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Epidemiological profile of congenital syphilis in the state of Mato Grosso do Sul, Brazil

Perfil epidemiológico da sífilis congênita no estado do Mato Grosso do Sul, Brasil

Perfil epidemiológico de la sífilis congénita en el estado de Mato Grosso do Sul, Brasil

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ABSTRACT

Introduction: When syphilis is not treated during pregnancy, it results in a considerable proportion of early fetal and neonatal deaths, with a high probability of vertical transmission, and when this occurs, Congenital Syphilis (CS) develops. **Aim:** To evaluate the epidemiological profile of SC in the state of Mato Grosso do Sul, from 2012 to 2021. **Design:** A cross-sectional, descriptive, retrospective, qualitative and quantitative study was carried out, limited to the years 2012 to 2021, with secondary data and the variables: child's age, final diagnosis, mother's age range, race, or color, having undergone prenatal care, time of diagnosis of maternal syphilis, maternal treatment regimen and deaths due to CS in children under one year of age. **Results:** 2,932 cases of CS were reported during the period. In the state, 88.1% of cases were in children less than 7 days old. 71.4% of mothers reported receiving prenatal care. Given the information about the mother's therapeutic regimen, 39.1% were inadequate, 28.8% did not receive treatment and in only 3.2% the treatment was adequate. **Implications:** The CS incidence rate in the State remained above the established national parameter, which is why it is necessary to invest more in epidemiological surveillance, as this is the first step to controlling the disease.

DESCRIPTORS

Pregnant Women; Sexually Transmitted Diseases; Maternal and Child Health; *Treponema pallidum*.

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INTRODUCTION

Syphilis is a sexually transmitted infection caused by a bacterium, *Treponema pallidum*. This disease, although it is easy to diagnose and has a simple and low-cost treatment, is still responsible for high mortality rates, which makes it a serious public health problem.¹

Syphilis affects approximately one million pregnant women annually and is the most common co-infection in pregnant women infected with the Acquired Immunodeficiency Virus. Furthermore, in 2016, the WHO released data with more than 600,000 cases of congenital syphilis in the world, being responsible for over 200,000 cases of neonatal deaths along with stillbirths, being the second leading cause of preventable fetal death throughout the world.²⁻⁴

Congenital syphilis has transplacental transmission, that is, it is transmitted to the fetus by the infected mother, who is untreated or inadequately treated, either through inappropriate medications or incorrect use of medications indicated for treatment.⁵

The rate of vertical transmission of syphilis to the fetus can reach 80%, being highest during the primary and secondary phases of maternal syphilis. This can result in fetal or neonatal death, and in approximately 30% to 50% of cases, in prematurity.⁶

For the fetus, this disease can cause serious damage, such as fetal death, miscarriage, stillbirth, low birth weight, prematurity and neurological, visual, auditory, motor and cognitive sequelae.⁷⁻⁸

Congenital syphilis is classified either as early congenital syphilis, when the clinical manifestations of the disease occur in the first two years of child's life; or late congenital syphilis, when manifestations occur after the second year of life.⁹

The most effective way to prevent congenital syphilis is early detection and the correct implementation and carrying out of treatment for the pregnant woman. When these points are reached, vertical transmission is interrupted, however, the

timely diagnosis of syphilis in pregnancy is still the main challenge for controlling congenital syphilis and its complications during and post-pregnancy.¹⁰⁻¹³

The increase in syphilis in pregnancy and congenital syphilis is still constant. In Brazil, the incidence rate of these conditions increased significantly between 2010 and 2018, with emphasis on congenital syphilis, which increased four times - from 2.4 to 9.0/1,000 Live Births (LB); and syphilis in pregnancy, which increased sixfold, from 3.5 to 21.4 cases/1,000 LB.⁶

Thus, congenital syphilis, even though it is easy to prevent, diagnose and treat, due to its increased incidence rate, represents a challenge to public health. Social inequalities and weaknesses in prenatal care and coverage are fundamental factors in increasing the occurrence of the disease, which is why congenital syphilis is recognized as an indicator of the quality of prenatal care.^{10,14}

In this sense, the analysis of reported cases of congenital syphilis favors knowledge of the regionality of the epidemic, as well as factors related to incidence, which can help managers make assertive decisions regarding the control and prevention of the disease. Therefore, the present research aimed to evaluate the epidemiological profile of congenital syphilis in the state of Mato Grosso do Sul, from 2012 to 2021.

METHOD

For this research, a cross-sectional, descriptive, retrospective, and qualitative study was carried out. The sample was limited to the years 2012 to 2021, searching for reported cases of congenital syphilis in the state of Mato Grosso do Sul, comprising all municipalities as units of analysis.

The information analyzed is secondary data collected from the Department of Chronic Conditions and Sexually Transmitted Infections (DCCI), of the Ministry of Health. The following variables were used for the study: child's age, final diagnosis, mother's age range, race or color, having undergone prenatal

care, time of diagnosis of maternal syphilis, maternal treatment regimen, whether the partner has received treatment for syphilis and deaths due to CS in children under one year of age.

The information obtained was tabulated in the version 4.2.2 of the software R and subjected to descriptive statistical analysis. The images were also processed and produced using the same software.

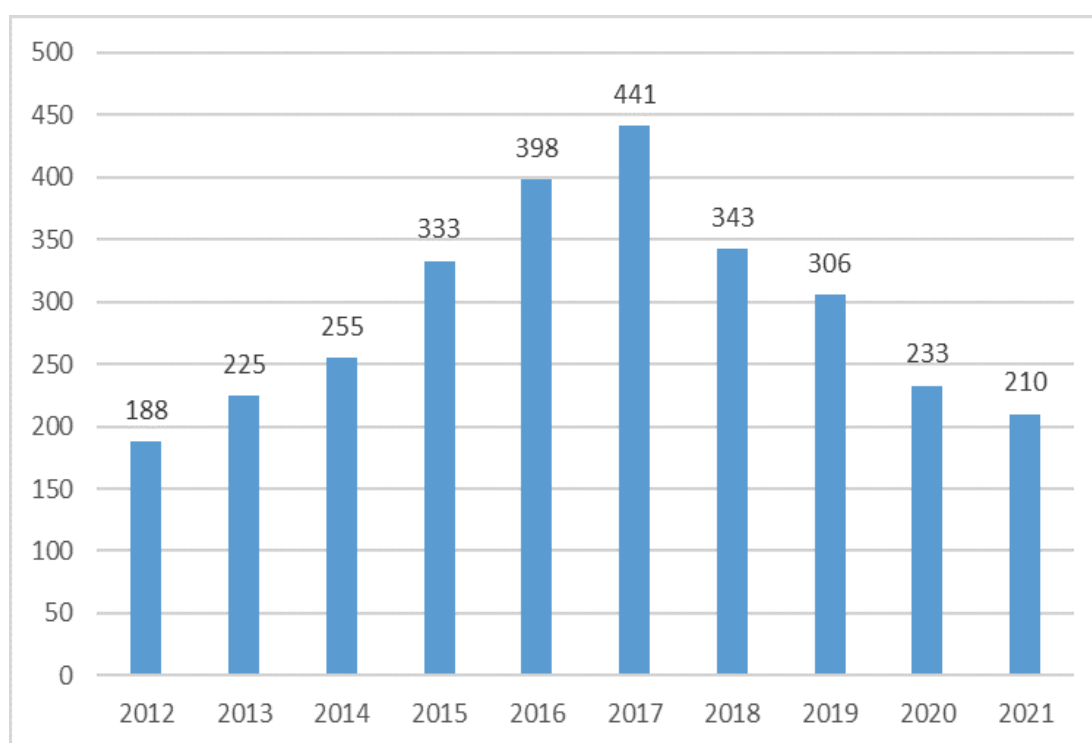
Because it used public data, the research was exempt from evaluation by the Research Ethics

Committee, in accordance with Resolution No. 510/2016 of the National Health Council (CNS).

RESULTS

During the period analyzed, 2,932 cases of congenital syphilis (CS) were reported in children under 1 year of age in the state of Mato Grosso do Sul. The annual distribution of cases is described in Figure 1.

Figure 1. Annual distribution of congenital syphilis cases in the state of Mato Grosso do Sul, 2012-2021

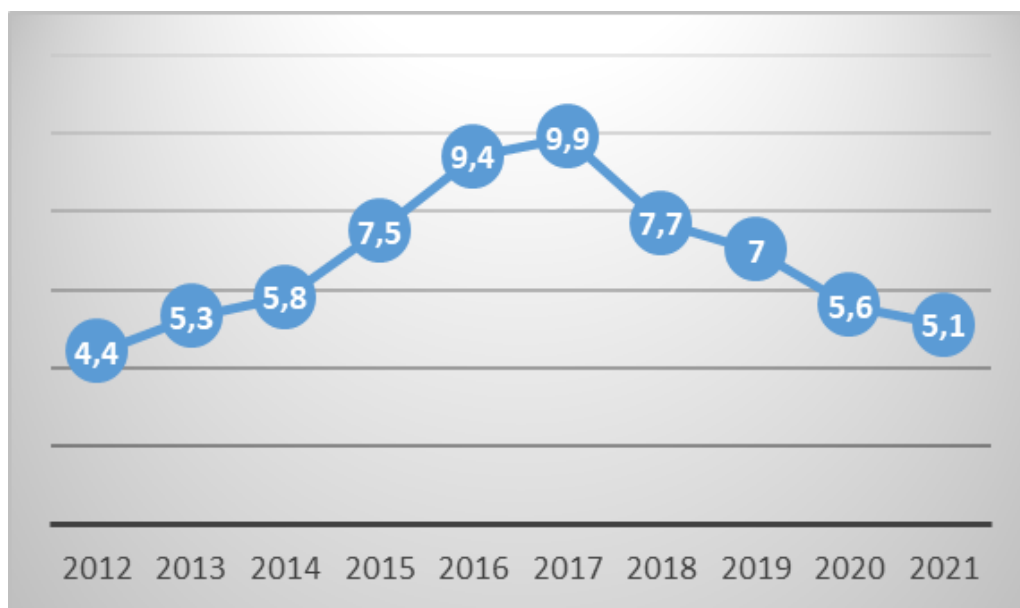


Source: Research data, 2023.

According to Figure 1, the number of reported cases increased from 2012 to 2017, concentrating the largest number of cases. From then on, there was a drop in subsequent years.

The incidence rate of the condition in the state of Mato Grosso do Sul during the study period is shown in Figure 2.

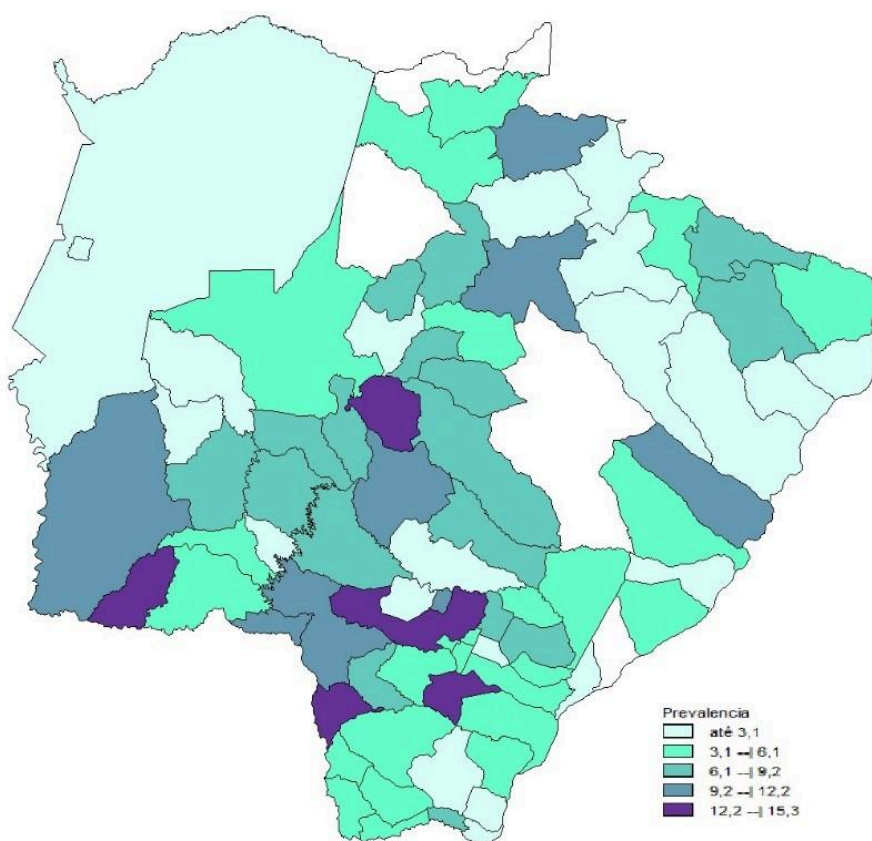
Figure 2. Incidence rate per 1000 live births, of the cases of congenital syphilis in children under 1 year of age in the state of Mato Grosso do Sul, 2012-2021



Source: Research data, 2023.

Regarding the prevalence of the disease in the municipalities, the results are shown in Figure 3.

Figure 3. Geographic distribution of the prevalence of CS cases in children under 1 year of age in the state of Mato Grosso do Sul from 2012 to 2021

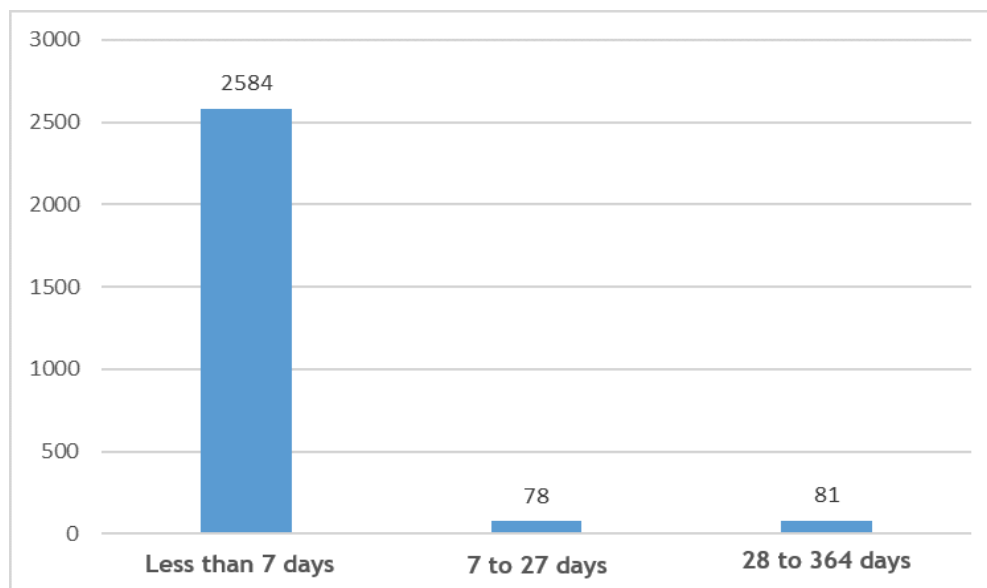


Source: Research data, 2023.

As to the municipalities with the highest prevalence of CS in children under 1 year of age in the state of Mato Grosso do Sul, Terenos, Dourados, Juti, Aral Moreira and Caracol stood out.

When analyzing the age of children affected by CS under 1 year of age, the results are expressed in Figure 4.

Figure 4. Age of the child affected by CS in children under 1 year of age in the state of Mato Grosso do Sul, 2012-2021



Source: Research data, 2023.

The state presented 94.3% of cases in children less than 7 days old, 2.7% between 7 and 27 days old and 3% between 28 and 364 days old.

As for late congenital syphilis, only eight cases were recorded, while there were 64 miscarriages due to syphilis and 114 stillbirths due to syphilis during the study period.

Regarding mother's age range, 50.5% occurred in women between 20 and 29 years old, 24.7% between 15 and 19 years old, 19% between 30 and 39 years old, 2% over 40 years old, 1% under 10 to 14 years old and 2.8% ignored age range.

Concerning mother's educational attainment, the following was observed: either complete or incomplete elementary/middle school (33.4%), complete/incomplete high school (22%) and ignored (32.1%).

As to race/color, Pardo (mixed race), with 58.8%, and Caucasian, with 24.7%, stood out.

71.4% of mothers of children with CS reported having received prenatal care, 12.8% did not receive prenatal care and 15.9% of cases had this data as "ignored".

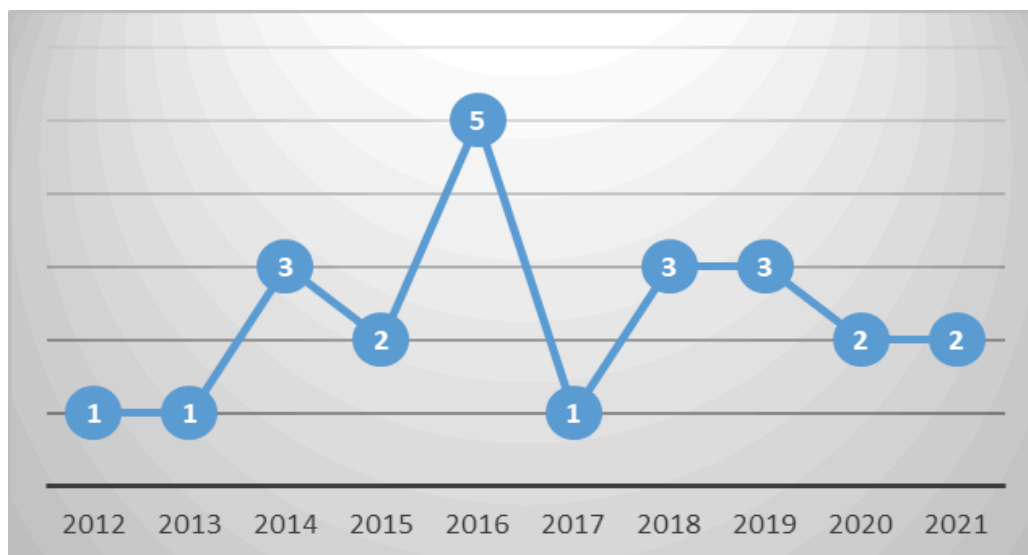
The moment of diagnosis was for 50.2% of pregnant women during prenatal care, 27.1% at the time of delivery/curettage, 9% after delivery, 0.5% not performed and 13.1% had this field of notification ignored.

Given the information about the mother's therapeutic regimen, 39.1% were inadequate, 28.8% did not receive treatment and in only 3.2% the treatment was adequate. The moment of diagnosis was for 50.2% of pregnant women during prenatal care, 27.1% at the time of delivery/curettage, 9% after delivery, 0.5% not performed and 13.1% had this field of notification ignored, which may harm the analysis of this data.

During the study period, 23 deaths occurred in children under 1 year of age due to CS in the state

of Mato Grosso do Sul. The annual distribution of these cases is described in Figure 5.

Figure 5. Annual distribution of CS deaths in children under 1 year of age in the state of Mato Grosso do Sul, 2012 to 2021



Source: Research data, 2023.

The year 2016 stood out for accounting for 21.7% of deaths, being the second year with the highest number of cases of the disease. The year 2017 stood out for being the year with the highest number of cases, but only one death occurred.

The CS fatality rate in the state of Mato Grosso do Sul was 0.78%, considered low, and the mortality rate was 5 per 100,000 live births.

DISCUSSION

When evaluating the incidence rate of the disease, it was noted that the year 2017 presented the majority of new cases, with 9.9 cases/1000 live births. The current incidence (year 2021) was 5.1. This data is similar to that found in the state of Minas Gerais (5.08), but it is higher than that recommended by the Ministry of Health, which determined the reduction to ≤ 0.5 cases/1,000 live births.¹⁵

Another important issue to highlight is that from 2012 to 2017 there was an increase in incidence, and this fact may be related to an effective increase in the number of cases or improvement in the collection of information due to the reduction of

underreporting, as well as improvement in epidemiological surveillance actions that guides to a better approach and identification of cases of the disease in the state.

Some municipalities stood out for having a higher prevalence of the disease and require immediate actions to control and prevent of the disease in order to reduce the number of cases.

The state presented the majority of cases in children less than 7 days old. It is emphasized that recent CS occurs when signs and symptoms appear in the first two years of life and may become evident between birth and the third month (commonly, in the first five weeks).

Research carried out in the state of Minas Gerais corroborates this, as 95.2% of cases were diagnosed as recent congenital syphilis; 0.1% as late congenital syphilis and 4.7% as stillbirth with syphilis.¹⁶ Just as studies carried out in Rio Grande do Norte, Southern Brazil and Maranhão observed a higher prevalence up to 7 days of life.¹⁷⁻¹⁹

Regarding the age of the mothers of children affected by GS, young adults (20 to 39 years old) and

teenage mothers (15 to 19 years old) stood out, as already reported in other researches.^{16,19} The brown race also stood out and this predominance may be related to the characterization of the population of Mato Grosso do Sul, which, for the most part, declares itself mixed race. Research carried out in Maranhão¹⁹ also reported a higher occurrence in brown mothers.

Low adherence to prenatal care was detected in this research. A study carried out in Minas Gerais¹⁶ reinforced that 82.2% of pregnant women underwent prenatal care and that they received a diagnosis of syphilis during prenatal care in 56.2% of cases, while 28.1% received it at the time of childbirth or curettage. In turn, in a study carried out in the state of Maranhão,¹⁹ 84.1% underwent prenatal care, and in relation to the moment of diagnosis, 47.2% occurred during prenatal care and 24.6% at the time of birth/curettage, with 15.7% diagnosed after birth and 10.6% had this notification field ignored.

The increase in the number of CS cases may be related to deficiencies in prenatal care, which causes failures in the treatment of positive pregnant women.²⁰

Negative perinatal outcomes can be reduced through prenatal care, as this practice makes it possible to monitor pregnancy, diagnose and treat possible clinical and obstetric complications, and carry out specific prophylaxis for certain conditions. Therefore, the importance of this practice for the prevention of CS is highlighted, as it allows for serological tests and timely treatment for positive mothers and their partners.²¹

Even with guidance from the Ministry of Health for the carrying out of the diagnostic tests, it is believed that the high incidence of the disease occurs due to the failure of performing the diagnosis and the refusal or non-attendance of the partner for treatment. Treatment of the partner is essential, because if only the woman is treated, she can become reinfected by an untreated sexual partner.²²

The Unified Health System (SUS) carries out screening tests on pregnant women in primary care and created the stork network, aiming to increase the detection rate of syphilis in pregnant women.²³

Information about the mother's therapeutic regimen revealed that few received correct treatment for syphilis. A study carried out in Minas Gerais demonstrated that regarding the treatment regimen of these mothers, only 3.6% performed it adequately, 41.2% inadequately and 25.9% did not perform it.¹⁶ Just like research carried out in Maranhão, in which in relation to treatment 67.8% performed it inappropriately, 12.92% did not perform it and only 3.68% performed it appropriately, the remainder (15.5%) had this field ignored.¹⁹ Failure to carry out the treatment, or carrying out treatment inappropriately can cause serious harm to the baby's health.

The state of Mato Grosso do Sul had a low number of deaths, especially in 2016, but 2017 had a higher number of notifications and only one death. This fact may be related to improved surveillance and early diagnosis of the disease, which allows for adequate and effective treatment.

The CS lethality rate was low, as was the mortality coefficient. A study carried out in Minas Gerais showed that 85.1% of the children were alive at the time of notification and 2.6% died from Congenital Syphilis.¹⁶ In Maranhão,¹⁹ 1.7% of children died from CS. In Brazil, the national mortality rate is 6.5 per 100,000 live births.³¹

Limitations

As this is a research in a public database from the Department of Chronic Diseases and Sexually Transmitted Infections (DCCI), of the Ministry of Health, the total number of cases may vary due to database updates. The data used for this research was consulted in July 2023.

CONCLUSION

The findings presented in the present study show that, within the period under analysis, the CS incidence rate in the state of Mato Grosso do Sul remained above the established national parameter. Some factors may be related to this, mainly the mother's treatment, of which only 3.2% were correct, in addition, failure to perform prenatal care, as 28.6% of pregnant women did not receive it.

For a change in the epidemiological picture of CS in the state to occur, mutual actions are necessary from primary care aimed at adequate prenatal care, associated with diagnosis and treatment of the couple when affected. These actions can be carried out through the *Estratégia de Saúde da Família* - ESF

(“health strategy of the family”) family health strategy, as it is the main form of contact with the population, mainly with the inclusion of community health agents actively searching for pregnant women.

Epidemiological surveillance also plays an important role in controlling CS cases, as it is through it that notifications are made, which makes it possible to carry out investigation and follow-up of cases, in addition to the establishment of early treatment for both the pregnant woman and her partner, as for the baby. Therefore, actions to strengthen surveillance of the disease must be instituted in search of more assertive actions that will promote the reduction of cases of the disease in the State.

RESUMO

Introdução: A sífilis quando não tratada durante a gestação, resulta em considerável proporção de mortes fetais e neonatais precoces, com alta probabilidade de transmissão vertical, e quando isso ocorre, instala-se a Sífilis Congênita (SC). **Objetivo:** Avaliar o perfil epidemiológico da SC no estado de Mato Grosso do Sul, dos anos de 2012 a 2021. **Métodos:** Foi realizado um estudo transversal, descritivo, retrospectivo e quali-quantitativo, delimitado aos anos de 2012 a 2021. **Métodos:** Foi realizado um estudo transversal, descritivo, retrospectivo e quali-quantitativo, delimitado aos anos de 2012 a 2021, com dados secundários sendo utilizadas as variáveis: idade da criança, diagnóstico final, faixa etária da mãe, raça ou cor, realização do pré-natal, momento do diagnóstico da sífilis materna, esquema de tratamento materno e óbitos de SC em menores de um ano. **Resultados:** Foram notificados no período 2.932 casos de SC. O estado apresentou 88,1% dos casos em crianças com menos de 7 dias de vida. Relataram realizar pré-natal, 71,4% das mães. Diante das informações sobre o esquema terapêutico da mãe, 39,1% foram inadequados, 28,8% não receberam tratamento e em apenas 3,2% o tratamento foi adequado. **Implicações:** A taxa de incidência da SC no Estado permaneceu acima do parâmetro nacional estabelecido, por isso faz-se necessário investir mais em vigilância epidemiológica, pois este é o primeiro passo para controlar o agravo.

DESCRITORES

Gestantes; Infecções Sexualmente Transmissíveis; Saúde Materno-infantil; *Treponema pallidum*.

RESUMEN

Introducción: Cuando la sífilis no es tratada durante el embarazo, resulta en una proporción considerable de muertes fetales y neonatales tempranas, con alta probabilidad de transmisión vertical, y cuando esto ocurre, se desarrolla Sífilis Congénita (SC). **Objetivo:** Evaluar el perfil epidemiológico del SC en el estado de Mato Grosso do Sul, de 2012 a 2021. **Delineación:** Se realizó un estudio transversal, descriptivo, retrospectivo y cuali-cuantitativo, limitado a los años de 2012 a 2021, utilizándose como datos secundarios las variables: edad del niño, diagnóstico final, grupo de edad de la madre, raza o color, atención prenatal, momento del diagnóstico de sífilis materna, régimen de tratamiento materno y muertes por CS en niños menores de un año. **Resultados:** Se notificaron 2.932 casos de SC durante el período. El estado presentó el 88.1% de los casos en niños menores de 7 días. El 71,4% de las madres refirió haber recibido atención prenatal. Dada la información sobre el régimen terapéutico de la madre, el 39,1% fue inadecuado, el 28,8% no recibió tratamiento y sólo en el 3,2% el tratamiento fue adecuado. **Implicaciones:** La tasa de incidencia de SC en el Estado se mantuvo por encima del parámetro nacional establecido, por lo que es necesario invertir más en vigilancia epidemiológica, ya que este es el primer paso para el control de la enfermedad.

DESCRIPTORES

Mujeres Embarazadas; Enfermedades de Transmisión Sexual; Salud Materno-Infantil; *Treponema pallidum*.

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COLLABORATIONS

GCSJ: theme selection, data collection and processing, paper writing. MMC: data collection and processing, paper writing. AS: data collection and processing, paperwriting, approval of the final paper. KFB: writing of the paper, approval of the final paper. LDCA: writing of the paper, approval of the final paper. DFRF: theme selection, data collection and processing, paper writing, approval of the final paper. All authors agree and are responsible for the content of this version of the manuscript to be published.

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There are no conflicts of interest to declare.