Exploring factors influencing Pre-Exposure Prophylaxis (PrEP) uptake among Key Populations in Indonesia: A Literature Review

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A thesis submitted in partial fulfilment of the requirement for the degree of

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Declaration:

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ABSTRACT

Background: Indonesia has one of the fastest-growing HIV epidemics in the Asia-Pacific region, with an estimated 570,000 people living with HIV. The national HIV prevalence is higher among key populations, ranging from 2.2% to 25.3%. Although Pre-Exposure Prophylaxis (PrEP) access expanded in 2024, overall uptake remains limited. As of 2024, only 3.2% of MSM, 3.2% of sex workers, 4.8% of transgender people, and 2.0% of people who inject drugs have initiated PrEP.

Methodology: This thesis explores the factors influencing PrEP uptake among KPs in Indonesia through a literature review. An adapted socio-ecological framework, based on Scott *et al* and Kayasu *et al*., was modified to analyze factors at the individual, interpersonal, community, institutional, and structural levels.

Findings: Pervasive stigma toward key populations remains a significant barrier to PrEP uptake in Indonesia. In addition, limited PrEP delivery models and methods, stockouts, and punitive laws create complex obstacles for key populations to access and adhere to PrEP.

Conclusion: KP decisions to initiate PrEP are influenced by stigma, delivery models, availability of PrEP, and the legal and regulatory environment. To improve uptake, efforts should focus on expanding HIV and PrEP education among communities and health workers, scaling up diverse and decentralized delivery models, broadening PrEP options, reviewing discriminatory laws and policies, and strengthening the supply chain.

Keywords: PrEP Uptake, Key Populations, Indonesia.

Word count: 11.993.

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ABBREVIATIONS

ART	Antiretroviral Therapy
ARV	Antiretroviral
CBO	Community-Based Organization
D-PrEP	Daily-PrEP
DVR	Dapivirine Vaginal Ring
ED-PrEP	Event-Driven PrEP
FSW	Female Sex Workers
IBBS	Integrated Biological and Behavioral Surveillance
JKN	Jaminan Kesehatan Nasional/National health Insurance
KPs	Key Populations
MoH	Ministry Of Health
MSM	Men who have sex with Men
PWID	People Who Inject Drugs
PHC	Primary Health Center
PLHIV	People Living with HIV
PrEP	Pre-Exposure Prophylaxis
SIHA	HIV/AIDS Information System
STI	Sexually Transmitted Disease
RPJPN	Rencana Pembangunan Jangka Panjang Nasiona/National Long-term Development Plan
TG	Transgender

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1. INTRODUCTION

Indonesia has one of the fastest-growing HIV epidemics in the Asia-Pacific region. According to UNAIDS, by 2024, approximately 570,000 people were living with HIV (PLHIV) in the country. The national HIV prevalence was 0.4% in the general population, but much higher among key populations (KPs), ranging from 2.2% to 25.3%. In the same year, an estimated 26,000 people in Indonesia died from AIDS-related illnesses. These figures highlight the urgent need for effective prevention strategies and equitable access to HIV services, especially for populations at highest risk.

Since beginning my work in HIV services, I have been consistently involved in both treatment and prevention efforts across multiple levels of the healthcare system in my district. I initially served at primary health centers, where I actively contributed to HIV health promotion and prevention activities targeting key populations. Currently, I work at the HIV clinic in the district hospital, established in 2022, where I provide antiretroviral therapy (ART) to PLHIV in collaboration with the District Health Office and the District AIDS Commission.

Throughout my professional experience, I have worked closely with key populations, particularly men who have sex with men (MSM), through clinical services. This ongoing engagement has provided me with the challenges they face, including stigma, discrimination, limited service accessibility, and fear of disclosure. Despite our ongoing efforts, the incidence of new HIV infections in the district continues to rise. While PrEP has been available in Sulawesi Tengah province since October 2024, it is still not accessible in the Sigi district. As a result, many individuals at substantial risk of HIV acquisition remain unprotected.

This thesis, titled *"Exploring Factors Influencing PrEP Uptake Among Key Populations in Indonesia,"* aims to examine the barriers and enablers that shape decisions regarding PrEP use among key populations. The findings are intended to inform future efforts to introduce and scale up PrEP services in underserved areas, including the Sigi district, and ultimately contribute to reducing HIV transmission at the local and national levels.

2. BACKGROUND

2.1. Geographical and Socio-demographic profile of Indonesia

Indonesia is located between two continents, Asia and Australia, and two oceans, the Indian Ocean and the Pacific Ocean (1). Geographically, Indonesia lies from 6°04'30" North Latitude to 11°00'36" South Latitude, and from 94°58'21" to 141°01'10" East Longitude (1), as seen in the map of Indonesia (See Figure 1) (2). Indonesia's archipelago consists of over 17,000 islands, among which are six major islands: Sumatra, Java, Kalimantan, Sulawesi, Moluccan, and Papua (1). According to the 2020 Indonesian Population Census, the country's population stood at approximately 270 million, with an average annual growth rate of 1.25% between 2010 and 2020, where 56.10% of the population was concentrated on Java Island (3). The gender distribution is males comprising 50.58% (136.66 million) and females 49.42% (133.54 million) of the population (3).

Indonesia officially recognizes six religions: Islam, followed by 207 million people (87.2%); Christianity (6.9%); Catholicism (2.9%); Hinduism (1.7%); Buddhism (0.7%); and Confucianism (0.05%) (4). In addition, the school enrollment rate was 105.62% for elementary school, 92.51% for junior high school, and 86.34% for senior high school (1).

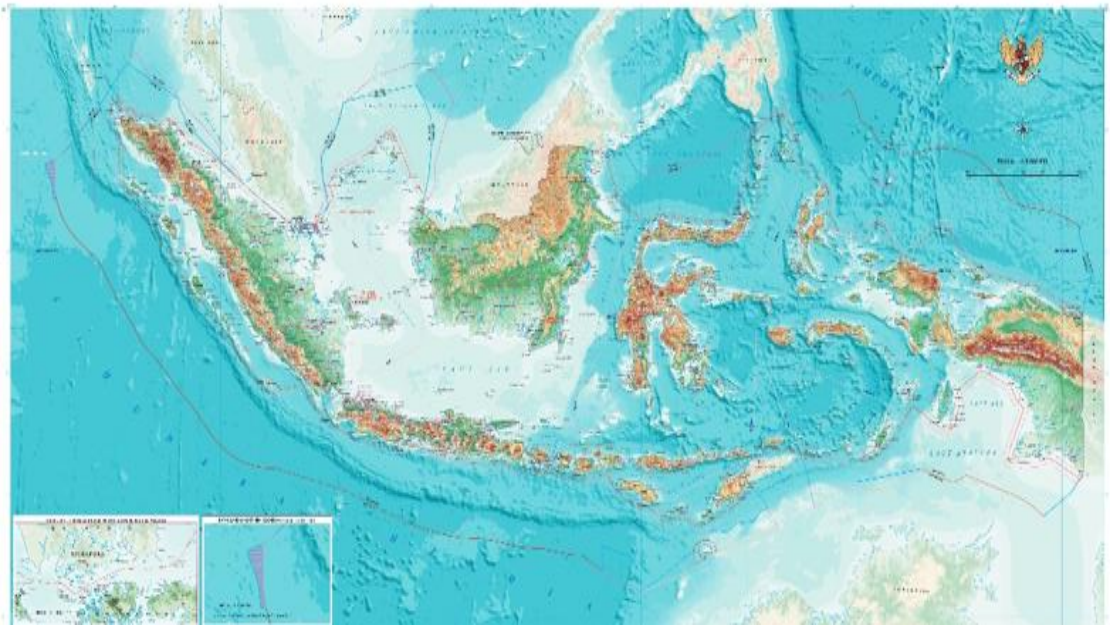

Figure 1. Map of Indonesia (2).

2.2. Health System in Indonesia

2.2.1. Structure of the Health System

The health system structure in Indonesia is aligned with the country's decentralized governance structure, which delegates authority across three levels: central, provincial, and district governments (5) (see Figure 2). At the central level, the Ministry of Health (MoH) holds the mandate for formulating national health policies, setting standards and regulations, and managing specialized referral hospitals (5–9). The provincial government oversees the administration of provincial hospitals and supervises health service delivery at the district level (5,7). Meanwhile, district governments are directly responsible for the management of district hospitals and Primary Health Centers (PHCs) (7).

Indonesia's health system is characterized by a mixed model involving both public and private providers, as well as blended financing mechanisms (9). The private health sector comprises various types of providers, including non-profit clinics and hospitals, for-profit hospitals, as well as individual practices by private doctors and midwives (9). As of the most recent data, the government operates approximately 10,180 PHCs and 3,155 hospitals (10). Indonesia faces a double burden of disease, with infectious diseases such as tuberculosis, diarrhea, and respiratory infections remaining significant, while non-communicable diseases like stroke, ischemic heart disease, and diabetes are on the rise (10,11).

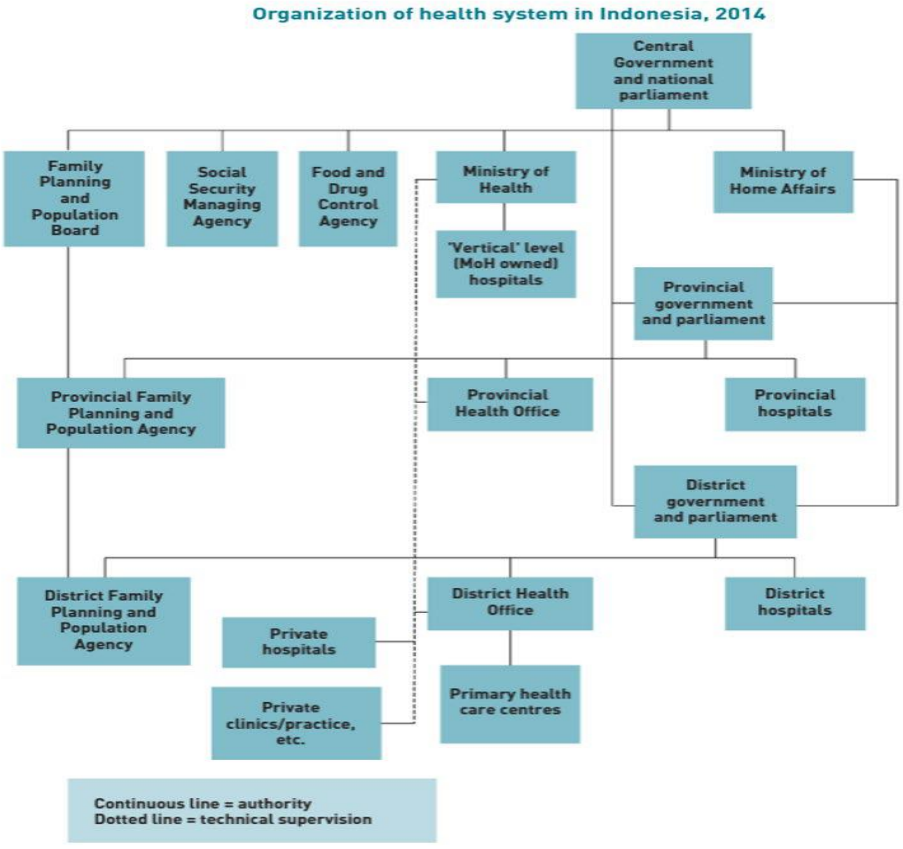

Figure 2. Structure of the Health System in Indonesia (5) .

2.2.2. Health Financing

In 2025, Indonesia's health expenditures were approximately 4.6% of GDP, a decline from 5.6% in 2024 (12). The primary funding for health services is provided by the National Health Insurance Scheme/Jaminan Kesehatan Nasional (JKN), which was launched in 2014 under Presidential Regulation No. 12 of 2013. It aims to provide universal health coverage (UHC) for all Indonesian citizens (13).

In addition to JKN, health service financing is supported by sub-national public funds through regional budgets (Anggaran Pendapatan dan Belanja Daerah/APBD), private health insurance, and out-of-pocket payments made directly by patients (14). As of 2025, approximately 95.77% of the population, equivalent to 267.3 million people, were covered under the JKN scheme (15). Contributions to JKN come from a combination of government subsidies (30.1%), wage workers segment in business sectors (27.7%), non-wage workers by local government (10.7%), subsidies by local government (2.1%), and from non-salaried individuals (0.7%) to the total contribution revenue (10,13).

2.2.3. Health Financing for HIV/AIDS

HIV/AIDS programs in Indonesia are financed through a combination of domestic and international sources. The Indonesian government contributes about 69.69% of the funding, allocating approximately 0.2% of its health budget to HIV/AIDS programs. International partners, including PEPFAR, the Global Fund, and UNAIDS, provide the remaining 30.31%, supporting service expansion, prevention efforts, and treatment delivery (16).

Indonesia's health insurance system also includes coverage for HIV treatment, including the treatment of opportunistic infections, CD4 and viral load testing, and other laboratory diagnostics (5). Antiretroviral (ARV) medications are procured and distributed by the government and are provided to patients free of charge (5).

According to UNAIDS, Indonesia allocates less than 10% of its total HIV expenditure budget to prevention programs targeting key populations (17).

2.3. HIV situation in Indonesia

By the end of 2023, an estimated 39.9 million people were living with HIV (PLHIV) worldwide, and approximately 630,000 people died from AIDS-related deaths (18). Sustainable Development Goal (SDG) 3.3 aims to eliminate AIDS as a major public health issue by the year 2030 (19). In support of this goal, UNAIDS established the 95-95-95 targets for 2025: 95% of all people living with HIV know their HIV status, 95% of those diagnosed receive sustained antiretroviral therapy (ART), and 95% of those on ART achieve viral suppression. Furthermore, the global response is also guided by the "Three Zeros" strategy: zero new HIV infections, zero AIDS-related deaths, and zero HIV-related discrimination (20)

In 2024, UNAIDS reported that about 570,000 PLHIV in Indonesia (21). The national HIV prevalence was 0.4% among adults 15-49 years old and ranged from 2.2% to 25.3% among KPS (5). Approximately 26,000 people died from AIDS-related illnesses in the same year (21). Nationally, HIV prevalence was 21.9% among men who have sex with men (MSM), 14.7% among people who inject drugs (PWID), 12.7% among transgender people (TG),

25.27% among male sex workers, and 2,1% among female sex workers (FSW) outside Papua, and 15.92% among FSW in Papua (5).

Indonesia is a country with a concentrated epidemic in most regions, and a low-level generalized epidemic in Papua (22). Within the 34 provinces, the five provinces with the highest HIV numbers are West Java, Central Java, East Java, DKI Jakarta, and Banten (23).

Based on the UNAIDS evaluation 2023, Indonesia is not on track to reach 95-95-95 by 2030 (5). The recent data show that 60 % of PLHIV know their status, 41% of PLHIV are on ART, and less than 38 % of PLHIV on treatment have achieved viral suppression (21). Additionally, only 51% of PLHIV remain on treatment. Among those lost to follow-up (LTFU), 54% discontinued care without notice, 40% have died, and 1% stopped ART (23). Furthermore, in 2023, it is reported that 57.299 new cases of HIV and 16.410 cases of AIDS (10). (See Figure 3).

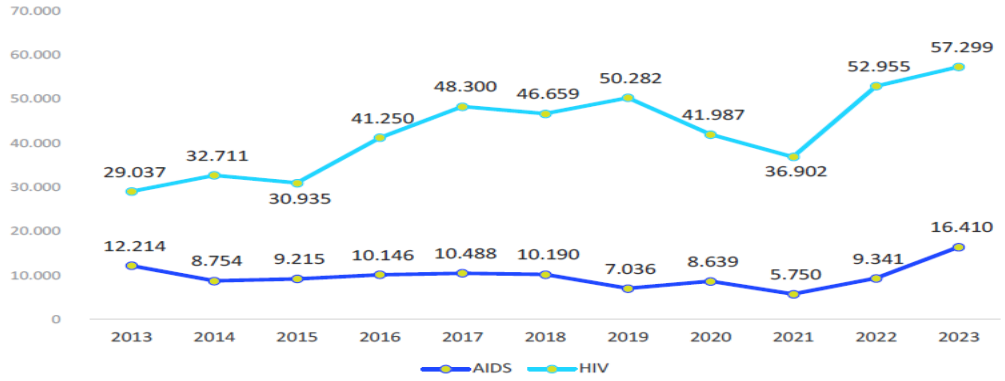

Figure 3. New cases of HIV/AIDS 2013-2023 (10).

In Indonesia, the prevalence of HIV is higher among males (73%) compared to females (27%) and higher among the productive age (10) (See Figure 4).

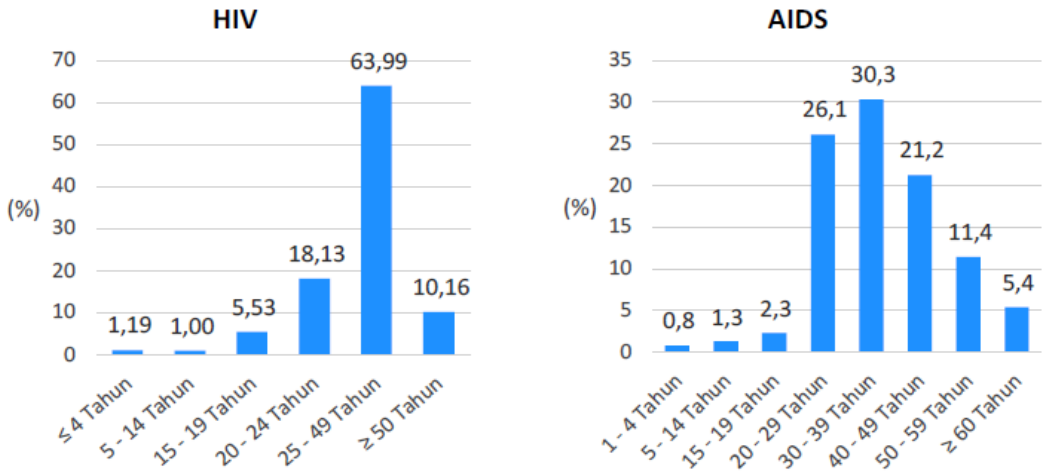

Figure 4. Distribution of HIV/AIDS based on Age (10).

Indonesia's 2020–2024 National Action Plan outlines strategic targets to strengthen the national HIV response (22). Furthermore, in 2022, the MoH released Regulation No. 23 of 2022 on the Prevention and Control of HIV, AIDS, and STIs to achieve the target of ending AIDS by 2030 through the fast-track 95-95-95 approach (5,24).

Prevention programs target both the general population and KPs, and include: increasing knowledge about HIV and AIDS, condom use, sterile needle services (LASS), methadone maintenance therapy (MMT), pre-exposure prophylaxis (PrEP), post-exposure prophylaxis (PEP) (22).

2.4. PrEP program in Indonesia

In 2015, the WHO recommended oral PrEP as part of an HIV prevention strategy (25). According to the MoH Regulation No. 23 of 2022, PrEP in Indonesia is provided to high-risk populations, including MSM, FSW, PWID, TG people, and high-risk couples (24,26). PrEP is an additional HIV prevention for HIV negative individuals who have a high risk of HIV exposure (27). Oral PrEP has been implemented in Indonesia through a pilot program since 2021 in 21 districts in 10 provinces with a high prevalence of HIV (28).

According to UNAIDS, there were 9,923 PrEP initiations in Indonesia during 2022–2023 in 23 districts/cities (17,29). This number increased significantly in 2024, with the MoH reporting 31,101 PrEP initiations across 648 health facilities in 95 districts/cities within 33 provinces (30). Of these, 21,005 were among MSM, 6,450 among FSW, 1,608 among TG, and 380 among PWID. In the first quarter of 2025 (January–March), the MoH reported 9,707 additional PrEP initiations, including 6,437 MSM, 2,314 FSW, 443 TG, and 142 PWID, with the highest initiations in West Java, Central Java, and Jakarta (31).

Currently, only oral PrEP regimens are available in Indonesia, as illustrated in Table 1 (26). Oral PrEP in Indonesia is administered through two primary regimens: event-driven PrEP (ED-PrEP) and daily PrEP (D-PrEP) (26).

The ED-PrEP regimen consists of taking two pills 2 to 24 hours before sexual activity, followed by one pill 24 hours after the initial dose, and another pill 24 hours after the second dose (25). In contrast, D-PrEP involves taking one pill consistently each day (27). Individuals taking PrEP are required to undergo regular laboratory monitoring, including testing for sexually transmitted infections (STIs), hepatitis B and C, and kidney function every three months to ensure early detection of any adverse effects (26).

Nama Obat	Dosis
Tenofovir disoproxil fumarate (TDF) / Emtricitabine (FTC)	300 mg TDF dan 200 mg FTC
Tenofovir disoproxil fumarate (TDF) / *Lamivudine* (3TC)	300mg TDF dan 300mg 3TC

Table 1. Oral PrEP regimen in Indonesia (26).

2.4.1. Key population in Indonesia

According to UNAIDS, Key populations are defined as “groups who, due to specific higher-risk behaviours, are at increased risk of HIV, viral hepatitis, or STIs irrespective of the epidemic type or local context.” (32). KPs include MSM, FSW, TG people, and PWID (5,32). The risk of acquiring HIV is 26 times higher among MSM, 29 times higher among PWID, 30 times higher for sex workers, and 13 times higher for TG (20). UNAIDS reported that it is estimated that the KPs in Indonesia are about 1.100.400 people, with the number of sex workers 271.800, MSM 847.300, PWID 27.000, and TG people 43.100 (21).

KPs often face discrimination, violence, and punitive legal and social environment factors that significantly contribute to their vulnerability to HIV (20). The Global Strategy to end Inequalities and End AIDS 2021–2026 sets a “10-10-10” target, meaning less than 10% of PLHIV and KPs experience stigma and discrimination, less than 10% of PLHIV women and girls and KPs experience gender based inequalities and gender based violence, and less than 10% of countries have punitive laws and policies (20).

3. PROBLEM STATEMENT AND JUSTIFICATION

3.1. Problem statement

According to the WHO, HIV is still a global public health challenge, with more than 39 million people living with HIV in 2022 (33). Indonesia has one of the fastest-growing HIV epidemics (34), with 57.299 new HIV cases in 2023 (10). In 2000, there were only 2,000 reported AIDS cases (35), By 2024, this number had increased to 570,000 PLHIV, with approximately 26,000 AIDS-related deaths in the same year(21).

As of 2022, the national HIV prevalence among adults aged 15–49 years was 0.3%, but among KPs, prevalence ranged from 2.2% to 25.3% (5). Specifically, HIV prevalence was 21.9% among MSM, 14.7% among PWID, 12.7% among TG people, 25.27% among male sex workers, 2.2% among FSW outside Papua, and 15.92% among FSW in Papua (5).

PrEP is a highly effective intervention that can reduce HIV transmission by more than 90% when used consistently (27). PrEP initiation in Indonesia has increased through the expansion of health facilities, from 23 districts/cities in 2023 to 95 in 2024, with 31,101 initiations in 2024 and an additional 9,707 from January to March 2025 (30,31). However, overall uptake remains low compared to neighboring countries such as Vietnam, with 83,825 initiations (36).

Furthermore, Indonesia's Ministry of Health (MoH) reported in its 2022 annual report that PrEP retention remains very low. Out of 2,794 individuals who initiated PrEP, only 14 continued for 12 months. This suggests that long-term adherence remains a significant challenge despite efforts to expand access (23).

Moreover, coverage among KPs remains low, with only 27,442 out of 847,300 MSM, 8,764 out of 21,800 sex workers, 2,051 out of 43,100 TG, and 552 out of 27,000 PWID starting PrEP (21,30,31).

Despite Indonesia’s growing HIV epidemic and government efforts to expand PrEP services, uptake remains disproportionately low, particularly among marginalized groups. This gap signals systemic challenges beyond mere service availability, rooted in socio-cultural stigma, infrastructure barriers, and punitive legal frameworks. These barriers not only deter vulnerable populations from accessing prevention services but also underscore critical inequities in Indonesia’s health system that hamper progress toward ending the HIV epidemic. Understanding how these intersecting factors shape individual and community behaviors is essential to developing targeted, sustainable interventions.

3.2. Justification

Indonesia’s 2025–2029 National Development Plan identifies health as a strategic development pillar, with a clear focus on HIV/AIDS prevention and elimination (37). These goals are aligned with SDG Target 3.3, which aims to end the AIDS epidemic by 2030 (19),

and with the global 95-95-95 targets to enhance testing, treatment, and viral suppression among PLHIV (20).

Although PrEP is highly effective in HIV prevention, its uptake in Indonesia remains low due to a range of barriers, including limited access, logistical challenges, and insufficient knowledge among healthcare workers (23). According to UNAIDS reports, stigma becomes a significant barrier to PrEP uptake in Indonesia (17). Additionally, findings from the PrEP pilot program indicate that challenges with oral PrEP intake have influenced adherence (28).

While several studies have examined willingness to use among key populations in Indonesia, there is a lack of comprehensive understanding of how these factors intersect to affect PrEP uptake among diverse key populations in the Indonesian context. Addressing this gap is essential for designing effective, tailored interventions that can improve PrEP adoption and contribute to reducing new HIV infections in Indonesia.

Therefore, this study aims to provide a deeper understanding of these factors and their intersections, which is essential for developing strategies to increase PrEP adoption among key populations and to help reduce new HIV infections and overall HIV prevalence in Indonesia.

Ultimately, these insights are critical for strengthening Indonesia's national HIV response and advancing both national and global goals for HIV/AIDS elimination.

4. OBJECTIVE

General objective: to explore factors influencing the PrEP uptake among key populations in Indonesia

Specific Objectives:

1. To assess the PrEP uptake among key populations in Indonesia
2. To describe the individual factors on PrEP uptake among key populations in Indonesia
3. To explore the influence of socio-cultural and community factors on PrEP uptake among key populations in Indonesia
4. To describe the health system's role in the PrEP uptake in Indonesia
5. To identify best practices in PrEP uptake among the key population to be applied in Indonesia
6. To give recommendations to improve the PrEP program in Indonesia

5. METHODOLOGY

5.1. Study Design:

This thesis is based on a literature review. Literature review is chosen for its suitability in synthesizing existing research on complex, multi-level determinants of PrEP uptake among key populations. Primary data collection was not conducted due to limited resources and time.

5.2. Searching and screening procedures:

A comprehensive literature search was conducted across Google Scholar, PubMed, Vrije Universiteit Library Search (VU Search), and ResearchGate.

Keywords: Search keywords included combinations of: “Indonesia”, “PrEP”, “HIV prevention”, “key populations,” “men who have sex with men”, “female sex workers”, “transgender” “people who inject drugs” and specific factors such as “stigma,” “cost”, “knowledge”, and “accessibility”. Boolean operators (AND/OR) were used to refine results (see Annex 1).

Inclusion criteria are:

- Studies published in peer-reviewed journals.
- Studies published since 2010.
- Studies in English or Indonesian.
- Studies that investigate factors influencing PrEP uptake and HIV prevention among key populations in Indonesia.
- To enrich this study, some studies from Southeast Asia, Africa, and Brazil are also included.
- Grey literature was also included by searching government websites such as the Ministry of Health, the Ministry of Internal Affairs, and Statistics Indonesia, as well as reports and documents from organizations like WHO, UNAIDS, and AVAC.

Exclusion criteria are:

- Study protocols
- Articles published before 2010
- Full texts unavailable.

Screening and Selection Process:

- Step 1: Title and abstract screening to remove duplicates and irrelevant articles
- Step 2: Full-text review to assess their relevance.

- Step 3: Data extraction using a standardized form, capturing publication details, study context, and relevant findings related to PrEP uptake and HIV prevention. (see Annex 2).

5.3. Conceptual framework:

This study utilizes a conceptual framework to explore factors influencing PrEP uptake among KPs in Indonesia, guiding the literature search, analysis, and presentation of findings.

In choosing this framework, various approaches were considered, including individual-level models such as the Health Belief Model (HBM) and the Capability, Opportunity, Motivation – Behavior (COM-B) model, alongside broader socio-ecological perspectives. The socio-ecological framework was selected due to its comprehensive ability to understand health behaviors across multiple factors: individual, interpersonal, community, institutional, and structural levels, rather than solely focusing on individual factors.

This study adopts a modified socio-ecological model as its framework (see Figure 6). The adapted framework draws from (see Annex 3):

- Scott *et al, "Intention to Initiate HIV Pre-exposure Prophylaxis Among Cisgender Women in a High HIV Prevalence U.S. City,"* (38). This adapted socioecological framework was chosen because it fits the Indonesian context, where individuals, interpersonal relationships, and communities come first, followed by institutions and structural factors.
- Kayasu et al, *"Uptake of and Adherence to Oral Pre-Exposure Prophylaxis Among Adolescent Girls and Young Women at High Risk of HIV Infection in Kampala, Uganda."* (39). This framework was selected because its sublevels align well with the objectives of this study.

By combining factors from both, the framework helps explore research objectives at various levels of the socioecological framework that influence the uptake of PrEP. In this study, PrEP uptake is defined as both the initiation of PrEP and continued adherence to the regimen. This comprehensive definition allows the framework to capture not only the decision to start PrEP but also the sustained behavior needed for effective HIV prevention.

Moreover, in this study, adjustments to the frameworks were necessary to reflect Indonesia's context, ensuring a more nuanced and relevant analysis. For example, factors such as stigma, PrEP Delivery models, PrEP methods, financing, monitoring, and evaluation were added, while elements like racial group, less relevant in the Indonesian context, were excluded.

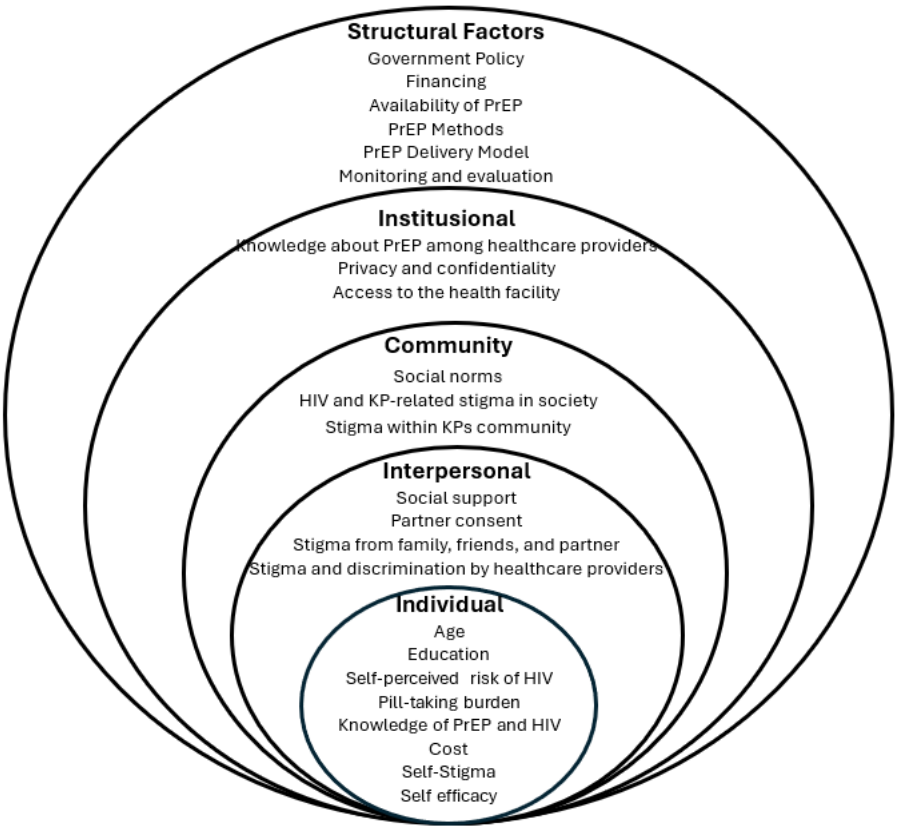

Figure 6. Socioecological framework, adapted from Scott *et al (38)* and Kayasu *et al (39)*.

5.4. Limitation:

- Language Bias: While Indonesian sources were included, some translation nuances may remain. Native understanding helped reduce misinterpretation.
- Incomplete Data: Socio-demographic variables (e.g., SES, religion, occupation) were often missing, limiting subgroup analysis.
- Heterogeneity: Differences in study design and measurement limited comparability. Findings were therefore thematically synthesized using a socio-ecological framework.

5. RESULT

This literature review aimed to explore the factors influencing PrEP uptake among KPs in Indonesia. Guided by a socio-ecological framework, the findings are presented across multiple levels: individual, interpersonal, community, Institutional, and structural levels, reflecting the complex factors that shape PrEP uptake in Indonesia. The results synthesize evidence from both national and international studies.

5.1. Individual

5.1.1. Age

A cross-sectional study among FSW in Jember found that age was significantly associated with the intention to use PrEP (40). Participants aged 21–30 years showed a higher interest in using PrEP compared to older respondents aged 31 and below 21 (40). Similarly, a cross-sectional study conducted among MSM and TG people at an STI clinic in Bali found that there is a correlation between age and perception of high risk of HIV infection and intention of using PrEP (41), where the highest interest in PrEP use was among those aged 25 years (38%), followed by those aged 25-29 years (35%). Individuals over 30 years old were less likely to perceive themselves as at risk of HIV infection (41).

Furthermore, no study writes about the correlation between age and intention to use PrEP among PWID.

Findings from the pilot program show high use of PrEP among individuals aged 25–49 (68%), followed by those aged 20–34 (26%), and only 2.2% among those above 50, with a mean age of 29.8 years (28).

A study in Thailand shows similar findings, where younger individuals demonstrated greater interest in PrEP, due to higher exposure to social media, which provides more access to health information, including PrEP, and support from their peers. In contrast, older individuals tend to have a lower self-perceived risk of HIV infection and are more affected by persistent stigma, which may contribute to their lower interest in PrEP (42).

5.1.2. Education

Based on a study among LGBT individuals in Indonesia, education level is correlated with high-risk behavior; the higher the education level, the more likely individuals are to practice safe sex (43). According to the IBBS, higher education levels among TG are associated with better health outcomes due to increased health literacy and access to information (44). Furthermore, A cross-sectional study in 15 Asian countries, including Indonesia, found that having a university degree has been identified as a factor positively associated with willingness to use PrEP (45).

A study among MSM and TG in Bali shows that senior high school graduates have the highest interest in using PrEP at 58%, followed by those with a university degree at 30%, and primary school graduates at 11% (42). Additionally, a study among FSW found that FSW with higher levels of education (junior and senior high school) demonstrated greater interest in using PrEP compared to those with lower education levels (41). No study among PWID has investigated the correlation between education and PrEP use.

A similar result was found in Malaysia, where TG people with higher levels of education were more likely to express interest in using PrEP. Moreover, in their multivariate analysis, both education and hormone use were identified as key predictors of PrEP use (46).

5.1.3. Self-perceived risk of HIV

The 2023 IBBS revealed variations in self-perceived HIV risk across KPs in Indonesia (44). Among MSM, 61.4% believed they were healthy and not at risk of HIV infection. About 63% of PWID acknowledged their high risk due to needle sharing, non-sterile needles, and unsafe sex, and only 34.2% perceived themselves at risk. For TG people, 70.5% perceived themselves at risk, and 45.2% of FSW perceived themselves at risk(44).

A study among MSM and TG found a correlation between self-perceived risk of HIV infection and interest in using PrEP (41). Among the participants, 75.9% perceived themselves to be at high risk for HIV. High-risk behaviors were prevalent, with 71.2% of MSM and TG people reporting inconsistent condom use, and 70.5% reporting having multiple sexual partners. Furthermore, multivariate analysis indicated that the intention to use PrEP was significantly higher among those who both engaged in high-risk behaviors and perceived themselves to be at high risk (41). A study among FSW also revealed that FSW who have a length of sex selling between 1-5 years have a higher intention to use PrEP than <1 year and >10 years (40). No specific study among PWID writes about the correlation between self-perceived HIV risk and intention to use PrEP.

A similar finding was reported in a study from a PrEP pilot program, which found a correlation between self-perceived high risk of HIV infection and interest in using PrEP. People who engage in high-risk behaviors, such as having multiple sexual partners, inconsistent condom use, and participation in paid sex, were significantly associated with a greater interest in using PrEP (28). However, another study in Indonesia has also found that despite a high perceived risk of HIV, people continued to engage in unsafe sexual practices (41).

A similar finding was observed in Malaysia, where individuals who perceived themselves as being at high risk for HIV were more likely to engage in high-risk behaviors, such as having multiple sexual partners, engaging in unprotected sex, and using condoms inconsistently. Those with high self-perceived risk were found to be 17 times more likely to be infected with HIV compared to those with low self-perceived risk (47).

5.1.4. Knowledge about HIV

Comprehensive knowledge about HIV plays a critical role in prevention efforts. It encompasses awareness of HIV transmission routes, such as unprotected sexual intercourse, sharing of needles, and unsafe blood transfusions, as well as knowledge of preventive measures, including consistent condom use and maintaining mutually faithful partnerships (44).

Among MSM, approximately 82% had been exposed to HIV-related information, and about 39% were found to have comprehensive knowledge about HIV transmission and prevention (44). Among FSW, while 64.5% reported receiving information about HIV, only 17.4%

demonstrated comprehensive knowledge. Furthermore, 81% of PWID had been exposed to HIV-related information, yet only 40.6% demonstrated comprehensive knowledge. Among TG, 86.9% reported receiving HIV information, and 44.7% were identified as having comprehensive knowledge (44).

Furthermore, the IBBS revealed disparities between overall knowledge of HIV and perceived risk of infection. Among MSM, 39% had comprehensive knowledge of HIV, and of those, 61% perceived themselves to be at risk. Among PWID, 40% had comprehensive knowledge, with 63% perceiving themselves at risk. Among FSW, only 23% had comprehensive knowledge, and just 45.2% perceived themselves at risk. For TG, 44% had comprehensive knowledge, and 70.5% perceived themselves at risk(44). There are no specific studies among KPs that write about the association between knowledge of HIV and intention to use PrEP.

A study conducted in Southeast Asia found that knowledge levels do not always match self-perceived HIV risk. This study found that 49.5% of participants had comprehensive knowledge about HIV, and only 0.06% perceived themselves at risk (48). In contrast, a study among Asian MSM in Sydney found that Southeast Asian MSM showed less interest in using PrEP compared to those from other Asian countries due to limited knowledge about HIV and PrEP in their countries of origin (49).

5.1.5. Knowledge about PrEP

According to the IBBS, awareness of PrEP among KPs in Indonesia remains limited; among TG, only 27.9% had ever heard of PrEP, and just 9.2% had participated in a PrEP program. Awareness was even lower among FSW, with only 2.6% reporting prior knowledge of PrEP (44).

A study among MSM and TG people found low awareness of PrEP, but after being informed about PrEP, interest in its use increased significantly, with 74.5% expressing willingness to use PrEP (41). In contrast, a study among FSW in Jember found that PrEP-related knowledge was not significantly associated with their intention to use PrEP. Although 96.4% of participants had low PrEP-related knowledge, 65.2% expressed a high interest in using PrEP (40). This finding aligns with a cross-sectional study conducted at a PHC in Makassar, where 56.5% of PrEP users demonstrated adequate knowledge of PrEP, such as PrEP's benefits, proper usage, and effectiveness, yet no significant correlation was observed between knowledge and actual PrEP use (50).

A similar result was reported in a study from the Philippines, where knowledge of PrEP was not significantly associated with the intention to use PrEP (51). In contrast, one study conducted in Thailand has found that PrEP knowledge was a significant predictor of intention to use PrEP, and enhancing PrEP knowledge is essential for increasing preventive behavior (42).

5.1.6. Pill taking burden

A study from a pilot PrEP program in Indonesia reported that 65.2% chose D-PrEP and 34.7% chose ED-PrEP (28). The study also revealed low overall adherence to PrEP and high rates of treatment discontinuation, with adherence observed in 76.1% of assessments among D-PrEP users, compared to 56.1% among ED-PrEP users, due to the intake of schedules (28). Similarly, another study among PrEP clients revealed that it is difficult for them to take PrEP consistently (52).

A study conducted in Makassar reported that misconceptions about PrEP remain high regarding potential side effects, doubts about its effectiveness, and confusion about correct usage (50). Additionally, a mixed qualitative and quantitative study in Semarang reported a high dropout rate from PrEP use, primarily due to side effects, forgetting to take the medication, and boredom or fatigue from taking PrEP regularly (53). Another study in Indonesia suggests that a mobile PrEP application could also be a useful tool, since it offers individualized and frequent reminders, including daily or weekly check-ins on sexual behavior as a measure of HIV risk (28). This strategy can help with frequent adherence issues, such as trouble remembering sexual activity and the strain of the D-PrEP and E-PrEP intake schedule (28).

These findings are consistent with a multicountry study conducted across 15 Asian countries, including Indonesia, which revealed that concerns about side effects significantly influenced decisions not to initiate and to discontinue PrEP (45). Additionally, a dislike of taking PrEP daily was reported as a barrier, contributing to 15% choosing not to start PrEP and 20% deciding to stop its use (45). It is also consistent with a study in Myanmar, where 86.5% of those who refused PrEP cited the daily pill burden as their main reason for not starting (54). Moreover, a study among MSM in Malaysia found a preference for on-demand or injectable PrEP over daily pills, as a way to avoid the burden of daily medication (55).

5.1.7. Cost

A qualitative study found that the primary funding source for the PrEP program in nine PHC clinics and HIV community-based clinics across five major cities in Indonesia is that PrEP in Indonesia is free of charge; clients only need to pay for registration, which costs about $0.75 per visit and transportation cost and productivity loss about $2.39- $10.6 per visit (56). Meanwhile, a cross-sectional study in Solo estimates that 9.27% of the total cost comprises direct non-medical expenses, such as transportation and meals, along with indirect costs, including opportunity costs and productivity losses (57). Specifically, transportation costs amount to $16.88 per person per year, while productivity losses are estimated at $14.88 per person per year, based on an average of eight visits annually (57).

A similar study in Kenya found that, while PrEP is free of charge, the indirect cost of initiating and following up with PrEP is approximately 6–7% of a person's income, and $5–7 per refill

visit. Additionally, clients require around 3 hours for the initiation visit and 2 hours for each refill visit (58).

5.1.8. Self-stigma

Studies among KPs have shown that self-stigma can lead individuals to avoid healthcare facilities, thereby hindering their access to health services (59,60). Feelings of guilt and sinfulness and doubting of forgiveness from God, especially among those who engaged in risky sexual behavior, were intensified by societal stigma and discrimination, leading to withdrawal from society (59,60).

Self-stigma is a significant issue among women who inject drugs, with many internalizing negative societal attitudes that lead them to conceal their drug use, including from HIV prevention services (61). Furthermore, self-stigma is one of the reasons for poor healthcare-seeking behavior among MSM, as they often want to conceal their identity from healthcare providers. As a result, they frequently self-medicate or rely on their peers for information about medications (62).

A similar result was found in a qualitative study in Malaysia, where MSM expressed fears of being judged as promiscuous or "at risk," which led to reluctance in seeking PrEP or discussing its use openly (63).

5.1.9. Self-Efficacy

A study among FSWs shows that self-efficacy is a primary driver of the intention to use PrEP, revealing a correlation where low intention to use PrEP is associated with low self-efficacy (40). Furthermore, this study found that low self-efficacy was influenced by a lack of knowledge about PrEP (40) . Another study revealed that self-efficacy related to adherence to PrEP (50).

A similar result was found in a study among MSM and transgender individuals in Thailand, showing that those with high self-efficacy to adhere to PrEP were three times more likely to intend to take it daily compared to those with low perceived control (64).

5.2. Interpersonal

5.2.1. Social support

A cross-sectional study found that MSM who face limited social support, conceal their sexual identity, and have limited exposure to HIV/STI health promotion and services are significantly less likely to engage with HIV care services (65). Furthermore, another study shows that support from friends and outreach workers influences the decision of FSW to take PreP or not (66).

Furthermore, two different studies have shown that support from peers, through peer-support groups where individuals can share experiences and motivation, and community-based activities, can increase PrEP acceptance and reduce stigma (50,60). Additionally, two

other studies show that through peer support groups, PWID can improve medication adherence (53,67).

A similar study conducted in Malaysia among MSM found that a lack of support from family and friends leads to low self-confidence and emotional distress, which further hinders efforts toward HIV prevention (55).

5.2.2. Partner Consent

Very few studies have explored the role of partner approval or disapproval in PrEP uptake among KPs in Indonesia and Southeast Asia. Only one study reported that 1% of participants had never used PrEP because their partners disapproved of it, and another 1% discontinued PrEP use for the same reason (45).

A study mentions that approval from a partner is a positive factor for adherence, while disapproval from a partner can lead to discontinuation of PrEP. Furthermore, the lack of support from a partner is often due to the perception that using PrEP signals a lack of trust and loyalty in the relationship (68).

5.2.3. Stigma from family, friends, and partner

KPs are vulnerable to stigma and discrimination from society, including from family and friends (60). These concerns often include the possibility of rejection by actual or potential partners, as well as stigma linked to perceptions of promiscuity, associations with chemsex, and the broader negative labels frequently attached to PrEP users (41). MSM and TG people often fear being judged or stigmatized by their peers for using PrEP or for their sexual behavior (41). Another study also found that 12% of participants reported never using PrEP due to concerns about how their family and friends would perceive it, while 5% discontinued PrEP use for the same reason (45).

A study among women who inject drugs revealed that many participants concealed their drug use from non-using friends, family, and HIV prevention services to avoid stigma (61). TG people have reported experiencing verbal harassment and feeling discriminated against by family members (69). Similarly, MSM and FSW respondents also reported experiencing discrimination, verbal harassment, and exclusion from family activities (69). Moreover, 10% of PWID reported that stigma and discrimination hinder their participation in family activities (44).

A cross-sectional study in Thailand revealed that 20% of hospital clients and 12% of KP-led health service clients experienced difficulties when family, friends, or partners found out they were using PrEP, due to feelings of shame associated with PrEP use and its perceived link to HIV. Furthermore, 31.8% of hospital clients and 9.1% of KP-led clients chose to hide their PrEP use from others (70).

5.2.4. Stigma and discrimination by healthcare providers

Stigma remains a significant barrier that limits healthcare access among KPs in Indonesia (60). KPs often avoid seeking healthcare services due to the stigma and discrimination associated with their identities, including negative attitudes and disrespectful behavior from healthcare workers (69). The relationship between KPs and healthcare workers is important

due to the need for regular check-ups, prompt diagnosis and treatment, as well as effective HIV prevention (60).

The 2023 Integrated IBBS found that many MSM avoid seeking healthcare services due to fears of being judged for their sexual orientation (44). In Prabumulih City, approximately 30% of MSM reported avoiding health facilities because of stigma from healthcare providers (44). Similarly, PWID face stigma related to their drug use status, which contributes to low utilization of harm reduction services. It is reported that only 10% of PWID accessed needle exchange programs, and in Bekasi City, 24.3% of PWID reported avoiding healthcare services due to fear of discrimination (44). About 24% of FSWs reported avoiding healthcare facilities due to concerns about privacy and discrimination (44). TG people are similarly affected, with 28% reporting healthcare avoidance linked to stigma (44).

A qualitative study among healthcare workers identified provider stigma as a significant barrier to the uptake of PrEP, discouraging individuals from initiating or continuing PrEP use (53). Moreover, some health workers believe that the PrEP program supports free sex and the LGBT communities (71). This perception, combined with intrapersonal conflicts between religious beliefs and professional responsibilities, has led some health workers to be less supportive of the PrEP program (71). Another study shows that many participants wish that healthcare providers provide a safe space, free from stigma and judgment regarding their sexual orientation (72).

A study in Vietnam found that MSM are reluctant to seek HIV prevention services due to stigma from healthcare providers. In addition to fears of having their sexual identity disclosed, they are also concerned about the quality of care they would receive (73).

5.3. Community Factors

5.3.1. Social norms

Reaching KPs remains challenging in Indonesia due to prevailing social norms, religious beliefs, and cultural expectations (23,43,60). Many MSM choose to keep their identity private from their families and communities due to religious and cultural values surrounding sexual identity, as well as the association with HIV/AIDS (74). The stigma of promiscuity is often associated with MSM and PrEP users, further hindering their access to PrEP (74).

The gender identity and expression of TG and MSM do not align with the heteronormative concept held by the communities, creating challenges for the acceptance of same-sex relationships (69). A study found that many KPs keep their sexual orientation private due to conflict with cultural and religious norms to protect their family's reputation (43). This deviation from cultural standards has been reported to cause feelings of shame, not only for the affected individuals but also for their families (75). Although TG people harmonize with the communities, they are often viewed as deviating from societal norms (43,69).

Additionally, the patriarchal system deeply rooted in Indonesian culture contributes to women's low status in decision-making, including in matters related to safe sex practices such as the use of PrEP and condoms (12,75). Women who inject drugs in Indonesia

described experiencing a 'double stigma' from society, reflecting the compounded discrimination faced due to both their gender and drug use (61).

Malaysia, which shares a similar cultural and religious background with Indonesia, faces cultural taboos around discussions of sex, especially non-heterosexual sex. An article notes that this cultural silence limits awareness and acceptance of STI prevention, including HIV prevention (76).

5.3.2. HIV and KPs-related stigma in the community

One of the major obstacles to HIV prevention is stigma and discrimination within the community (60). Stigma leads to the social ostracism of HIV sufferers and KPs, which in turn discourages them from accessing HIV services (53,60). Stigma in the community, including stigma received from the workplace, neighbours, government apparatus, and community organizations (43,60). Due to identity labeling and stereotyping, many KPs are viewed as unclean, carriers of disease, and further become victims of violence and harassment, and in some cases, are even expelled from their communities (43,60).

Nationally, about 1.4% of MSM across 27 areas reported facing violence in the form of arrest due to their sexual behavior (44). Meanwhile, in Depok City, 33% of PWID reported being apprehended due to drug-related offenses. Reports indicate that approximately 7% of PWID have experienced physical or sexual violence, with the highest rate observed in Jakarta at 32% (44). About 7.9% of FSW experienced physical or verbal violence in the past year, while 5.8% reported facing stigma and discrimination (44). Moreover, 28.7% of TG people reported experiencing forced sex (43). The consequences of such violence are profound, including severe physical, psychological, and social impacts, which further hinder TG people from accessing health services and support systems (43,44).

A study conducted across 15 countries in Asia, including Indonesia, found that conservative and homophobic community attitudes are significant barriers to PrEP uptake (45).

5.3.3. Stigma within the KPs community

A study among MSM and TG found that participants with higher levels of social engagement, such as socially active MSM and TG people, were significantly less likely to express interest in using PrEP (41). In contrast, individuals with lower levels of social engagement exhibited higher interest in PrEP use. This difference may be due to a greater sense of privacy and safety when considering PrEP outside of prominent social networks, possibly influenced by fears of stigma or judgment from peers within MSM and TG communities (41). A similar finding was reported in Malaysia, where stigma within the MSM community contributed to negative perceptions of PrEP users. Individuals who used PrEP were often viewed by their peers as engaging in riskier sexual behavior or being involved in sex work, which discouraged uptake of PrEP (77).

5.4. Institutional Factors

5.4.1. Knowledge about PrEP among Health Workers

A study from the pilot program revealed that health workers need to have adequate knowledge, as they are responsible for providing counseling on PrEP, its side effects, and the importance of adherence (28). Furthermore, a qualitative study in Semarang among health workers revealed that only trained physicians and HIV program coordinators reported having a comprehensive understanding of PrEP (71). Other healthcare workers often perceive the PrEP program as complex, particularly regarding ED-PrEP dosage regimens (71). Additionally, healthcare providers often lack motivation to learn about PrEP due to double responsibilities with other public health programs that they are required to implement (71).

Another study indicated that health workers should be equipped with knowledge about side effects, adherence, and stigma when explaining PrEP usage (50). Additionally, a cross-sectional study mentioned that raising health workers' awareness of HIV, stigma, and discriminatory behaviors can decrease these issues (78).

In Nigeria, the ECHO platform was established to strengthen healthcare provider capacity through continued education and mentorship, effectively increasing knowledge and uptake of PrEP (79).

5.4.2. Privacy and confidentiality

According to the technical guidelines for the implementation of PrEP in Indonesia, health care providers must maintain confidentiality, refrain from judgment, and respect privacy (26). However, a study has shown that some PrEP users avoid specific health centers due to fears of disclosing their identity when filling out registration (52). Similarly, findings from the IBBS show that FSWs are more likely to prefer private clinics over public facilities, primarily due to privacy, confidentiality, and non-discriminatory services (44).
A similar finding was reported in Malaysia, where many MSM avoid visiting government health facilities due to concerns about being registered in the national health information system, which they fear could disclose their sexual identity and lead to criminalization (77).

5.4.3. Access to the health facility

According to WHO, Accessibility of health services is “aspect of the structure of health services or health facilities that enhances the ability of people to reach a health care practitioner, in terms of location, time, and ease of approach”(80).

Indonesia is experiencing a concentrated HIV epidemic, with PrEP services currently being delivered in targeted high-prevalence areas, primarily within select provinces (56). A study among FSW in a rural area revealed that limited access to information about PrEP, primarily due to its unavailability in the region, has contributed to low interest in PrEP uptake (40). Additionally, a qualitative study in Bali revealed the challenges FSW face in accessing PHCs during regular morning hours, with participants suggesting that PrEP services be offered outside standard working hours to accommodate their schedules (66). FSW also expressed concerns that the procedures for accessing PrEP are complicated and confusing. Moreover,

they also advised forming partnerships with surrounding clinics or hospitals, including private healthcare providers in the area (66).

Another study highlighted the need for an HIV clinic directory equipped with a geo-location feature, providing information on comprehensive HIV services available at each facility, including HIV testing and PrEP (72). Such a tool would help users identify and select clinics that best meet their individual needs and preferences (72).

By comparison, South Africa has the highest number of PrEP initiations worldwide, decentralized PrEP distribution through PHC facilities and community-based approaches (14,15). These methods not only can reduce indirect costs for patients, cut down waiting times at health facilities, and prevent conflicts with working hours, but also increase access to PrEP (14).

5.5. Structural Factor

5.5.1. Government Policy

The Indonesian government has demonstrated commitment to HIV prevention through the formalization of HIV prevention and control policies, notably with the National Action Plan explicitly mentioning PrEP as part of Indonesia's HIV prevention strategy, and the MoH Regulation No. 23 of 2022, which includes the PrEP program (24).

By December 2024, 21,005 MSM were reached, representing 61% of the 2024 program target of 34,284. Among FSWs, 6,450 individuals were reached (34% of the target of 18,932). For TG people, 1,608 were reached (73% of the target of 2,216). Additionally, 380 PWID were reached during this time (30). From January to March 2025, an additional 9,707 PrEP initiations were recorded. Despite this progress, overall PrEP uptake among KPs remains low, with only 27,442 out of an estimated 847,300 MSM, 8,764 out of 271,800 FSW, 2,051 out of 43,100 TG people, and 552 out of 27,000 PWID starting PrEP as of March 2025 (21,30,31).

Indonesia formally upholds the rights of all individuals, including KPs, through Law No. 39 of 1999 on Human Rights, which guarantees the right to health and protection from discrimination (81). However, many laws further hinder KPs access to health services, particularly HIV-related services. For example, PWID face significant legal barriers, as Indonesia's Law No. 35 of 2009 on Narcotics primarily emphasizes punitive measures for drug-related offenses (82). As a result, many PWID avoid accessing health services due to the fear of criminalization (44).

Indonesia does not have a national law that explicitly criminalizes homosexuality (43). However, a regional regulation in Aceh, *Qanun Aceh Number 6 of 2014 on Islamic Criminal Law (Hukum Jinayat)*, criminalizes homosexual acts and punishes up to 100 lashes (83). In addition, the *Anti-Pornography Law* (Law No. 44/2008) defines pornography broadly to include any "deviant sexual acts," explicitly naming homosexual acts, which further MSM fear disclosing their identity (84,85). As a result, they are less likely to access health services, including HIV prevention, testing, and treatment (43).

Indonesia also does not have a national law that explicitly criminalizes sex work, but several regions enforce local regulations that effectively ban or penalize sex work activities (43). For example, Jakarta's Regional Regulation No. 8 of 2007 on Public Order, Article 42(2), prohibits individuals from engaging in acts associated with prostitution in public spaces (86). Such regional regulations lead many FSW to work in secrecy and conceal their identities (43). This legal and social pressure discourages FSWs from accessing health services, including HIV testing and PrEP, out of fear of being reported and prosecuted (43).

Similar legal barriers exist in other Asia-Pacific countries, such as Malaysia, where same-sex relations are criminalized; China and India, where sex work remains illegal or heavily penalized; and the Philippines, where punitive drug laws and compulsory rehabilitation limit access to services for PWID (87).

5.5.2. Financing

Access to PrEP remains limited in many LMIC due to affordability issues, and without subsidies, a significant portion of the population is unable to afford PrEP (45). Many Asian countries, including Indonesia, depend heavily on external donor funding to support their HIV prevention programs. However, this funding model faces challenges when financial support is reduced (45).

The recent funding freeze from the United States through USAID has disrupted several programs, including the HIV prevention efforts in Indonesia (88). Notably, prevention initiatives that previously reached about 30% of MSM in Jakarta have been negatively impacted. Additionally, the pilot implementation of long-acting PrEP has been halted due to the funding freeze (89). Furthermore, the 2025 national budget for the HIV program has decreased from last year, from IDR 309.43 million in 2024 to IDR 8.75 million in 2025 (90).

Although PrEP services are offered free of charge, Individuals without national health insurance are still required to pay a registration fee (56) . The amount of this fee varies by district, ranging from IDR 5,500 to IDR 22,000 (56). Additionally, about 72% of MSM, 73.3% PWID, 52.3% FSW, and 52.2% PWID were covered by the National Insurance (44).

In contrast, since 2019, PrEP has been included in Thailand’s UHC scheme, with the government now serving as the main financial supporter of PrEP scale-up, particularly for citizens covered by UHC (91). Additionally, the Thai Government has been producing generic ARVs since the late 1990s, which has helped reduce dependency on donor funding and maintain a sustainable stock of PrEP (92).

5.5.3. Availability of PrEP

As of October 2024, PrEP is provided at 182 hospitals, 322 PHCs, and 13 clinics across Indonesia (93). Additionally, PrEP initiation in Indonesia has increased through the expansion of health facilities by the government, from 23 districts/cities in 2023 to 95 in 2024, with 31,101 initiations in 2024 and an additional 9,707 from January to March 2025 (30,31). However, PrEP initiation varies by region and is primarily concentrated in provincial

areas. MoH reported that the highest initiation until March 2025 is in West Java, Central Java, and Jakarta (31). Residents of provinces outside Java and Bali are less likely to initiate PrEP, partly due to the limited availability of designated healthcare facilities in these regions (28). Furthermore, a study conducted in Semarang, one of the cities, found that one of the barriers to accessing PrEP is the limited number of private clinics providing PrEP services (53).

In Vietnam, PrEP is widely available through various facilities, including public, private, and community-based settings. Access points include Mobile PrEP, Tele-PrEP, community-led clinics, general health clinics, HIV clinics, family planning clinics, NGOs, and pharmacies (36,79).

5.5.4. PrEP Methods

The PrEP method currently available in Indonesia is oral PrEP (26). Oral PrEP is highly recommended as an additional HIV prevention option for individuals at high risk. Meanwhile, DVR and long-acting cabotegravir are conditionally recommended as additional options for people at substantial risk (94). Adequate adherence (>95%) was observed in 68.7% (6,291) of participants, while 31.7% (2,924) showed low adherence. D-PrEP demonstrated higher adherence compared to ED-PrEP (28). Furthermore, this study found a moderately high HIV incidence (31 incidences) due to discontinued PrEP (28). Although many people are eligible for PrEP at initiation, only 55% start PrEP due to barriers such as limited access, stigma, and other factors (28). The study also recommended alternatives to ED-PrEP, as some individuals may choose not to initiate PrEP due to confusion with the ED-PrEP regimen (28). Therefore, this study suggests the need to expand methods following the pilot phase, such as the introduction of long-acting injectable PrEP, which may improve adherence (28).
South Africa has the highest number of PrEP initiations globally, with 1,348,089 initiations (36). This successful implementation is due to a wide range of delivery models and various PrEP methods, such as oral PrEP, the DVR, and the long-acting injectable option (36). Furthermore, a recent study in South Africa found that long-acting injectable (Carbotegravir) is cost-effective compared to oral PrEP within 10 years (95)

5.5.5. PrEP Delivery Models

The WHO recommends various delivery models, such as a facility-based delivery model, community-based delivery models, as well as pharmacy-based and telehealth models (94). Indonesia's PrEP delivery model is delivered through a health facility-based model through Hospitals, PHC, private clinics, and community-based clinics (26,28).

A study in Semarang found that only a limited number of private clinics provide PrEP. This indicates the need to enhance delivery models through public–private–community partnerships (53). KPs often prefer private health services over public ones due to concerns about stigma and identity (43,53). Another study shows that PrEP is also expected to be made available in a wider range of clinics, with diverse methods and delivery models to increase accessibility and uptake (56).

The high Vietnam initiation has been supported by the implementation of innovative delivery models, including Mobile PrEP, Tele-PrEP, and community-led clinics, alongside general health clinics, HIV clinics, family planning clinics, NGOs, and pharmacies (36,79). Vietnam has also collaborated with the private sector to enhance accessibility further and expand service coverage (96). Currently, 79.3% of PrEP initiations in Vietnam take place in private sector clinics, while 20.7% occur in public sector facilities (96). Additionally, KP-led service delivery has been adopted in Thailand, proving to be one of the most cost-effective approaches compared to others. KP-led services now constitute the largest share of PrEP delivery in Thailand, accounting for 60% of all initiations (97).

5.5.6. Monitoring and Evaluation

In Indonesia, the centralized health information system for HIV is known as SIHA (Sistem Informasi HIV-AIDS), which serves as the national platform for collecting, managing, and reporting HIV-related data, including data on the PrEP program from health facilities across the country (26). All PrEP-related data, starting from HIV testing, initiation of treatment, and including logistics, are recorded and reported in SIHA in real time. This enables monitoring of program updates. For evaluation purposes, each service provider is required to submit regular reports on a monthly, quarterly, or biannual basis, depending on the reporting schedule (26). The MoH is fully responsible for the procurement of PrEP logistics and supplies. The supply chain follows a structure similar to that of ARV distribution, with supplies flowing from the MoH to provincial health departments, then to district health departments, and finally to health service facilities (26,98).

However, frequent stockouts of PrEP drugs and reagents in health facilities are caused by delays in the distribution process from the MoH to service providers, as well as continued reliance on imports from Thailand (71). Indonesia, with more than 17,000 islands, faces significant logistical and distribution challenges, particularly in delivering essential medications such as ARVs and PrEP, which share similar supply chains (99). In 2020, several regions in Indonesia experienced stockouts of ARVs. In response, 73 organizations submitted a letter to the MoH regarding the stockouts in health facilities. To address the ARV crisis and improve availability, there were calls to strengthen monitoring, evaluation, procurement, and supply chain systems (100).

In comparison, Brazil has an integrated data system that manages medical distribution to ensure a reliable supply chain (79). This system also supports surveillance of PrEP and HIV treatment by linking public healthcare services with pharmacies, thereby improving coordination and access to essential medications (79).

6. DISCUSSION

The findings from the existing literature review are discussed in alignment with the general objectives of this study, which aim to explore the factors influencing PrEP uptake among key populations in Indonesia. This discussion is structured according to the specific objectives of the study. The literature reveals that PrEP uptake among KPs is influenced by factors present at each level of the socioecological framework, as well as by the intersection between these levels.

6.1. Assessment of PrEP uptake among key populations in Indonesia

A significant increase in PrEP initiation from 23 districts in 2023 to 95 in 2024 reflects a substantial expansion of PrEP access across Indonesia. However, uptake varies among KPs. By December 2024, the highest initiation rates were observed among MSM at 61% of the 2024 program target and TG people at 73%, while lower rates were found among FSW at 34% and PWID, with only 380 initiations.

This discrepancy suggests that stronger community cohesion, peer support, and engagement with CBO predominantly benefit MSM and TG groups, facilitating PrEP awareness and uptake. Conversely, FSW and PWID may encounter unique barriers, including less suitable existing PrEP formulations (e.g., oral PrEP), highlighting a critical need for diversified, tailored methods such as the DVR or long-acting injectable PrEP.

Moreover, when these numbers are compared to the estimated population sizes of each KP group, overall coverage remains low, emphasizing that many individuals at the highest HIV risk are still underserved. Furthermore, literature indicates that higher initiation rates in West Java, Central Java, and Jakarta suggest geographical disparities in program effectiveness.

6.2. Individual factors influencing PrEP uptake among key populations in Indonesia

Existing literature demonstrates an association between age and interest in PrEP use, with individuals aged 20–35 showing greater enthusiasm. This trend is predominantly observed among MSM, FSW, and TG people, as no literature exists among PWID that writes about the correlation between age and PrEP among PWID, highlighting the need for future research for this group. This study aligns with a study in Thailand, where younger people tend to be more enthusiastic about PrEP, likely because they are more exposed to social media, more adaptable to new technologies and health services, and have stronger peer support. In contrast, older individuals tend to be less aware of current HIV prevention methods due to limited exposure to health information, are less trusting of new health innovations, and prefer old methods such as condoms. These findings show the need for age-specific education to increase PrEP uptake among KP. For example, for older groups, education methods should be delivered more frequently, while for younger groups, technology-based approaches may be more effective.

Based on the existing literature, a correlation has been found between education level and awareness and knowledge of PrEP among MSM, TG, and FSW. No literature was found regarding the correlation between the educational level of PWID and interest in using PrEP.

Individuals with higher levels of education tend to show a greater interest in using PrEP. This is likely because higher education provides better access to health information, including HIV prevention, and is associated with higher health literacy. Furthermore, addressing individuals education levels can help set prevention and intervention strategies. For example, among KPs with low education levels, educational materials should be simple and easy to understand

According to the existing literature, overall knowledge of prEP among KPs is still low. One study shows an association between knowledge of PrEP and interest in PrEP. However, two studies found no significant correlation between knowledge of PrEP and the interest in using it. The lack of correlation between knowledge and interest in using PrEP in Indonesia is likely influenced by the background of KPs, such as stigma surrounding KPs, HIV, and PrEP, concerns about confidentiality, education level, and also fear of criminalization that hinders them from taking PrEP regardless of their knowledge.

Many KPs have a moderately high perception of HIV risk despite having limited comprehensive knowledge. These findings show that HIV knowledge alone is not enough to influence the risk perception or protective behavior of KPs. This may be due to personal or community experiences with HIV, which increase their sense of vulnerability. Factors such as education, healthcare provider competence and approachability, environment, stigma, and cultural norms also shape how KPs see their vulnerability. Therefore, effective interventions must not only share knowledge but also address stigma and customize education to the social and cultural contexts of KPs, improving risk perception and encouraging protective behaviors. There is no literature about the association of HIV knowledge and intention to use PrEP.

According to the literature, Self-Perceived HIV risk is associated with intention to use PrEP. However, Self-perceived HIV risk does not consistently predict protective behaviors, revealing paradoxes common in HIV prevention literature. KPs who perceive themselves to be at high risk of HIV continue to engage in risky behaviors. This may result from a feeling of hopelessness, believing it is too late to change, or denial, which may undermine motivation to adopt safer behaviors. Lack of social and emotional support, particularly in environments that do not support safe sex practices, and also cultural factors common in Southeast Asia, where talking about sex is taboo, reduce their agency in negotiating safe sex practices and contribute to underestimating their actual risk of HIV infection. Additionally, limited access to HIV prevention services further hinders individuals from taking protective actions, even when they are aware of the risks.

According to the literature, pill-taking burden is an essential factor influencing why key KPs may choose not to initiate or may discontinue PrEP use. Contributing factors include the difficulty of adhering to D-PrEP, the complexity of the ED-PrEP schedule, and concerns about potential side effects. The D-PrEP requires consistent discipline, which can lead to pill fatigue over time. Meanwhile, the ED-PrEP schedule is often perceived as confusing and complicated to follow correctly, particularly in spontaneous sexual situations. Additionally, concerns about long-term side effects associated with daily PrEP may reduce motivation to continue. Based on these findings, enhanced counseling before initiating PrEP, covering

dosing options, potential side effects, and the importance of adherence, is essential to improving both uptake and continuation. Furthermore, offering alternative PrEP methods, such as the DVR or long-acting injectable PrEP, may help address the pill burden and support sustained use among KPs.

Although PrEP is provided free of charge in Indonesia, KPs have to pay several indirect costs when accessing health facilities, such as registration fees, transportation, meals, opportunity costs, and productivity loss, which can influence their decision to initiate or discontinue PrEP. For individuals already facing economic vulnerability or precarious employment, even minor financial burdens can create disproportionate obstacles to accessing care. Moreover, repeated visits required for PrEP initiation, follow-up, and monitoring may exacerbate productivity loss, further discouraging continued engagement with health services. Expanding PrEP delivery models can help reduce these indirect burdens and improve uptake and adherence. Strategies may include reducing the number of required facility visits by offering extended refill schedules such as semi-annual refills, increasing the availability of PrEP in private clinics, implementing community-based delivery models, and introducing pharmacy-based delivery.

Among KPs, social norms and religious beliefs often generate feelings of guilt and sinfulness associated with their identities or behaviors, which in turn contribute to self-stigma. This self-stigma leads KPs to avoid seeking health services, including PrEP.

Based on existing literature, self-efficacy has a significant correlation with the intention to use PrEP, as it is linked to an individual's confidence to take action. Lack of knowledge and information about PrEP, especially in rural areas, leads to low self-efficacy and low initiation of PrEP.

6.3. Socio-cultural and community influences on PrEP uptake among key populations in Indonesia

Based on the literature, stigma remains a significant barrier to PrEP uptake among key KPs in Indonesia, existing at the Individual, Interpersonal, Community, and Institutional levels of the socioecological model and shaped by cultural norms and religious beliefs. KPs often experience double stigma, first, due to their identity, being labeled as "dirty" or "sinners" by family, peers, and community members; and second, due to the association of PrEP use with promiscuity. This dual stigma contributes to self-stigma, psychological distress, social withdrawal, and avoidance of health services. Stigma also exists within KP communities themselves, where PrEP users may face judgment or mistrust from peers who associate PrEP use with promiscuity or engage in riskier behavior. Furthermore, community-level stigma escalates to verbal harassment and even violence. Moreover, literature shows that a lack of knowledge among health workers also triggers stigma and discrimination within healthcare facilities. This layered stigma significantly hinders KPs from seeking and staying engaged in health services, including accessing and adhering to PrEP.

Existing literature highlights that support from family, friends, partners, and peer networks is crucial in promoting PrEP uptake and continued use among KPs, as it fosters a sense of

acceptance, trust, and confidence in using HIV prevention methods. Conversely, stigma from these same sources can act as a significant barrier, leading to secrecy and reluctance to initiate or adhere to PrEP.

6.4. Role of the health system in PrEP uptake in Indonesia

Although Indonesia has regulations that protect human rights, including KPs, and added PrEP as a national HIV prevention program, several laws continue to hinder KPs from accessing PrEP services. For example, the Narcotics Law criminalizes PWID, while various regional regulations restrict or penalize KPs. These laws and regulations discourage KPs from seeking care due to fear of legal consequences, limit outreach by CBOs, and drive KPs underground, making it difficult to identify, counsel, and retain individuals in PrEP programs.

Furthermore, HIV programs in Indonesia have relied on donor funding. However, due to the current funding freeze from USAID and the uncertain financial situation, Indonesia's HIV prevention efforts need to explore alternative strategies to sustain its PrEP program. Scaling up PrEP is a cost-effective approach for the government, as it prevents new HIV infections and reduces the need for lifelong ART, which is more costly. Additionally, since PrEP has not yet been included in Indonesia's national health insurance scheme, the sustainability of the program is at risk because donors still fund laboratory tests. Including PrEP in the national insurance system could ensure more sustainable access.

Despite some decentralization and community clinic involvement, nationwide coverage remains low. Indonesia primarily uses a facility-based approach for PrEP delivery, relying on hospitals, PHCs, and a limited number of private health providers. As of October 2024, only 13 private health providers and 322 out of approximately 10,000 PHCs provided PrEP services, mostly in urban areas. This uneven distribution significantly limits access to PrEP for KPs in rural areas and negatively impacts uptake. Furthermore, KPs often feel more comfortable visiting private providers than public ones due to concerns about stigma, judgment, and confidentiality. However, the number of private health providers offering PrEP services is limited. In addition, rigid facility schedules and restricted working hours pose further barriers, making it difficult for some KPs to access PrEP. To enhance accessibility and increase PrEP uptake, expanding delivery to the private sector and diversifying delivery models, such as community-based clinics, Mobile PrEP, TelePreP, and Pharmacy-based delivery, is essential.

Literature reveals that the lack of PrEP options in Indonesia also affects uptake, as the program currently offers only oral PrEP. This limited method diversity may restrict access for KPs, many of whom face challenges with D-PrEP or ED-PrEP regimens. Offering only one form of PrEP fails to account for the varied needs, preferences, and lifestyles of diverse KP groups. Expanding the range of PrEP modalities, such as long-acting injectables or DVR, could improve uptake and retention in the PrEP program.

To track distribution and monitor progress, Indonesia has implemented a centralized data system for its HIV program, including PrEP. However, the distribution process from the MoH to health facilities remains challenging due to geographical issues. Furthermore, there is a problem with real-time tracking and forecasting, leading to mismatches between facility-

level supply and demand. These discrepancies disrupt procurement planning by the MoH and contribute to PrEP stockouts at health facilities. The causes include infrastructure gaps, particularly in under-resourced regions where access to stable electricity and internet connectivity is limited. Moreover, many health workers have limited capacity to use digital systems like SIHA effectively. As a result, frequent stockouts of PrEP persist in health facilities, further hindering PrEP uptake and contributing to discontinuation.

Indonesia's reliance on imported ARV contributes to frequent stockout issues and supply chain vulnerabilities. Global supply disruptions, currency fluctuations, and procurement delays can impact the availability of PrEP at health facilities. To address these challenges and enhance sustainability, Indonesia could explore local production of ARV, including PrEP, which could reduce dependency on international suppliers, shorten delivery timelines, and improve stock management.

6.5. Best practices in PrEP uptake that can be applied in Indonesia

- Diverse delivery models implemented in Vietnam have contributed to 83,825 PrEP initiations, such as Mobile PrEP, Tele-PrEP, and community-led clinics, and a strong public-private partnership, with 79.3% of initiations occurring in private clinics.
- KP-led service delivery has been adopted in Thailand, proving to be one of the most cost-effective approaches. KP-led services contribute to 60% of all initiations in Thailand.
- Multiple PrEP options, such as Oral PrEP, the DVR, and long-acting injectable PrEP, contributed to high PrEP uptake in South Africa, with 1,348,089 PrEP initiations. Long-acting cabotegravir is cost-effective compared to oral PrEP

6.6. Summary and Reflection of Conceptual Framework

Each factor within the framework contributed significantly to fulfilling the research objectives outlined in this study. Applying the socio-ecological framework reveals how multilayered stigma exerts compounded effects on PrEP uptake among KPs in Indonesia. At the individual level, self-stigma undermines self-efficacy and perceived HIV risk, limiting motivation to initiate PrEP. Interpersonally, fear of disclosing PrEP use to partners, friends, and family generates secrecy and isolation. Furthermore, stigma among health workers, manifested in discrimination, further erodes trust in the system. At the community level, social norms stigmatize both HIV and sexual minorities, producing hostile environments that discourage engagement with health services. Moreover, punitive laws criminalizing KPs and uneven distribution of PrEP services concentrated in urban centers disproportionately disadvantage rural and marginalized groups. Thus, interventions must simultaneously address these interdependent layers, combining stigma reduction, policy reform, decentralization, and method diversification to create enabling environments conducive to sustained PrEP uptake.

6.7. Limitations

This study faced several limitations. First, there is limited available literature on PrEP in the Indonesian context, particularly regarding its use among each specific KPs. PWID were underrepresented due to a lack of studies focusing on this group in Indonesia. Additionally, most existing studies were conducted in urban areas, which limits to generalize of the findings and may not accurately reflect the experiences and needs of KPs living in rural settings. Third, the presented data primarily focuses on PrEP initiation, offering less detail on long-term adherence and retention, which are equally vital for program effectiveness. Also, the word limit may have restricted the depth of analysis and discussion.

6.8. Strength

This study includes up-to-date data and compares Indonesia's context with successful international practices, which can inform tailored interventions and policy decisions.

7. CONCLUSION AND RECOMMENDATIONS

7.1. Conclusion

This study demonstrates that low PrEP uptake among Indonesia's KPs is not the result of a single barrier, but rather the cumulative effect of interacting individual, interpersonal, community, institutional, and structural factors. The socio-ecological analysis shows how self-stigma, social isolation, cultural and religious norms, healthcare provider discrimination, shape pervasive stigma towards KPs, and punitive laws reinforce creating complex obstacles to PrEP access and adherence.

While government initiatives have expanded facility-based PrEP delivery, these efforts remain hampered by urban concentration, limited method diversity, and persistent stockout problems rooted in both infrastructure and policy. The current legal and regulatory environment, particularly punitive measures against MSM, PWID, and sex workers, continues to discourage these groups from seeking preventive care, perpetuating inequities within the health system.

Therefore, effective strategies must move beyond provider-centered interventions and instead adopt a holistic approach:

- Integrate stigma reduction at all decentralized and diversify PrEP delivery models to reach rural and underserved communities;
- Secure sustainable financing and robust supply chains to prevent service gaps.
- Reform legal and policy frameworks to protect key populations.

Ultimately, addressing HIV prevention in Indonesia requires recognizing and tackling the root causes of vulnerability, socio-cultural, policy, and health system barriers, so that PrEP can truly fulfill its potential in reducing HIV incidence. These lessons contribute to global understanding and can inform similar contexts facing concentrated epidemics and multi-layered stigma.

7.2. Recommendation

The recommendation chapter is structured based on the importance and feasibility of each proposed action.

7.2.1. Recommendation for the Ministry of Health

1. Stigma Reduction Across All Levels
    - Enhance HIV education efforts through regular or existing HIV health promotion programs in PHC by working in partnership with religious leaders, community leaders, and NGOs that aim to reduce stigma in communities toward KPs, HIV, and PrEP to ensure cultural relevance.
    - Provide culturally tailored training for healthcare workers, focusing on communication, confidentiality, and non-judgmental care for KPs. Include routine anti-stigma workshops as part of professional development in both the public and private sectors.

- Develop and integrate comprehensive HIV and HIV prevention curricula into medical, nursing, and midwifery schools to reduce stigma among future health workers.

2. Diversification and Decentralization of PrEP Services.
   - Scale up community-based and private-sector PrEP delivery, especially in rural settings.
   - Pilot and evaluate alternative PrEP modalities (e.g., long-acting injectables, dapivirine vaginal ring) to address pill fatigue, increase choice, and better match user preferences.
   - Extend service hours and establish mobile PrEP and tele-PrEP options to overcome scheduling barriers for sex workers and other mobile populations.
3. Strengthen Health System Infrastructure and Financing.
   - Invest in robust, real-time supply chain systems and local ARV procurement to reduce stockouts and respond to geographic disparities.
   - Integrate PrEP services into the National Health Insurance Scheme to ensure financial sustainability and remove indirect cost barriers like registration and laboratory testing fees.
4. Increase government funding for HIV prevention programs in annual health planning.
5. Enhance Community Engagement and Support.
   Support KPs outreach program by collaborating with a KP-led organization through education and psychosocial support to reduce self-stigma and stigma within KPs communities.
6. Legal and Policy Reforms.
   Establish a cross-sectoral policy task force to review and reform laws and regulations that criminalize or penalize MSM, sex workers, and PWID at both the national and local levels.

7.2.2. Recommendation for researchers

1. Future research should include primary qualitative data collection to validate and deepen the findings.
2. Increase research on PrEP in Indonesia, particularly in rural areas, where existing studies are limited.
3. Conduct a focus study on PrEP uptake among PWID, as data on this group are particularly scarce.

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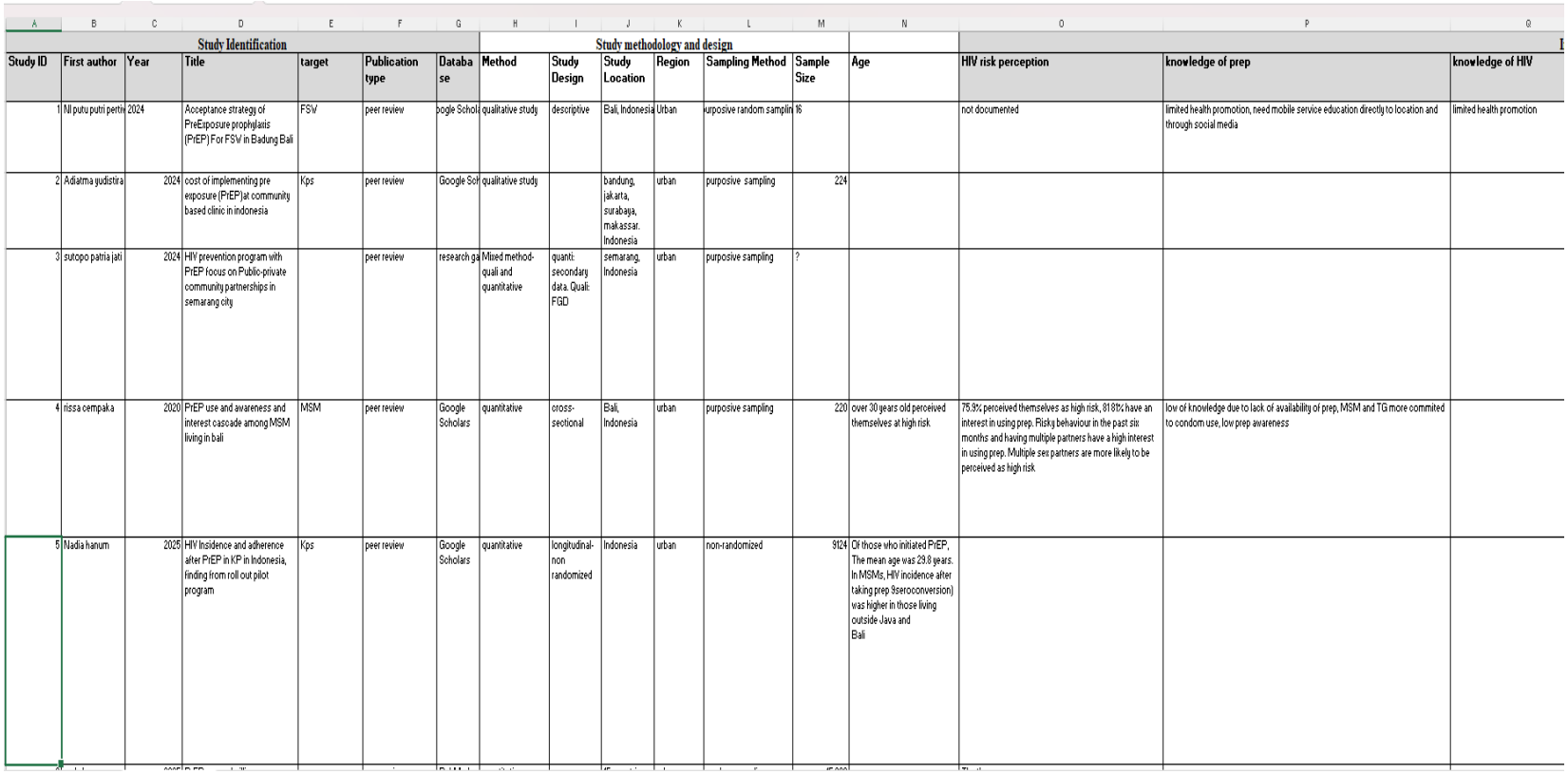
Annex 1. Details of Search Strategy

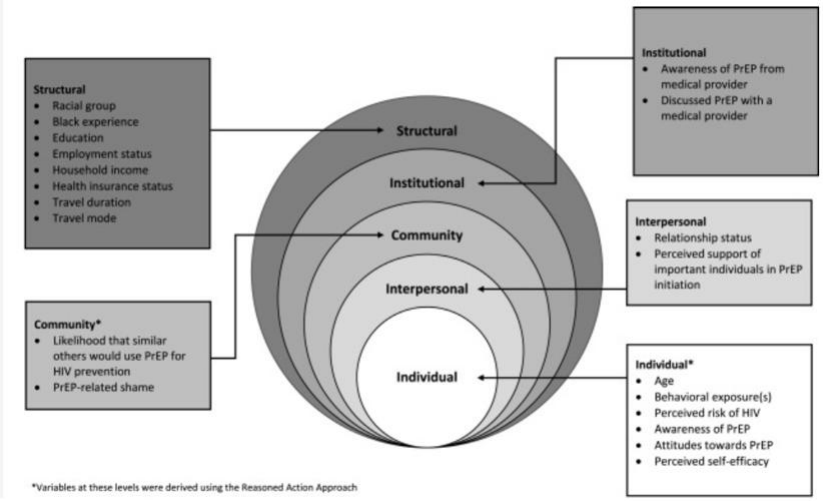
Strategy				Details		
Includes				Scientific peer review literature and grey literature on PrEP uptake among key populations in Indonesia		
Language				English		
Key terms				Pre-exposure Prophylaxis, HIV prevention, Key Populations, Indonesia		
Time frame				2010-2025		
Search databases				Google Scholar, PubMed, VU Search Library		
Topic		KPs (OR)		Factors (OR)		Geographical Scope (OR)
Pre-exposure prophylaxis				Age		Indonesia
				Education level		
				Self-stigma		
				Self efficacy		
		Key Populations		Knowledge of HIV		
		Men who have sex with men		Self-perceived of HIV risk		
	AND	Female Sex Workers	AND	Knowledge of prEP	AND	South East Asia
OR		Transgender People		Pill-taking burden		
		People Who Inject Drugs		Cost		
				Stigma from family, friends and partners		
				Social support		Africa
HIV Prevention				Partner consent		
				HIV and KP-related stigma in community		
				Social norms		
				Stigma within KPs community		
				PrEP knowledge among healthcare provider		
				Stigma and discrimination by healthcare provider health provider		
				Privacy and confidentiality		
				Government policy		
				Financing		
				Access to health facility		
				Availability of PrEP		
				PrEP methods		
				Prep delivery models		
				Monitoring and evaluation		

Annex 2. Screenshot data extraction table from Excel

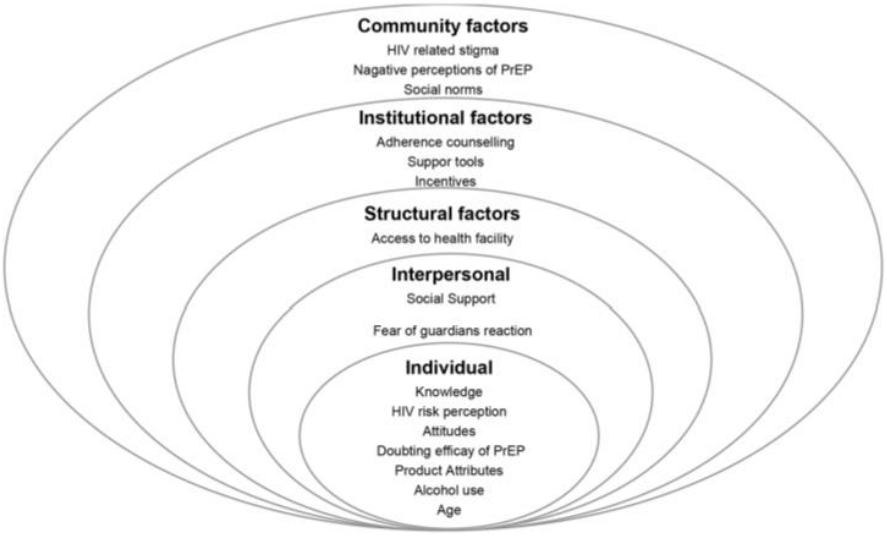


			Study Identification				Study methodology and design									
Study ID	First author	Year	Title	target	Publication type	Database	Method	Study Design	Study Location	Region	Sampling Method	Sample Size	Age	HIV risk perception	knowledge of prep	knowledge of HIV
1	Ni putu putri pertiv	2024	Acceptance strategy of PreExposure prophylaxis (PrEP) For FSW in Badung Bali	FSW	peer review	oogle Schol	qualitative study	descriptive	Bali, Indonesia	Urban	urposive random samplin	16		not documented	limited health promotion, need mobile service education directly to location and through social media	limited health promotion
2	Adiatma gudistira	2024	cost of implementing pre exposure (PrEP)at community based clinic in indonesia	Kps	peer review	Google Sch	qualitative study		bandung, jakarta, surabaya, makassar. Indonesia	urban	purposive sampling	224				
3	sutopo patria jati	2024	HIV prevention program with PrEP focus on Public-private community partnerships in semarang city		peer review	research ga	Mixed method-quali and quantitative	quanti: secondary data. Quali: FGD	semarang, Indonesia	urban	purposive sampling	?				
4	rissa cempaka	2020	PrEP use and awareness and interest cascade among MSM living in bali	MSM	peer review	Google Scholars	quantitative	cross-sectional	Bali, Indonesia	urban	purposive sampling	220	over 30 years old perceived themselves at high risk	75.9% perceived themselves as high risk, 81.8% have an interest in using prep. Risky behaviour in the past six months and having multiple partners have a high interest in using prep. Multiple sex partners are more likely to be perceived as high risk	low of knowledge due to lack of availability of prep, MSM and TG more commited to condom use, low prep awareness	
5	Nadia hanum	2025	HIV Insidence and adherence after PrEP in KP in Indonesia, finding from roll out pilot program	Kps	peer review	Google Scholars	quantitative	longitudinal-non randomized	Indonesia	urban	non-randomized	9124	Of those who initiated PrEP, The mean age was 29.8 years. In MSMs, HIV incidence after taking prep 9seroconversion) was higher in those living outside Java and Bali			

Annex 3. Socioecological frameworks



Adapted Socioecological framework, Scott *et al*.



Adapted Socioecological Framework, Kayasu *et al*.

ANNEX 4

KIT Institute (Masters or Short course) Participants
Declaration for Use of Generative AI (GenAI)

Please complete and submit this form as an annex on the last page of your assignment file; and not as a separate document.

Check the box that applies to your completion of this assignment:

☐ I confirm that **I have not used** any generative AI tools to complete this assignment.

☒ I confirm that **I have used** generative AI tool(s) in accordance with the ***"Guidelines for the use of Generative AI for KIT Institute Master's and Short course participants".*** Below, I have listed the GenAI tools used and for what specific purpose:

Generative AI tool used	Purpose of use
1. ChatGPT	Brainstorming about the HIV and PrREP in Indonesia
2. perplexity	For insight about the HIV and PrREP in Indonesia
3. Grammarly	Check grammar