



## ORIGINALES

### Syphilis in pregnant and congenital: epidemiological profile and prevalence

Sífilis na gestante e congênita: perfil epidemiológico e prevalencia

Sífilis en la gestante y congénita: perfil epidemiológico y prevalencia

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#### ABSTRACT:

**Objective:** To describe the epidemiological profile through sociodemographic, obstetric and partner characteristics of the notified cases of syphilis in pregnant women in the period of 2012 to 2016.

**Methods:** This is a cross-sectional and descriptive study conducted at the 16th Apucarana Health Region of the State of Paraná through the compulsory notification sheets for syphilis in pregnant women and congenital syphilis inserted in the Notification System of Diseases and Diseases (SINAN).

**Results:** It was recorded 257 cases of syphilis in pregnant women and 119 cases of congenital syphilis. The prevalent rate of syphilis was 0,97% and the incidence rate of congenital syphilis was 4,73%. Women with congenital syphilis (SG) and congenital syphilis (SC) were mostly white, young, with low schooling and living in urban areas. Untreated partners accounted for 40,8% and 47.05% of the mothers were considered with inadequate treatment. Among live births (NS) with SC, 69.7% did not undergo TT at 18 months and 81.5% did not do TNT in CSF.

**Conclusion:** The health system must be reorganized ensuring the follow-up and follow-up of both the pregnant and the newborn.

**Key words:** Epidemiological profile; Pregnancy; Congenital Syphilis

#### RESUMO:

**Objetivo:** Descrever o perfil epidemiológico através das características sociodemográficas, obstétricas e do parceiro dos casos notificados de sífilis em gestantes e de sífilis congênita no período de 2012 a 2016.

**Métodos:** Trata-se de um estudo transversal e descritivo realizado na 16ª Regional de Saúde de Apucarana do estado do Paraná através das fichas de notificação compulsória de sífilis em gestante e sífilis congênita inseridas no Sistema de Notificação de Agravos e Doenças (SINAN).

**Resultados:** Foram notificados 257 casos de sífilis em gestante e 119 casos de sífilis congênita. A taxa de prevalência de sífilis gestacional foi de 0.97% e a taxa de incidência de sífilis congênita de 4.73%. As mulheres notificadas com sífilis em gestante (SG) e com recém nascido (RN) portador de sífilis congênita (SC) eram em sua maioria, brancas, jovens, com baixa escolaridade e residiam em zona urbana. Parceiros não tratados totalizaram 40,8% e 47.05% das mães foram consideradas com tratamento inadequado. Entre os nascidos vivos (NV) com SC, 69,7% não realizaram o TT aos 18 meses e 81.5% não fizeram o TNT no líquido.

**Conclusão:** O sistema de saúde deve ser reorganizado garantindo o seguimento e acompanhamento tanto da gestante quanto do recém-nascido.

**Palavras chave:** Perfil epidemiológico; Gestação; Sífilis congênita.

## RESUMEN:

**Objetivo:** Describir el perfil epidemiológico a través de las características sociodemográficas, obstétricas y del compañero, de casos notificados de sífilis en gestantes y de sífilis congénita, en el período de 2012 a 2016.

**Métodos:** Se trata de un estudio transversal y descriptivo realizado en la 16ª Regional de Salud de Apucarana, en el estado de Paraná, a través de las fichas de notificación compulsoria de sífilis en gestante y sífilis congénita, que constaban en el Sistema de Notificación de Perjuicios y Enfermedades (SINAN).

**Resultados:** Fueron notificados 257 casos de sífilis en gestantes y 119 casos de sífilis congénita. La tasa de prevalencia de sífilis gestacional fue de 0,97% y la tasa de incidencia de sífilis congénita de 4,73%. Las mujeres notificadas como "sífilis en gestante" (SG) y con recién nacido (RN) con "sífilis congénita" (SC), eran en su mayoría, blancas, jóvenes, con baja escolaridad y residían en zona urbana. Los compañeros no tratados totalizaron 40,8%; las madres consideradas con tratamiento inadecuado fueron 47,05%. Entre los nacidos vivos (NV) con SC, 69,7% no realizaron el test treponémico (TT) a los 18 meses y 81,5% no hicieron el test no treponémico (TNT) en el líquido cefalorraquídeo.

**Conclusión:** El sistema de salud debe ser reorganizado garantizando el seguimiento y acompañamiento tanto de la gestante como del recién nacido.

**Palabras clave:** Perfil epidemiológico; Gestación; Sífilis congénita.

## INTRODUCTION

Caused by the spirochete *Treponema pallidum*, syphilis is a systemic, chronic and often asymptomatic disease. It can be transmitted through sexual and maternal-fetal routes, being called acquired and congenital. Acquired syphilis is subdivided into recent if the disease progression time is less than one year (primary, secondary and recent latent) and if more than one year of infection, as late (late and tertiary latent). CS is classified as recent when it appears until the second year of life and late when it appears after the second year of life<sup>(1)</sup>.

Fetal infection usually occurs between the 16<sup>th</sup> and the 28<sup>th</sup> weeks of gestation, being that the vertical transmission rate of *Treponemapalidum* in untreated women ranges from 70 to 100%, considering the primary and secondary phase of the disease. In the case of untreated pregnant women, the disease can trigger spontaneous abortion, stillbirth or perinatal death in about 40% of infected children<sup>(2)</sup>.

Every year in Latin America and the Caribbean, it is estimated that between 166,000 and 344,000 children are born with CS. Syphilis affects one million pregnant women a year worldwide, leading to more than 300,000 fetal and neonatal deaths and putting more than 200,000 children at risk of premature death. It is also noteworthy that 66% of all adverse outcomes occurred in women who had been treated by prenatal care<sup>(3)</sup>.

In 2009, the Pan American Health Organization (PAHO) and the United Nations Children's Fund (UNICEF) launched the Regional Initiative for the Elimination of

Mother-to-Child Transmission of HIV and Congenital Syphilis in Latin America and the Caribbean. This regional initiative in 2010 was articulated with the Global Plan to eliminate new HIV infections and syphilis among children by 2015 and keep their mothers alive<sup>(4)</sup>.

The Ministry of Health epidemiological bulletin on syphilis in 2015 showed that in Brazil in 2004 the infection rate was 1.7 cases per 1,000 live births and in 2013 this rate increased to 4.7, i.e. an increase of more 100% in less than ten years. Following these rates, the infant mortality rate from syphilis has also increased over the past ten years in Brazil, from 2.2 deaths per 100,000 live births in 2004 to 5.5 in 2013<sup>(5)</sup>. In 2016, in Brazil, 87,593 cases of acquired syphilis, 37,436 cases of syphilis in pregnant women and 20,474 cases of congenital syphilis were reported, totaling 185 deaths<sup>(6)</sup>.

Congenital syphilis and syphilis in pregnant women have been compulsorily reported in Brazil since 1986 and 2005, respectively. Information on abortions, stillbirths and live births with congenital syphilis should be entered into the *Sistema de Informação de Agravos de Notificação* (SINAN), monitoring these infections through SINAN is of fundamental importance for the elimination of syphilis as it provides support for strategy planning and definition of the necessary interventions<sup>(7)</sup>.

Considering the high incidence of this disease, effective and low cost treatment, the easy access to diagnosis, the impact of this disease on public health and the need for its control, with the purpose of to describe the epidemiological profile through the sociodemographic, obstetric and partner characteristics of the reported cases of PS and CS from 2012 to 2016 in the *16ª Regional de Saúde de Apucarana* in the state of Paraná, Brazil. Seeking to identify possible failures in the care provided to pregnant women so that strategies can be drawn up with the team that performs care to improve the quality of health services offered.

## MATERIAL AND METHOD

This is a cross-sectional and descriptive study conducted at the *16ª Regional de Saúde de Apucarana*, composed of 17 municipalities: Apucarana, Araongas, Bom Sucesso, Borrazópolis, California, Cambira, Faxinal, Grandes Rios, Jandaia do Sul, Kaloré, Marilândia do Sul, Marumbi, Mauá da Serra, Rio Bom, Sabaúdia, São Pedro do Ivaí, which is located in the northern region of the state of Paraná, with a population of 346,963,000 inhabitants. Paraná is located in the southern region of Brazil and has a territorial area of 199,307,939 Km<sup>2</sup>, population of 10,444,526 inhabitants, with per capita household monthly nominal income of R \$ 1,398.00, Human Development Index (HDI) of 0.749 ranking fifth in the country<sup>(8)</sup>.

It were included all cases of PS and CS registered in SINAN in the years 2012 to 2016, which met the case definition criteria confirmed according to the Ministry of Health.

The characteristics studied according to the information from the syphilis notification form in pregnant and congenital:

a) Maternal socio-demographic:

- age (in years: 10 to 14; 15 to 19; 20 to 34; 35 to 49).

- race / skin color (White; Black; Asian; Hispanic; American Indian).  
- schooling: illiterate; 1st to 4th incomplete grades of Elementary School; 4th grade complete of Elementary School; 5<sup>th</sup> to 8<sup>th</sup> grade incomplete of Elementary School; complete Elementary School; Incomplete High School; complete High School; Incomplete Higher Education; Complete Higher Education; ignored).

b) Prenatal care: (yes; no; ignored / blank).

c) Obstetric and treatment:

- time of maternal diagnosis (1st, 2nd, 3rd trimester or gestational age ignored).  
- clinical classification of the disease (primary; secondary; tertiary; latent; ignored / blank).  
- treponemal test (reactive; unreactive; unfulfilled; ignored / blank).  
- non-treponemal test (reactive; unreactive; unfulfilled).  
- prescribed treatment regimen for pregnant women (benzathine penicillin G 2,400,000 IU; benzathine penicillin G 4,800,000 IU; benzathine penicillin G 7,200,000 IU; other regimen; not done; ignored / blank).  
- Partner treatment (yes; no; ignored / blank).

d) Clinics and laboratories of the newborn:

- VDRL (venereal disease research laboratory) titration in peripheral blood (reagent; nonreactive; not performed; ignored / blank).  
- VDRL titration in fluid (reagent; non-reagent; not performed; ignored / blank).  
- alteration of long bone examination (yes; no; not performed; ignored / blank).  
- case evolution (alive; death from congenital syphilis; death from other causes; abortion; stillbirth).

Compulsory reporting forms consist of a standardized form with sociodemographic and clinical information completed by health professionals. Data tabulation was performed by Tabwin 32. Microsoft Excel 2010 software was used for data entry and analysis.

To calculate the prevalence of PS we used the total number of notifications during the period from 2012 to 2016 divided by the total number of pregnancies of the same year and multiplied by 100. The number of pregnancies was obtained by summing the number of live births and stillborn in the period, excluding abortions.

The GS detection rate was obtained by the ratio of the number of cases detected in a given year of notification, by the number of live births in the same place and year multiplied by 1,000<sup>(6)</sup>.

The incidence of CS was calculated by the total number of cases reported in the study period by the number of live births in the same period, multiplied by 1,000<sup>(6)</sup>.

The number of live births was obtained from the *Sistema de Informação Sobre Nascidos Vivos* (SINASC).

The study used exclusively secondary data from official databases, which are in the public domain and there is not possibility of identification of the individuals involved, therefore, there are not ethical implications regarding the approach of human beings.

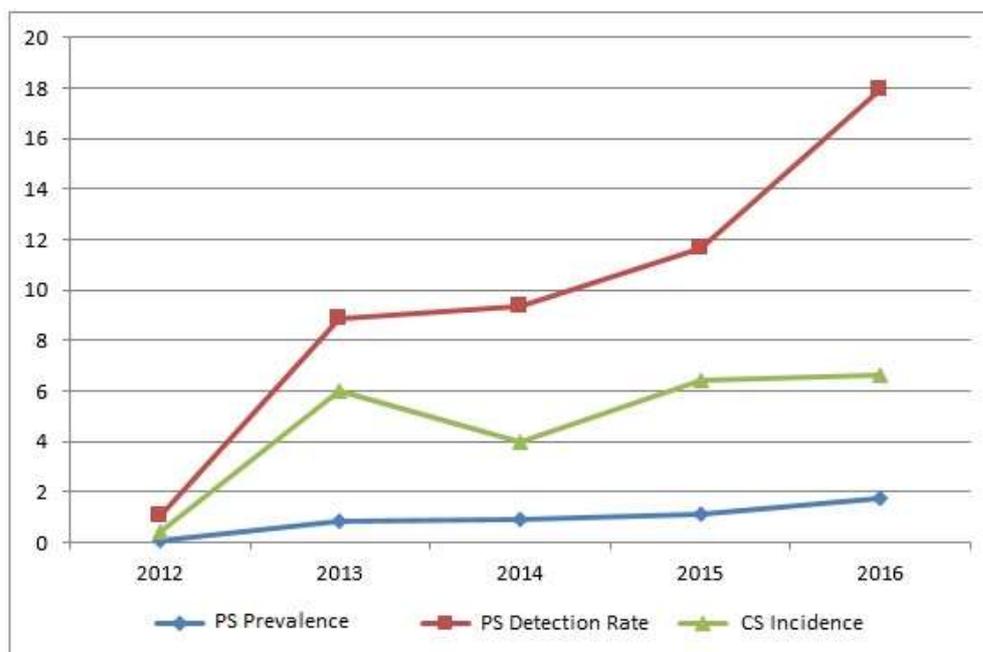
However, it sought to follow all principles of confidentiality of information recommended by Resolution no. 466/2012 of the National Health Council.

## RESULTS

In the 16<sup>a</sup> Regional de Saúdedo Paraná, between 2007 and 2016, 257 cases of PS and 119 cases of CS were reported from 2012 to 2016.

The prevalence rate of PS in the period from 2012 to 2016 was 0.97% and the incidence rate of CS from 2012 to 2016 was 4.73%. There was a considerable increase in the prevalence rate of PS from 0.10% to 1.78%. The year 2016 had the highest number of PS (n = 89; 34.6%), with the detection rate of PS went from 1.04 in 2012 to 17.9 in 2016 for every 1,000 live births.

**Chart 1: Distribution of syphilis prevalence and detection rates in pregnant women and the incidence rate of congenital syphilis in 16<sup>a</sup> Regional de Saúde do Paraná, 2012-2016.**



Regarding the age group of pregnant women with syphilis, 61.8% (n = 159) were between 20 and 34 years old (Chart 1). Belonged to the white race 65.3% of pregnant women (n = 168) and had incomplete education from 5th to 8th grade 23.3% of pregnant women (n = 60). It is important to note that 25.6% of the notified form contained this data as ignored / blank. 91.8% (n = 236) of the pregnant women lived in the urban area, 6.61% (n = 17) in the rural and peri-urban 1.55% (n = 4). (Chart 1)

As regards the clinical classification of the disease 49.8% (n = 128) were classified as primary syphilis, 10.1% as secondary syphilis (n = 26), 7% (n = 18) as tertiary and 1.55% (n = 4) as latent. Ignored / white totaled 31.5% (n = 81). Benzathine penicillin G 2,400,000 IU was prescribed for 32.2% (n = 33) of pregnant women, the benzathine penicillin G 4,800,000 IU scheme for 9.72% (n = 25) of pregnant women, 35.7% (n = 92), 7,200,000 IU benzathine penicillin G (n = 92), another regimen at 5.83% (n = 15) and untreated at 9.72% (n = 25). (Chart 1)

They had reactive TNT 94.1% (n = 242) of pregnant women, 1.55% (n = 4) nonreactive and 3.89% (n = 10) did not perform it. With reactive TT 48.6% (n = 125), unreactive 5.44% (n = 14), did not perform TT 33% (n = 85) and ignored 12.8% (n = 33). (Chart 1)

Untreated partners totaled 40.8% (n = 105), ignored treatment 21% (n = 54) and those who received treatment 38.1% (n = 98). As a reason for non-treatment of the partner 42.8% (n = 110) reported this field as ignored, 28.7% (n = 74) as other reasons, 14% (n = 36) of the partners had no further contact with the pregnant woman, partner with non-reactive serology 6.61% (n = 17), 5.05% (n = 13) of partners were called, but did not attend for treatment, 1.94% (n = 5) of partners were not called for treatment by the health unit, 0.77 % (n = 2) were called by the health unit, but refused treatment. (Chart 1)

The annual detection rate of CS rose from 0.41 in 2012 to 6.65 in 2016 for every 1,000 live births. Mothers who have filled the criteria for congenital syphilis, 78.1% (n = 93) were white, 67.22% (n = 80) were between the ages of 20 and 34 years old, 39.49% (n = 47) were incomplete or complete high school, and 24.36% (n = 29) had this information ignored in the notifications and 96.6% (n = 115) lived in urban areas.

They performed prenatal care 91.5% (n = 109) of the mothers, being that 83.19% (n = 99) were diagnosed with syphilis during prenatal care. TNT at delivery / curettage was performed in 88.23% (n = 105) of women and *treponemal* confirmatory testing was not performed at delivery in 68.06% (n = 81) of pregnant women.

As regards maternal treatment, 47.05% (n = 56) of the mothers were considered with inadequate treatment and 14.28% (n = 17) did not receive treatment. Sexual partnerships of 50.42% (n = 60) of pregnant women were not treated concomitantly.

Among live births with CS, 95.7% (n = 114) had TNT in the reactive peripheral blood, 69.7% (n = 83) did not perform TT at 18 months and 81.5% (n = 97) did not have TNT in fluid. Long bone x-ray was not performed in 78.1% (n = 93) of the newborns, 73.9% (n = 88) had a final diagnosis as a recent congenital syphilis, 31% (n = 37) were treated with another regimen not recommended according to the Ministry of Health protocol, 97.4% (n = 116) of the newborns remained alive, 1.6% died due to another cause and 0.84% had the evolution ignored in the notification.

**Chart 2: Distribution of pregnant women with syphilis (n = 247) according to sociodemographic, obstetric and partner variables, reported by SINANin16<sup>a</sup> Regional de Saúde do Paraná, 2012-2016.**

Variable	N	%
<b>Age range (in years)</b>		
10-14	4	1.55
15-19	76	29.57
20-34	159	61.87
35-49	18	7.00
<b>Race/skin color</b>		
White	163	65.9
Black	22	8.90
Asian	49	19.83
Hispanic	1	0.40
American Indian	2	0.80

Ignored/blank	10	4.04
<b>Schooling</b>		
Illiterate	0	0
Elementary School complete or not	17	6.88
High School complete or not	83	33.60
Higher Education complete or not	73	29.55
Ignored/blank	65	26.31
<b>Diagnosis momentum (pregnancy trimester)</b>		
1 <sup>st</sup> trimester	106	43.80
2 <sup>nd</sup> trimester	64	26.44
3 <sup>rd</sup> trimester	55	22.72
Ignored/blank	17	7.24
<b>Clinical classification of the disease</b>		
Primary	121	48.98
Secondary	26	10.52
Tertiary	18	7.287
Latent	4	1.619
Ignored/blank	78	31.57
<b>Treponemal test (quickly test or FTA-ABS<sup>b</sup> test)</b>		
Reactive	58	65.16
Unreactive	6	6.741
Unfulfilled	23	25.84
Ignored/blank	2	2.247
<b>Non-treponemal test (VDRL<sup>c</sup>)</b>		
Reactive	234	94.73
Unreactive	4	1.619
Ignored	1	0.404
Unfulfilled/blank	8	3.238
<b>Planning treatment to pregnant woman</b>		
Benzathine penicillin G 2.400.000UI <sup>d</sup>	77	31.17
Benzathine penicillin G 4.800.000UI <sup>d</sup>	25	10.12
Benzathine penicillin G 7.200.000UI <sup>d</sup>	90	36.43
Another planning	14	5.668
Unfulfilled	25	10.12
Ignored/blank	16	6.477
<b>Partner treated concurrently with pregnant woman</b>		
Yes	97	39.27
No	103	41.70
Ignored/blank	47	19.02
<b>Variables:</b>		
<b>Reasons for non-treatment of the partner</b>		
Partner with non-reactive serology	16	6.477
Partner no longer had contact with the pregnant woman	36	14.57
Partner was not convoked to the Health Unit for treatment	5	2.024
Partner was convoked to the Health Unit but declined treatment	2	0.809
Another reason	71	28.74

Ignored/blank	104	42.10
<b>Residence area:</b>		
Urban	229	92.71
Rural	14	5.668
Peri-urban	4	1.619

a) SINAN: Sistema de Informação de Agravos de Notificação

b) FTA-ABS: fluorescent treponemal antibody absorption test

c) VDRL: venereal disease research laboratory

d) UI: International Units

## DISCUSSION

It was observed that there was an increase in the prevalence of PS and increasing incidence of CS in the 16<sup>a</sup> *Regional de Saúde do Paraná*, as observed in other regions of the country<sup>(9,10)</sup> and the world<sup>(9-15)</sup>. The women with syphilis are mostly white, young and with low education and live in the urban area. The detection rate of PS in Brazil, from 2010 to 2016 increased about three times, from 3.5 to 12.4 cases per 1,000 live births<sup>(6)</sup>, a result similar to that found in this study where the detection rate of PS in the period from 2012 to 2016 went from 1,040 to 17.96 per 1,000 live births. (Chart 1)

Most pregnant women were diagnosed in the first trimester of pregnancy, which demonstrates that prenatal care has been catching this pregnant woman early and that accessibility to the diagnosis of syphilis during pregnancy was advocated according to a decree established by the Ministry of Health in 2011<sup>(16)</sup>. The considerable increase in PS diagnosis over time can be attributed to the considerable expansion in the offer of rapid HIV and syphilis tests with the implementation of the *Rede Cegonha* in 2011<sup>(4)</sup>.

Approximately half of the pregnant women were clinically classified as primary syphilis characterized by ulceration or erosion at the bacterial entry site (vulva, vagina, cervix), usually unique, painless, with a hardened base and clean bottom, rich in *treponemas*, accompanied by or not of inguinal lymphadenopathy. This stage can last between two to six weeks and disappear spontaneously<sup>(17)</sup>.

The treatment prescribed to more than one third of these pregnant women is recommended for latent, late or latent syphilis, with an ignored duration in which there is no clinical sign or symptom and tertiary syphilis that is considered rare and when it manifests itself as inflammation and tissue destruction of the nervous and cardiovascular system<sup>(17)</sup>. From these data we can observe that the treatment does not match the clinical phase of the disease, which reflects the difficulty of health professionals in making the diagnosis according to the clinical phase and prescribing the appropriate treatment. In a study conducted in Rio de Janeiro with prenatal professionals from the public health service network, several barriers related to knowledge and familiarity with care protocols, difficulties in addressing sexually transmitted infections, user issues and organizational context were found. Professionals with more access to training and technical manuals performed better<sup>(18)</sup>. Another study conducted in Bolivia, health professionals relate as barriers the elimination of syphilis transmission, lack of information and the short time available with pregnant women during prenatal consultation<sup>(14)</sup>.

Almost all of these women had a confirmed diagnosis of syphilis and underwent reactive TNT. TT was reactive in less than half of pregnant women, which shows that these women did not have access to the two types of tests necessary for the diagnosis of PS, as recommended by the Ministry of Health protocol<sup>(4)</sup>.

More than a third of partners were untreated, similar results in several studies<sup>(10, 15,19)</sup> and had the reason for non-treatment as information ignored in the notifications, was observed failed assistance given once sexual partners should perform immunological tests and be treated with syphilis at the same time in case of doubt in the follow-up<sup>(4)</sup>.

The record of care provided and the results found constitute an effective communication tool between health teams and allow the planning, continuity of care and evaluation of services provided to clients. In addition to subsidize information for legal activities, research, education and other related activities<sup>(20)</sup>.

In the last 10 years, in Brazil, there has been a progressive increase in the incidence rate of CS, from 2 cases per 1,000 live births to 6.8 cases per 1,000 live births in 2016<sup>(6)</sup>. In the *16ª Regional de Saúde de Apucarana*, an increase in the incidence rate of CS was observed by 16 times from 2012 to 2016, from 0.41 to 6.65 cases per 1,000 live births. (Chart 1). This result is far from the goal of elimination of CS proposed by WHO in 2008 for Latin America and the Caribbean and incorporated by the Ministry of Health of 0.5 cases or less for every 1,000 live births by 2015<sup>(4,19)</sup>. The schooling of these mothers was mostly reported as ignored information and in the reported cases, the highest percentage was of mothers with complete high school, almost all reside in urban areas.

More than half of the mothers were between the ages of 20 and 34 years old and belonged to the white race, that is, they are young, white mothers with more than three years of education, characteristics that exclude them from risk factors that would classify them as being of intermediate risk<sup>(1)</sup>.

Almost all pregnant women had prenatal care and more than two thirds of these were diagnosed during gestational follow-up, as found in other studies <sup>(7,14,17)</sup>, which demonstrates the fragility in health services that serve this public regarding accompaniment, follow-up and control of syphilis in pregnant women. As for testing, TNT with reactive result was found in most pregnant women, while TT was not performed in more than half of pregnant women, which is contrary to the protocols created by the Ministry of Health and shows another possible failure in follow-up of these patients<sup>(4,16)</sup>.

Approximately half of the pregnant women with syphilis who had their newborns notified with CS received inadequate treatment and did not have their sexual partners treated, which was observed in several other studies conducted in different locations in Brazil<sup>(10,11,14,17)</sup>. Sexual partnerships should be called up to the health service for guidance, clinical and laboratory evaluation, and treatment when needed. If sexual partnerships do not meet this call, the prescription for treatment should be sent by the pregnant woman. The activities related to the diagnosis, follow-up and control of the disease in the sexual partner are still poorly structured and the lack of this service is noticeable in the transmission of CS<sup>(12)</sup>.

**Chart 3: Sociodemographic and clinical characteristics of mothers of live births with congenital syphilis (n = 119) notified by SINAN in 16<sup>a</sup> Regional de Saúde do Paraná, 2012-2016.**

<b>Maternal Variables</b>	<b>N</b>	<b>%</b>
<b>Prenatal Care</b>		
Yes	109	91.59
No	9	7.563
Ignored/blank	1	0.840
<b>Partner Treatment</b>		
Yes	44	36.97
No	60	50.42
Ignored/blank	15	12.60
<b>Age Range (in years)</b>		
10-14	-	0.840
15-19	31	26.05
20-34	80	67.22
35-49	4	3.361
Ignored/blank	3	2.521
<b>Race/skin color</b>		
White	93	78.15
Black	3	2.521
Asian	-	-
Hispanic	19	15.96
American Indian	-	-
Ignored/blank	4	3.361
<b>Schooling</b>		
Illiterate	-	-
Elementary School complete or not	47	39.49
High School complete or not	42	35.29
Higher Education complete or not	1	0.840
Ignored/blank	29	24.36
<b>Residence Area</b>		
Urban	115	96.63
Rural	3	2.521
Peri – urban	-	-
Ignored/blank	1	0.840
<b>Maternal treatment planning</b>		
Adequate	33	27.73
Inadequate	56	47.05
Unfulfilled	17	14.28
Maternal treatment scheme	13	10.92
<b>Diagnosis of Maternal Syphilis</b>		
During prenatal	99	83.19
At childbirth / curettage	5	4.201
After childbirth	13	10.92
Unfulfilled	1	0.840
Ignored/blanket	1	0.840

a) SINAN: Sistema de Informação de Agravos de Notificação

**Chart 4: Diagnostic characteristics of congenital syphilis cases (n = 119) reported by SINAN in the 16ª Regional de Saúde do Paraná, 2012.**

<b>Variables</b>	<b>N</b>	<b>%</b>
<b>Non-treponemal peripheral blood test</b>		
Reagent	114	95.79
Non reagent	1	0.840
Unfulfilled	2	1.680
Ignored/blank	2	1.680
<b>Non-treponemal in fluid</b>		
Reagent	4	3.361
Non reagent	16	13.44
Unfulfilled	97	81.51
Ignored/blank	2	1.680
<b>LongBoneExamAlteration</b>		
Yes	1	0.840
No	20	16.80
Unfulfilled	93	78.15
Ignored/blank	5	4.201
<b>Final diagnosis</b>		
Recent congenital syphilis	88	73.94
Discarded	30	25.21
Ignored/blank	1	0.840
<b>Planning Treatment</b>		
Crystalline Penicillin G 100,000 to 150,000 UI / kg / day - 10 days	25	21.00
Penicillin G Procaine 50.000 UI/Kg/day – 10 days	6	5.042
Penicillin G benzathine 50.000 UI/Kg/day	17	14.28
Another planning	37	31.09
Unfulfilled	22	18.48
Ignored	12	10.08
<b>Case progression</b>		
Alive	116	97.47
Death by congenital syphilis	-	-
Death by other causes	2	1.680
Abortion	-	-
Stillborn	-	-
Ignored	1	0.840

The information Note No. 2-SEI / 2017- DIAHV / SVS / MS, for epidemiological surveillance purposes, does not consider the treatment of mother's sexual partnership as a case definition criterion for CS<sup>(6)</sup>.

As regards the follow-up of the newborn with CS, almost all of them obtained TNT reagent in peripheral blood, while TNT in fluid and long bone x-ray were not performed in more than two thirds of these newborns, which points to failure in providing care in a hospital environment, since the following tests are required to define the diagnosis of CS: blood sample (blood count, liver profile and electrolytes); neurological evaluation (cerebrospinal fluid puncture: cells, proteins, treponemal and non-treponemal tests); long-bone X-ray; ophthalmological and audiological evaluation<sup>(16)</sup>.

TT for syphilis should be performed at 18 months for follow-up and control of congenital syphilis cure<sup>(16,21)</sup>; however, more than two thirds of children notified with CS did not undergo this exam.

It was obtained as the final diagnosis of recent congenital syphilis was more than two thirds of these children and approximately one third of these children were treated with another regimen, that is, a different treatment from the one proposed by the Ministry of Health in the current protocols. The vast majority of these children remained alive, with 2 deaths due to causes other than CS.

## CONCLUSION

The results of this study show an increase in the detection rates of PS and CS, and these women are mostly white, young, with low education and residents in urban areas. The diagnosis was largely made prenatally, which shows that these pregnant women are being assisted, but not effectively, because the treatment does not match the clinical classification. Other failures in care are noticeable in the data, such as not performing both types of tests (treponemal and non-treponemal) and not treating sexual partnerships. Regarding the care provided in a hospital environment, failures were identified such as failure to perform the treponemal cerebrospinal fluid and long-bone x-ray tests, which are essential for the diagnosis of congenital syphilis. There was also failure to follow up this child at 18 months. The health system must be reorganized to ensure the follow-up and monitoring of both pregnant women and newborns and health professionals should be sensitized as to the consequences of failures in the care provided to the mother-child binomial so that Brazil can compliance with congenital syphilis elimination goals set by the World Health Organization.

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