



CONGENITAL SYPHILIS IN TEXAS IN 2018



DSHS HIV/STD Section

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Executive Summary

Syphilis is caused by the bacterium *Treponema pallidum*. 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 congenital syphilis 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. These outcomes can be avoided with early detection and proper treatment during pregnancy. Only Benzathine Penicillin G can be used to treat syphilis during pregnancy and adequate treatment 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.^{2,3} In 2018, 1,306 cases were reported nationally, which included 78 stillbirths and 16 deaths.³ Of these nationally reported cases, Texas accounted for approximately one-quarter (367 cases), ranking Texas first in the nation in 2018. The bulk of CS in Texas is in the three most populous metropolitan areas: Harris County (28 percent), Bexar County (17 percent), and Dallas County (16 percent), as well as the Rio Grande Valley (12 percent).

CS cases rise when syphilis cases in women of childbearing age (aged 15-44 years) rise. Texas CS cases have risen by an alarming 365 percent since 2012 when a total of 79 cases were reported. Nearly nine out of 10 of the infants reported with CS were delivered by Hispanic (45 percent) and Black (44 percent) women. Primary and secondary (P&S) syphilis among women of childbearing age rose in Texas from 2012 through 2018 (250 cases of P&S in 2012 to 380 cases in 2018). In 2018, about one-third (30 percent) of the mothers had a late diagnosis (<45 days prior to delivery). Additionally, among women delivering an infant with CS, 64 percent had inadequate treatment and 8 percent had no treatment. The rise in CS cases may be attributed to barriers to care that these women experience, such as transportation issues, finding a provider, or access to Medicaid.

¹ Centers for Disease Control and Prevention (CDC). Congenital Syphilis-Fact Sheet; Dated January 31, 2017. [cdc.gov/std/syphilis/stdfact-congenital-syphilis.htm](https://www.cdc.gov/std/syphilis/stdfact-congenital-syphilis.htm)

² Bowen, V., Su, J., Torrone, E., Kidd, S., & Weinstock, H. (2015). Increase in Incidence of Congenital Syphilis – United States, 2012–2014. *Morbidity and Mortality Weekly Report*, 64(44), 1241-1245. [cdc.gov/mmwr/preview/mmwrhtml/mm6444a3.htm](https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6444a3.htm)

³ Centers for Disease Control and Prevention (CDC). Sexually Transmitted Disease Surveillance 2018.; October 2019. [cdc.gov/std/stats18/STDSSurveillance2018-full-report.pdf](https://www.cdc.gov/std/stats18/STDSSurveillance2018-full-report.pdf)

The Texas Department of State Health Services (DSHS) is developing a logic model and corresponding workplan to determine steps that DSHS can take to decrease the number of CS cases in Texas. Some of these include: ensuring adequate treatment for pregnant women diagnosed with syphilis by improving testing, treatment, and reporting as well as increasing education for providers and the public. Additionally, DSHS aims to decrease barriers to care for pregnant women.

About This Report

This epidemiologic profile for congenital syphilis (CS) was created to inform planners, public health professionals, policy makers, and other stakeholders at the local and state levels about the epidemiology of CS, syphilis in women of childbearing age, and the underlying factors that may contribute to CS.

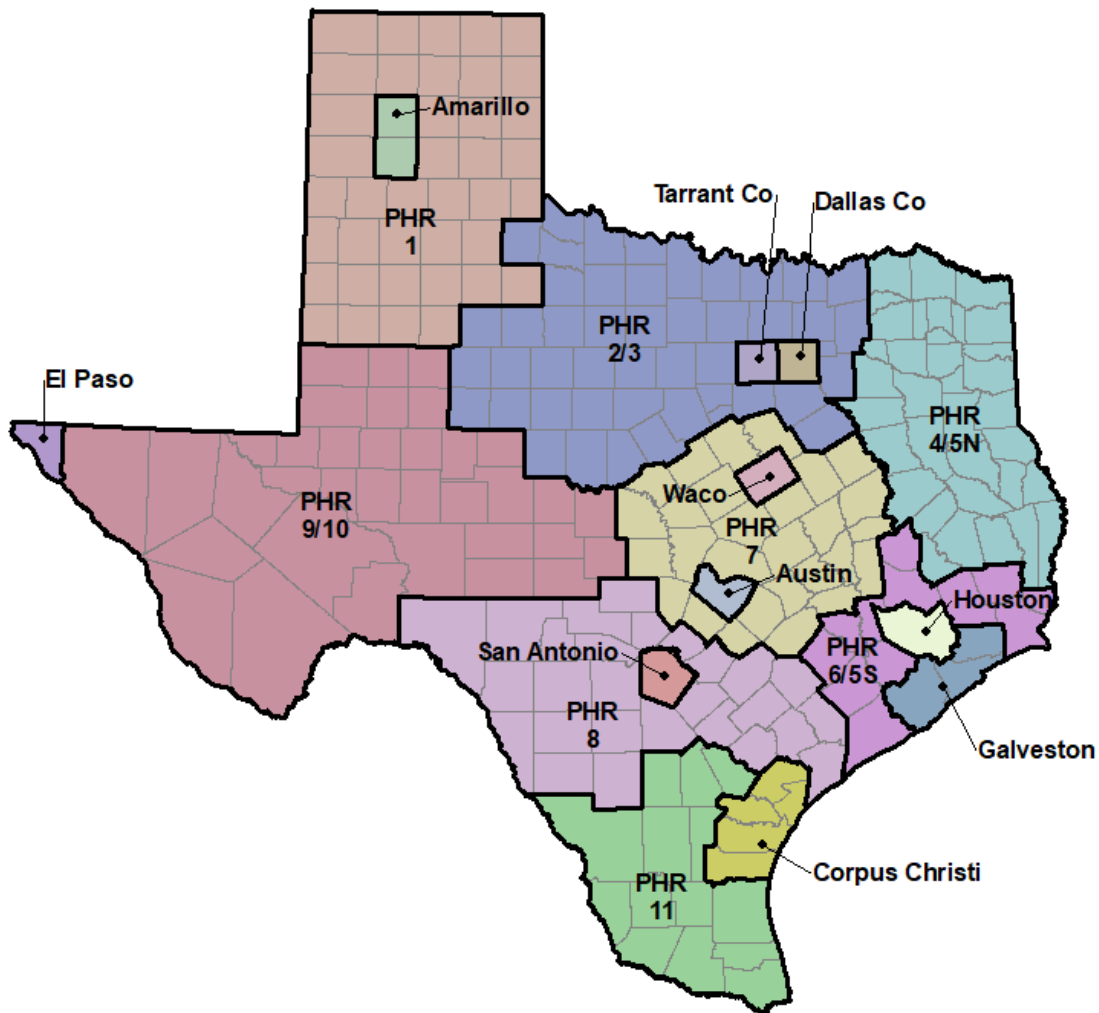
This profile only includes CS and syphilis cases among women of childbearing age who were Texas residents at the time of diagnosis. The cases analyzed met the Centers for Disease Control and Prevention (CDC) and Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions, which may differ from clinical diagnoses.

Public Health Follow-Up and Sexually Transmitted Disease Surveillance and Data Sources

The data for this profile came from public health follow-up (PHFU) and routine sexually transmitted disease (STD) surveillance activities. PHFU supports Disease Intervention Specialists (DIS) who act to interrupt STD transmission by notifying people of possible STD exposure and providing STD results, testing, and treatment. Surveillance and PHFU staff perform case and data management of STD investigations. Methods of case identification include partner services interviews, provider reporting, lab reporting, and matches with vital statistics.

Texas STD surveillance is decentralized and includes 18 STD local and regional reporting jurisdictions (Figure 1). Some local reporting sites are city health departments which cover their surrounding county(ies) and vice versa. There are also two health districts, Corpus Christi/Nueces County Health District and Galveston County Health District, that report for multiple surrounding counties. Public Health Regions (PHR) are DSHS regional offices that report for all counties in their area not reported by a local health authority.

Figure 1. PHFU and STD Surveillance Sites, Texas



Understanding Syphilis

Syphilis is an STD caused by *Treponema pallidum* and is passed from person to person by direct contact with a syphilitic sore. Transmission of syphilis occurs during vaginal, anal, or oral sex. Syphilis is most infectious in the primary and secondary stages (P&S). In 2018, there were 35,063 P&S cases reported nationally.⁴ A total of 115,045 syphilis cases were reported to the CDC in 2018.⁴

Primary syphilis refers to the first stage of the infection in which there is presence of a chancre (painless lesion) approximately 10 to 90 days after infection. Secondary syphilis refers to the next stage of infection

⁴ Texas Department of State Health Services. Texas 2018 STD Surveillance Report; Dated August 20, 2019. dshs.texas.gov/hivstd/reports/

characterized by a variety of cutaneous (skin) lesions, including rashes, condylomata lata (wart-like lesions on genitalia), and mucous patches. This occurs approximately four to eight weeks after the primary lesion. Early non-primary non-secondary syphilis refers to syphilis acquired within the last 12 months with no active signs or symptoms. Syphilis of unknown or late duration occurs when there are no active signs or symptoms and no indication that the infection was acquired in the 12 months prior to diagnosis. Per CDC treatment guidelines, patients at an early syphilis stage (primary, secondary, and early non-primary non-secondary) should receive one dose (2.4 million units intramuscularly) of Benzathine Penicillin G and patients with unknown or late duration should receive three doses (2.4 million units intramuscularly, each dose) of Benzathine Penicillin G at one-week intervals.⁵ Adequate treatment must be initiated at least 30 days prior to delivery to prevent a CS case.

A Note on Maternal Syphilis Treatment

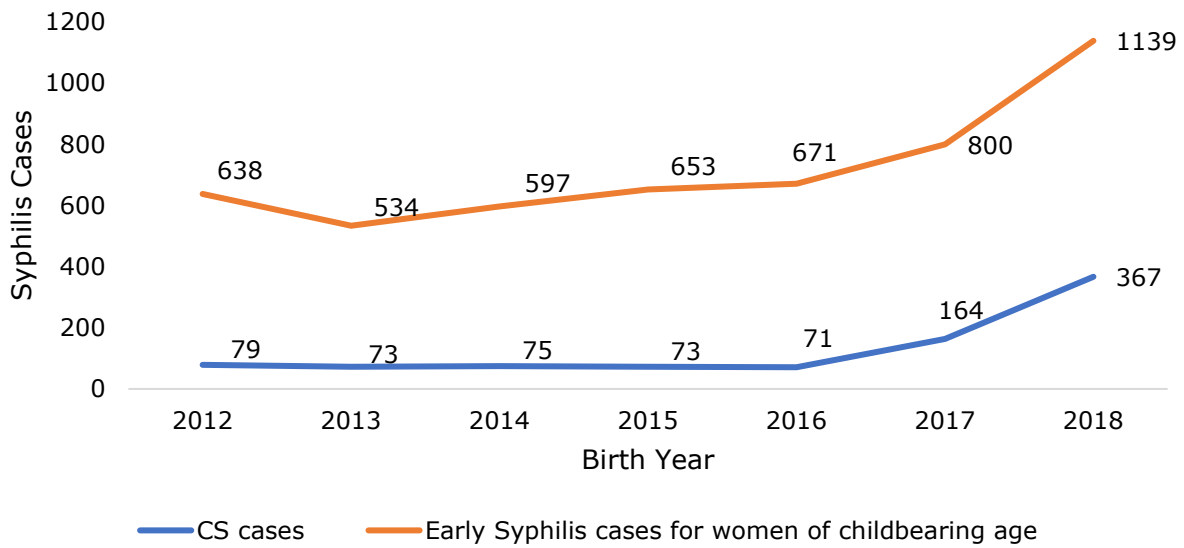
Assessment of adequate maternal syphilis treatment relies on documentation of diagnosis, treatment date(s), and dosage. DSHS uses treatment information documented in the CS investigation form and treatment tables in databases for complete ascertainment to analyze maternal treatment. For the unknown treatment group, one or more of the following data may have been missing: treatment type, treatment dosage, maternal syphilis diagnosis, or date treatment was initiated.

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

In 2018, there were 367 CS cases reported in Texas, a 124 percent increase from 2017 (Figure 2). This is a rate of 91.0 CS cases per 100,000 live births. Concurrently, there was an increase in reporting of all stages of syphilis in women of childbearing age. In 2018, there were 1,139 cases of early syphilis (primary, secondary, and early non-primary non-secondary) reported among women of childbearing age in Texas, representing a 42 percent increase from 2017 (Figure 2). There were 2,402 total syphilis cases (primary, secondary, early non-primary non-secondary, and unknown or late duration) among women of childbearing age, which is a 20 percent increase from 2017 (Figure 3).

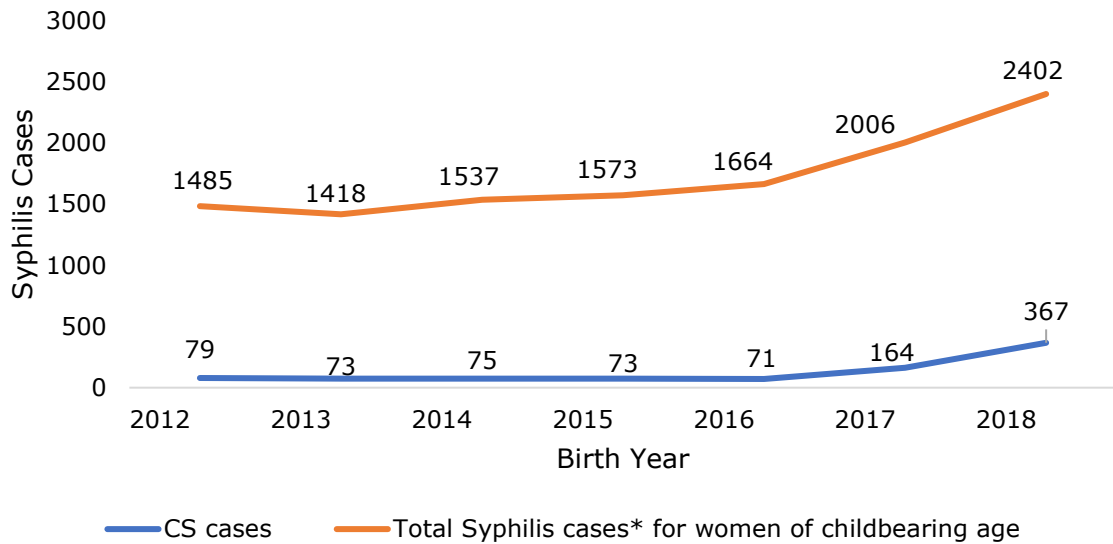
⁵ Centers for Disease Control and Prevention (CDC). 2015 Sexually Transmitted Diseases Treatment Guidelines.; December 2019. cdc.gov/std/tg2015/default.htm

Figure 2: CS and early syphilis cases* in women of childbearing age in Texas, 2012-2018



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

Figure 3: CS cases by year of birth and total syphilis cases in women of childbearing age in Texas, 2012-2018



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

Congenital Syphilis and Syphilis in Women of Childbearing Age by Geographic Area

The majority of CS and syphilis cases in women of childbearing age occurred around Texas metropolitan areas. In 2018, the top five Texas jurisdictions reporting the highest number of CS cases accounted for 79 percent of all CS cases (Figure 4). Three jurisdictions accounted for half the cases of women of childbearing age diagnosed with syphilis (Figure 5).

Figure 4: CS cases by STD surveillance site, Texas 2018

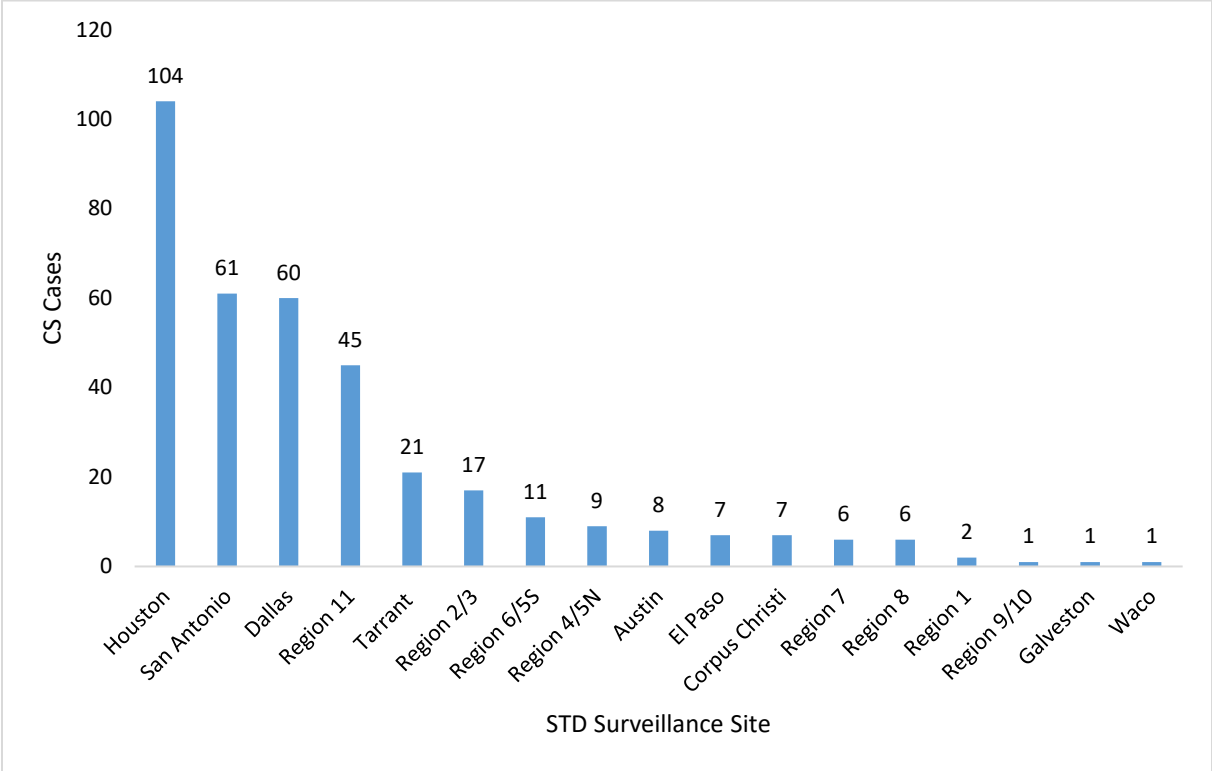
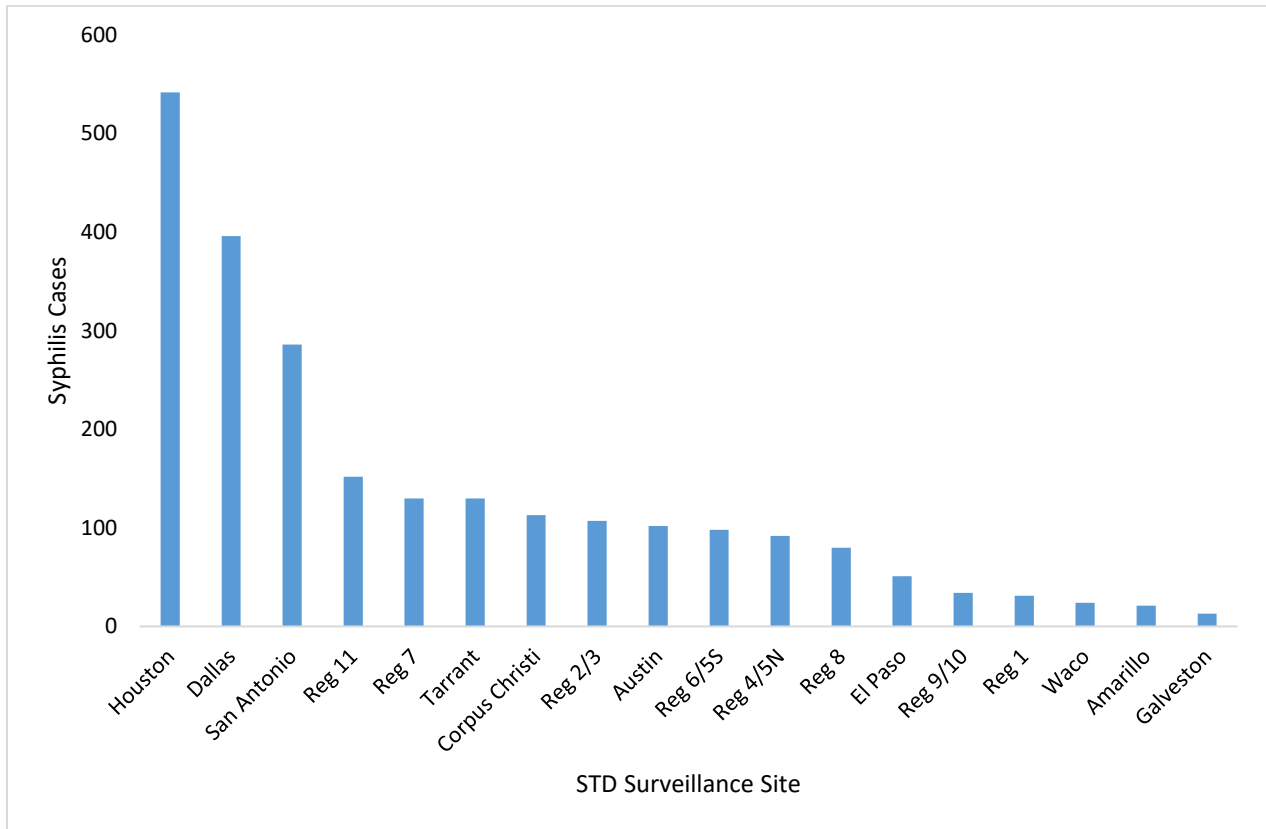
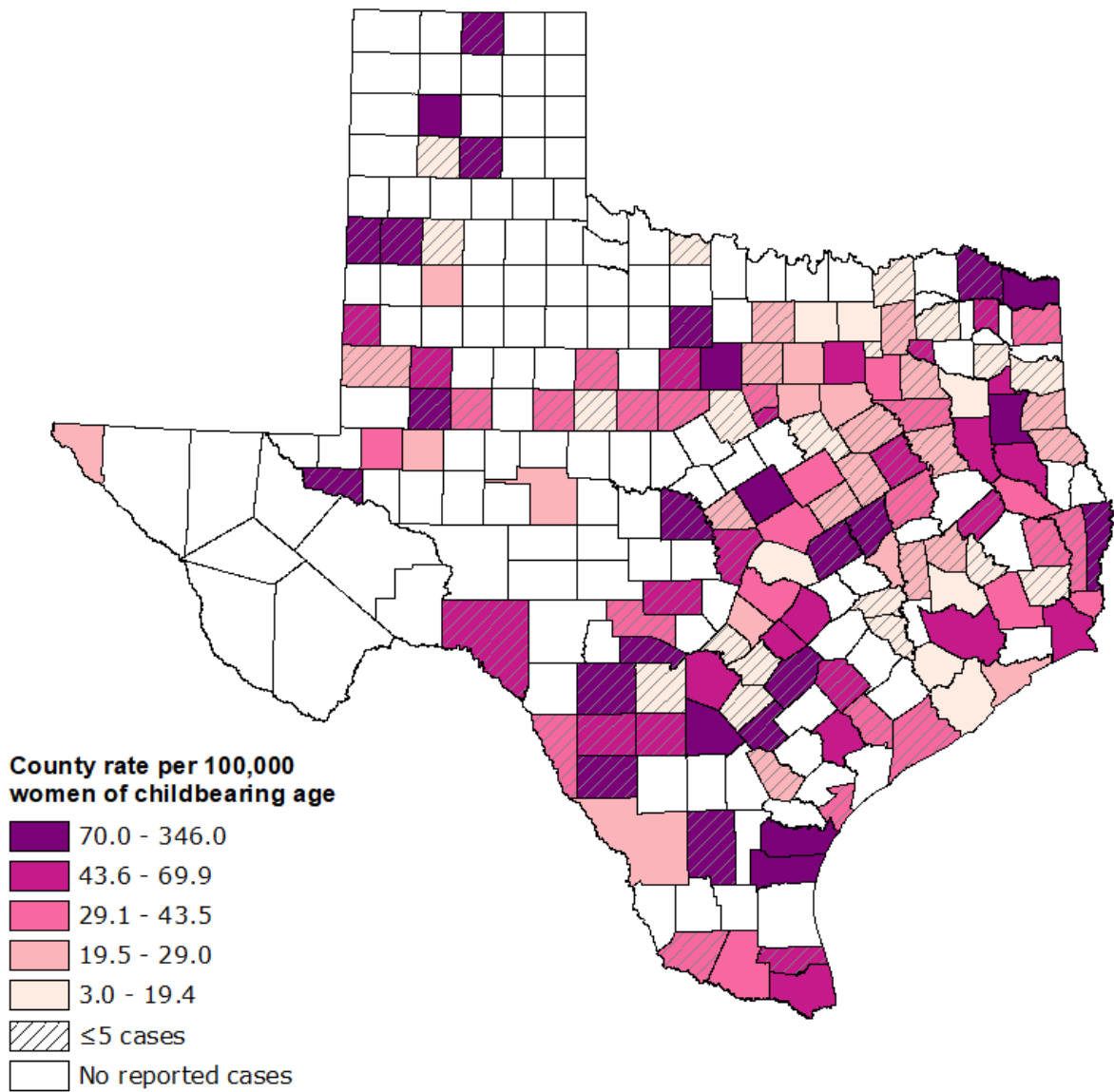


Figure 5: Syphilis cases in women of childbearing age by STD surveillance site, Texas 2018



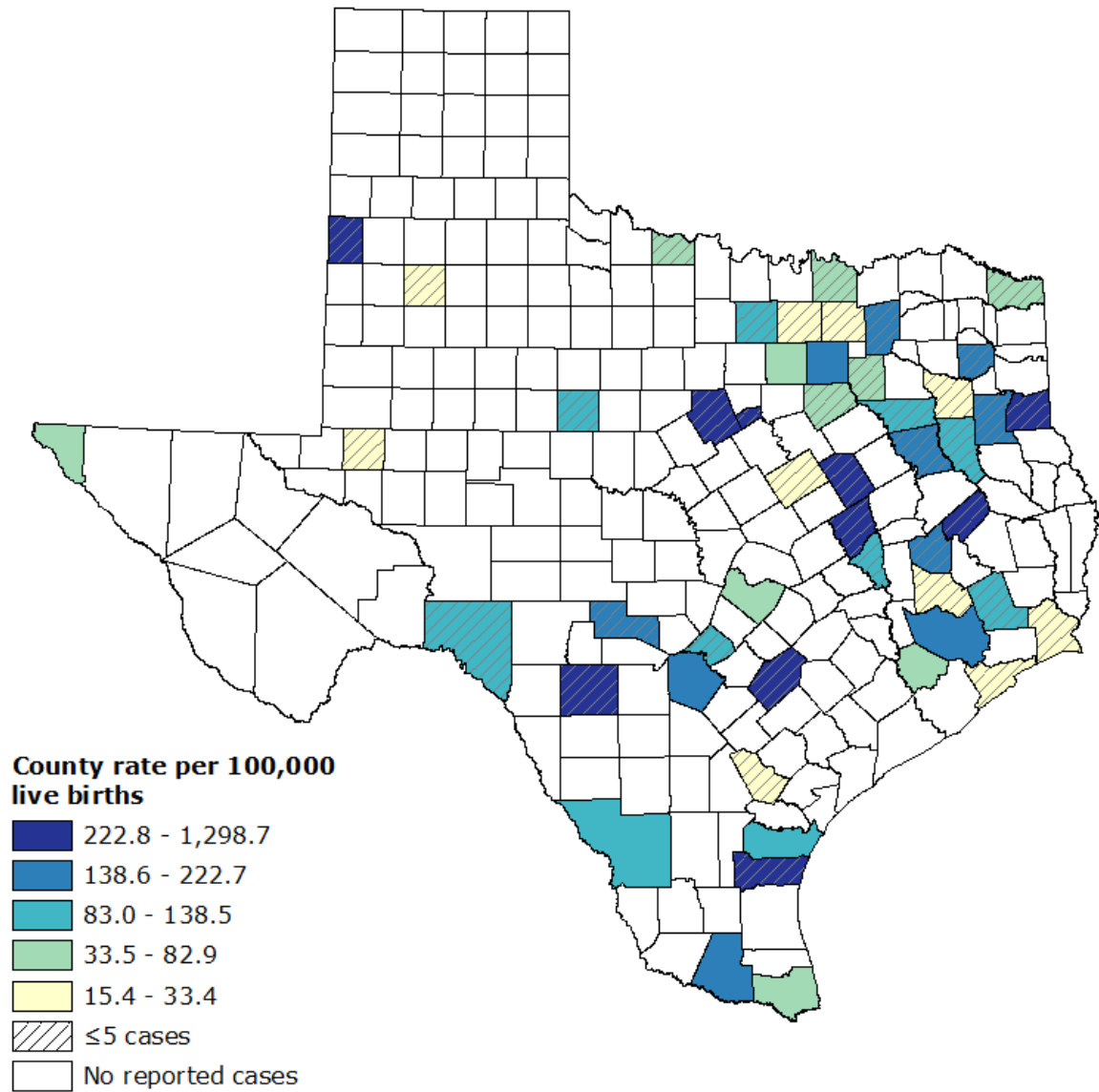
Half of Texas' 254 counties reported cases of syphilis among women of childbearing age (Figure 6), and 50 counties reported at least one case of CS (Figure 7).

Figure 6: Syphilis rates* in women of childbearing age by county, Texas 2018



*Rates are calculated out of women of childbearing age by county.

Figure 7: Rates of CS in Texas counties, Texas 2018*

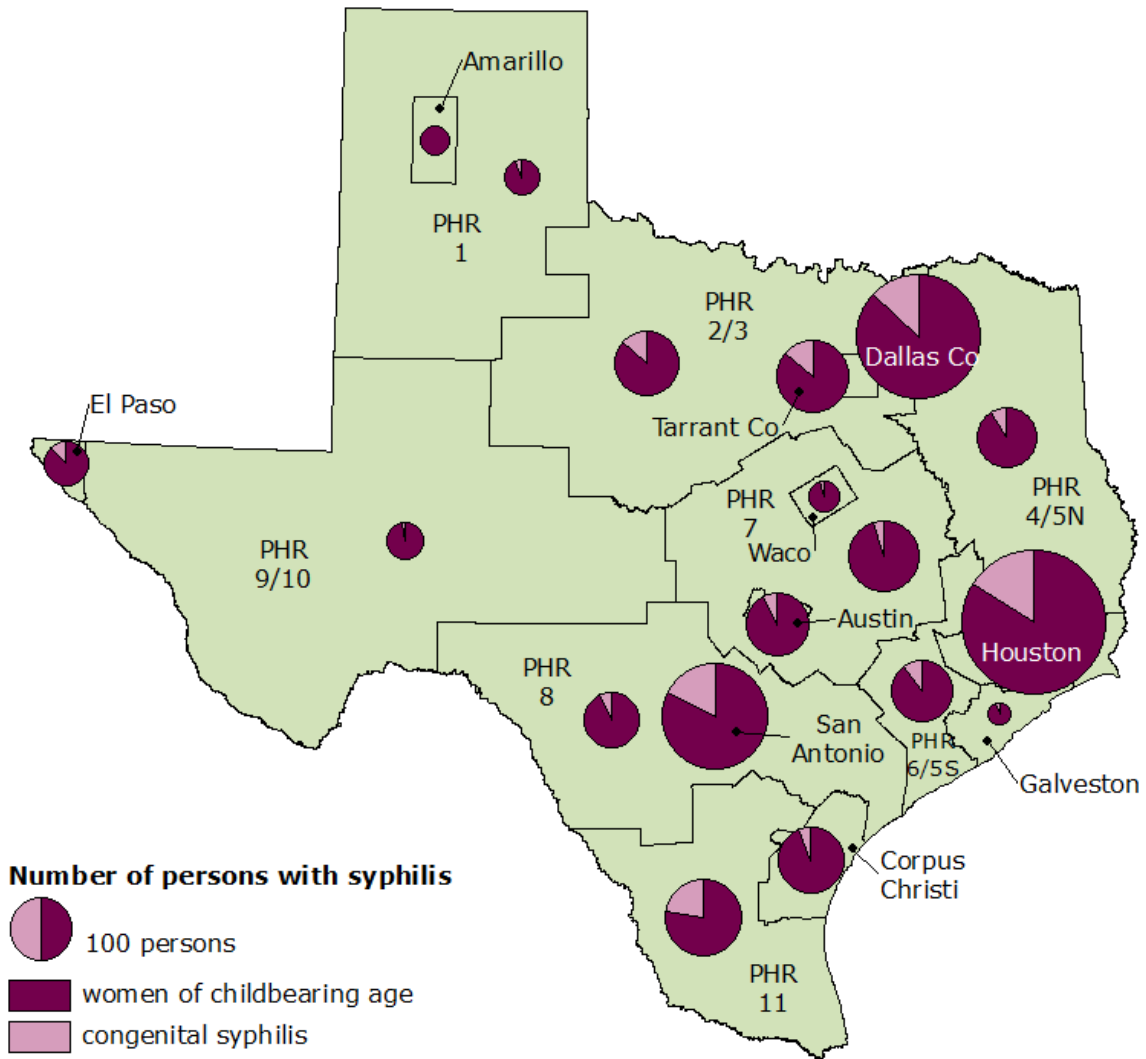


*Rate was calculated using the 2015 birth data

STD surveillance sites with higher proportions of women of childbearing age diagnosed with syphilis also had a higher proportion of CS cases (Figure 8).

Figure 8: Proportion of women of childbearing age with syphilis and proportion of CS cases* by STD surveillance site, Texas 2018

*Proportions are calculated out of all women of childbearing age



Maternal Demographics for Women Delivering Infants with Congenital Syphilis

Race/Ethnicity

Among the 367 infants reported with CS in 2018, almost nine out of 10 were born to Hispanic (45 percent) and Black (44 percent) Texas women (Figure 9). For rates of deliveries by mother’s race and ethnicity, Black women had the highest rate at 340.9 cases per 100,000 live births followed by Hispanic women with a rate of 86.9 cases per 100,000 live births (Figure 10).

Figure 9: Percentage CS cases by the race/ethnicity of the mother, Texas 2018

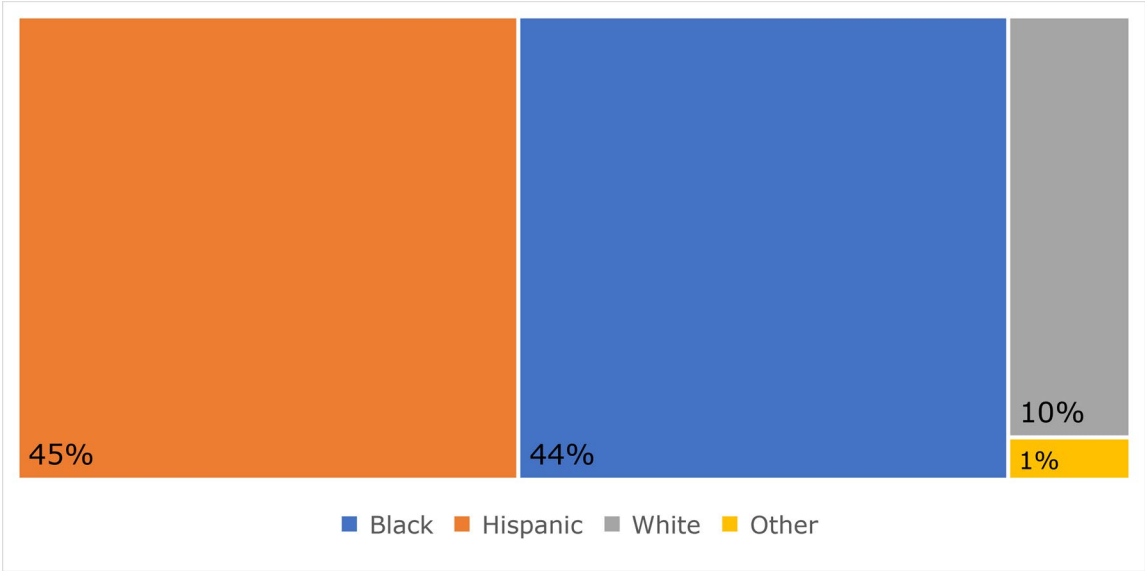
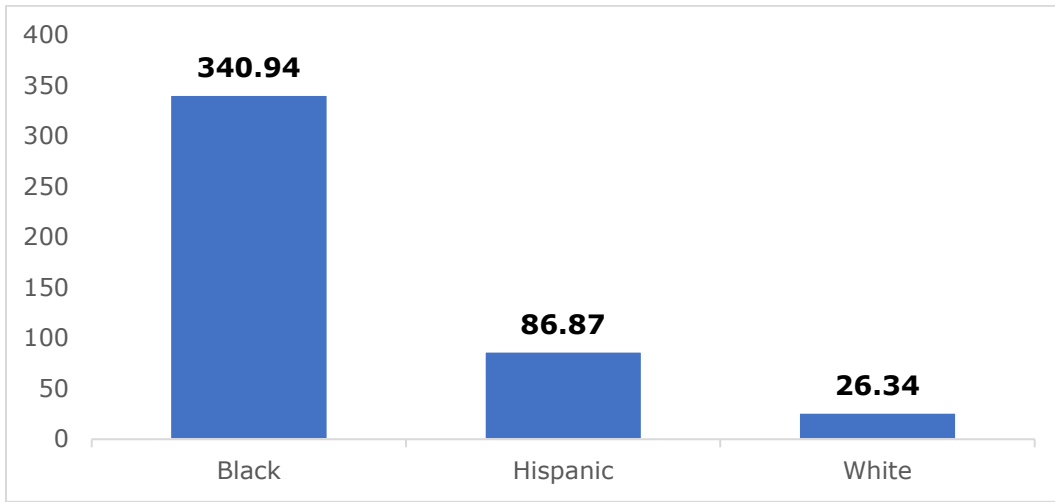


Figure 10: CS rates in infants by the race/ethnicity of the mother, Texas 2018

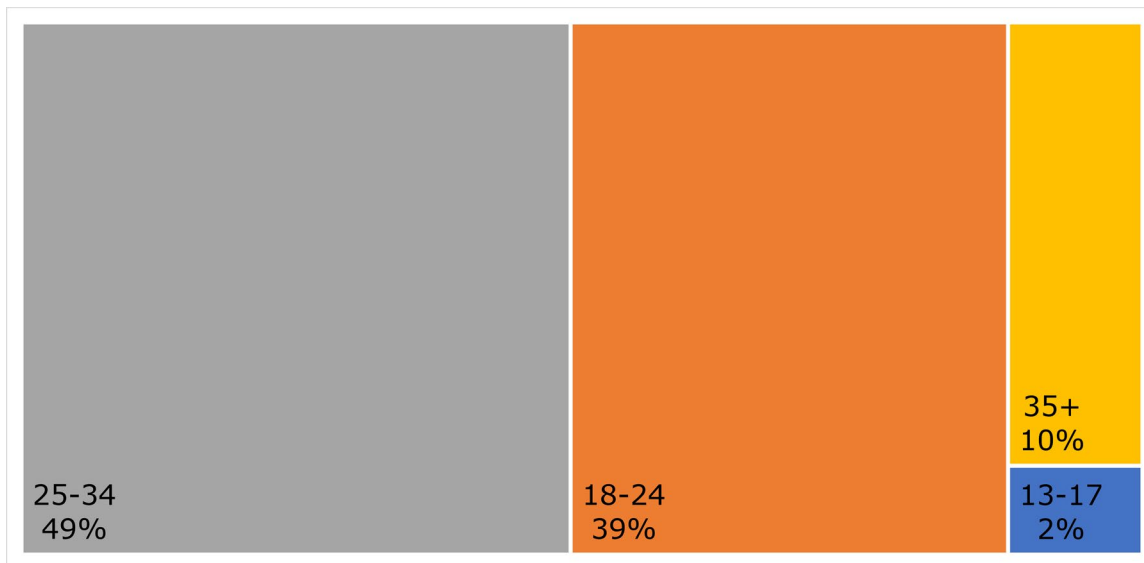


*Rates based on 2015 birth data. Rates are per 100,000 live births. Excludes Other/Unknown race.

Maternal Age at Delivery of an Infant with Congenital Syphilis

At the time of delivery, about half of the mothers were 25-34 years old. Almost all the mothers were 34 years old or younger.

Figure 11: Age of mothers of infants with CS at the time of delivery, Texas 2018



Facility of Maternal Syphilis Diagnosis

About seven out of 10 women delivering an infant with CS were diagnosed with syphilis at an inpatient hospital, private physician’s office, or obstetrics and gynecology/prenatal clinic.

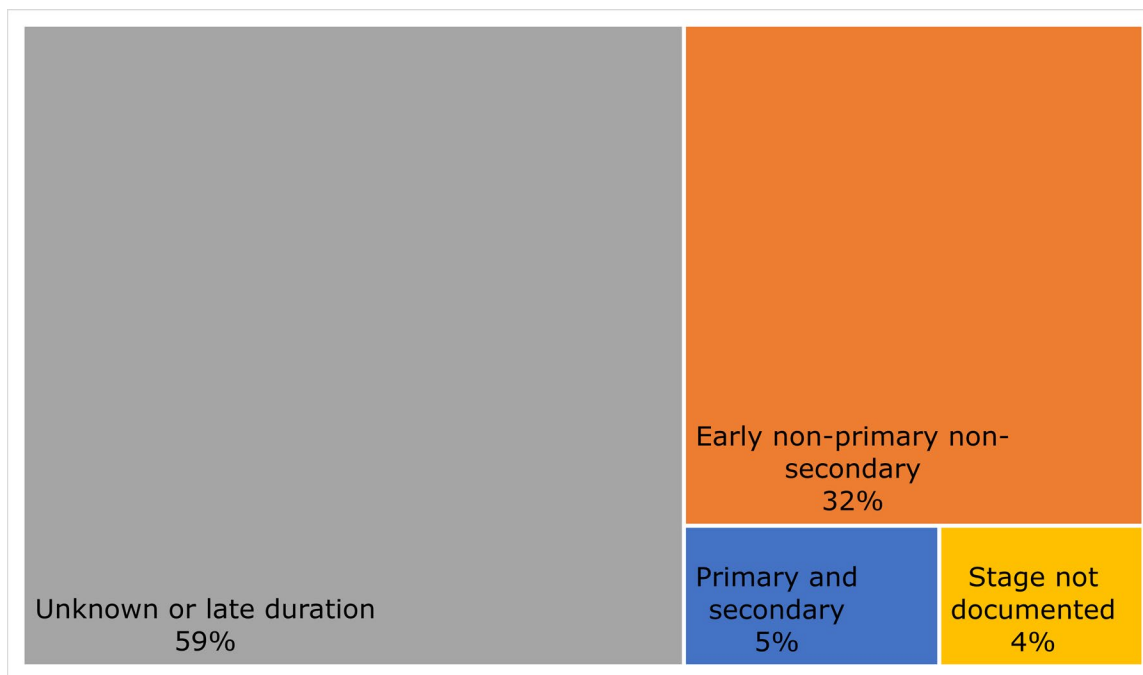
Table 1: Facility of maternal syphilis diagnosis in women delivering an infant with CS, Texas 2018

Facility Type	Percent
Hospital Inpatient	31%
Private Physician Office/Primary Care Clinic	23%
Obstetrics and Gynecology/Prenatal Clinic	16%
STD Clinic	8%
Family Planning Clinic	2%
Specialty Clinic/Hospital Clinic	2%
Correctional Facility	2%
Blood Bank, Plasma Center	2%
HIV Counseling and Testing Site	1%
Laboratory	1%
Community Health Center	1%
Health Department	1%
Emergency Room\Urgent Care	1%
Home Health Agency	<1%
Other/Unknown	9%

Maternal Syphilis Stage at Diagnosis

Identification of the maternal syphilis stage is important in determining the treatment regimen for syphilis. Almost three out of five mothers were diagnosed with syphilis of unknown or late duration. Pregnant women diagnosed with syphilis of unknown or late duration require three treatments of Benzathine Penicillin G given one week apart. Failure to complete this therapy appropriately will result in a report of a probable CS case.

Figure 12: Percentage of CS cases by maternal syphilis stage at diagnosis, Texas 2018



Barriers to Care

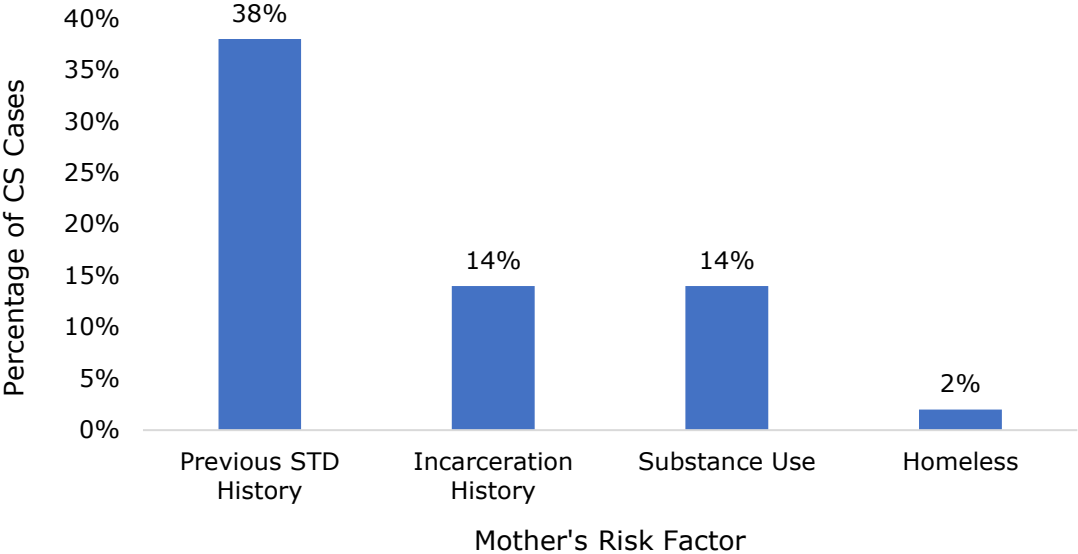
Texas utilizes internal and external case review boards to thoroughly examine probable and confirmed CS cases and syphilitic stillbirths, and review missed opportunities for CS prevention. DIS face challenges as they work to prevent maternal syphilis, such as delays in receiving a positive lab result or initiating partner services; there may be difficulty locating the client or their partner, leading to untreated syphilis cases or potential re-infection. Clients may experience housing instability, domestic or intimate partner violence, mental health issues, and/or substance use/abuse disorders that create competing priorities for seeking healthcare. Review boards have also found that women who deliver infants diagnosed with CS often have prior involvement with corrections (local, state, and federal jails or prisons) and/or child protective services. Transportation issues are frequently cited as a reason why a client could not make medical appointments. Clients report that late prenatal care is due to delays with Medicaid enrollment and difficulty finding a provider in their area. Additionally, Texas' surveillance data has shown that even when clients are in prenatal care, not all clients received the third trimester test which has been Texas law since September 1, 2015.

Maternal Risk History

The maternal risk history provides insight into challenges faced by women who deliver infants with CS. Not all women who delivered an infant with CS

have risk information available. Of the 222 women for whom this information was available, more than a third had a previous STD and one in seven had been incarcerated or had a history of substance use.

Figure 13: Risk History of Women Delivering an Infant with CS, Texas 2018*



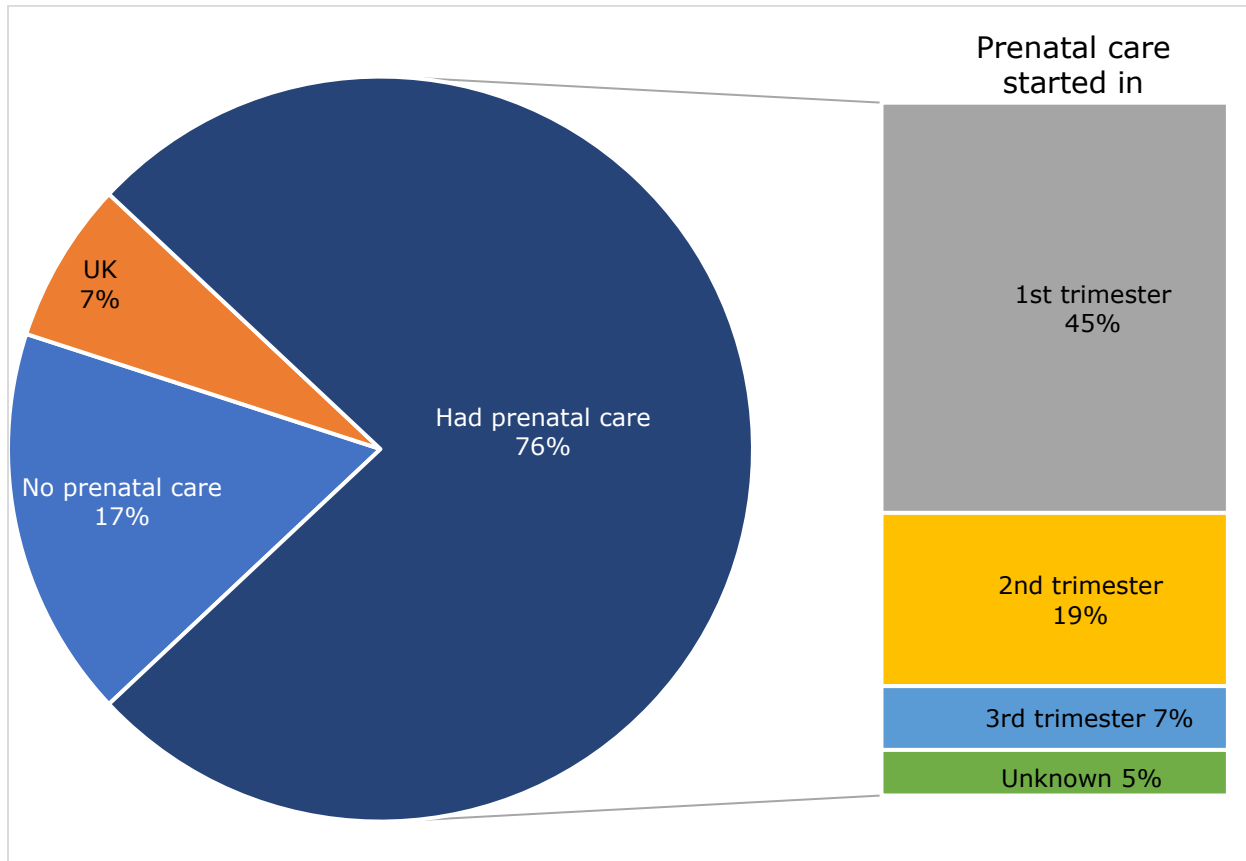
* Women delivering an infant with CS who received a partner services interview within three years prior to birth

Prenatal Care

Among all women giving birth in Texas, only three percent did not receive prenatal care.⁶ For women who gave birth to an infant with CS in 2018, the picture is very different. While three-quarters had some prenatal care, about one in four had no or unknown prenatal care. Among women with prenatal care, three out of five started care in their first trimester.

⁶ Texas Department of State Health Services. Centers for Health Statistics. 2018 Provisional Texas Birth Certificate data.

Figure 14: Prenatal care in mothers who delivered an infant with CS, Texas 2018



Timing of Maternal Syphilis Diagnosis in Relation to Delivery

Timing of maternal syphilis diagnosis is critical for the initiation of timely treatment. 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. In 2018, one-third of mothers were diagnosed with syphilis fewer than 45 days prior to delivery (Table 2).

Table 2: Timing of Maternal Syphilis Diagnosis Among Mothers Delivering an Infant with CS, Texas 2018

Maternal Timing of Diagnosis	Percent
45 days or more before delivery	62%
Fewer than 45 days before delivery	17%
At Delivery	10%
Post-Partum	3%
Unknown	8%

Maternal Treatment for Syphilis

For treatment among women delivering an infant diagnosed with CS, more than three in five had inadequate syphilis treatment (adequate treatment initiated <30 days prior to delivery, inadequate treatment for the diagnosed surveillance stage, or were untreated). Fewer than one in six had adequate syphilis treatment (treatment initiated \geq 30 days prior to delivery with appropriate treatment based on syphilis stage) (Figure 15). For mothers diagnosed \geq 45 days prior to delivery, the majority (63 percent) had inadequate treatment while only about one-quarter (24 percent) had adequate treatment (Figure 16).

Figure 15: Maternal Syphilis Treatment for Women Delivering an Infant with CS, Texas 2018

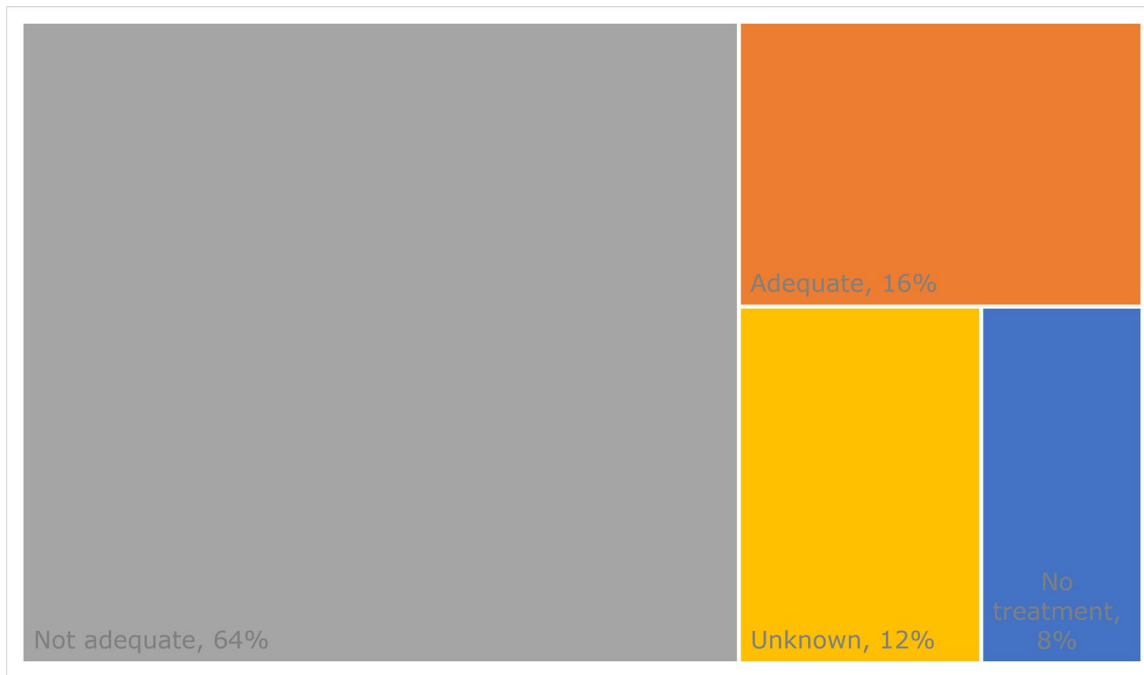
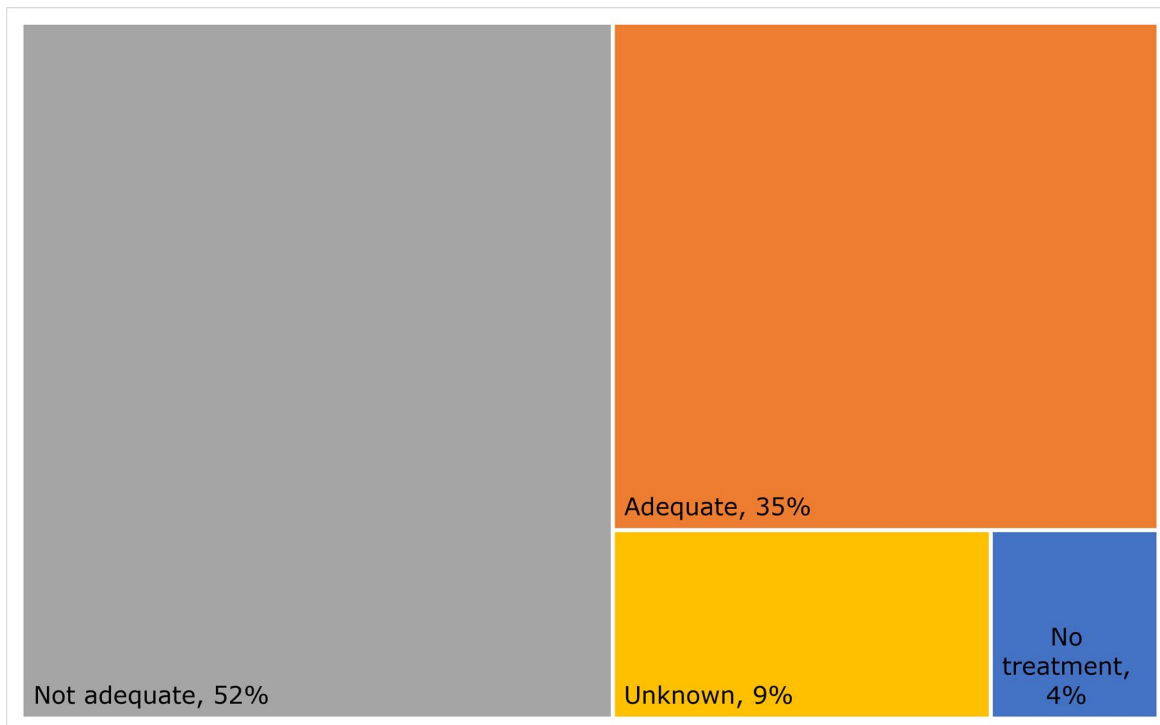


Figure 16: Maternal Syphilis Treatment for Women Delivering an Infant with CS who were diagnosed at least 45 days before delivery, Texas 2018



Birth Outcomes Associated with CS

A pregnant woman diagnosed with syphilis can transmit syphilis to her unborn child. A probable CS case most often includes a child whose mother had untreated or inadequately treated syphilis at the time of delivery. Probable CS cases can be identified through infants with 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 count or protein count without other cause.

A syphilitic stillbirth is classified as a birth to a woman with untreated or inadequately treated syphilis who delivered at least 20 weeks' gestation, or the fetus weighs at least 500 grams. A confirmed CS case is one that is confirmed through specialized laboratory testing for the presence of *Treponema pallidum*. CS is classified as "early" when the child exhibits symptoms at birth up to their second birthday, and "late" when symptoms start after age two.⁷ Early CS symptoms can include: vision or hearing loss, non-viral hepatitis causing jaundice of the skin and eyes, long bone abnormalities, developmental delays, enlargement of the liver and/or spleen, inflammation of the mucus membranes of the nose, rash, wart-like lesions on the genitals, and additional symptoms.⁷ Older children may develop clinical symptoms of late congenital syphilis, including problems with bone and teeth development, problems with hearing or vision, and issues with the central nervous and cardiovascular systems.⁷

Among the 367 CS cases in 2018, approximately one-quarter had a low birth weight (<2500g) and one-quarter were preterm (<37 weeks' gestation). The percentage of low birth weight and preterm infants was higher in comparison to all births in Texas where 8 percent were low birth weight and 11 percent were preterm.⁸ Seventeen (5 percent) of the reported CS cases resulted in a stillbirth or a neonatal death. Of the 367 infants reported with CS, there were 13 syphilitic stillbirths, two confirmed cases, and 352 probable cases.

⁷ Centers for Disease Control and Prevention, "Congenital Syphilis (*Treponema pallidum*) 2018 Case Definition." [Online]. Available: [cdc.gov/nndss/conditions/syphilis/case-definition/2018/](https://www.cdc.gov/nndss/conditions/syphilis/case-definition/2018/) [Accessed August 28, 2019].

⁸ Texas Department of State Health Services. Centers for Health Statistics. 2018 Provisional Texas Birth Certificate data.

Table 3: Birth Outcomes of CS Cases, Texas 2018

Birth Outcomes	No. of Cases	Percent
Total Cases	367	100%
Birth Weight		
Low Birth Weight (<2500g)	85	23%
Normal Birth Weight (≥2500g)	281	77%
Unknown	1	<1%
Gestational Age		
Preterm (<37 weeks)	94	26%
Full-term (≥37 weeks)	272	74%
Unknown	1	<1%
Vital Status		
Alive	348	95%
Stillbirth or neonatal death	17	5%
Unknown vital status	2	<1%
Classification		
Probable Case	352	96%
Syphilitic Stillbirth	13	4%
Confirmed Case	2	<1%

Testing and Treatment for Infants with CS

Treatment and evaluation decisions for infants born to mothers diagnosed with syphilis are based on maternal syphilis history, maternal treatment adequacy, and clinical and laboratory evaluation for the infant.

Per CDC treatment guidelines, all infants born to women with positive syphilis serology should have a quantitative non-treponemal lab rapid plasma reagin (RPR) or venereal disease research laboratory (VDRL) drawn at delivery.⁵ Although 96 percent of CS cases were probable or confirmed and should have had a non-treponemal test, only 43 percent of CS cases had an RPR or VDRL test performed (Figure 17). Further clinical evaluations may not be necessary for all reported CS cases depending on the provider’s assessment of the

infant's CS clinical scenario. Current surveillance data does not distinguish the clinical scenario; therefore, which infants were appropriately evaluated cannot be ascertained.

Confirmatory tests (darkfield, immunohistochemistry (IHC), polymerase chain reaction (PCR), or special stains) can definitively demonstrate the presence of *Treponema pallidum* in body fluids or tissue and can be performed on placentas, umbilical cords, or autopsy material. ⁵ While only one percent of infants reported with CS had an evaluation using the confirmatory testing methodology, 100 percent of those tested had reactive results on darkfield, IHC, PCR, or special stains (Figure 18).

Figure 17. Testing and Evaluation for Infants Reported with CS, Texas 2018

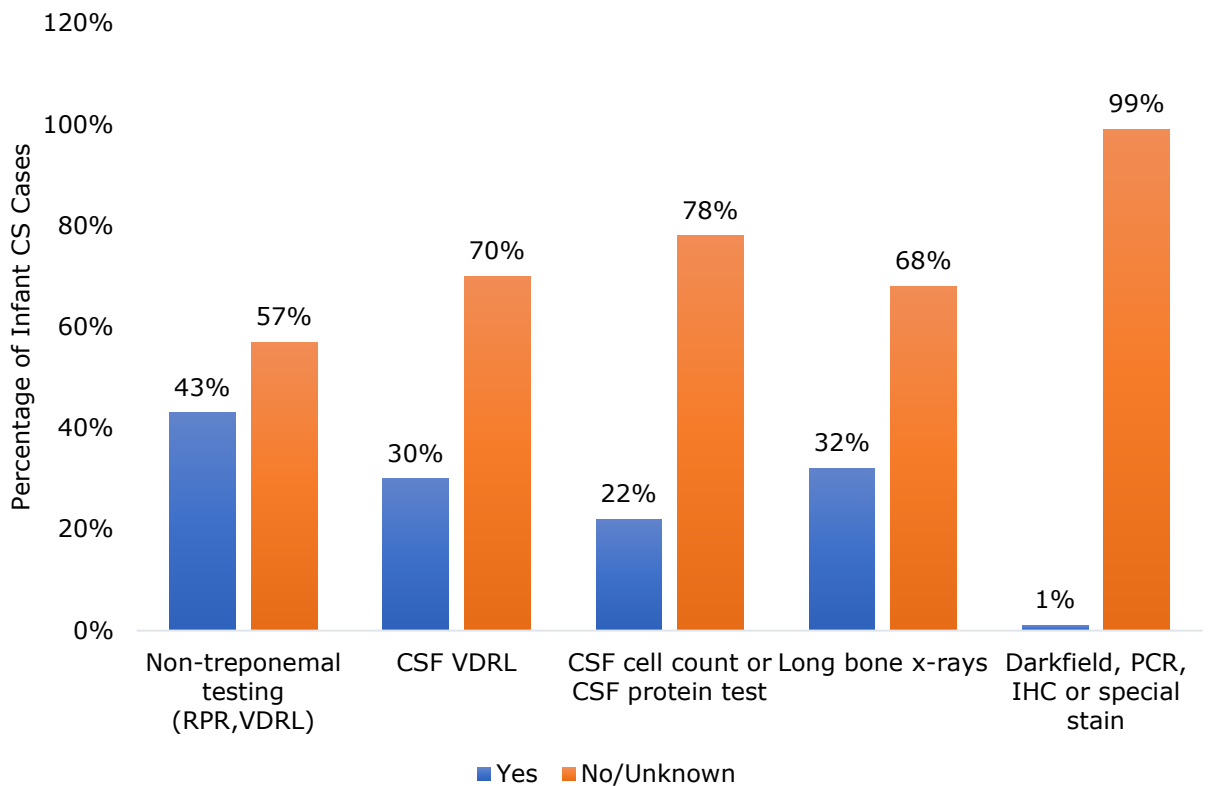
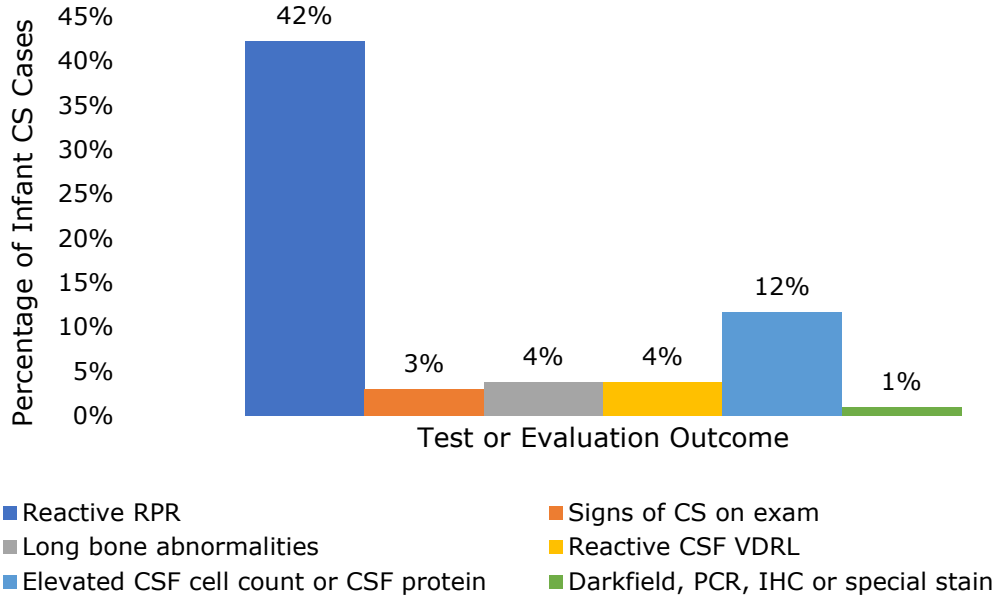


Figure 18. Outcomes of Testing and Evaluation for Infants Reported with CS, Texas 2018



Among infants reported with CS, approximately half (about 53 percent) received treatment (Table 4).

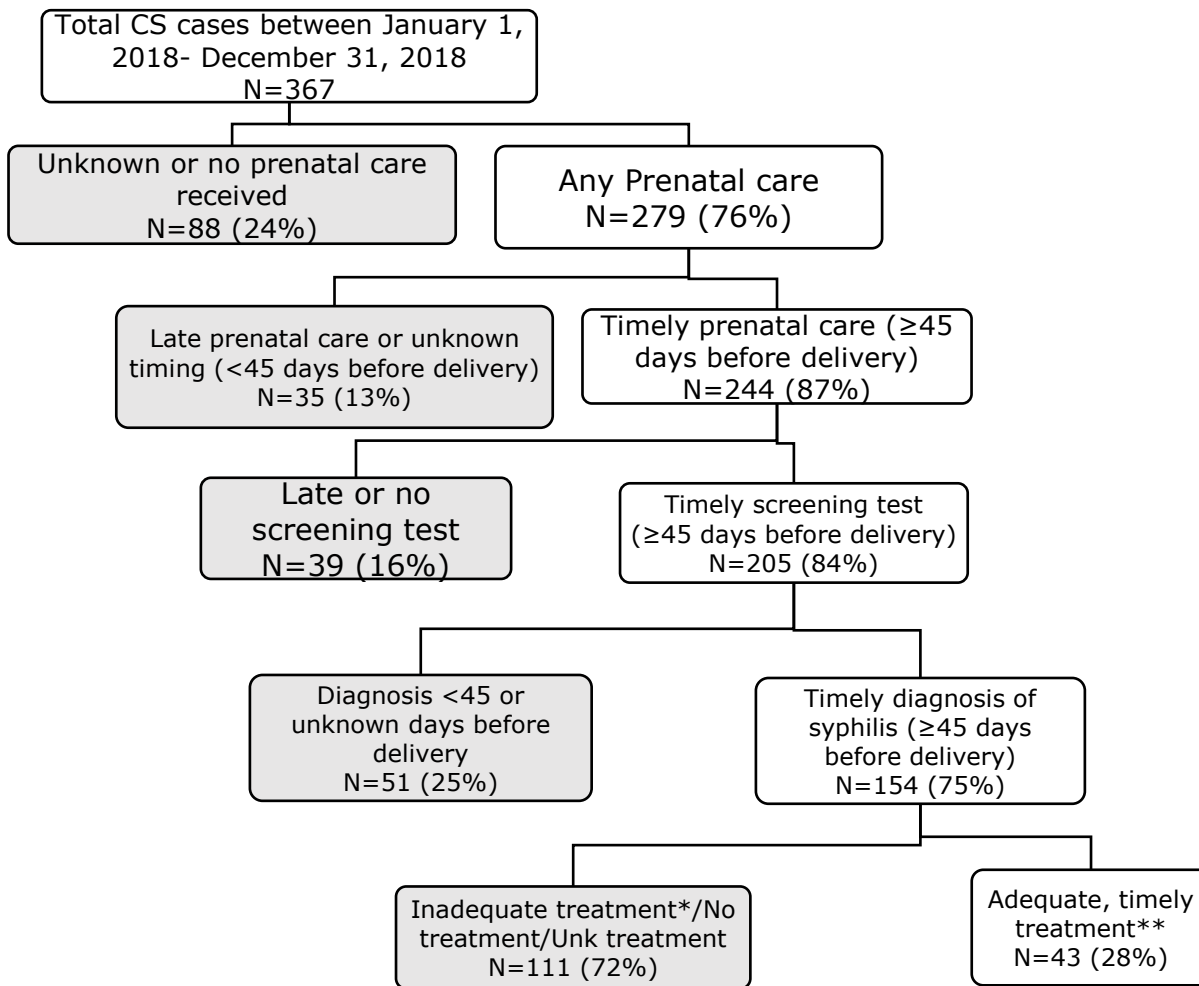
Table 4: Treatment for Infants with CS, Texas 2018

Treatment for Infants Reported with CS	No. of Infants	Percent
Yes, Aqueous or Procaine penicillin for ≥ 10 days	121	33%
Yes, with Benzathine penicillin X 1	46	12%
Yes, with other treatment	26	7%
No treatment	101	27%
Unknown	73	20%
Total	367	100%

Congenital Syphilis Cascade

This cascade is a tool used to help identify missed opportunities for prevention that may contribute to CS and areas for improvement. Based on information from the CS cascade, 154 (42 percent) mothers had timely prenatal care, testing, and diagnosis. However, despite receiving timely services, 72 percent had either inadequate treatment, received no treatment, or had unknown treatment (Figure 19).

Figure 19: CS Cascade, Texas 2018



*Inadequate treatment is that which is initiated <30 days prior to delivery or was incorrect dosage based on syphilis stage

**Persons in this group may have delivered infants who meet the CS case definition based on infant criteria

Efforts to Decrease Congenital Syphilis

Texas has implemented three Fetal Infant Morbidity Review Boards (FIMR) with external community stakeholders in the highest CS morbidity jurisdictions (Harris, Bexar, and Dallas counties) to perform in-depth reviews of CS cases. These FIMRs allow for community engagement to identify missed opportunities for disease intervention and create local action to change systemic barriers to care.

In 2018, a CS Health Advisory was sent to medical providers and in 2020, an educational summit will be held for medical providers focusing on the evaluation and treatment of pregnant women with syphilis and their infants. DSHS created an infant evaluation and treatment tool for medical providers to facilitate determination of CS infant clinical scenarios

(dshs.texas.gov/hivstd/healthcare/files/TexasInfantEvaluationandTreatmentCascadeFlowchart.pdf). It is critical for medical providers to discuss testing and treatment history with a client because persons can still test positive after receiving treatment. Local health departments can confirm testing and treatment history; the absence of confirmed treatment will result in a reported CS case.

DSHS has provided in-person and online trainings for field staff and created tools to improve pregnancy ascertainment, prenatal care referrals, and CS reporting. In 2019, Texas Health and Safety Code 81.090 was changed to include testing at the first prenatal visit, again in the third trimester but no sooner than 28 weeks' gestation, and again at delivery. This is in accordance with CDC recommendations for testing during pregnancy. The DSHS TB/HIV/STD Section is working with other DSHS organizational units, including Vital Statistics and the Birth Defects Registry as well as Medicaid at the Health and Human Services Commission, to improve case ascertainment and provide additional opportunities for analysis, including more comprehensive assessment of treatment adequacy. Findings will be utilized to improve provider education and inform stakeholders and policymakers. Additionally, DSHS will publish annual CS epidemiological profiles and CS fact sheet updates as well as provide biennial legislative reports to provide current data and recommendations.

References

- HIV/STD reports and slide sets: dshs.texas.gov/hivstd/reports/
- Congenital syphilis fact sheet, FIMR fact sheet, and STD surveillance report: dshs.texas.gov/hivstd/info/edmat-fact.shtm