



Journal of Nursing

Revista de Enfermagem

UFPE On Line

ISSN: 1981-8963

ORIGINAL ARTICLE

EPIDEMIOLOGICAL PROFILE OF CASES OF GESTATIONAL SYPHILIS

PERFIL EPIDEMIOLÓGICO DOS CASOS DE SÍFILIS GESTACIONAL

PERFIL EPIDEMIOLÓGICO DE LOS CASOS DE SÍFILIS GESTACIONAL

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ABSTRACT

Objective: to outline the epidemiological profile of gestational syphilis. **Method:** descriptive, cross-sectional and documentary study. The data reported in the state of Piauí between 2010 and 2013 from the National Disease Notification System (SINAN), available at the Information Technology Department of SUS (DATASUS), were used. **Results:** there were 388 cases of gestational syphilis in the State of Piauí, with an outcome of 193 cases of congenital syphilis between 2010 and 2013. The year 2012 had the highest incidence coefficient. Among the pregnant women, 72.4% were 20 to 39 years old, with a schooling range between the 5th and 8th incomplete grades (44.7%). As for cases of vertical transmission, 82.4% had performed prenatal care, 40.4% had been diagnosed with syphilis during gestation and 22.3% had performed concomitant treatment with the partner. **Conclusion:** the incidence rate presented increasing values among the study years, with numbers above the established goal for elimination of the disease. **Descriptors:** Epidemiology; Gestational Syphilis; Prenatal Care.

RESUMO

Objetivo: traçar o perfil epidemiológico dos casos de sífilis gestacional. **Método:** estudo descritivo do tipo seccional, de cunho documental. Utilizou-se os dados notificados no estado do Piauí entre 2010 e 2013, do Sistema de Informação de agravos de notificação (SINAN), disponíveis no Departamento de Informática do SUS (DATASUS). **Resultados:** verificou-se 388 casos de sífilis gestacional no estado do Piauí com desfecho de 193 casos de sífilis congênita entre 2010 e 2013. O ano de 2012 concentrou o maior coeficiente de incidência. Entre as gestantes, 72,4% possuem 20 a 39 anos com faixa entre 5º e 8º séries incompletas (44,7%). Quanto aos casos de transmissão vertical, 82,4% realizaram pré-natal, 40,4% obtiveram diagnóstico de sífilis durante a gestação e em 22,3% houve tratamento concomitante do parceiro. **Conclusão:** a taxa de incidência apresentou valores crescentes entre os anos de estudo, com números superiores à meta estabelecida para eliminação da doença. **Descritores:** Epidemiologia; Sífilis Gestacional; Cuidado Pré-Natal.

RESUMEN

Objetivo: trazar el perfil epidemiológico de los casos de sífilis gestacional. **Método:** estudio descriptivo del tipo seccional, de naturaleza documental. Se utilizaron los datos notificados en el estado de Piauí entre 2010 y 2013, del Sistema de Información de agravios de notificación (SINAN), disponibles en el Departamento de Informática del SUS (DATASUS). **Resultados:** se verificaron 388 casos de sífilis gestacional en el estado de Piauí con el desenlace de 193 casos de sífilis congénita entre 2010 y 2013. El año de 2012 concentró el mayor coeficiente de incidencia. Entre las gestantes, 72,4% poseen 20 a 39 años que están entre 5º y 8º años incompletos (44,7%). Referente a los casos de transmisión vertical, 82,4% realizaron prenatal, 40,4% obtuvieron diagnóstico de sífilis durante la gestación y en 22,3% hubo tratamiento concomitante del compañero. **Conclusión:** la tasa de incidencia presentó valores crecientes entre los años de estudio, con números superiores a la meta establecida para eliminación de la enfermedad. **Descritores:** Epidemiología; La Sífilis Gestacional; Cuidado Prenatal.

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INTRODUCTION

Syphilis is a chronic, systemic and infectious disease caused by the bacillus *Treponema pallidum*, a highly pathogenic spirochete with periodic cutaneous manifestations that can be latent in Gestational Syphilis (GS); its transmission is predominantly through sexual route. In addition to Acquired Syphilis, the bacillus can be transmitted through the placenta to the fetus, at any time during gestation or clinical stage of the disease in untreated or inadequately treated women. The disease has man as the only natural reservoir.¹

GS has a simple diagnosis and easy treatment/cure with a view to breaking the bacillus transmission chain, in which the early care in the period related to prenatal care and adequate treatment of pregnant women and their partners diagnosed with syphilis are crucial conditions for prevention and reduction of the incidence of Congenital Syphilis (CS).² However, despite being a simple disease and with effective treatment, its incidence is still high, especially in poor or developing countries.³ Vertical transmission of the disease still has been as a public health problem in Brazil as it is among the communicable diseases in the pregnancy-puerperal period with the highest infection rate, with rates ranging from 30% to 100%, depending on the clinical phase of the pregnant woman.⁴

In over 50% of the newborns of women with syphilis acquired during pregnancy, infection is asymptomatic, with the appearance of the first symptoms at approximately 3 months of life, which reinforces the importance of serological screening of pregnant women in the maternity ward.⁴

In view of perinatal risks and the magnitude of gestational syphilis, the Brazilian Ministry of Health (MoH) included in 2005 this disease in the national list of compulsory notification diseases, according to ordinance No. 33, from July 14, 2005.⁵ For the purpose of epidemiological surveillance, all women with clinical and non-treponemal reagent serological evidence and positive treponemal and non-conducted tests will be considered cases of gestational syphilis.⁶

The MOH recommends the obligatory request of at least two non-treponemal serological tests for diagnosis (VDRL) and conducting the mother's serology at the time of delivery in cases of failures in serological surveillance or in high-risk situations.⁷

Between 2005 and June 2012, 57,700 cases of GS were reported to the SINAN, with 14,828

(25.7%) cases reported in the Northeast region. Between 1998 and June 2012, 80,041 cases of CS were reported in children aged less than one year of age, with 25,133 (31.4%) cases registered in the Northeast of Brazil, which put the Northeast as the second region with the highest amount of notification of GS and CS in the last years.² In the period from 2007 to 2013, the Piauí State had 647 cases of gestational syphilis, with the highest incidence in 2007 (N=135/IC=8.6 cases per 100,000 inhabitants).⁸

Considering the magnitude of the disease as an important public health problem and its high incidence in the country and in the Brazilian Northeast, it is imperative to know its epidemiological characteristics in Piauí State. This study aimed to characterize the epidemiological distribution of reported cases of gestational syphilis in the state of Piauí between 2010 and 2013.

METHOD

This is a descriptive, cross-sectional study, based on data from the SINAN, available from the Information Technology Department of SUS (DATASUS), tabulated by TABNET, referring to cases of gestational syphilis reported in the Piauí State between January 2010 and December 2013.

Piauí is located in the northeastern region of Brazil, with an area of 251,577,738 square kilometers and borders in the states of Maranhão, Ceará, Pernambuco, Bahia and Tocantins.⁹

The data obtained in DATASUS were collected by following the methodological path: health information (TABNET); epidemiologies and morbidities; other notification diseases (since 2001); and data tabulation. The population bases necessary for the calculations of this research were obtained through census and demographic projections of IBGE (Brazilian Institute of Geography and Statistics).

In order to better understand the epidemiological status of GS in that state, the data were analyzed according to the variables: year of diagnosis; mother's schooling; mother's age range; performance of prenatal care; federated state (FS) of prenatal care; confirmation of maternal infection; performance of non-treponemal and treponemal test.

Data collection was done in October 2014. Inclusion criteria were all cases of GS and confirmed new cases of CS reported in Piauí between 2010 and 2013.

Descriptive and correlation analysis was performed using the Incidence Coefficient (IC), Relative Risk (RR), Attributable Risk (AR) and Chi-square test to verify possible correlations between performing prenatal care by the pregnant woman and partner treatment, age group and schooling of the pregnant woman with syphilis, always considering a level of statistical significance of 95% ($p < 0.05$).

For calculating incidence rates, the number of pregnant women in Piauí with confirmed diagnosis of syphilis reported in SINAN was taken as the numerator; the denominator was considered the number of women residing in the state multiplied by 100,000 for each year of study.

Relative Risk was calculated according to the formula: $[A/(A+B)]/[C/(C+D)]$, in which the variable "A" represents the sick population exposed to the risk, "B" represents the exposed but non-sick population, "C" consists of the sick population that was not exposed to the risk and D represents the non-exposed and non-sick population. For this analysis, the following variables were considered: performance of prenatal care and time of diagnosis of gestational syphilis; performance of prenatal care and partner treatment.

The chi-square test was calculated using the following formula: $\chi^2 = \sum [(o - e)^2 / e]$, in which "o" is the observed frequency for each class and the letter "e" represents the expected frequency for that class. This

analysis considered the relationship between prenatal care and age, educational level, time of diagnosis of maternal syphilis and partner treatment.

This work used secondary data and did not intend to study information about people or institutions. Thus, there was no need for an evaluation in the Research Ethics Committee (CEP) in accordance with Resolution 466/12 of the National Health Council.

The tables and graphs were prepared using the Excel software Microsoft Office 2010 and Tabwin3.2. The study population consisted of all cases of gestational syphilis and cases of vertical infection transmission.

RESULTS

Between 2010 and 2013, 388 cases of gestational syphilis were reported in the state of Piauí, with a growing trend up to 2012 (N=132; 34%) and a decline in 2013 (N=61; 15.7%). The interval with the highest incidence coefficient was concentrated between 2012 (N=132, IC=8.2/100.000hab.) and 2011 (N=105, IC=6.5/100.000hab.) with an average of 97 cases/year (Table 1).

Table 1. Characterization of pregnant women with syphilis and the incidence coefficient according to the year interval. Piauí (PI), Brazil, 2010-2013.

Year	N	%	Female Population	IC
2010	90	23.2	1,596,995	5.6
2011	105	27.1	1,606,415	6.5
2012	132	34.0	1,615,063	8.2
2013	61	15.7	1,622,978	3.8
Total	388	100.0	6,441,451	24.1

N= absolute value; IC= Incidence coefficient.
Source: National Disease Notification System.

Among the pregnant women diagnosed, 193 transmitted the bacillus *Treponema pallidum* for their children. The mean annual congenital syphilis among untreated and/or

inadequately treated pregnant women during the study period was 48.3 cases/year (Figure 1).

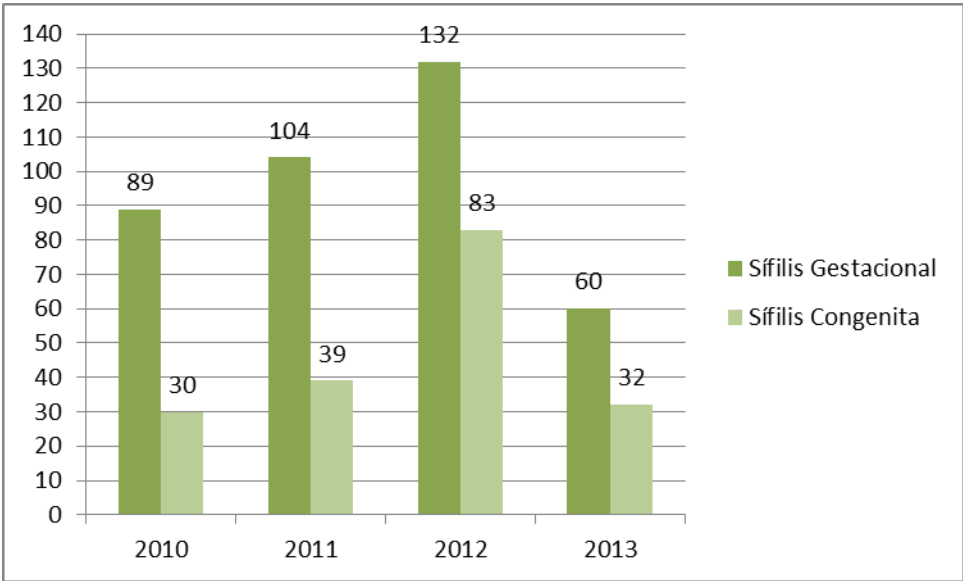


Figure 1. Characterization of gestational and congenital syphilis in the second year of diagnosis. Piauí (PI), Brazil, 2010-2013. Source: National Disease Notification System

As can be seen in Table 2, most women had age range of 20 to 39 years (N=281, 72.4%) or 15 to 19 years (N=96, 24.7%), although there was no statistically significant correlation ($p=0.05$) between the variables performance

of prenatal care (according to FS of residence) and age group ($p> 0.05$). The largest proportion of women had incomplete 5th to 8th grade or had incomplete high school, not presenting a significant value ($p>0.05$).

Table 2. Characterization of the reported cases of gestational syphilis in the state of Piauí according to age range and schooling of pregnant women. Piauí (PI), Brazil, 2010-2013.

FS of prenatal care	Piauí		Maranhão		Ignored/Blank		<i>p</i> <0.05	
	N	%	N	%	N	%		
Age range								
10 to 14	4	1,1	0	0,0	1	3,4	4,2	
15 to 19	89	24,9	1	50,0	6	20,7		
20 to 39	260	2,8	1	50,0	20	69,0		
40 to 59	4	1,2	0	0,0	2	6,9	0,3	
Total	357	100,0	2	100,0	29	100,0		
Schooling								
Illiterate	6	1,7	0	0,0	1	3,4		
Incomplete 1st to 4th grade	48	3,4	0	0,0	5	17,2		
Complete 4th grade	27	7,6	1	50,0	3	10,4		
Incomplete 5th to 8th grade	98	27,5	0	0,0	5	17,2		
Complete primary education	44	12,3	0	0,0	2	6,9		
Incomplete High School	35	9,8	0	0,0	3	10,4		
Complete High School	65	18,2	0	0,0	3	10,4		
Incomplete higher education	4	1,1	0	0,0	0	0,0		
Complete higher education	1	0,3	0	0,0	0	0,0		
Ignored/Blank	29	8,1	1	50,0	7	24,1		
Total	357	100,0	2	100,0	29	100,0		

*N= absolute value; FS= Federated state; *p*= Chi-square test
Source: National Disease Notification System.

Regarding the diagnosis of gestational syphilis, in 346 pregnant women (89.2%) the non-treponemal test was reactive, 13 were non-reactive (3.4%) and in 20 pregnant women it was not performed (5.2%). In 274 patients (70.6%) the treponemal test was not

performed, 17 were non-reactive (4.4%) and in 65 pregnant women (16.8%) it was reactive. Ignored or blank cases were disregarded for this variable in the notification sheets (Table 3).

Table 3. Characterization of pregnant women with syphilis according to non-treponemal and treponemal tests. Piauí (PI), Brasil, 2010-2013.

Variable	N	%
Cases confirmed by non-treponemal test		
Reactive	346	89.2
Non-reactive	13	3.4
Not performed	20	5.2
Ignored	9	2.2
Total	388	100.0
Cases confirmed by treponemal test		
Reactive	65	16.8
Non-reactive	17	4.4
Not performed	274	70.6
Ignored	32	8.2
Total	388	100.0

*N=absolute value
Source: National Disease Notification System.

According to **Table 4**, when considering the 193 cases of vertical transmission of the bacillus *Treponema pallidum*, in 159 of them (82.4%) the pregnant woman had undergone prenatal care and in 29 (15.0%) there was no prenatal care during pregnancy. There was adequate treatment of the sexual partners in 22.3% of the cases (N=43). Concerning the time of diagnosis of GS, in 78 of the mothers (40.4%) it occurred during gestation; in 66 cases (34.2%), at the time of delivery or curettage; 44 (22.8%) after delivery; in 1 (0.5%) case the disease was not investigated;

and 4 was the number of ignored cases in this variable (2.1%).

Performing prenatal care was statistically significant with the time of diagnosis of CS ($p = 0.00005$) and with the syphilitic partner treatment ($p = 0.03$). The diagnosis of syphilis during the prenatal period was a great protection factor in relation to the development of congenital syphilis by the newborn, with a RR of approximately 0.0. Diagnosis at any time during pregnancy or childbirth, however, reduces the risk of CS in varying degrees, as seen in the following table (Table 5).

Table 4. Characterization of cases of vertical transmission according to the variables prenatal care and the relationship with diagnosis of syphilis in the woman and partner treatment. Piauí (PI), Brazil, 2010-2013.

Performed prenatal care	Yes		No		Ignored/blank		p	RR	AR
Diagnosis of syphilis	N	%	N	%	N	%			
During prenatal care	76	47.8	0	0.0	2	40.0		0	0.48
At the time of childbirth/curettage	46	28.9	18	62.2	2	40.0		0.47	-0.33
After childbirth	34	21.4	10	34.4	0	0.0	0.00005	0.62	-0.13
Not performed	1	0.6	0	0.0	0	0.0		0	0.01
Ignored/blank	2	1.3	1	3.4	1	20.0		0.36	-0.02
Total	159	100.0	29	100.0	5	100.0			
Partner treatment									
Yes	41	95.4	99	79.2	19	76.0		1.2	0.16
No	1	2.3	24	19.2	4	16.0	0.03	0.12	-0.17
Ignored/blank	1	2.3	2	1.6	2	8.0		1.45	0.01
Total	43	100.0	125	100.0	25	100.0			

*p= Chi-square test; RR= Relative Risk, AR= Attributable Risk
Source: National Disease Notification System.

DISCUSSION

This study summarized the temporal evolution of congenital syphilis in Piauí, pointing to risk factors and groups of higher vulnerability, being a powerful guideline for actions in management and public health aimed at combating CS. However, there are inherent limitations to the method used and the collection of secondary data from official sources, and it is not possible to measure possible sub-registrations, underreporting, classification errors and incomplete completion of notification forms.¹⁰

Despite its limitations, this research was able to point out, in general terms, the

epidemiological pathways covered by the disease over the years, thus supporting the elaboration of future research in this field of knowledge. Congenital syphilis, according to Ministry of Health Ordinance No. 542 of December 22, 1986, has been considered a notifiable disease since 1986 in Brazil,¹ while gestational syphilis only became compulsory in 2005 (MOH/SVS No. 33, July 14, 2005).⁵ These facts are in line with and may partly justify the increase in the number of cases reported in the period from 2010 to 2012.

The notification of cases of GS in Brazil is compulsory, in which specific notification forms are used and filled in for all pregnant women who presents, during prenatal care,

clinical characteristics or non-treponemal reactive serology and treponemal test with positive result or in cases in which they had not been performed.¹¹ Laboratory confirmation with *Treponema pallidum* Hemoagglutination Assay (TPHA)/Fluorescent Treponemal Antibody Absorption Test (FTA-Abs) is recommended in Brazil; since it is not mandatory, its absence does not characterize reason for delay of conducts.¹²

This study showed that 70.6% of the pregnant women whose newborns were diagnosed with CS had not undergone treponemal test. Difficulties related to the accomplishment of this test were reported in other studies, which indicated as determinant factor the unavailability of the test or difficulty in access in several health services.¹³⁻⁴

The results pointed out by this research demonstrate that the quality of prenatal care is still precarious in that state. Because it is an easily preventable disease with favorable outcome when detected and treated appropriately in a timely manner, with concomitant treatment of sexual partners, GS can be considered a quality marker of health care in a given region.⁷ In this way, it shows weaknesses in the implementation of public control policies of STDs and, more specifically, distancing from the goals proposed by the national disease control policy in Brazil.

This study shows that there has been higher incidence of congenital syphilis in babies of young or adult-young women, being higher in groups with lower schooling. However, these associations were not statistically relevant. Similar results were obtained by several other authors who used similar methods¹⁴⁻⁵⁻⁶⁻⁷⁻⁸. In fact, the low level of schooling and the age range of pregnant women are important health determinants in general and, in a specific way, they determine the construction of a social, affective and economic environment favorable to exposure to risk of illness and death.^{14,16,18}

Most of the pregnant women whose children were diagnosed with CS had undergone prenatal care, which did not ensure adequate treatment of the syphilitic patient and her partner, despite of the ease of access of penicillin-based pharmacological treatment. Similar data were found in the city of Natal-RN¹⁰, in a study conducted between 2004 and 2007, in which 77.5% of pregnant women had vertically transmitted *Treponema pallidum* despite having performed prenatal care. A similar study carried out in the city of Fortaleza-CE showed that 81% of the syphilitic

pregnant women who had performed prenatal care transmitted the bacillus to their babies.¹⁶

Although most of the pregnant women in the study had performed prenatal care, most were diagnosed at delivery, curettage or after delivery. In a study carried out in Maranhão in the period from 2007 to 2010, 68.90% of pregnant women with syphilis had only been diagnosed at the time of delivery or curettage, evidencing important differences between states and the same trend towards late diagnosis of the disease.¹⁸

The vast majority of sexual partners had received no treatment for syphilis. These data reinforce the fragility of health services in the diagnosis and comprehensive and effective treatment of cases of GS to control the vertical transmission of the disease. National data from 2008 show similar results, in which 70% of the mothers diagnosed with GS had undergone prenatal care and only 20% of the partners had been treated.¹⁹

Men are generally less adept at healthy lifestyles and engage in more frequent risk and violence situations, making them vulnerable to various conditions. These vulnerabilities are based on cultural values and socially constructed images that define their masculine identity from a gender perspective that distances them from health services and actions for disease prevention and health promotion. These values become important in the transmission chain of sexually transmitted diseases, in the case of syphilis, and should be considered in the elaboration of combat strategies.²⁰⁻¹

The large proportion of diagnoses during prenatal care indicate deficiencies in the quality of care, which may be related to deficiency in health promotion targeted at sexually transmitted diseases such as syphilis, immediate treatment of pregnant women and their diagnosed partners, general guidelines during the specific treatment and in proven allergic pregnant women who should be desensitized and subsequently treated with penicillin or in the impossibility of erythromycin.⁴

This could be also explained, to some extent, by the limitations of the use of penicillin in the Brazilian Health System network, which in some Brazilian regions has unrealistic recommendations of referral of all individuals who need this drug to hospital units with emergency services,²² severe anaphylactic reactions after the use of penicillin (0.5 to 1/100,000), which are rare⁶ but often misinterpreted or confused with adverse reactions related to neurovegetative disorders and vasovagal reactions.^{4,23}

CONCLUSION

Although strategies for combating gestational syphilis have been defined for several years, the state of Piauí still has indicators that fall short of the goals set. This work is important for demonstrating the epidemiological pathways of the disease over the years, to the detriment of health interventions prompted by public policies, such as improved access to basic care in the state, greater coverage of health services and performance of prenatal care in pregnant women.

Thus, women of childbearing age from 20 to 39 years of age and of low schooling can be identified as being at greatest risk for developing gestational syphilis. The incidence of the disease was high in all the years of this study, increasing until the year 2012. Although most of the pregnant women had performed prenatal care, the disease was diagnosed only during delivery, curettage or after delivery. These factors point to fragilities of primary care in promoting the healthy social environment necessary for health promotion, as well as deficiencies in the prevention and early diagnosis of sexually transmitted diseases, rationally interfering in the transmission chain of the disease.

Although the treatment of the sexual partner of the woman diagnosed with syphilis is recommended, this research showed that a small number of men performed adequate treatment, which increases the risk of reinfection in a considerable way.

The summary of the results points to difficulties faced by primary health care in the fight against gestational syphilis. The verification of this reality imposes the need of reassessing or reformulating prenatal care in the state with identification of problematic situations and elaboration of resolute strategies in an integrated way with the community and considering quantitative and qualitative reality.

REFERENCES

1. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Departamento de Vigilância Epidemiológico. Doenças infecciosas e parasitárias: guia de bolso/Ministério da Saúde, Secretária de Vigilância em Saúde, Departamento de Vigilância Epidemiológico. 8th ed. Brasília: Ministério da Saúde; 2010.
2. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Departamento de DST, Aids e Hepatites Virais. Boletim Epidemiológico - Sífilis. Ed. Premium. Brasília: Ministério da Saúde; 2012.
3. Pires ON, Pimentel ZNS, Santos MVS, Santos WA. Vigilância epidemiológica da sífilis na gravidez no centro de saúde do bairro Uruará-Área Verde. DST - J bras Doenças Sex Transm [Internet]. 2007 [cited 2014 Sept 01];19(3-4):162-5. Available from: <http://www.dst.uff.br//revista19-3-2007/8.pdf>
4. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Programa Nacional de DST/AIDS. Diretrizes para controle da sífilis congênita: manual de bolso/ Ministério da Saúde, Secretaria de Vigilância em Saúde, Programa Nacional de DST/Aids. 2nd ed. Brasília: Ministério da Saúde; 2006.
5. Ministério da Saúde (BR). Portaria nº. 33, de 15 de julho de 2005. Inclui doenças à relação de notificação compulsória, define agravos de notificação imediata e a relação dos resultados laboratoriais que devem ser notificados pelos Laboratórios de Referência Nacional ou Regional. Brasília: Ministério da Saúde; 2005.
6. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Programa Nacional de DST e Aids. Protocolo para a prevenção de transmissão vertical de HIV e sífilis: manual de bolso / Ministério da Saúde, Secretaria de Vigilância em Saúde, Programa Nacional de DST e Aids. Brasília: Ministério da Saúde; 2007.
7. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Guia de vigilância epidemiológica / Ministério da Saúde, Secretaria de Vigilância em Saúde. 6th ed. Brasília: Ministério da Saúde; 2005
8. Datasus. Ministério da Saúde. Indicadores de cobertura e dados básicos. Numero de casos de sífilis congênita no Estado do Piauí. Brasília: Ministério da saúde, 2014 [cited 2014 Sept 13]. Available from: <http://dtr2004.saude.gov.br/sinanweb/tabnet/dh?sinannet/sifilisc/bases/sifilisbrnet.def>
9. Andrade-Júnior AS, Bastos EA, Barros AHZ, Silva CO, Gomes AAN. Classificação climática do Estado do Piauí. Teresina: Embrapa Meio-Norte, [Internet]. 2004 [cited 2014 Sept 13];86p. Available from: file:///C:/Users/Selma%20Soares/Downloads/01%20-%20cpamn_documentos_86.pdf
10. Holanda MTCG, Barreto MA, Machado KMM, Pereira RC. Perfil epidemiológico da sífilis congênita no Município do Natal, Rio Grande do Norte-2004 a 2007. Epidemiol. Serv Saúde [Internet]. 2011 Apr-June [cited 2014 Sept 16];20(2):203-12. Available from: http://scielo.iec.pa.gov.br/scielo.php?pid=S167949742011000200009&script=sci_arttext.

11. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Curso básico de vigilância epidemiológica em sífilis congênita, sífilis em gestante, infecção pelo HIV em gestantes e crianças expostas/ Ministério da Saúde, Secretaria de Vigilância em Saúde. Brasília : Ministério da Saúde, 2006 [cited 2014 Sept 16].
12. Amaral E. Sífilis na gravidez e óbito fetal: de volta para o futuro. Rev Bras Ginecol Obstet [Internet]. 2012 [cited 2014 Sept 16];34(2):52-5. Available from: <http://www.scielo.br/pdf/rbgo/v34n2/a02v34n2.pdf>
13. 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; 2012 [cited 2015 Jan 11]. Available from: http://apps.who.int/iris/bitstream/10665/75480/1/9789241504348_eng.pdf?ua=1
14. Magalhães DMS, Kawaguchi IAL, Dias A, Calderon IMP. Sífilis materna e congênita: ainda um desafio. Cad Saúde Pública [Internet]. 2013 June [cited 2015 Jan 24];29(6):1109-20. Available from: http://www.scielo.br/scielo.php?pid=S0102311X2013000600008&script=sci_arttext
15. Leitão EJL, Canedo MCM, Furiatti MF, Oliveira LRS, Diener LS, Lobo MP et al. Sífilis gestacional como indicador da qualidade do pré-natal no Centro de Saúde n.º 2 Samambaia-DF. Ciências Saúde [Internet]. 2009 [cited 2015 Jan 24];20(4):307-14. Available from: http://www.escs.edu.br/pesquisa/revista/2009Vol20_4sifilisgestacional.pdf
16. Campos, ALA, Araújo MAL, Melo SP, Gonçalves MLC. Epidemiologia da sífilis gestacional em Fortaleza, Ceará, Brasil: um agravamento sem controle. Cad Saúde Pública [Internet]. 2010 Sept [cited 2015 Jan 24];26(9):1747-55. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0102311X2010000900008
17. Nascimento MI, Cunha AA, Guimarães EV, Alvarez FS, Oliveira SRS, Bôas ELV. Gestações complicadas por sífilis materna e óbito fetal. Rev Bras Ginecol Obstet [Internet]. 2012 [cited 2015 Jan 24];34(2):56-62. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0100-72032012000200003
18. Barbosa DRM, Almeida MG, Costa JR, Almeida DFS. Perfil epidemiológico da sífilis congênita no Maranhão. II Conference online-Management, Education and Health Promotion [Internet]. 2013 [cited 2015 Jan 30]. Available from: http://www.convibra.org/upload/paper/2013/79/2013_79_7890.pdf
19. Araújo CL, Shimizu HE, Sousa AIA, Hamann EM. Incidência da sífilis congênita no Brasil e sua relação com a Estratégia Saúde da Família. Rev. Saúde Pública [Internet]. 2012 [cited 2015 Jan 30];46(3):479-86. Available from: http://www.scielo.br/scielo.php?pid=S0034-89102012000300010&script=sci_arttext
20. Berhane Y, Högberg U, Byass P, Wall S. Gender, literacy, and survival among Ethiopian adults. Bull World Health Organ [Internet]. 2002 [cited 2015 Jan 30];80(9):714-720. Available from: <http://www.scielosp.org/pdf/bwho/v80n9/v80n9a07.pdf>
21. Gomes R, Nascimento EF. A produção do conhecimento da saúde pública sobre a relação homem-saúde: uma revisão bibliográfica. Cad Saúde Pública [Internet]. 2006 May [cited 2015 Jan 30];22(5):901-11. Available from: http://www.scielo.br/scielo.php?pid=S0102-311X2006000500003&script=sci_arttext
22. Grumach AS, Matida LH, Heukelbach J, Coêlho HLL, Júnior ANR. A (Des)Informação Relativa à Aplicação da Penicilina na Rede do Sistema de Saúde do Brasil: O Caso da Sífilis. DST - J bras Doenças Sex Transm [Internet]. 2007 [cited 2015 Feb 1];19(3-4):120-7. Available from: http://www.aids.gov.br/sites/default/files/anexos/page/2010/44612/17_penicilina_pdf_22607.pdf
23. Robinson JL, Hameed T, Carr S. Practical aspects of choosing an antibiotic for patients with a reported allergy to an antibiotic. Clin Infect Dis [Internet]. 2002 June [cited 2015 Feb 3];35(1):26-31. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/12060871>

Submission: 2015/08/25

Accepted: 2017/03/23

Publishing: 2017/05/01

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