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Article

Analysis of the situation of the incidence of congenital syphilis and maternal epidemiological profile in Santa Catarina between 2020 and 2021*

Análise da situação da incidência de sífilis congênita e perfil epidemiológico materno em Santa Catarina entre 2020 e 2021

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Onofre CE, Munari TB, Miranda VIA. Analysis of the situation of the incidence of congenital syphilis and maternal epidemiological profile in Santa Catarina between 2020 and 2021 / *Análise da situação da incidência de sífilis congênita e perfil epidemiológico materno em Santa Catarina entre 2020 e 2021*

SUMMARY: Objective: To evaluate the incidence of congenital syphilis and the maternal epidemiological profile in the state of Santa Catarina in times of the pademic. **Methodology**: Quantitative research with a cross-sectional design with secondary data for the period 2020 and 2021. The outcome under study were the reported cases of congenital syphilis, and the exposure variables were maternal sociodemographic. Data analysis was performed using SPSS software. Descriptive analyzes were performed, presenting absolute and relative frequencies, with respective 95% confidence intervals. **Results**: The incidence of congenital syphilis in the year 2021 was 6.7 cases/1,000 live births, in 2020 it was 5.8 cases/1,000 live births. Cases were concentrated in the Midwest and Serra (10.7%) and Greater Florianópolis (8.8%) regions. Most mothers were between 20 and 34 years old (71.5%), lived in greater Florianópolis (23,5%), white skin color (82.7%), completed high school (49.1%). Most mothers performed prenatal care (89.5%) and were diagnosed with syphilis during prenatal care (69.5%), 16.1% performed the treatment properly and 69.6% of partners did not perform the prenatal care. With regard to the final evolution of newborns, (88.3%) had a favorable evolution, while 6.7% evolved to abortion, 3.5% died shortly after birth and 1.3% died of congenital syphilis. **Conclusion** There is a high incidence of congenital syphilis in the state of Santa Catarina. Considering that there are several strategies for coping with syphilis in Brazil, it's essencial for the identification of flaws in the implementation of control measures, as well as the search for strategies to prevent vertical transmission, through effective and quality prenatal care. It is essential to direct new strategies and actions for health promotion and prevention during pregnancy, grararanteeing access and comprehensive care.

KEY WORDS: Syphilis; Pregnant; Epidemiology; Prenatal.

RESUMO: Objetivo: Avaliar a incidência de sífilis congênita e o perfil epidemiológico materno no estado de Santa Catarina em tempos de pandemia. **Metodologia**: Pesquisa quantitativa, com delineamento transversal com dados secundários referente ao período de 2020 e 2021. O desfecho foram os casos notificados de sífilis congênita e as variáveis de exposições foram as sociodemográficas maternas. A análise de dados foi realizada através do software SPSS. Foram realizadas análises descritivas, apresentando as frequências absolutas e relativas, com respectivos intervalos de confiança de 95%. **Resultados**: A incidência de sífilis congênita no ano de 2021 foi 6,7 casos/1.000 nascidos vivos, e no ano de 2020 foi de 5,8 casos/1.000 nascidos vivos. Os casos estavam concentrados nas regiões do Meio Oeste e Serra (10,7%) e Grande Florianópolis (8,8%). A maioria das mães tinham idade entre 20 e 34 anos (71,5%), residiam na Grande Florianópolis (23,2%), cor de pele branca (82,7%), ensino médio completo (49,1%). A maioria das mães, realizaram o pré-natal (89,5%) e tiveram diagnóstico de sífilis durante o pré-natal (69,5%), apenas 16,1% realizaram o tratamento adequadamente e 69,6% dos parceiros não realizaram o tratamento concomitantemente. No que se refere à evolução final dos recém-nascidos, 88,3% tiveram evolução favorável, enquanto que 6,7% evoluíram para aborto, 4,8% foram a óbito por sífilis congênita. **Conclusão**: Aponta-se alta incidência de sífilis congênita no estado de Santa Catarina. Considerando que há diversas estratégias para o enfrentamento da sífilis no Brasil, torna-se fundamental a identificação das falhas na implementação das medidas de controle, assim como a busca de estratégias de prevenção da transmissão vertical, assim como a busca de estratégias de prevenção da transmissão vertical através da assistência de pré-natal eficaz e de qualidade. É fundamental o direcionamento de novas estratégias e ações de promoção e prevenção da saúde durante a gestação, garantindo o acesso e a continuidade do pré-natal e a integralidade do cuidado.

PALAVRAS-CHAVE: Sífilis; Gestante; Epidemiologia; Pré-natal.

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INTRODUCTION

Syphilis is an infectious disease caused by the bacterium *Treponema pallidum*. This disease is primarily transmitted through unprotected sexual contact with an infected person, but it can also be transmitted from mother to fetus during pregnancy or childbirth, resulting in congenital syphilis[1,2], which despite being a completely preventable condition, still has high incidence rates, representing a major public health problem [3,4,5].

In 2016, the World Health Organization (WHO) and the Pan American Health Organization (PAHO) renewed the "Action Plan for the Prevention and Control of HIV and Sexually Transmitted Infections 2016-2021", one of the objectives of which is to reduce the incidence of congenital syphilis to 0.5 cases per 1000 live births by 2030[6]. However, according to data included in an epidemiological bulletin with respect to 2010 to 2019, Brazil recorded an increase in the incidence of cases over these years, with a 3.3% reduction in the detection rate in pregnant women and an 8.7% reduction in the detection rate of congenital syphilis in 2019, far from the recommended national rate[7].

The state of Santa Catarina has seen an increase in the incidence of congenital syphilis in recent years, following the national trend. In certain areas of the state, the rates are significantly higher than the target recommended by the Ministry of Health, highlighting inequalities in access to and quality of health services[7]. Therefore, understanding the situation of congenital syphilis in the state of Santa Catarina is essential to analyze the effectiveness of the actions implemented to combat this infection and provide solid evidence for the development of more effective public health strategies.

It is known that one of the ways to prevent the occurrence of congenital syphilis is through quality prenatal care. The federal government and the Ministry of Health have introduced various initiatives that aim to guarantee improved access, coverage, and quality of prenatal, childbirth and postpartum care, both for pregnant women and newborns. One of its strategies is screening for syphilis, through rapid testing, within the scope of Primary Care, in order to promote early diagnosis and timely treatment, for the elimination of congenital syphilis, as well as the reduction in complications and neonatal deaths[5].

Taking into account the severity and epidemiological relevance of congenital syphilis, the objective of the current study is to verify the incidence of congenital syphilis and the maternal epidemiological profile in the years 2020 and 2021 in the state of Santa Catarina.

METHODS

A cross-sectional study was performed, using data from the Injury and Notification Information System (SINAN)[8], referring to the period 2020 and 2021. All reported cases of congenital syphilis in the state of Santa Catarina were studied. The state is composed of 7 health macro-regions, covering an area of 95,443Km², occupying 1.13% of the national territory, comprising 3.0% of the national population, and with the 6th largest GDP per capita, standing out for the diversity of production[9].

The outcome of the study was the incidence of congenital syphilis reported in SINAN. To calculate the incidence, the number of new cases per year was used, divided by the number of live births in the same year, and multiplied by 1000. The number of live births in the period analyzed was obtained through the Live Birth Information System (SINASC). The exposure variables were maternal sociodemographic variables (age, education, skin color, occupation, and region of residence) and those related to the notification form: whether prenatal care was performed during the current pregnancy, the time of diagnosis of the infection, treatment regimen (adequate or inadequate), and whether the partner underwent treatment at the same time as the pregnant woman.

The database was accessed, with authorization, through the Directorate of Epidemiological Surveillance of the State of Santa Catarina. The data were extracted from the SINAN database, with cases reported for congenital syphilis in the 295 municipalities of the seven macro-regions of Santa Catarina: Midwest and Serra, Greater Florianópolis, Southern Santa Catarina, Mouth of the Itajaí River, Greater West, Northern and Northeastern Plateaus, and Valley of the Itajaí River.

Data cleaning and validation were performed using Microsoft Excel. SPSS software, version 21, was used for data analysis. Descriptive analyses were performed of all variables studied, presenting absolute (n) and relative (%) frequencies, with respective 95% confidence intervals.

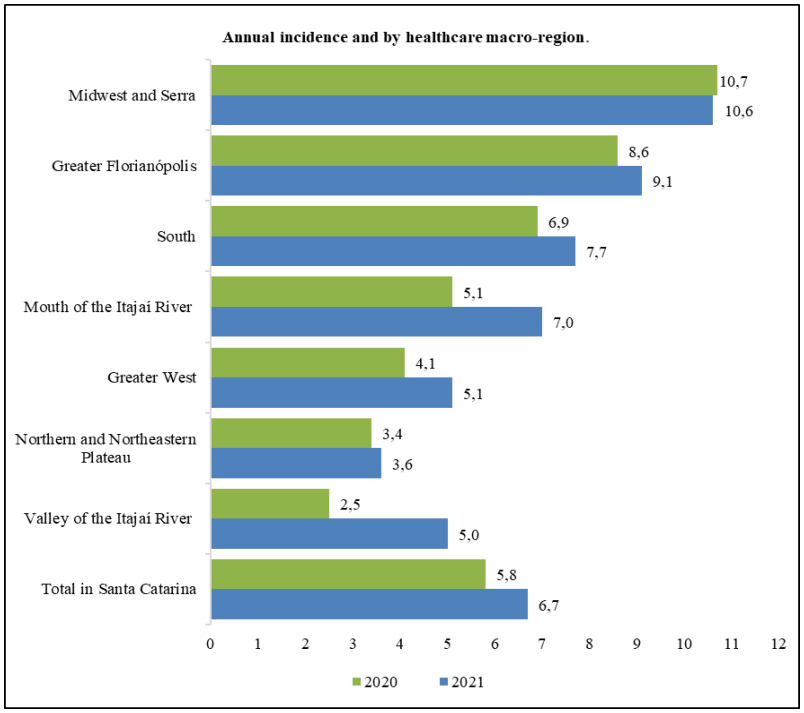
The study was submitted to and approved by the Research Ethics Committee of the Universidade do Extremo Sul Catarinense under protocol 5.564.956.

RESULTS

A total of 4,689 women with syphilis during pregnancy were reported between 2020 and 2021. In 2020, there were 2,230 reports of pregnant women, of which 570 newborns tested positive for congenital syphilis (25.7%). In 2021, of the 2,459 pregnant women reported with syphilis, 648 newborns had congenital syphilis (26.4%). The incidence of congenital syphilis was 5.8 per 1,000 live births in 2020 (95% CI 5.6–6.1) and 6.7 per 1,000 live births in 2021 (95% CI 6.5–7.0).).

The health regions with the highest incidence rates of congenital syphilis were the Midwest/Serra and Greater Florianópolis regions, being 10.7 per 1000 live births (95%CI 9.3 – 12.2) and 8.8 per 1000 live births (95%CI 7.8 – 10.4), respectively. In the other regions of the state there were no statistically significant differences when comparing the years 2020 and 2021 (Figure 1).

Regarding the maternal epidemiological profile, the majority of mothers lived in the Greater Florianópolis region (23.2%), were between 20 and 34 years of age (71.5%), had white skin color (82.7%), and had completed high school (49.2%), followed by elementary school (45.2%). Regarding maternal occupation, 69.4% were housewives and 26.5% had paid work (Table 1).



Source: Prepared by the author from research data, SINAN 2022.

Figure 1 - Annual incidence rate and by health macro-regions. Santa Catarina, Brazil, 2020 – 2021

Table 1 - Maternal characteristics of congenital syphilis cases. Santa Catarina, Brazil, 2020 – 2021. (N=1218)

YEAR	2020		2021		Total	
N / Confidence Interval	**N (%)**	**95%CI**	**N (%)**	**95%CI**	**N (%)**	**95%CI**
Age range						
13 to 19 years	101 (17.7)	14.6 – 20.9	112 (17.3)	14.0 – 19.9	213 (17.5)	15.4 – 19.5
20 to 34 years	405(71.1)	67.2 – 74.7	466 (71.9)	68.5 – 75.8	871 (71.5)	69.0 – 74.1
≥ 35 years	64 (11.2)	8.8 – 13.9	70 (10.8)	8.3 – 13.4	134 (11.0)	9.2 – 12.6
Skin color						
White	466 (84.0)	81.1 – 86.7	513 (81.6)	78.4 – 84.4	979 (82.7)	80.5 – 84.9
Black	30 (5.4)	3.6 – 7.4	40 (6.4)	4.5 – 8.3	70 (5.9)	4.6 – 7.2
Brown/Indigenous/Yellow	59 (10.6)	8.1 – 13.2	76 (12.1)	9.7 – 14.8	135 (11.4)	9.6 – 13.2
Schooling						
Elementary Education	214 (47.0)	42.4 – 51.9	234 (43.7)	39.6 – 47.9	448 (45.2)	42.0 – 48.4
Secondary Education	210 (46.2)	41.5 – 51.0	277 (51.7)	47.4 – 55.8	487 (49.1)	46.0 – 52.5
Higher Education	31 (6.8)	4.6 – 9.2	25 (4.7)	3.0 – 6.5	56 (5.7)	4.2 – 7.1
Occupation						
Housewife	246 (69.7)	64.9 – 74.5	273 (64.7)	60.0 – 69.4	519 (67.0)	63.6 – 70.2
Student	12 (3.4)	1.7 – 5.4	20 (4.7)	2.8 – 6.9	32 (4.1)	2.8 – 5.5
Paid work	88 (24.9)	20.7 – 29.5	117 (27.7)	23.5 – 32.0	205 (26.5)	23.5 – 29.5
Unemployed	7 (2.0)	0.8 – 3.7	12 (2.8)	1.4 – 4.5	19 (2.5)	1.4 – 3.6
Region of residence						
Greater West	47 (8.2)	6.1 – 10.7	58 (9.0)	6.9 – 11.1	105 (8.6)	7.1 – 10.3
Midwest and Serra	138 (24.2)	20.5 – 27.9	132 (20.4)	17.4 – 23.6	270 (22.2)	19.8 – 24.5
Northern and Northeastern Plateau	65 (11.4)	8.9 – 14.0	67 (10.3)	8.2 – 12.6	132 (10.8)	9.1 – 12.6
Mouth of the Itajaí River	57 (10.0)	7.7 – 12.6	77 (11.9)	9.6 – 14.5	134 (11.0)	9.3 – 12.9
Valley of the Itajaí River	35 (6.1)	4.2 – 8.2	70 (10.8)	8.5 – 13.3	105 (8.6)	7.1– 10.2
Greater Florianópolis	138 (24.2)	20.5 – 27.7	144 (22.2)	19.0 – 25.3	282 (23.2)	20.8 – 25.6
South	90 (15.8)	12.8 – 18.8	100 (15.4)	12.7 – 18.2	190 (15.6)	13.7 – 17.9

Source: Prepared by the author from research data, 2022

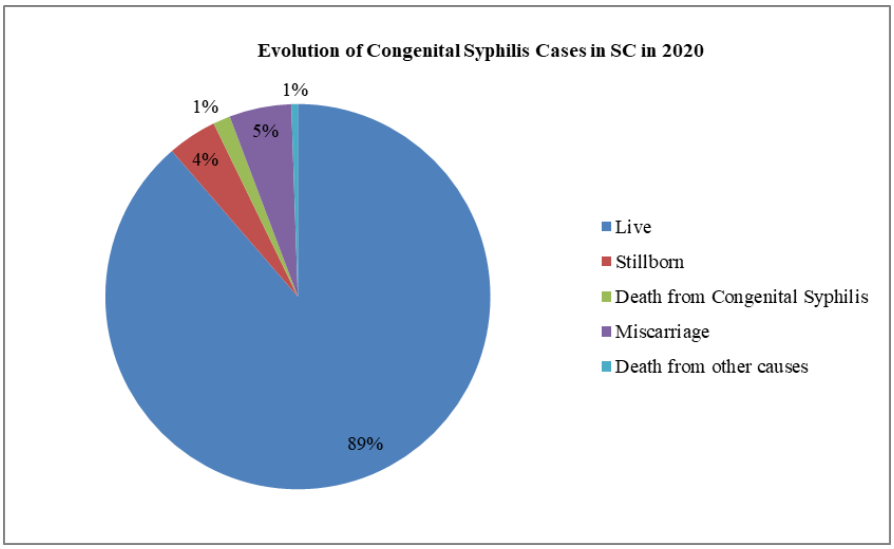
Regarding maternal clinical characteristics, there was a 2.9% decrease in prenatal monitoring in 2021 compared to 2020, as well as a reduction in syphilis diagnoses during delivery/curettage, 2020 (25.4%) and 2021 (24.9%) (Table 2). Regarding the treatment of syphilis, there was a decrease in the proportion of mothers who received treatment considered adequate, falling from 17.3% in 2020 to 15.0% in 2021. Furthermore, there was a 5% increase in mothers who did not undergo treatment in 2021 and a 2.8% reduction in mothers who underwent inadequate treatment in 2021. The majority of sexual partners in both 2020 (67.4%) and 2021 (71.5%) were not treated at the same time as the pregnant woman (Table 2).

Table 2 - Maternal clinical characteristics of congenital syphilis cases. Santa Catarina, Brazil, 2020 – 2021

	2020		2021	
	N (%)	95%CI	N (%)	95%CI
Prenatal care				
Yes	482 (88.0)	85.2 – 90.3	577 (90.9)	88.7 – 93.1
No	66 (12.0)	9.7 – 14.8	58 (9.1)	6.9 – 11.3
Timing of Syphilis diagnosis				
Prenatal	383 (69.4)	65.6 – 73.2	439 (69.7)	66.3 – 73.3
Delivery/curettage	140 (25.4)	21.7 – 29.7	157 (24.9)	21.6 – 28.3
Postpartum	27 (4.9)	3.3 – 6.7	31 (4.9)	3.3 – 6.7
Not performed	2 (0.4)	0.0 – 0.9	3 (0.5)	0.0 – 1.1
Treatment Scheme				
Adequate	82 (17.3)	14.1 – 20.9	83 (15.0)	12.0 – 18.1
Inadequate	225 (47.5)	42.6 – 51.9	247 (44.7)	40.2 – 48.9
Not performed	167 (35.2)	31.2 – 39.9	222 (40.2)	36.6 – 44.6
Partner Treated				
Yes	138 (32.6)	28.1 – 36.9	142 (28.5)	24.8 – 32.7
No	285 (67.4)	63.1 – 71.9	357 (71.5)	67.3 – 75.2

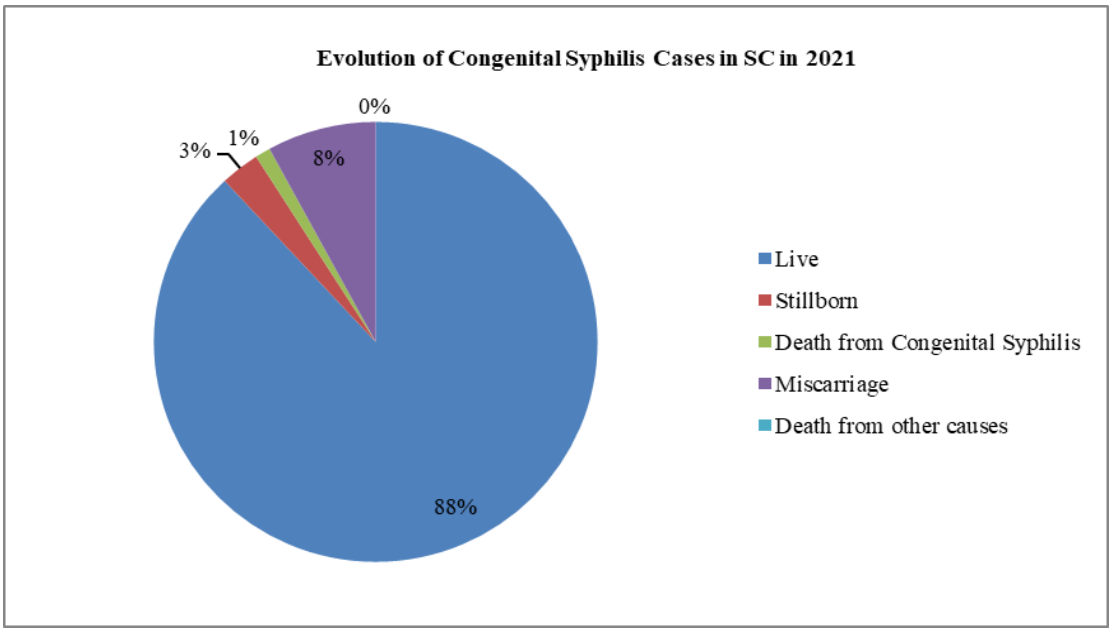
Source: Prepared by the author from research data, 2022

Regarding the final evolution of congenital syphilis cases, a 0.5% reduction in favorable evolution was observed in 2021 in cases that remained alive. When comparing the year 2021 to the year 2020, the results showed an increase in the number of miscarriage cases, from 5.2% (95%CI 3.4 - 7.2) in 2020 to 7.9% (95%CI 5.9 - 10.0) in 2021, as well as a reduction in stillbirth cases from 4.1% (95%CI 2.5 - 5.8) to 2.9% (95%CI 1.6 - 4.1), and a reduction of 0.3% in cases of death from congenital syphilis in 2021, however, there were no statistical differences between the years 2020 and 2021 (Figure 2; Figure 3).



Source: Prepared by the author from research data, 2022.

Figure 2 - Evolution of congenital syphilis cases, Santa Catarina, 2020 (%)



Source: Prepared by the author from research data, 2022
Figure 3 - Evolution of congenital syphilis cases, Santa Catarina, 2021 (%)

DISCUSSION

The incidence rates of congenital syphilis in the State of Santa Catarina during the COVID-19 pandemic were 5.8 per 1000 live births in 2020 and 6.7 per 1000 live births in 2021. The WHO aims to eliminate congenital syphilis, seeking to reduce the incidence to 0.5 or fewer cases[10]. Therefore, the incidence rates found in the current study were more than 10 times higher than the proposed elimination target. This was reaffirmed by Viscovi[11], in a study on the incidence of congenital syphilis also carried out in the state of Santa Catarina, which suggests as causes of this increase, ineffective prenatal care, inadequate treatment of infected pregnant women in a timely manner, and the lack of treatment of the sexual partner due to social distancing measures implemented during the pandemic period[12,13].

Even with so many advances towards access to effective prenatal care, aiming to reduce the incidences of gestational and congenital syphilis[14,15], it was observed that in 2020, 12.0% of pregnant women did not receive prenatal care. This finding may be explained by the fact that this period represented the height of the Covid-19 pandemic, which may have made it difficult for pregnant women to access the health system, which was overloaded with the demands of patients infected with Sars-Cov-2[16]. Although the prenatal program is well structured according to the principles of the SUS; universal, egalitarian, comprehensive, and with high coverage, there are still significant challenges to ensure that all pregnant women have effective access to prenatal care. The existence of pregnant women who do not receive prenatal care is due to several factors, such as lack of guidance, difficulty in accessing health services, and geographical, social, and cultural obstacles. This situation is worrying, as it can result in complications during pregnancy, childbirth, and postpartum, in addition to increasing risks to maternal and child health[15].

On the other hand, there was a 2.9% increase in mothers who received prenatal care in 2021, corroborating other studies where prenatal care was present in almost all of the pregnancies studied[17,1]. However, despite the majority of mothers having received prenatal care, in 2021, a significant number had an unfavorable outcome for congenital syphilis. A possible explanation for this outcome would be in relation to the quality of prenatal care[18].

The current study showed that in 2020 and 2021, 69% of mothers who received prenatal care were diagnosed with syphilis during this period. These data corroborate the study by Soares et al. (2021)[19] on the completeness and characterization of gestational and congenital syphilis records in Bahia. Despite this, the percentage is considered low, since most mothers received prenatal care, which includes the provision of rapid testing at the first consultation.

Despite the high number of pregnant women who underwent prenatal care, many were diagnosed with syphilis only at the time of delivery or curettage in 2020 (24.9%), data close to the descriptive, quantitative study by Kisner et al. (2021)[20] on the epidemiological profile of reported cases of congenital syphilis in the State of Rondônia, which indicated that 36.9% of patients with syphilis during pregnancy were diagnosed with the infection at the time of delivery or curettage.

Some studies indicate a decrease in the incidence of syphilis in 2020 and 2021, however, an observational study on the impact of the COVID-19 pandemic on the incidence of acquired syphilis in Brazil by Lima et al. (2022)[13] pointed out that the decrease in incidence during the pandemic period is due to underreporting of new cases. This underreporting arose from the lower demand for health services during the pandemic, as a result of the readjustment and change in the population's behavior, such as social distancing, which generated impacts on the entire health service, reducing the opportunity to detect

the disease in a timely manner, culminating in an increase in gestational and neonatal complications[12].

It should be noted that the rapid test is the main form of diagnosis for syphilis and is available in the SUS health services, being practical and easy to perform. The number of rapid tests for syphilis is determined by the clinical protocol of therapeutic guidelines, which establishes that pregnant women should perform three rapid tests during prenatal care[21,22].

Regarding the mothers' treatment regimen, the study showed a reduction of 2.8% in 2021 in relation to treatment considered inadequate and an increase of 0.8% in positive women who did not undergo treatment. These data are in agreement with those found in the research by Heringer et al. (2020)[23] who identified a very low percentage (1.6%) of women who underwent adequate treatment, a result associated with failures in prenatal care for pregnant women with syphilis due to the lack of preparation of health professionals, difficulty in adhering to care protocols and difficulty in approaching sexual partners.

In 2021, there was an increase in the incidence (71.5%) of sexual partners who were not treated at the same time as the pregnant women. Inadequate treatment is often attributed to the service's failure to call the partner and carry out the therapy, which is extremely important for the success of syphilis treatment during pregnancy, as corroborated by the research of Torres et al. (2022)[24].

Regarding the maternal epidemiological profile of congenital syphilis cases, there was a higher incidence among mothers aged 20 to 34, corroborating the study by Lima et al. (2020)[13], who pointed out a direct relationship between the age group of mothers, from 20 years old onwards, and the increase in congenital syphilis, perhaps because this is the most intense phase of sexual life. Low maternal education has been shown to be associated with higher incidences of syphilis in pregnant women who do not have higher education, as these constitute limiting factors for understanding the importance of prevention measures[25,26]. Regarding skin color, white skin color predominated among the cases analyzed. This can be attributed to the historical context of Santa Catarina, where European colonization, mainly by Italians and Germans, significantly influenced the ethnic composition of the population. The incidence in the black population was considered low (5.9%), reflecting not only the ethnic composition of the population of Santa Catarina, but also variations in socioeconomic conditions and access to health services among different ethnic groups[11,6].

Regarding the evolution of cases in the period analyzed, the majority of newborns had positive outcomes, indicating a decrease in unfavorable outcomes in 2020. However, in 2021 there was an increase in the number of cases that evolved to miscarriage compared to 2020, as found in the study by Volpatto[2], which demonstrated that 4.2% of cases evolved to miscarriage. It is known that maternal syphilis infections are associated with unfavorable fetal and neonatal outcomes, such as miscarriage, stillbirth, prematurity, and death, especially with regard to maternal syphilis infection[3,27].

In the current study, it was observed that most newborns with syphilis lived in the Midwest/Serra and Greater Florianópolis regions; however, the other regions did not show statistically significant differences in the number of cases of congenital syphilis. On the other hand, it is worth noting that monitoring indicators of syphilis in general and by region is extremely important for developing strategies and actions that can help control the disease[28,29].

Brazil has implemented several national strategies to control the disease, such as strengthening healthcare networks, the surveillance system to combat syphilis, the rapid response to syphilis in healthcare networks, the expansion of investigation committees to prevent vertical transmission of syphilis, educommunication, and the qualification of strategic information, forming the six axes that make up the Strategic Action Agenda for the reduction of Syphilis in Brazil, as agreed in 2020/2021[30].

CONCLUSION

In conclusion, that it is necessary to put into practice the proposals recommended by the MS, to improve maternal care during pregnancy, especially in relation to congenital syphilis, with regard to the structuring of health services, in order to ensure that pregnant women have adequate access to prenatal care, inclusion of partners in prenatal consultations, and adoption of new strategies for early detection, as well as ensuring timely adherence to treatment through health promotion and prevention actions during pregnancy, which guarantee the continuity of prenatal care and the integrity of care. These measures are able to strengthen the fight against vertical transmission and, consequently, contribute to the reduction in infant morbidity and mortality.

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