Epidemiological aspects mortality of acquired immunodeficiency syndrome in the city of Florianópolis, Brazil (1986–2006)

Aspectos epidemiológicos da mortalidade por síndrome da imunodeficiência adquirida em Florianópolis, Brasil (1986–2006)

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ABSTRACT

Introduction: The acquired immunodeficiency syndrome (AIDS) affects young adults of working age and commits sectors of society. **Objective:** To describe epidemiological aspects of AIDS deaths, people aged 13 and older living in Florianópolis (SC) from 1986 to 2006. **Methods:** descriptive, retrospective study of secondary data from the National Information System for Notifiable Diseases (Sinan), Information System (SIM) and the Brazilian Institute of Statistics and Geography and Statistics (IBGE). **Results:** There were 1,285 deaths, with 954 men and 331 women. Among them: men aged between 20 and 39, ignored skin color, complete high school and exposure categories for drugs and/or heterosexuality; women aged between 20 and 39, complete high school, ignored skin color, exposure categories and heterosexual heterosexual/drugs. **Conclusion:** The main epidemiological characteristics were age between 20-39 years old, male, skin color ignored, the average level of schooling. In males, the exposure category, emphasis is given to drugs, heterosexual/drugs, heterosexual and homosexual, the female standouts are the categories heterosexual, heterosexual/drugs and drugs. The ratio of deaths was higher among men than among women. Deaths due to AIDS in Florianópolis, show a decline from 1996 with improved survival for patients with AIDS.
Keywords: acquired immunodeficiency syndrome; mortality; epidemiology.

RESUMO

Introdução: A síndrome da imunodeficiência adquirida (AIDS) afeta os adultos jovens em idade produtiva e compromete setores da sociedade. **Objetivo:** Descrever aspectos epidemiológicos dos óbitos por AIDS de pessoas com 13 anos e mais residentes em Florianópolis (SC) entre 1986 e 2006. **Métodos:** Estudo descritivo, retrospectivo, de dados secundários do Sistema de Informação Nacional de Agravos de Notificação (Sinan), do Sistema de Informações sobre Mortalidade (SIM) e do Instituto Brasileiro de Geografia e Estatística (IBGE). **Resultados:** Ocorreram 1.285 óbitos, sendo 954 de homens e 331 de mulheres. Destacam-se: os homens com idade entre 20 e 39 anos, cor da pele ignorada, ensino médio completo e categorias de exposição drogas e/ou heterossexualidade; as mulheres com idade entre 20 e 39 anos, ensino médio completo, cor da pele ignorada, categorias de exposição heterossexual e heterossexual/drogas. **Conclusão:** As principais características epidemiológicas foram idade entre 20 e 39 anos, sexo masculino, cor da pele ignorada, escolaridade entre o nível médio. No sexo masculino, quanto à categoria de exposição, há destaque para drogas, heterossexual/drogas, heterossexual e homossexual; no sexo feminino, os destaques são as categorias heterossexual, heterossexual/drogas e drogas. A razão dos óbitos foi maior entre os homens do que entre as mulheres. Os óbitos por AIDS em Florianópolis apresentaram declínio a partir de 1996, com aumento de sobrevida para portadores de AIDS.
Palavras-chave: síndrome da imunodeficiência adquirida; mortalidade; epidemiologia.

INTRODUCTION

The acquired immunodeficiency syndrome (AIDS) has become a cruel disease for humanity. Researchers believe that the human immunodeficiency virus (HIV) started being disseminated beyond Africa, affecting men, women and children in the 1970s — 1971 precisely. It affects working young adults, thus impairing some sectors of the society, causing social and economic problems in the workforce or in the number of orphans due to the disease across the world[1,2].

The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates that in 2010 there were 34 million people with HIV in the world, 6.65 million with AIDS under treatment, 70 million pregnant women protected and under retroviral treatment, 20 million homosexuals, 7 million sex workers, 10 million injecting drug users (IDUs) being assisted at HIV/AIDS prevention services, and 7 million orphans due to the disease[3].

Forecasts for the next two years were 2.6 million new cases of AIDS, 1.3 million avoidable deaths due to opportunistic illnesses, increasing up to 50% of the disease incidence. Statistics indicate a reduction in AIDs incidence; however, sex workers, homosexuals and IDUs are still disproportionally affected by the epidemics. Fifty percent of people eligible for AIDS treatment worldwide do not have access to antiretroviral, children affected have less access to treatment compared to adults, and many people are unaware of their serologic status[3].

In Brazil, AIDS follows the same path as in other countries. Researchers have been studying trends and determinant factors of the disease, defining the epidemics behavior in social nuclei (federal States and regions), and helping structure and organize public policies of the Sexually Transmitted Diseases-AIDS National Program[4,5].

Between 1980 and 2011, 608,230 new cases of AIDS were registered in Brazil, in increasing order by region: 323,069 in the

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Southeast, 104,671 in the South, 64,706 in the Northeast, 31,011 in the Central-west, and 21.389 in the North[6].

Between 1980 and 2010, 241,469 deaths by AIDS as basic cause have been reported. In the last ten years, there was a reduction by 11.1% in mortality by AIDS in the country, but an increase in North, Northeast and South regions. Nevertheless, obits dropped in Southeast region and stabilized in the Central-West region[6].

In 2010, the State of Santa Catarina was in the 3rd place in the ranking of cases of AIDS in Brazilian federal states and in the 4th place in the ranking of incidence (30.2/100,000 inhabitants) and mortality rate (9.4/100,000 inhabitants), which is above the national average. Since 1998, Florianópolis, capital of Santa Catarina, have been placed among the cities with the highest rates of incidence and mortality in Brazil[6].

The questioning of this paper, based on the literature, is: what is the trajectory of AIDS in adults (notified and investigated) living in Florianópolis between 1986 and 2006?

The choice of this period is justifiable by the notification of the first case of AIDS in Florianopolis in 1986, and by the breakup of the prevention, assistance and care services for HIV/AIDS into the island and mainland territories of the city in 2006.

OBJECTIVE

To describe epidemiological aspects of deaths by AIDS among people aging 13 or more and living in Florianópolis between 1986 and 2006.

METHODS

This is a descriptive and retrospective study. The study population was composed of adults with AIDS living in Florianópolis, registered between 1986 and 2006 in the National Disease Notification System – AIDS (SINAN-AIDS) and in the Mortality Information System (SIM), and who died due to AIDS between 1986 and April 2010.

The orientation for cases were AIDS notification and investigation sheets for patients aging 13 or more[7], and death certificates (DC) as a source of notification (suspected or confirmed); therefore, all deaths due to AIDS as a primary/basic or contributing/secondary cause registered in SINAN-AIDS and SIM.

As the validated cases, after final diagnosis, with the SINAN-AIDS sheets properly filled in by the deadline and sent, after investigations, to the municipal, state and federal scopes[8]. Inclusion criteria was: people aging 13 years or more[7], notified for AIDS between 1986 and 2006, both genders, living in Florianopolis, searched for in SINAN-AIDS and/or SIM for death due to AIDS until April 2010, as well as cases meeting criteria by the AIDS epidemiological surveillance, based on the norms by the Center for Disease Control (CDC), in the USA: modified CDC criteria, Rio de Janeiro/Caracas criteria, exceptional CDC criteria, exceptional criteria for deaths and/or exceptional ARC criteria (AIDS-Related Complex) + death[8].

Exclusion criteria were cases in persons under 13 years of age, cases not meeting the criteria by the AIDS epidemiological surveillance, obits not related to AIDS (as primary/basic or contributing/secondary cause) and duplicity of cases in SINAN-AIDS and SIM.

We requested authorization for data collection, in March and April 2010, from SINAN-AIDS and SIM, at the epidemiological surveillance sector of the Municipal Department of Health in Florianópolis. Demographic data were collected from the website of Brazilian Institute of Geography and Statistics (IBGE), made available in March 2010[9].

The variables collected from SINAN-AIDS and SIM were: gender (male, female, ignored), age group (<20 years, 20–29, 30–39, 40–49, 50–59, 60 and more), akin color (white, other, ignored), education level (none, elementary school, high school, higher education, ignored), exposure category (work-related accident, bisexuality, bisexuality/drugs, drugs, hemophilia, hemophilia/drugs, heterosexuality, heterosexuality with risk partners, heterosexuality/drugs, heterosexuality/hemophilia, homosexuality, homosexuality/drugs, ignored), and population data of men and women living in Florianópolis between 1986 and 2006.

The software Epi Info 3.5.1 of the DCD was used to organize and analyze data. Results are presented in absolute numbers and frequencies, mortality coefficient and graphs.

The study was approved by the Ethics Committee of Universidade Federal de Santa Catarina (UFSC) in November 5, 2009, process 331, title page 290589, registration number 3813.0.000.242-09.

RESULTS

Between 1986 and 2006, SINAN-AIDS registered 3,209 cases of AIDS in adults from Florianópolis, aging 13–60 years or more. Of these cases, 1,285 adults (40%) died due to AIDS in Florianópolis from 1987 to January 2010, being 954 (74.2%) males and 331 (25.8%) females. The ratio between males and females was (M/F) 3:1.

Results show that deaths in adults aging 20–29 years of both genders are prevalent (71.7% males and 70.4% females) (**Table 1**).

There are significant differences between the variables sex and schooling; however, most adults had finished high school (83.1% males and 84.8% females) (**Table 1**).

As to the variables gender and skin color, the larger number of obits in males and females was in the ignored category (63.4% males and 59.5% females). We must emphasize that the variable "skin color" was not properly filled in, which resulted in a large number of ignored cases (**Table 1**).

Regarding sex and exposure category, men were more related to drugs, heterosexuality/drugs, heterosexuality and homosexuality, totaling 77.7%. Women, on the other hand, were mostly associated with heterosexuality, heterosexuality/drugs and drugs, with prevalence of 84.3% (**Table 2**).

Mortality rates were stable in ascending order between 1987 and 1996, with a drop in deaths after this period and consequent increase in survival rates among adults living with AIDS (**Table 3**).

About the survival and mortality by AIDS between 1986 to 2006, it was observed that between 1995-1997 the number of deaths decreases significantly, confirming the increased survival of carriers from that period (**Graph 1**).

Table 1 – Distribution of deaths due to AIDS in adults according to gender and age group, schooling and skin color, Florianópolis, Santa Catarina, Brazil (1986-2006).

Gender	Males 954		Females 331	
Variables	**f**	**%**	**f**	**%**
Age Group				
<20 years	16	1.6	15	4.6
20–29 years	276	28.9	105	31.7
30–39 years	408	42.8	128	38.7
40–49 years	173	18.1	54	16.3
50–59 years	55	5.8	18	5.4
60 and +	26	2.8	11	3.3
Schooling				
None	47	5.0	19	5.8
Elementary	200	21.0	67	20.2
High	593	62.1	214	64.6
Higher	82	8.6	18	5.4
Ignored	32	3.3	13	4.0
Skin color				
White	290	30.4	99	30.0
Others	59	6.2	35	10.5
Ignored	605	63.4	197	59.5

f: frequency.
Source: National Disease Notification System (SINAN), Mortality Information System (SIM) (March and April 2010).

Table 2 – Distribution of deaths due to AIDS in adults according to gender and exposure category, Florianópolis, Santa Catarina, Brazil (1986–2006).

Gender	Males 954		Females 331	
Exposure category	**f**	**%**	**f**	**%**
Work–related accident	1	0.1	–	–
Bisexual	45	4.7	–	–
Bisexual/drugs	23	2.4	–	–
Drugs	237	24.8	37	11.2
Drugs/hemophilic	1	0.1	–	–
Hemophilic	1	0.1	–	–
Heterosexual	172	18.0	179	54.1
Heterosexual/drugs	221	23.1	63	19.0
Heterosexual/hemophilic	1	0.1	–	–
Heterosexual with risk partner	44	4.6	34	10.3
Homosexual	113	11.8	–	–
Homosexual/drugs	35	3.6	–	–
Ignored	64	6.6	18	5.4

f: frequency.
Source: National Disease Notification System (SINAN), Mortality Information System (SIM) (March and April 2010).

Table 3 – Coefficient of mortality by acquired immunodeficiency syndrome per 10,000 inhabitants by sex. Florianópolis, Santa Catarina, Brazil (1986-2006).

Year	Gender		Year	Gender	
	Males	**Females**		**Males**	**Females**
1987	0.1	0.1	1997	5.6	1.5
1988	0.7	0.4	1998	4.9	1.0
1989	0.9	–	1999	4.6	1.0
1990	2.2	0.1	2000	4.3	1.1
1991	1.7	0.6	2001	4.4	1.6
1992	3.3	1.1	2002	4.7	1.4
1993	4.9	1.7	2003	4.4	1.7
1994	7.7	2.0	2004	4.3	0.9
1995	7.0	2.4	2005	4.5	1.8
1996	7.2	2.3	2006	4.1	1.2

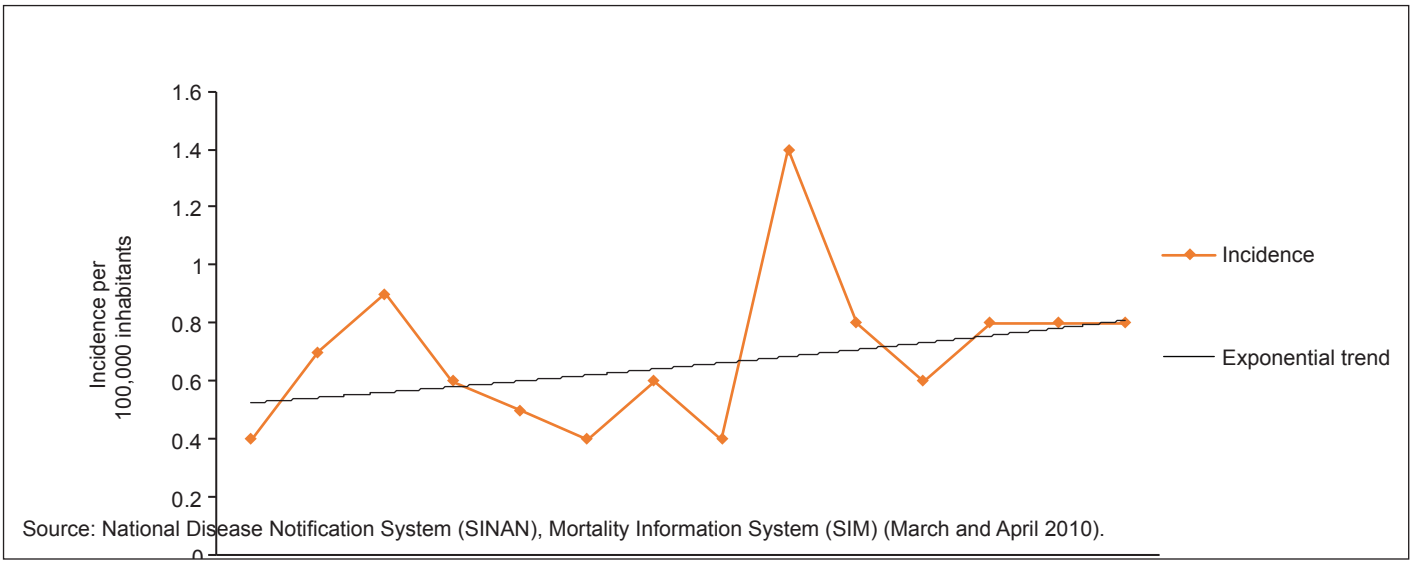
Source: National Disease Notification System (SINAN), Mortality Information System (SIM) and SUS Database (DATASUS) (March and April 2010).

DISCUSSION

In 2002, the Special Session of the United Nations General Assembly (UNGASS) was devoted to listing the monitoring and assessment of AIDS central indicators: contextual indicators, indicators related to the Brazilian Program for DST/AIDS, and impact indicators (morbimortality)[10]. In 2005, the UNGASS updated these indicators to commitment and social actions, behavior and knowledge, and impact (population at higher risk of HIV infection). The new indicators cover the monitoring of population subgroups (15–24 years old) in countries presenting concentrated epidemics, including Brazil. The risk of neglecting a population group to the detriment of exposed subgroups represents a fragility of the monitoring proposal: to renege on HIV/AIDS among young adults[10].

The literature tell us that, in the historical series from 1980 to 2011 in Santa Catarina, 30,284 cases of AIDS and 8,806 deaths by AIDS were reported[6]. In 2009, the Epidemiological Report by the Health Ministry showed that, among the 15 municipalities with the larger number of AIDS cases reported in Santa Catarina in the 1980s and 1990s, 51.1% were related to Florianópolis municipalities: Joinville and Itajaí[11].

Research show that the population who sought to find out their serologic status for HIV in Centers for Testing and Counseling (CTA) of Santa Catarina between 1984 and 2005 was composed of men and women who had been exposed to the HIV by sexual and blood routes, aging 20–29 years and followed by 30–39 year-olds[10,11]. Age groups with higher prevalence of deaths by AIDS in Florianópolis are those who seek the CTAs, that is, adults.



Graph 1 – Historical series of adults with AIDS according to year of diagnosis and current status (alive or dead), Florianópolis, , Santa Catarina, Brazil (1986–2006).

The analysis of the results unfolds deaths among adults aging 20–39 years; however, young adults and elderly (extremes of age groups) are vulnerable and exposed to the disease and to death. Studies on this condition indicate that late diagnosis, delayed treatment and the decrease in immune response also decrease survival of patients with AIDS, thus increasing the number of deaths[12].

Results show that adults who died due to AIDS compose a significant portion of the working and reproductive population, so they are more likely to infect their sexual partners. Advances in AIDS diagnosis and treatment emphasize that deaths interfere with family and social structures, investments in prevention actions and health promotion, which makes the follow-up with Family Health Teams, in the implementation of Adolescents, Men and Women Health Policies, really important for a new perspective of the disease involution[12,13].

The social level of adults who died by AIDS is a good parameter for the access to health services and care[10]. Lacking information about adults' income, we analyzed schooling. In Florianópolis, 62.1% of men and 64.6% of women had fulfilled elementary and high schools. In the analysis by age group, low educational levels among men increase deaths; among females, high educational levels increases deaths. There may be tendency among males with low schooling of not using protection in heterosexual/bisexual relations and when using injecting drugs, sharing needles or syringes without thinking about possible risks for their partners' health[4].

Among females, the risk of death increases along with the educational level. Many women find out AIDS when performing HIV tests, in antenatal care or after the death of their sexual partners. Women tend to accept unprotected sexual relations either by a request by their partners or by the belief that the person would not infect them. These situations imply the responsibility of health professionals in the approach to changes in sexual behavior[13-16]. Skin color is a gap in data collection, as the study shows. Historically, it leads our society to social and economic inequality, hampering an equal access to assistance and treatment in some parts of the country[17].

Predominantly Azorean ascendancy in Florianópolis, mixed with the immigration of Italians, Germans and other European people, and with people from neighboring States and from the Southeast region suggest predominance of white skin among the deaths by AIDS[18]. Information found in AIDS and Obit Declaration (OD) investigation sheets may be related to the cultural aspect of feeling part of an ethnical group, and the association between skin color and social status[17]. The depreciation of health professionals in the form filling by patients is also an important factor.

Studies performed in Brazil show that, in the 1980s, cases of AIDS were restricted to men, hemophilic patients, bisexual men, women with IDUs as partners and female sex workers[19,20]. In Florianópolis, the number of obits by AIDS, since the epidemics started, supports the finding in studies regarding exposure categories among males (IDU, heterosexual/IDU and heterosexual) and females (heterosexual, heterosexual/IDU and IDU).

Untill the 1990s, issues with drug trafficking and consumption, especially cocaine, showed the exposure of IDUs to AIDS in the South region, with epidemics spotted in coastal municipalities of Santa Catarina and Rio Grande do Sul[15,17,21]. These facts represent the process of heterosexualization, feminization, interiorization and impoverishment of the disease in the 20th century.

Women had been exposed to HIV, a risky situation that favors infection. AIDS, a disease that is insidious and asymptomatic for years; the economic dependency on their sexual partner; informal or low-paid employability; cultural social and religious patterns; sexual and domestic violence; and the lack or inefficiency of public policies aimed at females contribute to their exposure and vulnerability. Women aging 30–39 years (47.5%) reported not using condoms and women above 40 years old (64.3%) reported never having used it in sexual relations, which makes clear their total exposure to the virus[17,22].

The drop in mortality starting from 1996 is related to the introduction of antiretroviral treatment, increasing survival (with quality of life)

from 10 to 15 years, even though the disease is not curable. Late diagnosis, resistance of patients to antiretroviral drugs, gaps in assistance, difficulties in adhesion and improper treatment of co-infections such as hepatitis and tuberculosis still contribute to lethality among adults living with AIDS. The access to prevention resources, to health services and to early treatment, on the other hand, favor survival among these patients[17,21].

Stabilization and reduction in obits are related to the treatment with antiretroviral drugs, especially in the South and Southeast regions, where the epidemics is established for longer, with the control of drugs entrance and consumption, the change in the pattern of injecting drugs use to oral or inhalation routes (ecstasy, crack rocks, crystal, among others), and the reduction of cases among homosexual/bisexuals, and IDUs[5].

There is an approximation in the curve for the year of diagnosis and the year of death until 1995, but from 1996 on, the values were dissociated, as there was a reduction in the number of deaths and an increase in AIDS notifications.

These counterpoints of the population in the 1980s and beginning of 1990s are a characteristic of morbimortality by AIDS. When the subject is prevention, Brazil has invested in public policies to promote access to health, education and social features for the population in general[10,11,13,21].

Epidemiological surveillance of Florianópolis, paying attention to AIDS and to the perspective of treatment with antiretroviral drugs, invested in a decentralization of assistance to AIDS patients and created, starting in 2006: two Specialized Centers (SAEs) located in the center and in the mainland, two Assistance and Advising Centers (CTAs) in the central area (inland) and in the mainland, and the Program for Damage Reduction (PRD), aiming at avoiding HIV transmission among IDUs. The distribution of antiretroviral drugs in the municipality is performed in the pharmacy-school, which acts in conjunction with UFSC[23].

Knowing and analyzing epidemiological data allow the advance in knowledge about epidemiological trajectories of diseases, and help in the planning of strategies to confront illnesses. Therefore, we suggest that advances in studies about AIDs mortality (and other diseases) be made.

Household surveys on deaths by AIDS require large samples of people/families and have high cost, which makes it unfeasible to monitor mortality by AIDS. A strategy used in social micro-environments is the search in secondary databases, with data collection and analysis of variables associated with time, space and the person.

CONCLUSION

People aging 13 years or more who died due to AIDS in Florianópolis between 1986 and 2006 had some epidemiological characteristics in common: age between 20–39 years, male sex, ignored skin color, educational level until high school. Among men, some exposure categories emphasized are drugs, heterosexuality/drugs, heterosexuality and homosexuality; among women, the most common categories were heterosexuality, heterosexuality/drugs and drugs. Death ratio was higher among men than among women.

Deaths by AIDS in Florianópolis decreased from 1996 on, causing an increase in AIDS survival rates. However, despite the easier access to antiretroviral drugs, which improve survival, there is a need for AIDS monitoring in all population groups.

Conflict of interests

The authors report no conflict of interests.

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Received on: 04.30.2014
Approved on: 06.27.2014