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The Resurgence of Maternal and Congenital Syphilis in the United States: A Surveillance Analysis, 2022-2024

Biology * Public Health

1. Introduction: The Return of the Great Imitator

Following the introduction of penicillin and contact-tracing programs in the mid-20th century, Treponema pallidum infection plummeted across the United States, prompting the Centers for Disease Control and Prevention (CDC) to launch a national syphilis elimination plan in 1999. Congenital syphilis -- the vertical transmission of the spirochete from mother to fetus -- came to be viewed as a preventable medical "never event." Over the past decade, however, this public health triumph has unraveled. Surveillance data released by the National Center for Health Statistics (NCHS) in early 2026 (Health E-Stat 110) documents a 28% surge in the U.S. maternal syphilis rate between 2022 and 2024, compounding a 222% increase recorded between 2016 and 2022.[1][2]

This report analyzes the epidemiological velocity of the 2022-2024 resurgence across racial, age, and urban-rural lines; the molecular mechanisms of placental invasion; the syndemic interaction of methamphetamine use and housing instability; and the operational bottlenecks of prenatal screening and Benzathine Penicillin G (Bicillin L-A) supply shortages.

2. Epidemiological Trajectory and the Rural Shift (2022-2024)

While U.S. chlamydia and gonorrhea rates stabilized or declined in recent provisional datasets, maternal syphilis rose from 280.4 per 100,000 live births in 2022 to 324.6 in 2023 (+16%) and 357.9 in 2024 (+10%).[1][3] Consequently, national congenital syphilis cases reached 3,882 in 2023 -- including 279 syphilitic stillbirths and infant deaths -- and approached 4,000 in provisional 2024 counts, marking twelve consecutive years of growth.[3][4]

Aggregate national figures mask severe structural disparities:

* Indigenous, Black, and Hispanic Mothers: American Indian and Alaska Native (AI/AN) mothers experienced a 52% two-year surge, reaching 2,145.4 per 100,000 births in 2024 -- six times the national average -- reflecting chronic underfunding of Indian Health Service (IHS) infrastructure.[1] Rates rose 30% among Black non-Hispanic mothers (to 887.6) and 31% among Hispanic mothers (to 411.1).[1]

* Age Distribution: While absolute rates remained highest among mothers aged 20-24 (514.3) and under 20 (474.2), relative growth accelerated fastest among mothers aged 35-39 (+36%) and 40+ (+31%), challenging clinician assumptions that older pregnant patients face low STI risk.[1]

* The Rural Crossover: Between 2016 and 2023, maternal syphilis rates tripled in urban counties but quintupled in rural counties, with rural incidence surpassing urban incidence from 2021 onward.[6] Obstetrics unit closures across rural

"maternity care deserts" delay prenatal care entry, driving high congenital syphilis burdens in South Dakota (482.1 per 100,000 live births), New Mexico (421.0), and Mississippi (377.8).[5][6][7]

3. Pathophysiology of Vertical Transmission and Clinical Spectrum

Treponema pallidum is a motile, Gram-negative-like spirochete capable of crossing the placenta at any gestational stage -- a feat that many other bacteria cannot accomplish -- with molecular assays detecting fetal infection as early as 9-10 weeks of gestation.[8][13] Vertical invasion is mediated by the surface lipoprotein adhesin Tp0954, which binds heparan sulfate and dermatan sulfate glycosaminoglycans in the placental extracellular matrix to breach the syncytiotrophoblast barrier.[8]

Maternal-fetal transmission risk depends on maternal spirochetemia: untreated primary or secondary syphilis carries a 70%-100% vertical transmission rate, early latent (<1 year) carries ~40%, and late latent (>1 year) drops to ~8%.[11][12] Host immunological inflammation produces necrotizing funisitis (umbilical cord Wharton's jelly necrosis) and placentomegaly, impairing fetal nutrient and oxygen transfer and causing adverse outcomes in 50%-80% of untreated pregnancies via hydrops fetalis, intrauterine growth restriction, or stillbirth.[9][10][14]

Up to 60% of live-born infected infants are asymptomatic at birth but develop early congenital syphilis (<2 years) within weeks: hepatosplenomegaly, infectious nasal discharge ("snuffles"), desquamating palmoplantar rashes, painful osteochondritis/periostitis ("pseudoparalysis of Parrot"), and neurosyphilis.[12][15][16] Untreated survivors progress to late congenital syphilis (>2 years), characterized by Hutchinson's Triad (notched Hutchinson's incisors, interstitial keratitis, and eighth-nerve sensorineural deafness), saddle-nose deformity, and saber shins.[15][16][17]

4. Syndemic Drivers, Screening Reforms, and Supply Fragility

Nearly 90% of U.S. congenital syphilis cases involve preventable healthcare "missed opportunities."[20] These failures cluster within a syndemic of substance use and housing instability: CDC case analyses show infants with congenital syphilis are far more likely to have parents reporting methamphetamine use (46% vs. comparison cohorts) or homelessness (23% vs. 10%).[18] Fear of child welfare involvement deters prenatal care, while homelessness disrupts adherence to the required three-week Benzathine Penicillin G injection schedule for latent syphilis of unknown duration (where any missed interval forces a full restart).[18][19]

* The 30-Day Rule and Universal Triple Screening (2024): Because placental clearance requires maternal treatment to be initiated at least 30 days prior to delivery, subjective "risk-based" third-trimester testing repeatedly failed.[21][22] In April 2024, the American College of Obstetricians and Gynecologists (ACOG) recommended universal serological screening at three timepoints for all pregnancies: first prenatal visit, third trimester (~28 weeks), and delivery admission.[23][24]

* The Bicillin L-A Shortage and Prevention Gaps: Because doxycycline is contraindicated in pregnancy, Pfizer's single-source Benzathine Penicillin G (Bicillin L-A) is the sole curative option for pregnant patients.[25][26] Surging demand kept Bicillin L-A on FDA allocation and pediatric backorder into 2026,

forcing health departments to ration penicillin for pregnant women while shifting non-pregnant adults to 14-day oral doxycycline courses.[25][26][27] Meanwhile, although doxycycline post-exposure prophylaxis (Doxy-PEP) reduced syphilis incidence by ~87% in men who have sex with men and transgender women, trials in cisgender women showed insufficient efficacy, leaving reproductive-age women reliant on street medicine and emergency department opt-out screening.[28][29][30][31]

| Maternal Race and Hispanic Origin | | 2022 Rate (per 100k Births) | | 2023 Rate (per 100k Births) | | 2024 Rate (per 100k Births) | | 2022-2024 Change |

| All Races (U.S. Total) | | 280.4 | | 324.6 | | 357.9 | | +28% |

| American Indian / Alaska Native | | 1,410.5 | | 2,052.9 | | 2,145.4 | | +52% |

| Native Hawaiian / Pacific Islander | | 713.4 | | 932.8 | | 1,004.9 | | NS |

| Black, non-Hispanic | | 684.7 | | 786.6 | | 887.6 | | +30% |

| Hispanic | | 313.8 | | 358.7 | | 411.1 | | +31% |

| White, non-Hispanic | | 152.8 | | 174.4 | | 188.2 | | +23% |

| Asian, non-Hispanic | | 73.3 | | 80.0 | | 68.9 | | NS |

| 2023 State Rank | | State | | Congenital Cases | | Rate per 100,000 Live Births |

| 1 | | South Dakota | | 54 | | 482.1 |

| 2 | | New Mexico | | 91 | | 421.0 |

| 3 | | Mississippi | | 131 | | 377.8 |

| 4 | | Arizona | | 233 | | 296.6 |

| 5 | | Texas | | 930 | | 238.6 |

| 6-10 | | NV (232.0), LA (193.0), AR (180.4), MT (170.0), OK (163.5) | | 348 (combined) | | 163.5-232.0 |

5. Conclusion: Rebuilding the Perinatal Safety Net

The 28% rise in U.S. maternal syphilis between 2022 and 2024 reflects the convergence of spirochetal placental virulence with rural obstetrics closures, syndemic substance use, and single-manufacturer antibiotic fragility.[1][6][26] Halting preventable syphilitic stillbirths requires pairing ACOG's universal triple-screening mandate with federal domestic manufacturing investments for Benzathine Penicillin G, expanded Indian Health Service funding, and low-barrier field testing and treatment for unhoused and rural populations.[23][30]

Updates... (Nov 20, 2026): In 2026 CDC/FDA supply updates, Pfizer and the FDA extended the estimated recovery timeline for normal Bicillin L-A (benzathine penicillin G) inventory levels through the fourth quarter of 2027, granted shelf-life extensions on designated lots, and authorized temporary importation of Lentocilin while maintaining strict prioritization for pregnant patients and newborns.

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