



Burden of AIDS in a Brazilian State



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Summary

Background: To estimate the burden of a disease implies the simultaneous quantification of the impact of early mortality and the health problems that affect the individual's quality of life, and this evaluation can be particularly important in a disease such as AIDS that has become a long-term disease. The purpose of this study was to determine the burden of disease due to AIDS in the Brazilian Southern State of Santa Catarina.

Methods: An ecological designed study was performed using death and AIDS notifications data for 2009. The disability adjusted life years (DALYs) were estimated by the sum of years of life lost (YLL) and the years lived with disability (YLD). The YLL was estimated as the difference between the life expectancy from birth and the age at death with the application of a discount rate of 3% per year. The YLD was estimated as the product of the Burden of Disease Study's weight for AIDS of 0.167 and its average duration of 108 months in Brazil for the incident cases. The YLL, YLD and DALY rates were calculated per 100,000 inhabitants by sex and age groups.

Results: There were 2034 notified cases and 689 deaths due to AIDS reported. There were 15,756.5 YLLs estimated, resulting in 257.5 YLLs/100,000 inhabitants, and 4554.1 YLDs were estimated, resulting in 74.4 YLDs/100,000 inhabitants. The DALY was estimated at 20,310.6, with a rate of 331.9 DALYs/100,000 inhabitants. The highest rates were observed in males in the age groups 30–44 and 45–59 years.

Conclusions: The burden of AIDS was high and was observed mainly in adults, with a predominance in males.

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Introduction

Since the introduction of anti-retroviral drugs, an improved survival rate has been observed in individuals living with HIV, transforming AIDS into a long-term disease. The decrease in mortality rates in countries such as Brazil could hypothetically be attributed to this factor. Due to this increased life expectancy, the quality of life for individuals living with HIV, in terms of life years gained, should be considered and measured, and this is possible with the use of indicators that incorporate the impact generated by the disease and mortality.

Estimation of the burden of disease implies the simultaneous quantification of the impact of early mortality and the health problems that affect the individual's quality of life. The proposed indicator to assess the burden of disease is known as disability-adjusted life years (DALY). One DALY corresponds to one year of healthy life that is lost or lived with incapacity [1]. In the case of AIDS, the inclusion of the loss of years of healthy life due to incapacity brings up the subject of non-fatal consequences of the disease, which are rarely measured, but could be used as indicators of health needs. It allows for the assessment of disease severity in an incapacitating condition, which enables the identification of epidemiological priorities and research.

In Brazil, the incidence and number of deaths due to AIDS are very high, with the Southern region being one of the regions with the highest incidences [2,3]. According to the Brazilian Ministry of Health, the country had a total of 656,701 cases of AIDS between 1980 and 2012 reported in the National Case Registry Database. The state of Santa Catarina showed 33,155 cases of the disease in the same period. The incidence of AIDS between 2000 and 2011 in Brazil ranged from 17.2 to 20.2/100,000 inhabitants, and the incidence in Santa Catarina ranged from 30.5 to 36.4/100,000 inhabitants. The incidence rate in 2009 was 22.2/100,000 inhabitants. Among Brazilian cities with over 50,000 inhabitants, the top three cities with the highest incidence rates were located in Santa Catarina [4]. The state accumulated a total of 8231 deaths from 1997 to 2009. The mortality rate was estimated to be 10.2/100,000 inhabitants in 2009 [5]. This information is useful in understanding the epidemiology of AIDS in the State and in Brazil, but this is an opportune moment to search for a more comprehensive indicator. The knowledge of a measure that includes potential life years lost due to premature death, by adding equivalent years of healthy life lost due to health problems or incapacity [1], presents epidemiological data that is still poorly explored but offers better assistance for strategic

management planning aimed at controlling the impact of the disease. The aim of the present study was to estimate the burden of AIDS for the Brazilian State of Santa Catarina in 2009.

Methods

Santa Catarina is one of the three Southern Brazilian states. In the year of 2009, it had a population of 6,118,743 inhabitants. It had the highest HDI (United Nations Human Development Index) in the South and ranked third among 26 Brazilian states. The per capita income is the fourth highest in the country. The state has the lowest illiteracy rate in the country and ranks first in the number of children between six and 14 years enrolled in school. In the year under study, the infant mortality rate was 11.04/1000 live births [6]. This study used data from official systems for health information that are of public domain, without the risk of compromising the Code of Ethics in Research involving human beings.

An epidemiological study of ecological design, which involved records of individuals notified as confirmed AIDS cases or who had died of AIDS and were residents of Santa Catarina in 2009, was carried out. The 2009 dataset was the most recent year with consolidated data made available by the Ministry of Health of Brazil when the data were collected (2012). The Brazilian Government finalizes its statistics, especially on mortality, with a lag of about three years. Brazil is a country with continental dimensions with 5565 municipalities where data from both mortality and morbidity are primarily generated. Information regarding the population, estimated by sex and age group, from the same year was used. This information was not indexed by age, so nine age groups were created: <1 year, 1–4 years, 5–14 years, 15–29 years, 30–44 years, 45–59 years, 60–69 years, 70–79 years and 80 years and over [7].

The data for mortality were collected from the Mortality Information System database for 2009, available at www.datasus.gov.br (accessed on 10/03/2012). The morbidity data were collected from the National System for notifiable diseases available at www.datasus.gov.br (accessed on 10/03/2012). To compensate for underreporting of notification data, the total number of notifications was increased by 50% of the incident cases [7].

YLD calculation

The number of years lived with disability (YLD) was estimated by the product of weight and its duration

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