

# Gestational syphilis: associated factors, risk behavior and neonatal repercussions

## *Sífilis gestacional: fatores associados, comportamento de risco e repercussões neonatais*

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### RESUMO

**Objetivo:** analisar o comportamento de risco, os fatores associados e as repercussões neonatais em gestantes com sífilis. **Método:** estudo transversal, descritivo e retrospectivo, composto por 107 casos de sífilis gestacional em um hospital referência em gestação de alto risco, no período entre janeiro de 2016 e abril de 2017. Para análise estatística, foram aplicados os testes de qui-quadrado de Yates e Exato de Fisher. **Resultados:** maior ocorrência em mulheres jovens (56,1%), de cor não branca (81%), sem companheiro (53%), procedentes de outros municípios (65%), com menor escolaridade (62%) e sem exercer atividade remunerada (82%). Apesar de realizarem o pré-natal (95%), obtiveram um tratamento inadequado para a infecção (60%) e sem adesão dos parceiros sexuais (48%). Houve um predomínio de recém-nascidos pré-termos (51%), classificados com baixo peso ao nascer (35%) e vivos (90%). Houve uma associação estatisticamente significativa entre o comportamento de risco com a escolaridade de até 8 anos de estudos ( $p < 0.010$ ), número de consultas de pré-natal  $< 6$  ( $p < 0.001$ ) e ocorrência de parto vaginal ( $p < 0.032$ ). **Conclusão:** as desigualdades sociais, aliadas às falhas na assistência pré-natal, corroboram para a persistência do quadro epidemiológico de sífilis no Brasil.

**Descritores:** Doenças Sexualmente Transmissíveis; Sífilis; Saúde da Mulher; Infecções por Treponema; Comportamentos de Risco à Saúde.

### ABSTRACT

**Objective:** to analyze the risk behavior, associated factors and neonatal repercussions in pregnant women with syphilis. **Method:** a cross-sectional, descriptive and retrospective study of 107 cases of gestational syphilis in a high-risk gestational hospital, in the period between January 2016 and April 2017. For statistical analysis, the chi-square Yates and Fisher's Exact test were applied. **Results:** greater occurrence in young women (56.1%), non-white skin color (81%), without companion (53%), coming from other municipalities (65%), lower schooling (62%) and without exercising paid activity (82%). Although they performed prenatal care (95%), they were inadequately treated for infection (60%) and without adherence of sexual partners (48%). There was a predominance of preterm newborns (51%), classified as having low birth weight (35%) and alive (90%). There was a statistically significant association between risk behavior with up to 8 years of schooling ( $p < 0.010$ ), number of prenatal consultations  $< 6$  ( $p < 0.001$ ), and vaginal delivery ( $p < 0.032$ ). **Conclusion:** social inequalities, together with failures in prenatal care, corroborate the persistence of the epidemiological presentation of syphilis in Brazil.

**Descriptors:** Sexually Transmitted Diseases; Syphilis; Women's Health; Treponemal Infections; Health Risk Behaviors. , corroboram para a persistência do quadro epidemiológico de sífilis no Brasil. presentment

### NOTA

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## INTRODUCTION

Syphilis is a sexually transmitted infection (STI) with the etiologic agent *Treponema Pallidum* <sup>(1)</sup>. The World Health Organization (WHO) estimates that annually, 11 million cases of syphilis occur worldwide; of these, 1.5 million are pregnant women <sup>(2)</sup>. In Brazil, the number of reported cases of syphilis during pregnancy increases every year. In 2016, the total number of cases reported in said country was 37,436, with 2.9% of cases occurring in the state of Goiás <sup>(3)</sup>.

Women with low schooling, non-white race and those attending public services have a higher prevalence of syphilis during pregnancy <sup>(4)</sup>. Other factors associated with the occurrence of the infection are inadequate prenatal care, drug abuse, human immunodeficiency virus infection and poverty <sup>(5)</sup>.

In all clinical phases of gestational syphilis manifestation, there may be vertical transmission of the disease, which may have repercussions on adverse events such as miscarriage, fetal and neonatal death, prematurity, low birth weight and congenital syphilis <sup>(6)</sup>. The risk of vertical transmission reduces to 1 to 2% in pregnant women who received the treatment. However, in the absence of treatment, vertical transmission of syphilis is high and can reach values of 30 to 100%, depending on the clinical stage of the disease <sup>(7-6)</sup>.

Vertical transmission of syphilis is directly related to failures in prenatal care, which results in loss of opportunities for identification and intervention, increasing the number of cases of this infection. In this sense, the actions to control syphilis in pregnant women involve the performance of serological tests, as well as the timely and appropriate treatment of pregnant women and their sexual partners <sup>(8)</sup>.

Syphilis in pregnant women presents a challenge to public health, since it is responsible for important perinatal complications. In this sense, a study on the factors associated with the occurrence of this infection and its neonatal repercussions can offer a new perspective and allow a better planning of education and prevention measures in the most vulnerable groups, as well as the evaluation of the actions to reduce vertical transmission of syphilis <sup>(9)</sup>.

Therefore, the present study aims to analyze the risk behavior, associated factors and neonatal repercussions in pregnant women diagnosed with syphilis in a public hospital of the state network.

## METHOD

It is a cross-sectional, descriptive and retrospective methodological outline. Secondary data were collected from the gestational syphilis notification files and medical records of pregnant women admitted to a high risk gestational public hospital in the city of Goiânia, Goiás, in the

period between January 2016 and April 2017. The choice for the period was determined according to the archival routine of the nucleus of epidemiological surveillance.

The data collection was performed through a structured questionnaire with closed and open questions, which was developed specifically to be applied in this study, and was made based on a review of the literature on the subject.

The study comprised the following variables: socio-demographic conditions (age group, municipality of residence, color, schooling, marital status and paid work), risk behavior (illicit drug use, alcoholism and smoking), current gestation and / or obstetric complications, presence of vaginal and / or sexually transmitted infections, prenatal accomplishment, gestational trimester of prenatal care and number of visits), syphilis data (timing of notification, timing of diagnosis, treatment of the pregnant women and treatment of the sexual partners), delivery (birth route) and neonatal (classification of gestational age, apgar, weight classification and neonatal outcome).

Data collection was performed in May, June and July 2017, by means of a survey of all the records of notification of gestational syphilis that were filed in the nucleus of epidemiological surveillance. The information extracted from the notification forms and the medical records annexes were transcribed into the collection questionnaire elaborated in this research. 127 cases were detected, however, 20 of them did not meet the inclusion criteria of the study. Thus, the population was composed of 107 pregnant women diagnosed with syphilis.

The study sample consisted of pregnant women who met the following inclusion criteria: have syphilis notification and have medical records at the study institution. Exclusion criteria were: to present duplication in the records of notifications and failures in the records and in the archiving of medical records.

For statistical analysis of the study, the information was transcribed into a spreadsheet in the software Microsoft Office Excel® 2016. The quantitative data were analyzed descriptively, through frequency distribution, means and standard deviation. The Yates chi-square test and the Fisher's exact test were used for statistical analysis, and the differences in p were lower than 5% ( $p < 0.05$ ) were considered statistically significant. In the presentation of the results, the totals vary due to the exclusion of data without information.

The project was approved by the Research Ethics Committee via Plataforma Brasil, with the number of opinion 2,101,960, CAAE: 50897715.6.0000.5080, according to the recommendations proposed by the National Health Council, through Resolution 466/2012, which presents the guidelines and regulatory norms of research involving human beings <sup>(10)</sup>.

## RESULTS

Regarding the characterization of the sociodemographic profile of pregnant women who were diagnosed with syphilis, the prevalence of the age group of 20 to 29 years old (56.1%) was observed, with an average age of  $24.1 \pm 6.5$  years. There was a higher frequency of pregnant women from other municipalities (65%); of non-white color (81%); without companion (53%); with up to 8 years of schooling (62%) and did not exercise paid work (82%), as shown in table 1.

Regarding risk behavior (61%), the pregnant women practiced the use of illicit drugs (37%), alcoholism (34%) and smoking (44%). There was a statistically significant association in presenting risk behavior, with up to 8 years of schooling, number of prenatal consultations below 6 and occurrence of vaginal delivery, as shown in table 2.

Regarding the current gestation data, a predominance of single-type gestation (94%), pregnant women with prenatal care (95%), with onset in the first trimester (60%) and with  $\geq 6$  pre- (54%). Most pregnant women had obstetric pathologies and / or intercurrents (84%), with a higher occurrence of preterm labor (32%). In the presence of vaginal and / or sexually transmitted infections (64%), the most common were vaginosis (37%), human immunodeficiency virus (31%), candidiasis (19%) and trichomoniasis (13%).

With regard to syphilis data, there was a predominance of reports in the third trimester (88%), syphilis diagnoses during prenatal care (96%) and inadequate treatment of pregnant women (60%). In addition, the incorrect treatment for the clinical phase of infection (45%), incomplete treatment (23%), and failure to start

treatment 30 days before delivery (21%) or failure to complete treatment (11%), implicated in the inadequate treatment of pregnant women.

The sexual partners were treated concomitantly with the pregnant women (52%), and the non-treatment (48%) was associated with no contact with the pregnant woman (52%), other reasons (29%), the partner not being convened (9%) or refused treatment (6%), and having non-reactive serology (4%).

Regarding the neonatal variables, preterm newborns predominated (51%), with average gestational age of  $36.1$  weeks  $\pm 4$  weeks; apgar index greater than 7 in the first (80%) and in the fifth minute of life (91%); classified as low birth weight (35%) and alive (90%); however, some cases with outcome for fetal death (8%) and early neonatal death (2%).

## DISCUSSION

In the present study, most pregnant women with syphilis were young (56.1%). This distribution corroborates the results of other studies and is expected, since these women are of reproductive age and are more likely to become infected because of their social behavior<sup>(11-12)</sup>.

Most of the pregnant women came from other municipalities in the state of Goiás (65%), a number that may point out the unavailability of a network of obstetric services of high complexity in the places of origin of this population. Due to the scarcity of specialized resources in these places, there is a search for health care in the capitals, which has repercussions on the delay and the difficulty of the care and early interventions and causes overcrowding in these health institutions<sup>(13)</sup>.

**TABLE 1 – Sociodemographic variables in pregnant women with syphilis. Goiânia, GO, Brazil, 2016 to 2017.**

Sociodemographic	n	%
<b>Age Group</b>		
< 19 years old	24	22,4
20 - 29 years old	60	56,1
$\geq 30$ years old	23	21,5
<b>Municipality</b>		
Goiânia	37	35
Other municipalities	70	65
<b>Color</b>		
White	17	19
Non-white	74	81
<b>Marital Status</b>		
Have a partner	52	53
Don't have a partner	46	47
<b>Schooling</b>		
$\leq 8$ years of schooling	56	62
$> 8$ years of schooling	35	38
<b>Paid Work</b>		
Yes	18	18
No	84	82

Source: research data. n: number of cases. %: percentage



**TABLE 2 – Association between social, obstetric and newborn variables and risk behavior in pregnant women with syphilis. Goiânia, GO, Brazil, 2016 to 2017.**

Characteristics	Risk Behavior <sup>a</sup>		P value
	Yes (n =33)	No (n=21)	
	n (%)	n (%)	
<b>Age</b>			
< 19 years old	4 (12)	5 (24)	0.287 <sup>c</sup>
20 - 29 years old	22 (67)	9(43)	0.149 <sup>b</sup>
≥ 30 years old	7 (21)	7 (33)	0.501 <sup>b</sup>
<b>Schooling</b>			
Up to 8 years of schooling	25 (86)	9 (47)	<b>0.010</b> <sup>b</sup>
More than 8 years of schooling	4 (14)	10 (53)	
<b>Had prenatal care</b>			
Yes	27 (84)	21 (100)	0.144 <sup>c</sup>
No	5 (16)	0 (0)	
<b>Number of Consults</b>			
< 6 consults	18 (72)	4 (36)	<b>0.001</b> <sup>b</sup>
≥ 6 consults	7 (28)	17 (64)	
<b>Type of Delivery</b>			
Vaginal	23 (74)	8 (40)	<b>0.032</b> <sup>b</sup>
C-section	8 (26)	12 (60)	
<b>Classification of Gestational</b>			
<b>Age</b>			
Term	13 (42)	12 (60)	0.331 <sup>b</sup>
Preterm	18 (58)	8 (40)	
<b>Apgar Index</b>			
Apgar 1 <sup>st</sup> min			
<7	7 (24)	3 (15)	0.496 <sup>b</sup>
≥7	22 (76)	17 (85)	
Apgar 5 <sup>th</sup> min			
<7	5 (17)	0 (0)	0.070 <sup>c</sup>
≥7	24 (83)	20 (100)	
<b>Neonatal outcome</b>			
Alive	26 (84)	19 (95)	0.384 <sup>c</sup>
Dead	5 (16)	1 (5)	

Source: research data. a: Ethnicism, smoking and / or use of illicit drugs (crack, marijuana and cocaine). b: Chi-square test. c: Fisher's exact test.

In this study, there was a predominance of non-white women (81%), which is similar to the result found in a study conducted in Belo Horizonte, where 72.9% of pregnant women with syphilis referred to themselves as non-white <sup>(11)</sup>. Although the difficulties in providing quality care to this group of pregnant women can be attributed to poverty. Institutional racism is recognized, which is responsible for inequalities in care delivery and lower opportunities for access to health care <sup>(14)</sup>.

Most of the pregnant women did not have a partner (53%), which corroborates the results of another study <sup>(11)</sup>. It is believed that subjects without fixed partners tend to engage with multiple partners and thus increase the risk of acquiring sexually transmitted infections <sup>(15)</sup>.

The schooling was of up to 8 years of studies (62%), as verified in another study <sup>(11)</sup>. In addition, this sociodemographic factor had a statistically significant association with risk behavior ( $p < 0.010$ ). Low schooling is considered a marker of risk for exposure to sexually transmitted infections and may indicate greater vulnerability in the investigated population, less access to information, limited understanding of the importance of health care, and especially of measures to prevent infection <sup>(11-16)</sup>.

Regarding paid activity, there was a predominance of women who did not exercise paid work (82%). This event

can be attributed to the social vulnerability of these women, who are mostly non-white and have low levels of schooling, which implies lower conditions for getting a job <sup>(12)</sup>.

The risk behavior among pregnant women reported with syphilis was evidenced through the use of illicit drugs (37%), alcoholism (34%) and smoking (44%). Similarly, a study conducted in the Northeast of Brazil, which identified the prevalence and factors associated with syphilis in 173 parturients, found a strong association between illicit drug use and the occurrence of syphilis <sup>(15)</sup>.

It is known that exposure to alcohol during gestation increases the risk of mortality and the incidence of different diseases to women's health, as well as repercussions on the fetus and the newborn <sup>(17)</sup>. Likewise, smoking is cited as a risk marker for prematurity, as well as affecting the placental barrier and increasing syphilis vertical transmission <sup>(18)</sup>. Thus, it is necessary to focus efforts to identify early risk behavior presented by pregnant women, to avoid or reduce maternal and child health damages and harms <sup>(17)</sup>.

The current gestation showed a higher frequency of pregnant women with syphilis who received prenatal care (95%), started prenatal care in the first trimester (60%) and performed the minimum amount of ≥6 pre-

natal consultations (54%), similar to the results of other research<sup>(8-9-11-12)</sup>.

Although prenatal care of pregnant women meets the recommended criteria, the assistance has not been enough to ensure quality prenatal care, since cases of congenital syphilis and pregnant women increase in Brazil each year<sup>(3)</sup>. This fact confirms the need to develop studies that assess the quality of care provided during prenatal care. It is conceivable, however, that some characteristics of greater vulnerability, such as lower schooling, race, geographic, cultural and social access barriers may also influence the assistance offered<sup>(4)</sup>.

There was a statistically significant association in presenting risk behavior with a number of prenatal visits less than 6 ( $p < 0.001$ ). The identification of pregnant women who use illicit drugs during prenatal care may allow earlier intervention, reducing health risk behaviors and improving the quality of maternal and child care<sup>(17)</sup>.

As for the presence of gestational intercurrents (84%), there was a high frequency of preterm labor (32%), which is described in the literature when associated with maternal syphilis<sup>(18)</sup>.

In a study conducted in Rio de Janeiro, which evaluated prenatal care in the prevention of syphilis vertical transmission, it was found that 9.3% of pregnant women had obstetric history of risk. It is worth noting that the higher prevalence of syphilis in pregnancy in women with a risk-obstetric history makes the challenge of syphilis control in this population even more complex<sup>(19)</sup>.

In the present study, regarding vaginal and / or sexually transmitted infections (64%), pregnant women with syphilis had bacterial vaginosis (37%), human immunodeficiency virus (31%), candidiasis (19%) and trichomoniasis (13%).

A study in sub-Saharan Africa found that more than 50% of women had some sexually transmitted infection or vaginal infection during pregnancy<sup>(20)</sup>. Other research indicated that women diagnosed with syphilis had a higher prevalence of human immunodeficiency virus infection, since the entry of the virus is facilitated by the presence of syphilitic lesions<sup>(18-1)</sup>.

Regarding the syphilis variables, most of the pregnant women were diagnosed with this infection during prenatal care (96%), as in a study conducted in the Federal District. It should be highlighted that the improvement in the timely diagnosis of pregnant women may be related to the rapid testing of the health units, as well as serological testing during prenatal care, which allows the early diagnosis of infection and the adoption of measures to prevent vertical transmission<sup>(8)</sup>.

Although most of the pregnant women were diagnosed with syphilis during the prenatal period (96%), they had the minimum recommended prenatal visits (54%),

which started in the first trimester (60%), there was a predominance of reports in the third quarter (88%). In this sense, it is recommended the definition of strategies that help in the strengthening of epidemiological surveillance, as well as the technical training of the health teams, with regard to notifications.

Regarding the treatment of pregnant women, the majority proceeded inadequately (60%), also to the results of several studies<sup>(8-9-12)</sup>. This fact reveals that the guarantee of prenatal care performed as recommended is not sufficient to ensure quality care (8). In order to be considered adequate treatment in the pregnant woman with syphilis, it is necessary to perform the complete treatment, according to the clinical stage of the disease, with benzathine penicillin and with the beginning of the therapeutic scheme within 30 days before delivery<sup>(3)</sup>.

The frequency of sexual partners not treated concomitantly with the pregnant woman was unsatisfactory (48%), which shows a serious flaw in the prevention of vertical transmission and in the treatment of maternal syphilis, since, despite adequate treatment by the women, they are subject reinfection through their companions<sup>(8)</sup>.

In the present study, there was a statistically significant association in presenting risk behavior with vaginal delivery ( $p < 0.032$ ). One study pointed out that pregnant women in situations of vulnerability receive differentiated and discriminatory care during childbirth care, which results in smaller obstetric interventions in the parturition process. Inequalities in the process of attention to gestation and childbirth contribute to disparities in health indicators<sup>(14)</sup>.

Regarding birth weight, the number of newborns classified as low weight (35%) was predominant. A national hospital-based study found that 10.9% of the newborns had low birth weight, similarly to a study conducted in the Federal District, where this occurrence presented a percentage of 12%<sup>(18-8)</sup>.

A predominance of preterm newborns (51%) was observed in the present study. Although other studies indicate lower values of prematurity, several authors relate this neonatal outcome to the occurrence of gestational syphilis<sup>(8-11-18)</sup>.

This study evidenced the occurrence of fetal deaths (8%) and early neonatal deaths (2%) in concepts of women reported with syphilis. In pregnant women with untreated syphilis, pregnancy can evolve with negative outcomes. A study showed a proportion of fetal deaths among cases of congenital syphilis, six times higher than that observed in women without syphilis<sup>(18)</sup>.

The consequences of maternal-fetal transmission reinforce the importance of the diagnosis and timely treatment of syphilis in pregnant women and sexual partners, as well as evidence of the need for treatment and adequate follow-up of the newborn until the case is denied<sup>(1)</sup>.

## CONCLUSION

The results found in the present study point out that social inequalities, associated with attendance failures, such as inadequate treatment of pregnant women and low adherence of sexual partners, corroborate the persistence of the epidemiological picture of syphilis in Brazil.

Thus, it is verified that the pregnant women with syphilis and with greater risk of developing the disease are not being detected and treated properly. It is important that the active search of pregnant women with positive tests and their sexual partners occurs, individualized and more frequent care in order to prevent congenital syphilis.

The technical training and sensitization of nurses, doctors and community health agents who assist pregnant women will contribute to a greater coverage of the

testing of pregnant women and their partners, as well as the follow-up of positive cases. Thus some action strategies were flagged, although they are not exhaustive considering the diagnostic complexity of this disease; and the recognition and reach of socially vulnerable population groups that are more exposed to infection.

The study had limitations inherent to the research, such as the absence and partiality of the records in the records and in the records of the analyzed reports, resulting in a high frequency of uninformed variables. In view of the importance of registries regarding the follow-up of notified cases, incomplete filling, as well as divergent or ignored information, shows a failure in care, since professionals do not adequately use a resource that contemplates prenatal care.

## REFERENCES

1. Ministério da Saúde (BR). Clinical Protocol and Therapeutic Guidelines for Integral Care for Sexually Transmitted Infections. Brasília: Ministério da Saúde; [Internet] 2015 [acesso em 05 ago 2017]. Disponível em: [http://bvsmis.saude.gov.br/bvsmis/publicacoes/protocolo\\_clinico\\_diretrizes\\_terapeutica\\_atencao\\_integral\\_pessoas\\_infecoes\\_sexualmente\\_transmissiveis.pdf](http://bvsmis.saude.gov.br/bvsmis/publicacoes/protocolo_clinico_diretrizes_terapeutica_atencao_integral_pessoas_infecoes_sexualmente_transmissiveis.pdf)
2. World Health Organization. Investment case for eliminating mother-to-child transmission of syphilis: promoting better maternal and child health and stronger health systems. Geneva: World Health Organization; [Internet] 2012 [acesso em 05 ago 2017]. Disponível em: [http://apps.who.int/iris/bitstream/10665/75480/1/9789241504348\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/75480/1/9789241504348_eng.pdf?ua=1)
3. Ministério da Saúde (BR). Syphilis Epidemiological Bulletin 2017. Brasília: Ministério da Saúde; [Internet] 2017 [acesso em 02 mai 2018]. Disponível em: <http://portalquivos.saude.gov.br/images/pdf/2017/novembro/13/BE-2017-038-Boletim-Sifilis-11-2017-publicacao-.pdf>
4. Domingues RMSM, Szwarcwald CL, Junior PRBS, Leal MC. Prevalence of syphilis in pregnancy and prenatal syphilis testing in Brazil: Birth in Brazil study. *Rev Saúde Pública* [Internet]. 2014 [acesso em 13 ago 2017]; 48(5):766-774. Disponível em: <http://www.scielo.br/pdf/rsp/v48n5/0034-8910-rsp-48-5-0766.pdf>
5. Rodrigues CS, Guimarães MDC, Grupo Nacional de Estudo sobre Sífilis Congênita. Positivity for syphilis in puerperal women: still a challenge for Brazil. *Rev Panam Salud Pública* [Internet]. 2004 [acesso em 17 ago 2017]; 16(3):168-75. Disponível em: <https://www.scielosp.org/pdf/rpsp/v16n3/23086.pdf>
6. Secretária de Estado da Saúde de São Paulo. Congenital Syphilis and Syphilis in Pregnancy. *Rev Saúde Pública* [Internet]. 2008 [acesso em 03 set 2017]; 42(4):768-72. Disponível em: <http://www.scielo.br/pdf/rsp/v42n4/itss.pdf>
7. Sheffield JS, Sánchez PJ, Morris G, Maberry H, Zeray F, McIntire DD, et al. Congenital syphilis after maternal treatment for syphilis during pregnancy. *Am J Obstet Gynecol* [Internet]. 2002 [acesso em 10 set 2017] Mar; 186 (3): 569-73. Disponível em: [http://www.ajog.org/article/S0002-9378\(02\)39771-0/fulltext](http://www.ajog.org/article/S0002-9378(02)39771-0/fulltext)
8. Magalhães DMS, Kawaguchi IAL, Dias A, Calderon IMP. Maternal and congenital syphilis: still a challenge. *Cad Saúde Pública* [Internet]. 2013 [acesso em 13 ago 2017] Jun; 29(6):1109-1120. Disponível em: <http://www.scielo.br/pdf/csp/v29n6/a08v29n6.pdf>
9. Cavalcante PAM, Pereira RBL, Castro JGD. Syphilis in pregnancy and congenital syphilis in Palmas, Tocantins State, Brazil, 2007-2014. *Epidemiol Serv Saúde* [Internet]. 2017 [acesso em 17 ago 2017]; 26(2):255-264. Disponível em: [http://www.scielo.br/pdf/ress/v26n2/en\\_2237-9622-ress-26-02-00255.pdf](http://www.scielo.br/pdf/ress/v26n2/en_2237-9622-ress-26-02-00255.pdf)
10. Ministério da Saúde (BR). Resolução n°. 466, de 12 de dezembro de 2012. Regulatory guidelines and norms for research involving human beings. *Diário Oficial da União* [Internet] 13 jun 2013 [acesso em 03 set 2017]; Seção 1. Disponível em: [http://bvsmis.saude.gov.br/bvsmis/saudelegis/cns/2013/res0466\\_12\\_12\\_2012.html](http://bvsmis.saude.gov.br/bvsmis/saudelegis/cns/2013/res0466_12_12_2012.html)
11. Nonato SM, Melo APS, Guimarães MDC. Syphilis in pregnancy and factors associated with congenital syphilis in Belo Horizonte-MG, Brazil, 2010-2013. *Epidemiol Serv Saúde* [Internet]. 2015 [acesso em 13 ago 2017]; 24(4):681-694. Disponível em: [http://www.scielo.br/pdf/ress/v24n4/en\\_2237-9622-ress-24-04-00681.pdf](http://www.scielo.br/pdf/ress/v24n4/en_2237-9622-ress-24-04-00681.pdf)
12. Moreira KFA, Oliveira DM, Alencar LN, Cavalcante DFB, Pinheiro AS, Orfão H. Profile of notified cases of congenital syphilis. *Cogitare Enferm* [Internet]. 2017 [acesso em 03 set 2017]; (22)2: e48949. Disponível em: [http://revistas.ufpr.br/cogitare/article/view/48949/pdf\\_en](http://revistas.ufpr.br/cogitare/article/view/48949/pdf_en)
13. Castro BC, Ramos SCS. Profile of maternal mortality in a public maternity hospital in the city of Manaus-AM. *Revista Saúde Santa Maria* [Internet]. 2016 [acesso em 10 set 2017]; 42(1):103-112. Disponível em: <https://periodicos.ufsm.br/revistasauade/article/view/20953/pdf>
14. Leal MC, Gama SGN, Pereira APE, Pacheco VE, Carmo CN, Santos RV. The color of pain: racial inequities in prenatal care and childbirth in Brazil. *Cad Saúde Pública* [Internet]. 2017 [acesso em 10 set 2017]; 33 Sup 1:e00078816. Disponível em: [http://www.scielo.br/pdf/csp/v33s1/en\\_1678-4464-csp-33-s1-e00078816.pdf](http://www.scielo.br/pdf/csp/v33s1/en_1678-4464-csp-33-s1-e00078816.pdf)
15. Araújo MAL, Freitas SCR, Moura HJ, Gondim APS, Silva RM. Prevalence and factors associated with syphilis in parturient women in Northeast, Brazil. *BMC Public Health* [Internet]. 2013 [acesso em 13 ago 2017]; 13:206. Disponível em: <https://bmcpublihealth.biomedcentral.com/track/pdf/10.1186/1471-2458-13-206?site=bmcpublihealth.biomedcentral.com>
16. Padovani C, Antunes MB, Bega AG, Gravena AAF, Fernandes CAM, Pelloso SM. Screening of syphilis cases in gestation in southern Brazil. *Rev Enferm Atual* [Internet]. 2017 [acesso em 03 mai 2018]; 83. Disponível em: <https://revistaenfermagematual.com.br/uploads/revistas/21/revista.pdf>
17. Zanoti-Jeronymo DV, Nicolau JF, Botti ML, Soares LG. Repercussions of Alcohol Consumption in Pregnancy - Study of effects on the fetus. *BJSCR* [Internet]. 2014 [acesso em 03 set 2017]; 6(3): 40-46. Disponível em: [https://www.mastereditora.com.br/periodico/20140501\\_181135.pdf](https://www.mastereditora.com.br/periodico/20140501_181135.pdf)
18. Domingues RMSM, Leal MC. Incidence of congenital syphilis and factors associated with syphilis vertical transmission: data from the study Born in Brazil. *Cad Saúde Pública* [Internet]. 2016 [acesso em 10 set 2017] Jun; 32(6):e00082415. Disponível em: <http://www.scielo.br/pdf/csp/v32n6/1678-4464-csp-32-06-e00082415.pdf>
19. Domingues RMS, Saraceni V, Hartz ZMA, Leal MC. Congenital syphilis: a sentinel event in antenatal care quality. *Rev Saúde Pública* [Internet]. 2013 [acesso em 11 set 2017]; 47

- (1):147-57. Disponível em: [http://www.scielo.br/pdf/rsp/v47n1/en\\_19.pdf](http://www.scielo.br/pdf/rsp/v47n1/en_19.pdf)
20. Kurewa NE, Mapingure MP, Munjoma MW, Chirenje MZ, Rusakaniko S, Stray-Pedersen B. The burden and risk factors of Sexually Transmitted Infections and Reproductive Tract Infections among pregnant women in Zimbabwe. BMC Infectious Diseases [Internet]. 2010 [acesso em 10 set 2017]; 10:127. Disponível em: <https://bmcinfectdis.biomedcentral.com/track/pdf/10.1186/1471-2334-10-127?site=bmcinfectdis.biomedcentral.com>