;/sup&gt; Santo Domingo and Boca Chica (Dominican Republic)</td>
<td>Respondent-driven sampling</td>
<td>72</td>
<td>NA (formative)</td>
<td>NA</td>
<td>Individual-level or behavioural-level approaches unlikely to be effective in altering important contextual factors contributing to HIV risk. Work should be developed that are comprehensive and multi-level and that reduce stigma associated with male sex work. More focus should be given to understanding context relative to more proximate behavioural determinants.</td>
</tr>
<tr>
<td>Infante, 2009&lt;sup&gt;25&lt;/sup&gt; Mexico City (Mexico)</td>
<td>Convenience sampling</td>
<td>36</td>
<td>NA (formative)</td>
<td>NA</td>
<td>Targeted interventions are not currently offered. Interventions should be developed that address structural vulnerabilities: access to health care, prevention information, and methods; community social support; stigma and discrimination; and sexual exploitation.</td>
</tr>
<tr>
<td>van der Elst, 2009&lt;sup&gt;26&lt;/sup&gt; Mombasa (Kenya)</td>
<td>Not provided (newly enrolled cohort study)</td>
<td>259</td>
<td>NA (survey methodology)</td>
<td>NA</td>
<td>Though not appropriate for male sex workers with poor reading skills (about 20%), ACASI might derive more honest responses on sexual risk behaviours in intervention surveys compared with face-to-face interviewing in locales with high homophobia and sex work-related stigma.</td>
</tr>
<tr>
<td>Lippman, 2010&lt;sup&gt;27&lt;/sup&gt; Corumba (Brazil)</td>
<td>Not provided</td>
<td>19</td>
<td>Social-environmental cohesion, networks, resources</td>
<td>Effective</td>
<td>Increased perceptions of social cohesion were marginally associated with fewer unprotected sex acts. Wider access to and better management of social and material resources were significantly associated with fewer unprotected sex acts.</td>
</tr>
<tr>
<td>Zhao, 2011&lt;sup&gt;28&lt;/sup&gt; Shenzhen (China)</td>
<td>Time-location sampling</td>
<td>394</td>
<td>NA</td>
<td>Suggestive</td>
<td>Current health promotion efforts in entertainment venues are probably effective. More attention should be paid to male sex workers in parks and family clubs, targeted at migrant male sex workers from areas with high prevalence of HIV.</td>
</tr>
<tr>
<td>Geibel, 2012&lt;sup&gt;30&lt;/sup&gt; Mombasa (Kenya)</td>
<td>Time-location sampling</td>
<td>425 (baseline); 442 (follow-up)</td>
<td>Peer education, HIV counselling, testing, and referral services, drop-in centre, condom distribution</td>
<td>Effective</td>
<td>Increased uptake of HIV testing, increased condom use with male partners (both paying and non-paying); increased knowledge of HIV risk from unprotected anal intercourse; Peer education dose–associated with condom use for anal intercourse with male paying partners; HIV testing uptake; drop-in centre attendance; and knowledge of HIV risk from unprotected anal intercourse.</td>
</tr>
</tbody>
</table>

*Findings and suggestions for further research or intervention development (Table 3 continues on next page)*
vulnerable men are more likely to become involved, frequently in less secure conditions, and they might also increase their vulnerability: in the USA, young men who engage in commercial sex show disparately higher rates of depression and substance misuse, which can persist after involvement in sex work, perhaps attributable to the stresses of endured stigma.58

Most public policies affecting male sex workers represent structural barriers to care rather than improved access to it. Broadly, three categories of criminalisation intersect with male sex work: the illegality of sex work, of same-sex practices, and of non-disclosure of HIV infection. These policies or stigmatising contexts might drive male sex workers to emigrate to countries with supportive legislation and improved working environments.96 For example, some countries in eastern Europe have adopted punitive laws analogous to those existing in Sweden, in which buying or selling sex is targeted with misdemeanour or criminal charges; male sex workers from this region have been known to migrate to countries in central and western Europe, such as Germany and Switzerland. The relation between criminalisation of same-sex practices and difficulty in researching and addressing the HIV prevention, treatment, and care needs of MSM has been well described in scientific literature. Moreover, criminalisation of non-disclosure of HIV infection is relevant to male sex workers in many countries because of the efficient transmission of HIV during anal intercourse and the persistent need for male sex workers to have many sexual partnerships to support income. In view of the complex risk environment for these men, and akin to other populations, the most effective intervention designs possibly represent combinations of behavioural, biomedical, and structural approaches.

Intervention designs should probably be very specific to local context, paying attention to the legal framework, levels of visibility, and specific identities of male sex workers, and the availability of HIV services that are both general and focused on MSM. By no means should interventions expose male sex workers to public sight beyond their own choices and legal threats should be specifically prevented.

In various contexts, formative research suggests that individual-level and network-level interventions incorporating incentivised harm-reduction approaches,99 access to social services and resources, and medical (including mental health) care could be coupled with community-level antistigma campaigns114 for maximum effectiveness. Biobehavioural approaches that include use of antiretroviral drugs for pre-exposure and postexposure prophylaxis are relevant options for male sex workers.102 Some male sex workers report difficulties negotiating condom use during anal sex with clients, or they might accept higher rates for unprotected sex; these

### HIV prevention, treatment, and care

Despite the high burden of HIV infection and amplified risk status, few intervention studies have addressed specifically the needs of male sex workers (table 3).45,53,81,96–110 Randomised controlled trials of techniques to help male sex workers reduce their HIV risk are scarce, although many methods for MSM and female sex workers have been tested. The need for HIV-prevention programmes targeting male sex workers is pressing, because of the efficient transmission of HIV during anal intercourse and the persistent need for male sex workers to have many sexual partnerships to support income. In view of the complex risk environment for these men, and akin to other populations, the most effective intervention designs possibly represent combinations of behavioural, biomedical, and structural approaches.

TABLE 3: Reported HIV prevention studies for men who sell sex

<table>
<thead>
<tr>
<th>Study location (country)</th>
<th>Sampling method</th>
<th>Male sex workers (n)</th>
<th>Underlying behaviour change theory</th>
<th>Prevention evaluation results</th>
<th>Findings and suggestions for further research or intervention development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liu, 2012109</td>
<td>Convenience</td>
<td>28</td>
<td>NA (formative)</td>
<td>NA</td>
<td>Interventions for money boys should include psychological assistance, information on sexually transmitted infections and risk reduction, physical safety, and employment skills. Internet-based information pages and education provided by managers (“mommys”) are suggested.</td>
</tr>
<tr>
<td>Resa-Paul, 2012110</td>
<td>Purposive sampling</td>
<td>Not provided</td>
<td>Structural drop-in centre, police liaisons, peer education, rapid response teams</td>
<td>Effective (male and female sex worker aggregate data)</td>
<td>Structural interventions (drop-in centre, police liaisons, rapid response team) and peer education associated with longitudinal decrease in violent incidents reported by sex workers (male and female sex worker results aggregated)</td>
</tr>
<tr>
<td>Friedman, 2013109</td>
<td>Convenience</td>
<td>119</td>
<td>RESPECT and enhanced RESPECT;109 rational choice theory</td>
<td>NA (baseline results only)</td>
<td>Bisexually behaving male sex workers might benefit from network-level interventions that include mental health care and substance use treatment components.</td>
</tr>
</tbody>
</table>
to end violence against women and girls. The global slogan of last year’s campaign was: “1 billion rising for justice”.

Figure 2: STAR-STAR supporting the V-day campaign in Macedonia, 2013

For more on V-Day see http://www.vday.org/

situations could arise, in particular, for male sex workers of low socioeconomic status working in open-space venues who have concurrent psychosocial risks for HIV. Innovations in HIV testing are important for addressing the crucial problem of undiagnosed infections. In view of scant targeted services, substantial social stigma, and a high incidence and prevalence of HIV among many male sex workers, individuals who acquire HIV infection might remain undiagnosed for a long time. Addressing the needs of male sex workers living with HIV is vital to ensure that their own health needs are considered, including prevention of HIV superinfection and onward transmission of HIV to all sexual partners. Furthermore, mean and total viral load in a population has been linked to population-level transmission rates of HIV. For male sex workers, antiretroviral-based prevention approaches are a relevant option, because these drugs might enable them to control their HIV risk not solely with condom use, although strategies to ensure adherence would be needed if such approaches were used. Intervention designs that help male sex workers remediate background risk factors such as substance misuse, depression, legal assistance, employment readiness, educational attainment, homelessness, and low social capital—while also providing HIV prevention and testing, medical care, and pre-exposure and postexposure prophylaxis—will be ideally suited to this population with multiple needs. Such an approach is being implemented and evaluated.

The role of structural changes to meet the needs of male sex workers, including amendments to legal frameworks, is fundamental in many parts of the world. In South Africa, protective constitutional provisions for gay men and other MSM are at odds with sex work remaining illegal. As a result, no national programme exists to address the needs of male sex workers, and such a task is covered in part by non-governmental organisations such as the Sex Worker Education and Advocacy Taskforce (SWEAT). The work of SWEAT and its allies resulted in the South African Government including decriminalisation of sex work in early iterations of its national health strategic plan, although decriminalisation was ultimately not included in the final national plan. Decriminalisation of sex work has been included again in the country’s revised 2012 current national health strategic plan, and the hope is that decriminalisation will take place during 2014–15. Such a move in South Africa would be akin to the Delhi High Court overturning Penal Code 377 (which criminalised same-sex activities) as a means of protecting public health. Decriminalisation of sex work and access to protective public health and legal structures would probably improve our understanding of health issues specific to male sex workers, increase service uptake, and—from an occupational health perspective—foster better working conditions. However, legal frameworks affecting MSM are increasing in complexity, with new laws enacted in Nigeria and Uganda and, in 2013, the reinstatement of Penal Code 377 in India. These laws might further limit the ability to address effectively the needs of male sex workers. In the USA and Canada, sex work is largely illegal; even in some Mexican cities, where sex work is quasilegal and registered, male sex workers do not typically register with municipal authorities for fear of adverse consequences. The provision of legal protection to adult film actors in Los Angeles, in addition to surveillance and treatment of HIV and sexually transmitted infections among this group, could be used as a model to deliver such services to the broader population of male sex workers, where legal and cultural contexts make such a move feasible. In Brazil, male sex workers can report sex work as an official occupation, facilitating access to social benefits, and this country has a history of antihomophobia social marketing campaigns sponsored by the government. However, recent government changes in Brazil might negate these advances in HIV prevention. Thus, although governmental entities are crucial stakeholders, communities of male sex workers need to be supported to provide an effective response to their needs.

Several active community-driven networks include male sex workers. For example, the Sex Workers Rights Advocacy Network (SWAN) operates in central and eastern Europe and central Asia and includes male sex workers on the steering committee and advisory board. SWAN is a network of civil society organisations engaged in advocating for the human rights of sex workers in central and eastern Europe, the Commonwealth of Independent States, and southeastern Europe. Another relevant regional entity for
male sex workers is the International Committee on the Rights of Sex Workers in Europe (ICRSE), of which most of the Board are sex workers. The ICRSE strives: to raise awareness about the social exclusion of female, male, and transgender sex workers in Europe; to promote the human and civil rights of all sex workers at national, regional, and global levels; and to create strong alliances between sex workers, allies, and other civil society organisations. Finally, the Global Network of Sex Work Projects (NSWP) is the biggest sex worker-led network and includes leadership from male sex workers. Small-scale resources include HOOK, which promotes safer sex work and positive cultural identity. In view of the recent proliferation of internet sites and smartphone applications among male sex workers to arrange commercial sex encounters (appendix p 8), new interventions provided in virtual spheres have great potential for saliency and reach, although they have—so far—been evaluated sparingly.

Moving forward

Men who sell sex represent a subset of individuals who have been mostly ignored to date in the context of the global response to HIV/AIDS. Although few studies and scant systematic surveillance have been done of the burden of HIV among these men, evidence indicates consistently that the HIV burden of this population has been sustained or is increasing, within the broader context of rising HIV rates among MSM. Several clear facilitators exist for HIV acquisition and transmission, including biological, behavioural, and structural factors. However, many public health questions about male sex workers remain poorly studied. In view of the diverse identities and contexts of male sex workers, to what extent could partly standardised definitions be used to facilitate programme design and implementation? How profound are the HIV-related health disparities of male sex workers, compared with other MSM, after controlling for multiple cultural factors (eg, young age, racial or ethnic minority status)? What are the factors at the individual, community, and structural level that mediate and modify HIV risks posed by commercial sex? How could male sex workers be offered comprehensive health services that, respecting their autonomy, can prevent escalation of their vulnerability? What are the positive and protective aspects of male sex worker involvement beyond immediate sustenance (eg, social capital, social mobility)? Does scientific stigma surround research into HIV prevention and does this obstacle manifest to limit our knowledge base?

Encouragingly, public and private funders are recognising that high-impact HIV prevention and care has to include key populations such as male sex workers, as part of comprehensive HIV responses. The numbers of programmes are increasing, such as STAR-STAR in Macedonia, which was founded and governed by male sex workers to support their peers (figure 2) and is funded partly by the Global Fund for AIDS, Tuberculosis, and Malaria. Moreover, USAID, the President’s Emergency Plan for AIDS Relief (PEPFAR), and the US Centers for Disease Control and Prevention are funding research into HIV prevention, treatment, and care and programming for male sex workers. Initiatives such as these are crucial to ensure a changing trajectory of the HIV epidemic among these men by strengthening community groups focused on the needs of male sex workers specifically to ensure provision and uptake of proven and emerging HIV prevention, treatment, and care strategies. Ultimately, dedicated advocacy, funding, surveillance, research initiatives, and a range of preventive options for male sex workers are essential not only for public health but also for social justice and human rights.

Contributors

Authors completed in-person and digital consultations for different regions: MRF for North America, CFC for Latin America and the Caribbean, SG for east Africa, KR for southern Africa, BB for Europe, DD for western Africa, and RC for Asia. KS provided access to UNAIDS country-reported data. CEH completed reviews and data abstraction for epidemiology and risk factors and MRF undertook these tasks for prevention approaches for male sex workers. All authors provided input and guidance on the idea and outline of the report. Every author wrote sections of the report, with guidance from SDB. SDB, MRF, and CFC incorporated the various sections while writing the final report.

Declaration of interests

We declare no competing interests.

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HIV and sex workers 6

HIV risk and preventive interventions in transgender women sex workers

Tonia Poteat, Andrea L Wirtz, Anita Radix, Annick Borquez, Alfonso Silva-Santisteban, Madeline B Deutsch, Sharful Islam Khan, Sam Winter, Don Operario

Worldwide, transgender women who engage in sex work have a disproportionate risk for HIV compared with natal male and female sex workers. We reviewed recent epidemiological research on HIV in transgender women and show that transgender sex workers (TSW) face unique structural, interpersonal, and individual vulnerabilities that contribute to risk for HIV. Only six studies of evidence-based prevention interventions were identified, none of which focused exclusively on TSW. We developed a deterministic model based on findings related to HIV risks and interventions. The model examines HIV prevention approaches in TSW in two settings (Lima, Peru and San Francisco, CA, USA) to identify which interventions would probably achieve the UN goal of 50% reduction in HIV incidence in 10 years. A combination of interventions that achieves small changes in behaviour and low coverage of biomedical interventions was promising in both settings, suggesting that the expansion of prevention services in TSW would be highly effective. However, this expansion needs appropriate sustainable interventions to tackle the upstream drivers of HIV risk and successfully reach this population. Case studies of six countries show context-specific issues that should inform development and implementation of key interventions across heterogeneous settings. We summarise the evidence and knowledge gaps that affect the HIV epidemic in TSW, and propose a research agenda to improve HIV services and policies for this population.

Introduction

Emerging data show the disproportionate burden of HIV in transgender women and transgender women sex workers (TSW) compared with other populations.1–3 Worldwide, HIV prevalence is about 19·1% in transgender women, with an odds ratio of 48·8 (95% CI 21·2–76·3) compared with the general adult populations.1 This prevalence is greater for TSW who have an estimated worldwide HIV prevalence of 27·3%.4 Laboratory-confirmed HIV data for transgender women is available from only 15 countries (one in North America, six in Asia Pacific, five in Latin America, three in Europe), which emphasises the need for greater attention to the HIV-related requirements of transgender women and TSW. In view of these data, TSW have been identified by UNAIDS as a key population at risk for HIV within the worldwide epidemic response.1

The term transgender refers to a diverse population whose gender identity or expression differs from their assigned sex at birth.1 Language about and recognition of this population vary by geography, ethnic origin, and culture, and continue to change over time. Transgender people are culturally recognised with specific social roles in some countries; in others, they receive little public acknowledgment.2,5 A subset of terms used for this population is presented in the appendix (p 1).

TSW have been reported in every continent, often in urban HIV epicentres. However, TSW and their partners and clients, have been largely absent from HIV national surveillance and programme interventions. Invisibility of TSW could be due to misclassification as men who have sex with men (MSM) or natal female sex workers, or attributable to systematic neglect. Sampling, methodological, and theoretical limitations in studies of TSW further undermine an effective public health response to the needs of this population.

The proportion of transgender women who sell sex is uncertain, because estimates are limited by non-probability sampling methods and different definitions of sex work. A US-based meta-analysis of HIV in transgender populations estimated that 24–75%...
Search strategy and selection criteria

For the review of HIV risks we searched PubMed (MEDLINE), EBSCOhost, and Cumulative Index to Nursing and Allied Health Literature (CINAHL) for English language articles. Additional sources included publicly available reports, health surveys, and needs assessments done in transgender communities by governmental and non-governmental organisations, including the US Department of State, the International Lesbian and Gay Association, the International Lesbian and Gay Human Rights Commission, and The UN Development Programme. Medical subject headings (MeSH) terms for transgender (including “transsexual”, “cross dresser”, “transvestite”, and “Travesti”) were cross-referenced with terms for sex work (including “sex workers”, “prostitution”); “HIV or AIDS”; “sexually transmitted diseases”; and “silicone or soft tissue fillers”. We searched for country reports in Google Scholar using “transgender” AND (country or region). This search engine was used to investigate structural risks for transgender women and transgender women sex workers cross-referenced against the key terms “stigma”, “discrimination”, “criminalization”, and “structural risks.” Abstract reviews were done on unduplicated references for relevance, with subsequent full-text review for data abstraction. Using the AACODS checklist, three reviewers (DO, MBD, AR) assessed non-peer reviewed reports to assess quality, including transparency of methods and presence of disaggregated data for transgender women or transgender women sex workers.

For the review of interventions we searched PubMed, Embase, Global Health, Scopus, PsycINFO, Sociological Abstracts, CINAHL, and Web of Science for peer-reviewed studies. Additionally, we searched the Center for Disease Control’s Compendium of Evidence-based HIV Prevention Interventions. Conference abstracts were searched from the online archives of the International AIDS Conference. The search included terms for HIV and terms for sex work (including “prostitution”), and terms associated with transgender (appendix). Active studies were searched on the NIH RePORTER database using the term “transgender”. Studies published or presented between Jan 1, 2009, and Jan 20, 2014 were included. The search was not limited by language, country, or setting. However, to meet inclusion criteria, the study had to assess an intervention for transgender women using a before and after design or comparison groups and measure one of the several outcomes: HIV testing, HIV infection, sexually transmitted infections, condom use, frequency of condomless anal intercourse, use of illicit injectable hormones or soft tissue fillers (eg, silicone). Three reviewers (TP, ASS, SIK) independently assessed the full-text articles of all selected abstracts for eligibility and data abstraction. Using the AACODS checklist, three reviewers (DO, MBD, AR) assessed non-peer reviewed reports to assess quality, including transparency of methods and presence of disaggregated data for transgender women or transgender women sex workers.

To address knowledge gaps about TSW, we review the HIV epidemiology and risk factors at the structural, interpersonal, and individual levels, and describe the prevention interventions for TSW. Our Review focuses specifically on sex work in transgender women, individuals categorised as male at birth who identify or express themselves as women irrespective of anatomy or medical interventions. Few data exist on sex work in transgender men, people assigned female at birth who identify or express themselves as men; thus, they are not included in our Review. We use mathematical modelling to assess the effect of various HIV prevention interventions on TSW in two distinct settings: Lima, Peru and San Francisco, CA, USA. Projections identify potential combination prevention interventions that are needed to halve the number of new infections within a 10-year period. Case-study scenarios provide descriptions of six regionally and epidemiologically diverse countries (India, Kyrgyzstan, Peru, South Africa, Thailand, and the USA) to show how structural, social, and epidemic contexts relate to HIV in TSW. First-person accounts emphasise why TSW must be included in the formulation of local and national HIV strategies.

HIV vulnerability: a complex interaction of multilevel risks

Structural risks: global discrimination

Because transgender women challenge gender norms, they are often socially, economically, politically, and legally marginalised. Discrimination against TSW stems from many forms of stigma relating to gender identity, gender expression, perceived sexual orientation, and involvement in sex work. Stigma could also be related to poverty, refugee or migration status, ethnic origin, substance misuse, and other factors. Published work from all regions has described the relation of stigma and discrimination with the general health and wellbeing of transgender women (appendix, p 3).

Legal environments worldwide express and sustain stigma for transgender women. In most countries, transgender people are either unable to obtain gender-appropriate legal identification or must undergo surgery to do so. Some transgender women do not want surgery to change their bodies. However, for those who want such procedures, the surgeries might not be covered by health insurance (either private or socialised). Undergoing surgery can be costly relative to the income of many transgender women, and few surgeons are trained to undertake genital reconstruction.

The absence of either a legally authorised or a gender-appropriate identification could heighten the risk of discrimination. Absence of a gender-congruent identification could affect access to a range of services, such as health care, education, employment, and voting rights. Many jurisdictions offer no effective and enforceable legal protections against such discrimination. These sociopolitical factors marginalise transgender women and can precipitate entrance into sex work. Stigma, discrimination, and no legal status of transgender identity restrict economic opportunities for transgender women. The financial benefits of sex work
for transgender women who have little access to the formal labour market have been reported.29 For example, sex work provides funds for livelihood and to pay for gender-affirming hormones, injections, and surgeries; and a more feminine appearance was reported to increase sex work earning power. Non-financial benefits of sex work for transgender women include a sense of community and social support from other TSW, and a sense of gender validation from male clients seeking their sexual services.23–24 Despite these potential benefits, sex work, particularly street-based sex work, could increase exposure to abuse and violence.25 Studies have reported an association between violence, reduced rates of condom use, and increased risk of sexually transmitted infections in TSW.25–27

TSW face many of the same structural risks as other sex workers.26 Police harassment, exploitation, arrest, and violence against TSW have been reported in many countries, particularly where sodomy laws and criminalisation of sex work are used to oppress TSW.27 Compared with male and natal female sex workers, TSW face greater violence from both police and clients.25–26 Furthermore, TSW might be at the bottom of the hierarchy of sex workers, because they receive lower pay than other sex workers despite engagement in higher risk activity.28 In addition to the laws used against male and female sex workers, laws prohibiting cross-dressing or impersonation of another sex are used to suppress the activities of TSW.25–27

Possession of condoms is often used by law enforcement as evidence of sex work.29 Consequences of this police practice include reduced access to condoms during sex work, reduced condom negotiation with clients, and increased condomless sexual intercourse in sex workers.29–31 Transgender women detained or imprisoned in connection with sex work are often placed in male facilities, where they are subject to both sexual and injection risks.29 These factors create a climate of intimidation and reduce the likelihood of adherence to safer sexual practices.30 Finally, TSW often report that sexual health services ignore their needs, focusing instead on other at-risk populations such as natal female sex workers or MSM.29–31

**Relationship risks: partners of transgender women**

The primary route for HIV transmission in transgender women is through condomless intercourse with male partners, including clients and stable and casual partners.11,27,28 Several studies have described how male partners can be an important source of gender validation for transgender women,25,27,28,29 which can undermine their intentions to engage in safer sex behaviour.30–31

Despite the crucial part played by male partners and clients in HIV risk in TSW,28 these men have been largely absent from the research literature or HIV prevention programmes.32–41 To our knowledge, no data specific to male clients of TSW have been reported. The sexual relationship patterns of men who have sex with transgender women show many concurrent partners in diverse sexual networks, including natal women, men, and transgender women.32–34 These diverse partnerships present opportunities for HIV transmission across populations.32–34 Emerging data suggest that male partners of transgender women might be more likely to engage in high-risk drug-using behaviour (eg, injecting drugs, selling drugs, injecting in prison) than drug users who do not partner with transgender women.33

Relationship status also affects sexual behaviour. TSW are more likely to have condomless receptive anal intercourse with stable partners than with clients.35–37 Within stable relationships, condomless receptive anal intercourse might show a sense of intimacy, but it has also been linked to higher rates of substance misuse and lower self-esteem and self-efficacy in transgender women.38,39 Additionally, many TSW report not knowing the HIV status of their partners.39 Thus, stable relationships could be an important source of HIV infection for TSW.

Unprotected sex with male partners is the primary proximal HIV risk for TSW. We need research to understand the diverse sexual behaviours, identities, and methods needed to reach both TSW and their partners. Similar to natal female sex workers, TSW are less likely to use condoms with stable partners. Thus, the feasibility and acceptability of couples-focused interventions for TSW and their partners should be assessed.35–37

**Personal vulnerabilities: mental health and gender validation**

Stigma, violence, and no social support have been associated with many mental health issues, including anxiety, depression, suicidality, and substance misuse.32,33,35–37 Over 60% of transgender women with a history of sex work had attempted suicide in one study.38 Life stressors, depression, low self-esteem, discrimination, and substance misuse have been linked to increased sexual risk taking in transgender women.33,34,35 High levels of drug use have been reported in transgender women, and drugs are often used in the context of sex with partners and clients.36–39

Transgender women who wish to feminise their appearance usually need hormone treatment and can undergo breast augmentation, facial feminisation surgeries, and genital surgeries.39 Transgender women face many barriers to accessing gender-related health care, including stigma and discrimination in medical settings, costly surgical interventions (often not covered by insurance), and few appropriately trained clinicians.32–35 Faced with these barriers, many use hormones without medical supervision and feminise their appearance with soft tissue fillers, such as industrial silicone, injected into the hips, buttocks, and breasts.39 Contaminated needles for hormone or silicone injections pose a potential risk for HIV transmission; however, reported frequency of needle sharing for hormones is low, and no confirmed reports of HIV transmission through this practice have been documented.31
Biological risks: shared and unique

Anal sex, particularly condomless receptive anal intercourse, is a highly efficient mechanism for HIV infection. Transgender women (TSW) engage in condomless receptive anal intercourse and insertive anal sex with clients and partners. Hormones used for feminisation can result in erectile dysfunction and interfere with correct condom use, thereby increasing HIV risk during anal insertive sex. New data suggest that medroxyprogesterone acetate (a hormonal contraceptive) can increase HIV acquisition and viral shedding in natal women; however, the effect of hormones used by transgender women on the susceptibility of the anal epithelium to HIV is unknown.

Only 11–16% of transgender women undergo vaginoplasty (appendix p 2). However, those who have had vaginoplasty could have additional risks through condomless receptive neovaginal intercourse. Although the intact stratified squamous keratinised epithelium of the neovagina might be resistant to some sexually transmitted infections such as gonorrhoea and chlamydia, the use of urethral mucosa or sigmoid colon in constructing the neovagina could confer an increased risk of infection. The mechanical (ie, abrasion) and physiological (ie, accumulation of sebum and retained semen or lubricant) factors to which the neovaginal lining is exposed could increase the risk of microtears, especially for TSW who have frequent sexual intercourse. Postoperative granulation tissue, which can persist after the initial healing period, is another biological risk.

Interventions to prevent HIV infection

Early HIV interventions for transgender women were behaviourally based and had mixed success. During the past 5 years, HIV prevention has changed substantially, with increasing evidence for the effectiveness of biomedical interventions such as microbicides, pre-exposure prophylaxis (PrEP), and early treatment. Evidence-based HIV interventions for transgender women include six peer-reviewed journal articles, two International AIDS Society (IAS) Conference abstracts, and five ongoing NIH-funded studies (figure 1). Details of each journal article are summarised in the appendix (pp 6–12). These studies took place in Peru, Laos, Thailand, the USA, and India. None were highly rigorous, with methodological rating scores ranging from 1 to 3 out of 8, and none focused exclusively on TSW.

The study of TSW in Lima, Peru compared characteristics of those seeking HIV testing at mobile outreach units with a fixed clinical site, and noted that the mobile unit was more likely to reach transgender women and to identify previously undetected HIV in this population. There were no data on the proportion of transgender women who engaged in sex work; however, findings from another study in the same city noted that 64% of transgender women report sex work as their main economic activity. The study in Laos assessed the effect of an integrated social marketing approach to HIV prevention in kathoey (a Thai term for transgender women), who were not asked about sex work. Intervention exposure was associated with a higher likelihood of condom use at last anal sex with casual partners and with greater use of water-based lubricant. However, the intention to use condoms with casual partners was reduced when water-based lubricant was available. Exposure to the Sisters programme in Thailand, a TSW-led HIV prevention programme that emphasises safe spaces and peer outreach, was associated with increased condom use at last sex with clients but not casual or stable partners. Greater than 90% of the study sample were sex workers. The pilot study in the USA assessed Girlfriends, a group-level HIV behavioural risk reduction intervention for adults. 38% of participants had engaged in sex work in the previous 3 months. After completion of the group sessions, participants reported fewer sexual partners and were less likely to have condomless anal sex with clients or condomless sex at last vaginal or anal sex with casual or stable partners.

Two studies in India (Andhra Pradesh and Tamil Nadu provinces) assessed the Avahan programme. Avahan is a well known large-scale HIV-prevention intervention for key populations worldwide. Established in 2003, Avahan

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Figure 1: HIV prevention intervention systematic search protocol and results

CDC=Centers for Disease Control and Prevention. IAS=International AIDS Society. NIH=National Institutes of Health.
includes community engagement and empowerment, peer outreach, treatment of sexually transmitted infections, condom and lubricant distribution, community mobilisation, and advocacy for an enabling environment. In Andhra Pradesh, transgender women and MSM were more likely to report consistent condom use after Avahan implementation compared with baseline; the proportion HIV-positive after implementation did not change. Whereas only 4% of the sample reported sex work as their main occupation, 38–52% reported ever having a paying male partner. In Tamil Nadu, transgender women (20–40% were TSW) had reductions in both syphilis and HIV prevalence after implementation of the programme compared with baseline.

The CDC compendium of evidence-based behavioural interventions has none tailored for transgender women. However, the website provides a link to information about adapting the SISTA intervention for transgender women of colour. SISTA is a group-level intervention shown to increase condom use in African-American women. T-SISTA, the adaptation guide, includes transgender-specific HIV vulnerability, sex work, adaptation examples and suggestions, and a Sheroes transgender pride campaign. No assessment of T-SISTA was reported in the published literature.

Two studies were identified in IAS abstracts from 2009 to 2013, one from the USA and the other was multinational. The USA-based study described an assessment of the Transgender Family Programme, which included the implementation of transgender-friendly clinic policies, standards, and training, and integration of HIV and gender care in a medical home model. The investigators did not describe the proportion of TSW, but they did report a significant decrease in sex work, needle sharing, unregulated hormone injections, and an increase in regular condom use in transgender women after participation in the programme. HIV prevalence in programme participants fell from 44% in 2007 to 38·3% in 2011 with one seroconversion during that period.

The other study was a secondary analysis of findings from the iPrex multinational study of PrEP in MSM and transgender women. In the 366 iPrex participants (15%) who self-identified as transgender women or who reported using feminising hormones, there was no difference in new infections (n=11) in the treatment versus placebo group. PrEP was estimated to increase risk by 4% for transgender women and decrease risk by 49% for MSM; however, this difference was not statistically significant (p=0·13). Although the presenters suggested various reasons for the difference, no data were provided.

In the NIH database of active studies, there are five studies designed to test or assess HIV interventions in transgender women: a feasibility study of an antistigma intervention in health-care providers in Mumbai, India to improve access to HIV services for hijra (a south Asian term for transgender women); a feasibility study of a

Figure 2: Conceptual framework for selected factors leading to increased HIV infection risk in TSW

Horizonal arrows show the association between higher level and biological factors, whereas vertical arrows show how effects in one domain can propagate to other domains. TSW=transgender women sex workers. STI=sexually transmitted infection. ART=antiretroviral therapy.
telemedicine approach to improve engagement in care in transgender women of colour in Washington, DC; a randomised controlled trial of the LifeSkills programme (a six-session, peer-led, group intervention for sexually active transgender women aged 16–24 years) in Boston and Chicago (although not restricted to TSW, the sessions address survival sex and sex work); a randomised controlled trial of T-Talk, a peer-led harm reduction and social support intervention for transgender women in New York City, NY, including TSW; and a pilot randomised controlled trial of Sheroes, a five-session group intervention based on gender affirmation in the USA.

**Testing and adherence in the midst of other health priorities**

Knowledge of HIV status and treatment adherence is essential for effective interventions based on antiretroviral therapy. In studies from Canada and Thailand only half of transgender women had ever been tested for HIV. Findings from other studies show that transgender women with HIV were less likely to receive antiretroviral therapy and less likely to report adherence than non-transgender participants. Transgender women who engage in sex work could face barriers to HIV testing and antiretroviral adherence due to similar structural factors that increase their vulnerability to HIV. Stigma, past negative experiences, prioritisation of hormone therapy, and concerns about drug interactions between antiretroviral drugs and hormone therapy affect adherence in transgender women. During a WHO consultation on HIV prevention in sex workers, TSW identified the need for recognition of their specific health-care requirements (eg, hormone therapy and gender-appropriate education materials) within HIV strategies and services. Culturally competent, gender-affirming HIV care that integrates transition-related needs could be an effective facilitator of engagement in care and antiretroviral adherence for TSW.

**Assessment of HIV preventive interventions for TSW by mathematical modelling**

Mathematical modelling was used to identify the combination of interventions needed to halve the number of new infections within 10 years in TSW in two diverse social and epidemiological settings for which sufficient data were available: Lima, Peru and San Francisco, CA, USA. This is a development goal of the UN General Assembly, and is a crucial first step to guide programmatic planning for HIV prevention. The cities differ in HIV care coverage, patterns of sexual positioning in TSW, and income level. We built a deterministic model of HIV transmission in TSW, their male clients, and male stable partners, accounting for sexual positioning and differences in behaviour in TSW with each partner type. The model was parameterised with and fit to data from each setting, and intervention effects were based on the findings of our Review and relevant interventions shown to be effective in other populations (ie, PrEP and early antiretroviral therapy; appendix, pp 13–30).

We assessed the effect of realistic changes in proximate determinants that directly affect infection (condom use, number of partners, infectiousness) and that can be quantified in a model. However, changes in proximate determinants can only be made through appropriate interventions that consider the upstream psychosocial, social, and structural factors as shown in our conceptual framework (figure 2). For example, legal rights and better working conditions could allow TSW to earn a higher income with fewer clients, thereby decreasing their risk, especially in settings where TSW have a high client volume. The table gives a description of the changes in the proximate factors modelled, their size relative to the baseline value, associated effectiveness, coverage, and the type of interventions that would be needed. Interventions were systematically tested to identify which coverage levels and combinations could reach the desired aim. Cost was not included in this analysis because our focus was
achieving substantial reduction in new infections in TSW. In Lima, when realistic coverage and effectiveness estimates are considered, the individual interventions with the greatest effect on incidence were increased condom use with clients (A) and decreased number of commercial transactions (C; figure 3). 50% reduction in new infections was achieved with a 20% increase in condom use with clients in combination with one of any of the other interventions. In the absence of an increase in condom use with clients, the combination of at least three interventions including a 20% increase in condom use with stable partners, and PrEP use in 20% of all TSW was needed, suggesting that reducing condomless sex with clients might be essential to achieve the proposed goal in this setting. In San Francisco, where coverage of antiretroviral therapy is higher and the number of clients lower, a 50% reduction in new infections needs the combination of at least four interventions. A 20% increase in condom use with clients and stable partners, a 20% PrEP coverage, and treatment of 80% of HIV-positive patients 1 year after infection would be needed, although other combination prevention scenarios result in similar reductions. In isolation, the most effective intervention is an increase in condom use with stable partners. A high proportion of TSW in San Francisco report having a stable partner (nearly 70%) and condom use is lower with partners than with clients.

Although early treatment can reduce HIV transmission in discordant heterosexual couples, no studies have examined its effectiveness in TSW. Our models estimate that test and treat of TSW would achieve more than 10% reduction in new infections in San Francisco and less in Peru due to lower coverage and testing frequency. Therefore, a combination of interventions that can include, but are not restricted to, early treatment might be

Figure 3: Proportion of new infections averted in transgender women sex workers (TSW) over 10 years with each intervention in isolation and in combination in Lima, Peru and San Francisco, CA, USA

The histograms are the best-fitting baseline epidemiological scenario. The error bars are the minimum and maximum effects obtained for the ten best epidemiological scenarios. A=condom use with clients (+20%). B=condom use with stable partners (+20%). C=number of commercial transactions (–20%). D=pre-exposure prophylaxis to 20% of all TSW (44% effectiveness). E=test and treat in TSW and stable partners (40% 2 years after infection in Lima, 80% 1 year after infection in San Francisco).
most appropriate for TSW. These modelling analyses showed that a 50% decrease in HIV incidence in 10 years is an achievable goal in these two settings when implementing a tailored combination of feasible interventions. However, sustainability is crucial as these interventions must be maintained throughout the entire period for the effect to be evident. Lasting change is best achieved through TSW-led strategies that address the distal (eg, violence) and proximal (eg, substance misuse) barriers to making those changes.

Panel: Community voices

Gulam, a peer educador with SWEAT, a local sex workers organisation, in Cape Town

I became a sex worker at the age of 19. I had finished school and my family left me alone in Cape Town. I had nowhere to go. I was living with people here, but I needed to have some income. I got into sex work through some of my friends at the time. I had never thought before when I had sex that people would pay something. But one guy paid me and that gave me a little bit of hope because in those days work was scarce and I did not have qualifications and skills. I realised that sex work is a type of work that you can do. It was so unexpected and it helped me a lot to get a stable life and to support myself, to pay my way through life.

But there are challenges—we face a lot of challenges, from client abuse to police harassment, and interpartner relationships. It is difficult, especially when the community start discriminating against you. There is a lot of stigma that goes around. Transgender women get that unwelcome feeling, they feel rejected at the clinics and the health-care service, and they feel discriminated against. Sometimes they do not attend their own clinics in their communities—they would rather go somewhere else, or they call us, so that one of us can go fetch them and take them to a friendly clinic, because we run a support group for transgender sex workers. For us, the coordinators and facilitators, we need to be strong, because somebody needs to be strong for them, so that at the end of the day when they leave our group they can feel relieved.

We do sensitisation at the clinics, from the receptionists up to the sister in charge. We want to show them that all people are human beings, and health care is there for everybody. Because who knows what the face of a sex worker looks like? To me, everybody is a sex worker. The best thing for me about being a peer educator is when we go out and we give our services to the sex workers, the faces that you see, the relief, they do not even have words to say thank you because they are too overwhelmed with the help that we give them. We help them at the Department of Home Affairs, assist them to attend clinics, assist them at hospitals, and assist them if the police arrest them. We make our voices heard—on what basis do these people have to suffer, they are human beings and they obey the law.

So it gives me great pleasure at the end of the day to say, “another day, another job well done”. You do not need a medal, just a simple thank you. I love my job and I love what I am doing, and I will still be doing it for many years to come, even when I am old and grey and retired my voice will still be there to be heard.

Joya Sikder: the journey of a hijra (transgender) from a sex worker to President of the National Platform of Sex Workers and President of Somporker Noya Setu, a national community based organisation (CBO) working for the rights of sexual minorities, in Dhaka, Bangladesh

I realised I was different when I was 8 or 9 years old. I loved cross-dressing, playing with girls, and being feminine. The ridicule started from my family and continued at school. When I was only 12 years old, I was raped by a neighbour on my way to school. It was a terrible experience, and I stopped going to school after that because of fear, denial, and guilt.

Later, I met some hijra and for the first time, I realised that I am a hijra. I used to visit them every day, and I learnt their special language called ulti. At age 16, I came to Dhaka with my family, and we were unexpectedly stricken by extreme poverty. There, I found some hijra who became my best friends. Once, I visited a hijra’s residence and two hijra were counting money, lots of money! My friends told me that this money came from the sex trade and it was their earnings from one night only! I was so convinced that I became a sex worker.

Life as a sex worker was full of humiliations. Forced sex, physical abuse, and theft were common. Stigma was overwhelming, and I might even be sent to prison for having sex with males. I did not want to accept this situation, so when CARE approached hijras to work with us in 1998, I became an outreach worker for my community. Initially, when I gave condoms to other hijras, they made fun of me, saying condoms are to prevent pregnancy. That changed in 1999 when a national surveillance study found that a lot of us had syphilis.

We started thinking about how to address stigma and protect ourselves from HIV and other sexually transmitted infections. In 2000, we formed Badhan Hijra Sangha, a CBO for the hijra community. I learnt a lot in the process of forming this CBO. I also worked on surveillances studies and with a DFID-funded research project with International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b). This was a wonderful experience for me. I learnt about professionalism, management, networking, adaptability, and it shaped my leadership skills. I formed and led a hijra improvisational theatre group, Rongberongthat, that performed in front of national and international audiences. I joined the global fund project of icddr,b in 2010 and have been continuing with this project through which I have received an opportunity to directly work for the hijra community of Bangladesh.

(Continues on next page)
I have attended workshops and represented the hijra community in several countries. These experiences helped to shape my dream: a society free of stigma and discrimination against sexual minorities. In 2009, I was elected as the President of the Sex Workers Network of Bangladesh and was able to work for all sex workers, including hijra sex workers.

With this experience, I formed another CBO in 2010, Somporker Noya Setu. Through this CBO, I address developmental needs, health issues, stigma reduction, and capacity building for all sexual minorities, not just hijra.

Stigma persists. Some of my family members still do not accept me as a hijra. But, at the end of the day, I forget all this pain when I think about the love and respect I have received not only from the hijra community, but from all sex workers and sexual minorities and from many others who work for our community. It will take time to eliminate stigma and for society to acknowledge people outside the male–female gender dichotomy.

However, the movement has started and we are on the right track. The Government of Bangladesh has officially approved the existence of hijra as a separate gender category in November 2013. Now I dream that based on this official approval, the hijra of Bangladesh will enjoy their gender identity along with males and females and their rights in all aspects as separate gender will be preserved and their lives will be protected.

**Rose’s story, Nepal**

Growing up, my family did not have a lot of money or social status in the city in Nepal where we lived. My family tried to give my sister and me a good education and life, but when I was 15 I started being harassed in school because I was more feminine than the other boys. I could not share this situation with my family, so instead I started skipping school to deal with the abuse.

When I realised at 17 that I wanted to become a woman—that I was transgender—I left school. I started staying overnight with my transgender friends in Kathmandu where I felt freer, and soon I had moved out from my home to a shared house with other transgender people. Slowly they introduced me to sex work as a means of getting money—because I did not have educational qualifications and now needed to support myself, it was the only way to make money. I also feared stigma and discrimination if I tried to get another job—I was dressing like a woman but the transition was not complete and they would know I was transgender.

I would sell sex every night, and I had to go everywhere and deal with clients of all ages. Once I was physically harassed by someone in the military—I was forced to have a sexual relationship with him, and as a younger person I did not know how to deal with the situation. I was too young to know I could say no. He threatened me that if I said no he would take me to the police.

I am still afraid to go to the health services because I am transgender. They do not understand and do not want to provide services to me. There is no specific place to go and have a check-up. I cannot access hormone treatment so I use contraceptive pills—I have taken two pills per day for 2 years.

Because of the stress of sex work, I decided to go abroad to the Middle East for work. My parents were pressuring me as their only son to make more money to support the family. I worked in domestic work but I was raped. Because I had been a sex worker I did not think I could report it, so I never told anyone. The household owner sent me back to Kathmandu where I now live.

My family still does not know I am transgender; when I go home, I wear my hair up and dress like a boy. I lead a double life, and it is really hard to manage.

There are many young transgender people like me who want to pursue an education, but they cannot due to the bullying and harassment. We are stuck in society, outside the social norms and without options for our future. Many young transgender sex workers try to commit suicide due to this stigma and discrimination. We have low self-esteem and other issues that are hard to overcome.

I would love to see laws and policies being implemented that protect our rights. I hope in the future that there is gender equality, so we do not have to hide and we can just be who we are. We want to access the things other young people access—education and employment.

**Country case studies: examining TSW risks in context**

Case studies provide contextual information that is essential for appropriate design and implementation of programmes for TSW. Six countries (India, Kyrgyzstan, Peru, South Africa, Thailand, and the USA) were selected to represent heterogeneous political, social, and epidemic contexts, and present data and gaps in knowledge. Countries were selected on the basis of geographical, epidemic, and demographic diversity, and whether there were data available from peer-reviewed publications or programmatic reports on transgender women or TSW from that country. Structural, social, and individual level data for each of these six countries were reviewed and are described in the appendix (pp 38–40). The case studies describe how comprehensive interventions identified by the modelling could be implemented in each setting.

Recent data related to the epidemic context for TSW have been identified in India, Thailand, Peru, and the USA. An early understanding of HIV risks and prevalence in transgender women in these settings arose from HIV research in MSM, although epidemiology and intervention research has begun to focus separately on transgender women, and particularly TSW. In these settings, there are opportunities to better understand the specific HIV-related risks and needs of TSW, and to test acceptable,
comprehensive, HIV prevention interventions. Thailand and India provide cultural contexts as countries in which transgender women have social (and now legal recognition, in India) as a third gender.

In countries such as Kyrgyzstan and South Africa, the understanding of HIV epidemiology in TSW is still nascent. Community-based and human rights organisations have increased visibility and mitigated stigma and violence against transgender people, including TSW. More research on HIV epidemiology and appropriate interventions for TSW are needed in these settings, ideally in collaboration with the community groups and human rights defenders already working towards the wellbeing of TSW. Detailed case-study descriptions for each country are provided in the appendix (pp 31–45).

Common themes, common struggles
TSW bear a disproportionate burden of HIV compared with other key populations worldwide (panel). Rigorous research, tailored interventions, and an improved environment for accessing HIV services have not progressed quickly enough. Although our aim was to identify and synthesise findings from studies worldwide, HIV research with transgender populations is scarce in sub-Saharan Africa, eastern Europe, and central Asia. Research is needed to understand the epidemiology and social context for TSW, and should begin by engaging existing transgender advocates and communities in those regions, and ensuring that data are disaggregated by sex, gender, and sex work status.

Where data were available, we note that stigma, discrimination, and exclusion from social and economic opportunities were common and served as the impetus for many transgender women to sell sex. For some TSW, sex work provides a way to find community and affirm their femininity.21,22,24,44 Within the context of sex work, economic distress and social disadvantage make it difficult for many TSW to protect themselves from HIV.41 The intersection of legal and social discrimination based on sex work, gender identity, and perceived sexual orientation form barriers to HIV prevention and care. Stigma, discrimination, and violence against TSW need to be addressed to enable them to protect their health.

Mathematical modelling has shown that reductions in sexual violence against natal female sex workers can lead to substantial reductions in new HIV infections,96 and the same outcome is probable for TSW. Victimisation, substance use, and psychological distress promote HIV risk in TSW.36,78 Lessons learned from large-scale interventions, such as Avahan, emphasise the importance of multilevel approaches that address structural and individual risks.78,99 Access to legal gender change, economic and community empowerment, strong support networks, culturally competent mental and behavioural health services, and appropriate gender-related care are key components of effective HIV interventions for TSW.36,38,90,91

Few evidence-based behavioural interventions exist for transgender women, and no interventions have been specifically designed for TSW. Although some NIH-funded studies are underway that might include TSW as a subset of transgender women, all but one are taking place in the USA, underscoring the need for intervention research in TSW outside North America.

Stratification by transgender and sex work status as the foundation for constructing scientific evidence
The lower effectiveness of PrEP in transgender women than MSM in the iPrex92 substudy raises questions about the best way to use this new HIV prevention approach. In our mathematical models, 20% PrEP coverage resulted in a 8–13% reduction in new infections in TSW. Strategically prioritising transgender women and high-risk MSM for PrEP could be a cost-effective intervention in some settings.93,94 However, both models assumed that PrEP was equally effective for MSM and transgender women. Acceptability of microbicides has been reported as greater than 90%95 but only 37% for PrEP.96 Research to confirm these findings and better understand the reasons for differences in effectiveness and acceptability is essential for the strategic use of PrEP in TSW.

Conclusions
Our Review, including the modelling analysis, was constrained by the limited quantity and quality of published research on HIV in TSW. Funders need to prioritise the research gaps for this population. An analysis of funding patterns at NIH98 showed that only 0·1% of all NIH-funded studies addressed lesbian, gay, bisexual, and transgender health concerns and, of that 0·1%, less than 7% studied transgender populations. The near absence of NIH-funded research helps to perpetuate health disparities.98 A greater prioritisation of TSW in HIV research, prevention, care, and treatment is necessary to address the gaps in data and services in this population that is burdened by HIV.

Contributors
TP and DO designed the Review and wrote the initial conceptual outline. TP wrote the first full draft of the manuscript. AR, SW, DO, MBD, and AS-S undertook the comprehensive literature review of HIV risk. TP, AS-S, and SIK did the systematic review of HIV prevention interventions. AB designed, completed, and described the modelling exercises. ALW developed and wrote the country case studies. All authors contributed to the interpretation of the findings and each author reviewed, edited, and approved the final manuscript.

Declaration of interests
We declare no competing interests.

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An action agenda for HIV and sex workers


The women, men, and transgender people who sell sex globally have disproportionate risks and burdens of HIV in countries of low, middle, and high income, and in concentrated and generalised epidemic contexts. The greatest HIV burdens continue to be in African female sex workers. Worldwide, sex workers still face reduced access to needed HIV prevention, treatment, and care services. Legal environments, policies, police practices, absence of funding for research and HIV programmes, human rights violations, and stigma and discrimination continue to challenge sex workers’ abilities to protect themselves, their families, and their sexual partners from HIV. These realities must change to realise the benefits of advances in HIV prevention and treatment and to achieve global control of the pandemic. Effective combination prevention and treatment approaches are feasible, can be tailored for cultural competence, can be cost-saving, and can help to address the unmet needs of sex workers and their communities in ways that uphold their human rights. To address HIV in sex workers will need sustained community engagement and empowerment, continued research, political will, structural and policy reform, and innovative programmes. But such actions can and must be achieved for sex worker communities everywhere.

Introduction

Women, men, and transgender people who engage in sex work face disproportionate burdens of HIV, HIV risks, and a scarcity of access to essential services. This is true in countries of low, middle, and high income, in concentrated HIV epidemics, and in generalised ones.

We must do better and we can. Improved efforts by and for people who sell sex can no longer be seen as peripheral to the achievement of universal access to HIV services and to eventual control of the pandemic.

Sex workers are an enormously diverse group working in a wide array of contexts—some in safety—and some in difficult and dangerous settings. In this Series, Shannon and colleagues show how structural measures can heighten risk of HIV, or markedly decrease it. Although governments and security entities, most notably the police, have crucial roles in helping to establish environments that support public health goals of safety and HIV risk reduction, they are often impediments to protection.

There is great optimism regarding HIV prevention. Breakthroughs in HIV treatment, prevention science, programme implementation, and human rights realisation have led to assertions that an AIDS free generation is possible. Advances in HIV prevention science relevant to sex workers were reviewed by Bekker and colleagues for women, by Baral and colleagues for men, and by Poteat and colleagues for transgender women, and show substantial promise. Uptake, adaptation, and successful use of these innovations by sex workers are crucial steps for the future. Yet, however far the global response to HIV can move towards the goal of universal access to these new interventions, Decker

Search strategy and selection criteria

We updated the 2012 estimates by Baral and colleagues to identify new publications since the last search and to do a global analysis that included high-income countries. We searched PubMed and Embase for studies published in English between Jan 1, 2007, and June 20, 2013. Articles and citations were reviewed with QUOSA information management software (version 8.05) and EndNote (version X4). The search included MeSH terms for HIV or AIDS, and terms associated with sex work (“prostitute”, “sex work”, “sex worker”, “HIV”, or “AIDS”). Other data sources were UNAIDS and national surveillance system reports, which included demographic health surveys, and integrated biobehavioural surveillance studies undertaken by large international non-governmental organisations.

We included studies and reports from countries of low, middle, and high income, with samples sizes greater than 50 female sex workers and of any design that measured the prevalence or incidence of HIV in female sex workers. Studies were accepted if clear descriptions of sampling, HIV testing methods (ie, laboratory-derived HIV status with biological samples from blood, urine, or oral specimens), and analytical methods were included. Excluded were studies with: self-reported HIV status, estimates derived from respondent-driven sampling that did not provide sample sizes, and non-weighted estimates. Studies in which female sex workers were not the main focus of the study were included only if results were disaggregated to provide results specific to female sex workers. Studies that required additional criteria, such as injection drug use or present incarceration, were excluded.
HIV epidemics in female sex workers are generally similar to the HIV burden in heterosexual adults in their surrounding communities, but with substantially higher HIV incidence and prevalence. The most burdened sex workers are African women and all countries with more than 50% HIV prevalence in sex workers are in sub-Saharan Africa.

Male sex workers have very high HIV risks and burdens, as a result of the high HIV incidence in gay, bisexual, and other men who have sex with men at risk worldwide.

The burden of HIV among transgender women sex workers is very high and HIV prevention and care is challenged by significant structural and social barriers.

Structural measures, including laws, policies, rights contexts, community organisation, and the physical and economic features of sex work have crucial roles in generation or mitigation of risks for HIV infection in sex workers. Models suggest that decriminalisation of sex work could avert 33–46% of new HIV infections in sex workers and clients during a decade, through its iterative effects on violence, policing, safer work environment, and HIV transmission.

Human rights violations against sex workers increase HIV susceptibility and undermine effective prevention. Many rights violations, including physical and sexual violence by police and other state groups, are the result of climates of impunity which must change.

Decriminalisation, expanded access to antiviral treatment for sex workers living with HIV, and community empowerment and engagement could have synergistic effects on reduction of HIV infections in sex workers.

and Kerrigan8 state that without a rights-based framework for HIV interventions, and participation, engagement, and empowerment of sex workers, HIV control will remain elusive.

When we reviewed the evidence about HIV in sex workers, we identified striking trends and problematic gaps. For the first two decades of HIV, female sex workers were central to many HIV research and programme efforts. Studies of HIV in women were either routinely undertaken within populations of female sex workers or included a substantial number of them. Community-based and led-intervention efforts, including the Sonagachi Programme and other efforts in Bangladesh, Thailand, Cambodia, Kenya, the Gambia, and Brazil, showed impressive reductions in HIV risk, and in other sexually transmitted infections (STI), before the antiretroviral therapy (ART) era.4,20,11

Several events and trends markedly changed this situation and slowed further progress. Controversy regarding the ethics of the first oral pre-exposure prophylaxis (PrEP) trials in women, which had been designed for female sex workers in Cambodia in 2004 and Cameroon in 2005, halted both studies. Many researchers moved toward less-contested populations.2 The 2003 so-called Prostitution Pledge policy requirement for US Federal (PEPFAR) funding reduced programmatic engagement with sex workers in some settings.2,13,14 This reduction has been associated with reduced financing of HIV programmes for sex workers, particularly programmes which funded organisations led by sex workers.22 Finally, the very high HIV incidence in women in southern sub-Saharan Africa from 2001 to 2005, meant that HIV studies which required HIV seroconversion endpoints (eg, microbicides, HIV vaccines, and PrEP) could be undertaken in the general population of reproductive-aged women, and would markedly reduce the necessity of recruiting sex workers. These trends led to a challenging new situation: there has been a substantial increase in effective HIV-prevention techniques and approaches—yet none of these advances have specifically been investigated in sex workers. Adaptation of these methods, and assessment of sex workers’ interest and effectiveness of their use in this group, is still to be done. Table 1 sets forth a research agenda to address these gaps.
The global burden of HIV in sex workers

Estimates of the global numbers of sex workers and their global HIV burden have been challenged by limitations in surveillance, research methods, and available data. Baral and colleagues did a systematic review and meta-analysis of HIV prevalence data in female sex workers in countries of low and middle income from January, 2007 to June, 2011. Data were available from 50 countries, and included HIV data for 99,878 adult women. Overall HIV prevalence was estimated at 11.8% (95% CI 11.6–12.0), with the highest burdens in sub-Saharan Africa (36.9% [36.2–37.5]) and eastern Europe (10.9% [9.8–12.0]). A comparison of these burdens with women of reproductive age in the same populations yielded a pooled global odds ratio (OR) of 13.5 (10.0–18.1).

We expanded these data to include high-income countries and updated prevalence estimates for countries of low and middle income countries from June, 2011 to June 20, 2013. The figure shows the global burden of HIV in female sex workers by 2013 from 79 countries (n=437,025 women). The appendix pp 1–12 shows the meta-analysis by region and country economy level. Sub-Saharan Africa remains the highest burden region with a combined HIV prevalence of 29.3% (25.0–33.8). Countries with more than 50% of sex workers with HIV are all in southern Africa. Differences in HIV prevalence across economic strata are marked but might be biased by an absence of data in high-income countries; neither the USA nor Canada collect HIV-surveillance data for sex workers.

The high HIV burdens in sex workers globally (figure), particularly in southern Africa, underscore the need for tailored interventions for sex workers with HIV. Although all sex workers need access to condoms, education, STI care, and other basic services, ART access for those with HIV is a treatment and prevention priority.

Prüss-Ustün and colleagues reported a population attributable fraction (PAF) analysis of the estimated proportion of HIV in women and of the number of HIV deaths in women attributable to sexual transmission in sex work. They estimated that globally, 15% (range 11.5–18.6%) of HIV infections in women in 2011 were attributable to sexual transmission in sex work, with the...
highest proportions in sub-Saharan Africa (17.8%, 13.6–22.1%). The proportion of new HIV infections within the past year that were due to sexual transmission in sex work is estimated to include nearly a third of new infections in Ghana, 14% in Kenya, and 10% in Uganda.\(^{17–19}\)

A microsimulation study showed a reduction in incident HIV infection in the total population of Kisumu, Kenya by 66% (range 54–75%) during 20 years with the removal of transmission in sex work.\(^{20}\)

For male sex workers, data for HIV burden are sparse. As of 2011, 51 countries provided data for this issue to UNAIDS.\(^6\) Four countries reported HIV prevalence of more than 25%, 12 between 12.5% and 25, and 35 less than 12.5%.

Global data for the burden of HIV in transgender sex workers are also scarce. A meta-analysis of data from 14 countries reported that transgender female sex worker had a higher burden of HIV (27%) than other transgender women (15%), male (15%), and female sex workers (5%). A report from Argentina showed that transgender sex workers were the most HIV-burdened group (33.9% HIV prevalence and an incidence of 11.3 per 100 person-years).\(^{21}\)

However, transgender women and transgender female sex workers are often incorrectly included in research as men who have sex with men (MSM) or female sex workers. Results stratified by transgender status are rarely available, which reduces the understanding of HIV epidemiology or intervention effects. The very high HIV burdens in transgender women argue for urgent action in research and interventions.

**Calls to action**

**The role of structural measures**

In the epidemiology paper of this Series,\(^7\) we reviewed the global epidemiology of HIV in female sex worker and the extent to which epidemiology considers structural measures (eg, laws, migration, and stigma; community organisation; social, policy, economic, and physical features of the work environment), with partner or dyad, behavioural, and biological factors in HIV transmission. We then modelled the potential course of HIV epidemics and potential reduction of infections through structural change in three epidemiological settings: high and medium prevalence, concentrated epidemics (India and Canada), and heavy HIV burden settings (Kenya).

Coverage and equitable access to condoms, ART, and HIV prevention for sex workers continues to lag. In countries with a heavy HIV burden such as Kenya, where access remains low and ability of sex workers to organise has been limited by criminalisation, stigma, and funding gaps, enhanced ART for sex workers and client populations to meet new WHO guidelines (CD4 count <500 cells per μL) could avert 34% of HIV infections in sex workers and clients if met with structural support (eg, reduction of stigma and discrimination). Even slight peer or sex worker-led outreach and support could avert a further 20% of infections in sex workers and clients over the next decade. These results support calls for multipronged structural and community-led interventions that substantially reduce HIV burden and promote human rights.

Our review and modeling emphasise that macrostructural changes (eg, decriminalisation of sex work; and addressing of migration and stigma), and work environment features (eg, reductions or elimination of violence, police harassment, and implementation of supportive venue-based policies and practices) that they engender, are crucial to stem HIV epidemics in sex workers and clients. In settings such as Kenya and Canada where sex work is criminalised and sexual violence against sex workers (by clients, police, partners, or strangers) remains endemic, elimination of sexual violence alone could avert 17–20% of HIV infections in sex workers and clients over the next decade. Access to safer work environments (eg, venues with supportive policies and practices on...
violence, HIV, and access to condoms) could substantially shift the course of epidemics. Decriminalisation of sex work could avert the largest percentage of HIV infections in sex workers and clients (33–46%) during the next decade, through iterative effects on violence, police harassment, safer work environments, and HIV transmission pathways.

**Prevention**

Reduction of the HIV transmissions associated with sex work and making sex work safer for workers and clients are key components to achieve universal HIV prevention.\(^2\) Bekker and colleagues\(^3\) describe an impressive array of prevention modalities that can be combined and applied to reduce the risk of HIV acquisition in female sex worker populations globally. In this era of biomedical advances, including topical and oral ARV-based PrEP and earlier antiretroviral treatment as prevention, it is crucial that these are additive, voluntary, and not at the cost of established prevention methods.\(^5\) Community-empowerment programmes such as Sonagachi\(^6\) and others\(^7\) have shown the effectiveness of sex-worker-led, rights-based programmes for a range of HIV-related prevention outcomes—although not HIV incidence—and these approaches can serve as the essential platforms for adaptation and uptake of the next generation of prevention approaches.\(^8\) These are occupational health approaches, which recognise sex work as work, that many people will continue to sell sex, and that a reduction in HIV risks and exposures is a key goal.\(^9\) Model simulations suggest that condom promotion and distribution in South Africa have already reduced HIV incidence in sex workers and their clients by more than 70%. Voluntary access to PrEP for sex workers with a test and treat approach could further reduce HIV incidence in South African female sex workers and their clients by 40% or more between 2015 and 2025.\(^5\) Biomedical ART-based interventions provide roughly more than 90% protection against transmission if used consistently.\(^10\) The great value of treatment with ART to individual health is clear, in terms of cost-effectiveness, and reductions in individual morbidity and mortality. Earlier effective treatment at community levels will also prevent further transmission of HIV to sex workers by reducing the pool of potentially infectious clients.\(^2\) Scale-up of coverage will be a challenge, therefore other promising approaches should be available and accessible. Male circumcision might also reduce the risks of female sex workers getting HIV by reducing the number of men with HIV infection at community levels, although this hypothesis has not been formally investigated. These approaches should be carefully added to tailored prevention packages that recognise and support safe workplaces and respect communities, which will go far to reduce HIV infection in sex workers.

**Community-empowerment responses**

Kerrigan and colleagues\(^8\) report that community-empowerment-based responses to HIV are significantly associated with reductions in HIV (OR: 0.68, 95% CI 0.52–0.89), gonorrhoea (OR: 0.61, 95% CI 0.46–0.82), chlamydia (OR: 0.74, 95% CI 0.57–0.98), and high-titre syphilis (OR: 0.53, 95% CI 0.41–0.69), and were associated with increased consistent condom use with clients (OR: 3.27; 95% CI: 2.32–4.62). Their review, which examined both peer-reviewed and practice-based evidence from sex worker-led initiatives, documented formidable barriers to implementation and scale-up of community-empowerment approaches despite the growing evidence of its effectiveness. Challenges include regressive international discourses and funding constraints, national laws criminalising sex work, and intersecting social stigmas, discrimination, and violence that includes those related to occupation, sex, and HIV status. These findings underscore the need for social and political change related to the recognition of sex work as work.

**Human rights and the law**

A rapidly growing evidence base confirms that human rights violations raise HIV vulnerability and undermine effective prevention.\(^1\) Punitive laws create substantial barriers to the access of justice, which creates a climate of impunity that fuels abuses by police and non-state groups alike. Many rights violations against sex workers represent gross misinterpretations of policy. Physical and sexual abuses by police, which include rape in detention, are completely outside of international law. Even when lawfully implemented, punitive laws preclude health and safety measures and often result in sex workers being incarcerated or detained, including in so-called rehabilitation centres, without access to HIV treatment or prevention. HIV prevention and treatment for sex workers requires laws, policies, and a social climate that enable their human rights. Furthermore, HIV-interventions themselves must abide by human rights guidelines and policy programmes; and practices that are coercive or discriminatory, such as mandatory or forced testing, or denial of care, must be ended. Policy shifts and innovative programmes suggest promise for the future for a rights-based HIV response. Shifts toward full decriminalisation, such as that in New Zealand, have improved human rights for sex workers, which include the right to health\(^1\) (panel 1).

**Male sex workers**

Risks of HIV acquisition have been reported at many levels for male sex workers including the efficient transmission of HIV in anal intercourse, high numbers of sexual partners, large and non-dense sexual networks, and compounded intersectional stigmas.\(^5\) Risk reduction for these men is impeded by laws criminalising sex work, homosexual acts or people, and HIV non-disclosure, and reduced access to HIV prevention and treatment. To address the complex needs of these men necessitates: synergisation of laws with public health policy so that available HIV prevention and treatment can be accessed by
Series

Panel 1: The Global Commission on HIV and the law

In 2011, the Global Commission on HIV and the law examined the relation between law and public health in the context of HIV. The 14 member independent commission, chaired by Fernando Henrique Cardoso (former President of Brazil), assessed research and submissions from more than 1000 investigators in 140 countries, and engaged parliamentarians, ministries of justice and health, judiciary, lawyers, police, and civil society in frank and constructive policy dialogue.

The Commission concluded that laws criminalising consensual adult sex and a range of other laws and legal practices, are undermining effective HIV programming with and for sex workers. The Commission noted that:

- Laws against consensual adult sex work impede HIV prevention, allow for police harassment and violence, and weaken sex workers’ ability to negotiate safe sex. These laws deterr sex workers from accessing services for HIV and other health issues and raise HIV vulnerability.
- Criminal laws conflate trafficking with consensual adult sex work, and the broad deployment of antitrafficking laws against sex work results in denial of human rights of people in sex work. The harms from this conflation have increased over the past decade because much HIV funding has been predicated on the acceptance of the conflation of trafficking with consensual adult sex work.
- Criminalisation of the clients of sex workers negatively affects sex workers and hinders effective HIV responses. This approach shifts sex work into underground settings with less security, more violence, and raised susceptibility to HIV, and worsens the lives of sex workers.
- Rights-based approaches that empower sex workers and engage law-enforcement officials are crucial for effective HIV responses. When the rights of sex workers are recognised, they are collectivised to protect their health, bodily integrity, and control HIV.

Progress is being made: sex workers are becoming increasingly organised and are demanding recognition that they do not lose their rights when involved in sex work. Some communities have had long experience with rights-based approaches to sex work, and data show that HIV and other health outcomes have improved. Some countries have moved away from the so-called rehabilitation centre model and other punitive approaches, and court decisions have begun to disentangle the conflation of sex work with human trafficking:—eg, the decision to strike down punitive conditions in development assistance.

The Commission concluded that countries should reform their approach towards sex work so that consenting adults involved in sex work are not punished but are ensured safe working conditions, and that sex workers and clients have access to services for HIV and health. Countries must take all measures to stop police harassment and violence against sex workers, which should include stopping mandatory testing for HIV and sexually transmitted infections. They should also ensure that enforcement of human antitrafficking laws is carefully targeted to punish those who use force, dishonesty, or coercion to procure people into sex work. Antitrafficking laws should be used to prohibit sexual exploitation of adults and children, but they must not be used against adults involved in consensual sex work.

Reformation of the legal environments related to sex work is not without political challenges, but it is the right thing to do. Such reformation is essential to curb the HIV epidemic and to ensure the realisation of human rights.

male sex workers; improvement in HIV surveillance; characterisation of context-specific HIV risks; and provision of comprehensive HIV prevention, treatment, and care programmes. An increase in access to basic prevention technologies, including condoms and condom-compatible lubricants, is necessary, but will probably be insufficient. Combination HIV-prevention programmes for male sex workers that address the biological drivers of HIV infection, including the strategic and tailored use of antiretroviral drugs such as post-exposure prophylaxis, PrEP, and rectal microbicide formulations, will probably be necessary for HIV-prevention success. High coverage of HIV-testing services with active linkage to CD4 testing, ART initiation, and retention services are core components to ensure optimum health outcomes and to reduce HIV transmission.

Transgender sex workers

Transgender sex workers face unique susceptibilities to HIV. Globally, social acceptance of transgender women is heterogeneous, and ranges from cultural acceptance to social stigma and criminalisation. Stigmatisation and criminalisation of cross-dressing, perceived homosexuality, and sex worker status, can create intensely hostile environments for transgender sex workers. Challenges related to legal identities often reduce their access to HIV services and other care. Few evidence-based HIV prevention interventions have been assessed in transgender sex workers and none address structural drivers. Better-quality research and surveillance are needed that clearly differentiate transgender women sex workers from MSM, female sex workers, and other transgender women. In sub-Saharan Africa and eastern Europe or central Asia where there are no data for this issue, researchers should engage and collaborate with local transgender communities to fill this gap. Mathematical modelling of data from distinct settings in San Francisco and Peru shows that even slight improvements in coverage of biomedical interventions might effect a 50% reduction in HIV incidence within 10 years. Rapid implementation of sustainable, community-led, combination-prevention strategies that address social, interpersonal, and individual risks of HIV,
and integrate gender care into HIV services are urgently needed (panel 2).

**Diversity and communality**

The great diversity of sex workers and of sex-work settings, contexts, and work environments is a challenge for the optimisation of HIV services. Although burdens of HIV infection in sex workers are generally similar, albeit at higher prevalence levels, to the HIV burdens in the populations of which they are a part,1 sex workers do share some communalities that transcend context and might need novel approaches to HIV prevention and treatment (panel 3).

**Multiple partnerships, antiretroviral coverage, and viral load in sex workers**

In high HIV prevalence networks, even slight risks can yield high probabilities of infection.30 The proportion of people on the basis of sexual orientation. All people, including adults, and children are entitled to equal rights and to equal access to HIV prevention, care, and treatment information and services. The promotion of gender equality is essential to HIV services. The promotion of gender equality is essential to HIV and effective public health programmes.

To defeat HIV and achieve universal access to HIV prevention, treatment, care, and support, nobody should be criminalised or discriminated against because of their gender, age, race, ethnicity, disability, religious or spiritual beliefs, country of origin, national status, sexual orientation, gender identity, status as a sex worker, prisoner or detainee, because they use or have used illicit drugs, or because they are living with HIV.

We affirm that all women, men, transgender and intersex adults, and children are entitled to equal rights and to equal access to HIV prevention, care, and treatment information and services. The promotion of gender equality is essential to HIV responses that truly meet the needs of those most affected. Additionally, people who sell or who have sold sex, and people who use, or who have used, illicit drugs, are entitled to the same rights as everyone else, including non-discrimination and confidentiality in access to HIV care and treatment services.

We express our shared and profound concern at the continued enforcement of discriminatory, stigmatising, criminalising, and harmful laws which lead to policies and practices that increase vulnerability to HIV. These laws, policies, and practices incite extreme violence towards marginalised populations, reinforce stigma, and undermine HIV programmes, and as such are significant steps backward for social justice, equality, human rights, and access to health care for people living with HIV and people most at risk of acquiring the virus.

In over 80 countries, there are unacceptable laws that criminalise people on the basis of sexual orientation. All people, including lesbian, gay, bisexual, transgender, and intersex people are entitled to the same rights as everyone else. All people are born free and equal, and are equal members of the human family.

Health providers who discriminate against people living with HIV or groups at risk of HIV infection or other health threats, violate their ethical obligations to care for and treat people impartially.

**We therefore call for the immediate and unified opposition to these discriminatory and stigmatising practices and urge all parties to take a more equitable and effective approach through the following actions:**

- Governments must repeal repressive laws and end policies that reinforce discriminatory and stigmatising practices that increase the susceptibility to HIV, and pass laws that actively promote equality.
- Decision makers must not use international health meetings or conferences as a platform to promote discriminatory laws and policies that undermine health and wellbeing.
- The exclusion of organisations that promote intolerance and discrimination including sexism, homophobia, and transphobia against individuals or groups, from donor funding for HIV programmes.
- All health-care providers must show the implementation of non-discriminatory policies as a prerequisite for future HIV programme funding.
- Restrictions on funding, such as the antiprostitution pledge and the ban on the purchase of needles and syringes, should be removed as they actively impede the struggle to combat HIV, sexually transmitted infections, and hepatitis C in sex workers and people who inject drugs.
- Advocacy by all signatories to this Declaration for the principles of inclusion, non-criminalisation, non-discrimination, and tolerance.

In conclusion we reaffirm our unwavering commitment to fairness, to universal access to health care and treatment services, and to support the inherent dignity and rights of all human beings. All people are entitled to the rights and protections afforded by international human rights frameworks.

An end to AIDS is only possible if we overcome the barriers of criminalisation, stigma, and discrimination that remain key drivers of the epidemic.

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**Panel 2: The Melbourne 2014 declaration**

**Nobody left behind**

All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood.

**Article 1, Universal Declaration of Human Rights, 1948.**

We gather in Melbourne, the traditional meeting place of the Wurundjeri, Boonerwurung, Taungurong, Djaawuwarung, and the Wathaurung people, the original and enduring custodians of the lands that make up the Kulin nation, to assess progress on the global HIV response and its future direction, at the 20th International AIDS Conference, AIDS 2014.

We, the signatories and endorsers of this Declaration, affirm that non-discrimination is fundamental to an evidence-based, rights-based, and gender-transformative response to HIV and effective public health programmes.

The great diversity of sex workers and of sex-work settings, contexts, and work environments is a challenge for the optimisation of HIV services. Although burdens of HIV infection in sex workers are generally similar, albeit at higher prevalence levels, to the HIV burdens in...
**Panel 3: Christine's story, Burma**

“I started selling sex when I was 18. When I was 15 or 16, I started taking [a form of] cough syrup as a drug. My friends were doing drugs, and then I got a boyfriend who also used drugs so we started doing it together. Then we broke up and I started trading sex for drugs.

In 2008, Cyclone Nargis hit my country. During the cyclone, my father passed away. After his death, I had to look after my family. Before the cyclone, I was not forced to sell sex; I could choose when and with whom, and I could say no. But after the cyclone, I had to go with any client that came. Some clients were good and some were bad. But I wanted to give my little sister and brothers an education, and my grandmother needed an eye operation.

To deal with the stress, I started taking more cough syrup. At first I didn’t take a lot, but then I started using it to get high and ease the pain. The drugs made me feel inner peace and also allowed me to do more work since I didn’t need to sleep. It was a circle of doing drugs, and needing money for drugs and my siblings’ education.

I had some health problems in the beginning, like excessive discharge, pain, and bruising. My fellow sex workers and I helped each other to heal our health issues. You need to have feelings like if you are happy or sad. I had an implant for birth control in case a condom broke, but I also used condoms and every 3 months went for an HIV test. I never wanted problems with the police, so whenever they wanted to have sex, I gave it to them for free. They didn’t care if I was tired or didn’t want to—they just told me they want it. Also, the police made us pay for their food in tea houses. If I went to do sex work in a different area of my city, I had to make a deal with the police chief of that area. Sometimes I had to give them money for alcohol.

Through having saved money, I finally managed to support education for my two younger brothers and my sister, and I was able to pay for my grandmother’s eye operation. I also got a job in an international non-governmental organisation, and they helped me to stop my [drug] addiction through keeping me busy with work but also providing me information about drug use. Having the job with the NGO made my grandmother so proud of me—she cried when I told her the news.

I do sex work sometimes when I travel because my job doesn’t pay me enough to break, but I also used condoms and every 3 months went for an HIV test. I still do sex work sometimes when I travel because my job doesn’t pay me enough to support my family. My salary is only 100 dollars a month. But I feel proud at what I’ve achieved.

I want to keep working on human rights issues, and also support other young people like me.”

HIV-infected people treated or untreated with ART has a crucial role in individual risks of HIV acquisition.\(^3\) Sexually-active people in networks with high viral load and low ART coverage are at higher risk of HIV infection.\(^3\) For individuals in serodiscordant relationships, earlier initiation of ART is effective for HIV prevention.\(^3\) But for those with many partners, who could encounter people at different stages of HIV infection (acute, recent, established, diagnosed, undiagnosed, treated, and untreated), the population levels of these parameters could be crucial. This might explain why women who sell sex in settings with high rates of HIV infection and low treatment coverage, as in southern and east Africa, have the highest global rates of HIV infection in sex workers. Theoretical models suggest that because of the preventive effects of ART, scale-up of ART access in Kenya for both female sex workers and their male clients to meet new WHO treatment guidelines of treatment initiation (at CD4 <500) could avert a third of new HIV infections in sex workers and clients during the next decade.\(^3\)

Because ART has been shown to substantially reduce onward transmission with the suppression of viral load, treatment for sex workers with HIV is an important prevention priority and an individual right and is essential to improved morbidity and mortality outcomes. Many sex worker community groups and advocates are rightfully cautious about HIV testing programmes targeting sex workers—in view of the rights violations inherent in ongoing mandatory testing programmes. Testing innovations, including self-testing, might help sex workers who wish to know their status free of coercion.\(^3\) Reduction in discrimination in health-care settings will also be a necessary part of successful treatment programmes. Too many sex workers are treated as unwelcome, unworthy, and undeserving of the treatment that they need.\(^4,5\) Violence and trauma have been shown to undermine treatment adherence, which underscores the need for trauma-informed approaches for sex workers, when relevant.\(^6–8\)

**Molecular epidemiology**

Molecular epidemiology informs the understanding of HIV transmission dynamics, spread of resistance, network and community level dynamics, and the role of acute and super-infection. Because sex workers share the potential risks of multiple partners, and for many, patterns of mobility and social mixing both for themselves and their clients, they might face some distinct biological challenges to HIV prevention and treatment. Sex workers have participated in many molecular epidemiological investigations, which include some early studies that showed the usefulness of molecular approaches to understanding of HIV outbreaks.\(^9,10\) Table 2 summarises some of the work regarding molecular epidemiology in sex workers.

Encouragingly, studies have investigated, but not identified, increases in ART resistance mutations in sex workers.\(^4,9\) Several groups have reported substantial clustering of HIV subtypes by sex-work status, clade differences from other high-risk groups, linkage with general population samples, and high proportions of dual, multiple, and recombinant HIV infections (table 2). These findings are consistent with multiple and repeated exposures. The molecular epidemiology of HIV in female sex workers is generally linked to heterosexual variants in the populations from which they come (table 2). Male and transgender sex workers, by contrast, typically cluster with MSM populations, and less so with either female sex workers or other heterosexual networks.\(^2,3,6,8\)

Female sex workers, and their distinctive risk exposures, have also been part of intensive research on
HIV-exposed seronegative individuals. Cohorts of female sex workers, who have remained HIV uninfected despite very high levels of exposure to HIV, have been studied in Kenya, Thailand, and Cote d’Ivoire since the 1990s.49–51 Although a wide range of immunological factors have been investigated to understand this occurrence and its implications for HIV prevention, no mucosal immunological finding yet fully explains why subsets of women who sell sex might not acquire HIV.49,52,53

Costing of a new response

Optimisation of HIV prevention for sex workers and clients needs estimates of the costs and benefits of interventions within national and local contexts, which are shaped by HIV epidemiology, patterns and characteristics of sex work, and economic, social, and policy environments. Unfortunately few cost-effectiveness studies focus on female sex workers (and none on transgender sex workers), and scarce data are available for intervention costs, infections averted, treatment costs saved, and disability-adjusted life-years (DALYs) averted. Mathematical models have begun to address some of these limitations by extrapolation of the benefits and costs of interventions for female sex workers. We reviewed the cost-effectiveness literature for individual-based and structural interventions for female sex workers and clients. Models of this series of biomedical and structural interventions for female sex workers allow estimates of the thresholds for these interventions to be cost-saving or cost-effective; these have also been reported (appendix pp 13–26).

A main HIV prevention strategy—to increase condom use in sex work—has long been identified as an economical strategy.54 Mathematical models of the epidemic in South Africa suggest that increases in condom use during sex work since 1990 prevented 66% of new infections in clients and 85% in sex workers in 2010.5 In sub-Saharan Africa and southeast Asia, peer or community counselling and condom distribution among female sex workers was estimated to be cost effective, at US$86 per infection averted and $5 per DALY averted (all costs from here expressed in 2012 US$), and was more cost-effective than school-based education, voluntary counselling and testing, prevention of mother-to-child transmission, and STI treatment.55 For the female condom, simulations suggest that distribution to rural Kenyan female sex workers would be cost saving,56 but substitution of female condoms for less-expensive male condoms that would otherwise have been used might reduce financial benefits.57 Female condoms might be most appropriate when the use of male condoms is not a viable prevention strategy.18

Microbicides and oral PrEP are promising prevention strategies, but more data are needed for efficacy, acceptability, adherence, and risk compensation. Models by Bekker and colleagues show that even with slight uptake and efficacy and reduced condom use, microbicide use by female sex workers in South Africa could prevent 1385 new infections in female sex workers and clients during 10 years, and save more than US$10 million in HIV-treatment costs (appendix pp 13–26). On the basis of estimated intervention costs in South Africa,29,40 microbicides are unlikely to cost less than the cost-saving threshold of $0.17 per sex act, but they could meet the highly cost-effective threshold of $2.17 based on international standards.51

Use of PrEP by female sex workers in South Africa would reduce incident infections in this population by 7.4% during 10 years and prevent nearly 3000 infections.5 General population person-year costs are estimated at $200 in South Africa,54 therefore PrEP for female sex workers would be cost-saving. However, for both microbicides and PrEP, additional expenditures might be needed to reach and engage female sex workers and to help with adequate coverage and adherence. Drug costs will be a major determinant—Truvada costs as much as $10000 per year in

<table>
<thead>
<tr>
<th>Population</th>
<th>Findings</th>
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<tbody>
<tr>
<td>Ssemwanga, et al40</td>
<td>324 HIV-positive FSW in Kampala, Uganda</td>
</tr>
<tr>
<td>Carobene, et al41</td>
<td>273 HIV-positive TG SW in Argentina</td>
</tr>
<tr>
<td>Merati, et al42</td>
<td>175 IDU, SW, and MSM in Bali, and Jakarta, Indonesia</td>
</tr>
<tr>
<td>Tran, et al43</td>
<td>264 FSW in Vietnam</td>
</tr>
<tr>
<td>Mehta, et al44</td>
<td>Many sources such as San Diego, USA, and Tijuana, Mexico</td>
</tr>
<tr>
<td>Pando, et al45</td>
<td>12 592 people: MSM, IDU, FSW, MSW, TGSW, and FDU, in Argentina</td>
</tr>
<tr>
<td>Land, et al46</td>
<td>240 people: mixed risk and FSW, in Nairobi, Kenya</td>
</tr>
</tbody>
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Table 2: Studies on the molecular epidemiology of HIV-1 in sex workers

FSW=female sex workers. TG SW=transgender sex workers. IDU=injecting drug users. MSM=men who have sex with men. CRF=circulating recombinant forms. NRTI=non-nucleoside reverse transcriptase inhibitor. PI=protease inhibitor. ARV=antiretroviral. FDU=female drug user.
Panel 4: Calls for action for stakeholders in the HIV response for sex workers

For communities
- Engage in SW community empowerment, and commit to activism.
- Advocate for community engagement as it is cost effective and reduces HIV risks.\(^5\)
- Advocate for universal access to services, including HIV services provided with dignity, safety, and confidentiality.
- Monitor the work of governments, donors, and multilaterals, and hold them accountable for adequate programming and policy to address HIV among SW.

For governments
- Decriminalise sex work. Decriminalisation can improve the risk environment.\(^1\,^3\)
- End impunity for crimes and abuses committed against sex workers.\(^3\)
- Advance evidence-based policies and practices in partnership with SW-led organisations.\(^5\)
- End discriminatory laws, policies, and practices against female, male, and transgender sex workers.\(^7\)
- Include sex workers in epidemiological surveillance and make results publicly available.
- Include civil society, including SW-led organisations, in national policy planning.
- Recognise sex work as work, and develop occupational health and safety standards, mechanisms to redress violence against sex workers and other violations of labour and human rights.

For donors
- Address the present underfunding of the responses to HIV among sex workers.
- Raise support for the research agenda for combination HIV-prevention and care services for SW.
- Novel and combined enhanced prevention and treatment programmes have not been investigated in SW. This needs to change.
- Support SW-led organisations at global, regional, and country levels.
- Empowerment models require funding of community-led organisations rather than organisations working with communities.\(^24\,^5\)
- Invest in strategic information about HIV and sex work.
- Reliable data for HIV and sex work is needed and should include access to ART and ART coverage; condoms and lubricants; comprehensive SRH services; migration and mobility; trafficking in people meeting the Palermo Protocol; gender-based violence; and affirmative action to address human rights violations towards sex workers.

Harmonise donor responses
- Interventions that compete with each other, including those driven by ideology and not science, reduce the scale and effectiveness of the HIV response in sex workers.\(^8\,^9\)

For implementers and providers
- Tailor care and support programmes for sex workers living with HIV.
- SW mainly live and work away from home communities. National and local support for the wider population living with HIV is unavailable to SW, and this needs to change.
- Scale up comprehensive HIV, STI, and SRH programmes for SW that are non-stigmatising and meet quality standards.
- SW face inadequate access to ART, condoms and lubricants; safe abortions and post-abortion care; STI management; contraception services; vertical transmission programmes; and maternal health services and drug treatment services.
- Act to reduce stigma and discrimination in health-care settings for SW.
- Refrain from participation in health programmes that are not evidence-based.
- Ensure training in culturally competent care for all personnel in clinical settings, including non-clinical staff (security, intake) who might interact with sex workers.

For researchers
- Partner with sex-worker communities and organisations to focus research efforts on questions of relevance to sex workers.
- Partnerships between researchers and sex-worker communities have led to some of the most robust research findings for HIV prevention.
- Investigate novel options for HIV prevention, treatment, and care for SW of all genders, including those in challenging policy environments.
- Take advantage of natural experiments to assess the effect of various sex work regulations on HIV incidence, prevention, care, and treatment.
- Dispel myths about sex workers that undermine access to HIV prevention, care, and treatment.
- Research can be a powerful method to dispel myths about SW.\(^1\)
- Expand implementation science and operations research to develop and refine HIV services for SW.
- Expand research of SW-relevant issues in understudied regions, including Africa, the Middle East, eastern Europe and central Asia.
- Very little prevention or treatment research has been undertaken in some crucial areas where HIV epidemics continue to expand.
- Expand research on HIV prevention and treatment for male and TG sex workers, particularly in regions where there are little or no data.
- No research has been done for, or with, male or TG SW in most countries worldwide. HIV data for TG women in general were available for only 15 countries in 2013.\(^76\)

SW=sex worker. TG=transgender. ART=anti-retroviral therapy. SRH=sexual reproductive health. STI=sexually transmitted infection.
some countries. Additionally, local variation in HIV, condom use, and patterns of sex work can substantially affect the effectiveness of microbicides and oral PrEP.

Periodic testing of HIV status and the offer of immediate treatment for female sex workers is an especially promising intervention. Mathematical models show that during a 40-year period in Vietnam, an additional 19% investment in HIV testing, counselling, and ART could prevent 31% of new infections at an estimated cost of $116 per DALY. For female sex workers in South Africa, a test-and-treat strategy during a 10-year period could reduce infections in clients by 23%, prevent nearly 34000 infections, and save $265 million in treatment costs. However, investments of more than $80 million would probably be needed to achieve these savings.

Individual-based interventions could need additional activities and resources when stigmatisation affects prevention programmes, condoms as evidence of sex work affects condom carriage and use, or social exclusion affects access to care. Community-based, structural interventions, by contrast, change these contexts through the creation of safer work environments, and a reduction in violence and police harassment.

Beatie and colleagues provide estimates of the effectiveness (but not the costs) of violence-reduction interventions for female sex workers, and modelling studies show that elimination of violence-attributable risk of HIV in various countries would substantially reduce HIV transmission. However, the investments required to achieve such benefits have not been established, and cost estimates are similarly needed for reduction of police harassment and creation of safer work environments.

To inform policy makers about the merits of sex-work decriminalisation needs better identification and...
quantification of the potential benefits and costs. In addition to HIV prevention, other societal benefits could include raised access to police protection, improved occupational health and safety in work, and the redirection of law enforcement and criminal justice expenditures towards health and social services. Even with rights-based law reform, advocacy and interventions led by female sex workers with police departments might be required to maximise the benefits in regard to reduced harassment and increased access to justice for female sex workers.

On the basis of their modelling, Shannon and colleagues estimated that decriminalisation of sex work would, during 10 years, avert 72 infections in female sex workers and clients in Vancouver, Canada; 233 in Bellary, India; and 1155 in Mombasa, Kenya. The cost-saving and highly cost-effective thresholds for the decriminalisation of sex work varies across these settings because of differences in the estimated number of infections averted, gross domestic product, HIV-treatment costs, and DALYs averted. The cost-saving thresholds are estimated to be around $24 million for Vancouver, $1-5 million for Bellary, and $12 million for Mombasa (appendix pp 13–26).

Several cost-effectiveness studies show the value of community empowerment. In Ahmedabad, India, empowerment, outreach, peer education, condom distribution, and free STI clinics were cost saving and eliminated more than 50% of incident infections in female sex workers and their clients. Two community-mobilisation interventions in the Dominican Republic were cost effective and reduced HIV by $523 and $1356 per DALY averted. Modelled scale-up of empowerment-based approaches in Ukraine, Kenya, Brazil, and Thailand during a 5-year period has shown reductions in around 8–12% of new infections in sex workers, with benefits further enhanced by scale-up of ART. Kerrigan and colleagues estimated that the cost per DALY averted with these community empowerment-based interventions would vary between countries: $87 in Ukraine and Kenya, $1448 in Brazil, and $3167 in Thailand. These studies are investigating how the prevention response could be improved, but much more research is needed. How is the cost-effectiveness of individual or combined interventions for female sex workers shaped by local and national contexts? How will the costs and benefits of tailored interventions overcome the unique barriers to HIV-risk reduction in female sex workers? And can resilience be strengthened and leveraged?

Conclusions

The component of global HIV and AIDS related to sex workers has been understudied and underaddressed for too long. Sex workers are in need of HIV services globally, and empowered and engaged individuals, collectives, and communities want and will use these services if they are available in safety, and with dignity and freedom from harassment. To recognise the diversity of sex workers and their environments and to appropriately tailor promising HIV interventions to the specific contexts are public health priorities. Many HIV interventions which meet criteria for efficacy or effectiveness, or both, would also be cost saving. In the present policy and funding climate in which some donors seek to transition to country ownership of HIV efforts, HIV programmes for sex workers might be challenged. All engaged in the HIV response must work to ensure that effective programmes for sex workers are supported and sustained in these transitions. Punitive approaches to sex work have hindered responses, and helped and abetted the HIV virus. Such occurrences are barriers to pragmatic and public health oriented approaches which can reduce transmission, save lives, and reduce violence and rights abuses against the women, men, and transgender people who sell sex. The rich evidence base for community-based interventions shows that when sex workers lead in interventions, real and measureable improvements in health and rights can be achieved. Together, community engagement and new biomedical methods for HIV prevention and treatment offer the promise of substantial reductions in HIV risks and burdens for sex workers in the future, and could reduce treatment costs and save lives. If these advances can be made available in policy contexts where carrying condoms is seen as a positive occurrence, where police protect sex workers from violence rather than perpetrate it, and where outcomes of policies are measured in reduced HIV infections, not increases in arrests, this component of the global HIV response could be markedly more effective (panel 5).

Contributors

CR did the original conceptualisation of the manuscript, drafted the outline, led the paper writing team, drafted the introduction diversity, molecular epidemiology sections, and contributed to tables 1 and 2, the figure, and panels. A-LC contributed to the human rights call to action, and to table 1 and panel 4. L-GB contributed to the prevention call to action section, and to table 1 and panel 4. JB contributed to the community empowerment call to action, and to table 1 and panel 4. KS contributed to the structural determinants call, and to table 1 and panel 4. DJK contributed to the community empowerment call and to tables 1 and 2. MRD contributed to the human rights and the law section. SDB contributed to the male sex worker call to action and to table 1 and panel 4. TP contributed to the transgender sex worker call to action. AIW led the systematic review and analysis for the global burden of HIV among sex workers section and contributed to the figure, and to the appendix (global burden of disease). BWW led the costing analysis section and drafted that section, and the appendix (costing). FB-S contributed to the policy and human rights analysis. MK contributed to the policy and programme components and to panel 4. MS contributed to the prevention and implementation components of the manuscript and to panel 4. K-LD contributed to the prevention call to action and to panel 4. M-CB led the modelling work for the structural determinants call to action and contributed to the introduction and conclusions. SAS contributed to the conceptualisation of the manuscript and to the overall writing and editing of the manuscript.

Declaration of interests

We declare no competing interests.
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