Epidemiological overview of AIDS in elderly people in the state of Santa Catarina from 2008 to 2018

Panorama epidemiológico da aids em idosos no estado de Santa Catarina de 2008 a 2018

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ABSTRACT

Introduction: In recent years there has been an increase in the number of AIDS diagnoses in the general population, with a significant growth among elderly individuals. **Objective:** To analyze the epidemiological situation of AIDS in the elderly population and its temporal trend in the Santa Catarina State. **Methods:** Ecological study, conducted with the elderly (≥60 years) living in Santa Catarina, who were diagnosed with AIDS and notified in the Brazilian Information System for Notifiable Diseases (SINAN) from 2008 to 2018. The incidence rate according to sex, age group and health macro-region was calculated, as well as the time trend, through linear regression. Race/skin color and scholarity were analyzed by proportion in relation to the total. **Results:** 1,365 cases were notified from 2008 to 2018. There was an increase in cases from 6,7/100.000 in 2008 to 23,1 in 2018 (1,77% yearly), higher among men aged 60 to 69 and living in the area of Florianópolis. **Conclusion:** there was an increase in AIDS notifications among the elderly in the state.
Keywords: sexually transmitted diseases; HIV infections; acquired immunodeficiency syndrome; aged.

RESUMO

Introdução: Nos últimos anos, tem-se observado um aumento no número de diagnósticos de aids na população em geral, entre eles um crescimento expressivo entre indivíduos idosos. **Objetivo:** Analisar o panorama epidemiológico da aids em idosos no estado catarinense e a tendência temporal dos casos. **Métodos:** Estudo ecológico, com idosos (≥60 anos) residentes no estado de Santa Catarina que apresentaram o diagnóstico e a notificação de aids no Sistema de Informação de Agravos de Notificação nos anos de 2008 a 2018. Foram calculadas a incidência segundo sexo, faixa etária e macrorregião de saúde de Santa Catarina, bem como a tendência no período, por meio da regressão linear. Para raça/cor e escolaridade, considerou-se a proporção das notificações em relação ao total de casos. **Resultados:** Foram notificados 1.365 casos no período. A incidência aumentou de 6,7/100.000 em 2008 para 23,1 em 2018 (1,77 pontos percentuais ao ano), sendo maior na faixa etária de 60 a 69 anos, entre homens e residentes na macrorregião da Grande Florianópolis. **Conclusão:** Verificou-se crescimento das notificações de aids em idosos no estado de Santa Catarina.
Palavras-chave: doenças sexualmente transmissíveis; infecções por HIV; síndrome de imunodeficiência adquirida; idoso.

INTRODUCTION

In 2015, according to the Joint United Nations Program on Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (UNAIDS), AIDS had affected 36.7 million individuals worldwide. Among them, 5.8 million were aged 50 or over. Likewise, an increase in the number of Brazilians with the diagnosis of this pathology in this age group can be observed[1]. The lack of knowledge about the sexuality of the elderly, the increase in life expectancy and the development of the pharmaceutical industry, with medications that improve sexual performance or perform hormone replacement, explain that[2].

With the advent of antiretroviral therapy, the control of viral multiplication and the chronification of HIV were seen, reducing morbidity and mortality and also generating an increase in quality of life and life expectancy. Thus, these patients are reaching old age more frequently[3,4].

As the main risk factor for HIV transmission in the elderly is unsafe sexual practice– because, at this age, there is less concern with contraception–, it is important to understand that the elderly has desires, and these combined with protected sexual practice can contribute to an improvement in quality of life[5,6]. However, as this subject is very rarely approached, it can directly influence the increased vulnerability to sexually transmitted infections (STIs), such as HIV infection[5]. Although this is notorious, little is done for the awareness of the elderly about infections, their prevention and treatment, since most campaigns related to STIs do not include this age group[6].

In 2018, according to the HIV/AIDS epidemiological bulletin, there were 43,941 new cases of HIV infection in Brazil, including 1,665 cases in individuals over 60 years of age[7]. Furthermore, Santa Catarina is one of the Brazilian states most affected by AIDS, with a detection rate of 26.8 cases/100,000 inhabitants, while Brazil's rate is 18.3 cases/100,000[8].

Over the past 10 years, our state has registered an average of 2,200 new AIDS cases annually. From 2007 to June 2018, 11,234 cases of HIV infection were reported in Santa Catarina, through the Information System for Notifiable Diseases (Sinan), in all age groups, mainly in municipalities in the macro-region of Greater Florianópolis[9].

OBJECTIVE

The aim of this study was to provide an epidemiological overview of AIDS cases in elderly people living in Santa Catarina, Brazil, from 2008 to 2018.

METHODS

This is an ecological observational study, whose study population consisted of individuals residing in the state of Santa Catarina, in southern Brazil (estimated population of 7,252,502[10]), aged over 60 years (elderly), who had been diagnosed with AIDS in the years

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2008 to 2018 and presenting a notification, therefore not including asymptomatic HIV infections. All elderly individuals registered in Sinan were included, with data available through the virtual platform of the Epidemiological Surveillance Board (DIVE). Cases with unavailable data were excluded.

Variables were chosen based on the notification form. Year of notification, age group, sex, macro-region of residence, race/skin color and education were used.

Data collection was performed using the TABNET – Sinan database, available on the DIVE website (http://200.19.223.105/cgi-bin/dh?sinan/def/tetac.def). Population data were obtained from the virtual platform of the Informatics Department of the Unified Health System (DataSUS). To calculate the incidence rate according to sex, age group and macro-region of interest, the number of cases reported in the elderly population in each category and the year of analysis was divided by the reference population and multiplied by 100,000.

The denominator, for the years 2008 to 2012, was made up from data from the 2010 population census conducted by the Brazilian Institute of Geography and Statistics[11]. For the period from 2013 to 2018, data from the population estimate for the year 2015 provided by the Inter-Agency Health Information Network (RIPSA) were considered[12].

Due to the unavailability of population data according to the variables race/skin color and education, the proportion of cases per category was calculated considering the total number of cases each year, multiplied by 100.

To analyze the compilation of the entire period (2008-2018), the average incidence was calculated considering: total number of notifications/number of years analyzed and, as a denominator, the reference population for the year 2013 (middle of the period), provided by RIPSA. Differences according to sex, age group and macro-region were evaluated by the binomial proportion Z test.

The percentage variation of rates was calculated, considering the initial and final year of the series, based on Equation 1:

[(final rate–initial rate)/initial rate] × 100 (1)

Time series analysis was based on linear regression analysis, considering incidence as the response variable and year as the explanatory variable. The mean annual variation was determined by the value of the beta angular coefficient (β), which represents the mean annual increase/decrease in incidence for each category and year analyzed. The model's adequacy was evaluated by the coefficient of determination (R^2). The significance level adopted was 5%. After extracting and tabulating data on a Microsoft Excel spreadsheet, the content was analyzed using the Statistical Package for Social Sciences (SPSS) version 21.0.

Information from a publicly accessible database was used, without research subjects, only analysis population. Thus, this study does not fall under the terms of National Health Council Resolution 466/2012 (chapter XIII, item 3) and 510/2016 (Art. 1st sole paragraph, items II, III and V) for consideration by the Ethics Committee for Research Involving Human Beings.

RESULTS

During the study period, more than a thousand cases of AIDS in the elderly were reported in the state of Santa Catarina. The average incidence in the period was 16 cases/100,000 inhabitants, going from 6.7 in 2008 to 23.1 in 2018, a 245% increase in notifications over 10 years.

Table 1 shows the sociodemographic profile of cases and the average incidence for the period. **Table 2** shows the incidence rate trend over the years covered, specified by sex, age group and macro-region.

In relation to sex, the incidence was higher among men in all years, being 50% higher in 2018. Over the period analyzed, there was a significant increase in both sexes, but also higher in the male population (284%). **Figure 1** illustrates the variation in incidence per year.

As for age group, the age range between 60 and 69 years was shown to be more affected, with 31.4 cases per 100,000 inhabitants

Table 1 – Sociodemographic profile of elderly individuals (≥60 years old) with AIDS in the state of Santa Catarina (Brazil) and average incidence in the period from 2008 to 2018.

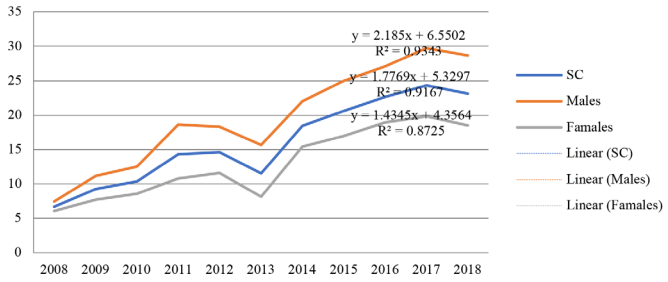
Santa Catarina	N	%	Average incidence*	p-value
	1.365	100	16.6	-
Sex				
Male	759	55.6	20.4	<0.001
Female	606	44.4	13.4	
Age range (years)				
60-69	1121	82.1	23.1	<0.001#
70-79	217	15.9	9.2	<0.001$
80 and more*	27	2.0	2.6	
Macro region				
Mid-West, Serra (T1)	74	5.4	6.0	∞
Great West (T2)	91	6.7	8.8	0.349 (T1xT2)
Northeast and North Plateau (T3)	216	15.8	14.8	0.011(T1xT3)
Vale do Itajaí (T4)	194	14.2	15.8	0.005 (T1xT4)
South (T5)	221	16.2	17.5	0.0214 (T2xT5)
Great Florianópolis (T6)	342	25.0	25.4	0.006 (T3xT6); 0.024 (T4xT6)
Foz do Rio Itajaí (T7)	225	16.5	32.9	<0.001(T5xT7)

*Considering the average of notifications in the period (11 in total) and, in the denominator, the population of 2013 (mid-period) provided by the Interagency Health Information Network × 100,000; #comparison of 60–69 years old with 70–79 years old and 80 years old and over; $comparison of 70–79 years with ≥80 years; ∞p values indicate which comparison resulted in significant differences in rates according to macro-region, considering p<0.05.

Table 2 – Trend in AIDS incidence rate among the elderly (≥60 years) per year in the state of Santa Catarina (Brazil), specified by sex, age group and macro-region.

Incidence*	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Coefficient B#	p-value	R^2
Santa Catarina	6.7	9.3	10.4	14.3	14.6	11.6	18.4	20.6	22.6	24.3	23.1	1.77	<0.001	0.92
Sex														
Male	7.5	11.2	12.5	18.6	18.3	15.7	22.0	25.0	27.1	29.7	28.7	2.18	<0.001	0.93
Female	6.1	7.7	8.6	10.8	11.6	8.2	15.4	17.0	18.9	19.8	18.5	1.43	<0.001	0.87
Age range (years)														
60-69	9.7	13.9	13.9	21.0	21.3	16.3	25.7	29.7	29.7	33.6	31.4	2.33	<0.001	0.89
70-79	3.6	3.6	6.7	6.7	7.7	5.6	9.8	9.8	15.4	13.7	14.9	1.20	<0.001	0.87
80 and more	0.0	1.2	2.5	1.2	0.0	2.8	3.8	1.9	5.7	4.7	2.8	0.39	0.014	0.51
Macro region														
South	8.9	10.9	12.9	12.9	18.8	9.5	19.7	26.0	17.4	28.4	22.1	1.60	0.010	0.57
Northeast and North Plateau	6.1	5.2	12.2	13.0	15.6	14.9	13.6	17.0	19.7	18.3	22.4	1.42	<0.001	0.82
Mid-West and Serra	2.0	4.9	1.0	3.9	4.9	6.6	6.6	12.3	6.6	6.6	8.2	0.63	0.043	0.42
Great West	3.6	4.8	4.8	8.4	8.4	8.7	15.5	10.7	5.8	12.6	10.7	0.66	0.081	0.33
Great Florianópolis	6.7	15.3	13.4	29.6	18.1	14.5	24.6	29.0	33.3	41.3	42.0	0.24	0.002	0.82
Foz do Rio Itajaí	16.9	18.8	26.3	26.3	30.1	17.1	37.1	37.1	60.0	42.9	37.1	2.97	0.020	0.51
Vale do Itajaí	7.2	9.2	8.2	10.2	12.3	10.5	19.4	17.0	26.7	25.1	21.1	2.00	<0.001	0.79

*Number of reported cases/mid-term reference population × 100,000 inhabitants. For data from 2008 to 2012, population referring to 2010 was considered. For data from 2013 to 2018, population estimates from the Inter-Agency Health Information Network for 2015; #average annual variation, in percentage points per year, referring to coefficient B of linear regression.



SC: Santa Catarina.

Figure 1 – Trend in the incidence of AIDS cases among the elderly (≥60 years old) in the state of Santa Catarina (Brazil), from 2008 to 2018, specified by sex.

in 2018, and a significant annual growth of 2.33 cases per year (**Table 2**). There was also an upward trend between the ages of 70 and 79 years.

With regard to macro-regions of residence, Greater Florianópolis stood out with the highest incidence rate, increasing from 6.7 cases/100,000 inhabitants in 2008 to 42 in 2018, an expansion of 526%. The highest average annual variation in the period was for the regions of Vale and Foz do Rio Itajaí, increasing by two percentage points per year. **Table 2** shows the incidence trend by macroregion.

Table 3 shows data on race/skin color and education of individuals assessed in the study and the proportion in relation to the total number of cases.

The white race/skin color stands out, in the vast majority of cases.

As for level of education, we noticed a predominance of incomplete 5th to 8th grade of elementary school, followed by the interval from incomplete 1st to 4th grade of elementary school (**Table 3**). The large number of cases with ignored/blank education is also worth mentioning.

Table 3 – Racial and educational profile of elderly individuals (≥60 years) with AIDS in the state of Santa Catarina (Brazil) from 2008 to 2018.

Santa Catarina	N	%
	1,365	100
Race/skin color		
White	1,197	87.69
Black	80	5.86
Yellow	6	0.44
Brown	58	4.25
Indigenous	5	0.37
Ignored	19	1.39
Education		
Illiterate	98	7.18
1st–4th grade, incomplete elementary school	233	17.07
4th grade, complete elementary school	176	12.89
5th–8th grade, incomplete elementary school	295	21.61
Complete elementary school	138	10.11
Incomplete high school	52	3.81
Complete high school	138	10.11
Incomplete higher education	20	1.47
Complete higher education	71	5.20
Ignored	144	10.55

DISCUSSION

From 2008 to 2018, in the state of Santa Catarina, notified cases of AIDS in the elderly population had a linear growth trend, with a slight decrease only in 2012 to 2013 and 2017 to 2018. These data disagree with those exposed in the Epidemiological Bulletin on

HIV/AIDS in 2019, which describes a decrease in the annual number of cases in Brazil since 2013. However, in the same source, we can see a concentrated distribution in the Southeast and South regions[7].

When analyzing the most affected age group, most cases occur between 60 and 69 years. A similar result was found by Maia et al., who pointed out that 86.8% of cases were in this age group, and by Aguiar et al., with a mean age of 64.98 years[13,14]. Furthermore, this group, allied to the variable male sex, is characterized as a likely diffuser of the AIDS epidemic in the elderly. It is also inferred that the infection in this population may have occurred before, because, on average, from infection to diagnosis and notification, it takes 5 to 10 years[13].

The findings point to a greater number of cases among men, which is similar to what Pereira et al. found in a descriptive study in Rio Grande do Sul, whose scenario had 59.3% males, and Castro et al. in an ecological study in Minas Gerais, with 67.8% males[15,16]. A factor that justifies the higher incidence in this group is sexual practice with multiple partners, as well as irregular use of condoms and random relationships[17]. Men who have sex with men and injecting-drug users also stand out[9]. However, it is suggested that the female sex is vulnerable to contracting the infection from partners who have extramarital relationships[18,19].

Among the macro-regions, Great Florianópolis stands out. This finding is corroborated by the study by Vaz et al., which shows that HIV cases notified from 2007 to 2017 are concentrated in the health macro-regions of Great Florianópolis, Foz do Rio Itajaí and Vale do Itajaí, corresponding to 58% of the total number of cases in the state[20]. However, these data contrast with the review by Silva et al., according to whom the most frequent origin was residents from regions far from the capitals, supported by the fact that the epidemic in Brazil has become internalized, especially since 1990[21].

In the present study, the white population was majority. This is in line with the cross-sectional study by Dartora et al., which highlights that 46.9% of individuals diagnosed with AIDS in Brazil in the years 2005 to 2012 are white[22]. This can be justified by the population of Santa Catarina being mostly white due to its colonization by the German, Italian and Portuguese people[23].

Education is used to assess the socioeconomic status of a population. In this study, most cases were found in individuals who had incomplete 5th to 8th grades of elementary school. This finding shows a population with low educational level, similar to the study by Santos et al., which showed 47.1% of individuals having only completed elementary school, and the study by Torres et al. in which the number of years studied ranged from one to four[19,24]. It is also pointed out that low education would influence access to information about prevention, the belief that condoms are linked to contraception only, and even the adherence to antiretroviral therapy[24]. Furthermore, Melo et al. reported that 86.9% of the elderly residents in the South region have low education, mostly elementary education only[25].

Thus, the importance of this STI is denoted not only in terms of health, but also economy. A study on the cost of the disease has showed that, in Brazil, the annual costs of prevention and mainly the treatment of AIDS exceed 1 billion reais, given the complexity and comorbidities involved[26].

It is essential to broaden the focus of prevention, which currently focuses on young adults, as this study exposes the vulnerability and misinformation of the elderly population in relation to the disease, as well as the invisibility of the elderly's sexuality. It is extremely important to break the taboo on sexuality so that the discomfort of health professionals in addressing this issue is reduced and information about prevention for this age range can be spread[1].

This study, however, has limitations such as the use of notifications due to the worsening of AIDS, not including asymptomatic HIV infections. Considering that AIDS has had mandatory notification since 1986 and that HIV infection only since 2014 (Ordinance No. 1,271, of June 2014), asymptomatic cases can be a bias towards the real dimension of the contamination in this state. In addition, the unavailability of population data stratified by age group and macro-region for the entire study period made possible the use of years 2010 and 2015 only to calculate incidences.

On the other hand, this study portrays a little explored reality of the disease, which is the possibility of exposure, infection and illness in a population considered elderly, but sexually active, especially when considering the increase in life expectancy in the longest-lived population in the country.

CONCLUSION

AIDS is a reality in the population aged 60 years and over in Santa Catarina and, between 2008 and 2018, we report an increasing incidence in both sexes, in different age groups and in most of the state's macro-regions, especially in Foz do Rio Itajaí. Given the above, it is necessary to increase prevention measures against AIDS aimed at the elderly. Counseling process, in addition to reducing costs, can be a tool to inform and encourage safe practices, dispel myths and prejudices, and support people living with HIV.

Participation of each author

GEM participated in study design, was responsible for data collection and the first version of the manuscript. BPMI assisted in the study design, data collection and analysis, and manuscript review. BTR and FBC collaborated with the writing of the article and its review. DAI coordinated the study from its conception to the final review.

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Conflict of interests

There is no conflict of interest to be reported.

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