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Structural determinants of HIV/STI prevalence, HIV/STI/SRH access, and condom use among immigrant sex workers globally: a systematic review

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Abstract

Objective: Given stark health inequities among precarious and criminalized workers, we aimed to apply a structural determinants framework to systematically review evidence on HIV/STI prevalence, access to HIV/STI/SRH services, and condom use among im/migrant sex workers (ISWs) globally.

Methods: Systematic search of peer-reviewed English studies (2009–2019). Eligible studies reported HIV/STI, access to HIV/STI/SRH services, and/or condom use and/or lived experiences among ISWs. Quantitative and qualitative data were synthesized using a structural determinants framework.

Results: Of 425 studies screened, 29 studies from 15 countries were included. HIV prevalence ranged from 0.3%–13.6% and varied across settings, with highest prevalence among undocumented ISWs in a high-income country (Portugal). Precarious immigration status was a structural factor associated with poorer HIV/STI outcomes, whereas qualitative narratives showed ISWs' lived experiences as strongly shaped by policing and stigma. Despite disparities, in some settings, HIV and STI prevalence were lower and odds of condom use with clients were higher among ISWs relative to non-im/migrant SWs. This review identified a paucity of research on SRH and male and gender-diverse ISWs. Across legislative settings, criminalization of SW and im/migrant status, policing, and migration-related marginalization were prominent structural barriers to ISWs' HIV/STI/SRH access.

Conclusion: This review identified important inequities and variation in HIV/STI prevalence among ISWs globally. Our findings highlight impacts of the intersections of migration and criminalization, and suggest a need to reform criminalized SW laws; address punitive policing and immigration enforcement; enable safer indoor work environments; and expand community-based interventions towards promoting HIV/STI/SRH access and health equity among ISWs.

Keywords

Migrant sex work; sex work; HIV/STIs; health inequities; sexual and reproductive health; condom use

Background

Globally, sex workers (SWs) continue to face egregious health inequities, with disproportionate burdens of HIV, STIs and workplace violence that vary substantially by policy contexts[1,2]. Structural barriers including criminalization, punitive law enforcement, and stigma have been documented to restrict access to HIV/STI prevention and health services[1–3] to shape SWs' health outcomes. These barriers are amplified among international im/migrant[4] sex workers (ISWs), who may additionally face racialized policing, precarious immigration status, language barriers and discrimination in destination settings[5–8]. The COVID-19 pandemic has highlighted health and labour inequities faced by informal/precarious workers, including concerns regarding racialization, poor working conditions, and exclusionary immigration policies, underscoring the need to ensure that public health policies don't leave marginalized ISWs behind.

Research has highlighted varied motivations for im/migrants' engagement in sexual labour, which represents an intentional, calculated economic strategy for ISWs in diverse settings[8–13]. Despite calls for deeper examination of marginalized, criminalized workers' experiences[14,15], ISWS' health needs are not well-characterized in the literature. Further, research involving ISWs has focused largely on infectious disease, with insufficient attention to broader issues of labour conditions, healthcare access, and equity.

Platt et al conducted the most recent review in this area in 2013; comparing HIV/STI prevalence/incidence and health-related harms by migration status among female SWs globally[8]. Given the documented role of macrostructural determinants in shaping SWs' health[3], there is a need to further synthesize recent evidence and examine the ways in which structural factors (i.e., SW/immigration laws, policies, policing strategies, economic/linguistic/cultural context, work environments) impact ISWs' access to HIV/STI and sexual and reproductive health (SRH) services[1,16–19]. Beyond ISWs representing a key population in the HIV response, there is a need to critically review existing evidence to inform broader policy recommendations towards addressing health and labour inequities among this group.

Methods

We applied a structural determinants framework[19](Figure 1) to systematically review current evidence on HIV/STI prevalence/incidence, access to HIV/STI/SRH services, and condom use among ISWs globally. This review was conducted using the PRISMA guidelines[20].

Search strategy

We searched OVID Medline and EMBASE to capture records reflecting three search domains: im/migrant status, SW, and selected HIV/STI/SRH outcomes. Search terms are presented in Appendix 1. We developed this strategy in consultation with a qualified librarian. Studies were restricted to English language, and our initial search returned 425 unique references.

Inclusion

Eligible studies reported HIV/STI, access to HIV/STI/SRH services, and/or condom use outcomes and/or lived experiences among ISWs. Articles were initially included if they were peer-reviewed quantitative/qualitative/mixed-methods studies, matched at least one term within each of the three domains, and published January 1 2009-March 11 2019. We selected this time frame to examine evidence published after Platt et al's 2013 review. Studies were included if the sample involved SWs and defined the proportion of international (cross-border) im/migrant participants[1]. Given that Platt et al's review was restricted to female sex workers[8], we included studies involving SWs of any biological sex, gender identity and expression[2]. Of these studies, articles were included if they presented data on HIV/STI prevalence/incidence; HIV/STI/SRH services access; condom access; or condom use. To be included in the final review, studies had to report outcomes with the above-mentioned criteria through either appropriate statistical tests, estimation of effect measures and confidence intervals, or qualitative methods. See Appendix 2 for operational terminology and outcome definitions.

Search protocol and data extraction

We conducted the database search; compiled studies matching one or more terms for each search domain; then evaluated articles in three stages: 1) reviewing titles and abstracts to screen for duplicates, non-English studies, non-full-text records, and non-empirical research; 2) screening abstracts and full texts for inclusion of SWs and defining the proportion of international ISWs; 3) screening records to assess whether the study reported data on eligible outcomes. Quantitative (prevalence estimates, odds ratios) and qualitative (thematic findings, participant quotes) data from included studies were extracted into respective tables. Key patterns, associations and/or determinants for each outcome, as identified by each study's authors, were synthesized using a structural determinants framework[19]. Structural determinants were categorized at macrostructural (e.g., SW/immigration laws, policing, mobility, stigma), work environment (e.g., physical venue characteristics, management practices), and community organization (e.g., community empowerment, SW collectivization) levels. See Appendix 3 for a PRISMA[20] flowchart of our search strategy and data extraction process.

[1]Studies that featured a low proportion of ISWs relative to non-im/migrant SWs were retained only if their analysis was stratified by im/migration status or reported associations with international im/migration measures. Studies which combined internal and international im/migrants (i.e., did not examine outcomes by sub-group) were only retained if international im/migrants represented >50% of the total sample, to ensure that overall, results reflected ISWs' experiences.

[2]Our review did not exclude any studies on the basis of sex or gender(s) represented in study samples. We aimed to capture studies involving SWs of any biological sex (i.e., female, male) and any gender identity or expression, including cisgender women, cisgender men, transgender people (individuals whose gender identity differs from the sex they were assigned at birth)[76] including those who identify as transsexual or transvestite, and genderqueer people (people who experience their gender as fluid).

Results

Of the 425 unique references identified in our search, 29 studies (6.8%) from 15 countries (Appendix 4) met eligibility criteria and were included[9,21–48]. Most studies originated from north and central America (12) and Europe (6)(Table 1). 19 studies were quantitative; seven were qualitative; and three featured mixed-methods[24,34,48][3]. The proportion of ISWs in study samples ranged from 0.4%–100%. Most studies focused on female SWs; four on cis and trans women SWs[9,41,42,47]; two included other gender minority SWs[35,48]; and two included male SWs[40,48]. Aspects of SW (selling/purchasing/organizing) were criminalized in 13 study settings; while SW was legalized in three settings (Switzerland;[35] Melbourne, Australia,[36]; the Netherlands[40]), these all featured additional restrictions on/criminalization of im/migrants' involvement in SW.

As highlighting ISWs' unique experiences and needs in relation to HIV/STI/SRH services was a key aim for our review, results are stratified by migration status when possible (comparing outcomes between ISWs/non-im/migrant SWs). Results for quantitative and qualitative studies are summarized in Tables 3 and 4; results from mixed-methods studies are included in both tables.

HIV/STI prevalence

13 studies reported on HIV and/or STI prevalence; none reported on HIV/STI incidence. Among high-income countries, HIV prevalence among ISWs was 0.3%[37]-1.2% in England[38], 0.6% in Canada[9], 4.6% in Italy[31], 8% in the Netherlands (among male ISWs)[40], and 13.6% in Portugal (among undocumented ISWs)[32]. Among upper-middle-income countries, HIV prevalence was 8.2%[43] and 3.2%[46] in two studies in China; among low-income countries, HIV prevalence was 5.2% in Somalia[21] and 12.7% in Mali[26]. Syphilis was the most commonly reported STI. Among high-income countries, syphilis prevalence was 2.0% among ISWs in Italy[31], 2.4% in England[38], and 15% in the Netherlands (among male ISWs)[40]. Among upper-middle-income countries, syphilis prevalence was 6.9%[46] and 8.2%[43] in two studies from China; among low-income countries, it was 3.1% in Somalia[21].

Differences by migration status—Studies in Mali[26] and Canada[9] identified lower HIV prevalence among ISWs vs. non-im/migrant SWs; studies in China[43,46], Italy[31], Portugal[32] and Somalia[21] identified higher HIV prevalence among ISWs; and a London, England study found no significant difference[38]. Regarding STIs, a study in Mali found that a lower proportion of ISWs reported STI symptoms than non-im/migrant SWs at all survey time points[26], while studies in London, England[38] and Australia[36] found no differences in chlamydia or gonorrhea prevalence; another study in England found mixed results[37]. Among male and female SWs in the Netherlands, of whom the majority were ISWs, female SWs faced a 73% decreased odds of an STI diagnosis relative to male SWs[40].

[3]Quantitative study sample sizes ranged from 12,622[43] to 50[35]; qualitative sample sizes ranged from 53[28] to 23[45]

Key structural determinants—Only five (4 quantitative; 1 qualitative) of 13 studies reported on structural determinants. Quantitative studies found recent im/migration[31] and undocumented status[32]as macrostructural determinants associated with heightened sexual HIV/STI risk among ISWs, whereas formal indoor venues[9] and condom availability in the workplace[26] were work environment factors associated with decreased HIV/STI risk. One qualitative study described informal work settings (i.e., hotels) as shaping heightened HIV/STI risk[33].

HIV/STI services

21 studies described patterns and determinants of HIV/STI services access (HIV/STI testing/treatment/care; outreach services; and/or community-led education/resources). Most studies (12 quantitative, 5 qualitative) focused on HIV/STI testing, which ranged from 0% ever tested among undocumented ISWs in Italy[31] to 55% tested in the past 3 months among ISWs in Australia (relative to 73% among non-im/migrant SWs)[48]. Among SWs in the Netherlands, the majority of whom were ISWs, male SWs had lower STI clinic attendance relative to female SWs[40].

Differences by migration status—In studies in Portugal[32], Canada[42,47] and Australia,[48] lower proportions of ISWs vs. non-im/migrant SWs accessed HIV/STI services. In England, one study found that ISWs had higher odds of HIV testing or sexual health screening relative to non-im/migrant SWs[37], another found no significant differences[38]. Both studies found that ISWs had increased contact with genitourinary medicine clinics/SW outreach services relative to non-im/migrant SWs[37,38].

Key structural determinants—Only qualitative studies reported on structural determinants. They identified stigma and privacy concerns, SW criminalization resulting in restricted HIV/STI outreach in workplaces, precarious immigration status, language barriers, lack of culturally appropriate services, prohibitive costs, mandatory health testing[28,44], and requiring a permit/health card[48] as macrostructural barriers to ISWs' HIV/STI services access(Box 2). At community organization and work environment levels, qualitative research highlighted how community-based HIV/STI outreach to SW venues[24], working in indoor venues (i.e., massage parlours, bars)[24,33], and supportive managers[33] facilitated engagement in HIV/STI services for ISWs.

SRH services

Six studies (4 quantitative; 2 qualitative) reported on SRH access outcomes. While qualitative and quantitative studies with ISWs in diverse settings described severe unmet SRH needs[25,35,45](Box 3), no quantitative studies reported on contraceptive use, pregnancy care, or abortion care among ISWs.

Differences by migration status—Studies in South Africa and Canada identified lower odds of SRH service use among ISWs vs. non-im/migrant SWs[9,29], while an England study found that ISWs made more visits to genitourinary medicine clinics than non-im/migrant SWs[37].

Key structural determinants—Only 2 qualitative studies from Canada[45] and the Mexico-Guatemala border[25] reported on structural determinants. They highlighted how ISWs' lived experiences of macrostructural criminalization, precarious immigration status, language barriers, stigma, prohibitive costs, and lack of information posed severe barriers to SRH access[25,45].

Condom access

Eight studies described patterns of condom access, which ranged from only one participant (0.4%) receiving condoms through a clinic/outreach in the past year in Somalia[21] to 99.3% of SWs reporting having condoms available in the workplace in Mali[26].

Differences by migration status—While very few studies compared condom access between ISWs and non-migrants, one Mali study reported marginally higher workplace condom availability among ISWs at three of four survey time points compared to non-im/migrant SWs[26].

Key structural determinants—Only qualitative studies reported on structural determinants, describing macrostructural contexts of policing and fear of police apprehension[39] as prominent barriers to ISWs' condom access. In workplaces, managers limiting condom storage/delivery by outreach due to fear of authorities using condoms as criminal evidence[34,45](Box 4) posed serious barriers to condom access.

Condom use

17 studies reported on patterns and determinants of condom use and negotiation. Recent consistent condom use with clients ranged from 4.3% among ISWs in Somalia[21] to 94.5% among ISWs in Canada[41].

Differences by migration status—Studies from Mali[26], the Mexico-Guatemala border[27], and Canada[9] documented higher odds of consistent condom use with clients among ISWs vs. non-im/migrant SWs. In South Africa[29], ISWs had marginally lower odds (p=0.08) of condom use with clients, while studies from high-income contexts of England and Australia found no differences[38,48].

Key structural determinants—9 studies (3 quantitative; 6 qualitative) reported on structural determinants. A quantitative study found difficulty accessing condoms at work to be associated with inconsistent condom use[41], whereas uptake of community-based health promotion[23] and serving clients in indoor venues[27,41] were positively associated with consistent condom use.

Qualitative studies revealed economic marginalization (i.e., accepting increased pay for unprotected sex)[33,39](Box 5), language barriers[34], and fear of police using condoms as evidence[22,34] as macrostructural barriers to condom negotiation and use. In work venues, gaps in condom availability[22], client/aggressor violence[39], and stealthy condom removal by clients[24,34,44] posed pervasive barriers to condom use. Conversely, community/peer

support[33] and working in indoor venues with supportive venue management[44] facilitated sex workers' agency in negotiating condom use.

Discussion

Our review identified significant variation in HIV/STI prevalence, HIV/STI/SRH services access, and condom use among ISWs globally. HIV prevalence ranged from 0.3%–13.6% and was high even in high and upper-middle-income settings of Portugal (12.7%)[32], China (8.2%)[43], and the Netherlands (8% among male ISWs)[40], highlighting the critical role of migration status in shaping health access and outcomes and challenging traditional epidemiological notions of high vs. low prevalence contexts. Quantitative studies identified precarious immigration status as a structural factor associated with poorer HIV/STI outcomes, whereas qualitative narratives showed ISWs' lived experiences to be strongly shaped by punitive policing and stigma. Consistent with Platt et al[8], in high-income settings (Canada and England), ISWs' HIV[9] and STI[37] prevalence was lower than non-im/migrant SWs'. In quantitative studies from Mali[26], Canada[9], and the Mexico-Guatemala border[27], ISWs had higher odds of consistent condom use relative to non-im/migrant SWs. However, ISWs across contexts consistently faced macrostructural barriers, including criminalization and punitive policing, to accessing HIV/STI/SRH services and condoms. Even in the three study settings featuring a SW legalization model (Switzerland; Melbourne, Australia; Netherlands), im/migrants faced restrictions on sex industry involvement which undermined ISWs' health services access due to fear of police and immigration officials[35,36,40].

In contrast to Platt et al's finding that ISWs in all countries were at increased risk of acute STIs[8], we reviewed studies from England[37] and Mali[26] which identified lower STI prevalence among ISWs relative to non-im/migrant SWs, and studies in England and Australia which found no differences[36,38]. Four studies identified higher HIV prevalence among ISWs; one found that gaps in HIV testing were greatest among undocumented ISWs[32] and another found recent im/migration to be associated with a higher burden of HIV, syphilis and HCV[31], suggesting that recent im/migration and precarious status enhance ISWs' vulnerability to STI exposure and gaps in care. Despite stigmatizing stereotypes positing ISWs as vectors for disease, our review found no evidence of ISWs bringing HIV/STIs to destination settings. Our findings affirm evidence that health access and outcomes among im/migrants are shaped by restrictive and xenophobic immigration policies that marginalized im/migrants, including ISWs, contend with in destination settings[49,50].

While HIV/STI/SRH access varied considerably by setting, ISWs faced fairly consistent structural barriers to services across contexts. SW criminalization was frequently linked to punitive policing and surveillance which restricted access to HIV/STI/SRH outreach[45]. In settings where public health policies mandate routine HIV/STI testing, [27,28] ISWs reported that authorities utilized this system to harass, arrest, and deport racialized im/migrant women[28], and im/migration status concerns were barriers to HIV/STI testing[28,44]. Fear of authorities, im/migration status revocation/deportation, and implications of a positive HIV/STI result were prominent barriers to services access

among precarious im/migrants[32,44,45], and stigma and privacy concerns restricted many ISWs from disclosing their work to healthcare providers[24,35,45,48]. Similarly to among other labour im/migrants, prohibitive service costs, language barriers, and low awareness of services limited ISWs' access to HIV/STI/SRH care. Across five countries[25,30,35,38,39], ISWs reported preferring to access such services in their country of origin, raising concerns regarding delays in their access to timely healthcare.

In the qualitative studies reviewed, ISWs expressed strong motivations, often related to health and remittance goals, to practice safer sex and access HIV/STI/SRH services. However, we found that macrostructural barriers restricted ISWs' agency to engage in consistent condom use. Criminalization and police harassment constrained ISWs' access to condoms and HIV/STI testing in workplaces[22,34,39,45]; economic marginalization contributed to ISWs accepting higher pay for condomless sex[33,34,39]; and language barriers[34,44], precarious immigration status,[48] and aggressor violence[24,33,39] shaped ISWs' condom use negotiation. These barriers were documented even in contexts where ISWs had relatively good HIV/STI/health access outcomes.

Our review included studies from high-income settings in which ISWs reported greater HIV/STI/SRH services access than non-im/migrants[37,38], primarily via SW-specific clinics[37], which affirms evidence that SW-specific, language-appropriate services can be a vital means of meeting marginalized ISWs' needs and promoting equity[51]. Studies also demonstrated positive impacts of peer support[33,44], the ability to travel to access services, and high rates of condom use among ISWs in many contexts, highlighting their resilience despite criminalization and labour precarity.

Recommendations for intervention

This review informed five evidence-based recommendations at macrostructural, work environment, and community organization levels to enhance HIV/STI/SRH services access and health equity among ISWs globally (Table 2).

We found that the structural violence of SW criminalization, restrictions among im/migrants' involvement in SW and precarious immigration status, and resulting regressive policing constituted major structural barriers to HIV/STI services, safer work environments, and condom access and negotiation among ISWs. Our results align with robust evidence that criminalization promotes police and client violence against SWs which promotes HIV/STI transmission[1,52], and affirm international policy institutions' calls for full decriminalization of SW as necessary to promote SWs' health and human rights[2,53–55]. Further, the reviewed studies present strong evidence that criminalizing SW among marginalized im/migrants enhances their vulnerability to racialized policing and workplace violence - a finding reflected in community reports[51,56]. Prohibitions on SW among im/migrants must be lifted to promote ISWs' safety and enhance their access to police protections and labour rights[51], and amid current calls to address police brutality among marginalized, racialized groups, punitive policing of ISWs must be addressed through education and trainings among law enforcement.

Our review identified managed indoor venues as key sites for intervention[24,33]: supportive management and access to HIV/STI/SRH services and condoms in work venues were associated with effective condom negotiation, increased HIV/STI testing uptake[23,26,33,44], and lower HIV/STI prevalence[9,26,37] among ISWs in several settings. Our findings are consistent with evidence highlighting supportive third parties (i.e., managers) as a critical facet of HIV prevention[57,58], and underscore how managed indoor venues can promote sexual health among ISWs.

Finally, the single quasi-experimental study reviewed found that a community-based HIV/STI prevention intervention in Singapore significantly enhanced HIV knowledge and consistent condom use among ISWs[23], illustrating the potential of culturally-tailored, community-led programming. In qualitative studies, ISWs were critical of mandatory testing and registration as these approaches exacerbated exclusion among marginalized SWs (i.e., precarious immigrants; those living with HIV/STIs)[28,44,48], but expressed appreciation for community/peer outreach services offering condoms, voluntary HIV/STI testing, and private, nonjudgmental SRH nursing[24,33,35,42,45]. Community-based programming can help to mitigate precarious immigration status, stigma, and limited language proficiency – barriers relating to all five outcomes reviewed – towards increasing access to timely, appropriate HIV/STI/SRH care for ISWs[24,33,42], and should be expanded.

Recommendations for future research

In our review, most of the structural factors impacting our outcomes of interest were identified and described in qualitative studies, forming an important limitation to our discussion and recommendations. Further epidemiological research across diverse ISW groups is needed to elucidate how structural determinants shape HIV/STI/SRH/condom use outcomes, towards informing policies and programs which promote access to HIV/STI/SRH services and supportive labour conditions.

While this review applied a binary distinction between international/internal im/migrants, our findings suggest that shifts in SW and immigration laws; policing strategies; and work environments may be more critical factors shaping HIV/STI/SRH access among ISWs than borders crossed. Using frameworks to account for shifts in structural determinants between origin and destination settings,[59] encompassing the continuum of voluntary to forced migration (e.g., economic migration/family reunification/asylum-seeking/internal displacement/deportation), and a deeper analysis of migration pathways/stages, including circular migration and mobility[7,27,59] would enable a more nuanced analysis of the intersections between migration and sexual labour.

Despite many im/migrant women and SWs globally being women of reproductive age[16–18], this review uncovered a dearth of data on contraception, pregnancy and abortion care among ISWs. This suggests existing research fails to address ISWs' agency and roles in pregnancy/parenthood, which may stem from misrepresentations of ISWs as victims of coercion rather than labour im/migrants[60]. The dearth of research on maternal health among this population[61,62] hampers the development of evidence-based interventions to enhance ISWs' SRH and rights. Finally, we uncovered a paucity of research on male and gender-diverse ISWs: while six studies were trans-inclusive[9,35,41,42,47,48]; none

directly explored experiences among transgender ISWs, despite the overrepresentation of transgender people in SW globally[2]. Despite high HIV/STI prevalence and unique health barriers among male SWs[2,51,63,64], SW policies have focused largely on women[12,65–67]. Further work is needed to investigate how immigration and gender identity intersect to shape HIV/STI services access among gender-diverse ISWs.

Conclusion

While HIV/STI prevalence and condom use varied broadly for ISWs across the globe, ISWs consistently faced macrostructural barriers to accessing HIV/STI/SRH services and condoms. Despite pervasive SW criminalization, im/migrant-specific restrictions, punitive policing and marginalization which shaped poor labour conditions, ISWs globally accessed HIV/STI services, practiced safer sex, used existing services creatively, shared SRH resources, and traveled to meet their health needs; reflecting their agency and resistance against structural oppression. Amid COVID-19 and ongoing health inequities faced by informal workers, this review suggests a need to reform laws criminalizing SW; address punitive policing and immigration enforcement; and expand community-based HIV/STI services to promote ISWs' health and labour rights.

Appendix 1.: Systematic review search terms

Terms used in the literature search were: "immigrant*" OR "migrant*" OR "refugee*" OR "undocumented" OR "displaced" OR "asylum" OR "im/migrant" OR "forced migration" OR "deportation" AND "sex work*" OR "prostitut* OR "sex trade" OR "sex industry" AND "HIV" OR "STI*" OR "STD*" OR "human immunodeficiency virus*" OR "sexually transmitted infection*" OR "sexually transmitted disease*" OR "HIV testing" OR "STI testing" OR "sexual health services" OR "sexual health outreach" OR "sexual health education" OR "condom access" OR "access to condoms" OR "condom refusal" OR "unprotected sex" OR "reproductive health services" OR "SRH services" OR "sexual and reproductive health services" OR "contraception" OR "pap testing" OR "abortion services" OR "pregnancy care". We also used medical subject heading (MeSH) terms for each domain. For migration, we used 'undocumented immigrant/ or immigrant/ or migration/'; for sex work, 'exp prostitution/, sex work/'; and for HIV/STI/sexual health access outcomes, 'exp sexually transmitted disease/', 'human immunodeficiency virus infection/ or acquired immune deficiency syndrome/', 'safe sex/ or unsafe sex'/, 'reproductive health services/ or family planning services/ or maternal health services/'.

Appendix 2:: Analytical definitions of key terms and outcomes for systematic review of HIV/STI prevalence, access to HIV/STI/SRH services, access to condoms and condom use among im/migrant sex workers globally (2009–2019)

Term/outcome	Definition
Sex worker	Anyone who has ever received money or goods in exchange for sexual services, and consciously defined those activities as income-generating even if they did not consider sex work their occupation[75]
Im/migrant	Immigrant (non-national who moves into a country for the purpose of settlement[4]) or migrant (person who is moving/has moved across an international border away from their habitual place of residence, regardless of the person's im/migration status; whether the movement is voluntary or involuntary; the causes for the movement; or the length of stay[4]). This definition aims to capture studies involving sex workers with diverse migration experiences who may face precarious im/migration status, racialization and language barriers in destination settings, but to exclude studies focused on internal (within-country) migrants to achieve a more focused review.

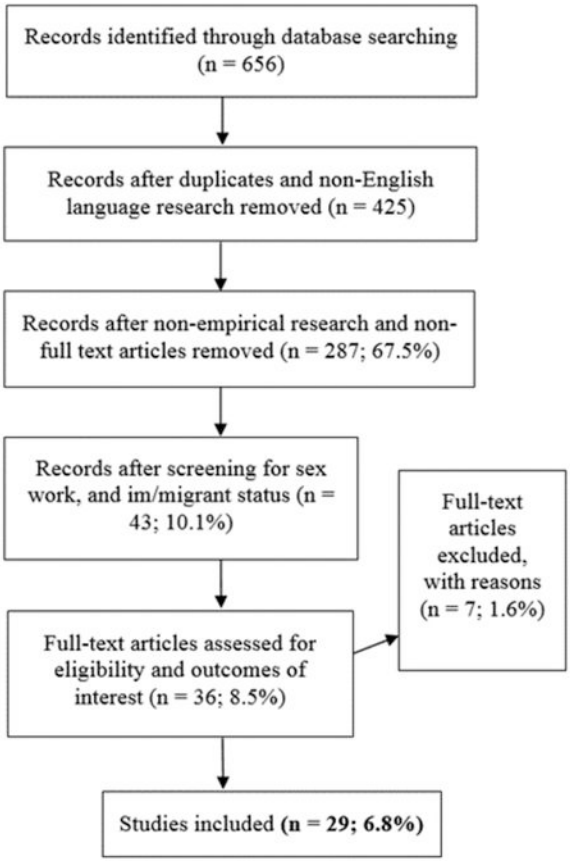
Term/outcome	Definition
HIV/STI prevalence/ incidence	Biologically measured prevalence or incidence of HIV, syphilis/T pallidum, chlamydia/C trachomatis, cervical or pharyngeal gonorrhea, trichomoniasis, pelvic inflammatory disease, HCV, or self-reported STI symptoms (genital ulcer or genital sore)
HIV/STI services	Access to/use of HIV/STI testing *, treatment and care services; HIV/STI outreach [mobile outreach, street or venue-based outreach], or community/sex worker-led HIV/STI services, education or resources
SRH services	Access to/use of sexual and reproductive health services including pap testing, contraception, abortion, pregnancy, maternal health services; access to SRH education; access to sex worker or im/migrant-specific SRH services
Access to condoms	Access to condoms for work, access to condom distribution via outreach or in the workplace
Condom use **	Self-reported condom use, condom refusal, and unprotected sex

* HIV/STI testing was variably defined as testing in the last month/last year/ever/within the destination country across the studies in this review

** Consistent condom use was variably defined as at last transactional sex and with all/most clients over the past month/past 6 months across the studies in this review

Appendix 3.: PRISMA search strategy and data extraction process for systematic review of HIV/STI prevalence, access to HIV/STI/SRH services,

access to condoms and condom use among im/migrant sex workers globally (2009–2019)



Appendix 4:: Countries included in systematic review of HIV/STI prevalence, access to HIV/STI/SRH services, and condom use among im/migrant sex workers globally (N=29 studies, 2009–2019)

29 studies from 15 countries were included in this review. Countries represented were Canada, Mexico, Guatemala, United Kingdom, Portugal, Italy, Switzerland, the Netherlands, Mali, Somalia, South Africa, Russia, China, Singapore, and Australia. No South American countries were included in the review.

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Box 1:

Key Findings

- Our review identified significant variation in HIV/STI prevalence across high to low income settings, highlighting the role of immigration status in shaping health outcomes and challenging traditional epidemiological notions of high vs. low prevalence contexts
- Precarious immigration status was identified as a structural factor associated with poorer HIV and STI outcomes, whereas qualitative narratives showed that ISWs' lived experiences were strongly shaped by punitive policing and stigma
- While ISWs generally faced disparities in HIV/STI outcomes and services access, findings were complex: in some settings, HIV and STI prevalence were lower and odds of condom use with clients were higher among ISWs relative to non-im/migrant SWs
- Across countries and legislative settings, criminalization of SW and im/migrant status and punitive policing were identified as foremost structural barriers to ISWs' access to HIV/STI/SRH services and condoms
- This review identified a paucity of research on SRH and research involving male and gender-diverse ISWs

Box 2

"[Bar managers] send us to health services every Tuesday, and they give us workshops on how to use condoms. "Don't use Vaseline, don't use lotion because that warms it up, use a water-based lubricant," they say. They explain that we always have to use condoms because we could get an unwanted pregnancy, aside from infections [STIs]."

-ISW, Tecún Umán, Guatemala[44]

"[Health authority] used to provide [HIV/STI testing] service for working women [SWs], however, they came in one day with police officers. All working women were shocked and afraid. They thought [health authority] had betrayed them and brought police to capture them. So after that incident, most businesses didn't allow any health authority to enter the premises. They even rejected services from other health organizations."

-ISW, Vancouver, Canada l[45]

Box 3

"Nobody talked to me about my pregnancy […] I barely got information about my pregnancy and how to avoid getting pregnant."

-ISW, Tapachula, Mexico[25]

Box 4

"The police searched every room and found used condoms. They also questioned all the clients and working women [SWs]. Women were ID-checked and questioned individually. … Finding the used condoms was not a good development for us."

-ISW, Vancouver, Canada[45]

Box 5

"If someone pays me more, like not 2,000 but 4,000 [rubles], I sleep without condoms and then go home to Ukraine for a check-up."

-ISW, Moscow, Russia[39]

"There was a client who asked for service without condom and tried to take advantage of my poor English skill. After I refused to provide service without condom, he intentionally broke the condom, but fortunately I found out. So I figured to provide the service again, and asked him to use a new condom–he got mad…He also threatened to call the police…he was trying to threaten to report me."

-ISW, Vancouver, Canada[34]

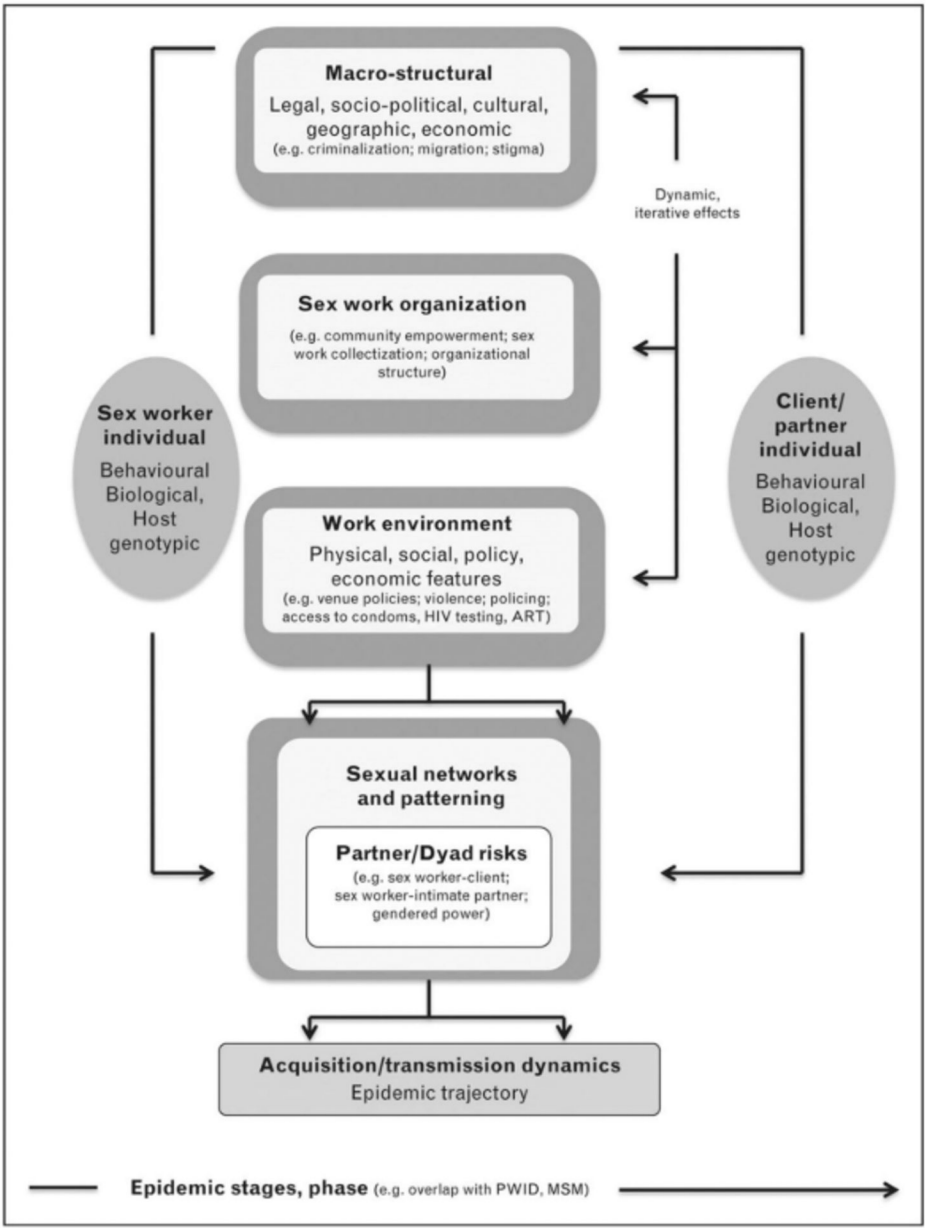

Figure 1:

Structural determinants of HIV framework by Shannon et al, 2014[19], adapted from Blanchard and Aral[68], Connell[69], Diez Roux[70], Overs[71], and Rhodes[72,73].

Table 1:

Characteristics of reviewed studies on HIV/STI prevalence, access to HIV/STI/SRH services, access to condoms and condom use among im/migrant sex workers globally (N=29, 2009–2019)

Reference	Study design & data source	Setting	Legal status of sex work in study setting*	Proportion of im/migrants in SW sample: % (n/total)	Outcomes				
					HIV/STIs	HIV/STI services	SRH services	Condom access	Condom use
Kritmaa et al[21]	Cross-sectional; survey data	Hargeisa, Somalia	Selling, purchase and organizing criminalized	59% (139/237)	*x*	*x*		*x*	*x*
Dias et al[32]	Cross-sectional; bio-behavioral survey data	Portugal	Selling and organizing criminalized	44.1% (376/853)	*x*	*x*			
Deering et al[42]	Longitudinal; cohort survey data	Vancouver, Canada	Selling, purchase and organizing criminalized; additional restrictions for im/migrants	27.6% (120/435)		*x*			
Zhou et al[43]	Cross-sectional; national surveillance data	Guangxi, China	Selling, purchase and organizing criminalized	0.4% (49/12,622)	*x*				
Goldenberg et al[44]	Ethnographic fieldwork, qualitative analysis of interview and focus group data	Tecún Umán, Guatemala	Organizing criminalized	46.2% (18/39)		*x*		*x*	*x*
Anderson et al[45]	Ethnographic fieldwork; qualitative analysis of interview data	Vancouver, Canada	Selling, purchase and organizing criminalized; additional restrictions for im/migrants	100% (23/23)		*x*	*x*	*x*	
Zhang et al[46]	Repeated cross-sectional; national surveillance data	Guanxi, China	Selling, purchase and organizing criminalized	100% (1026/1026)	*x*				*x*
Socias et al[47]	Longitudinal; cohort survey data,	Vancouver, Canada	Purchase and organizing criminalized; additional restrictions for im/migrants	30.3% (167/552)		*x*			
Selvey et al[48]	Cross-sectional; survey data, qualitative analysis of interview data	Western Australia	Selling, purchase and organizing criminalized; additional restrictions for im/migrants	27% (94/354)		*x*			*x*
Lim et al[22]	Qualitative analysis of interview and observational data	Singapore	Organizing criminalized; additional restrictions for im/migrants	100% (440/440)		*x*			*x*
Bungay et al[24]	Cross-sectional; survey data, qualitative analysis of focus group data	Vancouver, Canada	Purchase and organizing criminalized; additional restrictions for im/migrants	62% (80/129)		*x*			*x*
Rocha-Jimenez et al[25]	Ethnographic fieldwork, qualitative analysis of interview data	Guatemala; Mexico	Selling and organizing criminalized	100% (31/31)		*x*	*x*		

Reference	Study design & data source	Setting	Legal status of sex work in study setting*	Proportion of im/migrants in SW sample: % (n/total)	Outcomes				
					HIV/STIs	HIV/STI services	SRH services	Condom access	Condom use
Trout et al[26]	Repeated cross-sectional; survey and bio-behavioural surveillance data	Mali	Selling and organizing criminalized	63.2% (1536/2430)	x			x	x
Rocha-Jimenez et al[27]	Cross-sectional; survey data	Guatemala; Mexico	Selling and organizing criminalized	29% (77/266)		x		x	x
Goldenberg et al[9]	Cross-sectional; cohort survey data and HIV/STI testing data	Vancouver, Canada	Selling, purchase and organizing criminalized; additional restrictions for im/migrants	25.1% (163/650)	x		x		x
Rocha-Jimenez et al[28]	Qualitative analysis of interview and focus group data	Guatemala	Organizing criminalized	51% (27/53)		x			
Richter et al[29]	Cross-sectional; survey data	South Africa	Selling, purchase and organizing criminalized	46.3 % (758/1636)			x		x
Wong et al[30]	Cross-sectional; survey data	Singapore	Organizing criminalized; additional restrictions for im/migrants	100% (167/167)		x			x
Zermiani et al[31]	Cross sectional; survey data	Verona, Italy	Selling and organizing criminalized	100% (345/345)	x	x			
Febres-Cordero et al[33]	Qualitative analysis of interview data	Guatemala; Mexico	Selling and organizing criminalized	100% (31/31)	x	x		x	x
Goldenberg et al[34]	Cross-sectional; qualitative analysis of interview data, cohort survey data	Vancouver, Canada	Selling, purchase and organizing criminalized; additional restrictions for im/migrants	100% (44/44; 198/198)		x		x	x
Darling et al[35]	Cross-sectional; survey data	Lausanne, Switzerland	Sex work legalized, additional restrictions for im/migrants	96% (48/50)		x	x		
Tang et al[36]	Longitudinal; retrospective data analysis, Melbourne Sexual Health Centre database	Melbourne, Australia	Sex work legalized, additional restrictions for im/migrants	57% (2454 /4296)	x				
Sou et al[41]	Cross-sectional; cohort survey data and HIV/STI testing data, AESHA	Vancouver, Canada	Selling, purchase and organizing criminalized; additional restrictions for im/migrants	100% (182/182)					x
Platt et al[38]	Cross-sectional; survey data	London, England	Selling, purchase and organizing criminalized; additional restrictions for im/migrants	61% (163/268)	x	x			x
Lim et al[23]	Quasi-experimental pre-test/post-test intervention trial with a comparison group	Singapore	Organizing criminalized; additional restrictions for im/migrants	100% (440/440)	x	x			x

Reference	Study design & data source	Setting	Legal status of sex work in study setting*	Proportion of im/ migrants in SW sample: % (n/ total)	Outcomes				
					HIV/ STIs	HIV/STI services	SRH services	Condom access	Condom use
McGrath-Lone et al[37]	Cross-sectional; STI surveillance data	England	Selling, purchase and organizing criminalized; additional restrictions for im/ migrants	61.6% (1666/2704)	x	x	x		
Weine et al[39]	Qualitative analysis of interview data	Moscow, Russia	Selling and organizing criminalized	79% (19/24)			x	x	x
Verhaegh-Haasnoot et al[40]	Cross-sectional; clinic-based HIV/STI testing and survey data	Limberg, Netherlands	Sex work legalized; additional restrictions for im/migrants	>88% (>188/212) among male sex workers	x	x			

*"Selling" includes activities associated with selling such as soliciting, advertising or sharing indoor premises with other sex workers. "Purchase" includes activities associated with purchasing sex services, including kerb crawling. "Organizing" refers to management or organization of commercial sex. "Additional restrictions for im/migrants" refers to immigration policies which features restrictions on sex industry involvement among some/all im/migrants. Data source: NSWP 2020[74]

Table 2:

Recommendations for interventions to promote HIV/STI/SRH services access, health equity and human rights among im/migrant sex workers globally

Level of intervention	Evidence-based recommendations
Country laws and policies	1. Decriminalize all aspects of sex work to address punitive policing, enable safer indoor work environments, and promote HIV/STI prevention
	2. Remove immigration policy prohibitions on sex work involvement among im/migrants
Regional law enforcement practices	3. Address punitive policing in sex work criminalization through mandating rights-based education and trainings among law enforcement
Work environment	4. Enable the legal operation of managed indoor sex work venues and support their management in promoting sexual health
Community organization	5. Support community-based and ISW-specific health promotion to enhance access to HIV/STI/SRH services and promote collectivization

Table 3:

Results of quantitative studies for systematic review of HIV/STI prevalence, access to HIV/STI/SRH services, access to condoms and condom use among im/migrant sex workers globally (n=19) (2009–2019)

1) HIV/STI outcomes					
Study	**HIV prevalence**		**STI prevalence**		**Association between im/migrant status and positive HIV/STI status**
	ISWs	**Non-im/migrant SWs**	**ISWs**	**Non-im/migrant SWs**	
Kritmaa et al[21]	5.2% (entire sample)		Syphilis: 3.1% (entire sample)		-
Dias et al[32]	13.6% (undocumented) 2.3% (documented)	8%	-	-	-
Zhou et al[43]	8.2%	1%	Syphilis: 8.2%	Syphilis: 6.2%	ISWs had significantly higher odds of being HIV+ (AOR 3.82, 95% CI 0.96–15.34) relative to non-im/migrant SWs
Zhang et al[46]	3.2 % (entire sample)		Syphilis: 6.9% (entire sample)		-
Trout et al[26]	12.7%	28.5%	Gonorrhea: 1.3%	Gonorrhea: 21.6%	Non-im/migrant SWs had significantly higher odds of being HIV+ (AOR 2.20, 95% CI 1.54–3.13) relative to ISWs
			Chlamydia: 3.4%	Chlamydia: 17.4%	
Goldenberg et al[9]	0.6%	15.2%	Acute syphilis, gonorrhea or chlamydia infection: 4.9%	Acute syphilis, gonorrhea or chlamydia infection: 13.1%	International migration was negatively associated with HIV infection (AOR 0.09, 95 % CI 0.01–0.79) relative to non-im/migrant SWs
Zermiani et al[31]	4.6% (entire sample)		Syphilis: 2.0% (entire sample)		ISWs from Africa had no significant differences in odds of HIV infection (AOR 1.44, 95% CI 0.34–6.19) relative to ISWs from other countries ISWs from Africa had significantly lower odds of syphilis infection relative to ISWs from Eastern Europe (AOR 0.03; 95% CI 0.00–0.28)
Tang et al[36]	-	-	Chlamydia: 1.2%	Chlamydia: 0.9%	ISWs had statistically (but clinically insignificantly) higher prevalence of chlamydia (AOR 1.35, 95% CI 1.09–1.66) and gonorrhea (AOR 2.30, 95% CI 1.31–4.05) relative to non-im/migrant SWs
			Gonorrhea: 0.3%	Gonorrhea: 0.1%	
Platt et al[38]	1.2%	0.9%	Syphilis: 2.4%	Syphilis: 1.9%	ISWs had higher odds of syphilis, chlamydia and gonorrhea infection relative to non-im/migrant SWs, but these differences remained insignificant
			Chlamydia: 5%	Chlamydia: 3.3%	
			Gonorrhea: 3.6%	Gonorrhea: 0%	
McGrath-Lone et al[37]	0.3%	0%	Chlamydia: 8.5%	Chlamydia: 13.5%	ISWs had significantly lower odds of chlamydia infection (AOR 0.61, 95% CI 0.38–0.97) relative to non-im/migrant SWs
			Gonorrhea: 2.4%	Gonorrhea: 3.2%	
Verhaegh-Haasnoot et al[40]	8% (male ISWs) 0% (female ISWs)		Syphilis: 15% (male ISWs), 1% (female ISWs) Chlamydia: 18% (male ISWs), 6% (female ISWs) Gonorrhea: 8% (male ISWs), 3% (female ISWs)		Male ISWs had significantly higher odds of being diagnosed with any new STI (including HIV) during

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				a consultation (AOR 6.5, 95% CI 4.5–9.4) relative to female ISWs
All reviewed studies used biological methods (rapid testing or enzyme immunoassay) to assess HIV and STI prevalence.				
2) Access to HIV/STI services				
Study	**Accessed HIV/STI testing**		**Measure**	**Association between im/migrant status and HIV/STI testing**
	ISWs	**Non-im/migrant SWs**		
Kritmaa et al[21]	4% (entire sample)		Ever had an HIV test	-
Dias et al[32]	85% (undocumented) 90.7% (documented)	92.2%	Ever had an HIV test	-
Deering et al[42]	36.6%	78.7%	Had an HIV test in the past year	ISWs had reduced odds of having a HIV test in the past year (AOR 0.33, 95% CI 0.19–0.56) relative to non-im/migrant SWs
Socias et al[47]	15.0%	69.2%	Had an HCV test in the past year	ISWs had reduced odds of having a HCV test in the past year (AOR 0.24, 95% CI 0.12–0.48) relative to non-im/migrant SWs
Selvey et al[48]	57%	74%	Had a sexual health check in the past 3 months	-
Bungay et al[24]	HIV: 30.2% (entire sample)		Had an HIV test once per year	-
	STIs: 34.1% (entire sample)		Had an STI test once per year	
Wong et al[30]	48.9% (entire sample)		Had STI screening either locally or abroad in the past 3 months	-
Zermiani et al[31]	0% (entire sample)		Ever screened for HIV or STIs in the destination country (Italy)	-
Darling et al[35]	HIV, past year: 25% (entire sample)		Had an HIV test in the past year	-
	HIV, ever: 50% (entire sample)		Ever had an HIV test	
Platt et al[38]	HIV: 83.9%	HIV: 69.9%	No HIV test in the past year	ISWs and non-im/migrant SWs had no significant differences in odds of HIV testing in the past year (AOR 1.9, 95% CI 0.81–4.53) or having an STI screen in the past 6 months (AOR 1.1, 95% CI 0.44–2.50)
	STIs: 17.5%	STIs: 19.1%	No STI screen in the past 6 months	
McGrath-Lone et al[37]	HIV: 97.2% of clinic attendees	HIV: 87.4% of clinic attendees	Had an HIV test over the year 2011	ISWs had significantly higher odds of having an HIV test or sexual health screen at genitourinary medicine clinics in England in 2011 relative to non-im/migrant SWs (p=<0.01)
	STIs: 94.6% of clinic attendees	STIs: 92.0% of clinic attendees	Had a sexual health screen over the year 2011	
Verhaegh-Haasnoot et al[40]	4% (male ISWs) 11% (female ISWs)		Had an HIV test 3 times over a 3 year study period	-
3) Access to SRH services				

Study	Accessed SRH services		Measure	Association between im/migrant status and SRH services access
	ISWs	Non-im/migrant SWs		
Goldenberg et al[9]	10.4%	38.4%	Accessed SRH services in the past 6 months	ISWs had significantly lower odds of accessing SRH services in the past 6 months relative to non-im/migrant SWs (p=<0.001)
Richter et al[29]	58.6 %	60.7%	Accessed facility or community-based health services in the last month	ISWs had significantly lower odds of accessing health services (AOR 0.59; 95% CI 0.40–0.86) relative to non-im/migrant SWs
Darling et al[35]	20% (entire sample)		Accessed hospital gynecology services in the past year	-
McGrath-Lone et al[37]	Contraception: 41.1% of clinic attendees	Contraception: 18.2% of clinic attendees	Accessed contraception at genitourinary medicine clinics over the year 2011	ISWs made more visits to genitourinary medicine clinics relative to non-im/migrant SWs (mean number of visits in 2011; 3.7 vs 2.9, p<0.001)
	Pap test: 16.2% of clinic attendees	Pap test: 5.9% of clinic attendees	Had a pap test at genitourinary medicine clinics over the year 2011	
4) Access to condoms				
Study	**Access to condoms**		**Measure**	**Association between im/migrant status and condom use**
	ISWs	**Non-im/migrant SWs**		
Kritmaa et al[21]	0.4% (entire sample)		Received condoms through a clinic/outreach in the past year	-
Trout et al[26]	89.6% (2000)	88.6% (2000)	Condoms available at workplace	A marginally higher proportion of ISWs vs. non-im/migrant SWs reported condom availability in work venues at three of four survey time points
	99.1% (2003)	98% (2003)		
	97.6% (2006)	94% (2006)		
	99% (2009)	99% (2009)		
5) Condom use				
Study	**Condom use**		**Measure**	**Association between im/migrant status and condom use**
	ISWs	**Non-im/migrant SWs**		
Kritmaa et al[21]	Condom use, last sex: 24% (entire sample)		Used a condom at last transactional sex	-
	Consistent condom use: 4.3% (entire sample)		Consistent condom use with clients over the past month	
Zhang et al[46]	25.1% (entire sample)		Inconsistent condom use in the last month from 2010–2014	-
Selvey et al[48]	Vaginal sex: 73.5%	Vaginal sex: 66.5%	Condom use with all clients for vaginal sex	ISWs and non-im/migrant SWs had no significant differences in reported condom use with clients for vaginal sex (p=0.98) or oral sex (p=0.39)
	Oral sex: 34.8%	Oral sex: 35.3%	Condom use with all clients for oral sex	

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Bungay et al[24]	Anal/vaginal sex: 86.7% (entire sample)		Consistent condom use with clients for anal/vaginal sex	-
	Oral sex: 75.6% (entire sample)		Consistent condom use with clients for oral sex	
Trout et al[26]	90.94%	81.5%	Always used condoms with clients last 30 days	A higher proportion of ISWs reported consistent condom use with any clients and regular clients over the past 30 days at all 4 survey time points relative to non-im/migrant SWs
Rocha-Jimenez et al[27]	57%	37%	Consistent condom use with clients, past 30 days	ISWs had significantly higher odds of reporting consistent condom use with clients over the past 30 days (AOR 2.09, 95% CI 1.09–3.98) relative to non-im/migrant SWs
Goldenberg et al[9]	95.09%	78.44%	Consistent condom use with one-time and regular clients	International migration was negatively associated with inconsistent condom use with clients (AOR 0.32, 95 % CI 0.14–0.75) relative to non-im/migrant SWs
Richter et al[29]	90.6%	94.6%	Condom-use with last client during penetrative intercourse	A significantly greater proportion of non-im/migrant SWs (94.6%) reported condom use during penetrative sex with last client relative to ISWs (90.6%), p=0.08
Wong et al[30]	Vaginal sex: 51.9%		Consistent condom use with clients in a usual week in the past 3 months for vaginal sex, oral sex, and anal sex	-
	Oral sex: 37.9%			
	Anal sex: 46.9%			
Sou et al[41]	94.5%		Consistent condom use with clients for vaginal/anal sex in each 6 month period	-

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Table 4:

Results of qualitative studies for systematic review of HIV/STI prevalence, access to HIV/STI/SRH services, access to condoms and condom use among im/migrant sex workers globally (n=11) (2009–2019)

1) HIV/STI outcomes		
Study	**Factors shaping HIV/STI outcomes among ISWs**	**Participant quotes**
Febres-Cordero et al[33]	4 of 31 participants reported having an STI: all worked in informal settings (e.g., hotel, motel, rented room, trailer/truck) rather than in bars or cantinas.	-
2) Access to HIV/STI services		
Study	**Factors shaping access to HIV/STI services among ISWs**	**Participant quotes**
Goldenberg et al[44]	• Peer support and mentorship promoted access to HIV/STI services • ISWs in formal indoor venues (e.g., bars, cantinas) with supportive management frequently supported each other's access to HIV/STI testing services by going to appointments together or sharing information • Public health regulations requiring mandatory HIV/STI testing were often used as a basis for authorities to abuse and punish SWs	"My peers told me that I needed to protect myself. They said I should do everything with a condom. They told me everything from their experience, so I wasn't left with any [question]" -ISW, Tapachula, Mexico "They [bar managers] send us to the health services every Tuesday, and they give us workshops on how to use condoms. "Don't use Vaseline; don't use lotion, because that warms it up, use a water based lubricant," they say. They explain that we always have to use condoms because we could get an unwanted pregnancy, aside from infections [STIs]." -ISW, Tecún Umán, Guatemala
Anderson et al[45]	• Criminalization, raids, and police use of condoms as evidence of sex work resulted in venue managers prohibiting HIV/STI testing by outreach workers in their venues	"[In] The last parlour [I worked in], there were nurses who volunteered to do some blood testing for us, but my employer would not let them come in, so we didn't have many opportunities to get our blood drawn." -ISW, Vancouver, Canada "X Health Authority used to provide service for these working women, however, they came in one day with police officers. All working women were shocked and afraid. They thought that the X Health Authority had betrayed them and brought police to capture them. So after that incident, most businesses didn't allow any X Health Authority to enter the business premise. They even rejected any services from any other health organizations too." -ISW, Vancouver, Canada
Selvey et al[48]	• Limited access to information to and to peer educators restricted access to HIV/STI services and knowledge about safe sex • Requiring a Medicare card, stigma, and long waiting times restricted access to services	"I would like to receive regular check-ups in an easier way without needing to use a card." -ISW, Western Australia
Lim et al[22]	• Fear of identity exposure, stigma, high costs and language barriers restricted access to HIV/STI services	-

Bungay et al[24]	• Not wanting to be tested by their primary care provider, lack of awareness of sexual health clinics, language barriers, knowledge deficits regarding need for testing, and challenges with scheduling were barriers to HIV/STI services • Peer testing services by community health workers in sex work venues provided flexibility, convenience, privacy and nonjudgmental supports: these mitigated many barriers to services access	"The service you provide is very good and convenient for us. We have busy schedules and some work every day. We can't go to the [clinic]." -ISW, Vancouver, Canada "I feel embarrassed to go to family doctors and request a HIV test … They would think that "how come you have AIDS? You must have some secret." If you go to a doctor and ask for whole body exam, or specifically ask for HIV test, your doctor will see you differently right away." -ISW, Vancouver, Canada
Rocha-Jimenez et al[25]	• Privacy concerns, safety concerns, stigma and not wanting clients to think SWs are HIV/STI-positive were barriers to accessing free HIV/STI testing at a local health clinic	"Sometimes I go to the clinic, the only thing is that sometimes I feel bad because the housewives see us [sex workers] and you know that for society we are not very well looked upon. They [housewives] can tell we're not from over here [Guatemala] … and many people see us [migrant sex workers] as unequal, they discriminate upon us. That's why I avoid the clinic sometimes." -ISW, Quetzaltenango, Guatemala
Rocha-Jimenez et al[28]	• Public health regulations requiring mandatory HIV/STI testing by SWs resulted in privacy and confidentiality concerns and fears about immigration status	"Because of shame…There are women that…let's say that they think that this [test results] will [be] leaked." -ISW, Guatemala "We don't want the authorities to come after the bar owner, and we don't want them to identify us as sex workers…I get worried about this…so when we go to the clinic we give them a different name." -ISW, Guatemala
Febres-Cordero et al[33]	• Lack of access to HIV/STI prevention information and skills (e.g., condom demonstrations) and working in isolated outdoor environments restricted access to services • Peer support, working in indoor venues, and supportive management promoted access to services	-
Goldenberg et al[34]	Criminalization of venue managers/owners, limited awareness of existing services, limited English fluency, and lack of multilingual resources restricted access to HIV/STI services	"The manager just tells us to be careful… but she doesn't have the ability to do too much. She's also afraid of the police coming here and knowing that we're doing this work. It would shut down her parlour." -ISW, Vancouver, Canada
Weine et al[39]	Lack of healthcare coverage and prohibitive costs were barriers to HIV/STI services	"For women's health, I go home. I have my own gynecologist there. Once in three months I take all the tests." -ISW, Moscow, Russia
3) Access to SRH services		
Study	**Factors shaping SRH services access among ISWs**	**Participant quotes**
Anderson et al[45]	• Criminalization and police raids resulted in venue owners barring SRH outreach services from entry to indoor work venues	"[The bosses] really repel this type of [health outreach] service because the business was illegal. They push these [outreach workers] out." -ISW, Vancouver, Canada

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Rocha-Jimenez et al[25]	• Lack of information and education, stigma, high costs, and precarious immigration status were barriers to SRH services	"Nobody talked to me about my pregnancy, not even my family, not even my mother … I barely got information about my pregnancy and how to avoid getting pregnant." -ISW, Tapachula, Mexico
4) Access to condoms		
Study	**Factors shaping access to condoms among ISWs**	**Participant quotes**
Goldenberg et al[44]	• Indoor venues and managers who provided condom advice/ demonstrations, and offered condoms onsite enhanced condom access	"When I got there, the first thing the lady did was take me to the room…She brought a box of condoms and gave it to me. "These are condoms, I don't know if you've seen them before. But you can use this. Each man that you come with should use a condom." And she came and took one out and explained how to put it on. She's been very helpful." ISW, Tecún Umán, Guatemala
Anderson et al[45]	• Police raids and police use of condoms as evidence led to venue managers limiting condoms onsite and prohibiting delivery of condoms	"The police searched every room and found used condoms. They also questioned all the clients and working women. Women were ID checked and questioned individually. … Finding the used condoms was not a good development for us." -ISW, Vancouver, Canada "My last employer refused to have condoms delivered here by outreach programs, and we would have to go and buy some ourselves. At times we didn't have condoms [onsite], it became frustrating." -ISW, Vancouver, Canada
Febres-Cordero et al[33]	• Peer support enhanced access to condoms: ISWs shared condoms and lubricants amongst themselves	-
Goldenberg et al[34]	• Police raids led venue managers to avoid discussing HIV/STI prevention with workers or permitting large quantities of condoms onsite	-
Weine et al[39]	• Fear of being apprehended by police, accused of being sex workers and forced to pay bribes were barriers to carrying condoms while working	-
5) Condom use		
Study	**Factors shaping condom use among ISWs**	**Participant quotes**
Goldenberg et al[44]	Social and economic pressures to drink alcohol during sex work undermined ISWs' capacity to negotiate safer sex with clients	"The violence happens once people are drunk…clients that humiliate you inside the room. They start saying that if they don't get what they want, they want their money back…some try to take off the condom or carry weapons or knifes, so we have to withstand the humiliation." -ISW, Tecún Umán, Guatemala
Lim et al[22]	• Misconceptions on HIV/STI transmission, low risk perception of contracting HIV/STIs, lack of condom use negotiation skills, lack of condoms in the work venue, and fear of police using condoms as circumstantial evidence were barriers to condom use	-

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Bungay et al[24]	• Clients trying to pull off/sneak condoms off during sex were a barrier to condom use reported by over half of ISWs	-
Febres-Cordero et al[33]	• Economic challenges, clients' offers of increased pay for unprotected sex, and client violence were barriers to safer sex • Peer support for consistent condom use and warnings regarding clients who wouldn't use condoms enhanced condom use	"He [client] took the condom off and he took my hands and he grabbed me like an animal! He hurt me a lot! I came out crying, I wanted to die!" –39 year old ISW, Tapachula, Mexico "There is a dude (who) doesn't use a condom, he pays $400 pesos but he never tells us what disease he has. I told [another sex worker]: "this man has AIDS, don't get involved with him. You're not going to recover your health or your life with $400 pesos" -ISW, Tapachula, Mexico "The peers tell you that you have to protect yourself because they see that it's your first time; they explain that you have to use a condom (and) what you must not do. In every place you go there is always someone good." -ISW, Tecún Umán, Guatemala
Goldenberg et al[34]	Criminalization, language barriers, and coercion and threats from clients undermined ISWs' ability to insist on condom use	"There was a client who asked for service without condom and tried to take advantage of my poor English skill. After I refused to provide service without condom, he intentionally broke the condom, but fortunately I found out. So I figured to provide the service again, and asked him to use a new condom–he got mad…He also threatened to call the police…he was trying to threaten to report me." -ISW, Vancouver, Canada
Weine et al[39]	Economic marginalization, client offers of increased pay for unprotected sex, and client violence undermined ISWs' ability to insist on condom use	"If someone pays me more, like not 2,000 but 4,000 [rubles], I sleep without condoms and then go home to Ukraine for a check-up." -ISW, Moscow, Russia "Sometimes they force you to have sex without condoms because when we refused someone would hold our legs, someone would hold our arms." -ISW, Moscow, Russia

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