BKM Public Health & Community Medicine
Berita Kedokteran Masyarakat

Volume 41 **Number** 6, 2025, **Pages** e17860
DOI: 10.22146/bkm.v41i06.17860

Sociodemographic and clinical predictors of HIV-AIDS among clients in the HKBP AIDS Ministry

FBA Ummiyah[1]*, Rahayu Lubis[1]

Submitted:
November 24th, 2024
Accepted:
June 24th, 2025
Published:
June 30th, 2025

[1]Department of Epidemiology, Public Health, Universitas Sumatera Utara, Medan, North Sumatra, Indonesia

***Correspondence:**
fbaummiyah@gmail.com

Abstract

Purpose: This study aims to determine the factors related to the incidence of HIV and AIDS among people living with HIV/AIDS (PLWHA) at the HKBP (Huria Kristen Batak Protestan) AIDS Ministry in 2019–2021, as the only institution established to provide assistance and empowerment to PLWHA in the Toba Regency. **Methods:** This research employs an analytical, quantitative approach with a cross-sectional design. The sample consisted of 172 respondents aged 15 to 64 years who were selected as participants. The study's results were derived from data collected through interviews that utilized questionnaires, which were then analyzed using both univariate and bivariate analysis, including a chi-square statistical test. **Results:** The results showed that the proportion of HIV incidence was 79.7% and AIDS incidence was 20.3%. The results of bivariate analysis showed that there was a significant relationship between the variable history of infectious diseases ($p < 0.001$) and the incidence of HIV and AIDS. There was no significant relationship between the variables gender ($p = 0.462$), education level ($p = 0.859$), occupation ($p = 0.462$), mode of transmission ($p=0.254$), and knowledge ($p = 0.225$) with the incidence of HIV and AIDS in the HKBP AIDS Ministry in 2019-2021. **Conclusion:** People who have a history of infectious diseases are at most significant risk of contracting HIV in the AIDS Ministry. Patients are expected to consume antiretroviral therapy routinely and pay more attention to handling and management of infectious diseases when having sexual intercourse.

Keywords: AIDS; antiretroviral; human immunodeficiency virus; infectious diseases; risk factors

INTRODUCTION

Acquired Immune Deficiency Syndrome (AIDS) is a potentially life-threatening disease caused by HIV infection [1]. Approximately 40 million people worldwide are infected with this virus, and around 1.7 million new cases are added to the existing number each year. Additionally, 700,000 individuals worldwide lose their lives to AIDS each year [2]. This infection is one of the leading sources of health problems worldwide by 2020 [3]. Based on data from the Joint United Nations Program on HIV/AIDS (UNAIDS), information is obtained that of the 38 million people living with HIV, 25.4 million people are on treatment [4]. According to data from the World Health Organization (WHO), there are more than 35 million sufferers to date [5].

Globally in 2019, nearly a quarter (23%) of adult HIV infections occurred among men who have sex with men [6]. This population accounted for more than 40%

of new infections in the Pacific Rim, Asia, and Latin America, and nearly two-thirds (64%) of new infections in Central and Western Europe and North America. Men who have sex with men, aged 15 to 24 years, are at particular risk in high-income countries in Central and Western Europe and parts of North America, accounting for 36% of total infections in these regions in 2019 [7].

About 10% of all new adult HIV infections globally occur among people who inject drugs. These populations account for nearly half (48%) of new infections in Central Asia and Eastern Europe, 43% in North Africa and the Middle East, 17% in the Asia-Pacific region, and 15% in Central and Western Europe, as well as parts of North America. An estimated 8% of all new adult infections globally occur among sex workers of all genders, while transgender women account for a small proportion of new HIV infections worldwide [1].

Included in the Southeast Asia region, Indonesia has a high number of people with HIV/AIDS and has experienced an increase in the number of sufferers every year. Based on the report of the Ministry of Health, Directorate General of Disease Prevention and Control on the development of HIV/AIDS in the first quarter of January to March 2017, there were 10,376 confirmed HIV infection patients, and 69.6% of the total were aged 25-49 years. The fourth-quarter report, covering the period from October to December, confirmed that there were 14,640 patients [8].

Of the 34 provinces with HIV/AIDS, North Sumatra ranks seventh [9]. Of the reported cases, the number of people with HIV until December 2018 reached 16,890 people, and the number of people living with AIDS reached 4,064 people in North Sumatra [10]. The district/city with the highest number of HIV/AIDS patients in 2018 was Medan City with 601 cases (40.12%). In the second position, Deli Serdang district reported 128 cases (8.64%), Karo district reported 98 cases (6.54%), and Toba Samosir district reported 88 cases (5.87%) [9].

In 2018, North Sumatra established as many as 8 VCT (Voluntary Counselling and Testing) and ART (Antiretroviral Therapy) referral hospitals for HIV/AIDS, one of which is at HKBP Balige Hospital, in partnership with the HKBP AIDS Ministry [11]. HKBP AIDS Ministry (HAM) is a church organization engaged in the prevention and treatment of HIV/AIDS. The HKBP AIDS Ministry is appointed as a VCT clinic, providing extensive education and counseling to the public regarding HIV/AIDS, as well as offering assistance and treatment, including the treatment process for PLWHA, in the Toba Samosir region and the North Tapanuli region. Based on data from the HKBP AIDS Ministry, 310 patients were assisted between 2003 and 2021. For 2020 alone, approximately 65 patients received assistance in the treatment process.

The problem of HIV infection and AIDS that occurs today is distressing. Identifying factors that influence the incidence of a disease is crucial so that effective prevention and intervention measures can be planned and implemented. Much literature contains factors that affect HIV/AIDS incidence in VCT clinics. Still, since the appointment of the HKBP AIDS Ministry as an assisting institution, no study has specifically identified sociodemographic factors and clinical predictors associated with incidence within the HKBP AIDS Ministry.

METHODS

This type of research is an analytic, quantitative study with a cross-sectional design. This research was conducted at the HKBP AIDS Ministry located at Jl. Church No. 17, Lumban Dolok Haume Bange, Balige, Toba Samosir Regency. The research was conducted from January 2021 to August 2021. The sample in this study consisted of patients who were actively assisting at the HKBP AIDS Ministry, aged 15-64 years, and willing to participate as respondents. A total of 172 respondents who were registered to help at the HKBP AIDS Ministry were interviewed in this study. Before the interview, the patient signed an informed consent form, and the results of the interview, as well as the respondent's data, were kept confidential.

Data collection in this study was obtained from secondary data, including medical records recorded at the HKBP AIDS Ministry, and primary data were collected through interviews to determine respondents' knowledge about HIV/AIDS. The data collection tools used were questionnaires. The collected data will be processed using a computer, following the stages of data editing, coding, data entry, and data cleaning. The HKBP AIDS Ministry provided ethical approval for the data collection process during the research.

Data were analyzed univariately to see the characteristics and frequency distribution of each variable, such as age, gender, ethnicity, religion, education (low or higher), occupation, marital status, area of residence, mode of transmission (sexual or nonsexual), history of infectious diseases, family history, and knowledge (less; if the respondent's answer score < 75% or good if the respondent's answer score is ≥ 75% based on the results of interviews obtained). Bivariate analyses were also conducted to see the relationship between the variables of gender,

education, occupation, mode of transmission, history of infectious diseases, and knowledge of the incidence of HIV and AIDS, which the researcher considered to have a direct and strong relevance to the objectives and formulation of research problems, which were further analyzed bivariately, which was tested with the Chi-square test if the results of statistical analysis with a significance value of $p < 0.05$ were declared related. This analysis was conducted to determine the factors associated with the incidence of HIV and AIDS, which will be presented in the form of tables and narratives.

RESULTS

Table 1 presents the demographic, behavioral, and clinical characteristics of respondents diagnosed with HIV in the study. The patient profile highlights key factors that can guide local social and religious groups in providing targeted support for individuals living with HIV. Most patients are males aged 35–44, predominantly from the Batak ethnic group and with a Christian background, indicating that faith-based organizations rooted in this cultural context play a strategic role in outreach and care. Many work as entrepreneurs, are married, and have completed high school, suggesting that HIV affects socially active, economically engaged individuals who may not fit common risk stereotypes. Despite the predominance of heterosexual transmission, over half of the respondents had low knowledge about HIV, revealing an urgent need for community-driven education that is respectful, stigma-free, and grounded in trust. Social and religious groups are well-positioned to offer not only emotional and spiritual support but also practical education and advocacy tailored to these specific demographic and behavioral patterns.

Table 2 presents the distribution of HIV and AIDS cases by age, occupation, marital status, and gender. The highest proportion of cases was found among males aged 35 and older, who accounted for 77.7% of the sample in this age group. Males also dominated in terms of occupation and marital status, with most being employed and married. These findings suggest that from 2019 to 2021, the majority of patients seeking care at the HKBP AIDS Ministry (HAM) were adult males in their productive years, highlighting the need for targeted prevention and support strategies for this demographic.

Table 1. Sociodemographic and clinical characteristics of respondents at HKBP AIDS Ministry 2019-2021 (n=172)

Variable	n	%
Incidence		
HIV	137	79.7
AIDS	35	20.3
Sociodemographics		
Age (year)		
15-24	8	4.7
25-34	52	30.2
35-44	80	46.5
45-54	28	16.3
55-64	4	2.3
Sex		
Male	132	76.7
Female	40	23.3
Ethnicity		
Batak	169	98.3
Karo	2	1.2
Etc	1	0.6
Religion		
Islam	2	1.2
Christian	166	96.5
Catholic	4	2.3
Education level		
Not in school	1	0.6
Elementary school graduate	9	5.2
Junior high school graduate	25	14.5
Senior high school graduate	123	71.5
University graduate	14	8.1
Occupation		
Students	2	1.2
Employees/ Laborers	10	5.8
Civil servants	3	1.7
Entrepreneur	65	37.8
Farmer	63	36.6
Doesn't work	29	16.9
Marital status		
Not married yet	50	29.1
Marry	111	64.5
Divorce on/off	11	6.4
Mode of transmission		
Heterosexual	148	86.0
Homosexual	3	1.7
Blood Transfusion	2	1.2
IDU/Narcotics	17	9.9
Mother to Child	2	1.2
History of infectious disease		
STI	7	4.1
Non-STI	44	25.6
No history	121	70.3
Family history		
Yes	25	14.5
No	147	85.5
Knowledge level		
Less	87	50.6
Good	85	49.4

Table 2. Bivariate analysis between gender, education, occupation, mode of transmission, and level of knowledge with the incidence of HIV and AIDS in patients assisted at HKBP AIDS Ministry 2019-2021 (n=172)

Variable	HIV/AIDS				Total		p-value
	HIV		AIDS				
	n	%	n	%	n	%	
Gender							
Male	103	78.0	29	22.0	132	100	0.462
Female	34	85.0	6	15.0	40	100	
Education level							
Low	27	77.1	8	22.9	35	100	0.859
Higher	110	80.3	27	19.7	137	100	
Occupation							
Yes	116	81.1	27	18.9	143	100	0.419
No	21	72.4	8	27.6	29	100	
Mode of transmission							
Sexual	118	78.1	33	21.9	151	100	0.254
Nonsexual	19	90.5	2	9.5	21	100	
History of infectious disease							
Yes	23	45.1	28	54.9	51	100	0.001
No	114	94.2	7	5.8	121	100	
Knowledge level							
Less	73	83.9	14	27.9	122	100	0.225
Good	64	75.3	21	12.0	50	100	

DISCUSSIONS

Relationship between gender and the incidence of HIV and AIDS

The chi-square test found no significant link between gender and HIV/AIDS incidence. Nur Aini Hidayah's 2013 research in Tanah Papua yielded a value of p = 0.118, suggesting a lack of significant correlation between HIV incidence and gender [12]. The higher incidence of HIV cases among men is attributed to their risky behaviors, which increase their susceptibility to HIV infection. Additionally, men tend to be more active in expressing sexual behavior, further contributing to their vulnerability to both HIV and AIDS, although women are biologically more vulnerable as well [13].

The Directorate General of P2P of the Ministry of Health of the Republic of Indonesia 2020 explained that HIV/AIDS cases in men are more numerous (65%) than in women (35%) [3]. In line with Haryanti's research in 2016 in the Sukoharjo Regency, men are 3.248 times more at risk of HIV/AIDS than women [14].

The finding of a non-significant relationship in this study may be due to the uniformity of respondent characteristics. Additionally, the limited sample size and the predominance of certain genders in the respondent group may also impact the analysis's power [15]. Other studies have also shown that social and cultural contexts strongly influence the dynamics of the relationship between gender and HIV, including masculinity norms, discrimination against LGBT people, and unequal access to health services [16]. Therefore, HIV prevention programs need to integrate gender-sensitive approaches and strengthen women's empowerment and men's engagement in prevention behaviors.

Relationship between education level and the incidence of HIV and AIDS

The results of the chi-square statistical test obtained (p = 0.859) indicate that there is no significant relationship between education level and the incidence of HIV and AIDS. The results of this study are also in line with the research of Diani (2016) at the VCT Clinic of H. Adam Malik Medan Hospital for Women of Fertile Age (WUS), which obtained a p-value > 0.05, which indicates that there is no significant relationship between education level and the incidence of HIV/AIDS [17]. In contrast to the results of the research by Hidayah (2013) in Tanah Papua (p = 0.026, which indicates a significant relationship between education level and the incidence of HIV/AIDS [12].

Education plays a vital role in responding to HIV and AIDS. Someone can better understand and know how to protect themselves from HIV and AIDS infection, and be able to delay sexual activity to defend themselves if they are well educated. In the book, Notoatmodjo (2005) states that a person's level of education can increase knowledge, especially in the health sector [16]. This study shows that the occurrence of HIV and AIDS infection is likely due to the lack of acceptance of education on prevention and transmission, as well as behaviors that are at risk of HIV and AIDS infection. Suppose the acceptance of health education among those with high education is sufficient and accompanied by positive behavior. In that case, it could lead to a decrease in the number of people with HIV and AIDS, including those in the low education level group.

Relationship between occupation and the incidence of HIV and AIDS

There is no significant relationship between occupation and the incidence of HIV and AIDS based on the results of the chi-square statistical test. The results of this study are in line with Diani's research (2016) at the VCT Clinic of H. Adam Malik Medan Hospital for Women of Fertile Age (WUS), which shows that there is

no significant relationship between work and the incidence of HIV/AIDS. [17]. Different things were obtained from Riska's research (2020), which showed a relationship between work and the incidence of HIV in MSM at the Teladan Health Center in Medan City (p = 0.01) [18]. Work is closely related to meeting life's needs; on the other hand, not working can also be an option, such as taking on risky work that can endanger and bring disease to respondents.

The non-significance of the association in this study may be due to several factors. Firstly, the distribution of occupations in the sample may not have been varied enough, resulting in no notable differences in risk between occupational groups. Secondly, there is a possibility that the occupational classification is too general or not detailed enough to capture the nuances of risk between professions.

Relationship between the mode of transmission and the incidence of HIV and AIDS

Based on the results of the chi-square statistical test, the results, p = 0.254, indicate that there is no significant relationship between the mode of transmission and the incidence of HIV and AIDS. The mode of transmission is closely related to the factors that influence the incidence of HIV infection and AIDS. In this study, the sexual mode of transmission consisted of homosexual and heterosexual modes of transmission. Widoyono (2008) mentioned in his book that HIV/AIDS transmission has a considerable risk of spreading sexually, with a transmission prevalence of 70-80% [19].

In this study, several factors may explain the non-significant results. First, respondents may have had uniformly high awareness and knowledge about HIV transmission due to prior education, leading to limited variability in the data. Second, it is likely that reporting bias exists because HIV transmission is a sensitive topic. Some individuals may have concealed the actual mode of transmission due to stigma, particularly if it involved homosexuality, drug use, or sex work. Third, incomplete or limited medical records may have caused inaccuracies or oversimplifications in classifying transmission modes.

Relationship between knowledge and the incidence of HIV and AIDS

The results of the chi-square statistical test obtained the result of p = 0.225, which indicates that there is no significant relationship between the level of knowledge and the incidence of HIV and AIDS. According to the information found during the research, some positive respondents, when visiting and taking medicine, claimed to have forgotten a lot of information and knowledge about HIV and AIDS, even though counseling had been given to all assisted patients. Once the officers provided counseling again, the respondents were able to recall and acquire information and knowledge about HIV and AIDS. The high number of HIV and AIDS cases can be caused by the lack of knowledge about HIV and AIDS information related to transmission, treatment, and prevention. It is hoped that education on handling during assistance will always be routinely carried out and monitored.

This finding indicates that knowledge alone is not enough to change behavior or protect individuals from HIV infection. This result aligns with previous studies that demonstrate the existence of a “knowledge-behavior gap,” which refers to the discrepancy between what individuals know and how they behave in real life [20]. The insignificance of this variable could be due to 1) uniformity of knowledge levels among respondents; for example, if most respondents have a high knowledge score because they have participated in community education, then the variation is small, making it difficult to show statistical associations; 2) Knowledge is cognitive, but behavioral decision-making is also influenced by social norms, peer group pressure, stigma, and access to health services [21]; 3) the possibility of social bias in filling out the questionnaire, where respondents give the “ideal” answer because they know the answer that is considered correct, even though it does not necessarily reflect actual beliefs or actions (social desirability bias).

Relationship between the history of infectious disease and the incidence of HIV and AIDS

This study showed a significant relationship between the history of infectious disease and the incidence of HIV and AIDS (p-value = 0.001). This result is relevant to Sulilowati *et al.*, showing there is a significant relationship between the history of infectious diseases and the incidence of HIV/AIDS [22]. Sexually transmitted diseases (STDs) can increase the incidence of HIV and AIDS, which can disrupt normal epithelial defenses. The accumulation of infected cells (lymphocytes or macrophages) in semen and vaginal secretions can cause injury to the genitals. The high rate of HIV transmission occurs through risky sexual activity, either with heterosexual or homosexual partners, which can increase the risk of sexually transmitted infections (STIs) and lead to the transmission of HIV/AIDS infections [22].

Individuals with a history of infectious diseases have a higher risk of being diagnosed with HIV. Biologically and epidemiologically, this relationship can

be explained in two ways. First, individuals with weakened immune systems due to recurrent or chronic infections are more susceptible to HIV infection if exposed. Second, certain infections, such as STIs, may increase the risk of HIV transmission through mucosal damage and increased numbers of target cells for the HIV [23]. Previous studies have also shown that HIV co-infection with TB, hepatitis B/C, or STIs is common, especially in developing countries, and that a history of these diseases is often the entry point into the healthcare system, where HIV is subsequently detected [24].

These findings have important health policy implications: Patients with a history of TB, STIs, and other infectious diseases should be targeted as a priority in HIV screening programs. Integration of TB-HIV and STI-HIV services is needed to enable early diagnosis. Training primary healthcare workers is essential to increase awareness of the possibility of HIV infection among patients with recurrent infectious diseases.

This research illustrates the value of integrating infectious disease services with HIV screening, particularly for patients with a history of TB or STIs. Community education should not only increase knowledge but also promote behavior change and reduce stigma. Personalized and empathetic counseling, health worker training, and improved health information systems are essential. These findings provide a foundation for future research that incorporates broader variables and employs a stronger study design.

Limitations of this study include the reliance on secondary data, which is heavily dependent on the quality of previous records. Additionally, the design in this study only captures data at a single point, which limits its ability to confirm the cause-and-effect relationship between variables.

CONCLUSION

The results showed that a history of infectious disease was significantly associated with an increased risk of contracting HIV within the HKBP AIDS Ministry. Individuals with a history of infectious diseases have a higher susceptibility to HIV infection, possibly due to an impaired immune system that has not recovered optimally or prevention practices that are not consistently applied.

These findings emphasize the importance of comprehensive management of infectious diseases as part of HIV prevention strategies. Intensive education and ongoing counseling for patients with a history of communicable diseases are needed to improve adherence to antiretroviral (ARV) therapy and safe sexual behavior. Community-based interventions and personalized approaches that take into account the patient's medical history can also strengthen overall HIV prevention efforts.

REFERENCES

1. Kementerian Kesehatan RI. Infodatin situasi penyakit HIV AIDS di Indonesia. 2020. Available from: [Website]
2. Mohammadi Y, Mirzaei M, Shirmohammadi N, Farhadian M. Identifying risk factors for late HIV diagnosis and survival analysis of people living with HIV/AIDS in Iran (1987–2016). BMC Infectious Diseases. 2021;21(1):390.
3. Ditjen P2P Kementerian Kesehatan RI. Profil kesehatan Indonesia tahun 2019. 2020. Available from: [Website]
4. United Nations Programme on HIV and AIDS. Global HIV & AIDS statistics fact sheet. 2020. Available from: [Website]
5. World Health Organization. HIV and AIDS. 2019. Available from: [Website]
6. Katiandagho D. Epidemiologi HIV-AIDS. Bogor: In Media; 2015.
7. Centers for Disease Control and Prevention. About HIV. 2025. Available from: [Website]
8. Kementerian Kesehatan RI. Laporan situasi perkembangan HIV/AIDS & PIMS di Indonesia Januari - Desember 2017. Jakarta: Kemenkes RI; 2017.
9. Dinas Kesehatan Provinsi Sumatera Utara. Profil kesehatan Provinsi Sumatera Utara tahun 2017. 2018. Available from: [Website]
10. Dinas Kesehatan Provinsi Sumatera Utara. Profil kesehatan Provinsi Sumatera tahun 2018. 2019. Available from: [Website]
11. Dinas Kesehatan Kabupaten Toba Samosir. Profil Kabupaten Toba Samosir. 2019. Available from: [Website]
12. Hidayah NA. Prevalensi HIV dan faktor-faktor risiko yang berhubungan dengan kejadian HIV di Tanah Papua Tahun 2013. Universitas Indonesia. 2015.
13. Amelia M, Hadisaputro S, Laksono B, Anies A. Faktor risiko yang berpengaruh terhadap kejadian HIV/AIDS pada laki-laki umur 25 - 44 Tahun di Kota Dili, Timor Leste. Jurnal Epidemiologi Kesehatan Komunitas. 2016;1(1): 39-46.

14. Haryanti T. Identifikasi karakteristik dan faktor penyebab HIV/AIDS di Kabupaten Sukoharjo. Jurnal Ilmiah Medsains. 2017;3(2):11-17.
15. Polit DF, Beck CT. Nursing research: generating and assessing evidence for nursing practice (11th ed.). Philadelphia: Wolters Kluwer; 2021.
16. Gupta GR, Parkhurst JO, Ogden JA, Aggleton P, Mahal A. Structural approaches to HIV prevention. The Lancet. 2008;372(9640):764–775.
17. Ruth D. Faktor-faktor yang berhubungan dengan kejadian HIV/AIDS pada Wanita Usia Subur (WUS) yang datang ke Klinik VCT RSUP H. Adam Malik Medan. Medan: Universitas Sumatera Utara; 2016.
18. Aulia R. Faktor risiko HIV pada lelaki seks lelaki bulan Juli-Agustus tahun 2019. Medan; Universitas Sumatera Utara; 2020
19. Widoyono. Penyakit tropis: epidemiologi, penularan, pencegahan & pemberatasan. Semarang: Erlangga; 2008.
20. Airhihenbuwa CO, Ford CL, Iwelunmor JI. Why Culture Matters in Health Interventions: Lessons From HIV/AIDS Stigma and NCDs. Health Education & Behavior. 2013;41(1):78-84.
21. Fisher JD, Fisher WA. Changing AIDS-risk behavior. Psychological Bulletin. 1992;111(3): 455–474.
22. Susilowati T, Sofro MAU, Sari AB. Faktor risiko yang mempengaruhi kejadian HIV/AIDS di Magelang. Seminar Nasional Rekam Medis & Informasi Kesehatan: Standar Akreditasi Rumah Sakit (SNARS) Edisi 1 Terkait Rekam Medis. Yogyakarta: APTIRMIK; 2018.
23. Cohen MS, McCauley M, Gamble TR. HIV treatment as prevention and HPTN 052. Current Opinion in HIV and AIDS. 2012;7(2):99-105.
24. Getahun H, Gunneberg C, Granich R, Nunn P. HIV infection–associated tuberculosis: the epidemiology and the response. Clinical Infectious Diseases. 2010;50(S3):S201–S207.