



# Syphilis Update from NMDOH

Miranda Durham, MD

Chief Medical Officer, NMDOH

# Objectives

- Review epidemiology of Syphilis in US and NM
- Overview of Syphilis
- Understand new screening recommendations
- Explain Doxycycline Post Exposure Prophylaxis
- Describe NM DOH resources for providers

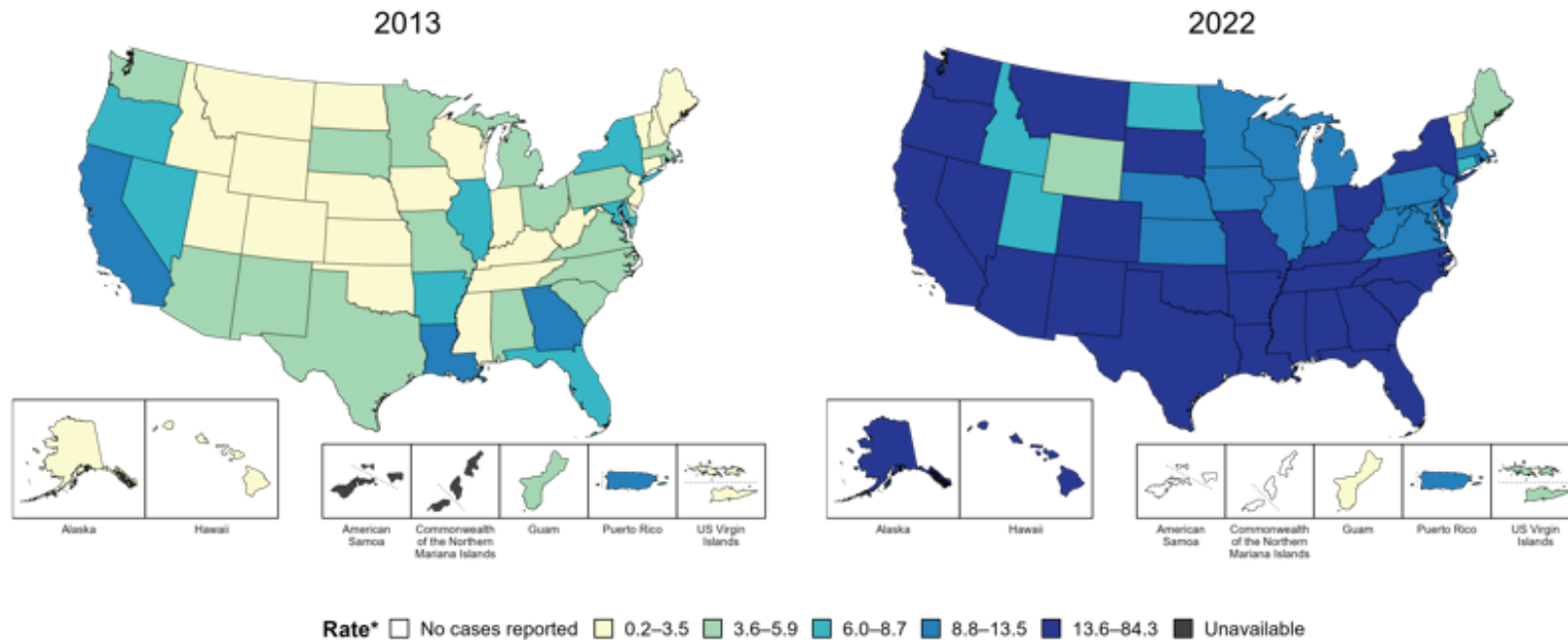
# Disclosures

Nothing to Disclose

# Objectives

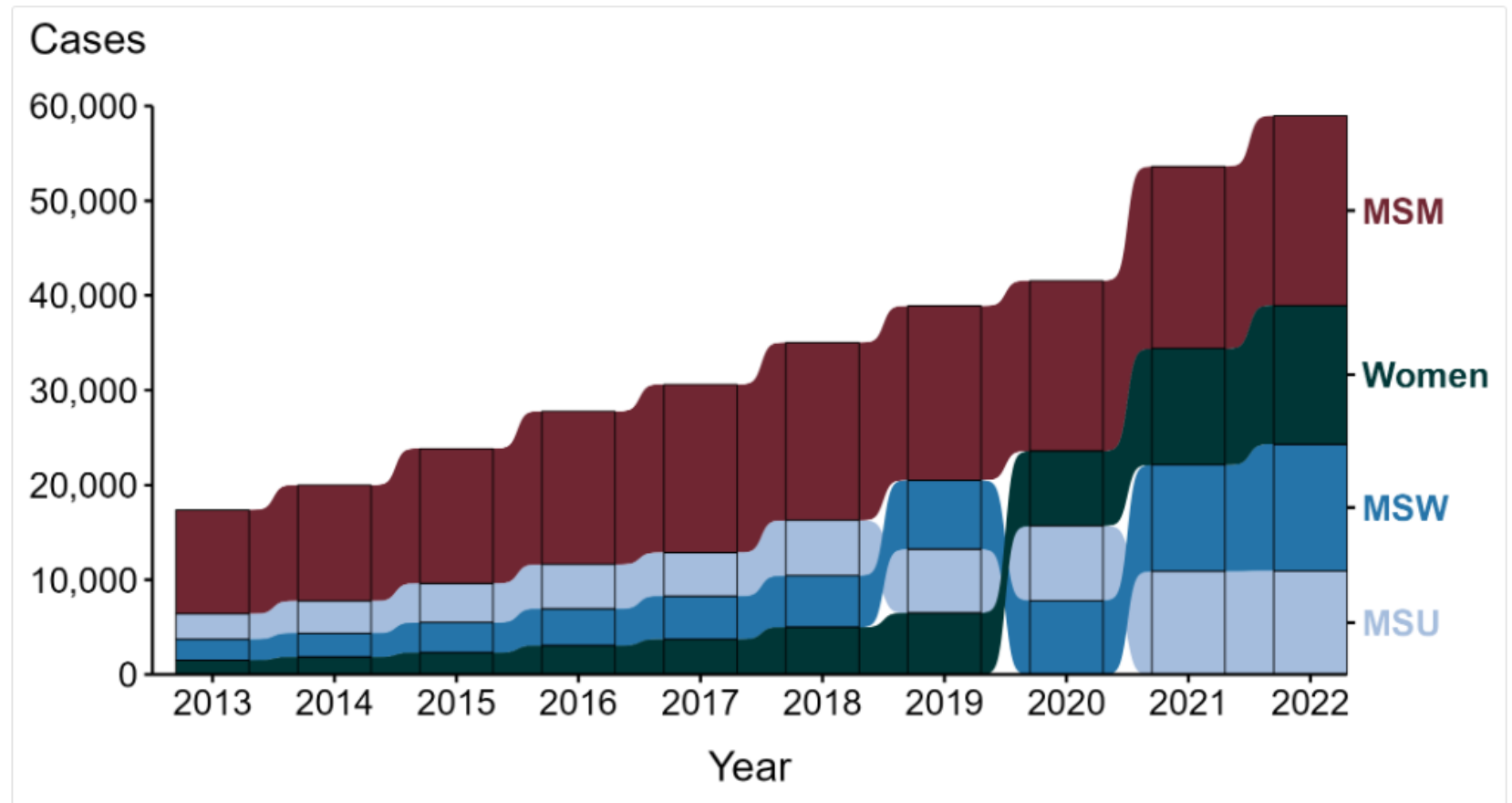
- **Review epidemiology of Syphilis in US and NM**
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# Primary and Secondary Syphilis — Rates of Reported Cases by Jurisdiction, United States and Territories, 2013 and 2022



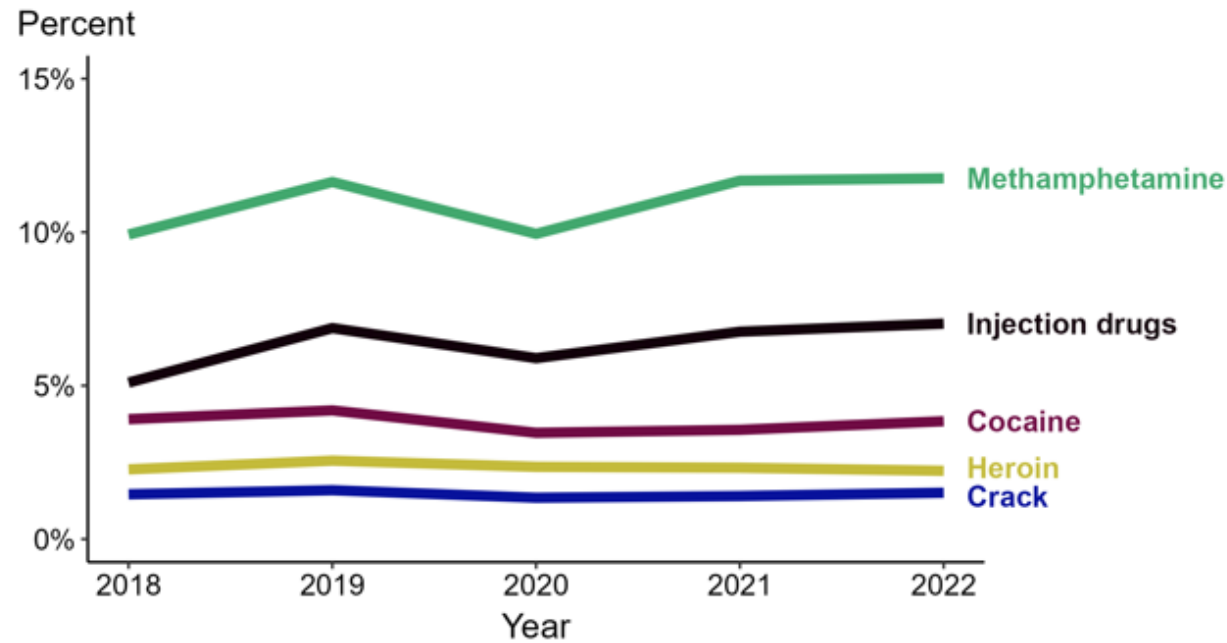
## Primary and Secondary Syphilis — Reported Cases by Sex and Sex of Sex Partners, United States, 2013–2022

[Print](#)



[Primary and Secondary Syphilis — Reported Cases by Sex and Sex of Sex Partners, United States, 2013–2022 \(cdc.gov\)](#)

## Primary and Secondary Syphilis — Percentage of Cases Reporting Selected Substance Use Behaviors\*, United States, 2018–2022

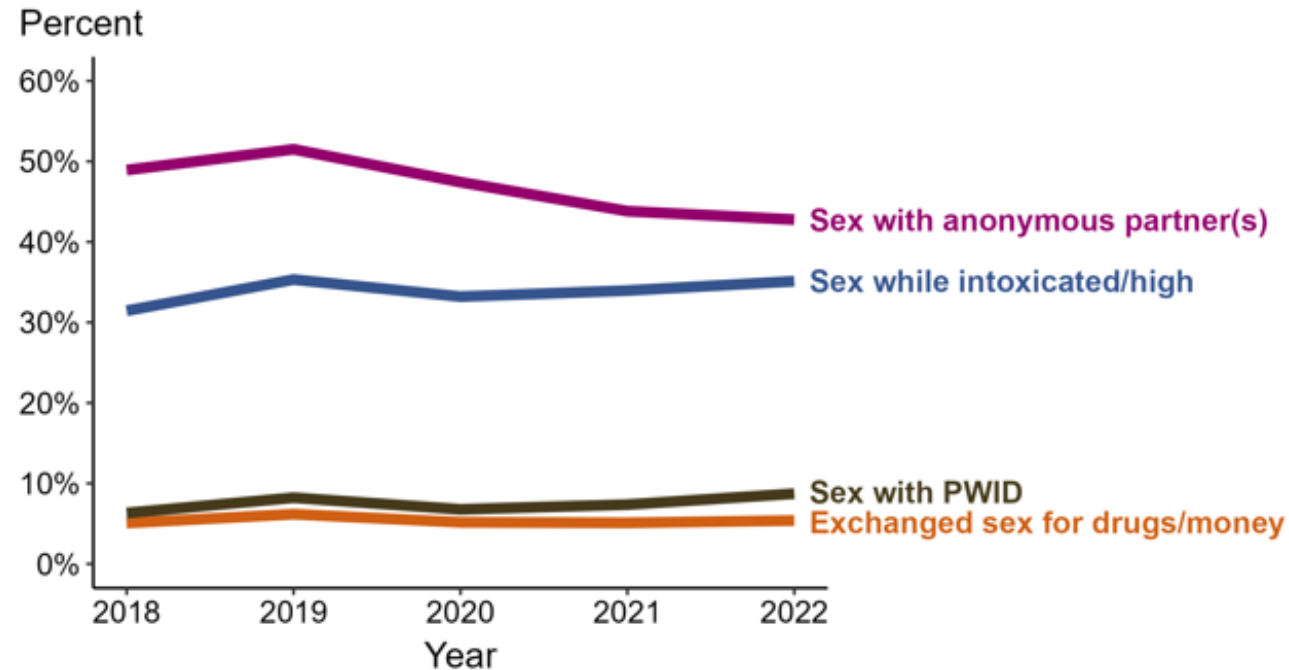


Roughly 26% of cases reported drug use in the prior year

\* Proportion reporting injection drug use, methamphetamine use, heroin use, crack use, or cocaine use within the last 12 months calculated among cases with known data (cases with missing or unknown responses were excluded from the denominator).



## Primary and Secondary Syphilis — Percentage of Cases Reporting Selected Sexual Behaviors\*, United States, 2018–2022

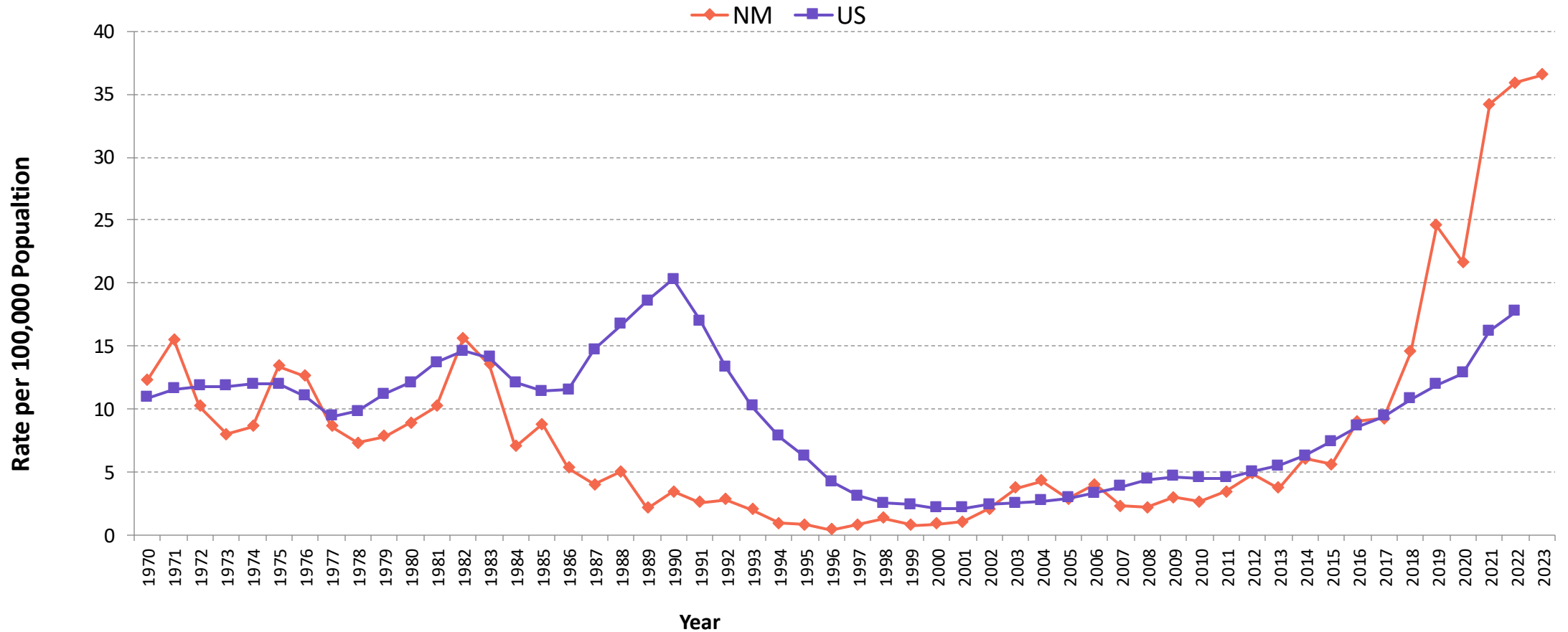


\* Proportion reporting sex with PWID, sex with anonymous partners, sex while intoxicated/high on drugs, or exchanging drugs or money for sex within the last 12 months calculated among cases with known data (cases with missing or unknown responses were excluded from the denominator).

ACRONYMS: PWID = Person who injects drugs

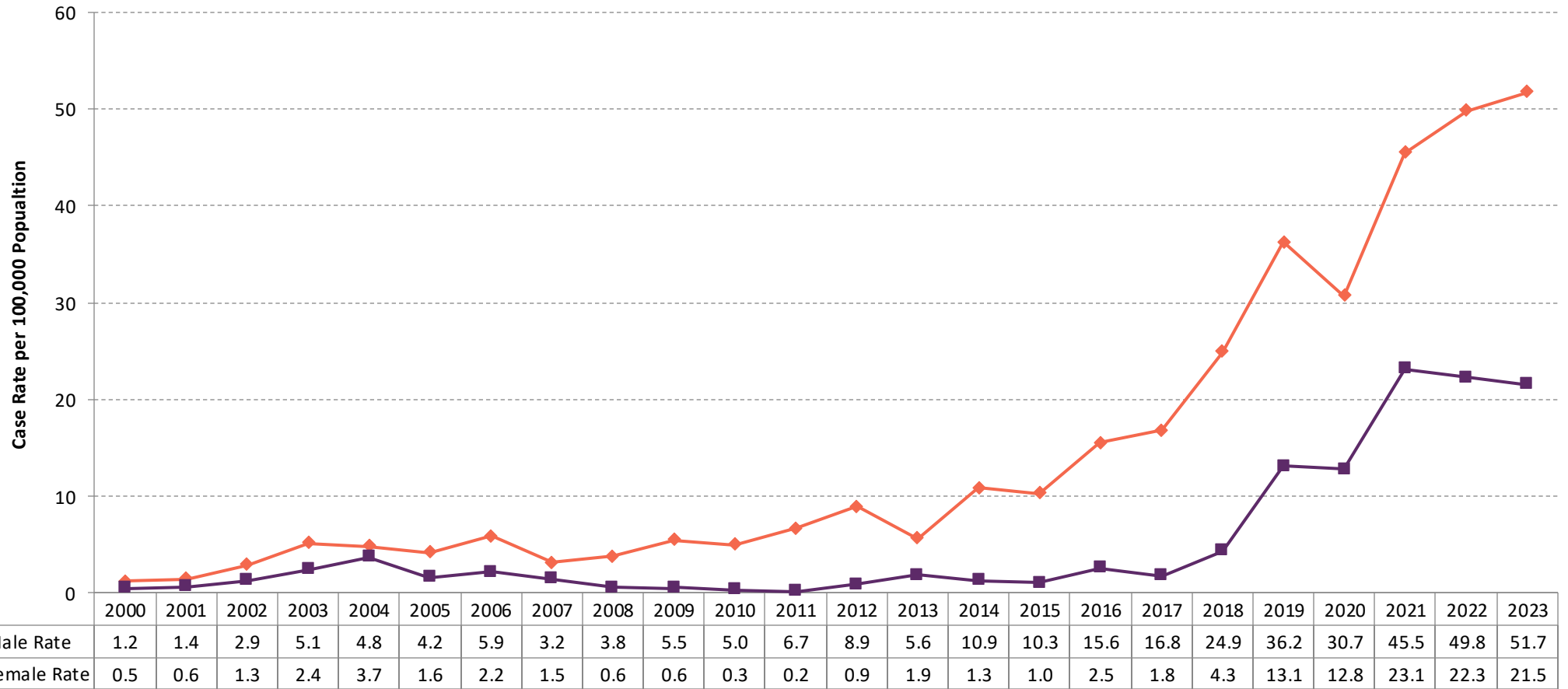


# Primary and Secondary Syphilis Rates, New Mexico and US, 1970 - 2023



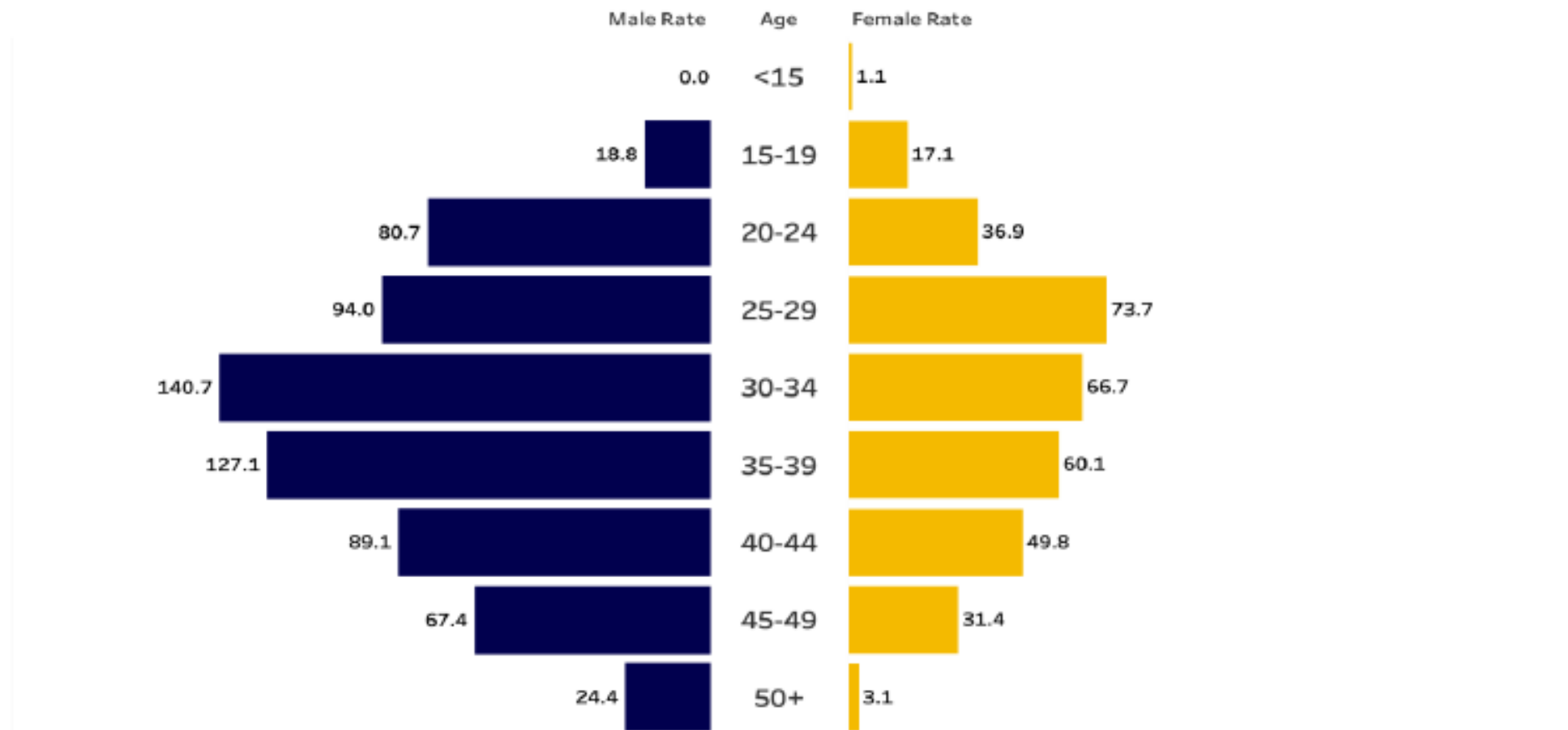


# P&S Syphilis Cases by Sex, NM, 2000-2023



# P&S syphilis by Age

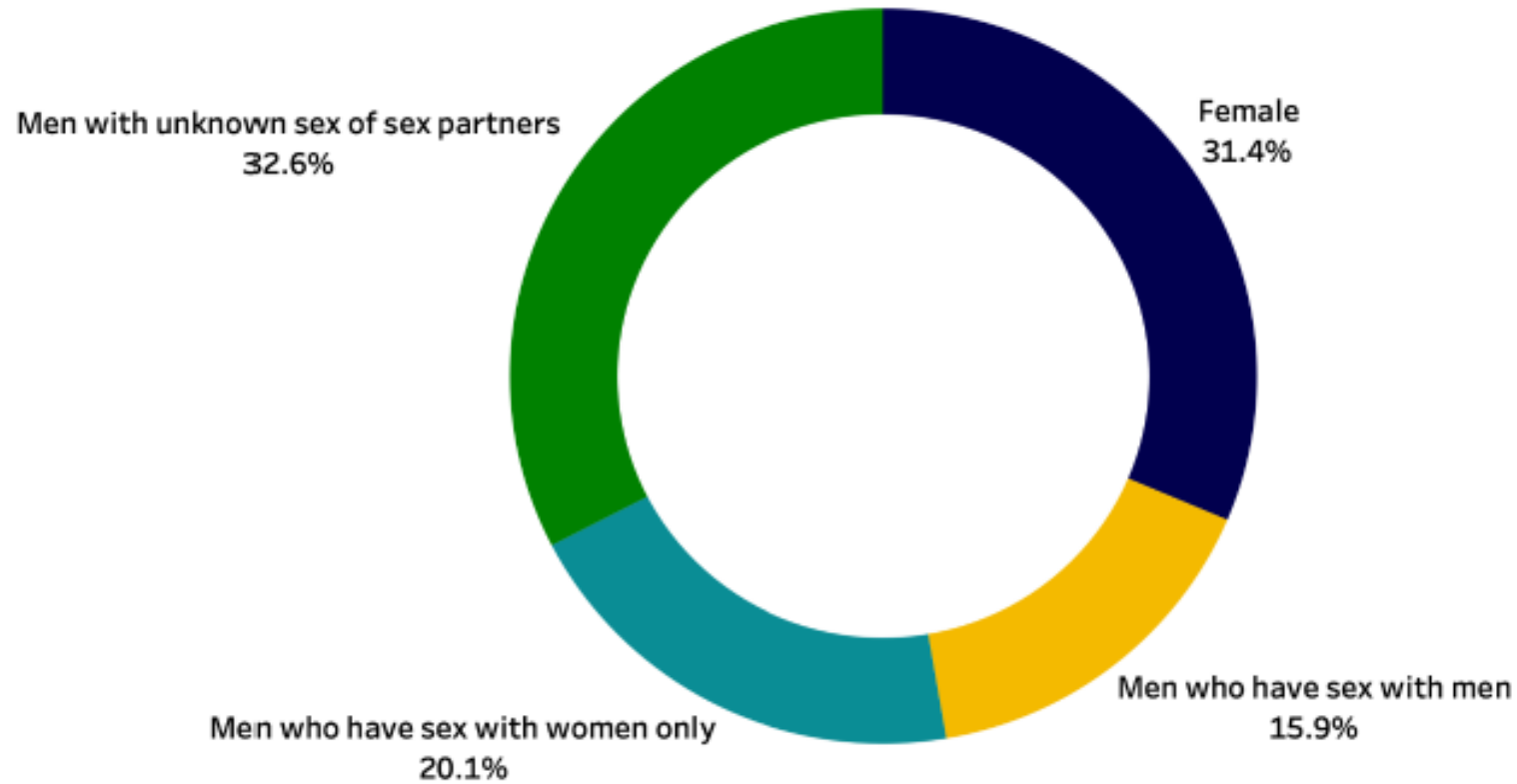
Figure 4. Rate of P&S Syphilis Cases per 100,000 People by Age and Sex, New Mexico, 2022



Case data sourced from CDC's National Notifiable Diseases Surveillance System; Population sourced from Census American Community Survey Estimates for 2022

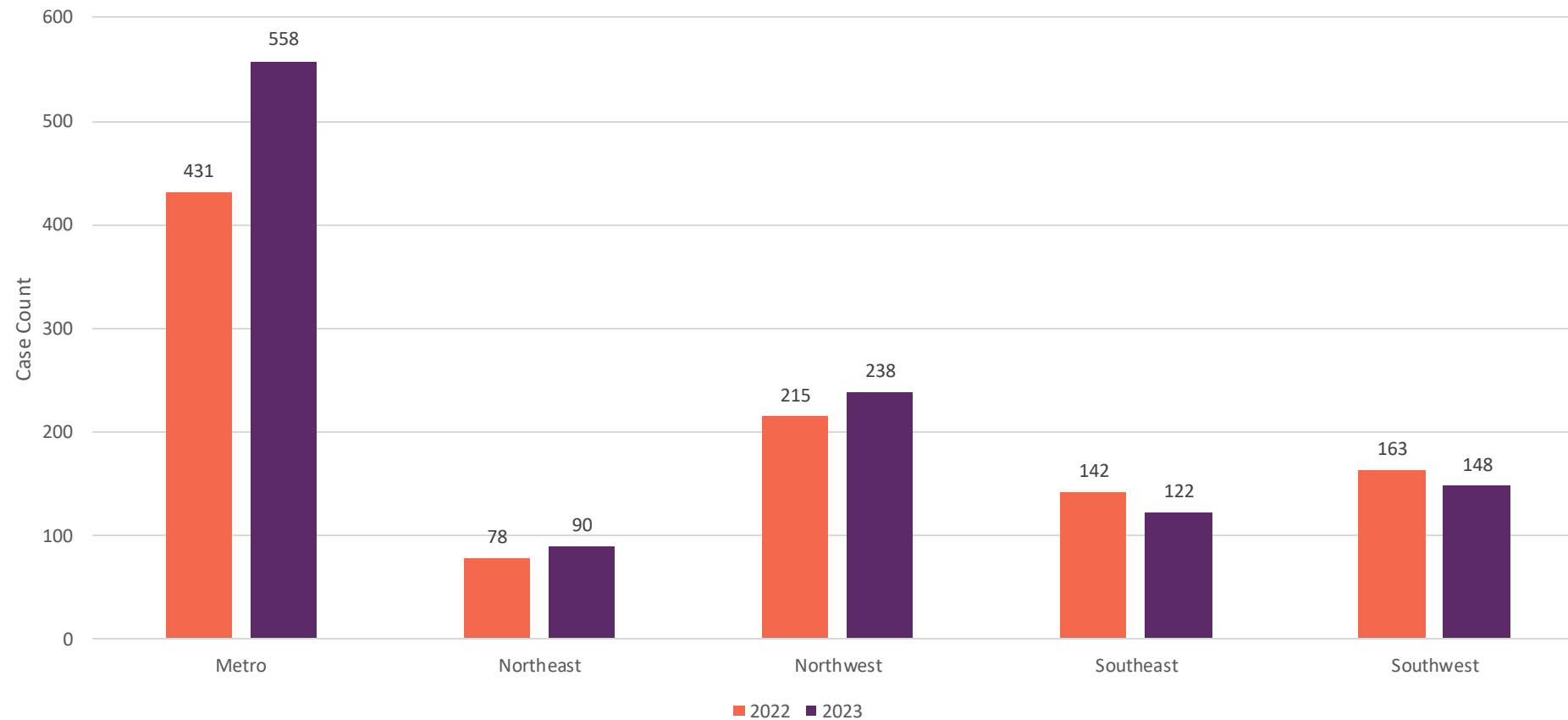
## P&S Syphilis by Sex and Sex of Sex Partner among Men 2022

Figure 5. Percentage of P&S Syphilis Cases by Sex and Sex of Sex Partners Among Men, New Mexico, 2022

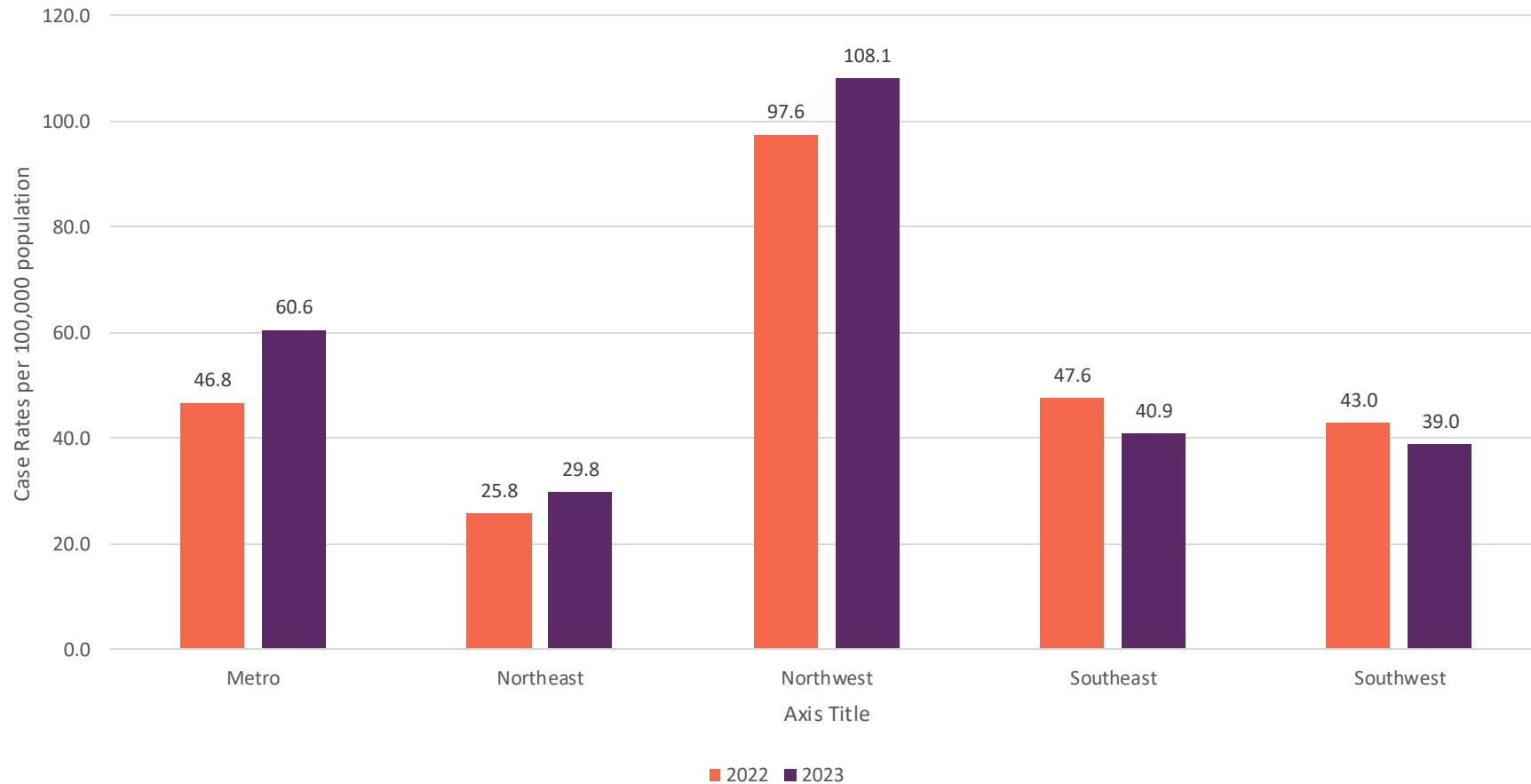


Data sourced from CDC's National Notifiable Diseases Surveillance System

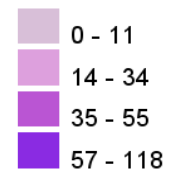
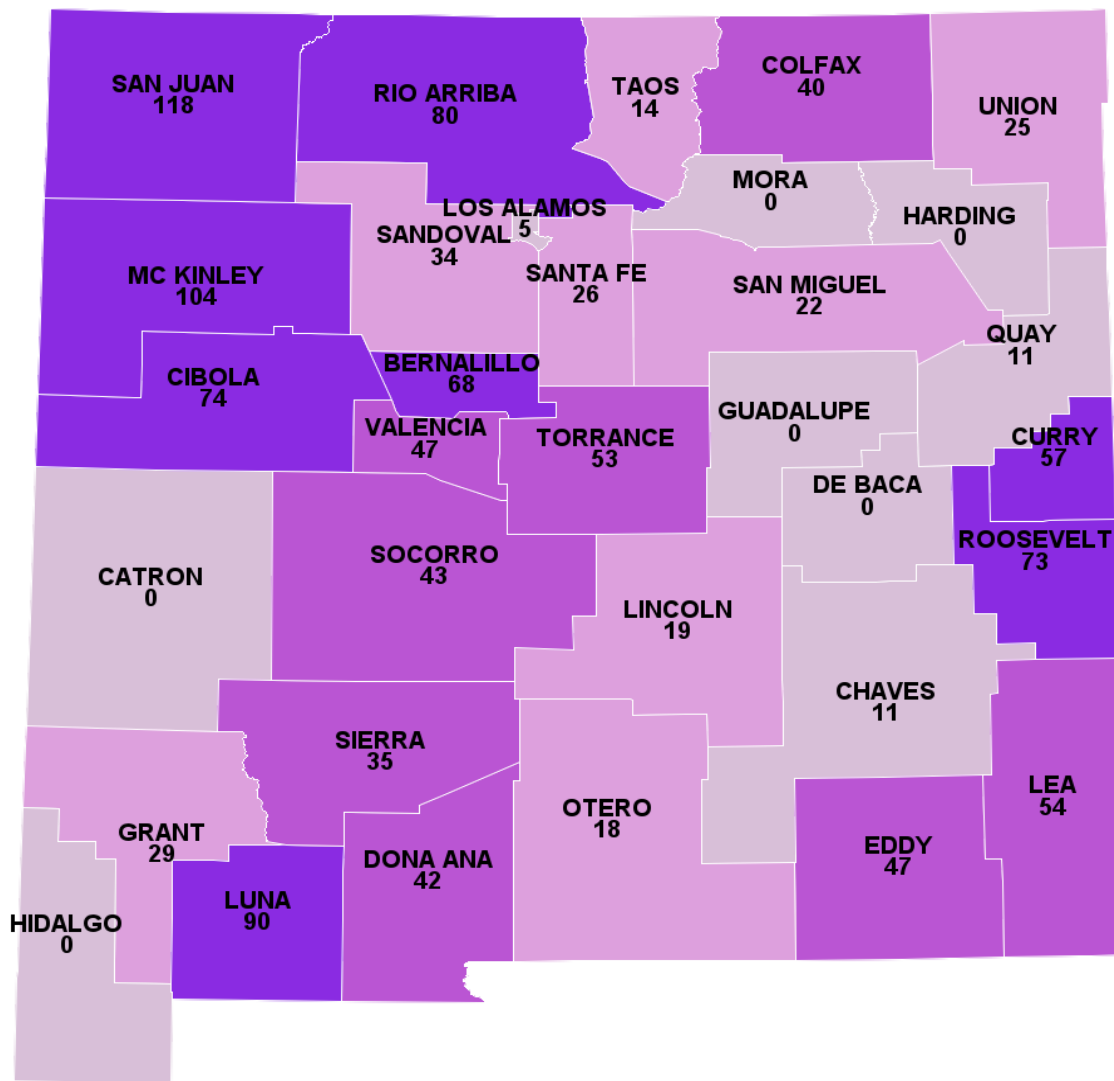
## Primary, Secondary, Early Latent *Cases* by Region, 2022 – 2023, New Mexico



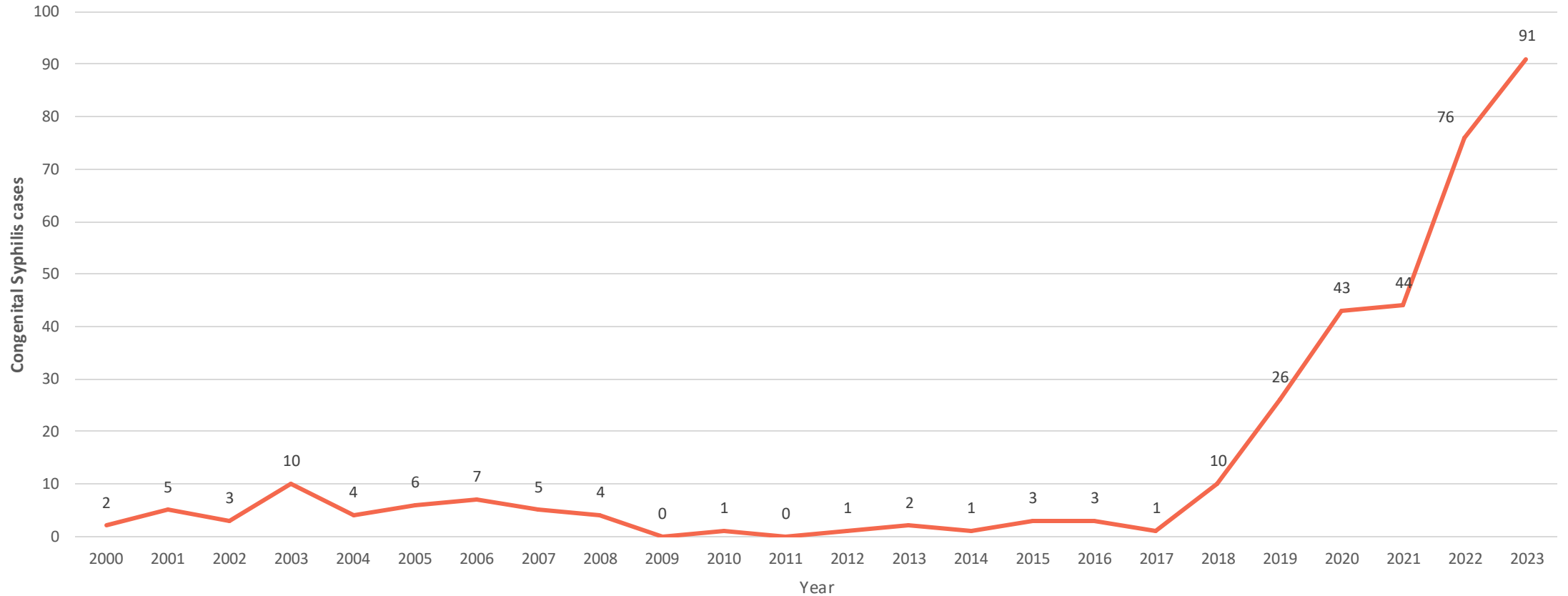
# Primary, Secondary, Early Latent *Rates* by Region, 2022 – 2023, New Mexico



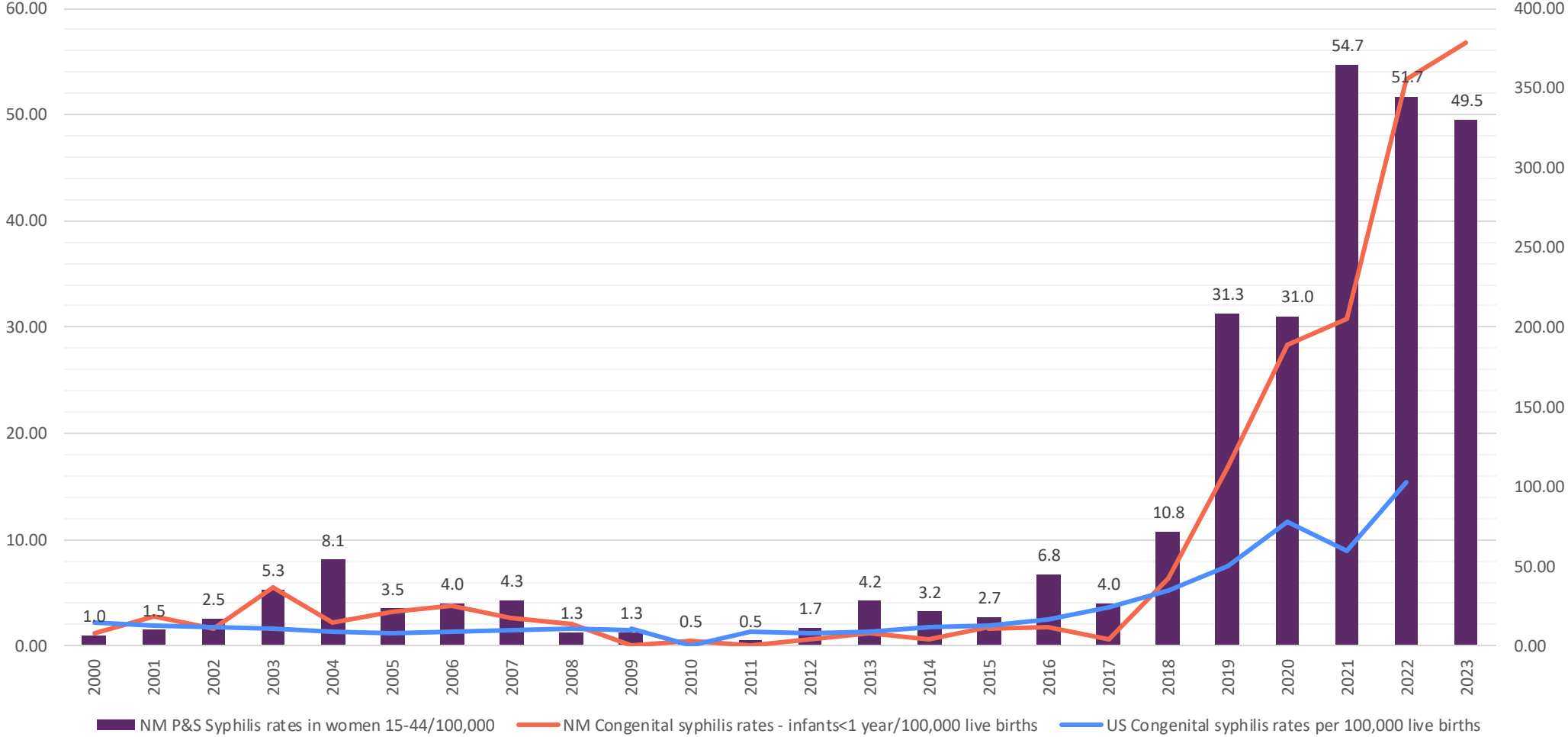
# P/S/EL Rates per 100,000 population 2023



# Congenital Syphilis case counts in infants <1 year, New Mexico, 2000 - 2023

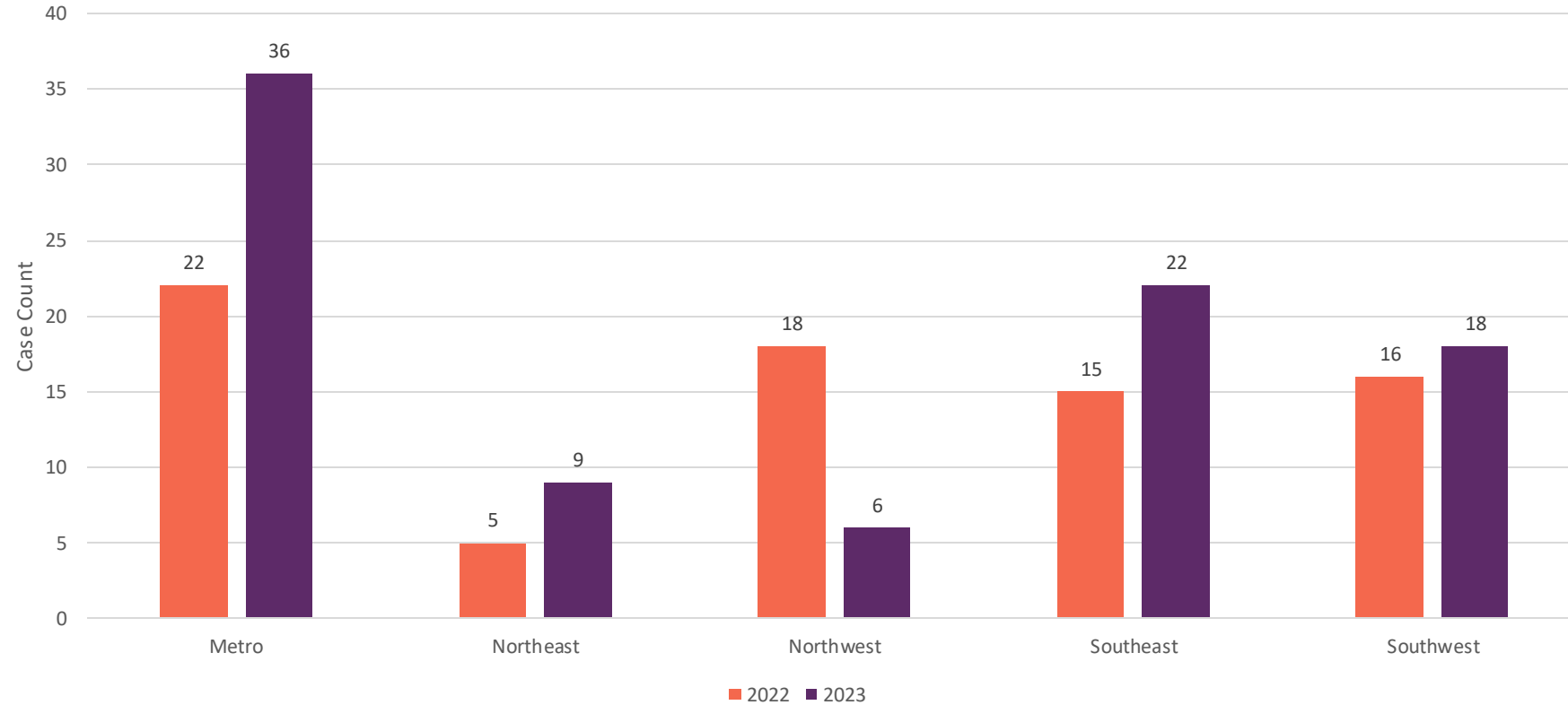


# Congenital Syphilis rates and P/S Syphilis rates in women aged 15-44

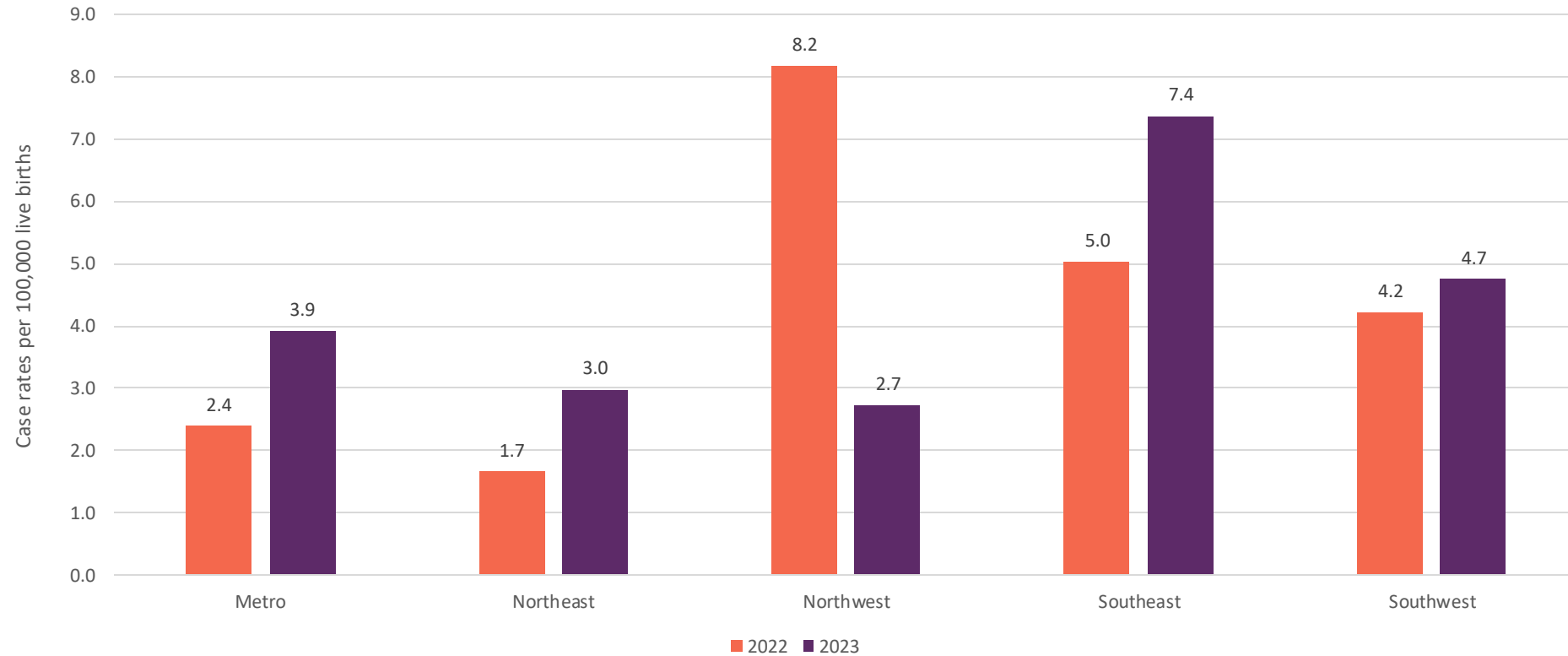




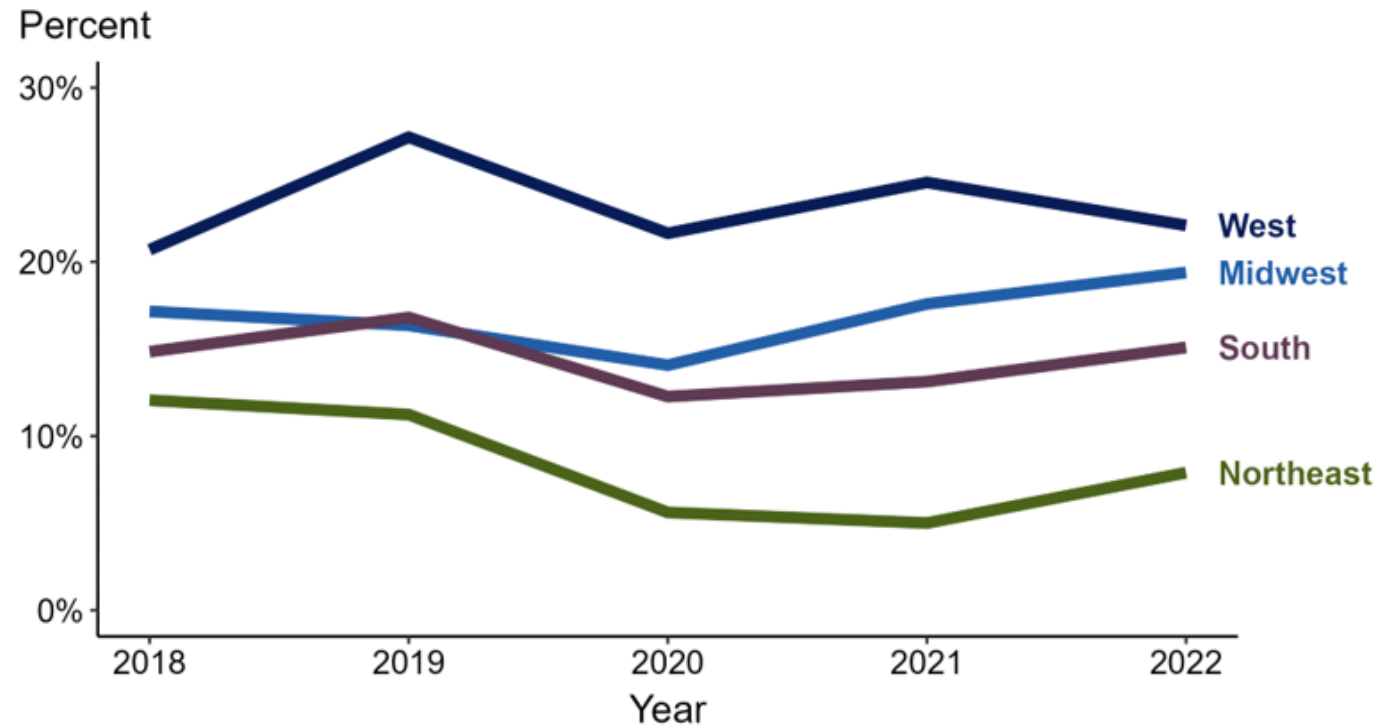
## Congenital Syphilis *Cases* by Region, 2022 – 2023, New Mexico



# Congenital Syphilis *Rates* by Region, 2022 – 2023, New Mexico

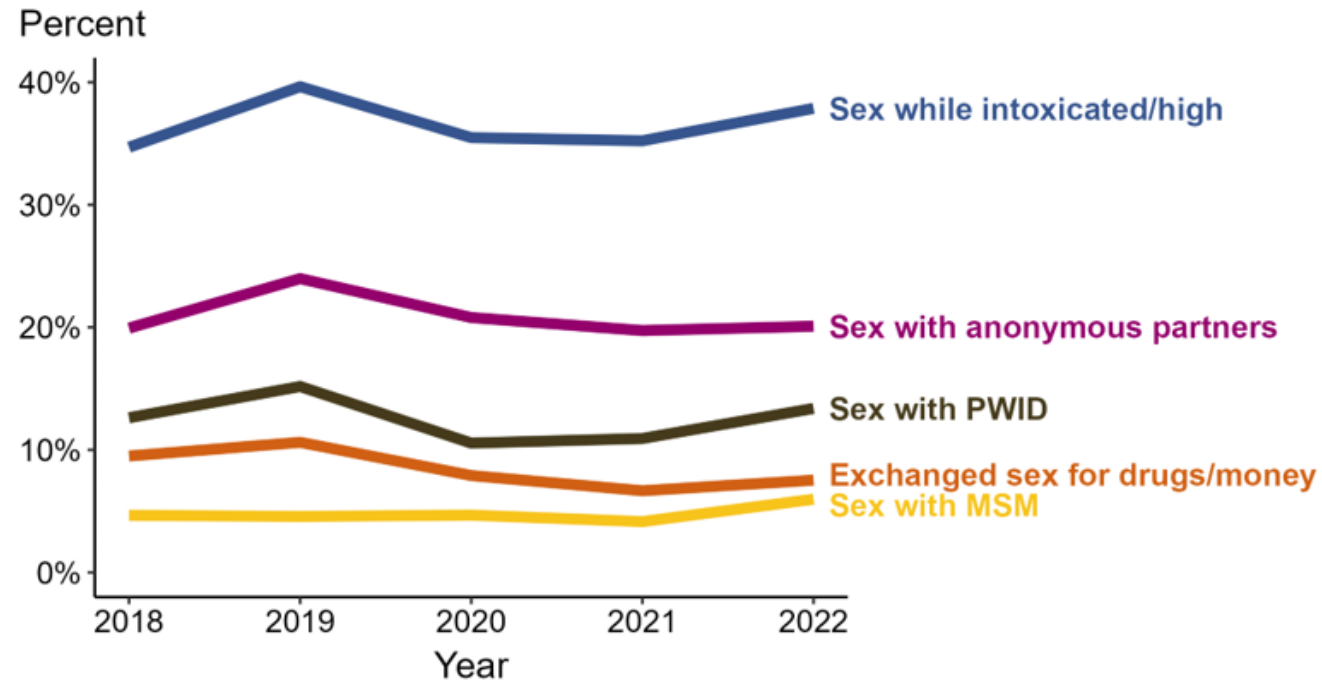


## Primary and Secondary Syphilis — Percentage of Cases Reporting Incarceration\* Among Women by Region, United States, 2018–2022



\* Proportion reporting being incarcerated within the last 12 months calculated among cases with known data (cases with missing or unknown responses were excluded from the denominator).

## Primary and Secondary Syphilis — Percentage of Cases Reporting Selected Sexual Behaviors\* Among Women, United States, 2018–2022



\* Proportion reporting sex with PWID, sex with anonymous partners, sex while intoxicated/high on drugs, or exchanging drugs or money for sex within the last 12 months calculated among cases with known data (cases with missing or unknown responses were excluded from the denominator).

ACRONYMS: PWID = Person who injects drugs; MSM = Men who have sex with men



# Objectives

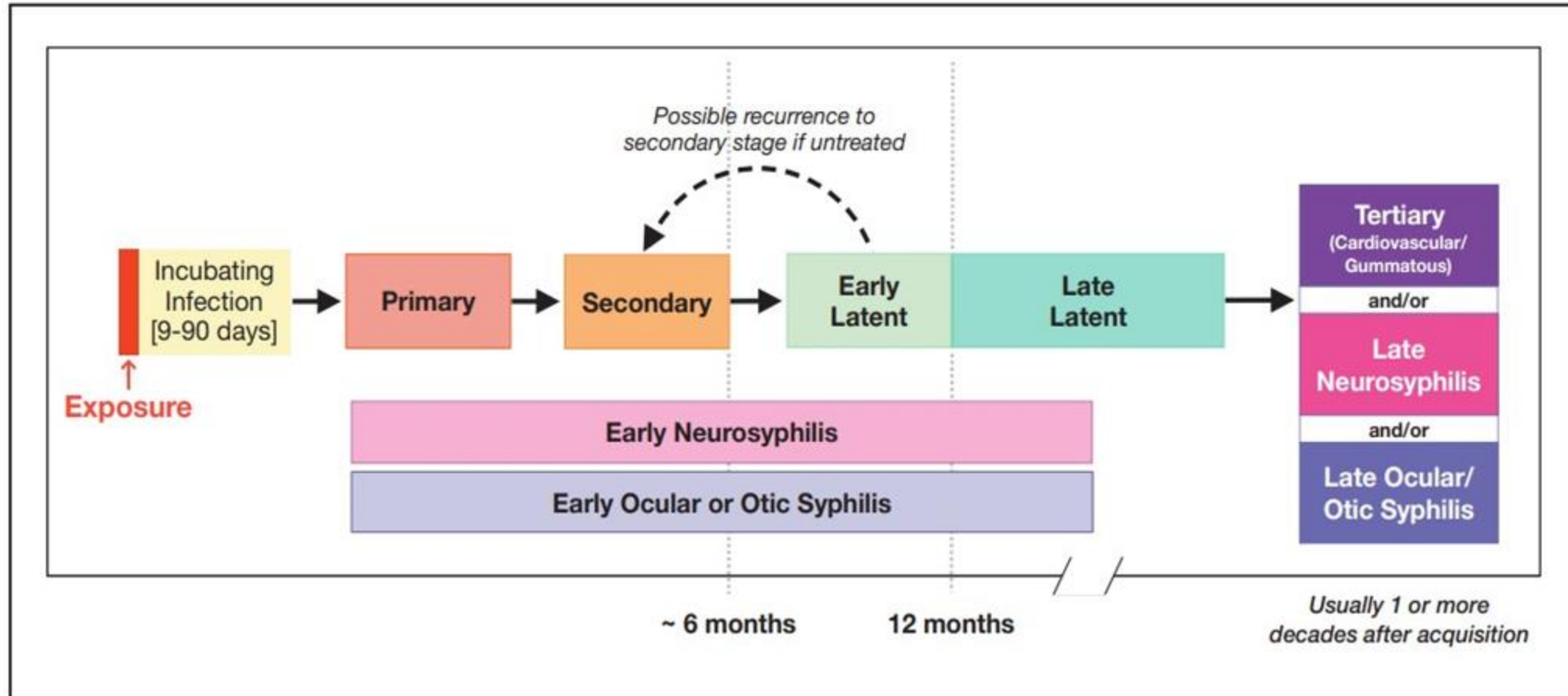
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# Syphilis Microbiology

- **Bacteria:** *Treponema pallidum*
- Only infects humans
- Doesn't survive in the environment
- Can't be seen on usual microscopy
- Can't be cultured in standard lab
- Sexual transmission
- The great "pretender"



# Stages of Syphilis



<https://emorymedicine.wordpress.com/2021/01/15/krakow-conference-what-are-the-different-stages-of-syphilis/>

# Primary Syphilis Manifestations



Up to 40% have multiple and/or painful lesions

[Syphilis-Diagnosis-and-Treatment-State-of-The-Art.pdf](#)



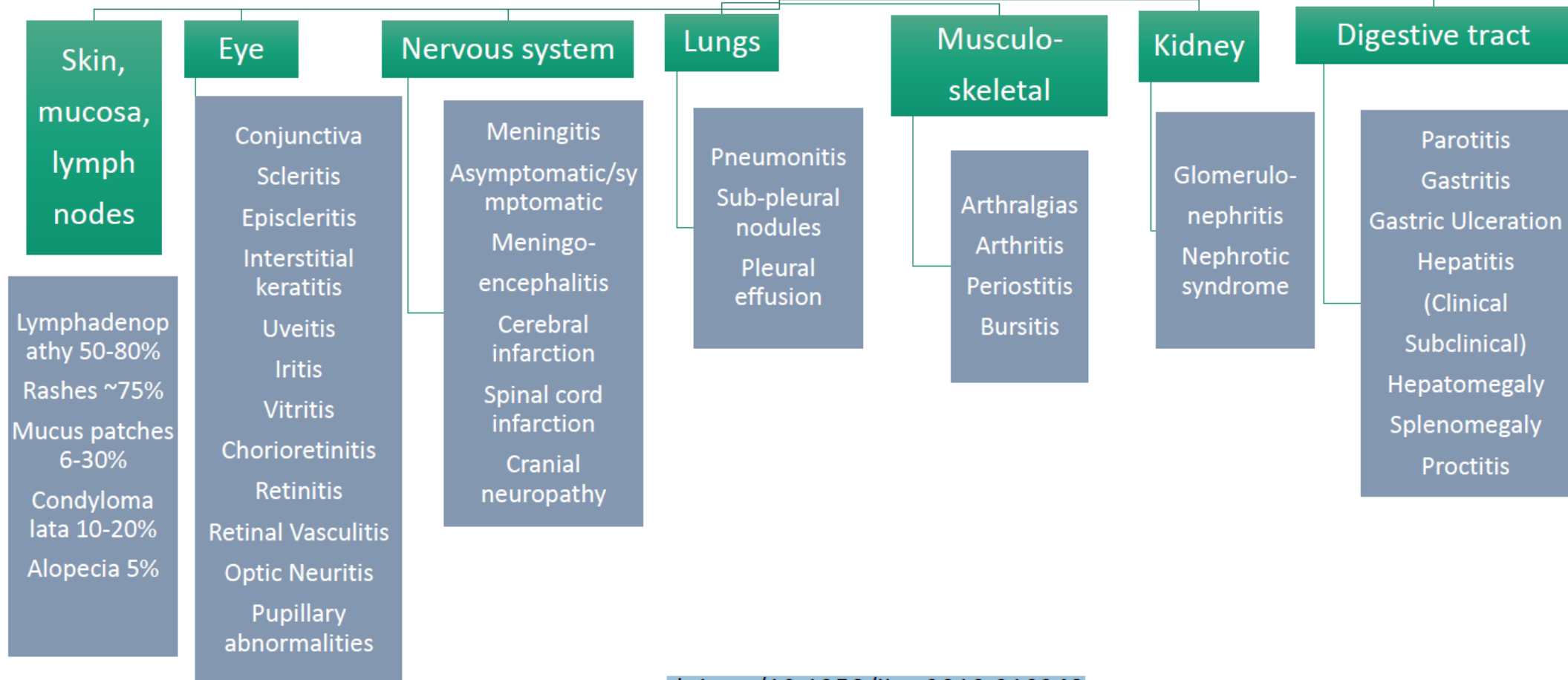
# Secondary Syphilis Dermatologic Manifestations



[www.cdc.gov](http://www.cdc.gov)

[Quick Search - Public Health Image Library\(PHIL\)](#)

## Secondary Syphilis



[doi.org/10.1258/ijsa.2010.010243](https://doi.org/10.1258/ijsa.2010.010243)

Secondary syphilis: the classical triad of skin rash, mucosal ulceration and lymphadenopathy - C Moolooly, S P Higgins, 2010

# Syphilis Testing



## Non-Treponemal Tests



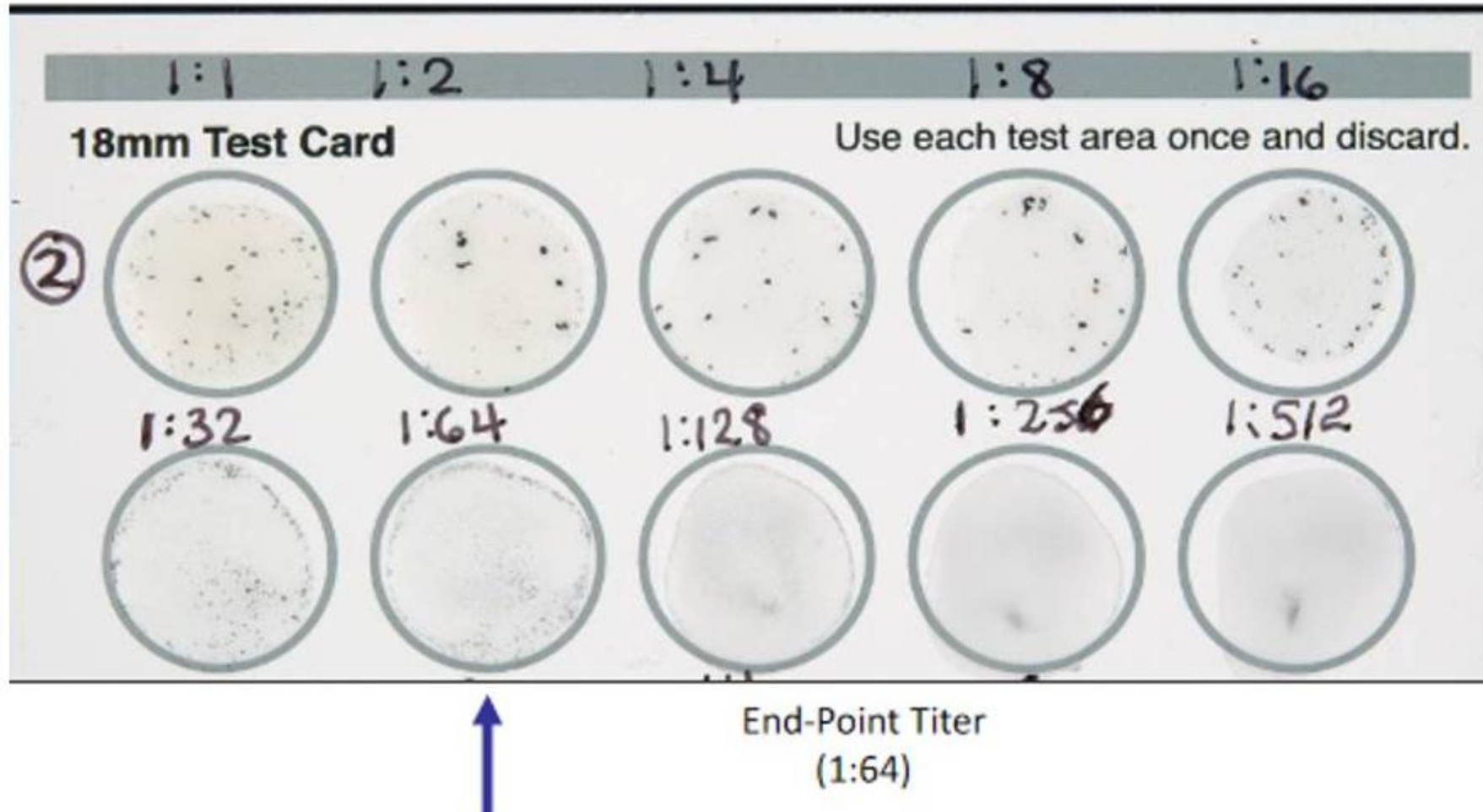
Test Names	Type of Test	Results	Uses	Change over Time
<ul style="list-style-type: none"> <li>RPR</li> <li>VDRL</li> </ul>	Tests for antibodies to cells damaged by syphilis	Quantitative (i.e. 1: 64)	<ul style="list-style-type: none"> <li>Monitoring treatment</li> <li>Detecting re-infection</li> <li>Screening &amp; diagnosis</li> </ul>	<ul style="list-style-type: none"> <li>Titers drop with (or without) treatment</li> <li>Can be negative in early or late disease</li> </ul>
<ul style="list-style-type: none"> <li>TPPA</li> <li>FTA – ABS</li> <li>EIA/CIA</li> </ul>	Tests for antibodies specific to syphilis	Qualitative (+ or -)	<ul style="list-style-type: none"> <li>Screening</li> <li>Confirmation of diagnosis</li> </ul>	Usually remains positive for life (with or without treatment)
<ul style="list-style-type: none"> <li>PCR</li> </ul>	Treponema pallidum DNA (swab of lesion)	Qualitative	<ul style="list-style-type: none"> <li>Diagnosis</li> </ul>	Negative after treatment

## Treponemal Tests

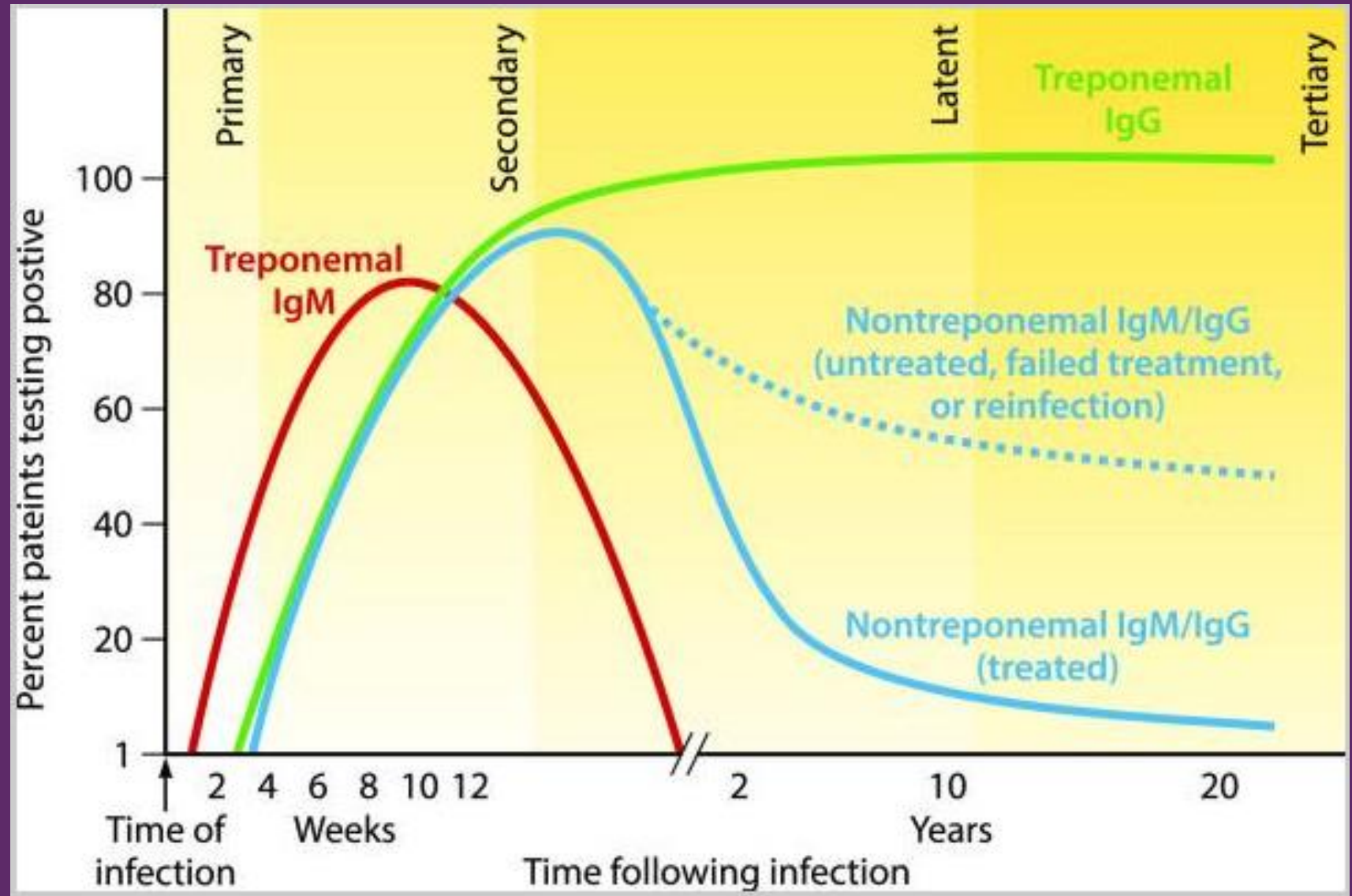


## PCR Tests



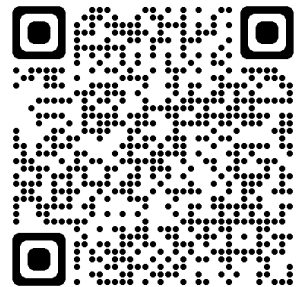
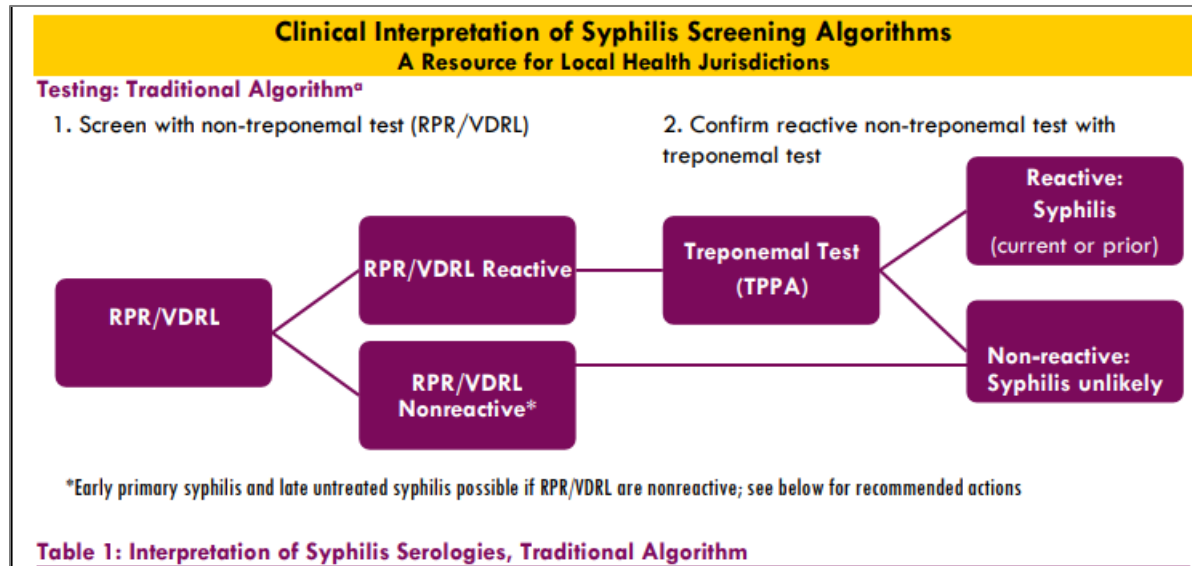


# Timing of serologic responses in syphilis infection

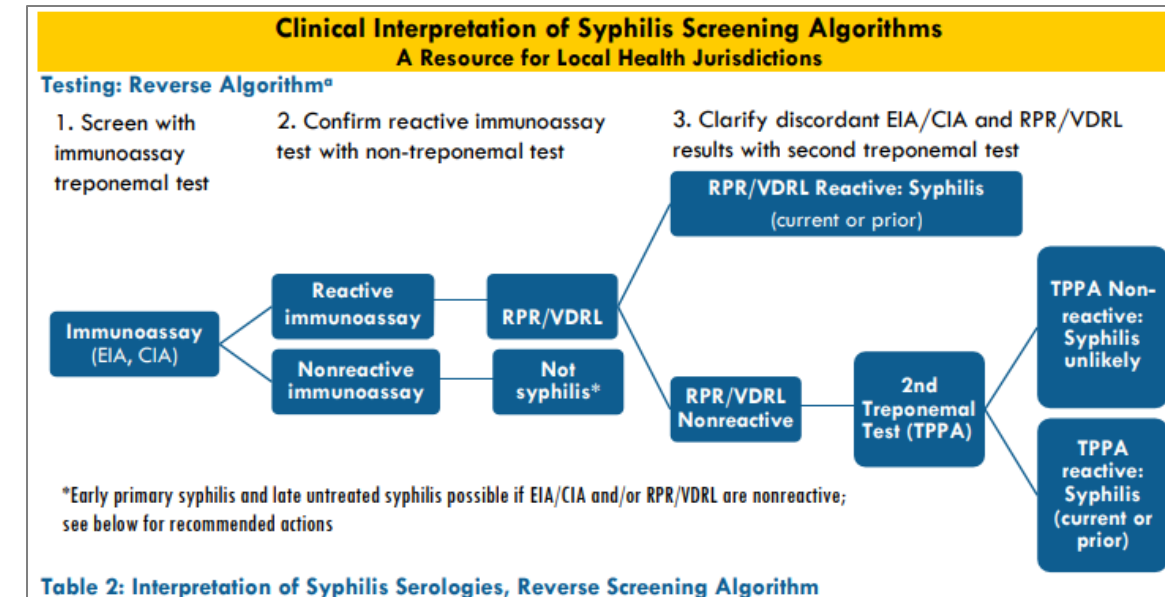


[The Laboratory Diagnosis of Syphilis - PMC \(nih.gov\)](#)

# Syphilis Testing Algorithms



[Clinical Interpretation of Syphilis Screening Algorithms \(nmhealth.org\)](https://nmhealth.org)





# Syphilis Testing: Biologic False Positives

## Non-Treponemal Tests (*RPR/VDRL*)

- Autoimmune disease
- Pregnancy
- Injection drug use
- Advanced age
- Other infections (HIV, HBV)
- Recent vaccination
- Chronic liver disease
- False positive occurs in about 1% of US patients; titer usually 1:8 or less

## Treponemal Tests (*TP-AB, TPPA, EIA, CIA*)

- Autoimmune disease
- Other spirochetes
- Pregnancy
- Inflammatory disease
- Advanced age (>50 years),
- Tumor
- Dialysis
- Systemic infections unrelated to syphilis (TB, rickettsial diseases, endocarditis, malaria)

# Test Characteristics

Test	Sensitivity during stage of infection, % (range)				Specificity, % (range)
	Primary	Secondary	Latent	Late	
<b>Nontreponemal tests</b>					
VDRL [14]	78 (74–87)	100	96 (88–100)	71 (37–94)	98 (96–99)
TRUST [14]	85 (77–86)	100	98 (95–100)	NA	99 (98–99)
RPR [14]	86 (77–99)	100	98 (95–100)	73	98 (93–99)
<b>Early treponemal tests</b>					
MHA-TP [15]	76 (69–90)	100	97 (97–100)	94	99 (98–100)
TPPA [16]	88 (86–100)	100	100	NA	96 (95–100)
TPHA [17]	86	100	100	99	96
FTA-ABS [14]	84 (70–100)	100	100	96	97 (94–100)
<b>Enzyme immunoassays</b>					
IgG-ELISA [18]	100	100	100	NA	100
IgM-EIA [19]	93	85	64	NA	NA
ICE [20]	77	100	100	100	99
<b>Immunochemiluminescence assays</b>					
CLIA [21]	98	100	100	100	99

**NOTE.** CLIA, chemiluminescence assay; ELISA, enzyme-linked immunosorbent assay; EIA, enzyme immunoassay; FTA-ABS, fluorescent treponemal antibody absorption assay; ICE, immune-capture EIA; MHA-TP, microhemagglutination assay for *Treponema pallidum*; NA, not available; TPHA, *T. pallidum* hemagglutination assay; TPPA, *T. pallidum* particle agglutination; TRUST, toluidine red unheated serum test.



# Syphilis Staging and Treatment Algorithm

Symptoms at the time of blood draw?

YES

- Presence of painless lesion (chancre)
- RPR may be positive or negative
- Confirmatory test is reactive or non-reactive

YES

PRIMARY SYPHILIS

- Presence of palmar/plantar rash, body rash, alopecia, or condylomata lata
- Serology results
- RPR is usually positive
- Confirmatory test is reactive

YES

SECONDARY SYPHILIS

NO

- Was there a VERIFIED negative syphilis blood test in the last 12 months? -or-
- Did patient have signs or symptoms in the past 12 months? -or-
- Are there infected partners independently staged as primary/secondary/early? -or-
- If previously treated for syphilis, was there a 2 dilution (4-fold) increase in RPR titer?
- RPR can be positive or negative
- Confirmatory test is reactive

YES

EARLY LATENT

NO

LATE or UNK

## SYPHILIS TREATMENT

Primary, Secondary, or Early Latent  
Benzathine penicillin G\*  
-2.4 million units IM in a single dose

\*See CDC Guidelines for treatment if patient is allergic to PCN or has symptoms of neurosyphilis

## SYPHILIS TREATMENT

Late Latent or Unknown Duration  
Benzathine penicillin G\*  
-7.2 million units total, administered as 3 doses of 2.4 million units IM each at 1-week intervals

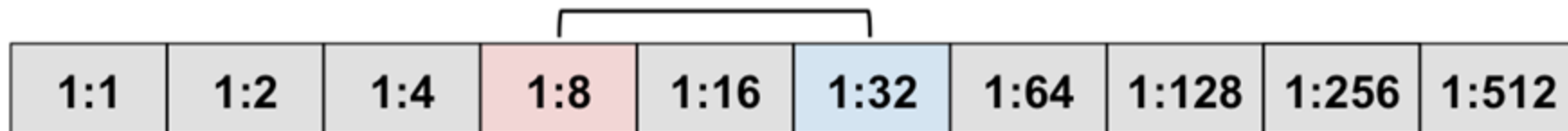
**SPECIAL NOTE ABOUT PREGNANCY:** Penicillin is the only acceptable treatment for pregnant women. Penicillin administered at intervals greater than 7 days are unacceptable. If a single day of penicillin therapy is missed, patient must restart treatment if stage is late latent or unknown.

# Treatment

- Treatment for neuro/ocular/oto-syphilis is aqueous pen G (IV)
- Alternate therapy: Procaine penicillin-G and probenecid
- Bicillin L-A<sup>®</sup> Shortage
- Check a day of treatment titer
- Jarisch–Herxheimer (JH) reaction

# Patient Follow-up

- Check RPR **6 and 12 months** after treatment for early syphilis
- Check another RPR at **24 months** for latent syphilis
- Persons with HIV infection:
  - RPR at **3, 6, 9, 12, and 24 months** after treatment for early syphilis
  - RPR at **6, 12, 18 and 24 months** after treatment for latent
- Adequate treatment = **4-fold** (2 dilutions) decrease by **12 months for early Syphilis and 24 months for late Syphilis**



# Objectives

- Review epidemiology of Syphilis in US and NM
- Overview of Syphilis
- **Understand new screening recommendations**
- Explain Doxycycline Post Exposure Prophylaxis
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# Screening for Syphilis

- Recommendations have targeted individual risk factors.
- Living in areas with "high rates" of syphilis considered a risk factor but threshold not defined.
- Focus of screening has been preventing congenital syphilis

Syphilis	
Women	<ul style="list-style-type: none"> <li>• Screen asymptomatic women at increased risk (history of incarceration or transactional sex work, <u>geography</u>, <u>race/ethnicity</u>) for syphilis infection<sup>2,7</sup></li> </ul>
Pregnant Women	<ul style="list-style-type: none"> <li>• All pregnant women at the first prenatal visit<sup>8</sup></li> <li>• Retest at 28 weeks gestation and at delivery if at high risk (<u>lives in a community with high</u> syphilis morbidity or is at risk for syphilis acquisition during pregnancy [drug misuse, STIs during pregnancy, multiple partners, a new partner, partner with STIs])<sup>2</sup></li> </ul>
Men Who Have Sex With Women	<ul style="list-style-type: none"> <li>• Screen asymptomatic adults at increased risk (history of incarceration or transactional sex work, <u>geography</u>, <u>race/ethnicity</u>, and being a male younger than 29 years) for syphilis infection<sup>2,7</sup></li> </ul>
Men Who Have Sex With Men	<ul style="list-style-type: none"> <li>• At least annually for sexually active MSM<sup>2</sup></li> <li>• Every 3 to 6 months if at increased risk<sup>2</sup></li> <li>• Screen asymptomatic adults at increased risk (history of incarceration or transactional sex work, <u>geography</u>, <u>race/ethnicity</u>, and being a male younger than 29 years) for syphilis infection<sup>2,7</sup></li> </ul>
Transgender and Gender Diverse People	<ul style="list-style-type: none"> <li>• Consider screening at least annually based on reported sexual behaviors and exposure<sup>2</sup></li> </ul>
Persons with HIV	<ul style="list-style-type: none"> <li>• For sexually active individuals, screen at first HIV evaluation, and at least annually thereafter<sup>2,6</sup></li> <li>• More frequent screening might be appropriate depending on individual risk behaviors and the local epidemiology<sup>2</sup></li> </ul>

# New Screening Recommendation from CDC

A screenshot of the CDC website showing the title page of a Morbidity and Mortality Weekly Report (MMWR) article. The page includes the CDC logo and name, a search bar, the MMWR title, the article title, release date, a print link, and a list of authors with affiliations.

 Centers for Disease Control and Prevention  
CDC 24/7: Saving Lives, Protecting People™

Search 

Morbidity and Mortality Weekly Report (*MMWR*)

## *Vital Signs*: Missed Opportunities for Preventing Congenital Syphilis — United States, 2022

*Early Release* / November 7, 2023 / 72

[Print](#)

Robert McDonald, MD<sup>1</sup>; Kevin O'Callaghan, MBBCh<sup>1</sup>; Elizabeth Torrone, PhD<sup>1</sup>; Lindley Barbee, MD<sup>1</sup>; Jeremy Grey, PhD<sup>1</sup>; David Jackson, MD<sup>1</sup>; Kate Woodworth, MD<sup>2</sup>; Emily Olsen, PhD<sup>2</sup>; Jennifer Ludovic, DrPH<sup>1</sup>; Nikki Mayes<sup>1</sup>; Sherry Chen, MPH<sup>1</sup>; Rachel Wingard<sup>3</sup>; Michelle Johnson Jones, MPH<sup>1</sup>; Fanta Drame, MPH<sup>1</sup>; Laura Bachmann, MD<sup>1</sup>; Raul Romaguera, DMD<sup>1</sup>; Leandro Mena, MD<sup>1</sup> ([VIEW AUTHOR AFFILIATIONS](#))

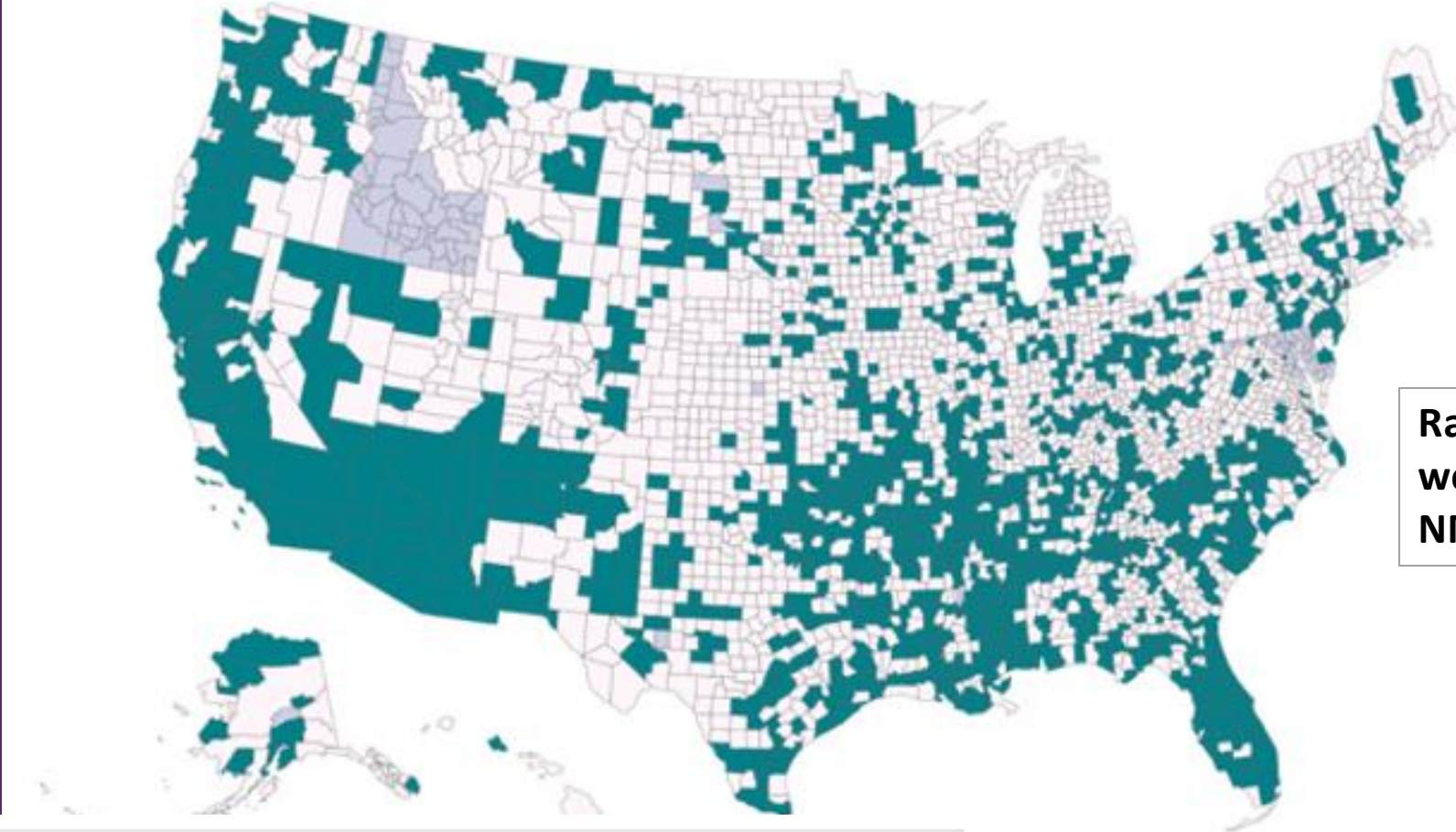
"High rate" defined as: a rate of P/S syphilis among females aged 15–44 years that is over 4.6 per 100,000 population

[Vital Signs: Missed Opportunities for Preventing Congenital Syphilis — United States, 2022 | MMWR \(cdc.gov\)](#)



# P/S Syphilis Rates for Women ages 15 - 44

County-level syphilis rates among women can help direct syphilis screening efforts.

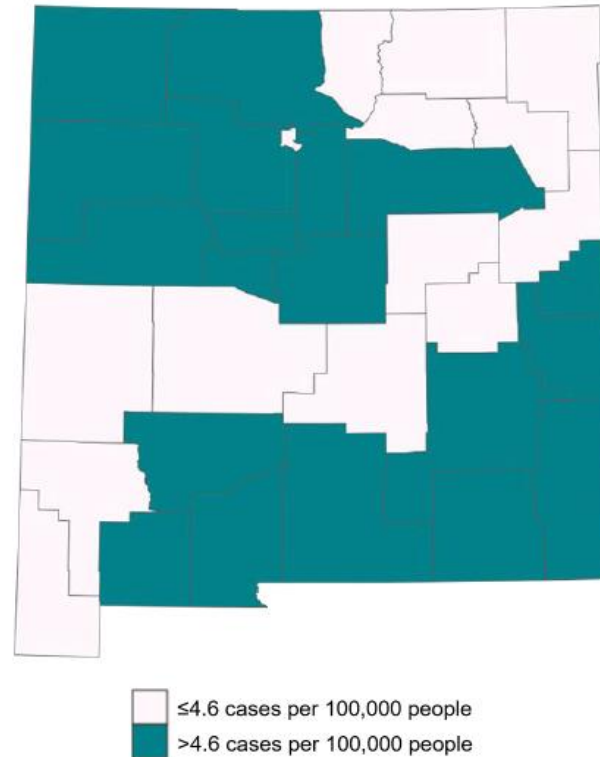


Rate of P/S syphilis in women ages 15 – 44, NM: 50/100K

- Continue to assess individual risk factors to determine screening needs\*
- Offer syphilis testing to all sexually active people aged 15-44\*\*
- Suppressed†

# P/S Syphilis Rates for Women ages 15 - 44

Figure 2. Counties in New Mexico with Rates of P&S Syphilis Among Females 15-44 Years of Age Over 4.6 Cases per 100,000 People, 2022



Data sourced from CDC's National Notifiable Diseases Surveillance System

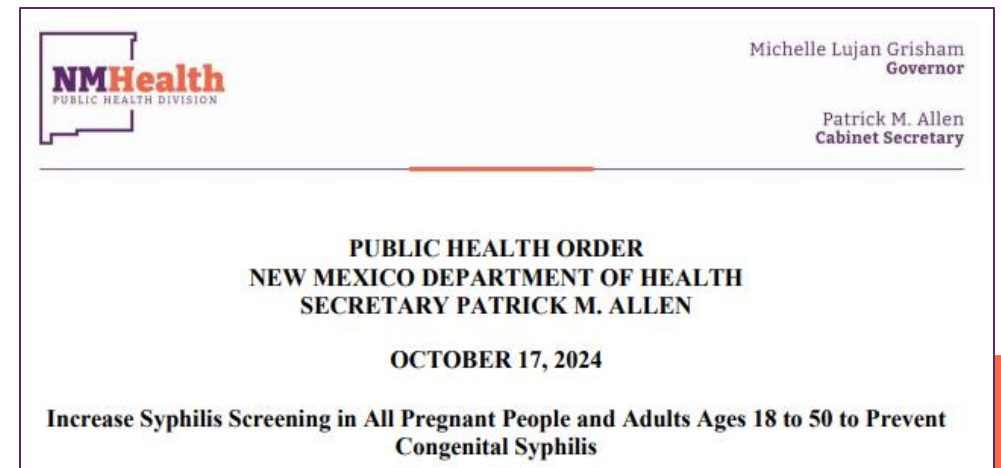
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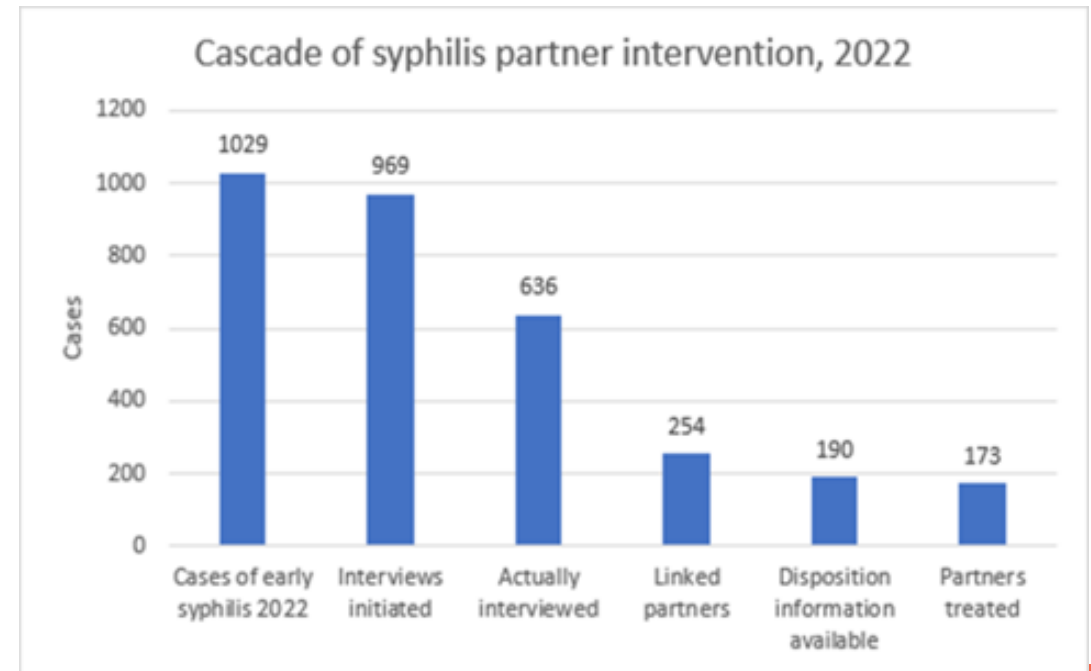
# Congenital Syphilis Public Health Order 2023/2024

1. Adults aged 18 to 50 should be tested for syphilis at least once in the next 12 months, or more often as recommended based on individual risk or pregnancy status
2. Test pregnant people:
  - first trimester (or initial prenatal visit)
  - 3<sup>rd</sup> trimester (28-32 weeks gestation)
  - at delivery
  - urgent care or ER if no prior prenatal care
  - intrauterine fetal demise at any gestational age
  - correctional facilities



# The Case for Expanded Screening in NM:

- Focusing testing only on pregnant people isn't solving the problem.
- Testing at delivery is important but isn't "prevention"
- Increase community prevalence tracks with increase in congenital syphilis
- Limitations of contact tracing
- Risk factors are real (but not exclusive):
  - Sex with multiple partners
  - Drug use
  - Transactional sex
  - Incarceration
  - Unstable housing or homelessness
  - Lack of access to or engagement with prenatal care



# Expanded Syphilis Screening

## Advantages:

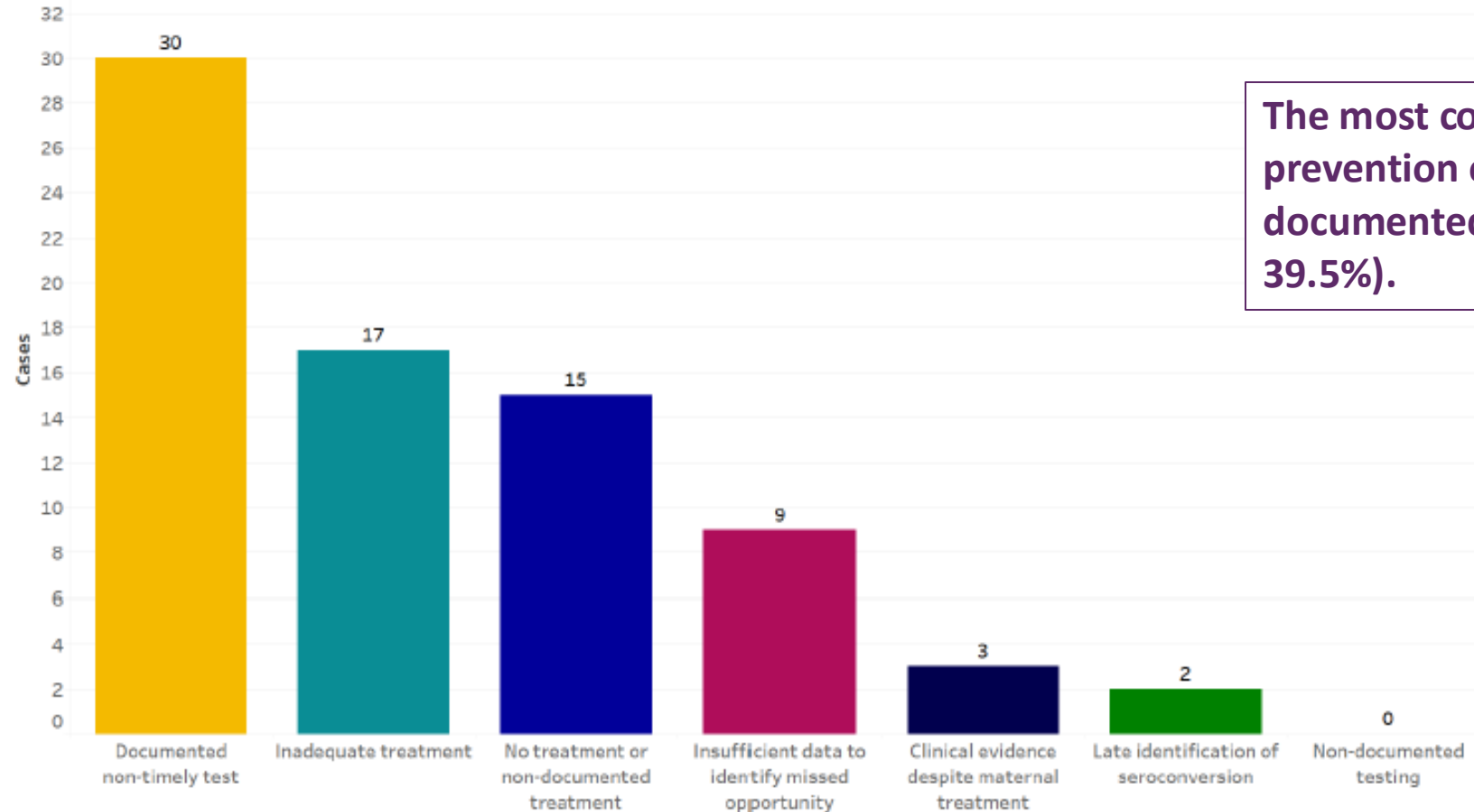
- Independent of providers taking a thorough sexual history or risk screen
- Reduces stigma and bias in syphilis screening
- Can be more readily normalized into clinical care (i.e., incorporated into order sets and clinical reminders)

## Challenges:

- More false positives (use a reflex test)
- Possibility of over treatment
- More work and cost across all systems

# Missed Opportunities - NM

Figure 8. Missed CS Prevention Opportunities, New Mexico, 2022



The most common missed prevention opportunity was a documented non timely test (n=30, 39.5%).

Data sourced from CDC's National Notifiable Diseases Surveillance System

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- **Explain Doxycycline Post Exposure Prophylaxis**
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# What is Doxy-PEP

- 200mg Doxycycline taken within 72 hours *after* unprotected sex
- The first biomedical prevention tool for *bacterial* STIs that is effective and well-tolerated
- Reduces new cases of bacterial STIs (chlamydia, gonorrhea and syphilis) by ~60%.



# The EVIDENCE:

1. IPERGAY study (France; 2017)
  - 232 MSM/TGW on HIV PrEP
  - Reduced risk of CT/Syphilis by 70%
  - No difference in GC infections
  
2. DOXY-PEP Study (Seattle and San Francisco; April 2023)
  - 501 MSM/TGW on HIV PrEP or PLWH
  - Reduced CT/GC/Syphilis by ~60%
  
3. ARNS DoxyVAC study (France; presented CROI Feb 2023)
  - 546 MSM on HIV PrEP
  - Significant reductions in CT/GC/Syphilis

THE NEW ENGLAND JOURNAL OF MEDICINE

RESEARCH SUMMARY

## Postexposure Doxycycline to Prevent Bacterial Sexually Transmitted Infections

Lustkenmeyer AF et al. DOI: 10.1056/NEJMoa2211934

**CLINICAL PROBLEM**  
Rates of bacterial sexually transmitted infections (STIs) are increasing. Cisgender men who have sex with men (MSM) and transgender women are disproportionately affected.

**CLINICAL TRIAL**  
**Design:** A randomized, open-label study assessed the efficacy and safety of doxycycline postexposure prophylaxis among MSM and transgender women who were either taking HIV preexposure prophylaxis (PrEP) or living with HIV and who had had a bacterial STI in the past year.  
**Intervention:** 501 participants were randomly assigned in a 2:1 ratio either to take doxycycline (200 mg) within 72 hours after condomless sex or to receive standard care. The primary efficacy end point was the incidence of  $\geq 1$  bacterial STI diagnosis per follow-up quarter.


**RESULTS**  
**Efficacy:** Among both PrEP recipients and persons living with HIV infection, the doxycycline group had a significantly lower percentage of quarterly visits in which participants tested positive for a bacterial STI than the standard-care group.

**Antibiotic Resistance and Safety:** Of the participants with *Neisseria gonorrhoeae* culture available, tetracycline-resistant gonorrhea was more frequent in the doxycycline group than in the standard-care group. A modestly higher percentage of participants had doxycycline-resistant *Staphylococcus aureus* in the doxycycline group than in the standard-care group. No serious adverse events related to treatment occurred among participants taking doxycycline.

**LIMITATIONS AND REMAINING QUESTIONS**

- Participants recorded sexual activity and doxycycline use in quarterly surveys; however, such data are limited by recall.
- Less than 5% of study participants were transgender women, which limits generalizability in this population.
- Further study is warranted to understand whether doxycycline postexposure prophylaxis would be effective in other populations or in settings with a higher prevalence of tetracycline resistance.

Links: Full Article | NEJM Quick Take



**Quarterly Visits with  $\geq 1$  STI**

Difference in risk, 21.2 percentage points      Difference in risk, 18.7 percentage points

Group	Doxycycline (%)	Standard Care (%)
Taking PrEP	10.7	31.9
Living with HIV	11.8	30.5

**Tetracycline-Resistant *N. gonorrhoeae***      **Doxycycline-Resistant *S. aureus***

Group	Doxycycline (N)	Standard Care (N)
Tetracycline-Resistant <i>N. gonorrhoeae</i>	5 (N=21)	16 (N=16)
Doxycycline-Resistant <i>S. aureus</i>	5 (N=31)	24 (N=24)

**CONCLUSIONS**  
Among MSM and transgender women who had recently had a bacterial STI, doxycycline postexposure prophylaxis was associated with a lower risk of bacterial STIs than standard care.

Copyright © 2023 Massachusetts Medical Society

# STUDY POPULATION:

**Study participants (Luetkemeyer et al) met the following eligibility criteria:**

- At least 18 years of age
- Assigned male sex at birth
- Living with HIV or taking HIV PrEP
- Condomless sex with a man in the previous 12 months, AND
- STD diagnosis in the previous 12 months (67% had GC, 58% CT, 20% syphilis)

**In the 3 months before enrollment:**

- median of 9 sexual partners (interquartile range, 4 to 17)
- median of 5 sexual acts per month (interquartile range, 1.7 to 10.7)
- 90.1% of sex as condomless



# EFFICACY:

Table: Quarterly STI incidence by HIV status and by randomization to doxyPEP & control arms

	HIV uninfected MSM/TGW on PrEP		MSM/TGW living with HIV		Total	
	Doxy arm N=240	Control arm N=120	Doxy arm N=134	Control arm N=60	Doxy Arm N=374	Control arm N=180
Follow up quarters	491	220	266	108	757	328
Participants with an incident STI (GC, CT or syphilis)	41	42	24	18	65	60
Primary STI endpoints	47 (9.6%)	65 (29.5%)	31 (11.7%)	30 (27.8%)	78 (10.3%)	95 (29.0%)
Gonorrhea	40 (8.1%)	45 (20.5%)	21 (7.9%)	20 (18.5%)	61 (8.1%)	65 (19.8%)
Chlamydia	7 (1.4%)	23 (10.5%)	12 (4.5%)	16 (14.8%)	19 (2.5%)	39 (11.9%)
Syphilis	1 (0.2%)	5 (2.3%)	3 (1.1%)	2 (1.9%)	4 (0.5%)	7 (2.1%)

<https://programme.aids2022.org/Abstract/Abstract/?abstractid=13231>

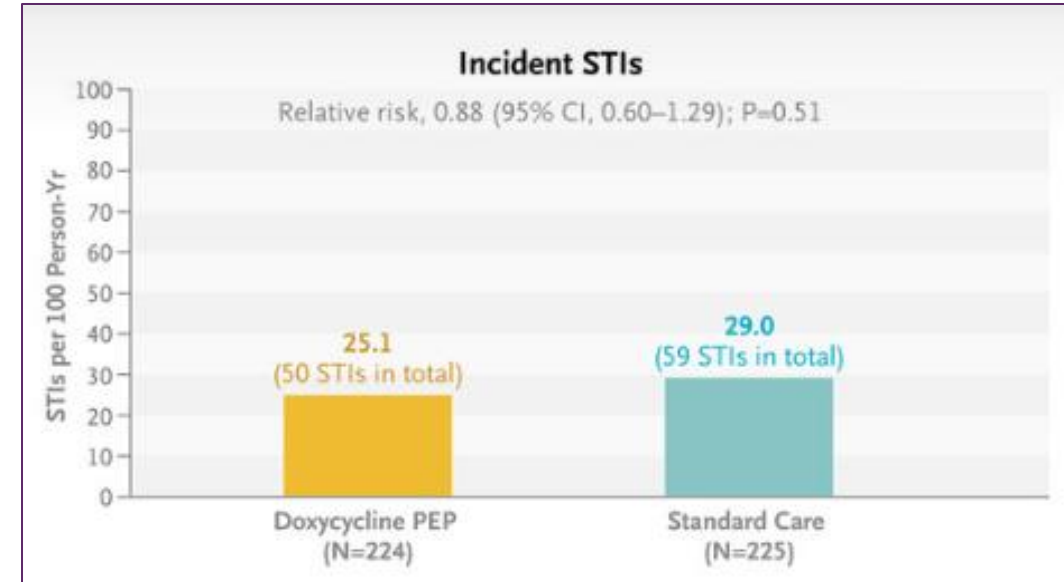
# Doxy-PEP in Cis-women

- Randomized, open label trial
- 449 cis-women on HIV PrEP in Kenya
- **No significant difference** in STIs between the two groups.
- Use of doxycycline PEP, as assessed by analysis of hair samples, was low

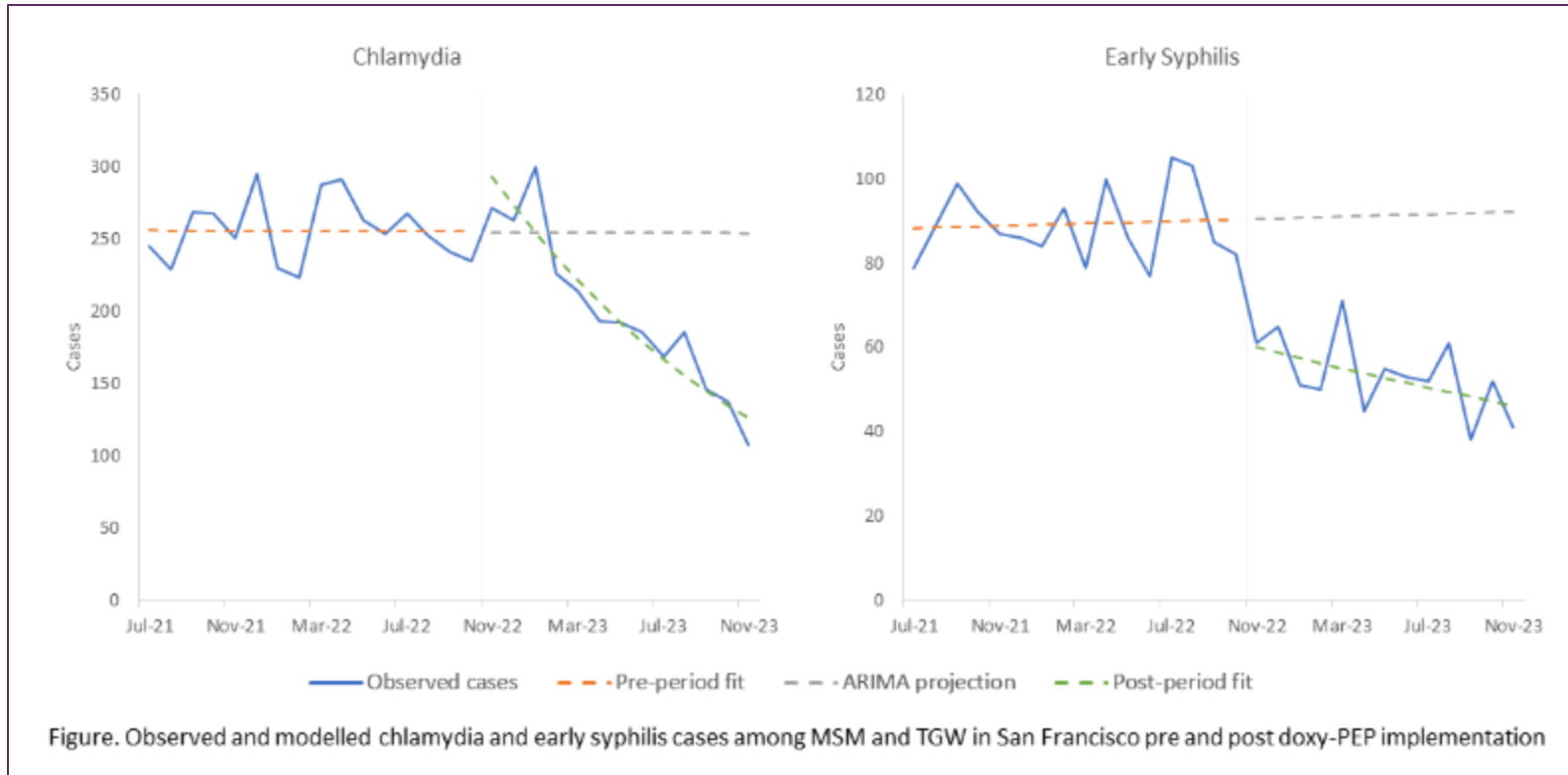
## Limitations and Remaining Questions :

- Participants did not have access to STI testing, and their history of STIs was unknown.
- No rectal or pharyngeal testing
- All *N. gonorrhoeae* isolates that were identified in the trial were resistant to tetracycline, and the incidence of syphilis was low.

[Doxycycline Prophylaxis to Prevent Sexually Transmitted Infections in Women | New England Journal of Medicine \(nejm.org\)](https://www.nejm.org/doi/full/10.1056/NEJMoa1911265)

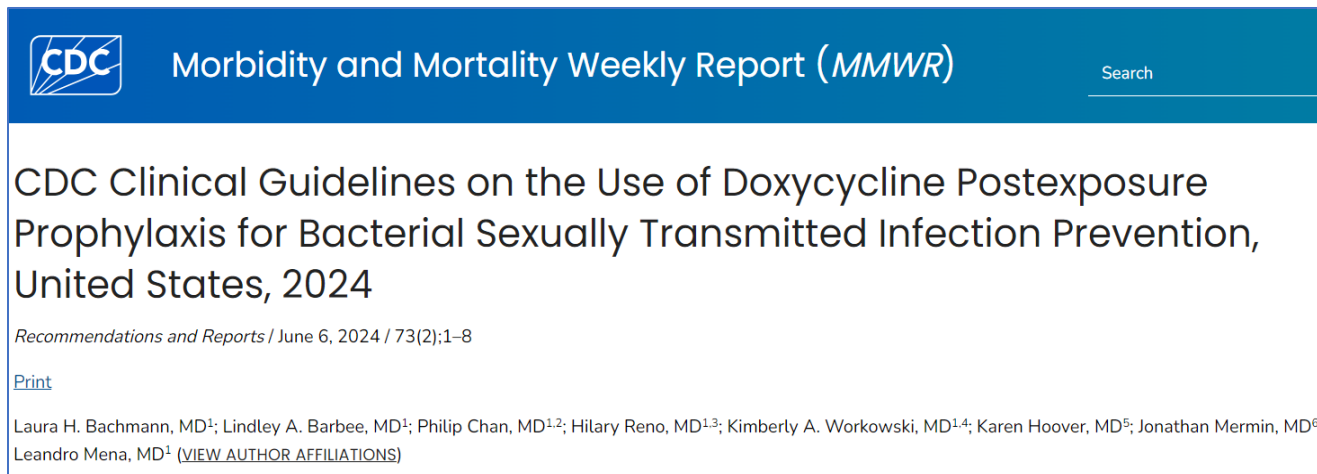


# Follow up from San Francisco



- 13 month follow up
- Chlamydia and early syphilis cases decreased 50%
- No significant change in GC cases
- Chlamydia cases increased by 2.43% per month in cis women

# CDC Guidelines



**CDC** Morbidity and Mortality Weekly Report (MMWR) Search

**CDC Clinical Guidelines on the Use of Doxycycline Postexposure Prophylaxis for Bacterial Sexually Transmitted Infection Prevention, United States, 2024**

*Recommendations and Reports* / June 6, 2024 / 73(2);1-8

[Print](#)

Laura H. Bachmann, MD<sup>1</sup>; Lindley A. Barbee, MD<sup>1</sup>; Philip Chan, MD<sup>1,2</sup>; Hilary Reno, MD<sup>1,3</sup>; Kimberly A. Workowski, MD<sup>1,4</sup>; Karen Hoover, MD<sup>5</sup>; Jonathan Mermin, MD<sup>6</sup>; Leandro Mena, MD<sup>1</sup> ([VIEW AUTHOR AFFILIATIONS](#))

## Key Components:

- Shared clinical decision making
- Part of comprehensive sexual health services

[CDC Clinical Guidelines on the Use of Doxycycline Postexposure Prophylaxis for Bacterial Sexually Transmitted Infection Prevention, United States, 2024 | MMWR](#)



# PRESCRIBING

- ❑ Doxycycline hyclate ***delayed release*** 200 mg (1 tab)
- ❑ Doxycycline hyclate or monohydrate ***immediate release*** 100 mg (2 tabs taken simultaneously)
  - No more than one 200mg dose in 24 hours
  - Prescribe enough for 3 months
  - Immediate release is less expensive and equivalently bioavailable.
  - The delayed release formulation has an enteric coating which delays release until further down the GI tract which prevents nausea.





# Patient Counseling

Instructions on dosing

Key side effects

Pill esophagitis

Photosensitivity

Unknowns

Microbiome

AMR

Cis-women



## What is Doxy-PEP? (Postexposure Doxycycline)

Doxy-PEP is when a person takes the antibiotic pill doxycycline after having sex to prevent getting Sexually Transmitted Infections (STIs). It is like a morning-after pill but for STIs. Taking doxy-PEP lowers your chance of developing diseases like syphilis, gonorrhea, and chlamydia by 66%. Doxy-PEP has been shown to be effective in men who have sex with men and transgender women, but not in cisgender women.



### When should I take doxy-PEP?



Take 200mg of doxycycline (two 100mg pills taken together) within 24 hours but no later than 72 hours after condomless sex. Condomless sex means oral, anal or vaginal/front-hole sex where a condom is not used for the entire time.

If you have sex again within 24 hours of taking doxycycline, take another dose 24 hours after your last dose. You can take doxycycline as often as every day when you are having condomless sex but **do not take more than 200mg every 24 hours.**



### How should I take doxy-PEP?

-  Take doxycycline with plenty of water or something else to drink so that it does not get stuck when you swallow. If your stomach is upset by doxycycline, taking it with food may help.
-  Some people are more sensitive to the sun when they take doxycycline, so wear sunscreen.



-  Avoid dairy products, calcium, antacids, or multivitamins 2 hours before and after taking doxycycline.
-  Please do not share doxycycline with others.

### What are we still learning about doxy-PEP?

Some of the things we are still learning about doxy-PEP are

- How it affects normal or good bacteria in our intestines and on our skin.
- If doxy-PEP increases resistance in bacteria that cause sexually transmitted infections (STIs).
- If doxy-PEP is effective for cisgender women.

While chlamydia and syphilis aren't resistant to doxycycline after decades of use, about 25% of gonorrhea in the United States are resistant to doxycycline. This means the medication might not work against every gonorrhea bacteria.

-  Doxy-PEP does not protect you from Mpox, HIV, or other viral infections. You should not take doxy-PEP if you are pregnant.
-  Please continue to get tested for STIs every 3 months and whenever you have symptoms.

Talk to your local public health office about doxy-PEP

Address: \_\_\_\_\_

Phone: \_\_\_\_\_



May 2023

# Follow Up



- Screen for STIs every 3 months
- Treat any STI according to: [STI Treatment Guidelines \(cdc.gov\)](https://www.cdc.gov/std/treatment-guidelines)
- Consider periodic lab work: LFTs, renal function, CBC
- Offer vaccination as appropriate: hepatitis A and B, mpox (Jynneos), HPV

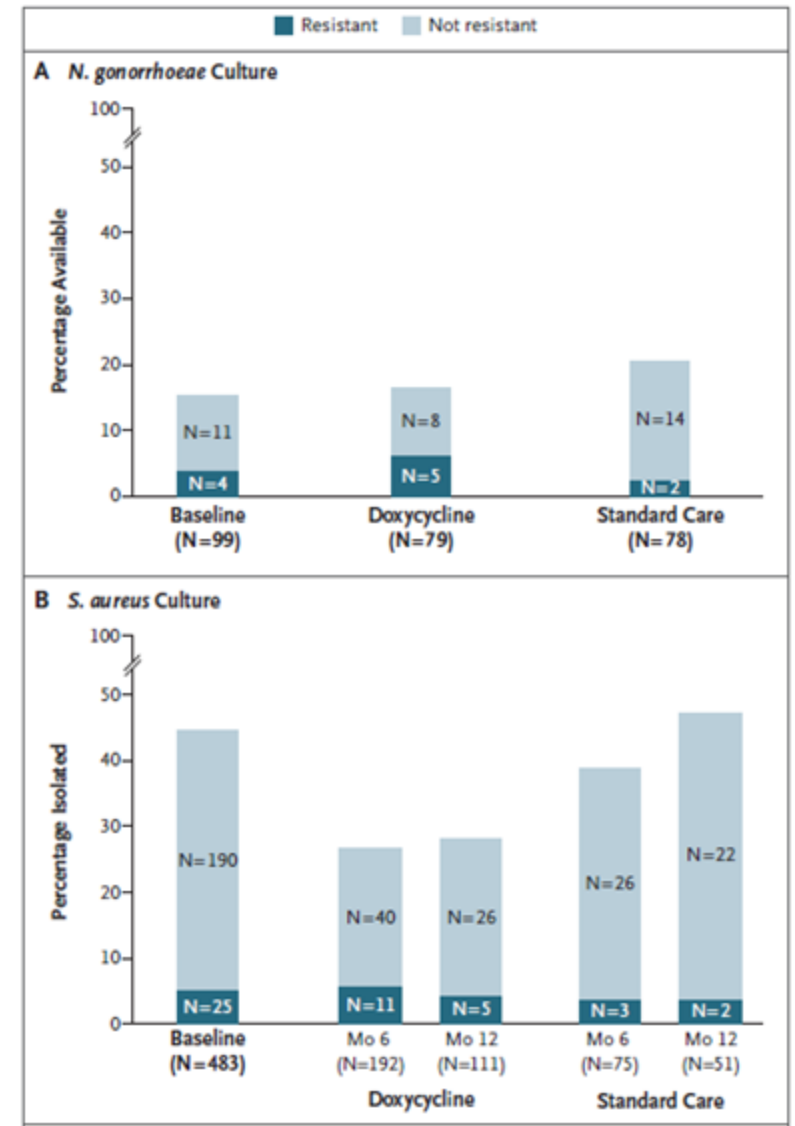
[Doxy as STI PEP Marketing Tools | NCSD \(ncsddc.org\)](https://ncsddc.org)

# Antibiotic Resistance

Researchers looked at:

1. Tetracycline resistance in *N. gonorrhoea* →
  - limited by low numbers
  - Unable to assess Doxy-PEP as a driver of resistance
2. *S. aureus*
  - *S. aureus* colonization decreased by 14% for the DoxyPEP group
  - Doxy-resistant *S. Aureus* levels increased 8%.
3. MRSA →
  - Colonization low and no change with doxy-PEP use
  - No change in doxy resistance
4. Commensal *Neisseria* → 2/3 samples with doxy resistance and no change with doxy-PEP use

\*\* reduced need for antibiotics for treatment - ceftriaxone use decreased by 50% in the doxy-PEP arm \*\*

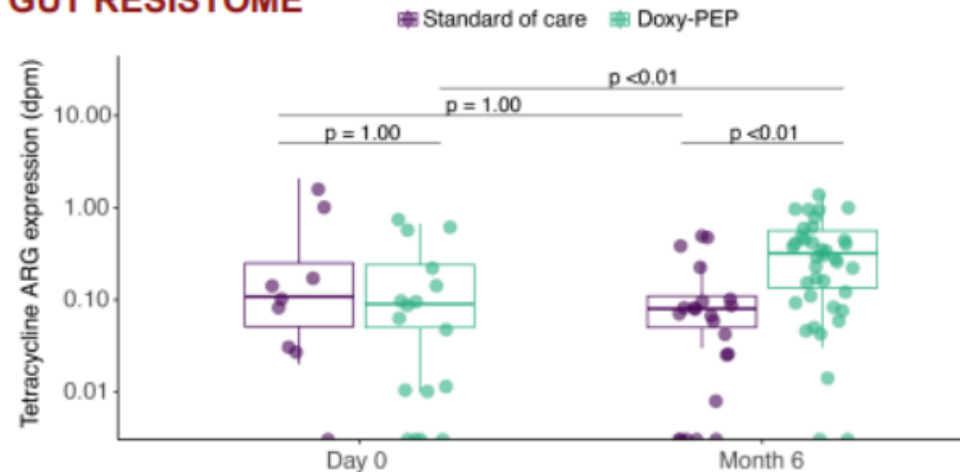




# Early data re AMR & Microbiome

- Methods (in brief):
  - Used rectal swabs from Doxy-PEP study, collected at month 0 and month 6
  - Performed metagenomic sequencing of DNA and RNA
- Conclusions:
  - **Doxy-PEP use over 6 months did not significantly alter bacterial microbiome diversity or total bacterial abundance.**
  - **Doxy-PEP use was associated with a dose-dependent increase in tetracycline AMR gene expression.**
  - Active expression of non-tetracycline AMR gene classes was unchanged by doxy-PEP use.

## GUT RESISTOME



**Figure 3. Tetracycline ARG expression by study arm and visit in the RNA-seq samples (n=86).** Tetracycline ARG expression increased in the doxy-PEP Month 6 group compared with the SOC Month 6 and the doxy-PEP Day 0 groups.

# Objectives

- Review epidemiology of Syphilis in US and NM
- Overview of Syphilis
- Understand new screening recommendations
- Explain Doxycycline Post Exposure Prophylaxis
- **Describe NM DOH resources for providers**

# NMDOH STD Program

- Disease Prevention
- Case Management
- Surveillance/Data
- Contact Tracing
- Partner Services
- Outreach and Education

**Disease Intervention Specialists (DIS)** identify persons with a reportable STD, conduct interviews, and ensure that both the patient and their partners are properly treated.

*This was the original “contact tracing” before the COVID-19 pandemic.*

# STD CASE REPORTING FORM



## NEW MEXICO SEXUALLY TRANSMITTED DISEASE MORBIDITY FORM

### PATIENT DEMOGRAPHIC DATA

LAST NAME: \_\_\_\_\_ FIRST NAME: \_\_\_\_\_ MIDDLE: \_\_\_\_\_  
 STREET ADDRESS: \_\_\_\_\_ TOWN/CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP CODE: \_\_\_\_\_  
 DATE OF BIRTH: \_\_\_\_\_ PHONE (Home/Cell): \_\_\_\_\_ (Work): \_\_\_\_\_  
 SEX ASSIGNED AT BIRTH:  Male  Female CURRENT GENDER IDENTITY:  M  F  Trans/MTF  Trans/FTM  Other \_\_\_\_\_  
 RACE (Check all that apply):  White  Black  Native American  Asian  Native Hawaiian/Pacific Islander  Other  Unknown  
 ETHNICITY:  Hispanic  Non-Hispanic  Unknown MARITAL STATUS:  Single  Married  Partnered  Unknown

### DISEASE DATA

CHECK REPORTABLE DISEASES:

SYPHILIS  GONORRHEA  CHLAMYDIA  
 PRIMARY  Uncomplicated Asymptomatic PID  YES  NO  
 SECONDARY  Uncomplicated Symptomatic  CHANCROID  
 Early Non-Primary/Non-Secondary  SALPINGITIS  
 Late Latent or Unknown  EPIDIDYMITIS  Other Untreated STD \_\_\_\_\_  
 Neuro Involvement  Yes  No  
 Optic Involvement  Yes  No  
 Otic Involvement  Yes  No SYMPTOMS: \_\_\_\_\_ SYMPTOM onset (Date): \_\_\_\_\_

### MEDICAL INFORMATION

NAME OF FACILITY: \_\_\_\_\_ REPORTED BY: \_\_\_\_\_ PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_ TOWN/CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

DATE OF TEST COLLECTION	DIAGNOSTIC TEST	RESULTS	SPECIMEN SOURCE	LABORATORY NAME

### TREATMENT INFORMATION

DATE OF TREATMENT	TREATMENT/DRUG	DOSE/AMOUNT	NAME AND TITLE OF CLINICIAN

IS PATIENT PREGNANT? YES  NO  UNKNOWN  ESTIMATED DUE DATE: \_\_\_\_\_

PATIENT on PrEP? YES  NO  WAS PrEP OFFERED/PRESCRIBED? YES  NO

WAS EXPEDITED PARTNER THERAPY PROVIDED FOR SEXUAL PARTNER(S)? YES  NO

IF EPT WAS PROVIDED, HOW MANY DOSES WERE GIVEN? \_\_\_\_\_

PHYSICIANS COMMENTS: \_\_\_\_\_

New Mexico Revised Statutes 12-3-5, 1, Health Department Regulations Art. 1, 24-1-7 and New Mexico Administrative Code 7.4.3.13 require that patients with laboratory confirmed chlamydia, syphilis and gonorrhea be reported to the New Mexico Department of Health (NMDOH) STD Program within 24 hours.

PLEASE FAX COMPLETED FORM TO:

505-207-7991 or  
505-476-3638

FOR CONSULTATION CALL: (505) 476-3636 or (505) 709-7617

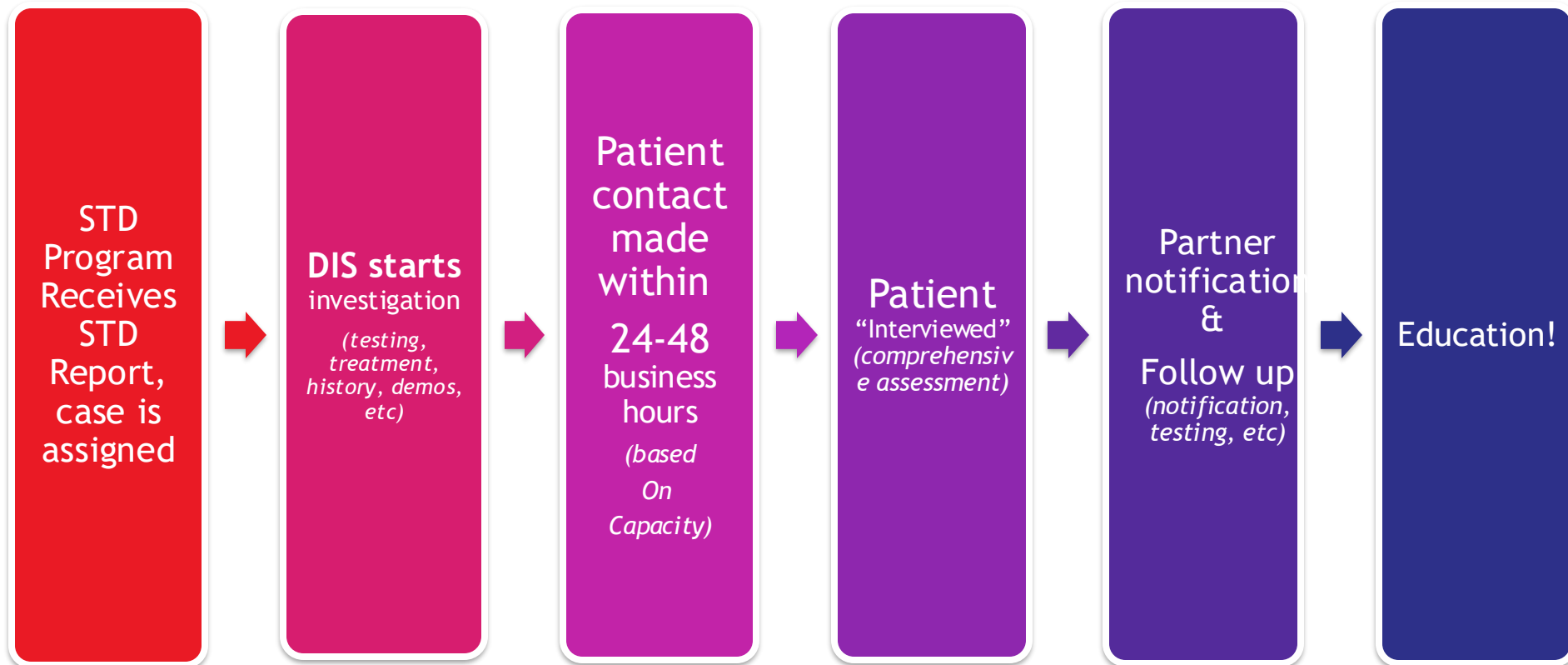
This form is available electronically at: <http://nmhealth.org/about/phd/idb/std/>  
OR by scanning the QR code



10/01/2024



# STD Case Investigation





# Public Health Offices

## Public Health Offices

These locations are some of the primary ways in which we support the health of all New Mexicans. Each location has its own hours of operation, and a unique set of services. Please note that some locations require an appointment and do not accept walk-ins. Identify a location near you, call to learn more, and schedule an appointment today. You will be so glad that you did!

### Counties

[Bernalillo](#)  
[Curry](#)  
[Grant](#)  
[Lincoln](#)  
[Mora](#)  
[Roosevelt](#)  
[Santa Fe](#)  
[Torrance](#)

[Chaves](#)  
[De Baca](#)  
[Guadalupe](#)  
[Los Alamos](#)  
[Otero](#)  
[San Juan](#)  
[Sierra](#)  
[Union](#)

[Cibola](#)  
[Doña Ana](#)  
[Hidalgo](#)  
[Luna](#)  
[Quay](#)  
[San Miguel](#)  
[Socorro](#)  
[Valencia](#)

[Colfax](#)  
[Eddy](#)  
[Lea](#)  
[McKinley](#)  
[Rio Arriba](#)  
[Sandoval](#)  
[Taos](#)

<https://www.nmhealth.org/location/public/>



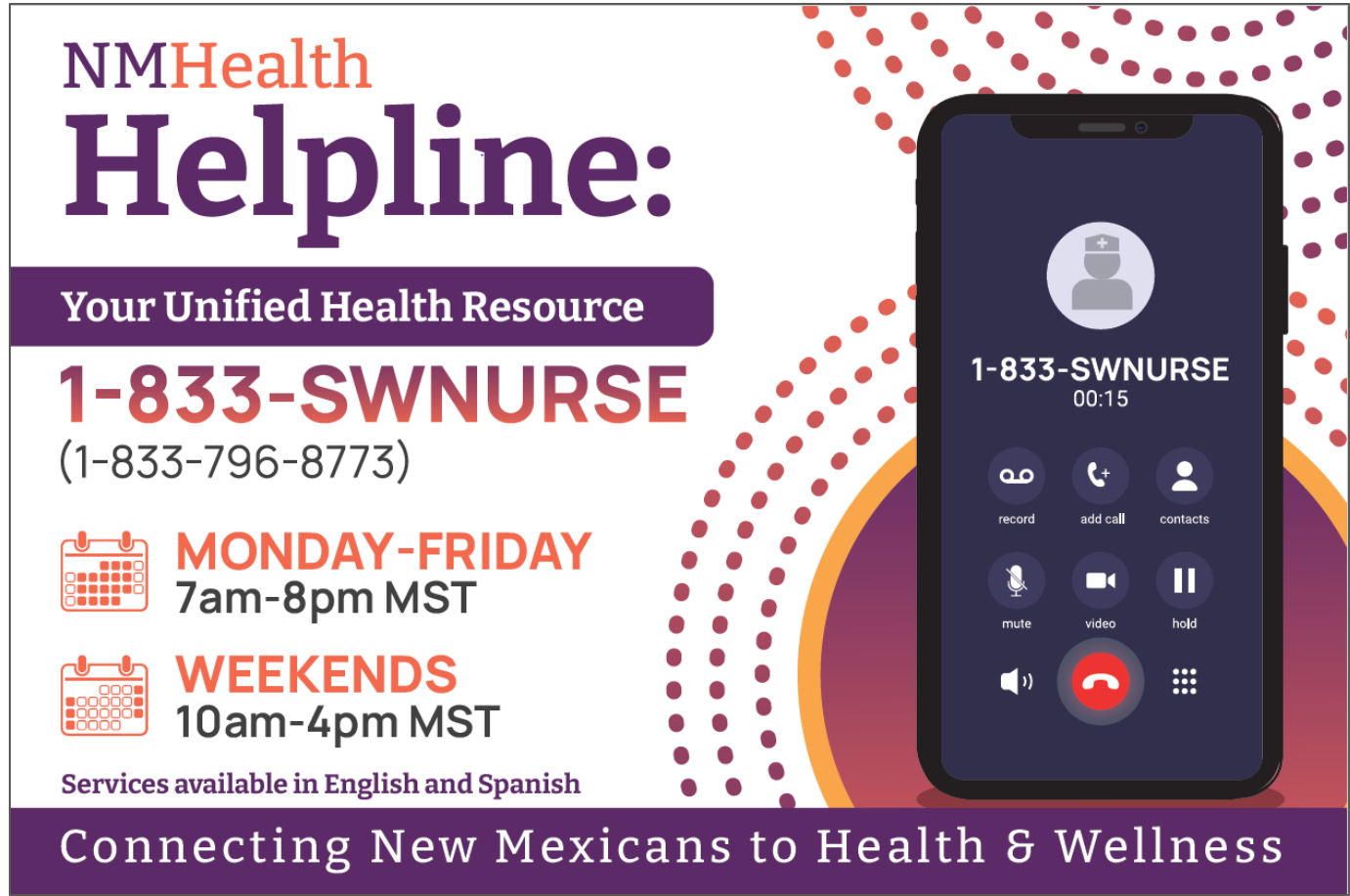
# PRISM NM STD Database



Location/Provider	Screening Date	Exam Date	Treatment Date	Treatment Name
UNIVERSITY OF NEW MEXICO HOSPITAL EMERGENCY ROOM - ER: 2211 Lomas Blvd NE, Albuquerque, NM: 505-277-1572			06/13/2019	Benzathine Penicillin G 2.4 MU IM (Dose 1)
La Familia Medical Center-Alto-Santa Fe: 1035 Alto St, Santa Fe, NM: 505-982-4425			07/16/2019	Benzathine Penicillin G 2.4 MU IM (Dose 1)

Chlamydia	CT NAT	Urine	06/12/2019	06/12/2019	Negative	
Gonorrhea	GC NAT	Urine	06/12/2019	06/12/2019	Negative	
HIV	HIV-1/2 Ag/Ab	Blood	06/12/2019	06/12/2019	Negative	
Syphilis	RPR		06/12/2019	06/12/2019	Reactive	1:4


HELP LINE Nurses have PRISM access - taking NM provider calls (option 4)




**NMHealth**  
**Helpline:**

Your Unified Health Resource

**1-833-SWNURSE**  
(1-833-796-8773)

 **MONDAY-FRIDAY**  
7am-8pm MST

 **WEEKENDS**  
10am-4pm MST

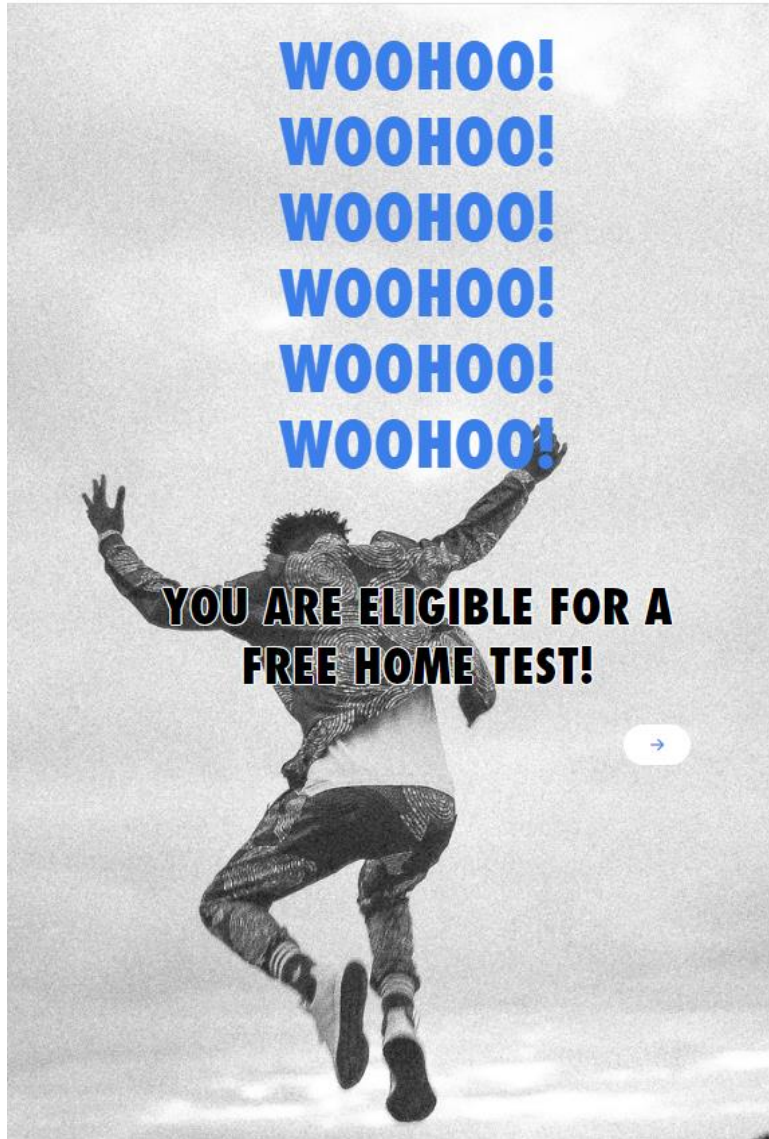
Services available in English and Spanish

Connecting New Mexicans to Health & Wellness

The advertisement features a smartphone on the right side displaying a call interface. The screen shows a contact icon with a nurse's cap, the number 1-833-SWNURSE, and a timer at 00:15. Below the timer are several call control icons: record, add call, contacts, mute, video, hold, and a red end call button. The background of the smartphone screen is dark blue, and the overall graphic has a pattern of red and purple dots.



TAKEMEHOME



[TakeMeHome](https://www.takemehome.org)

# Take Me Home

Takemehome.org

Tests:

- GC/CT
- HIV
- Syphilis

Clients get results via personal account portal.

Clients are given DOH Help Line number for guidance on managing positives



# RESOURCES:

## CDC Treatment Guidelines 2021:

[STI Treatment Guidelines](#)

[Provider Resources \(mobile app\)](#)

## CDC STD Data and Resources:

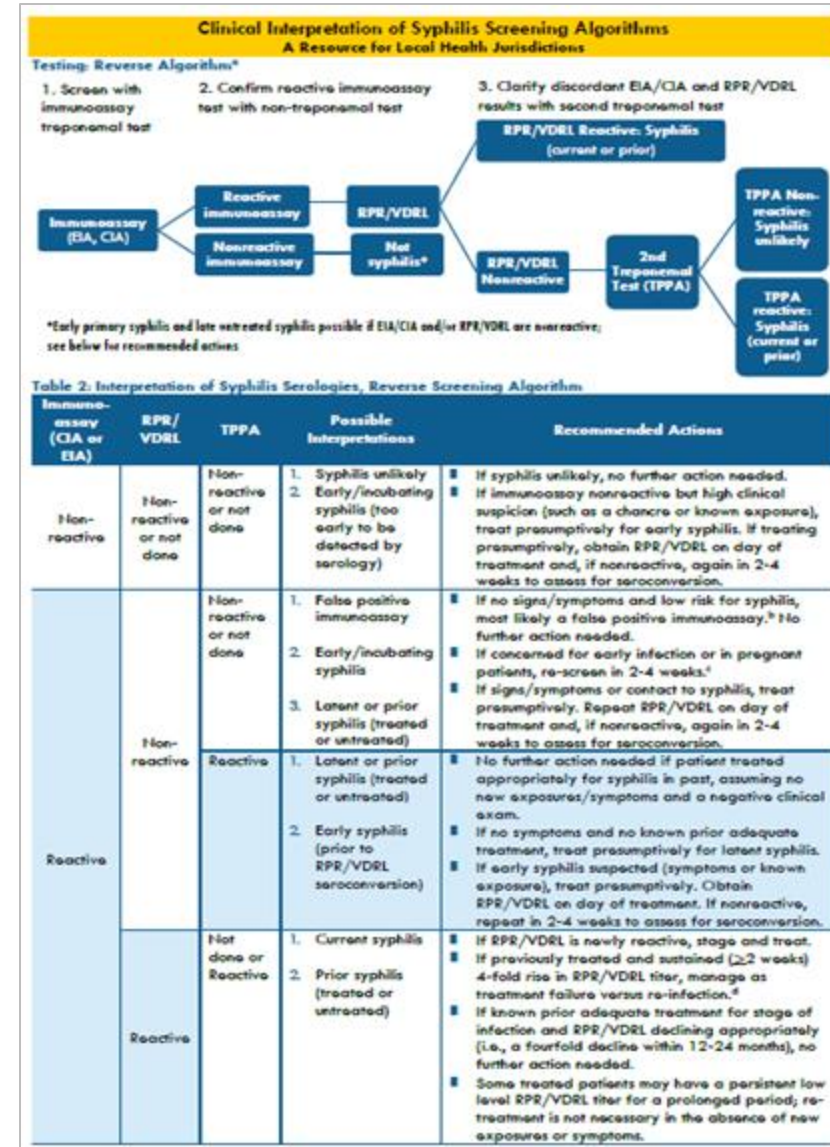
[Sexually Transmitted Diseases - Information from CDC](#)

## NMDOH STD Program Website:

<https://nmhealth.org/about/phd/idb/std/>

## New Mexico Administrative Code:

<https://www.srca.nm.gov/parts/title07/07.004.0003.html>



# SUMMARY

- Screen yearly for syphilis in people ages 18 – 50
- Keep syphilis on your differential
- Talk to appropriate patients about Doxy-PEP
- Questions about all things DOH: 1–833 – SWNURSE  
(1-833-796-8773)

# REFERENCES:



- USPSTF: [syphilis-screening-non-pregnant-adults-final-evidence-review.pdf](#)
- CDC slides: [2022-STI-Surveillance-All-Slides.pptx \(live.com\)](#)
- CAPTC talk on DoxyPEP: [STI Expert Hour Webinar on Doxycycline Post-Exposure Prophylaxis \(californiaptc.com\)](#)
- Luetkemeyer et al study: [Postexposure Doxycycline to Prevent Bacterial Sexually Transmitted Infections | NEJM](#)
- [Post-exposure prophylaxis with doxycycline to prevent sexually transmitted infections in men who have sex with men: an open-label randomised substudy of the ANRS IPERGAY trial \(thelancet.com\)](#) (Dec 2017)
- DoxyVAC study: [DoxyPEP and Meningococcal Vax Keep Protecting MSM PrEP Users From STIs \(natap.org\)](#) (presented Feb 2023, CROI)
- New Mexico PRISM database
- IBIS for New Mexico population numbers
- CDC Surveillance Reports for US rates

# Thank you!

[Miranda.Durham@doh.nm.gov](mailto:Miranda.Durham@doh.nm.gov)

**SYPHILIS IS SPREADING,  
STAY AHEAD OF IT!**

**OMG!**

**Syphilis is making a comeback in New Mexico,  
but we have the power to stop it in its tracks.**

**Get Tested**  
Learn about syphilis symptoms and transmission, and prioritize regular testing for early detection and easier treatment.

**Seek Treatment**  
Seek immediate treatment if affected, as syphilis is curable with proper medical care.

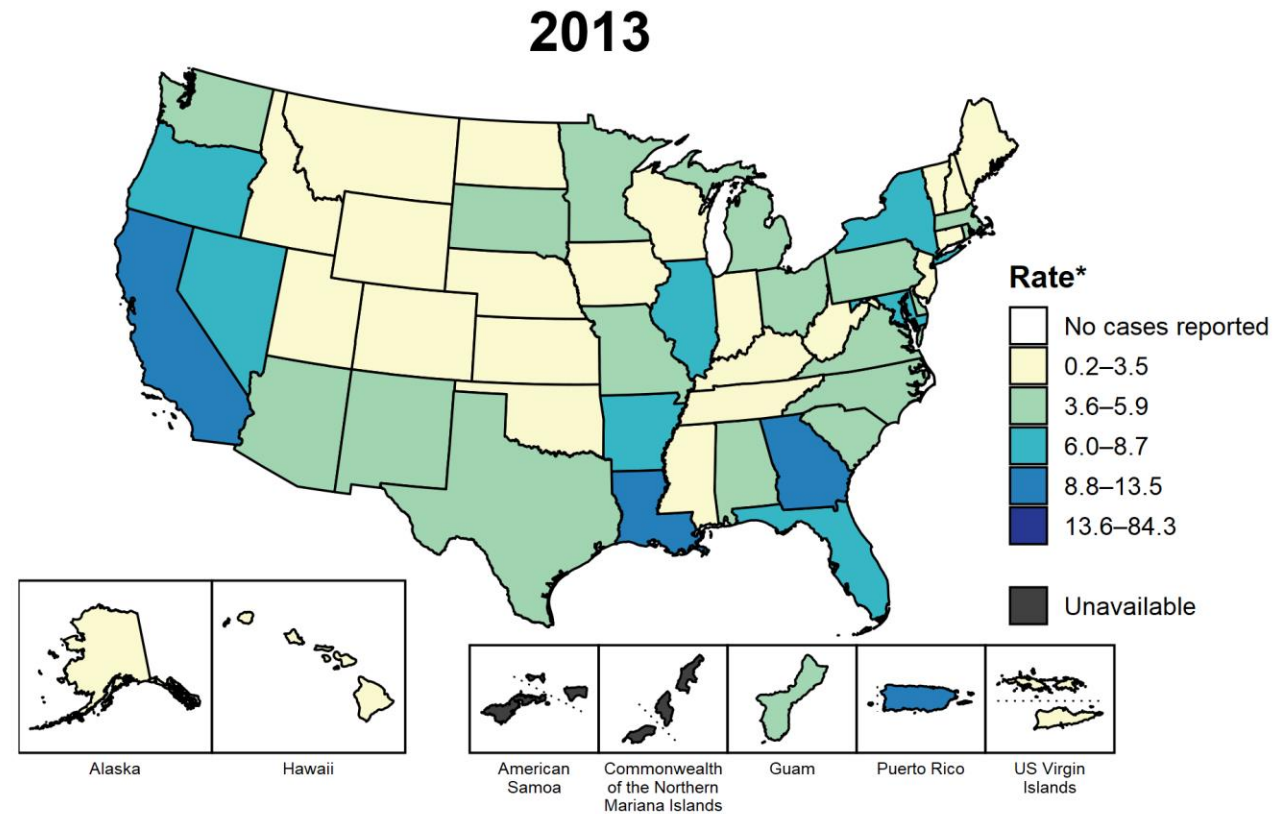
**Open Communication**  
Open conversations about sexual health can break down stigma and misinformation. Let's talk more about prevention, testing, and healthy practices.

Discover more at [NMSTDTest.org](https://NMSTDTest.org)  
Access resources, support, and local testing information.

NMDOH

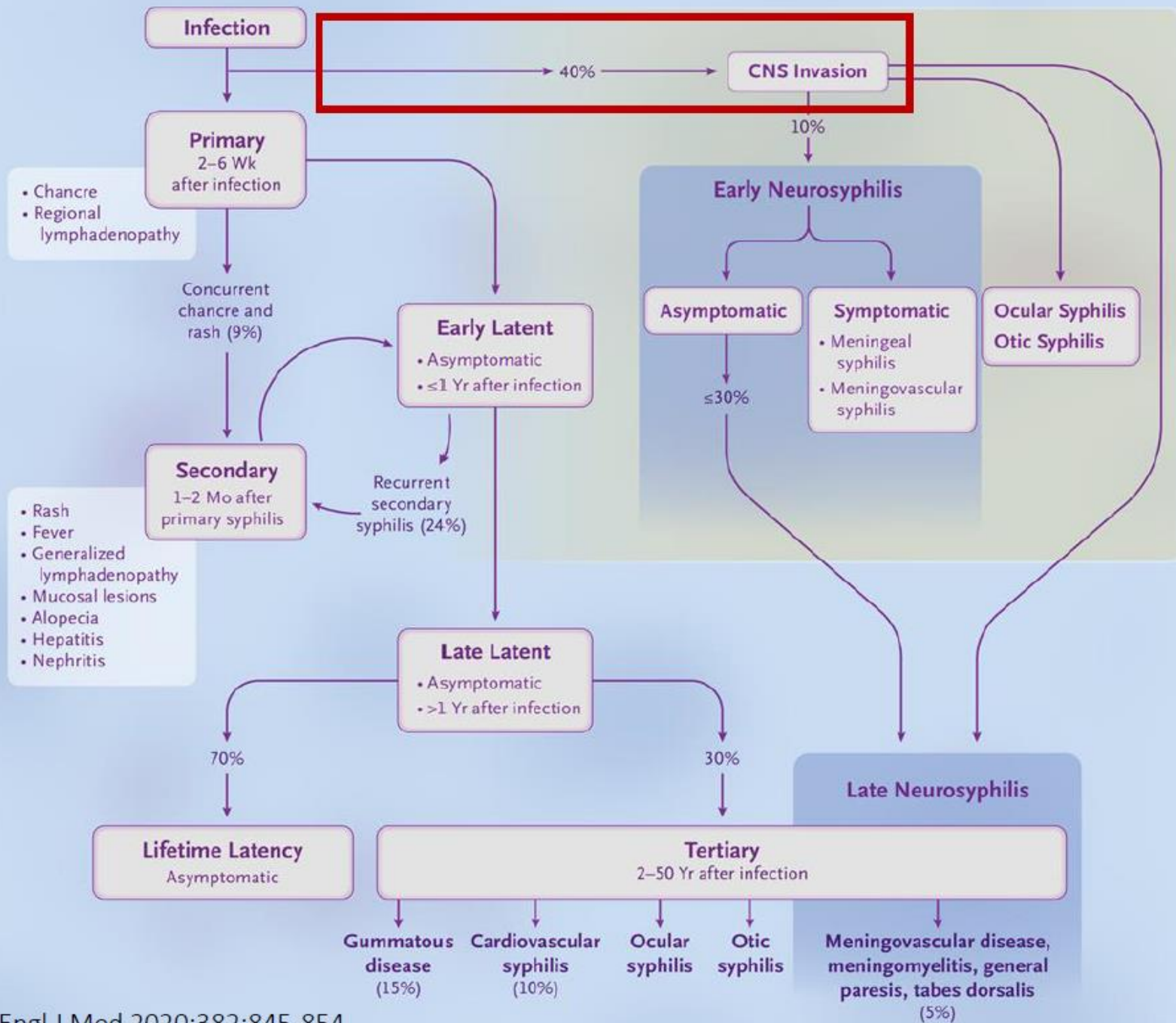


# Primary and Secondary Syphilis — Rates of Reported Cases by Jurisdiction, United States and Territories, 2013–2022



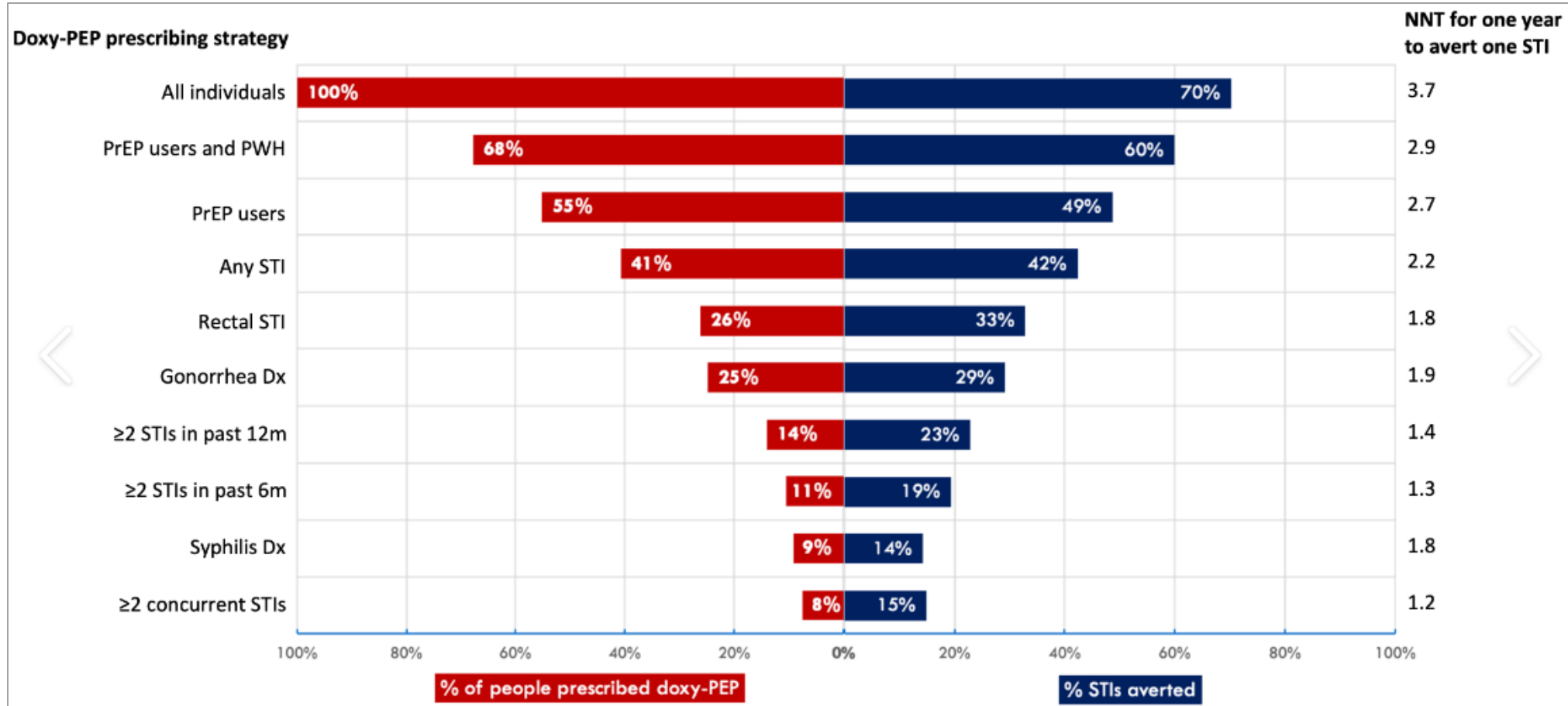
\* Per 100,000





# Stages of Syphilis

# Public Health Strategy:



[POTENTIAL IMPACT AND EFFICIENCY OF DOXY-PEP AMONG PEOPLE WITH OR AT RISK OF HIV - CROI Conference](#)