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Aids in Santa Cruz do Sul: epidemiology of cases and deaths between 2019 and 2023

Aids em Santa Cruz do Sul: epidemiologia dos casos e óbitos entre 2019 e 2023
Sida en Santa Cruz do Sul: epidemiología de casos y muertes entre 2019 y 2023

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ABSTRACT

Background and Objectives: Acquired Immunodeficiency Syndrome (Aids) is a significant public health concern, requiring the continuous improvement of preventive, diagnostic, and treatment methods. The objective of this study was to analyze records of Aids-related cases and deaths in a municipality in the state of Rio Grande do Sul, identifying epidemiological patterns. **Methods:** This is a retrospective descriptive study of Aids cases and deaths recorded between 2019 and 2023 in the municipality of Santa Cruz do Sul, RS. The data, analyzed using descriptive statistics, were obtained from the Notifiable Diseases Information System (SINAN) and the Department of Informatics of the Unified Health System (DATASUS). **Results:** Between 2019 and 2023, a total of 167 Aids cases were reported, of which 115 (68,8%) were male, and 83 individuals (49,7%) were identified as white. Regarding sexual orientation, 59 records (35,3%) were listed as unknown; 41 (24,5%) were heterosexual men and 33 (19,7%) heterosexual women. In terms of mortality, 73 deaths were recorded during the study period. The most affected age group was 50 to 59 years old, with 19 deaths (11,3%), followed by the 40 to 49 age group, with 16 deaths (9,5%). Most of the deaths were among women (51 cases; 69,8%), with white individuals accounting for the majority (54 cases; 73,9%). Sexual orientation was not recorded in the mortality data. **Conclusion:** The findings highlight the importance of a continuous, multifaceted, and locally adapted approach to addressing Aids, as the epidemiological profile observed differs from the national pattern.

Keywords: *Acquired immunodeficiency syndrome. HIV. Epidemiology.*

RESUMO

Justificativa e Objetivos: A Síndrome da Imunodeficiência Adquirida (Aids) é uma preocupação para a saúde pública, exigindo aprimoramento constante dos métodos preventivos, diagnósticos e de tratamento. O objetivo do estudo foi analisar os registros de casos e óbitos associados a Aids em um município do Rio Grande do Sul, identificando padrões epidemiológicos. **Métodos:** estudo retrospectivo descritivo sobre casos e óbitos por Aids registrados entre os anos de 2019 e 2023 no município de Santa Cruz do Sul/RS. Os dados analisados através da estatística descritiva foram coletados das bases de dados do Sistema de Informação de Agravos de Notificação (SINAN) e do Departamento de Informática do Sistema Único de Saúde (DATASUS). **Resultados:** Entre 2019 e 2023, houve 167 casos de Aids, destes, 115 (68,8%) eram do sexo masculino e 83 pessoas da raça branca (49,7%). Quanto à sexualidade, houve 59 (35,3%) registros ignorados, 41 (24,5%) homens e 33 (19,7%) mulheres heterossexuais. Já em relação aos óbitos, ocorreram 73 no total nesse período, sendo a faixa etária mais prevalente entre 50 e 59 anos, com 19 óbitos (11,3%), seguida pela faixa etária entre 40 e 49 anos, com 16 óbitos (9,5%). Os óbitos foram de 51 mulheres (69,8%), sendo a raça branca a mais prevalente com 54 casos (73,9%). A sexualidade foi ignorada nos registros de óbitos. **Conclusão:** Os dados refletem a importância da abordagem contínua, multifacetada e adaptada ao cenário epidemiológico local no combate da Aids, uma vez que o quadro é divergente do padrão epidemiológico nacional.

Descritores: *Síndrome da imunodeficiência adquirida. HIV. Epidemiologia.*

RESUMEN

Justificación y Objetivos: El síndrome de inmunodeficiencia adquirida (Sida) es un problema de salud pública que requiere mejoras en prevención, diagnóstico y tratamiento. El objetivo de este estudio fue analizar los registros de casos y muertes relacionadas con el Sida en un municipio de Rio Grande do Sul, identificando patrones epidemiológicos. **Métodos:** Estudio descriptivo retrospectivo de los casos y muertes relacionadas con el Sids registrados entre 2019 y 2023 en el municipio de Santa Cruz do Sul, Rio Grande do Sul. Los datos analizados mediante estadística descriptiva se recopilaron del Sistema Integrado de Información de Enfermedades de Declaración Obligatoria (SINAN) y del Departamento de Informática del Sistema Único de Salud (DATASUS). **Resultados:** Entre 2019 y 2023 se registraron 167 casos de Sida, de los cuales 115 (68,8%) fueron hombres y 83 (49,7%) blancos. Respecto a la sexualidad, se ignoraron 59 (35,3%) registros, 41 (24,5%) hombres y 33 (19,7%) mujeres heterosexuales. En cuanto a las defunciones, se registraron 73 durante este período, siendo el grupo de edad más prevalente el de 50 a 59 años, con 19 (11,3%), seguido del grupo de 40 a 49 años, con 16 (9,5%). Las defunciones fueron de 51 mujeres (69,8%), siendo la raza blanca la más prevalente con 54 (73,9%). La sexualidad fue ignorada en los registros de defunción. **Conclusión:** Los datos reflejan la importancia de un enfoque continuo y adaptado al escenario epidemiológico local en la lucha contra el Sida, que difiere del patrón nacional.

Palabras Clave: *Síndrome de inmunodeficiencia adquirida. VIH. Epidemiología.*

INTRODUCTION

The Human Immunodeficiency Virus (HIV) is a retrovirus with tropism for the human body's defense cells, especially CD4 T lymphocytes, and is transmitted through bodily secretions such as blood, semen, cerebrospinal fluid, breast milk, and vaginal fluids. It is known that the HIV surface protein binds to the lymphocyte surface protein (CD4), allowing the virus to penetrate the cell and use it for viral replication, which is destroyed after the process. Thus, a single virus infecting a single cell can generate millions of other viruses. The main characteristic of the disease is the decrease in the number of TCD4 lymphocytes, which progresses as the viral load increases. Once the CD4 count falls below 200 cells/mm^3, the patient is characterized as having advanced HIV, also known as Acquired Immune Deficiency Syndrome (Aids), which can cause the onset of opportunistic diseases such as tuberculosis and histoplasmosis.[1]

This progression of the infection was first recorded in 1981 in the United States of America (USA), when a distinct cluster of cases of pneumonia caused by *Pneumocystis jiroveci* and Kaposi's sarcoma was identified in young, previously healthy men who had sex with other men, characterizing the first recognized cases of Aids and marking the beginning of a pandemic.[2] Since then, this state of immunosuppression, of infectious origin, has been a public health concern, since HIV affects a total of 39 million individuals worldwide, and approximately 2.56% of this index is composed of Brazilians.[3] In addition, it is noted that only 786,893 people (78%) living with HIV receive antiretroviral therapy (ART) in Brazil.[4] Therefore, it appears that the portion of the population that does not receive drug treatment is more susceptible to developing Aids and, consequently, may die from opportunistic diseases closely related to the weakening of the immune system.

In this same context, it has been found that, since 1980, 1,165,599 cases of advanced HIV and 392,981 deaths related to the infection and opportunistic diseases associated with it have been recorded in Brazil.[5] It should also be noted that, until 2021, Rio Grande do Sul (RS) accounted for 9.8% of cases registered in Brazil and 49.5% of cases in the South Region. In terms of deaths, by 2020, 64,146 (17.8%) deaths were linked to the Southern Region, of which 35,306 (9.8%) were in RS.[6] Consequently, this demonstrates the need for constant improvement in preventive, diagnostic, and treatment methods.

In addition, we must consider that an individual's health is deeply interconnected with the environmental, social, and economic factors in which they live, and that Brazil presents great territorial heterogeneity in all these areas, creating distinct epidemiological dynamics.[5] We also note that it is necessary to identify key and/or priority populations, such as sex workers and men who have sex with men, which are historically determined by processes of stigmatization and social exclusion, thus presenting a much higher prevalence of HIV and consequent progression to advanced stages compared to the general population.[1]

Thus, there is a need to develop sound strategies and policies that correspond to local and population findings and realities, offering better guidance and effectiveness in mitigating the impacts caused by infection and combating this epidemic. Therefore, the following study aims to analyze the records of cases and deaths associated with AIDS in a municipality in Rio Grande do Sul, identifying epidemiological patterns.

METHODS

A cross-sectional observational study with a descriptive and retrospective approach to confirmed cases and deaths from Aids recorded between 2019 and 2023 in the municipality of Santa Cruz do Sul, located in the Rio Pardo Valley, in the central-eastern region of Rio Grande do Sul (RS).

The municipality analyzed has an estimated population of 133,230 inhabitants and has a Municipal Serology Care Center (CEMAS), which is a specialized service that treats cases of HIV and other sexually transmitted infections (STIs). The service serves all residents of the city, both those in the public and private health systems, providing consultations, follow-ups, testing, and medication dispensing.[7,8]

The data used in this study were obtained from the Notifiable Diseases Information System (SINAN) and the Department of Informatics of the Unified Health System (DATASUS), accessed between September 13 and 19, 2024. To collect information on confirmed cases and deaths resulting from the disease, the following variables were selected: municipality of residence (Santa Cruz do Sul), year (2019 to 2023), age group (< 1 year; 1 to 4 years; 5 to 9 years; 10 to 14 years; 15 to 19 years; 20 to 34 years; 35 to 49 years; 50 to 64 years; 65 to 79 years; 80 years and over), race (white; black; yellow; brown; indigenous; unknown), gender (female; male; unknown; blank), sexuality (homosexual; bisexual; heterosexual; unknown).

The data obtained were then tabulated in Microsoft Excel and analyzed using descriptive analyses of absolute and relative frequencies, cases, and deaths during the period. It should also be noted that, since the records were obtained from an open database provided by the Ministry of Health, there was no need for approval by the Research Ethics Committee (REC).

RESULTS

A total of 167 cases of AIDS were reported during this period, with 37 (22.1%) in 2019, 42 (25.1%) in 2020, 33 (19.7%) in 2021, 33 (19.7%) in 2022, and 22 (13.1%) in 2023.[9,10]

Of these, one case (0.6%) was identified under one year of age, two (1.2%) between 15 and 19 years of age, 48 (28.8%) between 20 and 34 years of age, 58 (34.7%) between 35 and 49 years of age, 47 (28.1%) between 50 and 64 years of age, 10 (6%) between 65 and 79 years of age, and one case (0.6%) over 80 years of age. There were no records between one and 14 years of age.[9, 10]

In relation to gender, it was observed that 115 (68.9%) of the recorded cases were male and 52 (31.1%) were female.[9,10]

Furthermore, regarding gender and sexuality, it was observed that 41 (24.5%) and 33 (19.7%) were heterosexual men and women, respectively, 23 (13.7%) were homosexual men, and five (3%) were bisexual men. Seven (35.3%) records were found that ignored this specification.[9,10]

Regarding race/skin color, 83 (49.7%) individuals were white, 15 (~9%) were black, 10 (~6%) were brown, one (~0.6%) was yellow, and 58 (34.7%) of the registered cases ignored this field. There are no records of cases of indigenous individuals.[9,10]

There were 73 deaths during this period, with 11 (15.1%) deaths in 2019, 17 (23.3%) deaths in 2020, 11 (15.1%) deaths in 2021, 15 (20.5%) in 2022, and 19 (26%) in 2023.[9,10]

Of these, three occurred between the ages of 20 and 29 (4.1%), 13 between the ages of 30 and 39 (17.8%), 16 between the ages of 40 and 49 (22%), 19 between the ages of 50 and 59 (26%), 14 between 60 and 69 years of age (19.2%), seven between 70 and 79 years of age (9.6%), and one over 80 years of age (1.3%). No deaths were reported among individuals aged between one and 19 years.[9,10]

Regarding gender, 51 (69.9%) were female and 22 (30.1%) were male.[9,10]

With regard to sexuality, there are no records of deaths specified in this way. In relation to race/color, 54 (73.9%) were white, 11 (15%) were black, and eight (10.9%) were brown. There were no records of deaths of Asian or indigenous individuals.[9,10]

DISCUSSION

The data presented for the years 2019 to 2023 provide a comprehensive overview of the prevalence associated with Aids in the municipality analyzed, showing that there has been a slight reduction in the number of cases recorded over the years. This reduction is in line with the trend recorded over the last 10 years, which shows an overall decline in the number of new cases registered in Brazil, mainly in the South (33%), where the municipality analyzed is located, and Southeast (25.9%) regions.[5] Furthermore, in this same scenario, it can be observed that in Rio Grande do Sul, there has also been a reduction in the rate of Aids detection recorded between 2010 and 2020 per 100,000 inhabitants.[6] Therefore, it is suggested that the decrease may be directly related to the increase in ART coverage in the country, which rose from 71% in 2019 to 78% in 2023.[11]

It should also be noted that the records were greatly influenced by underreporting during the Covid-19 pandemic, showing an exponential drop throughout Brazil in 2020, including the state of Rio Grande do Sul, which saw a 6.8% drop in the Aids detection rate per 100,000 inhabitants, from 28.6 in 2019 to 21.8 in 2020.[5,6] However, the opposite is observed in the municipality analyzed, which recorded its highest number of cases in the same year.

The age distribution reveals a higher concentration of Aids cases among people aged 20 to 34 and 35 to 49, which is partially consistent with data recorded since the 1980s in Brazil, which shows a higher concentration of cases among people aged 25 to 39.[5] This may suggest greater susceptibility to HIV infection in these age groups, which may be related to more frequent risky behaviors, such as unsafe sexual practices, which is the main form of transmission in both men (78.3%) and women (84.3%) aged 13 and older, and the sharing of needles and syringes during injecting drug use, which has kept its infection rates relatively stable since 2020, but still accounts for 2% and 1.6% of transmission sources in men and women, respectively.[5]

There were no recorded cases among children aged between one and 14 years old, which may reflect the effectiveness of prenatal care in preventing vertical transmission (VT) of the virus and neonatal screening after birth for early identification of infection, since the detection rate of Aids cases in children under 5 years of age is used as a proxy indicator for monitoring VT and alerting to the effectiveness of care for infected children, thus demonstrating the effectiveness of the municipality's prevention and treatment campaigns in relation to VT.[5]

The absence of cases in this age group may also be related to increased coverage of antiretroviral drugs, since in 2023 it was reported that 84% of HIV+ pregnant women had access to ART during pregnancy, thus preventing PTE and the development of advanced infection in children and preteens under the age of 13.[3]

Furthermore, these data demonstrate the effectiveness of strategies aimed at preteens, such as sex education in schools, encouraging the use of male or female condoms, and testing provided by health services, which prevent the progression of the disease if it is detected.

In terms of distribution by gender, men represent the majority of new cases in the municipality, in line with other regions of Brazil, where the prevalence of HIV/Aids is historically higher among males, since, since 1980, 1,165,599 national cases of advanced immunosuppression caused by the virus have been recorded, with men accounting for 66.3% of this number and women only 33.7%.[5] This can also be observed at the state level, which recorded, up to 2021, 60,755 (59.4%) cases in men and 41,537 (40.6%) in women.[6]

The racial distribution reveals a higher number of Aids cases among the white population, while black, brown, and Asian races recorded significantly lower numbers, which is consistent with data recorded in Rio Grande do Sul until 2021, which shows a predominance of self-declared white users.[6] This finding can be associated with the racial distribution of the state and municipality, which is composed mainly of people of European descent.[12] It is important to note that 58 of the 167 cases recorded had this specification ignored, which makes it difficult to understand which race/color is most affected.

Finally, it was found that there are more cases among heterosexual men and women in the municipality. This finding, in relation to females, is in line with national rates, as 84.3% of cases fit this pattern, regardless of age group.[5] With regard to males, the majority of cases recorded (41.3%) in Brazil occur among men who have sex with men, i.e., homosexuals and bisexuals, except for those over 40 years of age, an age group in which cases among heterosexuals predominate.[5] It is also observed that similar rates were recorded at the state level, where there is a predominance of cases among heterosexual men.[6] Thus, the local predominance of heterosexual cases is linked to the high number of cases recorded among older men and cases related to females.

With regard to mortality, there is variability in the number of deaths recorded, with 11 deaths recorded in 2019, 17 in 2020, 11 in 2021, 15 in 2022, and 19 deaths in 2023. This fluctuation in the number of deaths recorded may be related to loss of follow-up of drug treatment, with an increase in the number of loss of follow-up cases recorded in Brazil during the period examined, from 13% in 2019 to 15% in 2023. At the state level, it was observed that the loss of treatment follow-up did not evolve or regress during the period analyzed, remaining at 12%.[13]

It should be noted that 2019 and 2021 recorded the lowest number of deaths and 2023 recorded the highest number during the period analyzed. This finding is consistent with the 32.9% reduction in the standardized Aids mortality rate recorded in Brazil since 2013, as well as with the national rates recorded during the same period, which show a gradual decline from 16,000 deaths to 14,000 nationwide between 2019 and 2023, respectively.[5,14] This reduction in the standardized mortality ratio was also recorded in Rio Grande do Sul, falling from 11.2 in 2013 to 7.2 in 2020.[6]

It is observed that the age group with the highest prevalence of deaths was between 50 and 59 years old, which may indicate the impact of chronic infection and the adverse effects of ART after prolonged use, which can hinder long-term adherence. There were no deaths among individuals aged 1 to 19 years, which may reflect the low number of cases recorded in these age groups and also the decrease in the death rate in the age groups under 5 years, 5 to 9 years, and 15 to 19 years, which fell by 77.1%, 79.3%, and 49.5%, respectively.[5]

The predominance of deaths among women contrasts with global data, which since 2010 has shown a more pronounced reduction in mortality rates among women and girls (56%) compared to men and boys (47%). In the national context, records show that since 1980, there have been 392,981 Aids deaths, of which 70.1% occurred among men.[3,5]

This finding may be linked to the different clinical and social characteristics of the infection between men and women, such as different opportunistic infections, differences in toxicity and side effects related to prolonged use of antiretrovirals, difficulty in accessing treatment, and psychosocial issues, including gender violence and prejudice.[15]

Furthermore, it was found that there were more deaths among the white population, which is directly proportional to the number of cases registered in the municipality. However, this contradicts national statistics, since 48% of deaths occurred among brown-skinned people, 15% among black people, and only 34.9% among white people.[5]

Brazil is a signatory to the Sustainable Development Goals (SDGs) and is aligned with the 2030 Agenda, one of whose objectives is the elimination of certain epidemics, such as Aids.[5] Therefore, its elimination becomes a public health issue, and it is important to note that there is a commitment to implement healthy strategies and policies to achieve these goals in a more effective and qualitative manner, such as the establishment of the Healthy Brazil Program – Unir para Cuidar (Healthy Brazil – Unite to Care), which aims to diagnose 95% of people living with HIV and/or AIDS, treat 95% of those diagnosed, and have at least 95% of those people undergoing treatment with an undetectable viral load by 2030.[5] Furthermore, this program also aims to reduce the incidence rate of HIV and Aids mortality by 90% by 2030, compared to 2010 rates.[5]

Limitations of this study included the possibility of underreporting, incomplete information, and/or possible inconsistencies in the records. In addition, the time lag and possible changes in reporting criteria may have compromised the comparability of the data. Furthermore, inadequate interpretation of the data and

the absence of information on the causes of treatment interruption may contribute to the worsening of the clinical condition of individuals.

It is also understood that, in cases of Aids-related deaths, external variables should be considered, as these may interfere with risk factors such as social inequalities, stigma, barriers to access to health services, and behavioral factors, situations that are not captured by the secondary databases used.

To overcome these limitations, it is necessary to reinforce to health professionals the importance of reporting, as well as instructing them on how to correctly fill out these reports, updating them on the reporting criteria. It should also be noted that in order to create more appropriate hypotheses regarding the abandonment of drug treatment and its motivation, it would be necessary to have direct contact with patients who were affected by Aids and whose cases were reported. The same can be said in relation to recorded deaths, since it is not possible to determine the scenario in which these affected population groups find themselves, unless there is access to medical records.

Thus, the data analyzed are important for guiding and improving strategies, actions, and public policies, and local epidemiological patterns should be considered for the development of continuous and multifaceted approaches to combating HIV/Aids in the municipality investigated. Thus, it is important to strengthen intersectoral policies and actions aimed at reducing the incidence of cases and deaths, especially among vulnerable populations, contributing to the fulfillment, at the local level, of national goals for combating Aids.

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AUTHORS' CONTRIBUTIONS

Pamela Amanda Gralow contributed to project management, data collection, writing the abstract, introduction, methodology, discussion, interpretation and description of results, preparation of graphs, conclusions, review, and statistics. **Sophia Scholz Boelter** contributed to writing the abstract, methodology, interpretation of results, preparation of graphs, review, and statistics. **Isadora Molz** contributed to the writing of the abstract, introduction, review, and statistics. **Camile Moraes Haffner** contributed to writing the abstract, revision, and statistics. **Eduarda Guareschi Marchionatti** contributed to writing the abstract, methodology, review, and statistics. Nicole Strassburger contributed to writing the abstract, revision, and statistics. **Carina Suzana Pereira Corrêa** contributed to project management, data collection, writing the abstract, interpreting and describing the results, conclusions, review, and statistics. **Bruna Rezende Martins** contributed to the interpretation and description of results, review, and statistics. **Suzane Beatriz Frantz Krug** contributed to project management, abstract writing, review, and statistics.

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

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