



# Congenital Syphilis in NE Tennessee

ETSU Child and Family Health Institute Collaborative Series

Cynthia C. Thomas, DO, MPH

# Disclosure Statement

I have no disclosures to report.

# The number of babies born with syphilis is surging

American Academy of Pediatrics



Vital Signs

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## Syphilis in Babies Reflects Health System Failures

Tailored strategies can address missed prevention opportunities during pregnancy

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**10x**

Over 10 times as many babies were born with syphilis in 2022 than in 2012.

**9 in 10**

Timely testing and treatment during pregnancy might have prevented almost 9 in 10 (88%) cases in 2022.

**2 in 5**

Two in 5 (40%) people who had a baby with syphilis did not get prenatal care.

Minimizing Trafficking in the US - American Academy of Pediatrics  
Key Safety Updates - Safety Hazards and Risk Reduction  
2.1.2023  
Risk-Reduced Health After Pediatric Stroke Intervention  
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FROM THE AMERICAN ACADEMY OF PEDIATRICS  
Addressing Maternal & Pediatric Health Disparities  
and Improving Pregnancy, Pediatric, and Adolescent Health  
SUPPLEMENT | An organization that does not discriminate on the basis of race, ethnicity, or national origin in its programs and activities.  
Member since 1919.

<https://doi.org/10.1542/peds.2021-050449>

[Article history](#)

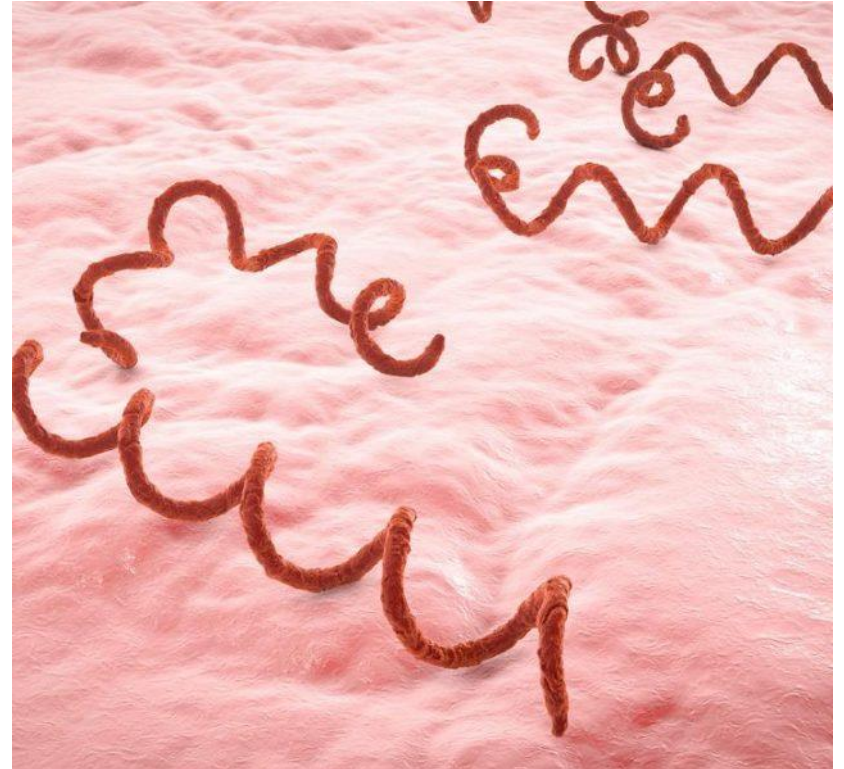
Congenital syphilis, first described by Gaspar Torella in 1497, results primarily from the transplacental passage of *Treponema pallidum* and continues to cause major negative consequences worldwide.<sup>1</sup> After a steady decline in U.S. cases of primary and secondary syphilis after 1990, which led to hopes of its elimination, rates hit a nadir in 2001.

# What is syphilis?

- First described among soldiers fighting in a conflict between France and Naples, Italy in 1494
- Widely believed to have been brought to Europe from the Americas by Christopher Columbus's sailors after their journey to the New World in 1492
- Commonly referred to as "French Disease" (although the French called it "Neopolitan Disease")
- The name syphilis, originates from a poem (Syphilis, sive morbus gallicus, 'Syphilis, or the French disease'), published in 1530 by Girolamo Fracastoro, an Italian poet, mathematician, and physician

# What is syphilis?

- Treponema pallidum
  - Gram negative bacterium
  - Spirochete
- Host
  - Humans
- Transmission
  - Sexual
  - Vertical



# What is syphilis?

- Stages of untreated infection
  - Early Syphilis
    - Primary – usually painless chancre
    - Secondary – systemic illness often with rash (involvement of palms and soles), condyloma lata
  - Late Syphilis
    - Tertiary – symptomatic manifestations of CV or gummatous dx
    - Latent (asymptomatic)
      - Early – within first year following infection
      - Late – more than one year following infection
  - Neurosyphilis
    - Early – often meningitis or ocular or otologic
    - Late – usually involve brain and spinal cord; dementia, tabes dorsalis
- “The Great Imitator”
- Treated with penicillin

# What is congenital syphilis?

- Congenital syphilis occurs when a mother with syphilis passes the infection to her baby during pregnancy

**CONGENITAL  
SYPHILIS IS:**



**INCREASING  
IN THE UNITED STATES**

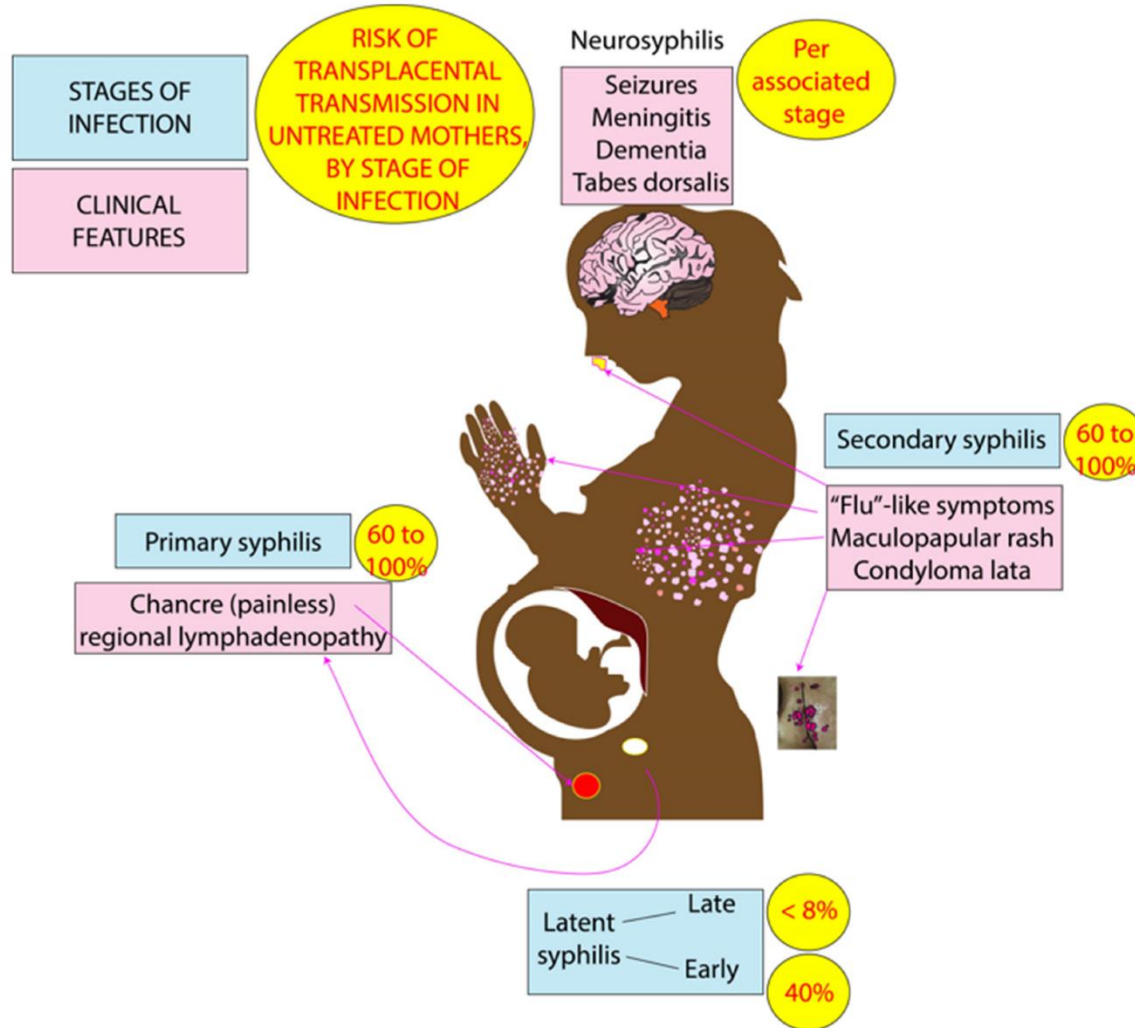
**A SOURCE OF MAJOR HEALTH  
PROBLEMS, EVEN DEATH**



**PREVENTABLE**



# Vertical transmission of syphilis



Sankaran D, Partridge E, Lakshminrusimha S. Congenital Syphilis—An Illustrative Review. *Children*. 2023; 10(8):1310. <https://doi.org/10.3390/children10081310>



# Syphilis During Pregnancy – Birth Outcomes

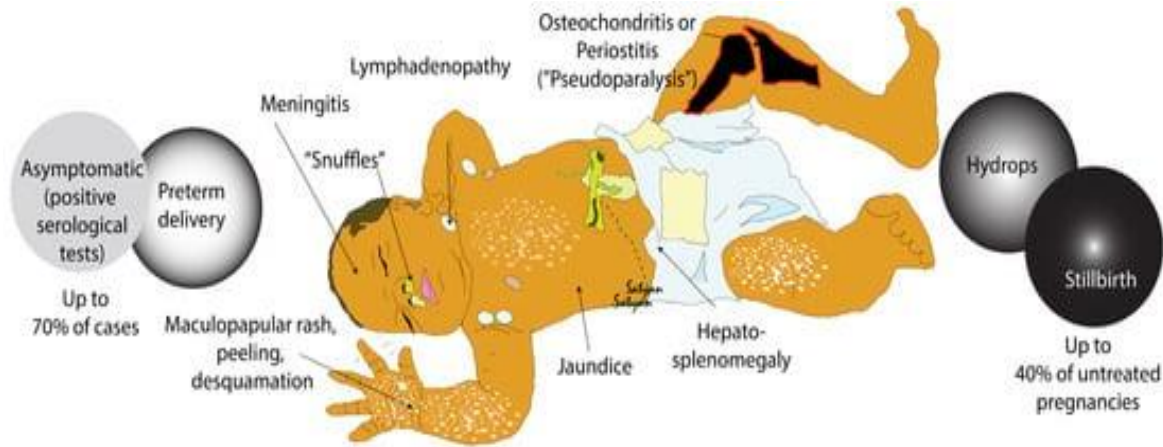
Up to 40% of babies born to untreated mothers, may be stillborn or die from the infection as a newborn



<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10453258/>

- Stillbirth
- Miscarriage
- Perinatal death
- Preterm delivery
- Low birth weight
- Congenital infection
  - Lifelong disabilities
  - Vision and hearing problems
  - Developmental delays
  - Bone abnormalities
  - Death

# Clinical manifestations of early CS



Sankaran D, Partridge E, Lakshminrusimha S. Congenital Syphilis—An Illustrative Review. *Children*. 2023; 10(8):1310.  
<https://doi.org/10.3390/children10081310>

Reproduced from: the Public Health Image Library, Centers for Disease Control and Prevention. Photo by Dr. Norman Cole

# Clinical manifestations of late CS

- Onset after two years of age
- Develops in approximately 40 percent of infants born to women with untreated syphilis during pregnancy
  - **Facial features** – Frontal bossing , saddle nose, short maxilla, protuberant mandible.
  - **Ophthalmologic** – Interstitial keratitis (bilateral, usually occurs around puberty but can occur anytime between 4 and 30 years), secondary glaucoma, corneal scarring, optic atrophy.
  - **Hearing** – Sensorineural hearing loss associated with late congenital syphilis typically develops suddenly at 8 to 10 years of age and often accompanies interstitial keratitis.
  - **Oropharynx** – Hutchinson teeth (hypoplastic, notched, widely spaced permanent teeth, mulberry molars, and perforation of the hard palate
  - **Cutaneous** – Rhagades (perioral fissures or a cluster of scars radiating around the mouth) , gummas
  - **Neurologic** – Intellectual disability, arrested hydrocephalus, cranial nerve palsies.
  - **Skeletal** – Anterior bowing of the shins ("saber shins"), enlargement of the sternoclavicular portion of the clavicle (Higoumenakis sign), painless arthritis of the knees ("Clutton joints")
  - **Hematologic** – Paroxysmal cold hemoglobinuria.



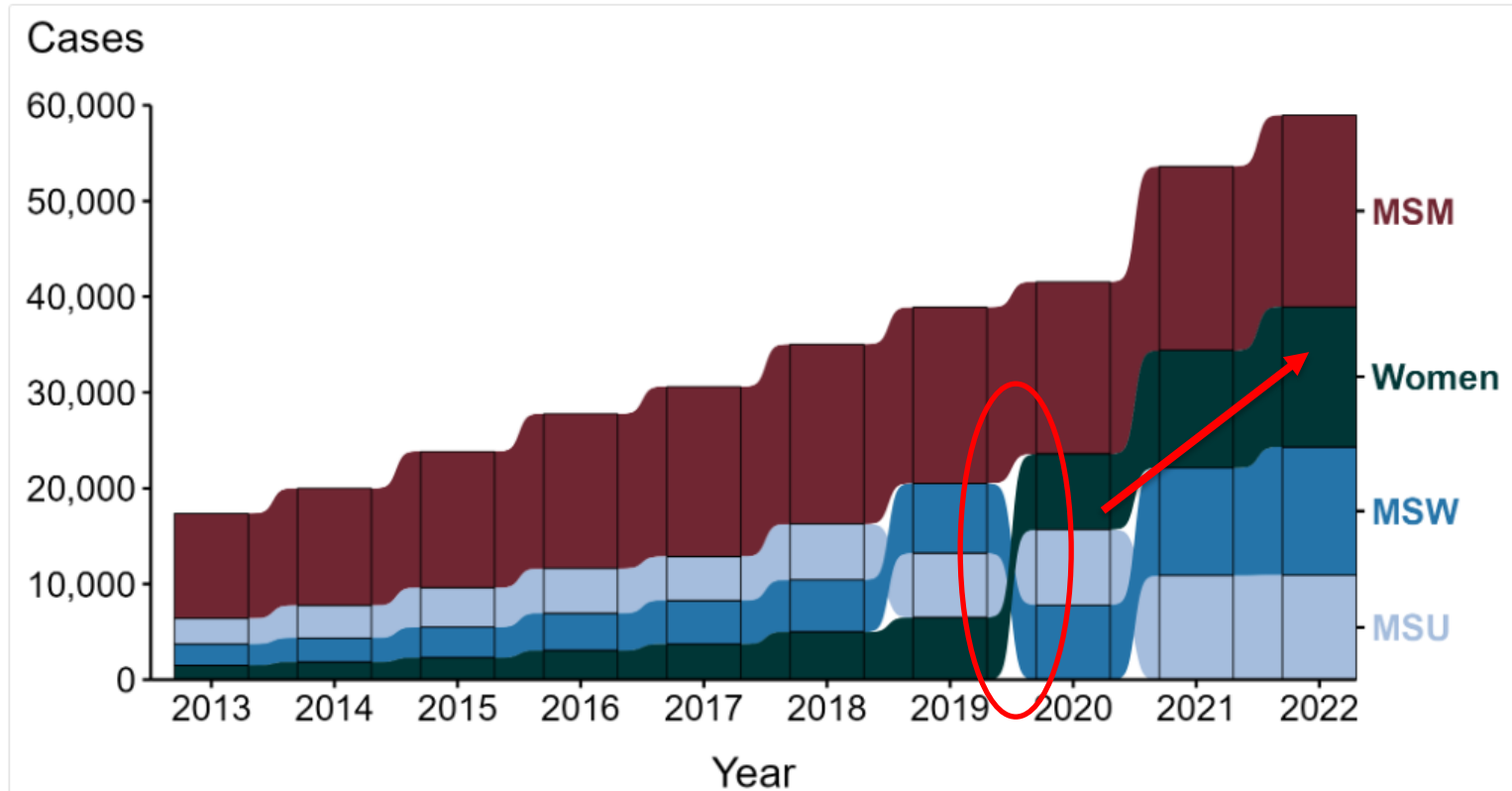
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# Epidemiology of Syphilis

# Syphilis Rates In United States

Primary and Secondary Syphilis — Reported Cases by Sex and Sex of Sex Partners, United States, 2013–2022

[Print](#)



[PNG - 128 KB]

\* Per 100,000

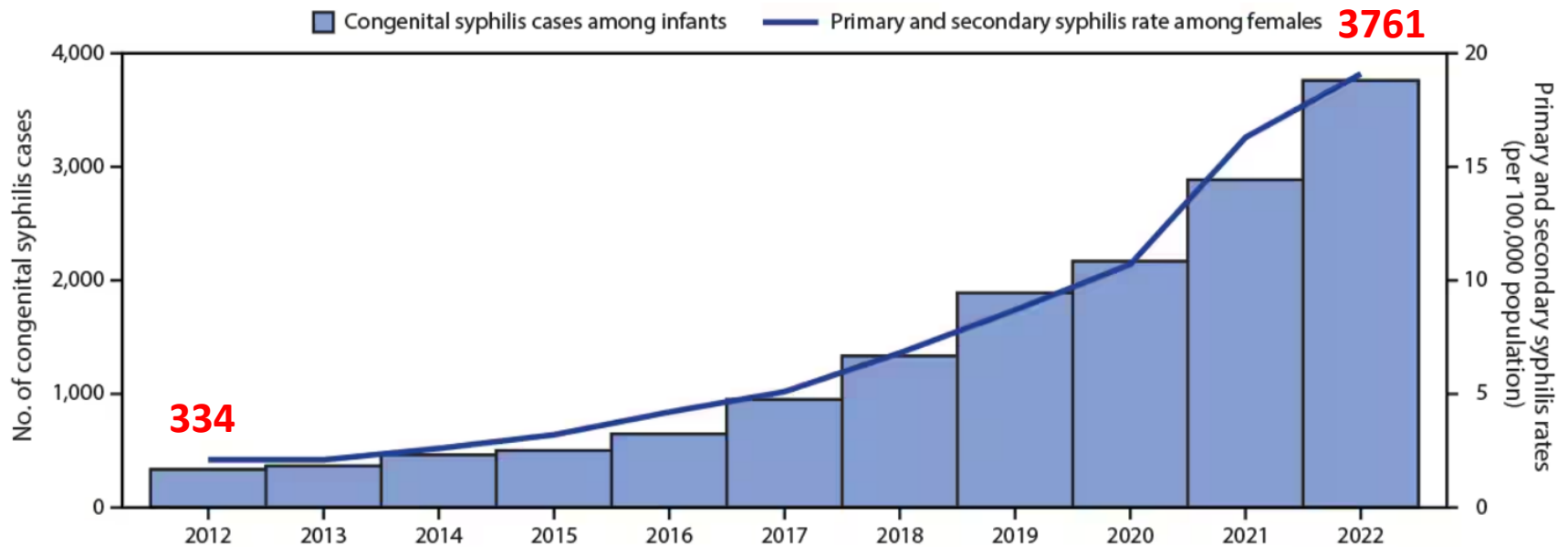
ACRONYMS: AI/AN = American Indian or Alaska Native; Black/AA = Black or African American; NH/PI = Native Hawaiian or other Pacific Islander

<https://gis.cdc.gov/grasp/nchhstpatlas/charts.html>



# Congenital Syphilis Trends – Reported number of cases by year of birth and syphilis rates among women 15-44 years

**FIGURE 1. Reported number of cases of congenital syphilis among infants, by year of birth, and rates\* of reported cases of primary and secondary syphilis<sup>†</sup> among females aged 15–44 years, by year – United States, 2012–2022**

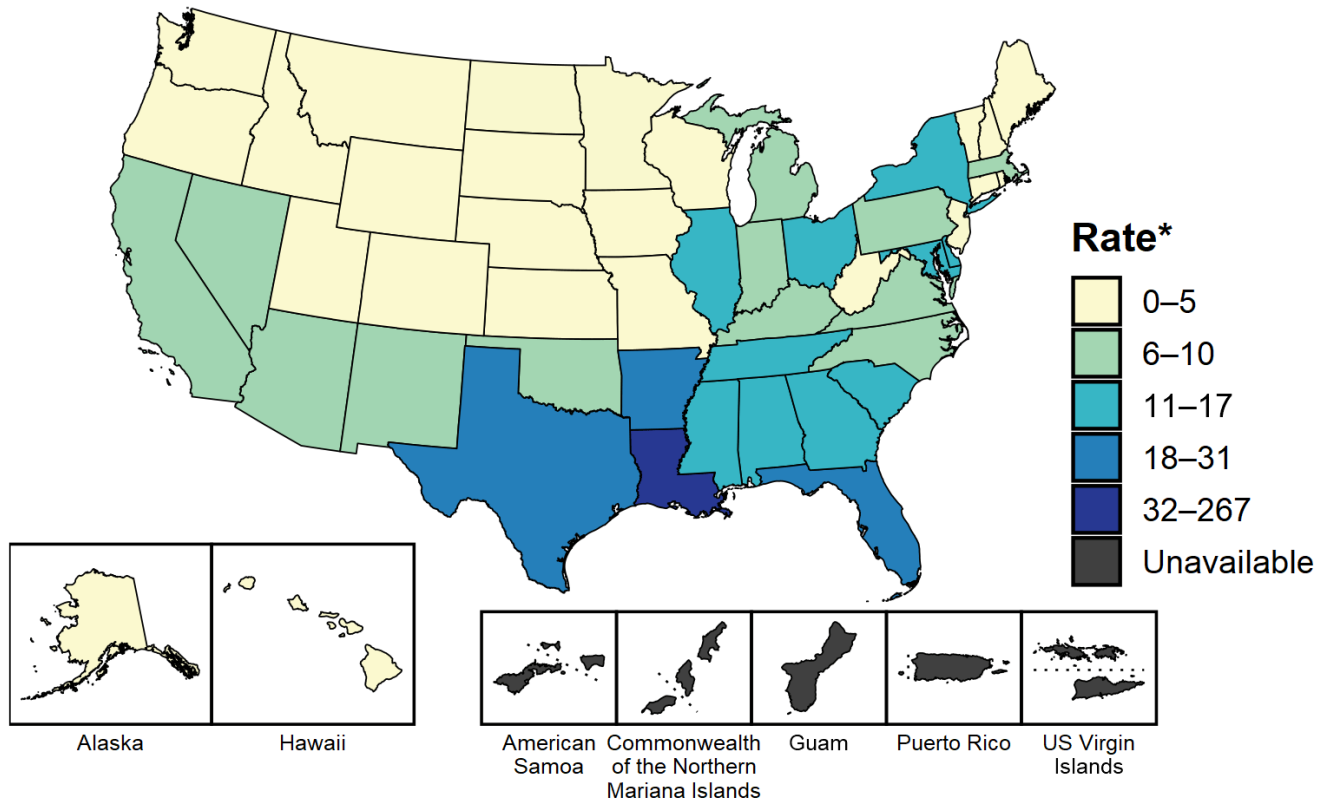


\* Cases per 100,000 population.

<sup>†</sup> Primary and secondary syphilis case data for all U.S. territories and freely associated states and outlying areas were not available for all years; therefore, rates presented include only the 50 states and the District of Columbia.

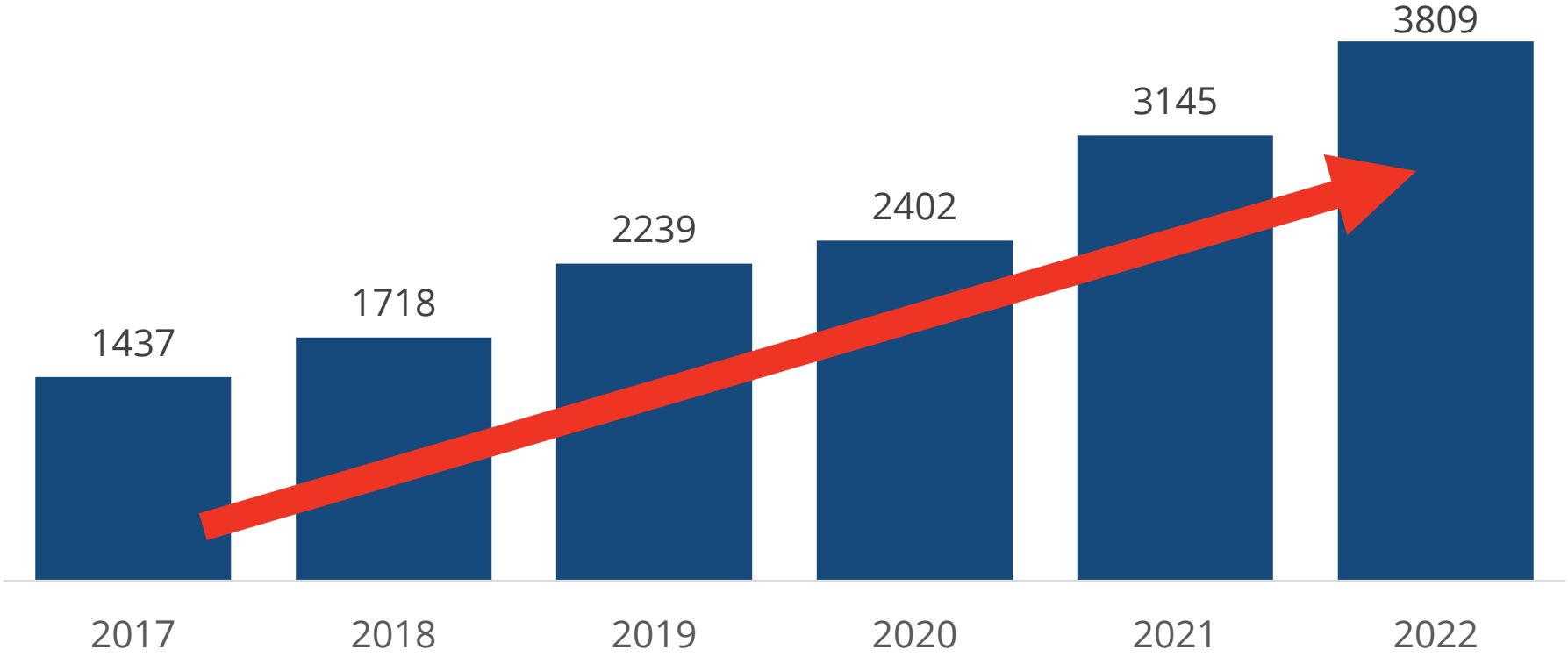
# Congenital Syphilis – reported cases by state 2012 - 2021

## 2012



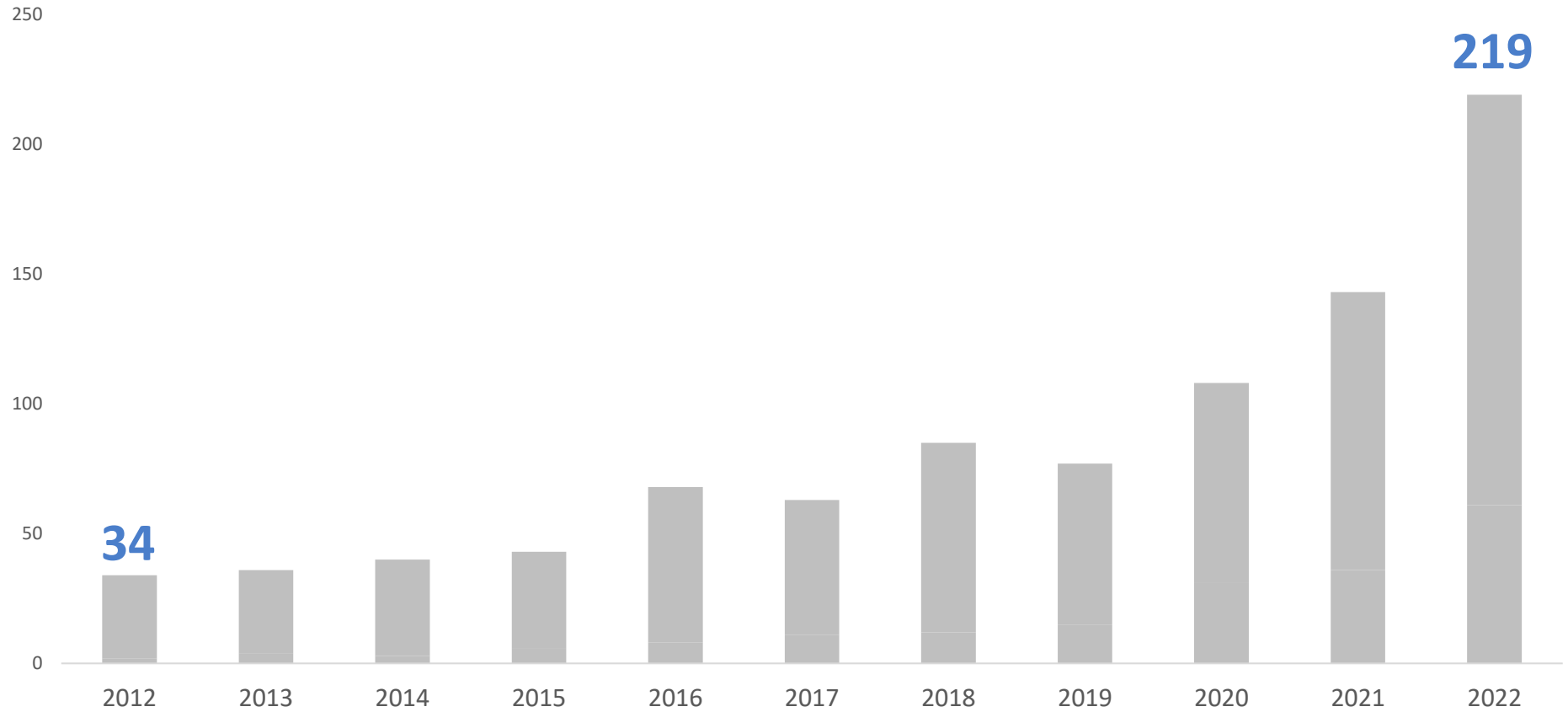


# Syphilis (all stages) in TN, 2017–2022

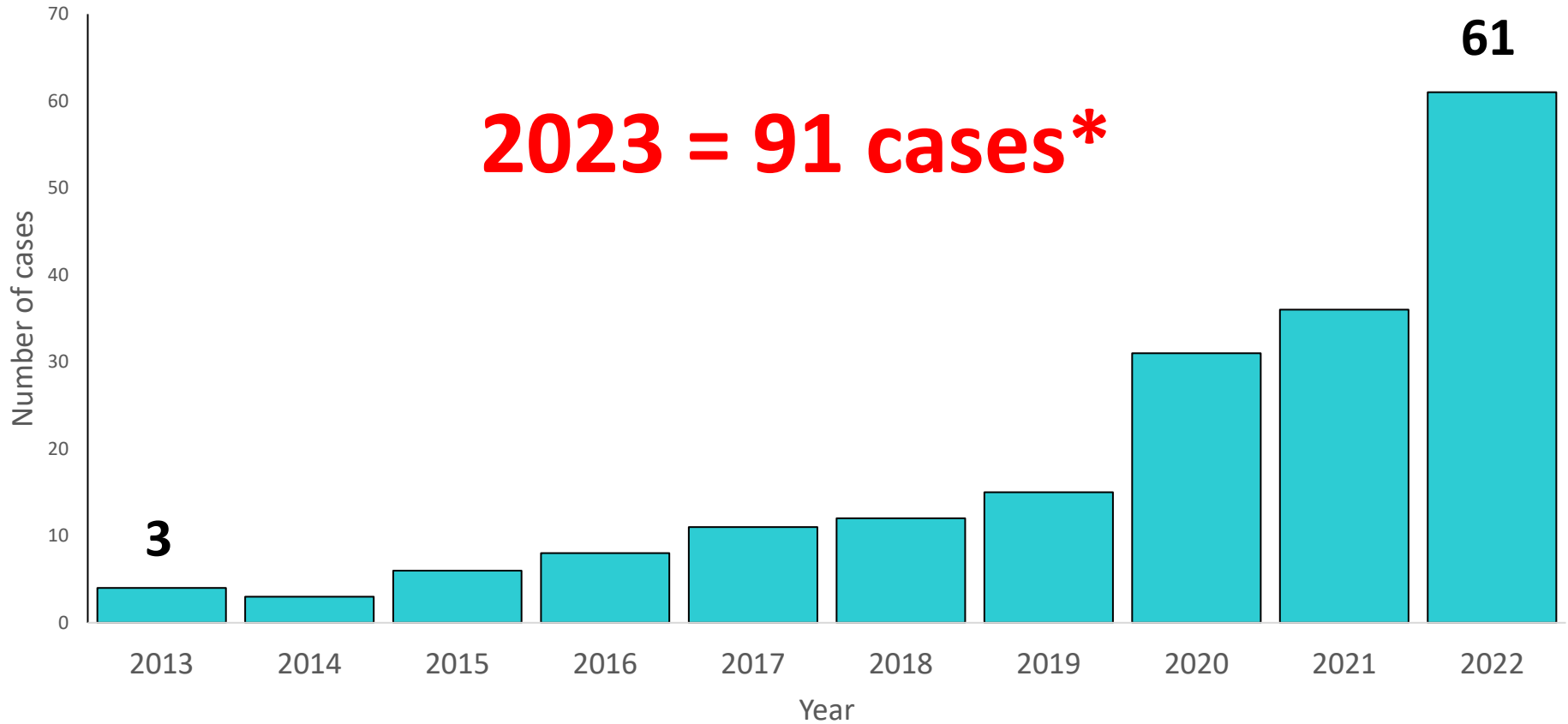


Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2017-2022.

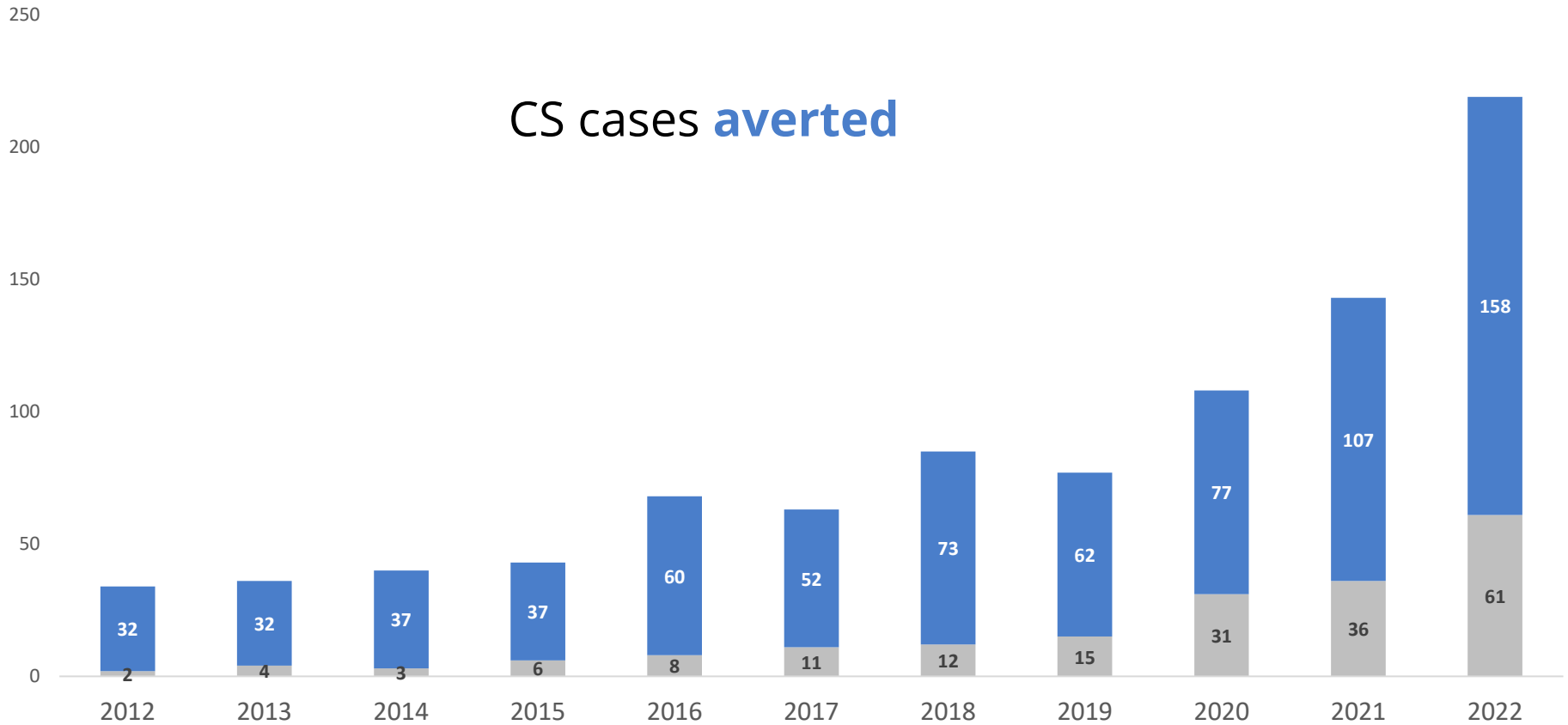
# Pregnant women with syphilis in TN, 2012-2022




# Congenital Syphilis in Tennessee, 2013-2022



# Pregnant women with syphilis in TN, 2012-2022



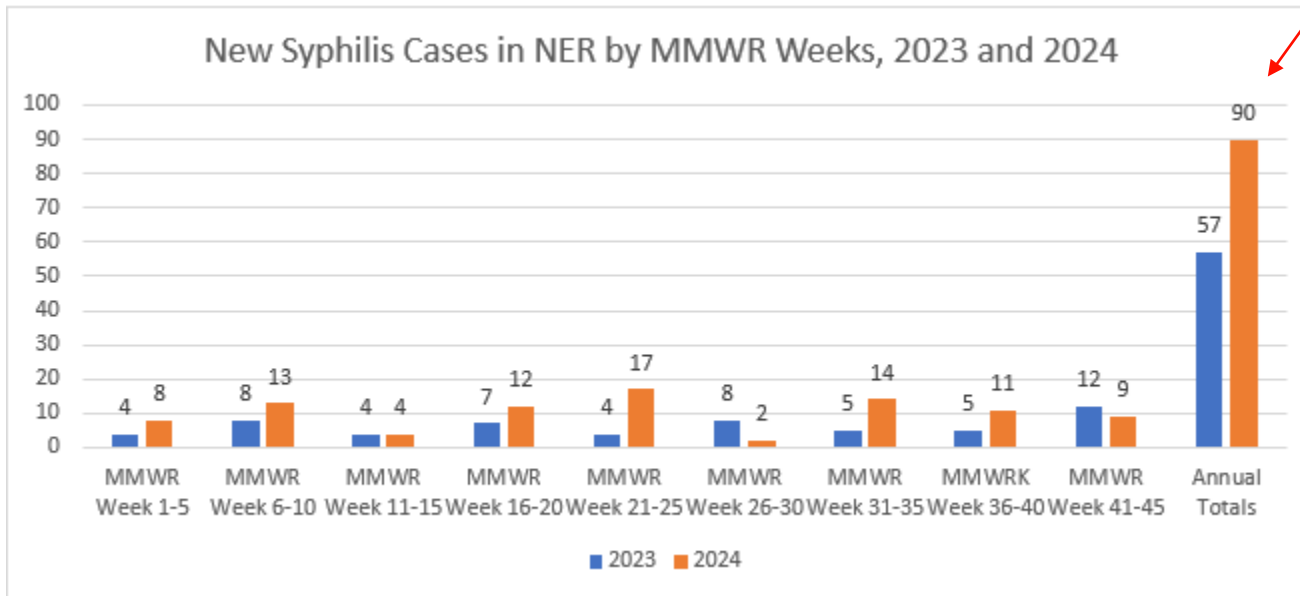
# Known Risk Factors For CS

- **Lack of prenatal care**
  - **Late initiation of prenatal care**
  - Lack of health insurance
  - Late enrollment in Medicaid
  - Lack of adequate transportation
  - Lack of childcare
  - Food insecurity
  - Insecure housing
  - Violence
  - Poverty
  - Low educational levels
  - Social isolation
  - Lack of control in one's life
  - Unplanned/unwanted pregnancy
  - Psychological stresses
  - Other behavioral risk factors
  - Incarceration
  - Substance use
  - Mental health
  - Cost of copays
- 

# Syphilis in NER

The Northeast Region (NER) includes Carter, Greene, Hancock, Hawkins, Johnson, Unicoi and Washington Counties

90 syphilis cases identified in NER as of MMWR week 45 in 2024



# CS in NER

- Since January 2023, there have been 13 cases of syphilis identified among pregnant women in the Northeast Region\*
- To date, there have been two cases of CS identified in the NER since January 2023

Source: The National Electronic Disease Surveillance System (NEDSS) Base System (NBS)





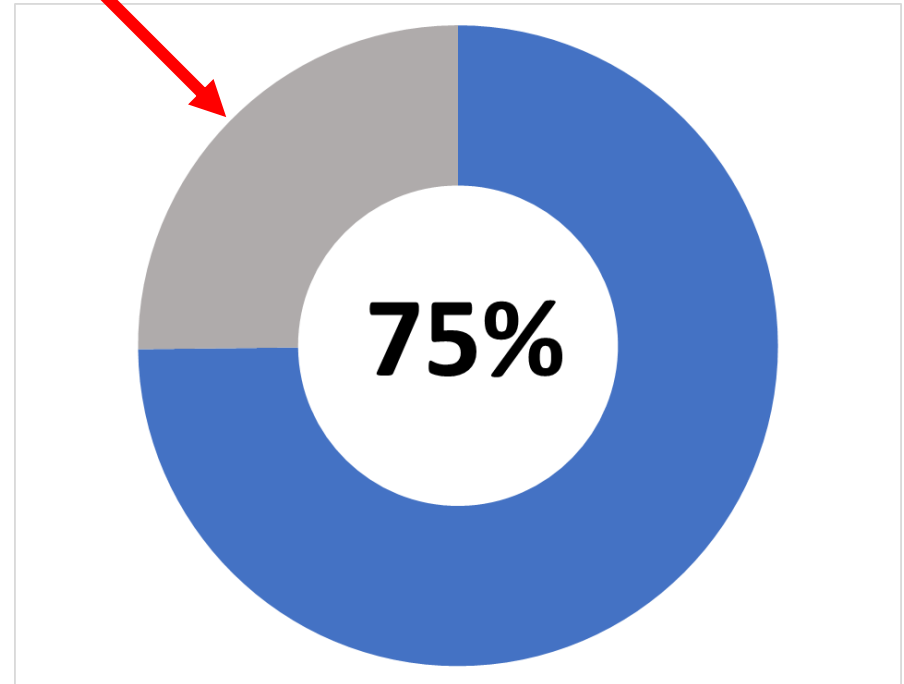
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# Syphilis Screening and CS Prevention

# CS is preventable

Why aren't 100% of cases averted?

- ✓ We know how to detect it
- ✓ We know how to treat it
- ✓ We know how it's transmitted



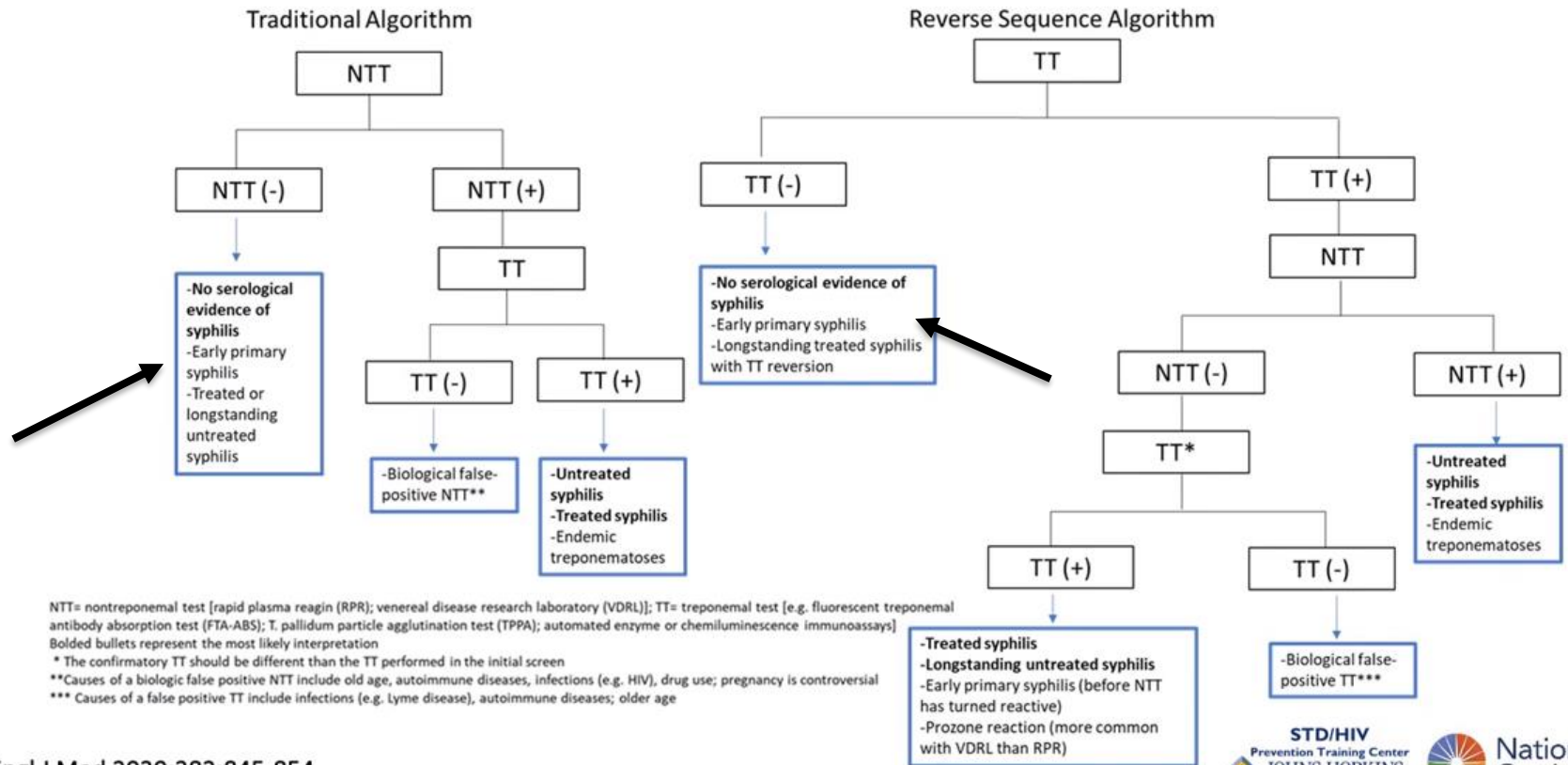
Potential congenital syphilis cases averted in 2021

# Testing Algorithms

NTT= Non-Treponemal Testing: VDRL, RPR

TT= Treponemal Testing: TPPA, FTA-ABS, etc.

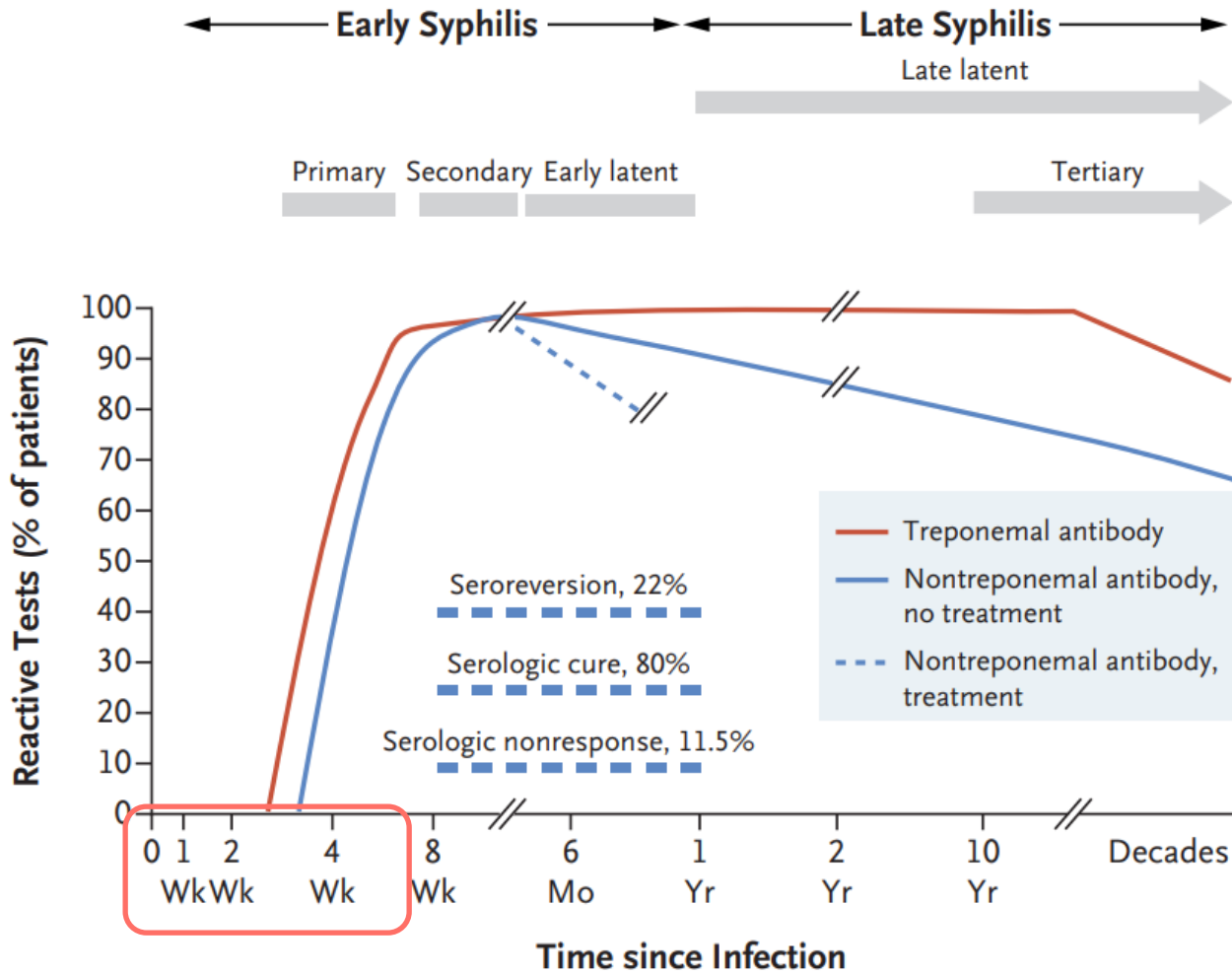
Reflex needed every screening



N Engl J Med 2020;382:845-854

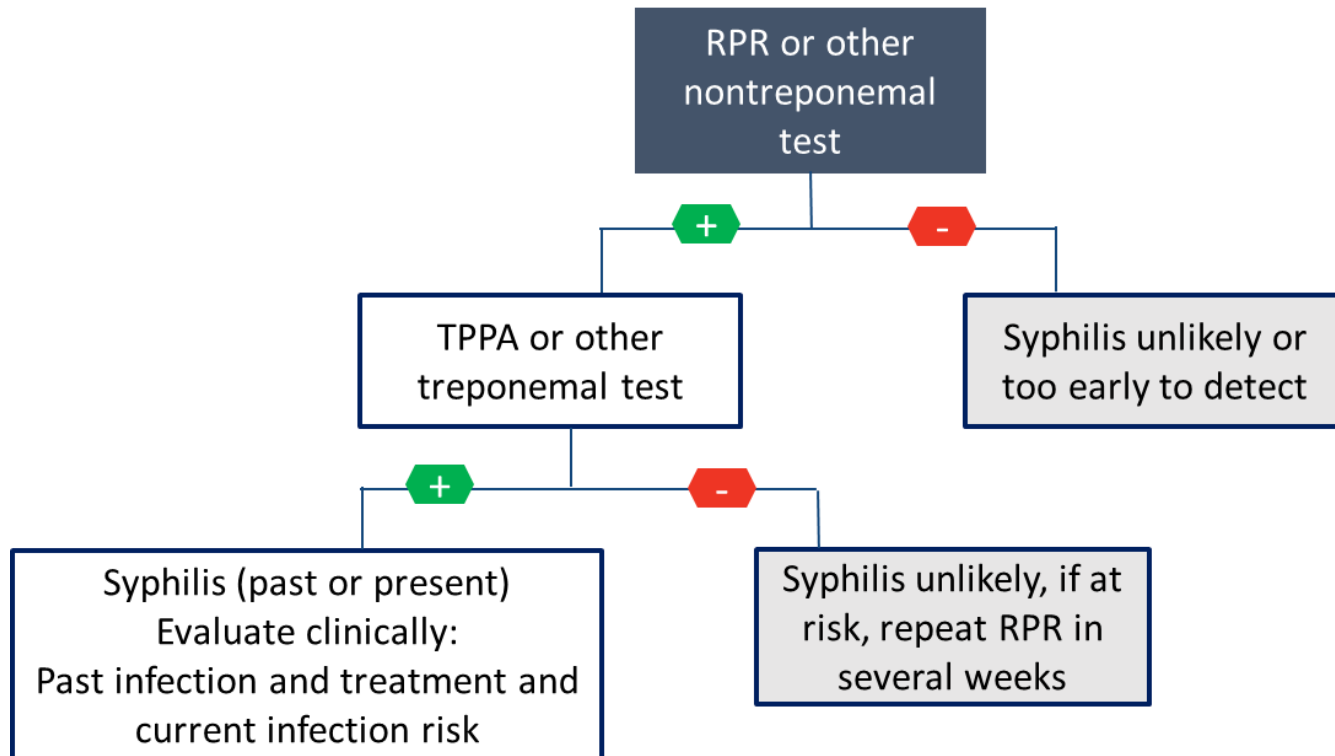


# Syphilis Screening



N Engl J Med 2020; 382:845-854

# Detection




# Detection

- Infection during pregnancy or reinfection
- Lack of prenatal care and/or screening
  - Ideal: 1st trimester, 3<sup>rd</sup> trimester, and at delivery
- Imperfect diagnostics
  - Biologic false positives, interpreting titers, no culture, etc.

# Treatment

- Inadequate treatment for stage
- Treatment too late
- Bicillin shortages
  - Treatment compliance with doxycycline (for partners) is an issue



Centers for Disease Control and Prevention  
National Center for HIV, Viral Hepatitis, STD, and TB Prevention  
Division of STD Prevention

July 20, 2023

Dear Colleagues,

We would like to bring your attention to [FDA's listing of Penicillin G benzathine injectable suspension products \(Bicillin L-A®\) on their drug shortage webpage](#), noting limited supply due to increased demand. In addition, Penicillin G procaine [has been discontinued by the manufacturer](#).

We are aware that jurisdictions may currently be [experiencing challenges](#) procuring enough Bicillin L-A® to meet their needs. As we await resolution of this issue, it remains critical that limited inventory be used to treat the patients who need it most.

**CDC strongly encourages the following priority actions during the ongoing shortage:**

**Take inventory:**

- Monitor local supply of Bicillin L-A® and [determine the local pattern of use to forecast need](#).
- Continue to contact distributors to procure Bicillin L-A® as appropriate. Contact Pfizer (see "[Dear Patient Letter](#)" posted on the FDA website) if there is less than a 2-week supply, the distributor has no supply, and there is a risk that patients may not be treated.

**Prioritize using Bicillin L-A® to treat pregnant people with syphilis and babies with congenital syphilis – penicillin is the only recommended treatment for these populations.**

- **Choose doxycycline** for non-pregnant people to help preserve Bicillin L-A® supplies. See [CDC's treatment recommendations](#) for more.





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# Screening Recommendations