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TAXA DE DETECÇÃO DE INFECÇÃO PELO HIV EM CRIANÇAS MENORES DE 5 ANOS NO PIAUÍ, 2020 A 2024

HIV INFECTION DETECTION RATE IN CHILDREN UNDER 5 YEARS OLD IN PIAUÍ, 2020 TO 2024

TASA DE DETECCIÓN DE LA INFECCIÓN POR VIH EN NIÑOS MENORES DE 5 AÑOS EN PIAUÍ, 2020 A 2024

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Resumo

O vírus da imunodeficiência humana (HIV) é transmitido por meio do sangue, sêmen, secreções vaginais e leite materno. Em estágio avançado, pode evoluir para a síndrome da imunodeficiência adquirida (SIDA). A transmissão vertical do HIV corresponde à passagem do vírus da mãe para o filho, podendo resultar em diversas complicações na infância. Diante disso, o Sistema Único de Saúde (SUS) adota protocolos específicos para prevenção dessa via de transmissão. O objetivo da pesquisa foi identificar a taxa de detecção da infecção pelo HIV em crianças menores de 5 anos no Piauí, no período de 2020 a 2024. Trata-se de uma pesquisa transversal, observacional e descritiva de abordagem quantitativa, baseada em dados secundários coletados nos Sistemas de informações em saúde alojados no Departamento de informática do Sistema Único de Saúde (DATASUS). A partir disso, foi verificado que o Estado do Piauí registrou dez notificações na população-alvo. No que tange à taxa de detecção geral, o coeficiente durante o período da pesquisa no Estado do Piauí foi de 2,2 casos/100.000 habitantes. Os dados da plataforma DATASUS referentes às notificações por HIV entre os anos de 2020 e 2024 na faixa etária selecionada exibem redução de casos. Sugere-se que investigações futuras utilizem períodos temporais mais extensos visando maior robustez estatística e melhor compreensão dos padrões de distribuição do HIV.
Palavras-chave: HIV; Detecção; Piauí; crianças < 5 anos.

Abstract

Human immunodeficiency virus (HIV) is transmitted through blood, semen, vaginal secretions, and

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breast milk. In advanced stages, it can evolve into acquired immunodeficiency syndrome (AIDS). Vertical transmission of HIV corresponds to the passage of the virus from mother to child, which can result in various complications in childhood. Therefore, the Brazilian Unified Health System (SUS) adopts specific protocols for the prevention of this transmission route. The objective of this research was to identify the rate of HIV infection detection in children under 5 years of age in Piauí, from 2020 to 2024. This is a cross-sectional, observational, and descriptive study with a quantitative approach, based on secondary data collected from health information systems housed in the Department of Informatics of the Unified Health System (DATASUS). From this, it was verified that the state of Piauí registered tem notifications in the target population. Regarding the overall detection rate, the coefficient during the research period in the state of Piauí was 2.2 cases/100,000 inhabitants. Data from the DATASUS platform concerning HIV notifications between 2020 and 2024 in the selected age group show a reduction in cases. It is suggested that future investigations use longer time periods to achieve greater statistical robustness and a better understanding of HIV distribution patterns.

Keywords: HIV; Detection; Piauí; children < 5 years.

Resumen

El virus de la inmunodeficiencia humana (VIH) se transmite a través de la sangre, el semen, las secreciones vaginales y la leche materna. En etapas avanzadas, puede evolucionar al síndrome de inmunodeficiencia adquirida (SIDA). La transmisión vertical del VIH corresponde al paso del virus de madre a hijo, lo que puede resultar en diversas complicaciones en la infancia. Por lo tanto, el Sistema Único de Salud (SUS) de Brasil adopta protocolos específicos para la prevención de esta vía de transmisión. El objetivo de esta investigación fue identificar la tasa de detección de infección por VIH en niños menores de 5 años en Piauí, de 2020 a 2024. Este es un estudio transversal, observacional y descriptivo con un enfoque cuantitativo, basado en datos secundarios recopilados de sistemas de información de salud alojados en el Departamento de Informática del Sistema Único de Salud (DATASUS). A partir de esto, se verificó que el estado de Piauí registró diez notificaciones en la población objetivo. Con respecto a la tasa de detección general, el coeficiente durante el período de investigación en el estado de Piauí fue de 2.2 casos/100,000 habitantes. Los datos de la plataforma DATASUS sobre las notificaciones de VIH entre 2020 y 2024 en el grupo de edad seleccionado muestran una reducción de casos. Se sugiere que futuras investigaciones utilicen periodos de tiempo más largos para lograr una mayor solidez estadística y una mejor comprensión de los patrones de distribución del VIH.

Palabras clave: VIH; Detección; Piauí; niños menores de 5 años.

1. Introduction

The human immunodeficiency virus (HIV) is na enveloped retrovirus responsible for acquired immunodeficiency syndrome (AIDS), the most advanced stage of infection caused by this microorganism. Currently, this condition has protocols for detection, diagnosis, monitoring, and effective treatment that ensure quality of life for seropositive individuals. The transmission of the virus occurs through blood, semen, vaginal secretions, and breast milk (Costa *et al*., 2020;

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Brazil, 2023a; Pan American Health Organization, [n.d.]).

HIV infection in children under five years of age represents a serious public health issue with economic and social implications, as these individuals have immature immunity. Therefore, prevention of vertical HIV transmission is essential through appropriate interventions during pregnancy, childbirth, and breastfeeding. In the state of Piauí, many families face socioeconomic and geographic limitations that directly impact the effectiveness of early diagnosis and timely treatment actions (Brazil, 2024b).

Currently in Brazil, HIV cases are undergoing a process of feminization, highlighting women of reproductive age as a target group for preventive policies. Additionally, there is na increasing number of young people (13–17 years old) who begin sexual activity early and discontinue condom use (UNAIDS, 2024). These factors, associated with the congestion of SUS services during the COVID-19 pandemic, have placed vertical HIV transmission in focus.

Given the context presented, this quantitative, descriptive, and retrospective epidemiological study aims to identify the detection rates of HIV infection in children under five years of age in the state of Piauí, from 2020 to 2024, by quantifying the occurrence of infections in the analyzed population (Cavalcante; Vasconcelos; Borges, 2022).

Therefore, this study contributes to the scientific evidence base for further research by investigating whether this rate remained constant or showed a decreasing trend during the pandemic period. It thus provides support for technical and policy decisions aimed at strengthening the response to vertical HIV transmission and improving the health system’s capacity to address this challenge.

2. Literature Review

2.1. HIV and AIDS

The human immunodeficiency virus (HIV) is na enveloped retrovirus of the Lentiviridae subfamily responsible for acquired immunodeficiency syndrome (AIDS), which compromises the immune system. HIV has two subtypes, HIV-1 and HIV-2. Its transmission occurs through bodily fluids, namely blood, semen, vaginal secretions,

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and breast milk. AIDS causes immunodeficiency that exposes individuals to various other diseases such as tuberculosis, toxoplasmosis, neoplasms, and pneumonias (Costa *et al*., 2020; Focaccia; Siciliano, 2021).

Thus, infection by this virus occurs in two phases: the initial phase, known as the acute phase (21 to 42 days), usually characterized by nonspecific flu-like symptoms, and the asymptomatic phase, in which the organism interacts with the virus in a balanced manner and which may last for decades. At the end of this last stage, the individual's immune system collapses and AIDS develops. Due to the difficulty of clinical diagnosis of this infection, testing policies are essential to ensure access to treatment and prevent progression to the final stage (Brazil, 2016; Pinto Neto *et al*., 2021).

Diagnosis of HIV infection can be performed using rapid tests based on antibody detection, immunoassays such as ELISA and Western blot, and molecular methods that identify viral RNA or DNA. To confirm the diagnosis in adults, at least two tests are required, with the first test being more sensitive and the second more specific. The Unified Health System (SUS) provides all these tests and carries out mobile rapid testing programs (Brazil, 2018; Rio de Janeiro, 2022).

HIV treatment is fully provided by the Brazilian Unified Health System (SUS). The medications used are antiretrovirals (ARVs), which inhibit viral replication. The therapeutic regimen generally includes three ARVs, with lamivudine, dolutegravir, and tenofovir being preferred. After initiation of therapy with the chosen regimen, follow-up through laboratory viral load testing is required after 8 to 12 weeks to assess the effectiveness of the therapeutic choice. In addition, SUS provides pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP) regimens for the human immunodeficiency virus (Rio de Janeiro, 2022).

According to the 2024 epidemiological bulletin on HIV/AIDS in Brazil, the notification rate among children under five years of age has shown a reduction, in contrast to the notification rate of infection among pregnant women, which has increased. In 2023, more than 20 million seropositive individuals were female. This scenario may indicate that mothers are gaining access to prenatal care and

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preventive procedures. Thus, the importance of vertical transmission prevention strategies is reinforced, such as neonatal prophylaxis (Cavalcante; Vasconcelos; Borges, 2022; Brazil, 2024a; Silva; Lima; Oliveira, 2024).

2.2. Vertical transmission and prophylaxis

The placenta forms a connection between the mother and the fetus without blood exchange, allowing only the passage of nutrients and oxygen due to the presence of a protective placental membrane. However, there is a possibility that the HIV virus may cross this barrier and reach the fetus; this risk is strongly reduced by decreasing the mother's viral load. In addition to congenital transmission, the infant may acquire HIV through contact with the parturient's vaginal secretions and blood during delivery, and afterwards through ingestion of breast milk (Friedrich et al., 2016; Martinez *et al*., 2016; Sripan *et al*., 2015).

Newborns exposed to HIV may present with underweight and short stature, infections and recurrent unexplained fevers, feeding disorders, and delayed neuropsychomotor development, and may also develop the late stage of infection more rapidly. To reduce this transmission, there are population testing policies carried out in a mobile manner throughout the country. Prenatal care includes several tests for the diagnosis of infections that may affect fetal development, HIV being one of them (Leal *et al*., 2020)

These programs enable the initiation of antiretroviral therapy, which generally reduces the viral load in users, significantly decreasing the likelihood of vertical transmission, which may reach less than 5%. Monitoring the pregnant woman's viral load is essential; vaginal delivery is not recommended when values are high, and even in cases of low values, elective cesarean section is indicated, preferably with the infant em caul, without rupture of the amniotic sac (Martinez *et al*., 2016).

In both delivery methods, prophylaxis with zidovudine is required beforehand; in cases of high transmission risk, this prophylaxis is carried out with a three-ARV regimen. After birth, prophylaxis must be initiated in the newborn within 4 hours, and

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delays must not occur under any circumstances. Pathogen genotyping should be performed, when possible, in pregnant women and children to adjust the provided ART and other prophylactic procedures (CONITEC, 2020).

The antiretroviral drugs that compose the newborn's therapeutic regimen are defined based on a transmission risk assessment, and the duration is generally 4 weeks. The available ARVs are zidovudine, raltegravir, lamivudine, and nevirapine. Thus, it is necessary to collect biological material after birth to determine the neonate's viral load, preferably before the administration of ARVs. Viral load sampling should be performed at birth, at 14 days of life, and at 6 and 8 weeks of life (Costa *et al*., 2020).

Thus, to confirm na HIV diagnosis, a detectable HIV viral load result followed by detectable proviral DNA is required, or two detectable viral load results, with the second being equal to or greater than 100 viral copies/mL (Brazil, 2023c). Furthermore, all cases of HIV and AIDS, as well as exposed children, are subject to compulsory notification, a practice that is essential for maintaining health programs related to this issue (Brazil, 2016).

Tests based on antibody methodologies and their reaction with specific antigens have no diagnostic value in children under 2 years of age suspected of vertical transmission, as maternal antibodies may remain in the offspring for up to 24 months. Molecular tests require more than one confirmation due to possible interference of maternal ART in the child (Brazil, 2023c).

The definitive exclusion of HIV infection diagnosis is based on the presence of at least two undetectable viral load results obtained after completion of prophylaxis, documentation of anti-HIV seroreversion by immunoassay after 12 months of age, and absence of characteristic symptoms, demonstrating good clinical condition with adequate neuropsychomotor development and no evidence of immunological impairment (São Paulo, 2023).

2.3. Epidemiology and Epidemiological Surveillance

Epidemiology constitutes the main theoretical and methodological foundation

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of public health, being responsible for analyzing the distribution of health conditions and their determinants, as well as for applying this knowledge in their management and prevention. Its use allows the description of occurrence patterns according to time and place, in addition to identifying more vulnerable population groups, contributing to the understanding of health inequalities. Furthermore, it plays a central role in the organization and design of public policies by providing essential epidemiological evidence for health actions (Costa; Sabatino, 2023).

Epidemiological surveillance, as the operational component of epidemiology, is defined as a systematic set of actions aimed at the detection, monitoring, and continuous analysis of health conditions. This process is carried out through the collection and processing of data from health information systems, particularly the Notifiable Diseases Information System, which is fed by compulsory notifications (Brazil, 2023b).

Compulsory notification, by making the reporting of diseases such as HIV mandatory, forms the basis for the production of epidemiological information, allowing the monitoring of the magnitude, distribution, and evolution of cases. The quality of this information, expressed through attributes such as completeness, consistency, and timeliness, is crucial for the sensitivity and usefulness of the surveillance system. Thus, epidemiological surveillance goes beyond a descriptive function, assuming a strategic role in organizing public health responses (Brazil, 2023b).

In the context of HIV infection in children under five years of age, screening and early detection play a central role in the effectiveness of epidemiological surveillance actions. Case identification depends on the capacity of health services to perform timely diagnosis and ensure proper recording through compulsory notifications, which trigger the epidemiological investigation process (Silva; Chalkidis, 2021).

Based on notifications, actions are initiated to identify the agent, modes of transmission, and possible contacts, supporting measures for control and interruption of the transmission chain. Strategies such as active case finding and systematic monitoring of vulnerable populations help reduce underreporting and increase the

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sensitivity of the system. Thus, qualified screening is essential to ensure data reliability and the effectiveness of interventions (Silva; Chalkidis, 2021; Brazil, 2023b).

The analysis of the health situation, based on data from information systems, allows the characterization of the population's epidemiological profile and guides the definition of priorities. Continuous monitoring of cases, supported by compulsory notifications, makes it possible to assess the effectiveness of interventions and direct more efficient control and prevention strategies. In this sense, epidemiological surveillance is established as a strategic tool for reducing incidence and improving public policies, contributing to the response to HIV in the population (Ferreira *et al*., 2016; Silva; Chalkidis, 2021).

3. Methodology

This is a cross-sectional, observational, and descriptive study with a quantitative approach, based on secondary data collected from health information systems housed at the Information Technology Department of the Brazilian Unified Health System (DATASUS), covering the period from 2020 to 2024. Quantitative variables related to HIV infections in the federative unit of Piauí were considered. In addition, variables such as municipality of occurrence and mode of transmission were included, allowing a more detailed analysis of the epidemiological profile of the reported cases.

Cases of HIV infection in children under five years of age recorded in health information systems were analyzed, with residency in the state of Piauí, considering records in which notification also occurred in the same federative unit. The analysis was performed according to municipality of residence. The studied population was stratified by age group into children under five years, and from 1 to 4 years, with further detail (0 to <5 years). In addition, variables such as exposure category were considered, including vertical transmission and records classified as unknown for this variable, in order to avoid underestimation of cases.

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In this study, different health information systems from DATASUS were consulted. The SIM (Mortality Information System) records mortality data based on Death Certificates. The SINAN (Notifiable Diseases Information System) compiles reports of compulsory notifiable conditions, supporting epidemiological surveillance. The SISCEL (Laboratory Test Control System) is dedicated to monitoring laboratory tests related to HIV, such as CD4/CD8 counts and viral load, used in the clinical follow-up of people living with HIV.

Data were obtained from DATASUS, using the SINAN, SIM, and SISCEL systems in na aggregated form. Na assessment of data consistency was perform through the identification of extreme values, temporal coherence analysis, and verification of aggregated totals. It is noteworthy that, due to the aggregated nature of the available data, it was not possible to identify duplicate individual records, and the analysis was limited to consistency across systems and to the quality of the available information. This limitation is inherent to the use of aggregated secondary data and should be considered in the interpretation of the results.

The study outcome was defined as cases of HIV infection in children under five years of age, recorded in health information systems (SINAN, SIM, and SISCEL) available in DATASUS. The collected data were organized and tabulated using Tabnet software. Subsequently, Microsoft Office Excel was used for data analysis, enabling the construction of tables and the systematization of the obtained information. In this way, it was possible to interpret the results in a clear and objective manner.

Data collection performed through the DATASUS system aimed to obtain information used to calculate the detection rate of HIV infection in the population aged 0 (zero) to <5 years (four years, 11 months, and 29 days) in the state of Piauí and its capital, evaluating the number of cases between 2020 and 2024. This research was not submitted to a Human Research Ethics Committee, in accordance with Resolution 510/2016, as it involves public and anonymized data.

The detection rate of HIV infection was calculated as the ratio between the number of cases in children under five years of age recorded in the SINAN, SIM, and SISCEL systems in na aggregated form, available in DATASUS, and the population

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in this age group, multiplied by 100,000 inhabitants. This method is widely used in epidemiological studies of time series, trend analysis, and health surveillance, as described in the literature (Schneider; Freitas, 2018; Neves *et al*., 2023; Barros *et al*., 2024).

Data on the resident population under five years of age were obtained from the difference between live births from 2015 to 2024 and deaths of children under five years of age in the period from 2020 to 2024. The defined interval for the analysis of live births considered that births in 2015 meet the inclusion criteria for the age group used, since in 2020 the individual would have completed five years of age. The information was obtained through the DATASUS-Tabnet platform, in the vital statistics section. The screening was carried out by year, federative unit, and municipality.

These data were used as the denominator in the calculation of the detection rate. All data were collected from the DATASUS-Tabnet platform to prioritize data security, quality, and uniformity. The use of the resident population under five years of age in the state as the denominator was excluded due to the higher risk of data duplication. Thus, to calculate the detection rate for the state, its capital, and relevant municipalities (case confirmation), the following formula was used:

$$N^0 of \frac{cases\ registered\ in\ the\ periods}{Population\ < 5\ years\ of\ age\ (state\ or\ municipality)}\ x\ 10^5$$

4. Results and Discussion

From data collection on the DATASUS platform, it was found that the state of Piauí recorded tem cases of HIV in children aged 0 to <5 years in the period from 2020 to 2024. There was fluctuation in the number of cases according to the year (Figure 1). In 2020, two cases were recorded (20%); in 2021 and 2022, this number was 3 (30%) in each year, representing the period with the highest number of occurrences. Finally, in 2023 and 2024, there was a constant occurrence of 1 case (10%) per year.

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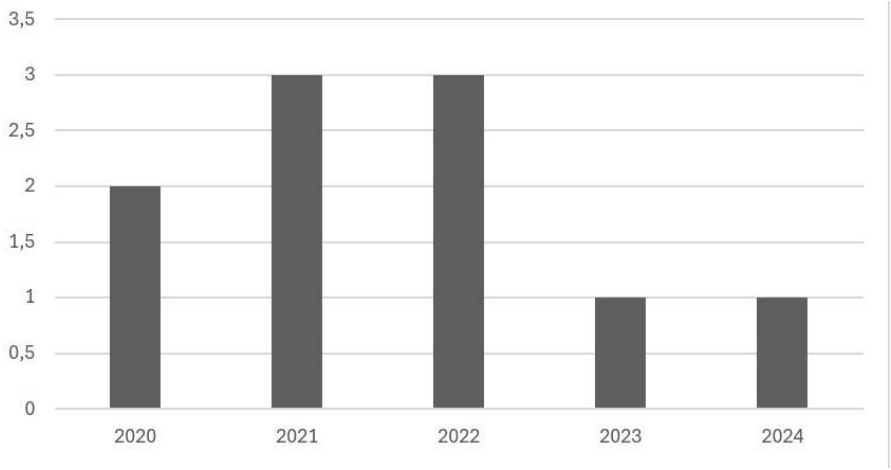
Figure 1: Temporal distribution of HIV cases recorded in DATASUS from 2020 to 2024 in children aged 0 to <5 years in the state of Piauí.



SOURCE: DATASUS; Author, 2026.

Table 1: Distribution by municipality (place of residence) of HIV cases in children aged 0 to <5 years in the state of Piauí, between 2020 and 2024.

MUNICIPALITY OF RESIDENCE	2020	2021	2022	2023	2024	TOTAL
Esperantina	0	0	1	0	0	**1**
Lagoa Alegre	0	0	0	0	1	**1**
Miguel Alves	0	0	1	0	0	**1**
Teresina	2	3	1	1	0	**7**
TOTAL	**2**	**3**	**3**	**1**	**1**	**10**

SOURCE: DATASUS; Author, 2026.

Regarding the distribution of cases by municipality of residence, they were concentrated in the capital Teresina, which recorded seven events. The remaining records were reported in three different cities (Esperantina, Lagoa Alegre, and Miguel Alves) (Table 1).

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The age group under 1 year, as well as the ≥ 3 to < 4 years group, accounted for 4 cases (40%). In the 2 to 3 years group, 2 cases (20%) were recorded. A reduction in the frequency of cases was observed (Table 2).

Table 2: Age distribution of HIV cases in children aged 0 to <5 years in the state of Piauí, between 2020 and 2024.

AGE	2020	2021	2022	2023	2024	TOTAL
< 1 year	1	1	1	0	1	**4**
≥ 2 a < 3 years	0	0	2	0	0	**2**
≥ 3 a < 4 years	1	2	0	1	0	**4**
TOTAL	**2**	**3**	**3**	**1**	**1**	**10**

SOURCE: DATASUS; Author, 2026.

Table 3: Distribution by mode of transmission of HIV cases in children aged 0 to <5 years in the state of Piauí, between 2020 and 2024.

Transmission	Esperantina	Lagoa Alegre	Miguel Alves	Teresina	TOTAL
Vertical transmission	1	1	1	4	**7**
Unknown	0	0	0	3	**3**
TOTAL	**1**	**1**	**1**	**7**	**10**

SOURCE: DATASUS; Author, 2026.

Regarding the mode of viral transmission, 70% of the cases provided information on this aspect, classifying them as vertical HIV transmission. The remaining 30% had this classification recorded as unknown, with these cases reported in 2020 and 2021 in Teresina, the state capital.

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Table 4: Number of live births (2015–2024), deaths, and population under 5 years (2020–2024).

STATE/MUNICIPALITY OF RESIDENCE	Live births (2015-2024)	Deaths of < 5 years (2020-2024)	Population < 5 years (2020-2024)
Piauí	457.508	470	457.038
Teresina	127.590	105	127.485
Esperantina	6.191	7	6.184
Lagoa Alegre	1.066	4	1.062
Miguel Alves	5.057	7	5.050

SOURCE: DATASUS; Author, 2026.

The population under 5 years of age, which was used as the denominator in the calculation of the detection rate, was obtained through the difference between live births and deaths (Table 4). From the ratio between recorded cases and the population under 5 years of age, followed by multiplication by 100,000, the corresponding detection rates were obtained for the state, Teresina, Esperantina, Lagoa Alegre, and Miguel Alves.

Regarding the overall detection rate, the coefficient during the study period in the state of Piauí was 2.2 cases/100,000 inhabitants, and in its capital it was 5.5 cases/100,000 inhabitants. Regarding the municipalities with recorded cases, Esperantina presented a rate of 16.2 cases/100,000 inhabitants, Lagoa Alegre had 94.2 cases/100,000 inhabitants, and Miguel Alves had 19.8 cases/100,000 inhabitants. The high detection rates occurred due to the reduced population adopted in the study, necessary to meet the intended analytical scope.

In relation to the presented information, the records from the last five years in Teresina and in the selected municipalities, shown in Table 1, presented high detection rates. However, the state coefficient was not high. According to the 2024 epidemiological bulletin on HIV and AIDS, the number of pregnant women with HIV has shown na increase, while vertical transmission and cases in children under 5 years have shown a reduction. Thus, it is important to recognize that prophylaxis and

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early diagnosis of infection are essential for controlling this disease (Vasconcelos *et al*., 2021; Brazil, 2022a; Brazil, 2024a).

Recent studies, such as those by Figueiredo *et al*. (2023) and Santos and Brandão (2024), show a progressive decline in vertical HIV transmission in the Northeast region and in Brazil, respectively. DATASUS data regarding HIV notifications between 2020 and 2024 show a reduction in occurrences in the target population, which may be the result of infection control, changes in case notification practices, and underreporting, as the low frequency analyzed makes it impossible to establish definitive correlations.

The reduced frequency of recorded cases should not be used to indicate the effectiveness of public policies for prophylaxis and monitoring of vertical HIV transmission, even in light of studies presenting findings, such as Gusmão and Bispo (2023), which show a progressive decline in the prevalence of HIV in the pediatric population (0 to 14 years) in the Northeast, especially after the consolidation of vertical transmission prevention policies and the expansion of access to antiretroviral therapy. This limitation is associated with rate instability and the reduced population size adopted.

The recorded data show that 60% of infection cases in the analyzed period were diagnosed in individuals older than 1 year, with 40% corresponding to diagnoses in individuals older than 3 years (Table 2). According to the National Institutes of Health (United States, 2025), early diagnosis combined with regular clinical and laboratory monitoring is na essential component for the appropriate indication of ART, as well as for verifying the effectiveness and safety of managing this infection in children under five years of age.

The low number of absolute cases in the present study may be partly related to the impact of the COVID-19 pandemic on the organization and functioning of health services, with direct repercussions on epidemiological surveillance, diagnosis, and HIV case reporting. This scenario is consistent with evidence showing a reduction in HIV/AIDS diagnosis rates in Brazil during the pandemic, associated with na increase in AIDS-related mortality due to late diagnosis, reflecting interruptions in screening strategies and continuity of care (Andrade *et al*., 2023).

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This study presents limitations inherent to the use of secondary data from health information systems, with possible underreporting or inconsistencies in case records. In addition, the low absolute number of events may have influenced the instability of detection rates, especially in small populations, where small variations in the number of cases can generate marked fluctuations in indicators.

Thus, the interpretation of the results should be performed with caution, both regarding comparisons between municipalities and the inference of spatial patterns. It should also be noted that, given the low magnitude of the events, it is not possible to reliably establish direct relationships between the observed variations in rates and the success or effectiveness of preventive measures, since fluctuations may result more from statistical instability than from real changes in the epidemiological behavior of the condition.

Brazil is a country committed to eliminating vertical transmission. To achieve this goal, the National Pact for the Elimination of Vertical Transmission was established in 2022. Under this model, municipalities and states may request certification of elimination of vertical transmission, provided they meet predefined targets. In 2024, this commitment was reaffirmed through the creation of the “Brasil Saudável” program. From this perspective, detailed information is necessary to enable screening and epidemiological studies. In this regard, the state presents many missing or ignored data (Brazil, 2022b; 2024c).

The validation of Brazil by the World Health Organization regarding the elimination of vertical HIV transmission constitutes na important indicator of the effectiveness of maternal and child health public policies, with maintenance of a transmission rate below 2% and high coverage of preventive interventions (PAHO, 2025). This scenario may contribute to the low magnitude of cases observed in the present study; however, due to the reduced number of events, it is not possible to establish direct relationships between municipal rates and the isolated impact of these strategies.

5. Conclusion

This study allowed for the analysis of the epidemiological profile of HIV from

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2020 to 2024 in the state of Piauí, with emphasis on aspects related to vertical transmission in children under five years of age. A low detection rate was observed over the analyzed period, with no notifications in 2023 and 2024, which may reflect both the low occurrence of the condition and the impact of prevention and early diagnosis strategies implemented within the Brazilian Unified Health System.

In this context, it is noteworthy that Brazil was recently recognized by the World Health Organization for the elimination of vertical HIV transmission as a public health problem, resulting from policies that ensure high coverage of prenatal care, testing, and timely treatment of pregnant women and newborns.

The study presents limitations inherent to the use of secondary data from DATASUS, including possible underreporting and inconsistencies in information records, which may affect the accuracy of the analyses. In addition, the low absolute number of cases may lead to instability in epidemiological indicators.

Nevertheless, the results obtained are consistent with findings from previous studies and epidemiological bulletins, contributing to the understanding of the local scenario. The information presented here may support health managers and professionals in planning surveillance, prevention, and control actions for vertical HIV transmission, strengthening strategies aimed at maintaining the elimination of this condition.

It is suggested that future investigations use longer time periods and aggregated spatial approaches, such as analysis by health regions, in order to achieve greater statistical robustness and a better understanding of HIV distribution patterns, thereby improving the consistency of epidemiological indicators and the quality of analysis regarding the completeness and reliability of health information.

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