**Revista da Sociedade Brasileira de Medicina Tropical**
*Journal of the Brazilian Society of Tropical Medicine*
**Vol.:52:e20180226: 2019**
doi: 10.1590/0037-8682-0226-2018

## Short Communication

# Reemerging diseases in Brazil: sociodemographic and epidemiological characteristics of syphilis and its under-reporting

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**Abstract**

**Introduction:** This paper analyzed sociodemographic and epidemiological data of individuals with syphilis as well as the compulsory reporting of the disease, for being a reemerging disease in Brazil. **Methods:** General information and sociodemographic, epidemiological, clinical, and laboratory data were verified in compulsory reporting. **Results:** From 2010 to 2016, 157 reporting forms were explored. Acquired and gestational syphilis occurred predominantly in those 20 to 29 years of age and those who did not complete secondary education. Compulsory reporting forms were not complete. **Conclusions:** The number of syphilis cases has varied over the years in the city. Incomplete compulsory reporting was noted.

**Keywords:** Epidemiology. Syphilis. Congenital syphilis. Notifiable diseases.

The advent of penicillin and the greater attention given to measures that prevent sexually transmissible infections (STIs) resulted in a decrease in the number of syphilis cases. However, several countries have shown a great increase in the disease's prevalence over the past few years[1].

Most people infected with syphilis tend to be unaware of their serological state; thus, they can transmit it to sexual partners owing to few or no symptoms. The infection has four stages[2,3]. The disease may present itself in the so-called decapitated form, in which the disease does not present the initial stage and begins in the secondary stage. This form of the disease is usually transmitted through blood transfusion or drug injection[4].

Syphilis is a reemerging disease in Brazil and has currently reappeared as a national health issue after a period of apparent control and decline in its incidence[5]. The number of cases increased by 32.7% for acquired syphilis (sexually transmitted), 20.9% for gestational syphilis, and 1.9% for congenital syphilis (transmitted from mother to baby) between 2014 and 2015[6].

In accordance with Ordinance 204 issued on February 17, 2016, this disease requires weekly compulsory reporting and according to protocols within the Brazilian National Health System (SUS)" follows a sharing flow within the Brazilian public health system's management spheres (SUS), established by the Health Surveillance Secretariat (SVS/ Ministry of Health)[7]. In this context, the present study aimed to analyze the sociodemographic and epidemiological data of individuals affected by syphilis and the compulsory reporting of acquired, gestational, and congenital syphilis in a municipality in northwest São Paulo, Brazil. This is a descriptive and quantitative research study with an exploratory approach.

The research was conducted in the Department of STIs, AIDS, and Viral Hepatitis in the city of Araçatuba, São Paulo, Brazil, where a database was created through the analysis of compulsory reporting of patients diagnosed with acquired, gestational, and congenital syphilis. The estimated population for 2017 according to protocols within the Brazilian National Health System (SUS)"was 194,874 inhabitants in the city[8]. Data were collected in June and July 2017, and the

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**Received** 8 June 2018
**Accepted** 4 July 2018

compulsory reporting was registered from 2010 throughout 2016. Compulsory reporting presented common variables for acquired, gestational and congenital syphilis, such as general information and sociodemographic, epidemiological, clinical and laboratory data.

For gestational syphilis cases, extra data including the epidemiological background of mothers and data of their sexual partners were collected. For congenital syphilis cases, information on epidemiological background, prenatal care, diagnosis and treatment of maternal syphilis, and laboratory and clinical data of the child were also collected.

The obtained data were entered into an Excel spreadsheet and processed in the software Epi Info™ 7.2. The data are presented in absolute and relative frequencies.

The study analyzed 157 compulsory reporting files, of which 103 (65.6%) reported acquired syphilis, 32 (20.5%) reported gestational syphilis, and 12 (14%) reported congenital syphilis. Concerning the year of reporting, 2013 presented the highest incidence of acquired and gestational syphilis, and 2016 showed the highest value for congenital syphilis (**Figure 1**).

Regarding acquired syphilis, the following sociodemographic data were missing: area of residence (39 reports, 24.8%), level of education (32 reports, 22.1%), ethnicity (16 reports, 10.2%), health care unit patients attended (9 reports, 5.7%), and date of compulsory notification (6 reports, 3.8%).

The predominant age range was 20 to 29 years, with 33 individuals (32%); 82 individuals (79.6%) were male; 58 were self-defined as white (65.2%); 44 individuals did not complete secondary education (57.9%); and 29 lived in an urban area (82.9%).

Regarding acquired syphilis almost all reports missed clinical, epidemiological, laboratory, treatment and conclusion data for acquired syphilis, except for 3 reports (2.9%), which precluded a thorough analysis of cases.

Missing sociodemographic information was also observed in the reports on gestational syphilis, although they were more complete than those on acquired syphilis. The predominant age range was 20 to 29 years, with 18 individuals (56.3%); 13 persons were self-defined as white (41.9); 18 individuals did not complete secondary education (66.7%); 30 lived in urban areas (100%); and 50% of respondents left the occupation field blank. Regarding clinical classification, 13 reports (59.7%) were blank; among those answered, 13 (68.4%) cases were classified as primary syphilis, 1 (5.3%) was classified as latent, and 5 (26.3%) were ignored. Information regarding the non-treponemal test was not included in 5 reports (15.6%); in the reports including this information, 24 (88.9%) tests were reactive, 2 were non-reactive (7.4%), and 1 (3.7%) did not perform the non-treponemal test. Regarding the treatment course, 31 reports included this information, with 14 patients (45.2%) treated with benzathine penicillin G 7,200,000 IU, 9 patients (29%) with benzathine penicillin G 2,400,000 IU, and 2 patients (6.5%) with benzathine penicillin G 4,800,000 IU; 3 patients (9.7%) followed a different treatment regimen; 2 patients (6.5%) were not treated; and in 1 report (3.1%), the treatment regimen was not provided.

Concerning sexual partners, 7 reports (21.9%) did not include any information. Of the reports that did, 10 (40%) partners were not treated, 9 (36%) were treated at the same time as the mother, and in 6 reports (24%), these data were not provided. Of the 9 treated patients, 3 (33.3%) were prescribed

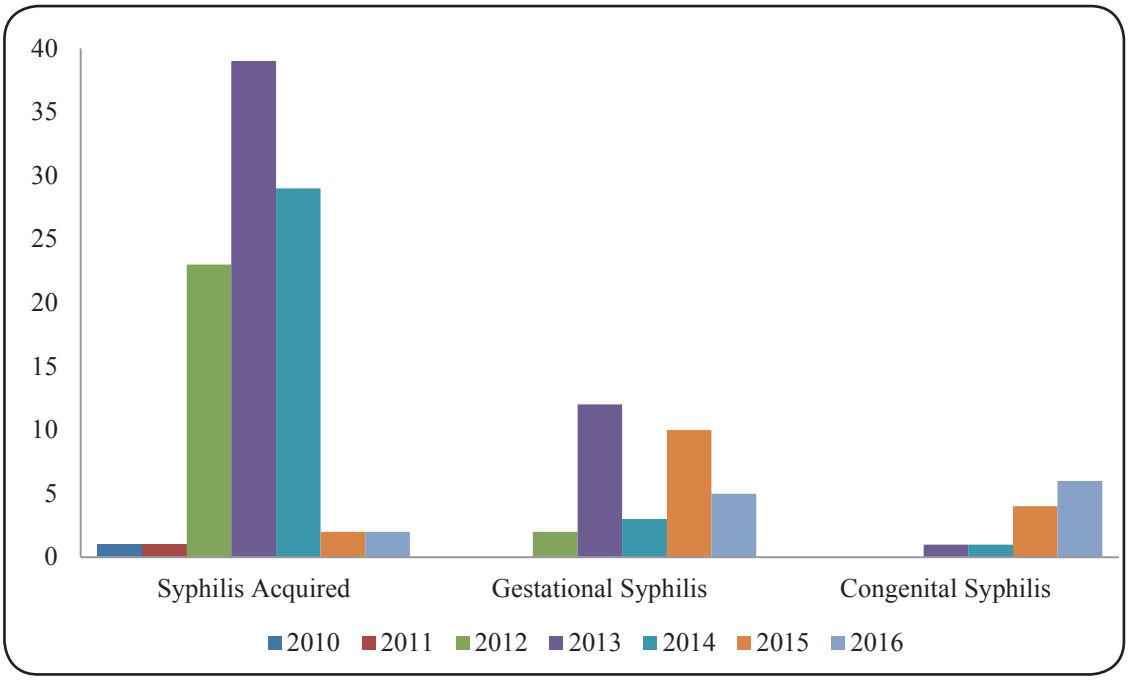


**FIGURE 1:** Number of cases of syphilis per year of reporting, Araçatuba, 2017.

benzathine penicillin G 2,400,000 IU, 2 (22.2%) were prescribed benzathine penicillin G 7,200,000 IU, 1 patient received benzathine penicillin G 4,800,000 IU, and 3 patients (33.3%) followed a different treatment regimen.

Regarding congenital syphilis, the main age range for babies was between 1 and 2 days of life, and most were female (7 babies, 58.3%). Regarding the mothers' sociodemographic characteristics, 6 (50%) were between 18 and 29 years of age and had brown skin. Two reports did not include the mothers' occupation (16.7%), and 5 of the mothers (50%) were homemakers. Regarding the mothers' level of education, only 6 reports (50%) included this information, and 3 of these mothers (50%) did not complete secondary education.

Eleven mothers (91.7%) had access to prenatal care, 8 (66.7%) of whom received a syphilis diagnosis during their prenatal care. Regarding the non-treponemal test at delivery, 10 (83.3%) had a reactive test, and in the confirmatory treponemal test at delivery, 6 (50%) had a reactive test. Regarding the treatment of pregnant women, 4 (33.3%) were classified as appropriate, 2 (50%) began treatment during pregnancy, and 2 (50%) initiated treatment 2 days after delivery. Regarding their partners, only 2 (16.7%) were treated at the same time as the women.

Regarding laboratory data on newborns, 10 (83.3%) reported that the non-treponemal test (peripheral blood) was conducted, and they were all reactive. No treponemal test 18 months after birth was registered as performed. Only 8 non-treponemal tests (cerebrospinal fluid) (66.6%) were marked as completed. Among these, 4 (50%) were non-reactive, and the others did not include the result.

Concerning the treatment regimen, 6 reports (50%) included this information; 3 (50%) were prescribed procaine penicillin G 50,000 IU/kg/day and 3 (50%) were prescribed benzathine penicillin G 50,000 IU/kg/day, for 10 days.

Syphilis is considered a worrisome public health issue, as it leads to a significant increase in the risk of infection by HIV, as the entry of HIV is easier through syphilitic lesions. For the most vulnerable populations, such as men who have sex with men, infection rates are higher. In addition, congenital syphilis is responsible for high rates of morbidity and mortality and a rate of miscarriage, fetal death, and neonatal death as high as 40%[2,3].

This study observed a predominance of syphilis in male adults, agreeing with data provided in the Epidemiological Handout, which showed the disease's prevalence among male individuals between 25 and 34 years of age[2]. However, many studies have revealed a high prevalence of syphilis among women owing to the aggravated risks it may cause in this group, such as gestational syphilis, vertical transmission, and congenital syphilis[9,10].

Mothers and their partners must be aware of the need to seek prenatal care in the first trimester of pregnancy. Rapid tests are indicated at the first prenatal appointment, which increase the chance of cure for the mother and reduce transmission of syphilis to the baby[6]. The present study demonstrated that most pregnant women did not have their partners treated, exposing the failure to eradicate the disease. Furthermore, pregnant women can be reinfected and have their treatment interrupted, which can spread the disease again. The high number of cases in this population reflects the poor quality of prenatal assistance, showing the need for capacity building and training of health professionals[11].

The present study revealed that individuals affected by syphilis presented a low education level, a fact supported by another study[10]. Individuals with little schooling usually belong to less favored social strata and have less access to health-related factors, health systems, and preventive or educational programs. Therefore, they are more vulnerable to diseases owing to nonexistent or inappropriate prenatal care during pregnancy[12].

Concerning the treatment regimen, benzathine penicillin is a safe and effective medication for treating syphilis as well as controlling the vertical transmission of the disease. Crystalline penicillin is indicated for babies with congenital syphilis. This study showed that most cases have been treated with penicillin in recent years. However, according to the Brazilian Health Surveillance Department, there has been a shortage of the drug in several countries since 2014 owing to a lack of the active ingredient for its production, which may also have contributed to the increase in the number of cases of the disease in Brazil[6].

According to the 2017 Syphilis Epidemiological Handout for Brazil and the state of Sao Paulo, the 3 types of the disease have gradually increased in recent years. Therefore, the disease has been addressed by the Brazilian Ministry of Health as an epidemic[13,14]. These data differ from those found in the present study, which indicated syphilis reoccurrence. The highest percentage for acquired syphilis was in 2013, with a great reduction of syphilis cases in the past 2 years. According to the Syphilis Detection Rate Method, used to verify the occurrence of cases in the general population, the municipality studied had a rate of 31.9 per 100,000 inhabitants[15]. Data on gestational and congenital syphilis are similar to those found in the Handout[13], in which the prevalence of gestational syphilis peaked in 2013 and 2015 and that of congenital syphilis peaked in 2016. A study conducted in Aracaju, Sergipe, also verified an increase in the number of cases[10].

In 2010, syphilis was included in the list of notifiable diseases, which may have caused the increase in the number of cases, as services that already performed diagnosis of the disease started to report the cases found to the National System of Disease Reporting (SINAN). The detection rate of acquired syphilis raised from 2.0 cases per 100,000 inhabitants in 2010 to 42.5 cases per 100,000 inhabitants in 2016. The increased incidence is allegedly owing to the higher number of reports rather than an actual increase in the number of cases. Additionally, the distribution of rapid tests for states and municipalities to detect the disease in the public health system has increased[6,13].

The absence or shortcoming of public policies on sexual education for the younger population is another disease-propagating factor. Data from the Ministry of Health show a decrease in the use of condoms in casual sexual relations in recent years[6].

The present study observed that different information was missing in many reports, supporting other studies affirming that the under-reporting of the disease could be associated with incorrect completion of reporting forms and missing information.

The main function of disease reporting is to provide a foundation to implement public health policies that promote, protect, and control the health of the population. Despite the variation in the number of syphilis cases in the last years in the municipality, the disease has constantly increased in the country. Incomplete reporting hinders the development of public policies to implement preventive strategies.

### Ethical considerations

The Ethics Committee for Research on Humans approved this research according to the standards required by Resolution 466/12 (CAAE 69466117.2.0000.5420).

**Conflict of interest:** The authors declare that there is no conflict of interest.

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