

Overview of HIV/AIDS cases reported in the state of Piauí between 2000 to 2021

Panorama dos casos de HIV/AIDS notificados no estado do Piauí entre 2000 a 2021

Panorama de los casos de VIH/SIDA notificados en el estado de Piauí de 2000 a 2021

RESUMO

Objetivo: Observar através de indicadores o panorama dos casos de HIV/AIDS notificados no estado do Piauí entre 2000 a 2021 e a sua relação com a dinâmica demográfica. Método: Estudo ecológico, de série temporal e abordagem quantitativa que se utilizou de casos notificados no Sistema de Informação de Agravos de Notificação (SINAN). Foram utilizadas as variáveis sociodemográficas e informações relativas aos casos de HIV/AIDS. Foi utilizado o Microsoft Office 2010® e Tabwin® versão 4.1.5 para tabulação e análise dos dados. Resultados: Entre 2000 e 2021, 5.173 casos de HIV/AIDS foram notificados no Piauí, com prevalência do sexo masculino (68,69%), faixa etária de 35 a 64 anos (50,09%), cor parda (69,30%), heterossexuais (57,07%) e com escolaridade ignorada (23,96%). Conclusão: Sugere-se o reforço e aprimoramento de programas de políticas públicas de prevenção do HIV/AIDS, e a inclusão de aspectos relacionados ao tratamento, à terapia antirretroviral e o uso de preservativos para a população.

DESCRIPTORIOS: Epidemiologia; HIV; Notificação.

ABSTRACT

Objective: To observe, through indicators, the panorama of HIV/AIDS cases reported in the state of Piauí between 2000 and 2021 and their relationship with demographic dynamics. Method: Ecological study, with a time series and a quantitative approach that used cases reported in the Notifiable Diseases Information System (SINAN). Sociodemographic variables and information related to HIV/AIDS cases were used. Microsoft Office 2010® and Tabwin® version 4.1.5 were used for data tabulation and analysis. Results: Between 2000 and 2021, 5,173 cases of HIV/AIDS were reported in Piauí, with a prevalence of males (68.69%), age group 35 to 64 years (50.09%), brown (69.30%), heterosexuals (57.07%) and with unknown education (23.96%). Conclusion: It is suggested to reinforce and improve public policy programs for the prevention of HIV/AIDS, and the inclusion of aspects related to treatment, antiretroviral therapy and the use of condoms for the population.

DESCRIPTORS: Epidemiology; HIV; Notification.

RESUMEN

Objetivo: Observar, a través de indicadores, el panorama de los casos de VIH/SIDA notificados en el estado de Piauí entre 2000 y 2021 y su relación con la dinámica demográfica. Método: Estudio ecológico, con serie de tiempo y enfoque cuantitativo que utilizó casos notificados en el Sistema de Información de Enfermedades de Declaración Obligatoria (SINAN). Se utilizaron variables sociodemográficas e información relacionada con los casos de VIH/SIDA. Para la tabulación y análisis de datos se utilizó Microsoft Office 2010® y Tabwin® versión 4.1.5. Resultados: Entre 2000 y 2021, se notificaron 5.173 casos de VIH/SIDA en Piauí, con predominio del sexo masculino (68,69%), grupo de edad de 35 a 64 años (50,09%), pardos (69,30%), heterossexuales (57,07%) y con estudios desconocidos (23,96%). Conclusión: Se sugiere reforzar y mejorar los programas de política pública para la prevención del VIH/SIDA, y la inclusión de aspectos relacionados con el tratamiento, la terapia antirretroviral y el uso de preservativo para la población.

DESCRIPTORIOS: Epidemiología; VIH; Notificación.

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INTRODUCTION

AIDS (acquired immunodeficiency syndrome) is the advanced clinical manifestation of Human Immunodeficiency Virus (HIV) infection. It is characterized by the depletion of cells with the CD4+ phenotypic marker, T lymphocytes, which leads to immunosuppression and the consequent development of opportunistic diseases and other complications ⁽¹⁾. The virus is transmitted through unprotected sexual intercourse (vaginal, anal or oral) (without a condom) with a seropositive person, by sharing contaminated sharp objects, such as needles, pliers, etc., from an untreated seropositive mother to her child during pregnancy, childbirth or breastfeeding ⁽²⁾.

HIV/AIDS has been a notifiable disease in Brazil since 1986, systemati-

cally registered in the Notifiable Diseases Information System (SINAN). Its surveillance in the country ranges from identifying the possibility of crossing databases (Reck-link). In addition to SINAN data, data obtained from the Mortality Information System (SIM), the Laboratory Test Control System of the National CD4+/CD8+ Lymphocyte Counting and HIV Viral Load Network (SISCEL), the Medication Logistic Control System (SICLOM), which are specific systems for controlling tests and medications for people living with HIV/AIDS (PLWHA) ⁽³⁾.

Despite more than 30 years of its identification, it still worries and challenges the world. With the disease, numerous devastating consequences emerged, including the increased impact on health sector spending and stigmatization ⁽⁴⁾. The severity of the epidemic is such that

in 2021 there were 1.5 million new infections, adding to a total of 38.4 million people living with HIV/AIDS in the world since the 1980s. In Brazil, the total number of cases reaches 1,045,355 combined cases of HIV/AIDS in the year 2021 since the 1980s ⁽⁵⁾. In view of this, latest trends in the epidemic in the world point to a reemergence of the disease in the country ⁽⁶⁾.

In this context, the state of Piauí has a large territorial extension, a low Human Development Index (HDI) and social, economic and geographic disparities that can influence this distribution. Understanding this spatial and temporal distribution of HIV/AIDS cases in the state through the information system is essential, as this allows for a better understanding of the dynamics of infection and disease and the path it takes in the population ⁽⁷⁾. The situation ahead of us

makes health managers and professionals understand the importance of analyzing the epidemiological design of HIV/AIDS cases, serving as subsidies for the elaboration and implementation of actions and policies with a preventive focus and HIV management⁽⁸⁾.

Given the context presented, the current study aimed to provide an overview of the cases of HIV/AIDS notified in the state of Piauí, Brazil in the period from 2000 to 2021 and their relationship with the demographic dynamics to draw an overview of this disease in the state.

METHOD

This is an ecological, time-series study with a quantitative approach that used reported cases of HIV/AIDS in the state of Piauí from January 2000 to December 2021 and their relationship with demographic dynamics to design a panorama of this disease in the state.

The state of Piauí, located in the Northeast Region of the country, has a total area of 251,755.481 km². According to data from the Brazilian Institute of Geography and Statistics (IBGE) in 2021, it has an estimated population of 3,289,290 inhabitants with a demographic density of 12.4 inhabitants per km² and a human development index (HDI) of 0.646, maintaining the 24th position among the 26 Brazilian states and the Federal District. The state is made up of 224 municipalities, 4 mesoregions and 15 geographic microregions, areas formed according to the physical, geographic, and productive structure aspects of the state. The four Piauí mesoregions are divided into: Center-North, North, Southeast and Southwest of Piauí.

The study population comprised all cases of HIV/AIDS reported in the Notifiable Diseases Information System (SINAN), from January 2000 to December 2021, of residents of the state of Piauí. Data from notifications made in the state of Piauí were included and cases of HIV/AIDS that were not notified in the state (which would make spatialization unfe-

asible) or were identified as residents of another state were excluded. It was decided not to include data referring to the current year, due to the numbers not yet being complete, since the system is fed mainly by the notification and investigation of cases.

The variables used in the study were: gender (male and female), age group (under 1 year old, 1-9, 10-14, 15-19, 20-29, 30-64, 65-79 and 85 or more), race (white, black, yellow, brown, indigenous and cases ignored), schooling (none, 1st to 4th grade, 5th to 8th grade, incomplete elementary school, incomplete high school, incomplete higher education, completed higher education and cases ignored) and the type of exposure (Homosexuals, Bisexuals, Heterosexuals, Injecting drug users - IDU, hemophiliacs, Vertical transmission and ignored cases).

Information related to HIV/AIDS cases was supported by data collected between October and November 2022, on SINAN, available in the virtual environment of the Department of Health of the SUS (DATASUS). For the descriptive analyses, the variables "State of notification" and "period (2000-2021)" were used.

To obtain population data for the state of Piauí, population estimates for each year, produced by the IBGE, available in the DATASUS virtual environment, were used.

The collected data were tabulated, analyzed and arranged in tables with the help of Excel Software Microsoft Office 2010[®] and Tabwin[®] version 4.1.5, to calculate the absolute and relative frequencies of incidence.

The research was carried out with secondary data without identifying the participants, complying with the ethical aspects of Resolutions 466/2012 and 510/2016 of the National Health Council (CNS), and submission to the Research Ethics Committee (CEP) is waived.

RESULTS

The study identified that, during the

years 2000 to 2021, 5,173 cases of HIV/AIDS were reported in the state of Piauí, Brazil. Presenting an average of 235 annual cases, which were distributed in all years analyzed.

Table 1 presents the sociodemographic characterization of reported cases of HIV/AIDS in the state of Piauí between 2000 and 2021, assigned according to the variables: gender, age group, race, education and exposure. Of the reported cases, 68.69% were male. Notifications were more prevalent in the population aged 35 to 64 years (50.09%), followed by the population aged 20 to 34 years (44.46%). Cases in individuals of brown race are predominant (69.30%), with a high prevalence of unregistered cases being analyzed in terms of education (23.96%). As for the exposure variable, heterosexuals had the highest number of HIV/AIDS records in Piauí during the analyzed period, with 2,952 cases, which represents 57.07% of notifications in the state, followed by homosexuals with 15.32 % of the number of notified cases, with a total of 792 notifications.

It is possible to identify through Figure 1 that there was an increase in the number of cases between 2000 and 2014, being much more prevalent in the year 2014, and decreases in notifications in later years, except for the year 2017, where AIDS cases presented a new elevation.

It was observed, over the time limit, that the incidence rate of notified cases increased, as shown in picture 2, going from the incidence rate of 3.89 per 100,000 inhabitants to 10.6 per 100,000 inhabitants in a seven-year interval (2000-2007). It is analyzed that from 2014 it obtained the highest incidence coefficient, with 14.36 cases per 100 thousand inhabitants, and in subsequent years, the incidence rates decreased, except for the year 2017, where the incidence had a slight increase compared to the previous year, with 9.27 per 100,000 inhabitants.

There were no records of death cases in the year 2021 on SINAN, much less in the Epidemiological Bulletin released by MS. As a result, the data recorded betwe-

en 2000 and 2020 was listed. According to DATASUS, the state of Piauí between 2000 and 2020 reported 348,607 deaths from general causes, generating a general mortality rate 526,38 of 526.38 deaths per 100,000 inhabitants. In this same period, 2,020 deaths due to HIV/AIDS were recorded by 2020, which represents 3.05 deaths from HIV per 100,000 inhabitants. Whereas 2.18 deaths from HIV are male to 0.86 female deaths, with 0.1 (1 case) being ignored. The indicated information is shown in Table 2. Furthermore, in the year 2021, deaths due to the cause were not recorded until the moment the research was carried out.

According to the Special Epidemiological Bulletin of HIV/AIDS from the Ministry of Health (MS), published in December 2021, 1,045,355 cases of HIV/AIDS were detected in Brazil in the period from 1980 to 2021, with a record of 360,323 deaths in the period in which All country. In the state of Piauí, between the years 2000 and 2021, out of a total of 5,173 registered cases of HIV/AIDS, 2,020 died by the year 2020, with a mortality rate of 39.0 per 100,000 inhabitants, according to identification calculation of the lethality of the disease (2,020 deaths/ 5,173 registered cases) x 100 = 39% lethality (Picture 3).

Such data are related to the still persistent and continuous dissemination characteristics of this epidemic in Brazil.

DISCUSSION

Certain behaviors increase vulnerability to HIV infection. Among these, we highlight the performance of anal or vaginal sex without a condom/condom and the sharing of syringes^(9,10). Research indicates that the use of alcohol and drugs, homosexual/bisexual orientation, low income, Sexually Transmitted Infections (STIs), multiple partners, little use of condoms and failure to carry out laboratory tests and rapid tests facilitate HIV infection among the population^(11,12).

The high HIV/AIDS detection rates identified in the state may be related to

Table 1: Sociodemographic characteristics of notified cases of HIV/AIDS in the state of Piauí between 2000 and 2021. Teresina-PI, Brazil, 2022.

Variables	Cases	Cases	Incidence Coefficient
	Number	%	
Gender			
Male	3.553	68,69	5,11
Female	1.620	31,31	2,33
Age group			
< 1 year old	12	0,23	0,01
1-9	57	1,10	0,08
10-14	10	0,20	0,01
15-19	119	2,30	0,17
20-34	2.300	44,46	3,30
35-64	2.591	50,09	3,72
65-79	78	1,51	0,11
80>	06	0,11	0,00
Race			
White	815	15,76	1,17
Black	471	9,10	0,67
Yellow	15	0,29	0,02
Mixed	3.585	69,30	5,15
Indigenous	02	0,04	0,00
Ignored ones	285	5,51	0,40
Education			
None	231	4,46	0,33
1st to 4th grade	1.057	20,44	1,52
5th to 8th grade	955	18,47	1,37
Elementary School Incomplete	540	10,44	0,77
High School Incomplete	562	10,85	0,80
Higher Education incomplete	177	3,42	0,25
Higher Education complete	412	7,96	0,59
Ignored ones	1.239	23,96	1,78
Exposition			
Homosexual	792	15,32	1,13
Bisexual person	489	9,45	0,70
Heterosexual	2.952	57,07	4,24
UDI	70	1,35	0,10
Hemophiliacs	01	0,01	0,00
Vertical transmission	93	1,80	0,13
Ignored ones	776	15,00	1,11

Source: Sinan – DATASUS, 2022.

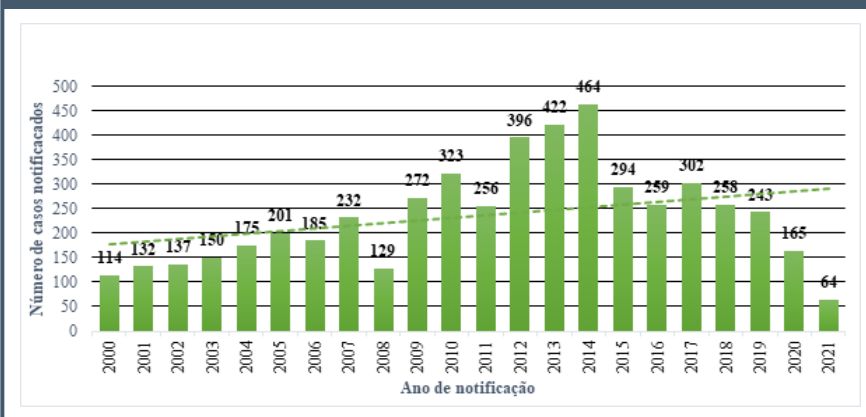
weaknesses in the reflections of structural problems, such as the lack of human resources and continuous technical training of health professionals as well as in the care network⁽²⁾. Faced with this situation, some aspects should be considered, for example, the elaboration of health education strategies, in an attempt to change risky behavior, the importance and need for public policies and sexual health programs, in order to contribute with adequate guidance to the public, so that they are able to be aware and make decisions about their sexuality⁽¹³⁾.

Considering the variables raised, it is observed that the male sex presents the highest number of cases during the analyzed period. Such data are similar to the study carried out in Ceará⁽¹⁴⁾, where male individuals held the majority of HIV/AIDS notifications in the state in an analyzed period of 2001 and 2011. This fact is related to sexual intercourse at an early age by the male public, in addition to having a relationship with more than one sexual partner(s) and having occasional relationships, disposing them to risky behaviors and delaying the diagnosis of serious illnesses⁽¹⁵⁾. Thus, the average age at the time of diagnosis of HIV/AIDS is higher among men than among women, that is, in the male population the diagnosis has occurred late.

In addition to these facts, the male population has low access to health services, diagnostic tests, and drug therapy⁽¹⁶⁾. Furthermore, the allegation of loss of sexual pleasure with the use of condoms is also justified. This stigma has potential, with effects on the identity of individuals, groups, and social relationships, in addition to the reflection on health and illness process^(17,18).

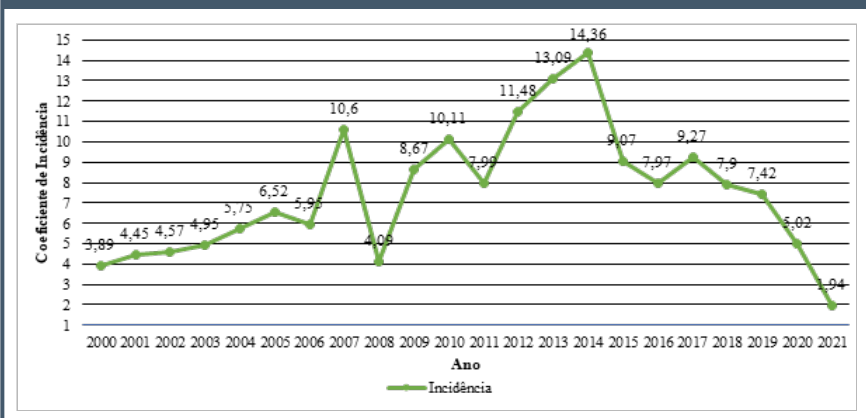
Regarding the age group, the age group between 35 and 64 years old is the most frequent, followed by the age group between 20 and 34 years old. Such results corroborate the findings of a study carried out in Ceará, from 1983 to 2012, where individuals in the age range of 20 to 49 years correspond to more than 80% of notifications in the state⁽¹⁹⁾. Another

Picture 1: Number of reported cases and HIV/AIDS trend line in the state of Piauí between 2000 and 2021. Teresina-PI, Brazil, 2022.



Source: Sinan – DATASUS, 2022.

Picture 2: Incidence coefficient per (100,000 inhabitants) of HIV/AIDS notified in the state of Piauí by year of notification. Teresina-PI, Brazil, 2022.



Source: Sinan – DATASUS, 2022.

Table 2: Specific mortality coefficients according to sex (HIV/AIDS deaths as cause/100,000 inhabitants) in Piauí between 2000 and 2020. Teresina-PI, Brazil, 2022.

	Absolute cases	Incidence coefficient per death
Gender		
Male	1,445	2.18
Female	574	0.86
Ignored ones	1	0.1
Total	2,020	3.05

Source: Sinan – DATASUS, 2022.

study carried out in the same state, points to a prevalence among individuals aged

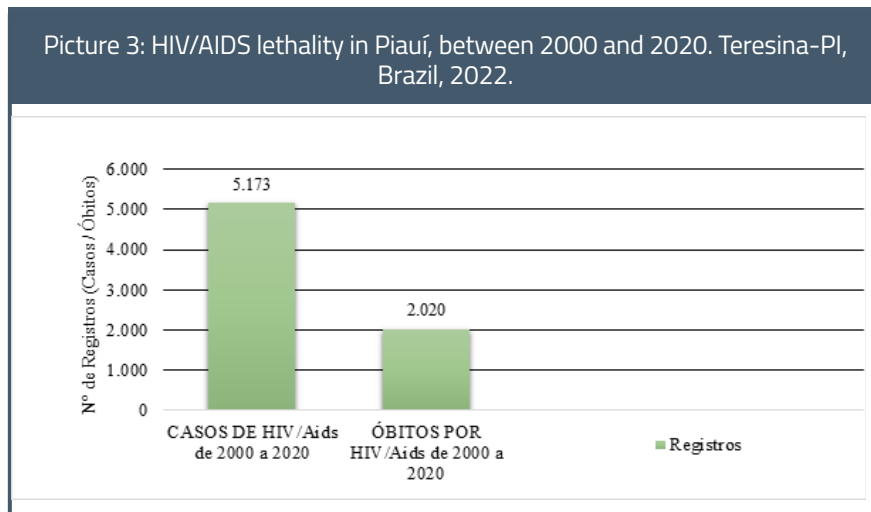
25 to 39 years, proceeding from 40 to 49 years⁽¹⁴⁾.

Even though there is a youthfulness of AIDS, the prevalence of the disease persists in the adult population, especially between 30 and 39 years old, similar to national data ⁽²⁾. Such data show that cases have decreased among the adolescent population, as a result of the knowledge that they may be acquiring as a result of health education given to this public ⁽²⁰⁾.

As for the race variable, the study identified a predominance of the brown race, followed by the white race, in the state of Piauí, throughout the analyzed territory. These results are related to the results of another study carried out in Piauí between 2008 and 2018⁽⁸⁾, where the brown race also predominated in cases of HIV/AIDS. Contrary to this, in a study carried out in the state of Santa Catarina ⁽¹⁴⁾, the results indicated that white individuals predominated in the number of cases. These results are directly related to the fact that Santa Catarina has a predominantly white population ⁽²⁾. In a study carried out in the United States from 2006 to 2009, in relation to race/ethnicity, the incidence of the epidemic was higher among blacks/African-Americans and Hispanics/Latinos than among white people⁽²¹⁾.

In Brazil, there was a 33.5% increase among self-declared brown people between 2007 and 2017 ⁽²⁾. Given this, the results of this study may be linked by the fact that the Brazilian population is mostly made up of whites and browns. According to IBGE data, around 45.5% declared themselves white and 45% brown according to the National Household Sample Survey (PNAD) in 2017⁽²²⁾. Thus, the black population is considered to be formed by those who recognize themselves as black and brown in accordance with the Statute of Racial Equality, Law n. 12.288/2010.

With regard to schooling, results similar to those of a survey also carried out in the state of Piauí ⁽⁸⁾ were observed, where a high percentage of ignored cases was found, which makes it difficult to better assess HIV/AIDS cases related to this variable. It is evident that the lower the



Source: Sinan – DATASUS, 2022.

level of education, the greater the chance of becoming ill due to the difficulty in accessing information, as information is the most efficient method of preventing HIV ^(23,24).

Thus, the higher the education, the greater the frequency of condom use ⁽²³⁾. However, the lower the level of education, the greater the propensity to use drugs, providing vulnerable conditions for the spread of HIV, with education being a considerable fact with regard to infection by the virus. It is worth noting that national data show a predominance of cases among individuals with complete secondary education, contrary to the data presented in this study ⁽²⁵⁾.

It is reiterated that the state of Piauí has high rates when evaluating the scenarios of Health Vulnerability Indicators (IVS), Desertification (IVD), Economic-Demographic (IVED), Public Health Costs (IVC), while of lower vulnerability regarding the General Vulnerability Indicator (GVI) in Brazil. The state of Piauí has its economy intensely affected by climate change due to the agricultural sector, which is related to education and health, and should become the object of studies and specific policies⁽²⁶⁾.

In the study carried out, it was identified that the mode of transmission/exposure to the HIV virus was more expressive

in the heterosexual population, being associated with the sexual route. Then, homosexuals occupied the second position with more prevalence in cases of HIV infection. These data are also confirmed in other studies ^(8,13,27), which associated unprotected sexual practice as the main route of transmission between people, although homosexual/bisexual transmission between men is also expressive, which is related to the low condom use for cultural causes

Despite the data observed in this study, it is analyzed in another study ⁽²⁸⁾ that heterosexuals are not perceived as a group at risk for HIV infection as well as homosexuals and other population groups. Thus, heterosexuals were subsumed into the “general population” category in epidemiological surveillance analyses, not being highlighted in prevention policies or actions.

However, it is analyzed that heterosexuals are epidemiologically more susceptible to HIV/AIDS infection, highlighting the difficulties of adopting safe sex among women, as they have difficulties in negotiating the use of condoms with their partners, initiating the discussion of issues of gender in the HIV/AIDS epidemic in Brazil⁽²⁹⁾.

In a national study carried out between 2005 and 2015⁽³⁰⁾, it points out that the

prevalence of reported cases is exposure by bisexuals, followed by homosexual. This fact may be associated with risk behaviors practiced by these vulnerable groups due to adherence to risk practices such as casual sex and not using condoms in relationships, often combined through dating apps⁽³¹⁾, and even the difficulty of access to education and health services, as a result of stigma and discrimination.

However, a survey carried out in Ceará showed that HIV/AIDS is associated with the pace and risky behavior of modern, urban life. Behavioral and cultural factors such as use of alcohol and other drugs, unprotected sexual practices, multiple partners, sexuality issues, gender and stigma increase vulnerability to HIV, which may also explain the increased incidence of infection, justifying the importance of intensification of health promotion and disease prevention actions both in the general population and in the key population, the most affected by the epidemic⁽³²⁾.

In some countries, mortality in the general population varies according to the socioeconomic status of the localities. With regard to AIDS, late diagnosis can occur in economically disadvantaged locations, with an increase in opportunistic diseases or even early death, due to poor adherence to rapid tests for detection of the virus^(32,33).

Another aspect that significantly con-

tributes to the increase in mortality is poor adherence to antiretroviral therapy (ART). The incidence rate of non-adherence to treatment is high in the first months, in addition to the irregular use of antiretrovirals when the virus is diagnosed⁽³³⁾.

In view of this, it is extremely important to identify regions with large records of HIV/AIDS cases, which can contribute to better targeting of actions, planning and implementation of strategies to prevent transmission of the virus. Especially when these actions depend on scarce resources offered for public health interventions, such as the strategy to increase treatment coverage in order to reduce the community viral load of HIV⁽³⁴⁾.

Study limitations

As a limitation of the study, there is the possibility that the data are underestimated due to the underreporting of HIV/AIDS cases in SINAN, however, this does not preclude the results presented here. The main one is related to the use of secondary data, which may present inconsistencies or losses in the quality and quantity of the information obtained. However, SINAN is considered a useful tool for secondary research, of the epidemiological type, where data were extracted, becoming an official data base in Brazil.

CONCLUSION

In the period studied, the reported cases of HIV/AIDS in the state of Piauí, there was a prevalence in males, aged 35 to 64 years, brown, heterosexual (sexual) and with unknown records regarding education. In the period studied, the reported cases of HIV/AIDS in the state of Piauí, there was a prevalence in males, aged 35 to 64 years, brown, heterosexual (sexual) and with unknown records regarding education. Thus, it is suggested to reinforce and improve HIV/AIDS prevention programs, educational campaigns on the modes of transmission and prevention of the virus, and the inclusion of aspects related to treatment and antiretroviral therapy, as well as reinforcing the use of condoms to the general population, with a view to maintaining the declining incidence.

In line with the above, the panorama analyzed demonstrates that the findings in the study can contribute as a subsidy for public policy discussions on preventive and care practice by health professionals, in the sense of developing educational actions that consider the demographic dynamics of the state, the singularities and needs of individuals and the population. Such assumptions allow not only the prevention of the virus, but also a better quality of care for affected individuals.

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