

# Epidemiological profile of the reported cases of maternal and congenital syphilis in a reference maternity hospital from Belo Horizonte

*Perfil epidemiológico dos casos notificados de sífilis materna e congênita em uma maternidade referência em Belo Horizonte*

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## ABSTRACT

**Introduction:** Syphilis is an infectious contagious disease caused by bacterium *Treponema pallidum*, with predominantly sexual transmission. In untreated or inadequately treated pregnant women, the infection occurs transplacentally. **Purpose:** To trace the epidemiological profile of the maternal and congenital syphilis cases. **Methods:** A cross-sectional, descriptive and quantitative study conducted through access to the syphilis cases reported from January to June 2020, in a maternity hospital that is a reference in maternal and childcare in Belo Horizonte, Minas Gerais. **Results:** A total of 232 reported cases of congenital syphilis were identified in this period and the prevalence of the disease was 4.3%. Among the pregnant women, 69% are aged between 20 and 34 years old, 14.65% have complete elementary school, and 43.1% are brown-skinned. As for the cases of vertical transmission, 87.5% attended prenatal care, 23.3% were diagnosed with syphilis at the time of delivery and, in 15.1% there was concomitant treatment of the partners. **Conclusion:** In the maternity hospital under study, the prevalence of congenital syphilis is high. The results show the need for improvement in the control of syphilis during pregnancy.

**Keywords:** Congenital Syphilis; Epidemiology; Prenatal Care.

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## RESUMO

**Introdução:** A sífilis é uma doença infectocontagiosa causada pela bactéria *Treponema pallidum*, com transmissão predominantemente sexual. Nas gestantes não tratadas ou tratadas de forma inadequada, a infecção ocorre por via transplacentária. **Objetivos:** Traçar o perfil epidemiológico dos casos de sífilis materna e congênita. **Métodos:** Estudo transversal, descritivo e quantitativo realizado através do acesso aos casos notificados de sífilis no período de janeiro a junho de 2020, em uma maternidade referência em assistência materno-infantil em Belo Horizonte, Minas Gerais. **Resultados:** Foram identificados 232 casos notificados de sífilis congênita neste período e a prevalência da doença foi de 4,3%. Entre as gestantes, 69% possuem 20 a 34 anos, 14,65% ensino fundamental completo e 43,1% são de raça parda. Quanto aos casos de transmissão vertical, 87,5% realizaram pré-natal, 23,3% obtiveram diagnóstico de sífilis no momento do parto e em 15,1% houve tratamento concomitante do parceiro. **Conclusão:** Na maternidade estudada é elevada a prevalência da sífilis congênita. Os resultados demonstram a necessidade de melhoria no controle da sífilis na gestação.

**Palavras-chave:** Sífilis Congênita; Epidemiologia; Cuidado Pré-natal.

## INTRODUCTION

Syphilis is an infectious contagious disease caused by bacterium *Treponema pallidum*, with predominantly sexual transmission. In untreated or inadequately treated pregnant women, the infection occurs transplacentally to the fetus and is influenced by the syphilis stage in the mother. Vertical transmission of intrauterine syphilis varies from 70% to 100% in pregnant women with primary or secondary syphilis or in those who undergo inadequate treatment, such as during passage of the fetus through the birth canal when there is an active lesion. Transmission through breastfeeding is uncommon and is caused by cracked breasts<sup>1</sup>.

Congenital syphilis (CS) is considered a completely preventable and treatable disease through access to quality prenatal care with timely diagnosis and treatment, including the partner. Despite the availability of rapid diagnosis and of effective and low-cost treatment, CS remains a public health problem<sup>2</sup>.

CS transmission is around 70% to 100% in the primary and secondary phases, when there is greater bacterial replication, and it may occur at any phase of the disease. It reflects the spread of syphilis in undiagnosed and/or precociously and adequately treated pregnant women, which may result in abortion, stillbirth or neonatal sepsis, affecting the central nervous, reticuloendothelial, hematological and musculoskeletal systems and, more rarely, organs such as eyes, kidneys and lungs<sup>2</sup>.

At the global level, strategies were devised by the World Health Assembly (2016-2021) in the context of sexually transmitted infections (STIs), which includes the expansion of evidence-based interventions and services to control STIs

and reduce their impact as a public health problem until 2030<sup>3</sup>.

In 2019, 24,130 cases were reported in Brazil, most of which (44.6%) were in the Southeast, followed by the Northeast (26.3%), South (13.7%), North (9.2%) and Midwest (6.1%) regions. From 2018 to 2019, there was an 8.7% reduction in the number of notifications in Brazil. With regard to the regions, the greatest reduction occurred in the Northeast region (19.1%), followed by the South (6.4%) and Southeast (5.3%) regions<sup>4</sup>.

In the country, syphilis remains with high incidence. In 2019, there was an incidence rate of 8.2 cases for every 1,000 live births in Brazil, with the Southeast Region (9.4 cases/1,000 live births) above the national rate<sup>3</sup>.

Given the above, this study aims at identifying the prevalence and evaluating the epidemiological profile of the reported cases of congenital and maternal syphilis at a hospital that is a reference in maternal and childcare in Minas Gerais.

## METHODS

This is a cross-sectional and descriptive study with a quantitative approach. The data were obtained by consulting the records of the notified cases of congenital syphilis.

The study was carried out at the Sofia Feldman Hospital (*Hospital Sofia Feldman - HSF*), an institution that is a reference in maternal and childcare both in the city of Belo Horizonte and in the state of Minas Gerais (MG). All the cases of congenital syphilis reported from January to June 2020 were included in the study.

The data collected were registered in a semi-structured form with the variables of interest: sociodemographic variables regarding the mothers, and those related to diagnoses and health care present in the notification form; NB profile, such as data referring to diagnoses (treponemal test; non-treponemal test; CSF alteration and alteration of long bones), signs and symptoms, treatment scheme and evolution of the case (miscarriage; stillbirth; death due to congenital syphilis; live birth; death due to other causes).

Maternal and neonatal information was stored in a database in the Microsoft Excel® program (2016). The STATA software, version 12.0, was used for data analysis. Descriptive analyses of the sociodemographic and maternal and neonatal care variables were performed by means of tables and graphs, using measures of central tendency for variables.

This study waives use of the free and informed consent form as it deals with consultations of secondary data; however, the data use commitment form (DUCF) was presented.

The research was submitted to the research ethics committee of the Sofia Feldman Hospital, following the determinations set forth in Resolution No. 466/12 of the National Council of Ethics in Research (*Conselho Nacional de Ética em Pesquisa - CONEP/Conselho Nacional de Saúde - CNS*) and approved under opinion No. 4,369,411.

## RESULTS

Between January and June 2020, 232 reported cases of congenital syphilis were identified at the institution. Table 1 shows the number of live births in the period and observed the lowest percentage in February 14.8% and the highest in April 19%.

**Table 1.** Number of live births in a maternity hospital in Belo Horizonte, MG, Brazil, 2020 (N=5.424).

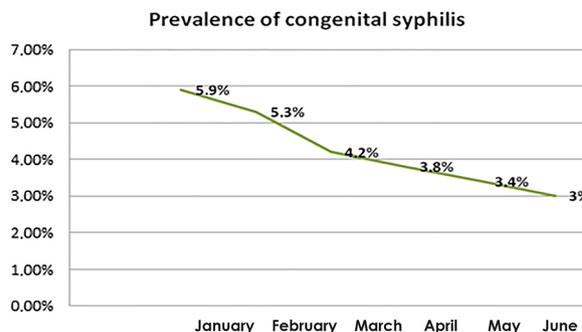
Month	N	%
January	844	15.5
February	800	14.8
March	986	18.1
April	1.033	19
May	907	16.8
June	854	15.8

Source: Patient Safety Center (*Núcleo de Segurança do Paciente, NSP*).

Graph 1 shows the prevalence of congenital syphilis in the maternity hospital under study. The prevalence found in this period was 4.3%.

Table 2 shows that 50.4% of the live births with congenital syphilis presented venereal disease research laboratory (VDRL) in reagent peripheral blood, 5.2% had CSF alteration and 2.6% change on long bone radiograph.

As for the women's sociodemographic characteristics, 69% were aged between 20 and 34 years old, 14.6% had not completed elementary school, 71.6% did not inform their schooling level; 23.3% were housewives and 43.1% declared themselves as brown-skinned (Table 3).



**Graph 1.** Prevalence of congenital syphilis cases in a maternity hospital from Belo Horizonte, MG, in the first half of 2020. Source: Patient Safety Center (*Núcleo de Segurança do Paciente, NSP*).

**Table 2.** Demographic and diagnostic characteristics referring to the reported cases of congenital syphilis in a maternity hospital from Belo Horizonte, MG, Brazil, 2020 (N=232).

Characteristics of the cases	N	%
<b>Gender</b>		
Male	95	40.9
Female	98	42.3
No information or unknown	39	16.8
<b>Race</b>		
White	22	9.5
Black	12	5.2
Asian	2	0.7
Brown	104	44.8
No information or unknown	92	39.7
<b>Peripheral blood</b>		
Reactive	117	50.4
Non-reactive	84	36.2
Not performed	9	3.9
No information or unknown	22	9.5
<b>CSF alteration</b>		
Yes	12	5.2
No	100	43.1
Not performed	55	23.7
No information or unknown	65	28
<b>Long bone alteration</b>		
Yes	6	2.6
No	148	63.8
Not performed	33	14.2
No information or unknown	45	19.4

Source: Patient Safety Center (*Núcleo de Segurança do Paciente, NSP*).

**Table 3.** Reported cases of congenital syphilis according to the characteristics of the mothers in a maternity hospital from Belo Horizonte, MG, Brazil, 2020 (N=232).

Characteristics of the mothers	N	%
<b>Age group</b>		
15-19	26	11.2
20-34	160	69
35-49	22	9.5
No information or unknown	24	10.3
<b>Schooling</b>		
Illiterate	1	0.4
Incomplete elementary school	9	3.9
Complete elementary school	34	14.6
Complete high school	21	9.0
Complete higher education	1	0.4
No information or unknown	166	71.6
<b>Occupation</b>		
Student	5	2.1
Housewife	54	23.3
Others	44	19
No information or unknown	129	55.6
<b>Race</b>		
White	20	8.6
Black	29	12.5
Asian	2	0.9
Brown	100	43.1
No information or unknown	81	34.9

Source: Patient Safety Center (*Núcleo de Segurança do Paciente, NSP*).

Table 4 shows that 87.5% of the women attended prenatal care that the partners did not undergo treatment in 50.4% and that treatment of the pregnant women was considered adequate in 26.3%. At delivery, they presented VDRL, reactive non-treponemal test (68.5%) and reactive treponemal test (75.9%).

## DISCUSSION

Congenital syphilis is considered a sentinel event and may be avoided by means of effective diagnosis and treatment of the infected pregnant woman and her partner in a timely manner<sup>5</sup>.

Between January and June 2020, there was a reduction in the number of CS cases notified in the hospital under study, although prevalence is high considering the period analyzed. The increase in the cases of acquired syphilis in pregnant women and in the congenital form in the country and in several other countries shows that the disease remains a public health problem<sup>6</sup>.

The disbelieving curve of cases found in this study may be associated with the improvement of national strategies by the Ministry of Health for the control of syphilis<sup>3</sup>. In contrast, it is important to emphasize that the decrease in

**Table 4.** Distribution of the reported cases of congenital syphilis according to the characteristics of prenatal care and diagnosis in a maternity hospital from Belo Horizonte, MG, 2020 (N=232).

Variables	N	%
<b>Attended prenatal care</b>		
Yes	203	87.5
No	10	4.3
No information or unknown	19	8.2
<b>Partner underwent treatment</b>		
Yes	35	15.1
No	117	50.4
No information or unknown	80	34.5
<b>Pregnant woman treatment</b>		
Adequate	61	26.3
Inadequate	70	30.2
Not performed	55	23.7
No information or unknown	46	19.8
<b>Maternal syphilis</b>		
During prenatal care	125	53.9
At delivery/curettage	54	23.3
After delivery	30	12.9
Not performed	1	0.4
No information or unknown	22	9.5
<b>Non-treponemal test at delivery</b>		
Reactive	159	68.5
Non-reactive	63	27.2
Not performed	3	1.3
No information or unknown	7	3
<b>Treponemal test at delivery</b>		
Reactive	176	75.9
Non-reactive	7	3.0
Not performed	11	4.7
No information or unknown	38	16.4

Source: Patient Safety Center (*Núcleo de Segurança do Paciente, NSP*).

the number of cases also results from a delay in notification, due to the local mobilization of health professionals caused by the COVID-19 pandemic<sup>4</sup>.

The rates were evaluated in relation to the characteristics of the notified cases of congenital syphilis in which 14.2% did not undergo the long bone alteration test, and 19.4% of the information is unknown or not filled out. Long bone X-rays are of great relevance, offering diagnostic assistance, as there are cases of asymptomatic infected newborns, whose only alteration is the radiographic finding<sup>7</sup>. Bone lesions commonly affect the tibia and other long bones in the body and are usually multiple and symmetrical. Lesions can be classified as osteochondritis, osteomyelitis, and osteoperiostitis<sup>8</sup>.

Most of the women diagnosed with syphilis were aged between 20 and 34 years old, of reproductive age, also

considering other studies that investigate syphilis in pregnant and non-pregnant women<sup>9-11</sup>. In relation to schooling, most of the mothers (14.6%) had completed high school, and most of the information was blank or unknown (71.6%) and corroborates with other work the same was identified in other studies, such as the one carried out in Ceará<sup>12</sup>, with high underreporting of this information, corresponding to 60.4% of the cases; the same occurred in Rio Grande do Norte<sup>13</sup> and at the national level. Low schooling means that the mothers have limited access to information that prevents infection and the consequent vertical transmission of syphilis and, in the case of diagnoses, they must undergo appropriate treatment<sup>13</sup>.

In this study, the characteristics of the mothers and the cases of congenital syphilis collaborate to confirm the hypothesis that the large number of notified cases of congenital syphilis is a reflection of deficiencies in prenatal care since, in this study, 87.5% of the mothers of the notified cases had access to prenatal care, with 53.9% of the pregnant women diagnosed with syphilis during prenatal care and 23.3% at the time of delivery, suggesting that prenatal care was not effective for the treatment of syphilis in pregnant women, corroborating other authors<sup>6,11,14</sup>. Prenatal screening for syphilis (first consultation, 28 gestational weeks and at delivery) is recommended in order to identify possible infection during pregnancy<sup>6</sup>.

According to a study carried out in Belo Horizonte, Minas Gerais, on the incidence and risk factors for congenital syphilis, there are factors responsible for treatment failure and recurrence of the disease, such as failure to diagnose syphilis in the prenatal period: number of consultations in prenatal care below seven, absence of tests to detect syphilis in the first and third trimester of pregnancy, delay of the laboratories in delivering the results, non-return of the pregnant woman to the health center to present the test result to the health professionals, as well as failure by the health services to rescue pregnant women who have abandoned prenatal care<sup>15</sup>.

With regard to prenatal care, the Ministry of Health recommends performing rapid VDRL tests during the first and third trimesters of pregnancy and at the time of delivery. The first two moments aim at ensuring early diagnosis of pregnant women with syphilis and its timely treatment, and the third exam allows for the early treatment of the newborn. In the study, it was identified that 30.2% of the pregnant women were inadequately treated, surpassing the percentage of pregnant women adequately treated (26.3%), which enables recurrence, resistance to treatment and transmission of congenital syphilis<sup>5,6</sup>.

Starting prenatal care in a timely manner increases the chances of treatment and reduces the risk of developing congenital syphilis. It is essential that health services have adequate human and physical resources for the management of syphilis and that health professionals recognize the daily challenge of being an educator focused on care practices aimed at promoting health and preventing sexually transmitted infections.

Another key point for a reflection on the quality of prenatal care refers to the fact that only 15.1% of the partners were treated, and this data is in line with a study carried out in Rio Grande do Norte, whose objective was to describe the occurrence and profile of the notified cases of congenital syphilis, in the period from 2007 to 2010, in which 25.3%

of the partners were treated. It is necessary that the partner is made aware of participating in the prenatal consultations and understands the importance of proper diagnosis and treatment<sup>13,16</sup>.

As a strategy for coping with syphilis in men, the Brazilian Ministry of Health launched in 2016 the "Partner's Prenatal Guide", which aims to expand men's access to prenatal care, in addition to raising awareness and raising awareness of the importance of conscious and active involvement of this population group in all actions aimed at reproductive planning. This strategy helps the partner actively participate in the process of health promotion, prevention and treatment, especially of sexually transmitted infections such as syphilis<sup>6,11</sup>. Health education activities developed by health professionals are essential in preventing sexually transmitted infections in the population.

The educational process requires constant updating and reflection on the practices adopted and becomes a valuable tool in preventing this problem. The construction of spaces that allow for knowledge exchange, respect for the community's culture, co-responsibility and joint decision-making on collective health practices and problems constitute favorable measures for healthy living habits and for the prevention of syphilis and others STIs<sup>6,11</sup>.

The increase in CS cases in the country in the last five years can be related to the stigma associated with STI patients. Lack of information and cultural issues in society on the subject matter causes an almost common sense that associates STI infections with promiscuity, homosexuality, prostitution and drug use<sup>11,17</sup>.

One of the challenges to advance in the detection and control of syphilis in the general population and, specifically in pregnant women, is related to actions that aim at deconstructing the stigmas associated with the disease. It is imperative that health professionals are technically trained to clarify the disease in terms of prevention and treatment, have empathy, do not make value judgments, and recognize the diversity of sexual behaviors<sup>11</sup>.

The study presented some limitations, such as the stipulated period for data collection, the high percentage of unknown or blank information in some variables and the chance of underreporting, a condition that could favor misinterpretations of epidemiological characteristics related to a certain disease.

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## AUTHOR'S CONTRIBUTION

We describe contributions to the papers using the taxonomy (CRediT) provide above: Conceptualization, Investigation, Methodology, Visualization & Writing – Review & Editing: Marília Dorea dos Santos, Flávia Aparecida Felipe de Lima Silva, Felipe Leonardo Rigo, Thaízy Valânia Lopes Silveira, Saionara Costa do Sacramento e Pedro Sérgio Pinto Camponêz. Project administration, Supervision & Writing – original draft: Marília Dorea dos Santos, Flávia Aparecida Felipe de Lima Silva and Felipe Leonardo Rigo. Validation & Software: Marília Dorea dos Santos, Flávia Aparecida Felipe de Lima Silva e Felipe Leonardo Rigo. Resources & Funding acquisition No. Data curation & Formal Analysis: Marília Dorea dos Santos, Flávia Aparecida Felipe de Lima Silva e Felipe Leonardo Rigo.

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## CONCLUSION

In the maternity hospital under study, the prevalence of congenital syphilis is high. The results show the need for improvement in the control of syphilis during pregnancy, since a significant number of women who were diagnosed in the maternity hospital attended prenatal care and underwent prenatal diagnostic tests.

It is noted that, for control and treatment of syphilis, there is still a need to rethink about the possible care failures from the point of view of the current public health policies.

Control of the disease remains an important public health problem that poses challenges and requires significant advances and changes in public policies, strengthening of the health care networks for pregnant women, changes in the care practices, ensuring timely diagnosis through rapid testing and inclusion and awareness of the sexual partner in the consultations, as well as treatment and changes in educational practices regarding the approach to syphilis.

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