

Gestational Syphilis in the State of Pará: Situational Diagnosis

Sífilis Gestacional en el Estado de Pará: Diagnóstico Situacional

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RESUMO

Objetivo: Analisar o perfil epidemiológico dos casos de sífilis gestacional no estado do Pará. **Método:** Trata-se de um estudo epidemiológico referentes os casos notificados de sífilis gestacional no estado do Pará, entre o período de 2019 a 2024. **Resultados:** Os resultados mostraram maior prevalência em 2022 e 2024, com predominância entre gestantes com Ensino Médio e idade entre 20 e 39 anos. Indivíduos de cor parda representaram a maioria dos casos. Clinicamente, a forma primária foi a mais comum, seguida pela latente. Houve alta prevalência de resultados reativos nos testes treponêmicos e não treponêmicos, apesar de muitos registros ignorados ou não realizados. **Conclusão:** A análise indica que as desigualdades regionais na oferta de serviços de saúde no Pará, especialmente em áreas interiores, dificultam o controle da sífilis gestacional.

DESCRIPTORIOS: Sífilis; Cuidado pré-natal; Gestação.

ABSTRACT

Objective: To analyze the epidemiological profile of gestational syphilis cases in the state of Pará. **Method:** This is an epidemiological study of reported cases of gestational syphilis in Pará from 2019 to 2024. **Results:** The results showed higher prevalence in 2022 and 2024, predominantly among pregnant women with a high school education and aged between 20 and 39 years. Individuals of mixed race (parda) accounted for most cases. Clinically, the primary form was the most common, followed by latent. There was a high prevalence of reactive results in both treponemal and non-treponemal tests, despite many records being ignored or not performed. **Conclusion:** The analysis indicates that regional inequalities in the availability of health services in Pará, especially in rural areas, hinder the control of gestational syphilis. The need to strengthen public policies to expand primary care, qualify professionals, and improve surveillance and notification systems is emphasized.

DESCRIPTORS: Syphilis; Prenatal care; Pregnancy.

RESUMEN

Objetivo: Analizar el perfil epidemiológico de los casos de sífilis gestacional en el estado de Pará. **Método:** Se trata de un estudio epidemiológico sobre los casos notificados de sífilis gestacional en Pará entre 2019 y 2024. **Resultados:** Los resultados mostraron una mayor prevalencia en 2022 y 2024, predominando entre gestantes con educación secundaria y edad entre 20 y 39 años. Los individuos de color pardo representaron la mayoría de los casos. Clínicamente, la forma primaria fue la más común, seguida por la latente. Hubo alta prevalencia de resultados reactivos en las pruebas treponémicas y no treponémicas, a pesar de que muchos registros fueron ignorados o no realizados. **Conclusión:** El análisis indica que las desigualdades regionales en la oferta de servicios de salud en Pará, especialmente en áreas rurales, dificultan el control de la sífilis gestacional. Se destaca la necesidad de fortalecer las políticas públicas para ampliar la atención primaria, capacitar a los profesionales y mejorar los sistemas de vigilancia y notificación.

DESCRIPTORIOS: Sífilis; Atención prenatal; Embarazo.

RECEIVED: 06/05/2025 APPROVED: 06/26/2025

How to cite this article: Marquezan LB, Costa MEA, Leite YPM, Ramos WA. Gestational Syphilis in the State of Pará: Situational Diagnosis. Saúde Coletiva (Edição Brasileira) [Internet]. 2025 [acesso ano mês dia];15(98):16482-16493. Disponível em: DOI: 10.36489/saudecoletiva.2025v15i98p16482-16493

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INTRODUCTION

Syphilis is a chronic systemic infection caused by the gram-negative bacterium *Treponema pallidum*, whose main route of transmission is sexual. However, vertical transmission remains one of the most worrying forms, and can occur during pregnancy or childbirth and result in congenital syphilis.⁽¹⁾ Along with other sexually transmitted infections (STIs) such as trichomoniasis, chlamydia and gonorrhoea, syphilis accounts for an average of one million new infections per day worldwide, affecting men and women between the ages of 15 and 49.⁽²⁾

Gestational syphilis (GS) can lead to adverse obstetric outcomes such as spontaneous abortion, stillbirth, prematurity, low birth weight and congenital malformations.⁽¹⁾ Furthermore, pregnant women with syphilis have a higher risk of having premature babies, with low birth weight or small for gestational age, when compared to uninfected pregnant women.⁽³⁾

In the context of prenatal care, the diagnosis of syphilis involves the use of treponemal tests, which detect specific antibodies against *Treponema pallidum*.⁽⁴⁾ However, in cases of a history of previous treatment of the infection during pregnancy, the use of non-treponemal tests for investigation is recommended, which identify nonspecific antibodies that, although not exclusive to the etiological agent, are present in syphilis infection.⁽⁵⁾

Pregnancy screening should ideally occur at two times: in the first and third trimester of prenatal care, and should also

be repeated at the time of delivery or in cases of miscarriage or stillbirth, regardless of previous results. This approach should also be extended to the sexual partner.⁽⁵⁾ The confirmed diagnosis must be registered on the pregnant woman's card by the health professional and notified to the authorities through the Notifiable Diseases Information System (SINAN).⁽¹⁾

Despite the existence of effective diagnostic methods and low-cost treatment with benzathine penicillin, gestational syphilis remains a challenge, especially in regions with socioeconomic inequalities and barriers to access to health services.⁽⁶⁾ Early screening and timely treatment are fundamental strategies for preventing these complications.⁽⁷⁾ However, underreporting of cases is still a significant problem; it is estimated that, between 2007 and 2018, Brazil failed to report around 45,000 cases of gestational syphilis, with higher underreporting rates in the North and Northeast regions.⁽⁸⁾

Treatment should be started immediately after the pregnant woman is diagnosed. In case of a positive test, treatment consists of administering benzathine benzylpenicillin. To be considered adequate, treatment must be complete and started up to 30 days before delivery.⁽³⁾ Recently, the Ministry of Health updated the recommendation on the interval between penicillin doses, allowing an interval of up to nine days between doses, with the same efficacy for treatment.⁽⁹⁾

Access, use and quality of health services for mothers are essential to ensure that vertical transmission of syphilis is blocked.⁽⁹⁾ Early identification of pregnant women and provision of pregnancy

monitoring are essential for this.⁽¹⁰⁾

In the state of Pará, gestational syphilis is a major problem, reflecting weaknesses in screening programs, access to adequate prenatal care, and treatment for pregnant women and their sexual partners.⁽¹⁰⁾ Factors such as late initiation of prenatal care, low education, social vulnerability, and flaws in the management of health services contribute to the persistence of vertical transmission of syphilis.⁽¹¹⁾

In this sense, understanding the dynamics of gestational syphilis at the local level is essential to strengthen surveillance, prevention, and comprehensive care actions for pregnant women and newborns. The situational analysis in the state of Pará allows us to identify the main barriers faced by health services and support the formulation of more effective public policies for infection control.^(1, 12) Thus, this study aims to analyze the epidemiological profile of gestational syphilis in the state of Pará.

METHOD

This is a retrospective epidemiological study with a quantitative approach, based on secondary data from reported cases of pregnant women with syphilis in the Notifiable Diseases Information System (SINAN) and the Live Births Information System (SINASC). The analysis covers records from the state of Pará, from 2019 to 2024.

The study was carried out in the state of Pará, located in the northern region of Brazil and is the second largest state in the country in terms of territorial extension, covering a vast area of forests, rivers and biodiversity.⁽¹³⁾ Cases of gestational

syphilis reported in the state of Pará between 2019 and 2024 with positive treponemal and non-treponemal tests were included. Women diagnosed before pregnancy, duplicate cases and those with inconclusive results were excluded from the sample.

The data used in this research were extracted from the Notification and Injury System (SINAN) and the Live Birth Information System (SINASC) made available by the Ministry of Health through the Department of Information Technology of the Unified Health System (DATASUS), using the TABNET tool, available at (<http://tabnet.datasus.gov.br/>). The extracted variables were divided into two blocks: socioeconomic (age group, race/color, education) and clinical (year of diagnosis, clinical classification, treponemal and non-treponemal test).

After collection, the data were organized and processed in Microsoft Office Excel 2016 software, and presented in descriptive tables and graphs. Statistical analysis included calculation of means and percentages. The following equation was used to estimate the prevalence rate:⁽⁹⁾

$$Prevalence = \left(\frac{\text{Number of cases of gestational syphilis}}{\text{Total number of pregnant women or live births}} \right) \times 100$$

Since this is a study based on publicly accessible secondary data provided by DATASUS, this research does not require submission to the Research Ethics Committee. As established in Resolution No. 510/2016 of the National Health Council, research using public domain databases without individual identification of participants is exempt from ethical approval, since they do not involve direct risks to the population studied.

For spatial analysis and creation of maps, the Geographic Information System (GIS) in QGIS software version 3.32.2 was used. The maps followed the Shape file format composed of three files with shp, shx and dbf extensions with Universal Transverse Mercator (UTM) projection. The information was extracted from the municipal grid of the Brazil-

ian Institute of Geography and Statistics (IBGE).

RESULTS

From the results obtained, it was noted that the largest proportion of

women with gestational syphilis were aged between 20 and 39 years (70.2%), self-declared as brown (79.9%) and had completed secondary education (35.6%), as shown in Table 1.

Table 1. Epidemiological profile of women diagnosed with syphilis during pregnancy in the State of Pará, between 2019 and 2024

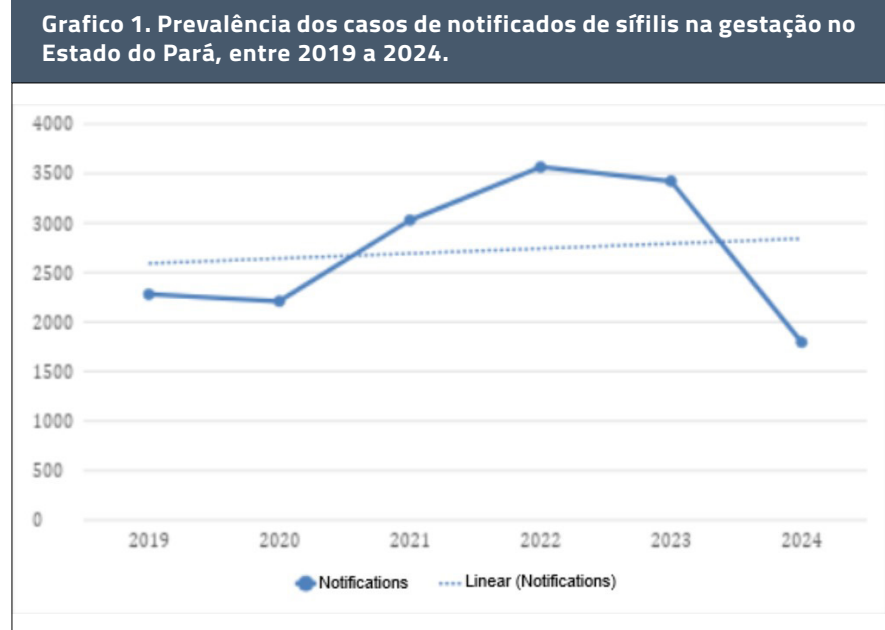
Variables	N (16.258)	%
Age group		
10 – 14 y/o	211	1,2%
15 – 19 y/o	4396	27%
20 – 39 y/o	11429	70,2%
40 – 59 y/o	248	1,5%
Color of skin		
White	1321	8,1%
Black	1183	7,2%
Yellow	125	0,7%
Brown	12995	79,9%
Indigenous	54	0,3%
Ignored	580	3,5%
Education		
Illiterate	66	0,4%
Elementary school	5481	33,7%
High School	5789	35,6%
Higher Education	515	3,1%
Ignored	2975	18,2%
Clinical classification		
Primary	6681	41,0%
Secondary	893	5,4%
Tertiary	2438	14,9%
Latent	2892	17,7%
Ignored	3354	20,6%
Treponemal test		
Reactive	11480	70,6%
Non-reactive	1015	6,2%
Not performed	2830	17,4%
Ignored	933	5,7%
Non-treponemal test		
Reactive	12633	77,7%
Non-reactive	497	3,0%
Not perfo	2438	14,9%
Ignorado	690	4,2%

Source: Notifiable Diseases Information System (SINAN)

Regarding the clinical classification of reported cases of gestational syphilis (GS), most women presented the primary form (41.0%), followed by the latent form (17.7%). Regarding the diagnosis of gestational syphilis, it was observed that treponemal tests were the most used, with 70.6% of cases presenting reactive results. Confirmation through non-treponemal tests also showed high positivity, with 77.7% of reactive tests.

The temporal analysis of reported cases of gestational syphilis (GS) revealed an increasing trend over the years, followed by a sharp decline in the last year investigated. The peak of notifications occurred in 2022, the year in which the highest number of women with GS was recorded. In contrast, the lowest number of reported cases was observed in 2024 (figure 1).

The spatial analysis of the municipalities of the state of Pará showed that the highest prevalence rates of gestational syphilis were recorded in the municipalities of Marituba (55.77 cases per 100,000 live births), Sapucaia (47.62/100,000 LB) and Marabá (46/100,000 LB). On the



Source: Notifiable Diseases Information System (SINAN)

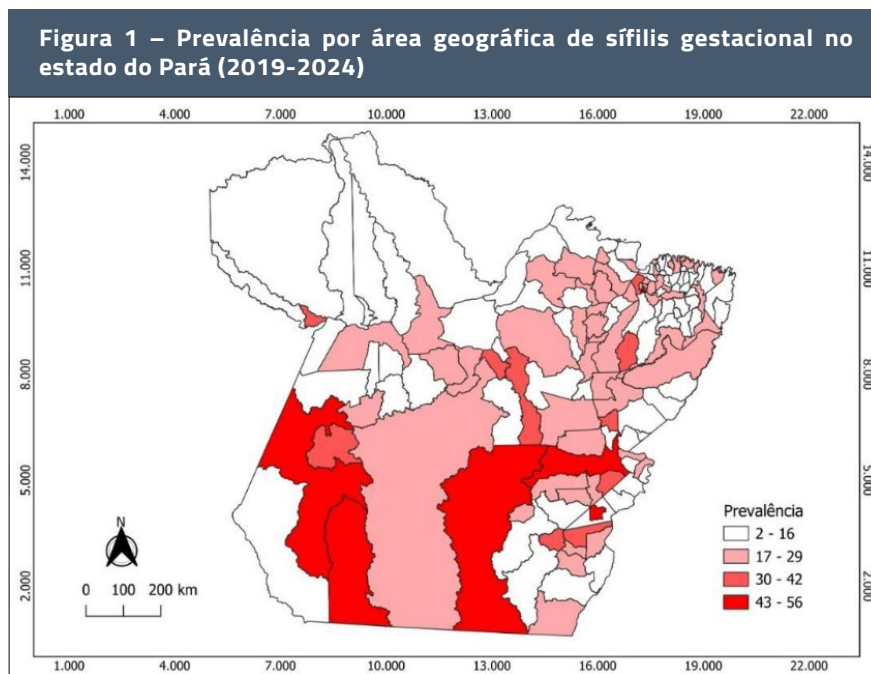
other hand, the lowest prevalence rates were observed in the municipalities of Cachoeira do Arari (2.43/100,000 LB), Almeirim (2.99/100,000 LB) and Bom Jesus do Tocantins (3.83/100,000 LB) (Figure 1).

The concentration of higher cases in certain areas may be related to factors such as higher population density, failures in health services, socioeconomic vulnerabilities or greater detection and reporting capacity, low prevalence or even underreporting, depending on the quality of local health surveillance.

DISCUSSION

During the study period (2019 to 2024), Brazil has faced an alarming epidemiological scenario regarding gestational syphilis, reflected in increasing notification rates and persistence of vertical transmission, especially in regions with greater social vulnerabilities, such as the North of the country. The analysis of the epidemiological profile of this period is essential to understand the recent evolution of the infection, identify changes in trends, characterize the most affected populations and evaluate the effectiveness of public policies and control strategies adopted.⁽¹⁴⁾

The data analyzed show a growing concern about gestational syphilis in the state of Pará, with emphasis on the year 2022, responsible for the highest prevalence of cases, followed by 2023. This increase



Source: Notifiable Diseases Information System (SINAN)

may be related to both the expansion of diagnostic coverage and epidemiological surveillance and the persistence of gaps in prenatal care. National studies indicate that Brazil has faced outbreaks of syphilis since the middle of the last decade, with gestational syphilis being a marker of inefficiency in sexual and reproductive health services.⁽¹¹⁾

Furthermore, the COVID-19 pandemic had a negative impact on public health actions, including the interruption of essential health services, which may have contributed to the increase in cases in subsequent years, as pointed out by Souza et al.⁽¹⁵⁾, who identified a drop in prenatal consultations and syphilis testing during the period.

The predominance of cases in women with secondary and primary education suggests that gestational syphilis is not limited to groups traditionally considered to be more socially vulnerable. This distribution corroborates recent literature, which observes a "reconfiguration of the epidemiological profile" of gestational syphilis, affecting young women with medium education, which may be associated with factors such as low adherence to prenatal care, lack of early testing and failures in partner approach.⁽¹⁶⁾

The analysis by Barreto et al.⁽¹⁷⁾ also reinforces this trend, pointing out that the increase in cases among women with a medium level of education is associated with issues such as misinformation about the disease and the lack of effective awareness strategies for this group. On the other hand, the low incidence among illiterate women may reflect underreporting or difficulty in accessing health services, an issue that deserves in-depth investigation.

The analysis of the age group confirms the predominance of the infection among women aged 20 to 39, which is in line with the period of greatest fertility and sexual activity of the female population. This pattern is widely documented in the literature and is recognized as a priority group for public prevention policies.⁽⁹⁾ However, the increasing incidence among pregnant adolescents (10-19 years old), al-

though lower, is equally worrying, as it indicates early vulnerabilities and demands integrated sexual education actions, access to contraceptive methods and regular testing. The research by Oliveira et al.⁽¹⁸⁾ highlights the importance of educational programs aimed at this age group, given that adolescence is a critical period for promoting sexual health.

The prevalence of brown skin color (around 80%) among reported cases reflects the local demographic profile, but may also indicate structural inequalities in access to health care, since studies indicate that the brown population is more susceptible to gestational syphilis due to social, racial and economic barriers.⁽¹⁹⁾ Low reporting among indigenous people should also be analyzed with caution, as it may indicate underreporting or difficulty in accessing health care networks for indigenous populations, especially in peripheral and rural regions. The analysis by Ribeiro et al.⁽²⁰⁾ suggests that indigenous populations face additional challenges, such as the lack of adequate infrastructure and trained professionals, which worsens the health situation in these communities.

The predominance of the primary clinical form suggests that, in many cases, diagnosis occurs in the early stages of infection. However, the high proportion of cases classified as "Unknown/Blank" and the presence of latent infections indicate weaknesses in records and clinical monitoring. This is worrying, since the latent form is often asymptomatic, making it difficult to identify and interrupt the chain of vertical transmission.⁽²¹⁾ Underreporting and lack of early diagnosis are problems widely discussed in the literature, with Ramos et al.⁽²²⁾ suggesting that the implementation of more robust monitoring systems and ongoing training of health professionals are essential to mitigate these gaps.

The results of the diagnostic tests reinforce the importance of early and adequate testing. The non-treponemal test showed 77.7% of reactive results, while the treponemal test confirmed positivity in more than 70% of cases. However, the numbers

of tests not performed or with ignored records – 3,128 for the non-treponemal test and 3,763 for the treponemal test – are significant and reveal flaws in the screening protocol, which may compromise the effectiveness of treatment and the prevention of vertical transmission.

The literature highlights that performing the tests jointly and sequentially is essential for the accurate diagnosis of gestational syphilis, and is a priority guideline of the Ministry of Health.⁽⁹⁾ A study by Silva et al.⁽²³⁾ also highlights the importance of continuing education for healthcare professionals on the correct use of tests, to ensure a more assertive diagnosis and an adequate response to treatment.

Therefore, the data from Pará reflect both advances in detection and persistent obstacles in surveillance, diagnosis and comprehensive care for pregnant women with syphilis. These findings converge with other studies that point to the need for ongoing training of healthcare teams, active surveillance of cases and intersectoral strategies to address gestational syphilis.⁽²⁴⁾ The most recent literature, such as the study by Oliveira et al.⁽¹⁸⁾, reinforces the urgency of public policies that promote universal and equal access to sexual and reproductive health, especially for populations in vulnerable situations. It is essential to invest in educational actions, strengthening primary care, universalizing prenatal testing and ensuring adequate treatment, both for pregnant women and their sexual partners.

CONCLUSION

The analysis of regional inequalities in the provision of health services in the state of Pará highlights the urgent need for strategies that take into account territorial specificities in the fight against gestational syphilis. The concentration of the population in urban centers and limited access in rural areas compromise prenatal care and the effectiveness of epidemiological surveillance actions. Therefore, it is essential to strengthen public policies aimed at expanding primary care coverage, training

health professionals, and improving reporting and monitoring systems. Only by overcoming these structural barriers will it be possible to guarantee comprehensive care and reduce inequalities in the control of gestational syphilis in the state of Pará.

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