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EPIDEMIOLOGICAL PROFILE OF WOMEN DIAGNOSED WITH SYPHILIS IN THE MUNICIPALITY OF BURITIS-RO IN THE PERIOD FROM 2008 TO 2018

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ABSTRACT

The objective of this study was to analyze the epidemiological profile of syphilis in women in the municipality of Buritis - RO, in the period between 2008 and 2018. The research was based on an epidemiological study, where cases of acquired syphilis, syphilis in pregnant women and congenital syphilis were characterized according to biological, socioeconomic and health service utilization variables. The average incidence rate (2008-2018) of acquired and pregnant syphilis was used, with indicators related to quality, age group, sex, color or race, education, clinical characterization, diagnosis and treatment as well as other important points for the epidemiological profile. Thus, as a large part of the cases reported in the municipality of Buritis, state of Rondônia, adequate treatment of infected patients should be focused on reducing the risks of this disease. Forty-eight women were diagnosed with acquired syphilis, 25 women with syphilis during pregnancy and 02 women with congenital syphilis, aged between 20 and 34 years, of mixed race, with education from 5th to 8th grade of elementary school. When diagnosed, they were treated with penicillin. According to the results, it opens perspectives for new studies using predictive approaches on databases related to congenital syphilis and its social determinants, through the adoption of data science techniques applied to health.

Keywords: Syphilis. Pregnant woman. Epidemiology. *Treponema pallidum*.

INTRODUCTION

Syphilis is considered a systemic, sexually transmitted infection, exclusive to humans, known since the 15th century. Its etiological agent is the spirochete bacterium *Treponema pallidum* and it can be acquired through contact sexual, this being the main route of transmission of the disease, going vertically to the fetus during the gestation period of a mother with untreated or inadequately treated syphilis or it can even occur through blood transfusion (COOPER et al., 2016; DOMINGUES; LEAL, 2016).

Furthermore, syphilis is an infectious disease, which can present itself in an acute or chronic form.

For the purpose of compulsory notification, this disease was classified by the Ministry of Health (MS) as: acquired syphilis, congenital syphilis and gestational syphilis, with congenital syphilis being of great importance to public health due to the high frequency with which serious outcomes are produced for pregnancy and the child. In order to prevent complications, it is necessary to screen acquired and/or gestational syphilis early and treat it appropriately.

Official reports from the World Health Organization (WHO) indicate that approximately 12 million new cases occur annually in the adult population worldwide, most of them in developing countries. In Brazil, it is estimated that the average prevalence of acquired syphilis in parturients varies between 1.4% and 2.8%, with a vertical transmission rate of approximately 25% (HOLANDA et al., 2011).

In the last decade, in Brazil, there has been an increase in notifications of cases of acquired syphilis, syphilis in pregnant women and congenital syphilis, which can be attributed, in part, to the improvement of the surveillance system and the expansion of the use of rapid tests. It is expected that the information that can be contained and supported regarding effective actions to reduce syphilis in the country and in the states, such as in the state of Rondônia, and, based on reflection on the data presented, there may be an intervention to reduce the distance between health surveillance actions and the field of practice of Primary Care and maternity hospitals.

Syphilis and its etiological agent

When the etiological agent is seen, the discovery must first be discussed. This was discovered in 1905 by

Fritz Richard Schaudinn and Paul Erich Hoffmann in Germany and in 1907. Historically, it is seen that Wassermann, at the time, developed the first serological test that effectively detected syphilis. (DOMINGUES; LEAL, 2016; ZUGAIB, 2012).

Then, penicillin was discovered in the 1940s, which led to a drop in the incidence of the disease, with dramatic rates resurfacing again in the late 1980s and early 1990s, which were caused by HIV/AIDS co-infection and drug abuse. More than 80% of women with syphilis are of reproductive age and at risk of vertical transmission of the disease (DOMINGUES; LEAL, 2016; ZUGAIB, 2012; MAGALHÃES, 2011; KOLBE, 2010).

In 2005, the Ministry of Health included syphilis in pregnant women in the list of diseases subject to compulsory notification, in the experiment regarding the control of vertical transmission and monitoring of the infection process, which involves planning and evaluation of treatment, prevention and control measures (FIGUEIRÓ FILHO et al., 2012; BRASIL, 2010; GUINSBURG; SANTOS, 2010; KOLBE, 2010). The World Health Organization (WHO) estimates that, globally, approximately 1.5 to 1.85 million pregnant women are infected with syphilis annually, and half of them have children with adverse outcomes (GOMEZ et al., 2013).

In 2010, together with the WHO, the Member Nations of the Pan American Health Organization (PAHO) approved the emergence of the Strategy and Plan of Action for the Elimination of Mother-to-Child Transmission of HIV and Congenital Syphilis, with the aim of reducing the incidence of this congenital disease to ≤ 0.5 cases per 1,000 live births in 2015 (COOPER et al., 2016; CAMPOS et al., 2010; PAN-AMERICAN HEALTH ORGANIZATION, 2010).

According to PAHO, in 2014, 17,400 cases (1.3/1,000 live births) of congenital syphilis were reported in the Americas, and 17 nations may have eliminated mother-to-child transmission of this disease (DOMINGUES; LEAL, 2016; BRAZIL, 2010; PAN-AMERICAN HEALTH ORGANIZATION, 2010). *Treponema* penetration occurs through small abrasions resulting from sexual intercourse. Soon after, *treponema* reaches the regional lymphatic system and, through hematogenous dissemination, other parts of the body. The local defense response results in erosion and ulceration at the inoculation site, while systemic dissemination results in the production of

circulating immune complexes that can be deposited in any organ. However, humoral immunity is not able to provide protection. Cellular immunity occurs later, allowing *T. pallidum* multiply and survive for long periods (AVELLEIRA, BOTTINO, 2006).

Acquired syphilis

Treponema pallidum is a gram-negative bacterium of the spirochete group, and is highly pathogenic. The genus has four pathogenic species, but syphilis is endemic, being attributed to the variant *T. pallidum* endemicum. This bacterium is about 10 micrometers long, is not cultivable in vitro, is extremely fragile and sensitive to temperature and humidity, and has the urogenital mucosa as its preferred habitat (SANTOS, TERRA, 2019).

The disease has different forms of transmission, and the most common is sexual transmission, called Acquired Syphilis. Its incubation period is 10 to 90 days, with an average of 21 days, from the infectious sexual contact. It manifests itself in three clinical stages (SANTOS, TERRA, 2019).

Syphilis is a disease transmitted sexually (acquired syphilis) and vertically (congenital syphilis) through the placenta from mother to fetus. Contact with contagious lesions (hard chancre and secondary lesions) on the genitals has been responsible for 95% of cases of the disease.

Between 2016 and 2017, it was found that Brazil and its regions showed growth in their detection rates. In the country, the increase was 31.8% (from 44.1 to 58.1 cases per 100,000 inhabitants) (BRASIL, 2019a).

Congenital syphilis is the result of hematogenous dissemination of *Treponema pallidum* from an untreated or inadequately treated infected pregnant woman to her fetus via the transplacental route.

Its diagnosis takes several years, through VDRL, which is a simple test and even affordable to pay. Possibly the late start of prenatal care is associated with the delay in returning the results, suggesting that pregnant women cannot receive the VDRL result during prenatal care. It is known that the process of implementing the rapid test for syphilis is a recent tool in the diagnosis of the pathology, and for this reason it has not yet reached all health units, with VDRL still being the most widely used test in the public health network. (BRASIL, 2015).

Syphilis in pregnancy

In 2005, the Ministry of Health (MS) included syphilis in pregnant women in the list of diseases requiring compulsory notification, in an attempt to control vertical transmission and adequately monitor the infection process, thus being able to plan and evaluate treatment, prevention and control measures (FIGUEIRÓ FILHO et al., 2012; BRASIL, 2010; GUINSBURG; SANTOS, 2010; KOLBE, 2010).

The World Health Organization (WHO) estimates that, globally, approximately 1.5 to 1.85 million pregnant women are infected with syphilis annually, and half of them have children with adverse outcomes (GOMEZ et al., 2013).

No ano de 2010, juntamente à OMS, as Nações Membros da Organização Pan-Americana da Saúde (OPAS) aprovaram o surgimento da Estratégia e Plano de Ação para a Eliminação da Transmissão Materno-Infantil do HIV e da Sífilis Congênita, objetivando reduzir a incidência dessa enfermidade congênita para o quantitativo de $\leq 0,5$ casos para 1.000 nascidos vivos em 2015 (COOPER et al., 2016; CAMPOS et al., 2010; PAN AMERICAN HEALTH ORGANIZATION, 2010).

According to PAHO, in 2014, 17,400 cases (1.3/1,000 live births) of congenital syphilis were reported in the Americas, and 17 nations may have eliminated mother-to-child transmission of this disease (DOMINGUES; LEAL, 2016; BRAZIL, 2010; PAN-AMERICAN HEALTH ORGANIZATION, 2010).

The fetus can be infected transplacentally at any stage of pregnancy or through the vaginal canal during delivery. The Ministry of Health recommends performing a VDRL serological test at the beginning of prenatal care (and in case of a positive result, treatment should be started for the pregnant woman and her partner) and another in the third trimester, around the 28th week, in addition to screening for syphilis at delivery or during abortion (BRASIL, 2015b; MINISTRY OF HEALTH, 2006; MILANEZ, AMARAL, 008; SILVA, 2016).

Transmission

Vertical transmission of *T. pallidum* can occur at any gestational stage or clinical stage of maternal disease. The main factors that determine the likelihood of vertical transmission of *T. pallidum* are the stage of

syphilis in the mother and the duration of exposure of the fetus in utero.

The infection rate of vertical transmission of *T. pallidum* in women is not treated is 70 to 100%, in the primary and secondary phases of the disease, reducing to approximately 30% in the late phases of maternal infection (late latent and tertiary).

The main factors that determine the probability of transmission are the stage of syphilis in the mother and the duration of exposure of the fetus in the womb. Therefore, transmission will be greater in the early stages of the disease, when there are more spirochetes in circulation (AVELLEIRA, BOTTINO, 2006).

Syphilis transmission to the baby can occur from the 9th week of pregnancy, although it is often between the 16th and 28th weeks, which may reinforce the need for early diagnosis and treatment. It is seen that in the treatment, the clinical stage of the infection is unclear or, in this case, it has no longer been possible to know the history of previous adequate treatment of the pregnant woman, thus considering tertiary or late latent syphilis. It is essential to monitor the cure in order to evaluate the treatment, thus controlling possible reinfections, especially when the partner does not show up for treatment (BRASIL, 2015b).

The problems that weaken the prevention of Congenital Syphilis are closely related to prenatal care and are: failure to perform and delay in delivering tests; abandonment of prenatal care; lack of identification and rescue of absent pregnant women; difficulty in managing the infection by professionals; difficulty in identifying and treating the partner; lack of follow-up of mothers and children after birth; in addition to the presence of incomplete data in medical records and epidemiological forms (MAGALHÃES et al ., 2013; CAMPOS et al ., 2010; SARACENI et al ., 2012; LIMA et al ., 2013).

According to the Epidemiological Surveillance Services of São Paulo (2008), the treatment of syphilis during pregnancy is the same as that carried out for acquired syphilis in accordance with the stage of the disease: primary syphilis (with hard chancre): benzathine penicillin 2,400,000 IU intramuscularly (1.2 million in each buttock in the same application)

Epidemiology of syphilis in pregnancy

Epidemiological surveillance of syphilis during pregnancy aims to control the vertical transmission of *Treponema pallidum* , adequately monitoring the behavior of the infection in pregnant women, planning and evaluating treatment, prevention and control measures. It is considered that the case of syphilis during pregnancy can be clinically evidenced by the disease and/or non-reactive treponemal serology, with any titration, even if the absence results in the treponemal test, which is performed prenatally or at the time of delivery or curettage (BRASIL, 2006a).

From 2005 to June 2017, 200,253 cases of syphilis in pregnant women were reported in SINAN, of which 44.2% were cases residing in the Southeast Region, 20.7% in the Northeast, 14.6% in the South, 11.1% in the North and 9.4% in the Central-West. In 2016, the total number of cases reported in Brazil was 37,436, of which 17,551 (46.9%) cases were residents of the Southeast Region, 6,571 (17.5%) in the Northeast Region, 6,608 (17.7%) in the South Region, 3,890 (10.4%) in the North Region and 2,816 (7.5%) in the Central-West Region (BRAZIL, 2017).

All states in the Northeast Region had rates below the national average; in addition to these, the states of Mato Grosso, Goiás, Distrito Federal, Minas Gerais, Amapá, Tocantins, Roraima and Rondônia had rates below the average.

When comparing the rates in 2011 and 2016, it can be seen that the only two states that showed a decrease, albeit slight, were Paraíba and Sergipe. The states of Amazonas and Rio Grande do Sul stand out, with the highest proportions of increase in their rates, as shown in Figure 1:

Figure 1 - Syphilis detection rate in pregnant women (per 1,000 live births) according to Federation Unit of residence by year of diagnosis. Brazil, 2011-2016.



Regarding the capitals, Rio de Janeiro, Vitória and Rio Branco were the capitals that presented the highest rates of syphilis detection in pregnant women in 2016, with values of 34.2, 33.7 and 32.4 cases per thousand live births, respectively. Other capitals that also presented high rates in 2016 were Manaus, Salvador, Florianópolis, Porto Alegre and Campo Grande, all with rates above 20 cases per thousand live births.

Regarding treatment, in 2016, 88.9% of prescriptions were for benzathine penicillin (at least one dose) and 2.1% were for other regimens. In 4.7% of cases, there was no prescription, and in 4.2% there was no information (unknown). The proportions of penicillin prescriptions in the stratification by UF ranged from 96.1% in Sergipe to 70.5% in Maranhão (BRASIL, 2017).

According to the Coordination of the State Program IST/Aids-SP (2008), when it comes to syphilis in pregnant women, it is considered that the inclusion of syphilis in pregnancy as a sexually transmitted infection with compulsory notification has justified the increase in the prevalence rate and high rate of vertical transmission, which varies from 30 to 100% without treatment or with inadequate treatment.

It is seen that in the period from 2005 to June 2018, they were notified in SINAN 259,087 cases of syphilis in pregnant women, of which 45.1% were cases residing in the Southeast Region, 20.5% in the Northeast Region, 14.7% in the South Region, 10.5% in the North Region and 9.1% in the Central-West Region. In 2017, the total number of cases reported in Brazil was 49,013 (28.4% more cases than in the previous year), of which 23,470 (47.9%) cases were residents of the Southeast Region, 9,084 (18.5%) in the Northeast Region, 7,864 (16%) in the South Region, 4,675 (10.5%) in the North Region and 3,920 (8%) in the Central-West Region. From 2016 to 2017, the number of notifications increased in all regions, with emphasis on increases of 38% and 36% in the Northeast and Central-West regions (BRASIL, 2019a).

This increase can be attributed, in part, to the change in the criteria for defining cases, which began to consider notification, in addition to prenatal care, at delivery and postpartum care as of October 2017. In 2017, in Brazil, a detection rate of 17.2 cases of syphilis in pregnant women/1,000 live births was observed (28.4% higher than the rate observed in

the previous year). The national detection rate was surpassed by the Southeast (20.8/1,000 live births) and South (20.1/1,000 live births) regions (BRASIL, 2019a).

METHODOLOGY

The present study brought epidemiological data from the municipality of Buritis, in Rondônia, Brazil, relating women who were diagnosed with acquired and pregnant syphilis between 2008 and 2018, and were registered in the SINAN system.

This is an epidemiological, documentary, cross-sectional, descriptive study with a quantitative approach, which will epidemiologically evaluate the frequency of cases registered in SINAN of syphilis acquired in women and gestational syphilis, in the Municipality of Buritis - RO, in the historical period formed by the years "2008 to 2018".

Data were sought in the SINAN and DATASUS systems only for those registered with information about the disease.

The municipality of Buritis, located in the state of Rondônia in the country of Brazil. Its population estimated by the 2010 Census is 32,383 inhabitants. Buritis is located 92 km southwest of Ariquemes, the largest city in the surrounding area. Situated at an altitude of 158 meters, Buritis has the following geographic coordinates: Latitude: 10° 12' 45" South, Longitude: 63° 49' 46" West.

PRESENTATION AND ANALYSIS OF RESULTS

The results below were created in tables according to the collection of registered data, including cases and detection rate of pregnant women with syphilis/1000 live births; syphilis in pregnant women by age group, percentage by age group with syphilis in pregnant women, education, percentage by education, race or color, percentage by race and color, clinical classification, percentage by clinical classification as well as results of congenital syphilis.

To verify the incidence of acquired, congenital and gestational syphilis in the Municipality of Buritis - RO in the proposed period.

The incidence of acquired, congenital and gestational

syphilis was worked on in the Municipality of Buritis - RO in the period proposed above, identifying the main obstacles and critics in relation to the diagnosis, treatment and increase in the number of cases of syphilis in the proposed period, so that soon after, it can be contributed to the reduction in the number of cases of acquired syphilis, syphilis in pregnant women and congenital syphilis in the Municipality of Buritis - RO.

Table 1 - Reported cases of acquired syphilis by municipality of residence from 2008 to 2018 in the municipality of Buritis - RO.

Reported cases of acquired syphilis by municipality of residence and year of notification. Rondônia 2008 to 2018												
Municipality of Residence	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Buritis	0	0	0	0	0	2	1	15	14	19	40	124

Source: Datasus (2019)

Regarding the reported cases of acquired syphilis in the municipality of Buritis between 2008 and 2018, it was found that only the years 2013 to 2018 had occurrences. Of 124 reported cases, there were 02 cases in 2013, 01 case in 2014, 15 cases in 2015, 14 cases in 2016, 19 cases in 2017 and twice as many increase in 2018, with 40 cases.

It was noted that the year 2018 had the highest rate of sexually transmitted infection (STI) due to this disease.

Table 2- Table of acquired syphilis in women from 2008 to 2018 in the municipality of Buritis RO.

Table of acquired syphilis in women in the municipality of Buritis, from 2008 to 2018												
Age Range	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Buritis	2	3	3	3		6	8	10		13		48

Source: Datasus (2019)

According to table 2, regarding syphilis acquired in women in the municipality of Buritis, it is seen that there were 48 cases between the years 2008 to 2018, with an increase between these years, with the highest rate in 2017, with 13 cases.

Table 3- Syphilis table in pregnant women in the period from 2008 to 2018 in the municipality of Buritis - RO.

Syphilis table in pregnant women in the municipality of Buritis, from 2008 to 2018												
Municipality of Residence	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Buritis	0	0	1	0	0	1	2	3	7	11	0	25

Regarding cases and detection rate of pregnant women with syphilis, there were 25 cases between 2008 and 2018, however, there was only 01 case in 2010 and 2013, 02 cases in 2014, 03 cases in 2015, 07 cases in 2016 and 11 cases in 2017.

Table 4 - Table of congenital syphilis from 2008 to 2018 in the municipality of Buritis - RO .

Syphilis table in pregnant women in the municipality of Buritis, from 2008 to 2018												
Age Range	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Buritis	0	0	0	0	0	0	0	1	0	1	0	2

Source: Datasus (2019)

Regarding congenital syphilis in Buritis, it was found that there were only 02 cases, in the years 2015 and 2017.

To describe the epidemiological profile of women who were diagnosed with acquired syphilis and syphilis in pregnant women in the proposed period and location. Below, the epidemiological profile of women who were diagnosed with acquired and pregnant syphilis in the municipality of Buritis-RO was described.

Table 5 - Acquired Syphilis, by sex, from 2008 to 2018 in the municipality of Buritis - RO.

Sex - Acquired Syphilis 2008 to 2018				
Municipality of Residence	Ignored	Masculine	Feminine	Total
Buritis	0	76	48	124

Source: Datasus (2019)

Regarding gender, there were 124 people who had acquired syphilis, 76 males and 48 females. It is clear that the number of infected men is higher.

Table 6 - Acquired syphilis, in women by age group, from 2008 to 2018 in the municipality of Buritis - RO

Age Range - Acquired Syphilis in Women 2008 - 2018								
Municipality of Residence	10-14	15-19	20-34	35-49	50-64	65-79	80 and+	Total
Buritis	2	5	20	12	5	4	0	48

Source: Datasus (2019)

Regarding the age range of women between 2008 and

2018, there were 48 cases, aged between 10 and over 80 years. Between 10 and 14 years old, there were 2 cases of acquired syphilis; between 15 and 19 years old, there were 5 cases; between 20 and 34 years old, there were 20 cases; between 35 and 49 years old, there were 12 cases; between 50 and 64 years old, there were 5 cases; between 65 and 79 years old, there were 4 cases and, among those over 80 years old, there was only one case. It was noted that the age group most affected by this acquired syphilis infection was between 20 and 34 years old.

Table 7 - Acquired syphilis, in women, according to education level, from 2008 to 2018 in the municipality of Buritis - RO .

Schooling of acquired syphilis 2008 – 2018 in women												
Education and	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Illiterate	0	0	0	0	0	0	0	0	0	0	0	0
1st to 4th incomplete series	0	0	0	0	0	0	0	0	0	1	0	1
4th series complete	0	0	2	3	1	0	4	0	1	0	0	11
5th to 8th grade incomplete	0	0	0	5	2	1	3	1	1	2	0	15
Complete elementary	0	0	0	0	0	0	0	0	1	1	0	2
Incomplete medium	0	0	0	0	0	2	0	2	0	2	0	6
Complete medium	0	0	0	0	0	0	1	0	1	2	0	4
Incomplete higher education	0	0	0	0	0	0	0	0	0	0	0	0
Completed higher education	0	0	0	0	0	0	0	0	0	0	0	0
Not applicable	0	0	0	0	0	0	0	0	0	0	0	0
Ignored	0	0	1	0	0	0	2	0	3	3	0	9
TOTAL												48

Source: Datasus (2019)

According to the education level of acquired syphilis in women, it was noted that the highest incidence was in education between 5th grade and incomplete 8th grade in the years 2011, 2014 and 2017, with 15 cases. Next comes the 4th complete series between the years 2010, 2011, 2014, totaling 11 cases.

Table 8 - Acquired syphilis, in women, according to race/color, in the period from 2008 to 2018 in the municipality from Buritis - RO.

Race acquired syphilis 2008 to 2018							
Municipality	Ign/White	White	Black	Yellow	Brown	Indigenou s	Total
Buritis	6	15	3	1	23	0	48

Source: Datasus (2019)

According to race, there were 48 cases of women who acquired acquired syphilis, 6 of which were ignored, 15 were white, 3 were black, 1 was yellow, 23 were brown, with the latter color prevailing.

Table 9 - Syphilis in pregnant women, according to age group, from 2008 to 2018 in the municipality of Buritis- RO.

Syphilis in pregnant women by age group between 2008 and 2018												
Age range	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
10-14	0	0	1	0	0	0	0	0	1	0	0	1
15-19	0	0	1	0	0	0	1	1	1	7	0	11
20-29	0	0	0	0	0	1	2	4	2	0	0	10
30-39	0	0	0	0	0	0	0	0	1	1	0	2
40 or more	0	0	0	0	0	0	0	0	0	1	0	1
Ignored	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL												25

Source: Datasus (2019)

According to age group, there were 25 cases of syphilis in pregnant women, with 11 cases between 10 and 14 years old, with 1 occurrence in 2010 and 2016. between 15 and 19 years old; 01 occurrence in 2010, 2014 and 2015; 07 occurrences in 2017.

In the age group of 20 to 29 years, there were 10 cases, with 01 occurrence between the years 2013 and 2014; 02 occurrences between the year 2015, 04 occurrences in 2016, 02 occurrences in 2017.

In the age group between 30 and 39 years, there were 2 cases between 2016 and 2017. In the age group between 40 years and older, there was only 01 case in 2017.

Table 10 - Syphilis in pregnant women, according to education level, from 2008 to 2018 in the municipality of Buritis

Education - syphilis in pregnant women												
Education	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Illiterate	0	0	0	0	0	0	0	0	0	0	0	0
1st to 4th grade incomplete	0	0	0	0	0	0	0	0	0	1	0	1
4th series complete	0	0	0	0	0	0	0	0	1	0	0	1
5th to 8th grade incomplete	0	0	0	0	0	1	0	1	1	2	0	5
Complete elementary	0	0	0	0	0	0	0	0	1	1	0	2
Average incomplete	0	0	0	0	0	0	0	2	0	2	0	4
Complete medium	0	0	0	0	0	0	0	0	1	2	0	3
Incomplete higher education	0	0	0	0	0	0	0	0	0	0	0	0
Completed higher education	0	0	0	0	0	0	0	0	0	0	0	0
Not applicable	0	0	0	0	0	0	0	0	0	0	0	0
Ignored	0	0	1	0	0	0	2	0	3	3	0	9
TOTAL												25

Source: Datasus (2019)

According to the level of education, there were 25 cases of syphilis in pregnant women. There was 1 case in 2017, in a pregnant woman who was in the 1st to 4th grade. There was 1 case in 2016, in the 4th grade. There was 1 case in 2013, 2015 and 2016 in the 5th to 8th grade and also 2 cases in this level of education in 2017.

There was 01 case in 2016 and 2017 in complete elementary school. There were 02 cases in 2015 and 2017 in incomplete high school. There was 01 case in 2016 in complete high school and also 02 cases in this schooling level in 2017. A total of 9 cases were ignored between the years 2010, 2014, 2016 and 2017.

Table 11 - Syphilis in pregnant women, according to race/color, from 2008 to 2018 in the municipality of Buritis - RO.

Race or color - syphilis in pregnant women												
Race	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
White	0	0	1	0	0	1	0	1	1	2	0	6
Black	0	0	0	0	0	0	0	0	0	1	0	1
Yellow	0	0	0	0	0	0	0	0	0	0	0	0
Brown	0	0	0	0	0	0	0	2	4	7	0	13
Indigenous	0	0	0	0	0	0	0	0	0	0	0	0
Ignored	0	0	0	0	0	0	2	0	2	1	0	5
TOTAL												25

Source: Datasus (2019)

Regarding race or color in syphilis in pregnant women, 25 cases were found in total, with 01 case in white women between the years 2010, 2013, 2015 and 2016, as well as 02 cases in the year 2017. In black women there was only 01 case in 2017. In brown women there were 02 cases in 2015, 04 cases in 2016 and 07 cases in 2017. of those ignored, there were 02 cases in 2014 and 2016 and 01 case in 2017.

Table 12 - Syphilis in pregnant women, according to clinical classification, from 2008 to 2018 in the municipality of Buritis - RO.

Clinical classification - syphilis in pregnant women												
Classification	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Primary syphilis	0	0	1	0	0	0	2	0	3	2	0	8
Secondary syphilis	0	0	0	0	0	0	0	0	0	6	0	6
Tertiary syphilis	0	0	0	0	0	0	0	1	2	1	0	4
Latent syphilis	0	0	0	0	0	0	0	0	0	0	0	0
Ignored	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL												18

Source: Datasus (2019)

According to the clinical classification of syphilis in pregnant women, it was found that there were a total of 18 cases classified as primary, secondary, tertiary and latent syphilis. Between the years, it was found that in 2010 there was 01 case of primary syphilis, 02 cases in 2014 and 2017 and also, 3 cases in 2016. In the year 2017, there were 06 cases of secondary syphilis. In the years 2015 and 2017 there was 01 case of tertiary syphilis and 02 cases in 2016.

According to the epidemiological data collected, it was found that there is no clinical classification of

tertiary and latent syphilis.

Table 13 - Congenital syphilis, according to age group, from 2008 to 2018 in the municipality of Buritis - RO

Congenital syphilis by age group												
Age range	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
10-14	0	0	0	0	0	0	0	0	0	0	0	0
15-19	0	0	0	0	0	0	0	0	0	1	0	1
20-29	0	0	0	0	0	0	0	1	0	0	0	1
30-39	0	0	0	0	0	0	0	0	0	0	0	0
40 or more	0	0	0	0	0	0	0	0	0	0	0	0
Ignored	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL												2

Source: Datasus (2019)

According to table 10, regarding the age range of congenital syphilis, it was found that there were only 02 cases in total, between the ages of 15 to 19 years with 01 case in 2017 and from 20 to 29 years also with one case in 2015.

Table 14 - Congenital syphilis, according to education, from 2008 to 2018 in the municipality of Buritis - RO.

Education - congenital syphilis												
Education	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Illiterate	0	0	0	0	0	0	0	0	0	0	0	0
1st to 4th grade incomplete	0	0	0	0	0	0	0	0	0	0	0	0
4th series complete	0	0	0	0	0	0	0	0	0	0	0	0
5th to 8th grade incomplete	0	0	0	0	0	0	0	1	0	0	0	1
Complete elementary	0	0	0	0	0	0	0	0	0	1	0	1
Incomplete medium	0	0	0	0	0	0	0	0	0	0	0	0
Complete medium	0	0	0	0	0	0	0	0	0	0	0	0
Incomplete higher education	0	0	0	0	0	0	0	0	0	0	0	0
Completed higher education	0	0	0	0	0	0	0	0	0	0	0	0
Not applicable	0	0	0	0	0	0	0	0	0	0	0	0
Ignored	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL												2

Source: Datasus (2019)

According to education, there were also only 2 cases of congenital syphilis. In 2015, there was one case in the 5th to 8th grade incomplete schooling and in 2017, there was one case in the elementary school completed.

Table 15 - Congenital syphilis, according to race/color, in the period from 2008 to 2018 in the municipality of Buritis - RO.

Race or color – congenital syphilis												
Race or color	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
White	0	0	0	0	0	0	0	0	0	0	0	0
Black	0	0	0	0	0	0	0	0	0	0	0	0
Yellow	0	0	0	0	0	0	0	0	0	0	0	0
Brown	0	0	0	0	0	0	0	1	0	1	0	2
Indigenous	0	0	0	0	0	0	0	0	0	0	0	0
Ignored	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL												2

Source: Datasus (2019)

According to the race or color of congenital syphilis, there were only 02 cases, whose infections occurred in brown people between the years 2015 and 2017.

Identify the main obstacles and criteria regarding the diagnosis, treatment and increase in the number of syphilis cases in the proposed period .

Below, the main obstacles and criteria regarding the diagnosis and increase in the number of syphilis cases among women in the municipality of Buritis-RO were identified.

Table 16- Cases and detection rate (per 1,000 live births) of pregnant women with syphilis by year of diagnosis in the period from 2008 to 2018 in the municipality of Buritis - RO.

Detection of pregnant women with syphilis by diagnosis												
Syphilis in Pregnant Women Cases	Total	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
	25	0	0	1	0	0	1	2	3	7	11	0
Detection rate	-	0	0	1.5	0	0	1.7	3.2	4.9	11.5	18.1	-

Source: Datasus (2019)

According to the cases and detection rate of pregnant women with syphilis, it was noted that there were 25 cases in total, with 01 case in 2010, 01 case in 2013, 02 cases in 2014, 3 cases in 2015, 7 cases in 2016 and 11 cases in 2017, with 2017 being the highest year of all.

Table 17 - Percentage distribution of cases of pregnant women with syphilis according to treatment regimen by year of diagnosis in the period from 2008 to 2018 in the municipality of Buritis - RO.

Pregnant women with syphilis according to treatment regimen												
Moment of diagnosis of maternal syphilis	Total	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
During prenatal care	1	0	0	0	0	0	0	0	1	0	0	0
At the time of delivery/curettage	1	0	0	0	0	0	0	0	0	0	1	0
After childbirth	-	0	0	0	0	0	0	0	0	0	0	0
Unrealized	-	0	0	0	0	0	0	0	0	0	0	0
Ignored	-	0	0	0	0	0	0	0	0	0	0	0

Source: Datasus (2019)

According to the percentage of cases of pregnant women with syphilis according to treatment regimen per year, it was noted that there were only two cases, 1 case in 2015 and another in 2017, during prenatal care and at the time of delivery/curettage.

Table 18 - Cases of congenital syphilis according to final diagnosis by year of diagnosis in the period from 2008 to 2018 in the municipality of Buritis - RO.

Congenital syphilis according to final diagnosis												
Final Gnostic	Total	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Recent congenital syphilis	2	0	0	0	0	0	0	0	1	0	1	0
Congenital syphilis late	0	0	0	0	0	0	0	0	0	0	0	0
Abortion due to syphilis	0	0	0	0	0	0	0	0	0	0	0	0
Stillbirth due to syphilis	0	0	0	0	0	0	0	0	0	0	0	0

Source: Datasus (2019)

Regarding cases of congenital syphilis according to final diagnosis per year, it was noted that there were only 02 cases, of recent congenital syphilis, in the years 2015 and 2017.

Table 19 - Cases of congenital syphilis according to treatment regimen, from 2008 to 2018 in the municipality of Buritis - RO.

Treatment Scheme	2014	2015	2016	2017
Penicillin	2	3	7	10
Another Scheme	-	-	-	-
Unrealized	-	-	-	1
Ignored	-	-	-	-

Source: Datasus (2019)

Regarding the treatment regimen, there were 23 cases that used the treatment, and in 2014, there were two cases that used penicillin, 2015 had 03 cases that used penicillin, in 2016, there were 07 cases that used penicillin and 10 cases in 2017 that used penicillin.

Table 20 - Cases of congenital syphilis according to maternal treatment regimen, in the period 2008 to 2018 in the municipality of Buritis - RO.

Maternal treatment scheme	Total	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Adequate	0	0	0	0	0	0	0	0	0	0	0	0
Inappropriate	0	0	0	0	0	0	0	0	0	0	0	0
Unrealized	2	0	0	0	0	0	0	1	0	1	0	0
Ignored	0	0	0	0	0	0	0	0	0	0	0	0

Source: Datasus (2019)

Regarding the treatment regimen, there were 23 cases that used the treatment, and in 2014, there were two cases that used penicillin, 2015 had 03 cases that used penicillin, in 2016, there were 07 cases that used

penicillin and 10 cases in 2017 that used penicillin.

Table 20 - Cases of congenital syphilis according to maternal treatment regimen, in the period 2008 to 2018 in the municipality of Buritis - RO.

Maternal treatment scheme	Total	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Adequate	0	0	0	0	0	0	0	0	0	0	0	0
Inappropriate	0	0	0	0	0	0	0	0	0	0	0	0
Unrealized	2	0	0	0	0	0	0	0	1	0	1	0
Ignored	0	0	0	0	0	0	0	0	0	0	0	0

Source: Datasus (2019)

According to the maternal treatment scheme, there were no cases between 2015 and 2017, with 02 cases in total.

With the exception of asymptomatic newborns with non-reactive VDRL and born to adequately treated mothers, all other newborns with maternal diagnosis and treatment of syphilis should undergo screening procedures in the maternity ward. Therefore, it was not performed because there were no treated or non-reactive mothers.

Preventive measures are taken during prenatal care, at the time of delivery and after delivery, involving pregnant women, children and sexual partners. Medications must be available at the location where prenatal care and delivery will be carried out, whether in the municipality or another referenced location. Other fundamental preventive actions include: having cabergoline available in maternity hospitals, in the municipality where the pregnant woman lives or in the reference municipality, to inhibit lactation (as well as guidance on the reason for not breastfeeding); zidovudine (AZT) oral solution for use for four weeks by the newborn or until the child's first consultation; and the provision of infant milk formula for feeding and nutrition of the child.

According to epidemiological data collected from the municipality of Buritis, state of Rondônia, it was initially found that there were 124 reported cases among men and women regarding acquired syphilis per municipality per residence and year of notification, with the highest rate in 2018, with 40 cases, this means that it had the highest rate of sexually transmitted infection (STI) for this disease.

From the data collected among pregnant patients, the variables age, race, education, occupation, gestational age on the date of notification, clinical classification of syphilis and other important points, such as diagnosis

and treatment, were analyzed.

It is known that laboratory diagnosis plays a fundamental role in combating syphilis, as it allows confirmation of the diagnosis and monitoring of the response to treatment. Thus, in accordance with the specific objectives of the previous item, the results are available regarding acquired syphilis, in pregnant women and congenital syphilis.

Regarding syphilis acquired in women in the municipality of Buritis, it was noted that there were 48 cases between 2008 and 2018.

Syphilis in pregnant women in the municipality of Buritis, it was observed that there were a total of 25 cases detected, with the highest incidence in 2017, with 11 cases. Regarding congenital syphilis, in general, in the municipality of Buritis-RO, it was found that there were only 02 cases, in the years 2015 and 2017. Regarding the age range age, it was found that the age most affected by this acquired syphilis infection was between 20 and 34 years old between 2008 and 2018. Still on acquired syphilis, in terms of sex, males prevailed, and they were infected. In terms of age range between 2008 and 2018, there were 124 cases, with ages ranging from 10 to over 80 years old, with the largest number of cases in the age range between 20 and 34 years old, being the age group most affected by the disease that is acquired.

According to studies by Brasil (2018), it is considered that in Brazil, in the historical series from 2005 to 2017, it was observed that 52% of pregnant women diagnosed with syphilis were in the age group of 20 to 29 years, 24.7% in the age group of 15 to 19 years and 19.8% in the age group of 30 to 39 years. Since 2005, the proportion of syphilis diagnoses in pregnant women between 30 and 39 years was higher than that of those between 15 and 19 years, with an inversion of this relationship having been observed since 2011.

Guglielminetti (2017) describes that the age group between 15 and 34 years old is the group that registered the greatest growth in Syphilis contamination between 2010 and 2016, according to data from Devisa (Department of Health Surveillance). In 2010, there were 43 people infected with the disease, compared to 624 people in 2017 – an increase of 14 times.

According to studies by the Ministry of Health (2010), in the case of primary syphilis, laboratory diagnosis can be made by direct examination of *Treponema pallidum* using dark-field microscopy, Fontana-

Tribondeau staining, which uses silver salts, and direct immunofluorescence. Antibodies begin to appear in the bloodstream approximately 7 to 10 days after the appearance of the hard chancre, which is why serological tests are non-reactive at this stage.

Epidemiological data regarding race, of acquired syphilis, it was noted that brown skin color prevails more.

Regarding syphilis in pregnant women, by age group, it was noted that there were 25 cases, overall, with a higher rate of cases in the ages between 15 and 19 years old.

Marques et al . (2018) reports that during the period of their study, there were 9 cases in the age group of 10 to 14 years (2% of the total), 94 cases of 15 to 19 years (20.8%), 336 cases aged 20 to 39 years (74.4%) and 13 cases aged 40 to 59 years (2.8%). These data indicate that most cases of syphilis occur in the age group of 20 to 39 years, reinforcing the importance of screening and notification programs specific to women's most fertile phase.

In terms of education, there were a total of 25 cases, with a prevalence of incomplete 5th to 8th grade, that is, a higher rate of cases.

Regarding the race or color of syphilis in pregnant women, there were 25 cases in total, with 2017 being the most common year, with 7 cases of brown skin.

Brasil (2018) presents its data according to the race/color criterion, identifying that, in 2017, 48.6% of pregnant women diagnosed with syphilis were brown, 30.7% white and 12.7% black. When considering the classification "black", which corresponds to black and brown women, the percentage increases to 61.2%. Due to the decrease in the proportion of "ignored" cases over the course of the historical series (from 20.2% in 2005 to 6.6% in 2017), it was observed that there was an improvement in the completion of this variable. In 2017, indigenous and yellow women represented 1.4% of the total number of pregnant women with syphilis. Regarding syphilis in pregnant women regarding clinical classification, in 2017, there were 06 cases of secondary syphilis, with no clinical classification of tertiary and latent syphilis.

The clinical classification of syphilis in pregnant women increased in 2016, with the relevance of the clinical classification concerning the risk of vertical transmission, which is greater in primary and

secondary syphilis, according to data collected from Marques et al ., (2018).

In congenital syphilis by age group, it was observed that there were only 02 cases between 15 and 19 years old. Regarding education in congenital syphilis, there were only 02 cases in the 5th to 8th grade incomplete education and in the complete elementary school.

Furthermore, regarding education, the highest rate was in 2015 and 2017, between 5th and 8th grade.

Regarding education, 26.1% of the information was recorded as "unknown" in 2017. Furthermore, 53.1% of the women who were notified had not completed high school, and 20.7% completed at least high school (BRAZIL, 2018)

It is seen that for the diagnosis of syphilis during pregnancy, data from the prenatal card and hospital records of the puerperal woman and newborn were used.

A case of syphilis during pregnancy was considered to be a puerperal woman who presented one of the following situations: reactive results recorded on the prenatal card, regardless of the titration; record of syphilis infection in the hospital records; record of congenital syphilis diagnosis in the newborn's records. The incidence of congenital syphilis per thousand live births and the vertical transmission rate, with their respective 95% CI, were estimated for Brazil and macro-regions and compared to cases reported to the Notifiable Diseases Information System (SINAN) in 2011.

Regarding the race or color of congenital syphilis, it was found that infections occurred in brown people between 2015 and 2017.

Regarding the cases and detection rate of pregnant women with syphilis, it was noted that there were 25 cases in total, with 2017 being the year with the highest number of cases.

According to the percentage of cases of pregnant women with syphilis according to treatment regimen per year, there were only two cases during prenatal care and at the time of delivery/curettage.

Regarding cases of congenital syphilis according to final diagnosis per year, it was noted that there were only 02 cases, which were recent congenital syphilis. Despite the overall reduction in the incidence of

congenital syphilis and the fact that the Unified Health System (SUS) provides diagnostic tests and treatment for pregnant women in the context of prenatal care - considered the most effective public health measure for controlling congenital syphilis - its incidence remains very high in Brazil. According to data from the Ministry of Health (2017), the incidence rate of congenital syphilis in 2015 was 6.5 cases per thousand live births, which represents, in absolute terms, 19,235 new cases of congenital syphilis in the country.

Regarding the treatment regimen, the year 2017 was the most prevalent, using penicillin.

According to the maternal treatment scheme, there were no cases between 2015 and 2017, with 02 cases in total.

Finally, according to the Ministry of Health's Syphilis Epidemiological Bulletin (2017), in Brazil, the incidence rate of congenital syphilis (from 2.4 to 6.8 cases per 1,000 live births) and the detection rate of syphilis in pregnant women (from 3.5 to 12.4 cases per 1,000 live births) have increased approximately threefold in the last five years. The Strategic Action Agenda for the Reduction of Congenital Syphilis in Brazil was launched in 2016, aiming at the implementation of strategic and priority actions to reduce syphilis.

CONCLUSION AND RECOMMENDATIONS

There was a predominance of syphilis in pregnant women with a tertiary clinical classification and a tendency towards specific population groups, such as brown women aged between 20 and 39 years, with a low level of education, living in urban areas and representatives of less favored socioeconomic classes. Given this scenario, it can be inferred that there is a need for more vigorous interventions aimed at prevention, early diagnosis and adequate treatment of syphilis, focusing on more vulnerable populations, with the aim of reducing the observed social disparities.

Therefore, knowing the clinical characterization of syphilis is vital for adopting the appropriate therapy. In syphilis, treatment must be carried out, which may show improvement, but there may also be a dropout rate due to its greater complexity.

Therefore, as with most of the cases reported in the municipality of Buritis, state of Rondônia, the focus should be on adequate treatment for infected patients,

aiming to reduce the risks of this disease.

To reduce the prevalence of syphilis during pregnancy and congenital syphilis, it is essential that health professionals and the community become aware of the importance of early diagnosis and effective treatment for women.

Given the above, this work opens up perspectives for new studies using predictive approaches on databases related to congenital syphilis and its social determinants, through the adoption of data science techniques applied to health.

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