Social determinants of health associated with gestational and congenital syphilis in Risaralda

German Alberto Moreno-Gómez [a], Jhon Gerardo Moreno-Gómez [b], Karol Tatiana Colorado-Barrios [c].

a. Physician, PhD in Public Health. Universidad Tecnológica de Pereira. ORCID: https://orcid.org/0000-0001-5210-2517

b. Physician and surgeon, Mg in health systems management. Government of Risaralda, Fundación Universitaria Visión de las Américas. ORCID: https://orcid.org/0000-0002-7381-1424

c. Nurse epidemiologist, Mg in Education. Government of Risaralda, Universidad del Tolima. ORCID: https://orcid.org/0000-0003-2854-5056

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Abstract

Among the described causes of gestational and congenital syphilis are inadequate management of syphilis during gestation, low level of education, failures in the model of the general social security health system and the incidence of some social determinants. **Objectives:** this research aims to establish the association between some social determinants of health and the incidence of gestational and congenital syphilis in the department of Risaralda, by describing the sociodemographic characteristics, analyzing the tendency of cases, and estimating the level of association of some social determinants of health. **Materials and methods:** the study corresponded to an analytical descriptive observational design of cases and controls. **Results:** Single marital status, Afro-descendant ethnicity, none or low level of schooling, no affiliation to the SGSSS or affiliation to the subsidized regime (related to poverty) are the social determinants of health that are associated with gestational syphilis in the department. Newborns with congenital syphilis living in Risaralda have less weight, less height, a shorter gestational age, are born to younger mothers, with less schooling and a greater number of previous pregnancies. **Conclusions:** it was found and corroborated that gestational syphilis and horizontal transmission of congenital syphilis is related to health determinants such as marital status, low educational level and the insurance regime of the mothers, so that the prevalence is higher

in women who belonged to the subsidized insurance regime or who are not even insured.

Keywords

Syphilis, Congenital syphilis, social determinants of health, public health surveillance.

Resumen

Entre las causas descritas de sífilis gestacional y congénita se encuentran el manejo inadecuado de la sífilis durante la gestación, el bajo nivel de educación, fallas en el modelo de sistema general de seguridad social en salud e incidencia de algunos determinantes sociales. **Objetivos:** la presente investigación pretende establecer la asociación de algunos determinantes sociales de la salud y la incidencia de sífilis gestacional y congénita en el departamento de Risaralda, al describir las características sociodemográficas, analizar la tendencia de casos y estimar el nivel de asociación de algunos determinantes sociales de la salud. **Materiales y métodos:** el estudio correspondió a un diseño observacional descriptivo analítico de casos y controles. **Resultados:** el estado civil soltera, la etnia afrodescendiente, el nulo o bajo nivel de escolaridad, la no afiliación al SGSSS o afiliación al régimen subsidiado (relacionado con la pobreza) son los determinantes sociales de la salud que se encuentran asociados con sífilis gestacional en el departamento. Los recién nacidos con sífilis congénita residentes en Risaralda tienen menos peso, menos talla, un menor tiempo de gestación, son hijos de madres más jóvenes, con menos escolaridad y un mayor número de embarazos previos. **Conclusiones:** se encontró y corroboró que la sífilis gestacional y la transmisión horizontal de sífilis congénita está relacionada con determinantes de la salud como el estado civil, el bajo nivel educativo y el régimen de aseguramiento de las madres, por lo que es mayor la prevalencia en mujeres que pertenecían al régimen de aseguramiento subsidiado o que incluso no se encuentran aseguradas

Palabras clave

Sífilis, sífilis Congénita, determinantes sociales de la salud, vigilancia en salud pública

Introduction

Sexually transmitted infections (STIs) are one of the main causes of disease in the world and have not only biological but also economic, social and health consequences that have great repercussions in many countries, especially in developing countries. Complications mainly affect women and

children; in the case of syphilis, it is estimated that two thirds of pregnancies of infected pregnant women result in congenital syphilis or spontaneous abortion (1)

It is estimated that only 20% of pregnant women with untreated syphilis in Colombia are able to complete pregnancy with a normal newborn. During pregnancy there is a high risk of transplacental infection from the mother to the fetus, causing perinatal death, premature delivery, low birth weight, congenital anomalies and active syphilis in the newborn (1).

Syphilis in pregnant, postpartum, or recently aborted patients who have not received adequate treatment during gestation or were re-infected without treatment is called gestational syphilis (2). Every year, an average of 6 million cases of syphilis are reported worldwide, causing more than 300,000 fetal and neonatal deaths per year, and exposing another 215,000 children to the risk of premature death (3). In Latin America and the Caribbean, prevalence in pregnant women varies between 0.1% and 7% depending on the country, and in 2012 of the 63,000 infections recorded, 14,000 had an unfavorable outcome (4). When comparing cases of untreated gestational syphilis with women without syphilis there is a higher frequency of fetal loss by 21%, neonatal death by 9%, low birth weight and premature birth by 5.8%, however, only 15% of children of pregnant women with syphilis have clinical evidence of the disease, hospitalizations, and long-term effects (5) Regarding the national epidemiological situation, the prevalence ratio for gestational syphilis in Colombia was 6. 1 to 15.1 cases / 1,000 live births between 2016 and 2021 (6).

A direct cause of gestational syphilis is the misuse of barrier contraceptive methods since this disease is mainly transmitted by close and direct contact with the genital chancre of an infected person in the midst of sexual activity. Therefore, having sex with strangers, having a history of multiple partners in the past or currently, and engaging in sexual acts during pregnancy predispose to reinfection. Less frequently, transmission occurs through blood transfusion, when the donor is in the early stage of syphilis (7).

Studies have shown that congenital syphilis is related to the low socioeconomic status of the mother, and also to social inequalities (8) regarding women's access to prenatal care (9, 10). In general, congenital syphilis mainly affects the poorest and most vulnerable populations, as they have limited access to health services and safe drinking water (11). Other risk factors are inadequate or no pregnancy control, poor implementation of screening

regulations for pregnant women and at the time of delivery, and women's lack of awareness of the need for syphilis diagnosis during prenatal care. Even some health personnel do not take congenital syphilis to prevention or practice a poor follow-up of newborns and their mothers with syphilis (12,13). It is important to mention that most of the syphilis diagnoses were made during pregnancy or after delivery and this also leads to an increase in cases of congenital disease (9, 13). It was also found that the primary health care provider may not receive the test results, or even if they do, treatment is not provided because the patient does not attend the hospital (10).

A high prevalence of gestational syphilis may be a sign of inadequate prenatal care services and poor quality of sexually transmitted disease promotion and prevention programs. Other factors that contribute to the prevalence of the disease are: difficult access or non-attendance of pregnant women to prenatal check-ups and screening tests, poor economic situation, remote geographic location, and poor supply of health services in their area of residence (7).

Current evidence establishes that there is a strong association between the living conditions of the population and their state of health and well-being (15). These conditions, which are outside the scope of medical care, include aspects such as poverty, lack of education, unemployment, inadequate housing conditions, ethnic or gender discrimination, which are considered Social Determinants of Health (hereinafter SDH) and give rise to systematic, unfair, and avoidable differences in the health status of different social groups, identified as inequities (16). Its counterpart, the concept of equity in health, is related to the ethical principle of justice and specifically to distributive justice. These social advantages or disadvantages are related to the social position of the individual or group, which determines prestige, power, access to resources and depends on the social value assigned to gender, ethnicity, religion, nationality, income, level of education, occupation, marital status, age or political affiliation, among other factors (17).

Several factors have been described that can increase the prevalence and incidence of congenital syphilis, among them is that one of the major risk factors for developing the disease is the frequent change of sexual partners (18, 19). In addition, failures in the treatment and follow-up of gestational syphilis lead to complications that could be entirely preventable and, moreover, reveal deficiencies in both programs and the application of guidelines in health services. Treatment should consider the stage of maternal in-

fection and gestational age. Despite being adequate, at least 14% will have fetal death or infected newborns (18 - 20). Another element that has been studied is the lack of perception of the possible serious consequences of gestational and congenital syphilis, describing it as a public health problem, in which the lack of perception of possible consequences on the part of policy makers, program managers and health providers is noteworthy (21, 22). The increase in the incidence of congenital syphilis suggests deficiencies in the prevention of vertical transmission of syphilis, especially in regions with the lowest percentage of coverage in terms of public health strategies (23).

A very important risk factor is associated with low educational level, lack of education in the prevention of sexually transmitted infections (STIs), and poor knowledge about this type of infection (24, 25). According to the study Incidence of congenital syphilis and factors associated with vertical transmission: data from the Birth in Brazil study, an important relationship was identified: the lower the mother's educational level, the higher the incidence of syphilis and CS (congenital syphilis) (26). It is important to mention that among the causes of the latter, non-attendance to prenatal care refers to a problem of quality of health care within the existing prenatal care programs, related to problems in the increase of barriers in access to prenatal care services (27) and also to the rural geographic location of pregnant women, since they daily face complications in traveling from their place of residence to urban areas (21, 28). Regarding the lack of available screening tests, users of health services experience a shortage of serological tests (27), which reduces the number of notifications and, therefore, the number of check-ups (21, 29).

Several studies have shown that quality prenatal care is required, with which some irregularities in this control such as late diagnosis and the use of inadequate treatment for syphilis in pregnant women or their partners are related to increases in cases of congenital syphilis (30,31). If syphilis is not diagnosed, treated early, or inadequately cared for, it has irreversible long-term consequences (32), leading to an increase in the prevalence of gestational syphilis and the incidence of congenital syphilis (33).

In Colombia, according to the National Institute of Health, gestational and congenital syphilis constitute a public health problem. For this reason, measures are taken that are considered necessary to decrease the prevalence and incidence of the disease, one of them, for example, is related to the Sustainable Development Goals (hereinafter SDGs) postulated by the

United Nations Organization (UN), specifically with goal number 3 that establishes guidelines for health and well-being. It also takes directions administered by the World Health Organization (WHO), such as the *Guide for the elimination of congenital syphilis in Latin America and the Caribbean* (6).

Materials y methods

Quantitative observational analytical case-control study.

The Secretary of Health of the Department of Risaralda provided the SIVIGILA database containing the records of cases of gestational syphilis, congenital syphilis, and the database of live births in the department during the observation period. In the analysis of gestational syphilis, the period between 2015 and 2020 was taken; for congenital syphilis the period 2016-2021 with residents in the department of Risaralda.

Results

Gestational Syphilis (GS):

The databases of live newborns (75,078) and women with gestational syphilis (791) were obtained, which generated a total of 845 cases for an average of 1.07 cases per pregnant woman. When comparing the rates of cases per 1000 live births in 2019 (the year with the highest incidence of cases), it is observed that Balboa, La Virginia and Marsella had the highest rates in relation to the number of live births. Pereira reported the highest number of cases, presenting a rate of 10 per 1,000 live births.

Table 1. Incidence of gestational syphilis by municipality.

Municipality of residence	Total de casos	Live births 2019	Rate per 1000 live births
Balboa	3	9	333
La Virginia	14	85	165
Marsella	8	77	104
Dosquebradas	38	615|	62
Santa Rosa de Cabal	13	211	62
Belén de Umbría	3	78	38
Santuario	1	26	38
Quinchía	4	131	31
Guática	1	47	21
Pereira	86	8569	10
Mistrató	3	302	3
Pueblo Rico	1	376	3
Apia	--	--	--
Total	175	10526	16,6

There is a predominance of cases in urban areas, but the proportion of cases in rural areas is higher according to the population (21.6% of Risaralda corresponds to rural areas). However, the average percentage of affiliation to the subsidized regime for the department of Risaralda is 43%, 60.1% of the cases of gestational syphilis occurred in women belonging to this regime. Of the pregnant women with GS, 16.7% were not under prenatal care at the time of diagnosis; the rapid test was the most used in 66.1% of the reported cases.

9% of GS cases occurred in women of different ethnicities, mainly indigenous (5.6%). The rate of GS in indigenous women was 10 per 1,000 live births for the year with the highest incidence. Of all the records in which the socioeconomic level was obtained, more than 90% of the cases occurred in the population of levels 1, 2 and 3.

Regarding adherence to the SIVIGILA protocol, despite the fact that the event must be entered with a positive treponemal and nontreponemal test, 85.1% have a positive treponemal test and 4.4% have a negative nontreponemal test.

Table 2. Number of benzathine penicillin doses received prior to delivery.

Number of doses	Quantity	%	% valid	% accumulated
0 doses	42	5,3	5,4	5,4
1 doses	185	23,4	23,8	29,2
2 doses	14	1,8	1,8	31,0
3 doses	536	67,8	69,0	100
Subtotal	777		100	
No data	14	1,8	1,8	
Total	791	100	100	

5.3% (42) of the individuals did not receive any dose of benzathine penicillin before delivery. In more than 40% of the cases there was no exposure treatment.

As for the variables of interest and related to the social determinants of health, it was observed that one in five cases of GS occurred in children under 19 years of age and there were 10 cases of GS in children under 14 years of age. There was a statistically significant association with the weight (lower weight) of the newborn (hereinafter NB), height (lower height), mother's schooling (lower schooling), greater number of children and previous pregnancies.

Table 3. Qualitative Variables Analysis.

Variable	OR	Interval		Valor de p
Gender NB	0,95	0,81	1,09	0,441
Birth weight	1,38	1,09	1,72	0,004
Single	1,72	1,46	2,05	0,000
Indigenous	1,13	0,86	1,47	0,347
NARP	2,5	1,71	3,58	0,000
No education	1,71	1,18	2,41	0,002
Elementary school	2,51	2,14	2,93	0,000
Urban Rural	0,876	0,733	1,045	0,134
Not affiliated to the SGSSS	1,658	1,252	2,16	0,000
Subsidized Regime	2,82	2,38	3,34	0,000

When comparing the variables of interest between mothers diagnosed with GS and those who did not, significant differences were found for: birth weight (low weight in GS), single mothers, black or afro-descendant population, no or low education, not affiliated to the SGSSS or affiliation to the subsidized regime.

Congenital Syphilis (CS):

For the observation period, 75,088 records of live births and 76 newborns with a diagnosis of CS were identified. It is evident that this has been increasing since 2018 in Risaralda, according to the data recorded in Table 4.

Table 4. CS rate per 10,000 births and per year department of Risaralda

Year	NB	CS Cases	Rate per 10.000 NB
2016	11338	17	15,0
2017	11057	10	9,0
2018	10748	6	5,6
2019	10589	10	9,4
2020	10708	16	14,9
2021	9093	17	18,7

Although the majority of live births are male (51.3%), the CS rate is higher in females (12.3 x 10,000 live births). Although the majority of cases occurred in the municipal capital, the rate of CS in rural areas is higher (12.3 x 10,000 live births).When the percentages of cases belonging to the subsidized and uninsured regimes are added together, these correspond to 67.1% of the total number of CS. They are classified as the poorest sectors,

since when the rate is calculated, it is evident that the uninsured individuals are the most likely to develop the disease.

In Risaralda, out of a group of 100,000 indigenous persons, 16.71 cases of CS were reported, while for every 100,000 whites or mestizos, 7.77 cases of the disease were observed. Similarly, 5.97 cases were reported in the ethnic group of mulattos, Afro-Colombians, and blacks.

It is observed that the highest number of CS cases occurs in the lower social strata; a little more than two thirds of these cases occur in social level 1. The number decreases as the social level increases, with 1, 2 and 3 accounting for 97.4% of the reported cases.

When comparing the population of each municipality with the number of cases, the highest risk municipalities for CS are Pueblo Rico and Mistrató, with 11.76 cases per 100,000 inhabitants, followed by Pereira, with 9.74 cases per 100,000 inhabitants, and Mistrató, with 9.74 cases per 100,000 inhabitants.

It is noteworthy that 61.8% of CS cases were diagnosed during childbirth or puerperium, 81.6% of sexual contacts of patients with congenital syphilis had not been treated at the time of diagnosis (Table 5).

Table 5. Treatment of contacts of mothers with syphilis.

Treatment	Frequency	Percentage	Cumulative percentage
No	62	81,6	100
Yes	14	18,4	18,4
Total	76	100	

According to gestational age in weeks at birth, it was observed that 32.9% of the cases with CS were born before 36 weeks of gestation.

In general, newborns with CS have lower weight, shorter length, shorter gestation time, are born to younger mothers, with less schooling and a greater number of previous pregnancies. These differences were significant for low birth weight, single mothers, low or no education, no affiliation to the SGSSS or affiliation to the subsidized regime (Table 6).

Table 6. Association between social determinants and CS cases.

Congenital syphilis	Cases 66 (n-%)	Controls 75025 (n-%)	OR	IC-95%	Value of P
Underweight<2500gr	20 (30,3)	6.577 (8,8)	4,5	2,6-7,6	0,000
Ethnicity - indigenous	7 (10,6%)	5.478 (7,3%)	1,5	0,6-3,2	0,336
Blacks and Afro descend-ants	2 (3,0%)	1.329 (1,8%)	1,7	0,4-7,0	0,327
Single marital status	23 (34,8%)	11.723 (15,6%)	3,1	1,8-5,2	0,000
No educational level	5 (7,6%)	2.066 (2,8%)	3	1,2-7,6	0,03
Elementary education lev-el	24 (36,4%)	11.790 (15,7%)	3,3	1,9-5,5	0,000
No affiliation to the SGSSS	14 (21,2%)	3.713 (4,9%)	5,1	2,8-9,3	0,000
Subsidized regime	40 (60,6%)	34.962 (46,6%)	3,4	1,8-6,6	0,000
Rural area	14 (21,2%)	17.691 (23,6%)	0,8	0,4-1,5	0,651

Discussion

GS and CS are a serious public health problem, and their incidence is increasing. The same tendency is observed in the department of Risaralda, which presents rates above the national average (19.9 cases of GS per 1,000 live births in 2021).

Single marital status, Afro-descendant ethnicity, no or low level of education, no affiliation to the SGSSS or affiliation to the subsidized regime (related to poverty) are the social determinants of health that are associated with GS in the department of Risaralda.

Various factors have been described that can increase the prevalence and incidence of CS, among which are the socioeconomic level of the mother. Several studies confirm that there is a higher incidence of CS in women who have a low level of education, are single or belong to socioeconomic levels 1 and 2 (34 - 36). The objective of this study was to identify the social determinants associated with vertical transmission of CS, and it was found that its horizontal transmission is related to unmarried marital status, low educational level and the insurance regime of the mothers, with a higher prevalence in women who belonged to the subsidized insurance regime or who are not even insured. According to the manual for trainers in the syndromic management of sexually transmitted infections, poor education weakens the ability to negotiate access to sexual relations and the use of protection, and also limits access to health services due to the lack of perception of the importance of these services.

Bibliographic references

1. Salud INd. Protocolo de Vigilancia en Salud Pública: Sífilis gestacional y Sífilis congénita. Bogotá: Instituto Nacional de Salud; 2015.
2. Gaitán H, Páez C, Rivera D, Ángel E, Estrada S, Cifuentes M. Guía de práctica clínica (GPC) basada en la evidencia para la atención integral de la sífilis gestacional y congénita. Bogotá: Ministerio de Salud y Protección Social, Fondo de Población de las Naciones Unidas; 2014.126 p.
3. Organization WH. Estrategia mundial del sector de la salud contra las Infecciones de Transmisión Sexual 2016–2021. Hacia el fin de las ITS. 2016.
4. Salud OMdlSOPdl. Marco para la eliminación de la transmisión maternoinfantil del VIH, la sífilis, la hepatitis y la enfermedad de Chagas. Geneva: Organización Mundial da la Salud; 2017.
5. Gomez GB, Kamb ML, Newman LM, Mark J, Broutet N, Hawkes SJ. Untreated maternal syphilis and adverse outcomes of pregnancy: a systematic review and meta-analysis. Bull World Health Organ. 2013; 91(3): 217-26.
6. Salud INd. Protocolo de vigilancia en Salud Pública. Sífilis Gestacional y Congénita. Bogotá: Instituto Nacional de Salud; 2017. p. 17.
7. Rondón-Esquive KJ, Salamanca-Valencia LF. Nivel de conocimiento sobre sífilis gestacional y congénita en mujeres puérperas atendidas en el Hospital de Bosa II Nivel entre agosto y octubre de 2016. 2016.
8. Heringer A, Kawa H, Fonseca SC, Brignol SMS, Zarpellon LA, Reis AC. [Inequalities in congenital syphilis trends in the city of Niterói, Brazil, 2007-2016. Desigualdades en la tendencia de sífilis congénita en la ciudad de Niterói, Brasil, 2007-2016]. Revista panamericana de salud pública = Pan American journal of public health. 2020; 44: e3.
9. Soares KKS, Prado TND, Zandonade E, Moreira-Silva SF, Miranda AE. Spatial analysis of syphilis in pregnancy and congenital syphilis in the state of Espírito Santo, Brazil, 2001-2018. Epidemiologia e servicos de saude: revista do Sistema Unico de Saude do Brasil. 2020; 29(1): e2018193.
10. Parker LA, Deschutter EJ, Bornay-Llinares FJ, Hernandez-Aguado I, Silva G, Piragine RdC, et al. Clinical and socioeconomic determinants of congenital syphilis in Posadas, Argentina. International Journal of Infectious Diseases. 2012; 16(4): e256-e61.
11. Herrero MB, Deluca G, Faraone S. Social inequalities, iniquities and neglected diseases: congenital syphilis on the international health agenda. Physis. 2020; 30(4).
12. López-Gómez A, Benia W, Alemán A, José V. Una década de sífilis gestacional y congénita en Uruguay: 2000-2009: situación epidemiológica, determinantes sociales y políticas públicas: informe. 2011. p. 94.
13. Robledo-Aceves M, Olguín-Flores R, Gaytán-Meza JJ, Orozco-Alatorre LG. [Early congenital syphilis, inadequate screening. Case report]. Revista médica del Instituto Mexicano del Seguro Social. 2020; 58(1): 61-5.
14. Lima MG, dos Santos RFR, Barbosa GJA, Ribeiro Gd. Incidence and risk factors for congenital syphilis in Belo Horizonte, Minas Gerais, 2001-2008. Ciencia & saude coletiva. 2013;18(2):499.
15. Venkatapuram S, Bell R, Marmot M. The right to sutures: social epidemiology, human rights, and social justice. Health and human rights. 2010;12(2):3.
16. Braveman P. Health disparities and health equity: concepts and measurement. Annu Rev Public Health. 2006; 27: 167-94.

17. Solar O, Irwin A. A conceptual framework for action on the social determinants of health. WHO Document Production Services; 2010.

18. Agudelo-Loaiza RD, Medina-Arredondo MC, Cardona-Rivas D. Caracterización de la sífilis congénita y gestacional en caldas, Colombia. Archivos de Medicina (1657-320X). 2016;16(2).

19. Salud Md. Ministerio de Salud Colombia. Normas técnicas y guías de atención integral, versión actualizada 2007. Resolución 412. Bogotá: 2007.

20. Casas RL, Rodríguez M, Rivas J. Sífilis y embarazo: ¿Cómo diagnosticar y tratar oportunamente? Revista colombiana de Obstetricia y Ginecología. 2009;60(1):49-56.

21. Alzate-Granados JP, Sánchez-Bello NF, Amaya-Arias AC, Peralta-Pizza F, Eslava-Schmalbach J. Congenital syphilis incidence disparities in Colombia 2005 to 2011: An ecological study. Revista de Salud Pública. 2012;14(6): 965-77.

22. INd S. Protocolo de sífilis congénita y gestacional. Bogotá: Ministerio de la Protección Social-Instituto Nacional de Salud; 2007.32 p.

23. Nunes PS, Zara SA, Rocha DF, Marinho TA, Mandacarú PMP, Turchi MD. Syphilis in pregnancy and congenital syphilis and their relationship with Family Health Strategy coverage, Goiás, Brazil, 2007-2014: an ecological study.

24. Oliveira LR, Santos ES, Souto FJD. Syphilis in pregnant women and congenital syphilis: spatial pattern and relationship with social determinants of health in Mato Grosso. Revista da Sociedade Brasileira de Medicina Tropical. 2020; 53.

25. Casas RL, Rodríguez M, Rivas J. Sífilis y embarazo: ¿Cómo diagnosticar y tratar oportunamente? Revista colombiana de Obstetricia y Ginecología. 2009; 60(1): 49-56.

26. Domingues CSB, Duarte G, Passos MRL, Sztajnbok DCdN, Menezes MLB. Protocolo Brasileiro para Infecções Sexualmente Transmissíveis 2020: sífilis congênita e criança exposta à sífilis. Epidemiologia e Serviços de Saúde. 2021;30.

27. Figueiredo D, Figueiredo AM, Souza TKB, Tavares G, Vianna RPT. [Relationship between the supply of syphilis diagnosis and treatment in primary care and incidence of gestational and congenital syphilis]. Cadernos de saude publica. 2020; 36(3): e00074519.

28. Social MdlP. Primer informe nacional de calidad de la atención en salud. "INCAS Colombia. Bogotá: 2009.

29. Kamb M, Schwartz-Benzaken A, Karem K, Matheu J, Pérez F. Orientación para el diagnóstico de la sífilis en América Latina y el Caribe: cómo mejorar la adopción, interpretación y calidad del diagnóstico en diferentes entornos clínicos. Washington: OPS/OMS; 2015. 32 p.

30. Magalhães DM, Kawaguchi IA, Dias A, Calderon Ide M. [Maternal and congenital syphilis: a persistent challenge]. Cadernos de saude publica. 2013; 29(6):1109-1120.

31. Soeiro CM, Miranda AE, Saraceni V, Santos MC, Talhari S, Ferreira LC. Syphilis in pregnancy and congenital syphilis in Amazonas State, Brazil: an evaluation using database linkage. Cadernos de saude publica. 2014; 30(4): 715-723.

32. Torres RG, Mendonça ALN, Montes GC, Manzan JJ, Ribeiro JU, Paschoini MC. Syphilis in Pregnancy: The Reality in a Public Hospital. Revista brasileira de ginecologia e obstetricia: revista da Federacao Brasileira das Sociedades de Ginecologia e Obstetricia. 2019; 41(2): 90-6.

33. Soares KKS, Prado TND, Zandonade E, Moreira-Silva SF, Miranda AE. Spatial analysis of syphilis in pregnancy and congenital syphilis in the state of Espírito Santo, Brazil, 2001-2018. Epidemiologia e servicos de saude: revista do Sistema Unico de Saude do Brasil. 2020; 29(1): e2018193.

34. Magalhães D, Kawaguchi I, Dias A. Maternal and congenital syphilis: a persistent challenge. Cadernos de saude publica. 2013; 29(6):1109-1120.

35. Organization WH. WHO guideline on syphilis screening and treatment for pregnant women. World Health Organization; 2017.

36. Mattei PL, Beachkofsky TM, Gilson RT, Wisco OJ. Syphilis: a reemerging infection. American family physician. 2012; 86(5): 433-40.