Epidemiological Profile of HIV/AIDS Cases in Anápolis-Goiás From 2017 to 2022

Perfil Epidemiológico dos Casos de HIV/AIDS em Anápolis-Goiás Entre os Anos de 2017 a 2022

Perfil Epidemiológico de los Casos de VIH/SIDA en Anápolis-Goiás Entre 2017 y 2022

RESUMO

Objetivo: descrever o perfil epidemiológico dos casos de HIV/Aids entre homens e mulheres em Anápolis, Goiás - Brasil no período de 2017-2022. **Métodos:** estudo analítico, transversal e retrospectivo. Foram utilizados dados da ficha de Aids (paciente com 13 anos ou mais), cadastrada no Departamento de Vigilância Epidemiológica. Utilizado o teste G com nível de significância de cinco (5%) (p<0,05). **Resultados:** foram notificados 1.021 casos, com curva ascendente entre os anos, sendo a maioria homens (80,9%) na faixa de 23-32 anos (46,2%) e pardos (87,2%). A principal transmissão foi a via sexual em heterossexuais (homens - 60,9%; mulheres - 94,9%). Houve diferença significativa em relação a faixa etária (p= 0,001), escolaridade (p=0,007) e a transmissão por via sexual (p= 0,001). **Conclusão:** houve ascensão no número de casos entre os anos, necessitando fortalecer as políticas de prevenção e conscientização para que sejam ainda mais efetivos em suas ações de enfrentamento da Aids.

DESCRITORES: HIV; Síndrome da Imunodeficiência Adquirida; Saúde Pública; Epidemiologia.

ABSTRACT

Objective: to describe the epidemiological profile of HIV/AIDS cases among men and women in Anápolis, Goiás - Brazil in the period 2017-2022. **Methods:** Analytical, cross-sectional and retrospective study. We used data from the AIDS file (patients aged 13 and over), registered with the Epidemiological Surveillance Department. The G-test was used with a significance level of five (5%) (p<0.05). **Results:** 1,021 cases were reported, with an upward curve between the years, the majority being men (80.9%) aged 23-32 (46.2%) and brown (87.2%). The main transmission was via sexual intercourse in heterosexuals (men - 60.9%; women - 94.9%). There was a significant difference in age (p= 0.001), education (p=0.007) and sexual transmission (p= 0.001). **Conclusion:** the number of cases has risen over the years, making it necessary to strengthen prevention and awareness policies so that they are even more effective in their actions to combat AIDS.

DESCRIPTORS: HIV; Acquired Immunodeficiency Syndrome; Public Health; Epidemiology.

RESUMEN

Objetivo: describir el perfil epidemiológico de los casos de VIH/Sida en hombres y mujeres de Anápolis, Goiás - Brasil en el período 2017-2022. **Métodos:** Estudio analítico, transversal y retrospectivo. Se utilizaron datos del archivo de SIDA (pacientes de 13 años y más), registrados en el Departamento de Vigilancia Epidemiológica. Se utilizó la prueba G con un nivel de significación del cinco (5%) (p<0,05). **Resultados:** Se notificaron 1.021 casos, con una curva ascendente entre los años, siendo la mayoría hombres (80,9%) de 23 a 32 años (46,2%) y castaños (87,2%). La principal vía de transmisión fue la sexual en heterosexuales (hombres - 60,9%; mujeres - 94,9%). Hubo una diferencia significativa en la edad (p= 0,001), la escolaridad (p= 0,007) y la transmisión sexual (p= 0,001). **Conclusión:** el número de casos ha aumentado a lo largo de los años y es necesario reforzar las políticas de prevención y sensibilización para que sean aún más eficaces en sus acciones de lucha contra el SIDA.

DESCRIPTORES: VIH; Síndrome de Inmunodeficiencia Adquirida; Salud Pública; Epidemiología.

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Lara Luísa Modesto Lima
Medical student at the Evangelical University of Goiás (UniEVANGELICA), Anápolis, GO, Brazil
ORCID: https://orcid.org/0009-0005-0332-9674

João Ricardo Sousa Vasconcellos
Medical student at the Evangelical University of Goiás – UniEVANGÉLICA, Anápolis/GO – Brazil
ORCID: https://orcid.org/0000-0002-4333-5930

Gabriella Andrade Viegas de Arruda
Medical student at the Evangelical University of Goiás – UniEVANGÉLICA, Anápolis/GO – Brazil
ORCID: https://orcid.org/0009-0004-0234-7689

Ana Clara Ramos Silva
Medical student at the Evangelical University of Goiás – UniEVANGÉLICA, Anápolis/GO – Brazil
ORCID: https://orcid.org/0009-0006-8827-447X

Luana Freitas de Oliveira
Medical student at the Evangelical University of Goiás – UniEVANGÉLICA, Anápolis/GO – Brazil
ORCID: https://orcid.org/0009-0004-2392-4879

Gabriella Pereira Ribeiro de Araújo
Medical student at the Evangelical University of Goiás – UniEVANGÉLICA, Anápolis/GO – Brazil
ORCID: https://orcid.org/0009-0008-0749-1021

Mirlene Garcia Nasciment
Epidemiological Surveillance Manager of Anápolis-GO, Brazi
ORCID: https://orcid.org/0000-0002-3065-940X

Constanza Thaise Xavier Silva
PhD in Health Sciences. Professor of the medical course at the Evangelical University of Goiás (UniEVANGÉLICA), Anápolis-GO, Brazil.
ORCID: https://orcid.org/0000-0003-0980-9343

INTRODUCTION

Acquired immunodeficiency syndrome (AIDS) is an epidemic of worldwide importance, resulting from immunodeficiency caused by the human immunodeficiency virus (HIV), and showing clinical manifestations and dysfunctions in the immune system, so individuals can be HIV positive and not show AIDS.[1] HIV is a retrovirus that mainly attacks CD4+ T lymphocytes, the body's defense cells, and is mainly spread through unprotected sex, sharing contaminated syringes or during pregnancy and breastfeeding.[2]

From 1980 to June 2023, 1,124,063 AIDS cases were recorded in Brazil.[3] The detection rate fell by 26.5%, from 22.5 cases/100,000 inhabitants in 2011 to 16.5 cases/100,000 inhabitants in 2021. In the same period, this reduction was more significant in females (43.6%) than in males (16.2%). In 2021, 35,246 AIDS cases were recorded and the sex ratio, expressed as the ratio between the number of AIDS cases in men and women, was twenty out of five men for every ten women.[4]

In the 1980s, AIDS particularly affected male homosexuals, sex workers and injecting drug users, all of whom were considered risk groups for infection, which reinforced prejudices and stigmas.[5] Today, heterosexual exposure among men and women has increased significantly, and with this, AIDS infection has undergone a process of change in the epidemiological profile, demonstrated by the intensification of heterosexualization, feminization and juvenization, which has contributed to a better perception of the magnitude of the disease and the notion of vulnerability to it. Currently, classification by risk groups or even risk behaviors for contracting the virus is no longer accepted, but rather the degree of vulnerability to which the individual is exposed.[6]

In antiretroviral therapy (ART), the choice of the pharmacological regimen to be used is made individually for each individual, based on the clinical, laboratory and pharmacological characteristics of the antiretroviral drugs.[7] Initial therapy consists of at least two nucleotide reverse transcriptase inhibitors, which can be combined with a non-nucleotide reverse transcriptase inhibitor or a viral protease inhibitor. It is worth noting that monotherapy is not effective for antiretroviral therapy. After starting ART, viral replication is inhibited and the concentration of circulating CD4+ T lymphocytes increases.[8]

In addition, timely HIV testing and the start of ART are determining factors in the survival of HIV-infected individuals, associated with a better prognosis and lower rates of disease progression, since regular use of antiretroviral drugs is also fundamental to improving the quality of life of people living with HIV and reducing the number of hospitalizations and infections due to opportunistic diseases.[9]

HIV infection and AIDS are part of the National List of Compulsory Notifiable Diseases. AIDS has been compulsorily notifiable since 1986, HIV infection in pregnant women, women who have recently given birth and children exposed to the risk of mother-to-child transmission of HIV since 2000, and HIV infection since 2014. Thus, when cases of HIV infection or AIDS occur, they must be reported to the health authorities[1].

Notification becomes immediate within 24 hours to the municipal and

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state health secretariats, inclusion on the list which allows monitoring of outbreak cases, and all notified cases are stored in the Notifiable Diseases Information System (SINAN), the system is fed by the notification and investigation of cases of diseases and illnesses that appear on the national list of compulsorily notifiable diseases[10].

Thus, it is necessary to provide updated results of the AIDS scenario at the municipal and state level, highlighting the importance of public health policies, which based on the demands and needs evidenced over time, based on the profile of the population, have favored the development of laws, programs and strategies that contribute to the development of care actions. Thus, the following question arises: What is the clinical epidemiological profile of AIDS cases among men and women in Anápolis, Goiás - Brazil in the period 2017-2022?

Therefore, it is essential to know the regional clinical-epidemiological reality of the disease so that prevention and control actions can be adopted. In view of this, the aim of this study was to describe the epidemiological profile of AIDS cases among men and women in Anápolis, Goiás - Brazil in the period 2017-2022.

METHODS

This is an analytical, cross-sectional and retrospective study, based on secondary data from the AIDS Notification/Investigation Forms (patients aged 13 and over) provided by the Epidemiology Surveillance Department of the Municipal Health Department , registered in the SINAN database from January 2017 to December 2022.

The study was carried out in the municipality of Anápolis - GO, which is located 53 km from the capital, Goiânia, and 139 km from the federal capital. With these two cities, it makes up the Goiânia-Anápolis-Brasília axis, the most developed region in the Midwest. According to the latest census carried out in Anápolis by the Brazilian Institute of Geography and Statistics (IBGE) in 2022, the population is made up of 398,869 inhabitants[11].

The study included patients diagnosed with AIDS (patients aged 13 or over), of both sexes, notified on SINAN in the city of Anápolis-Goiás in the period 2017-2022, and excluded data from duplicate notification forms.

The sociodemographic characteristics assessed were: frequency of occurrence per year, gender, age group, ethnicity and level of education. The clinical and epidemiological variables were: probable mode of transmission (vertical, blood and sexual), presence of opportunistic infections according to the Rio de Janeiro/Caracas criteria and the criteria of the Centers for Disease Control and Prevention (CDC). The groups were also analyzed according to the outcome situations (alive, death from AIDS, death from other causes), this variable being considered the outcome of the disease.

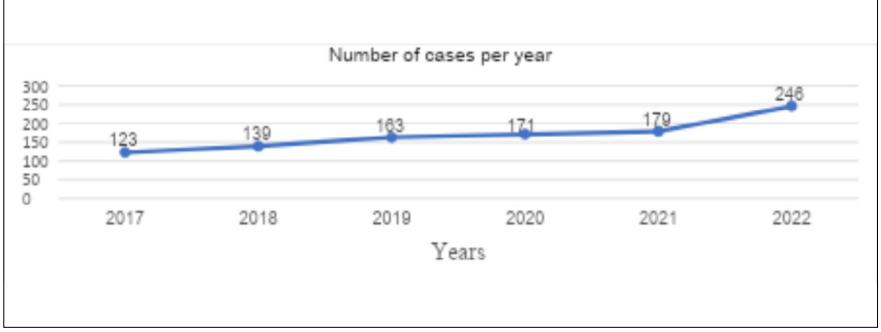
The data was collected between May and July 2023 by the researchers and included all the AIDS cases reported in Anápolis-GO from January 2017 to December 2022, transcribed into a spreadsheet and then systematized and subjected to statistical analysis with absolute and relative frequencies represented in tables. Subsequently, the G-test (with Williams correction) was used to verify the association between categorical variables, with a significance level of 5% ($p<0.05$) being adopted for all analyses. The data was analyzed using BioEstat software, version 5.0.

This study was approved by the UniEVANGÉLICA Research Ethics Committee under opinion number 5.937.647, in accordance with Resolution 466/2012 of the National Health Council (CNS), which deals with research with human beings. Only the database referring to the notification form was used, so the signing of the Informed Consent Form (ICF) was waived. Furthermore, the database was made available without nominal identification, in order to reduce the risk of a breach of confidentiality of the participant's information.

RESULTS

According to the data obtained from the notification forms on AIDS cases (patients aged 13 or over) from the Epidemiological Surveillance Department of the Municipal Health Department of Anápolis-GO, from January 2017 to December 2022, the number of notifications was 1,021 cases, distributed over these 6 years in which the graph showed a considerable upward curve. The highest number of notified cases occurred in 2022, with 246 cases, and the year with the lowest notification was the first year of analysis, 2017, with 123 cases (Graph 1).

Graph 1: Number of HIV/AIDS cases between 2017 and 2022 in the municipality of Anápolis - Goiás.



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Notifications of the disease were more prevalent among males (80.9%). In men, infection was prevalent among young adults, 23-32 years old (46.2%), the self-reported color was brown (87.2%) with ≥8 years of schooling (94.6%). In women, infection was more prevalent among those aged 33-42 (28.4%) and 43-52 (23.7%), brown (88.7%) and ≥8 years of schooling (91.2%). The socio-demographic variables related to age (p=0.001) and schooling (p=0.007) were associated with infection by the virus in relation to gender (Table 1).

Table 1: Sociodemographic characteristics of notified AIDS cases between 2017-2022, by sex in Anápolis - GO, Brazil.

Variables	Women	Men	Total	*p*
	n (%)	n (%)	n (%)	
	194 (19,1)	827 (80,9)	1021 (100)	
Age group				
13 - 22	20 (10,3)	140 (16,9)	160 (15,7)	0,001
23 - 32	40 (20,6)	382 (46,2)	422 (41,3)	
33 - 42	55 (28,4)	154 (18,6)	209 (20,5)	
43 - 52	46 (23,7)	101 (12,2)	147 (14,4)	
53 - 62	24 (12,4)	37 (4,5)	61 (6,0)	
63 - 72	9 (4,6)	11 (1,4)	20 (1,9)	
≥73	-	2 (0,2)	2 (0,2)	
Ethnicity/color				
White	14 (7,2)	90 (10,9)	104 (10,2)	0,999
Black	8 (4,1)	15 (1,8)	23 (2,3)	
Yellow	-	-	-	
Brown	172 (88,7)	721 (87,2)	893 (87,4)	
Indigenous	-	-	-	
Ignored	-	1 (0,1)	1 (0,1)	
Education				
< 8 years	5 (2,6)	7 (0,8)	12 (1,2)	0,007
≥8 years	177 (91,2)	782 (94,6)	959 (93,9)	
Ignored	8 (4,1)	8 (1,0)	16 (1,6)	
No information	4 (2,1)	30 (3,6)	34 (3,3)	

Regarding the mode of transmission, it can be seen that the majority of men (97.8%) and women (97.4%) reported that transmission was not vertical, showing no statistically significant difference (p= 0.796) and in blood-borne transmission through drug use, the majority of men (94.4%) and women (94.8%) also reported that this was not the route of transmission of the virus, showing no statistically significant difference (p= 0.579). As for sexual transmission, the majority of men reported having sex with women (60.9%), and the majority of women reported having sex with men (94.9%), showing that heterosexual relations were more prevalent in the transmission of the virus, showing a statistically significant difference (p = <0.001) (Table 2).

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Table 2: Distribution of notified AIDS cases according to mode of transmission between 2017-2022, by sex in Anápolis - GO, Brazil.

Transmission mode	Women	Men	Total	*p*
	n (%)	n (%)	n (%)	
	194 (19,1)	827 (80,9)	1021 (100)	
Vertical				
Yes	2 (1,0)	10 (1,2)	10 (1,0)	0,796
No	189 (97,4)	809 (97,8)	998 (97,7)	
Ignored	3 (1,6)	8 (1,0)	13 (1,3)	
Blood - Drug				
Yes	3 (1,5)	7 (0,9)	10 (1,0)	0,579
No	184 (94,8)	781 (94,4)	965 (94,5)	
Ignored	7 (3,7)	39 (4,7)	46 (4,5)	
Sexual				
Sexual relations with men	184 (94,9)	252 (30,5)	436 (42,7)	<0,001
Sexual relations with women	1 (0,5)	504 (60,9)	505 (49,5)	
Sexual relations with men and women	1 (0,5)	29 (3,5)	30 (2,9)	
Ignored	8 (4,1)	42 (5,1)	50 (4,9)	

With regard to opportunistic infections, according to the Rio de Janeiro/Caracas criteria, the majority of women had no cases of tuberculosis (96.9%), candidosis (94.3%) or herpes (97.4%) and only a minority tested positive for candidosis (3.1%), while the other diseases had no positive cases. Among the men, it was also found that the majority had no cases of tuberculosis (96.0%), candidosis (94.4%) or herpes (97.6%). There were no statistical differences in relation to gender in cases of tuberculosis (p= 0.166), candidosis (p= 0.923) or herpes (p= 0.380), as shown in table 3.

Among opportunistic infections according to the CDC criteria, the majority of women had no cases of cerebral toxoplasmosis (92.3%) or Pneumocystis carinii pneumonia (94.8%). The majority of men also had no cases of cerebral toxoplasmosis (95.2%) or Pneumocystis carinii pneumonia (96.1%). There were no statistical differences in relation to gender in cases of cerebral toxoplasmosis (p= 0.105) and Pneumocystis carinii pneumonia (p= 0.259) (Table 3).

Table 3: Distribution of notified HIV/AIDS cases according to opportunistic infections according to the Rio de Janeiro/Caracas criteria and adapted CDC criteria, between the years 2017-2022, according to sex in Anápolis - GO, Brazil.

CRITERIA RIO DE JANEIRO /CARACAS	Women	Men	Total	*p*
	n (%)	n (%)	n (%)	
	194 (19,1)	827 (80,9)	1021 (100)	
Tuberculosis				
Yes	-	9 (1,1)	9 (0,8)	0,166
No	188 (96,9)	794 (96,0)	982 (96,2)	
Ignored	6 (3,1)	24 (2,9)	30 (3,0)	
Candidiasis				
Yes	6 (3,1)	22 (2,7)	28 (2,7)	0,923
No	183 (94,3)	781 (94,4)	964 (94,4)	
Ignored	5 (2,6)	24 (2,9)	29 (2,9)	

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Herpes				
Yes	-	5 (0,6)	5 (0,5)	0,380
No	189 (97,4)	799 (96,6)	988 (96,8)	
Ignored	5 (2,6)	23 (2,8)	28 (2,7)	
ADAPTED CDC* CRITERIA				
Cerebral toxoplasmosis				
Yes	7 (3,6)	10 (1,2)	17 (1,7)	0,259
No	179 (92,3)	787 (95,2)	966 (94,6)	
Ignored	8 (4,1)	30 (3,6)	38 (3,7)	

*CDC: Centers for Disease Control and Prevention.

Regarding the evolution of the cases studied, the majority of women remained alive (92.8%) and the minority died of AIDS (4.6%), while the majority of men were alive (94.5%) and died of AIDS-related diseases (3.5%). In addition, there was no statistical difference between sex and case progression (p= 0.906).

Table 4: Distribution of notified HIV/AIDS cases according to clinical evolution between 2017-2022, by sex in Anápolis - GO, Brazil.

Case progression	Women	Men	Total	*p*
	n (%)	n (%)	n (%)	
	194 (19,1)	827 (80,9)	1021 (100)	
Live	180 (92,8)	781 (94,5)	962 (94,1)	0,906
Deaths from AIDS-related diseases	9 (4,6)	29 (3,5)	38 (3,7)	
Death from other causes	5 (2,6)	16 (1,9)	21 (2,1)	
Ignored	-	1 (0,1)	1 (0,1)	

DISCUSSION

The temporal pattern of the number of HIV/AIDS cases in the municipality of Anápolis rose between the years studied, with the highest prevalence in 2022. The same did not occur according to the data provided by the latest Epidemiological Bulletin in Brazil, updated in 2023[3], which has shown a reduction in the number of cases over the last ten years. Between 2013 and 2017, there was an average reduction of 2.8% in the number of AIDS cases per year. In the following years, 2018 and 2019, the decline was smaller, 1.0% and 0.6%, respectively.

The coronavirus disease (Covid-19) pandemic has had a major impact on HIV/AIDS notifications and contributed to a 20.2% drop in registrations, i.e. 7,726 fewer cases, when comparing the years 2019 and 2020.[12] However, there was a 15.9% increase between 2020 and 2021, and in the following year a 3.8% increase in the number of notified cases when compared to the previous year, still lower than in 2019.[3]

This study found that the majority of reported cases were young men aged 23-32, which is in line with other studies[13, 14, 15]. In addition, the largest contingent of cases is among males (homosexual and heterosexual) as in the study in question, which may be associated with the existence of multiple sexual partnerships and non-use of condoms, in addition to the absence and/or deficiency in seeking health services.[16]

In addition, the 2023 epidemiological bulletin3shows that a total of 52,513 young people with HIV, aged 15 to 24 (2011 and 2021), of both sexes, developed AIDS, showing the importance of the development of the disease in this age group and the need to make efforts to link them to services and adhere to ART, and in 2021, the sex ratio among young people aged 15 to 24 was 36 men for every ten women.

Based on this data, it is worth highlighting the importance of public policies focusing on men's health, working to raise awareness among this population group, which has historically had less understanding of the importance of prevention and health care services16. Despite the low prevalence, the over-60s age group requires greater attention, as it is a population segment that is indifferent to sexual practices, i.e. a group that is not seen as a priority for sexual health actions

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and which has seen a growing increase in HIV cases.[17]

As for the characteristics of color/ethnicity, the majority of those infected declared themselves to be brown, in Alagoinhas 48% brown[18], and in Coari 91% brown[19], so the race/ethnicity with the highest incidence of AIDS infection in Brazil is brown, and in Brazil it is the most prevalent.

When analyzing schooling, in the present study most of the reported cases had more than 8 years of schooling, where gender did not influence schooling, parallel to this finding, a study carried out in the municipality of Alagoinha-BA in the period 2007-2017, found that individuals with less schooling were more affected, thus perceiving a heterogeneity on the schooling of individuals infected with AIDS in Brazil.[18]

With regard to the mode of transmission of HIV/AIDS, sexual transmission was the most prevalent, in both males and females. Sexual transmission revealed that heterosexual practice has been predominant, and this data can be compared with similar studies in other Brazilian regions [18, 20].

In relation to the opportunistic infections analyzed under the Rio de Janeiro/Caracas criteria in this study, the majority of patients of both sexes who presented any of the infections had candidiasis, a factor that differs from the results observed in two other national studies, in which the most prevalent opportunistic infection was diarrhea for more than 30 days without an etiological diagnosis (32.4%)[21] and (22%)[22] It was also observed that pulmonary tuberculosis was the most prevalent clinical condition among patients diagnosed with AIDS, affecting 32.4% of patients.[23]

In the present study, based on the results obtained in relation to opportunistic infections, according to the CDC Criteria, the most prevalent infection was cerebral toxoplasmosis, followed by Pneumocystis pneumonia, and this result presents a similar scenario to the study carried out in Palmas-TO, on the prevalence of opportunistic infections, in which Pneumocystis carinii pneumonia was the most prevalent, followed by esophageal candidosis and cerebral toxoplasmosis.[23]

According to the evolution of the cases in this study, the minority of patients died of AIDS, which is consistent with other studies in the state of Goiás25, 26. Despite these declines, especially after the implementation of ART, opportunistic infections still represent the most important causes of mortality among PLHIV in Brazil[27]. In view of this, it is essential to improve efforts to ensure timely diagnosis, to start ART as soon as possible and thus reduce the consequences of HIV infection, since medication alone is not enough to guarantee patient survival, but it must also be taken into account that late diagnosis, associated clinical manifestations and poor adherence to treatment can have a negative impact on the incidence of AIDS-related deaths[28].

In addition, this study has limitations, such as the use of secondary data, since they are conditioned to the quality of the records, as well as not being able to estimate how much the frequency of underreporting can distort the results found. However, the databases used, despite their limitations, are considered to be reliable and of good quality, producing reliable information, and the large amount of data is relevant to the results. The notification form was also incompletely filled out, so it is suggested that the professionals responsible for filling out the form be retrained in order to optimize its completion and minimize incompleteness.

CONCLUSION

The epidemiological profile of AIDS cases in Anápolis - GO over 6 years (2017-2022) showed a scenario marked by the prevalence of young adults, males, aged between 30 and 39, brown, with more than 8 years of schooling and who contracted the virus through heterosexual relations, the main mode of transmission was through sexual intercourse with heterosexual intercourse, without opportunistic infections and alive.

However, this study makes it possible to contribute to the planning of public prevention policies that are more effective and geared towards the epidemiological scenario of AIDS, targeting the groups most vulnerable to this pathology, and consequently enabling a more effective approach, focusing not only on prevention, but also on minimizing opportunistic infections. Epidemiological studies are also important, as they allow cases to be compared and monitored numerically, making it possible to assess the current profile, analyze the growth or decrease in the number of cases, causes and/or reasons for contamination, thus facilitating the characterization of those affected for the development of approach strategies.

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