

# CUIDADO É FUNDAMENTAL

Escola de Enfermagem Alfredo Pinto – UNIRIO

RESEARCH

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## FACTORS ASSOCIATED WITH THE DIAGNOSIS OF ACQUIRED SYPHILIS IN USERS OF A TESTING AND COUNSELING CENTER

*Fatores associados ao diagnóstico da sífilis adquirida em usuários de um centro de testagem e aconselhamento*  
*Factores asociados al diagnóstico de sífilis adquirida en usuarios de un centro de pruebas y asesoramiento*

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### ABSTRACT

**Objective:** to analyze the frequency of syphilis among users of the Testing and Counseling Center in Montes Claros, Minas Gerais, and the factors associated with the infection. **Method:** this is a cross-sectional study, with descriptive and analytical components, carried out with users seen at the service between 2014 and 2019. Data were collected from a secondary source, by random and systematic sampling. **Results:** the sample consisted of 957 user forms and the frequency of cases of rapid reactive tests for syphilis was 11.3%, with similar distribution between genders. The diagnosis of syphilis was significantly associated with the variables: marital status, age, education, number of sexual partners, sexual orientation and drug use in the last year. **Conclusion:** counseling and rapid testing programs should be encouraged to prevent and reduce sexually transmitted infections in Montes Claros and across the country.

**DESCRIPTORS:** Sexually transmitted diseases; Syphilis; Prevalence; Risk factors; Cross-sectional studies.

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## RESUMO

**Objetivo:** analisar a frequência de sífilis entre os usuários do Centro de Testagem e Aconselhamento de Montes Claros, Minas Gerais, e os fatores associados à infecção. **Método:** trata-se de um estudo transversal, com componentes descritivos e analíticos, realizado com usuários atendidos no serviço entre 2014 e 2019. Os dados foram coletados de fonte secundária, por amostragem aleatória e sistemática. **Resultados:** a amostra foi composta por 957 formulários de usuários e a frequência de casos de testes rápidos reagentes para sífilis foi de 11,3%, com distribuição semelhante entre os sexos. O diagnóstico da sífilis se associou de forma significativa às variáveis: situação conjugal, idade, escolaridade, quantidade de parcerias sexuais, orientação sexual e uso de drogas no último ano. **Conclusão:** programas de aconselhamento e testagem rápida devem ser incentivados para prevenção e diminuição das infecções sexualmente transmissíveis em Montes Claros e em todo país.

**DESCRITORES:** Doenças sexualmente transmissíveis; Sífilis; Prevalência; Fatores de risco; Estudos transversais.

## RESUMEN

**Objetivo:** analizar la frecuencia de sífilis entre los usuarios del Centro de Asesoramiento y Pruebas en Montes Claros, Minas Gerais y los factores asociados a la infección. **Método:** se trata de un estudio transversal, con componentes descriptivos y analíticos, realizado con usuarios atendidos en el servicio entre 2014 y 2019. Los datos se recolectaron de una fuente secundaria, mediante muestreo aleatorio y sistemático. **Resultados:** la muestra estuvo conformada por 957 formularios de usuario y la frecuencia de casos de pruebas reactivas rápidas para sífilis fue de 11,3%, con distribución similar entre géneros. El diagnóstico de sífilis se asoció significativamente con las variables: estado civil, edad, educación, número de parejas sexuales, orientación sexual y consumo de drogas en el último año. **Conclusión:** se deben fomentar los programas de asesoramiento y pruebas rápidas para prevenir y reducir las infecciones de transmisión sexual en Montes Claros y en todo el país.

**DESCRIPTORES:** Enfermedades de transmisión sexual; Sífilis; Prevalencia; Factores de riesgo; Estudios transversales.

## INTRODUCTION

Syphilis is one of the most common sexually transmitted infections (STI) worldwide, with about 6.3 million new cases in 2016.<sup>1</sup> Its transmission occurs predominantly by unprotected sexual contact (vaginal, anal and oral sex), but can also occur by vertical transmission (mother-to-child) or, more rarely, by blood transfusion.<sup>2</sup>

When not properly treated, syphilis progresses over the years and, according to its clinical features and time of evolution, it is classified into recent (primary, secondary, recent latent) and late (late latent and tertiary) syphilis, the primary and secondary stages of infection being those with the highest risk of sexual transmission.<sup>3</sup>

Syphilis is considered a public health problem in Brazil because it is a highly prevalent disease, despite its well-defined diagnosis and treatment. Southeastern Brazil, a region that has been showing a lower number of new cases when compared to the others, showed a 12.2% increase (from 73.0 to 81.9 cases per 100,000 inhabitants) in the detection rate of acquired syphilis between the years 2017 and 2018.<sup>4</sup>

It is noteworthy that the increase in syphilis cases can currently be attributed to the improvement of the notification system for epidemiological surveillance and also to the expanded use of rapid tests by reference services, such as the Testing and Counseling Centers (CTA) and, more recently, by the Basic Health Units (BHU). Moreover, one must consider the greater sexual freedom that has occurred among young people, mainly due to the effectiveness of antiretroviral treatments for HIV/AIDS control.<sup>5</sup>

In this context, the Centers for Testing and Counseling (CTA) stand out for playing a key role in intermediation between prevention and care, in addition to contributing as a source of epidemiological information, allowing the knowledge of the characteristics of their users and the development of research in the area.<sup>6</sup>

Considering the reemerging nature of syphilis and the impact that the disease can cause on the physical, emotional and social health of individuals and, in order to contribute to the actions of prevention, diagnosis and assistance to STIs, we developed this study, which aimed to analyze the frequency of syphilis cases and the factors associated with infection among users of the Counseling and Testing Center (CTA) in the municipality of Montes Claros, Minas Gerais.

## METHODS

This is a retrospective cross-sectional study with descriptive and analytical components, conducted at the CTA of Montes Claros, a municipality located in the north of the State of Minas Gerais.

The study sample was selected from a universe of 12,556 users seen in the period from 2014 to 2019. The sampling technique used was random and systematic, considering a sampling error of 5% and a confidence level of 95%. Thus, the study sample was formed by 957 user forms (FU), which were selected in intervals of 15, obeying the order of their sequence.

The variables of interest (sex, age, race, marital status, drug use, sexual orientation, number of sexual partnerships, and con-

dom use in the last year) were extracted from the Information System of the Counseling and Testing Centers (SI-CTA), which is fed from the information recorded by the counselors during the individual counseling sessions. All FU who had records of previous treatment for syphilis were excluded from the study, as they were considered cases of serological scarring. For individuals who had more than one visit during the study period, the FU of the first visit was considered.

The data collected were typed and organized in Statistical Package for Social Sciences (SPSS) version 20 spreadsheets, where they were analyzed descriptively and inferentially. Simple and relative frequencies were used to describe the sample characteristics, and to verify the presence of association between the outcome variable "Rapid Syphilis Reactive Test" and the other variables investigated, Pearson's chi-square test was used, with a 5% significance level.

The study was approved by the Research Ethics Committee of the State University of Montes Claros (UNIMONTES) on June 1, 2017, under opinion number 2112313. At all times, the ethical precepts of the CNS Resolution no. 466/2012 were observed. Since this is an investigation that used secondary data, the Informed Consent Form (ICF) was waived by the Ethics Committee.

## RESULTS

Among the 957 forms analyzed, 108 were found with reagent results for syphilis, which resulted in a frequency of 11.3% of infection in the sample studied (95% CI 0.4-0.6).

As for the profile of users with positive results (Table 1), most were male (60.2%), single (81.5%), non-white (86.9%), with eight or more years of schooling (70.4%), and had some paid activity (58.7%). The mean age was 31.9 years, with a minimum of 15 and a maximum of 74 years, with a predominance of those younger than 25 (49.1%). The majority declared themselves as heterosexual (73.1%), had used licit and/or illicit drugs in the last year (61.1%), and had up to three sexual partners in the last year (63.9%).

The bivariate analysis (Table 2) showed that the diagnosis of syphilis was significantly associated with the following variables: marital status ( $p=0.003$ ), age ( $p=0.015$ ), education ( $p=0.011$ ), number of sexual partnerships ( $p=0.005$ ), sexual orientation ( $p=0.000$ ) and use of licit and/or illicit drugs in the last year ( $p=0.032$ ).

As for sexual behavior, it was found that the frequency of condom use in the last year and in the last sexual intercourse, regardless of the type of partnership (permanent or occasional), was not significantly associated with the diagnosis of syphilis. The number of sexual partners significantly influenced ( $p=0.005$ ) the risk of infection, since, among those users with more than three partners in the year, the frequency was more expressive (17.3%).

A significant association between syphilis and sexual orientation was also observed ( $p=0.000$ ), with a greater involvement among homosexual/bisexual users when compared to those reported as heterosexual (Table 2). It is noteworthy that in this category, 91.5% were male (data not shown).

Finally, people who had used some type of drug, licit and/or illicit, in the last year had a significantly higher frequency of reactive tests ( $p=0.032$ ) than the group that had not used drugs in the last year (Table 2).

## DISCUSSION

In this study, the frequency of syphilis found in the CTA of Montes Claros was higher than the prevalence estimated for the country's general population (0.5%) and also higher than that found in a study carried out in Teresina, Piauí, with sex workers, one of the groups considered at higher risk for STIs.<sup>7-8</sup>

We verified that the profile of users was similar to that found in a study carried out at a CTA in Fortaleza,<sup>9</sup> corroborating the hypothesis that men, singles, and younger people represent the public that seeks this service the most, possibly because they engage in more risk situations and behaviors to acquire an STI, such as syphilis.

Although women have sought testing and counseling for STIs at the CTA of Montes Claros in a smaller proportion, they were infected with syphilis in a similar way to men. Historically, women, especially those in stable relationships, have low STI risk perception. In this context, the trust placed in the partner ends up becoming their greatest source of vulnerability.<sup>10</sup> It is noted that, in Brazil, the women most affected by syphilis are younger and black, representing a large part of the cases reported in 2019.<sup>7</sup>

As a consequence of syphilis in women, vertical transmission stands out, whose national model of confrontation has proven inefficient or below expectations, presenting several failures that lead to losses to public health, represented not only by the direct sequelae of congenital transmission as well as higher incidences of abortive outcomes and perinatal deaths.<sup>11</sup>

Regardless of sex, single and younger people also showed a significantly higher rate of positivity for syphilis when compared to married people and those older than 25 years of age, thus confirming that behaviors more typical of young people and singles, such as use of alcohol and other drugs, greater frequency of unprotected sex and multiple partnerships, culminate in higher risk of STIs.<sup>12</sup>

Another current aspect that should be taken into account is the large reach of young people to social networks and dating applications that, as a practical, fast and efficient way to find sexual partners, contributes to increase the exposure of its users to risky situations.<sup>13</sup>

**Table 1** – Distribution of sociodemographic and behavioral variables of CTA users, with syphilis diagnosis from 2014 to 2019, Montes Claros, MG, Brazil, 2021, (n=108)

<b>Variables</b>	<b>n</b>	<b>%</b>
<b>Gender</b>		
Male	65	60,2%
Female	43	39,8%
<b>Age</b>		
< 25 years	53	49,1%
25 a 50 years	47	43,5%
> 50 years	8	7,4%
<b>Race</b>		
White	14	13,1%
No White	93	86,9%
<b>Education</b>		
Eight years or more	76	70,4%
Less than eight years	32	29,6%
<b>Gainful employment</b>		
Yes	57	58,8%
No	40	41,2%
<b>Marital status</b>		
Married/Stable Union	20	18,5%
Single/Separated/Widowed	88	81,5%
<b>Sexual orientation</b>		
Heterosexual	79	73,1%
Bi/Homossexual	29	26,9%
<b>Drug use in the last year</b>		
Yes	66	61,1%
No	42	38,9%
<b>Number of partners last year</b>		
Single Partner	42	38,9%
Two to three partners	27	25,0%
More than three partners	39	36,1%
<b>Condom use with fixed partner in the last year</b>		
Always	3	4,1%
Never/Regular	71	95,9%
<b>Condom use with a fixed partner at last intercourse</b>		
Yes	12	16,2%
No	62	83,8%
<b>Condom use with casual partner in the last year</b>		
Always	15	23,5%
Never/Regular	49	76,5%
<b>Condom use with casual partner at last intercourse</b>		
Yes	23	37,1%
No	39	62,9%

Source: Forms of users of CTA- Montes Claros, MG.

**Table 2** – Distribution of sociobehavioral variables according to rapid test result for syphilis in CTA users, from 2014-2019. Montes Claros, MG, Brazil, 2021, (n=957)

Analyzed Variables	Result of rapid syphilis test		P value	
	Non-reactive	Reagent		
<b>Gender</b>	Male	499 (88,5%)	65 (11,5%)	0,779
	Female	350 (89,1%)	43 (10,9%)	
<b>Marital status</b>	Married/Stable Union	274 (93,2%)	20 (6,8%)	0,003
	Single/Divorced	574 (86,7%)	88 (13,3%)	
<b>Age Group</b>	Under 25 years old	296 (84,8%)	53 (15,2%)	0,015
	25 to 50 years old	471 (90,9%)	47 (9,1%)	
	More than 50 years	82 (91,1%)	8 (8,9%)	
<b>Education in years of completed studies</b>	8 years and older	684 (90%)	76 (10%)	0,011
	Less than 8 years old	162 (83,5%)	32 (16,5%)	
<b>Gainful employment</b>	Yes	538 (90,4%)	57 (9,6%)	0,102
	No	264 (86,8%)	40 (13,2%)	
<b>Condom use in the last year (fixed partnership)</b>	Always/Most of the time	165 (93,8%)	11 (6,2%)	0,062
	No/Minority of the time	507 (88,9%)	63 (11,1%)	
<b>Condom use in the last year (casual partnership)</b>	Always/Most of the time	235 (85,8%)	39 (14,2%)	0,336
	No/Minority of the time	196 (88,7%)	25 (11,3%)	
<b>Condom use at last sexual intercourse (fixed partnership)</b>	Yes	137 (91,9%)	12 (8,1%)	0,407
	No	539 (89,7%)	62 (10,3%)	
<b>Condom use at last sexual intercourse (casual partnership)</b>	Yes	186 (89,0%)	23 (11,0%)	0,351
	No	243 (86,2%)	39 (13,8%)	
<b>Number of sexual partnerships in the last year</b>	Unique Partner	402 (90,5%)	42 (9,5%)	0,005
	2 to 3 partners	259 (90,6%)	27 (9,4%)	
	More than 3 partners	187 (82,7%)	39 (17,3%)	
<b>Sexual orientation</b>	Heterosexual	752 (90,5%)	79 (9,5%)	0,000
	Homo/Bisexual	97 (77,0%)	29 (23,0%)	
<b>Drug use in the last year</b>	Yes	426 (86,6%)	66 (13,4%)	0,032
	No	423 (91,0%)	42 (9,0%)	

Source: CTA users' forms – Montes Claros, MG

Studies have also associated syphilis infection with less favored social strata,<sup>14-15</sup> which corroborates our findings, since less education and lack of paid occupation were significantly associated with the diagnosis of syphilis in the sample studied at the CTA of Montes Claros. Thus, evidence arises that markers of social inequality such as education and income contribute to the greater vulnerability of a population with limited access to information, which compromises their ability to maintain preventive actions for their health.<sup>15-16</sup>

Understanding the behavior and sexual connections of the general population is essential to focus efforts to interrupt the chain of transmission of STIs. In this study, it was found that the frequency of condom use in the last year and during the last sexual intercourse, regardless of the type of partnership (permanent or occasional), was not significantly associated with the diagnosis of syphilis, which goes against what was expected, since condoms are still the most effective method for reducing STIs.<sup>17</sup> Thus, the

hypothesis of incorrect condom use or late infection, acquired more than a year ago, is raised.

The referred number of sexual partners showed statistical significance ( $p=0.005$ ) on the risk of syphilis infection, since, among those users with more than three partners in the year, the prevalence was more expressive (17.3%). Thus, like unprotected sex, the high number of sexual partners is also considered a behavior that increases people's vulnerability.<sup>14</sup>

A significant association between syphilis and sexual orientation was also observed ( $p=0.000$ ), with higher positivity of the tests among homosexual/bisexuals (23.0%) when compared to those who declared themselves heterosexual (9.5%). It is exposed that, generally, the population of men who have sex with men (HSH) has higher risk behavior such as anal sex, multiple sexual partners and irregular use of condoms, which culminates in higher incidence of STIs in this group.<sup>18</sup>



In this context, it is worth noting the synergistic action of syphilis with the human immunodeficiency virus (HIV), which contributes to both increased HIV transmissibility and an atypical evolution of syphilis.<sup>18</sup> Current data from the MS show an increase in reported cases of HIV in the HSH population over the past five years, which coincides with the peak period of syphilis reemergence in the country.<sup>20</sup>

However, it should be noted that the increase in the notification of syphilis in MSM populations is not exclusive to underdeveloped countries or Brazil, since since the year 2000, new diagnoses of the disease have been exponentially reported in other regions of the world, such as the United States and Eastern Europe.<sup>12</sup>

Although there is a greater risk association in sex between men, a study conducted among women who have sex with women (MSM) has shown that this population is also vulnerable,<sup>21</sup> mainly due to the lack of perception about the risk of acquiring an STI in this type of relationship, both by the women themselves and by the health professionals who attend them.

In addition, one should consider the stigma, discrimination, and social repression suffered by these groups as contributing factors that negatively influence their access to protective measures and health promotion, corroborating to increased vulnerability among both HSM and MSM.<sup>18</sup>

Another behavior generally associated with greater exposure to STI risk situations, such as not using condoms, is the use of licit and/or illicit drugs.<sup>22</sup> This association was also verified in this study, with greater significance for alcohol use (data not shown). It is noteworthy that alcohol, as a licit and easily available drug, is considered the substance most associated with risk behaviors, since it decreases the activities of the central nervous system, causing disinhibition and decreased ability to discern risks, especially among adolescents.<sup>23</sup>

Finally, it is noteworthy that this study has some limitations, such as the use of secondary data, since they are conditioned to the quality of the records. Moreover, due to the design used, it is not possible to establish a temporal and causal relationship between the diagnosis of syphilis and the other variables analyzed.

## CONCLUSION

The prevalence of syphilis in users of the Montes Claros CTA is high, much higher than that estimated for the Brazilian population. We observed a similar distribution of syphilis between genders (slightly higher among men) and a significantly higher frequency of infection among homo/bisexuals, single, young and less educated individuals. Behavioral variables such as higher number of sexual partnerships and use of licit/illicit drugs were also associated with higher risk of infection. Contrary to what was expected, the frequency of condom use in the last year and during the last sexual intercourse was not statistically significant.

Thus, we reiterate the importance of knowledge and epidemiological analysis of syphilis for the planning, evaluation, and organization of health services that can effectively impact the risk

perception of the exposed population and, therefore, contribute to the adoption of healthier behaviors and lifestyles in the context of STI prevention, such as syphilis.

To this end, it is necessary to break with the biomedical model and the fragmentation of care, which requires investments in training health professionals to include, in addition to early diagnosis and appropriate treatment, counseling as a strategy to break the chain of infection transmission. We suggest that future follow-up studies of CTA users be developed to assess the impact of counseling measures in reducing STI cases, especially syphilis in our midst.

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