ASSOCIATION BETWEEN AIDS CASES IN CHILDREN UNDER FIVE AND COVERAGE OF PRIMARY CARE

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OBJECTIVE: To evaluate the number of new AIDS cases in children under five years old and their association with the population coverage provided by Primary Care teams. Method: A cross-sectional study that used secondary data from the official database of the State of Santa Catarina. The indicators ‘number of new AIDS cases in children under five’ and ‘population coverage by Primary Care teams’ were collected. Descriptive statistics were calculated, such as means and standard deviations, and the Spearman rank correlation coefficient was calculated using the SPSS 25 software. Results: The number of new AIDS cases in children under five increased and was conversely correlated with the population coverage provided by primary care teams. Conclusion: The correlation found shows the importance of population coverage by Primary Care teams in controlling the disease transmission chain.

Descriptors: Primary Health Care; Family Health; Nursing Care; Acquired Immunodeficiency Syndrome; HIV.
INTRODUCTION

Acquired Immunodeficiency Syndrome (AIDS), caused by the Human Immunodeficiency Virus (HIV), was found by the Centers for Disease Control and Prevention (CDC) of Atlanta – USA, in 1981. In the more than three decades since its discovery, HIV infection and AIDS have become a global epidemic and numerous scientific advances have been achieved, including the identification of the mechanisms of the disease and the introduction of antiretroviral therapy (ART).

Although these scientific findings have resulted in better health care and increased the longevity of infected people, HIV and AIDS infection still represent a challenge for health systems worldwide\(^{(1-2)}\).

In Brazil, HIV infection and AIDS are part of the National List of Mandatory Notification diseases, and AIDS has been a mandatory notified disease since 1986 and HIV infection 2014\(^{(3)}\). From 1980 to 2019, 966,058 cases of AIDS were identified in Brazil. The country has registered an average of 39,000 new cases annually in the last five years\(^{(4)}\).

However, the detection rate of this disease has been falling in Brazil in recent years. Since 2012, there has been a decrease in this rate, of 16.8%. This reduction in the detection rate has been more pronounced since the recommendation named treatment for all, implemented in December 2013. The measure brought more access to treatment and increased diagnoses. Therefore, in the last five years, the downward trend in AIDS rate was higher\(^{(2)}\).

Despite this, HIV infection increased among pregnant women. In this population, the HIV detection rate over a ten-year period increased 38.1%. This increase can be partly explained by the expansion of the diagnosis in prenatal care and the consequent prevention of vertical HIV transmission\(^{(2)}\).

Considering that the infected pregnant woman can transmit the virus to the unborn baby, during pregnancy/delivery or to the newborn, during breastfeeding, vertical transmission of HIV is still a public health challenge for several countries. Brazil has signed a commitment to eliminate vertical HIV transmission, which is one of the six priorities of the Departamento de Doenças de Condições Crônicas e Infeções Sexualmente Transmissíveis (DCCI) of the Brazilian Secretariat of Health Surveillance, Ministry of Health\(^{(4-5)}\).

The effectiveness of policies to prevent vertical transmission of HIV can be measured by the number of new cases of this disease in children under 5 years old. This number has been used as an indicator for monitoring vertical HIV transmission and, therefore, this data is part of the inter federative agreement of indicators for the period 2017–2021, related to national health priorities\(^{(4)}\).

From 2014 to 2018, there was a reduction of 26.9% in the AIDS detection rate in children under 5 years old, from 2.6 cases in 2014 (386 cases) to 1.9 (265 cases) per 100,000 inhabitants in 2018. It is assumed that this trend of decline is associated with the adequate treatment of HIV-infected pregnant women, which prevents vertical transmission and, consequently, decreases the number of cases in children\(^{(2)}\). Actions carried out by the health system range from access to prenatal care and HIV testing to the follow-up of exposed children and can be successful in reducing vertical HIV transmission\(^{(5)}\).

Hence, the performance of Primary Health Care (PHC) with pregnant women deserves attention. In Brazil, since the 1990s, there has been increasing coverage of prenatal care in PHC, reaching values above 90% in all regions of the country and for women with different demographic, social and reproductive characteristics. It is a fact that prenatal care is fundamental for maternal and fetal well-being, and can contribute to the prevention of HIV vertical transmission\(^{(6-7)}\).

The literature points out that a reduction in HIV/AIDS cases can be achieved by promoting educational actions, providing rapid tests on a regular basis and offering services that ensure the treatment of infected people, and these actions can be achieved through greater access to PHC\(^{(7)}\). In the last decade, greater access to PHC has contributed, in some way, to an advance in the health of people infected with HIV\(^{(5-7)}\). Access to PHC actions and services can be measured through population coverage by primary care teams that considers the PHC centrality in health care organization, being a fundamental indicator, which is also part of the agreement\(^{(4)}\). However, there is a gap in publications on the influence of population coverage by Primary Care teams in reducing the incidence of AIDS in children under five years old. Thus, the question is: Is the number of new cases of this disease in children under five years old, associated with population coverage by Primary Care teams?
The hypothesis is that there is an association between the number of new AIDS cases in children under five years old and population coverage by Primary Care teams, i.e., a reduction in the number of cases in children under five years old is associated with greater population coverage by Primary Care teams.

Thus, this study aimed to evaluate the number of new AIDS cases in children under five years old and its association with population coverage by Primary Care teams.

**METHODS**

This is a cross-sectional ecological study based on secondary data from the Interfederative Agreement 2017 - 2021. The secondary data was obtained from the official database of the Diretoria de Vigilância Epidemiológica of the State of Santa Catarina (DIVE/SC)(8). This data is publicly accessible. For this study, the following indicators were extracted from the database: number of new AIDS cases in children under five years old and population coverage by Primary Care teams. The period studied was the years 2017 and 2018.

The dependent variable was the number of new cases of AIDS in children under five years old. This variable considers the number of new cases of the disease in the population of children under 5 years old, living in a given place, in the year considered, measuring the risk of occurrence of new cases in this population. The unit of measure is expressed in absolute number(4).

The independent variable was population coverage by Primary Care teams. This variable considers the value of 3,450 individuals, covered by a Family Health team, and 3,000 individuals covered by parameterized Primary Care teams and equivalent teams. Thus, the calculation method has as numerator: the number of Family Health teams x 3,450 + (number of parameterized Primary Care teams and equivalent teams) x 3,000 in a given location and period. The denominator is the population estimate of the previous year. The unit of measure is expressed as a percentage. This variable is used to monitor access to PHC services, to strengthen the plan of the Sistema Único de Saúde (SUS) and its resolution capacity(4). The independent variable was population coverage by primary care teams.

All data collected was inserted into a spreadsheet in Excel 2016® (Microsoft Office) with double typing. Afterwards, they were exported to the software Statistical Package for the Social Sciences (SPSS), version 25.0 of the statistical software platform IBM and R – an environment with an integrated set of software resources for data processing, calculations and graphic display(9), where the analyses were performed. Descriptive analyses were conducted using measurements of means, standard deviations, minimum and maximum for the study indicators. To test the hypothesis of association between the indicators studied, we design a correlation matrix calculating Spearman's rank correlation coefficient. All tests considered a bidirectional α of 0.05 and a confidence interval (CI) of 95%. The cutoff point for statistical significance was a p-value less than 0.05.

In Spearman's correlation matrix, presented in this study, the variable number of new AIDS cases in children under five years old is presented as V12 and the variable Population coverage by Primary Care teams will be presented as V23. That is because this study is part of a macro project that evaluated the population coverage by Primary Care teams in the municipalities of Santa Catarina and the scope of the indicators, according to the data from the interfederative agreement 2017-2021. In the macro project, each of the 23 indicators of the interfederative agreement was treated as an analysis variable, identified by the letter V (variable) followed by an Arabic numeral (1 to 23).

Regarding ethical aspects, this study used data from official public domain health information system, so that it was not need of consideration by an ethics committee. Resolution No. 510, of 07/04/2016, of the Conselho Nacional de Saúde (CNS), in its sole paragraph, determines that research using public domain information will not need to be evaluated by the Ethics and Research Committee.

**RESULTS AND DISCUSSION**

The study revealed that the number of new cases of AIDS, in children under five years old, increased in Santa Catarina, between 2017 and 2018. The state had 3 new cases in 2017 and 5 new cases in 2018. Population coverage by Primary Care teams, in turn, decreased in the period studied, with averages of 82.8 in 2017 and 82.4 in 2018, as shown in Table 1.

Table 1 - Number of new AIDS cases in children under five years old and population coverage by Primary Care teams in 2017 and 2018. Santa Catarina, Brazil, 2019.
Regarding the number of new cases, in children under five years old, the study shows that in 2017, 292 municipalities (98.86%) did not have new cases and three municipalities had records of new cases. Each of these municipalities had 70.33%, 74.45% and 77.77% of population coverage by Primary Care teams. In 2018, in 291 municipalities (98.48%), there were no new cases in children under five years old, and four municipalities registered new cases, and three municipalities had one case and one municipality presented two cases. These four cities had 100%, 87.03%, 87.07% and 91.65% population coverage by Primary Care teams.

Regarding population coverage by Primary Care teams, the results also showed that, in 2017, 86.78% of the municipalities had coverage higher than the target agreed and 13.22% of the municipalities of Santa Catarina had coverage lower than the target. In 2018, 87.12% had coverage higher than the target and 12.88% had coverage lower than the target agreed.

The correlation matrix between the various indicators of the interfederative agreement in the state of Santa Catarina, in 2017 and 2018, in Figure 1, shows that the number of new cases of AIDS in children under five years old (in V12) is inversely correlated to population coverage by Primary Care teams (in V23).

The results of this study showed an increase in the number of new AIDS cases in children under five years old, between 2017 and 2018, in the state of Santa Catarina. This data differs from the current trend in most Brazilian states since there is, in general, a significant downward trend of this indicator in the country. The literature indicates that the number of cases of the disease in children under five years old has been decreasing in Brazil, although there are many regional differences. It is assumed that these differences are a reflection of inequalities in the installed network of health services in the country.

Despite the increase in the number of new cases in children under five years old in the period studied, historically, when analyzing the other years, the state of Santa Catarina have shown a reduction in this indicator. In addition, it is worthy to emphasize that the state reached the target proposed in 2018. In this sense, it is...
important to highlight the importance of free and universal access to antiretroviral drugs and HIV testing in Brazil, including the state of Santa Catarina. The literature describes these measures as responsible for the significant reduction of vertical transmission and, consequently, the incidence of the disease in children under five years old\(^{[12-13]}\).

However, it is also important to think about the quality of prenatal care as well as during childbirth and puerperium, taking some aspects as reference: the time of diagnosis of HIV infection in the mother, the number of consultations held and the performance of antiretroviral therapy in time\(^{[13]}\). It is possible to infer that with better population coverage by Primary Care teams can facilitate all these factors.

However, this study showed a decrease in population coverage by Primary Care teams between 2017 and 2018. Moreover, the state did not reach the targets agreed for this indicator in the period studied\(^{[10]}\). Although there is no defined national parameter for this indicator, and the target is agreed by the states based on each epidemiological reality, the greater the population coverage by Primary Care, the greater the capacity for basic health actions and services provision to the population\(^{[14]}\). This fact may explain the significant and inverse correlation between the number of new AIDS cases in children under five years old and population coverage by Primary Care teams evidenced in this study.

In this sense, a literature review that aimed to investigate the difficulties of HIV-positive women in adhering to prenatal care in PHC showed that this adhesion is still reduced. The study points to prenatal care as a determining factor in the prevention of vertical transmission of HIV and highlights access to PHC and the quality of prenatal care as significant factors that enable taking steps to reduce transmission\(^{[15]}\). Although the population coverage by Primary Care teams indicates access to PHC, this indicator measures the workload of professionals and not the work actually performed by them\(^{[14]}\). However, assessing the potential supply of health services in PHC helps to understand the access to this level of health care\(^{[14-15]}\). Therefore, the decrease of this indicator in the state, as well as its correlation with the increase in the number of cases in children under five years old deserves discussion, since the population coverage of Primary Care can bring pregnant women closer to preventive interventions capable of reducing HIV vertical transmission\(^{[9]}\).

Despite the significant and inverse correlation between the indicators studied, in the state of Santa Catarina the results showed that, in 2018, municipalities that had new cases of AIDS in children under five years old, had population coverage by Primary Care teams within the targets agreed.

It is possible to infer that, with the expansion and qualification of access to quality health services, emphasizing humanized care, equity and attention to health needs as guidelines\(^{[4]}\), better population coverage by Primary Care teams can bring better results in the prevention of vertical transmission, but should not be seen in isolation. There is evidence that better population coverage by Primary Care teams organizes care in the health system and favors its problem-control capacity\(^{[16-18]}\), but solely, it may not be enough to reduce vertical HIV transmission.

In this sense, it is noteworthy that, although HIV promotion and prevention actions are already widespread among health teams, the diagnosis of new cases (in all regions) and, mainly, positive people follow-up (in some municipalities) are very recent processes in PHC, surrounded by controversy and still poorly studied\(^{[19-20]}\). Thus, it is possible to infer that intervention strategies should be elaborated in PHC, considering the contexts in which HIV vertical transmission occurs.

The evaluation of the number of new AIDS cases in children under five years old provides support for planning, management and evaluation of health policies and actions aimed at controlling HIV/AIDS transmission in specific areas and populations and, mainly, highlights the results of policies to prevent vertical transmission. The information determined by this indicator provides the indispensable rationale for assessing the actions carried out by the health system\(^{[21-22]}\).

Therefore, the results found in this study strengthen the importance of care processes performed by health teams in PHC, especially by the nursing team. Since the population coverage by Primary Care teams is the centrality of PHC and the organizer of health care, it is up to the nurse, as one of the main modulating agents of the care coordination, to strengthen their practices ensuring proximity and reception of pregnant women. Better population coverage by Primary Care teams ensures the necessary access of pregnant women to the services for preventing vertical transmission and presupposes a logic of
organization and functioning of the health system that linkage and accountability, fundamental aspects inherent to the work of nurses in PHC.

Thus, therapeutic management, monitoring the population’s health situation and managing the nursing team and health service are essential tasks of nurses in PHC\(^{(23-24)}\) that consolidate population coverage, improving various aspects of the population’s health, including care of pregnant women and prevention of vertical transmission of HIV.

Among the limitations of this study, it is noteworthy that using secondary data implies the possibility of sub-records. This limitation does not reduce the reliability of the study but should be considered in the interpretation of the results.

**CONCLUSION**

This study showed an increase in the number of new cases of AIDS in children under five years old in the State of Santa Catarina, between 2017 and 2018, despite the declining trends of this indicator in Brazil. Although the increase, this indicator reached the target proposed for the year 2018. In the period studied, the state showed a decrease in population coverage by Primary Care teams and this fact was significantly associated with the increase in the number of new AIDS cases in children under five years old.

It is possible to say that evaluating the dynamics of the number of new cases in children under five years old and knowing the aspects of care provided by PHC related to it, is fundamental for planning quality health management. In this sense, planning work processes of health professionals can directly reflect on the population served. Thus, this work can contribute to the direction of nurses’ decision-making regarding the reduction of the number of new cases in children under five years old and reinforces the need for practices related to the prevention of vertical transmission, which can be facilitated when there is better population coverage by Primary Care teams.

In response to the findings, a recommendation is to strengthen the institutional guidelines in the municipalities studied, in line with the SUS guidelines, ensuring population coverage by Primary Care teams. Another recommendation is to conduct future studies related to the identification of the variables of the quality of care in PHC that predict the reduction in the number of new cases of AIDS, in children under five years old.

**REFERENCES**


Note: This study is part of a macro project that evaluated primary care coverage in the municipalities of Santa Catarina and the scope of indicators of inter federative agreement 2017-2021[4].

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