PUBLICAÇÃO OFICIAL DO NÚCLEO HOSPITALAR DE EPIDEMIOLOGIA DO HOSPITAL SANTA CRUZ E PROGRAMA
DE PÓS GRADUAÇÃO EM PROMOÇÃO DA SAÚDE - DEPARTAMENTO DE BIOLOGIA E FARMÁCIA DA UNISC

Revista de Epidemiologia e Controle de Infecção

Hospital Santa Cruz

ORIGINAL ARTICLE

Epidemiological profile of individuals with HIV/Aids in a municipality in Maranhão State, Brazil, from 2017 to 2020

Perfil epidemiológico de individuos con VIH/SIDA en municipio en Maranhão, Brasil, de 2017 a 2020

Perfil epidemiológico de indivíduos com HIV/Aids em município no Maranhão, Brasil, de 2017 a 2020

https://doi.org/10.17058/reci.v14i1.18161

Received: *02/17/2023*
Accepted: *02/22/2024*
Available online: *05/14/2024*

Corresponding Author:
Thiago Goncalves Araujo e Silva
goncalvesthiago48@hotmail.com

Address: Av. Dom Afonso Felipe Gregory - Main Avenue, 100. Imperatriz, MA, Brasil; CEP: 65915-240.

Thiago Goncalves Araujo e Silva[1];
Eduardo Henrique Ribeiro da Silva[1];
Francisco Jucianno Rodrigues da Silva[1];
Claudia Regina de Andrade Arrais Rosa[1];

[1] *Universidade Federal do Maranhão, Imperatriz, Maranhão, Brasil.*

ABSTRACT

Background and Objective: To understand the main forms of transmission of HIV in order to foster the containment of the transmission chain, early diagnosis and the epidemiological profile of patients. In this sense, it will enable the analysis of the epidemiological profile and the transmissibility variables of patients with HIV/Aids from the municipality of Imperatriz-MA.. **Method:** This is an observational cross-sectional study. Data collection was performed from the analysis of patients' records registered in the Center for Testing and Counseling (CTA) from 2017 to 2020. For data collection, a questionnaire with transmission variables and epidemiological characteristics of patients was used. **Results**: From January 2017 to December 2020, 211 medical records were filed. Of these, 71.6% were male, 55.5% of the participants were between 21 and 40 years, and 66.4% from Imperatriz-MA. The most prevalent type of exposure was sexual intercourse without a condom. Among the participants, 83.9% (n=177) were positive only for HIV. About 140 people with HIV had an undetectable viral load (VL) (< 50 copies/ml) after 6 months of using antiretroviral therapy, making it low transmissibility. **Conclusion:** The study was able to characterize the epidemiological profile of patients from the Specialized Assistance Service (SAE) in Imperatriz between 2017 and 2020. Despite the increase in the number of cases among women, the most affected public remains young men, from 21 to 40 years of age, with 8 to 11 years of education, single and brown. Sexual intercourse without a condom is the main type of exposure.

Keywords: *Human immunodeficiency virus. Epidemiology. Infectious disease transmission.*

RESUMEN

Justificación y Objetivo: Buscando proporcionar a la contención de la cadena de transmisión del VIH, el diagnóstico precoz y el perfil epidemiológico de los pacientes para conocer las principales formas de transmisión del VIH. En este sentido, el estudio tiene como objetivo analizar el perfil epidemiológico y las variables de transmisibilidad de los usuarios con VIH/sida del municipio de Imperatriz-MA. **Método:** Se trata de un estudio observacional de carácter

transversal, la recolección de datos fue realizada a partir del análisis de registros de usuarios registrados en el CTA en el período de 2017 a 2020. Para la recolección de datos, se utilizó un cuestionario con variables de transmisión y características epidemiológicas de los pacientes. **Resultados**: Se registraron 211 registros y enero de 2017 a diciembre de 2020. De estos, 71,6% del sexo masculino, 55,5% de los participantes tenían entre 21 y 40 años y 66,4% de Imperatriz - MA. El tipo de exposición más prevalente fue la relación sexual sin condón. Entre los participantes, 83,9% (n=177) fueron positivos solo para el VIH. Cerca de 140 personas con VIH tenían carga viral indetectable (< 50 copias/ml) después de 6 meses usando terapia antirretroviral, haciéndola de baja transmisibilidad. **Conclusión:** El público más afectado sigue siendo hombres jóvenes, de 21 a 40 años, con 8 a 11 años de educación, solteros y de piel morena. Las relaciones sexuales sin preservativo son el principal tipo de exposición.

Palabras clave: *Virus de la inmunodeficiencia humana. Epidemiología. Transmisión de enfermedad infecciosa.*

RESUMO

Justificativa e Objetivo: Conhecer as principais formas de transmissão do HIV para proporcionar a contenção da cadeia de transmissão do HIV, o diagnóstico precoce e o perfil epidemiológico dos pacientes. Nesse sentido, será possível analisar o perfil epidemiológico e as variáveis de transmissibilidade dos usuários com HIV/Aids do município de Imperatriz-MA. **Métodos:** Trata-se de um estudo observacional de caráter transversal. A coleta de dados foi realizada a partir da análise de registros de usuários cadastrados no CTA no período de 2017 a 2020. Para a coleta de dados, utilizou-se um questionário com variáveis de transmissão e características epidemiológicas dos pacientes. **Resultados**: Foram registrados 211 prontuários de janeiro de 2017 a dezembro de 2020. Destes, 71,6% do sexo masculino, 55,5% dos participantes tinham entre 21 e 40 anos e 66,4% de Imperatriz-MA. O tipo de exposição mais prevalente foi a relação sexual sem preservativo. Entre os participantes, 83,9% (n=177) foram positivos apenas para HIV. Cerca de 140 pessoas com HIV tinham carga viral indetectável (< 50 cópias/ml) após 6 meses usando terapia antirretroviral, tornando-a de baixa transmissibilidade. **Conclusões**: O estudo conseguiu caracterizar o perfil epidemiológico dos usuários de SAE em Imperatriz entre 2017 e 2020. Apesar do aumento no número de casos em mulheres, o público mais afetado continua sendo homens jovens, de 21 a 40 anos, com 8 a 11 anos de educação, solteiros e pardos. A relação sexual sem preservativo é o principal tipo de exposição.

Descritores: *Vírus da imunodeficiência humana, Epidemiologia, Transmissão de doença infecciosa.*

INTRODUCTION

The human immunodeficiency virus (HIV) is the etiologic agent that causes acquired immunodeficiency syndrome (Aids), a pathology that reduces the functions of the immune system against immunity and other opportunistic diseases. [1] The genetic material of HIV is formed by ribonucleic acid (RNA), which is transcribed into double-stranded DNA by the viral reverse transcriptase enzyme and, finally, incorporated into the host's genetic material.[2] Transmission of the HIV virus can occur through sexual, vertical, and parenteral exposure. Unprotected sexual exposure represents the main risk factor for the transmission of the virus.[3,4]

To track people infected with HIV, the Brazilian Ministry of Health has implemented the Centers for Testing and Counseling (CTA – Centro de Testagem e Aconselhamento), in order to guarantee free tests for sexually transmitted infections (STIs), including Aids.[5] The diagnosis is made through immunostatic tests such as ELISA (Enzyme-Linked Immunosorbent Assay), rapid and molecular tests, and blood samples on filter paper. Due to the user's access to Rapid Test, the detection of HIV infection can be performed in laboratory and non-laboratory environments, making it possible to expand the coverage of the diagnosis.[6]

According to data from the World Health Organization (WHO), it is estimated that in 2017 the number of people living with HIV was 37.9 million. In Brazil, the number of documented cases of HIV since the implementation of the Disease Information and Notification System (SINAN) reached the mark of 342,459 cases (2007 to 2020).[7] In Maranhão, more than 19,000 cases of Aids were reported from January 2000 to June 2020, with a detection rate in 2018 of 18.7 per 100,000 inhabitants recorded in SINAN, representing an increase of 41.7% compared to 2008.[8]

The interiorization of Aids in Brazil manifests as a discernible trend temporally and geospatially. Within the cases recorded from January 2015 to June 2020, the majority consists of males, predominantly comprised of heterosexual men, within the age range of 20 to 49 years old.[9] The epidemiological profile of SAE users in medium and small cities still requires studies, unlike national surveys that cover the population of large Brazilian capital cities. Thus, due to the socioeconomic growth of the southern region of Maranhão, associated with the demographic explosion of recent years, there has been an increase in the number of notifications due to HIV-1 infection and the spread of the epidemic to inland regions, requiring an understanding of the dynamics of the HIV infection to promote actions seeking prevention and monitoring of this disease. [10]

Comprehensive understanding of the local epidemic dynamics is paramount for the proficient formulation

Please cite this article as: *Gonçalves T, Henrique E, Jucianno F, Claudia C. Perfil epidemiológico e variáveis de transmissão de Pessoas Vivendo com HIV/Aids em um Municipio do Nordeste Brasileiro. Rev Epidemiol Control Infect [Internet]. 8º de março de 2024 [citado 23º de março de 2024];14(1). Disponível em: https://online.unisc.br/seer/index.php/epidemiologia/article/view/18161*

and execution of public health policies geared towards the prevention, treatment, and support of individuals living with HIV/Aids. Therefore, the present research aims to analyze the epidemiological profile and the variables of transmissibility from patients with HIV/Aids in the city of Imperatriz-MA. The information generated can contribute to the actions of the CTA and the target public to direct measures to contain the chain of transmission of HIV as well as to establish the early diagnosis of this syndrome.

METHODS

The study was characterized by being observational and cross-sectional analytical, considering that the researcher does not interfere in the exposure and outcome, which are recorded at the same time. Thus, the data was analyzed without interference from the observer. [11]

Data collected from the files of users admitted between January 2017 and December 2020 at the CTA of Imperatriz-MA who met the following criteria were included: a) age greater than or equal to 15 years; b) forms correctly completed with origin, age, gender, and date of admission to the CTA; and c) users with 2 HIV positive tests. Records of patients who, during the analysis, did not have the diagnosis confirmed through laboratory analysis and it was not possible to obtain information about the patient's clinical and epidemiological data due to incompleteness or ineligible records were excluded.

To construct the sociodemographic profile of HIV--infected users, the following variables were analyzed: age (>15 to 20 years, 21 to 40 years, 41 to 60 years, >60 years), sex (male, female), city (Imperatriz, others) years of education (none, 1 to 3, 4 to 7, 8 to 11, >12), skin color (white, brown, black, others), marital status (not married, married, widower, not informed).

The variables studied regarding the clinical and pathological history and prognoses were: recent infection with syphilis/ tuberculosis/ hepatitis b (yes, no), type of recent partners (not informed, men who have sex with men only, men who have sex with women only, women who have sex with women only, men who have sex with both men and women, men who have sex with transvestites/transsexuals), number of recent partners (1, 2, 3 to 5, 6 to 10, 11 to 20, > 20), type of exposure (sexual intercourse without a condom, mother-to-child transmission, hemophiliac/transfusion, not informed), condom use with steady partner (never, always, sometimes, not informed), condom use with casual partner (never, always, sometimes, not informed), reason for not using (trust the partner, does not like, partner does not accept, there was not enough time, under the influence of alcohol/drugs, other, not applicable), lifetime drug use (never used, drink or have drunk often, uses or has used injecting drugs, uses or has used other drugs), population group (drug user, injecting drug user, people living with HIV, men who have sex with men, sex worker, general population), VL > 1000 (yes, not), VL < 50 after 6 months (yes, no).

The data was tabulated using Microsoft Excel® software and later exported to the open-access statistical program R Studio (R Core Team, 2022®). Data analysis was performed using Pearson's Chi-Square test to compare the expected proportions between variable categories. A p value < 0.05 was considered significant.

The study was conducted obeying the ethical aspects that regulate scientific research involving human beings, published in resolution number 466/12 from the National Health Council. The study was approved by the Research Ethics Committee of the Federal University of Maranhão, with protocol CAAE 56081721.0.0000.5086 on 04/28/2022.

RESULTS

During the study period, between 2017 and 2020, 211 cases of HIV/Aids assisted at the SAE in the macroregion of Imperatriz-MA were reported. With regard to the sociodemographic profile of patients with HIV/Aids studied, our findings revealed that the sample was predominantly composed of individuals between 21 and 40 years old (55.5%, n=117) , male (71.6%, n=151), from the city of Imperatriz (66.4%, n=140), with 8 to 11 years of education (43.11%, n=91), brown skin color (64%, n=135) and not married (55%, n=116). (Table 1).

Table 1. Sociodemographic profile of patients with HIV/Aids assisted at the Specialized Assistance Service (SAE) in the macroregion of Imperatriz-MA, from January 2017 to December 2020. (n=211).

Variable	Frequency %	n
Age		
>15 to 20 years	15.6%	33
21 to 40 years	55.5%	117
41 to 60 years	24.6%	52
> 60 years	4.3%	9
Sex		
Male	71.6%	151
Female	28.4%	60
City		
Imperatriz	66.4%	140
Others	33.6¨%	71
Years of education		
None	2.8%	6
1 to 3	7.1%	15
4 to 7	31.8%	67
8 to 11	43.1%	91
> 12	15.2%	32
Skin color		
White	21.8%	46
Brown	64%	135
Black	10.9%	23
Others (yellow/indigenous)	3.3%	7
Marital status		
Not Married	55%	116
Married	35.5%	75
Widower	3.8%	8
Not informed	5.7%	12

Please cite this article as: *Gonçalves T, Henrique E, Jucianno F, Claudia C. Perfil epidemiológico e variáveis de transmissão de Pessoas Vivendo com HIV/Aids em um Municipio do Nordeste Brasileiro. Rev Epidemiol Control Infect [Internet]. 8º de março de 2024 [citado 23º de março de 2024];14(1). Disponível em: https://online.unisc.br/seer/index.php/epidemiologia/article/view/18161*

Table 2. Distribution of transmission variables among people living with HIV assisted at the Specialized Assistance Service (SAE) in the macroregion of Imperatriz-MA, from January 2017 to December 2020. (n=211).

Variable	Frequency %	n
Recent infection with Syphilis/ Tuberculosis/ Hepatitis B		
Yes	22.3	47
No	77.7	164
Type of recent partners		
Not informed	0.5	1
Men who have sex with men only	42.1%	89
Men who have sex with women only	18.8%	39
Women who have sex with women only	29.9%	63
Men who have sex with both men and women	9.0%	19
Men who have sex with transvestites/transsexuals	4.5%	10
Number of recent partners		
1	2.8%	6
2	41.2%	87
3 to 5	15.2%	32
6 to 10	22.7%	48
11 to 20	10.9%	23
> 20	7.1%	15
Type of Exposure		
Sexual intercourse without a condom	92%	194
Mother-to-child transmission	0.9%	2
Hemophiliac/transfusion	0%	0
Not informed	7.1%	15
Condom use with steady partner		
Never	41.7%	88
Always	10.4%	22
Sometimes	43.6%	92
Not informed	4.3%	9
Condom use with casual partner		
Never	54.5%	115
Always	45.0%	95
Sometimes	0.5%	1
Not informed	0 %	0
Reason for not using condom		
Trust the partner	41.7%	88
Does not like	10.4%	22
Partner does not accept	7.1%	15
There was not enough time	11.4%	24
Under the influence of alcohol/drugs	4.7%	1
Other	14.7%	31
Not applicable	10.0%	21
Lifetime drug use		
Never used	34.6%	73
Drink or have drunk often	50.7%	107
Uses or has used injecting drugs	2.8%	6
Uses or has used other drugs (cocaine, crack)	11.8%	25
Population group		
Drug user	3.8%	8
Injecting Drug User	3.8%	8
People living with HIV	17.2%	36
Men who have sex with men	34.6%	73
Sex worker	1.9%	4
General population	38.9%	82
VL* > 1000		
Yes	67.3%	142
Not	32.7%	69
VL* < 50 after 6 months		
Yes	66.4%	140
Not	33.6%	71

Regarding clinical and pathological history and prognoses, the data indicates a higher frequency of men who have sex with men (42.1%, n=89), people without recent infection with syphilis/ tuberculosis/ hepatitis B (77.7%, n=164), who drink or have drunk often (50.7%, n=107), with 6 to 10 recent sexual partners (22.7%, n=48), who never (54.5%, n=115) or sometimes (45%, n=95) use condoms with steady partners, for trusting them (41.7%, n=88). In relation to the viral load, it was observed that 67.3% (n=140) of patients had VL>1000, and after 6 months, 66.6% had VL <50. (Table 2).

When correlating the variables among people living with HIV assisted at the SAE in the macroregion of Imperatriz-MA, it was observed that regardless of the number of sexual partners, groups that never or only occasionally use condoms predominate (p-value = 0.036). When relating viral load < 50 after ART treatment with recent STI infections, it was found that the majority of the patients without STI achieved a decline in viral load, while among those recently infected with syphilis, tuberculosis, and hepatitis B half achieved a decrease in viral load and the other half did not (p-value = 0.001). (Table 3)

Table 3. Correlation between variables among people living with HIV assisted at the Specialized Assistance Service (SAE) in the macroregion of Imperatriz-MA, from January 2017 to December 2020. (n=211).

	Sex		p-value
	Male	Female	Male
Years of education			
0 a 3 years	6	15	6
4 a 7 years	38	29	38
8 a 11 years	64	27	64
>12 years	20	12	20

	Use condom with partner Fixed			p-value
	Never	Always	Sometimes	
Number of Partners				
1	2	1	3	
2	37	9	41	0.036
3 a 5	12	4	16	
6 a 10	23	6	19	
>11	14	4	20	

	Recent infection with Syphilis/ Tuberculosis/ Hepatitis B		p-value
	Yes	No	
Viral load < 50 ART treatment			
Yes	23	117	0.001
No	24	47	

DISCUSSION

After analyzing the sociodemographic variables, an increase in cases was observed in the southern region of Maranhão, due to the rapid economic growth resulting from the installation of agricultural companies and the offer of formal job vacancies in the region.[13] When addressing the predominance of gender, there was a gre-

Please cite this article as: *Gonçalves T, Henrique E, Jucianno F, Claudia C. Perfil epidemiológico e variáveis de transmissão de Pessoas Vivendo com HIV/Aids em um Municipio do Nordeste Brasileiro. Rev Epidemiol Control Infect [Internet]. 8º de março de 2024 [citado 23º de março de 2024];14(1). Disponível em: https://online.unisc.br/seer/index.php/epidemiologia/article/view/18161*

ater number of male patients (71.6%). This finding reaffirms the prevalence of 7HIV/Aids cases among men in the country between 2017-2020, in which more than 70% of cases occurred in men. The data is similar to the study carried out at the reference hospital for the treatment of HIV/Aids in Goiânia, Goiás, where (56.6%) of the patients were men.[13]

Although, an increase in the number of cases among females was noted over time. In Brazil, from 2008 to 2020, there was an increase in the participation of women in cases of HIV. With that, monitoring the historical evolution, 688,348 cases of HIV were notified in men and 356,885 in women. Over time, the ratio between the sexes has been progressively decreasing. In 1985, the ratio was 15 cases in men to one case in women. Currently, the ratio is 2.4 to one.[7]

Since 2013, there has been a decrease in the number of Aids cases among women and men. In 2017, the proportion of Aids cases reported on SINAN by gender was male 2.3:1 female. In Imperatriz, in 2014, the proportion of cases by sex was 1:1, and in 2020 the ratio was male 2.3:1 female. Data that confirms other studies, where the centralization of the number of cases is observed in areas that suffer population explosion and with high demographic density, due to the intense migration of individuals with variable health conditions that need tracking, diagnosis, and treatment in more urbanized regions.[15]

As for the incidence of cases of HIV/Aids reported, in the Northeast region cases jumped from 3,190 in 2018 to 3,322 in 2019. In Imperatriz, there was a drop in cases compared to previous years. With the COVID-19 pandemic period, the number of confirmed cases in the country reduced by 67.34% (2019: 26,141 cases in men; 2020: 8,434 cases in men).[16] This drop reflects the possible underreporting of cases, due to the social isolation proposed during the COVID-19 pandemic period and also the reallocation of health professionals to other sectors to fight the new virus. Thus, a progressive increase in the number of cases between 2020 and 2022 is expected, leading to consequences in the promotion, prevention, and care of patients with HIV.[17]

In our findings, it was observed that the primary age group living with HIV/Aids in Imperatriz is between 21 and 40 years old, aligning with the epidemiological profile in Brazil.[9] As for the level of education, participants with complete secondary education, followed by those who completed elementary school, predominated in this study, with 43% and 31% respectively. This data reaffirms the information collected for cases of HIV/Aids in Brazil between 2013 and 2017. In this period, the percentage of HIV-positive patients who attended high school was 38.4%, and elementary school 37.5%.[15]

It was also verified that the highest percentage of the population self-declared brown 64.0% (135), followed by white 21.8% (46), and black 10.9%. This data is in accordance with the national scenario. According to the Ministry of Health, between 2013-2017, cases of HIV/Aids predominated among white (44%) and brown (43.5%) ethnic groups. Overall, the division of cases is in line with the ethnic prevalence of the country. According to the Brazilian Institute of Geography and Statistics (IBGE), in the period from 2012 to 2019, 46.8% of Brazilians self-declared to be brown, 42.7% white, 9.4% black and 1.1% yellow or indigenous.[7]

Research data reveals that 34.6% of male patients claim to have sex with another man. According to another study, it is noted that the number of cases among young men who have sex with men (MSM) increased by 140% between 2009 and 2016. Considering general data, the prevalence of MSM with HIV jumped from 12.1% to 18. 4% - 1.5 times higher.[4]

According to the Ministry of Health, it is possible to notice a gradual increase in HIV/Aids infections among MSM in the last decade, which jumped from 35.6% in 2006 to 47.3% in 2016, an increase of 32.9%. The growing prevalence of AIDS and the number of people infected with HIV among MSM reflects the moral reaction to sexual practices. However, it is necessary to consider that in addition to social and programmatic issues, individual and subjective decisions contribute to the conversion of social groups that are more vulnerable to HIV.[17]

As for the population group, the proportion of heterosexual patients with HIV/Aids is on average 38% of the cases. In Imperatriz, the cases reported between 2016-2020 among heterosexuals correspond to 56% of all cases reported. [15] It is important to emphasize that, in this research, the number of MSM, homosexuals and bisexuals may be underestimated, as the answers given by patients may not represent their real sexual inclination. And conversely, the prevalence of heterosexuals may be overestimated. Since the categorization of homosexual and bisexual is influenced by ethical and cultural issues, the population tends to highlight their heterosexual relationships as a form of social acceptance.[18]

Regarding the reasons for not using condoms, the population studied claims to dismiss prevention measures during sexual practices with occasional or steady partners, even though they recognize the importance of prevention. In this study, it was observed that 17% of patients reported trusting their partner and therefore never using condoms in sexual intercourse with occasional partners, despite of knowing their importance for preventing STI. In this sense, it is necessary to integrate and offer education about HIV/Aids to promote the continuous use of prevention methods.[19]

Observational studies with serodiscordant couples reveal that antiretroviral treatment in patients with HIV-1 decreases sexual transmission of the virus. Early therapy reduces the risk of HIV-1 infections by 96%. In this research, it was observed that 32.7% of those infected started early antiretroviral therapy with expressive results in the reduction of the viral load and, consequently, in the viral transmission chain. Thus, the Ministry of Health establishes that all infected people who are not yet receiving ART should receive ART, regardless of their CD4+ count.[20]

It is observed that cases of HIV/Aids in the country began in the social classes with higher education, with considerable expansion to the classes with lower education.[12] The study showed significance (p-value < 0.05) in the proportion of participants with low education, in

Please cite this article as: *Gonçalves T, Henrique E, Jucianno F, Claudia C. Perfil epidemiológico e variáveis de transmissão de Pessoas Vivendo com HIV/Aids em um Municipio do Nordeste Brasileiro. Rev Epidemiol Control Infect [Internet]. 8º de março de 2024 [citado 23º de março de 2024];14(1). Disponível em: https://online.unisc.br/seer/index.php/epidemiologia/article/view/18161*

which 43.1% have only completed elementary school. In females, it is observed that the lower the education level, the higher the risk of exposure, similar to data from the Southeast and Midwest regions of Brazil. Thus, this data reflects the patterns of involvement related to knowledge and education deficiency.[21]

Statistically proven, individuals with recent infections of syphilis, tuberculosis, or hepatitis B show positive responses to treatment, achieving parity with those without recent infection regarding undetectable viral load after 6 months of ART. This observation is substantiated by a study conducted in Belo Horizonte, the capital of the state of Minas Gerais, Brazil. The study found that at the end of 12 months of ART, only 6.8% of individuals co-infected with syphilis and HIV had a detectable viral load.[22]

The limitation of the present study is related to the method used in the collection of data, which was obtained through medical records, performed by health professionals and presented with incomplete filling. The lack of records such as symptoms, cause of death, and laboratory follow-up data, among others, significantly impairs the description of the epidemiological and clinical pattern of the study.

The study characterized the epidemiological profile of SAE users in Imperatriz between 2017 and 2020. Despite the increase in the number of cases among women, the most affected public remains young men, from 21 to 40 years, with 8 to 11 years of education, single and brown. Sexual intercourse without a condom is the main type of exposure. In this sense, it is necessary to develop public health policies aimed at this community to adopt relevant and effective actions for the promotion, prevention, and restoration of health, seeking to promote condom use and health education regarding HIV/AIDS infection, focusing in their sociodemographic and clinical characteristics and social motivators.

REFERENCES

1. Ferreira GC de F, Silva JN dos S, Freitas KDO, et al. HIV/Aids and vertical transmission: Understanding HIV-positive pregnant women. Nursing in Focus 2020;11(6). http://revista.cofen.gov.br/index.php/enfermagem/article/view/3923
2. Matos AF de M, Zöllner MSA. EPIDEMIOLOGY OF HIV INFECTIONS BETWEEN 2010 AND 2021 IN BRAZIL. The Brazilian Journal of Infectious Diseases. 2022. https://www.sciencedirect.com/science/article/pii/S1413867022003014
3. Ministry of Health (BR). Secretary of Health Surveillance. Department of Surveillance, Prevention and Control of Sexually Transmitted Infections, HIV/Aids and Viral Hepatitis. Guidelines for organizing the CTA within the scope of Combined Prevention and in the Health Care Networks/Ministry of Health, Health Surveillance Secretariat, Department of Surveillance, Prevention and Control of Sexually Transmitted Infections, HIV/Aids and Viral Hepatitis. Brasília: Ministry of Health, 2021. http://antigo.Aids.gov.br/pt-br/pub/2021/clinical-protocol-and-therapeutic-guidelines-for-post-exposure-prophylaxis-risk-pep
4. Ministry of Health (BR). Secretary of Health Surveillance. Department of STD, Aids and Viral Hepatitis. Clinical Protocol and Therapeutic Guidelines for Post-Exposure Prophylaxis (PEP) of Risk for HIV Infection, STIs and Viral Hepatitis. Brasilia: Ministry of Health, 2022. http://antigo.Aids.gov.br/pt-br/pub/2021/protocolo-clinico-e-diretrizes-terapeuticas-para-profilaxia-pos-exposicao-pep-de-risco
5. Ministry of Health (BR). Department of Surveillance, Prevention and Control of Sexually Transmitted Infections, HIV/Aids and Viral Hepatitis. Clinical protocol and therapeutic guidelines for the management of HIV infection in adults. Brasilia: Ministry of Health, 2018. http://antigo.Aids.gov.br/pt-br/pub/2013/protocolo-clinico-e-diretrizes-terapeuticas-para-manejo-da-infeccao-pelo-hiv-em-adultos
6. 6. Sabanchieva ZhKhS, Shmeleva SVS, Zavarzina OOZ, et al. New approaches to the diagnosis of HIV infection. Pharmateca. 2022 Oct 29;10_2022:43–6. DOI: 10.18565/pharmateca.2022.10.43-46
7. Ministry of Health (BR). Performing the Rapid Test for HIV and Syphilis in primary care and counseling in STD/ Aids da Rede. Brasilia: Ministry of Health, 2017. http://conselho.saude.gov.br/resolucoes/2017/Reso466.pdf.
8. Domingues CL, Pereira TTJ, Ramos ASMB, et al. Epidemiological profile of people with HIV/Aids in the capital of the state of Maranhão from 2014 to 2017. Brazilian Journal of Development. doi: 10.34117/bjdv8n4-032
9. Teixeira, L. G., Chagas, B. L. F., Alves, F. S., et al. (2022). The epidemiological profile of Aids in Brazil. Brazilian Journal of Health Review, 5(1), 1980–1992, 5(1), 1980–1992. doi: 10.34119/bjhrv5n1-174
10. Trindade FF, Fernandes GT, Nascimento RHF, et al. Epidemiological profile and trend analysis of HIV/Aids. J. Health NPEPS. June 1, 2019. 4(1):153-65. https://periodicos.unemat.br/index.php/jhnpeps/article/view/3394
11. Hulley SB, Cummings SR, Browner WS. et al. Outlining clinical research. 2015; 4. ed. Porto Alegre: Artmed. ISBN: 8582711905, 9788582711903
12. Nguyen LH, Tran BX, Rocha LEC, et al. A Systematic Review of eHealth Interventions Addressing HIV/STI Prevention Among Men Who Have Sex With Men. Aids and Behavior. 2019 Aug 10;23(9):2253–72. https://link.springer.com/article/10.1007/s10461-019-02626-1
13. Dias RFG, Bento LO, Tavares C, et al. Epidemiological and clinical profile of HIV-infected patients from Southwestern Goias State, Brazil. Revista do Instituto de Medicina Tropical de São Paulo [Internet]. 2018 Jul 19];60(0). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6056885/
14. Silva BCL da, Lopes WM. ESTIGMA, DISCRIMINAÇÃO E DESAFIOS DE PACIENTES EM TRATAMENTO NO PROGRAMA MUNICIPAL IST/Aids NA CIDADE DE IMPERATRIZ (MA). Congresso Brasileiro de Assistentes Sociais 2019;16(1). https://broseguini.bonino.com.br/ojs/index.php/CBAS/article/view/56
15. Ministry of Health (BR). Department of Health Surveillance. Department of Surveillance, Prevention and Control of Sexually Transmitted Infections, HIV/Aids and Viral Hepatitis. HIV/Aids. Brasília, DF; 2018;49(53). http://www.Aids.gov.br/system/tdf/pub/2016/66196/boletim_hiv_Aids_12_2018.pdf?file=1&typenode&id=66196&force=1

16. Silva HRS, Silvério AP. STUDY OF HIV DATA MONITORING IN BRAZIL DURING THE COVID-19 PANDEMIC. Facit Business and Technology Journal. 2021 Jun 29.http://revistas.faculdadefacit.edu.br/index.php/JNT/article/view/1035
17. Guimarães R de CP, Cavadinha ET, Mendonça AVM, et al. Assistance to the LGBT population in a Brazilian capital: what do Community Health Agents say? Tempus Actas de Saúde Coletiva. 2017 Nov 13;11(1): https://www.tempusactas.unb.br/index.php/tempus/article/view/2327/1754
18. Miller SS, Mantell JE, Parmley LE, et al. Stigma, Social Cohesion, and HIV Risk Among Sexual and Gender Minorities in Two Cities in Zimbabwe. Aids and behavior. 2022 Sep 1 ;26(9):2994–3007. https://pubmed.ncbi.nlm.nih.gov/35304904/
19. Bezerra E de O, Pereira MLD, Chaves ACP, et al. Social representations of adolescents on sexual relations and the use of condoms. Revista Gaúcha de Enfermagem. 2015 Mar;36(1):84–91. doi: 10.1590/1983-1447.2015.01.45639
20. Yamamoto N, Ejima K, Nishiura H. Modelling the impact of correlations between condom use and sexual contact pattern on the dynamics of sexually transmitted infections. Theoretical Biology and Medical Modelling. 2018 May 31;15(1). https://pubmed.ncbi.nlm.nih.gov/29848374/
21. Batista RL, Verduguez E dal R, Inacio M, et al. Impact of schooling in the HIV/Aids prevalence among Brazilian transgender women. Archives of Endocrinology and Metabolism. 2020 May 27: https://www.scielo.br/j/aem/a/wCcTQmQtng7Ym4vMqgzkRLB/?format=html&lang=en
22. Simões LA, Mendes JC, Silveira MR, et al. Factors associated with HIV/syphilis co-infection initiating of antiretroviral therapy. Rev Saude Publica. 2022 Jun 24;56:59. doi: 10.11606/s1518-8787.2022056003904

AUTHORS' CONTRIBUTIONS

Thiago Goncalves Araujo e Silva contributed to the interpretation of data and writing of the article. **Francisco Jucianno Rodrigues da Silva** and **Eduardo Henrique Ribeiro da Silva** contributed to the conception and design of the study, data analysis and critical review of the manuscript. **Claudia Regina de Andrade Arrais Rosa** contributed to the design of the project and relevant critical review of the intellectual content.

All authors approved the final version of the manuscript to be published and are responsible for all aspects of it, including ensuring its accuracy and integrity.