CONGENITAL SYPHILIS IN TEXAS IN 2022

Department of State Health Services

Contents

Executive Summary

The bacterium *Treponema pallidum* causes syphilis. Congenital syphilis (CS) occurs when a pregnant woman passes syphilis to her baby during pregnancy.[1] CS may lead to miscarriage, stillbirth, premature birth, and death immediately after birth. Death occurs in up to 40 percent of infants born to women with untreated syphilis because of the infection.[1] While CS can occur without symptoms, it can also present with a spectrum of serious manifestations, including but not limited to, vision or hearing loss and improper bone or tooth development. Benzathine penicillin G is the only treatment for syphilis during pregnancy. Adequate treatment of a pregnant mother who delivers after 20 weeks' gestation can prevent CS with a success rate of 98 percent.[2]

In the U.S., the number of CS cases has increased each year since 2012, and in 2022 the Centers for Disease Control and Prevention (CDC) reported 3,755 CS cases with a case rate of 102.5 per 100,000 population.[2,3] Of these nationally reported cases, Texas accounted for approximately one-quarter (922 cases), ranking Texas first in case count and fourth in case rate. Over 57 percent of CS cases in Texas occurred in the four following areas: Harris County (17 percent), Dallas County (16 percent), Bexar County (13 percent), and Public Health Region 11 (10 percent).

Texas CS cases increased by 148 percent and syphilitic stillbirths increased over 207 percent in the past five years. Hispanic and Black women delivered approximately seven out of ten infants born with CS. CS disproportionately impacts Hispanic and Black mothers as shown among syphilitic stillbirths with 43 percent of syphilitic stillbirths born to Hispanic Texas mothers and 32 percent born to Black Texas mothers.

In 2022, the Texas rate for primary and secondary syphilis among women of childbearing age increased from 15.4 cases per 100,000 women of childbearing age in 2021 to 18.0 cases per 100,000 women of childbearing age. Early syphilis cases (which include primary, secondary, and early non-primary non-secondary cases) among women of childbearing age in Texas

---

[1] Centers for Disease Control and Prevention (31 January 2017). Congenital Syphilis-Fact Sheet retrieved from cdc.gov/std/syphilis/stdfact-congenital-syphilis.htm.

[2] Bowen, V., Su, J., Torrone, E., Kidd, S., & Weinstock, H. (13 November 2015). Increase in Incidence of Congenital Syphilis – United States, 2012–2014. Retrieved from cdc.gov/mmwr/preview/mmwrhtml/mm6444a3.htm.

[3] Center for Disease Control and Prevention (30 January 2024). Sexually Transmitted Infections Surveillance, 2022. Retrieved from cdc.gov/std/statistics/2022/.

increased 485 percent from 2013 to 2022 (534 cases in 2013 to 3,125 cases in 2022).

CS cases rise when syphilis cases in women of childbearing age (aged 15–44 years) rise. In 2022, more than half (52 percent) of the women who delivered an infant with CS received their diagnosis late during pregnancy, at delivery, or postpartum. Additionally, among women delivering an infant with CS, 74 percent received inadequate treatment, and 16 percent received no treatment. Of the 922 CS cases reported in 2022, 80 percent accessed prenatal care in the first or second trimester, received timely syphilis screening (>45 days prior to delivery), received a timely syphilis diagnosis, but did not receive adequate treatment. Incorrect treatment intervals, no treatment, and not receiving a full course of treatment are the most common reasons for inadequate treatment leading to CS cases. Barriers to care, such as transportation, finding a provider, or access to Medicaid, may contribute to the rise in CS cases among women of childbearing age.

About This Report

DSHS created this epidemiologic profile on CS to inform planners, public health professionals, policymakers, and other stakeholders at local and state levels about the epidemiology of CS, syphilis in women of childbearing age, and underlying factors which may contribute to CS.

This profile only includes diagnoses of CS and syphilis cases among women of childbearing age in Texas. Cases analyzed met the CDC and Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions, which may differ from clinical diagnoses.

Understanding Syphilis

The *Treponema pallidum* bacterium causes syphilis. Syphilis can cause serious health problems when not treated. Syphilis transmission can occur through person-to-person sexual contact or from a pregnant woman to her unborn baby.[4] Syphilis infections progress through stages with different signs and symptoms. Although common signs and symptoms of syphilis exist, many people do not exhibit them or may not recognize them as syphilis. Signs and symptoms of syphilis can dissipate without treatment, but the disease continues to progress.[5] A medical provider performs a blood test to

[4] Centers for Disease Control and Prevention (1 November 2017). Syphilis Pocket Guide for Providers. Retrieved from cdc.gov/std/syphilis/Syphilis-Pocket-Guide-FINAL-508.pdf.
[5] Centers for Disease Control and Prevention (12 April 2022). Syphilis-CDC Detailed Fact Sheet. Retrieved from cdc.gov/std/syphilis/stdfact-syphilis-detailed.htm.

determine if a person has syphilis. The provider can conduct additional testing during the primary stage of syphilis when a sore presents.

Primary and secondary syphilis, the most contagious stages, commonly present with signs and symptoms. Primary syphilis occurs when a sore develops at the site bacteria enters the body. A primary syphilis sore is usually firm, round, and painless and will go away on its own without treatment. When syphilis is not treated, the infection progresses to secondary syphilis. A person is classified as having secondary syphilis when they present symptoms: such as rash on their body, hands, or feet, substantial amounts of hair loss (i.e., alopecia), sores in the mouth (i.e., mucous patches), or sores in the genital region known as condyloma lata.[6]

Early non-primary non-secondary syphilis exists when an infection occurred within the past 12 months and does not have any signs or symptoms. Syphilis of unknown or late duration occurs when an infection occurred more than 12 months prior or when it cannot be determined when a person was infected with the bacteria.[7]

Early syphilis (primary, secondary, and early non-primary non-secondary) in a pregnant woman requires a single dose of long-acting antibiotics for treatment. Late or unknown duration syphilis stage requires three doses of long-acting antibiotics, each one week apart. Pregnant women diagnosed with syphilis should receive treatment as early as possible, to prevent transmission to the baby, complications during their pregnancy, and serious health problems once they deliver their infant. Treatment initiated at least 30 days prior to delivery can prevent transmission of syphilis from a pregnant woman to her baby, with a success rate of up to 98 percent.[8] Women diagnosed with and treated for syphilis before they become pregnant decrease the likelihood of transmitting syphilis to the infant during pregnancy. However, when a woman contracts syphilis during pregnancy, the infection can cross the placenta and infect the developing baby. Women with symptomatic syphilis (primary or secondary syphilis) during their pregnancy experience an 80 percent chance of a negative pregnancy outcome (e.g., stillbirth, neonatal death, or signs and symptoms at birth). Women with untreated or inadequately treated non-symptomatic syphilis (early latent, late latent, or latent syphilis of unknown duration) possess a 23 percent

[6] Centers for Disease Control and Prevention (17 November 2022). Syphilis Pocket Guide for Providers. Retrieved from cdc.gov/std/syphilis/Syphilis-Pocket-Guide-FINAL-508.pdf.
[7] Centers for Disease Control and Prevention (16 April 2021). Syphilis (Treponema Pallidum) 2018 Case Definition. Retrieved from ndc.services.cdc.gov/case-definitions/syphilis-2018/.
[8] Centers for Disease Control and Prevention (30 March 2022). Sexually Transmitted Infections Treatment Guidelines-2021. Retrieved from cdc.gov/std/treatment-guidelines/syphilis.htm.

chance of the same outcomes.[9] Therefore, the DSHS prioritizes program efforts on women of childbearing age (women 15–44 years old), pregnant women diagnosed with syphilis, and women who delivered an infant exposed to syphilis.

Maternal Syphilis Treatment

Assessment of adequate maternal syphilis treatment relies on documentation of diagnosis, treatment date(s), and dosage. DSHS uses treatment information documented on the CS investigation form and in treatment tables in databases for complete ascertainment to analyze maternal treatment.

Population Numbers for Case Rates

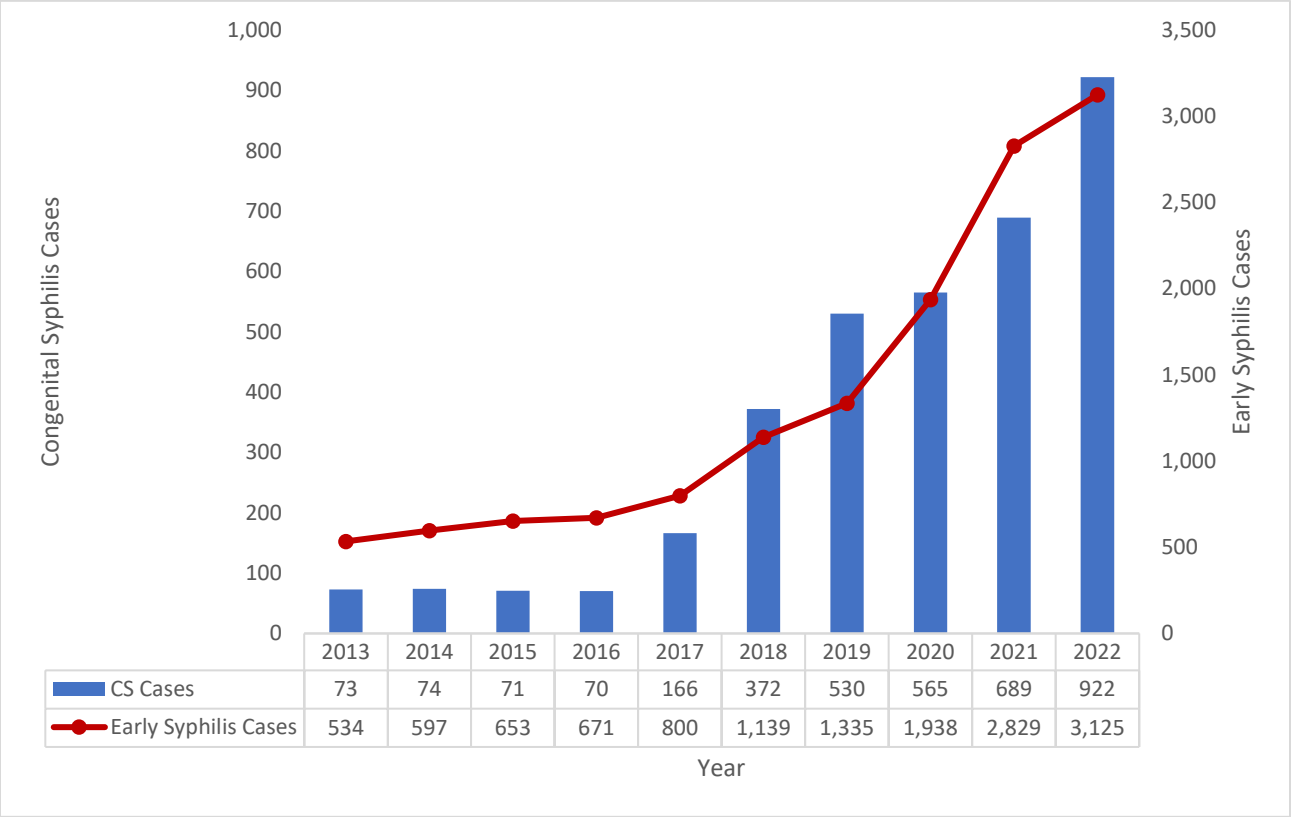
Population numbers used to calculate 2013-2022 CS rates come from the vital event-birth data disseminated by the Center for Health Statistics at DSHS. CS rates are calculated per 100,000 live births. Population numbers used to calculate rates for syphilis among women of childbearing age come from the U.S. Census Bureau and include estimates of the resident population of the United States from January 1, 2013, to December 31, 2022, by year, county, single year of age (0, 1, 2,..., 85 years and over), bridged race, Hispanic origin, and sex.

An Overview of CS and Syphilis in Women of Childbearing Age in Texas

In 2022, Texas reported 922 CS cases, an approximate 34 percent increase from 2021 (Figure 1). This represents a rate of 230 CS cases per 100,000 live births. Concurrently, an increase in reporting of syphilis in women of childbearing age occurred. In 2022, Texas reported 3,125 cases of early syphilis (primary, secondary, and early non-primary non-secondary) among women of childbearing age, representing a 10 percent increase from 2021 (Figure 1). Texas also reported 7,343 total syphilis cases (early and late) among women of childbearing age, which represents a 25 percent increase from 2021 (Figure 2).

[9] Arnold, S., Ford-Jones, E. (5 November 2000). Congenital Syphilis: A guide to diagnosis and management. Pediatrics & Child Health. Retrieved from ncbi.nlm.nih.gov/pmc/articles/PMC2819963/.

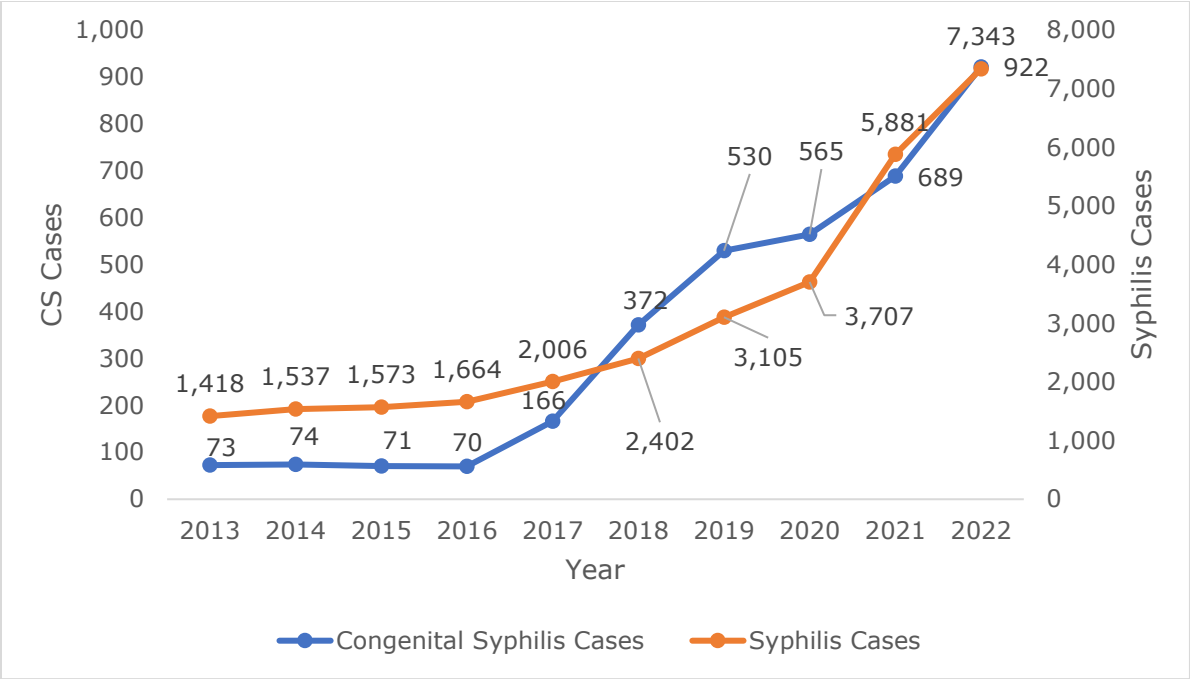
Figure 1: CS and Early Syphilis Cases in Women of Childbearing Age in Texas, 2013-2022*



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
CS Cases	73	74	71	70	166	372	530	565	689	922
Early Syphilis Cases	534	597	653	671	800	1,139	1,335	1,938	2,829	3,125

*Includes primary, secondary, and early non-primary non-secondary

Figure 2: CS Cases by Year of Birth and Total Syphilis Cases in Women of Childbearing Age in Texas, 2013-2022*



*Includes primary, secondary, early non-primary non-secondary, and unknown or late duration

CS and Syphilis in Women of Childbearing Age by Geographic Area

The majority of CS and syphilis cases in women of childbearing age occurred in and around Texas' metropolitan areas. In 2022, the top three Texas jurisdictions reporting the highest number of CS cases accounted for approximately 63 percent of CS cases (Figure 3). Four sites accounted for half of cases of women of childbearing age diagnosed with syphilis (Figure 4). More than half of Texas' 254 counties reported cases of syphilis among women of childbearing age (192 counties) (Figure 5), and 107 counties reported at least one case of CS (Figure 6).

In 2022, Corpus Christi (463.4), San Antonio (443.7), Dallas (403.2), PHR 4/5N (366.6), and PHR 11 (305.4) were the top five reporting STD surveillance sites by CS case rate (per 100,000 live births) (Figure 7). Sites with higher proportions of women of childbearing age diagnosed with syphilis also experienced a higher proportion of CS cases (Figure 8). These top five reporting STD surveillance sites by case rate simultaneously reported high rates of syphilis among women of childbearing age (per 100,000 population). In 2022, Corpus Christi reported the highest CS case rate in Texas (463.4) and a high case rate of syphilis women of childbearing age (231.5), with both

case rates higher than the Texas CS case rate (230.0) and syphilis among women of childbearing age case rate (116.7).

Figure 3: CS Cases by STD Surveillance Site in Texas, 2022

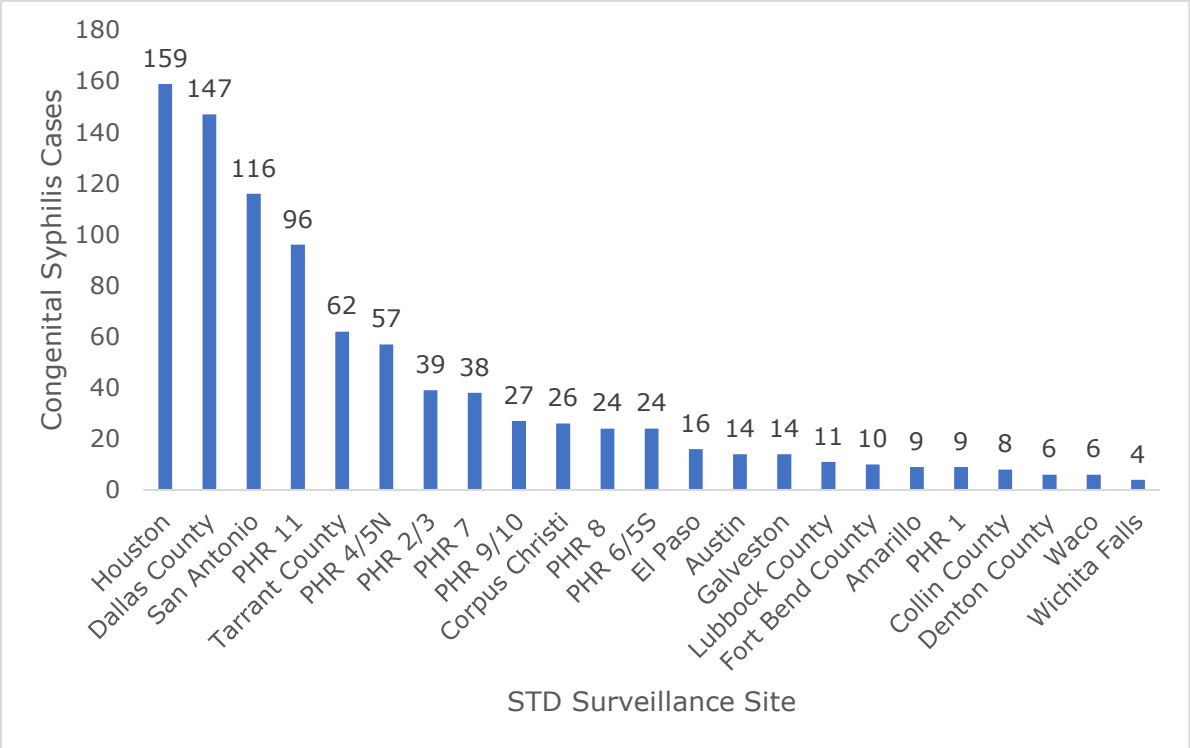


Figure 4: Syphilis Cases in Women of Childbearing Age by STD Surveillance Site in Texas, 2022

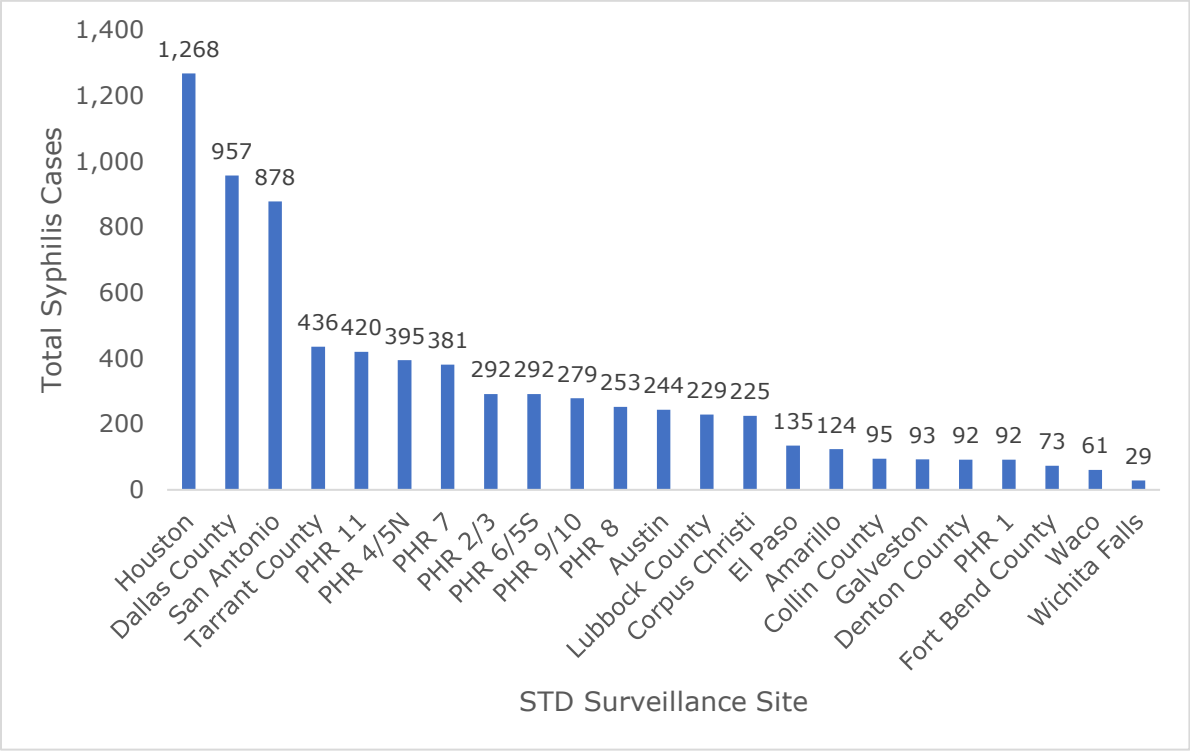
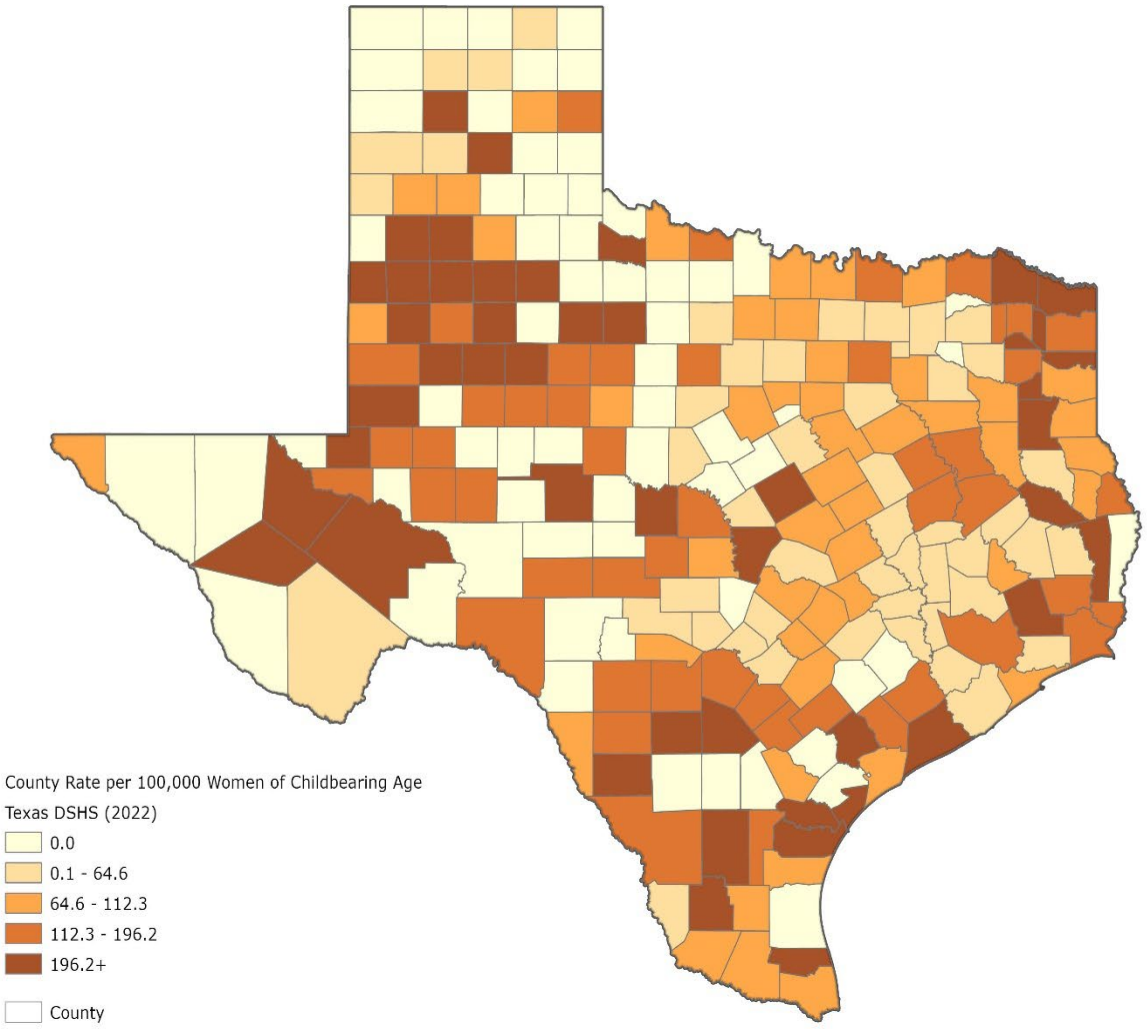
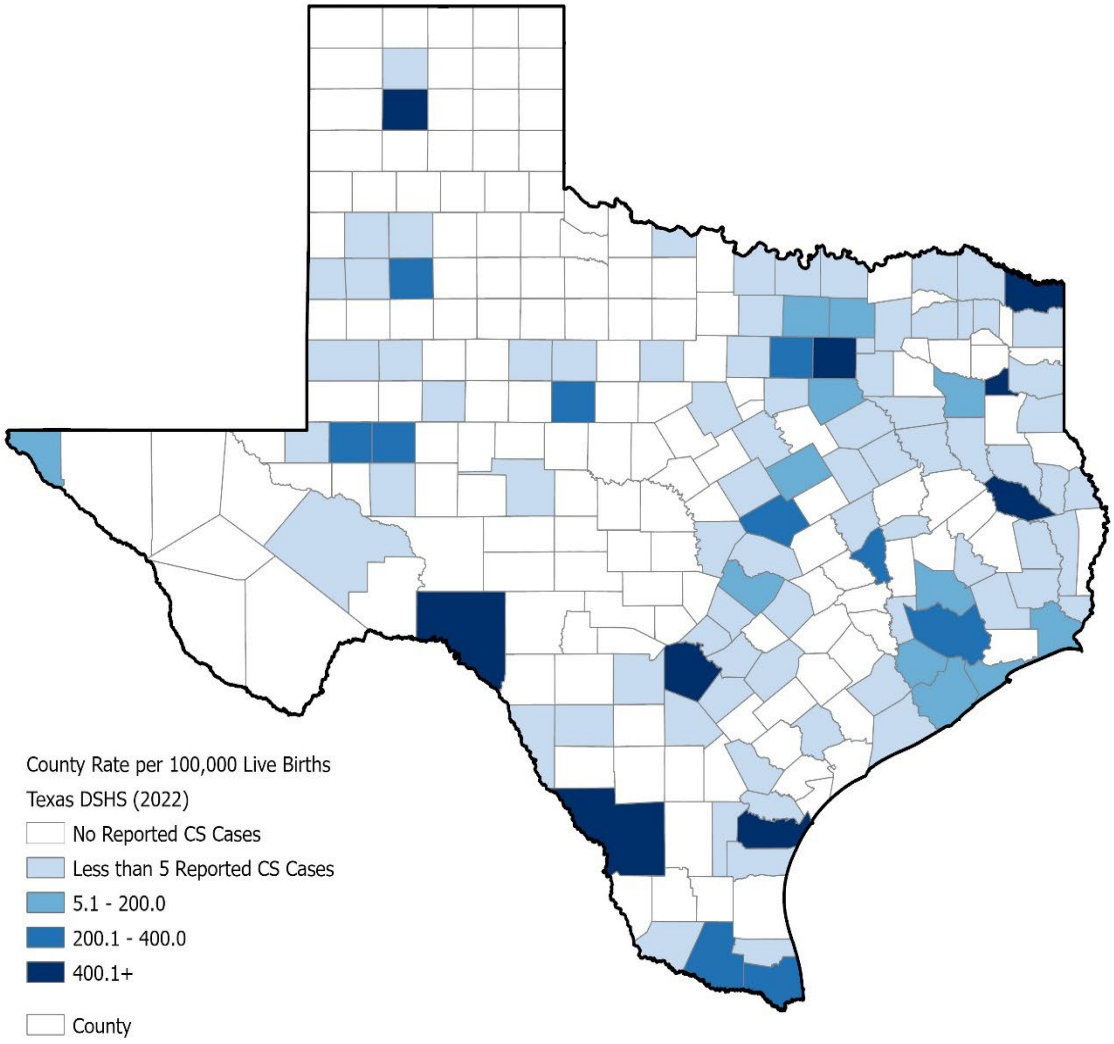


*Figure 5: Syphilis Rates in Women of Childbearing Age by County in Texas, 2022**



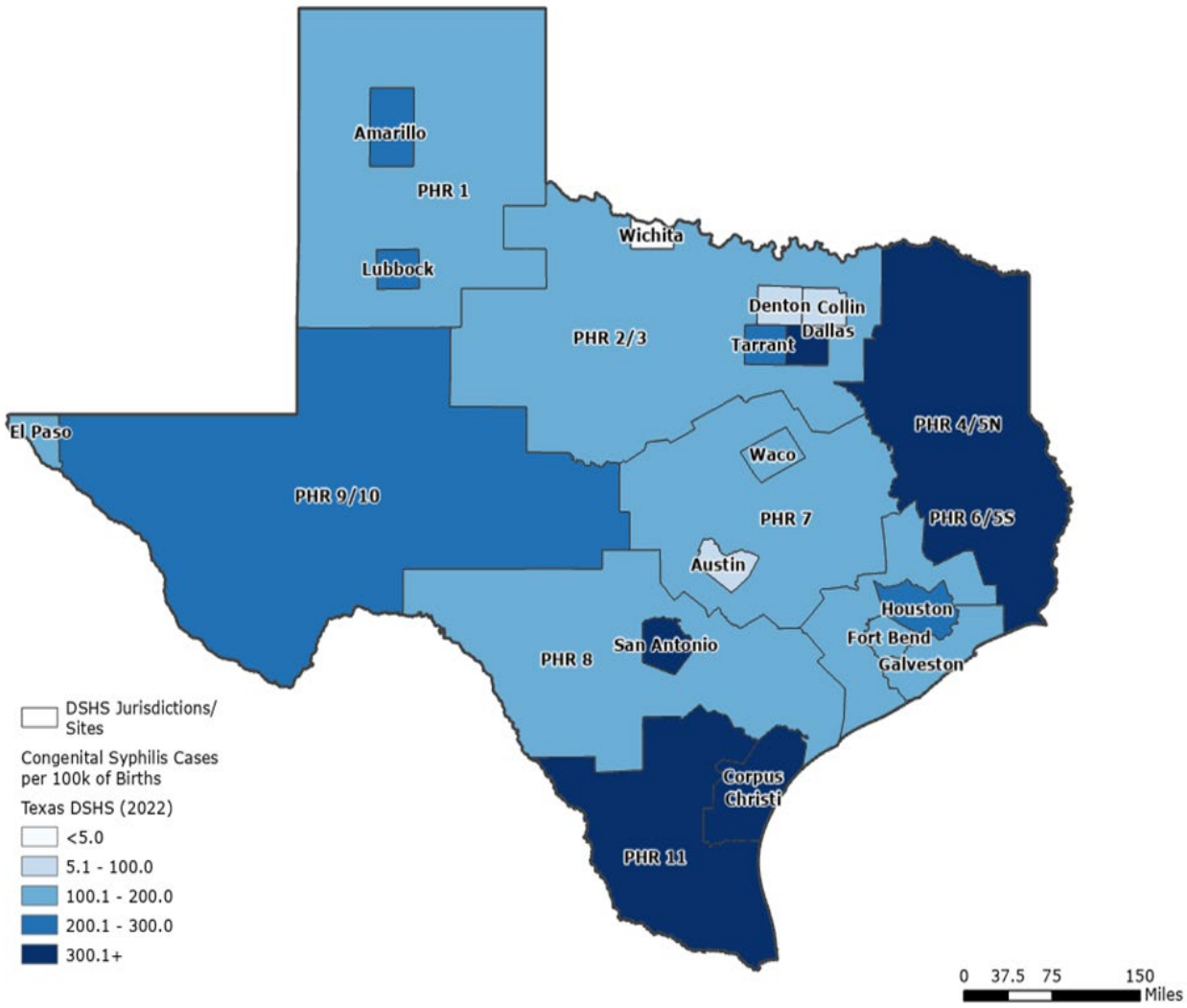
*Denominator used to calculate rate is women of childbearing age by county.

*Figure 6: Rates of CS by County in Texas, 2022**



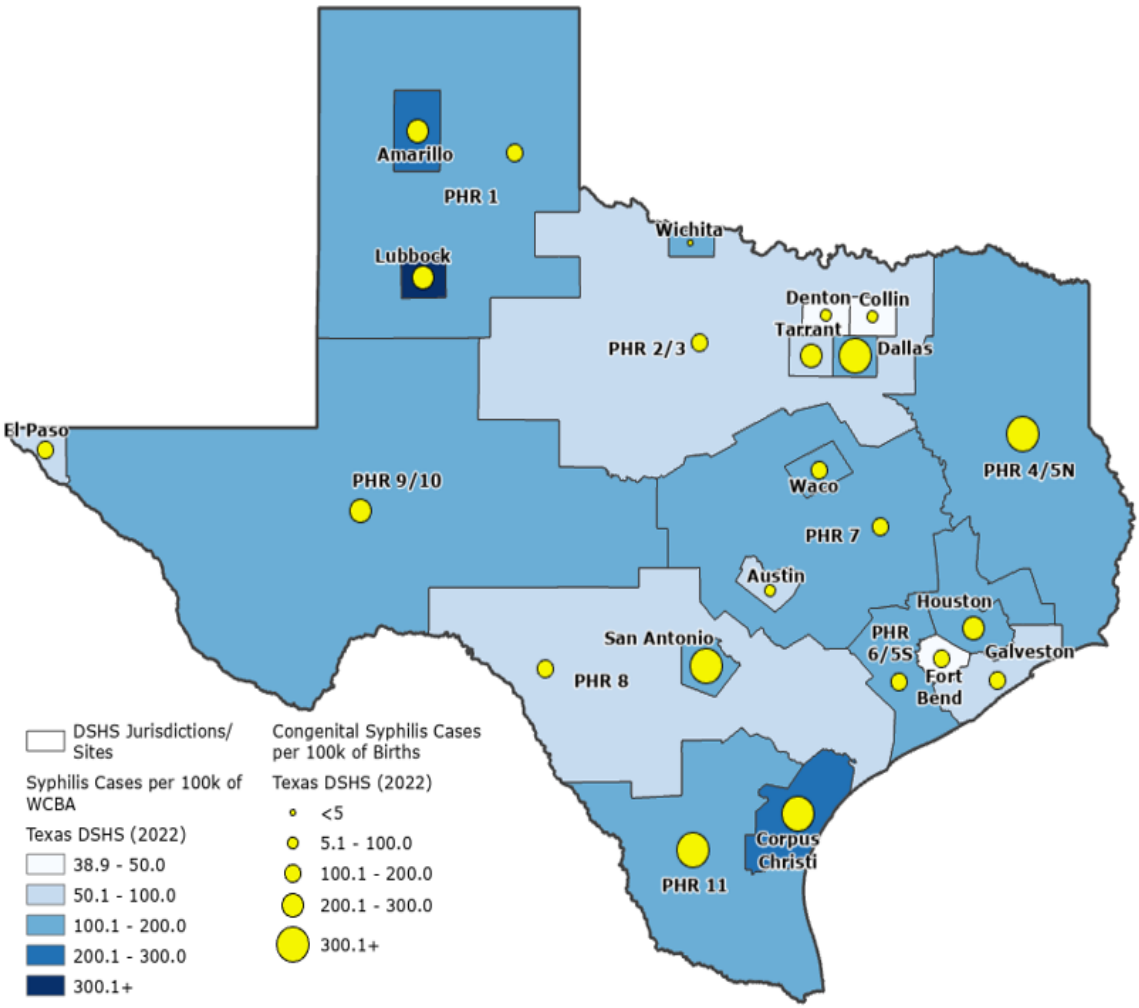
*Denominator used to calculate rate is the 2022 CHS birth data by county.

*Figure 7: CS Cases Rates by STD Surveillance Site in Texas, 2022**



*Denominator used to calculate rate is the 2022 CHS birth data by county.

Figure 8: Proportion of Women of Childbearing Age with Syphilis and Proportion of CS Cases by STD Surveillance Site in Texas, 2022



Maternal Demographics for Women Delivering Infants with CS

Race/Ethnicity

Among the 922 infants reported with CS in 2022, Hispanic (45 percent) and Black (29 percent) Texas women accounted for more than seven out of ten CS cases (Figure 9). For CS case rates by mother's race and ethnicity, Black women experienced the highest rate at 524.2 cases per 100,000 live births, followed by Hispanic women with a rate of 236.2 cases per 100,000 live births (Figure 10).

Figure 9: Percentage of CS Cases by Mother's Race/Ethnicity in Texas, 2022

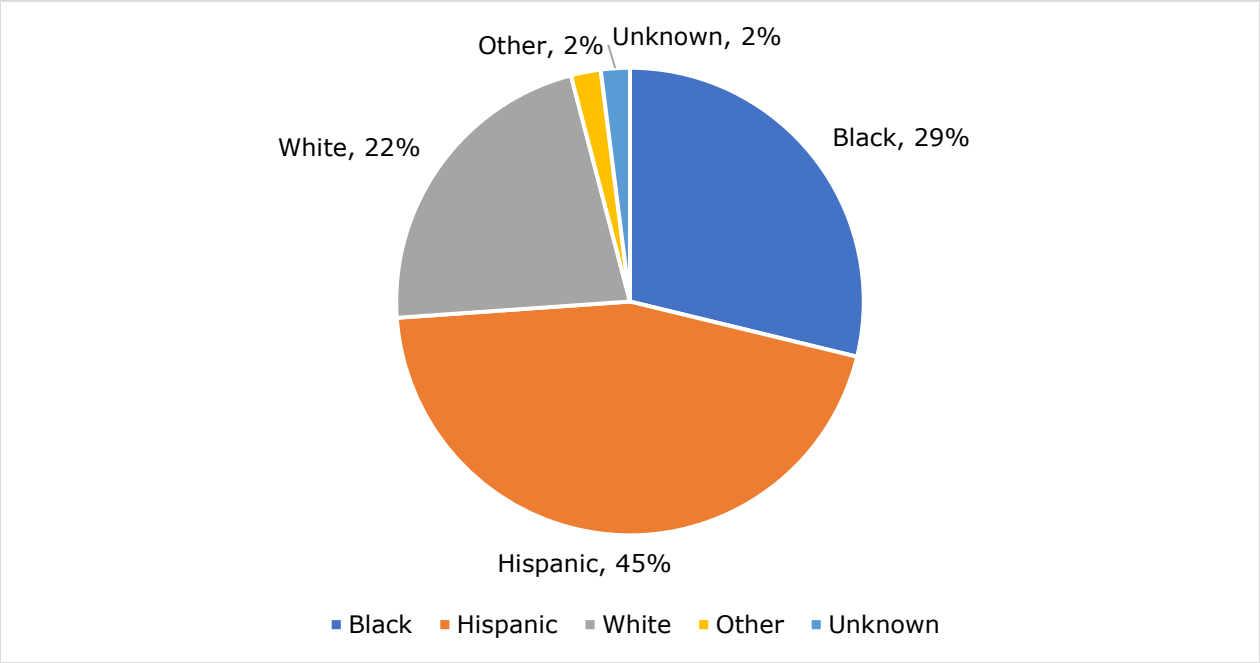
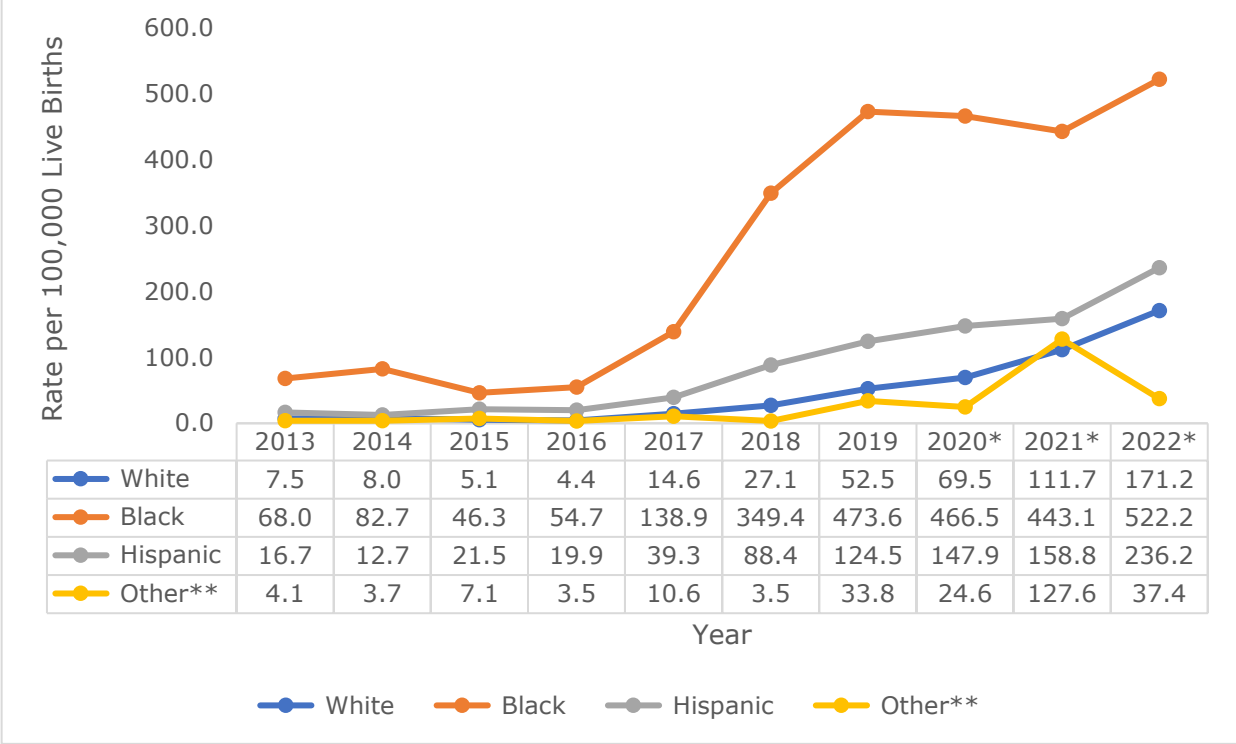


*Figure 10: CS Rates† in Infants by Mother's Race/Ethnicity in Texas, 2013-2022**



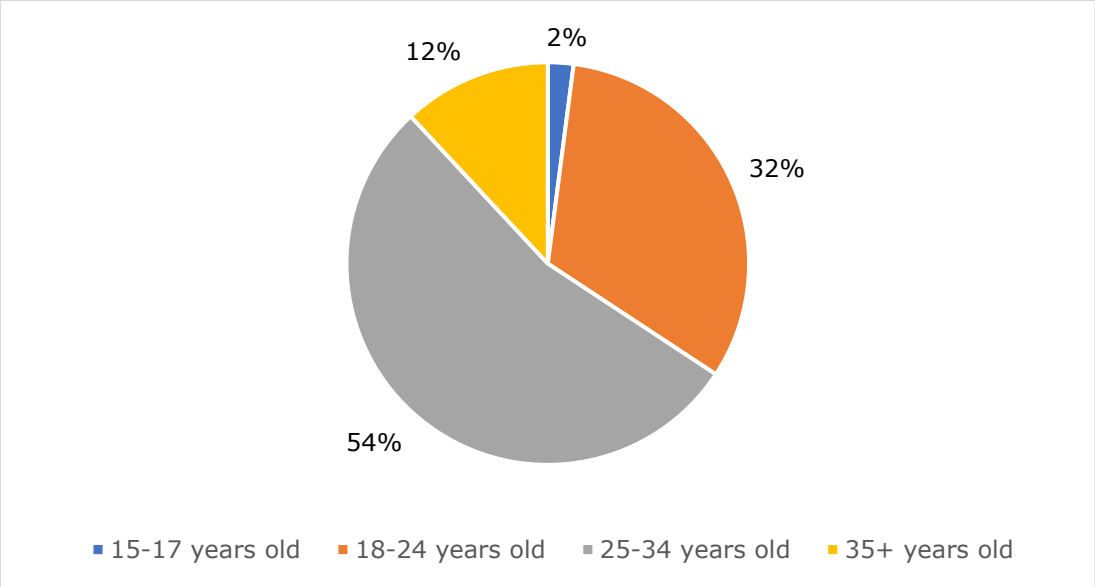
	2013	2014	2015	2016	2017	2018	2019	2020*	2021*	2022*
White	7.5	8.0	5.1	4.4	14.6	27.1	52.5	69.5	111.7	171.2
Black	68.0	82.7	46.3	54.7	138.9	349.4	473.6	466.5	443.1	522.2
Hispanic	16.7	12.7	21.5	19.9	39.3	88.4	124.5	147.9	158.8	236.2
Other**	4.1	3.7	7.1	3.5	10.6	3.5	33.8	24.6	127.6	37.4

† Rates represent cases per 100,000 live births.
*2020, 2021, and 2022 rates are based on provisional 2020, 2021, and 2022 birth data.
**Other includes Native Hawaiian/Pacific Islander, American Indian/Alaskan Native, and Asian race/ethnic groups.

Maternal Age at Delivery of an Infant with CS

At the time of delivery, women 25-34 years old accounted for more than half of mothers. Mothers 18 years and older accounted for 98 percent of CS cases in 2022 (Figure 11).

Figure 11: Age (Years) of Mothers Delivering Infants Diagnosed with CS at the Time of Delivery in Texas, 2022



Facility of Maternal Syphilis Diagnosis

Approximately seven out of ten women delivering an infant with CS received their syphilis diagnosis at an inpatient hospital, private physician's office, or obstetrics and gynecology/prenatal clinic.

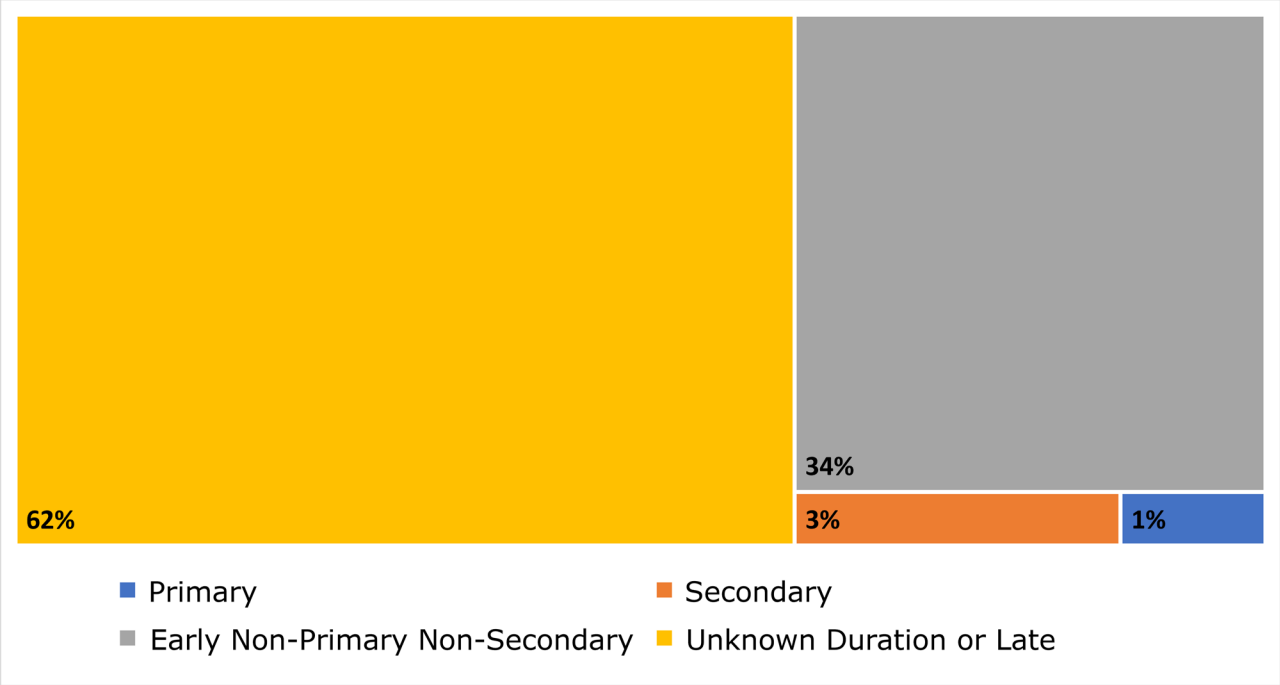
Table 1: Facility of Maternal Syphilis Diagnosis in Women Delivering an Infant Diagnosed with CS in Texas, 2022

Facility Type	Percentage
Hospital Inpatient	40%
Private Physician Office/Primary Care Clinic	18%
Obstetrics and Gynecology/Prenatal Clinic	15%
Specialty Clinic/Hospital Clinic	6%
STD Clinic	3%
Laboratory	3%
Community Health Center	2%
Emergency Room/Urgent Care	2%
Inpatient/Labor and Delivery	2%
Correctional Facility	2%
Family Planning Clinic	2%
Other	2%
Unknown	1%
Blood Bank, Plasma Center	1%
Health Department	1%

Maternal Syphilis Stage at Diagnosis

Maternal syphilis staging determines the appropriate treatment regimen for syphilis. In 2022, more than 60 percent of mothers with syphilis received a diagnosis of unknown or late duration (Figure 12). Pregnant women diagnosed with syphilis of late or unknown duration require three treatments of Benzathine penicillin G, given one week apart. If a person misses a dose or takes it more than nine days apart, they must restart the treatment. Failure to complete this treatment therapy appropriately results in a report of a probable CS case.

Figure 12: Percentage of CS Cases by Maternal Syphilis Stage at Diagnosis in Texas, 2022

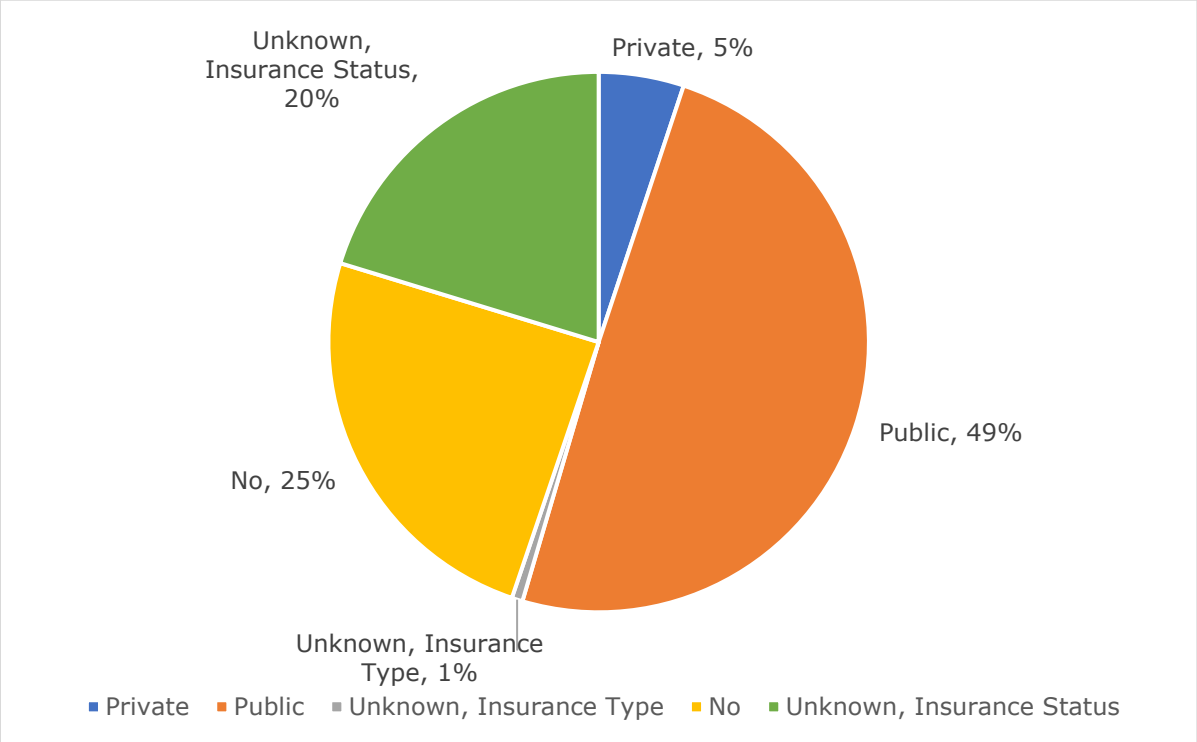


Barriers to Care

Texas utilizes internal and external case review boards to thoroughly examine probable and confirmed CS cases and syphilitic stillbirths, and to review missed opportunities for CS prevention. DIS face challenges, such as delays in receiving a positive lab result or initiating partner services, as they work to prevent maternal syphilis. Difficulty locating the client or their partner leads to untreated syphilis cases or potential reinfection. Clients report housing instability, domestic or intimate partner violence, mental health issues, and substance use disorders as barriers to seeking healthcare.

Review boards identified women who deliver infants diagnosed with CS often experience prior involvement with corrections (local, state, and federal jails or prisons) or child protective services. Clients often cite transportation issues as a reason they cannot make medical appointments. Clients report the process of enrolling in Medicaid and finding a provider in their area are factors that contribute to late prenatal care. In 2022, among the 55 percent of mothers who reported accessing insurance during their pregnancy, half reported accessing public insurance (Figure 13).

*Figure 13: Percentage of CS Cases by Maternal Insurance Status in Texas, 2022**



Prenatal Care

In 2022, 63 percent of women delivering an infant diagnosed with CS received some level of prenatal care, and about one-third of women delivering an infant diagnosed with CS experienced no or unknown prenatal care. Among women accessing prenatal care, over 50 percent of women who entered prenatal care, entered after the first trimester (Figure 14). Of the 29 percent of women accessing prenatal care in the first trimester, 6 percent did not receive prenatal care past the first trimester.

Corpus Christi and PHR 11 both reported high case rates of CS and syphilis among women of childbearing age and reported a high number of CS cases without prenatal care. Of the 23 CS cases Corpus Christi reported, 50 percent did not access prenatal care, and of the 96 CS cases PHR 11 reported, 44 percent did not access prenatal care (Figure 15).

Figure 14: Prenatal Care in Mothers who Delivered an Infant with CS in Texas, 2022

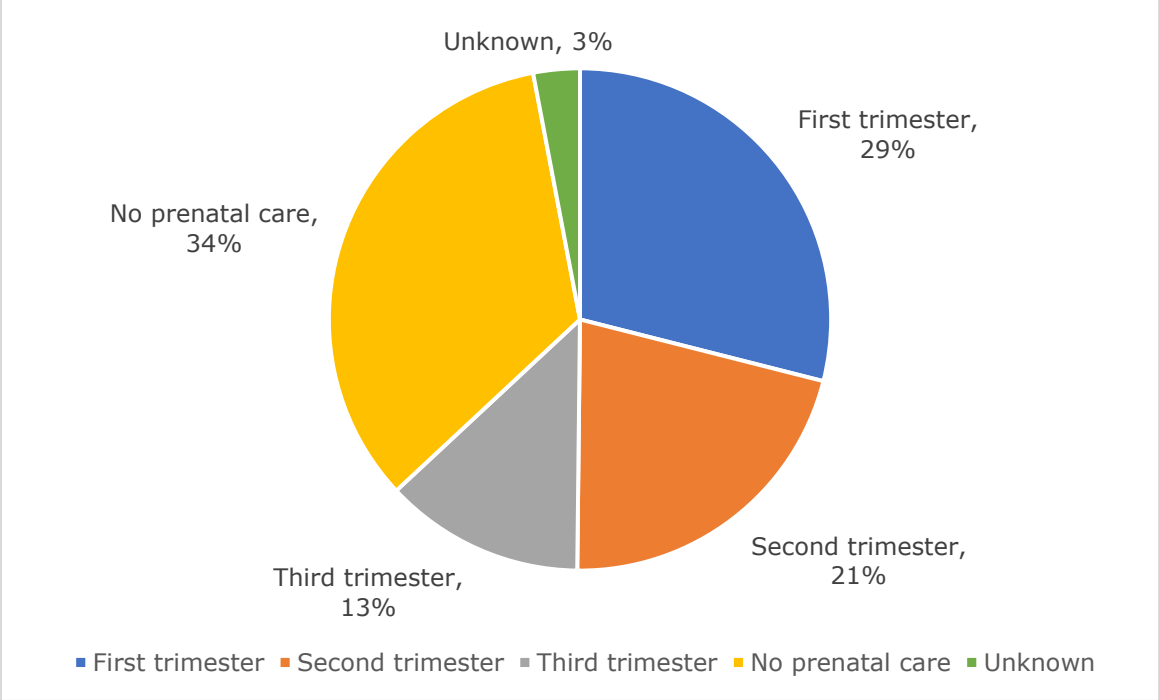
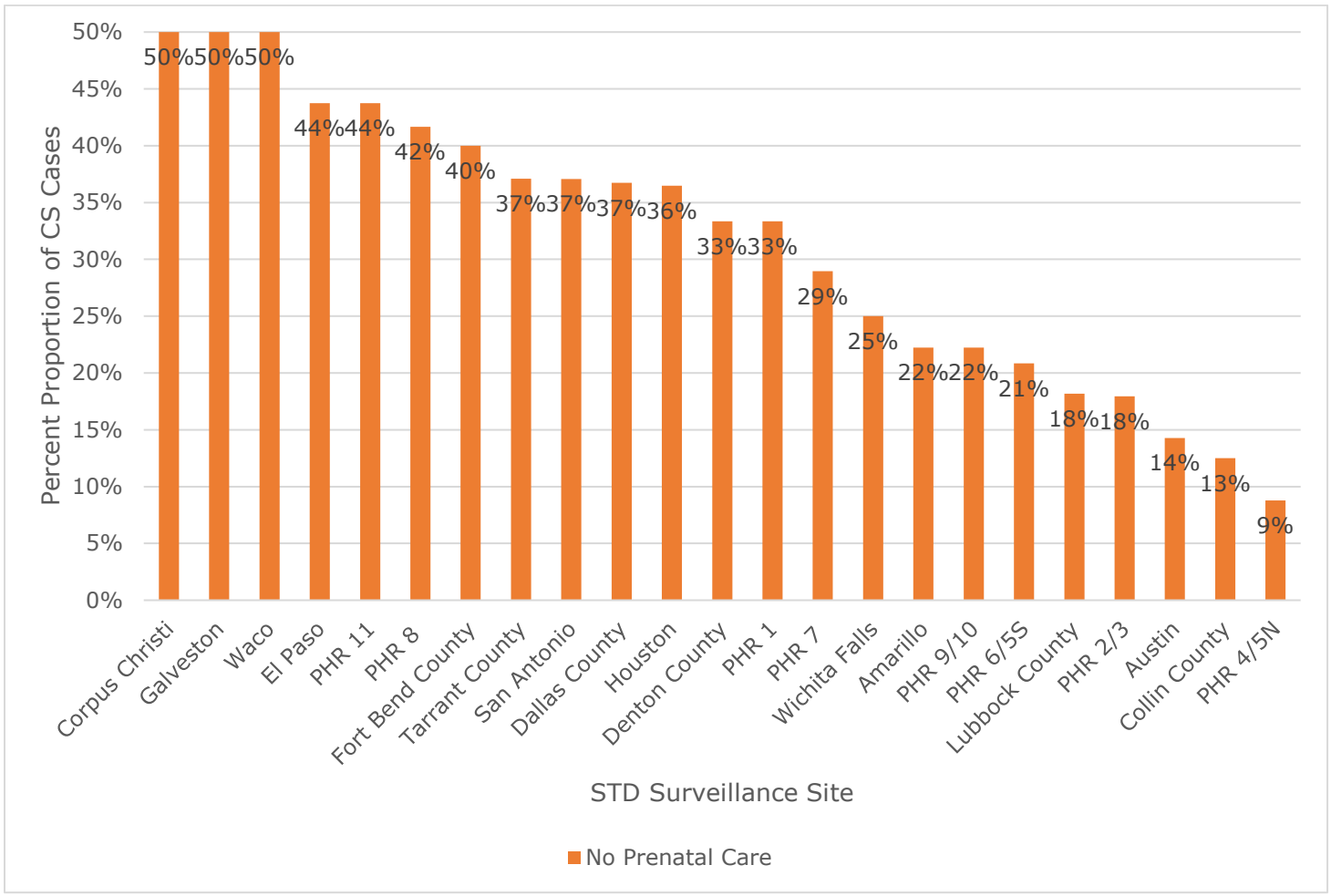


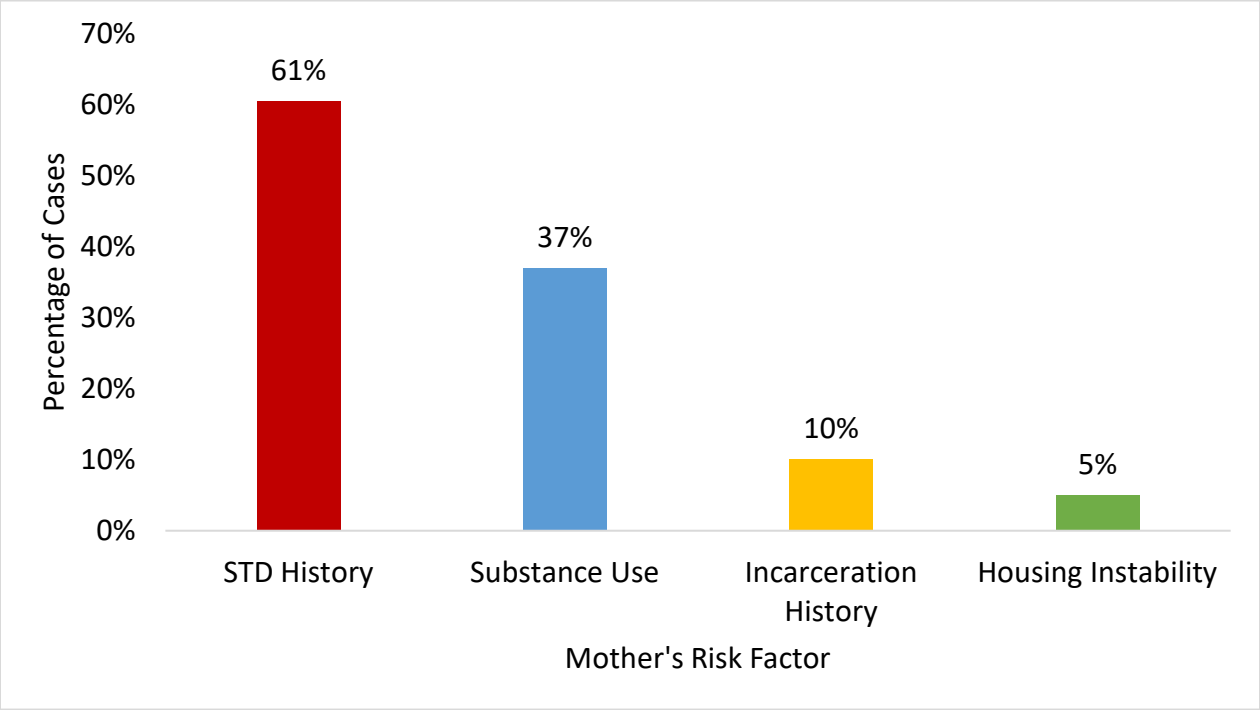
Figure 15: Percent of CS Cases with No Prenatal Care by STD Surveillance Site in Texas, 2022



Maternal Risk History

Maternal risk history provides insight into challenges faced by women delivering infants with CS. Out of 463 women who participated in a partner services interview, 61 percent had a previous STD (Figure 16). The factors below contribute to an increased risk of CS.

*Figure 16: Risk History of Women Delivering an Infant with CS in Texas, 2022**



* Women delivering an infant with CS who received a partner services interview at the time of diagnosis.

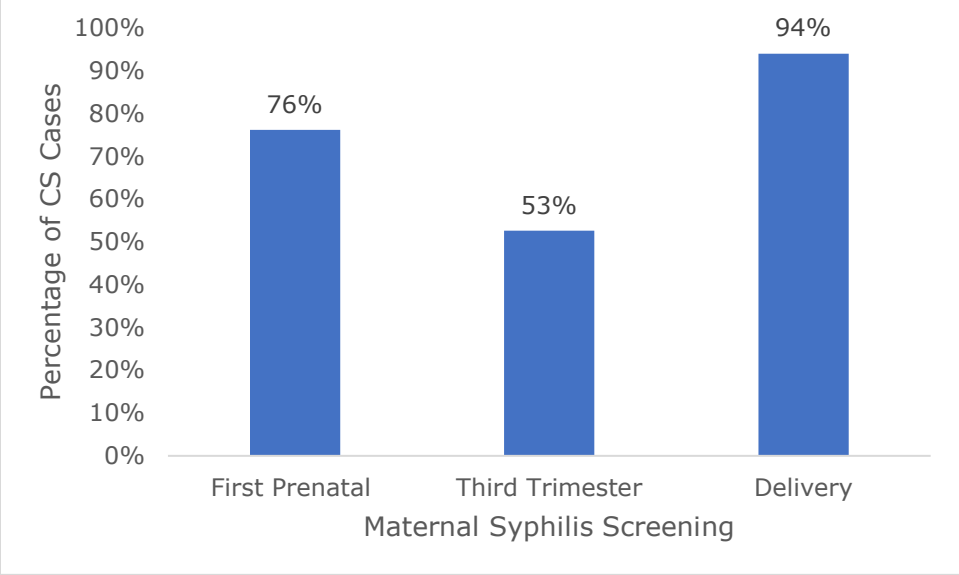
Maternal Syphilis Screening During Pregnancy

The Texas Health and Safety Code §81.090 mandates syphilis screening three times during pregnancy:

- At first prenatal care examination;
- During third trimester (no earlier than 28 weeks' gestation); and,
- At delivery.

In 2022, over 99 percent of mothers received syphilis screening during pregnancy or at delivery. However, 75 percent of those who accessed prenatal care did not receive syphilis screening in accordance with the Texas Health and Safety Code §81.090. In 2022, of mothers whose babies were born with CS and who accessed prenatal care, only around half received third trimester screening (Figure 17). There is a need for increased syphilis screening for pregnant women to prevent CS.

Figure 17: Maternal Syphilis Screening for Women Delivering an Infant with CS in Texas, 2022



Timing of Maternal Syphilis Diagnosis in Relation to Delivery

A syphilis diagnosis at least 45 days prior to delivery allows enough time for providers and health departments to receive positive lab results and initiate adequate maternal treatment at least 30 days prior to delivery to significantly reduce the chance of CS. In 2022, 68 percent of mothers delivering an infant with CS received a syphilis diagnosis during pregnancy. Over half of mothers delivering an infant with CS received their syphilis diagnosis fewer than 45 days prior to delivery, at the time of delivery, or postpartum (Table 2).

Table 2: Timing of Maternal Syphilis Diagnosis Among Mothers Delivering an Infant with CS in Texas, 2022

Maternal Timing of Diagnosis	Percent
45 days or more before delivery	49%
Fewer than 45 days before delivery	19%
At Delivery	30%
Post-Partum	2%

Maternal Treatment for Syphilis

For treatment among women delivering an infant diagnosed with CS, 90 percent received inadequate or no syphilis treatment, and nine percent received adequate syphilis treatment (Figure 18). Adequate syphilis treatment depends on the syphilis stage at the time of diagnosis and must begin at least 30 days prior to delivery. For mothers diagnosed at least 45 days prior to delivery, approximately 78 percent received inadequate treatment or no treatment (Figure 19).

Figure 18: Maternal Syphilis Treatment for Women Delivering an Infant with CS in Texas, 2022

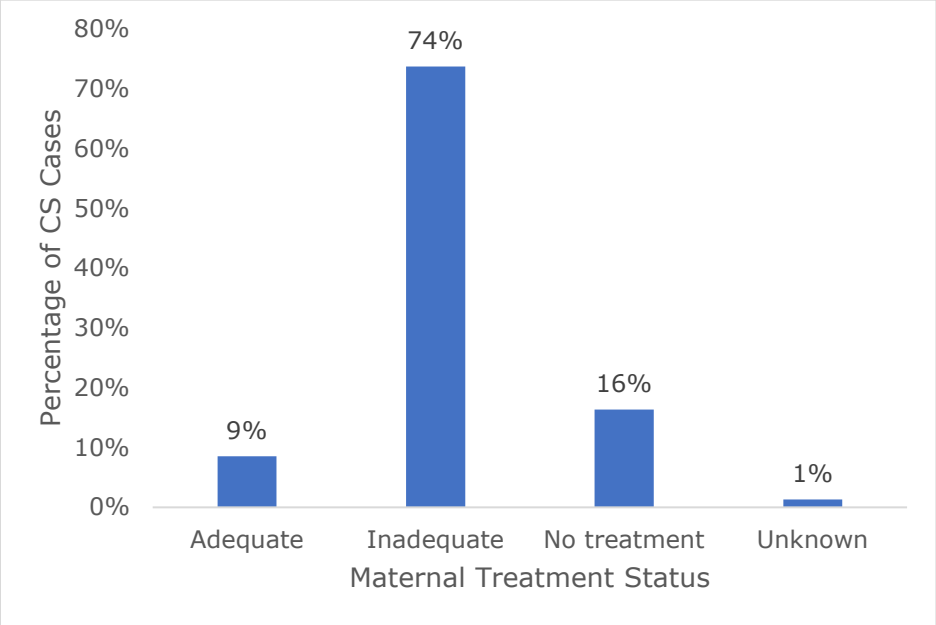
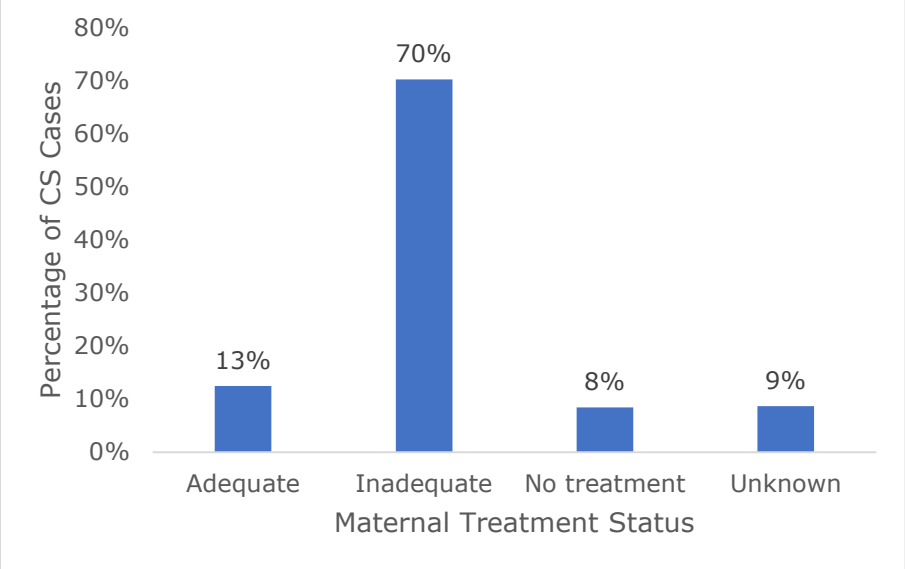


Figure 19: Maternal Syphilis Treatment for Women Diagnosed at Least 45 Days before Delivery in Texas, 2022



Birth Outcomes Associated with CS

CS occurs when syphilis is transmitted to babies during pregnancy, or at delivery by an untreated or inadequately treated woman with syphilis. CS can lead to miscarriage, stillbirth, preterm delivery, birth defects, and even perinatal death. Some infants with CS may present healthy, with no signs and symptoms at birth, but may develop life-altering complications later in life.[10] According to the CDC, about 40 percent of infants born to women with untreated syphilis can be born stillborn or the infant can die shortly after birth.[11] A probable CS case most often includes an infant whose mother experienced untreated or inadequately treated syphilis at the time of delivery.

A syphilitic stillbirth occurs when a woman with untreated or inadequately treated syphilis delivers a fetus with at least 20 weeks' gestation, or the fetus weighs at least 500 grams. Specialized laboratory testing for the presence of *Treponema pallidum* confirms a CS case. CS may cause vision or hearing loss, liver inflammation leading to jaundice of the skin and eyes, long-bone abnormalities, developmental delays, snuffles (a highly contagious, physical symptom of CS consisting of mucous around the eyes, nose, and mouth), rashes, wart-like lesions on the genitals, and additional symptoms. Clinical

[10] Centers for Disease Control and Prevention (12 April 2022). CS – CDC Fact Sheet. Retrieved from cdc.gov/std/syphilis/stdfact-congenital-syphilis.htm.
[11] Centers for Disease Control and Prevention (11 August 2022). Pregnancy and HIV, Viral Hepatitis, STD & TB Prevention. Retrieved from cdc.gov/nchhstp/pregnancy/effects/syphilis.html.

manifestations of late CS include problems with bone and tooth development, hearing, and vision, as well as the central nervous and cardiovascular systems. Timely prenatal care, testing, and treatment can avert potentially devastating health outcomes for infants. [12]

Among the 922 CS cases in 2022, infants with a low birth weight (<2500g) accounted for more than one-quarter of CS cases, and 30 percent classified as preterm (<37 weeks' gestation). Of the reported CS cases, 52 (six percent) resulted in stillbirth or neonatal death. Texas' 922 reported CS cases consist of: 40 syphilitic stillbirths, five confirmed cases, and 877 probable cases (Table 3).

Table 3: Birth Outcomes of CS Cases, Texas 2022

Birth Outcomes	No. of Cases	Percent
Total Cases	**922**	**100%**
Birth Weight		
Low Birth Weight (<2500g)	239	26%
Normal Birth Weight (≥2500g)	670	73%
Unknown Birth Weight	13	1%
Gestational Age		
Preterm (<37 weeks)	267	29%
Full-term (≥37 weeks)	653	71%
Unknown Gestational Age	2	0%
Vital Status		
Alive	870	94%
Stillbirth or neonatal death	52	6%
Classification		
Probable Case	878	95%
Syphilitic Stillbirth	40	4%
Confirmed Case	4	1%

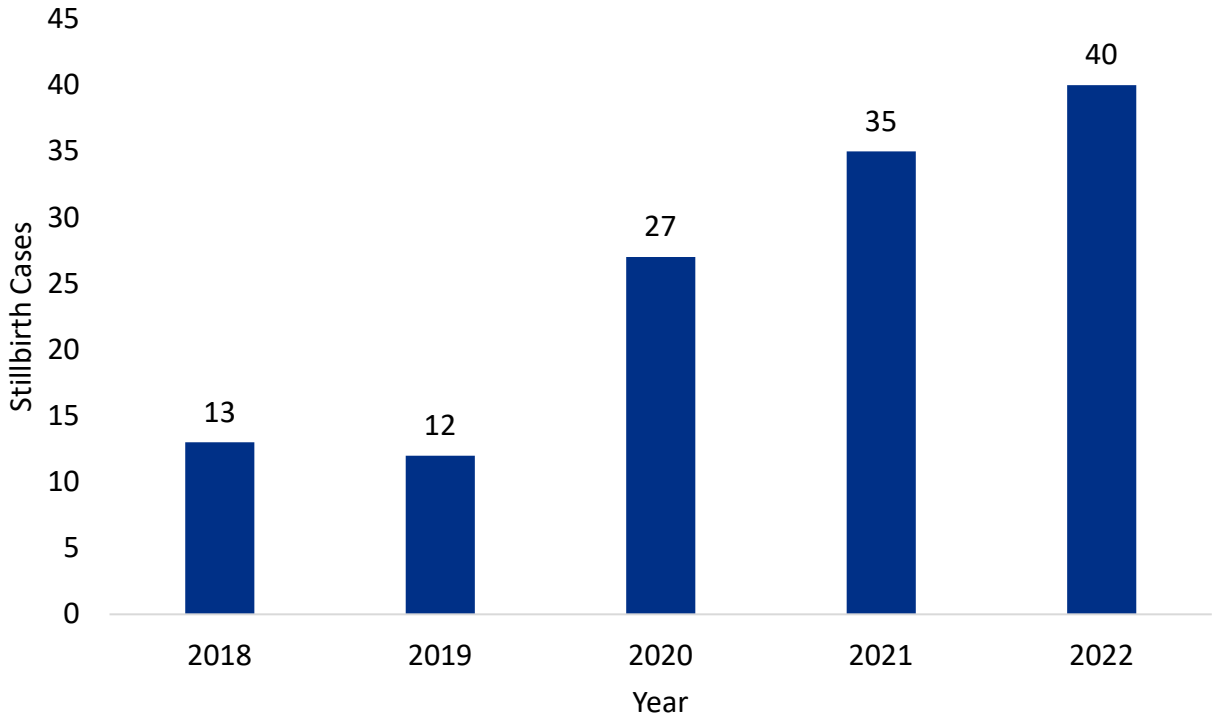
Syphilitic Stillbirths

Nationally, 231 syphilitic stillbirths were reported in 2022. Of those, Texas accounted for 40 (17 percent).[13] Over the past five years, Texas experienced

[12] Centers for Disease Control and Prevention (16 April 2021). CS (Treponema pallidum) 2018 Case Definition. Retrieved from ndc.services.cdc.gov/case-definitions/syphilis-2018/.
[13] Center for Disease Control and Prevention (17 November 2023). Vital Signs: Missed Opportunities for Preventing Congenital Syphilis — United States, 2022. Retrieved from cdc.gov/mmwr/volumes/72/wr/mm7246e1.htm.

a 207 percent increase in the number of reported CS stillbirths from 13 in 2018 to 40 in 2022 (Figure 20).

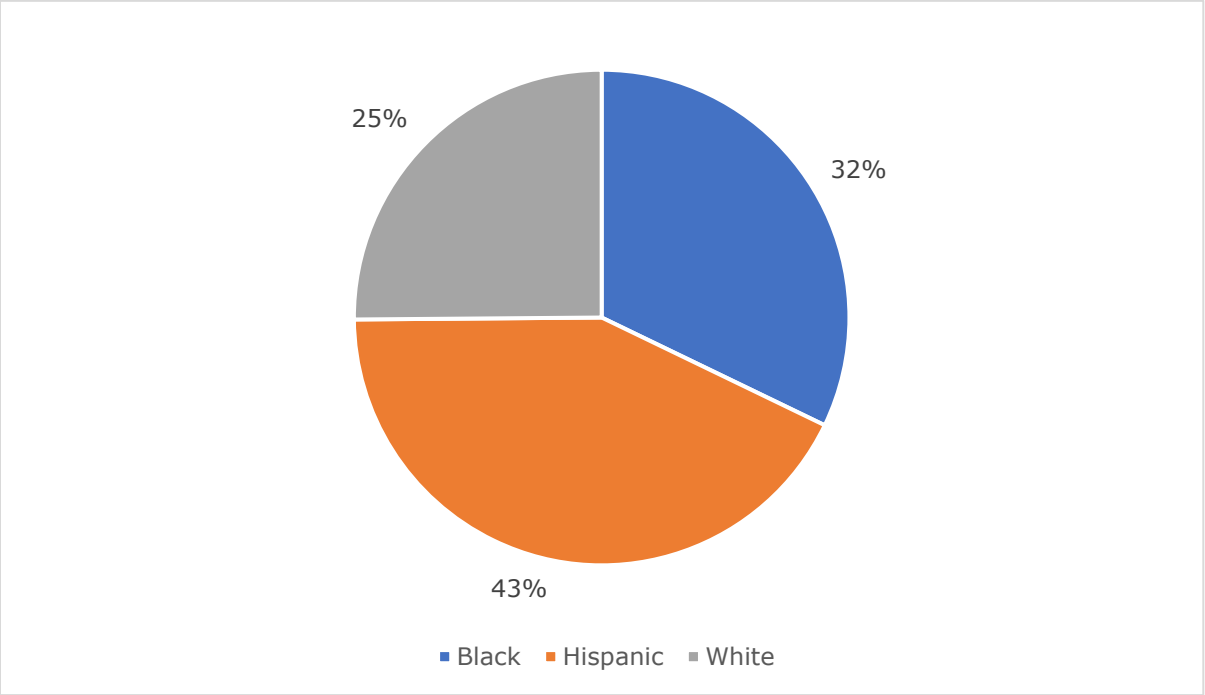
Figure 20: Syphilitic Stillbirths in Texas, 2018-2022



The disproportionate impact of CS cases on Hispanic and Black mothers is seen among syphilitic stillbirths with 43 percent of syphilitic stillbirths in Texas born to Hispanic mothers and 32 percent born to Black mothers (Figure 21). In 2022, five percent of Black mothers delivering an infant with CS (265) delivered a syphilitic stillbirth (Figure 22).

In 2022, more than half of women delivering a syphilitic stillbirth received a syphilis diagnosis at delivery. Out of 40 syphilitic stillbirths, only 15 percent were diagnosed 45 days or more prior to delivery (Figure 23).

Figure 21: Percentage of Syphilitic Stillbirths by Mother's Race/Ethnicity in Texas, 2022*



*Other and Unknown race categories had zero syphilitic stillbirths

Figure 22: Percent Proportion of CS Case Classifications by Mother's Race/Ethnicity in Texas, 2022

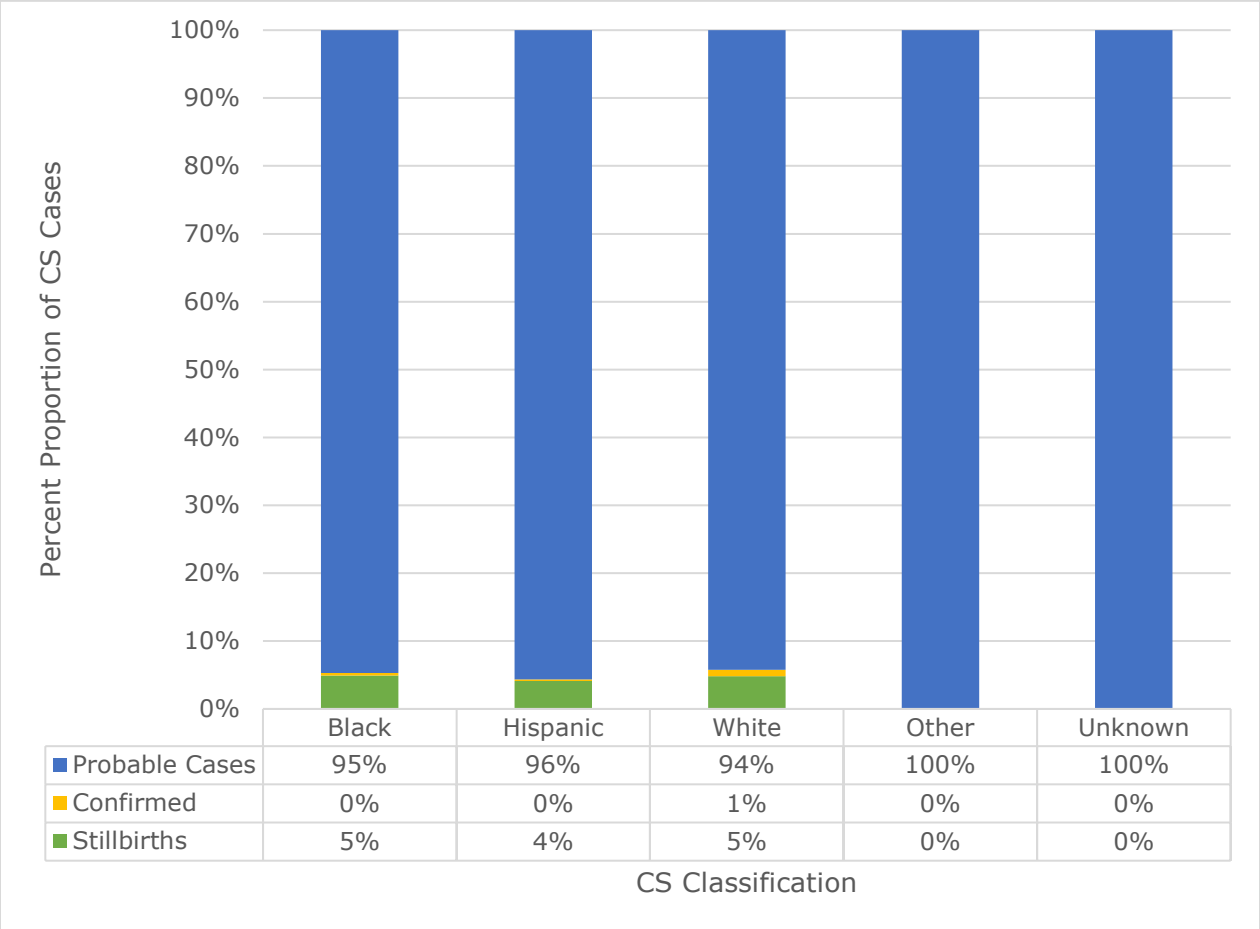
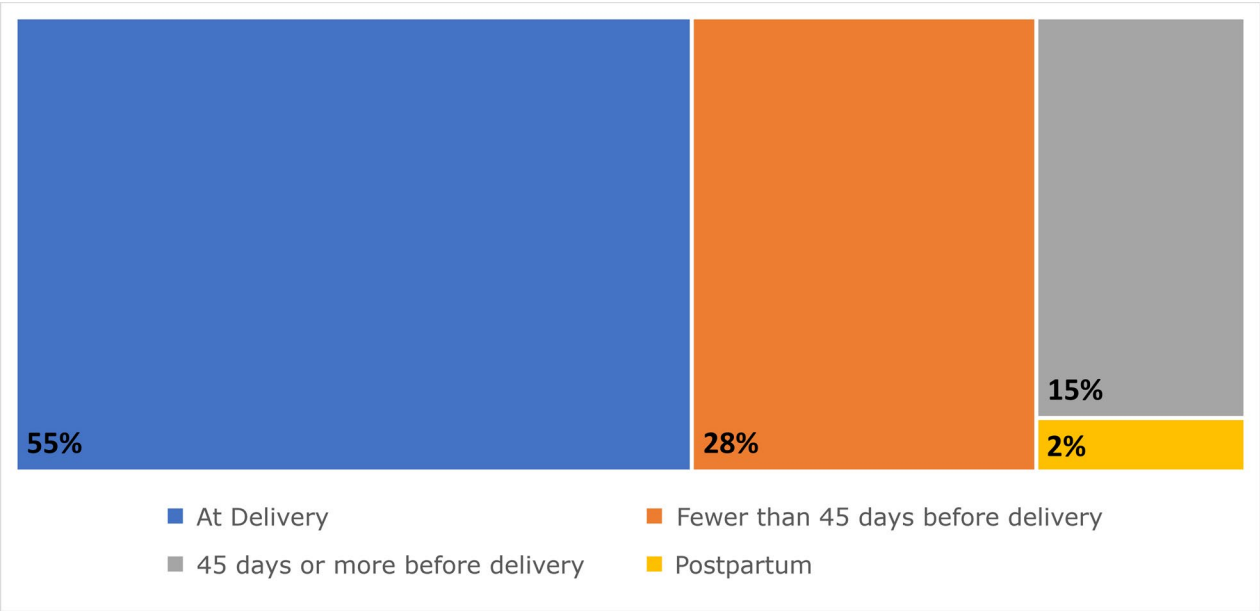


Figure 23: Percentage of Syphilitic Stillbirths Grouped by Time to Delivery at Diagnosis in Texas, 2022



Testing and Treatment for Infants with CS

Maternal treatment adequacy and clinical and laboratory evaluations of the infant determine treatment and evaluation decisions for infants born to mothers diagnosed with syphilis. CS evaluation differs and requires more steps than testing for sexually acquired syphilis. These steps include reactive non-treponemal blood tests and one of the following: evidence of CS on physical exam, long-bone x-ray, reactive cerebrospinal fluid (CSF) venereal disease research laboratory (VDRL) test, or elevated CSF white blood cell or protein count without other cause. A CSF analysis from a lumbar puncture can evaluate possible neurological involvement.[14] In Texas, 84 percent of probable and confirmed CS cases (881) received a non-treponemal test at delivery (Figure 24). Treponemal tests (e.g., EIA/CIA, FTA, and TPPA) test for *Treponema pallidum* antibodies and confirm a syphilis diagnosis. Due to the likelihood of passively transferring maternal antibodies to an infant, which can persist for more than 15 months after delivery, treponemal testing for infants is not recommended.[15]

Confirmatory tests (darkfield, immunohistochemistry (IHC), polymerase chain reaction (PCR), or special stains) can definitively demonstrate the presence of *Treponema pallidum* in bodily fluids, or in tissue on placentas, umbilical cords, or autopsy material.[15] Two percent of infants reported with CS received further evaluation using the confirmatory testing methodology; 27 percent of those tested resulted in reactive results on darkfield, IHC, PCR, or special stains (Figure 25). Among infants reported with CS, 30 percent did not receive treatment (Table 4).

[14] Centers for Disease Control and Prevention (30 March 2022). Sexually Transmitted Infections Treatment Guidelines-2021. Retrieved from cdc.gov/std/treatment-guidelines/syphilis.htm.
[15] Center for Disease Control and Prevention (30 March 2022). Sexually Transmitted Infections Treatment Guidelines-2021-Congenital Syphilis. Retrieved from cdc.gov/std/treatment-guidelines/congenital-syphilis.htm.

Figure 24: Testing and Evaluation for Infants Reported with CS in Texas, 2022

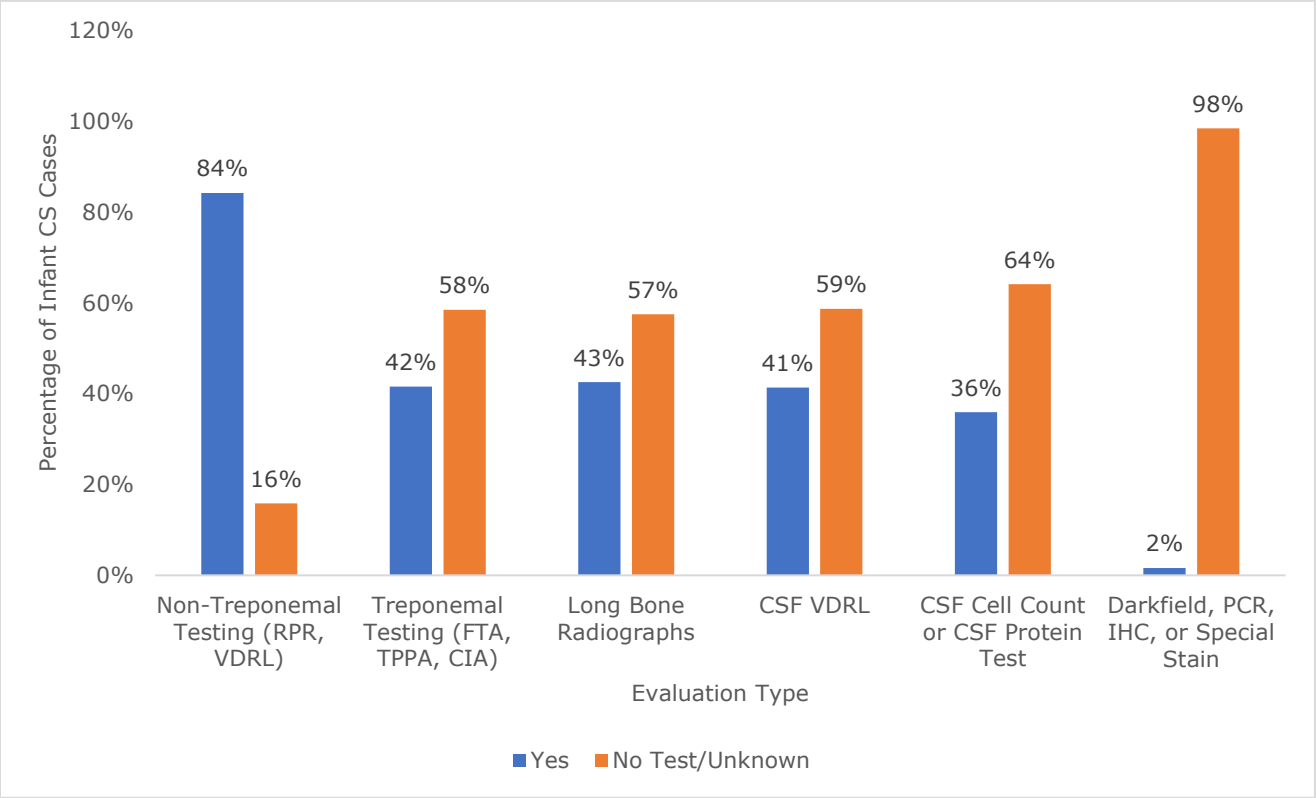


Figure 25: Reactive Testing and Evaluation Outcomes for Infants Reported with CS in Texas, 2022

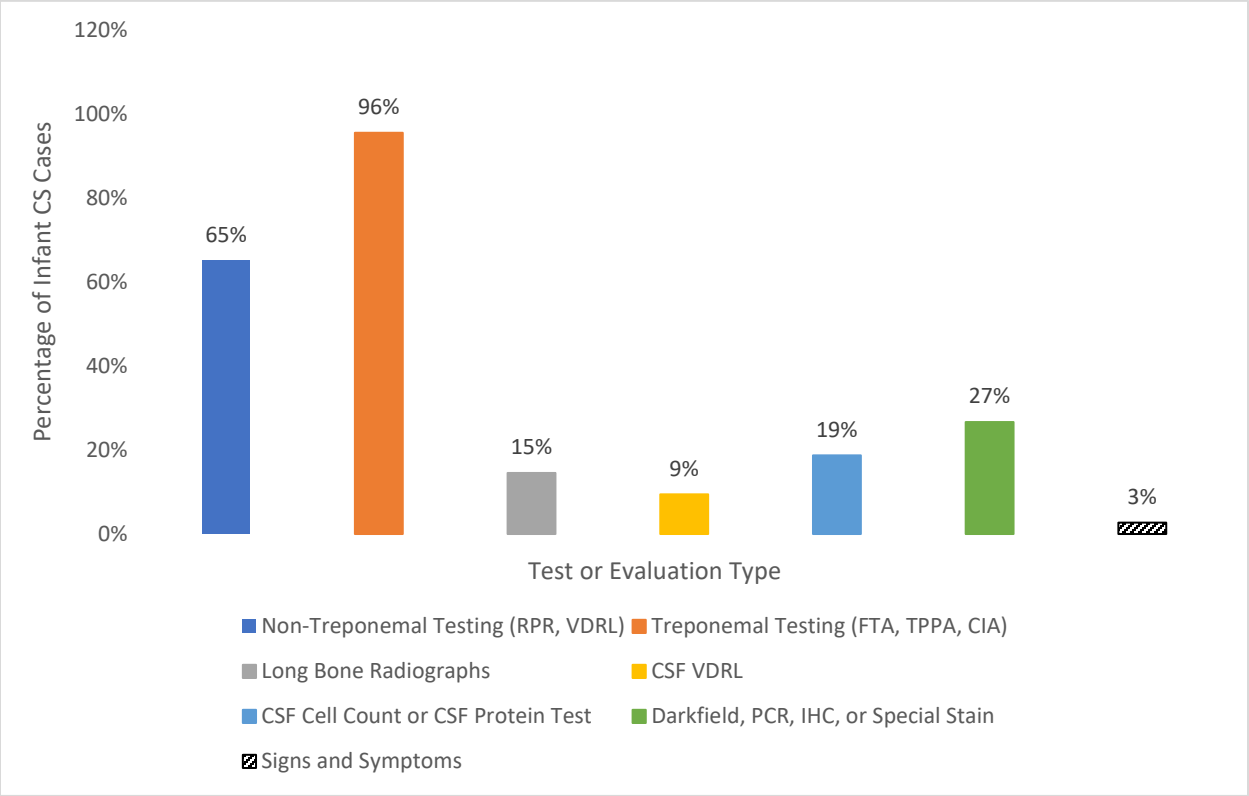


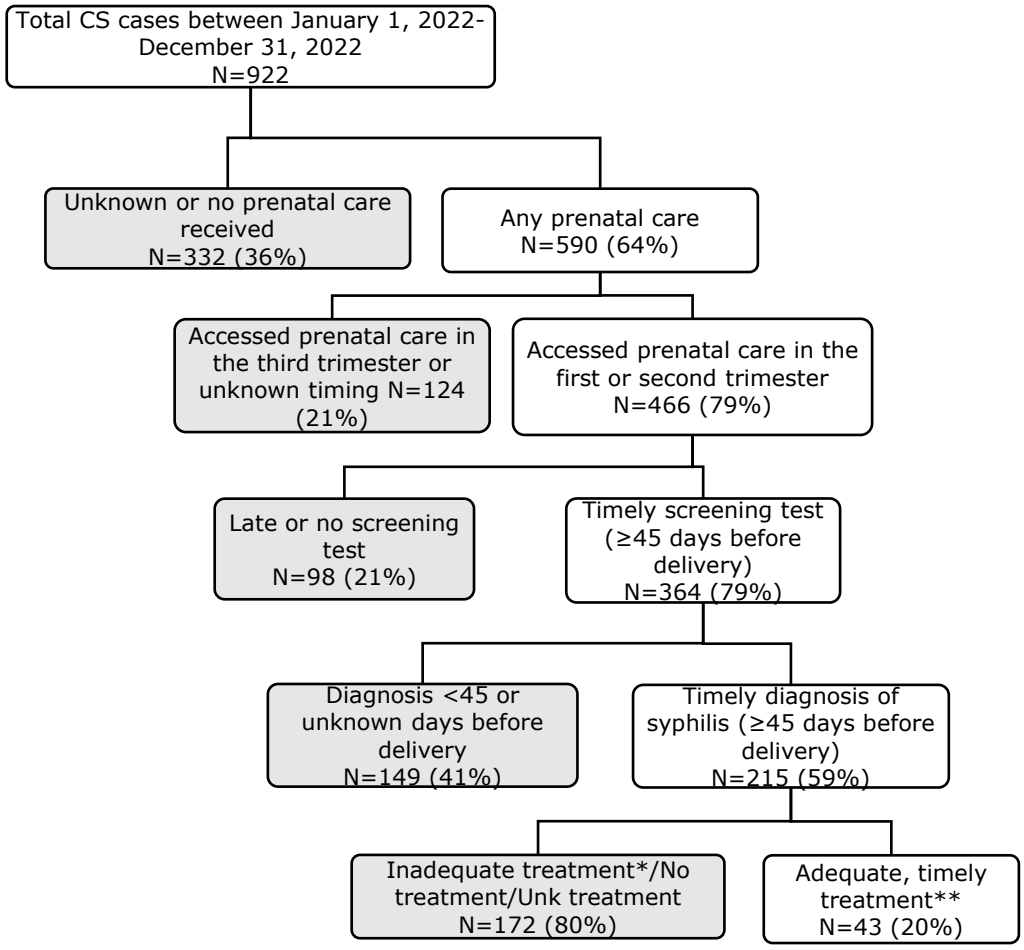
Table 4: Treatment for Infants with CS in Texas, 2022

Treatment for Infants Reported with CS	No. of Infants	Percent
Yes, Aqueous or Procaine penicillin for ≥ 10 days	442	48%
Yes, Benzathine penicillin X 1	136	15%
Yes, Ampicillin	7	1%
Yes, other treatment	35	4%
No treatment	276	30%
Unknown	26	2%
Total	**922**	**100%**

CS Cascade

This cascade serves as a tool to help identify missed opportunities for prevention of CS and areas for improvement. Based on information from the CS cascade, 215 (59 percent) mothers received timely prenatal care, testing, and diagnosis. However, of those receiving timely diagnosis, 80 percent experienced inadequate treatment, no treatment, or unknown treatment (Figure 26). Of 173 mothers who received timely prenatal care, testing, and diagnosis, 27 percent received no treatment, 23 percent were treated at incorrect treatment intervals, and 21 percent did not receive the full treatment for their stage of syphilis (Table 5).

Figure 26: CS Cascade in Texas, 2022



*Treatment initiated <30 days prior to delivery or incorrect dosage based on the CDC STD Treatment Guidelines, 2021 is inadequate.

**Persons in this group include cases with infants who meet the CS case definition based on infant criteria.

Table 5: Reasons for Treatment Inadequacy Among Mothers Who Received Timely Prenatal Care, Testing, and Diagnosis of Syphilis in Texas, 2022

Reasons for Inadequate Treatment	No. of CS Cases	Percent
Treated after delivery	3	2%
Incorrect medication and/or dosage	29	17%
Incorrect treatment intervals	40	23%
Treated less than 30 days prior to delivery	11	6%
Did not receive full treatment for stage of syphilis	37	21%
Treated after delivery	6	3%
No treatment	46	27%
Unknown	1	1%
Total	**173**	**100%**

Efforts to Decrease CS

Texas aligns with the rise in CS cases and national trends for opportunities for prevention.[16] The state uses CDC funding to support supplemental efforts in targeted areas to improve disease identification and reporting, increase referrals for women with a syphilis diagnosis, and identify barriers to care and missed opportunities for disease intervention. These efforts offer opportunities for improving identification of CS cases.

In 2018, DSHS began matching syphilis data with birth and infant death data from Vital Statistics. Matching facilitates identification of CS cases by identifying births not reported to the Local Health Authority. Matching occurs at least annually prior to the reporting deadline to identify previously missed cases. Matching also identifies hospitals or hospital systems not correctly reporting births. Identification increases opportunities for programs to work with delivery hospitals in their area to ensure appropriate testing and reporting. Texas Administrative Code 97.133 requires entities to report congenital syphilis infections.

Though it is too early to see the impact of DSHS's increased efforts, DSHS deployed multiple strategies to help decrease the number of cases. These include:

- Increased trainings for local and regional field staff, to provide necessary tools and information to obtain pregnancy status and verify adequate and timely treatment, including hosting biannual CS basics trainings and a biennial CS symposium.

- Provided education for medical providers to increase early diagnosis of syphilis and efforts to raise awareness of the need for testing pregnant women.

- Contracted with the University of Texas Rio Grande Valley School of Medicine to conduct provider education, improve syphilis testing of pregnant women, and enhance referrals for pregnant women, women of childbearing age, and their partners in the DSHS Public Health Region 11.

- Increased pregnancy ascertainment for women exposed to and diagnosed with syphilis. Obtaining pregnancy status informs treatment decisions as well as expedites referrals for reproductive health care, prenatal care, and other supportive services as needed.

- Implemented a new follow-up initiative to increase treatment adequacy for women of childbearing age with a history of inadequately treated syphilis.

- Produced a podcast titled "Exploring an Epidemic: CS in Texas" as an innovative way to reach wider audiences, including medical providers and the

[16] Center for Disease Control and Prevention (17 November 2023). Vital Signs: Missed Opportunities for Preventing Congenital Syphilis — United States, 2022. Retrieved from cdc.gov/mmwr/volumes/72/wr/mm7246e1.htm.

community, to increase awareness of CS. The DSHS released six episodes, with an additional six in development.

Since 2015, DSHS supports Fetal Infant Morbidity Review (FIMR) activities in the highest morbidity areas of Texas. FIMR case review boards currently exist in Houston, San Antonio, and Dallas-Fort Worth. FIMR boards review CS cases which result in stillbirth, perinatal death, infants with physical signs and symptoms, or which meet the criteria for reporting as a probable case. FIMR boards work to identify and address barriers to medical care which contribute to CS cases by conducting maternal interviews and enhancing medical chart abstractions. Medical providers, clinicians, and community members use information from both sources to develop appropriate interventions and action items for implementation at the local level.

In September 2022, the DSHS Commissioner identified CS as a priority issue for DSHS and supported the development of an agency-wide CS initiative. The Community Health Improvement Division leads the intra-agency collaboration, which consists of four participating divisions/sections: the Infectious Disease Prevention Division, Chief State Epidemiologist, Regional and Local Health Operations, and Chief of Staff/Center for External Relations Communication Unit.