Male Sex Workers Serving Men as Bridge Populations in Hong Kong's HIV Epidemic: The Role of Intersectional Stigma in Prevention and Care Engagement

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I. INTRODUCTION AND EPIDEMIOLOGICAL CONTEXT

A. HIV Epidemic in Hong Kong and the Asia-Pacific Region

The HIV epidemic continues to evolve across the Asia-Pacific region, with men who have sex with men (MSM) experiencing disproportionate HIV burden despite biomedical advances in prevention and treatment (Rajasegaram & Zakaria, 2025). Globally, the proportion of new adult HIV infections among MSM increased from 11% in 2010 to 20% in 2022, highlighting the persistent vulnerability of this key population (Korenromp et al., 2024). In Hong Kong specifically, sexual transmission has become the predominant mode of HIV acquisition, with MSM accounting for an increasing proportion of newly diagnosed cases. Between 2007-2008 and 2016-2018, the proportion of MSM among newly diagnosed HIV patients increased dramatically from 50.3% to 87.8% (Poon et al., 2022). The HIV prevalence among MSM in Hong Kong was estimated at 6.5% nationally by 2011, with considerable geographic variation and an alarming upward trajectory (Dong et al., 2019).

Phylogenetic analyses have revealed complex transmission dynamics within Hong Kong's MSM population. Multiple distinct HIV-1 subtype B epidemics emerged during the 1990s, with genetic clustering patterns indicating ongoing local transmission networks (Chen et al., 2011). The epidemic is characterized by substantial genetic diversity, with CRF01_AE (45.3%) and CRF07_BC (35.8%) representing the predominant circulating strains among MSM (Leung et al., 2019). Notably, molecular epidemiological studies have demonstrated that 70% of HIV sequences among non-MSM patients were genetic isolates, suggesting limited clustering in heterosexual transmission networks compared to the more densely connected MSM networks (Wong et al., 2020). This epidemiological pattern underscores

the importance of understanding transmission dynamics within and potentially beyond MSM populations.

B. MSM as a Key Population in Hong Kong's HIV Response

MSM in Hong Kong face multiple structural and behavioral risk factors that perpetuate HIV transmission. High-risk sexual behaviors remain prevalent, with studies documenting that 40.8% of MSM had unprotected anal intercourse with regular or non-regular male sex partners despite previous HIV testing experience (J. Gu et al., 2015). The emergence of chemsex—the intentional use of psychoactive substances to facilitate or enhance sexual experiences—has further complicated prevention efforts. Social media and gay social networking applications serve as major sources of influence on MSM's perceptions and behaviors related to sexualized drug use, with exposure to pro-chemsex content significantly associated with actual engagement in these practices (Wang et al., 2020). Additionally, 6.9% of Hong Kong MSM reported sexualized drug use within a six-month follow-up period, with positive attitudes toward such practices and perceived social norms being significant predictors (Wang et al., 2020).

Despite the availability of HIV prevention tools, uptake remains suboptimal. A pilot study on partially self-financed pre-exposure prophylaxis (PrEP) delivery demonstrated feasibility with 80% retention at 28 weeks, yet stigma and cost remained significant concerns (Lee et al., 2019). Only 22.4% of MSM in a national internet survey had heard of PrEP, and concerns about side effects, low perceived HIV risk, and preference for condoms negatively affected willingness to use PrEP (Han et al., 2019). The challenge of late presentation persists, with nearly 60% of newly diagnosed individuals classified as late

presenters in both the 2007-2008 and 2016-2018 cohorts, indicating that earlier detection strategies have not adequately penetrated this population (Poon et al., 2022).

C. Defining Male Sex Workers Who Serve Men (MSM-SWs)

Male sex workers who serve men (MSM-SWs) represent a particularly vulnerable subgroup within the broader MSM population, characterized by the intersection of sex work and same-sex sexual behavior. Unlike female sex workers, MSM-SWs often operate in less visible and more stigmatized contexts, complicating outreach and service delivery efforts (Verhaegh-Haasnoot et al., 2015). Research from China reveals striking disparities between male sex workers and non-sex worker MSM. In a large study conducted in Tianjin, MSM-SWs demonstrated an HIV prevalence of 17.8% compared to 6.5% among non-sex worker MSM (Yu et al., 2022). Male sex workers were significantly younger, more likely to live alone, had lower educational attainment, and reported higher rates of drug use before sex (Yu et al., 2022).

The profile of MSM-SWs varies considerably across contexts. In Western settings, internet-based male sex work has emerged as a significant phenomenon, with male sex workers serving men identified as a “hidden key population” that bridges HIV transmission between MSM and potentially to heterosexual networks (Verhaegh-Haasnoot et al., 2015). A clinic-based study found that male sex workers tested positive for sexually transmitted infections (STIs) including HIV in 40% of consultations, significantly higher than the 9% positivity rate among female sex workers and 14% among non-sex worker MSM (Verhaegh-Haasnoot et al., 2015). Importantly, MSM-SWs reported more frequent sex contacts with women and other sex workers, suggesting complex sexual networks that extend beyond same-sex encounters (Verhaegh-Haasnoot et al., 2015). These demographic

and behavioral characteristics position MSM-SWs as potential bridge populations capable of facilitating HIV transmission across multiple sexual networks.

D. Research Rationale and Review Objectives

The limited research on MSM-SWs in Hong Kong and the broader Asia-Pacific region represents a critical gap in understanding HIV transmission dynamics and designing effective prevention strategies. While studies have documented high HIV prevalence among male sex workers in various Asian contexts (Narayanan et al., 2013), the specific role of MSM-SWs as bridge populations within Hong Kong's epidemic remains poorly characterized. Furthermore, the impact of intersectional stigma—arising from the convergence of HIV status, sex work, and sexual minority identities—on prevention and care engagement has not been systematically examined in this population (Abubakari, Dada, et al., 2021).

This literature review aims to: (1) synthesize available evidence on MSM-SWs as potential bridge populations within HIV transmission networks in Hong Kong; (2) examine how intersectional stigma manifests across multiple social-ecological levels for MSM-SWs; (3) analyze the impact of these intersecting stigmas on HIV prevention engagement, including testing, PrEP uptake, and risk reduction; (4) assess barriers to HIV care continuum outcomes, including linkage to care, treatment adherence, and viral suppression; and (5) identify evidence-based intervention strategies and critical research gaps that must be addressed to achieve HIV epidemic control in this highly vulnerable population.

II. MSM-SWs AS BRIDGE POPULATIONS IN HIV TRANSMISSION NETWORKS

A. Bridge Population Concept and HIV Transmission Dynamics

The concept of bridge populations in HIV epidemiology refers to groups whose sexual or drug-using behaviors create pathways for HIV transmission between high-prevalence core groups and lower-prevalence general populations. Male clients of female sex workers have been extensively studied as bridge populations, with evidence demonstrating their role in heterosexual HIV transmission (Hodgins et al., 2022). In sub-Saharan Africa, 8% of sexually active men reported ever paying for sex, and these men had 50% higher HIV prevalence compared to men who had never paid for sex (Hodgins et al., 2022). Similarly, male clients of female sex workers in China have been characterized as important bridge populations, with their sexual behaviors creating transmission pathways from sex workers to their other partners (Lau et al., 2020).

The transmission dynamics involving sex workers are complex and multidirectional. Mathematical modeling studies have estimated infection ratios—the ratio of new infections among non-key population partners to infections acquired among key populations themselves. For female sex workers, the median infection ratio was 0.7 for acquisitions from clients and 1.2 for transmissions to all non-key population partners (Silhol et al., 2024). These ratios confirm that prevention and treatment needs among key populations, including sex workers, are central to reducing overall HIV incidence. Phylogenetic network analyses have further illuminated these dynamics, revealing overlapping transmission networks among different key populations and geographic locations (Schneider et al., 2021).

For MSM-SWs specifically, the bridge population potential is theoretically heightened by their position at the intersection of multiple sexual networks. Male sex workers in coastal Kenya who engaged in bisexual activity created HIV transmission pathways to partners in both MSM and heterosexual networks, though they exhibited lower individual acquisition risks compared to exclusive MSM sex workers (A. D. Smith et al., 2015). This finding suggests that bridging potential cannot be assumed based solely on bisexual behavior patterns; empirical data on actual transmission events and network connectivity are essential. Furthermore, epidemiological projection methods may overestimate the bridging potential of MSM-SW populations without accounting for systematic differences in HIV risk within these heterogeneous groups (A. D. Smith et al., 2015).

B. Sexual Network Characteristics of MSM-SWs

Sexual network analysis provides critical insights into how HIV spreads within and between populations. The structure and characteristics of MSM-SWs' sexual networks differ substantially from those of non-sex worker MSM. Among MSM-SWs in China, the average number of sexual partners was considerably higher, with one study documenting that MSM-SWs had significantly more male partners (8.9 versus 2.5) compared to other MSM (Narayanan et al., 2013). Additionally, MSM-SWs reported higher rates of receptive anal sex (96% versus 72%), a behavior associated with increased HIV acquisition risk (Narayanan et al., 2013). The sexual networks of MSM-SWs are characterized by multiple concurrent partnerships, including paying clients, regular romantic partners, and non-commercial casual partners.

Research on female sex workers' networks offers relevant insights that may apply to MSM-SWs. In China, female sex workers' sexual networks were characterized by multiple

relations (680 connections), unstable relationships (50% turnover), and high rates of inconsistent condom use with non-commercial partners (31%) (Liu et al., 2020). Some female sex workers were connected through shared partners, forming integrated network components with cohesive sub-networks that had larger size, more complex structures, and higher HIV prevalence compared to isolated networks (Liu et al., 2020). Male clients served as key nodes within these networks, functioning as bridges between high-risk groups and the general population (Liu et al., 2020). Similar patterns likely exist in MSM-SW networks, where clients and other sexual partners create pathways for HIV transmission across population segments.

In Hong Kong specifically, social media and smartphone applications have fundamentally transformed how MSM, including sex workers, form sexual networks. MSM using different channels for sex networking exhibited varying HIV and syphilis risks, with those using online forums having lower PrEP awareness compared to those visiting physical venues (Kwan & Lee, 2019). Furthermore, MSM who used recreational drugs for sex, a behavior more common among those involved in transactional sex, held positions of greater network importance based on centrality measures (Kwan et al., 2020). These digital platforms enable rapid partner turnover and geographic mobility, potentially accelerating HIV transmission within densely connected networks while simultaneously creating opportunities for innovative prevention interventions (Kwan et al., 2020).

C. HIV Prevalence and Risk Behaviors among MSM-SWs

HIV prevalence among MSM-SWs substantially exceeds that of non-sex worker MSM across diverse geographic contexts. The 17.8% HIV prevalence observed among MSM-SWs in China represents a nearly three-fold increase compared to the 6.5% prevalence in

non-sex worker MSM from the same study population (Yu et al., 2022). In Western settings, a clinic-based study found that male sex workers tested positive for STIs including HIV in 40% of consultations, with 8% newly diagnosed with HIV—rates dramatically higher than those observed in female sex workers or other MSM (Verhaegh-Haasnoot et al., 2015). In India, male sex workers who reported transactional sex had HIV prevalence of 43.6%, more than double the 18.1% prevalence among MSM who did not engage in sex work (Narayanan et al., 2013).

Beyond HIV prevalence, MSM-SWs engage in higher-risk sexual behaviors that facilitate transmission. The profile of risk behaviors includes: higher frequency of condomless anal intercourse, particularly with non-commercial partners; greater number of lifetime sexual partners; earlier sexual debut; and increased likelihood of substance use in sexual contexts (Verhaegh-Haasnoot et al., 2015; Yu et al., 2022). Paradoxically, while MSM-SWs reported higher proportions of always using condoms during anal sex overall (56.5% versus 42%), they had substantially lower rates of consistent condom use specifically during commercial sex encounters (81.3% versus 98.5%) compared to non-sex worker MSM (Yu et al., 2022). This pattern suggests that economic pressures and client preferences may override HIV prevention priorities during paid sexual encounters.

Notably, bisexual behavior patterns among MSM-SWs create additional transmission pathways. In the Chinese study, 37.9% of MSM reported bisexual behaviors, and MSM-SWs were more likely to report sex contacts with women and other sex workers (Verhaegh-Haasnoot et al., 2015; Yu et al., 2022). However, the relationship between bisexual activity and bridging risk is nuanced. Among MSM-SWs in Kenya, those with bisexual activity demonstrated lower individual HIV acquisition risks than exclusive MSM sex workers,

challenging assumptions about bridging potential based solely on bisexual behavior (A. D. Smith et al., 2015). These findings emphasize the need for empirical network data to accurately assess how MSM-SWs function as bridge populations rather than relying on behavioral proxies alone.

D. Phylogenetic and Molecular Evidence of HIV Transmission Networks

Molecular epidemiology and phylogenetic analysis provide powerful tools for reconstructing HIV transmission networks and identifying populations that serve as transmission hubs. In Hong Kong, phylogenetic studies of HIV-1 among MSM have revealed distinct epidemic patterns with multiple introductions and local transmission clusters (Chen et al., 2011). The genetic diversity observed—including CRF01_AE, CRF07_BC, and various unique recombinant forms—suggests multiple independent introductions followed by local amplification within sexual networks (Leung et al., 2019). Among 1229 HIV sequences from non-MSM patients, 70% were genetic isolates with only 17% forming small clusters (dyads or triads), contrasting sharply with the more extensive clustering observed in MSM populations (Wong et al., 2020).

Phylogenetic network analyses incorporating patient demographic and behavioral data have demonstrated the value of this approach for understanding transmission dynamics. A study integrating phylogenetic, clinical, and behavioral data from Hong Kong MSM found that genetic network connectivity varied according to channels used for sex networking and patterns of risk behavior engagement (Kwan et al., 2020). MSM using recreational drugs for sex held more central network positions, indicating their potential importance in sustaining transmission (Kwan et al., 2020). Furthermore, information diffusion modeling approaches revealed that CRF01_AE had higher transmission cascade metrics (scale, speed,

and range) compared to subtype B, signifying distinct transmission patterns for circulating HIV subtypes (Kwan et al., 2020).

While specific phylogenetic studies of MSM-SWs in Hong Kong were not identified in the current literature, research from other contexts demonstrates the feasibility and value of this approach. In Pakistan, phylogenetic analysis of HIV envelope sequences from male sex workers, female sex workers, and other key populations revealed significant connectivity and directionality, suggesting broad and overlapping transmission networks (Schneider et al., 2021). At least 15 independent HIV introductions were identified, with 12 clusters containing sequences from Pakistan and neighboring countries exclusively (Schneider et al., 2021). Applying similar molecular epidemiological methods to MSM-SWs in Hong Kong could elucidate their role in transmission networks, identify priority targets for intervention, and guide resource allocation for maximum epidemic impact.

III. INTERSECTIONAL STIGMA: THEORETICAL FRAMEWORK AND MANIFESTATIONS

A. Conceptualizing Intersectional Stigma in MSM-SWs

Intersectional stigma, grounded in intersectionality theory, recognizes that individuals with multiple marginalized identities experience stigma in ways that are qualitatively different from—and often more severe than—the additive effects of single stigmas (Abubakari, Dada, et al., 2021). For MSM-SWs, intersecting stigmas related to HIV status, sex work, sexual orientation, and potentially gender non-conformity converge to create unique experiences of discrimination, social exclusion, and structural disadvantage. The Health Stigma and Discrimination Framework provides a useful conceptual model, identifying

enacted stigma (experienced discrimination), anticipated stigma (expectations of discrimination), and internalized stigma (acceptance of negative societal attitudes) as key mechanisms through which stigma impacts health outcomes (Bhutada et al., 2023).

Research on intersectional stigma among MSM living with HIV in other contexts illuminates potential dynamics affecting MSM-SWs. In India, qualitative research revealed that enacted stigma associated with both HIV and MSM identity manifested as familial shame and healthcare discrimination, inhibiting access to social support and decreasing HIV care engagement (Bhutada et al., 2023). Anticipated stigma led to pervasive worry about disclosure and fear of societal repercussions, creating barriers even before discrimination was directly experienced (Bhutada et al., 2023). Among Chinese MSM living with HIV, those experiencing both high HIV-related stigma and high sexual and gender minority (SGM) stigma demonstrated significantly worse psychosocial outcomes—including depression, anxiety, reduced quality of life, and lower psychological resilience—compared to those experiencing only one type of stigma (Yang et al., 2020).

The concept of "living a private lie" emerged from research with young key populations in Zambia, where MSM and transgender women living with HIV described the compounding effect of hiding both sexuality and HIV status (Zulu et al., 2024). Thirty-six percent of participants had contemplated suicide, with transgender women experiencing particularly high rates of moderate to severe depression (40% versus 33% among MSM) and suicidal ideation (55% versus 36%) (Zulu et al., 2024). For MSM-SWs, the additional layer of sex work stigma—which carries moral condemnation and legal consequences in many jurisdictions—likely intensifies these psychological burdens and compounds barriers to health-seeking behavior. Understanding how these intersecting stigmas operate across

individual, interpersonal, community, and structural levels is essential for designing effective interventions (Embleton et al., 2022).

B. HIV-Related Stigma

HIV-related stigma remains a formidable barrier to prevention and care globally, despite decades of anti-stigma campaigns and the availability of effective treatment (Babel et al., 2021). In the United States, family stigma related to HIV (prevalence 47.5%) was paradoxically associated with greater healthcare engagement and PrEP awareness among HIV-negative MSM, possibly reflecting family concern driving health-seeking behavior (Wiginton et al., 2024). However, anticipated healthcare stigma (prevalence 14.5%) was associated with lower odds of healthcare engagement, current antiretroviral therapy use, and viral suppression among MSM living with HIV (Wiginton et al., 2024). General social stigma (prevalence 49.9%) demonstrated mixed associations, increasing PrEP awareness but decreasing antiretroviral therapy adherence (Wiginton et al., 2024).

In African contexts, HIV stigma manifests with particular intensity. Among MSM and transgender women in sub-Saharan Africa, 45% reported healthcare-related stigma experiences, with fear of seeking healthcare services (36.3%) and avoiding services due to potential discovery of MSM status (29.2%) being most common (Mbeda et al., 2020). Those without supportive gay community networks were significantly more likely to report healthcare stigma (adjusted odds ratio 1.46), while those with high social support and no history of transactional sex reported less stigma (Mbeda et al., 2020). In Ghana, where HIV prevalence among MSM reaches 18% compared to 2% in the general population, intersectional stigma at family, peer, healthcare, and community levels creates a web of barriers that discourage HIV testing and linkage to care (Abu-Baare et al., 2021).

For MSM-SWs specifically, HIV stigma intersects with sex work stigma to create unique challenges. The association between sex work and HIV risk in public consciousness means that MSM-SWs may face dual assumptions about HIV status and risk behaviors. Research on female sex workers demonstrates that HIV-positive sex workers experience compounded stigma from both identities, leading to social isolation, mental health problems, and reduced engagement with health services (Comins et al., 2019). While direct evidence on HIV stigma among MSM-SWs in Hong Kong is limited, studies from the region indicate that stigma intensity varies by cultural context, with more collectivist Asian societies potentially exhibiting stronger family-based and community-based stigma compared to individualist Western contexts (Rajasegaram & Zakaria, 2025).

C. Sex Work Stigma

Sex work stigma operates at multiple levels, from interpersonal discrimination to structural criminalization, profoundly affecting sex workers' health and wellbeing. Female sex workers globally report experiencing stigma from families, communities, intimate partners, clients, police, and healthcare providers (Fitzgerald-Husek et al., 2017). In Hong Kong, where sex work exists in a legal gray zone with some forms permitted while others criminalized, sex workers navigate complex legal and social landscapes that shape their vulnerability to stigma. While systematic research on male sex work stigma in Hong Kong specifically is scarce, insights from other contexts reveal common themes.

Male sex workers face distinct manifestations of stigma compared to female sex workers, often compounded by homophobia and challenges to heteronormative masculinity. In Western settings, male sex workers serving men are frequently perceived as failing to conform to masculine ideals, experiencing stigma both for selling sex and for same-sex

behavior (Verhaegh-Haasnoot et al., 2015). Many male sex workers do not readily identify themselves as sex workers or as homosexual, complicating outreach efforts and reinforcing their status as a "hidden key population" (Verhaegh-Haasnoot et al., 2015). This concealment, while protective against some forms of discrimination, limits access to sex worker-specific health services and peer support networks that could buffer against stigma's negative effects.

The intersection of sex work stigma with HIV risk creates additional burdens. Sex workers are frequently stereotyped as vectors of disease, blamed for HIV transmission, and subjected to mandatory testing policies that violate human rights (Jeffreys et al., 2012). In some contexts, these stigmatizing attitudes are enshrined in law enforcement practices that target sex workers for harassment and violence. Research from diverse settings documents how sex work criminalization and police harassment drive sex workers away from health services, increase unsafe working conditions, and undermine HIV prevention efforts (Milovanovic et al., 2021). For MSM-SWs, who may face both sex work-related law enforcement and criminalization or discrimination based on same-sex behavior, these structural stigmas compound to create particularly hostile environments for health-seeking.

D. Sexual Minority and Gender Non-Conformity Stigma

Sexual minority stigma encompasses discrimination, prejudice, and violence directed toward individuals based on non-heterosexual orientations or behaviors. In Hong Kong and across Asia, homophobia remains prevalent despite increasing social tolerance in some urban centers. Among MSM in Hong Kong, perceived discrimination and family rejection based on sexual orientation significantly impact mental health and HIV-related outcomes (Cai & Lau, 2014). Worry that condom use symbolizes mistrust in relationships and

perceived low acceptance of condom use by partners were significantly associated with unprotected anal intercourse, illustrating how relational dynamics influenced by heteronormative expectations shape HIV risk (Cai & Lau, 2014).

Gender non-conformity stigma adds another layer for MSM who do not conform to masculine gender norms or who identify as transgender or gender non-binary. In Ghana, stigmas at the intersection of HIV, same-sex behavior, and gender non-conformity were identified as key drivers of disproportionate HIV burden among MSM (Nyblade, Stockton, Saalim, Abu-Baare, et al., 2022). Healthcare workers' training to address intersectional stigma required specific attention to beliefs about gender norms, misconceptions that homosexuality is a mental illness, and stigmatizing attitudes toward gender non-conforming individuals (Nyblade, Stockton, Saalim, Abu-Baare, et al., 2022). In sub-Saharan Africa more broadly, MSM and transgender women reported that anticipated stigma in healthcare settings was a major barrier to accessing HIV services (Mbeda et al., 2020).

For MSM-SWs, gender presentation may be strategic, performative, or authentic, but gender non-conformity in any form attracts additional stigma. Ethnographic research with transgender female sex workers in China documented how embracing femininity served as both a form of self-expression and a survival strategy, yet simultaneously reinforced vulnerability to discrimination and violence (Tsang, 2021). The complexity of navigating multiple stigmatized identities requires MSM-SWs to make continuous decisions about disclosure, concealment, and identity management across different social contexts. These decisions have direct implications for access to appropriate health services, as healthcare providers may lack cultural competence to serve individuals with complex intersecting

identities (Ndione et al., 2022). The cumulative burden of managing multiple stigmas contributes to chronic stress, mental health problems, and disengagement from health-promoting behaviors and services (Ricks, 2020).

IV. IMPACT OF INTERSECTIONAL STIGMA ON HIV PREVENTION ENGAGEMENT

A. Barriers to HIV Testing and Diagnosis

HIV testing represents the critical entry point to the prevention and care continuum, yet intersectional stigma creates formidable barriers to testing uptake among MSM-SWs. Among MSM globally, stigma-related concerns constitute major impediments to HIV testing. In the United States, sexual behavior stigma across family, healthcare, and social domains was associated with reduced healthcare engagement, which in turn limited HIV testing opportunities (Wiginton et al., 2024). Anticipated healthcare stigma specifically predicted lower odds of healthcare utilization among MSM living with HIV, suggesting that fear of discriminatory treatment deters engagement even before actual discrimination occurs (Wiginton et al., 2024).

Research from sub-Saharan Africa demonstrates how intersectional stigma manifests as testing barriers. In Ghana, MSM identified stigma at family, peer, healthcare, and community levels as key obstacles to HIV testing, with many avoiding healthcare interactions altogether to protect against stigma exposure (Abu-Baare et al., 2021). Fear of seeking healthcare services was reported by 36.3% of MSM and transgender women, and 29.2% avoided services specifically due to concerns about discovery of MSM status (Mbeda et al., 2020). Among MSM living with HIV in India, enacted stigma in healthcare

settings—manifested as familial shame and provider discrimination—actively inhibited access to testing and support services (Bhutada et al., 2023).

For sex workers specifically, additional barriers compound these challenges. Female sex workers in Indonesia identified fear of judgment, concerns about confidentiality, and anticipated discriminatory treatment as major deterrents to HIV testing (Whitford et al., 2021). However, supportive relationships with peers, community-based organizations, and sympathetic healthcare providers facilitated testing uptake, highlighting the importance of stigma-free service environments (Whitford et al., 2021). Male sex workers likely face analogous barriers, though data specific to MSM-SWs in Hong Kong are lacking. The hidden nature of male sex work, combined with concerns about legal consequences, criminalization of same-sex behavior in some contexts, and fear of disclosure of sex worker identity, creates a particularly challenging environment for promoting testing uptake (Verhaegh-Haasnoot et al., 2015).

Innovative testing modalities offer potential solutions to stigma-related testing barriers. HIV self-testing (HIVST) enables individuals to test in private, avoiding healthcare facility-based stigma. Among MSM and transgender women globally, HIVST increased testing frequency and uptake compared to standard facility-based testing, and was particularly effective when combined with online or mail distribution (Witzel et al., 2020). However, HIVST also raised concerns about lack of immediate linkage to confirmatory testing and care, potential for coercion in intimate partner contexts, and questions about accuracy interpretation (Badru & Adeagbo, 2024). Among male clients of female sex workers in China, willingness to use HIVST was low (only 23.8% indicated probable/definite use), with positive attitudes, perceived behavioral control, and perceived

HIV risk being significant predictors of intention (Lau et al., 2020). Addressing stigma while ensuring effective linkage to prevention and care services remains a critical challenge for HIVST implementation.

B. Impediments to Pre-Exposure Prophylaxis (PrEP) Uptake

Pre-exposure prophylaxis represents a highly effective biomedical HIV prevention tool, yet uptake among MSM-SWs and other key populations remains disappointingly low. In Hong Kong, a pilot study of partially self-financed PrEP delivery achieved 80% retention among MSM participants at 28 weeks, demonstrating feasibility, yet stigma and cost were identified as significant ongoing concerns (Lee et al., 2019). Nationally in China, only 22.4% of MSM had heard of PrEP, and just 26% expressed definite willingness to use it when available, with 24.4% responding negatively (Han et al., 2019). Concerns about side effects, low perceived HIV risk, preference for condoms, and lack of previous HIV testing were all negatively associated with PrEP willingness (Han et al., 2019).

Stigma specifically related to PrEP use—sometimes termed “PrEP stigma”—has emerged as a distinct barrier. Qualitative research with MSM who use PrEP in the United States documented experiences of rejection by potential partners, stereotypes of promiscuity or “chemsex” involvement, and labeling of both users and the medication itself (Dubov et al., 2018). Participants connected PrEP stigma with HIV stigma, generational differences in HIV prevention attitudes, moralization of condom use, and inability to embrace one’s sexuality openly (Dubov et al., 2018). For MSM-SWs, who already navigate multiple stigmatized identities, PrEP stigma may compound existing barriers, particularly if PrEP use is interpreted by others as confirmation of “risky” sexual behavior or sex work involvement.

Structural and economic barriers further impede PrEP uptake. Among men who have sex with men in the southern United States who use substances—a population with some parallels to MSM-SWs—affordability emerged as the most robust barrier to PrEP uptake, with greater concern over affordability paradoxically associated with more willingness to use PrEP under various scenarios (Ertl et al., 2025). This suggests that economic constraints limit uptake even among those who recognize PrEP's value. In Hong Kong, where PrEP is not routinely covered by public healthcare, cost represents a substantial barrier, with only 51% of participants in one study considering a monthly cost of HK$500 (approximately US$64) as reasonable (Lee et al., 2019). For MSM-SWs who may experience economic precarity, medication costs represent a nearly insurmountable obstacle without subsidies or free provision.

Healthcare system factors also shape PrEP access. Perceived healthcare discrimination was negatively associated with PrEP awareness, particularly among HIV-negative Black MSM in the United States (Babel et al., 2021). In Malaysia, where stigma and discrimination toward MSM are high, an innovative clinic-integrated smartphone application (JomPrEP) was developed to provide a virtual platform for accessing PrEP services without face-to-face clinical encounters, addressing stigma-related barriers (Shrestha et al., 2023). Among 50 PrEP-naïve MSM without HIV, 92% initiated PrEP using the application, with 65% achieving same-day PrEP initiation and 39% choosing mail delivery of medications to avoid pharmacy encounters (Shrestha et al., 2023). Such approaches demonstrate the feasibility of reducing healthcare stigma through technology-mediated service delivery, though questions remain about long-term retention and adherence.

C. Challenges in Accessing Sexual Health Services

Beyond HIV-specific services, MSM-SWs face barriers to comprehensive sexual health care, including sexually transmitted infection (STI) screening and treatment, sexual health counseling, and reproductive health services. Healthcare-related stigma encompasses fear of seeking services, avoidance due to potential identity disclosure, and experiences of discriminatory treatment (Mbeda et al., 2020). In Ghana, where MSM HIV prevalence is eleven times higher than the general population, stigma at healthcare facilities was identified as a major deterrent to service utilization, with MSM avoiding interactions with healthcare systems to protect against stigma exposure (Abu-Baare et al., 2021).

Healthcare provider attitudes and behaviors significantly shape service accessibility. In Senegal, MSM described an ambiguous relationship with healthcare providers who were "torn between their professional duty to treat MSM and the cost of being stigmatized by other colleagues" (Ndione et al., 2022). Providers often limited displays of empathy toward MSM within hospital contexts, while MSM simultaneously trusted in provider confidentiality and felt relatively safe within clinical spaces (Ndione et al., 2022). However, stigmatizing factors that limited access included fear of meeting relatives at healthcare facilities, difficult relationships with non-medical support staff (particularly security guards), concerns about HIV status disclosure, and potential conflicts with other MSM patients (Ndione et al., 2022). These findings highlight that healthcare stigma operates not just through provider-patient interactions but through the entire healthcare environment, including non-clinical staff and physical spaces.

The intersection of sex work stigma and healthcare access creates additional challenges. Female sex workers in Indonesia reported that community outreach workers facilitated

HIV and STI testing through appointment reminders, accompanied visits, and emotional/informational support (Whitford et al., 2021). Community-based organizations collaborated with health services to provide mobile, community-based testing that overcame employment and family-related constraints inhibiting clinic attendance (Whitford et al., 2021). For MSM-SWs, analogous community-based and outreach approaches may be necessary, yet the hidden nature of male sex work and lack of established MSM-SW organizations in many contexts limits the infrastructure for such interventions.

Language barriers, cultural incompetence, and lack of tailored services further impede access. Healthcare providers often lack training in sexual and gender minority health, sex work contexts, and the specific needs of individuals with multiple marginalized identities (T. Brown et al., 2025). In South Carolina, HIV care providers identified limited resources, homophobia, medical mistrust, distance, medical costs, and HIV-related stigma as major barriers to HIV testing and treatment uptake among MSM, particularly in rural areas (T. Brown et al., 2025). Providers reported that MSM experience significant stigma associated with both sexual orientation and HIV status, creating a need for more affirming and accessible healthcare provision (T. Brown et al., 2025). For MSM-SWs, who face the added dimension of sex work stigma, finding providers with adequate cultural competence to address intersecting marginalized identities remains exceptionally challenging.

D. Structural and Policy-Level Barriers

Structural stigma—defined as societal-level conditions, cultural norms, and institutional policies that constrain opportunities and resources for stigmatized groups—operates through laws, policies, and institutional practices to shape HIV prevention access

(Hatzenbuehler et al., 2024). Criminalization of sex work, same-sex sexual behavior, and HIV transmission creates legal jeopardy that deters engagement with health services. In contexts where male same-sex behavior is criminalized, MSM face arrest, prosecution, and imprisonment, driving sexual behavior underground and away from prevention services (Nelson et al., 2021). Similarly, criminalization of sex work subjects MSM-SWs to police harassment, violence, arbitrary detention, and extortion, all of which undermine health-seeking behavior (Milovanovic et al., 2021).

Immigration and citizenship status create additional structural barriers. In many settings, access to HIV prevention and care services is restricted to citizens or legal residents, excluding undocumented migrants and foreign nationals. Research has documented high HIV prevalence among migrants in various contexts (Taylor et al., 2020), yet language barriers, fear of deportation, and immigration enforcement deter service utilization. Among MSM-SWs specifically, those working as migrants or engaging in cross-border sex work face compounded vulnerabilities, including limited knowledge of local health systems, inability to access subsidized services, and fear of immigration consequences if identified through healthcare encounters.

Economic and social determinants of health operate as structural barriers. Poverty, unstable housing, food insecurity, and lack of social support all impede HIV prevention engagement. Among MSM in Jamaica who sell sex, correlates included lower safer sex self-efficacy, concurrent partnerships, higher need for social support, lifetime forced sex, sexual stigma, food insecurity, and housing insecurity (Logie et al., 2018). These findings underscore that selling sex occurs within contexts of structural vulnerability and economic marginalization, with multiple intersecting factors undermining HIV prevention. Housing insecurity

specifically emerged as a significant correlate, with those lacking a regular healthcare provider being more likely to sell sex (Logie et al., 2018). Interventions addressing structural determinants—through housing support, economic empowerment, and social protection—may be as important as biomedical prevention tools for reducing HIV risk in this population.

Policy environments shape the availability and accessibility of prevention services. In Hong Kong, the lack of public funding for PrEP limits access primarily to those who can afford private provision or participation in research studies (Lee et al., 2019). The absence of comprehensive harm reduction services tailored to MSM who use drugs in sexual contexts represents another policy gap (Kong & Laidler, 2020). Neoliberal approaches to HIV and drug policy, which emphasize individual responsibility and market-based service provision, have created service gaps for populations like MSM-SWs who require integrated, comprehensive, and affordable services (Kong & Laidler, 2020). Addressing structural stigma requires not just service provision but fundamental policy reforms that decriminalize marginalized populations, guarantee universal healthcare access, and address social determinants of health through multisectoral approaches (Phillips et al., 2021).

V. IMPACT OF INTERSECTIONAL STIGMA ON HIV CARE CONTINUUM

A. Late Presentation and Linkage to Care

Late presentation for HIV care—typically defined as CD4 count below 350 cells/mm³ or AIDS-defining illness within three months of diagnosis—represents a critical problem that undermines treatment effectiveness and increases mortality risk. In Hong Kong, nearly 60% of newly diagnosed HIV-positive individuals were classified as late presenters in both the

2007-2008 and 2016-2018 cohorts, with heterosexual individuals at higher risk (adjusted odds ratio 1.58) compared to MSM (Poon et al., 2022). This persistent late presentation, despite improvements in treatment access and messaging about early care benefits, suggests that structural and stigma-related barriers continue to delay diagnosis and care entry.

Among MSM globally, intersectional stigma significantly impedes linkage to care following HIV diagnosis. In Ghana, where MSM face high levels of stigma related to HIV, same-sex behavior, and gender non-conformity, autonomy-supportive healthcare climate and lower felt normative HIV stigma predicted successful linkage to HIV care (L. Y. Gu et al., 2021). Conversely, vicarious HIV stigma (stigma witnessed happening to others) paradoxically predicted better linkage outcomes, possibly because observing discrimination heightened awareness of care importance (L. Y. Gu et al., 2021). Regional disparities were pronounced, with MSM from Takoradi being four to five times more likely to link to care compared to those from Kumasi and Accra, highlighting the role of local healthcare environments and stigma climates in shaping care access (L. Y. Gu et al., 2021).

For MSM-SWs specifically, additional barriers compound linkage challenges. Economic precarity may necessitate prioritizing immediate survival needs over health care (Logie et al., 2018). Competing time demands from sex work, particularly for those without stable housing or employment, create logistical obstacles to attending appointments. Anticipated stigma in healthcare settings—based on both HIV status and sex work identity—may lead MSM-SWs to delay care-seeking even after diagnosis. In sub-Saharan Africa, among MSM and transgender women newly diagnosed with HIV through a research study, 86% sought HIV care following diagnosis, yet reasons for not seeking care or experiencing delays

included lack of perceived health problems (feeling well despite diagnosis) and practical challenges such as distance to clinics and work obligations (Sandfort et al., 2025).

Healthcare system factors also influence linkage. In settings with fragmented healthcare systems, where HIV testing occurs at one facility and ongoing care at another, navigating referrals and transfers creates additional hurdles. Among MSM living with HIV in the United States, medical care ratings were lower among African Americans compared to Whites, and participants who experienced familial exclusion due to having sex with men were 40% less likely to report high medical care ratings (Maragh-Bass et al., 2023). These findings suggest that intersectional stigma experiences in family and social contexts carry over to shape perceptions of and engagement with healthcare services. For MSM-SWs, the compounding of multiple marginalized identities likely intensifies these dynamics, requiring healthcare systems to proactively address stigma and create explicitly affirming care environments.

B. Antiretroviral Therapy Adherence and Retention

Adherence to antiretroviral therapy (ART) is essential for achieving viral suppression, preventing HIV-related morbidity and mortality, and eliminating onward transmission risk. Yet intersectional stigma undermines adherence through multiple pathways. Among Chinese MSM living with HIV, those experiencing both high HIV-related stigma and high sexual and gender minority stigma demonstrated worse psychosocial wellbeing, including higher depression and anxiety, which in turn predicted poorer treatment adherence (Yang et al., 2020). The synergistic negative impact of experiencing multiple types of stigma was greater than the additive effects of individual stigmas, highlighting the importance of intersectional approaches to understanding adherence challenges (Yang et al., 2020).

In Zimbabwe, MSM and transgender women living with HIV described how intersectional stigma based on HIV status and sexual/gender identity impacted ART adherence and retention (Nyamaruze et al., 2025). Experiences of intersectional stigma, particularly anticipated stigma regarding potential discrimination and societal repercussions, led to threats to ART adherence and influenced commitment to staying on treatment (Nyamaruze et al., 2025). However, despite many potential risks to adherence, participants utilized various coping strategies to remain adherent, including accessing Community-Based Organizations, ART centers, and family support when available (Nyamaruze et al., 2025). The tension between stigma-related barriers and individual resilience underscores that adherence outcomes reflect both external structural factors and internal coping resources.

Mental health problems, exacerbated by intersectional stigma, represent a major pathway through which stigma affects adherence. Depression prevalence was high among MSM-SWs, with studies documenting rates of 36-40% for moderate to significant symptoms and 7-10% for major depression (Zulu et al., 2024). Anxiety, post-traumatic stress disorder, and substance use disorders are also elevated in this population (Milovanovic et al., 2021). These mental health conditions directly impair cognitive function, motivation, and self-care behaviors necessary for consistent medication adherence. Furthermore, untreated mental health problems may lead to self-medication through substance use, which introduces additional adherence challenges when drugs are used in contexts that disrupt daily routines and medication-taking schedules.

Healthcare provider stigma specifically undermines adherence and retention. In Nigeria, intersectional stigma reduction interventions for MSM and transgender women living with HIV demonstrated that enacted stigma in healthcare settings—manifested as healthcare

discrimination—decreased HIV care engagement and treatment adherence (Pulerwitz et al., 2024). Conversely, interventions employing cognitive behavioral therapy strategies to reduce internalized stigma and promote mental health wellness showed significant improvements in adherence outcomes (Pulerwitz et al., 2024). At three-month follow-up, 75% of intervention participants reported current PrEP use among those without HIV, and improvements in depression, resilience, and coping were observed (Pulerwitz et al., 2024). These findings suggest that addressing stigma through both healthcare system interventions and individual-level psychological support can meaningfully improve care continuum outcomes.

C. Healthcare Provider-Related Stigma

Healthcare providers serve as gatekeepers to HIV prevention and care services, yet provider attitudes and behaviors can either facilitate or impede cess for MSM-SWs. In Ghana, healthcare workers exhibited stigmatizing attitudes at the intersection of HIV, same-sex behavior, and gender non-conformity, requiring targeted training interventions to address awareness gaps, fear-based responses, and discriminatory environmental practices (Nyblade, Stockton, Saalim, Abu-Baare, et al., 2022). A healthcare facility staff intersectional stigma scale revealed three key domains: comfort with intersectional identities in the workplace, beliefs about gender and sexuality norms, and beliefs about people living with HIV (Oga et al., 2024). Staff who had recent clients engaging in same-gender sex showed greater comfort with intersectional identities but paradoxically held more stigmatizing beliefs about people living with HIV (Oga et al., 2024).

The quality and cultural competence of provider-patient interactions significantly shape care experiences. Among MSM living with HIV in the United States, those who perceived

that healthcare providers think people with HIV "sleep around" were half as likely to report high medical care ratings (Maragh-Bass et al., 2023). In South Africa, MSM and transgender women who experienced healthcare-related stigma—including denial of services, verbal harassment, or discriminatory treatment—were less likely to engage consistently with HIV services (C. A. Brown et al., 2023). Interestingly, those reporting higher enacted stigma were modestly more likely to attend additional drop-in visits, potentially seeking out sensitized care after negative experiences in other settings (C. A. Brown et al., 2023).

For MSM-SWs specifically, provider knowledge gaps about sex work contexts, occupational health risks, and appropriate sexual health counseling create additional barriers. Providers may lack training in harm reduction approaches relevant to sex work, hold moralistic attitudes about commercial sex, or make assumptions about clients' behaviors and identities. In Vietnam, healthcare providers' limited understanding of MSM diversity—including distinctions between hidden and openly gay-identified men, and between sex workers and non-sex workers—resulted in one-size-fits-all interventions that failed to reach hidden populations (Philbin et al., 2018). Developing provider capacity to deliver non-judgmental, affirming care that acknowledges clients' multiple identities and lived experiences represents a critical priority for improving care continuum outcomes.

D. Mental Health and Psychosocial Impacts

The psychological burden of navigating multiple intersecting stigmas takes a profound toll on mental health and overall wellbeing. Among young MSM and transgender women living with HIV in Zambia, 36% had contemplated suicide, 40% experienced moderate to severe depression, and 54% met criteria for post-traumatic stress disorder (Zulu et al.,

2024). The experience of "living a private lie"—concealing both sexuality and HIV status—created compounding stress that undermined both mental health and engagement in care (Zulu et al., 2024). Transgender women demonstrated particularly elevated rates, with 40% reporting moderate to severe depression and 55% reporting suicidal ideation compared to 33% and 36% respectively among MSM (Zulu et al., 2024).

The relationship between intersectional stigma and mental health operates bidirectionally. Stigma experiences lead to psychological distress, which in turn impairs capacity to cope with ongoing stigma and engage in health-promoting behaviors. Among MSM living with HIV in India, enacted stigma manifesting as familial shame and healthcare discrimination led to decreased social support access and worsening mental health, creating a vicious cycle that further discouraged care engagement (Bhutada et al., 2023). In China, MSM experiencing both high HIV-related stigma and high sexual minority stigma showed significantly worse scores across all psychosocial measures—depression, anxiety, quality of life, and psychological resilience—compared to those experiencing only one type of stigma (Yang et al., 2020).

Substance use represents both a coping mechanism for stigma-related distress and an additional health challenge. The emergence of chemsex in Hong Kong and other Asian cities reflects how drug use becomes intertwined with sexual identity, social networking, and commercial sex contexts (Kong & Laidler, 2020). Policy gaps created by divergent HIV and drug policy orientations have resulted in insufficient services for MSM who use drugs, leaving this population particularly vulnerable (Kong & Laidler, 2020). For MSM-SWs, substance use may be client-initiated, used to cope with sex work-related stress, or

employed to enhance sexual performance, with each pattern requiring distinct intervention approaches (Wang et al., 2020).

VI. INTERVENTION STRATEGIES AND FUTURE DIRECTIONS

A. Community-Led and Peer-Based Approaches

Community-based and peer-led interventions have demonstrated effectiveness in reducing stigma and improving HIV prevention and care outcomes. In Ghana, the HIV Education, Empathy, and Empowerment (HIVE3) peer support intervention for MSM successfully engaged participants through smartphone-based platforms that provided security, privacy, and connection to peer mentors with lived experience (Abu-Baare et al., 2021). Participants appreciated the confidentiality component and peer mentors' ability to make referrals to nurses and health services, demonstrating how peer support can serve as a bridge to formal healthcare (Abubakari, Turner, et al., 2021). The intervention addressed intersectional stigma by creating safe spaces where MSM could discuss experiences without fear of judgment or disclosure (Abubakari, Owusu-Dampare, et al., 2021).

Peer navigation and care coordination models show particular promise for addressing the complex needs of MSM-SWs. In the United States, client-centered care coordination for Black MSM participating in a PrEP demonstration project required an average of five encounters per participant, with most activities conducted by counselors averaging 30 minutes per encounter at a mean cost of only $8.70 per encounter (Whitfield et al., 2022). The relatively low cost combined with meaningful improvements in care engagement suggests scalability even in resource-constrained settings (Whitfield et al., 2022). Community health workers and peer navigators with lived experience of sex work, sexual

minority identity, or HIV can provide culturally concordant support that addresses both practical barriers and internalized stigma (Kizub et al., 2020).

However, power dynamics between peers and professional staff require careful attention. In Kenya, peer outreach workers in an HIV prevention program for MSM experienced tensions arising from their lower educational attainment, volunteer versus employee status, exclusion from decision-making, and insufficient training (Kizub et al., 2020). Despite these challenges, peers valued opportunities to help their community and appreciated free health services, while staff recognized peers' essential contributions to recruitment and retention (Kizub et al., 2020). Addressing these power disparities through adequate compensation, professional development opportunities, inclusion in program governance, and ongoing training can enhance peer worker retention and program sustainability (Kizub et al., 2020).

B. Healthcare System Interventions

Transforming healthcare systems to deliver stigma-free, culturally competent services requires multi-level interventions. In Ghana, adaptation of an evidence-based HIV stigma reduction curriculum for healthcare workers specifically addressed intersectional stigma at the intersection of HIV, same-sex behavior, and gender non-conformity (Nyblade, Stockton, Saalim, AbuBa"are, et al., 2022). The adapted curriculum included new exercises on sexual diversity, challenging beliefs that homosexuality is a mental illness, and addressing stigmatizing attitudes toward gender non-conforming individuals (Nyblade, Stockton, Saalim, AbuBa"are, et al., 2022). Training healthcare workers—including both clinical and non-clinical staff such as security guards and administrative personnel—

proved essential, as stigma can emanate from any point of contact within healthcare facilities (Ndione et al., 2022).

Creating affirming healthcare environments extends beyond individual provider training to encompass organizational policies, physical spaces, and service delivery models. In South Africa, the Siyaphambili study for female sex workers living with HIV employed a differentiated care approach that tailored service packages to individual needs, recognizing heterogeneity within sex worker populations (Comins et al., 2019). One-stop-shop service models that integrate HIV testing, treatment, sexual health services, and social support in single locations have shown higher adherence rates by reducing structural barriers and creating consolidated, supportive care environments (Sandfort et al., 2025). For MSM-SWs, similar integrated service models that combine sexual health, HIV care, mental health support, and harm reduction services could address multiple intersecting needs efficiently.

Technology-mediated healthcare delivery offers opportunities to circumvent some stigma-related barriers while creating new challenges. The use of standardized patients—MSM who presented scripted cases to consenting doctors—enabled direct observation of healthcare behaviors and identification of specific stigmatizing practices that informed training interventions (P. M. K. Smith et al., 2024). Following provider training informed by these observations, improvements were observed in HIV testing offers and diagnostic effort for HIV-positive MSM, though patient-centered care improvements were inconsistent (P. M. K. Smith et al., 2024). Such innovative measurement approaches can make invisible stigma visible and create accountability for stigma-reduction efforts.

C. Technology-Enhanced Solutions (mHealth, HIV Self-Testing)

Mobile health (mHealth) technologies provide platforms for delivering HIV prevention and care services that bypass some traditional barriers. In Malaysia, the JomPrEP smartphone application enabled MSM to engage in HIV prevention services virtually, avoiding face-to-face clinical encounters that might expose them to stigma (Shrestha et al., 2023). Among 50 participants, 92% initiated PrEP using the application, 65% achieved same-day initiation, and 39% chose mail delivery of medications, demonstrating high acceptability and feasibility (Shrestha et al., 2023). The system usability score of 73.8 indicated strong user satisfaction with the technology-mediated service model (Shrestha et al., 2023).

HIV self-testing represents another technology-enabled solution that addresses stigma-related testing barriers by enabling private, convenient testing outside healthcare facilities. Meta-analyses demonstrate that HIVST increases testing frequency and uptake among MSM and transgender women, with particularly strong effects when combined with online or mail distribution systems (Witzel et al., 2020). However, implementation challenges include ensuring linkage to confirmatory testing and care following reactive results, addressing potential for coercion in intimate partner contexts, and maintaining quality assurance for test performance and interpretation (Azevdo et al., 2025). Among MSM-SWs specifically, HIVST could address multiple barriers simultaneously—privacy concerns, time constraints from sex work schedules, and avoidance of healthcare facility stigma—though empirical data on uptake and outcomes in this population remain limited.

Social media and dating applications, while creating new HIV transmission risks through facilitation of sexual networking, also offer platforms for prevention messaging and service promotion. The reconstruction of MSM social networks from locally observed information

through surveys and online platforms enables targeted interventions that leverage network structures (Jing et al., 2021). However, digital divides based on age, language, technological literacy, and internet access may exclude some MSM-SWs from technology-based interventions, necessitating parallel offline strategies to ensure equity (Zhang et al., 2024).

D. Research Gaps and Policy Recommendations

Substantial knowledge gaps impede evidence-based responses to HIV among MSM-SWs in Hong Kong and globally. First, basic epidemiological data on MSM-SWs are lacking, including population size estimates, HIV prevalence and incidence, sexual network characteristics, and patterns of HIV transmission to and from this population. Molecular epidemiological studies incorporating phylogenetic analysis of HIV sequences from MSM-SWs could elucidate their role in transmission networks and identify priority intervention targets. Second, research on intersectional stigma's specific manifestations and impacts on MSM-SWs is virtually absent from the Hong Kong literature. Qualitative studies exploring lived experiences of navigating multiple marginalized identities could inform culturally appropriate interventions.

Third, intervention research with MSM-SWs is critically needed. While evidence-based interventions exist for MSM generally and for female sex workers, the unique needs of MSM-SWs require tailored approaches. Pilot studies testing adapted interventions for stigma reduction, HIV testing promotion, PrEP uptake, and care engagement among MSM-SWs would generate essential feasibility and acceptability data. Implementation science approaches that examine how to deliver effective interventions in real-world Hong Kong

contexts—considering resource constraints, policy environments, and service delivery systems—are particularly important for translating research into practice.

Policy reforms constitute essential structural interventions. Decriminalization of sex work and same-sex sexual behavior would reduce legal jeopardy and police harassment that drive populations away from health services. Universal healthcare coverage including HIV prevention and treatment services regardless of citizenship status would address barriers facing migrant MSM-SWs. Public funding for PrEP and harm reduction services would eliminate economic barriers to prevention access. Anti-discrimination laws protecting sexual and gender minorities in healthcare, employment, and housing would provide legal recourse against stigma and create enabling environments for health-seeking.

Finally, meaningful involvement of MSM-SWs in research design, intervention development, and policy formulation is essential. Community-based participatory research approaches that position MSM-SWs as co-researchers rather than passive subjects can ensure that interventions address community-identified priorities and are culturally concordant. Representation of MSM-SWs in advisory boards, steering committees, and policy forums would center lived expertise in decision-making processes. Building community infrastructure—including MSM-SW-led organizations, peer networks, and advocacy platforms—provides the foundation for sustained community engagement and ownership of HIV responses that ultimately determine their success and sustainability.

Conclusion

Male sex workers serving men occupy a critical yet understudied position within Hong Kong’s HIV epidemic, potentially functioning as bridge populations that facilitate

transmission across sexual networks while simultaneously facing profound barriers to prevention and care created by intersectional stigma. The convergence of HIV-related stigma, sex work stigma, and sexual minority stigma creates a web of discrimination operating across individual, interpersonal, community, and structural levels that systematically undermines health-seeking behaviors and care engagement. Addressing this complex challenge requires multi-level interventions spanning community empowerment, healthcare system transformation, technology-enabled service delivery, and fundamental policy reforms that eliminate criminalization and discrimination. Achieving HIV epidemic control in Hong Kong necessitates centering the needs and voices of MSM-SWs in research, programming, and policy—recognizing that their health and wellbeing are inseparable from broader goals of health equity and social justice.

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