Impact of Mortality Due to Acquired Immunodeficiency in the State of Ceará 2002 - 2022

Impacto da Mortalidade Pela Síndrome da Imunodeficiência Adquirida no Estado do Ceará de 2002 - 2022

Impacto de la Mortalidad por el Síndrome Inmunodeficiencia Adquirida en el Estado de Ceará 2002- 2022

RESUMO

Objetivo: Analisar o impacto dos óbitos causados pela síndrome da imunodeficiência adquirida (AIDS) no estado do Ceará entre 2002-2022. **Método:** Estudo epidemiológico, utilizando dados do Sistema de Informação sobre Mortalidade (SIM/DATASUS), com base na CID-10 (código B24). Realizaram-se análises descritivas (frequência absoluta e relativa) de variáveis sociodemográficas e taxas de mortalidade. **Resultados:** Os óbitos foram mais frequentes entre homens (70%), na faixa etária de 30 a 39 anos (32%), de raça/cor parda (71%), solteiros (64%) e com 1 a 3 anos de escolaridade (21%). **Conclusão:** A mortalidade por AIDS ainda é significativa no Ceará. Estudos contínuos são essenciais para compreender a evolução da epidemia, orientar políticas públicas, melhorar o tratamento e promover estratégias eficazes de prevenção.

DESCRITORES: Epidemiologia;Registros de Óbitos;Síndrome da Imunodeficiência Adquirida.

ABSTRACT

Objective: To analyze the impact of deaths caused by acquired immunodeficiency syndrome (AIDS) in the state of Ceará between 2002-2022. **Method:** Ecological study using data from the Mortality Information System (SIM/DATASUS), based on ICD-10 (code B24). Descriptive analyses (absolute and relative frequency) of sociodemographic variables and mortality rates were performed. **Results:** Deaths were more frequent among men (70%), aged 30 to 39 years (32%), of brown race/color (71%), single (64%) and with 1 to 3 years of schooling (21%). **Conclusion:** AIDS mortality is still significant in Ceará. Continuous studies are essential to understand the evolution of the epidemic, guide public policies, improve treatment and promote effective prevention strategies.

DESCRIPTORS: Epidemiology; Death Records; Acquired Immunodeficiency Syndrome.

RESUMEN

Objetivo: Analizar el impacto de las muertes causadas por el síndrome de inmunodeficiencia adquirida (SIDA) en el estado de Ceará entre 2002-2022. **Método:** Estudio ecológico, utilizando datos del Sistema de Información sobre Mortalidad (SIM/DATASUS), basado en la CID-10 (código B24). Se realizaron análisis descriptivos (frecuencia absoluta y relativa) de variables sociodemográficas y tasas de mortalidad. **Resultados:** Las defunciones fueron más frecuentes entre los hombres (70%), en el grupo de edad de 30 a 39 años (32%), de raza/color pardo (71%), solteros (64%) y con 1 a 3 años de escolaridad (21%). **Conclusión:** la mortalidad por SIDA es todavía significativa en Ceará. Los estudios continuos son esenciales para comprender la evolución de la epidemia, orientar las políticas públicas, mejorar el tratamiento y promover estrategias eficaces de prevención.

DESCRIPTORES: Epidemiología; Registros de Defunciones; Síndrome de Inmunodeficiencia Adquirida.

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INTRODUCTION

The Human Immunodeficiency Virus (HIV) is a retrovirus that mainly affects cells of the immune system, such as TCD4+ lymphocytes, leading to their progressive destruction. Acquired Immunodeficiency Syndrome (AIDS) results from this infection and is characterized by severe immunosuppression, opportunistic infections, malignant tumors, emaciation, and neurological impairment[1].

Recognized as a global public health issue, Acquired Immunodeficiency Syndrome (AIDS) imposes high costs on health systems and is associated with persistent social stigma. The difficulties faced by people living with Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) go beyond the clinical condition, involving social exclusion and barriers to access to treatment. However, with advances in medical science, especially in the development of Antiretroviral Therapy (ART), there has been a significant reduction in morbidity and mortality rates, which has prolonged life and improved the quality of life of patients[2].

The Northeast region of the country ranked second nationally in the proportion of deaths related to Acquired Immunodeficiency Syndrome (AIDS), representing 23.6% of the total. Some states in this region showed an increase in mortality rates, particularly Piauí (28.5%), Ceará (27.1%), Paraíba (15.4%), and Maranhão (2.5%)[3]. In addition, the epidemiological profile has been marked by a predominance of young males between the ages of 30 and 39, with elementary school education and infection originating from heterosexual relations[4].

With the aging population, there has been a change in the mortality pattern associated with Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS), especially in people aged 60 years or older. In 2020, there were 643 deaths in this age group, corresponding to 5.65% of the 11,372 total deaths[5]. In 2016, deaths among the elderly accounted for 11.08% of the national total, with the highest incidence in the Southeast, South, and Northeast regions[5].

Thus, Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) remains a condition with a high social, economic, and health impact, affecting different age groups and regions of the country. The burden on health services, increased costs of hospitalization and therapy, and loss of productivity make it urgent to develop more effective strategies for prevention, early diagnosis, and comprehensive treatment.

This research aims to contribute to a deeper understanding of mortality related to Acquired Immunodeficiency Syndrome (AIDS), focusing on the epidemiological reality of the state of Ceará. The proposed analysis will provide a better understanding of the dynamics of deaths over two decades, providing input for the development of more efficient public policies.

Thus, the objective of the study is to analyze the impact of deaths caused by Acquired Immunodeficiency Syndrome (AIDS) in the state of Ceará between 2002 and 2022, in addition to mapping their distribution during this period.What was the impact of deaths caused by Acquired Immunodeficiency Syndrome (AIDS) in the state of Ceará between 2002 and 2022, considering sociodemographic variables and geographical distribution?

METHOD

This is an epidemiological, descriptive, exploratory, and retrospective study, which was constructed according to the recommendations of the Checklist Strengthening the Reporting of Observational Studies in Epidemiology (STROBE). Ceará is a state located in the Northeast region of Brazil and is the fourth largest state in the country. According to the Brazilian Institute of Geography and Statistics (IBGE), the state has a total area of 148,894.447 km² and a resident population of 8,794,957 people. In 2022, the state had 1,161,434 enrollments in elementary school[6].

The data were collected from the Mortality Information System (SIM) through the website of the Department of Informatics of the Unified Health System (DATASUS). For data selection, the 10th International Classifi-

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cation of Diseases (ICD-10) was used, selecting code B24 and the International Classification of Diseases code for unspecified human immunodeficiency virus (HIV) disease. Deaths from unspecified human immunodeficiency virus (HIV) were collected from 2002 to 2022. Descriptive analyses (absolute and relative frequency) of sociodemographic variables were performed: age group, sex, race/color, education level, marital status, and place of death. The crude rate was calculated by dividing the total number of deaths in the period from 2002 to 2022 by the population in the central year and multiplying by 100,000 inhabitants. The tabulated results were presented in a table and map.

It should be noted that this study does not require review by the Research Ethics Committee, as it is a study using secondary, non-nominal data in the public domain. However, the researchers will strictly follow the ethical aspects and rules and guidelines that regulate according to Resolution No. 466/201212 and Resolution No. 510/2016 of the National Health Council.

RESULTS

Table 1 contains sociodemographic data on deaths by residence due to Human Immunodeficiency Virus (HIV)/ Acquired Immunodeficiency Syndrome (AIDS) between 2002 and 2022 in the state of Ceará, in the following order: sex, age group, color/race, marital status, and education level.The information collected and presented in Table 1 gives us the following results: regarding gender, there were a total of 838 deaths, the majority of which were males, with 583 (70%) deaths, and 255 (30%) females. Regarding age group, 30 to 39 years old, a total of 271 (32%) deaths were obtained, which was the highest rate in the category, followed by the age groups: 40 to 49 years, with 221 (26%), 20 to 29 years with 120 (14%), and 50 to 59 years with 117 (14%).

Table 1- Sociodemographic description of deaths from Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) 2002- 2022 in Ceará. Crateús - CE.

Sex	Deaths by Residence (N)	(%)
Male	583	70%
Female	255	30%
Not specified	-	-
Total	838	100%
Age Group	Deaths by Residence	
Under 1 year	3	0%
1 to 4	1	0%
5 to 9 years	1	0%
10 to 14 years	2	0%
15 to 19	9	2%
20 to 29	120	14%
30 to 39	271	32%
40 to 49	221	26%
50 to 59	117	14%
60 to 69	61	7%
70 to 19 years old	26	4%
80 years old and over	5	1%
Age unknown	1	0%
Total	838	100%
Color/race	Deaths by Residence	
White	145	17%
Black	24	4%
Yellow	2	0%
Brown	599	71%
Indigenous	-	-
Not specified	68	8%
Total	838	100%
Marital status	Deaths by Residence	
Single	533	64%
Married	157	19%
Widowed	38	4%
Legally separated	26	3%
Other	18	2%
Ignored	66	8%
Total	838	100%
Education	Deaths by Residence	
None	87	10%
1 to 3 years	179	21%
4 to 7 years	176	21%
8 to 11 years	143	17%
12 years and older	56	7%
1 to 8	-	-
9 to 11	-	-
Not specified	197	24%

Source: Prepared by the author using data from the Department of Information Technology of the Unified Health System (DATASUS), 2024.

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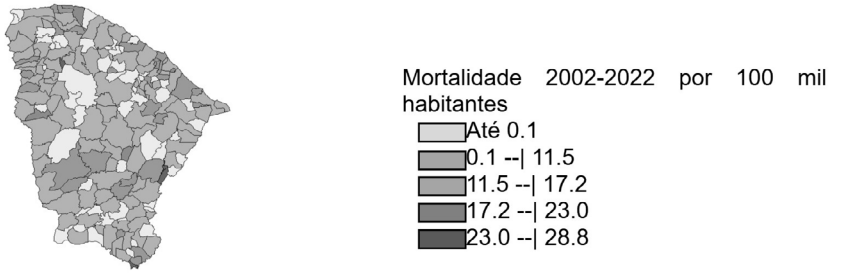
With regard to the distribution of deaths by Acquired Immunodeficiency Syndrome (AIDS), the overall picture was that deaths were related to the sex of the patients, with the highest rates among males, with 583 (70%) of deaths, aged "30 to 39 years," with 271 (32%) being of "brown" race/color, with 599 (71%) deaths, marital status "single," with 533 (64%) deaths, and "low" education, "1 to 3 years" throughout their lives, with 179 (21%) deaths.

FIGURE 1 - Descriptions of deaths from Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) 2002-2022 in Ceará. Crateús-CE.



Source: Prepared by the author with data from the Department of Information Technology of the Unified Health System (DATASUS), 2024.

Figure 1 shows that, during the years 2002–2022, the municipalities of Pena Forte, Pereiro, and Groaíras had a rate of 23.0 to 28.8 deaths per 100,000 inhabitants due to HIV/AIDS, forming the highest index, followed by the municipalities of Milhã, Pindoretama, Ipaporanga, and Acaraú, which also have high rates. Acquired Immunodeficiency Syndrome (AIDS) per 100,000 inhabitants, forming the highest rate, followed by the municipalities of Milhã, Pindoretama, Ipaporanga, and Acaraú, with a rate of 17.2 to 23.0 cases per 100,000 inhabitants. In addition, it is noteworthy that the municipalities mentioned obtained data on deaths for several consecutive years, with emphasis on Groaíras, which had the highest rate, considering the fifteen (15) consecutive years.

DISCUSSION

In Brazil, there has been an increase in the incidence of Human Immunodeficiency Virus (HIV) among cisgender men in the general population, while among cisgender women, this incidence has decreased. There is also a notable increase in the incidence of Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) among adolescents. This increase is more pronounced among cisgender men who have sex with other men (MSM) and transgender women. We can observe in this study that there were a total of 838 deaths, mostly among males with 583 (70%) deaths, and 255 (30%) among females, a number considered moderate for the Northeast region.

In the state of Paraíba, there were 1,295 deaths from HIV, distributed in the 20 to 60 age group, totaling 1,208 (93.3%). The majority, 940 (72.6%), were men, 711 (55%) had incomplete elementary education, followed by 268 (20.7%) with no information and 214 (16.5%) with incomplete high school education (EMI). The percentage of 910 (70.3%) represent brown skin color, 288 (22.2%) white, 917 (70.8%) were single and 257 (19.8%) married[7].

In the state of Bahia, there were large-scale deaths: a total of 5,413. Of these deaths, 4,992 (92.2%) were in the 20 to 60 age group, with 3,542 (65.4%) being men. The majority, 3,106 (57.4%), had incomplete elementary education, followed by 1,200 (22.2%) with incomplete high school education. The predominant race/color was brown, with 3,359 (62%), followed by 1,211 (22.4%) black and 837 (15.5%) white. Most individuals were single, with 4,112 (76%) and 875 (17%) married[7].

In the survey conducted in the city of Porto Alegre, among the sociodemographic variables, among deaths with criteria for investigation by CMAids (Committee for Mortality/Acquired Immunodeficiency Syndrome), attention is drawn to a majority of males, with 56.6% of cases (64/113 cases), an average age of 41 years (standard deviation: 11 years), a higher frequency of white race/skin color (61/113), and a predominance of low educational attainment (61/113 cases had incomplete 8th grade education)[8].

According to the Ministry of Health, since the beginning of the Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) epidemic in 1980, until the end of December 2020, Brazil recorded 360,323 deaths from Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS). Of these, 70.3% were men and 29.7% were women. This phenomenon occurs due to a lack of awareness among men about the importance of accessing preventive and health care services. This makes them less inclined to get tested for Human Immunodeficiency Virus (HIV), seek antiretroviral treatment, and may make them more likely to become ill and die[9].

Reflecting on the most prevalent age group, it is important to talk about early prevention. To prevent new Human Immunodeficiency Virus (HIV) infections, it is essential to adopt preventive measures, such as the proper and consistent use of condoms in all sexual relations, frequent testing for the virus, and the availability of antiretroviral treatment for people with Human Immunodeficiency Virus (HIV), which considerably reduces the transmission of the virus. It is equally crucial to conduct awareness and education campaigns on the importance of prevention and early diagnosis of Human

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Immunodeficiency Virus (HIV)[10].

Brown skin color was the most prevalent among the individuals in this study, with 599 (71%) cases. This is mainly due to socioeconomic status, which is influenced by unequal access to policies for the control of Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS).

Cases of Acquired Immunodeficiency Syndrome (AIDS) are declining in the country among the white population. However, there is a notable increase among people of color. It has been proven that, by 2018, there was a 33.5% increase in cases of Acquired Immunodeficiency Syndrome (AIDS) in this demographic group. This is also reflected in the mortality rate, which in 2017 showed that 60.3% of deaths from Acquired Immunodeficiency Syndrome (AIDS) occurred among black people[11].

This research showed that a good proportion of the indicators regarding marital status are single 533 (64%), followed by married 157 (19%) cases. In the municipality of Montes Claros, Minas Gerais, it was observed that a high percentage of individuals who died were single, representing 21 (65.7%) of cases. This data reflects the particularities of this age group. The dissemination of information and knowledge about sexually transmitted infections is crucial for the population to adopt preventive practices during sexual intercourse, thus contributing to the reduction of the spread of the virus. In this study, it is possible to observe a low level of education, ranging from 1 to 3 years throughout their lives, with 179 (21%) deaths[12]. This data reflects the particularities of this age group. In addition, the high incidence of single people in this study may suggest the presence of risky sexual behaviors, such as having multiple partners and not using barrier methods to prevent sexually transmitted infections (STIs).

The municipality of Jijoca de Jericoacoara, in the state of Ceará, had an incidence between 2007 and 2016. It is a municipality that attracts many tourists, including international visitors, due to its natural beauty and its wild and picturesque appearance. The city is known for its stunning beaches, such as Jericoacoara Beach and Paraíso Lagoon, and for cases of death from Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS).

In the state of Maranhão, located in the Northeast region, the Notifiable Diseases Information System (SINAN) recorded 81 cases of Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) in 2012, according to data from the Federal Unit (UF). In 2016, the mortality rate from Acquired Immunodeficiency Syndrome (AIDS) in Maranhão was 6.3 deaths per 100,000 inhabitants. In the same year, São Luís, the capital of Maranhão, had a detection rate of 41.0 cases of Acquired Immunodeficiency Syndrome (AIDS), according to the Notifiable Diseases Information System (SINAN), ranking 20th among cities with more than 100,000 inhabitants registered in the Notifiable Diseases Information System (SINAN).The study highlights that some municipalities in the state of Ceará had death rates for several consecutive years, between 5 and 10 years, with emphasis on the municipality of Groaíras, which had the highest incidence rate, considering the 15 consecutive years (2002 to 2016)[13].

Regarding the global spread of Human Immunodeficiency Virus (HIV), it is estimated that approximately 4 million people are infected with the virus. This indicates that the spread of the disease has not yet been completely contained, despite a significant drop in the mortality rate due to intense efforts by the pharmaceutical industry to create new antiretroviral drugs. By 2015, the goal was to control and reduce the Human Immunodeficiency Virus (HIV)/Acquired Immunodeficiency Syndrome (AIDS) epidemic worldwide, one of the eight main millennium goals set by each country[14].

Antiretroviral therapy (ART) has revolutionized treatment and clinical outcomes for people living with HIV, transforming HIV infection into a chronic, manageable disease. As a lifelong treatment, the optimal and continuous use of antiretroviral therapy (ART) is essential to ensure the greatest possible therapeutic benefits and minimize subsequent transmission[15].With the proper use of antiretroviral therapies, a significant decrease in opportunistic diseases has been observed, which consequently increases the life expectancy of individuals infected with the Human Immunodeficiency Virus (HIV). However, it is crucial that treatment is followed correctly.

The present study reflects that the Human Immunodeficiency Virus (HIV) affects all age groups and causes a significant number of deaths that profoundly impact the country's public health. The loss of lives at all ages leads to a decrease in the productive workforce, with possible long-term economic consequences. In addition, the costs associated with the treatment and care of individuals infected with the Human Immunodeficiency Virus (HIV) represent a considerable burden on health systems. However, the continued implementation of prevention and treatment programs requires substantial resources. Thus, the Human Immunodeficiency Virus (HIV) not only causes a human tragedy, but also poses significant challenges to the country's socioeconomic development and health infrastructure. In addition, it is necessary to redefine the targets for 2025 with the aim of eliminating Acquired Immunodeficiency Syndrome (AIDS) as a public health threat by 2030[16].

CONCLUSION

This study analyzed the impact of deaths caused by Acquired Immunodeficiency Syndrome (AIDS) in the state of Ceará from 2002 to 2022. The data collected and analyzed revealed significant trends, providing a deeper understanding of the situation of Acquired Immunodeficiency Syndrome (AIDS) in the region.

The need for further studies on mortality from Acquired Immunodeficiency Syndrome (AIDS) is of utmost importance. Continued research is vital to bet-

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ter understand the disease, develop more effective treatments and prevention strategies, and improve the quality of life of affected individuals.

Studies can help monitor the Human Immunodeficiency Virus (HIV)/ Acquired Immunodeficiency Syndrome (AIDS) epidemic and understand how it is changing over time, which can help identify new cases or changes in disease trends.

Finally, it highlights the importance of effective health policies and ongoing awareness programs to combat Human Immunodeficiency Virus (HIV)/ Acquired Immunodeficiency Syndrome (AIDS). In addition, we suggest that future research be conducted to monitor trends in the Human Immunodeficiency Virus (HIV) and death data from Acquired Immunodeficiency Syndrome (AIDS). This is particularly important so that the data recorded can be made available in a more up-to-date form.

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