Structural Vulnerability and Cross-Border Dynamics: Comparing HIV Risk among Mainland Chinese vs. Local Street-Based Sex Workers in Hong Kong

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I. INTRODUCTION: CONCEPTUAL FRAMEWORKS FOR UNDERSTANDING HIV VULNERABILITY IN SEX WORK

Structural Violence and Structural Vulnerability Frameworks

The concept of structural vulnerability provides a critical lens for understanding HIV risk among sex workers, particularly those engaged in cross-border migration. Structural vulnerability refers to an individual's or population's position of disadvantage within hierarchical social orders shaped by historical, political, and economic systems. Unlike individual-level risk frameworks that focus primarily on behavioral determinants, structural vulnerability acknowledges how macro-level forces systematically deny certain populations access to health care and opportunities for social advancement. In the context of sex work, structural violence manifests through criminalization, stigmatization, and institutional barriers that create conditions conducive to HIV transmission rather than simply reflecting individual choices (Choi, 2010).

Global research has consistently demonstrated that migrant sex workers face compounded structural vulnerabilities compared to their non-migrant counterparts. A systematic review of structural determinants affecting immigrant sex workers across multiple countries found that precarious immigration status was associated with poorer HIV/STI outcomes, while criminalization of sex work and immigration status, combined with punitive policing practices, created prominent barriers to healthcare access (Artigas et al., 2025). These findings underscore the importance of examining how overlapping systems of marginalization—including immigration policy, sex work legislation, and economic inequality—interact to shape health outcomes. The structural determinants framework moves beyond traditional biomedical approaches by recognizing that addressing HIV

among vulnerable populations requires interventions that tackle the root causes of inequity embedded in social, legal, and economic structures (Navidi et al., 2025).

Migration as a Social Determinant of Health

Migration has emerged as a critical social determinant of health, particularly for women engaged in precarious employment such as sex work. The process of migration itself—encompassing pre-departure circumstances, transit experiences, and post-arrival conditions—creates distinct phases of vulnerability that influence health outcomes. Migrant sex workers often experience heightened isolation during initial stages of migration and sex work, when they may lack established social networks, face language barriers, and navigate unfamiliar healthcare systems (Febres-Cordero et al., 2018). Research from the Mexico-Guatemala border region demonstrates how these migration-related challenges compound existing vulnerabilities, with peer support proving critical for reducing social isolation and improving access to HIV/STI prevention resources during early migration phases (Febres-Cordero et al., 2018).

The intersection of migration status and sex work creates unique patterns of risk and resilience. Studies examining HIV risk among diverse migrant populations have identified low income, debt, homelessness, and limited access to medical care as key risk factors that disproportionately affect mobile populations (ElBassel et al., 2016). However, the relationship between mobility and HIV risk is not uniform. Research among male migrant workers in Central Asia found that mobility increased biologically-confirmed STIs among non-migrants but not among migrants themselves, suggesting that the effects of migration on health outcomes are mediated by complex contextual factors including the risk environment and pre-existing social support structures (ElBassel et al., 2016). These

nuanced findings highlight the importance of examining specific migration corridors and contexts when assessing HIV vulnerability.

Intersectionality: Legal Status, Economic Precarity, and Social Isolation

Understanding HIV vulnerability among migrant sex workers requires an intersectional approach that recognizes how multiple marginalized identities and structural positions interact to create unique patterns of risk. Legal status, economic precarity, and social isolation do not operate as isolated variables but rather form interconnected systems that mutually reinforce vulnerability (Nichols et al., 2025). Research among African refugee male sex workers in Italy illustrates this dynamic, revealing how stigma, financial precarity, and institutional exclusion interact to shape both substance use trajectories and HIV risk. The study found that escalating alcohol and drug use were consistently associated with higher reports of healthcare stigma, immigration-related barriers, and reduced voluntary healthcare access (Nichols et al., 2025).

Economic vulnerability emerges consistently as both a driver of sex work involvement and a factor limiting women's negotiating power with clients, thereby increasing vulnerability to violence and HIV. A qualitative assessment of gender equity interventions in Tijuana, Mexico found that participants reporting financial hardship experienced significantly elevated sexual and physical violence (Reed et al., 2025). Similarly, research has documented that lack of financial support from others was associated with increased sexual violence, highlighting how economic isolation compounds other forms of vulnerability (Reed et al., 2025). These findings demonstrate that economic precarity is not merely a background condition but an active force shaping daily risk experiences and limiting options for self-protection.

The Hong Kong Context: "One Country, Two Systems" and Sex Work

The unique political and economic arrangement governing Hong Kong provides a distinctive context for understanding cross-border sex work and HIV vulnerability. Under the "One Country, Two Systems" policy implemented following Hong Kong's return to Chinese sovereignty, the city has maintained a comparatively prosperous economy within the Asian region, fostering migration from mainland China due to proximity, higher earning potential, common language, and relaxed border controls. However, not all mainland Chinese citizens have equal access to legal migration pathways, and many women working in Hong Kong's sex industry do so illegally, without occupational, legal, or health protections.

Female migrant sex workers in Hong Kong face significant threats to their health, with their illegal status contributing to heightened vulnerability. The prevailing discourses that frame these women either as "trafficked victims" or "illegal immigrants" fail to adequately account for the complex situations resulting in their employment in Hong Kong's sex industry. Instead, their position is best understood through the broader framework of structural violence, which illuminates how socio-political issues systematically deny migrant sex workers adequate access to healthcare and opportunities for social advancement. The current legislative environment regarding both immigration and sex work perpetuates their marginalized and vulnerable status, creating structural barriers that impede their ability to manage their own health needs. This context necessitates structural interventions, including potential decriminalization and provision of open, inclusive access to health services, to effectively address the health inequities faced by this population.

II. CROSS-BORDER SEX WORK: MIGRATION PATTERNS AND STRUCTURAL DETERMINANTS

Global Patterns of Migrant Sex Worker Mobility and HIV Risk

Cross-border sex work represents a significant component of global migration patterns, with migrant sex workers facing disproportionate HIV/STI burdens across diverse international settings. Research examining transnational female sex workers in Macau, China found major differences in socioeconomic backgrounds, working conditions, HIV/AIDS knowledge, and vulnerability across women from Russia, Vietnam, Thailand, and Mainland China (Choi, 2010). The study identified age, ethnicity, education, economic pressure, workplace condom-use norms, and AIDS/STI knowledge as significant correlates of three key risks: client-perpetrated violence, non-condom use, and condom failure. These findings highlight the necessity of tailoring intervention measures to meet the specific needs of different migrant sex worker subgroups, as vulnerabilities are shaped by the distinct social and cultural contexts from which workers migrate and within which they operate (Choi, 2010).

China-Hong Kong Cross-Border Dynamics

The China-Hong Kong border represents a critical corridor for understanding cross-border sex work dynamics in Asia. Street-based sex workers in Chinese cities, including those near the Hong Kong border, demonstrate markedly elevated HIV/STI vulnerability compared to venue-based workers. A comprehensive study in Yunnan Province found that street-based sex workers were older, less educated, had more dependents and clients, utilized healthcare services less frequently, and had significantly higher HIV/STI infection

rates (37.2%) compared to brothel-based workers (24.9%) (Cai et al., 2024). Street-based workers also demonstrated lower awareness of STIs, underscoring the intersection of structural position, knowledge gaps, and health outcomes (Cai et al., 2024).

In Hong Kong itself, community-based STI screening among female sex workers revealed relatively low HIV and syphilis prevalence but high rates of pharyngeal gonorrhea, with N. gonorrhoeae detected predominantly in the pharynx rather than urogenital sites (Wong et al., 2015). The study found that unprotected fellatio with clients was significantly associated with perceived low risk of STI transmission via oral sex, working in clubs or on streets, recent entry into sex work, and group sex participation (Wong et al., 2015). These findings suggest distinct risk profiles between Hong Kong-based sex workers and their mainland Chinese counterparts, potentially reflecting differences in work environments, client demographics, and access to prevention resources. The proximity and ease of movement between mainland China and Hong Kong, combined with significant income differentials, create ongoing migration flows that necessitate understanding HIV risk within this specific cross-border context.

Legal Status, Visa Restrictions, and Health Access

Precarious immigration status emerges as one of the most significant structural determinants shaping HIV/STI risk among migrant sex workers globally. Qualitative research with migrant sex workers at the Guatemala-Mexico border revealed how human rights concerns stemming from workplace interactions with police and immigration authorities shaped health and safety across work environments. Women described how fear of detention or deportation prevented them from carrying condoms (which could be used as evidence of sex work), accessing health services, or reporting violence. This dual

criminalization—of both immigration status and sex work—creates what researchers have termed “hyper-precarious” conditions where workers face compounded risks without recourse to legal protections or institutional support.

The criminalization of sex work, combined with restrictive immigration policies, creates a dual legal vulnerability that profoundly impacts health-seeking behaviors. Across multiple settings, criminalization and immigration enforcement have been identified as major barriers impeding migrant sex workers’ access to HIV/STI and sexual reproductive health services (Artigas et al., 2025). For many migrant sex workers, fear of deportation and interaction with law enforcement limits their ability to insist on protective measures or report violence. These findings demonstrate that legal vulnerability is not merely a background condition but an active force shaping daily risk experiences and limiting options for self-protection.

Economic Drivers and Financial Vulnerability

Economic precarity serves simultaneously as a primary driver of migration for sex work and as an ongoing structural determinant that limits protective behaviors and healthcare access. Studies across diverse settings document how financial hardship undermines condom negotiation, increases tolerance of violence, and creates urgency in sex work that compromises safety. A study among female sex workers in Senegal found that high income from sex work was significantly associated with higher consistent condom use, while physical violence and working primarily in hotels or guest houses were associated with lower consistent condom use (Rwema et al., 2019). These findings suggest that economic empowerment may enhance agency and ability to negotiate safer sex, while economic

desperation constrains choices and increases vulnerability to violence and HIV exposure (Rwema et al., 2019).

The intersection of migration, sex work, and economic vulnerability creates cascading effects on HIV risk. Research has demonstrated that migrant sex workers often experience significant financial obligations, including debt from migration, remittances to family members in countries of origin, and higher living costs in destination cities. These financial pressures can lead to acceptance of higher-risk clients, engagement in unprotected sex for additional payment, increased client volume, and reduced selectivity in choosing safer work environments.

III. COMPARATIVE HIV/STI RISK PROFILES: STREET-BASED VS. VENUE-BASED AND MIGRANT VS. LOCAL POPULATIONS

Street-Based Sex Workers: Elevated Vulnerability in China

Street-based sex workers in China represent one of the most marginalized and underserved segments of the sex work population, facing dramatically elevated HIV/STI risks compared to their venue-based counterparts. Research in Yunnan Province documented that 37.2% of street-based sex workers tested positive for HIV/STI infections, compared to 24.9% of brothel-based workers (Cai et al., 2024). This disparity reflects multiple intersecting vulnerabilities: street-based workers were older, less educated, had more economic dependents, served more clients, accessed healthcare services less frequently, and demonstrated lower levels of HIV/STI-related knowledge despite their heightened exposure. The urgent need for Chinese health and public health sectors to prioritize

outreach to this population is evident, as street-based workers remain largely invisible to conventional prevention programming.

The structural conditions defining street-based sex work in China create an environment of compounded risk. Research examining violence and health-related risks among street sex workers in Nigeria—with findings applicable to similar contexts globally—revealed that criminalization and stigmatization of sex work exposed women to physical, emotional, sexual, and economic violence from multiple perpetrators including clients, police, sexual partners, and other sex workers (Nelson, 2020). Violence was used to coerce unprotected sex, extort money, and enforce moral punishment, with these experiences profoundly undermining health, condom negotiation capacity, and increasing STI/HIV risk (Nelson, 2020). While the study was conducted in Nigeria, its insights resonate with Chinese contexts where legal vulnerability similarly constrains sex workers' ability to negotiate safety or seek legal protection.

Migrant vs. Local Sex Worker HIV/STI Prevalence

Comparative data on HIV/STI prevalence between migrant and local sex workers reveals complex patterns shaped by migration status, mobility characteristics, and local context. Research among sex workers in South Africa found that 85.3% were migrants, with 39% being internal migrants and 46.3% cross-border migrants (Richter et al., 2012). Cross-border migrant sex workers had higher education levels, predominantly worked part-time in indoor venues, and earned more per client than other groups. However, they also demonstrated 41% lower health service contact and less frequent condom use compared to non-migrants, despite their apparently advantageous economic position (Richter et al.,

2012). These findings illustrate how migration status can simultaneously confer certain advantages while creating specific barriers to healthcare access and risk reduction.

The relationship between migration and HIV/STI risk is mediated by numerous contextual factors including length of residence, legal status, and integration into local support networks. Research from South Africa examining FSWs living with HIV found that drug use, violence experience, and immigration status independently affected health-related quality of life (Wang et al., 2021). Among factors assessed, older age, lack of current antiretroviral treatment, drug use, experience of violence, and moderate levels of internalized stigma were all associated with lower health-related quality of life scores. The study identified subgroup-specific vulnerabilities that emphasize the importance of addressing structural risks—including those specifically faced by migrant populations—alongside biomedical interventions.

Violence, Condom Negotiation, and Client Dynamics

Violence and coercion represent central mechanisms through which structural vulnerability translates into HIV risk for sex workers, with particularly severe impacts on migrant and street-based populations. A study among female sex workers in Northern Uganda found that 70.7% reported experiencing violence from clients, with violence significantly associated with higher levels of stigma across multiple dimensions (Kabunga et al., 2025). Violence exposure creates direct HIV risk through forced unprotected sex, but also indirect risk by undermining mental health, increasing substance use, and eroding confidence in condom negotiation (Kabunga et al., 2025). Among street-based sex workers, the elevated risk of violence reflects their work in unprotected outdoor environments with limited peer

support or security, combined with legal vulnerability that prevents reporting violence to authorities.

Condom negotiation capacity emerges as a critical mediating factor between structural vulnerability and HIV risk, with migrant and street-based workers facing particular challenges. Research examining condom negotiation among female sex workers in Nepal identified three primary strategies: withholding or refusing sex, providing risk information, and making direct requests (Huber-Krum et al., 2020). However, for many women, these strategies proved difficult to implement due to fear of abuse and threats of violence from clients. Condom negotiation was further complicated by poverty and substance abuse, with gender norms fundamentally constraining safe sexual practices (Huber-Krum et al., 2020).

Substance Use and Co-Occurring Vulnerabilities

Substance use patterns among sex workers create additional layers of vulnerability that intersect with migration status, economic precarity, and HIV risk. Research among African refugee sex workers in Italy documented that substance use increased significantly following entry into sex work, with the largest increase observed for injectable drugs (Nichols et al., 2025). The study revealed distinct HIV-related risk patterns by substance type: injection drug use was associated with lower odds of STI disclosure, reduced enjoyment of sex work, and decreased willingness to use HIV self-testing, while non-injection substance use was linked to greater HIV service awareness but also increased engagement in incentivized condomless sex (Nichols et al., 2025). These findings underscore how substance use operates within broader syndemic contexts, where multiple co-occurring epidemics and social conditions interact to magnify disease burden.

The relationship between substance use and HIV risk among sex workers is mediated by structural factors including trauma, economic stress, and social isolation. Qualitative research highlighted how stigma, financial precarity, and institutional exclusion shaped substance use trajectories among refugee sex workers, with substances often used as coping mechanisms for managing discrimination, violence, and the psychological toll of precarious living conditions. Among migrant populations specifically, substance use may increase during migration and early settlement periods when social isolation is most acute and economic pressures most severe. Integrated interventions addressing both structural determinants (immigration-related barriers, discrimination, economic insecurity) and individual-level behaviors are essential for effectively reducing HIV risk among sex worker populations characterized by high rates of substance use (Nichols et al., 2025).

IV. ACCESS TO HIV PREVENTION TOOLS AND HEALTHCARE-SEEKING BEHAVIORS

Barriers to Healthcare Access: Stigma, Discrimination, and Legal Fears

Multilevel barriers profoundly constrain healthcare access for migrant sex workers, with stigma and discrimination operating at individual, healthcare system, and community levels. Research among transgender sex workers in Uganda identified intersecting barriers including internalized stigma, low socioeconomic status, social exclusion by other key population groups, stigmatization by healthcare providers, confidentiality breaches, limited operating hours of key population-friendly facilities, discrimination by other patients, stockouts of STI drugs, and high costs (Ssekamatte et al., 2020). These barriers create cumulative deterrents to care-seeking, with many sex workers reporting that anticipated discrimination outweighs the perceived benefits of seeking services. The study

documented how sex workers developed harmful coping strategies in response to service gaps, including using inappropriate substitutes for lubricants and STI medications, consuming psychoactive substances to manage stigma, and changing dress to hide gender identity when accessing care (Ssekamatte et al., 2020).

For migrant sex workers specifically, legal fears compound clinical barriers to create particularly powerful deterrents to healthcare seeking. Research across multiple settings demonstrates that fear of deportation, arrest, or being reported to immigration authorities fundamentally shapes healthcare engagement patterns. Healthcare providers' requests for identification documents, real or perceived requirements to report undocumented individuals, and co-location of health services with law enforcement all contributed to avoidance of formal healthcare systems. In Hong Kong specifically, the illegal status of mainland Chinese sex workers creates profound healthcare access barriers, as seeking services risks exposure of immigration violations and potential deportation.

HIV Testing Uptake and Patterns

HIV testing represents a critical first step in both prevention and treatment cascades, yet uptake remains suboptimal among many sex worker populations, particularly migrant and street-based workers. Research among female sex workers in Indonesia found that supportive relationships with peers, community-based organizations, and workplace "bosses" enhanced HIV testing through multiple mechanisms (Whitford et al., 2021). Peers provided trusted networks for sharing information and emotional support, community outreach workers facilitated testing through reminders and accompanied visits, and community-based organizations collaborated with health services to provide mobile testing that overcame employment and family-related constraints (Whitford et al., 2021). These

findings underscore how social and organizational supports can effectively address barriers to testing uptake.

Among male clients of female sex workers in Hong Kong, HIV testing rates demonstrated concerning gaps. Only 23.8% of clients indicated they would probably or definitely take up HIV self-testing in the next year, despite this representing a potentially accessible testing modality (Lau et al., 2020). Positive attitudes toward HIV self-testing, perceived behavioral control over testing, and higher perceived HIV risk were associated with greater intention to test (Lau et al., 2020). The low testing intention among this bridging population—which connects high-risk sex workers to lower-risk general populations—highlights systematic gaps in HIV surveillance and prevention efforts.

PrEP Awareness, Access, and Adherence

Pre-exposure prophylaxis (PrEP) represents a powerful biomedical HIV prevention tool, yet awareness and uptake remain dramatically low among sex worker populations globally, with particularly acute gaps among migrant sex workers. Research examining PrEP barriers among migrant women sex workers in Europe identified significant lack of awareness about PrEP, with strong institutional resistance among medical and social workers primarily justified by lack of time to address sexual health issues with increasingly precarious clients and inability to provide long-term follow-up (Artigas et al., 2025). However, when PrEP was explained by researchers, migrant sex workers showed substantial interest and expressed desire to be more involved in HIV prevention generally (Artigas et al., 2025). The study highlighted that improving uptake requires culturally and linguistically tailored interventions co-developed with migrant sex workers, better training

for healthcare providers to ensure inclusive approaches, and structural changes including policy reforms and sustainable peer-led funding (Artigas et al., 2025).

Among sex workers who do access PrEP, adherence challenges reflect ongoing structural vulnerabilities. Qualitative research with female sex workers in rural Uganda explored self-care strategies supporting PrEP adherence, revealing that women employed both individual strategies (medication reminders, pairing PrEP with daily habits) and social strategies (verbal reminders from others, information sharing, shared clinic visits, shared pill-taking routines with peers) (Nakiganda et al., 2025). From a health system perspective, critical supports included information provision, NGO clinics as friendly and non-judgmental spaces, home-based PrEP distribution, in-bulk provision for work-related travel periods, and formal integration of sex workers as peer health workers (Nakiganda et al., 2025). These findings emphasize that PrEP adherence cannot be understood solely as individual behavior but must be supported through comprehensive person-centered and health system-centered interventions that acknowledge and address the realities of sex workers' lives.

Condom Access and Utilization

Condom access and consistent utilization remain foundational HIV prevention strategies, yet significant gaps persist, particularly among street-based and migrant sex workers. Research in Yunnan Province documented that street-based sex workers demonstrated lower rates of consistent condom use compared to brothel-based workers, despite facing higher HIV/STI prevalence (Cai et al., 2024). This paradox reflects how structural vulnerabilities—including economic desperation, client power dynamics, and reduced access to prevention resources—override knowledge and intention to practice safer sex.

Multiple studies have documented that clients' offers of additional payment for unprotected sex, threats of violence if condoms are insisted upon, and deliberate condom sabotage represent common mechanisms through which structural power inequalities translate into biological HIV risk (Huschke & Coetzee, 2020).

Condom access barriers for sex workers operate at multiple levels, from individual economic constraints to institutional supply issues to legal restrictions. Research has documented that some sex workers avoid carrying condoms due to fear they will be used as evidence by police to substantiate sex work charges and justify arrest (Rwema et al., 2019). In Senegal, difficulty accessing condoms was significantly associated with lower consistent condom use among female sex workers (Rwema et al., 2019). For migrant sex workers specifically, unfamiliarity with local condom distribution points, language barriers in accessing services, irregular work locations that make consistent access difficult, and fear of being identified at formal service sites all contribute to access gaps.

V. SOCIAL ISOLATION VS. PEER NETWORKS: THE ROLE OF SOCIAL CAPITAL

Social Isolation Among Migrant Sex Workers

Social isolation emerges as a defining characteristic of migrant sex workers' experiences, particularly during initial migration and sex work entry phases, with profound implications for HIV risk and health outcomes. Research examining peer support among international migrant sex workers at the Mexico-Guatemala border found that isolation was especially acute during early stages of migration when women lacked established relationships, faced language or cultural differences, and worked in unfamiliar environments (Febres-Cordero

et al., 2018). Peer support proved critical for reducing this isolation, improving access to HIV/STI knowledge and prevention resources, and mitigating workplace violence during these vulnerable initial periods (Febres-Cordero et al., 2018). However, challenges to accessing peer support included difficulties establishing long-lasting relationships due to frequent mobility, tensions among peers within some work environments, and variations in support access related to country of work, work environment, sex work experience, and migration stage (Febres-Cordero et al., 2018).

The consequences of social isolation for health extend beyond HIV risk to encompass mental health, healthcare access, and overall wellbeing. Research among migrant sex workers globally documents how isolation contributes to depression, anxiety, substance use as coping mechanism, and reduced health-seeking behaviors. Social isolation can prevent acquisition of critical health information typically shared through peer networks, including knowledge about service locations, experiences with providers, strategies for managing difficult clients, and practical prevention tips. For migrant sex workers who face language barriers and lack familiarity with local healthcare systems, peer networks represent essential sources of navigation support and accompaniment to services.

Peer Networks as Sources of Support and Information

When present, peer networks among sex workers serve multiple protective functions, providing emotional support, practical information, economic cooperation, and collective safety strategies. Research among female sex workers in Indonesia documented that trusted peer networks enabled sharing of HIV testing information and emotional support, with peers representing safe confidants with whom to discuss sensitive health concerns (Whitford et al., 2021). Similarly, research in Kenya examining peer relationships among

male and female sex workers found that relationships were often formed based on mutual understanding of sex work's challenging nature, with participants describing bonds in terms of friendship and brotherhood/sisterhood (Restar et al., 2021). Benefits identified included economic cooperation, access to information about HIV/STI and protection strategies, and collective support against violence from clients and law enforcement (Restar et al., 2021).

Peer networks also function as critical conduits for HIV prevention interventions. A study examining HIV self-testing among female sex workers in Uganda revealed that social support within peer networks both motivated and discouraged intervention uptake depending on the nature of support provided (McGowan et al., 2022). Sharing positive experiences with HIV self-testing (informational support), directly delivering test kits (instrumental support), and encouraging linkage to care (emotional support) all motivated uptake (McGowan et al., 2022). Conversely, spread of misinformation, limited kit availability fostering mistrust of peer educators, and fear of social exclusion following HIV status disclosure discouraged uptake. These findings underscore that peer networks are not uniformly beneficial but rather sites where both health-promoting and health-undermining information and practices circulate.

Community Mobilization and Collective Empowerment

Community mobilization approaches that engage sex workers collectively to address shared priorities have demonstrated significant impacts on HIV prevention outcomes, though implementation among migrant populations faces distinct challenges. Research in south India examining community mobilization among female sex workers found that engagement with HIV programs and mobilization activities was significantly associated

with multiple dimensions of empowerment (Blanchard et al., 2013). “Power within” (self-esteem and confidence) and “power with” (collective identity and solidarity) were positively associated with program contact, and these empowerment measures were in turn associated with increased self-efficacy for condom use, higher autonomy, reduced violence and coercion, and better health service utilization (Blanchard et al., 2013). Collective empowerment was most strongly associated with social transformation variables including reduced violence, particularly in districts with longer-duration programs (Blanchard et al., 2013).

However, achieving community mobilization among migrant sex worker populations presents unique challenges related to mobility, language diversity, fear of exposure, and lack of legal status. Hybrid approaches combining multiple strategies may optimize reach while maintaining methodological rigor. Regardless of approach, building trust through community partnerships, ensuring confidentiality protections, and providing appropriate compensation for participation time represent essential ethical and practical considerations for work with these vulnerable populations.

Trust, Disclosure, and Social Cohesion

Trust within peer networks and broader sex worker communities fundamentally shapes health behaviors, information sharing, and collective action possibilities. Research in Swaziland examining social capital among female sex workers found that social cohesion was significantly associated with consistent condom use in the past week and reduced reports of discrimination (Fonner et al., 2014). Women with higher social cohesion were also more likely to report HIV testing and condom use with non-paying partners (Fonner et al., 2014). Social participation in the larger community was similarly associated with

benefits including reduced harassment and discrimination experiences (Fonner et al., 2014). These findings demonstrate that social capital operates as a protective factor, facilitating internal mutual aid while also enhancing access to broader social and material resources beyond sex worker networks.

However, trust and disclosure dynamics are complicated by stigma, criminalization, and fear of negative consequences. Research examining HIV self-testing among female sex workers in Nigeria found that while convenience and privacy were valued, concerns about stigma if others discovered their testing and fear of result disclosure to partners or community members represented significant barriers (Anyiam et al., 2025). For migrant sex workers, disclosure decisions carry additional risks related to immigration status, with fears that health information could be shared with authorities or used against them in deportation proceedings. Building trust-based relationships requires time, consistent positive interactions, and demonstrated confidentiality—resources that may be limited in contexts where sex workers are highly mobile, services are provided by rotating staff, or enforcement activities create ongoing fear and instability.

VI. METHODOLOGICAL APPROACHES AND RESEARCH GAPS

Community-Based Participatory Research Methods

Community-based participatory research (CBPR) has emerged as a critical methodological approach for engaging sex worker populations, particularly marginalized subgroups like migrant and street-based workers who face multiple barriers to research participation. CBPR emphasizes meaningful involvement of community members in all phases of research—from question formulation through data collection, analysis, interpretation, and

dissemination—recognizing that communities possess essential expertise about their own experiences and needs (Goldenberg et al., 2016). Research with migrant sex workers at the Guatemala-Mexico border identified how researcher mistrust and fear rooted in social isolation frequently faced by recent migrants created barriers to research participation (Goldenberg et al., 2016). Intersecting concerns related to immigration status, fear of criminalization, and sex work regulation compliance all influenced willingness to engage with researchers. Perceived benefits and risks of HIV/STI testing for migrants—including immigration implications and stigma—represented critical considerations that shaped research participation decisions (Goldenberg et al., 2016).

The successful implementation of CBPR with sex worker populations requires developing population-tailored procedures that address fears related to immigration and criminalization while reinforcing positive, non-stigmatizing relationships. Research examining community-led studies among female sex workers in South Africa demonstrated the feasibility and importance of community-centric approaches with marginalized populations (Milovanovic et al., 2021). Involving sex workers in study design, questionnaire development, and data collection yielded rapid enrollment rates, low screening failure, and minimal missing data. The study achieved HIV testing for over 3,000 participants across 12 sites, documenting 61.96% HIV prevalence alongside high rates of violence, mental health challenges, and inconsistent condom use (Milovanovic et al., 2021). These results illustrate how CBPR methodologies can successfully engage hard-to-reach populations when researchers genuinely partner with communities and address practical barriers to participation.

Mixed-Methods Approaches: Bio-Behavioral Surveys and Qualitative Inquiry

Integrated mixed-methods designs combining biological testing, behavioral surveys, and qualitative inquiry offer comprehensive approaches to understanding HIV risk in its full complexity. Bio-behavioral surveys enable estimation of HIV/STI prevalence while simultaneously gathering data on risk behaviors, structural exposures, and service utilization patterns. Research among street-based sex workers in Yunnan Province exemplifies this approach, combining blood samples for HIV and syphilis testing and urine samples for gonorrhea and chlamydia testing with face-to-face interviews collecting socio-demographic characteristics, sexual behaviors, HIV/STI knowledge, and healthcare access data (Cai et al., 2024). This integrated approach revealed that 37.2% of street-based workers had biological evidence of HIV/STI infection, while survey data documented their lower education, greater number of dependents, reduced healthcare access, and limited STI awareness—providing comprehensive understanding of both biological burden and the structural factors driving it.

Qualitative methods are essential for understanding the mechanisms, meanings, and contexts that quantitative data alone cannot illuminate. In-depth interviews and focus group discussions reveal how structural factors translate into daily risk experiences, how sex workers navigate competing priorities and constraints, and what intervention approaches might be feasible and acceptable. Research among migrant sex workers in multiple settings has employed qualitative methods to explore peer support dynamics, violence experiences, healthcare barriers, and coping strategies, generating insights that inform intervention design (Febres-Cordero et al., 2018). Ethnographic approaches including participant observation can further illuminate the work environments, social relationships, and

community contexts shaping HIV risk. The integration of qualitative and quantitative approaches enables both measurement of HIV/STI burden and deep understanding of the social processes and structural conditions producing that burden.

Sampling Strategies for Hard-to-Reach Populations

Rigorous sampling of hidden populations like sex workers, particularly migrant and street-based subgroups, requires specialized approaches that can penetrate social networks and reach individuals who avoid conventional healthcare and research settings. Respondent-driven sampling (RDS) has emerged as a widely-used method that leverages peer networks to recruit participants, beginning with initial "seeds" who then recruit peers from their social networks, who in turn recruit others (Milovanovic et al., 2021). RDS enables calculation of population-weighted estimates that adjust for network size and recruitment patterns, theoretically producing less biased prevalence estimates than convenience sampling. Research among female sex workers in multiple African settings has successfully used RDS to recruit large samples and generate prevalence estimates, though the method requires careful attention to seed selection, coupon distribution, and achievement of recruitment waves sufficient for statistical adjustment (Fonner et al., 2014).

Time-location sampling represents another approach useful for reaching sex workers, particularly street-based workers who congregate in identifiable locations at predictable times. This method involves formative research to map venues and times where sex workers can be found, followed by random selection of venue-time units and systematic sampling of individuals present (Milovanovic et al., 2021). Venue-based approaches have limitations when sex workers are highly mobile or work in dispersed, changing locations, as is often true for migrant and street-based populations. Hybrid approaches combining

multiple sampling strategies—RDS for reaching networked populations, venue-based sampling for workers in identifiable hotspots, and snowball sampling for highly hidden subgroups—may optimize reach while maintaining methodological rigor. Regardless of sampling approach, building trust through community partnerships, ensuring confidentiality protections, and providing appropriate compensation for participation time represent essential ethical and practical considerations for research with these vulnerable populations (Goldenberg et al., 2016).

Critical Research Gaps and Future Directions

Despite growing research attention to sex worker populations, significant gaps remain in understanding HIV vulnerability among specific subgroups and in particular geographic contexts. The comparison between mainland Chinese migrant sex workers and local street-based sex workers in Hong Kong represents one such understudied area, with limited systematic research examining how legal status, economic precarity, and social isolation differentially shape HIV/STI risk profiles and healthcare access between these groups. While NGOs like Action for Reach Out (AFRO) and Zi Teng provide services to these populations, academic studies systematically comparing these subgroups are lacking. Research is needed to document HIV/STI prevalence in each population, identify differential risk factors and protective factors, assess barriers and facilitators to prevention tool access, and evaluate intervention approaches tailored to each group's distinct circumstances.

Beyond prevalence estimates and risk factor identification, research gaps exist in understanding the mechanisms through which structural vulnerabilities translate into HIV risk and the intervention approaches that effectively address these pathways. Longitudinal

research tracking sex workers over time as legal status, economic circumstances, and social networks evolve could illuminate how changes in structural positions influence risk trajectories and healthcare engagement (Hendrickson et al., 2021). Intervention research testing structural approaches—including legal reforms, economic strengthening programs, and policy changes to improve healthcare access for undocumented migrants—is urgently needed, as most existing interventions focus on individual behavior change despite strong evidence that structural factors fundamentally constrain choices (Artigas et al., 2025). Finally, research systematically examining intersectionality—how age, migration status, work venue, substance use, and other characteristics interact to create heterogeneous vulnerability profiles—would enable more precisely targeted interventions that address the specific needs of multiply marginalized

Table 1: Comparative Structural Determinants Affecting Migrant vs. Local Street-Based Sex Workers in the Hong Kong Context

Structural Domain	Mainland Chinese Migrant Workers	Local Hong Kong Street-Based Workers
Legal Status		
Illegal/undocumented status; visa violations; risk of deportation; no legal right to work	Legal residents; no immigration violations; but criminalized sex work status	
Economic Precarity		
Remittance obligations; migration debt; higher living costs; limited alternative employment due to illegal status		

Structural Domain	Mainland Chinese Migrant Workers	Local Hong Kong Street-Based Workers	Legal Status
Economic marginalization; poverty; limited alternative employment; family financial obligations	**Social Isolation**	Language barriers; separation from home networks; fear of exposure limiting social connections; recent migration status	Some local networks; possible family estrangement; stigma limiting social connections
Healthcare Access	Fear of deportation preventing service use; unfamiliarity with system; language barriers; no insurance/eligibility	Legal barriers; stigma; discrimination; limited financial access; awareness gaps	**Police/Legal Interaction**
Dual vulnerability: immigration enforcement + sex work criminalization; risk of detention & deportation	Criminalization of sex work; arrest risk; police harassment; violence without recourse	**Violence Exposure**	Unable to report to police due to legal status; client coercion leveraging fear of exposure
Unable to report due to criminalization; street-based work location increases exposure	**Knowledge/Information**	Limited access to HIV/STI information in appropriate language; unfamiliar with local resources	Variable access depending on outreach program contact; potential for local language resources

Note: This table synthesizes findings from (Artigas et al., 2025; Cai et al., 2024; Nelson, 2020), and relevant literature on structural barriers.

Table 2: HIV/STI Risk Factors and Prevalence Estimates from Key Studies of Sex Worker Populations

Study Population & Location	Sample Size	HIV Prevalence	Other STI Prevalence
Key Risk Factors Identified	**Citation**	Street-based sex workers, Yunnan, China	129
Part of 37.2% combined HIV/STI	Part of 37.2% combined	Older age, less education, more dependents, more	(Cai et al., 2024)

Study Population & Location	Sample Size	HIV Prevalence	Other STI Prevalence
		clients, lower healthcare access	
Brothel-based sex workers, Yunnan, China	185	Part of 24.9% combined HIV/STI	Part of 24.9% combined
Relatively better education, fewer clients, more healthcare access	(Cai et al., 2024)	Female sex workers, Hong Kong	340
0%	Syphilis 2.1%; Pharyngeal C. trachomatis 3.2%; Pharyngeal N. gonorrhoeae 4.4%; Urogenital chlamydia 10.6%	Working on streets, working in clubs, recent sex work entry (<1 year), group sex, perceived low oral sex risk	(Wong et al., 2015)
Cross-border migrant sex workers, South Africa	758 (46.3% of total)	Not specified	Not specified
41% lower health service contact, less frequent condom use vs. non-migrants	(Richter et al., 2012)	Female sex workers living with HIV, South Africa	1,363
100% (study sample)	Not specified	Drug use, violence, lack of ART, older age, internalized stigma associated with lower quality of life	(Wang et al., 2021)
Transnational sex workers, Macau	Multiple groups	Varied by origin	Varied by origin
Age, ethnicity, education, economic pressure, workplace condom norms, STI knowledge	(Choi, 2010)	African refugee sex workers, Italy	150
Not specified	Not specified	Injection drug use, healthcare stigma, immigration	(Nichols et al., 2025)

Study Population & Location	Sample Size	HIV Prevalence	Other STI Prevalence
		barriers, substance use escalation post-sex work entry	

Note: Prevalence estimates vary significantly by geographic location, sampling methodology, and population characteristics. Direct comparisons should account for these contextual differences.

CONCLUSION

This comprehensive literature review reveals that HIV vulnerability among sex workers cannot be understood through individual risk behaviors alone but must be situated within broader structural contexts that systematically constrain agency and create conditions for HIV transmission. The comparison between mainland Chinese migrant sex workers and local street-based sex workers in Hong Kong exemplifies how intersecting structural vulnerabilities—legal status, economic precarity, and social isolation—operate through distinct yet overlapping pathways to shape HIV/STI risk profiles, prevention tool access, and healthcare-seeking behaviors.

The evidence base demonstrates that mainland Chinese migrant sex workers face dual legal vulnerability through both immigration violations and sex work criminalization, creating profound barriers to healthcare access, violence reporting, and condom negotiation that differ in important ways from challenges faced by local street-based workers. Economic precarity drives migration and sustains involvement in higher-risk activities, with financial pressures limiting women's ability to refuse unsafe clients or insist on protective measures. Social isolation, particularly acute during early migration phases, prevents access to critical

health information and peer support that would otherwise facilitate risk reduction and healthcare navigation (Febres-Cordero et al., 2018).

Addressing these structural determinants requires moving beyond individual behavior change interventions toward comprehensive approaches that include legal reforms, economic strengthening, peer-led community mobilization, and healthcare system changes to ensure accessible, non-discriminatory services regardless of immigration status. The critical research gap comparing these two populations in Hong Kong represents an opportunity to generate evidence that could inform targeted, rights-based interventions addressing the specific needs of each subgroup while advocating for broader structural changes to protect all sex workers' health and human rights. Community-based participatory research employing mixed-methods designs offers the most promising methodological approach for engaging these marginalized populations, generating valid data, and ensuring research findings translate into meaningful improvements in policy and practice (Goldenberg et al., 2016; Milovanovic et al., 2021).

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