

# HIV/AIDS IN PREGNANT WOMEN IN BRAZIL: 20-YEAR ANALYSIS

*HIV/AIDS EM GESTANTES NO BRASIL: ANÁLISE DE 20 ANOS*

*VIH/SIDA EN MUJERES EMBARAZADAS EN BRASIL: ANÁLISIS DE 20 AÑOS*

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## ABSTRACT

The incidence of HIV infection in women has increased in Brazil in the last two decades, leading to a greater attention to mother-to-child transmission (MTCT) and Aids in children < 5 years old data. Analyze the association of HIV/Aids incidence in women and pregnant women in Brazil, between 2000-2020, with MTCT rate. Retrospective study, based on HIV infection data collected from DATASUS, SICLOM, SISCEL, SIM and SINAN systems. HIV infection was more prevalent in fertile women, aged 20 to 39 years old. Even though a reduction of Aids cases in children < 5years old was observed, an increase of HIV infection in pregnant women was identified at the same time ( $p<0,001$ ). These findings are probably associated with an improvement in prenatal care, with early treatment of pregnant women and virologic control, leading to a decrease in MTCT and Aids in children < 5years old.

**Keywords:** *HIV; Vertical Infectious Disease Transmission; Pregnant Women.*

## RESUMO

No Brasil, a incidência de infecção pelo HIV em mulheres aumentou nas duas últimas décadas, resultando em maior enfoque nos índices de transmissão vertical (TV) e de Aids em crianças < 5 anos. Analisar a associação entre a incidência de HIV/Aids em mulheres e gestantes no Brasil, de 2000-2020, com a TV. Estudo retrospectivo, com coleta de dados de infecção pelo HIV dos sistemas DATASUS, SICLOM, SISCEL, SIM e SINAN. A infecção pelo HIV foi mais prevalente em mulheres em idade fértil, entre 20 e 39 anos. Foi observada ainda redução da incidência de Aids em crianças < 5 anos, apesar do aumento dos casos de infecção pelo HIV em gestantes no mesmo período ( $p<0,001$ ). Esse achado provavelmente está associado à melhora da assistência pré-natal, possibilitando o tratamento precoce e o controle virológico da gestante e, conseqüentemente, diminuindo TV e Aids em crianças < 5 anos.

**Descritores:** *HIV; Transmissão Vertical; Gestante.*

## RESUMEN

En Brasil, la incidencia de infección por VIH en mujeres ha aumentado en las últimas dos décadas, lo que ha dado lugar a una mayor atención a las tasas de transmisión vertical (TV) y SIDA en niños < 5 años. Analizar la asociación entre incidencia de VIH/SIDA en mujeres y gestantes en Brasil, de 2000 a 2020, con TV. Estudio retrospectivo con recolección de datos sobre infección por VIH de los sistemas DATASUS, SICLOM, SISCEL, SIM y SINAN. Infección por VIH fue más prevalente en mujeres en edad fértil, 20-39 años. Se observó reducción de incidencia del SIDA en niños < 5 años, a pesar del aumento de VIH en gestantes ( $p<0,001$ ). Este hallazgo probablemente se asocia con una mejor atención prenatal, permitiendo tratamiento precoz y control virológico de las gestantes y, en consecuencia, la reducción de TV y SIDA en niños < 5 años.

**Descritores:** *VIH; Transmisión Vertical de Enfermedad Infecciosa; Mujeres Embarazadas.*

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## INTRODUCTION

AIDS, a disease caused by HIV, was first identified in 1981. Since then, HIV infection has remained a pandemic, with approximately 85.6 million people having been infected by 2022. In 2022, of the 39 million people living with HIV in the world, 1.3 million were found to be carriers of the virus that year, which shows that the pandemic continues to grow globally<sup>1</sup>.

In Brazil, as of June 2023, about 1.12 million cases of AIDS were detected. Although the detection rate decreased (from 21.6 in 2012 to 17.1 cases/100 thousand inhabitants in 2022), HIV infection persists as an important public health problem, with 43,403 new cases in 2022<sup>2</sup>.

At the beginning of the epidemic, the profile of those infected consisted mainly of young men, specifically men who have sex with men (MSM)<sup>3</sup>. Over the years, however, a change in this profile has been observed, with a significant increase in the incidence in females. In Brazil, until 1986, transmission was predominantly associated with sexual intercourse among MSM and blood transfusion. Between the 1980s and 1990s, there was an increase in the number of cases involving the use of injectable drugs. From the 90s to the present day, heterosexual intercourse has emerged as the main form of transmission, which explains the increase in cases in women during this period<sup>4</sup>. As a result, the sex ratio, which was 25 cases of AIDS in men for every woman in 1991, decreased to 2 cases in men for every woman in 2000<sup>5</sup>.

This higher number of cases in females, especially in women of childbearing age, was initially accompanied by an increase in vertical transmission (VT). In 2004, the TV rate in Brazil ranged from 4.3% to 13.4%, depending on the region of the country<sup>6</sup>. Considering that VT is associated with variables such as maternal HIV viral load, the use of antiretroviral therapy (ART) during pregnancy, and the relationship between the effective duration of ART and the moment of delivery, the importance of early diagnosis of HIV infection in pregnant women is understood, a starting point for the institution of several other measures to prevent VT<sup>7</sup>. The notification of cases of pregnant women with HIV infection and, consequently, the incidence of these cases, represents, therefore, a parameter of the situation of this diagnosis in Brazil. According to data from the Ministry of Health, between January 2000 and June 2022, 149,591 pregnant women with HIV infection were notified<sup>8</sup>.

Thus, the objective of this study was to analyze the association between the incidence of HIV/AIDS in women and pregnant women in Brazil, from 2000-2020, with VT.

## METHODS

This is a retrospective, cross-sectional study with data collection from secondary sources. Data were collected from January to June 2023. The sources for data collection were the DATASUS, SICLOM, SISCEL and SINAN systems, in the period from 2000 to 2020. The following variables were collected: number of cases reported in women, pregnant women, children < 5 years of age and mother-to-child transmission, infection rate in pregnant women/1,000 live births, and incidence of AIDS in children < 5 years of

age. Data from children < 5 years of age were collected for our TV analysis, as they reflect most cases of HIV infection in this exposure category.

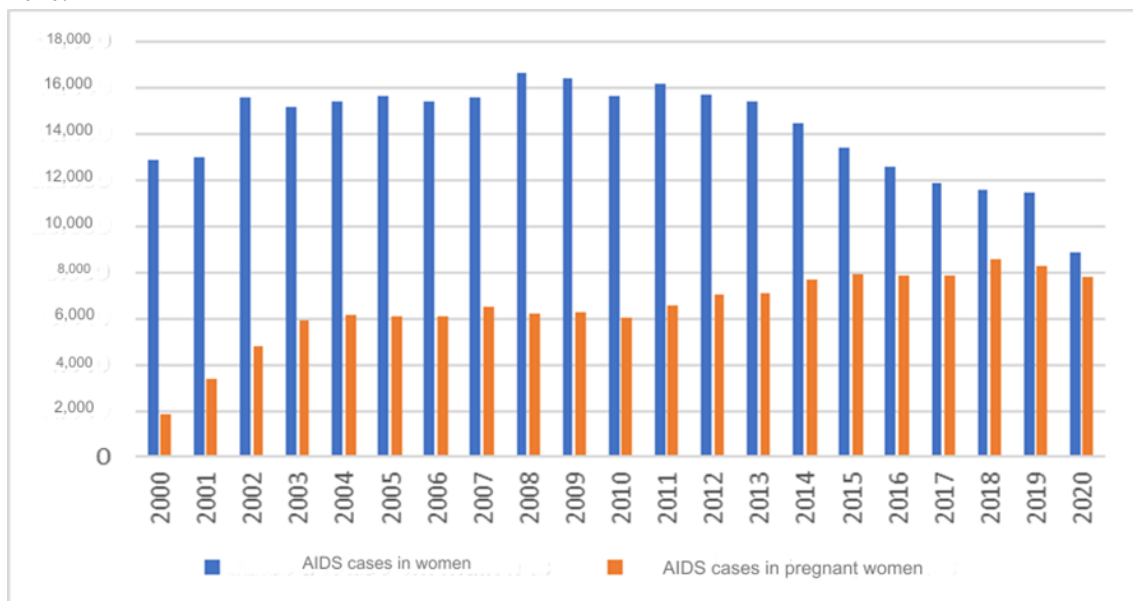
Frequency measures and linear correlation analysis were calculated for some of the numerical variables. A  $p$  lower than 0.05 was considered significant. Data were analyzed using the SPSS software.

As this is a study with data collection from government surveillance systems, which are in the public domain, there was no need for approval by the CEP-CONEP System.

## RESULTS

Although the incidence of HIV infection in women decreased in the study period (31% decrease), especially from 2011 onwards, there was a 316% increase in the diagnosis of HIV-infected pregnant women in the same period (Graph 1).

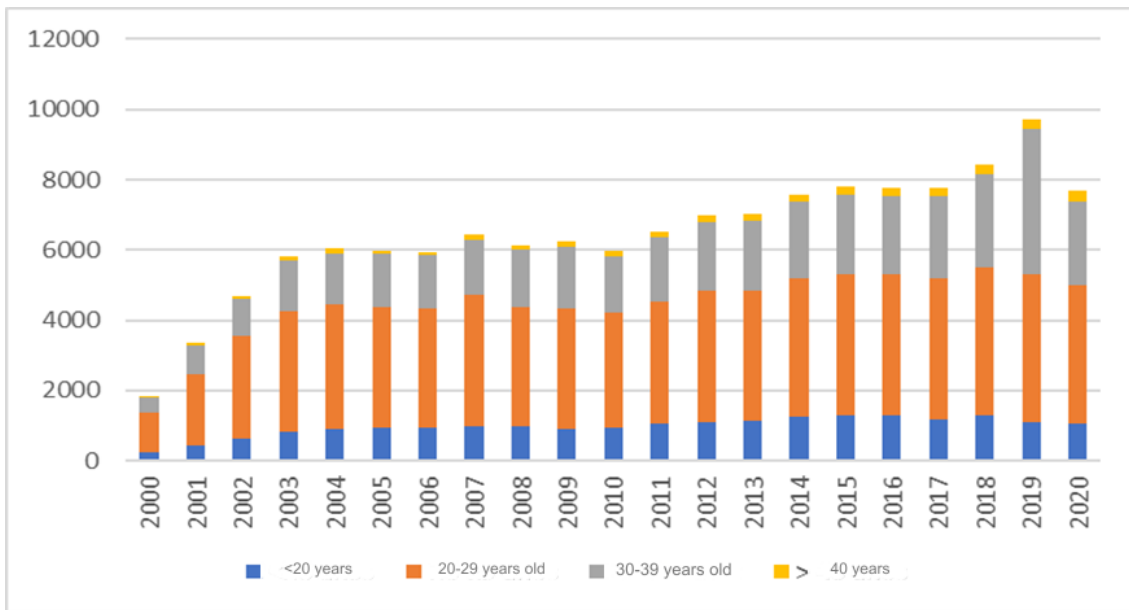
**Graph 1: Incidence of HIV infection cases in women and pregnant women in Brazil, from 2000 to 2020.**



**Source:** prepared by the authors.

The most prevalent age group of pregnant women with HIV remained between 20 and 29 years throughout the study period, representing an average of 54% of all pregnant women. However, it was possible to observe an increase in the notification of cases among pregnant women aged 30-39 years, which in 2000 represented approximately 24% of cases and in 2020 came to occupy 31% of the total, with a peak in 2019 of 42.3% (Graph 2).

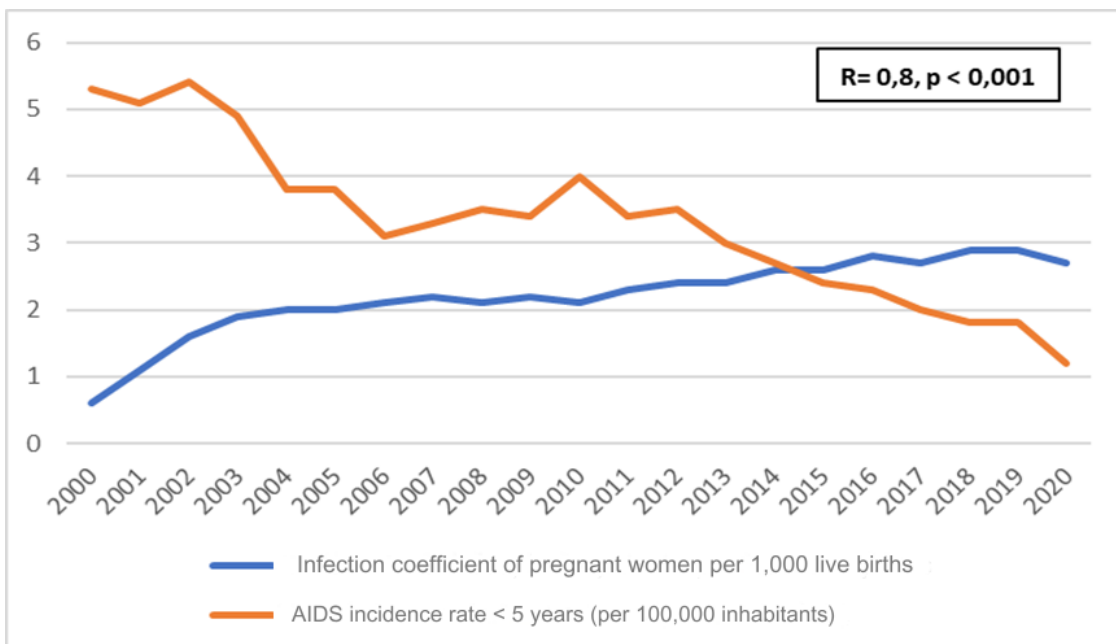
**Graph 2: Incidence by age group of HIV infection cases in pregnant women in Brazil during the period from 2000 to 2020.**



**Source:** prepared by the authors.

In the same period, there was a 77.3% drop in the incidence rate of AIDS in children < 5 years old (5.3 in 2000 and 1.2 in 2020) who have TV as their main means of transmission (Graph 3).

**Graph 3: Correlation between the coefficient of HIV infection in pregnant women/1000 live births and the incidence rate of AIDS in children under 5 years of age in Brazil during the period from 2000 to 2020.**



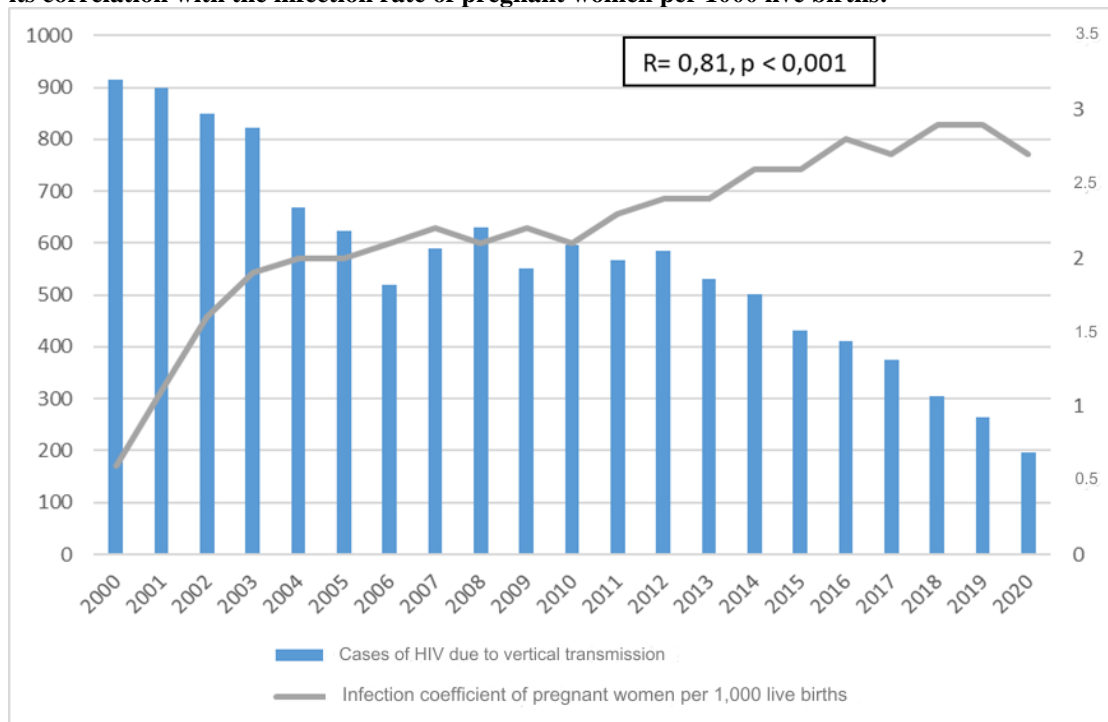
\*R = linear correlation coefficient.

**Source:** prepared by the authors.

There was also a 78.7% reduction in reported VT cases (914 in 2000 and 197 in 2020) (Chart 4).

Linear regression analysis showed a statistically significant correlation between the coefficient of diagnosis of pregnant women per 1,000 live births and the incidence of AIDS in children < 5 years of age ( $R= 0.8$ ,  $p<0.001$ ) and the number of reported VT cases ( $R= 0.81$ ,  $p<0.001$ ) (Graphs 3 and 4).

**Graph 4: Number of mother-to-child transmission of HIV reported in Brazil, from 2000 to 2020, and its correlation with the infection rate of pregnant women per 1000 live births.**



\*R = linear correlation coefficient.

Source: prepared by the authors.

## DISCUSSION

The finding of a 31% decrease in the incidence of infection in women, accompanied by a significant increase (316%) in the notifications of HIV-infected pregnant women, according to data from the present study, suggests an improvement in the diagnosis of HIV infection in these pregnant women during prenatal care. Data from the literature suggest that the increase in the number of diagnoses during pregnancy can be attributed to the inclusion of HIV testing in the prenatal routine. Prior to 2016, many patients did not undergo the test without medical advice. However, as of that year, most cases of HIV infection were identified before the start of prenatal care. In 2021, more than 57% of pregnant women with the virus had already received the diagnosis before the beginning of this phase. These data corroborate an improvement in HIV diagnosis not only in pregnant women, but also in the general population<sup>8-10</sup>.

Although HIV testing is already mandatory in the first prenatal visit in Brazil and in several other countries, some studies still reveal the occurrence of late diagnosis of HIV infection in pregnant women, often in the third trimester of prenatal care<sup>11-14</sup>. This

data indicates a critical gap, since HIV testing in the first trimester is essential to establish early diagnoses, allowing the implementation of treatment or preventive measures to avoid VT<sup>13,15,16</sup>. The lack not only of adequate serological tests, but also of prenatal care *per se*, is even more worrying, unfortunately, still evidenced by some authors. Ferreira *et al.*, in a study evaluating the occurrence of congenital syphilis, observed that 6.7% of parturients reported not having had any prenatal consultation<sup>17</sup>.

In the population studied, the analysis of the age group of pregnant women with HIV revealed a consistent pattern, highlighting the predominance among women aged 20-29 years, who represented more than half of all affected pregnant women in the period studied. This scenario clearly highlights the high number of cases in women of childbearing age and sexually active. However, the percentage increase recorded in pregnant women aged 30-39 years, as of 2008, demands special attention. Other authors have found results that corroborate the data found in this study<sup>18,19</sup>. This change in the epidemiological profile suggests a change in HIV infection patterns, indicating the need for specific prevention and guidance strategies, not only for younger women, but also for those in the older age group. In addition, it emphasizes the importance of reinforcing campaigns and preventive measures in the still predominant age group, aiming at an effective impact on reducing the incidence of HIV infection in pregnant women<sup>8-10</sup>.

In this study, the AIDS incidence rate decreased by 77.3% in children under 5 years of age. There was also a 78.7% reduction in notifications of mother-to-child transmission cases from 2000 to 2020. It is noteworthy that both data showed a significant correlation with the increase in the infection coefficient in pregnant women per 1000 live births. Vertical transmission by HIV transfers the virus from mother to child, either during pregnancy through the placenta, during childbirth or through breastfeeding, and is the main form of transmission in people up to 15 years of age. These types of vertical transmission vary in their rate of transmissibility and depend on the mother's viral load. Thus, in view of the early diagnosis of pregnant women, the institution of measures, such as the appropriate use of combined ART (in pregnant women and newborns) and correct guidance on avoiding breastfeeding, has a direct impact on HIV transmissibility<sup>16,20,21</sup>. Therefore, adequate prenatal care, according to the guidelines of the Ministry of Health, recommends the performance of at least two anti-HIV tests during pregnancy for all pregnant women. This procedure enables a comprehensive screening that, when identifying the infection, seeks to reduce the VT of HIV, reducing the incidence of HIV infection in children and avoiding worse prognoses<sup>22</sup>.

The present study, despite suggesting an association between the increase in the diagnosis of HIV infection in pregnant women and the reduction in VT cases, has the limitation of being retrospective and with secondary data collection (surveillance/notification systems), which makes it impossible to infer a direct cause-and-effect relationship between the results described. Another limitation is the possibility of underreporting of data, resulting in cases of infection in pregnant women or VT that were unknown and, therefore, not considered in the analysis of this study.



## CONCLUSION

It is concluded that there has been an increase in the number of diagnoses of HIV cases in pregnant women in Brazil, possibly resulting from an improvement in the quality of prenatal care. This expanded diagnosis probably made it possible to reduce the number of VT and HIV cases in children under 5 years of age. Thus, it is essential to highlight the importance of care for pregnant women as a tool for HIV prevention, requiring prenatal care with appropriate guidance and the use of assertive diagnostic tools for the sake of well-being and quality of life.

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