

Prevalence of HIV, Hepatitis B and Syphilis Among Pregnant Women: A Comprehensive Study

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<p>Kata Kunci: Penyakit Menular Seksual (PMS) , Ibu Hamil , Human Immunodeficiency Virus (HIV)</p> <p>Keywords: Sexually Transmitted Diseases (STDs), Pregnant Women, Human Immunodeficiency Virus (HIV)</p> <p>Info article: Date sent: 19 December 2025</p>	<p>Penyakit menular seksual (PMS) pada ibu hamil, terutama HIV, Hepatitis B, dan sifilis, merupakan masalah kesehatan masyarakat yang strategis karena mereka meningkatkan risiko penularan vertikal. Sebagai bagian dari rencana nasional untuk kesehatan ibu dan anak, pemerintah Indonesia melakukan Program Triple Elimination untuk menghentikan penularan ibu ke anak. Namun, keterbatasan data lokal yang luas masih menjadi hambatan untuk menilai keberhasilan program di tingkat daerah. Tujuan dari penelitian ini adalah untuk memberikan gambaran tentang prevalensi PMS pada ibu hamil di Kabupaten Sukoharjo dan untuk membantu mengevaluasi bagaimana program Triple Elimination dilaksanakan di tingkat puskesmas. Studi ini menggunakan desain observasional deskriptif dengan sampling total dari semua ibu hamil yang menjalani skrining PMS dari Januari hingga Desember 2024. Data dianalisis secara deskriptif menggunakan statistik frekuensi dan persentase. Sejalan dengan tren nasional, hasil penelitian menunjukkan bahwa Hepatitis B lebih umum dibandingkan HIV dan Sifilis. Hasil menunjukkan bahwa penguatan skrining prenatal, peningkatan kesadaran masyarakat, dan peningkatan kapasitas tenaga kesehatan sangat penting. Studi ini unik karena memberikan bukti empiris berbasis data lokal. Ini membantu memperluas literatur dan membangun kebijakan kesehatan ibu hamil di tingkat daerah.</p>
<p>Date revised: 31 December 2025</p> <p>Date received: 31 January 2026</p> <p>DOI Article: https://doi.org/10.33650/jkp.v14i1.13767</p> <p>Page: 246-258</p>	<p style="text-align: center;"><i>Prevalence of HIV, Hepatitis B, and Syphilis Among Pregnant Women: A Comprehensive Study</i></p> <p><i>Sexually transmitted infections (STIs) in pregnant women, especially HIV, Hepatitis B, and syphilis, are a strategic public health issue because they increase the risk of vertical transmission. As part of the national plan for maternal and child health, the Indonesian government is implementing the Triple Elimination Program to stop mother-to-child transmission. However, the widespread lack of local data still poses a barrier to assessing program success at the regional level. The purpose of this study is to provide an overview of the prevalence of PMS in pregnant women in Sukoharjo Regency and to help evaluate how the Triple Elimination program is implemented at the community health center level. This study uses a descriptive observational design with total sampling of all pregnant women undergoing STI screening from January to December 2024. Data were analyzed descriptively using frequency and percentage statistics. Consistent with national trends, the research findings indicate that Hepatitis B is more common than HIV and Syphilis. The results show that strengthening prenatal screening, increasing public awareness, and improving healthcare worker capacity are very important. This study is unique because it provides empirical evidence based on local data. This helps expand the literature and build maternal health policies at the local level.</i></p>

Introduction

Sexually transmitted diseases (STDs) among pregnant women constitute a significant global public health problem, particularly infections caused by Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and *Treponema pallidum*, the causative agent of syphilis. These three infections have serious implications because they can be transmitted vertically from mother to fetus or infant, a process known as mother-to-child transmission (MTCT) (Purba et al., 2023). The impact of MTCT not only increases the risk of pregnancy complications such as spontaneous abortion, stillbirth, prematurity, and low birth weight, but also results in long-term health burdens, including pediatric AIDS, congenital syphilis, and chronic hepatitis B infection, which may progress to cirrhosis and hepatocellular carcinoma.

In response to this challenge, the World Health Organization (WHO), in collaboration with the Indonesian government, initiated the Triple Elimination (TE) Program, which focuses on eliminating the transmission of HIV, syphilis, and hepatitis B from mother to child. This program is integrated into routine Antenatal Care (ANC) services and reinforced through national regulations that mandate screening for these three infections as part of standard maternal healthcare services. The core principles of the TE Program include early detection, prompt management, and integrated service delivery aimed at reducing vertical transmission rates and achieving national and global elimination targets. Various international studies have shown that the prevalence of sexually transmitted diseases (STDs) among pregnant women varies across regions and tends to be higher in developing countries or areas with limited access to healthcare services. A systematic review and meta-analysis by Wu et al. (2023) reported high prevalence rates of HIV, syphilis, and hepatitis B among pregnant women in low-income countries. Studies conducted in Ethiopia, Brazil, Cameroon, and Guatemala have further confirmed variations in prevalence influenced by socioeconomic factors, the quality of antenatal care services, and screening coverage. However, most previous studies have primarily focused on estimating prevalence and general risk factors, without specifically linking these findings to evaluations of national elimination program implementation at the primary healthcare level.

In Indonesia, particularly at the district level, empirical studies integrating STD prevalence data among pregnant women with the performance of the Triple Elimination Program remain limited. The research gap lies in the lack of local data-based evidence that can

illustrate the extent to which TE screening coverage has been achieved in primary healthcare facilities and how the prevalence patterns of each infection emerge within the context of national policy implementation. In addition, few studies have specifically evaluated the role of community health centers (puskesmas) as the frontline of TE Program implementation using routine medical record data. Based on these gaps, this study offers novelty through the utilization of secondary data derived from primary healthcare services to simultaneously analyze the prevalence of HIV, hepatitis B, and syphilis among pregnant women, while also evaluating the coverage of Triple Elimination screening across all community health centers (puskesmas) within a single administrative region. This approach provides a more contextual and practically applicable perspective for maternal and child health policy formulation at the local level.

Therefore, the aim of this study is to analyze the prevalence of HIV, hepatitis B, and syphilis among pregnant women and to evaluate the coverage of the Triple Elimination screening program in Sukoharjo Regency during 2024. The findings of this study are expected to serve as an evidence-based foundation for strengthening policies, improving the quality of antenatal care (ANC) services, and optimizing strategies for preventing vertical transmission at the primary healthcare level (Norfan, 2024). Overall, this study not only contributes to the enrichment of the epidemiological literature on sexually transmitted diseases among pregnant women, but also has practical implications for supporting the achievement of national elimination targets through a local evidence-based approach.

Methods

This study followed a quantitative descriptive observational strategy. The study covered all community health facilities (puskesmas) in Sukoharjo Regency. The investigated data comprised of secondary data obtained between January and December 2024. The study population included all pregnant women who had registered for Antenatal Care (ANC) services in Sukoharjo Regency during the study period. Sampling was done using a comprehensive sampling technique (census sampling), which included all pregnant women who had Triple Elimination Program screening throughout the given time period. The analysis comprised 7,970 pregnant women. The research instrument was a form for extracting data depending on the study variables. Data were acquired from pregnant women's medical records, as well as the Sukoharjo

District Health Office's monthly and annual reports on the Triple Elimination Program. Verification of the completeness and integrity of medical record documentation assured data validity. The data were evaluated descriptively using statistical tools. The analytic results were reported as frequencies and percentages, as well as distribution tables by disease category and subdistrict.

Results

During the year 2024, the total target population of pregnant women in Sukoharjo Regency was 9,552 individuals. Of this target population, 7,970 pregnant women underwent complete Triple Elimination screening (HIV, Hepatitis B, and Syphilis). Thus, the achieved screening coverage was 83.44%. The results of the study are presented in the following table.

Table 1. Study Population and Identified Data

Data Category	Indicator	Number/Percentage	Remarks
I. General District Data	Total Pregnant Women (Target Population)	9.552 individuals	Across 12 subdistricts in Sukoharjo Regency
	Total Pregnant Women Screened	7.970 individuals	Underwent complete testing (HIV, Hepatitis B, Syphilis)
	Total District Screening Coverage	83.44%	Program implementation considered adequate
	Percentage of Pregnant Women Not Yet Reached	16.56%	Additional efforts required to achieve the 95% target
II. Distribution of Pregnant Women (Highest)	Grogol Subdistrict	1.342 individuals	Subdistrict with the highest number of pregnant women
	Kartasura Subdistrict	1.261 individuals	Densely populated area and economic center
	Polokarto Subdistrict	1.001 individuals	
III. Distribution of Pregnant Women (Lowest)	Gatak Subdistrict	480 individuals	
	Bulu Subdistrict	422 individuals	Subdistrict with the lowest number of pregnant women
IV. Screening Coverage by Subdistrict (Highest)	Tawang Sari Subdistrict	91.37%	Highest coverage achieved
	Weru Subdistrict	90.58%	Very good coverage
	Sukoharjo Subdistrict	90.39%	Approaching the national ideal target
V. Screening Coverage by	Bulu Subdistrict	71.80%	Lowest coverage (requires greater attention)

Subdistrict (Lowest)	Grogol Subdistrict	72.65%	Low coverage despite a high number of pregnant women
	Kartasura Subdistrict	75.42%	Low coverage despite a high number of pregnant women

Table 2. Coverage of Sexually Transmitted Disease (STD) Screening

Sexually Transmitted Disease (STD)	Number of Pregnant Women Screened	Number of Reactive Cases	Prevalence (%)	Highest Case Distribution / Remarks
Hepatitis B	7.970	93	1.17%	Highest prevalence. The highest number of cases was found in Sukoharjo Subdistrict (12 cases) and Grogol Subdistrict (12 cases).
Syphilis	7.970	7	0.088%	Low prevalence. The highest number of cases was found in Sukoharjo Subdistrict (2 cases).
HIV	7.970	2	0.025%	Very low prevalence. Cases were identified in Sukoharjo Subdistrict (1 case) and Bendosari Subdistrict (1 case).
Total Pregnant Women (Target Population)	9.552	-	-	Total pregnant women population in Sukoharjo Regency
Screening Coverage (Triple Elimination)	7.970	-	83.44%	The majority of pregnant women were screened for all three infections.

Table 3. Geographic Distribution of Cases

Subdistrict	Number of Pregnant Women (Population)	Reactive Hepatitis B Cases	Reactive Syphilis Cases	Reactive HIV Cases	Case Pattern Description
Sukoharjo	968	12	2	1	Highest priority area: the highest number of reactive cases for all three STDs. Influenced by high urbanization and population mobility.
Grogol	1.342	12	1	0	Highest number of Hepatitis B cases; second-

					largest pregnant women population.
Kartasura	1.261	11+	Data not specified	Data not specified	High number of Hepatitis B cases; large pregnant women population.
Baki	Data not specified	10+	Data not specified	Data not specified	High number of Hepatitis B cases.
Mojolaban	Data not specified	10+	1	0	High number of Hepatitis B cases; one case of Syphilis identified.
Bendosari	Data not specified	Data not specified	Data not specified	1	One reactive HIV case identified.
Polokarto	1.001	Data not specified	0	0	Large pregnant women population, but no cases of Syphilis or HIV identified.
Gatak	Data not specified	Data not specified	0	0	No cases of Syphilis or HIV identified.

Regional Disparities in Screening Coverage

Although the overall district-level screening coverage was relatively high, significant variation was observed at the community health center (puskesmas) and subdistrict levels. For example, screening coverage in Weru Subdistrict reached 90.58%, indicating very effective outreach efforts. In contrast, Bulu Subdistrict recorded the lowest coverage, at only 71.80%. Analysis of case distribution further showed that Hepatitis B cases tended to be concentrated in several densely populated subdistricts, with Sukoharjo Subdistrict contributing the largest number of cases.

Discussion

The study's most notable conclusion was that Hepatitis B had the greatest frequency (1.17%) among pregnant women in Sukoharjo Regency. This chart identifies Hepatitis B as the primary problem in the region's Triple Elimination Program. Epidemiologically, a prevalence of 1.17% is still considered modest by World Health Organization (WHO) standards; nonetheless, the consequences for the Prevention of Mother-to-Child Transmission (PMTCT) program are significant. According to the Ministry of Health's Triple Elimination guidelines, Hepatitis B is more common than HIV and Syphilis, which are typically more strongly linked to high-risk behaviors. Hepatitis B is frequently spread through more extensive routes, such as non-sexual contact and childhood infections that develop into chronic conditions in adulthood. In the absence of adequate measures, pregnant women who test positive for Hepatitis B have a

90% chance of passing the virus to their unborn children, and most infected babies will develop into chronic carriers. As a result, the identification of 93 Hepatitis B-positive cases necessitates prompt follow-up through PMTCT management. This involves evaluating the mother's viral load and HBeAg status, considering prophylactic antiviral therapy (such as tenofovir) for the mother during the third trimester, and administering Hepatitis B Immunoglobulin (HBIG) and birth-dose vaccination to the newborn within the first 12 to 24 hours of life (Gozali, 2020).

According to the observed prevalence of syphilis (0.09%) and HIV (0.025%), Sukoharjo Regency has made excellent success in controlling both illnesses. A syphilis prevalence of less than 0.1% indicates a near-global elimination goal. Increased awareness, better ANC screening coverage, and the accessibility of suitable treatment—such as benzathine penicillin for syphilis and antiretroviral therapy (ART) for HIV—may all contribute to this achievement. However, the healthcare system must make sure that there are no cases of congenital syphilis due to the seven Syphilis-positive cases. In order to break the chain of transmission, every case involving a positive pregnant woman must undergo appropriate and comprehensive treatment, including treatment of sexual partners. Similarly, in order to achieve viral load suppression (VLS), which is a critical factor in preventing vertical transmission, the two discovered HIV-positive individuals need special attention to adherence to antiretroviral medication and ongoing counseling.

Although a Triple Elimination screening coverage of 83.44% indicates a high degree of dedication, the biggest danger to elimination failure is the gap of 16.56%. Due to limited access to healthcare services, such as incomplete or nonattendance at ANC, pregnant women who are not screened are frequently the most vulnerable. Undetected cases of vertical transmission could happen if it is believed that unscreened pregnant women have a comparable or even higher prevalence of infection. The found geographical disparities highlight the necessity for a root-cause examination, with Bulu Subdistrict having the lowest screening coverage (71.80%). Contributing elements could consist of Geographic accessibility, Socio-cultural factors, Service quality, and Recording systems (Fatmawati et al., 2024).

To close this gap, proactive outreach measures, such as community-based outreach by village midwives or health mobilization activities, should be expanded, especially in subdistricts where screening coverage is less than 80%. The study's findings have substantial policy

implications for the Sukoharjo District Health Office, which should prioritize Hepatitis B interventions and improve screening coverage targets to 100%. Through improved cross-sectoral coordination, strategies should focus on pregnant women who have fallen behind or who only receive ANC services in private clinics. To achieve zero transmission, a more integrated and real-time reporting system is required to monitor positive cases and assure 100% treatment follow-up, notably for HIV and syphilis (Sinaga et al., 2025).

Conclusion

Based on the analysis of the Triple Elimination Program data among pregnant women in Sukoharjo Regency in 2024, Hepatitis B demonstrated the highest prevalence (1.17%), followed by Syphilis (0.09%) and HIV (0.025%). Screening coverage reached 83.44%; however, further efforts are required to achieve universal coverage, particularly in subdistricts with the lowest screening rates. Strengthening targeted interventions for the prevention of vertical transmission of Hepatitis B, along with more aggressive outreach strategies to close the 16.56% screening gap among pregnant women, is essential to achieve the elimination targets for vertical transmission of the three sexually transmitted infections.

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