



## ANALYSIS OF THE EPIDEMIOLOGICAL ASPECTS OF CONGENITAL SYPHILIS

Análise dos aspectos epidemiológicos da Sífilis Congênita

Análisis de los aspectos epidemiológicos de la sífilis congénita

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### ABSTRACT

**Introduction:** Congenital syphilis is a serious public health problem, it is responsible for several unfavorable outcomes such as fetal or perinatal death. In this sense, in order to provide information for better planning of education and prevention measures in vulnerable groups aiming at reducing the transmission chain, the objective of this study was to analyze epidemiological aspects of congenital syphilis in Tocantins state. **Outline:** Cross-sectional, retrospective study with a quantitative and descriptive approach by consulting the database of the Information System for Notifiable Diseases of Brazilian Ministry of Health from January 2009 to December 2019. **Results:** 1746 reports of syphilis were verified in the age group under one year of age. Regarding the mother's age group, a greater number of cases were identified between 20 and 29 years old, totaling 959 diagnosed cases. Considering the time of diagnosis, most were performed during prenatal care (945 cases), those mothers with less education had a higher incidence. **Implications:** The profile of congenital syphilis in Tocantins state has a high incidence of cases in the sample studied, a fact associated with deficits in the therapeutic interventions of infected pregnant women.

### DESCRIPTORS

Epidemiological Monitoring; Pregnant Women; Prenatal Care.

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## INTRODUCTION

Syphilis is an infection of which the main route of transmission is sexual contact, followed by vertical transmission, passed to the fetus during the pregnancy of mothers with the disease treated inappropriately. The transplacental route is the most common form of vertical transmission and may occur during any period of pregnancy.<sup>1</sup>

Congenital syphilis (CS) has the bacterium *Treponema Pallidum* as an etiologic agent, and this infection is mandatory, as it is responsible for unfavorable outcomes such as fetal or perinatal death, prematurity, low birth weight, neurological injuries, among other sequelae.<sup>2</sup>

When syphilis appears soon after birth, or before the first two years of life, it is called early CS, equivalent to acquired secondary syphilis. When it begins after two years of life, it is called late CS and is equivalent to late syphilis.<sup>1</sup>

It is estimated that in the world, every year, one and a half million new cases of syphilis occur in pregnant women. In Brazil, only in 2016, 19,846 cases of CS were diagnosed, and 185 deaths in children under the age of one year were declared in the mortality information system, verifying that in ten years, there was a considerable increase in the rate of infant mortality due to CS.<sup>2</sup>

CS is a disease that can be prevented through early diagnosis. Epidemiological studies may promote knowledge to the population of a given region and help to identify opportunities for improving health care and preventing this type of disease. Despite the high frequency of CS in Brazil, epidemiological studies about this disease are scarce in Tocantins state.<sup>3</sup>

In this way, this study aimed to analyze the epidemiological aspects of CS in Tocantins state, from January 2009 to December 2019, with the intention of providing information for a better planning of education and prevention measures in vulnerable groups, and the evaluation of actions to reduce transmission.

## METHOD

Epidemiological, cross-sectional, retrospective, descriptive study with quantitative presentation, performed from information available in the Information System for Notifiable Diseases (SINAN).

The criteria for inclusion in the study were the cases diagnosed with congenital syphilis in Tocantins state, registered in the SINAN, from January 2009 to December 2019, to present the endemic behavior of the disease during the study period. In this manner, there was no need for approval by the Human Research Ethics Committee, according to Law No. 466/2012, due to the data has been previously collected.

Incomplete reports with registration outside the surveyed sample and variables not analyzed in the study were excluded. SINAN was approached as a source of information, as it presents data on reports and investigations of cases of pathologies and their complications, which are on the national list of reports, including CS.

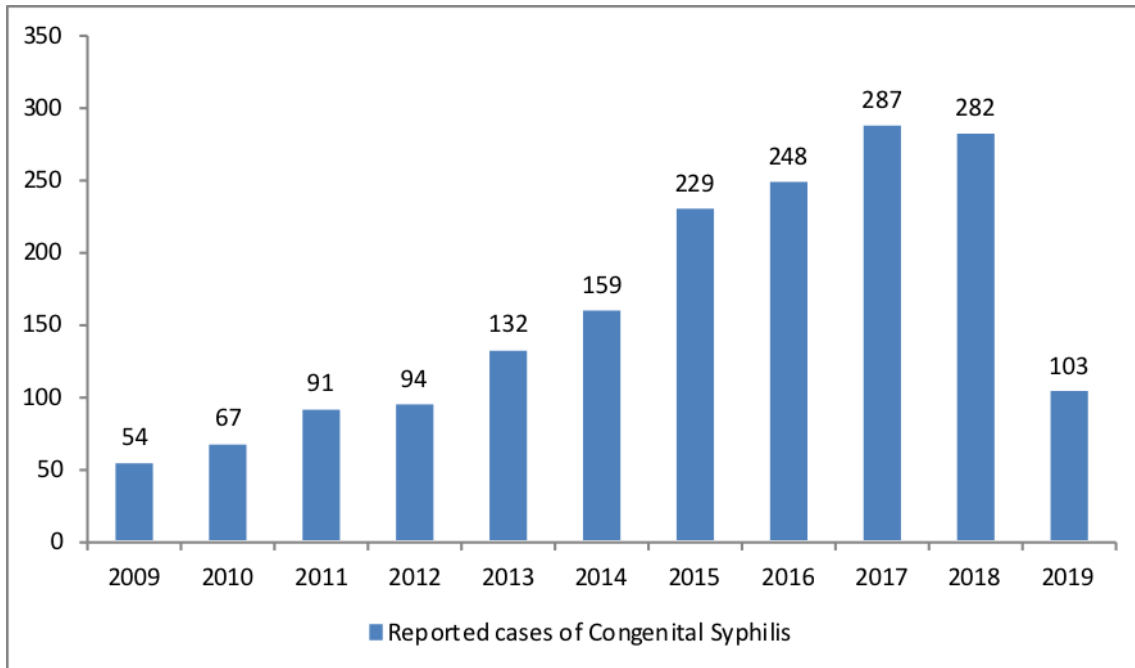
The analyzed variables were reported cases, annual detection, mother's age and education, child's age, and frequency of cases. These variables, according to the experience of the researchers in the study, are the most appropriate questions to understand the characteristics of those infected by the disease in the state. Data were collected by two independent researchers from spreadsheets created by the TabWin32 application in version 3.6b and sent to Microsoft Excel® 2013 software which allowed the descriptive statistical analysis of the study.

## RESULTS

Between January 2009 and December 2019, according to SINAN, in Tocantins state, 1746 cases of CS were diagnosed in children under the age of one

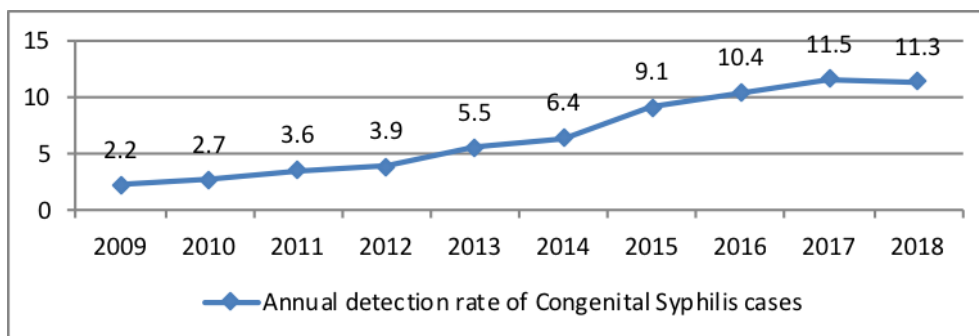
year. During the study period, there was a progressive increase in the number of diagnosed cases, except for the year 2019, when there was a decrease in the number of diagnosed children (Figures 1 and 2).

**Figure 1** – Reports of Congenital Syphilis in Tocantins state from 2009 to 2019.



Source: (SINAN, 2019).

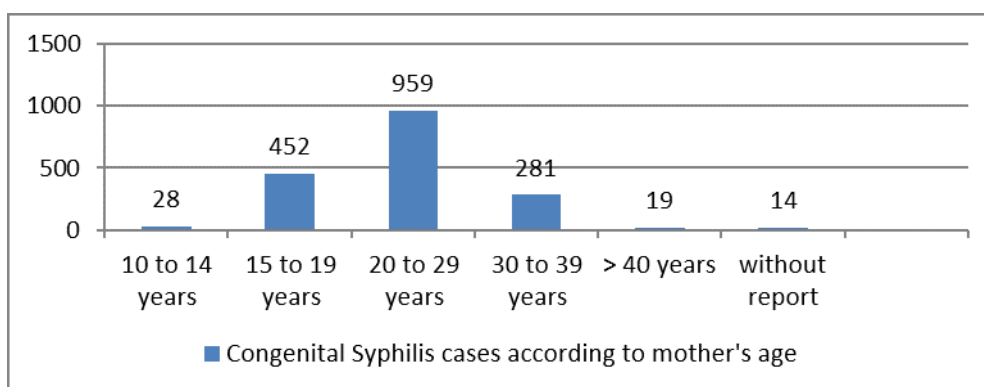
**Figure 2** – Annual detection rate of Congenital Syphilis cases in Tocantins state from 2009 to 2018.



Source: (SINAN, 2019).

When we analyzed the number of reports of CS in mother's age group, there was a higher prevalence between 20 and 29 years, totaling 959 cases.

**Figure 3** – Congenital Syphilis cases according to mother's age group by year of diagnosis in Tocantins state from 2009–2019.



Source: (SINAN, 2019).

Based on epidemiological data at the time of diagnosis, it was observed that 945 cases were diagnosed during prenatal care, while 660 were diagnosed at the time of delivery/curettage.

Regarding the level of education, it was observed that mothers with a higher level of

education, incomplete or complete higher education, had a lower number of cases. The highest prevalence of syphilis occurred in mothers with incomplete 5th to 8th grades (493 cases).

**Table 1** – Epidemiological data on congenital syphilis in Tocantins state from 2009–2019.

Variables	Total cases	Percentage of cases
<b>Mother's education</b>		
Illiterate	14	0.8%
Incomplete 1st to 4th grade	96	5.48%
Incomplete 4th grade	70	4%
Incomplete 5th to 8th grade	653	37.3%
Complete Elementary	175	10%
Incomplete High	270	15.43%
Complete High	396	22.64%
Incomplete Higher	22	1.2%
Complete Higher	27	1.5%
Does not apply	8	0.4%
Without report	182	10.40%
<b>Diagnosis of maternal syphilis</b>		
During prenatal care	945	54.03%
At childbirth/curettage	660	37.73%
After childbirth	122	6.97%
Unrealized	17	0.97%
Unreported	9	0.5%
<b>Maternal treatment scheme</b>		
Suitable	57	3.2%
Unsuitable	1.080	61.7%

Unrealized	525	30.01%
Unreported	91	5.2%
<b>Treated partner</b>		
Yes	225	12.86%
No	1240	70.9%
Unreported	284	16.29%

Source: (SINAN, 2019).

## DISCUSSION

During the analyzed period, an exponential increase in the number of reports was observed. This situation is due to the improvement of actions of the teams of the primary care basic units, aiming at an efficient epidemiological surveillance in the approach of the suspicious events of the disease, thus decreasing underreporting.<sup>4</sup>

However, the average annual detection rate of Tocantins was 6.66 cases/1,000 live births (LB), a value above the goal recommended by the Brazilian Ministry of Health, which is to register equal to or less than 1/1,000 LB. In 2019, there was a reduction in the reported numbers, representing the best implementation of actions related to the increase in the number of rapid tests for the early diagnosis of cases and of several informative and educational actions. However, the annual detection rate of 2019 was 11.3/1,000 LB, well above the goals of the Ministry of Health, demonstrating a negative assessment of the functioning of public health in the state and the need for improvements in health education for the population.<sup>5-6</sup>

Regarding the age group, it was found that between 20 and 29 years is the age of greatest susceptibility to contamination of women by syphilis, a fact justified because it represents the peak of the reproductive phase. Young women are more likely to become infected with *Treponema Pallidum*, as they usually have multiple partners and do not use condoms during sex.<sup>4,7</sup>

A significant number of syphilis in adolescents was also identified, which can be inferred from the lack of health education in this age group,

demonstrated by the early and unprotected initiation of sexual life.<sup>4</sup>

With regard to the level of education, it was observed that there was a high frequency in women with, at most, incomplete elementary education, a situation that becomes a major dilemma for public health, because for the population to be able to promote adequate prevention, the awareness of the disease is necessary. It is expected that the higher education level of the population, more efficient the measures taken for the prophylaxis of the disease will be.<sup>7-8</sup>

Another situation presented in the study was on the diagnosis, in which, although most pregnant women were diagnosed during prenatal care, only a percentage of 31.2% was diagnosed at the time of delivery or curettage. Thus, it is demonstrated that despite medical monitoring in Tocantins state, the late diagnosis of the infection still persists, which is related to a worse prognosis for the effectiveness of treatment in a timely manner, to prevent vertical transmission.<sup>4</sup>

The appropriate treatment to fight syphilis occurs through the administration of penicillin in the pregnant woman and her partner, in order to prevent the vertical transmission of *Treponema Pallidum*. It is necessary to finish the drug regimen 30 days before childbirth, and VDRL titration should be lower than four to eight times between three and six months before childbirth. The following are considered inadequate treatments: those that use antibiotics other than penicillin, treatments in periods shorter than recommended or outside the established deadline and untreated or inadequately treated partners.<sup>7</sup>

The study showed a percentage of 58.2% of cases with inadequate treatment and 27.3% of cases in which treatment was not performed, with 70.9% of partners not being treated. Once again, we demonstrate the need for improvements in health education for the population, in order to demonstrate the importance of complete treatment as well as the need for partner treatment. Since without effective therapy, this disease during pregnancy may cause miscarriage, prematurity and death.<sup>4</sup>

The limitation of this study was the number of variables that presented fields that were not filled in correctly by the people reported with syphilis, a fact that hinders a more effective analysis of the data presented. The complete filling of the report forms is essential to know the true epidemiological profile of the population.

We observed in this study important data for the public system to outline the improvement of strategies and actions in order to guarantee the adequate diagnosis, treatment and prevention for the population of Tocantins. In addition, the need for further studies on the subject is stated, in order to obtain a more refined analysis of the data presented.

## CONCLUSION

### RESUMO

**Introdução:** A sífilis congênita é um grave problema de saúde pública, é responsável por vários desfechos desfavoráveis como óbito fetal ou perinatal. Neste sentido, no intuito de fornecer informações para um melhor planejamento das medidas de educação e prevenção nos grupos vulneráveis visando a redução da cadeia de transmissão, essa pesquisa teve por objetivo analisar aspectos epidemiológicos da sífilis congênita no estado do Tocantins. **Delineamento:** Estudo transversal, retrospectivo com abordagem quantitativa e descritiva por meio da consulta à base de dados do Sistema de Informação de Agravos de Notificação do Ministério da Saúde no período de janeiro de 2009 a dezembro de 2019. **Resultado:** Foram verificadas 1746 notificações de sífilis na faixa etária menor que um ano de idade. Em relação à faixa etária da mãe, foi identificado um maior número de casos na idade entre 20 a 29 anos, totalizando 959 casos diagnosticados. Considerando o momento do diagnóstico, a maioria foi feita durante o pré-natal (945 casos), aquelas mães com menor escolaridade apresentaram-se com maior incidência. **Implicações:** O perfil da sífilis congênita no estado de Tocantins apresenta-se com elevada incidência de casos na amostra estudada, fato esse associado com déficits nas intervenções terapêuticas das gestantes infectadas.

### DESCRITORES

Monitoramento Epidemiológico; Gestantes; Cuidado Pré-Natal.

### RESUMEN

**Introducción:** La sífilis congénita es un problema grave de salud pública, es responsable de varios resultados desfavorables, como la muerte fetal o perinatal. En este sentido, con el fin de proporcionar información para una mejor planificación de la educación y medidas de prevención en grupos vulnerables con el objetivo de reducir la cadena de transmisión, esta investigación tuvo como objetivo analizar los aspectos epidemiológicos de la sífilis congénita en el estado de Tocantins. **Delineación:** Estudio transversal, retrospectivo con un enfoque cuantitativo y descriptivo consultando la base de datos del Sistema de Información de Enfermedades de Notificación del Ministerio de Salud desde enero de 2009 hasta diciembre de 2019. **Resultados:** Hubo 1746 notificaciones de sífilis en el grupo de edad de menos de un año. En cuanto al grupo de edad de la madre, se identificó un mayor número de casos entre 20 y 29 años, totalizando 959 casos diagnosticados. Teniendo en cuenta el

The results of this study made it possible to describe the epidemiological profile of CS in Tocantins state, from January 2009 to December 2019, demonstrating that this disease in the state is above the recommended by the Brazilian Ministry of Health. Certainly, this high frequency of reports is associated with ineffective therapeutic interventions.

This increase in the frequency of CS associated with inadequate treatment of pregnant women with syphilis during prenatal care becomes a risk for increased mortality. Another situation presented is in relation to the age group, which despite being more frequent between 20 and 29 years old, the occurrence of cases among children and adolescents is still a cause for concern.

Therefore, there is a need for improvements in prenatal care as well as adequate treatment, in order to reduce the high frequency of CS in Tocantins. In addition, improvements in health education actions are necessary in primary care units.

momento del diagnóstico, la mayoría se realizó durante la atención prenatal (945 casos), las madres con menos educación mostraron una mayor incidencia. **Implicaciones:** El perfil de sífilis congénita en el estado de Tocantins tiene una alta incidencia de casos en la muestra estudiada, un hecho asociado con déficits en las intervenciones terapéuticas de mujeres embarazadas infectadas.

#### DESCRIPTORES

Monitoreo Epidemiológico; Mujeres Embarazadas; Atención Prenatal.

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## COLLABORATIONS

CWBG: contributed to data collecting, analysis and interpretation and writing the article. ABPN and DLFG: contributed to data collecting and writing the article. GSL: contributed to writing the article and to critical review of the article. KHJFR: contributed to writing the article. JMS: contributed to critical review of the article. All the authors agree and take responsibility for the content of this manuscript version to be published.

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## AVAILABILITY OF DATA

Does not apply.

## FUDING SOURCE

Does not apply.

## CONFLICTS OF INTEREST

There are no conflicts of interest to declare.