

Epidemiological Review of Syphilis in the Americas

December 2021

Epidemiological Review of Syphilis in the Americas

December 2021

Epidemiological Review of Syphilis in the Americas, December 2021

PAHO/CDE/HT/22-0009

© **Pan American Health Organization, 2022**

Some rights reserved. This work is available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO license (CC BY-NC-SA 3.0 IGO); <https://creativecommons.org/licenses/by-nc-sa/3.0/igo>.

Under the terms of this license, this work may be copied, redistributed, and adapted for non-commercial purposes, provided the new work is issued using the same or equivalent Creative Commons license and it is appropriately cited. In any use of this work, there should be no suggestion that the Pan American Health Organization (PAHO) endorses any specific organization, product, or service. Use of the PAHO logo is not permitted.

All reasonable precautions have been taken by PAHO to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall PAHO be liable for damages arising from its use.

TABLE OF CONTENTS

Acknowledgments	vii
Abbreviations	viii
Executive Summary	xi
1. Introduction	1
2. Methods	1
3. Overview of Syphilis in the Region	2
4. Syphilis among Pregnant Women and Congenital Syphilis	4
4.1 Reported Congenital Syphilis Cases	10
5. Syphilis in Specific Populations	12
5.1 Syphilis among Men Who Have Sex with Men	14
5.2 Syphilis among Sex Workers	17
Conclusions	20
References	21
Annex	25

LIST OF FIGURES

Figure 1. Estimates of syphilis prevalence (%) by WHO region, 2016	2
Figure 2. Estimated syphilis incidence rates ('000) by WHO region, 2016	3
Figure 3. Syphilis prevalence estimates for adult women, 2016	4
Figure 4. Syphilis trend estimates in adult women, Region of the Americas, 2012–2016	5
Figure 5. Reported syphilis seropositivity among pregnant women in Latin America and the Caribbean, 2015 and 2017–2020	6
Figure 6. Acquired syphilis rate (per 100,000 population), syphilis rate in pregnant women, and congenital syphilis incidence rate (per 1,000 live births), by year of diagnosis, Brazil, 2010–2020	7
Figure 7. Reported number of pregnant women screened for syphilis in selected countries in Latin America and the Caribbean, 2015 and 2017–2020	8
Figure 8. Percentage of pregnant women who have access to prenatal care and were screened for syphilis, and the percentage of syphilis-positive pregnant women appropriately treated, Latin America and the Caribbean, 2011–2020	9
Figure 9. Number and incidence rate of congenital syphilis cases per 1,000 live births in the Americas, 2009–2020	11
Figure 10. Number and incidence rate of congenital syphilis cases per 1,000 live births in the Region of the Americas, excluding Brazil, 2015–2020	11
Figure 11. Data from eight studies on prevalence of active syphilis in Indigenous peoples and Afro-descendants versus benchmark proxy, Latin America, 2007–2014	13
Figure 12. Primary and secondary syphilis, rates of reported cases by race/Hispanic ethnicity, United States, 2015–2019	13
Figure 13. Map of syphilis prevalence estimates among men who have sex with men, by country	14

Figure 14. Percentage of men who have sex with men with active syphilis, for countries that reported at least twice in the last five years, the Americas 16

Figure 15. Primary and secondary syphilis, reported cases by sex and sex of sex partners, United States, 31 states,* 2015–2019 17

Figure 16. Percentage of reported sex workers with active syphilis, countries that reported at least twice in the last five years, Region of the Americas 19

LIST OF TABLES

Table 1. Reported type of syphilis test used to define positivity in pregnant women in Latin America and the Caribbean, 2016–2020 10

Table 2. Prevalence of syphilis among men who have sex with men in Latin America from a global systematic review and meta-analysis, 2000–2020 15

Table 3. Reported syphilis seropositivity among men who have sex with men, the Americas 15

Table 4. Reported syphilis seropositivity among sex workers, the Americas, last year reported 18

Table 5. Syphilis seropositivity among sex workers, disaggregated by male, female, and transgender, for reporting countries in Latin America and the Caribbean, 2016–2020 19

Table A 1. Reported prevalence of syphilis among men who have sex with men and among sex workers, the Americas, last year reported 25

Acknowledgments

The Pan American Health Organization (PAHO) is grateful to the following persons who contributed to this report.

Mónica Alonso González (Advisor, Strategic Information for HIV/STI, TB and Viral Hepatitis, PAHO) and Fernanda Fernandes Fonseca (PAHO Consultant) were responsible for the planning and production of the report.

Ruben Mayorga, Bernardo Nuche, Hortencia Peralta, and Leandro Sereno were part of the PAHO team that provided meaningful inputs or conducted a technical review of the document.

Abbreviations

CDC	U.S. Centers for Disease Control and Prevention
CS	congenital syphilis
EMTCT	elimination of mother-to-child transmission
GAM	Global AIDS Monitoring
HIV	human immunodeficiency virus
MSM	men who have sex with men
PAHO	Pan American Health Organization
RDS	respondent-driven sampling
SINAN	Notifiable Diseases Information System (Brazil)
STI	sexually transmitted infection
SW	sex workers
UNAIDS	Joint United Nations Programme on HIV/AIDS
WHO	World Health Organization

Executive Summary

At the 69th World Health Assembly in 2016, a commitment was made to reduce syphilis incidence by 90% globally between 2018 and 2030, and to reduce the incidence of congenital syphilis to less than 50 cases per 100,000 live births by 2030. The World Health Organization (WHO) published the Global Health Sector Strategy on Sexually Transmitted Infections 2016–2021 and set out global targets for ending the sexually transmitted infections epidemic as a public health problem. To promote progress toward syphilis and congenital syphilis elimination in the Americas, the Pan American Health Organization presents this document, which aims to review highlights of the epidemiological situation of syphilis in the Americas. The main findings are as follows:

- The estimated syphilis prevalence in the WHO Region of the Americas increased between 2012 and 2016 in both men and women, while the estimated global prevalence was stable in the same period. Based on 2016 values, there are an estimated 4,600,000 persons with syphilis in the Americas. According to this last estimate, the Region of the Americas had the highest incidence rate for syphilis in both women and men—5.3 per 1,000 in both men and women—which equates to more than 3 million incident cases. Similarly, estimates for maternal syphilis and congenital syphilis show an increasing trend in the Americas from 2012 to 2016.
- Almost half of the countries (45%) that reported data on pregnant women screened for syphilis showed increasing syphilis seropositivity over the last two years.
- In 2019–2020, combined reported syphilis seropositivity was greater than 1% in Argentina, Bahamas, Colombia, Cuba, Haiti, Jamaica, Panama, Paraguay, Saint Lucia, Uruguay, and Venezuela. Dominica reported 1.4% in 2020.
- There is a downward trend in syphilis screening among pregnant women in Latin America and the Caribbean since 2016. The decrease comes at the expense primarily of Latin America, where coverage of syphilis screening among pregnant women was 59% in 2020, while the Caribbean region maintained higher syphilis screening coverage, reaching 95% in 2020.
- A systematic review collecting data from 2000 to 2020 showed that Latin America and the Caribbean presents some of the highest estimates of syphilis among men who have sex with men (MSM) in the world, and syphilis prevalence among MSM appears to be increasing throughout the Americas. Corroborating this finding, based on Global AIDS Monitoring data reported by countries of the Americas, 60% of countries reported a seropositivity rate among MSM higher than 10%.
- Syphilis seropositivity among sex workers in the 18 countries that reported to Global AIDS Monitoring in 2021 ranged from zero in Antigua and Barbuda and Barbados to 8.5% in Paraguay. Among 6 of these countries the syphilis prevalence was higher than 5%. Reported data indicate that male and transgender sex workers seem to be disproportionately affected by syphilis in the Region.

1. INTRODUCTION

Syphilis is a curable sexually transmitted infection (STI) caused by *Treponema pallidum*, a motile Gram-negative spirochaete. Syphilis can cause neurological, cardiovascular, and dermatological disease in adults, and stillbirth, neonatal death, premature delivery, or severe disability in infants (1, 2). Syphilis is also implicated in increasing the risk of human immunodeficiency virus (HIV) acquisition and transmission (3, 4). Despite being a treatable disease, several challenges continue to affect global control efforts, due to the natural history of the disease (with a long latent infection stage), testing algorithms that need to be interpreted in the context of clinical history, examination, and any past record of treatment (5), as well as access to health services and stigma and discrimination toward vulnerable and higher burden populations.

At the 69th World Health Assembly in 2016, a commitment was made to reduce syphilis incidence by 90% globally between 2018 and 2030, and to reduce the incidence of congenital syphilis to less than 50 cases per 100,000 live births by 2030. The World Health Organization (WHO) published the Global Health Sector Strategy on Sexually Transmitted Infections 2016–2021 and set up global targets for ending the STI epidemic as a public health problem (6).

WHO routinely produces global estimates of curable STIs among men and women to provide policymakers and program managers with evidence that can be used to tailor interventions and to enhance program monitoring and evaluation. Global prevalence and incidence estimates of syphilis for 2016 were published in 2019 (7–9). The global prevalence estimate in both men and women was 0.5% (95% uncertainty interval [UI] [0.4, 0.6]), with regional values ranging from 0.1% to 1.6%, corresponding to 19.9 million cases of syphilis in the world and 6.3 million (95% UI [5.5 million, 7.1 million]) new syphilis cases in women and men aged 15–49 years in 2016.

To promote progress toward syphilis and congenital syphilis elimination in the WHO Region of the Americas, the Pan American Health Organization (PAHO) presents this review of the epidemiological situation of syphilis in the Americas. It aims to inform public health policies and promote discussion between PAHO and governments, civil society, and other stakeholders, presenting relevant information on syphilis among adults (pregnant women, key populations, and general population), and screening, diagnosis, and treatment responses in the Region.

2. METHODS

A scoping review was conducted on the epidemiological situation of syphilis in countries of the Americas. The following sources of data were used:

1. Global AIDS Monitoring (GAM) data (last accessed in September 2021)—mainly country reports on the indicators of active syphilis among men who have sex with men (MSM), sex workers,¹ and pregnant

women, and congenital syphilis case reports.

1. National surveillance reports published by the ministries of health.
2. Country reports on the elimination of mother-to-child transmission of HIV and congenital syphilis.
3. PubMed search for studies from the last five years, using: "syphilis" Latin America/Americas/Caribbean, including systematic reviews.

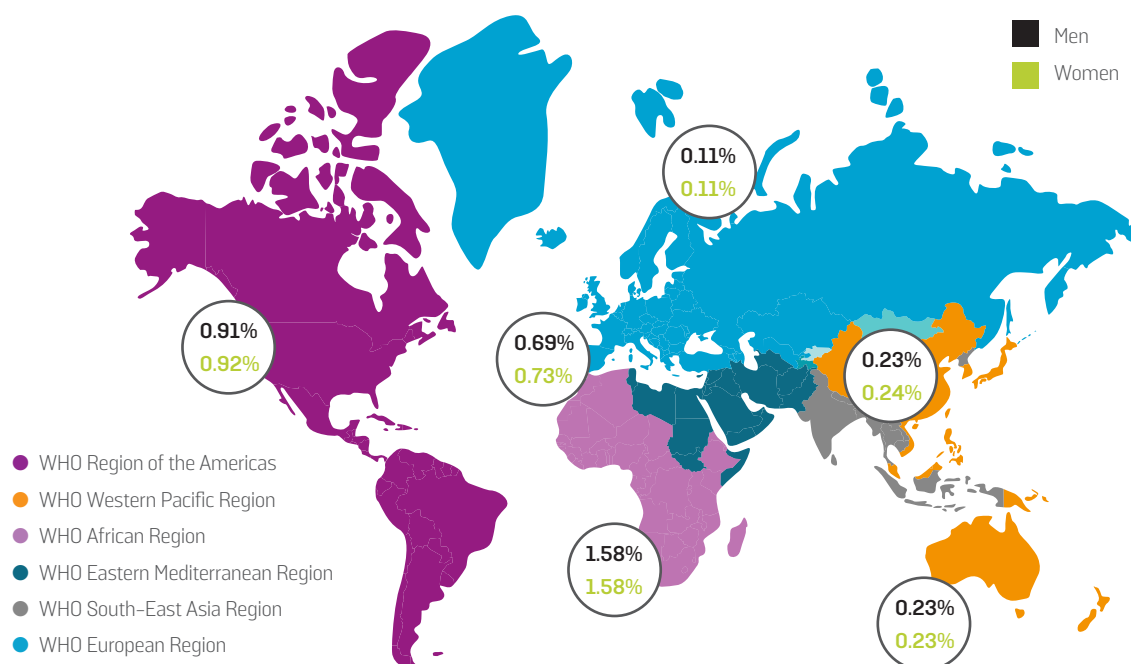
¹ The GAM definition of probable active syphilis was defined as concurrent positive serology on both nontreponemal and treponemal assays per the WHO/UNAIDS definitions (<https://www.unaids.org/en/global-aids-monitoring>).

3. OVERVIEW OF SYPHILIS IN THE REGION

While studies show that syphilis prevalence has been declining globally over the past three decades (7, 10), when analyzed by WHO region, the Region of the Americas shows increases from 0.70%, 95% UI (0.60–0.70), among women in 2012 to 0.92% (0.72, 1.12) (7,8) in 2016; and 0.7% (0.5, 0.8) to 0.91% (0.66, 1.16) among men in 2012 and 2016, respectively. For 2016, this represents 4,660,000 persons with syphilis in the Region (7, 11) (Figure 1). Latin America and the Caribbean has higher syphilis prevalence estimates, at 1.3% for men and women. Furthermore, the Region of the Americas had the highest incidence rate for syphilis in both women and men among the WHO regions, at 5.3 per 1,000 in both men and women, which equates to more than 3 million incident cases (11, 12) (Figure 2). In contrast, a global pooled analysis of syphilis prevalence indicates decreasing prevalence levels from 1990 to 2016, with an adjusted odds ratio of 0.92% for the Region of the Americas, but these figures are based on available pooled datasets. The updated WHO estimates for 2020 show increasing prevalence values.

These estimates show a similar or slightly lower estimated prevalence of syphilis for men compared with women (0.91% for men and 0.92% for women) in the Region of the Americas, as well as for the estimated syphilis incidence (3.9% among men and 4.0% among women). The WHO prevalence estimates of syphilis among adult women were based on syphilis maternal prevalence (8, 9) adding up a 10% to account for the higher burden among key populations. The prevalence estimates among adult men were obtained assuming an prevalence men to women ratio of 1.0 (7). These estimates should be interpreted with caution, as syphilis prevalence among key populations has shown to vary by sex, with a seemingly greater burden of disease among MSM, and there could be differences in access to health services between MSM and female sex workers.

Figure 1.
Estimates of syphilis prevalence (%) by WHO region, 2016

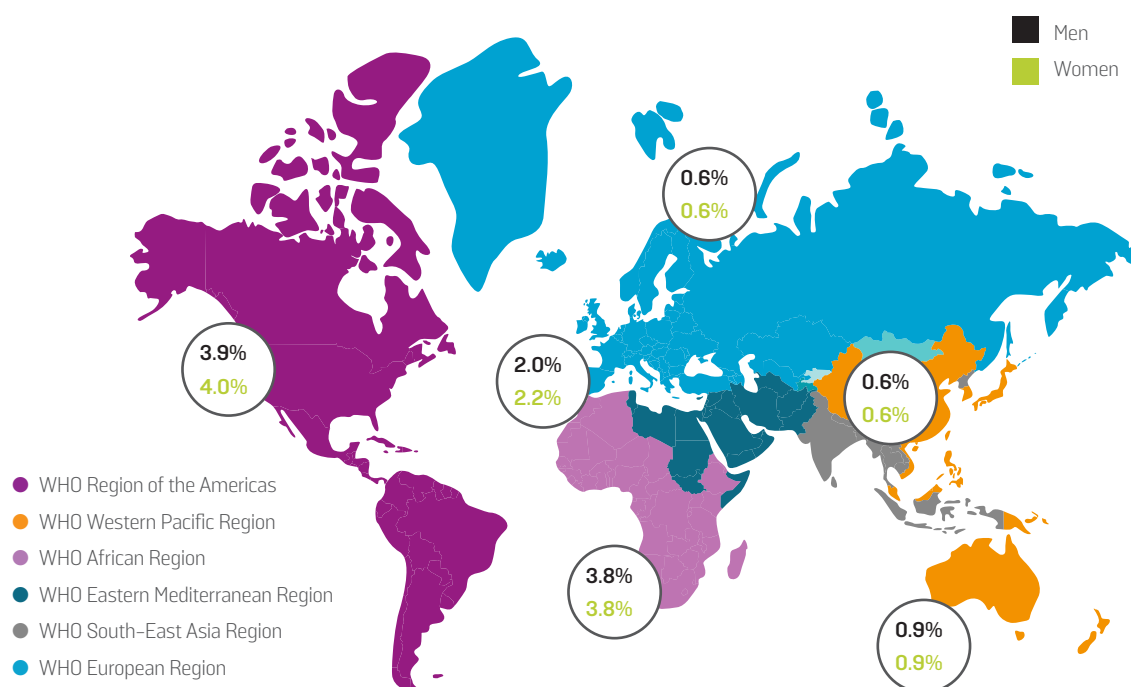


Note: Adults age 15–49 years.

Sources: Rowley J, Vander Hoorn S, Korenromp E, Low N, Unemo M, Abu-Raddad LJ, et al. Chlamydia, gonorrhoea, trichomoniasis and syphilis: global prevalence and incidence estimates, 2016. *Bull World Health Organ.* 2019;97(8):548–562P.

World Health Organization. Global estimates of 4 curable STIs and maternal and congenital syphilis, 2016. Geneva: WHO; 2019. Accessed 2021, Oct 9.

Figure 2.
Estimated syphilis incidence rates ('000) by WHO region, 2016



Note: Adults age 15–49 years.

Sources: Rowley J, Vander Hoorn S, Korenromp E, Low N, Unemo M, Abu-Raddad LJ, et al. Chlamydia, gonorrhoea, trichomoniasis and syphilis: global prevalence and incidence estimates, 2016. *Bull World Health Organ.* 2019;97(8):548–562P.

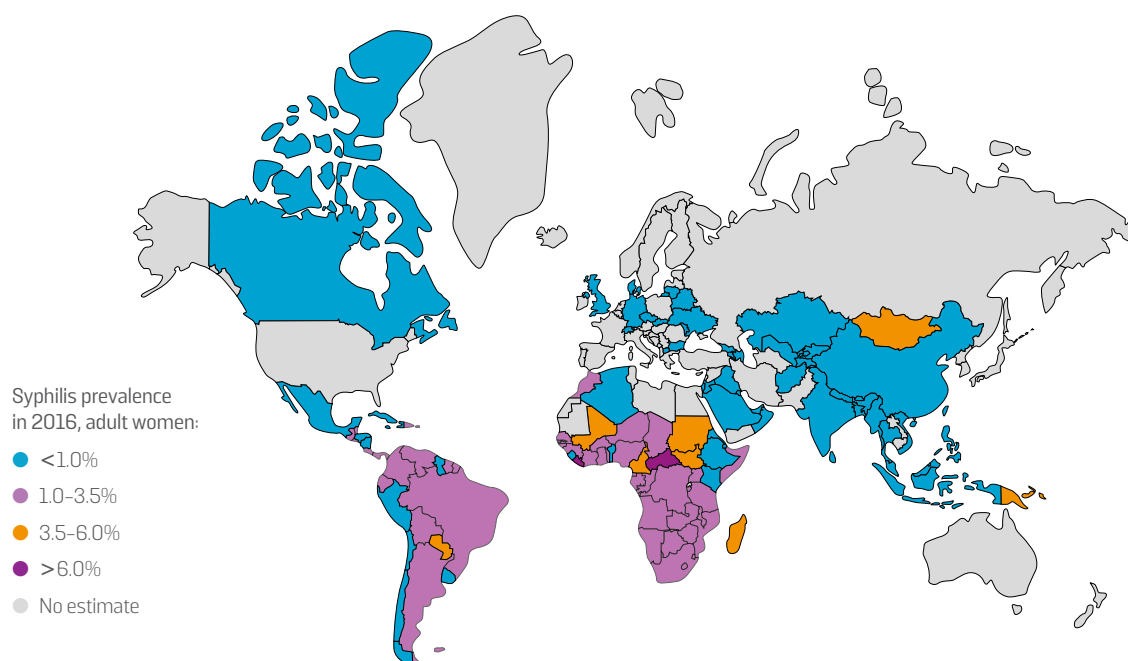
World Health Organization. Global estimates of 4 curable STIs and maternal and congenital syphilis, 2016. Geneva: WHO; 2019. Accessed 2021, Oct 9.

4. SYPHILIS AMONG PREGNANT WOMEN AND CONGENITAL SYPHILIS

In 2007, WHO launched the global initiative to eliminate mother-to-child transmission of syphilis (congenital syphilis, or CS) (13). To assess progress toward the goal of <50 congenital syphilis cases per 100,000 live births, WHO supported the development in 2019 of regional and global estimates of maternal and congenital syphilis for 2016 and updated the 2012 estimates (8, 9). **Figures 3 and 4** show the estimated prevalence in adult women for 2016 and the trend compared with 2012. This estimation

process (8) identified that the estimated maternal syphilis prevalence in the Region of the Americas had increased between 2012 and 2016, from 0.64%, 95% UI (0.56, 0.71), to 0.86% (0.76, 1.03). To achieve the elimination of congenital syphilis and assuming the compliance with programmatic targets established by the elimination initiative (95% testing and treatment among pregnant women), the prevalence of maternal syphilis cannot be greater than 0.5 or 0.6%.

Figure 3.
Syphilis prevalence estimates for adult women, 2016



Note: Estimates using Spectrum STI, Avenir Health; n = 132 countries. Adult women: 15–49 years.

Sources: Korenromp EL, Mahiané SG, Nagelkerke N, Taylor MM, Williams R, Chico RM, et al. Syphilis prevalence trends in adult women in 132 countries – estimations using the Spectrum Sexually Transmitted Infections model. *Sci Rep.* 2018;8(1):11503.

World Health Organization. Global estimates of 4 curable STIs and maternal and congenital syphilis, 2016. Geneva: WHO; 2019. Accessed 2021, Oct 9.

Figure 4.
Syphilis trend estimates in adult women, Region of the Americas, 2012–2016



Note: Estimates using Spectrum STI, Avenir Health; $n = 132$ countries. Adult women: 15–49 years.

Sources: Korenromp EL, Mahiané SG, Nagelkerke N, Taylor MM, Williams R, Chico RM, et al. Syphilis prevalence trends in adult women in 132 countries – estimations using the Spectrum Sexually Transmitted Infections model. *Sci Rep.* 2018;8(1):11503.

World Health Organization. Global estimates of 4 curable STIs and maternal and congenital syphilis, 2016. Geneva: WHO; 2019. Accessed 2021, Oct 9.

A multicountry study in 2015 (14) found that few of the included Latin American and Caribbean countries used a rapid syphilis test, but most of them did have benzathine penicillin available in primary care facilities. The study authors stated that most of the countries had national strategies and protocols for eliminating congenital syphilis. Poor follow-up of maternal syphilis cases and their sexual contacts was also reported. Since this study, the Region of the Americas has expanded the use of rapid tests, and updated studies are needed to assess availability and use of these tools. As for the dual HIV and syphilis rapid test, countries reported in 2020² that it was already in use in seven countries (Colombia, Guyana, Mexico, Paraguay, Peru, Uruguay, and Venezuela),

and nine countries have planned its future adoption (Barbados, Brazil, Canada, El Salvador, Guatemala, Honduras, Nicaragua, Saint Kitts and Nevis, and Trinidad and Tobago), while nine countries had no plan to adopt the dual HIV/syphilis rapid test (Argentina, Bahamas, Bolivia, Chile, Costa Rica, Dominican Republic, Haiti, Panama, and Saint Lucia).

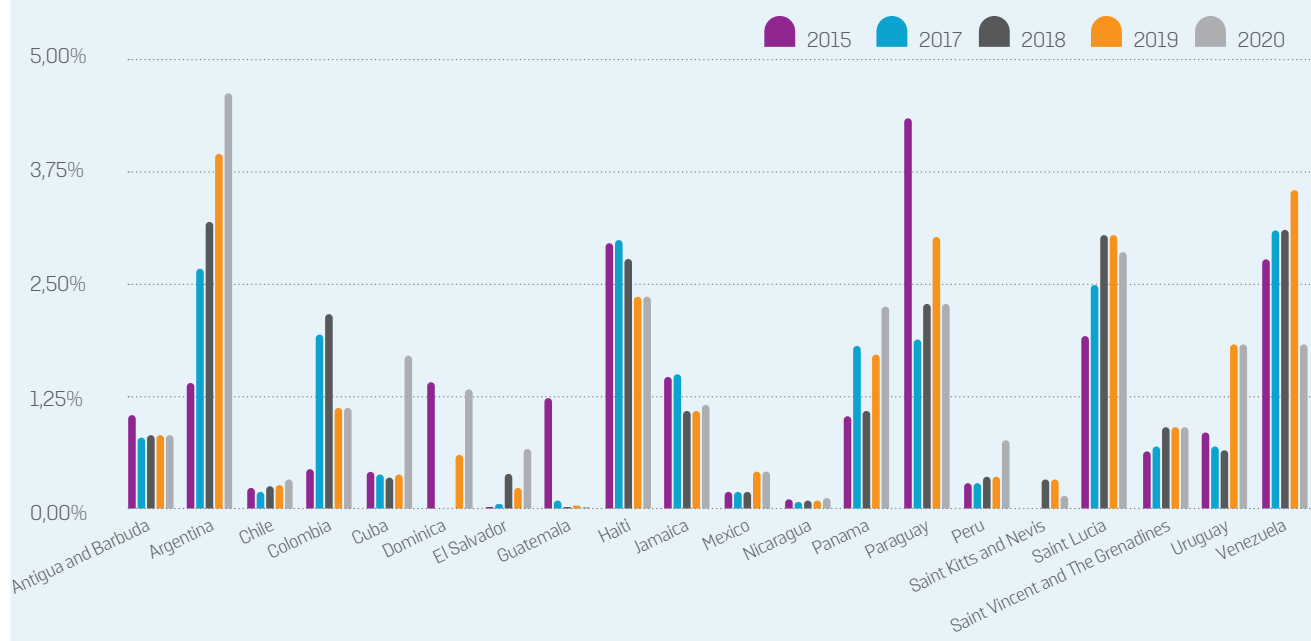
The reported seropositivity of syphilis among pregnant women in 2020 varied from zero in a few small Caribbean countries to 2.86% in Saint Lucia and 4.63% in Argentina. In 2020, 20 countries reported data on pregnant women screened for syphilis and the number of pregnant women with a positive syphilis test among them. Considering countries

² There was no information from Anguilla, Antigua and Barbuda, Belize, Cuba, Dominica, Ecuador, Grenada, Jamaica, Saint Vincent and the Grenadines, Suriname, and United States of America.

that have reported data in at least three of the last five years,³ it was possible to present the historical trend of the reported syphilis seropositivity among pregnant women (Figure 5). Anguilla (0%), Cayman Islands (0%), and Nicaragua (0.1%) have maintained very low and stable reported seropositivity over the last five years and are not shown in the charts below. For 2020, Argentina reported the highest syphilis seropositivity among pregnant women (4.6%), consistently increasing in recent years; as in Panama, which reached 2.3% in 2020, after a decrease to 1.1% in 2018. In Venezuela, the reported seropositivity had also been consistently increasing, reaching 3.55% in 2019, when there was a drop both in the reported seropositivity (1.6%) and in the number of pregnant women tested in 2020.⁴

Cuba had an increase in the prevalence of syphilis among pregnant women, which went from around 0.40% in recent years (2015–2019) to 1.7% in 2020. The same pattern is observed in the data reported from Dominica, 0% in 2017 and 2018 to 0.6% in 2019 and 1.4% in 2020; El Salvador, from 0.24% in 2019 to 0.70% in 2020; Peru, from 0.36% in 2019 to 0.80% in 2020; and in Uruguay, from 0.66% in 2018 to 1.84% in 2019. Decreasing values were observed in Colombia, Haiti, and Jamaica. In this analysis, almost half of the countries (45%) that reported data on screening pregnant women for syphilis reported an increase in syphilis seropositivity for the previous three to five years.

Figure 5.
Reported syphilis seropositivity among pregnant women in Latin America and the Caribbean, 2015 and 2017–2020



Note: Anguilla (0%) and the Cayman Islands (0%) were excluded from the graph for having very low prevalence.

Source: UNAIDS and WHO. 2021 Global AIDS Monitoring Online Reporting Tool. EMTCT country reports submitted to PAHO.

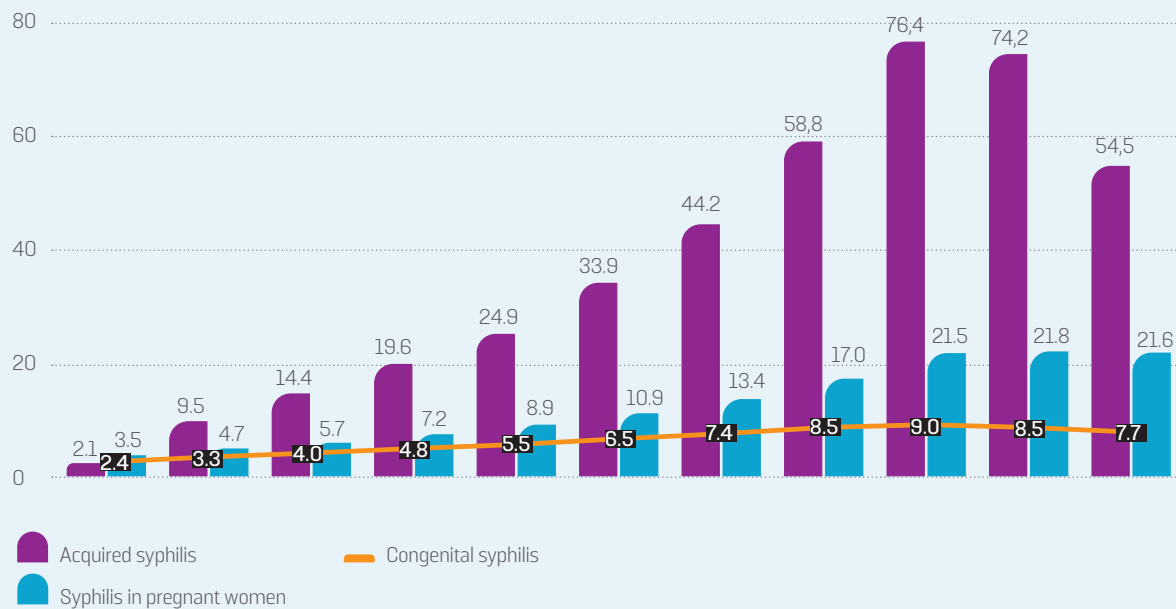
Brazil accounts for most of the reported congenital syphilis in the Americas. In 2020, 115,371 cases of acquired syphilis (54.5 cases per 100,000 population) were reported in the Brazilian Notifiable Diseases Information System (SINAN), 61,441 cases of syphilis in pregnant women (21.6 per 1,000 live births), and 22,065 cases of congenital syphilis (an incidence rate of 7.7 per 1,000 live births) (15) (Figure 6).

³ In 2019 and 2018 there were 24 reporting countries, and in 2017 there were 25 countries. In 2015 there were 31, while only 12 reported in 2016. In this way, a historical line of the last five years was constructed for the countries that have reported data with greater consistency, excluding countries that had more than two years without reporting in the period, and excluding the year 2016. With these criteria, there were 22 countries and territories: 7 from Latin America (Argentina, Chile, Colombia, Paraguay, Peru, Uruguay, and Venezuela), 14 from the Caribbean region (Anguilla, Antigua and Barbuda, Cayman Islands, Cuba, Dominica, El Salvador, Guatemala, Haiti, Jamaica, Nicaragua, Panama, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines), and one from Northern America (Mexico).

⁴ For Venezuela this represented a reduction, from more than 120,000 pregnant women tested in 2018 and 2019, to 81,269 in 2019, and 55,960 in 2020—a 67% and 46% reduction, respectively.

Figure 6.

Acquired syphilis rate (per 100,000 population), syphilis rate in pregnant women, and congenital syphilis incidence rate (per 1,000 live births), by year of diagnosis, Brazil, 2010–2020



Sources: Notifiable Diseases Information System (SINAN), updated on 30 June 2021.

In Brazil, in 2020, compared with 2019, there was a reduction in all rates: 26.6% in the rate of acquired syphilis diagnosis; 9.4% in the incidence rate of congenital syphilis; and 1% in the rate of syphilis diagnosis in pregnant women. According to the Ministry of Health of Brazil, the decline in the number of cases may also result from an underreporting of cases in the Information System for Notifiable Diseases (SINAN), due to local redeployment of health professionals to the COVID-19 pandemic (15).

Regarding treatment among pregnant women in Brazil, in 2020, 90% of the prescriptions were for benzathine penicillin (at least one dose) and 1.2% referred to other regimens. In 5.3% of the cases there was no treatment and in 3.6% there was no information about the treatment. As for the laboratory data on pregnant women with syphilis, in the last 10 years, there has been a reduction in the proportion of cases notified only with a non-treponemal reactive test—from 49.3% of cases in 2010 to 15.0% in 2020; as well as an increase in the proportion of cases notified with two reactive tests (treponemal and non-treponemal)—from 41.6% of cases in 2010 to 57.5% of cases in 2020 (15).

Brazil's epidemiological report indicates that there are more reported syphilis cases among women, mainly Black women and young women aged 20–29 years. In the comparison by sex, in 2020, 28.0% of the total number of reported cases were among women aged 20–29 years, compared with only 16.8% among men of the same age group. Assessing the race and ethnicity data of reported syphilis cases among pregnant women, in 2020, 64.7% of pregnant women with syphilis were Black, and this proportion is increasing, while syphilis among White women is decreasing. The last available demographic census from 2019 reported 56.2% of the Brazilian population as Black. Regarding the race of the mothers of children with congenital syphilis, most (67%) were Black (15). This same pattern is seen in the distribution of acquired syphilis by race and ethnicity.

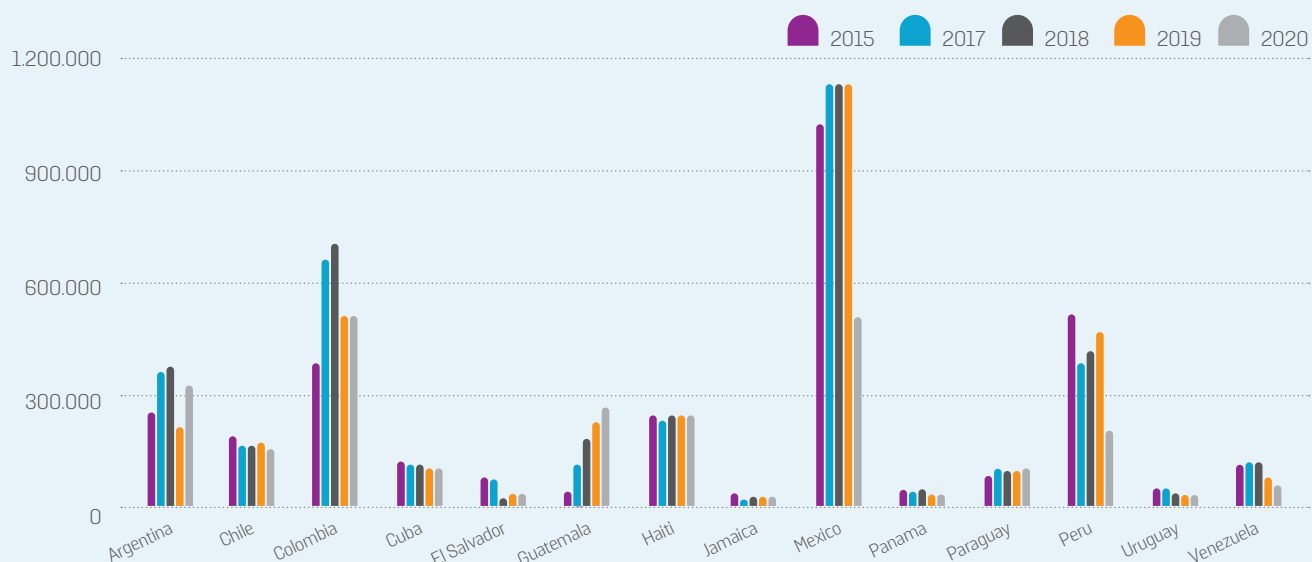
Based on reported country data, there has been a downward trend in syphilis screening among pregnant women in Latin America and the Caribbean since 2016: from 74% in 2016 to 70% in 2017, 60% in 2018, reaching 71% in 2019, and returning to 62% in 2020 (16) (Figure 7). This decrease is primarily in

Latin America, where coverage of syphilis screening among pregnant women fell to 57% in 2018, and despite a rise to 69% in 2019, decreased again to 59% in 2020; whereas the Caribbean region maintained higher syphilis screening coverage, reaching 95% in 2019 and 2020. The reduction in 2020 compared with 2018 was mainly related to decreases in Mexico (from around 50% in previous years to 31.6% in 2020), Ecuador (from 78.1% in 2019 to 11% in 2020), Peru (from around 94% in 2018 and 2019 to 57.2% in 2020), and Venezuela

(Figure 7). In the Caribbean, Dominica reported a testing coverage of 80.3% in 2020, compared with 100% coverage in 2018 and 2019. In contrast, data show an increase of syphilis screening among pregnant women in 2020 compared with 2018 and 2019 in Colombia (from 42.4% in 2018 to 74.1% in 2019 and 80.8% in 2020), Guatemala (from 51.4% in 2019 to 64.2% in 2020), Nicaragua (from 74.2% in 2018 to 88.2% in 2019 and 90.2% in 2020), Bahamas (98.0% in 2020), and Jamaica (99.0% in 2020).

Figure 7.

Reported number of pregnant women screened for syphilis in selected countries in Latin America and the Caribbean, 2015 and 2017–2020



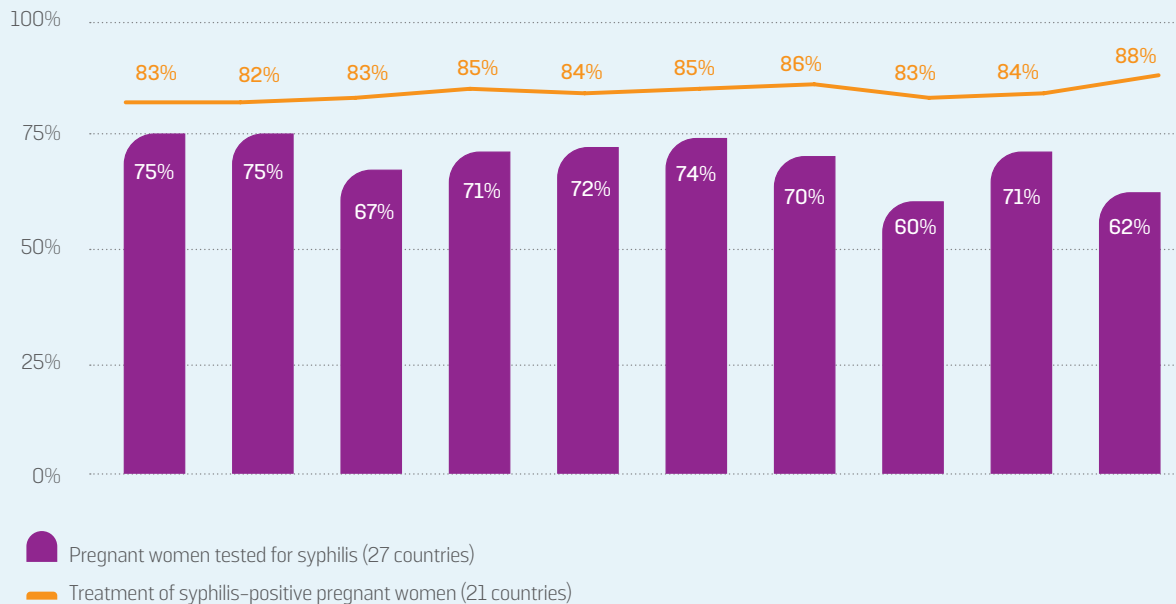
Sources: UNAIDS and WHO. 2021 Global AIDS Monitoring Online Reporting Tool.

Regarding percentage of appropriate syphilis treatment for pregnant women, there is an upward trend in this proportion in the Caribbean (reaching 100% in 2020), while it has remained stable in Latin America (83% in 2020), based on the reported

information from 21 countries (Figure 8). For 2020, 14 (63%) countries reported treatment coverage higher than 95% (or had no cases of syphilis among pregnant women).

Figure 8.

Percentage of pregnant women who have access to prenatal care and were screened for syphilis, and the percentage of syphilis-positive pregnant women appropriately treated, Latin America and the Caribbean, 2011–2020



Note: This information is based on reporting countries with no more than two consecutive years of missing information for the indicator. For countries missing information for one year, data were imputed from the previous year. The number of countries with imputed information for 2020 follows the trend from previous years. The testing indicator sums 13 countries from Latin America and 14 countries from the Caribbean region. The treatment indicator sums 14 countries from Latin America and 7 countries from the Caribbean region.

Sources: UNAIDS/WHO. Reports from the countries on Global AIDS Response Progress Reporting, 2021; U.S. Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2021; Brazil. Boletim epidemiológico – Sífilis 2020; and EMTCT country reports submitted to PAHO, 2015–2021.

Despite current scarce information about the types of syphilis tests available in countries, rapid test use has been expanding, and some countries, such as Peru, have introduced dual HIV/syphilis screening tests. Limitations in the availability and quality of quantitative nontreponemal tests have unofficially been reported to PAHO. From 2016 to 2020, the information about the type of syphilis test used to define positivity in pregnant women was reported by countries (Table 1). Most countries define positive as when both treponemal and nontreponemal tests are positive (41%; $n = 7$ countries in 2020), and approximately 25% ($n = 5$ countries in 2020) of countries reported defining positive as when either test is positive. Given the various clinical manifestations of syphilis, laboratory testing is a very important aspect of diagnosis. Syphilis should be diagnosed using a combination of treponemal

and nontreponemal serological tests to reach a high sensitivity and specificity, for both asymptomatic and symptomatic infections (5). The use of nontreponemal tests alone is not advised because of the delay in the production of antibodies in the early stages, the incidence of false-positives, and the prozone phenomenon. Quantitative nontreponemal tests are particularly useful for monitoring the response to treatment and to estimate the stage of disease, to distinguish active syphilis from lifetime syphilis (titers of 8 or more dilutions are interpreted as corresponding to active infection), and in the diagnosis of reinfection (because treponemal tests remain positive for life). Treponemal tests are more specific, become positive earlier, and are more perdurable than the above-mentioned tests, but titers do not correlate with the activity of the infection (1, 2, 5).

Table 1.

Reported type of syphilis test used to define positivity in pregnant women in Latin America and the Caribbean, 2016–2020					
	2016	2017	2018	2019	2020
Total number of reporting countries	26	26	24	19	17
Unknown type	0	1	1	1	2
Nontreponemal test	8	8	7	2	2
Treponemal	3	2	5	1	2
Both types of tests	0	10	7	5	7
Nontreponemal or treponemal	15	5	4	10	4

Note: Countries included in this analysis are Antigua and Barbuda, Argentina, Bahamas, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Grenada, Guatemala, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Uruguay, and Venezuela.

Sources: UNAIDS/WHO. Reports from the countries on Global AIDS Response Progress Reporting, 2021. EMTCT country reports submitted to PAHO, 2015–2021.

Among the responding countries, only Haiti reported using treponemal testing systematically (GAM reports from 2017 to 2019), and the Bahamas in 2020. Other countries reported using both, or one or the other test. Guatemala (since 2019) and Saint Kitts and Nevis (since 2018) reported confirmed syphilis diagnosis in pregnant women with a nontreponemal test; Antigua and Barbuda, Argentina, Brazil, and Venezuela with either test; while Chile, Panama, and Saint Lucia reported that both type of tests needed to be positive.

4.1. Reported Congenital Syphilis Cases

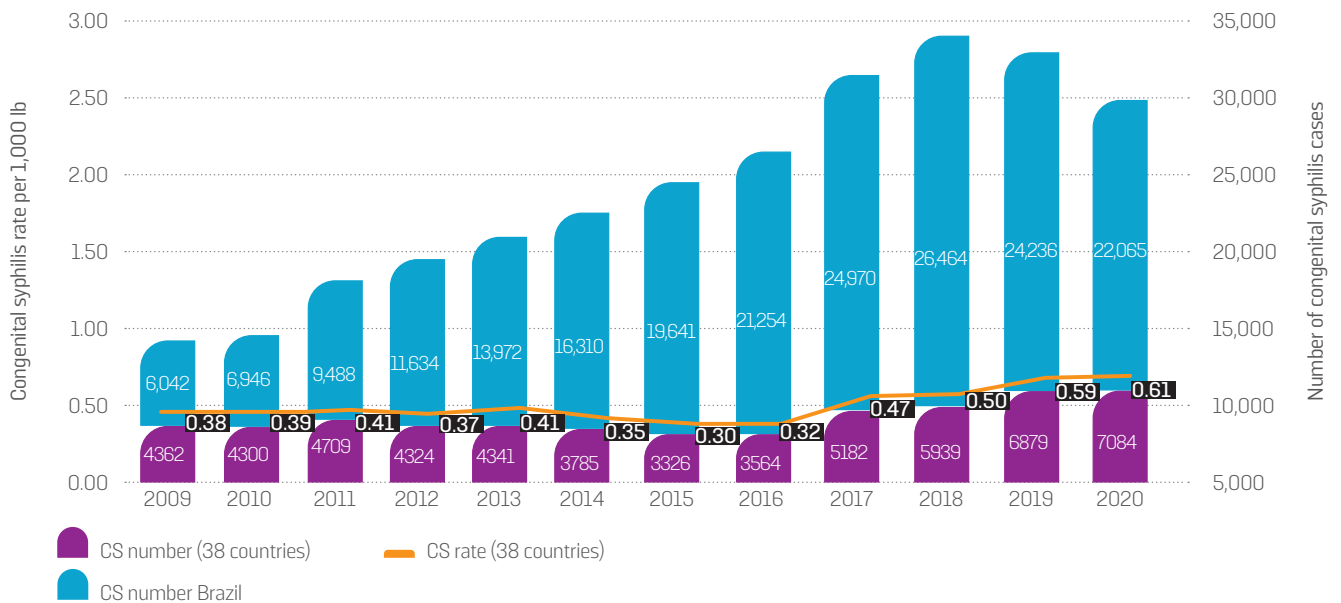
To reach the goal of reducing the incidence of congenital syphilis, one of the main recommendations is to promote 95% or greater coverage of syphilis screening in pregnant women and 95% or greater appropriate treatment (17). However, this percentage of coverage is far from being achieved in many countries of the Region (16). As a consequence, congenital syphilis is increasing in some countries (18). Eight countries and territories in the Region have had their elimination of mother-to-child transmission (EMTCT) of HIV and syphilis status validated by WHO: Cuba in 2015; Anguilla, Antigua and Barbuda, Bermuda, Cayman Islands, Montserrat, and Saint Kitts and Nevis in 2017; and Dominica in 2020.

There were 29,149 cases of congenital syphilis reported by countries of the Americas⁵ in 2020, corresponding to an incidence rate of 2.01 per 1,000 live births (Figures 9 and 10). Brazil accounted for 76% of reported congenital syphilis cases in the Region in 2020 ($n = 22,065$) (15), with a national incidence rate of 7.6 cases per 1,000 live births. Brazil's national surveillance data show there has been a decrease in the incidence rate of congenital syphilis as well as in the positivity rate of syphilis in pregnant women and in the general adult population in 2019 and 2020 (15). According to the Ministry of Health, this observed reduction may have multiple causes. First, a real decrease of cases in São Paulo (the most populated state). Second, an improvement in the syphilis surveillance among pregnant women that has led to a case redefinition in which only children born from diagnosed mothers are considered cases of congenital syphilis. Finally, the possible impact of COVID-19 in the reduction of notification.

Analyzing the 38 reporting countries in the Region, excluding Brazil, the number of cases and the incidence rate have been increasing (from 0.3 in 2009 to 0.61 per 1,000 in 2020).

⁵ Based on case reports from 38 out of 51 countries and territories of the Region of the Americas.

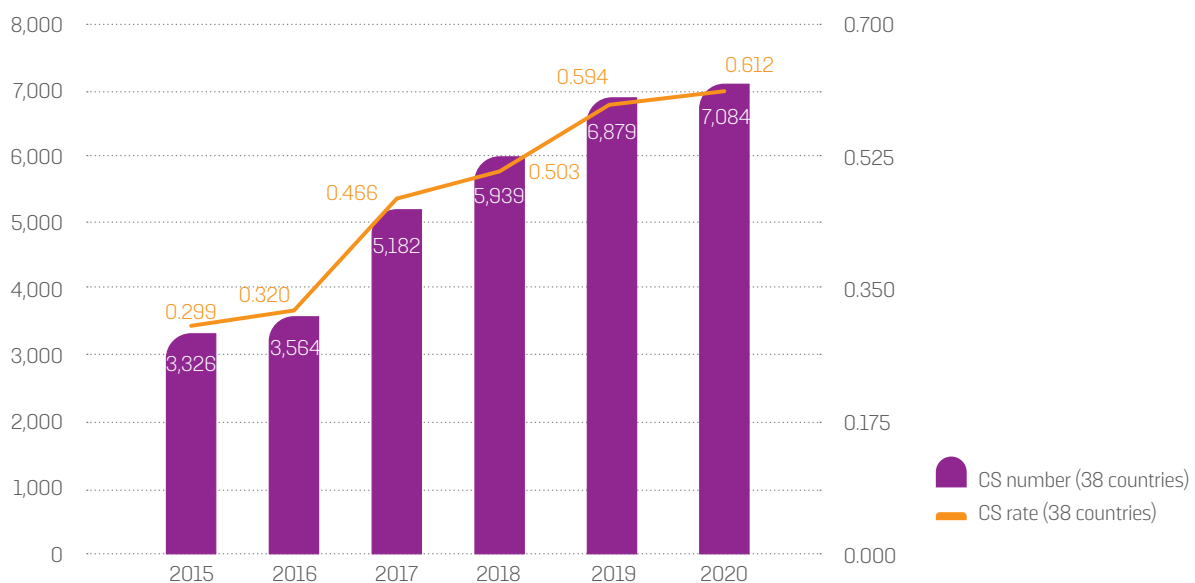
Figure 9.
Number and incidence rate per 1,000 live births of congenital syphilis in the Americas, 2009–2020



Note: CS, congenital syphilis. Regional CS case totals are based on CS case reports from 38 countries (values include imputing for missing yearly data for some countries).

Sources: WHO/UNAIDS, 2021 Global AIDS Monitoring Online Reporting Tool; EMTCT country reports submitted to PAHO; U.S. Centers for Disease Control and Prevention, 2021; Ministry of Health of Brazil, Boletim epidemiológico – Sífilis 2020. Denominator: PAHO Health Situation in the Americas: Basic Indicators 2019.

Figure 10.
Number and incidence rate per 1,000 live births of congenital syphilis cases in the Region of the Americas without Brazil, 2015–2020



Note: CS, congenital syphilis. Regional CS case totals are based on CS case reports from 38 countries (values include imputing for missing yearly data for some countries).

Source: WHO/UNAIDS, 2021 Global AIDS Monitoring Online Reporting Tool; EMTCT country reports submitted to PAHO; U.S. Centers for Disease Control and Prevention, 2021; Ministry of Health of Brazil, Boletim epidemiológico – Sífilis 2020. Denominator: PAHO Health Situation in the Americas: Basic Indicators 2019.

5. SYPHILIS IN SPECIFIC POPULATIONS

The risk for syphilis infection among men who have sex with men (MSM), transgender women, and sex workers of all genders is disproportionately high across countries (13, 23–25). In Latin America and the Caribbean, a 2013 systematic review (20) addressed syphilis among MSM, transgender women, sex workers, and clients of sex workers, including studies published from 2000 to 2010. The syphilis prevalence in MSM was greater than 4% in three-quarters of the studies reviewed and greater than 7.5% in half (20). Five studies of the systematic review included transgender women, with syphilis prevalence ranging from 6.5% in El Salvador (data collection in 2008) to 43.3% in Brazil (data collection in 1999). Of 49 studies among female sex workers, half had a syphilis prevalence greater than 5% but with large variations between the study results.

Globally, transgender women are at elevated risk for STIs (25, 25–27). Social and structural inequities, such as stigma, violence, and health care discrimination (23, 25, 28, 29), elevate transgender women's exposure to STIs and may limit STI testing access and uptake (27). Data reported on transgender women in the Dominican Republic indicate that syphilis infection prevalence ranged from 3.5% to 6.9% (28). In Jamaica, a study conducted in 2015 highlighted a high prevalence of lifetime syphilis infection (9.6%) among a sample ($n = 137$) of transgender women. This Jamaican study also found that syphilis testing uptake (60.6%) rates may be suboptimal among transgender women (29).

Other populations are also at higher risk of syphilis. A 2012 systematic review of incarcerated populations (30) calculated pooled syphilis prevalence estimates of 2.5% in men and 6.1% in women, finding that the incidence of infection among women was 2.7 times greater than in men (95% confidence interval [CI] [1.5, 4.8]). Although this study did not provide

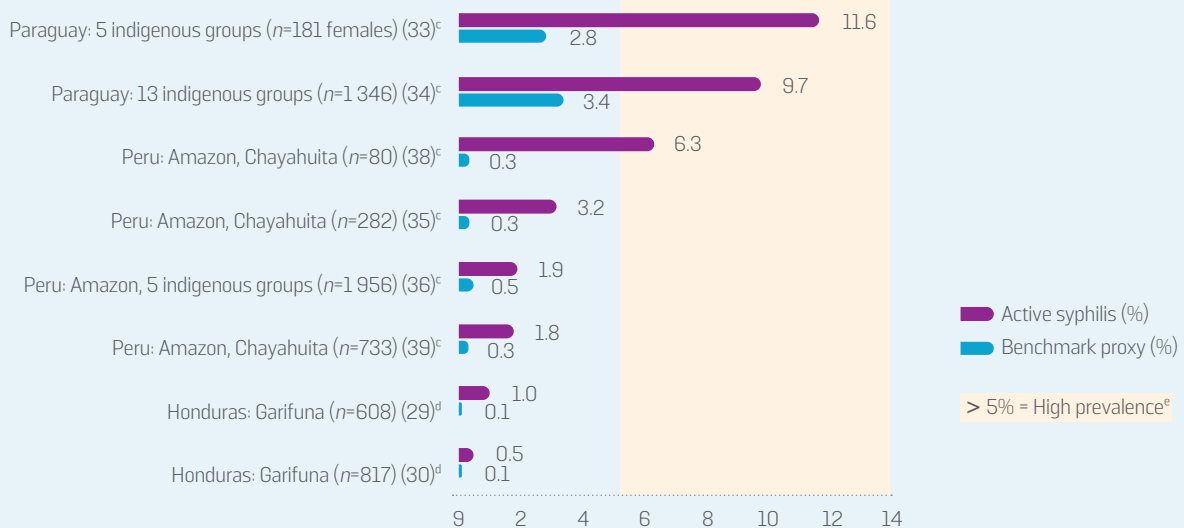
region-aggregated data for the Americas, from the 60 included studies, 42 were based in the United States of America and 7 in Brazil. Syphilis data were included from 30 studies: 10 included only men and 7 included only women; and half of the studies were done prior to 1995 and half after 1995. The prison setting may present both challenges and opportunities for the prevention and treatment of STIs (31).

A systematic review sought to identify and summarize existing literature on the burden of HIV, STIs, and viral hepatitis in Indigenous peoples and Afro-descendants in Latin America, to provide a panorama of the quantitative data available and highlight data gaps (32). Using the WHO threshold of 5% of active syphilis for classifying high prevalence settings (33), high prevalence was seen in some Indigenous communities in Paraguay (11.6% and 9.7%) and Peru (Chayahuita) (6.3%). [Figure 11](#) compares the data from the eight studies on active syphilis with national benchmarks published by PAHO in 2015 regarding the prevalence among pregnant women (34), showing higher syphilis prevalence in Indigenous and Afro-descendant populations in all eight studies.

The gaps in existing data on the burden of HIV, STIs, and viral hepatitis in Indigenous and Afro-descendant populations in Latin America highlight the need to 1) improve national surveillance, by systematically collecting and analyzing ethnicity variables and implementing integrated biobehavioral studies using robust methodologies and culturally sensitive strategies; 2) develop a region-wide response policy that considers the needs of Indigenous and Afro-descendant populations; and 3) implement an intercultural approach to health and service delivery to eliminate health access barriers and improve health outcomes for these populations (32).

Figure 11.

Data from eight studies on prevalence of active syphilis^a in indigenous peoples and afro-descendants versus benchmark proxy,^b Latin America, 2007–2014



Notes: National benchmarks published by PAHO in 2015 regarding the prevalence among pregnant women.

^a Based on nontreponemal tests combined with confirmatory treponemal tests.

^b Comparison data extracted from PAHO country reports using best proxy available in terms of date, population, and testing method.

^c Non-probability sampling methods used.

^d Probability sampling methods used.

^e Based on WHO threshold: World Health Organization. Information note on the use of dual HIV/syphilis rapid diagnostic tests (RDT). Geneva: WHO; 2017.

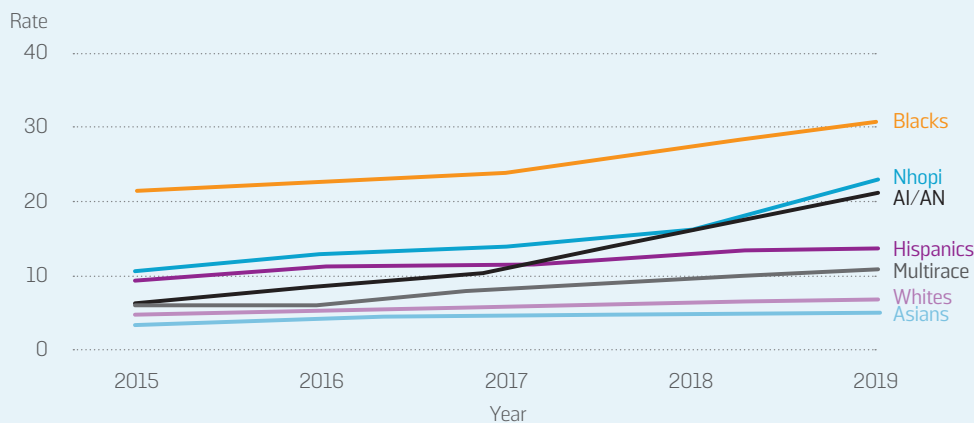
Source: Russell NK, Nazar K, del Pino S, Gonzalez MA, Bermúdez XPD, Ravasi G. HIV, syphilis, and viral hepatitis among Latin American indigenous peoples and Afro-descendants: a systematic review. Rev Panam Salud Publica. 2019;43:1–13.

Data from the U.S. Centers for Disease Control and Prevention (CDC) (14, 38) show a higher rate of syphilis among Black people, as well as American

Indians/Alaska Natives and Native Hawaiians/Other Pacific Islanders, in the United States of America (Figure 12).

Figure 12.

Primary and secondary syphilis, rates of reported cases by race/Hispanic ethnicity, United States, 2015–2019



Notes: * Per 100,000 live births

AI/AN: American Indians/Alaska Natives; NHOPI: Native Hawaiians/Other Pacific Islanders.

Source: U.S. Centers for Disease Control and Prevention. Atlanta, GA: CDC; 2021 Apr 13 [cited 2022 May 9]. Figures – Sexually Transmitted Disease Surveillance, 2019: Syphilis. Available from: <https://www.cdc.gov/std/statistics/2019/figures.htm>.

5.1 Syphilis among Men Who Have Sex with Men

At global level, syphilis prevalence among MSM is estimated to be 15–20 times higher than in the general male population (19, 37). A systematic review by Tsuboi et al. collected data from 2000 to 2020 and showed that Latin America and the Caribbean presents some of the highest estimates of syphilis in MSM (Figure 13), and syphilis prevalence among MSM appears to be increasing throughout the Americas (19). The uncorrected pooled prevalence estimates of syphilis among MSM in Latin America

and the Caribbean has been increasing in the last 20 years, from 10.7% in 2000–2009 to 12.2% in 2010–2020 (Table 2). The study also observed an increase in the number of MSM tested in published studies; this increase was of 7% in Latin America and the Caribbean. The impact of COVID-19 on access of high-risk populations to prevention technologies, screening, and treatment of syphilis might have further impact on syphilis control in the Region. One study suggested that annual screening and treatment of at least 62% of a population of sexually active MSM is necessary to achieve local elimination (defined as less than 1 case per 100,000 people) (38).

Figure 13.

Map of syphilis prevalence estimates among men who have sex with men, by country

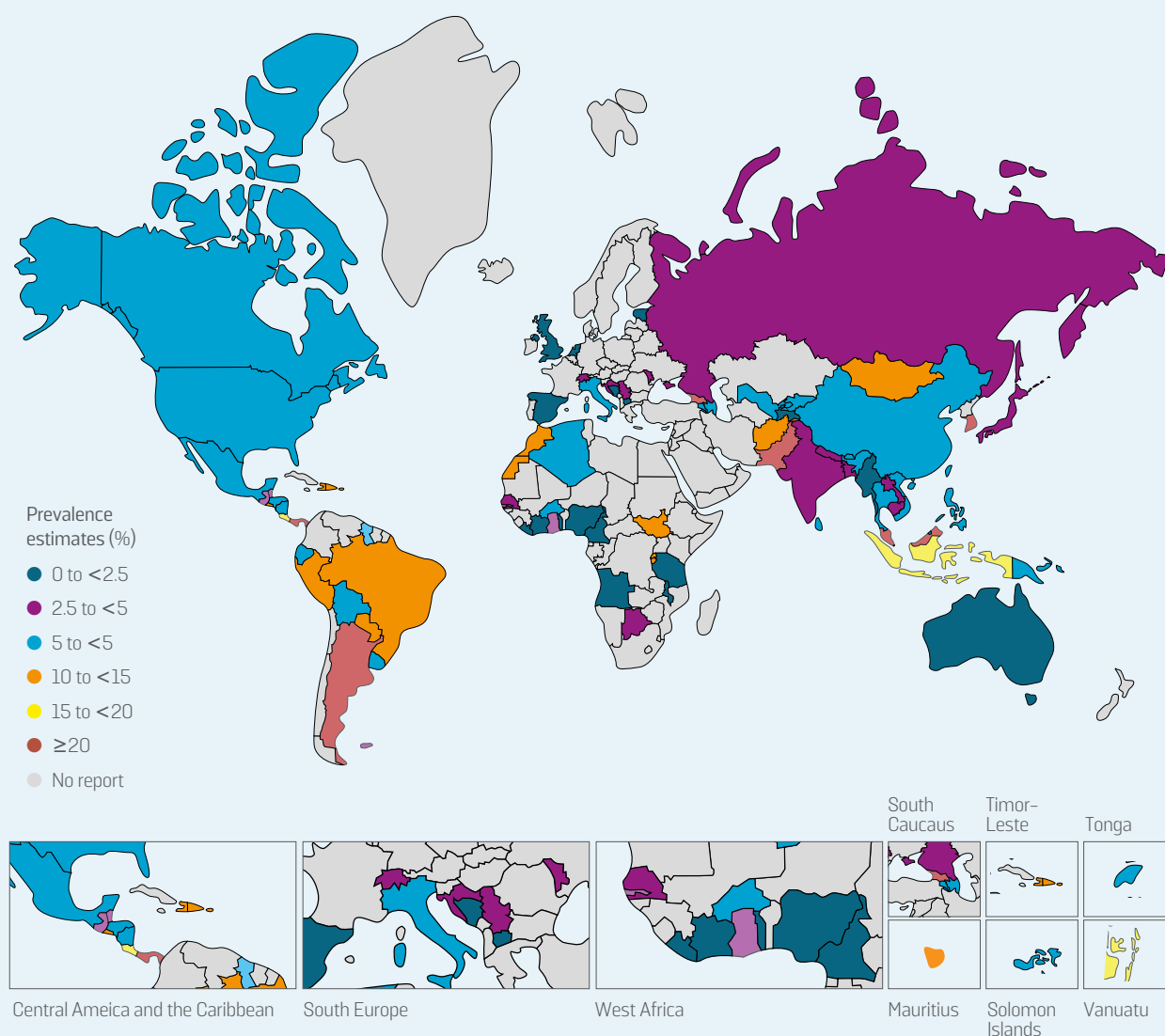


Table 2.**Prevalence of syphilis among men who have sex with men in Latin America from a global systematic review and meta-analysis, 2000–2020**

Year	Number of MSM with positive syphilis test	Number of MSM tested (% of total)	Uncorrected pooled prevalence estimates (95% CI)
2000–2009	1,895	15,609 (8.4%)	10.7% (8.1, 13.6)
2010–2020	2,249	16,707 (4.0%)	12.2% (9.2, 15.5)

Sources: Tsuijoi M, Evans J, Davies EP, Rowley J, Korenromp EL, Clayton T, et al. Prevalence of syphilis among men who have sex with men: a global systematic review and meta-analysis from 2000–2020. *Lancet Glob Health*. 2021;9(8):E1110–18.

Available from: [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(21\)00221-7/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(21)00221-7/fulltext)

Since 2016, countries and territories of the Americas have reported syphilis prevalence among MSM through the Global AIDS Monitoring (GAM) process. The seropositivity for active syphilis among MSM was reported by 20 countries between 2016 and 2020, and ranged from 0% ($n = 9$; 2016) in Barbados to

45.9% in Canada ($n = 2,429/5,294$; 2020) and 61.5% in Brazil ($n = 36,652/59,620$; 2017), considering the latest reported information. Of the reporting countries, 60% ($n = 12$) reported a seropositivity rate among MSM higher than 10% (Table 3; Figure 14).

Table 3.**Reported syphilis seropositivity among men who have sex with men, the Americas**

Country	No. of reported years	Last year reported	Data source	No. of men positive	No. of men tested	Seropositivity (%)
Bahamas	1	2016	–	36	102	35.0
Barbados	1	2016	SS	0	9	0.0
Bolivia	2	2018	SS	65	1,571	4.1
Brazil	1	2017	RDS	36,653	59,620	61.5
Canada	2	2020	RDS	5 36,653	5,294	45.9
Chile	1	2016	–	3	375	0.8
Colombia	1	2016	–	56	232	24.1
Costa Rica	1	2018	Other method seroprevalence study	38	268	14.2
Dominican Republic	1	2018	RDS	192	2,188	8.8
El Salvador	5	2020	SS	170	2,062	8.2
Guatemala	5	2020	PM	1,549	38,672	4.0
Honduras	5	2020	PM	278	2,560	10.9
Mexico	5	2020	SS	3,840	29,634	13.0
Nicaragua	4	2020	RDS	37	1,234	3.0
Panama	5	2020	SS	123	650	18.9
Paraguay	5	2020	SS	150	1,202	12.5
Peru	4	2020	PM	1,076	8,595	12.5
Trinidad and Tobago	1	2017	–	62	386	16.1
Uruguay	1	2016	–	61	290	21.0

Notes: –, no information; SS, sentinel surveillance; PM, programmatic monitoring; RDS, respondent-driven sampling.

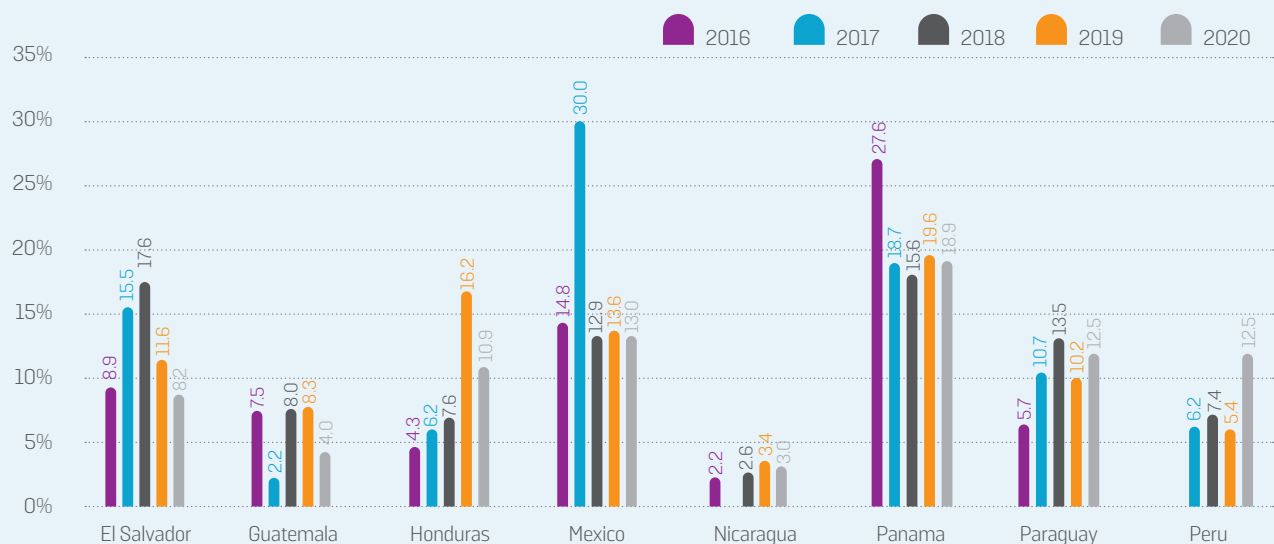
Source: WHO/UNAIDS. 2021 Global AIDS Monitoring Online Reporting Tool.

Analyzing countries that reported more than two years of data in GAM (Figure 14) and had higher syphilis seropositivity in 2020 than in the previous years, in 2020, Peru reported 12.5% of active syphilis among MSM, approximately two times higher than in the 2019 report. However, the monitoring data are gathered through clinic attendance and screening activities, and in 2020 only 32% of MSM were tested compared

with the previous year (2019: $n = 1,442/26,721$ and 2020: $n = 1,076/8,595$), a drop caused by the impact of the COVID-19 pandemic, according to the Ministry of Health of Peru. In Paraguay, the 22% increase in syphilis prevalence among MSM was also concomitant with a drop in the number of MSM tested from 2019 to 2020 (17% difference; $n = 1,202$ in 2020).

Figure 14.

Percentage of men who have sex with men with active syphilis, for countries that reported at least twice in the last five years, the Americas

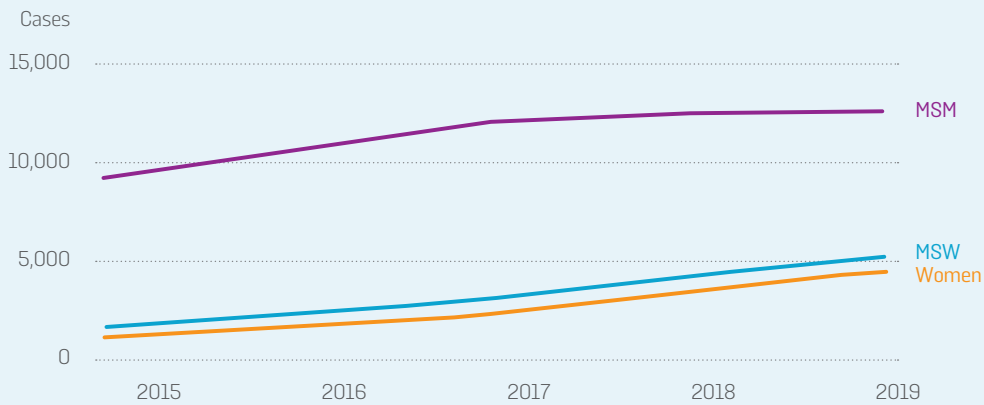


Sources: WHO/UNAIDS. 2021 Global AIDS Monitoring Online Reporting Tool.

In 2017, Mexico had a peak of 30% active syphilis seropositivity among MSM. Authors had previously indicated increases in syphilis among men aged 20–44 years in Mexico (39). However, except for 2017, syphilis prevalence among MSM in Mexico has remained around 13%–15% since 2016. Nicaragua (2.2% in 2016 and 3.0% in 2020), Paraguay (around 11% in 2017–2020), and Panama (around 18% in 2017–2020) have shown stable high seropositivity.

In the United States of America (14, 38), while MSM account for 4% of the population, this group concentrates nearly half of reported primary and secondary syphilis cases. Reported syphilis among MSM increased by 31% from 2015 to 2019 (Figure 15).

Figure 15.
Primary and secondary syphilis, reported cases by sex and sex of sex partners, United States, 31 states,* 2015–2019



Notes: MSM: gay, bisexual, and other men who have sex with men; MSW: men who have sex with women only.

* 31 states were able to classify $\geq 70\%$ of reported cases of primary and secondary syphilis among males as either MSM or MSW for each year during 2015–2019.

Source: U.S. Centers for Disease Control and Prevention . Atlanta, GA: CDC; 2021 Apr 13 [cited 2022 May 9]. Figures – Sexually Transmitted Disease Surveillance, 2019: Syphilis. Available from: <https://www.cdc.gov/std/statistics/2019/figures.htm>.

There have also been reports that MSM have had difficulty accessing STI testing and treatment during the COVID-19 pandemic, suggesting that potentially fewer syphilis cases are being diagnosed, treated, and subtracted from the MSM population (41, 55).

In summary, syphilis prevalence among MSM in the Region of the Americas is among the highest globally (19), and with increasing trends. At the individual level, the availability of friendly sexual health services and wide access to combination prevention technologies, including screening, treatment, and sexual partner supported contact notification, is important in syphilis control (42). Surveillance and close monitoring and data analysis at all levels are needed to address outbreaks and persistently high levels of syphilis infection among this population in the Region, and especially to be able to better evaluate the impact of COVID-19 on the syphilis epidemic (43).

5. 2. Syphilis among Sex Workers

Sex workers are vulnerable to HIV and STIs (such as syphilis) due to multiple factors, including large numbers of sex partners, unsafe working conditions, and inability to negotiate consistent condom use. Syphilis seropositivity among sex workers in the 18 countries that reported to GAM in 2021 ranged from zero in Antigua and Barbuda and Barbados to 4.5% in Nicaragua, 8.4% in Brazil, and 8.5% in Paraguay (Table 4). Syphilis prevalence was higher than 5% in 6 of the 18 countries. The data source is important to understand the data. Table 4 indicates the number of sex workers tested, the seropositivity, as well as the data source.

Table 4.

Reported syphilis seropositivity among sex workers, the Americas, last year reported							
Country	Years reported	Last year reported	Data source	Disaggregated*	No. of SW tested	No. SW positive	Seropositivity (%)
Antigua and Barbuda	1	2016	--	No	57	0	0
Barbados	1	2016	--	No	17	0	0
Dominican Republic	2	2018	RDS	No	2,323	192	8.2
Bolivia	1	2017	--	No	17,129	826	4.8
Brazil	1	2016	RDS	No	4,173	352	8.4
Chile	5	2020	PM	Yes	2,073	53	2.6
Colombia	1	2016	--	No	2,198	33	1.5
Costa Rica	2	2018	RDS	No	368	-	1.4
El Salvador	5	2020	SS	No	610	20	3.3
Guatemala	5	2020	PM	Yes	3,899	19	0.5
Honduras	5	2020	PM	Yes	373	29	7.8
Mexico	5	2020	PM	Yes	5,689	160	2.8
Nicaragua	1	2016	PM	No	--	6	4.5
Panama	5	2020	SS	Yes	275	11	4.0
Paraguay	5	2020	SS	Yes	798	68	8.5
Peru	4	2019	--	No	27,110	579	2.1
Uruguay	1	2016	SS	No	224	18	8.0
Venezuela	1	2019	RDS	No	535	38	7.3

Notes: --, no information; SW, sex workers; SS, sentinel surveillance; PM, programmatic monitoring; RDS, study using respondent-driven sampling.

*By transgender SW, male SW, and female SW.

Source: WHO/UNAIDS. 2021 Global AIDS Monitoring Online Reporting Tool.

Only five of the reporting countries in the Region of the Americas reported the data systematically to the GAM process (Chile, Guatemala, Honduras, Mexico, and Nicaragua). Chile, Guatemala, Honduras, Mexico, Panama, Paraguay, and Peru have data on male, female, and transgender sex workers (Table 4). Antigua and Barbuda, Barbados, Bolivia, Costa Rica, Dominican Republic, El Salvador, Nicaragua, and Venezuela only screened female sex workers. Brazil, Colombia, and Uruguay did not report such disaggregation.

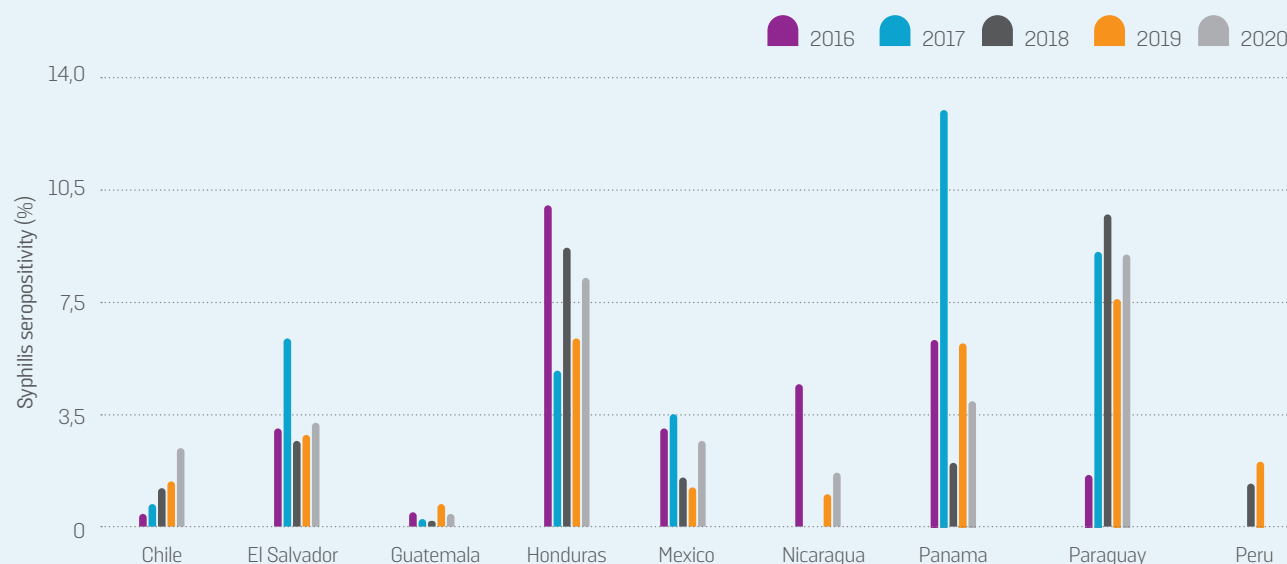
In Chile, the reported prevalence doubled from 2019 to 2020, while the number of sex workers tested dropped by 38%. In fact, since 2016, Chile has reported fewer tested sex workers than in the previous year. For Guatemala, on the other hand, the seropositivity reduction in 2020 (from 0.8% in 2019 to 0.5% in 2020) came along with a reduction of more than 40% (from 6,667 in 2019 to 3,899 in 2020) in

the number of sex workers tested in 2020 compared with 2019; whereas before 2020, the number of sex workers tested had been increasing since 2016. Guatemala reported that this reduction in screening was due to the impact of the COVID-19 pandemic. Peru did not report data on active syphilis among sex workers in 2020 because of COVID-19 impact. Other countries reported a drop in the number of sex workers screened, such as El Salvador (–40%), Honduras (–45%), Mexico (–48%), and Paraguay (–72%).

Data reported to GAM show a trend of increase in seropositivity among sex workers (Figure 16) in Chile and Honduras, for all gender categories, but specially for male and transgender sex workers (Table 5). Seropositivity also increased among male and transgender sex workers in Peru from 2018 to 2019. Higher prevalence among male sex workers was also reported in Mexico and Panama (also for transgender sex workers), for all years.

Figure 16.

Percentage of reported sex workers with active syphilis, countries that reported at least twice in the last five years, Region of the Americas



Sources: WHO/UNAIDS Global AIDS Monitoring System (GAM), 2021.

Table 5.

Syphilis seropositivity among sex workers, disaggregated by male, female, and transgender, for reporting countries in Latin America and the Caribbean, 2016–2020

Country	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020	2016	2017	2018	2019	2020
Chile	1%	8%	5%	12%	81%	0%	0%	1%	1%	1%	3%	6%	35%	0%	--
Guatemala	--	0%	1%	2%	2%	0%	0%	0%	1%	1%	--	1%	3%	8%	8%
Honduras	--	9%	37%	17%	20%	10%	3%	2%	5%	6%	--	12%	17%	19%	18%
Mexico	5%	9%	10%	6%	11%	2%	2%	0%	1%	2%	8%	--	--	--	--
Nicaragua	--	--	--	--	--	4%	--	--	1%	2%	--	--	--	--	--
Panama	--	24%	4%	--	12%	2%	1%	1%	6%	2%	28%	28%	31%	--	12%
Paraguay	0%	0%	--	--	--	1%	9%	9%	4%	9%	7%	--	15%	24%	--
Peru	--	--	6%	19%	--	--	--	1%	1%	--	--	--	11%	15%	--

Note: SW, sex workers; --, no information.

Source: WHO/UNAIDS. Global AIDS Monitoring, 2021.

CONCLUSIONS

Countries of the Americas are confronting levels of syphilis and congenital syphilis far from the commitments made to reduce syphilis incidence by 90% globally between 2018 and 2030, and to reduce the incidence of congenital syphilis to less than 50 cases per 100,000 live births by 2030. Syphilis has been on the rise in many countries and subpopulations, affecting the adult and infant population. While the COVID-19 pandemic has affected STI management and the delivery of comprehensive sexual health care—resulting from clinic closures, staffing diversions, and COVID-19-related resource constraints (41,42)—increases and outbreaks of syphilis throughout the

Region had also been seen before the pandemic. Regaining public health awareness is critical to combat syphilis and reach elimination. Political will, strengthening public health capacity at the local levels, and community collaboration are elements that are needed for syphilis elimination. Acknowledging inequities in STI rates is an important step toward empowering affected groups and the public health community to collaborate in addressing inequities in the burden of disease—with the ultimate goal of minimizing the health impacts of STIs on individuals and populations (44).

REFERENCES

1. Peeling RW, Mabey D, Kamb ML, Chen XS, Radolf JD, Benzaken AS. Syphilis. *Nat Rev Dis Primer*. 2017;3(1):17073. doi:10.1038/nrdp.2017.73. Available from: <http://www.nature.com/articles/nrdp201773>
2. Emerson CR. Syphilis: A Review of the Diagnosis and Treatment [Abstract] . *Open Infect Dis J* . 2009;3(1). doi:10.2174/1874279301004010143. Available from: <https://openinfectiousdiseasesjournal.com/VOLUME/3/PAGE/143/ABSTRACT/>
3. Senn T. Sexually Transmitted Diseases (STDs). In: Gellman MD, Turner JR, editors. *Encyclopedia of Behavioral Medicine* . New York, NY: Springer; 2013:1782–4. Available from: https://doi.org/10.1007/978-1-4419-1005-9_671
4. Zetola NM, Klausner JD. Syphilis and HIV infection: an update. *Clin Infect Dis*. 2007;44(9):1222–8. doi:10.1086/513427. Available from: <https://pubmed.ncbi.nlm.nih.gov/17407043/>
5. World Health Organization. Guidelines for the management of symptomatic sexually transmitted infections . Geneva: World Health Organization; 2021. Available from: <https://apps.who.int/iris/handle/10665/342523>
6. World Health Organization. Global Health Sector Strategy on Sexually Transmitted Infections 2016–2021 Towards Ending STIs. Geneva: WHO; 2021. Available from: <https://apps.who.int/iris/handle/10665/246296>
7. Rowley J, Vander Hoorn S, Korenromp E, Low N, Unemo M, Abu-Raddad LJ, et al. Chlamydia, gonorrhoea, trichomoniasis and syphilis: global prevalence and incidence estimates, 2016. *Bull World Health Organ* . 2019;97(8):548–562P. doi:10.2471/BLT.18.228486 Available from: <https://www.who.int/publications/i/item/chlamydia-gonorrhoea-trichomoniasis-and-syphilis-global-prevalence-and-incidence-estimates-2016>
8. Korenromp EL, Rowley J, Alonso M, Mello MB, Wijesooriya NS, Mahiané SG, et al. Global burden of maternal and congenital syphilis and associated adverse birth outcomes—Estimates for 2016 and progress since 2012. *PLOS ONE* . 2019;14(2):e0211720. doi:10.1371/journal.pone.0211720. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0211720>
9. Korenromp EL, Rowley J, Alonso M, Mello MB, Wijesooriya NS, Mahiané SG, et al. Correction: Global burden of maternal and congenital syphilis and associated adverse birth outcomes—Estimates for 2016 and progress since 2012. *PLOS ONE* . 2019;14(7):e0219613. doi:10.1371/journal.pone.0219613. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0219613>
10. Smolak A, Rowley J, Nagelkerke N, Kassebaum NJ, Chico RM, Korenromp EL, et al. Trends and Predictors of Syphilis Prevalence in the General Population: Global Pooled Analyses of 1103 Prevalence Measures Including 136 Million Syphilis Tests. *Clin Infect Dis* . 2018;66(8):1184–91. doi:10.1093/cid/cix975. Available from: <https://academic.oup.com/cid/article/66/8/1184/4607808>
11. World Health Organization. World Health Organization Global estimates of 4 curable STIs and maternal and congenital syphilis, 2016 . WHO; 2019. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0143304>
12. Rowley J, Vander Hoorn S, Korenromp E, Low N, Unemo M, Abu-Raddad LJ, et al. Supplemental files for Chlamydia, gonorrhoea, trichomoniasis and syphilis: Global and regional estimates of prevalence and incidence, 2016 . Figshare; Published 2019 Jun 5. Available from: https://figshare.com/articles/figure/Chlamydia_gonorrhoea_trichomoniasis_and_syphilis_Global_and_regional_estimates_of_prevalence_and_incidence_2016/8187107/1
13. World Health Organization. The Global Elimination of Congenital Syphilis : Rationale and Strategy for Action. Geneva: WHO; 2007. Available from: <https://apps.who.int/iris/handle/10665/43782> Accessed 2022 May 5

14. Silveira MF, Gomez Ponce de Leon R, Becerra F, Serruya SJ. Evolution towards the elimination of congenital syphilis in Latin America and the Caribbean: a multicountry analysis. *Rev Panam Salud Pública* . 2019;43:1. doi:10.26633/RPSP.2019.31 Available from: <http://iris.paho.org/xmlui/handle/123456789/50480>
15. Ministério da Saúde do Brasil, Secretaria de Vigilância em Saúde, Departamento de Doenças de Condições Crônicas e Infecções Sexualmente Transmissíveis. Boletim Epidemiológico Sífilis 2021. Número Especial (Ano V-no 01):57. Available from: <http://www.aids.gov.br/pt-br/pub/2021/boletim-epidemiologico-de-sifilis-2021> Accessed 2021 Oct 16.
16. Pan American Health Organization. New Generations Free of HIV, Syphilis, Hepatitis B, and Chagas Disease: EMTCT Plus in the Americas, 2018 . Washington: PAHO; 2019 [cited 2021 Sep 21]. 52 p. Available from: www.paho.org
17. Pan American Health Organization. Framework for elimination of mother-to-child transmission of HIV, Syphilis, Hepatitis B, and Chagas . Washington, D.C. : PAHO; 2017. Available from: <http://iris.paho.org/xmlui/handle/123456789/34306> Accessed 2021 Sep 21.
18. García-Cisneros S, Herrera-Ortiz A, Olamendi-Portugal M, Sánchez-Alemán MA. Re-emergence of syphilis in women of reproductive age and its association with the increase in congenital syphilis in Mexico during 2010–2019: an ecological study. *BMC Infect Dis*. 2021 Sep 23;21(1):992. doi:10.1186/s12879-021-06680-w
19. Tsuboi M, Evans J, Davies EP, Rowley J, Korenromp EL, Clayton T, et al. Prevalence of syphilis among men who have sex with men: a global systematic review and meta-analysis from 2000–20. 2021;9:9.
20. Zoni AC, González MA, Sjögren HW. Syphilis in the most at-risk populations in Latin America and the Caribbean: a systematic review. *Int J Infect Dis IJID Off Publ Int Soc Infect Dis*. 2013 Feb;17(2):e84–92. doi:10.1016/j.ijid.2012.07.021
21. Kitayama K, Segura ER, Lake JE, Perez-Brumer AG, Oldenburg CE, Myers BA, et al. Syphilis in the Americas: a protocol for a systematic review of syphilis prevalence and incidence in four high-risk groups, 1980–2016. *Syst Rev* . 2017;6(1):195. doi:10.1186/s13643-017-0595-3 Available from: <https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/s13643-017-0595-3>
22. Reisner SL, Poteat T, Keatley J, Cabral M, Mothopeng T, Dunham E, et al. Global Health Burden and Needs of Transgender Populations: A Review. *Lancet Lond Engl* . 2016 Jul 23;388(10042):412–36. doi:10.1016/S0140-6736(16)00684-X Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7035595/>
23. Operario D, Soma T, Underhill K. Sex work and HIV status among transgender women: systematic review and meta-analysis. *J Acquir Immune Defic Syndr* 1999. 2008 May 1;48(1):97–103. doi:10.1097/QAI.0b013e31816e3971
24. Baral SD, Poteat T, Strömdahl S, Wirtz AL, Guadamuz TE, Beyrer C. Worldwide burden of HIV in transgender women: a systematic review and meta-analysis. *Lancet Infect Dis*. 2013 Mar;13(3):214–22. doi:10.1016/S1473-3099(12)70315-8
25. Poteat T, Wirtz AL, Radix A, Borquez A, Silva-Santisteban A, Deutsch MB, et al. HIV risk and preventive interventions in transgender women sex workers. *Lancet Lond Engl*. 2015 Jan 17;385(9964):274–86. doi:10.1016/S0140-6736(14)60833-3
26. Cohen J, Lo YR, Caceres CF, Klausner JD, WHO guideline working group. WHO guidelines for HIV/STI prevention and care among MSM and transgender people: implications for policy and practice. *Sex Transm Infect*. 2013 Nov;89(7):536–8. doi:10.1136/sextrans-2013-051121
27. Andrinopoulos K, Hembling J, Guardado ME, de Maria Hernández F, Nieto AI, Melendez G. Evidence of the negative effect of sexual minority stigma on HIV testing among MSM and transgender women in San Salvador, El Salvador. *AIDS Behav*. 2015 Jan;19(1):60–71. doi:10.1007/s10461-014-0813-0

28. Johnston LG, Vaillant TC, Dolores Y, Vales HM. HIV, hepatitis B/C and syphilis prevalence and risk behaviors among gay, transsexuals and men who have sex with men, Dominican Republic. *Int J STD AIDS*. 2013 Apr;24(4):313–21. doi:10.1177/0956462412472460
29. Logie CH, Wang Y, Lacombe–Duncan A, Ahmed U, Jones N, Neil A, et al. Factors Associated With Syphilis Testing and a History of Syphilis Infection Among a Sample of Transgender Women in Jamaica. *Sex Transm Dis* . 2018;45(3):158–62. doi:10.1097/OLQ.0000000000000715 Available from: <https://journals.lww.com/00007435-201803000-00005>
30. Kouyoumdjian FG, Leto D, John S, Henein H, Bondy S. A systematic review and meta-analysis of the prevalence of chlamydia, gonorrhoea and syphilis in incarcerated persons. *Int J STD AIDS*. 2012 Apr;23(4):248–54. doi:10.1258/ijsa.2011.011194
31. Dolan K, Wirtz AL, Moazen B, Ndeffo-mbah M, Galvani A, Kinner SA, et al. Global burden of HIV, viral hepatitis, and tuberculosis in prisoners and detainees. *The Lancet* . 2016;388(10049):1089–102. doi:10.1016/S0140-6736(16)30466-4 Available from: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(16\)30466-4/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)30466-4/fulltext)
32. Russell NK, Nazar K, del Pino S, Gonzalez MA, Bermúdez XPD, Ravasi G. HIV, syphilis, and viral hepatitis among Latin American indigenous peoples and Afro-descendants: a systematic review. *Rev Panam Salud Pública* . 2019;43:1–13. doi:10.26633/RPSP.2019.17 Available from: <http://iris.paho.org/xmlui/handle/123456789/49727>
33. World Health Organization. Information note on the use of dual HIV/syphilis rapid diagnostic tests (RDT). Geneva: WHO; 2017. Available from: <https://www.who.int/publications/i/item/WHO-RHR-17.01> Accessed 2021 Oct 12.
34. Pan American Health Organization. Elimination of mother-to-child transmission of HIV and syphilis in the Americas: update 2015. Washington, DC: PAHO; 2015. Available from: <https://iris.paho.org/handle/10665.2/18372> Accessed 2021 Oct 12.
35. Centers for Disease Control (U.S.). Sexually Transmitted Diseases (STDs): Data and Statistics . Centers for Disease Control and Prevention. 2021. Available from: <https://www.cdc.gov/std/statistics/default.htm> Accessed 2021 Oct 9
36. Centers for Disease Control and Prevention. Sexually transmitted diseases surveillance 2019. National overview of STDs, 2019. Centers for Disease Control and Prevention. 2021. Available from: <https://www.cdc.gov/std/statistics/2019/default.htm> Accessed 2021 Oct 9
37. Cáceres CF, Konda KA, Klausner JD. Syphilis in men who have sex with men: advancing research and human rights. *Lancet Glob Health* . 2021;9(8):e1039–40. doi:10.1016/S2214-109X(21)00269-2 Available from: <https://linkinghub.elsevier.com/retrieve/pii/S2214109X21002692>
38. Tuite A, Fisman D. Go big or go home: impact of screening coverage on syphilis infection dynamics. *Sex Transm Infect*. 2016 Feb;92(1):49–54. doi:10.1136/sextrans-2014-052001
39. Herrera-Ortiz A, Uribe-Salas F, Olamendi-Portugal M, García-Cisneros S, Conde-Glez C, Sánchez-Alemán M. Análisis de la tendencia de sífilis adquirida en México durante el periodo 2003–2013. *Salud Pública México*. 2015 Jul 8;57:335. doi:10.21149/spm.v57i4.7577
40. Sanchez TH, Zlotorzynska M, Rai M, Baral SD. Characterizing the Impact of COVID-19 on Men Who Have Sex with Men Across the United States in April, 2020. *AIDS Behav* . 2020;1–9. doi:10.1007/s10461-020-02894-2 Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7189633/>
41. Nagendra G, Carnevale C, Neu N, Cohall A, Zucker J. The Potential Impact and Availability of Sexual Health Services During the COVID-19 Pandemic. *Sex Transm Dis* . 2020;47(7):434. doi:10.1097/OLQ.0000000000001198 Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7448722/>

42. Napoleon SC, Maynard MA, Almonte A, Cormier K, Bertrand T, Ard KL, et al. Considerations for STI Clinics During the COVID-19 Pandemic. *Sex Transm Dis*. 2020 Jul;47(7):431–3. doi:10.1097/OLQ.0000000000001192
43. Calabrò RS, Gervasi G. Could the pandemic affect sexually-transmitted disease incidence in high-risk groups? Considerations about the COVID-19 lockdown. *Cad Saúde Pública* . 2021;37. doi:10.1590/0102-311X00009521 Available from: <http://www.scielo.br/j/csp/a/TswXsxfYV8LmCx6DPxbd8Hx/?lang=en>
44. Committee on Prevention and Control of Sexually Transmitted Infections in the United States, Board on Population Health and Public Health Practice, Health and Medicine Division, National Academies of Sciences, Engineering, and Medicine. *Sexually Transmitted Infections: Adopting a Sexual Health Paradigm* . Vermund SH, Geller AB, Crowley JS, editors. Washington, D.C.: National Academies Press; 2021 . doi:10.17226/25955 Available from: <https://www.nap.edu/catalog/25955>

Annex

Table A 1.

Reported prevalence of syphilis among men who have sex with men and among sex workers, the Americas, last year reported

Countries and territories	Last reported prevalence of syphilis among pregnant women (proxy for general population)		Men who have sex with men (MSM) with active syphilis		Sex workers with active syphilis	
	%	Year*	%	Year*	%	Year*
North America						
Canada	...	...	45.90	2020	...	...
Mexico	0.43	2020	13.00	2020	2.80	2020
United States of America	...	...	...	...	...	...
Central America						
Costa Rica	1.38	2020	14.20	2018	1.40	2018
El Salvador	0.68	2020	8.20	2020	3.30	2020
Guatemala	0.04	2020	4.00	2020	0.49	2020
Honduras	0.10	2020	10.90	2020	7.80	2020
Nicaragua	0.14	2020	3.00	2020	1.80	2020
Panama	2.25	2020	18.92	2020	4.00	2020
Andean Region						
Bolivia (Plurinational State of)	...	...	4.10	2018	4.80	2017
Colombia	1.14	2019	24.10	2016	1.50	2016
Ecuador	0.34	2019	6.20	2010	...	...
Peru	0.78	2020	12.50	2020	2.10	2019
Venezuela (Bolivarian Republic of)	1.62	2020	...	...	7.30	2019
Southern Cone and Brazil						
Argentina	4.60	2020	17.70	2014	22.39	2008
Brazil	...	...	61.50	2017	8.40	2016
Chile	0.33	2020	0.80	2016	2.60	2020
Paraguay	2.28	2020	12.50	2020	8.50	2020
Uruguay	1.84	2019	21.00	2016	8.00	2016
Caribbean						
Anguilla	0.00	2020	...	...	...	...
Antigua and Barbuda	0.83	2019	...	...	0.00	2016
Aruba	...	...	...	...	...	...
Bahamas	...	...	36.00	2016	0.00	2013
Barbados	...	...	0.00	2016	0.00	2016
Belize	...	...	0.00	2012	0.46	2012
Bermuda	...	...	...	...	...	...
Bonaire	...	...	...	...	...	...

Caribbean						
Cayman Islands	0.00	2020	...	...	...	...
Cuba	1.71	2020	...	...	...	...
Curaçao	...	...	...	...	...	...
Dominica	1.35	2020	...	...	...	...
Dominican Republic	1.49	2018	8.80	2018	8.20	2018
French Guiana	...	...	...	...	...	...
Grenada	1.13	2018	...	...	...	...
Guadeloupe	...	...	...	...	...	...
Guyana	0.13	2019	1.00	2014	1.60	2014
Haiti	2.36	2019	...	...	...	...
Jamaica	1.17	2020	30.50	2018	1.23	2010
Martinique	...	...	...	...	...	...
Montserrat	...	...	...	...	...	...
Puerto Rico	...	...	...	...	...	...
Saba	...	...	...	...	...	...
Saint Kitts and Nevis	0.20	2020	...	...	...	...
Saint Lucia	2.86	2020	...	...	...	...
Saint Vincent and the Grenadines	0.92	2018	...	...	...	...
Sint Eustatius	...	...	...	...	...	...
Sint Maarten	...	...	...	...	...	...
Suriname	...	...	...	...	...	...
Trinidad and Tobago	...	...	16.10	2017	10.78	2011
Turks and Caicos Islands	...	...	...	...	...	...
Virgin Islands (UK)	...	...	...	...	...	...
Virgin Islands (US)	...	...	...	...	...	...

* Most recently available data.

Source: WHO/UNAIDS Global AIDS Reporting Country Reports, 2021.

PAHO



**Pan American
Health
Organization**



**World Health
Organization**
REGIONAL OFFICE FOR THE
Americas