Epidemiological profile of congenital syphilis in the municipality of São Luís, 2008–2017

Perfil epidemiológico da sífilis congênita no município de São Luís (MA), 2008–2017

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ABSTRACT

Introduction: Congenital syphilis is a disease of great magnitude due to increasing numbers of new annual cases, affecting a large contingent of children, which translates into high incidence rates. The occurrence of syphilis cases evidences failures in health services, especially in prenatal care.
Objective: To describe the epidemiological profile of congenital syphilis in the municipality of São Luís.
Methods: Descriptive study with a quantitative approach. Congenital syphilis data recorded in SINAN from 2008 to 2017 were used.
Results: The detection rate in the municipality shows a continuous increase. A total of 1,060 cases of congenital syphilis were diagnosed in neonates, 1,017 (96.0%) after the first week of life. Regarding the final diagnosis of cases, it was observed that 967 (91.2%) were classified as early congenital syphilis. The predominant maternal age range was 20 to 34 years, corresponding to 743 cases (70.1%). Regarding access to prenatal care, 802 (75.6%) mothers underwent prenatal care, while 219 (20.66%) did not. Among those who received prenatal care, 352 (33.0%) were diagnosed with syphilis during prenatal care, 481 (46.0%) were diagnosed at the time of delivery/curettage, and 59 (5.0%) were diagnosed after childbirth. Regarding the treatment regimen during pregnancy, 736 (70.0%) received inadequate treatment, 95 (8.0%) received no treatment and 62 (6.0%) received adequate treatment.
Conclusion: The study contributed to the identification of possible losses in the stages of such care, and in obtaining qualified information that will guide decision-making and planning of health actions, supporting the epidemiological surveillance work in guiding managers and health teams.
Keywords: syphilis; syphilis, congenital; epidemiology; treponemal infections.

RESUMO

Introdução: A sífilis congênita é uma doença de grande magnitude, pelos crescentes números de casos novos anuais, afetando grande contingente de crianças, que traduz elevadas taxas de incidência. A ocorrência dos casos de sífilis evidencia falhas dos serviços de saúde, principalmente na atenção pré-natal.
Objetivo: Descrever o perfil epidemiológico da doença no município de São Luís.
Métodos: Estudo descritivo com abordagem quantitativa. Utilizaram-se dados de sífilis congênita registrados no Sistema de Informação de Agravos de Notificação, no período de 2008 a 2017.
Resultados: A taxa de detecção no município apresenta crescente aumento. Foram diagnosticados 1.060 casos em neonatos, sendo 1.017 (96%) após a primeira semana de vida. Quanto ao diagnóstico final dos casos, observou-se que 967 (91,2%) foram classificados como sífilis congênita recente. A faixa etária da mãe predominante era de 20 a 34 anos, correspondendo a 743 casos (70,1%). Quanto ao acesso ao pré-natal, 802 (75,6%) das mães fizeram pré-natal, enquanto 219 (20,66%) não fizeram. Entre aquelas que fizeram, 352 (33%) tiveram diagnóstico de sífilis durante o pré-natal, 481 (46%) no momento do parto/curetagem e 59 (5%) após o parto. Em relação ao esquema de tratamento da gestante, 736 (70%) receberam tratamento inadequado, 95 (8%) não receberam tratamento e 62 (6%) receberam tratamento adequado.
Conclusão: O estudo contribuiu para a identificação de eventuais perdas nas etapas desse cuidado e a obtenção de informações qualificadas, que irão nortear tomadas de decisão e planejamento das ações em saúde, subsidiando o trabalho da vigilância epidemiológica na orientação aos gestores e equipes de saúde.
Palavras-chave: sífilis; sífilis congênita; epidemiologia; infecções por treponema.

INTRODUCTION

Congenital syphilis occurs due to the hematogenous spread of *Treponema pallidum* from the mother to the fetus, predominantly via the transplacental route. It is a preventable condition when the infected pregnant woman and her sexual partners are identified and treated appropriately and in a timely manner[1].

Early congenital syphilis manifests until the second year of life and must be diagnosed through a careful epidemiological assessment of the maternal situation, and clinical and laboratory assessment and imaging studies in the child. However, the diagnosis in the child is a complex process, since more than half of them are asymptomatic at birth and, in those with clinical expression, signs and symptoms are discrete or not very specific. There is no complementary assessment to accurately determine the child's diagnosis. In this sense, it is emphasized that the association of epidemiological, clinical and laboratory criteria should be the basis for the diagnosis of syphilis in children[1,2].

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. In Latin America and the Caribbean, it is estimated that between 166,000 and 344,000 children are born with congenital syphilis annually[3]. In Brazil, from 1998 to 2017, 159,890 cases of syphilis in children aged under one year were notified in the Information System for Notifiable Diseases (SINAN). In Maranhão, from 1998 to 2016, 3,767 cases of congenital syphilis were reported[4].

The Ministry of Health states that it is a disease of great magnitude, due to the growing number of new annual cases, affecting a large number of children, which is translated into high incidence rates[4].

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According to the World Health Organization (WHO), 25% of infected pregnant women have fetal death or spontaneous abortion as outcomes, and 25% have newborns with low birth weight or severe infection[1]. However, new monitoring studies are being carried out in the country due to the increase in the number of syphilis cases in pregnant women and congenital syphilis. Brazil is a signatory to the Pan American Health Organization (PAHO/WHO) for the elimination of mother-to-child transmission of HIV and syphilis in Latin America and the Caribbean[3].

This study was chosen due to the relevance of understanding the entire chain of events involved in the transmission of congenital syphilis. The occurrence of cases of this disease shows failures in health services, especially in prenatal care. The study will contribute to the identification of possible losses in the stages of such care and in obtaining qualified information, which will guide decision-making and the planning of health actions, subsidizing the work of epidemiological surveillance in guiding managers and the health team regarding the focus of local strategic actions to fight vertical transmission of syphilis.

OBJECTIVE

To describe the epidemiological profile of congenital syphilis in the municipality of São Luís (MA).

METHODS

Study type

This is a descriptive study with a quantitative approach.

Study location

The municipality of São Luís, the capital of the state of Maranhão, is located in the Northeast of Brazil, with an area of 582.9 km^2 and an estimated population of 1,014,837 inhabitants[5]. It is considered by the Ministry of Health to be a priority municipality for the control of syphilis, as it presents a high incidence of the disease[4].

Study population

The population consisted of all cases of congenital syphilis registered with SINAN, from 2008 to 2017.

Data source and collection

The source used for data collection was the cases of congenital syphilis in the SINAN database, from 2008 to 2017. The data were collected in October 2019, after authorization by the Municipal Health Secretary. The definitions of a congenital syphilis case adopted in the present study are those recommended by the Ministry of Health[3].

Data analysis

The collected data were tabulated and analyzed using Excel and discussed according to the relevant literature.

Ethical aspects

The study was conducted with secondary, publicly available data, given the ethical aspects of resolutions 466/12 and 510 510, of the National Health Council, being exempted from submission to the Ethics and Scientific Research Committee.

RESULTS

From 2008 to 2017, 1,532 cases of congenital syphilis in children aged under one year in São Luís were reported in SINAN (**Figure 1**), of which 69.1% (1,060) are residents in São Luís and 30.9% (472) reside in other municipalities (**Figure 2**).

In São Luís, there has been an increase in the incidence rate of congenital syphilis in the last 10 years. In 2008, the observed rate was 4.9/1,000 live births (LB) and, in 2017, it was 11.6/1,000 LB, with an increase of 136.7%, as shown in **Figure 3**.

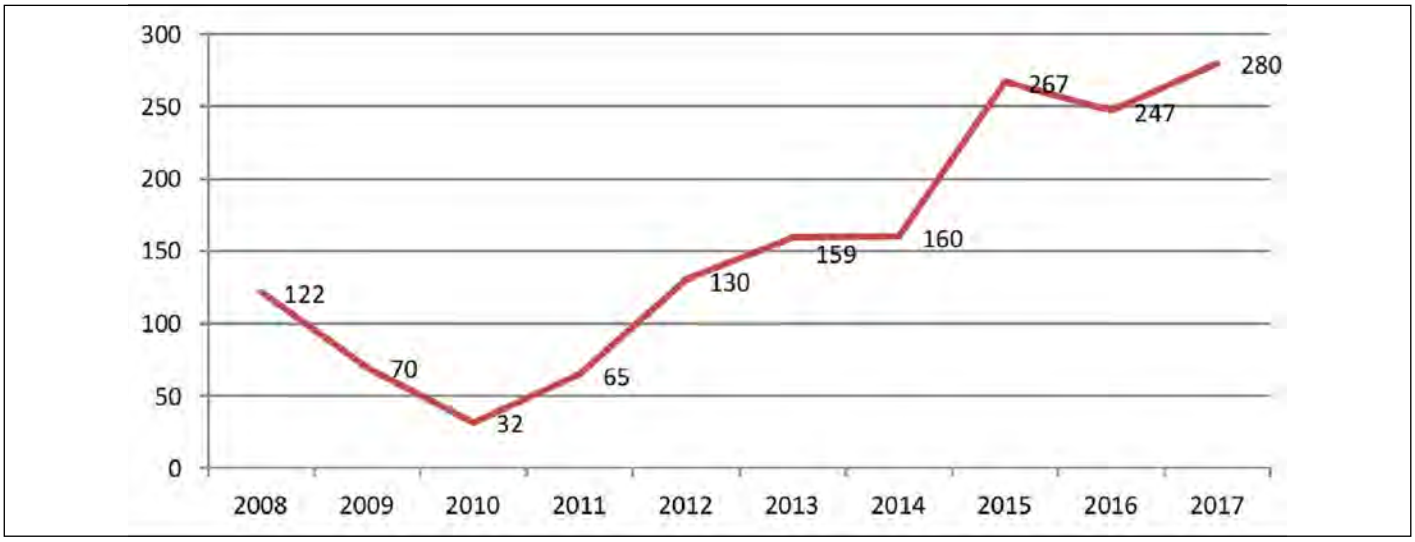


Figure 1 – Congenital syphilis cases notified by the municipality of São Luís (MA), 2008–2017.

In the period from 2008 to 2017, 1,060 cases of congenital syphilis were diagnosed in neonates, 1,017 (96%) of which were diagnosed after the first week of life (**Figure 4**).

As for the final diagnosis of cases, it was observed that 967 (91.2%) were classified as early congenital syphilis and one (0.09%) were classified as miscarriage due to syphilis (**Figure 5**).

The highest percentages of congenital syphilis cases, from 2008 to 2017, occurred in children whose mothers were aged between 20 and 34 years (743, or 70.1%), followed by the age groups of 15 to 19 years (215, or 20.2%) and 35 to 49 years (81, or 7.6%) (**Figure 6**).

As for maternal education, it was found that the majority had incomplete primary education (243, or 22.92%) and that, in 251 (23.67%) of the cases, this information was classified as ignored (**Figure 7**).

Regarding the race/color of the mothers of children with congenital syphilis, most self-reported to be brown (83.67%), followed by those who self-reported as white (8.01%) and black (5.66%) (**Figure 8**).

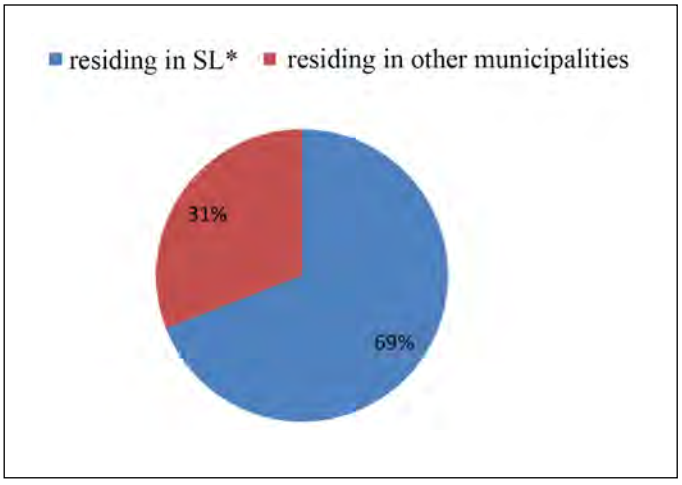
From 2008 to 2017, regarding access to prenatal care, 802 (75.6%) of the mothers of children with congenital syphilis received prenatal care, while 219 (20.66%) did not, and in 39 (3.67%) the information was classified as ignored (**Figure 9**).

Among those who received prenatal care, 352 (33%) were diagnosed with syphilis during prenatal care, 481 (46%) at the time of delivery/curettage, 59 (5%) after delivery and 14 (1%) had no diagnosis, in addition to 154 (15%) in which the information was classified as ignored (**Figure 10**).

Regarding the treatment regimen during pregnancy, 736 (70%) received inadequate treatment, 95 (8%) did not receive treatment, and only 62 (6%) received adequate treatment (**Figure 11**).

As for the treatment of partners, among the pregnant women who underwent prenatal care, in 645 (60%) of the cases, the partner was not treated, 156 (15%) of them underwent treatment and in 259 (25%) of the cases, this information is classified as ignored/left blank (**Figure 12**).

In the period from 2008 to 2017, the total of 19 deaths from syphilis in children aged under one year in São Luís was declared



SL: São Luís.

Figure 2 – Percentage of congenital syphilis in children aged under one year, per municipality of residence. São Luís (MA), 2008–2017.

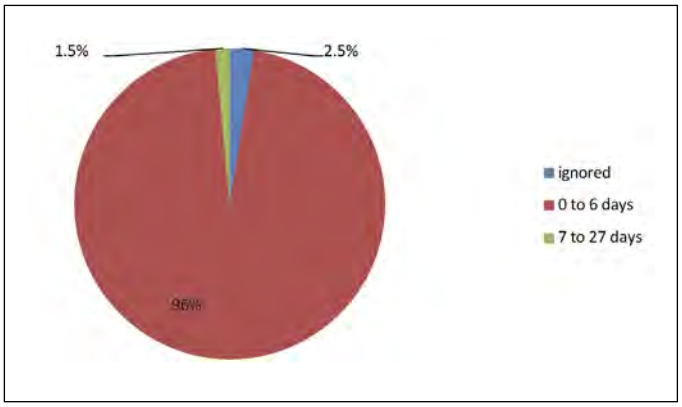


Figure 4 – Percentage of congenital syphilis cases, according to the child's age, São Luís (MA), 2008–2017.

Figure 3 – Incidence rate of congenital syphilis (per 1,000 live births) per year of diagnosis. São Luís (MA), 2008–2017.

in the Mortality Information System (SIM). From 2008 to 2013, there was an increase in the gross coefficient of infant mortality from syphilis, from 5.5/100,000 LB in 2008 to 29.1/100,000 LB in 2013. A decrease was observed in 2015, reaching the coefficient of 5.9/100,000 LB (**Figure 13**).

DISCUSSION

The detection rate of congenital syphilis in the municipality of São Luís showed an increase throughout the study period. In none of the 10 years studied, the municipality was able to reach the maximum incidence of 0.5 cases per 1,000 LB as proposed by PAHO. The increased incidence may be associated with improved notification and the investigation of cases, in addition to the higher quality of detection of gestational syphilis in prenatal care[6].

One of the possible reasons for the increase in the incidence of congenital syphilis, in 2016, may be the non-availability of raw material for the production of penicillin for the treatment of syphilis, as reported nationwide. As a result, penicillin stocks have decreased dramatically, and many Brazilian states have been left without any vials of the drug to treat mothers, partners and children[7].

Regarding the increasing incidence, according to study carried out in the state of Ceará over a period of 10 years, the notification of increasing congenital syphilis was also observed throughout the studied decade. There were 0.56 cases per 10,000 LB in the year 2000, and 49.32 per 10,000 LB in the year 2010[8].

National studies on congenital syphilis show that the majority of pregnant women are in the age group of 20 to 34 years old, in addition to self-reporting as brown[9,10]. Congenital syphilis is not a disease with a preference for population groups. However, young women are more likely to become infected with *Treponema pallidum*

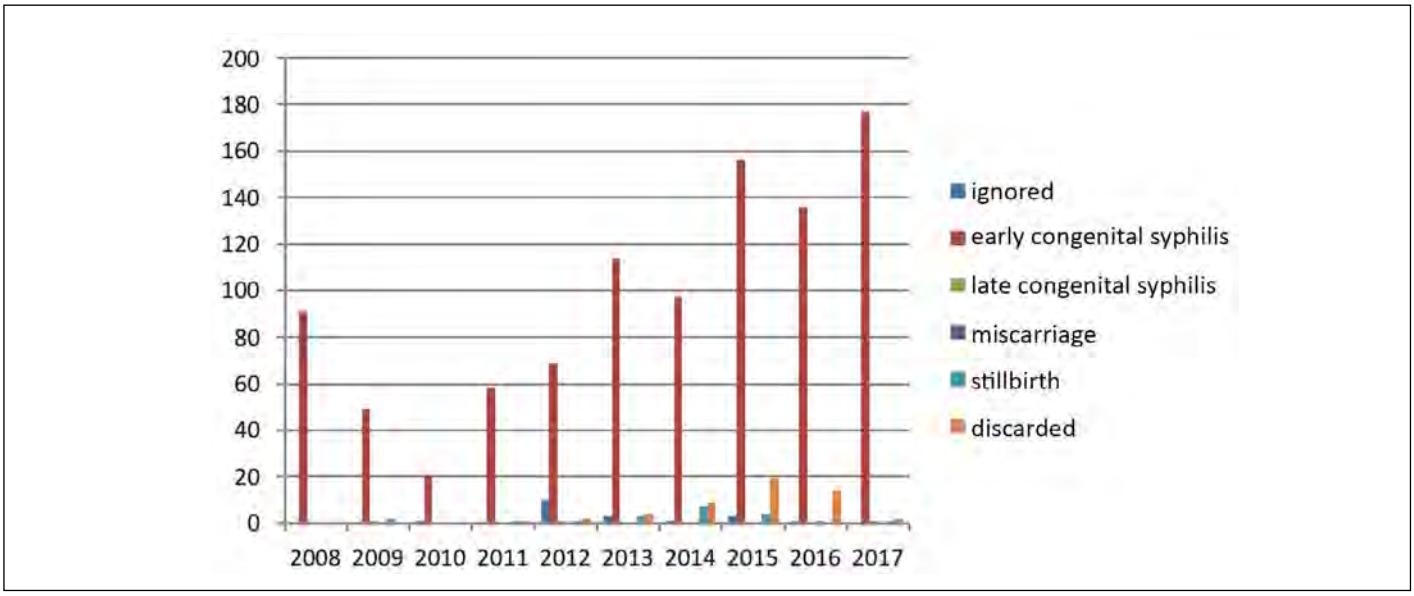


Figure 5 – Distribution of the percentage of congenital syphilis according to the final diagnosis. São Luís (MA), 2008–2017.

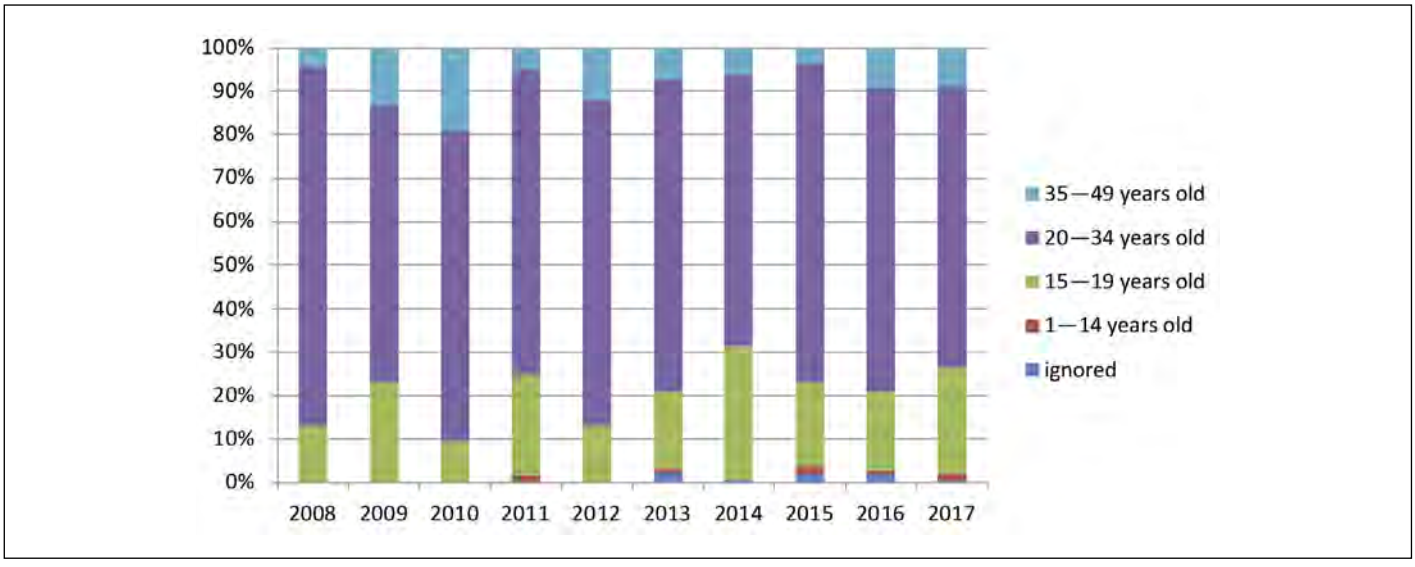


Figure 6 – Distribution of congenital syphilis cases, according to maternal age. São Luís (MA), 2008–2017.

due to social behavior. Usually, these women, as observed in two Brazilian regional studies, have multiple partners and do not use condoms during sexual intercourse[10,11]. As for race/skin color, "brown" follows the national pattern of miscegenated population, comprised of a majority of people who identify as brown or black[10,12].

The low level of education of 243 women (22.9%) in this study is a challenge for public health, as an adequate understanding of the pathology, its treatment and prevention, is of paramount importance for the adequate monitoring of pregnant women diagnosed with syphilis. It is expected that the higher the education level of the population,

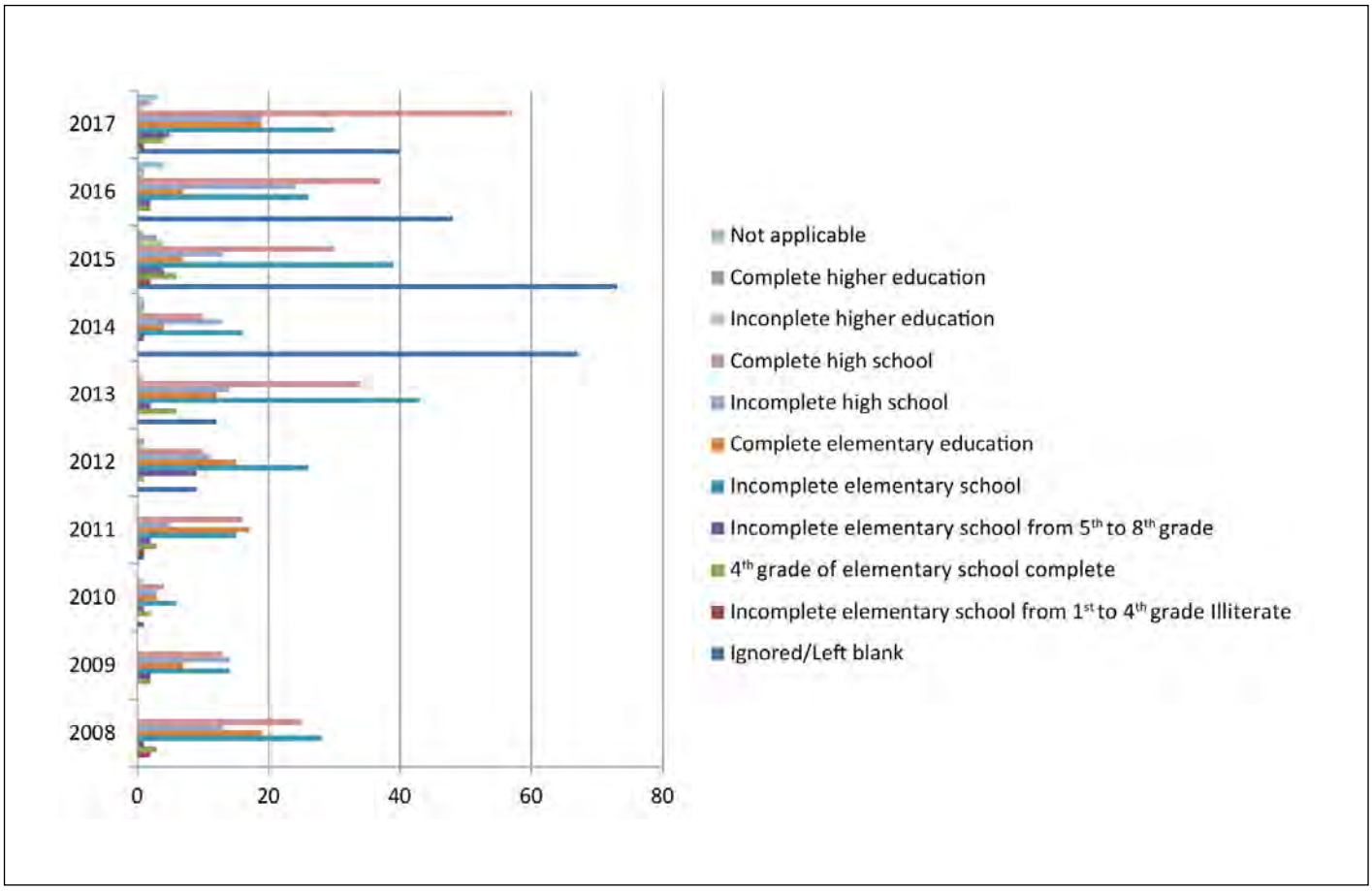


Figure 7 – Distribution of congenital syphilis cases, according to maternal education. São Luís (MA), 2008–2017.

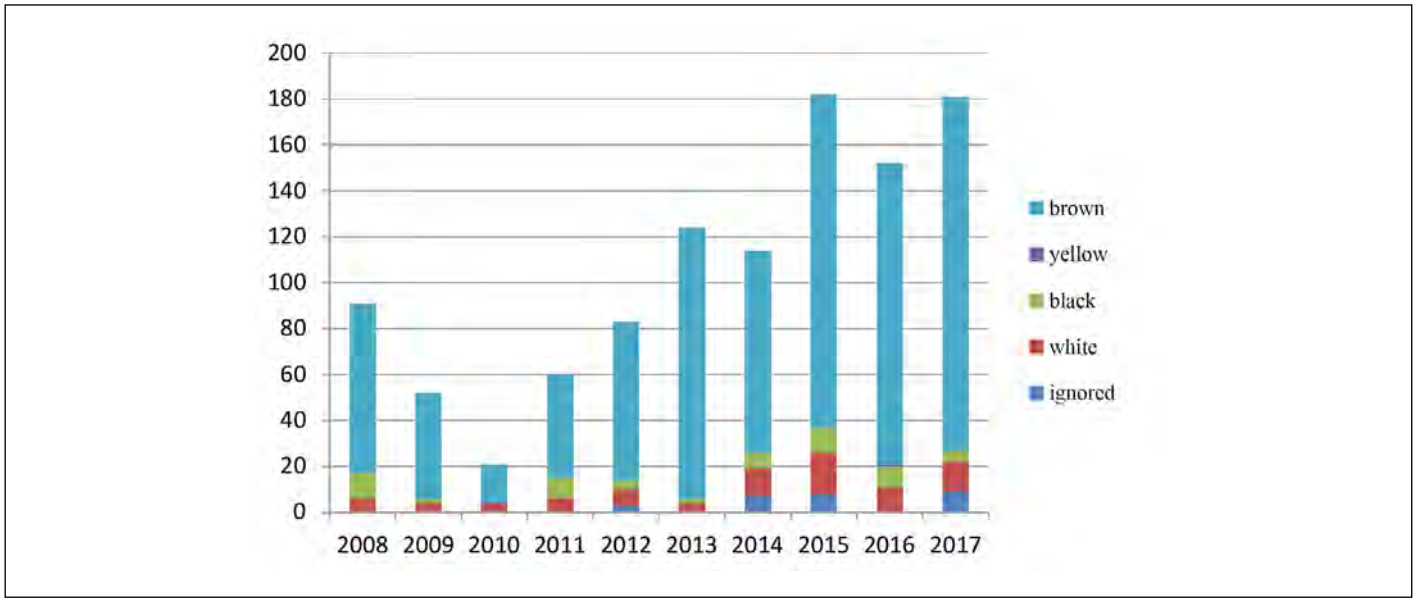


Figure 8 – Distribution of congenital syphilis cases, according to maternal skin color. São Luís (MA), 2008 to 2017.

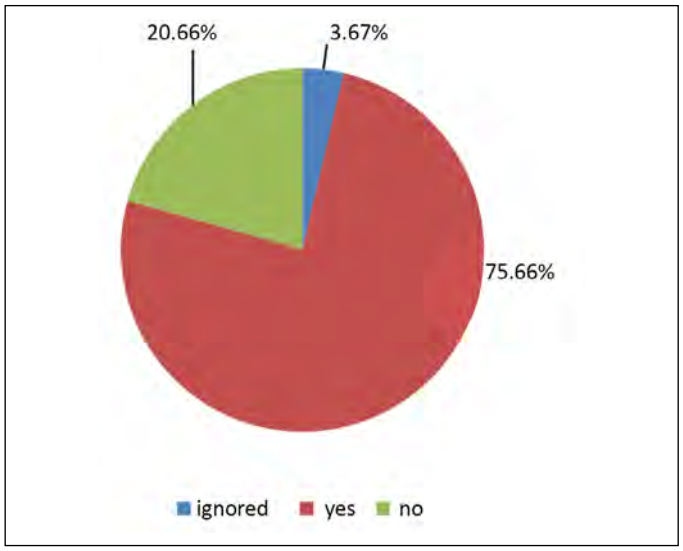


Figure 9 – Percentage of congenital syphilis cases, according to information on the mother's prenatal care. São Luís (MA), 2008–2017.

the better the actions taken to maintain good health[13]. A study by the Ministry of Health shows that 24.6% had only incomplete primary education, and that in 28% of cases, this information was classified as ignored, which corroborates the findings of this study[4].

Pregnancy is the ideal time for the prevention of congenital syphilis, which should be diagnosed by primary care in prenatal care. Although the majority of pregnant women (802, or 75.6%) have undergone prenatal care, the diagnosis was late, at the time of delivery/curettage, in 481 (46%). Treatment was considered inadequate in 736 women (70%). Between 2008 and 2013, in the municipality of Belém, state of Pará, most mothers (78.49%) of children diagnosed with congenital syphilis underwent prenatal care[14]. However, in the municipality of Montes Claros, in a study between 2007 and 2013, treatment for syphilis in during pregnancy was considered inadequate or incomplete in 64.8% of cases[15].

Syphilis testing should preferably be performed in the first trimester of pregnancy, at the time of the first consultation, in the third trimester of pregnancy, and upon admission for delivery or curettage due to miscarriage[2]. However, the data show that most cases were diagnosed late.

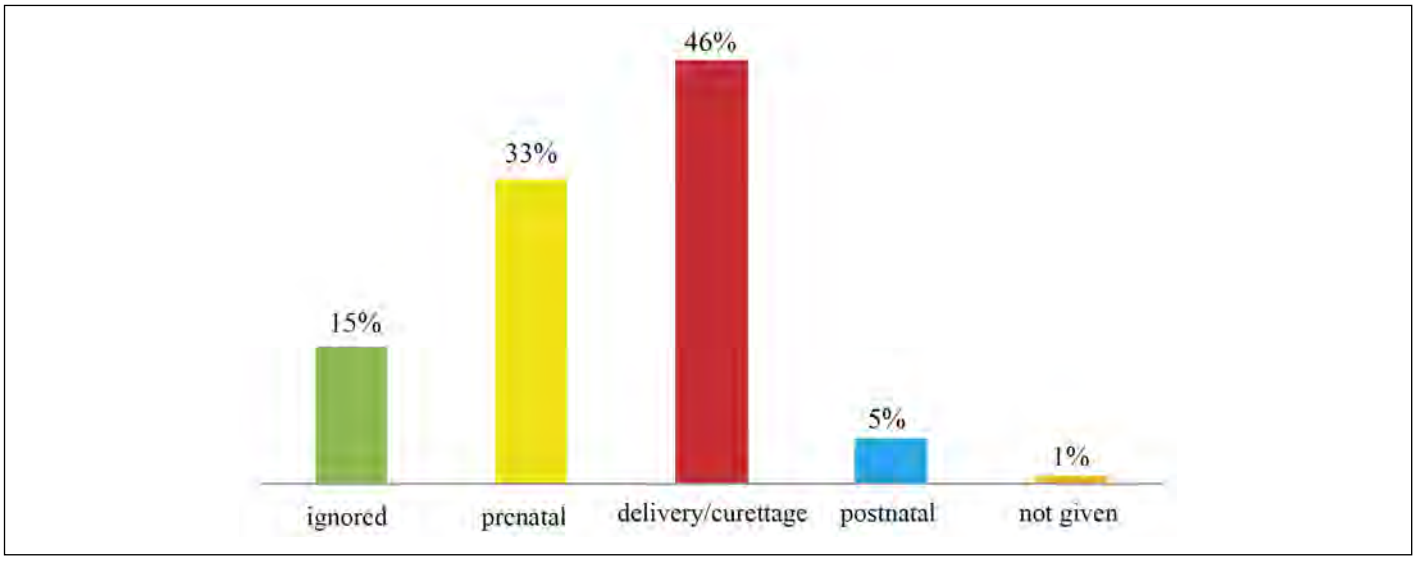


Figure 10 – Distribution of congenital syphilis cases, according to the time of diagnosis of maternal syphilis, São Luís (MA), 2008–2017.

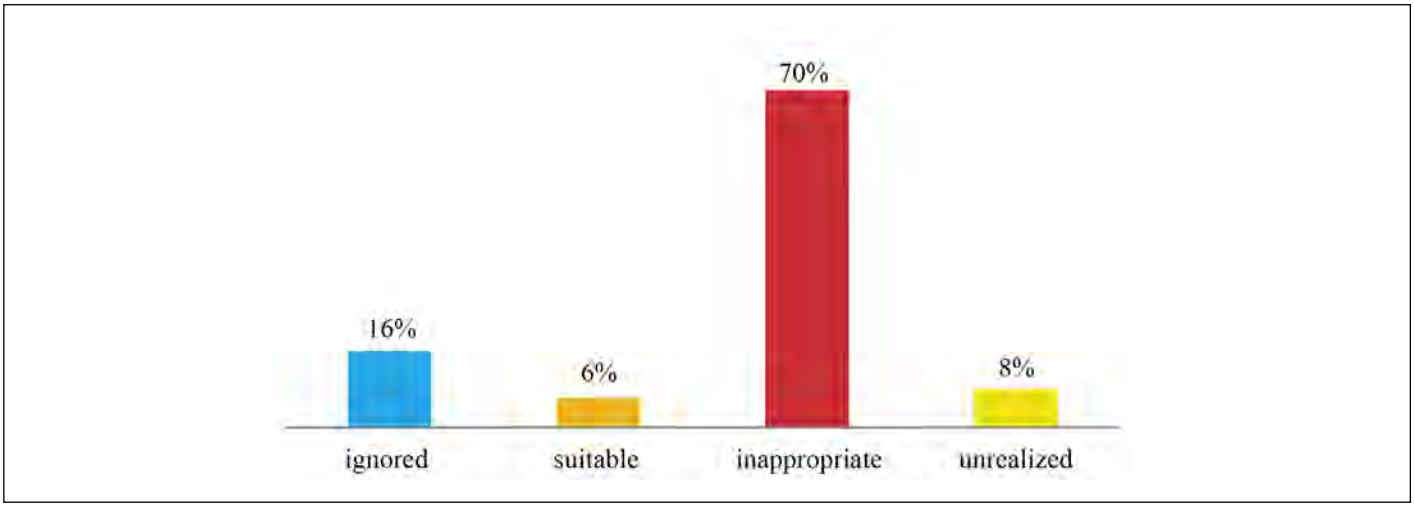


Figure 11 – Distribution of congenital syphilis cases, according to the mother's treatment regimen. São Luís (MA), 2008–2017.

A treatment is considered to be adequate when performed with benzathine penicillin, which is the only safe and effective option for the treatment of pregnant women, performed more than 30 days before delivery and in the proper dosage for the disease phase, ensuring protection to the mother and baby binomial. Treatment is considered inappropriate when performed with any medication other than penicillin, performed less than 30 days before delivery and in a different dosage for the stage of the disease. Any other treatment performed during pregnancy for the purposes of case definition of and therapeutic approach to congenital syphilis is considered an inappropriate treatment of the mother, therefore the newborn will be notified as having congenital syphilis and subjected to clinical and laboratory evaluation[2].

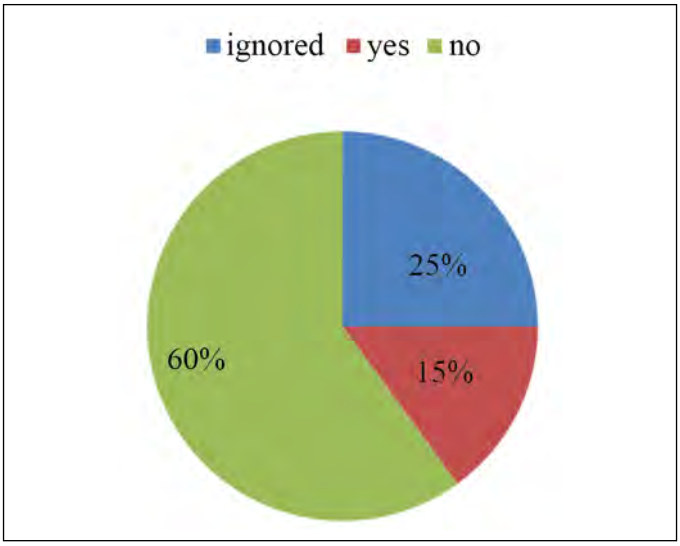


Figure 12 – Percentage of congenital syphilis cases, according to the treatment of the mother's partner. São Luís (MA), 2008–2017.

As for the treatment of partners, among the pregnant women who underwent prenatal care, in 645 (60%) of the cases, the partner was not treated, and they underwent treatment in 156 (15%) cases. In a case study of congenital syphilis carried out in the state of Amazonas, 67.1% of partners of pregnant women with gestational syphilis were not treated during prenatal care[16], data similar to those in this study. To reduce the incidence of maternal syphilis, it is essential to treat the pregnant woman's partner(s) concomitantly, in order to reduce or prevent reinfections[2].

There is a total of 19 deaths from syphilis in children aged under one year old in São Luís in the 10-year historical series, with variations in the decrease in the gross rate of child mortality from syphilis, reaching a coefficient of 5.9/100,000 live births in 2015. This situation showed underreporting in deaths from syphilis. In Brazil, the low quality and underreporting of health data compromises the analysis of deaths, especially with regard to early fetal and neonatal deaths[16,17]. The underreporting of congenital syphilis as one of the causes of fetal and infant death leads to ignorance of the reality of deaths from this disease. This situation has great consequences, since congenital syphilis remains little known by health managers, which hinders the development public policies aimed at its prevention[16].

Thus, preventive actions aimed at women of childbearing age, interrupting the chain of transmission of syphilis during pregnancy, consolidation of prenatal procedures for the uptake and follow-up of pregnant women are essential for the control of the disease, so that the possible failures that cause vertical transmission are identified, and that corrective measures in the prevention, assistance and surveillance of this transmission are proposed.

As a strong point, the study demonstrated that these findings may provide subsidies for a discussion on the care practiced by health professionals responsible for prenatal care, which is necessary for focusing on local strategic actions to fight vertical transmission of syphilis.

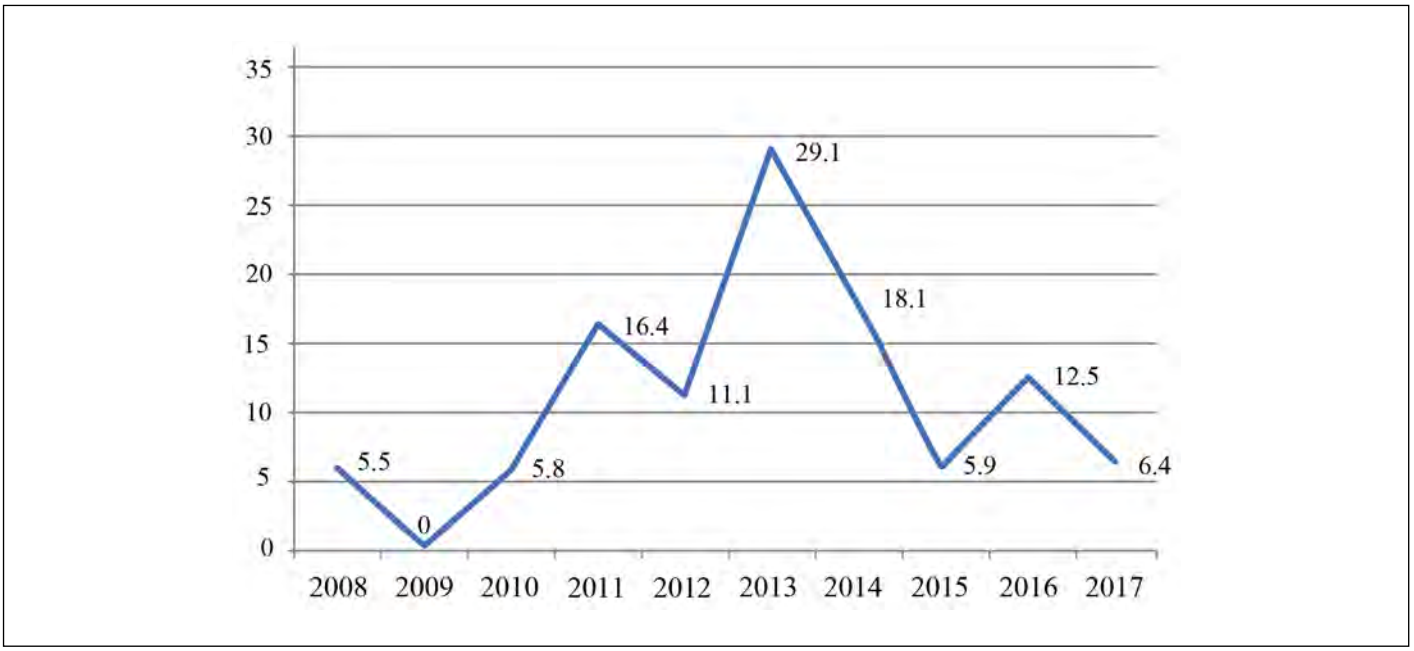


Figure 13 – Deaths due to congenital syphilis in children aged under one year and gross mortality coefficient (per 100,000 live births) according to the year of death. São Luís (MA), 2008–2017.

As limitations, there is the possibility that these data are underestimated by the underreporting of cases of congenital syphilis in SINAN. Another limitation was the number of variables that showed ignored fields, a fact that hinders a more refined analysis of the data presented.

CONCLUSION

The incidence of congenital syphilis in the municipality of São Luís is high. Most cases of the disease in neonates are being diagnosed after the first week of life, being classified as early syphilis.

The highest percentages of cases of congenital syphilis occurred in women of reproductive age, who were aged between 20 and 34 years and had low education. Although mothers had undergone prenatal care, most cases were identified in the maternity ward, not guaranteeing adequate treatment for mothers to avoid infection in the baby.

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Research Ethics Committee Approval

The study was conducted with secondary, publicly available data.

Authors' contributions

Alessandra Coelho Vivenkanada Meireles: study conception and design, data analysis and interpretation, writing and critical review of the intellectual content of the manuscript. All authors approved the final version of the manuscript and declare that they are responsible for all aspects of the work, ensuring its accuracy and integrity.

Livia Cristina Sousa: study conception and design, data analysis and interpretation, writing and critical review of the intellectual content of the manuscript. All authors approved the final version of the manuscript and declare that they are responsible for all aspects of the work, ensuring its accuracy and integrity.

Wendel Alencar de Oliveira: study conception and design, data analysis and interpretation, writing and critical review of the intellectual content of the manuscript. All authors approved the final version of the manuscript and declare that they are responsible for all aspects of the work, ensuring its accuracy and integrity.

Diana Maria Silveira da Silva: study conception and design, data analysis and interpretation, writing and critical review of the intellectual content of the manuscript. All authors approved the final version of the manuscript and declare that they are responsible for all aspects of the work, ensuring its accuracy and integrity.

Vanize Frazão Ribeiro: study conception and design, data analysis and interpretation, writing and critical review of the intellectual content of the manuscript. All authors approved the final version of the manuscript and declare that they are responsible for all aspects of the work, ensuring its accuracy and integrity.

Dorília Maria da Silva de Sousa Fernandes: study conception and design, data analysis and interpretation, writing and critical review of the intellectual content of the manuscript. All authors approved the final version of the manuscript and declare that they are responsible for all aspects of the work, ensuring its accuracy and integrity.

Marconi Relnner Mesquita Viana: study conception and design, data analysis and interpretation, writing and critical review of the intellectual content of the manuscript. All authors approved the final version of the manuscript and declare that they are responsible for all aspects of the work, ensuring its accuracy and integrity.

Silvana Mendes Costa: study conception and design, data analysis and interpretation, writing and critical review of the intellectual content of the manuscript. All authors approved the final version of the manuscript and declare that they are responsible for all aspects of the work, ensuring its accuracy and integrity.

Ana Cristina Brandão Machado: study conception and design, data analysis and interpretation, writing and critical review of the intellectual content of the manuscript. All authors approved the final version of the manuscript and declare that they are responsible for all aspects of the work, ensuring its accuracy and integrity.

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Conflict of interests

There is no conflict of interests.

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