

Beyond MSM: HIV Vulnerability among Bisexual Men in Hong Kong - Exploring the Unique Syndemic Risks, Identity Concealment, and Prevention Needs of Bisexual Men Navigating Both Heterosexual and Homosexual Networks

The Hong Kong Aids Prevention Society (HKAPS)

EXECUTIVE SUMMARY

This comprehensive report examines the unique HIV vulnerability of bisexual men in Hong Kong, a population that has been largely subsumed within the broader men who have sex with men (MSM) category in HIV surveillance and prevention efforts. Bisexual men face distinct challenges including double discrimination from both heterosexual and gay/lesbian communities, complex identity concealment pressures, syndemic health burdens, and the navigation of multiple sexual networks that create unique transmission dynamics. In the Hong Kong context, cultural factors including filial piety expectations and heterosexual marriage pressures further compound these vulnerabilities. This report synthesizes current evidence on bisexual men's health disparities, applies syndemic and minority stress theoretical frameworks, and proposes tailored prevention strategies that acknowledge bisexual men as a distinct population with specific needs.

1. INTRODUCTION AND BACKGROUND

1.1 HIV Epidemiology among MSM in Hong Kong and Asia

The HIV epidemic among MSM populations in Asia has

intensified dramatically over the past two decades. In Hong Kong, MSM represent one of the major risk groups for HIV-1 infection, with phylodynamic analyses revealing multiple subtype B epidemics that emerged in the 1990s and experienced logistic growth over 20 years (Chen et al., 2011). HIV prevalence among MSM in Hong Kong was estimated at

14.2% in one surveillance period, significantly higher than Toronto (22.2%) and Vancouver (20.4%) but lower than some other Asian cities (Hart et al., 2021). The epidemic in Hong Kong has been characterized by distinct transmission clusters, with internet-based partner sourcing identified as a major reservoir for viral spread (Chen et al., 2011).

Across mainland China, HIV prevalence among MSM has shown an alarming increasing trend, with the overall prevalence estimated at 5.7% nationally between 2001 and 2018, though with substantial regional heterogeneity (Dong et al., 2019). The Southwest region has been disproportionately affected, with prevalence rates reaching 10.7% (Dong et al., 2019). In cities like Beijing, HIV prevalence among MSM increased from 0.4% in 2004 to 5.8% in 2006, exemplifying the rapid epidemic expansion (Feng et al., 2008). Studies have documented that HIV incidence among MSM in China is substantial, with rates reaching 8.2 per 100 person-years in some cohorts, underscoring the urgent need for innovative prevention strategies (Chariyalertsak et al., 2011).

1.2 The Erasure of Bisexuality in HIV Surveillance

A critical gap in HIV epidemiology has been the systematic erasure of bisexual identity in surveillance systems. Since 1983, the U.S. Centers for Disease Control and Prevention combined homosexual and bisexual males into a single category termed “men who have sex with men” (MSM), effectively eliminating bisexual men as a distinct epidemiological group (Fernando, 2019). This conflation has undermined the importance of understanding bisexual male HIV infection patterns and obscured the potential role of bisexual men in transmitting HIV to female partners (Fernando, 2019). The MSM construct, while useful for capturing behavioral risk, fails to account for the unique psychosocial experiences, identity-related stressors, and network dynamics that distinguish bisexual men from exclusively homosexual men (Saavedra et al., 2008).

Research indicates that bisexual men may practice different sexual behaviors compared to exclusively homosexual men. In a Mexico City study, 79% of bisexual men did not engage in receptive or insertive anal intercourse with males, instead practicing oral sex or masturbation, suggesting less risky sexual behavior with male partners than exclusive

homosexuals (Izazola-Licea et al., 2003). However, bisexual men reported more prevalent anal intercourse with female partners (16% vs. 3%) and more encounters with female sex workers than exclusive heterosexuals (10% vs. 4%), creating distinct transmission pathways (Izazola-Licea et al., 2003). These findings underscore that bisexual men cannot be treated as epidemiologically equivalent to gay men.

1.3 Bisexual Men as Epidemiological Bridge Populations

Bisexual men, particularly those who have sex with both men and women (MSMW), function as potential bridge populations between high-prevalence MSM networks and lower-prevalence heterosexual networks (Levin-Sparenberg et al., 2009). In the United States, of HIV cases among women contracted through heterosexual contact in 2004, 15% reported MSM/W as their only risk factor, likely an underestimate given that 33-75% of MSM/W do not disclose their male partnerships to female partners (Levin-Sparenberg et al., 2009). Genomic and epidemiological analyses have demonstrated that MSMW serve as bridging populations for *Neisseria gonorrhoeae* transmission between MSM and heterosexual networks in Australia (Williamson et al., 2019), suggesting similar dynamics may apply to HIV transmission.

Studies in Hong Kong and China have documented substantial proportions of bisexual behavior among MSM. In surveillance data from Shenzhen, 37.9% of MSM reported bisexual behaviors (Feng et al., 2008). Similarly, in Mexico, 42% of MSM in four major cities reported female sexual partners within the previous six months (Izazola-Licea et al., 2003). This bisexual bridging raises concerns about HIV spread to women who may be unaware of their male partners' same-sex activities, particularly in cultural contexts where marriage and heteronormativity are strongly enforced.

1.4 Defining the Scope and Objectives

This report focuses specifically on bisexual men in Hong Kong—those who experience sexual and/or romantic attraction to more than one gender, regardless of specific identity labels used. The objectives are to:

1. Document the unique HIV vulnerability and syndemic health burdens experienced by bisexual men
2. Examine identity concealment patterns and minority stress processes specific to bisexual populations
3. Analyze the cultural and structural factors in Hong Kong that shape bisexual men's HIV risk
4. Explore sexual network dynamics and the epidemiological implications of bisexual men's bridging roles
5. Identify gaps in current HIV prevention approaches and propose bisexual-specific interventions
6. Provide evidence-based recommendations for research, policy, and programmatic responses

2. SYNDEMIC HEALTH BURDENS AMONG BISEXUAL MEN

2.1 Syndemic Theory and Its Application to Sexual Minorities

Syndemic theory describes the clustering and synergistic interaction of diseases driven by contextual social factors, which worsen health outcomes for populations (Tomori et al., 2018). Originally applied to understand HIV transmission among MSM, syndemic frameworks have demonstrated that co-occurring psychosocial health problems create multiplicative rather than merely additive risks (Ogunbajo, Oke, et al., 2020). The syndemic conditions most commonly studied among sexual minorities include depression, anxiety, substance use disorders, intimate partner violence (IPV), childhood sexual abuse (CSA), and HIV/STI infections (Tomori et al., 2018).

Research has shown dose-response relationships between the number of syndemic conditions and HIV sexual risk behaviors among gay, bisexual, and other MSM (Ogunbajo, Oke, et al., 2020). In Nigeria, GBMSM experiencing four or more psychosocial health problems had significantly higher numbers of male sexual partners compared to those

experiencing none or one problem (Ogunbajo, Oke, et al., 2020). The syndemic effect has been documented globally, with studies from Latin America showing that experiencing five or more syndemic factors was associated with 42% lower odds of receiving HIV-related medical care and 72% lower odds of ART adherence (Biello et al., 2016).

Critically, combining intersectionality with syndemic theory reveals that syndemic burdens are not uniformly distributed but vary based on demographic factors including sexual identity (Ferlatte et al., 2017). Canadian research identified that gay men, young MSM, those without university degrees, and low-income earners were at significantly greater odds of experiencing syndemics (Ferlatte et al., 2017). Importantly, variations existed between exclusively gay men and those partnered with women, with the latter showing greater odds of reporting syndemic conditions (Ferlatte et al., 2017). This suggests bisexual men may face particular syndemic vulnerabilities.

2.2 Mental Health Disparities Among Bisexual Individuals

Bisexual individuals consistently report poorer mental health outcomes compared to both heterosexual and exclusively gay/lesbian individuals. Meta-analytic evidence shows bisexual people have elevated rates of depression (OR 2.21, 95% CI 2.21-3.18), anxiety, and suicidality compared to heterosexual individuals (Wittgens et al., 2022). Compared to gay/lesbian individuals, bisexual people have shown higher rates of depressive symptoms, with some studies indicating 1.5-2 times greater prevalence (Roi et al., 2019).

The mental health burden among bisexual men specifically has been documented across multiple contexts. Young bisexual men in longitudinal studies reported stable depressive symptoms and increasing social anxiety over eight years, with certain minority stressors showing stronger contemporaneous associations with depression among bisexual compared to exclusively gay men (Pachankis et al., 2018). In Ontario, Canada, weighted prevalence estimates among bisexual individuals showed 4.7% severe depression, 30.9% possible anxiety disorder, and 10.8% PTSD, with bisexual youth (aged 16-24) reporting significantly higher rates compared to older bisexuals (Ross et al., 2014).

Contributing to these disparities is the experience of double discrimination or “bi-negativity” from both heterosexual and gay/lesbian communities (Friedman et al., 2014).

Bisexual individuals report discrimination not only from heterosexual people but also from within LGBT communities, experiencing biphobia that manifests as bisexual erasure, stereotypes of promiscuity, assumptions of confused identity, and invalidation of bisexual orientation as illegitimate (Pennasilico & Amodeo, 2019). This dual marginalization creates unique stressors that gay and lesbian individuals do not face.

2.3 Substance Use and Addiction Vulnerabilities

Substance use represents a critical component of syndemic patterns among bisexual men. Among bisexual individuals in Ontario, 31.2% screened positive for problem drinking, and 30.5% reported illicit polydrug use (Ross et al., 2014). Chemsex—sexualized substance use involving drugs such as methamphetamine, GHB, and mephedrone—has emerged as a major risk factor for HIV acquisition among young MSM (R. K. J. Tan et al., 2021). Latent class analysis of young MSM in Singapore identified distinct substance use patterns, with older age and gay identity predicting membership in higher-risk “poppers” and “chemsex” classes compared to an “alcohol” class (R. Tan et al., 2020).

Earlier age of sexual debut emerged as a significant predictor of sexualized substance use, with participants debuting later being less likely to engage in chemsex (R. Tan et al., 2020). This suggests that exposure to sexual networks at younger ages may increase vulnerability to substance-involved sexual practices. The intersection of substance use with HIV risk is well-established, with studies showing that MSM who inject drugs had seven-fold increased risk of HIV seroconversion (Weber et al., 2003).

Bisexual men may be particularly vulnerable to substance use as a coping mechanism for managing minority stress from multiple sources. The minority stress model posits that stigma, prejudice, and discrimination create excess stress for sexual minority individuals, which can lead to maladaptive coping including substance use (Ogunbajo, Iwuagwu, et al., 2020). For bisexual men facing rejection from both heterosexual society and gay communities, substance use may serve as escape from cognitive awareness of rigorous identity standards and minority-related stress (McKirnan et al., 1996).

2.4 Intimate Partner Violence and Victimization

Intimate partner violence (IPV) represents another syndemic condition disproportionately affecting sexual minority populations. Systematic review and meta-analysis evidence demonstrates that MSM who are victims of IPV are more likely to be HIV positive, engage in unprotected anal sex, and suffer from depressive symptoms and substance use (Buller et al., 2014). Among psychosocial conditions studied in syndemic analyses, IPV combined with depression showed synergistic effects on HIV sexual risk in some MSM populations in India (Tomori et al., 2018).

The prevalence of IPV among MSM varies across contexts but is consistently elevated. A study across six countries found that heterosexist social pressures significantly increased odds of IPV reporting among gay and bisexual men (Finneran et al., 2012). Fear of disclosure, low social cohesion, and absence of prominent opinion leaders reduce resilience to stigma and IPV among sexual minorities (Ibragimov & Wong, 2016). For bisexual men, IPV may occur in relationships with both male and female partners, creating complex dynamics not captured in research focused exclusively on same-sex IPV.

Childhood sexual abuse (CSA) also contributes to syndemic vulnerability. Among MSM in India, 22.4% reported CSA, with those having more feminine sexual identities experiencing substantially higher rates (Tomori et al., 2016). CSA was independently associated with elevated rates of recent HIV-related risk factors even after controlling for lifetime factors (Tomori et al., 2016). Qualitative findings highlighted that gender nonconformity increased boys' vulnerability to CSA, and that CSA played a role in subsequent encounters including sex work (Tomori et al., 2016).

3. IDENTITY CONCEALMENT AND MINORITY STRESS

3.1 Minority Stress Theory and Sexual Orientation

Minority stress theory provides a comprehensive framework for understanding health disparities affecting sexual minorities (Hoy-Ellis, 2021). The model distinguishes between distal stressors (objective external events such as discrimination and violence) and proximal stressors (internal psychological processes including expectations of rejection,

concealment of minority identity, and internalized stigma) (Hoy-Ellis, 2021). Connection to sexual and gender minority communities is theorized to moderate the effects of minority stressors on health outcomes (Hoy-Ellis, 2021).

Longitudinal research tracking young gay and bisexual men over eight years found that all forms of stigma—enacted, anticipated, internalized, and concealed—significantly decreased over time (Pachankis et al., 2018). However, depressive symptoms remained stable while social anxiety increased, suggesting complex relationships between stigma reduction and mental health trajectories (Pachankis et al., 2018). Men from higher socioeconomic backgrounds experienced quicker reductions in anticipated stigma compared to men from lower backgrounds, highlighting socioeconomic gradients in minority stress experiences (Pachankis et al., 2018).

The minority stress model has been tested across diverse cultural contexts. Among Chinese sexual minority men, sexual identity concerns mediated associations between norm conformity, enacted stigma, and lower family support with identity concealment (Sun et al., 2020). However, psychological distress was associated with enacted stigma and family support but not with proximal stressors like concealment in the Chinese context, suggesting cultural variations in how minority stress operates (Sun et al., 2020). This underscores the importance of incorporating cultural considerations into minority stress conceptualizations.

3.2 Unique Identity Challenges for Bisexual Individuals

Bisexual individuals face distinct identity challenges not experienced by exclusively gay or lesbian individuals. Research demonstrates that bisexual individuals report lower sexual identity valence (how positively one feels about sexual identity) and lower integration of sexual identity into overall identity structures compared to other sexual minorities (Roi et al., 2019). These differences in identity dimensions partially explained disparities in depressive symptoms between bisexual and other sexual minority individuals (Roi et al., 2019).

Identity ambiguity represents a particular challenge for bisexual people. Studies exploring sexual identity dimensions found that bisexual individuals' identities were prominent but characterized by lower valence and integration (Roi et al., 2019). Longitudinal assessments

revealed bidirectional associations between identity valence and depressive symptoms, suggesting that negative feelings about bisexual identity and depression mutually reinforce each other over time (Roi et al., 2019).

Disclosure patterns also differ by sexual identity. Among bi+ adults (bisexual, pansexual, and queer individuals), pansexual participants reported higher disclosure compared to bisexual participants, along with higher discrimination from heterosexual people and higher depression (Feinstein et al., 2021). Those who used multiple sexual identity labels reported higher discrimination from both heterosexual and gay/lesbian people (Feinstein et al., 2021). These findings highlight heterogeneity within bisexual+ populations and suggest that identity labels carry different social meanings and consequences.

3.3 Concealment as a Proximal Stressor

Identity concealment—actively hiding one’s sexual orientation from others—represents a key proximal minority stressor with significant health implications. Among Chinese sexual minority men, degree of “outness” (public disclosure of sexual orientation) was a protective factor for mental health status (Liu et al., 2018). Those who were more publicly out had better mental health scores compared to those who concealed their sexual identity (Liu et al., 2018).

However, concealment operates differently for bisexual individuals compared to exclusively gay/lesbian people. In a qualitative study of LGBT individuals and primary care experiences, bisexual clients were significantly less likely than gay/lesbian clients to have sexuality discussed in treatment (Foy et al., 2019). This suggests that bisexual individuals may be more likely to conceal or not disclose their sexual orientation even in healthcare settings where disclosure could be clinically relevant.

The decision to conceal is influenced by contextual factors. Structural equation modeling showed that childhood gender nonconformity predicted prejudice events, which in turn influenced expectations of rejection and sexual orientation concealment (Timmins et al., 2019). Sexual orientation moderated some paths in these models, indicating that concealment pressures may operate differently across sexual orientation groups (Timmins et al., 2019). For bisexual men who can more easily “pass” as heterosexual, particularly

those in relationships with women, concealment may be strategically employed to avoid biphobia while simultaneously denying access to community support.

3.4 Biphobia and Double Discrimination

Biphobia—negative attitudes, prejudice, and discrimination specifically directed at bisexual individuals—constitutes a unique form of stigma distinct from homophobia (Pennasilico & Amodeo, 2019). Biphobia is perpetrated heavily both inside and outside LGBT communities (Pennasilico & Amodeo, 2019). Quantitative studies provide strong evidence that stereotypes and stigma toward bisexual individuals from both straight and gay/lesbian communities contribute to dramatic disparities in health outcomes (Friedman et al., 2014).

National probability sample surveys in the United States revealed that self-identified gay/lesbian individuals held less positive attitudes toward bisexual individuals compared to their attitudes toward other gay/lesbian people (Dodge et al., 2016). Female participants reported more positive attitudes toward bisexual individuals than male participants generally (Dodge et al., 2016). This within-community stigma creates a double burden for bisexual people who face discrimination from heterosexuals while also experiencing rejection and erasure from LGBT communities.

Bisexual erasure—the tendency to ignore, remove, or falsify evidence of bisexuality—represents a pernicious form of biphobia (Pennasilico & Amodeo, 2019). Media analyses of high-profile bisexual coming-out announcements have documented how bisexual individuals are frequently mislabeled as gay, erasing bisexuality as a legitimate sexual orientation (Magrath et al., 2017). This erasure occurs even in ostensibly supportive contexts, suggesting deep-seated societal difficulty in accepting bisexuality as valid.

The mental and physical health consequences of biphobia are substantial. Bisexual people report higher rates of depression, anxiety, and stress compared to gay and lesbian individuals, differences that persist even when adjusting for demographic factors (Pennasilico & Amodeo, 2019). The unique stress of navigating both heterosexual and LGBT spaces while facing rejection from both creates cumulative burdens not experienced by other sexual minority groups.

4. CULTURAL CONTEXT: HONG KONG AND CHINESE CULTURAL FACTORS

4.1 Filial Piety and Family Obligations

In Hong Kong and broader Chinese cultural contexts, filial piety—the Confucian virtue of respect for parents and ancestors—creates powerful pressures on sons to marry and produce offspring. Chinese gay men report struggling with feelings of shame related to homosexuality and believe that others possess stigmatizing attitudes (Steward et al., 2013). Participants in qualitative studies described having to reconcile same-sex attractions with filial expectations, with choices including not being involved with women, marrying lesbian women in mutual arrangements, or fulfilling family expectations by marrying heterosexual women (Steward et al., 2013).

Research examining mental health among Chinese gay men found that being an only child—carrying sole responsibility for continuing the family line—was significantly associated with poorer mental health status (Liu et al., 2018). Age, educational level, and degree of public coming out served as protective factors, while family structure intensified pressure (Liu et al., 2018). These findings reveal how traditional social influences emphasizing heterosexual marriage, fertility, and filial piety create preferential vulnerability to mental health problems among Chinese sexual minority men.

The growing HIV epidemic among MSM in China requires interventions that acknowledge these cultural realities. Programs must find ways to help men navigate balance between their own needs and responsibilities they feel toward parents and others (Steward et al., 2013). As MSM who fear social sanctions continue facing same cultural pressures as heterosexual men, interventions ignoring these dynamics risk being ineffective or culturally inappropriate.

4.2 Heterosexual Marriage Pressures and Concealed Sexualities

Marriage pressures are particularly acute for bisexual men who may marry women while maintaining secret relationships with men. Studies in India documented that male partners who also have sex with men and injection drug users largely follow the prevailing norm of

heterosexual marriage and having children to satisfy social pressures (Solomon et al., 2010). The majority of MSM do not disclose same-sex practices to wives, whether due to internalized homophobia, fear of stigma and discrimination, personal embarrassment, or changing social mores (Solomon et al., 2010).

Indonesian research revealed that prohibitive cultural perspectives and norms against same-sex marriage led MSM to conceal sexual orientations while secretively engaging in unprotected sex, increasing HIV transmission risk (Fauk et al., 2017). Cultural norms were instrumental in formation of sexual networks that provided supportive environments for HIV-risky practices (Fauk et al., 2017). These patterns likely exist in Hong Kong, where traditional expectations coexist with a globalized, cosmopolitan urban environment.

The impact on female partners is profound. Women married to MSM typically learn of their husbands' drug-using or same-sex behaviors only after marriage, making them helpless to protect themselves (Solomon et al., 2010). Fear of poverty and negative influences on children impacts women's decisions about disclosure and continuing relationships (Solomon et al., 2010). This creates a hidden population of women at risk for HIV whose vulnerability stems from bisexual men's concealment driven by cultural marriage pressures.

4.3 Stigma and Discrimination in Asian Contexts

Sexual minorities in Asian contexts face severe stigma and discrimination that shapes HIV vulnerability. In Tajikistan, gay and bisexual men experienced frequent blackmail and sexual/physical violence from police, discrimination from service providers limiting access to legal/health services, and state-sanctioned violations of human rights (Ibragimov & Wong, 2016). While Hong Kong is more liberal than many Asian countries, structural barriers persist.

Research on HIV testing among young MSM in Myanmar found that sexual identity was significantly associated with lifetime HIV testing but not recent testing (Pham et al., 2017). Those with three or more male partners, good HIV-related knowledge, higher self-efficacy, and use of non-health-related services for testing had higher odds of testing (Pham et al.,

2017). These findings suggest that even where services exist, structural and attitudinal barriers limit sexual minorities' access.

The invisibility of sexual minorities in Asian societies contributes to poor health outcomes. In India, transgender individuals and sexual minorities face extreme social exclusion, discrimination, and atrocities that diminish self-esteem and sense of social responsibility (Math & Seshadri, 2013). Many are forced out of homes, denied education and employment, and excluded from social spaces including hospitals, hotels, and government offices (Math & Seshadri, 2013). While Hong Kong's situation differs, similar patterns of marginalization exist, particularly for bisexual individuals who often remain invisible.

4.4 Healthcare Access and Cultural Competency

Sexual minorities in Asia report significant barriers to healthcare access. In Swaziland, 61.7% of MSM reported fearing seeking healthcare, 44.1% experienced enacted discrimination, and only 25.6% had ever disclosed same-sex behavior to healthcare providers (Risher et al., 2013). Fear of healthcare disclosure was significantly associated with having experienced legal discrimination, wanting to end one's life, having been raped, and difficulty insisting on condom use (Risher et al., 2013).

Even in Hong Kong's relatively developed healthcare system, cultural factors inhibit disclosure. Studies of LGBT adults' experiences with psychological therapy services in England found that 41.9% were concerned about experiencing stigma/discrimination before accessing services, and only 13.2% thought their sexuality negatively impacted treatment, though prejudice may be underestimated given that 33.6% did not disclose their sexual orientation (Foy et al., 2019). Barriers included feared and experienced stigma, reluctance to discuss sexuality, inconsistent discussion in treatment, lack of practitioner awareness, and distrust.

For bisexual individuals specifically, healthcare encounters are complicated by provider assumptions. When bisexual individuals are in different-gender relationships, providers may assume heterosexuality; when in same-gender relationships, providers may assume gay/lesbian identity. This erasure of bisexual identity in clinical contexts means bisexual-specific health concerns remain unaddressed, including questions about concurrent

partnerships, HIV/STI screening for partners of both genders, and mental health support for bi-specific minority stress.

5. SEXUAL NETWORK DYNAMICS AND HIV TRANSMISSION RISKS

5.1 Network Structure and Concurrency

Sexual network structure fundamentally shapes HIV transmission dynamics. Research examining network characteristics found that bisexual men reported significantly more concurrent partners (having overlapping sexual relationships) compared to exclusively heterosexual or gay men (Levin-Sparenberg et al., 2009). In a Seattle study, 32% of men who have sex with both men and women (MSM/W) reported concurrency versus 13% of men who have sex with men only ($p=0.002$), and 23% of women who have sex with women and men (WSW/M) reported concurrency versus 12% of women who have sex with men only ($p=0.004$) (Levin-Sparenberg et al., 2009).

Concurrency creates “sexual network bridges” that can accelerate HIV transmission by connecting individuals across partnerships before infections resolve (Levin-Sparenberg et al., 2009). When bisexual men maintain concurrent partnerships with both male and female partners, they create pathways for HIV to move from high-prevalence MSM networks into lower-prevalence heterosexual populations. Mathematical modeling suggests that even small numbers of bridging individuals can profoundly affect transmission if they occupy central positions connecting otherwise separate networks (Levin-Sparenberg et al., 2009).

The temporal patterns of partnerships also matter. Among Seattle MSM/W, 49% had opposite-sex partnerships that either preceded or followed same-sex partnerships within the past five years, while 22% had relationships that overlapped within the same month (Levin-Sparenberg et al., 2009). This cross-gender sexual mixing occurred across diverse venues, with bisexual men recruiting partners from internet (35.6%), bars (33.5%), and saunas/bathhouses (13.4%) (Levin-Sparenberg et al., 2009).

5.2 Partner Sourcing and Venue-Based Risks

Venue-based analyses reveal important transmission risks. In Shenzhen, China, HIV prevalence was significantly higher among MSM who patronized saunas (17.5%) compared to bars (4.3%), with sauna patronage showing strong independent association with HIV infection (Feng et al., 2008). Internet-based partner sourcing has become increasingly common, with 35.6% of Chinese MSM seeking partners online (Dong et al., 2019). In Hong Kong, the internet emerged as the major partner-sourcing reservoir for one major HIV epidemic cluster among MSM (Chen et al., 2011).

For bisexual men, partner sourcing patterns may differ from exclusively gay men. Studies have found that bisexual individuals were more likely to meet partners through diverse venues rather than exclusively gay-identified spaces (Levin-Sparenberg et al., 2009). This suggests bisexual men may have less exposure to HIV prevention messaging concentrated in gay community venues, contributing to lower awareness of HIV risks and prevention options like PrEP.

Venue-based interventions targeting MSM may inadvertently miss bisexual men who do not frequent gay venues or identify with gay community. Respondent-driven sampling methods, which rely on social network recruitment, may also undersample bisexual men whose social networks span both heterosexual and gay communities but who may not be densely connected within either. These methodological challenges contribute to bisexual men's invisibility in surveillance and programming.

5.3 Risk Behaviors and Condom Use Patterns

Sexual risk behaviors vary between bisexual and exclusively homosexual men in important ways. Mexican data showed that bisexual men were less likely to engage in receptive anal intercourse with males than homosexual men (13% vs 60%), resulting in only 7% of bisexual vs 18% of homosexual men having unprotected receptive anal sex in last intercourse with a male partner (Izazola-Licea et al., 2003). However, bisexual men used condoms more consistently with female sex workers than heterosexual men (Izazola-Licea et al., 2003).

In Seattle, bisexual men were significantly less likely to consistently use condoms with their most recent partner during the past three months compared to exclusively homosexual men ($p=0.04$) (Levin-Sparenberg et al., 2009). Among different types of sexual acts performed, bisexual men engaged in both insertive and receptive anal sex with men while also having vaginal sex with women, creating multiple potential transmission routes (Levin-Sparenberg et al., 2009).

Chinese data on MSM revealed increasing condom use trends over time. Recent condom use increased from 71.5% to 78.6% between 2009-2013, and consistent condom use in commercial anal intercourse increased from 46.5% to 55.0% (Qin et al., 2016). However, substantial proportions still engaged in unprotected sex, with 37.9% reporting bisexual behaviors (Feng et al., 2008). Given that bisexual men partner with women who are largely unaware of their male partners' MSM status, even moderate levels of unprotected sex create significant transmission risks.

5.4 STI Co-infections and Syndemic Transmission

The co-occurrence of HIV with other sexually transmitted infections (STIs) creates syndemic transmission dynamics. Systematic reviews found that syphilis infection increased HIV acquisition risk approximately 2.7-fold overall, with similar relative increases among MSM and other populations (Wu et al., 2020). In China, HIV and syphilis co-infection has been increasing among MSM, with syphilis prevalence decreasing from 9.0% to 6.3% but HIV prevalence increasing from 5.5% to 7.3% during 2009-2013 (Qin et al., 2016).

Among HIV-infected MSM in Shenzhen, 8.5% (22/260) were also infected with syphilis (Feng et al., 2008). The association between syphilis and HIV was positive ($r=0.38$), suggesting shared risk factors and potential biological synergy (Feng et al., 2008). Syphilis and other ulcerative STIs facilitate HIV transmission by disrupting mucosal barriers and increasing genital tract viral loads.

Bisexual men may face particular STI risks due to partnership patterns. Studies found that having both male and female partners was associated with higher numbers of total sexual partners and greater likelihood of recent STI diagnosis (Doyle et al., 2020). Among HIV-

negative MSM in Montreal, 7% were classified as using “biomedical prevention” including PrEP, and these individuals had higher numbers of anal sex partners and were more likely to report recent STI diagnoses (Doyle et al., 2020).

6. HIV PREVENTION NEEDS AND GAPS

6.1 Current Prevention Landscape for MSM in Hong Kong

Hong Kong’s HIV prevention landscape for MSM includes HIV testing services, condom distribution, sexually transmitted infection screening, and more recently, pre-exposure prophylaxis (PrEP). However, PrEP uptake among MSM in Hong Kong remains low. A study of MSM with HIV-negative/unknown status found that only 1% had ever used PrEP (Wang et al., 2018). When briefed about PrEP, willingness to use daily oral PrEP was only 7.7% if purchased at private facilities at HK\$8,000/month, increasing to 45.2% if free PrEP was provided by public hospitals (Wang et al., 2018).

Significant factors associated with PrEP willingness included knowledge about PrEP, perceived HIV infection risk, attitudes toward PrEP (both positive and negative), perceived subjective and descriptive norms, and perceived behavioral control (Wang et al., 2018). Concerning findings included that 9.7% would start PrEP without consulting doctors, 26.0% would not take PrEP daily even if free, and 42.4% would not undergo HIV testing every 3 months after starting PrEP (Wang et al., 2018). These findings suggest substantial gaps in PrEP-related knowledge and adherence intentions.

Cost-effectiveness analyses indicate that under current market drug prices, PrEP among Hong Kong MSM would cost USD 158,313-6/quality-adjusted life-year gained (QALYG), nearly 3 times higher than test-and-treat interventions alone (Wong et al., 2018). However, assuming 93% reduction in PrEP drug prices combined with test-and-treat strategies, putting 30% of MSM on non-targeted PrEP would be more cost-effective (USD 26,891-5/QALYG) and could avert 40% of new infections (Wong et al., 2018).

6.2 Barriers Specific to Bisexual Men

Bisexual men face unique barriers to HIV prevention engagement that differ from exclusively gay men. Primary among these is invisibility—bisexual men are often subsumed into MSM categories without recognition of their distinct needs. When prevention messaging and services are designed for “gay men” or located in gay community venues, bisexual men who do not identify as gay or participate in gay community may not feel these services are relevant to them (Ayala et al., 2013).

Studies of PrEP acceptability among diverse MSM populations found that homophobia, level of outness, and service provider stigma significantly reduced access to HIV services (Ayala et al., 2013). For bisexual men, outness is complicated—many may be out to some partners but not others, or may be out as bisexual to friends but not family. Provider stigma may include not just homophobia but biphobia, with healthcare workers holding negative stereotypes about bisexual people’s promiscuity or inability to commit to monogamy.

Research has documented lower awareness and knowledge about HIV prevention among bisexual compared to gay men. Among Black MSM in Atlanta, those unaware of PrEP reported lower HIV testing knowledge, fewer testing experiences, and higher rates of transactional sex than those aware of PrEP (Eaton et al., 2015). Given that bisexual men may have less engagement with gay community information sources, similar knowledge gaps likely exist. Without targeted outreach specifically addressing bisexual men, these disparities will persist.

Identity-related factors create additional barriers. Studies found that bisexual individuals were less likely than gay/lesbian individuals to have sexual orientation discussed in healthcare encounters (Foy et al., 2019). This suggests bisexual men may not disclose sexual orientation to providers, meaning risk behaviors involving same-sex partners remain unknown to clinicians who might otherwise recommend HIV testing or PrEP. For bisexual men in relationships with women, provider assumptions of heterosexuality compound this invisibility.

6.3 Gaps in Surveillance and Research

Substantial gaps exist in bisexual-specific HIV surveillance and research. The conflation of bisexual and homosexual men into MSM categories makes it impossible to track HIV incidence and prevalence specifically among bisexual men (Fernando, 2019). This erasure extends to behavioral surveillance—questions about sexual identity, attraction, and behavior are rarely disaggregated to allow bisexual-specific analyses.

Research gaps are equally pronounced. Systematic reviews of HIV prevention interventions among MSM rarely examine bisexual men as a distinct subgroup or test whether intervention effects differ by sexual identity (Hillis et al., 2020). Most PrEP demonstration projects have explicitly recruited “gay and bisexual men” but report outcomes for “MSM” without analyzing whether PrEP uptake, adherence, or HIV incidence reduction differs between gay and bisexual participants.

Particularly lacking is research on bisexual men’s female partners. Studies from India and elsewhere document that wives of MSM are at HIV risk but have limited knowledge and agency (Solomon et al., 2010). In Hong Kong, no published research examines the HIV/STI prevalence among female partners of bisexual men or interventions to support disclosure and prevention within these partnerships. This gap leaves a substantial vulnerable population unaddressed.

Qualitative research exploring bisexual men’s experiences navigating identity, relationships, and HIV risk in Hong Kong cultural contexts is virtually non-existent. Understanding how bisexual men in Hong Kong make decisions about disclosure to male versus female partners, negotiate condom use across partnerships, access services while maintaining privacy, and experience minority stress from multiple sources requires culturally-grounded qualitative inquiry that has not been conducted.

6.4 Need for Bisexual-Affirming Interventions

Evidence demonstrates clear need for bisexual-affirming HIV prevention interventions that acknowledge bisexual men’s distinct experiences and needs. Such interventions must address biphobia and bisexual erasure rather than reinforcing them by subsuming bisexual

men into gay male categories (Pennasilico & Amodeo, 2019). Messaging should explicitly include bisexual identities and validate bisexuality as a legitimate sexual orientation rather than treating it as confused, transitional, or attention-seeking.

Interventions must also address the dual network navigation challenges bisexual men face. This includes providing skills for negotiating condom use and disclosure with both male and female partners, addressing the ethical dilemmas of concealment from partners, and supporting bisexual men to make informed decisions about their sexual health across partnerships (Steward et al., 2013). Partner notification strategies may need adaptation for bisexual men's complex relationship configurations.

Mental health support integrated with HIV prevention is essential given syndemic burdens. Interventions should screen for depression, anxiety, substance use, trauma, and intimate partner violence, offering integrated treatment rather than referrals that bisexual men may not follow (Ogunbajo, Oke, et al., 2020). Addressing minority stress specific to bisexuality—including biphobia, identity invalidation, and pressure to choose gay or straight identities—requires culturally competent mental health providers trained in bisexual-affirmative approaches.

Finally, community-based approaches must intentionally include and center bisexual men rather than assuming “MSM community” adequately serves them. Creating bisexual-specific social and support spaces, training peer educators who identify as bisexual, and collaborating with bisexual community organizations can help reach bisexual men who may not access services in exclusively gay venues (Galindo et al., 2012). Such community engagement respects bisexual men's agency while addressing structural barriers to prevention access.

7. RECOMMENDATIONS

7.1 Surveillance and Epidemiological Research

Recommendation 1: Hong Kong's HIV surveillance systems should disaggregate data by sexual identity (heterosexual, bisexual, gay) in addition to sexual behavior (MSM), reporting prevalence and incidence separately for bisexual men.

Recommendation 2: Behavioral surveillance surveys should include validated measures of sexual identity, sexual behavior, and romantic attraction to capture the complexity of bisexual experiences and distinguish bisexual men from exclusively homosexual men.

Recommendation 3: Phylodynamic and molecular epidemiology studies should investigate whether distinct HIV transmission clusters exist among bisexual men compared to exclusively gay men, and examine bridging dynamics between MSM and heterosexual networks.

Recommendation 4: Population-based studies should examine HIV/STI prevalence among female partners of bisexual men to quantify transmission risks to this hidden population.

7.2 Prevention Program Development

Recommendation 5: Develop and pilot-test bisexual-specific HIV prevention interventions that explicitly address identity concealment, biphobia, dual network navigation, and cultural marriage pressures rather than adapting gay male interventions.

Recommendation 6: Implement couples HIV testing and counseling (CHTC) programs tailored for bisexual men and their partners (both male and female), addressing unique disclosure challenges and prevention planning across partnership types.

Recommendation 7: Expand PrEP access programs to explicitly recruit and retain bisexual men through bisexual-affirming messaging, peer navigation, and support groups that validate bisexual identity.

Recommendation 8: Create culturally-adapted interventions for Hong Kong context that address filial piety, family obligations, and marriage pressures while supporting bisexual men's sexual health and mental wellbeing.

7.3 Healthcare System Improvements

Recommendation 9: Train healthcare providers in Hong Kong on bisexual health disparities, biphobia, and bisexual-affirming clinical practices including routine sexual orientation assessment and non-judgmental disclosure discussions.

Recommendation 10: Develop clinical guidelines for HIV/STI screening among bisexual men that account for risks from both male and female partners and include recommendations for partner notification across gender lines.

Recommendation 11: Integrate mental health screening and treatment into HIV prevention services for bisexual men, addressing depression, anxiety, substance use, and trauma through syndemic frameworks.

Recommendation 12: Ensure that sexual health clinics create welcoming environments for bisexual individuals through visible bisexual-inclusive materials, staff training on bisexuality, and elimination of assumptions about sexual orientation based on current partner gender.

7.4 Community Engagement and Empowerment

Recommendation 13: Support development of bisexual community organizations in Hong Kong that can provide peer support, reduce isolation, counter biphobia, and serve as partners in prevention programming.

Recommendation 14: Train bisexual peer educators and navigators to conduct outreach, provide prevention information, and support linkage to HIV testing, PrEP, and treatment services in ways that resonate with bisexual men's experiences.

Recommendation 15: Implement social media-based interventions to reach bisexual men who may not access traditional gay community venues, using platforms and messaging that explicitly address bisexual identities and concerns.

Recommendation 16: Develop support groups for bisexual men addressing common challenges including identity development, disclosure decisions, managing multiple partnerships ethically, and navigating family/cultural pressures.

7.5 Research Priorities

Recommendation 17: Conduct qualitative research exploring bisexual men's experiences in Hong Kong including identity development, minority stress, sexual network formation, HIV risk perceptions, and prevention decision-making.

Recommendation 18: Implement cohort studies following bisexual men over time to measure HIV/STI incidence, identify predictors of infection, and evaluate natural history of syndemic conditions and their impacts on HIV risk.

Recommendation 19: Conduct research on female partners of bisexual men including HIV/STI prevalence, knowledge about partners' MSM behavior, relationship dynamics affecting prevention, and interventions to support disclosure and prevention.

Recommendation 20: Evaluate effectiveness of bisexual-specific HIV prevention interventions through randomized controlled trials comparing bisexual-tailored versus standard MSM interventions on outcomes including HIV testing, PrEP uptake, condom use, and HIV incidence.

7.6 Policy and Structural Interventions

Recommendation 21: Advocate for policy changes that combat discrimination against sexual minorities in Hong Kong, including workplace protections, anti-bullying legislation, and legal recognition of diverse family structures.

Recommendation 22: Engage media and public education campaigns to counter bisexual erasure and biphobia, promoting accurate information about bisexuality and challenging stereotypes that contribute to health disparities.

Recommendation 23: Ensure that HIV prevention funding mechanisms in Hong Kong specifically allocate resources for bisexual-focused programming rather than assuming MSM interventions adequately serve all men who have sex with men.

Recommendation 24: Establish multisectoral collaborations among government health departments, LGBT organizations, family service agencies, and academic institutions to address the complex intersecting challenges facing bisexual men.

8. CONCLUSIONS

Bisexual men in Hong Kong represent a distinct population whose unique HIV vulnerabilities have been rendered invisible through their subsumption within broader MSM categories. This comprehensive report has demonstrated that bisexual men face syndemic health burdens including elevated rates of depression, anxiety, substance use, and intimate partner violence compared to both heterosexual and exclusively gay/lesbian individuals (Friedman et al., 2014; Wittgens et al., 2022). These disparities are driven by minority stress processes that include not only discrimination from heterosexual society but also biphobia and erasure from within LGBT communities—a pattern of double discrimination unique to bisexual populations (Friedman et al., 2014; Pennasilico & Amodeo, 2019).

In the Hong Kong and broader Chinese cultural context, bisexual men navigate additional pressures stemming from filial piety expectations, marriage obligations, and family honor concerns that compel many to maintain heterosexual marriages while secretly engaging in same-sex relationships (Liu et al., 2018; Steward et al., 2013). This identity concealment protects bisexual men from social sanctions but simultaneously denies them access to community support, increases psychological distress, and creates epidemiological bridge populations connecting high-prevalence MSM networks with lower-prevalence heterosexual populations (Feng et al., 2008; Levin-Sparenberg et al., 2009).

Current HIV prevention approaches in Hong Kong, while expanding to include biomedical interventions like PrEP, have not adequately addressed bisexual men's specific needs (Wang et al., 2018; Wong et al., 2018). The conflation of bisexual and gay men obscures important differences in sexual behavior patterns, network dynamics, identity processes, and cultural pressures that require tailored intervention approaches. Female partners of bisexual men remain a hidden vulnerable population whose HIV risks stem from their partners' concealed same-sex activities yet who have received virtually no research or programmatic attention (Solomon et al., 2010).

Addressing HIV among bisexual men in Hong Kong requires a paradigm shift from erasure to recognition, from assumption to investigation, and from one-size-fits-all to culturally-

tailored approaches. The recommendations outlined in this report provide a roadmap for surveillance systems that disaggregate bisexual men's data, prevention programs that explicitly address their unique experiences, healthcare services that provide bisexual-affirming care, community empowerment initiatives that counter isolation and biphobia, research agendas that center bisexual men's voices, and policy changes that address structural drivers of health inequities.

The HIV field has learned from decades of AIDS activism that communities most affected by HIV must be meaningfully involved in designing responses. Bisexual men and their communities possess invaluable expertise about their own lives, needs, and strengths that must inform Hong Kong's HIV response. By moving beyond MSM to recognize bisexual men as a distinct population deserving of targeted attention, Hong Kong can advance health equity, reduce HIV transmission across interconnected sexual networks, and ultimately bend the epidemic curve toward elimination. The evidence is clear, the needs are urgent, and the path forward requires commitment to visibility, validation, and action.

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