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# Pakistan's HIV high-risk populations: Critical appraisal of failure to curtail spread beyond key populations

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## ABSTRACT

Pakistan has been a hub of several HIV outbreaks over the last 2 decades, with four major outbreaks being registered since 2018. There has been a recent rise in HIV infections, especially in high-risk populations, mainly consisting of people who inject drugs, men who have sex with men, prisoners, the transgender women community, and female sex workers. Consistently poor infection control practices, unregulated unsafe blood transfusion, questionable ethical practices by healthcare providers, and a general lack of awareness are the main drivers of recent HIV outbreaks, with these issues exacerbated by the presence of untrained health care providers. To stop the spread of HIV systemically and sustainably, aggressive measures need to be taken at all levels by all concerned stakeholders that not only deal with building up testing, tracing, and treatment capabilities but also address underlying grassroots problems that have largely been ignored to date.

## Introduction

HIV has infected around 210,000 people in Pakistan, a country which has been a hub of several HIV outbreaks over the last 2 decades. In fact, since 2018, four outbreaks have been registered in the country [1]. A pressing concern has been the recent rise in HIV infections, with a 75% increase in infections within a period of 9 years from 2010 onwards, along with a 405% increase in AIDS-related deaths within the same period, leading to an incidence to mortality ratio of 3.33 [2].

Presently, in Pakistan, people living with HIV/AIDS (PLHAs) have mainly consisted of sex workers, men who have sex with men (MSMs), people who inject drugs (PWIDs), prisoners, and transgender women [3]. However, the HIV outbreak that occurred in Larkana showed that HIV has begun to penetrate the general population consisting of women and children who were not considered previously at a high-risk [1]. In light of the rise of HIV infections, this review aimed to identify current high-risk HIV populations in Pakistan and investigate the reasons for them continuing to remain at a high risk.

## Methodology

A search was conducted using the MEDLINE, EMBASE, and SCOPUS databases to identify articles in English on the subject. All kinds of arti-

cles, ranging from case reports, case series, letter to editors, systematic reviews, narrative reviews, observational studies, and randomized control trials published until September 1, 2023, were reviewed. The search terms included: "Human immunodeficiency virus OR HIV," "High-risk OR Key Population OR People Who Inject Drugs OR Men who have sex with men OR Female Sex Workers OR Prisoners OR Transgender," and "Pakistan." Figure 1 describes the screening process, including reasons for excluding articles. Around 700 articles were deemed relevant to our study and were independently reviewed, from which relevant information was extracted for this review.

## HIV high-risk populations

### People who inject drugs

PWIDs have long been a problematic high-risk group in Pakistan. In fact, for more than a decade, they have been at the forefront of the HIV epidemic in Pakistan, constituting the largest key population affected by the epidemic. According to the Joint United Nations Programme on HIV/AIDS (UNAIDS) 2020 data, 113,400 PWIDs exist in the country [2]. Up until the early 2000s, the HIV prevalence among PWIDs was presumably very low or unreliably recorded. The first HIV outbreak among PWIDs was reported in June 2003 in Larkana after testing 175 PWIDs,

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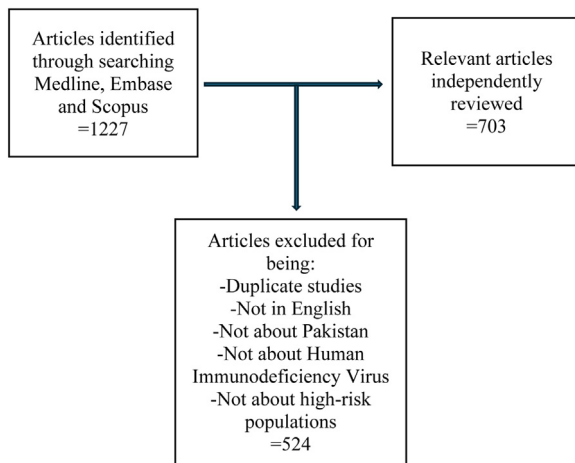
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**Figure 1.** Screening process during literature review.

of whom 17 (9.71%) were found to be HIV-positive [1]. In 2003, Altaf et al. reported a 0.6% prevalence of HIV among 161 PWIDs, whereas the prevalence of hepatitis C virus and hepatitis B virus was markedly higher at 94.3% and 7.5%, respectively [4]. However, since then, various studies have concluded that the actual figure is much higher, with a systematic review in 2017 by Ali et al. estimating that the HIV prevalence in PWIDs is around 15% after pooling the results of six studies [5]. In the last Integrated Biological & Behavioral Surveillance in Pakistan report published by the government in 2017, it was reported that the overall weight of HIV among PWIDs was 38.4% (95% confidence interval [CI] 37.9 to 38.9), with the highest prevalence found in Kasur (50.8%) and Karachi (48.7%) [6]. In addition, the sexual partners of PWIDs are at an increased risk and are considered “bridging populations,” with the prevalence of HIV in such populations being reported as 8.5% [7].

#### Men who have sex with men

The UNAIDS 2020 report states that, currently, in Pakistan, 832,000 MSMs exist [2]. Overall, MSMs (sex workers and non-sex workers) account for 22% of people currently living with HIV in Pakistan, making this group the second largest group of PLHAs after PWIDs. In fact, this group is so large that it constitutes more than seven times the number of PLHAs than the female sex worker (FSW) or transgender women sex workers (TSWs) group. Previous surveillance reports from Pakistan failed to account for non-sex worker MSMs who are also at increased risk for HIV transmission [6]. However, it has been noted that there has been a rising trend of PLHAs who are MSMs. This is evidenced by recent reports from Islamabad Capital Territory, where there is a growing number of HIV cases, with 519 individuals, mainly MSMs testing positive in 10 months in 2022 [8]. Furthermore, it has been found that these MSMs have increasingly been from the general population and are not sex workers [8]. The HIV prevalence in MSMs is estimated to be 5.4%, although studies have found the prevalence to be as high as 11% [9]. Furthermore, MSMs have been associated with several high-risk behaviors, including intravenous drug abuse, sharing needles, and unsafe sexual practices [9].

#### Female sex workers

Although men are seven times more likely to be infected with HIV than women, FSWs are also significantly at risk because, worldwide, heterosexual sex continues to be the most common mode of transmission [10]. Currently, in Pakistan, FSWs are reported to have the lowest prevalence of HIV among key populations, standing at 2.2% (95% CI 2.1 to 2.3) but data indicate a rising trend [6]. The UNAIDS 2020 numbers

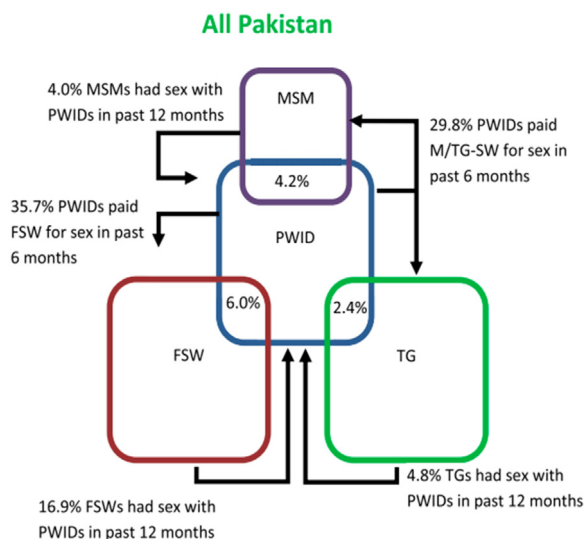
quoted that the current population of sex workers stands at 228,800, with 72.8% having awareness about HIV status and testing [2]. The estimates of FSWs in Pakistan stands at over 172,000, with the highest number being reported from Punjab province. The risk of contracting HIV along with other sexually transmitted infections remains high, considering that, on average, they engage 7-10 clients per week [11]. One study reporting that among 50 FSWs, 44% were found to be infected with syphilis, whereas in another, it was reported that 78% of FSWs had experienced symptoms of a sexually transmitted infection at least once in the past 6 months [11,12]. Over the years, condom use by FSWs has improved, leading to FSWs being able to negotiate safe sex with the help of programs and workshops. In fact, in 2020, 35.1% of FSW were using condoms [2]. However, it is quite clear that this strategy of programs and workshops alone would be insufficient to prevent the spillover of infection into the general population to contain the HIV epidemic in Pakistan.

#### Transgender women sex workers

Within Pakistan, transgender women are significant at-risk populations. With around 52,400 TSWs being reported by the UNAIDS in 2020, they remain the second most at-risk group in Pakistan (after PWIDs) [2]. Numerous social factors, such as societal stigma, exclusion, and severely limited acceptance, are key reasons for this underrepresented community in Pakistan to live in poverty and turn toward commercial sex as a source of income. This was also seen in a study conducted in Islamabad and Rawalpindi, which was done to determine the association of high-risk behaviors and social exclusion in the transgender women community [13]. The results of the study showed that 77.8% of the participants had endured physical assault, whereas, concerning, 99.5% had also experienced institutional discrimination. Furthermore, engagement in drug abuse (37.6%) and commercial sex (39.2%) was also reported by nearly two of five participants. In another study, 84% of transgender women were commercial sex workers. As in other populations of sex workers, TSWs have also exhibited a relatively poor knowledge of safe sexual practices, with one report stating that only 39% were aware of HIV prevention programs. The 2016-2017 Integrated Biological & Behavioral Surveillance Report found the weighted prevalence in TSWs to be 7.5% (95% CI 7.2 to 7.8), with the figure standing at 7.1% for the overall transgender women population [6]. Several hotspots were also identified, indicating localized cluster transmission in key areas, with the HIV prevalence far above the national average, with reports suggesting a prevalence as high as 18.2% for transgender women in Larkana, 15% in Bannu, and 12.9% in Karachi [9]. The interaction between FSWs, TSWs, MSMs, and PWIDs is shown in Figure 2 [6].

#### Prisoners

Prisons, although often neglected within Pakistan’s health care setup, are a prime hotspot for the spread of infectious diseases. Prisons in Pakistan are known for their poor living conditions and are often overcrowded. In April 2018, there were 80,139 registered prisoners nationwide against an authorized capacity of 56,628 [14]. Furthermore, prison inmates often hail from vulnerable populations (including sex workers and PWIDs), exhibiting high-risk behaviors [15]. In 2018, Wali et al. found that the prevalence of HIV in central jail Gaddani (one of the largest prisons in Balochistan) stood at 4.2% among prison inmates, far higher than the national average and statistics emerging from other jails in Balochistan, where the HIV prevalence was between 1% and 3% [16,17]. Older studies from prisons in Punjab and Sindh have found prevalence rates ranging from 1% to 4.4% [18]. Alarming, it is also pertinent to note that prisoners infected with HIV are also likely to have co-infections owing to risk-taking behaviors, with a study conducted among prison inmates of the jails of Lahore, finding an HIV prevalence of 2.01%, with 73.74% being co-infected with hepatitis C [19].



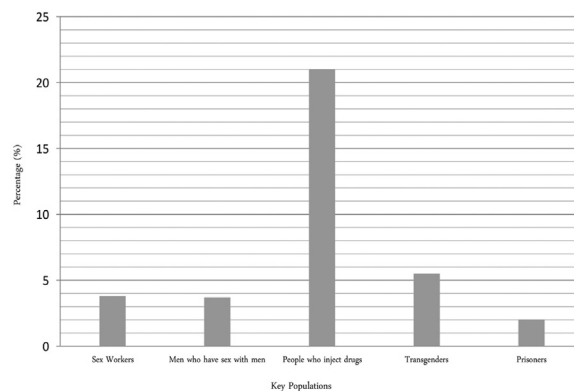
**Figure 2.** Interactions between PWIDs, MSMs, TGs, and FSWs. FSW, female sex workers; MSM, men who have sex with men; PWID, people who inject drugs; TG, the transgender community.

*General population*

Although there is a dearth of organized data on HIV prevalence among the general population, reports suggest that young adults and low-risk groups, such as women and children, have been reported positive, indicating that, over time, the infection has spread to the general population. Among PLHAs, according to latest estimates, 39% of such individuals hail from non-key low-risk populations [2,20]. The first documented shift occurred in 2008, in Jalalpur Jattan, Punjab where 88 individuals were found to be HIV-positive of a total of 246 screened [21]. Among them, 53 persons infected with HIV were identified, 27 being women and six being children under 10 years of age. Although a definite source could not be linked to the outbreak, researchers concluded that the outbreak largely stemmed from unsafe injection and needle practices, unsafe sexual practices, and a general lack of awareness of appropriate preventive measures. A total of 10 years later, in February 2018, another outbreak was reported in Sargodha, Punjab, consisting of 22 persons infected with HIV, again tied to unsafe injection practices [22]. Nearby, in Kot Momin within the Sargodha district of Punjab, a much larger outbreak was registered in January 2019, with 669 of 5000 individuals testing positive, with a greater prevalence in women and children [1]. This represented a significant increase in numbers, with the prevalence being 1.29% in June 2018, jumping to 13.38% in January 2019. Once again, unsafe injection practices were indicated, with the presence of untrained local practitioners being implicated. The UNAIDS country report in 2019 identifies the shifting nature of localized epidemic shifting from key populations to the general population, largely because of sexual networks, following the Asian epidemic modeling trend [2].

**Discussion**

Repeated outbreaks of HIV in Pakistan show that as of yet, lessons are not being learned and this is proving to have dire consequences. Although exact number of outbreaks remain unclear due to poor reporting and surveillance mechanisms, a systematic review analyzing 25 eligible outbreaks, found evidence of at least seven outbreaks between 2000 and 2019, with more than half occurring after 2016 [23]. UNAIDS has called Pakistan’s situation regarding HIV as a “major cause of concern,” being one of the few territories in the Asia Pacific region with a continued rise in infections. Although some of this rise may be



**Figure 3.** Percentage of HIV prevalence in high-risk populations in 2019.

attributed to increased testing, consistently poor infection control practices, unregulated unsafe blood transfusion, questionable ethical practices by healthcare providers, and a general lack of awareness owing to the taboo nature of the subject are the main drivers of recent HIV outbreaks, with these issues exacerbated by the presence of untrained health care providers. Repeated lapses in national policy have catalyzed the transition, with Pakistan moving from a “low-prevalence high-risk” state to a “concentrated epidemic” state.

It is key to note here that despite the recognition of key populations that are at a high risk for HIV infections, these population continue to remain at a high risk, clearly indicating that mitigation strategies have not been adequately implemented. Figure 3 shows the HIV prevalence rates in key risk populations according to the UNAIDS 2019 report [2]. The National AIDS Control Program, founded in 1986, has had difficulty in achieving adequate coverage of preventive, diagnostic, and curative programs among key populations. The 90-90-90 target is a metric devised by UNAIDS to track the progress of national HIV efforts; under this, UNAIDS envisages that by 2020, 90% of PLHAs will know they are infected, 90% of PLHAs will be accessing treatment, and finally, 90% of PLHAs on treatment will have viral loads that are suppressed [3]. As it stands, this target is woefully underachieved for Pakistan, with statistics in 2021 demonstrating that only 23% of PLHAs knew their status and only 14% of PLHAs were on treatment [2,3]. These figures demonstrate just how far Pakistan has to go to achieve complete control over the situation.

Considering the historical spread of HIV in Pakistan and the control strategies adopted so far, it becomes apparent that the current framework is grossly inadequate to sustainably stem the spread of HIV. This is largely due to the fact that systemic grassroots factors have not been considered and given their due weight, especially within Pakistan’s socio-geographical context. In the fight against HIV/AIDS, although global principles may apply, it is paramount that strategies are adapted to local context to achieve set goals. Any discussion regarding HIV in Pakistan would be incomplete without addressing the stigma attached to the disease from a local context. This stigma is so ingrained within Pakistan’s sociocultural framework that it has even permeated into the HIV prevention sector [24]. There have been experiences of doctors determining who gets treatment and excluding others based on non-adherent drug use, despite the World Health Organization’s stance on universal access to HIV treatment, regardless of drug status [24]. However, there are other instances of leaders from non-governmental organizations who are from these high-risk groups to strategically use the stigma to further their own position of power among their groups [24]. The stigma attached is a major factor that is indirectly responsible for many of the shortcomings of Pakistan’s HIV program and may be responsible for the rising numbers seen.

Pakistan’s geopolitical landscape also does it no favors. Afghanistan, which is the world’s leading supplier of illegal opioids, sits right next to

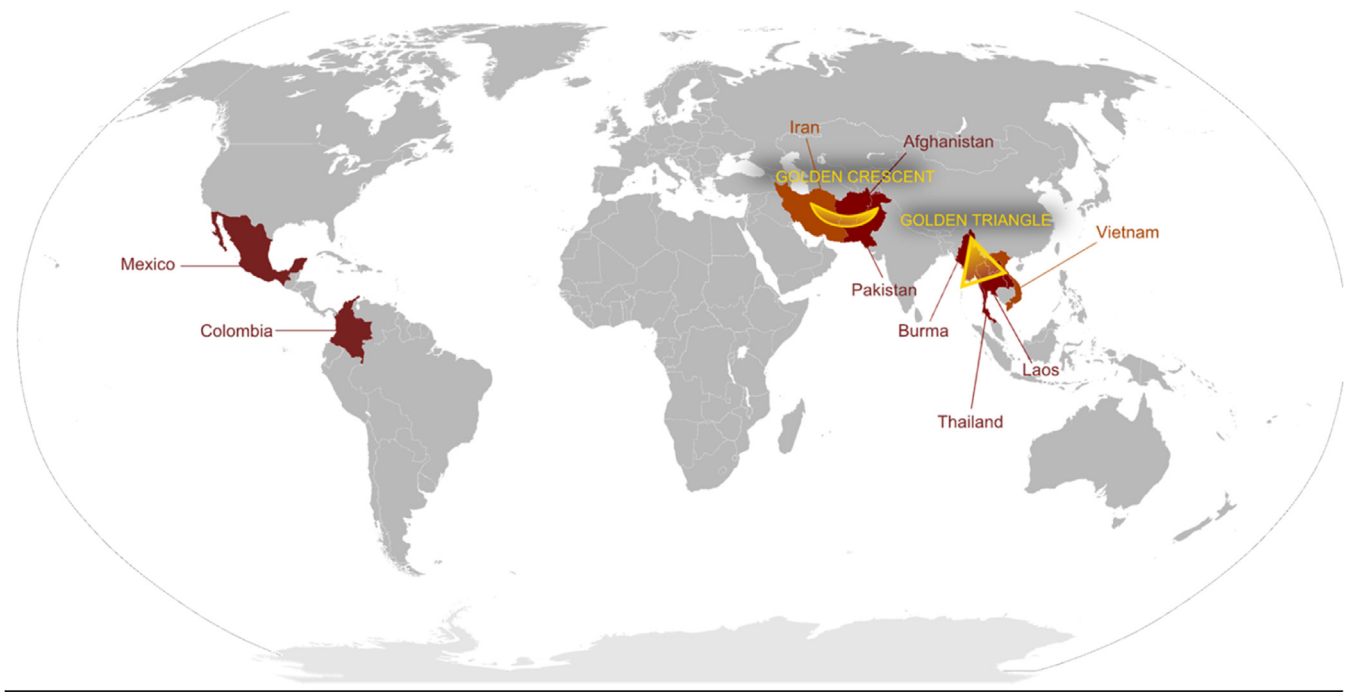


Figure 4. “The Golden Crescent.”

Pakistan and, as such, Pakistan remains among the world’s leading drug trafficking corridors. This region, including Afghanistan, Pakistan, and Iran, is so notorious that it has been colloquially named as the “Golden Crescent” (Figure 4), with studies showing that the direct passage of drugs through this global hub is directly linked to the rising incidence of HIV, among other blood borne diseases [25]. Progress in achieving HIV/AIDS goals will continue to remain hampered if there is a continuing steady supply of drugs within cities and rural areas. Previous data have shown that in Pakistan, PWIDs remain the highest at-risk group for contracting HIV due to unsafe practices associated with drug intake, for example, sharing needles [4]. Comprehensive measures are required to stop the drug epidemic and subsequently control the spread of HIV. Risk reduction programs need to be scaled up, along with the provision of opioid substitution therapy, which is largely unavailable in Pakistan [26]. It is important to aggressively target these underlying problems because PWIDs represent a high-risk population that have the capacity to spread the virus to the general population through their families.

Finally, it is important to also highlight that Pakistan has vastly different demographics compared with the west. With a literacy rate estimated to be at 60% in 2019-2020, it remains one of the unacknowledged underlying factors that enables the spread [26]. A lack of awareness regarding HIV has been noted in several studies, which has been quite concerning. In a large-scale study, Iqbal et al. showed only 42% of Pakistani women had heard about HIV/AIDS, with another study by Chaudhry et al. reporting that 50% of Pakistani truck drivers did not know HIV was spread via sharing needles [27,28]. Furthermore, the use of HIV pre-exposure and post-exposure prophylaxis medication is key in mitigating spread; however, we believe that due to a lack of awareness, they are underutilized in Pakistan, despite being free of cost at treatment centers because according to the UNAIDS, only 14% of PLHAs were using antiretroviral therapy in 2022 [3]. It is also worth mentioning that there is a dearth in literature regarding HIV prophylaxis in Pakistan. All these figures are, in short, alarming and show that unless widespread measures are conducted to boost general awareness, a lack of knowledge leads to ignorance and apathy regarding the disease and its consequences, hence facilitating the spread. Large-scale media campaigns and dissemination of informational material at health care centers across the

country may enable increased awareness regarding the disease. In fact, a study from Pakistan showed that electronic media has an important part to play in the ongoing polio vaccination campaign, with households having a television having a significantly higher number of children vaccinated against polio and vaccinations than households without a television [29]. This information can be used to design awareness campaigns to stem the spread of HIV in Pakistan.

## Conclusion

Pakistan is currently at a crossroads, with a looming threat of an HIV epidemic if corrective action is not taken. To stop the spread of HIV systematically and sustainably, aggressive and multi-strategic measures need to be taken at all levels by all concerned stakeholders that not only deal with building up testing, tracing, and treatment capabilities but also address the underlying grassroots problems, including HIV literacy, health equity, and social justice, especially in context of Pakistan’s marginalized communities that have largely been ignored to date.

## Declarations of competing interest

The authors have no competing interests to declare.

## CRediT authorship contribution statement

**Hussain Ahmed Raza:** Conceptualization, Writing – original draft, Writing – review & editing. **Mohammad Hassan Raza Raja:** Writing – original draft, Writing – review & editing. **Muhammad Mussab Khakwani:** Writing – review & editing. **Bushra Jamil:** Conceptualization, Supervision, Writing – review & editing.

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## Ethical approval statement

Not required.

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