Journal of Public Health for Tropical and Coastal Region (JPHTCR)
Journal homepage: https:/ejournal2.undip.ac.id/index.php/jphtr/index
ISSN: 2597- 4378

Human Immunodeficiency Virus Pre-Exposure Prophylaxis Service Program in Sidoarjo Regency: Development, Achievements and Challenges

Unsiyyatul Usriyyah[1*], Arief Hargono[2]
[1]Magister Epidemiology Public Health Faculty, Universitas Airlangga, Indonesia
[2]Lecturer Epidemiology Public Health Faculty, Universitas Airlangga, Indonesia
* Corresponding Author : Email: unsip2pm@gmail.com, arief.hargono@fkm.unair.ac.id

Abstract
Introduction: HIV Pre-exposure Prophylaxis (PrEP) is an additional prevention method for HIV transmission. Sidoarjo Regency, one of the pilot areas for HIV PrEP services in Indonesia, has been providing HIV PrEP services since 2022. In 2022 and 2023, the Sidoarjo Regency did not achieve the targets set by the Indonesian Ministry of Health. This study aimed to provide a comprehensive overview of the implementation of the PrEP program in Sidoarjo Regency.
Methods: This evaluation used a descriptive design. The indicators included (1) coverage of HIV-negative individuals among key populations, (2) PrEP initiation coverage, and (3) PrEP uptake coverage. Data were obtained from the National PrEP Information System and in-depth interviews with the program managers. The evaluation also examined input components, including the availability of human resources, funding, and facilities, as well as process components related to service implementation, supervision, and the mechanisms of service delivery.
Results: The expansion of PrEP services was conducted by increasing the number of service sites from four in 2022 to 15 in 2024. In addition, PrEP services have been integrated with mobile VCT and community-based referrals. PrEP uptake among key populations has also been studied; however, national initiation targets were achieved only among MSM in 2024.
Conclusion: HIV PrEP services must be expanded to provide more options for at-risk individuals. Moreover, the integration of PrEP administration during mobile VCT makes it easier for targets who have no access to health services that provide PrEP.

Keywords: Program evaluation, HIV Pre-exposure Prophylaxis Program, Prevention of HIV Transmission,

DOI: https://doi.org/10.14710/jphtcr.v9i1.29120

Article History: Received: 26th August 2025, Revised: 04th March 2026, Accepted: 30th March 2026

Introduction

HIV/AIDS remains a global public health challenge, with ongoing transmission and persistent difficulties in prevention and control. In Indonesia, a substantial number of people live with HIV has been reported, particularly among key populations, underscoring the need for strengthened and innovative prevention strategies. As of August 2024, Indonesia had 503, 261 people living with HIV. To reduce the number of HIV transmissions,

the government has adopted various strategies, one of which is the implementation Pre-exposure Prophylaxis (PrEP).[1–3]PrEP is an effective prophylactic intervention in preventing HIV infection in individuals who are not yet infected but have a high risk of exposure to the virus which WHO began recommending in 2016.[4–6]

The pre-exposure prophylaxis (PrEP) program is a health intervention that aims to prevent HIV transmission, especially in high-risk populations, in addition to various comprehensive prevention efforts that have been implemented. PrEP is administered to individuals at high risk of HIV infection.

According to the 2019 Integrated Biological and Behavioral Surveillance (STBP) data, although there was an increase in the use of condoms among the key population of FSW and sterile syringes among IDUs, the figures had not yet reached the target determined by the Ministry of Health, and data was obtained that the level of condom use in the male group -male sex (MSM) had decreased. PrEP as an intervention that is claimed to reduce the risk of HIV transmission by more than 90% if taken at the right dose is an opportunity as an additional prevention effort that can be applied in Indonesia.[7,8]

Sidoarjo Regency is one of the areas in East Java that has a significant number of HIV cases and is the first district in East Java to become a pilot area for providing PrEP since August 2022. This program is expected to provide optimal accessibility to PrEP services, increase public awareness, and reduce HIV transmission rates. Since its launch, the PrEP program in Sidoarjo Regency has provided positive results, although it still faces various challenges in implementation.

Evaluating the achievements, developments, and challenges of the PrEP program in Sidoarjo Regency is essential to enhance program effectiveness and inform future strategic planning and decision-making in accordance with national and global HIV/AIDS control targets. By overcoming these challenges, it is hoped that the PrEP program can be more effective in achieving the HIV/AIDS elimination target and developing more effective strategies in the future in the Sidoarjo Regency.

This study aimed to provide a comprehensive overview of the implementation of the PrEP program in Sidoarjo Regency through a systematic evaluation. It is hoped that the results of this research can become recommendations for policymakers, health workers, and other related parties in improving and strengthening the PrEP program, as well as supporting efforts to prevent and control HIV/AIDS in Indonesia.

Methods

This study used a descriptive research type with a cross-sectional approach to analyze the development, achievements, and challenges of implementing PrEP services in Sidoarjo Regency. Secondary data were obtained from the National PrEP Information System managed by the Ministry of Health (https://prep-sihapims2.kemkes.go.id/), including aggregated indicators of HIV testing and PrEP initiation among key populations in Sidoarjo Regency from August 2022 to October 2024. Data quality was maintained through routine validation and supervision by the District Health Office. Limitations in data completeness, including missing denominator data for certain indicators, were acknowledged and addressed in this study. Primary data were collected through key informant interviews with three officials at the Sidoarjo District Health Office: the Sub-Coordinator for the Prevention and Control of Infectious Diseases (P2PM), the HIV program manager, and the data officer. One interview was conducted for each role in the study. Interviews were conducted face-to-face at the Sidoarjo District Health Office between September and October 2024 and lasted approximately 30–45 min. The interviews focused on the development, implementation, and challenges of PrEP services in Sidoarjo Regency. The interview data were summarized using a descriptive thematic approach, identifying key themes related to service expansion, coordination, resource constraints, and monitoring challenges, which were then integrated with the findings from the secondary data analysis.

The sample used in this study was a total sample.

Results

A. Achievements of the PrEP Program in Sidoarjo Regency

The evaluation of implementation based on the process approach is carried out based on the input, process, and output components. The indicators for the input evaluation are as follows:

1. Human Resources (HR)
   Every PrEP service in Sidoarjo Regency has the appropriate competencies and has received on-the-job training. The team consists of doctors, nurses, laboratory analysts, pharmacists, and reporting officers. In addition, field outreach workers from PKBI East Java and the Delta Crisis Center, as Non-Governmental Organizations (NGOs) who work with attention to HIV problems in Sidoarjo Regency, also play a role in conveying PrEP information to high-risk populations and referrals to PrEP services.
2. Financing or Funds
   The source of funding for the PrEP program until 2026 comes from Global Fund funds, which include OJT for developing PrEP services, supervision, and coaching. The integration of activities is utilized in implementing PrEP service activities, for example, mobile VCT funds from Health Operational Costs (BOK) by the National Revenue and Expenditure Budget (APBN) of Indonesia, as well as for mobile PrEP services. The procurement of socialization and recording media, for example, leaflets and recording forms, is funded by the local government budget (APBD).
3. Facilities and Infrastructure
   The facilities available at the PrEP service are adequate for PrEP services, starting from HIV screening before administration, laboratory tests, pharmacy and counseling services, and educational media. Educational media are also available in virtual form, which can be shared easily and quickly through various social media platforms. However, there were two stock-outs of PrEP drugs, in January 2023, which lasted for approximately 5 weeks, and August 2024, which lasted for three weeks.

The process evaluation focused on the implementation of PrEP services in the Sidoarjo Regency. Service delivery has generally followed the implementation and development plan and is guided by national technical guidelines for PrEP administration. However, a locally standardized Standard Operating Procedure (SOP) for PrEP services has not yet been formally established. Despite this limitation, regular guidance and supervision are conducted by the Sidoarjo District Health Office to ensure adherence to technical guidelines and service quality.

Evaluation of output based on achievements against indicators set by the Indonesian Ministry of Health. Program achievements refer to the extent to which PrEP service targets were achieved in the Sidoarjo Regency, particularly in terms of service utilization and accessibility among key populations. Accordingly, the following output indicators were used for assessment:

1. Number of people in the risk group with negative HIV test results.
   Table 1 presents the number of HIV-negative test results among key populations who accessed HIV testing services. These data are descriptive and do not represent testing coverage, as the total number of individuals tested within each key population is not available. Therefore, the figures cannot be interpreted as program achievement indicators but rather as an illustration of the potential target population for PrEP services in the country.
   Table 2 presents the achievements of PrEP initiation among key populations in Sidoarjo Regency from August 2022 to October 2024, showing that only MSM reached the national initiation target by 2024.
2. Number of people offered PrEP. This indicator cannot be assessed from district data because it is not included in the health service reporting items. This is also a limitation of this study

because these data could only be obtained from PrEP services.

3. Number of people using PrEP. This can be seen from the trend of increasing numbers of at-risk populations accessing PrEP services, including female sex workers (FSW), men who have sex with men (MSM), injecting drug users (IDU), and serodiscordant couples (couples with different HIV statuses). An increase in PrEP use was observed among most key populations over the study period, whereas a decrease in 2024 was noted only among serodiscordant couples.

B. PrEP Development Program

The PrEP program in Sidoarjo showed positive developments in several aspects: 1) Increased service accessibility: PrEP services are available in more health facilities with the support of trained personnel. 2) Increased education and advocacy: Educational campaigns are conducted to increase understanding and reduce stigma towards PrEP users. 3) Integration with other HIV programs: PrEP programs should be combined with HIV testing and treatment services (existing programs) to ensure a comprehensive approach to HIV prevention.

Regarding the impact of increasing the number of PrEP services in Sidoarjo Regency, there was also a trend of increasing the number of visits to these services. This is shown in the figure below.

Figure 3 illustrates the relationship between the expansion of PrEP service sites and the number of individuals initiating PrEP in Sidoarjo Regency from 2022 to 2024. Over this period, the number of PrEP service sites increased gradually from four in 2022 to seven in 2023 and further expanded to 13 sites in 2024. In parallel, the number of individuals initiating PrEP also increased, with a modest increase between 2022 and 2023, followed by a marked increase in 2024. This pattern suggests that the expansion of service availability was accompanied by increased access to and utilization of PrEP services.[9]

C. Challenges

The challenges identified in this study were derived from an analysis of program reports and in-depth interviews with key informants at the Sidoarjo District Health Office, including the HIV program manager, the data officer, and the P2PM coordinator. Several recurring themes emerged from the data. First, social stigma was reported by program managers and outreach partners as a major barrier, as reflected in the reluctance of some at-risk individuals to access PrEP services, particularly at public health facilities. Second, resource limitations were identified through program reports, including intermittent PrEP drug stock-outs and constraints on trained human resources at service sites. Third, coordination gaps between stakeholders were evident from inconsistencies in referral documentation and reporting flows between health facilities and community-based organizations (CBOs). In addition, suboptimal adherence among some PrEP users was observed through follow-up records, indicating irregular clinic visits and missed medication refills. Finally, the analysis of routine reporting data revealed limitations in the existing monitoring system, particularly the absence of integrated indicators linking HIV testing, PrEP initiation, and continuation, which hampers comprehensive program evaluation.

Table 1. Number of HIV-negative test results among key populations accessing HIV testing services in Sidoarjo Regency, August 2022–October 2024[9]

No	Population at Risk	Number of Negative HIV Results		
		2022	2023	2024
1	Female Sex Worker (FSW)	185	219	234
2	Transgender (TG)	199	239	192
3	Man Sex Man (MSM)	634	760	589
4	Injection Drug Used (IDU)	230	228	222

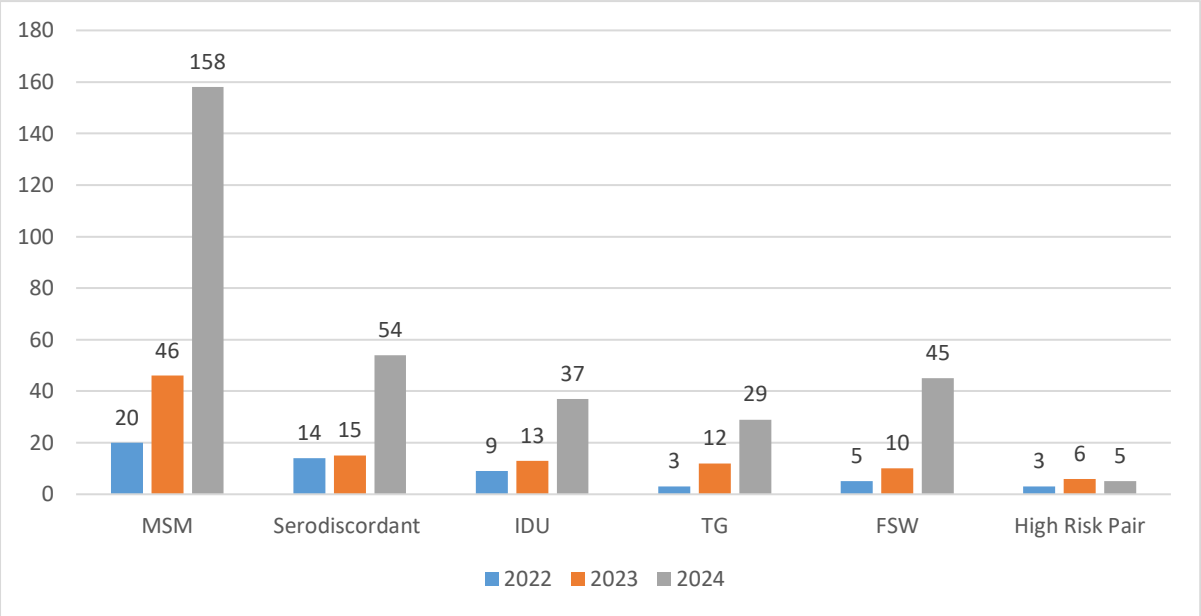

Figure 1. Number of new PrEP visits per population group in Sidoarjo Regency August 2022 to October 2024

Tabel 2. Table of achievements of PrEP initiation in key populations in Sidoarjo Regency August 2022 to October 2024

No	Coverage Indicator	2022		2023		2024	
		T	C	T	C	T	C
1	MSM	65	20	91	46	90	158
2	TG	0	3	0	12	20	29
3	FSW	0	6	0	10	88	45

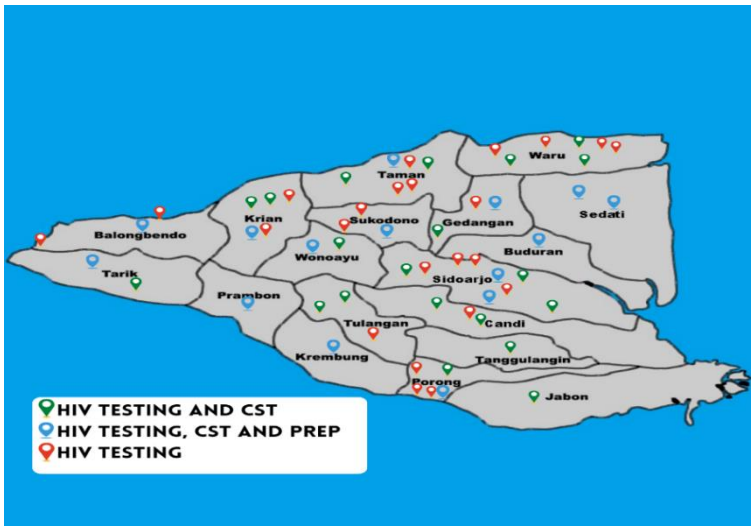

Figure 2. Map of distribution of HIV services in Sidoarjo Regency as of October 2024

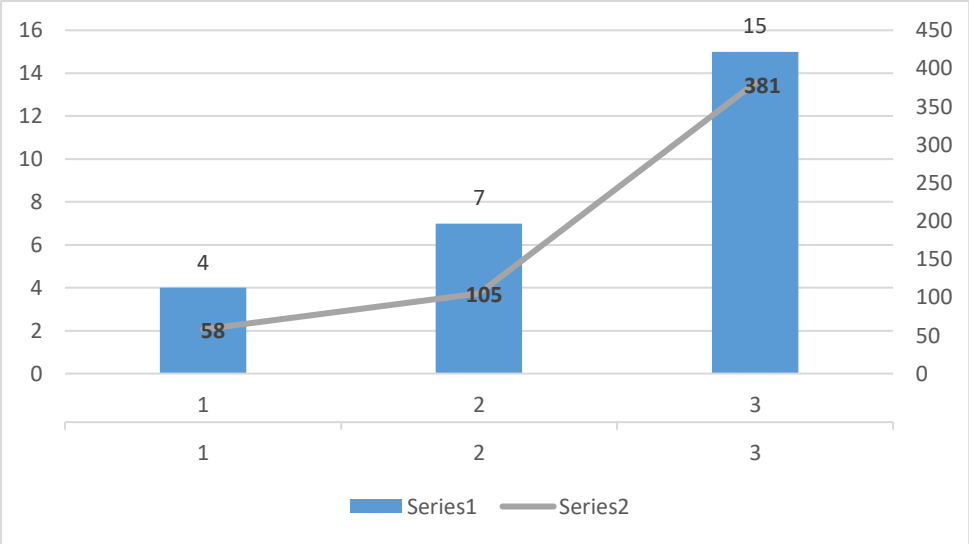

Figure 3. Trends in the number of PrEP initiation visits and the number of services in Sidoarjo Regency August 2022 to October 2024[9]

Discussion

This study evaluated the implementation of the HIV PrEP service program in Sidoarjo Regency using an input–process–output framework and identified several service delivery components associated with improved PrEP uptake among key populations in Indonesia. The findings indicate that the expansion of service delivery sites, integration of PrEP initiation into existing HIV services, and engagement of community-based organizations are important elements supporting program performance.

The expansion of PrEP services beyond primary health centers to include hospitals and private clinics improved service accessibility and flexibility, particularly through broader service hours and alternative locations. This finding is consistent with previous studies showing that decentralized and diversified PrEP delivery models are associated with higher uptake and retention among key populations.[2,10] Similar evidence from global settings suggests that facility diversification reduces structural barriers, including travel time and opportunity costs, which are common obstacles to PrEP access.[11,12]

The integration of PrEP initiation into mobile VCT activities was another key strategy identified in this study's findings. Mobile and outreach-based HIV services have been widely recognized as effective approaches for reaching populations who are less likely to access facility-based care.[4,13,14] The observed increase in PrEP initiation following service expansion and mobile integration in Sidoarjo aligns with implementation studies emphasizing the importance of service integration and flexibility in PrEP delivery.[12,15]

The involvement of community-based organizations in referrals and outreach is a critical enabling factor. Community engagement has been shown to enhance trust, reduce stigma, and improve service uptake among key populations. The findings of this study support previous research in Indonesia, demonstrating that community-led approaches play a vital role in facilitating access to HIV prevention services, including pre-exposure prophylaxis (PrEP).[16,17]

From a policy and programmatic perspective, these findings suggest that strengthening PrEP implementation requires not only expanding service coverage but also ensuring service integration, flexible delivery models, and sustained collaboration between health facilities and community organizations. Optimizing Point of Care (POC) services

with extended operating hours represents a practical strategy to enhance access without substantial additional infrastructure investment, particularly in urban and peri-urban settings.[18–20]

This study had several limitations. This study relied on aggregated routine program data and key informant interviews, which limited our ability to assess individual coverage, adherence, and long-term outcomes. In addition, the absence of denominator data constrained the epidemiological interpretation of HIV testing and PrEP uptake. Future research should incorporate longitudinal designs, individual-level data, and qualitative perspectives from PrEP users to better understand the determinants of initiation, adherence, and continuation, as well as to assess the long-term effectiveness of the expanded service delivery models.

Conclusion

Evaluations that have been carried out based on input, process, and output show that the implementation of the PrEP program in Sidoarjo Regency has not reached the targets set, and there are still many things that need to be improved, including expanding the service network by involving private health facilities and services that do not yet provide PrEP, preparing Operational Standards Procedures (SOP) for PrEP services, and improving integrated data-based monitoring and evaluation systems. By overcoming these challenges, the PrEP program in Sidoarjo Regency is expected to make a greater contribution to achieving the HIV/AIDS elimination target in accordance with national and global strategies.

Ethics approval

Ethics approval: “Not applicable” in this section.

Availability of data and materials

The datasets generated and/or analyzed during the current study are not publicly available due to restrictions related to data ownership by the Ministry of Health of the Republic of Indonesia and confidentiality of interview participants. However, the data are available from the corresponding author upon reasonable requests.

Acknowledegment

The authors would like to express their sincere gratitude to the Sidoarjo District Health Office, HIV program managers, and all health workers involved in PrEP services for their valuable support and collaboration during this study. Special thanks are also extended to the community organizations, PKBI East Java and Delta Crisis Center, for their contributions to outreach and referral efforts for at-risk populations.

Funding

This research was funded entirely by the authors’ personal resources. The funding body had no role in the study design, data collection, analysis, interpretation, or writing of this manuscript.

Author Contribution

UU conceptualized the study, conducted the data collection and analysis, interpreted the findings, and drafted the manuscript. AH contributed to the critical revision of the manuscript for the important intellectual content. Both authors have read and approved the final version of the manuscript.

References

1. World Health Organization (WHO). *WHO Implementation Tool for Pre-Exposure Prophylaxis (PrEP) of HIV Infection*. 2017.
2. Pyra MN, Haberer JE, Hasen N, Reed J, Mugo NR BJ. Global implementation of PrEP for HIV prevention: setting expectations for impact. Journal of the International AIDS Society. *John Wiley Sons Inc*. Published online 2019.
3. UNAIDS. The Path that Ends AIDS 2023 UNAIDS Global AIDS Update. 2023.
4. World Health Organization (WHO). *Preventing HIV During*

Pregnancy and Breastfeeding In The Context of PrEP. 2017.
5. CDC. Preexposure Prophylaxis For The Prevention of HIV Infection In The United States-2021 Update A Clinical Practice Guideline. 2021.
6. World Health Organization (WHO). *Medicines for HIV, Viral Hepatitis and Sexually Transmitted Infections in Low- and Middle-Income Countries: Forecasts of Global Demand for 2022-2026*. 2023.
7. Kementerian Kesehatan RI. *Petunjuk Teknis Tatalaksana Program Profilaksis Pra-Pajanan (Prep) Oral Untuk Orang Berisiko Tinggi Terinfeksi HIV Di Indonesia*. 2023.
8. Setiarto HB, Karo MB TT. Penanganan Virus HIV/AIDS. *Deep Publ*. Published online 2021.
9. Dinas Kesehatan Kabupaten Sidoarjo. *Profil Kesehatan Kabupaten Sidoarjo. Sidoarjo*. 2025.
10. Sullivan AK, Saunders J, Desai M, Cartier A, Mitchell HD, Jaffer S et al. HIV pre-exposure prophylaxis and its implementation in the PrEP Impact Trial in England: a pragmatic health technology assessment. *Lancet HIV*. 2023;10(12):e790–806.
11. Guimarães NS, Magno L, Monteiro GMB, Ramos ICN, de Castro CT, Aranha-Rossi TR et al. Demand creation and retention strategies for oral pre-exposure prophylaxis for HIV prevention among men who have sex with men and transgender women: a systematic review and meta-analysis. *BMC Infect Dis*. 2023;23(1).
12. Njuguna I, Saidi F, Joseph Davey D, Chi BH PJ. Editorial: Improving the delivery of pre-exposure prophylaxis (PrEP) to eliminate vertical HIV transmission. Frontiers in Reproductive Health. *Front Media SA*. Published online 224AD.
13. Hovaguimian F, Martin E, Reinacher M, Rasi M, Schmidt AJ, Bernasconi E et al. Participation, retention and uptake in a multicentre pre-exposure prophylaxis cohort using online, smartphone-compatible data collection. *HIV Med*. 2022;23(3):146–158.
14. Pico-Espinosa OJ, Hull M, MacPherson P, Grace D, Gaspar M, Lachowsky N et al. PrEP-related stigma and PrEP use among gay, bisexual and other men who have sex with men in Ontario and British Columbia, Canada. *AIDS Res Ther*. 2022;19(1).
15. Smith J, Bansi-Matharu L, Cambiano V, Dimitrov D, Bershteyn A, van de Vijver D et al. Predicted effects of the introduction of long-acting injectable cabotegravir pre-exposure prophylaxis in sub-Saharan Africa: a modelling study. *Lancet HIV*. 2023;10(4):e254–265.
16. Putu L, Wulandari L, He SY, Fairley CK, Bavinton BR, Schmidt HM et al. Preferences for pre-exposure prophylaxis for HIV: A systematic review of discrete choice experiments. *EClinicalMedicine*. 2022;51:101507.
17. Kementerian Kesehatan RI. *Survei Terpadu Biologis & Perilaku (STBP) Populasi Kunci Tahun 2023*. 2024.
18. Daroya E, Wells A, Gaspar M, Sinno J, Hull M, Lachowsky NJ et al. Navigating patterns of oral PrEP use: A qualitative

longitudinal study of gay, bisexual, and queer men's dynamic practices of pausing, on-demand, and stopping PrEP in Canada. *SSM - Qual Res Heal*. 224AD;1(5).

19. Agrahari V, Anderson SM, Peet MM, Wong AP, Singh ON, Doncel GF et al. Long-acting HIV pre-exposure prophylaxis (PrEP) approaches: recent advances, emerging technologies, and development challenges. *Expert Opin Drug Deliv Taylor Fr Ltd*. Published online 2020:1365–80.
20. Raisa Putri H. Sustainabilitas Program Pencegahan dan Pengendalian HIV AIDS dalam Mencapai Eliminasi HIV AIDS di Indonesia. Published online 2022.