DOI: 10.1590/1413-812320222712.10462022EN

Rapid tests for HIV, syphilis, and chronic hepatitis in a prison population in a prison complex in Salvador (BA), Brazil

Alice Gramosa da Silva Leite (https://orcid.org/0000-0003-3410-5727) [1]
Luanna Mota Damasceno (https://orcid.org/0000-0002-3700-4924) [1]
Suzana Coelho Conceição (https://orcid.org/0000-0002-7278-7311) [1]
Pedro Flávio Costa Motta (https://orcid.org/0000-0001-7979-7427) [1,2]

Abstract *This study aimed to quantitatively analyze the results of rapid tests for Human Immunodeficiency Virus (HIV), Syphilis, and Chronic Hepatitis in the prison population in a prison complex in Salvador (BA), Brazil. This cross-sectional study consisted of a sample of men incarcerated from August 2018 to August 2020 submitted to rapid tests. Descriptive statistics and prevalence ratios with respective 95% confidence intervals were employed to analyze data. A total of 6,160 men were studied. Most were black and brown (93.1%) and resided in Salvador (BA), Brazil (65.8%), with predominantly elementary schooling level (65.3%). Five hundred eighty-one (9.4%) people deprived of their liberty were positive for one or more STIs, and Syphilis was the most prevalent (80%). The variables age greater than 25 years [PR = 1.37 95%CI (1.17-1.61)] and schooling level without Higher Education [PR = 2.16 95%CI (1.04-4.49)] were associated with a higher positivity rate in tests, while not sharing drugs was a protective factor for test positivity [PR = 1.28 95%CI (1.07-1.53)]. We concluded that there was a low prevalence of STIs in the sample studied, and Syphilis was the most prevalent.*

Key words *Sexually transmitted infections, Prison, Public health*

[1] Faculdade de Medicina, Universidade de Salvador. Av. Luís Viana, Pituaçu - Imbuí. 41720-200 Salvador BA Brasil. alicegramosa@hotmail.com
[2] Escola Baiana de Medicina e Saúde Pública. Hospital Geral Ernesto Simões Filho. Salvador BA Brasil.

Introduction

In the modern setting, despite technological and scientific advances, sexually transmitted infections (STIs) still are a public health issue. Even with a straightforward diagnosis and accessible treatment, STIs are one of the most common causes of disease and even death worldwide, with economic and social consequences[1]. A total of 41,919 human immunodeficiency virus (HIV) cases were reported in Brazil in 2019. Records showed that 25.6% of these cases are concentrated in the Northeast region[2]. In hepatitis B cases, the Northeast ranked fourth, with the highest concentration, and third for hepatitis C cases[3]. A total of 152,915 acquired syphilis cases were reported in 2019, 15.8% of which were concentrated in the Northeast[4].

Statistical data on the prevalence and incidence of acquired immunodeficiency syndrome (AIDS) and STIs show a significant change in the infected individuals. While the infected were white people in the 1980s, with more than eight years of schooling and predominantly in the homosexual community, the infection has currently spread to blacks, the less-educated, and heterosexual population, especially the female population[5]. Moreover, the Ministry of Health classifies injecting drug users, sex workers, truck drivers, prospectors, and people deprived of liberty as individuals at risk and highly vulnerable to infection[6].

The criminal law system has been marked by significant transformations[7] throughout history. Punishment was transformed from a spectacle enjoyed in public squares to a closed punishment that follows strict rules to generate a proportionality between crime and punishment. However, these transformations did not solve the fundamental problems of these institutions. The obstacle of the lack of prison vacancies signaled the first deteriorating signs of the prisons and the consequences for its occupants. In this sense, notably, Brazil had the third-largest prison population worldwide in 2017, with about 726,354 prisoners[8].

Given the magnitude of the penitentiary institution, policies were necessary to ratify the rights of the inmates. Concerning health, Law n° 8080 of 1990, which provides for conditions of the Unified Health System (SUS), advocates that health is a citizen's right and duty of the State and must be guaranteed through the provision of universal, comprehensive, and free socioeconomic policies, which must be extended to all citizens, regardless of their condition[8]. Furthermore, this law is reiterated in the prison setting by the Criminal Enforcement Law (LEP) n° 7.210 of 1984.

The insignificant relationship between the incarcerated and the STIs requires an analysis of this population deprived of liberty and suffering in its community conditions. Because people deprived of their liberty are more susceptible to illness, its size indicates imprudence of Brazilian public health. With a vast demand in the prison public health sector, the Salvadoran backdrop requires analyzing the epidemiological profile of the incarcerated population to identify proposals for adequate health actions and policies to control these infections. Thus, this study aims to quantitatively analyze the results of rapid tests for HIV, syphilis, and chronic hepatitis in the prison population in a prison complex in Salvador (BA), Brazil.

Methods

An analytical cross-sectional study was carried out with secondary data in a consecutive sample of the prison population of the Mata Escura Penitentiary Complex in Salvador (BA). The sample included all men incarcerated from August 2018 to August 2020. We excluded those who did not perform the rapid screening tests for HIV, syphilis, and hepatitis B/C when admitted to the penitentiary complex or who did not have information about these tests taken on admission in their records.

The study's predictive variable is the population admitted to the Mata Escura Penitentiary Complex in Salvador (BA), while its outcome variable is HIV, syphilis, and chronic hepatitis. The following variables were analyzed: age, ethnicity, origin, schooling level, marital status (whether they have a partner or not), use of illicit substances (yes or no), and sharing drugs at some point (yes or no) – this last data refers to sharing syringes and pipes.

We employed electronic medical records from the Penal Observation Center (COP) to collect data based on screening performed at the entrance with rapid tests for HIV, syphilis, and hepatitis B/C. Using a standard brand of quick tests was impossible given the length of the period analyzed. Regarding the specificity and sensitivity of these rapid tests, HIV has a sensitivity rate ranging between 99.59 and 100% and specificity between 99.71 and 100%. The syphilis rapid

test has a sensitivity of 94.5% and a specificity of 93%. The hepatitis B rapid test has a sensitivity of 99.5% and a specificity of 99.4%. The rapid test for hepatitis C has a sensitivity of 99.4% and a specificity of 99.4%[10,30-32]. The data used were made available by the Sentencing Enforcement Monitoring Unit (UMEP) and the Public Prosecutor's Office of the State of Bahia (MP-BA). A previous technical partnership between MP-BA and Salvador University (UNIFACS) facilitated access to these records.

Data were tabulated and analyzed using the IBM SPSS Statistics statistical package, version 21. Simple and relative frequencies expressed qualitative variables, while median and interquartile ranges expressed quantitative ones. The sample was divided into two groups for comparison, with and without STIs. The prevalence ratio and respective 95% confidence interval were calculated to investigate factors associated with STIs. The UNIFACS Research Ethics Committee approved this research under opinion CAAE: 32073720.9.0000.5033. Furthermore, the research did not receive institutional or private funding and denies any conflict of interest.

Results

A total of 6,160 male prisoners from the Mata Escura Penitentiary Complex were studied. Table 1 shows the clinical and sociodemographic profile of the people deprived of liberty evaluated, primarily black and brown, 5,162 (93.1%), residing in Salvador, 3,968 (65.8%), with a predominantly elementary school level, 3,649 (65.3%).

Table 2 shows the distribution of inmates by presence or absence of STIs. Five hundred eighty-one inmates (9.4%) had one or more STIs. In terms of coinfections, among those incarcerated with HIV, 13 (17.1%) also tested positive for syphilis, two (2.6%) for hepatitis B (HBV), and one (1.3%) for hepatitis C (HCV). As for the coinfection of the incarcerated with syphilis, two (0.4%) also tested positive for HBV and four (0.9%) for HCV. There was no correlation between the incarcerated and HBV and HCV.

Table 3 describes the result of the bivariate analysis. The variables age older than 25 years [PR = 1.378 95%CI (1.172-1.619)], schooling without higher education [PR = 2.169 95%CI (1.046-4.494)], and not sharing drugs at some point [PR = 1,280 95%CI (1,070-1,531)] were associated with a higher positivity rate in rapid STI tests.

Table 1. Clinical and sociodemographic characteristics of the incarcerated at the Mata Escura Penitentiary Complex, Salvador (BA), Brazil, 2018 to 2020.

Characteristics	Total N = 6,160	Results
Age (years)	6,143 (99.7%)	
18-28		3,906 (63.6%)
29-39		1,558 (25.4%)
40-50		504 (8.2%)
51-61		142 (2.3%)
> 62		33 (0.5%)
Ethnicity	5,546 (90.0%)	
White		340 (6.1%)
Black		2,202 (39.7%)
Brown		2,960 (53.4%)
Yellow		21 (0.4%)
Indigenous		23 (0.4%)
City	6,031 (97.9%)	
Salvador		3,968 (65.8%)
Metropolitan region		921 (15.3%)
Inland Bahia		1,052 (17.4%)
Other		90 (1.5%)
District	3,961 (64.3%)	
Centro/Brotas		458 (11.6%)
Subúrbios/Ilha		505 (12.7%)
Cajazeiras		287 (7.2%)
Itapuã/Ipiranga		529 (13.4%)
Cidade baixa		276 (7.0%)
Barra/ Pituba		431 (10.9%)
Liberdade/São Caetano		416 (10.5%)
Cabula/Tancredo Neves		479 (12.1%)
Pau da Lima		170 (4.3%)
Valéria		124 (3.1%)
People living on the street		83 (2.1%)
Other		203 (5.1%)
Schooling	5,587 (90.7%)	
Illiterate		133 (2.4%)
Elementary school		3,649 (65.3%)
High school		1,648 (29.5%)
Higher education		157 (2.8%)
With partner	5,646 (91.7%)	2,768 (49.0%)
Used illicit drug	4,547 (73.8%)	3,627 (79.8%)
Shared drugs	4,540 (73.7%)	1,578 (34.8%)
Positivity in rapid testing	6,160 (100.0%)	
HIV		76 (1.2%)
Syphilis		465 (7.5%)
VHB		30 (0.5%)
VHC		32 (0.5%)

Source: Authors.

Table 2. Distribution of the incarcerated at the Mata Escura Penitentiary Complex, Salvador (BA), Brazil, 2018 to 2020, by presence or absence of STIs.

Characteristics	Presence of STIs	
	Yes 581 (9.4%)	No 5,579 (90.6%)
Age (years)*	27 (23-35)	25 (21-32)
Ethnicity		
White	25 (4.8%)	315 (6.3%)
Black	226 (43.5%)	1,976 (39.3%)
Brown	263 (50.7%)	2,697 (53.7%)
Yellow	1 (0.2%)	20 (0.4%)
Indigenous	4 (0.8%)	19 (0.4%)
City		
Salvador	417 (73.0%)	3,551 (65.0%)
Metropolitan region	72 (12.6%)	849 (15.5%)
Inland Bahia	76 (13.3%)	976 (17.9%)
Other	6 (1.1%)	84 (1.5%)
District		
Centro/Brotas	41 (9.8%)	417 (11.8%)
Subúrbios/Ilha	60 (14.3%)	445 (12.6%)
Cajazeiras	22 (5.3%)	265 (7.5%)
Itapuã/Ipiranga	53 (12.7%)	476 (13.4%)
Cidade baixa	40 (9.6%)	236 (6.7%)
Barra/Pituba	34 (8.1%)	397 (11.2%)
Liberdade/São	47 (11.2%)	369 (10.4%)
Caetano		
Cabula/Tancredo	55 (13.2%)	424 (12.0%)
Neves		
Pau da Lima	12 (2.9%)	158 (4.4%)
Valéria	15 (3.6%)	109 (3.0%)
People living on the	20 (4.8%)	63 (1.8%)
street		
Other	19 (4.5%)	184 (5.2%)
Schooling		
Illiterate	16 (3.0%)	117 (2.3%)
Elementary school	366 (68.8%)	3,283 (65.0%)
High school	143 (26.9%)	1,505 (29.8%)
Higher education	7 (1.3%)	150 (3.0%)
With partner	253 (47.4%)	2,515 (49.2%)
Used illicit drug	360 (80.9%)	3,267 (79.6%)
Shared drugs	180 (40.5%)	1,398 (34.1%)

Source: Authors.

Discussion

It is associated with the lack of control of STIs, the obstacle between the legislative effectiveness of guaranteeing citizenship and health to the prisoner with a setting of known diseases, tangible diagnosis, and treatment. Given this fact, there is still a negligible prevalence of STIs in the sample of the prison population. Syphilis was the most prevalent disease investigated in this study, followed by HIV and chronic hepatitis with the lowest magnitude.

Data in this study evidence that the prison sample is characterized by men aged 18-28 years, 3,906 (63.6%), ranging from 18 to 92 years. The young population[9] is predominant in Brazil's profile of people deprived of liberty. Furthermore, studies corroborate this finding, emphasizing inmates aged between two and three decades[10-17].

The population of Salvador is 80.2% black. The study's prison sample is composed of 2,202 (39.7%) blacks and 2,960 (53.4%) browns, in parallel with 340 (6.1%) whites. Thus, the dominant ethnicity in the prison environment reflects the demographic profile, as in other studies[12,14,15]. However, institutional racism, criminal selectivity, and social and economic vulnerability also support forming a black racial profile in prisons[18-20].

Regarding marital status, people deprived of liberty in this study are single without a steady partner, 2,878 (51%), in a small majority, and studies were carried out in prisons located in Rondônia, Mato Grosso do Sul, Piauí, and Rio Grande do Sul[10,12,14,15]. However, data obtained in a smaller number of studies showed that most married or single people have a steady partner[13,16]. Therefore, the fact that single men characterize the prison population in Brazil is consolidated.

Compared to a study in Mato Grosso do Sul, in which 54% of prisoners used illegal substances, the prison population in Bahia had a higher rate associated with this practice, 3,627 (79.8%)[12]. Studies revealed that only 3% of prisoners were associated[12,13] with drug sharing. However, this study reveals that 1,578 inmates (34.8%) shared pipes or syringes at some point. Although this data also refers to a modality unlinked to the risk of STI transmission, the higher percentage of illicit drug use corroborates the finding of greater drug sharing in the prison population of Salvador (BA).

This study presents an overview of people deprived of liberty vis-à-vis the STI backdrop, of which 581 (9.4%) were positive in the rapid tests. This rate confirms the analyses carried out in several studies regarding the characterization of these people as a population at risk, given a higher positivity rate than the general population[11,13,15,21,22].

Syphilis was the STI with the highest rate in the prison population of Salvador. Four hundred

Table 3. Distribution of the incarcerated at the Mata Escura Penitentiary Complex, Salvador (BA), Brazil, 2018 to 2020, by presence of STIs.

Characteristics	Presence of STIs 581 (9,4%)	PR	95% CI
Age (years)*			
< 25 years	213 (7.8%)	1.378	1.172-1.619
> 25 years	363 (10.7%)		
Ethnicity			
White	25 (7.4%)	1.291	0.877-1.899
Non-white	494 (9.5%)		
Schooling			
No higher education	525 (9.7%)	2.169	1.046-4.494
Higher Education	7 (4.5%)		
Partner			
Yes	253 (9.1%)	0.936	0.796-1.100
No	281 (9.8%)		
Using illicit substances			
Yes	360 (9.9%)	1.074	0.858-1.345
No	85 (9.2%)		
Sharing drugs			
Yes	180 (11.4%)	1.280	1.070-1.531
No	264 (8.9%)		

Source: Authors.

sixty-five inmates (7.5%) were positive in their rapid tests. Lower values for syphilis reagent results were found in analyses carried out in Rio Grande do Sul (6%), Rondônia (6% and 5.1%), and Pernambuco (3.9%)[10,11,16,17].

The panorama of syphilis in people deprived of liberty in Salvador reflects the observed increase in this pathology in Bahia. A total of 36,194 cases of acquired syphilis were recorded from 2012 to 2018, with an excessive increase of 427.6% in the number of cases[23,24]. This increase is linked to factors such as the refusal to use condoms, treatment withdrawal, non-adherence to treatment, the resistance of health professionals to the administration of penicillin in PHC, the worldwide shortage of penicillin, and the improvement of the surveillance system[25]. Strategies created by the Ministry of Health to reduce syphilis rates in Brazil have been observed in recent years, such as expanding diagnostic coverage through rapid tests[26]. However, these strategies were insufficient to contain the infection, which can be attributed to a lack of association between the identified diagnoses and disease prevention, advice, and treatment.

Regarding HIV seroprevalence, the positivity value presented was 76 (1.2%), which is similar to the values found in people deprived of liberty in Rondônia (1.1%), Piauí (1%), Pernambuco (1.2%) and Mato Grosso do Sul (1.8%)[10,12,21]. Furthermore, studies revealed higher rates, such as Rio Grande do Sul (4.9%) and Ribeirão Preto (5.7%)[11,22].

Regarding HBV infection, 30 (0.5%) people deprived of liberty had a positive result, an outcome similar to that found in the prison population of Piauí, but which disagrees with studies such as those carried out in Rio Grande do Sul and Rondônia, where the positivity rates found were respectively 2.6% and 8.7%[10,11,14]. As for HCV infection, 32 (0.5%) people deprived of liberty were positive in the rapid test. Similar rates were observed in Rondônia, 0.7%, while Rio Grande do Sul showed different results, 8.3% and 9.7%[10,11,15].

We also observed that 22 (0.4%) inmates had coinfections. Thirteen people deprived of liberty in this study (0.2%) tested positive for HIV and syphilis, with the highest correlation, as was also found in the study carried out in Rio Grande do Sul (0.9%)[11]. This relationship is based on the

greater risk of sexual transmission of HIV to those with syphilis due to the presence of ulcerated genital lesions[23].

People deprived of liberty with STIs were characterized by being brown and black, 50.7% and 43.5%, respectively, with a median of 27 years of age, in the Salvador region, 73%, with elementary education, 68.8%, without partners, 52.6%, using illicit drugs, 80.9%, but without sharing these, 59.5%. Regarding the origin, equivalent rates of positivity for STIs were found among the different municipalities and districts of Salvador (BA). We should highlight the high prevalence of positive homeless people, 24%, as already evidenced in the literature[27,28].

This study has some limitations because of its cross-sectional methodology, with secondary data obtained through a screening worksheet at the entrance door carried out by professionals from the penitentiary complex, which may have resulted in a loss of information on the variables. However, the study provides relevant information for the Salvador Prison System that allows enhancing and developing strategies for improving care for people deprived of liberty and their return to the community. It serves as an opportune place for diagnosis and treatment.

Conclusion

We conclude that the studied sample had a low prevalence of STIs. The variables age greater than 25 years and schooling level without higher education were associated with a higher rate of positivity in the rapid STI tests. On the other hand, not sharing drugs at some point was a protective factor against positivity in rapid STI tests. Syphilis was the most prevalent STI in people deprived of liberty who passed through the entrance door of the Mata Escura Penitentiary Complex. The growing number of syphilis cases in Bahia, associated with the presence of other STIs, in people deprived of their liberty reaffirms the need for screening, treatment, counseling, and preventive support at the gateway, which must be considered and evaluated as a component central to STI prevention.

Collaborations

AGS Leite and LM Damasceno: acquisition, analysis, and interpretation of data for the work; full elaboration of the work. SC Conceição and PFC Motta: substantial contributions to the conception or design of the work; critical review of intellectual content; final approval of the version to be published.

References

1. World Health Organization (WHO). *Global strategy for the prevention and control of sexually transmitted infections*: 2006-2015. Geneva: WHO; 2007.
2. Brasil. Ministério da Saúde (MS). Secretaria de Vigilância em Saúde. Departamento de Vigilância Epidemiológica. *Boletim Epidemiológico HIV/Aids 2020*. Brasília: MS; 2020.
3. Brasil. Ministério da Saúde (MS). Hepatites Virais. Secretaria de Vigilância em Saúde. Departamento Vigilância Epidemiológica. *Boletim Epidemiológico Hepatites Virais*. Brasília: MS; 2019.
4. Brasil. Ministério da Saúde (MS). Secretaria de Vigilância em Saúde. Departamento Vigilância Epidemiológica. *Boletim Epidemiológico Sífilis*. Brasília: MS; 2020.
5. Brasil. Ministério da Saúde (MS). Consulta Nacional sobre HIV/AIDS no Sistema Penitenciário. *Relatório final*. Brasília: MS; 2009;
6. Alquimim AF. Comportamento de risco para HIV em população carcerária de Montes Claros (MG). *Unimontes Científica* 2014; 16(1):48-54.
7. Santis BMD, Engbruch W. A evolução histórica do sistema prisional e a Penitenciária do Estado de São Paulo. *Rev Liberdades* 2012; 11:143-160.
8. Brasil. Ministério da Justiça e Segurança Pública. Departamento Penitenciário Nacional. *Levantamento Nacional de Informações Penitenciárias Atualização – Junho de 2017*. Brasília: Ministério da Justiça e Segurança Pública; 2017.
9. Brasil. Ministério da Justiça (MJ). Departamento Penitenciário Nacional. INFOPEN [Internet]. 2019. [acessado 2020 mar 15]. Disponível em: https://app.powerbi.com/view?r=eyJrIjoiZWI2MmJmMzYtODA2MC00YmZiLWI4M2ItNDU2ZmIyZjFjZGQ0IiwidCI6ImViMDkwNDIwLTQ0NGMtNDNmN y05MWYyLTRiOGRhNmJmZThlMSJ9
10. Negreiros DEH, Vieira D. Prevalência de hepatites B, C, sífilis e HIV em privados de liberdade – Porto Velho, Rondônia. *Rev Inter Uninovafapi* 2017; 10(1):43-52.
11. Brasil. Ministério da Saúde (MS). *Manual técnico para o diagnóstico de hepatites virais* [Internet]. Brasília: MS; 2018. [acessado 2021 nov 4]. Disponível em: https://qualitr.paginas.ufsc.br/files/2018/08/manual_tecnico_hepatites_08_2018_web.pdf.
12. Rocha TJM, Santos AM, Barbosa AB, Pimentel EC, Rodrigues MML. Avaliação de teste rápido para HIV, padronizado pelo ministério da saúde, utilizado em uma maternidade escola em Maceió-AL. *Rev Eletr Farm* 2014; 11(3):20-31.
13. Coelho HC, Oliveira SAN, Miguel JC, Oliveira MLA, Figueiredo JFC, Perdoná GC, Passos ADC. Soroprevalência da infecção pelo vírus da Hepatite B em uma prisão brasileira. *Rev Bras Epidemiol* 2009; 12(2):124-31.
14. Silva AAS, Araújo TME, Teles AS, Magalhães RLB, Andrade ELR. Prevalência de hepatite B e fatores associados em internos de sistema prisional. *Acta Paul Enferm* 2017; 30(1):66-72.
15. Rosa F, Carmeiro M, Duro LN, Valim ARM, Reuter CP, Burgos MS, Possuelo L. Resumo Prevalência de anti-HCV em uma população privada de liberdade. *Rev Assoc Med Bras* 2012; 58(5)557-560.

16. Albuquerque AC, Silva DM, Rabelo DC, Lucena WA, Lima PC, Coelho MR, Tiago GG. Soroprevalência e fatores associados ao vírus da imunodeficiência humana (HIV) e sífilis em presidiários do Estado de Pernambuco, Brasil. *Cien Saude Colet* 2014; 19(7):2125-2132.
17. Soares SCL, Spagno O, Souza C, Lima AAM, Lima EKV. Sífilis em privados de liberdade em uma unidade prisional no interior de Rondônia. *BJHR* 2019; 2(3):2195-2205.
18. Junior AO, Lima VCA. Segurança pública e racismo institucional [Internet]. 2013. [acessado 2022 out 12]. Disponível em: http://repositorio.ipea.gov.br/bitstream/11058/5931/1/BAPI_n04_p21-26_RD_Seguranca-publica-racismo_Diest_2013-out.pdf
19. Lima RS. Atributos raciais no funcionamento do Sistema de Justiça Criminal Paulista. *São Paulo Perspect* 2004; 18(1):60-65.
20. Sinhoretto J, Morais DS. Violência e racismo: novas faces de uma afinidade reiterada. *Rev Estud Sociales* 2017; 64:15-26.
21. Sousa KAA, Araújo TME, Teles AS, Rangel EML, Nery IS. Fatores associados à prevalência do vírus da imunodeficiência humana em população privada de liberdade. *Rev Esc Enferm USP* 2017; 51:e03274.
22. Coelho HC, Perdoná GC, Neves FR, Passos AD. HIV prevalence and risk factors in a Brazilian penitentiary. *Cad Saude Publica* 2007; 23(9):2197-2204.
23. Brasil. Ministério da Saúde (MS). Secretaria da Saúde do Governo. *Boletim Epidemiológico de Sífilis*. Brasília: MS; 2019.
24. Marques V. Aumento da sífilis no Brasil e a importância do teste rápido. *Rev Oswaldo Cruz* 2019; 6(23). [acessado 2020 nov 4]. Disponível em: http://revista.oswaldocruz.br/Content/pdf/Edicao_23_VICTORIA_MARQUES.pdf
25. Brasil. Ministério da Saúde (MS). Secretaria de Vigilância em Saúde. Departamento de DST, AIDS e Hepatites Virais. *Boletim Epidemiológico de Sífilis*. Brasília: MS; 2017.
26. Brasil. Ministério da Saúde (MS). Secretaria de Vigilância em Saúde. Departamento de Vigilância, Prevenção e Controle das Infecções Sexualmente Transmissíveis, do HIV/Aids e das Hepatites Virais. *Agenda de ações estratégicas para redução da sífilis no Brasil*. Brasília: MS; 2017.
27. Silva THS, Calisto MM, Carvalho ACM, Magalhães HJC, Monteiro-Neto V, Ribeiro EEC, Sousa MMF, Pereira DMS, Monteiro SG. Prevalência das hepatites B e C em moradores de rua em São Luís-MA. *Rev Investig Biomédica* 2018; 10(3):219-226.
28. Grangeiro A, Holcman MM, Onaga ET, Alencar HDR, Placco ALN, Teixeira PR. Prevalência e vulnerabilidade à infecção pelo HIV de moradores de rua em São Paulo, SP. *Rev Saude Publica* 2012; 46(4):674-684.

Article submitted 25/11/2021
Approved 30/06/2022
Final version submitted 02/07/2022

Chief editors: Maria Cecília de Souza Minayo, Romeu Gomes, Antônio Augusto Moura da Silva