

The State of Sexually Transmitted Infections: Climbing Rates, Concerning Trends, and Opportunities for Impact

Nick Van Wagoner, MD PhD
Co-Medical Director AL/NC STD Prevention Training Center
Associate Professor of Medicine
University of Alabama at Birmingham School of Medicine

Disclosures

Sanofi Pasteur: Research Funding

Simply Speaking Curriculum

Other Funding Source: CDC

Objectives

- Describe the current landscape of STI in the US and the Southeast
- Discuss the STI and HIV syndemic and rates of STIs among persons living with HIV
- Identify practical ways to address the STI epidemic in clinical care



STIs
increase
every year
for the last
5 years

1.8 million
Chlamydia
cases--up 19%

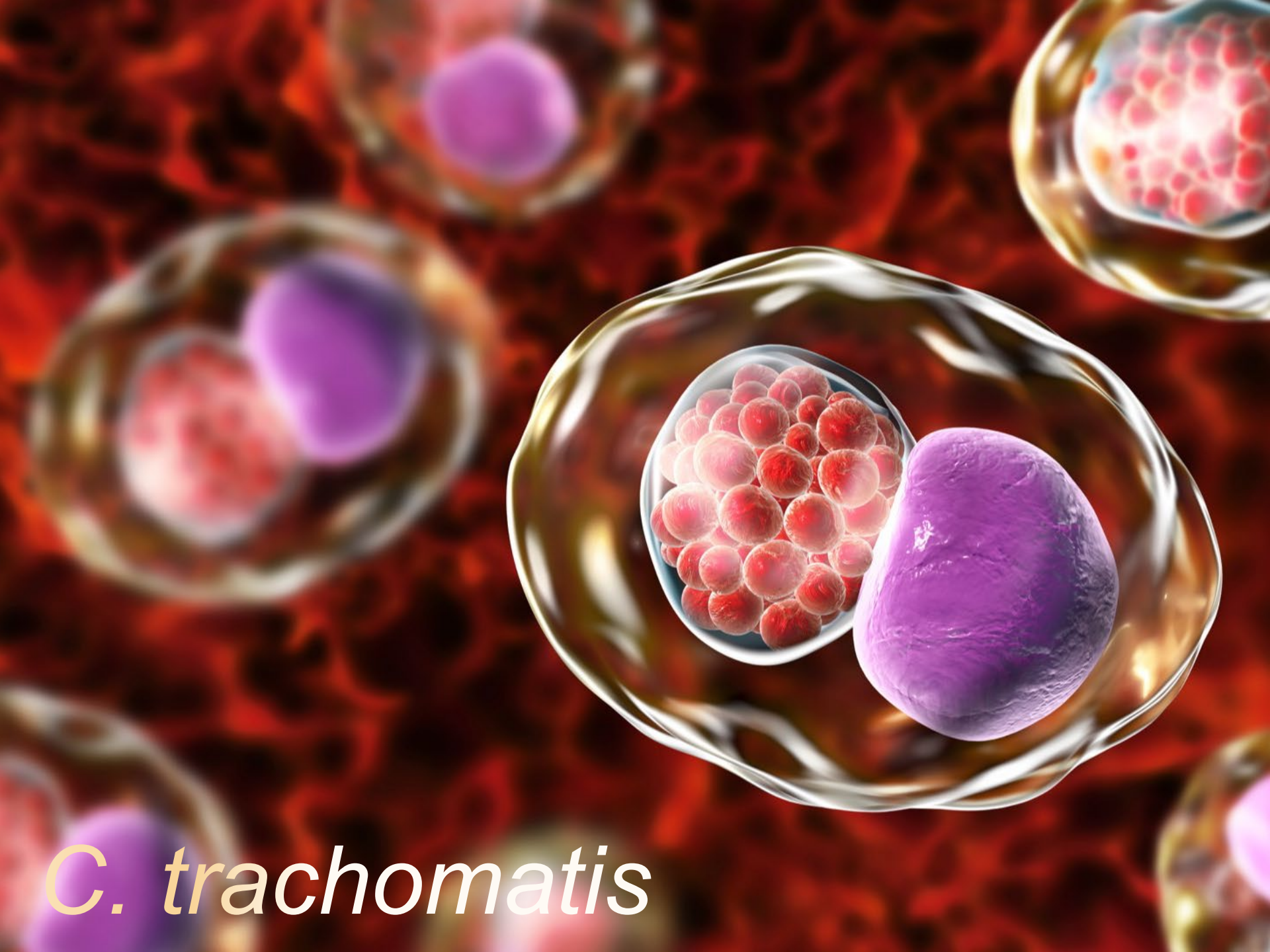
583,405
Gonorrhea
cases--up 63%

35,063
Primary and
Secondary
Syphilis cases-
-up 71%

1,306
Congenital
Syphilis cases-
-up 185%

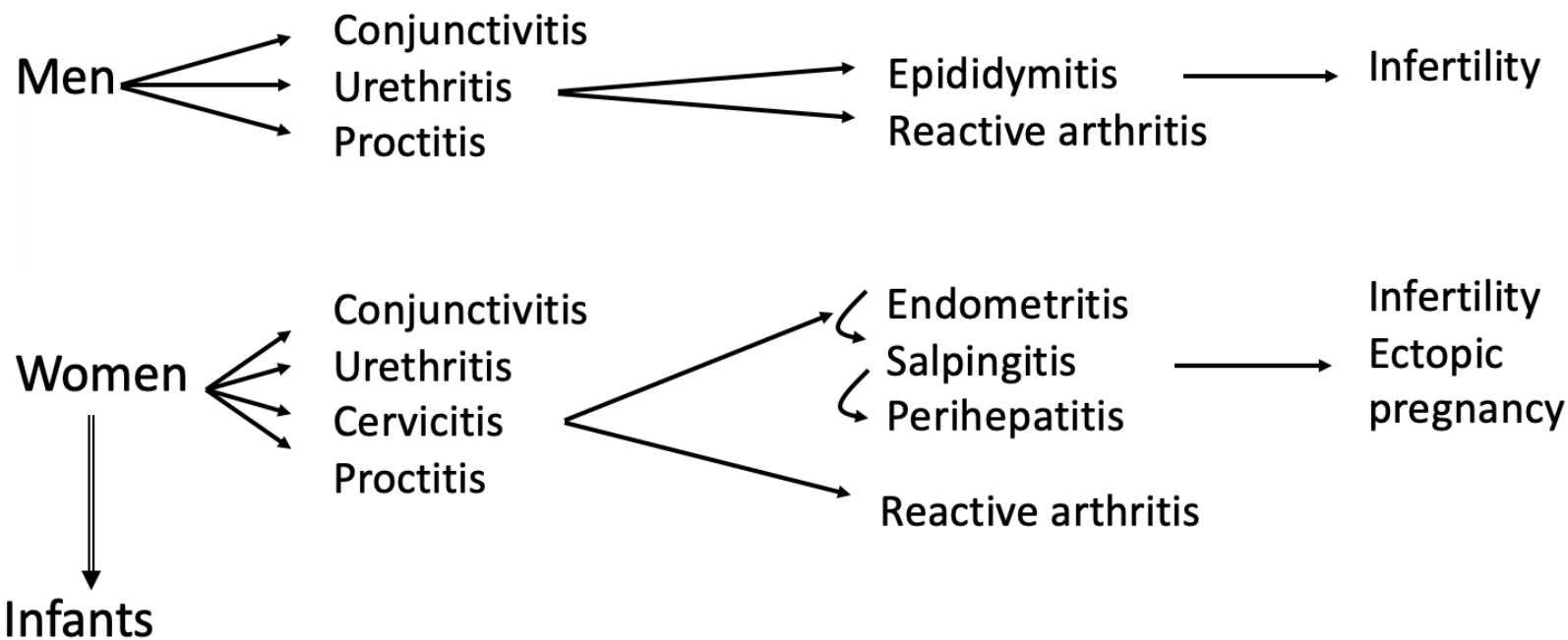
2018 STD Surveillance. CDC

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C. trachomatis

Clinical Syndromes Caused by *C. trachomatis*



Chlamydia

2018 STD Surveillance

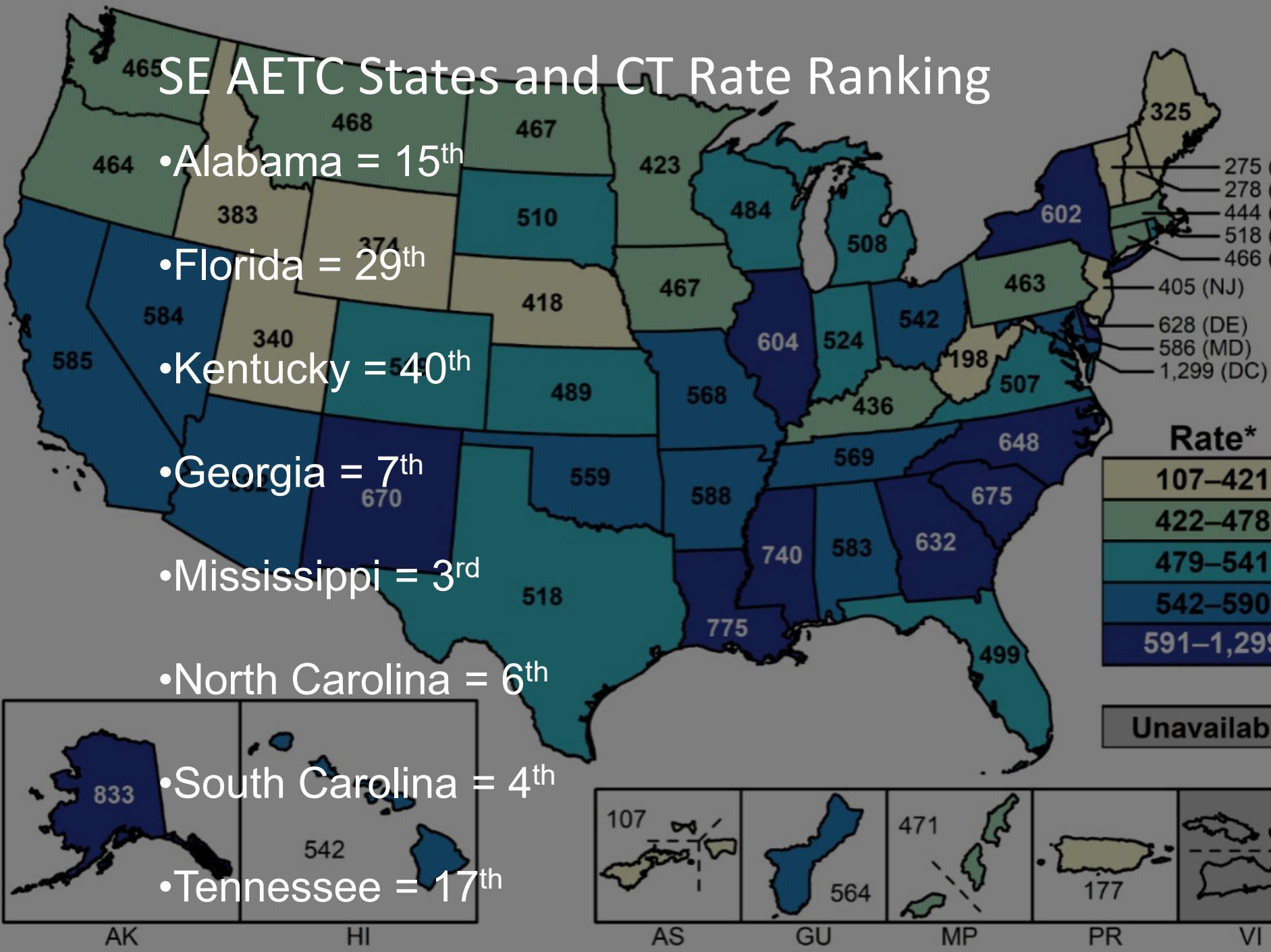
Increased among males and females, in all regions of the U.S. and among all racial/ethnic groups

Highest among adolescent and young adults

More reported cases in women
(37.8% increase in rates among men)

SE AETC States and CT Rate Ranking

- Alabama = 15th
- Florida = 29th
- Kentucky = 54th
- Georgia = 7th
- Mississippi = 3rd
- North Carolina = 6th
- South Carolina = 4th
- Tennessee = 17th



- 275 (V)
- 278 (M)
- 444 (M)
- 518 (F)
- 466 (C)
- 405 (NJ)
- 628 (DE)
- 586 (MD)
- 1,299 (DC)

AK 833

HI 542

AS 107

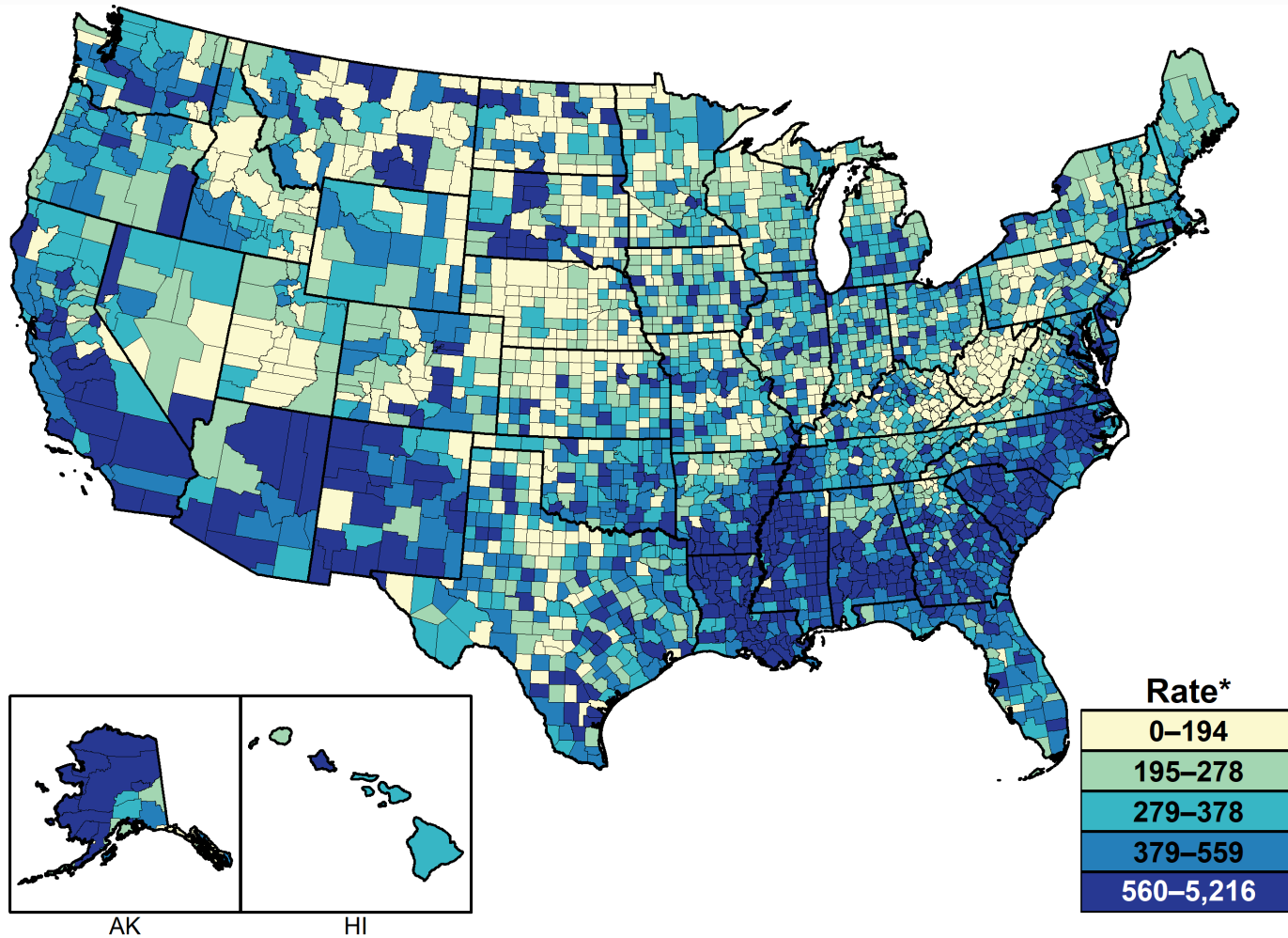
GU 564

MP 471

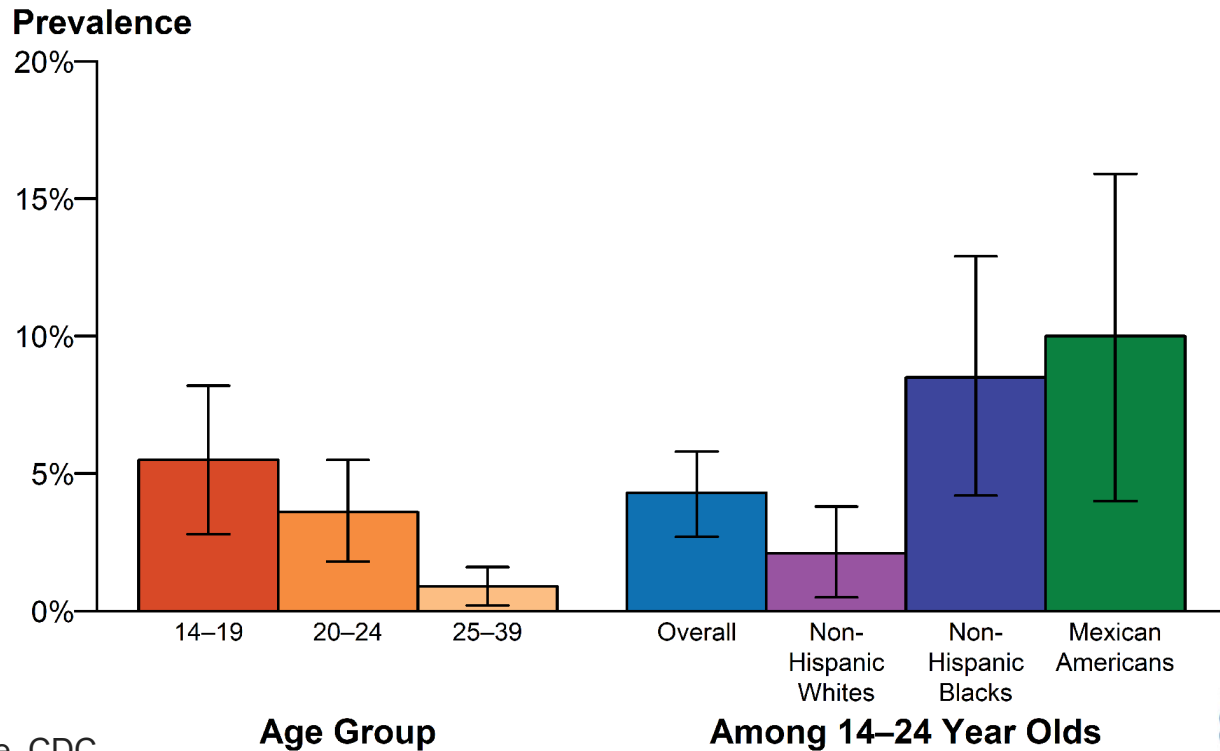
PR 177

VI

Chlamydia: Cases by County

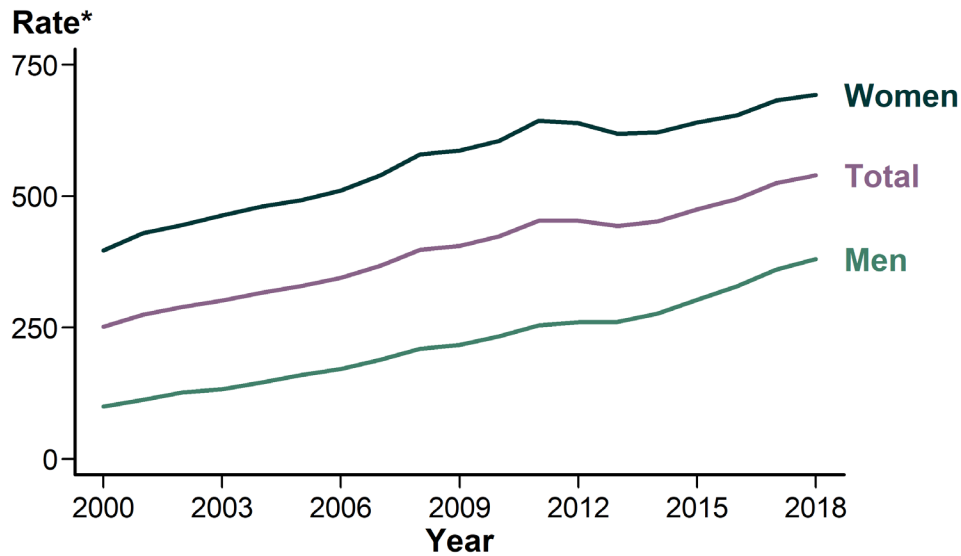


Chlamydia



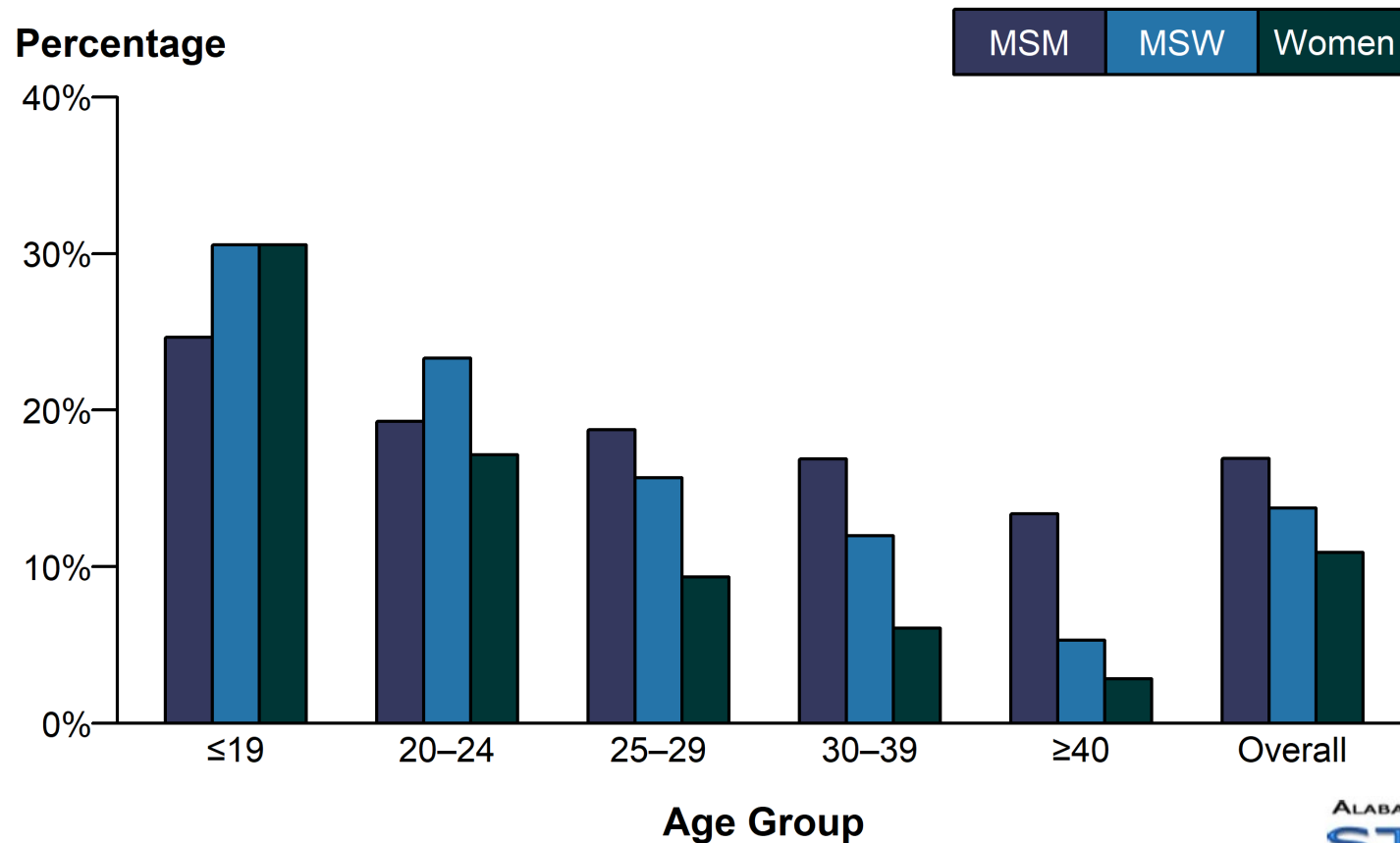
Chlamydia

Figure 1. Chlamydia — Rates of Reported Cases by Sex, United States, 2000–2018

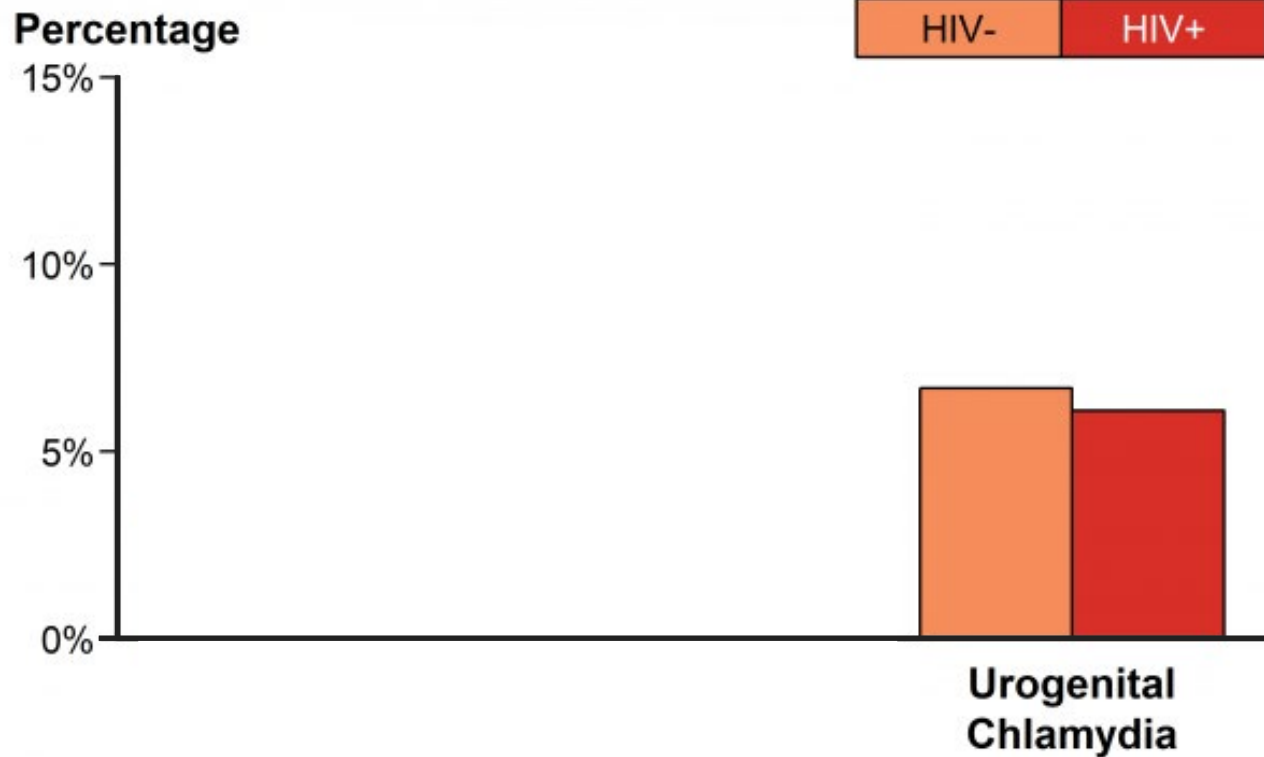


* Per 100,000.

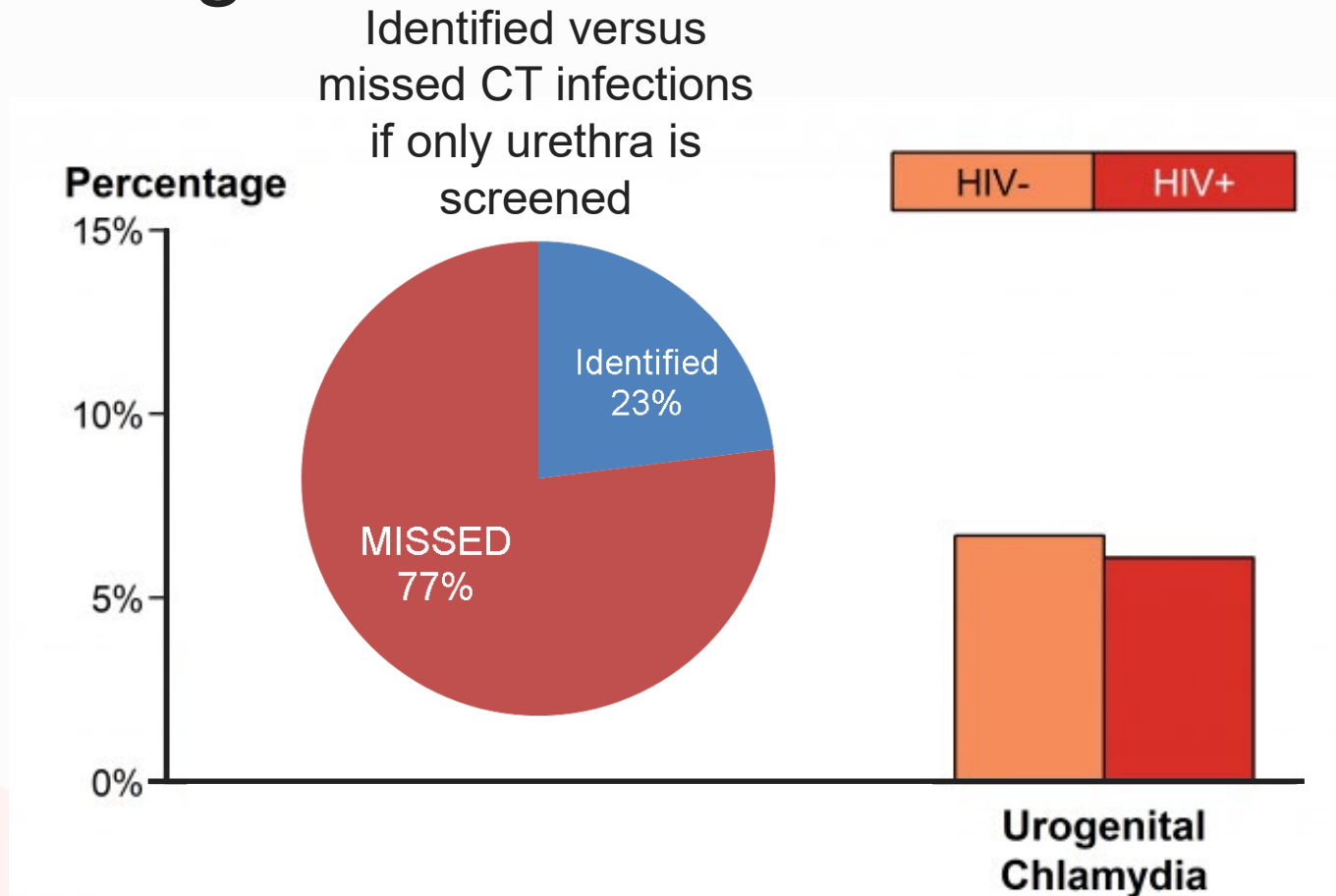
Proportion of STD Clinic Patients Testing Positive for CT by Age Group, Sex, and Sex of Sex Partners



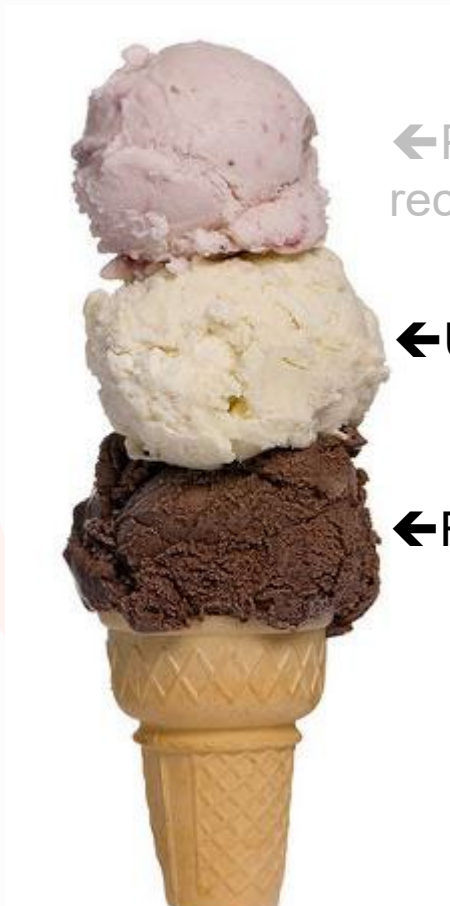
Urogenital Chlamydia is common in MSM



Urogenital Chlamydia is common in MSM but extragenital infection is more common



Screening MSM at Risk for CT, Treatment & Follow Up



← Pharyngeal (not recommended)

← Urine CT NAAT

← Rectal CT NAAT

Recommended First Line Treatment:
Azithromycin 1 gm po
Or
Doxycycline 100 mg bid for 7 days

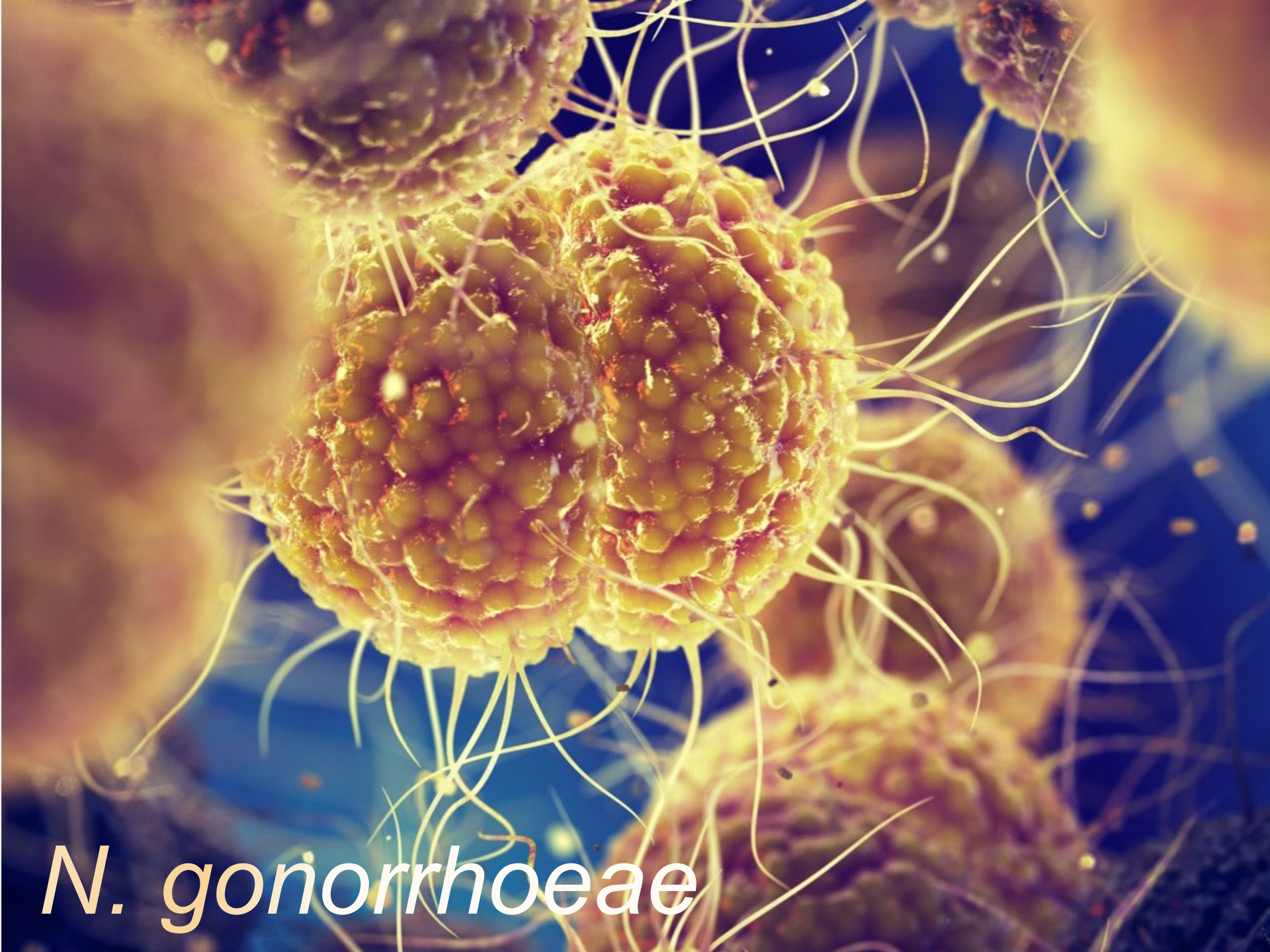
Rescreen 3 months after treatment

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Source: Primary Care Guidelines for the Management of Persons Infected with HIV; 2015 CDC STD Prevention Guidelines

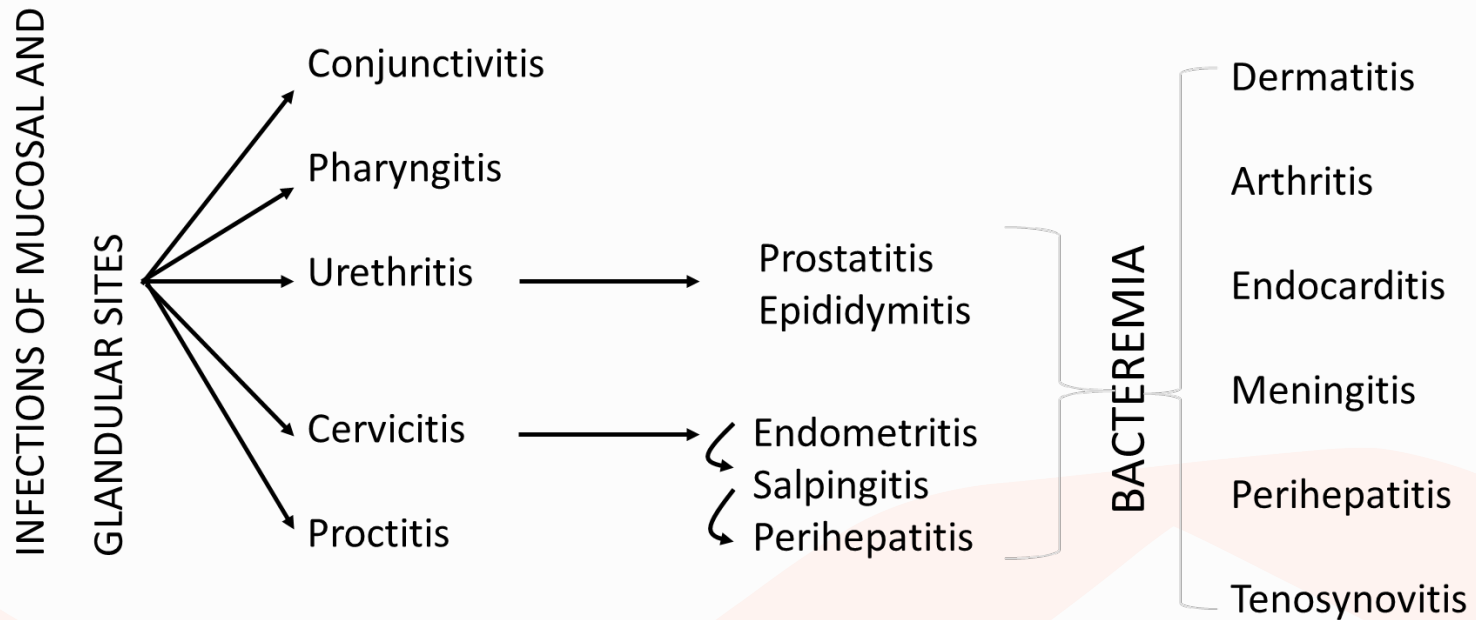
Screening Chlamydia

Women	<p>Sexually active women under 25 years of age¹</p> <p>Sexually active women aged 25 years and older if at increased risk²</p> <p>Retest approximately 3 months after treatment³</p>
Pregnant Women	<p>All pregnant women under 25 years of age¹</p> <p>Pregnant women, aged 25 and older if at increased risk²</p> <p>Retest during the 3rd trimester for women under 25 years of age or at risk^{3,4}</p> <p>Pregnant women with chlamydial infection should have a test-of-cure 3-4 weeks after treatment and be retested within 3 months¹</p>
Men	<p>*Consider screening young men in high prevalence clinical settings⁵ or in populations with high burden of infection (e.g. MSM)⁶</p>
Men Who have Sex With Men (MSM)	<p>At least annually for sexually active MSM at sites of contact (urethra, rectum) regardless of condom use⁶</p> <p>Every 3 to 6 months if at increased risk⁷</p>



N. gonorrhoeae

Clinical Syndromes Caused by *N. gonorrhoeae*



CDC Treatment Guidelines

Gonorrhea

2018 STD Surveillance

Increased among males and females, in all regions of the U.S. and among all racial/ethnic groups

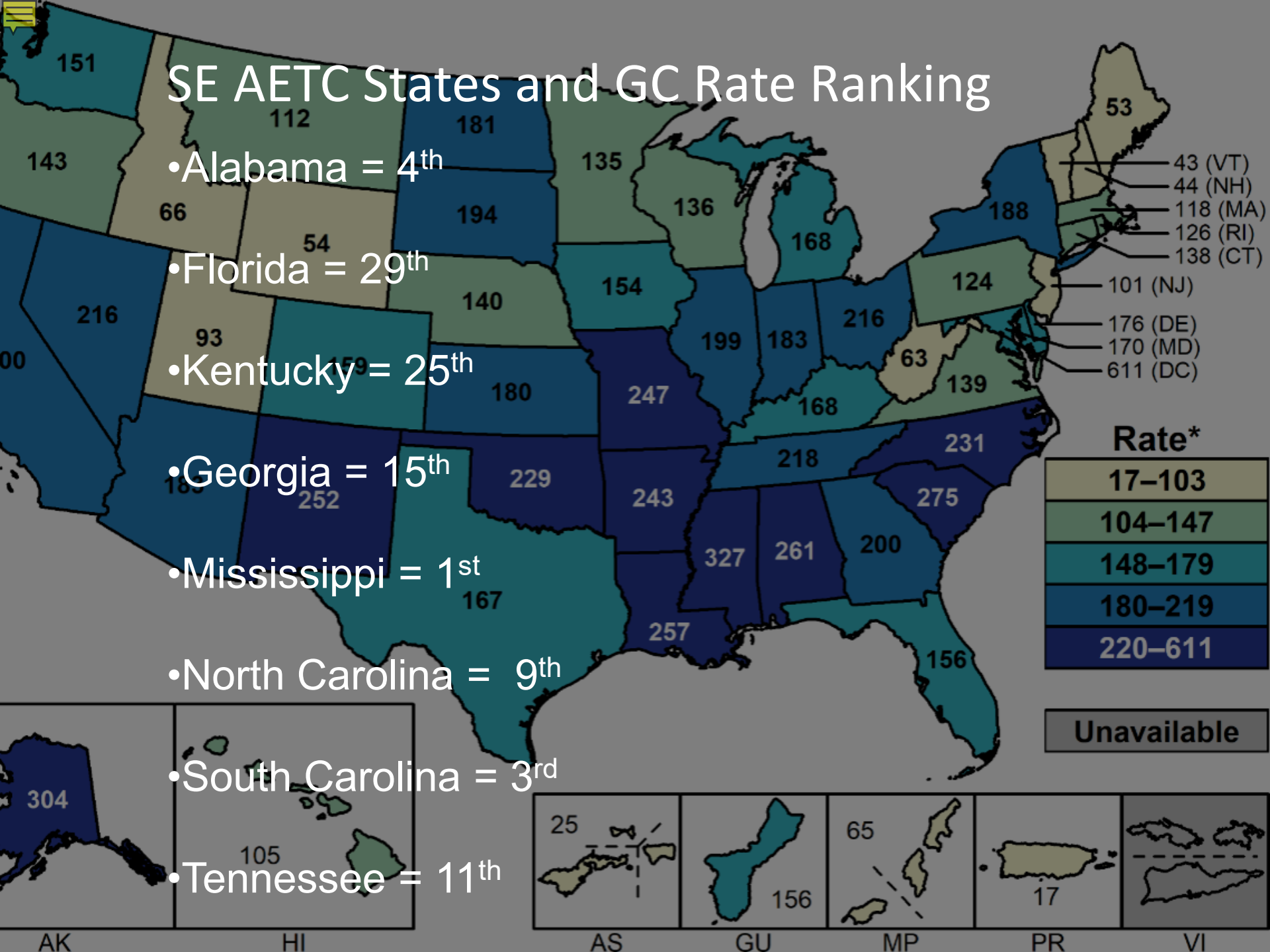
More reported cases in men

More than half of all infections were estimated to be resistant to at least one antibiotic

All circulating strains susceptible to Ceftriaxone.

SE AETC States and GC Rate Ranking

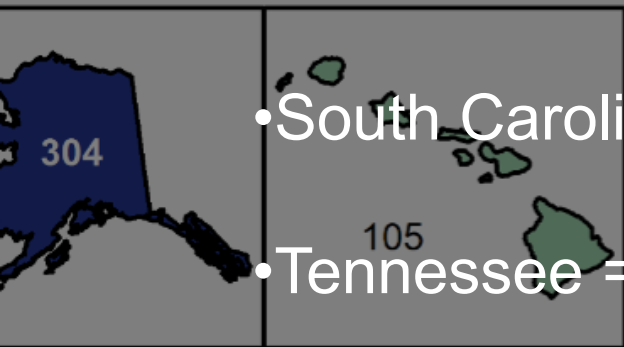
- Alabama = 4th
- Florida = 29th
- Kentucky = 25th
- Georgia = 15th
- Mississippi = 1st
- North Carolina = 9th
- South Carolina = 3rd
- Tennessee = 11th



Rate*

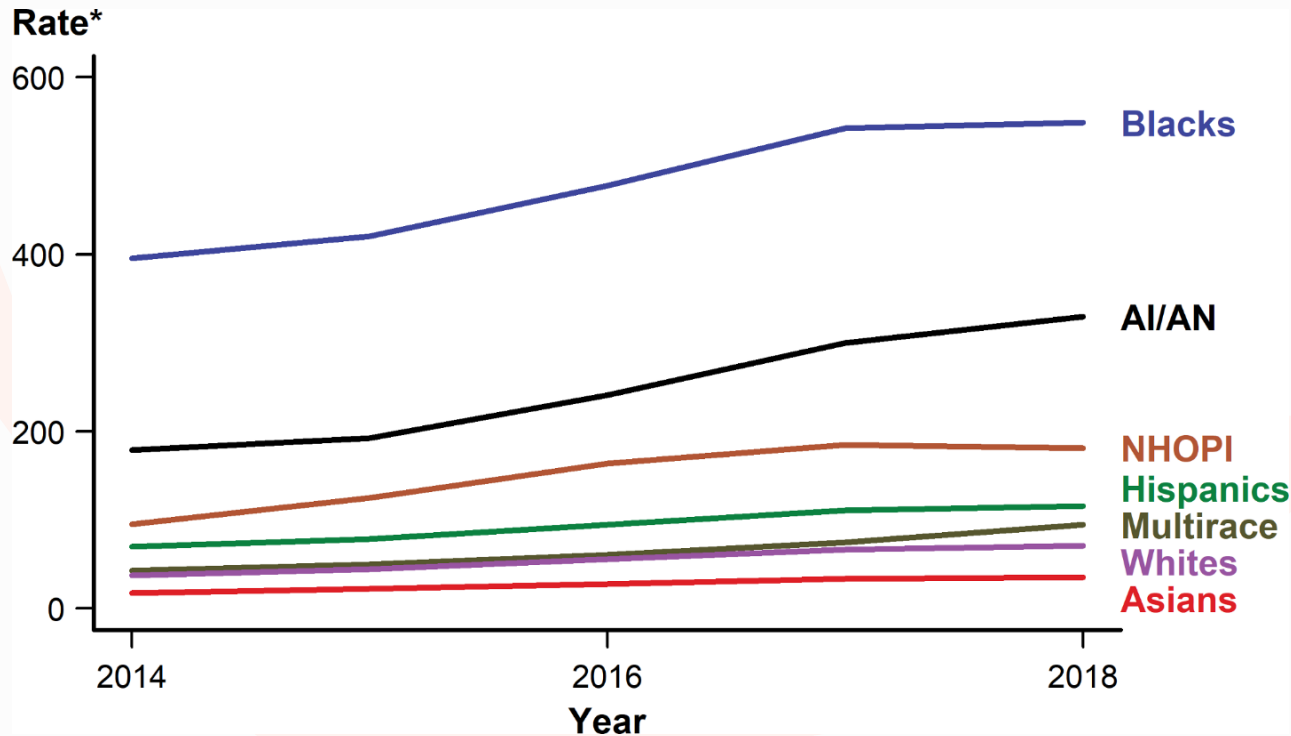
17-103
104-147
148-179
180-219
220-611

Unavailable



Gonorrhea

Rates of Reported Cases by Race/Hispanic Ethnicity



* Per 100,000.

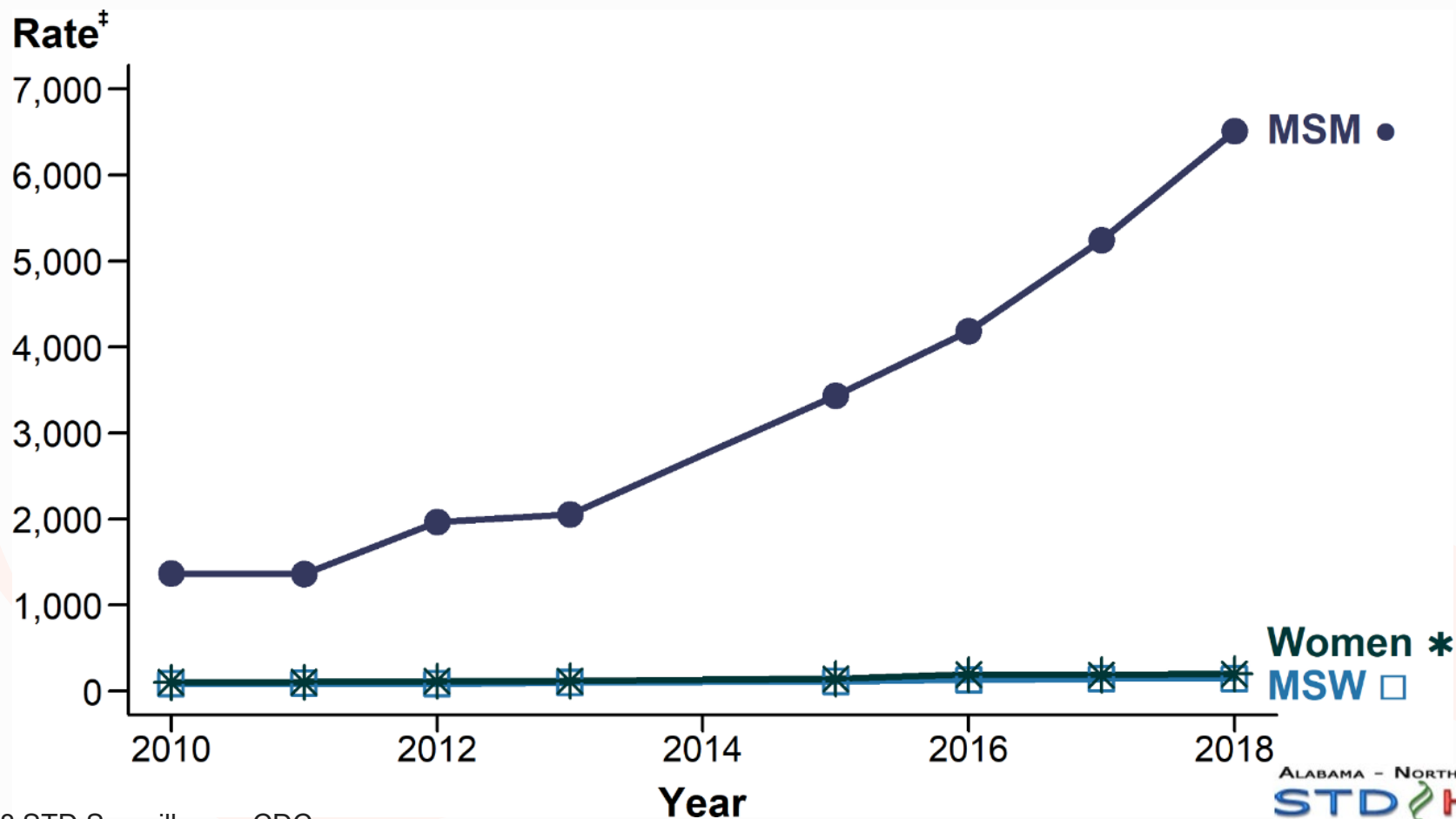
NOTE: See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.

ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.

2018 STD Surveillance. CDC

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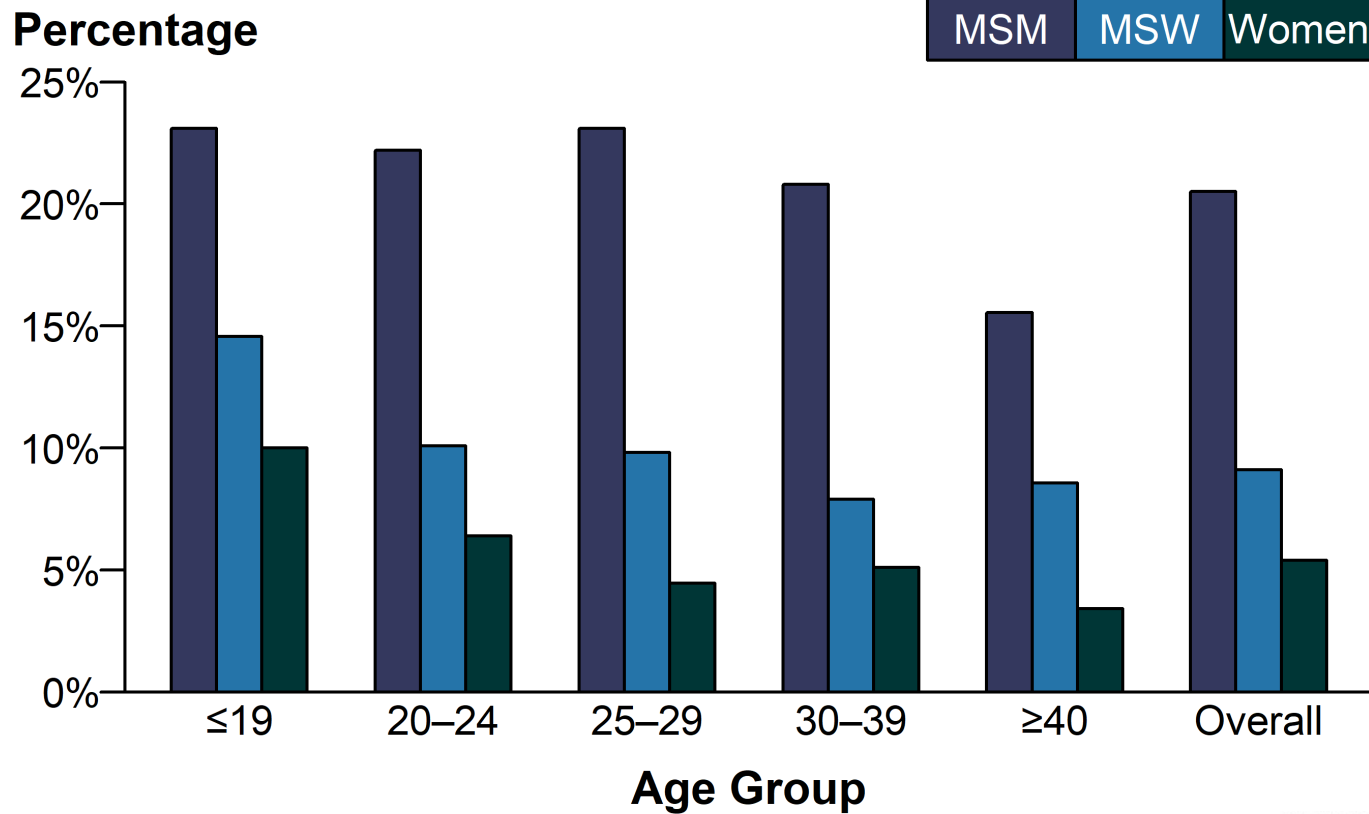
Gonorrhea — High Rates Among MSM



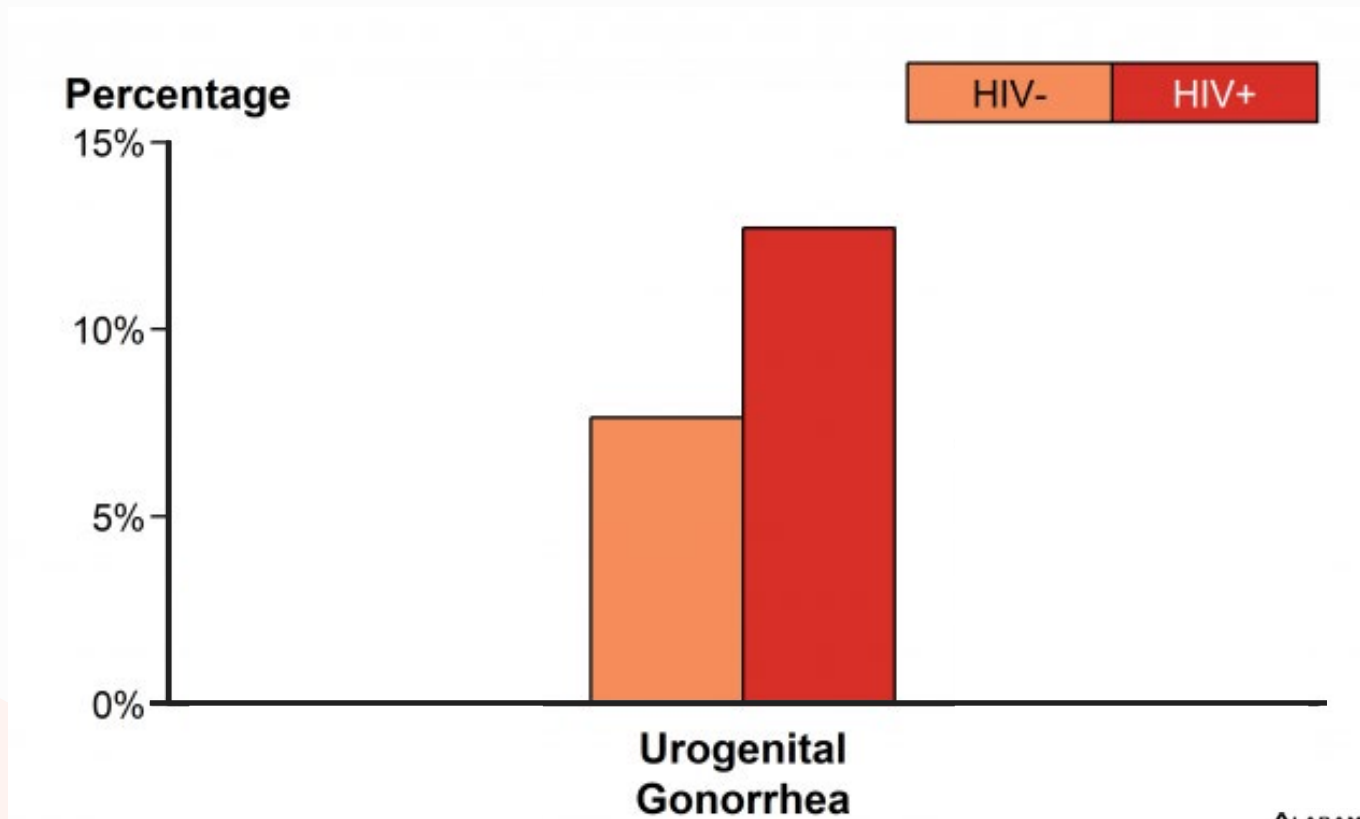
2018 STD Surveillance. CDC

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Proportion of STD Clinic Patients Testing Positive for GC by Age Group, Sex, and Sex of Sex Partners



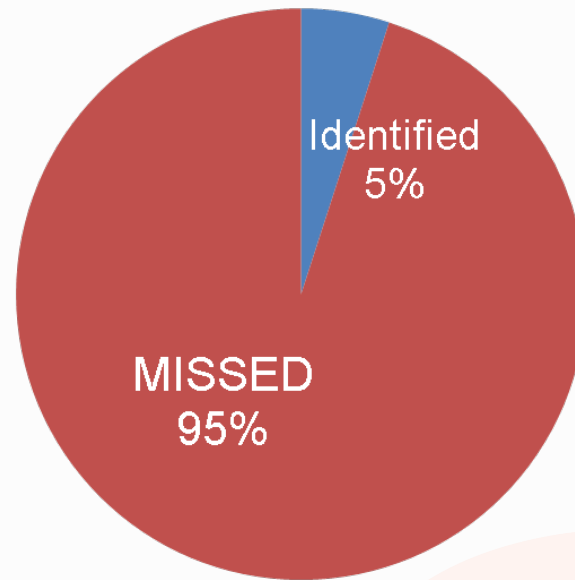
Urogenital Gonorrhea is common in MSM



2018 STD Surveillance. CDC

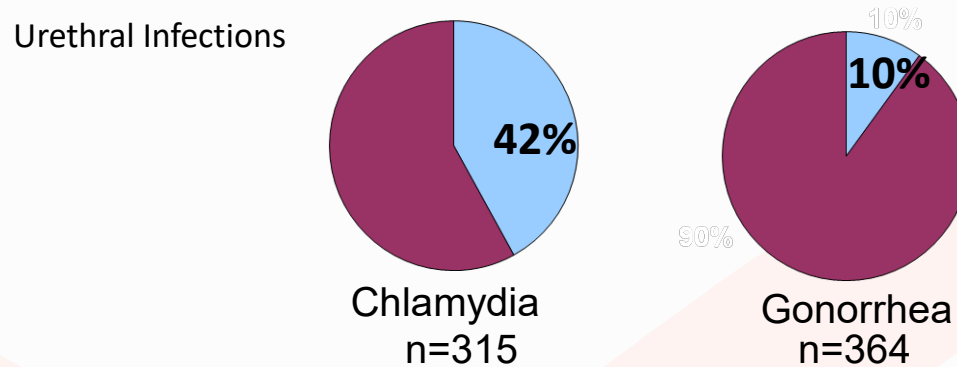
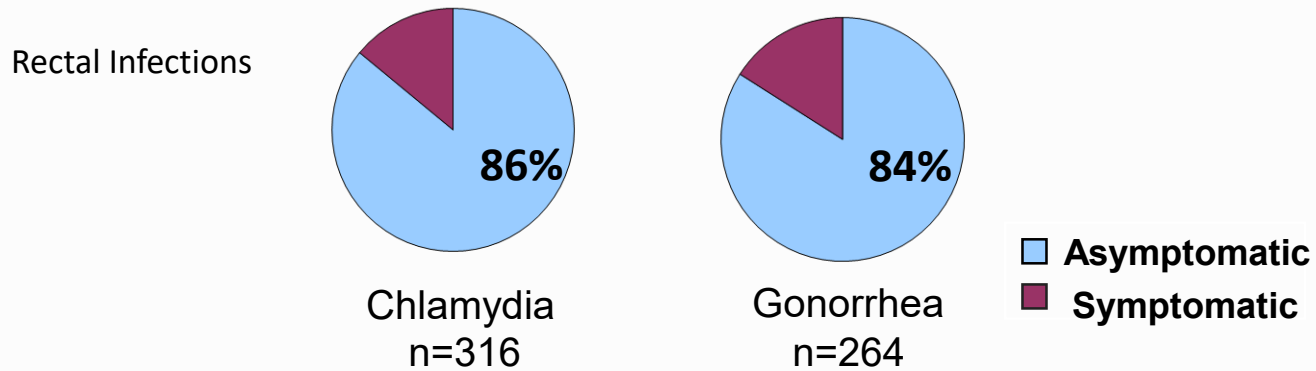
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Urogenital Gonorrhea is common in MSM, but extragenital infection is more common



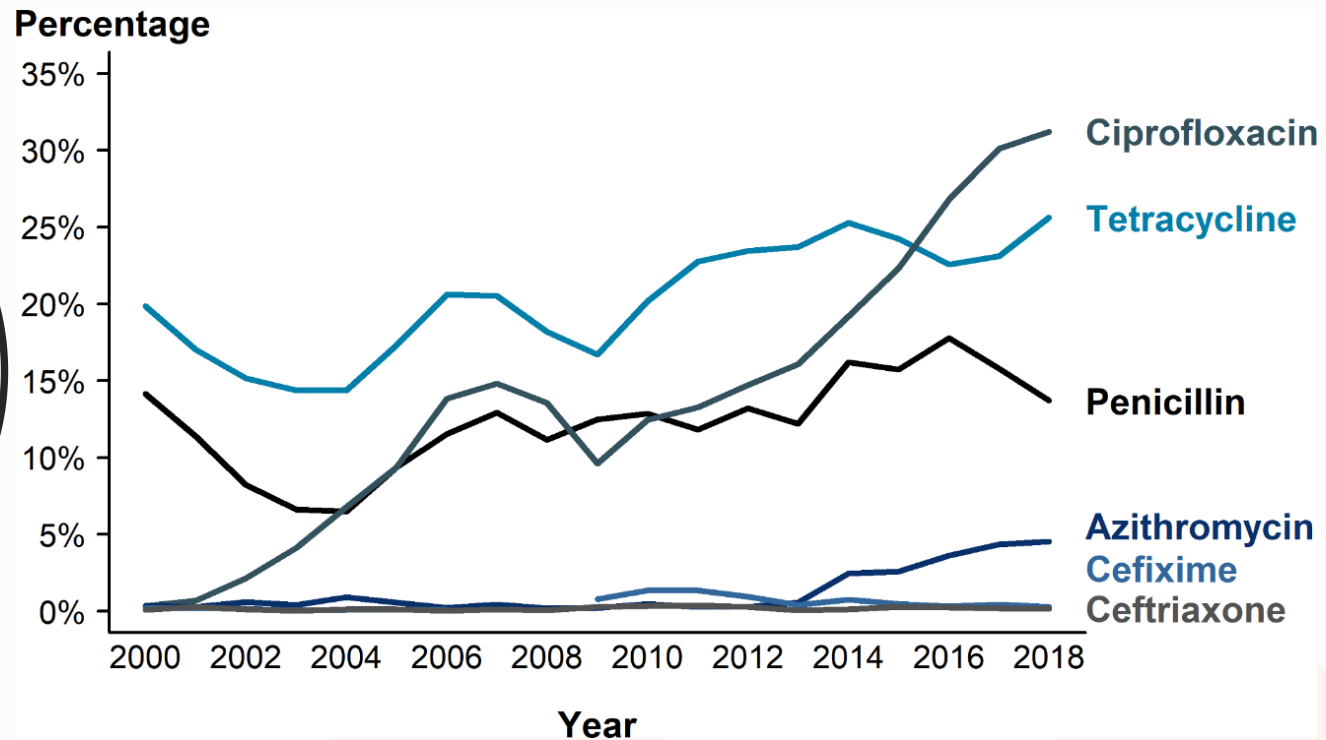
Gonorrhea

Majority of Rectal Infections in MSM are Asymptomatic



Source: Kent et al, CID, 2005.

Neisseria gonorrhoeae
—
Increasing Resistance



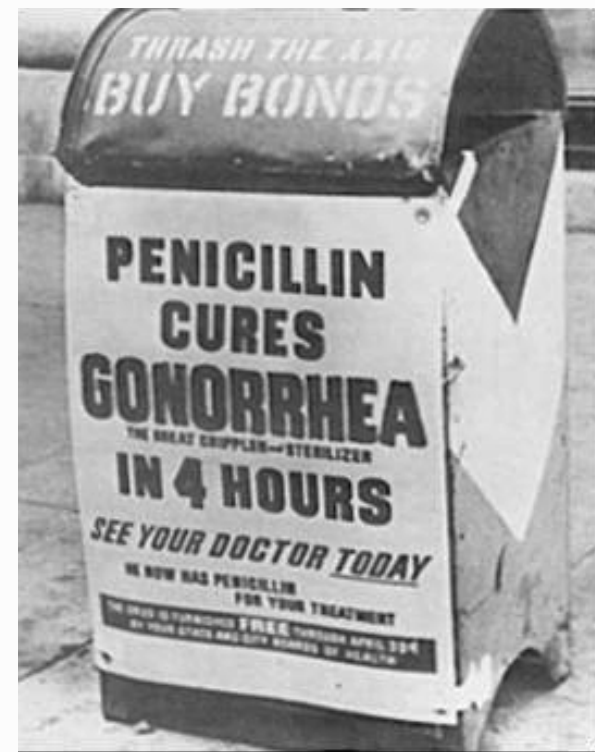
* Resistance = Fluoroquinolone (ciprofloxacin): MIC \geq 1.0 $\mu\text{g/mL}$; Penicillin: MIC \geq 2.0 $\mu\text{g/mL}$ or Beta-lactamase positive; Tetracycline: MIC \geq 2.0 $\mu\text{g/mL}$.

† Elevated MICs = Azithromycin: MIC \geq 1.0 $\mu\text{g/mL}$ (2000–2004), MIC \geq 2.0 $\mu\text{g/mL}$ (2005–2018); Ceftriaxone: MIC \geq 0.125 $\mu\text{g/mL}$; Cefixime: MIC \geq 0.25 $\mu\text{g/mL}$.

NOTE: Cefixime susceptibility was not tested in 2007 and 2008.

The Future of GC Treatment

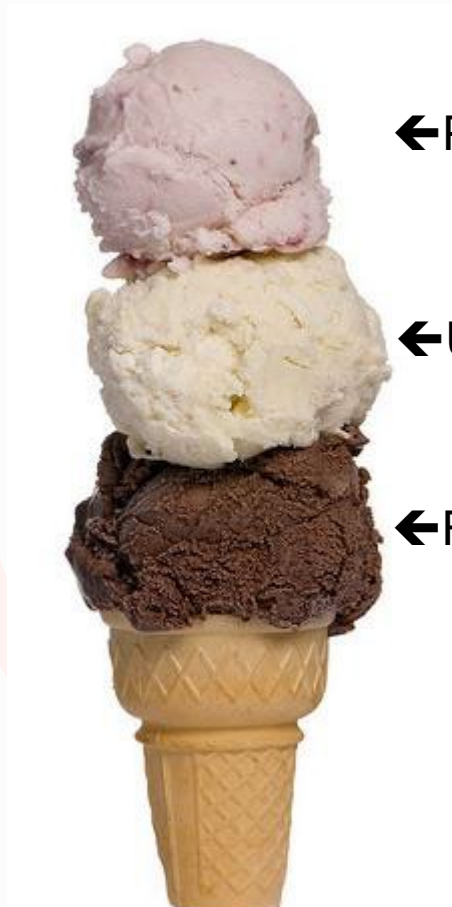
- Zoliflodacin (AZ D0914)
 - Topoisomerase Inhibitor
 - Activity at rectum; limited at pharynx
 - Activity against *C. trachomatis*, *M. genitalium*
 - Phase II trial completed (Taylor SA NEJM, 2018)
- Gepotidacin (BTZ116576)
 - Topoisomerase inhibitor
 - High efficacy potential – 3 separate ribosomal targets
 - Phase II trial completed (Taylor SA CID 2018)
- Solithromycin
 - Fluoroketolide; inhibits protein synthesis
 - Initial Ph 3 trial did not show non-inferiority to standard-of-care;
 - No resistance but given structural similarity to telithromycin, strain with high-level azithromycin resistance are a concern (Hook EW CID 2015)



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Screening MSM at Risk for GC, Treatment & Follow Up



← Pharyngeal GC

← Urine GC NAAT

← Rectal GC NAAT

Recommended First Line
Treatment:
Ceftriaxone 250 mg IM
Plus
Azithromycin 1 gm PO

Rescreen 3 months after
treatment

Source: Primary Care Guidelines for the Management of Persons Infected with HIV;
2015 CDC STD Prevention Guidelines

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Screening Gonorrhea

Women	<p>Sexually active women under 25 years of age¹</p> <hr/> <p>Sexually active women age 25 years and older if at increased risk⁹</p> <hr/> <p>Retest 3 months after treatment¹⁰</p>
Pregnant Women	<p>All pregnant women under 25 years of age and older women if at increased risk¹¹</p> <hr/> <p>Retest 3 months after treatment¹⁰</p>
Men Who have Sex With Men (MSM)	<p>At least annually for sexually active MSM at sites of contact (urethra, rectum, pharynx) regardless of condom use¹⁰</p> <hr/> <p>Every 3 to 6 months if at increased risk⁷</p>

T. pallidum



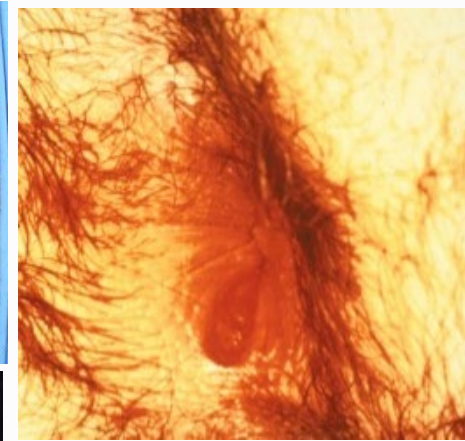
Natural History of Syphilis

20-50%



Primary Syphilis

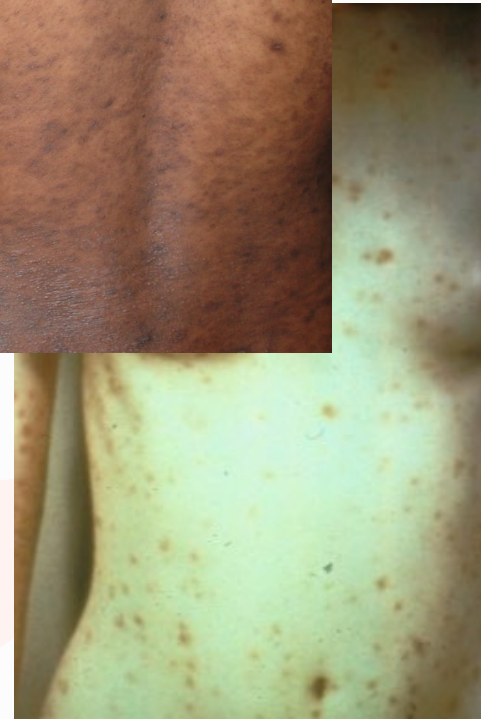
- Chancre
- Painless ulcer with heaped up borders
- Regional lymphadenopathy common
- Occurs at site of primary inoculation
- Heals in 2-6 weeks



CDC/NCHSTP/Division of STD Prevention, STD Clinical Slides, www.cdc.gov, Used with permission from Jeff Hill, DMD

Secondary Syphilis

- Skin Rash (can vary in presentation)
 - Widespread & symmetric
 - Pink, coppery, dusky red
 - Macular or papular
 - Non pruritic
 - Indurated
 - Superficial scale
- Fever
- Generalized lymphadenopathy



Secondary Syphilis

Palmar Rash



Nickel/Dime Lesions



Plantar Rash

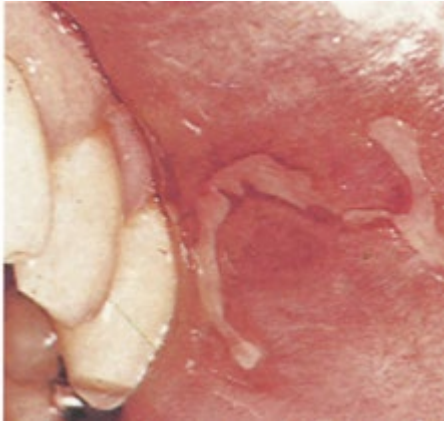


Alopecia



Secondary Syphilis

Mucus Patches



Condyloma Lata



- Other Manifestations
 - Meningitis
 - Iritis/Anterior Uveitis
 - Hepatitis
 - Periostitis
 - Nephropathy/Nephrotic Syndrome

Neurosyphilis

- Clinical signs
 - Cranial nerve dysfunction
 - Auditory abnormalities
 - Ophthalmic abnormalities
 - Meningitis
 - Stroke
 - Acute or chronic altered mental STATUS
 - Loss of vibration sense

Syphilis

2018 STD Surveillance

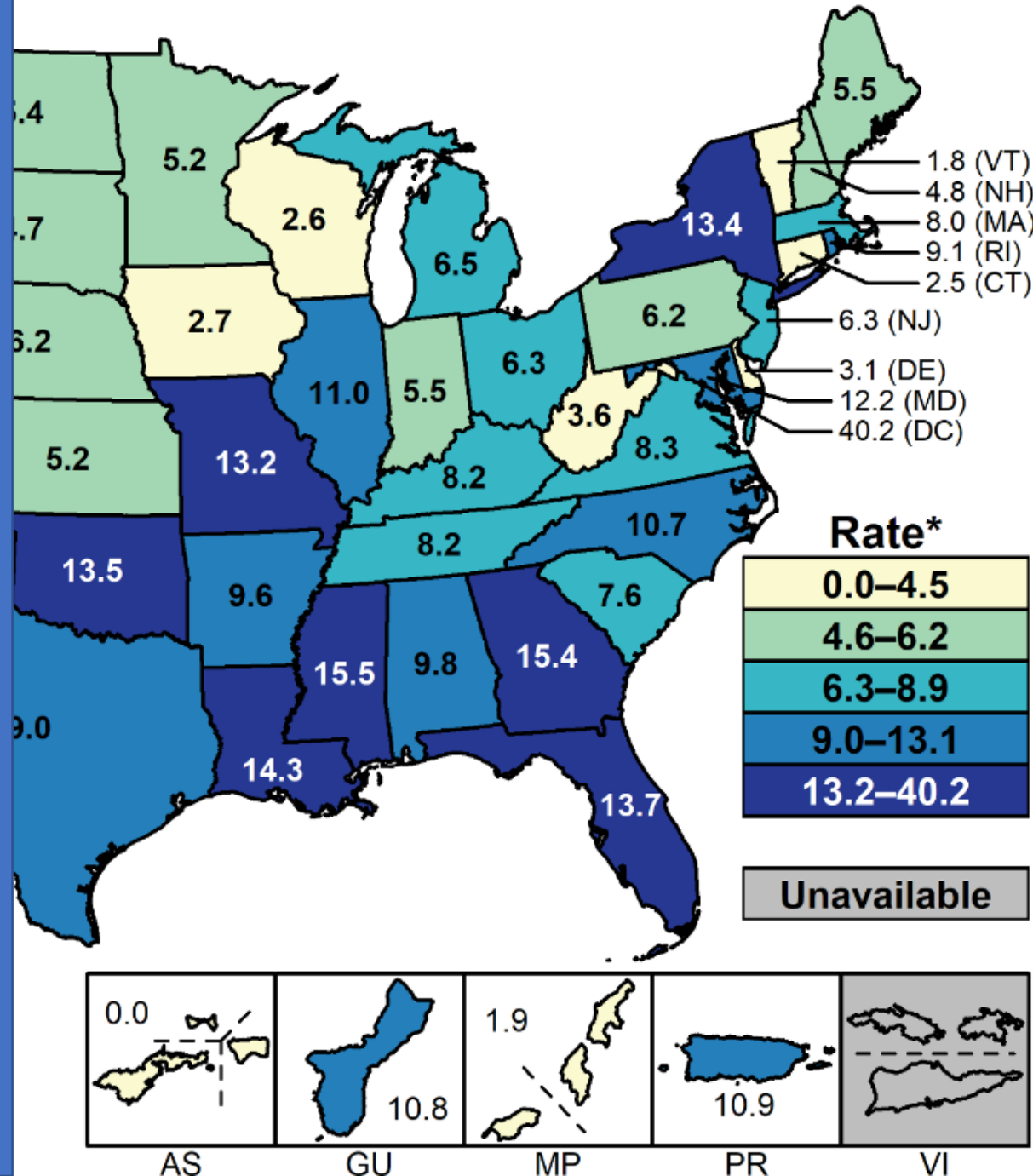
Increased among males and females, in all regions of the U.S. and among all racial/ethnic groups

MSM account for majority (53.5%) of reported cases of P&S Syphilis (41.6% also had HIV)

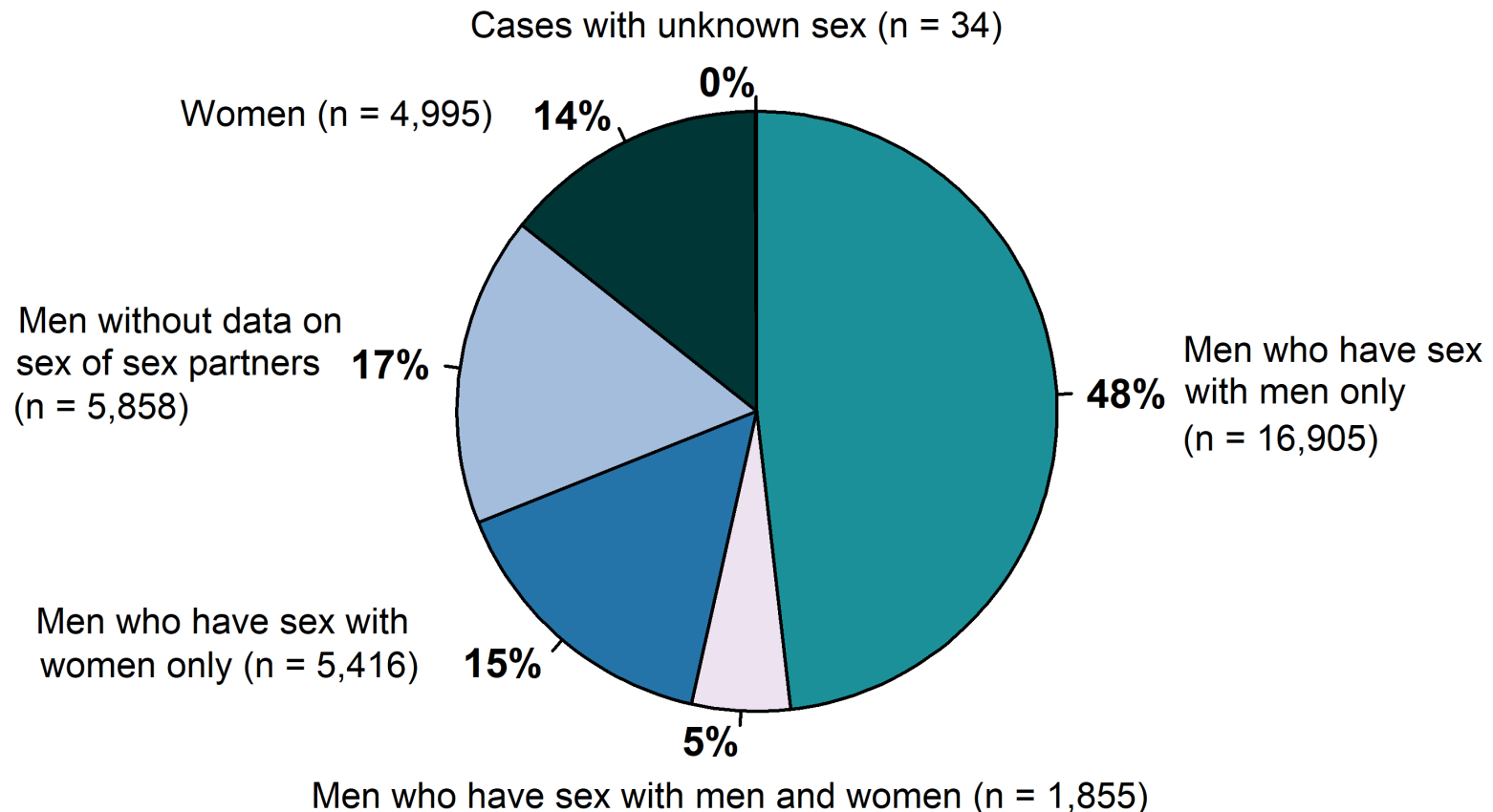
Rapidly expanding heterosexual epidemic (172.7% among women, 2014-2018).

SE AETC States and Syphilis Rate Ranking

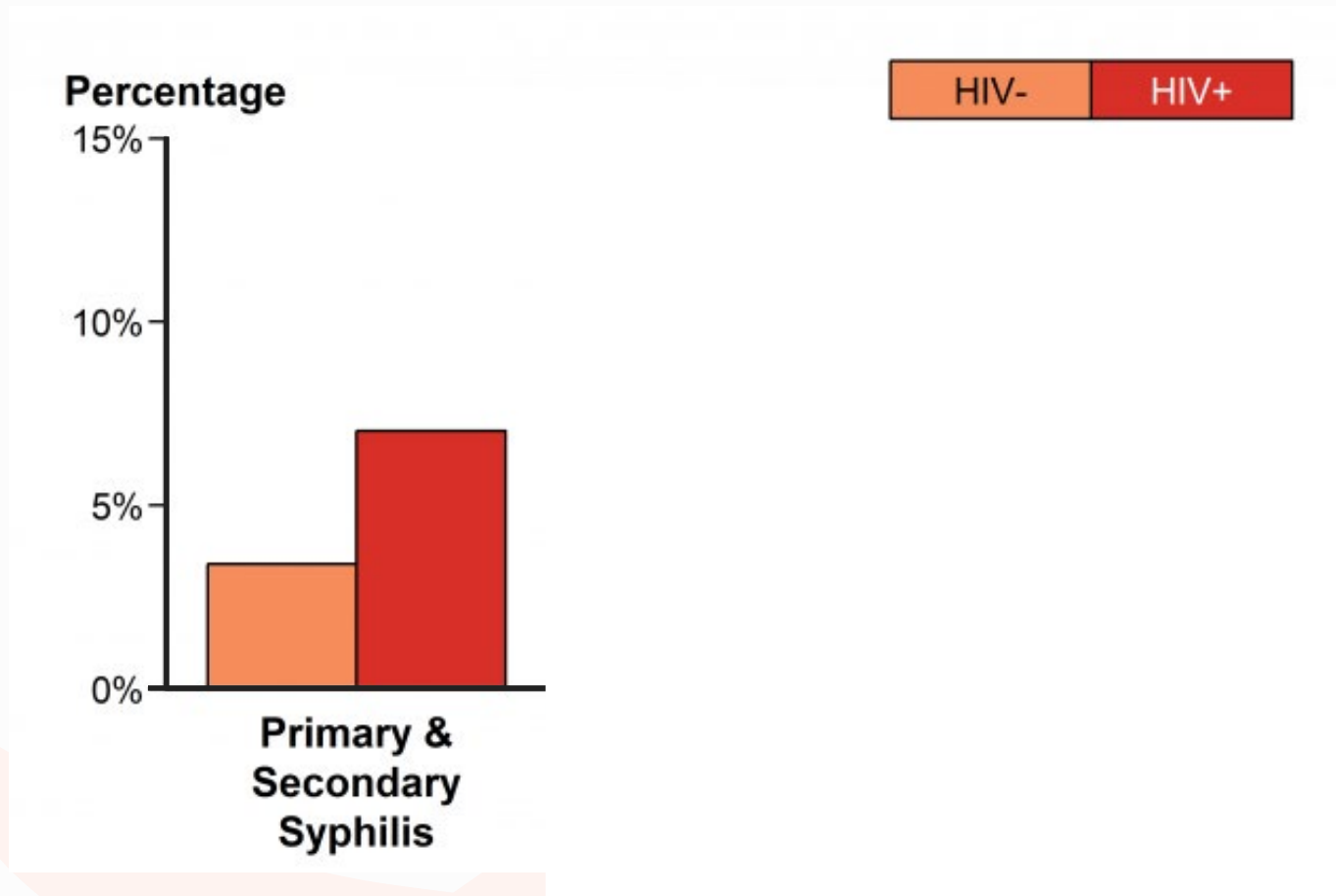
- Alabama = 17th
- Florida = 8th
- Kentucky = 23rd
- Georgia = 4th
- Mississippi = 3rd
- North Carolina = 15th
- South Carolina = 25th
- Tennessee = 22nd



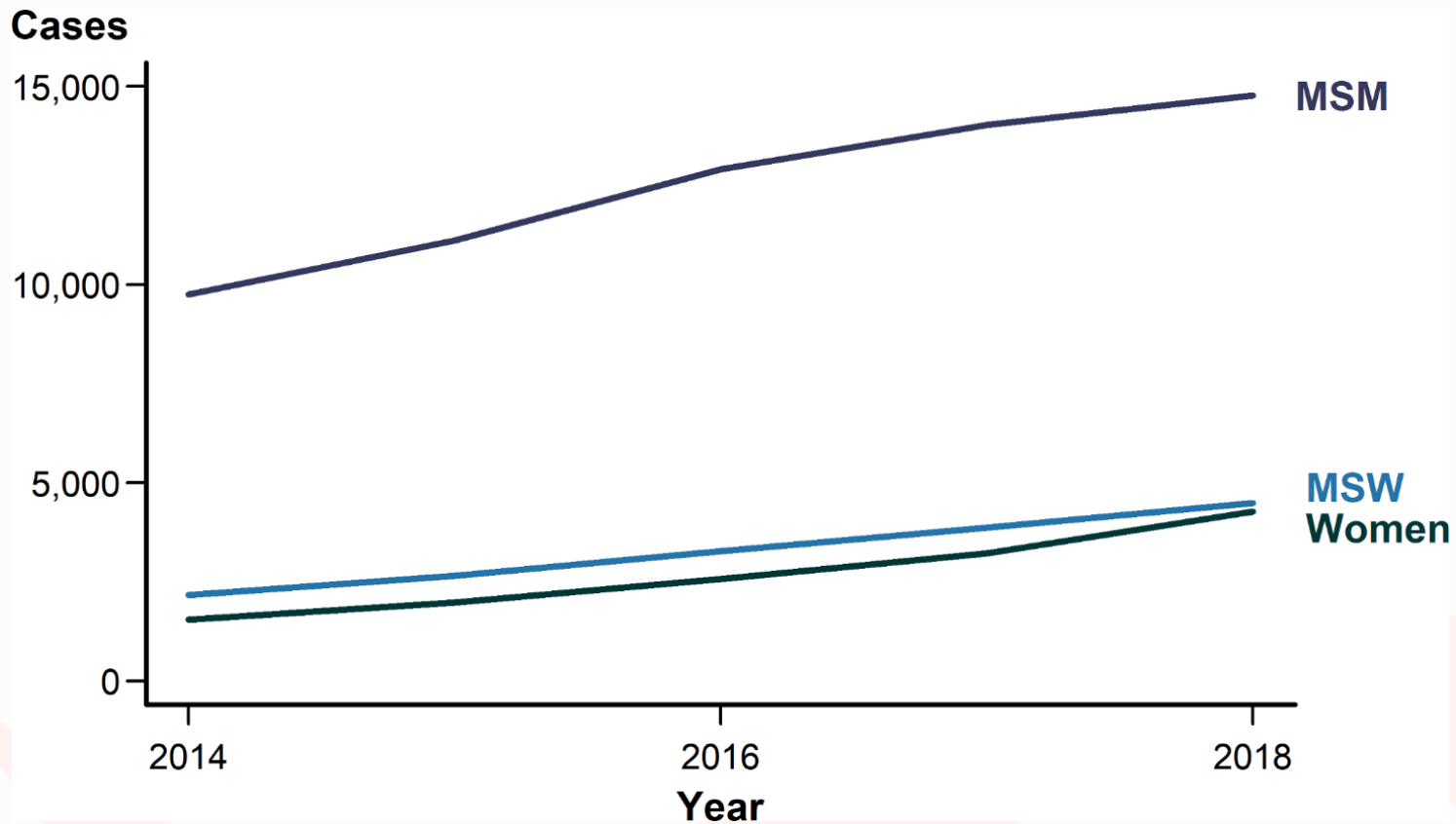
Primary and Secondary Syphilis Cases by Sex and Sex of Partners (2018)



Syphilis is common in MSM



Primary and Secondary Syphilis — Rates are Rising in All Sexual Behavior Groups



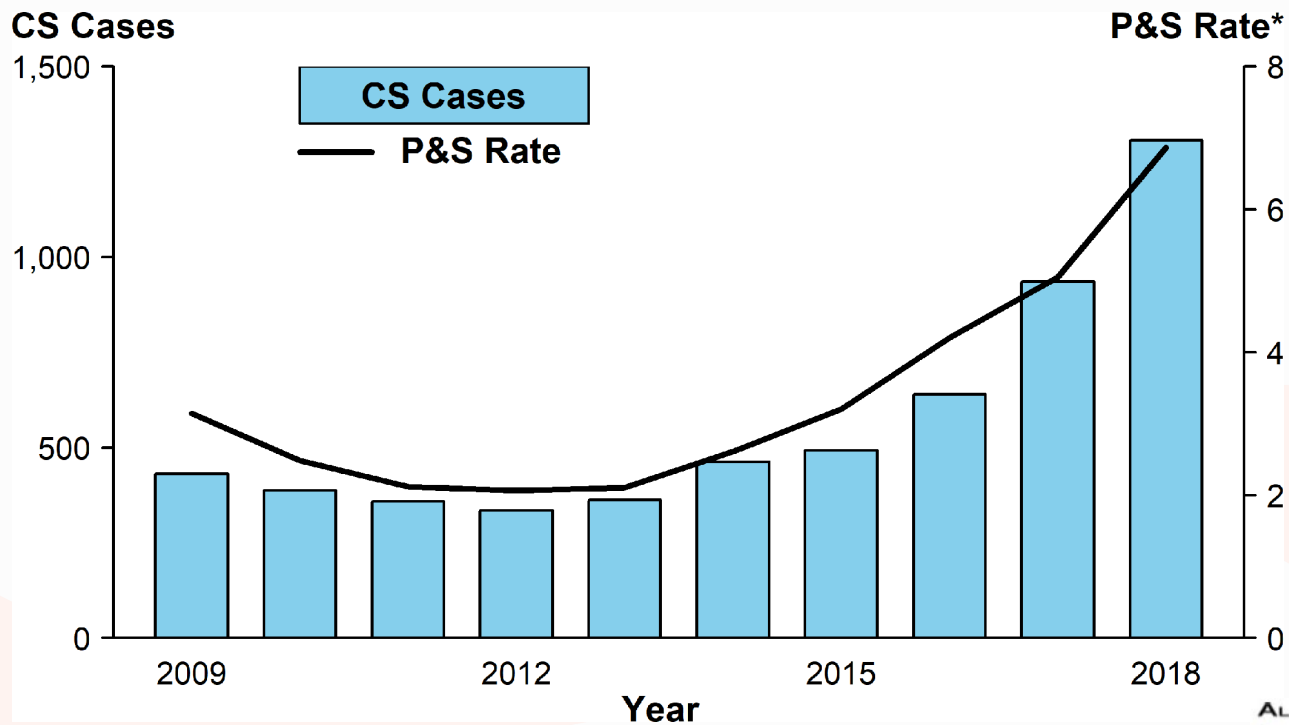
* 36 states were able to classify $\geq 70\%$ of reported cases of primary and secondary syphilis as either MSM, MSW, or women for each year during 2014–2018.

ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.

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Congenital Syphilis and Reported Cases of Primary and Secondary Syphilis Among Females are increasing

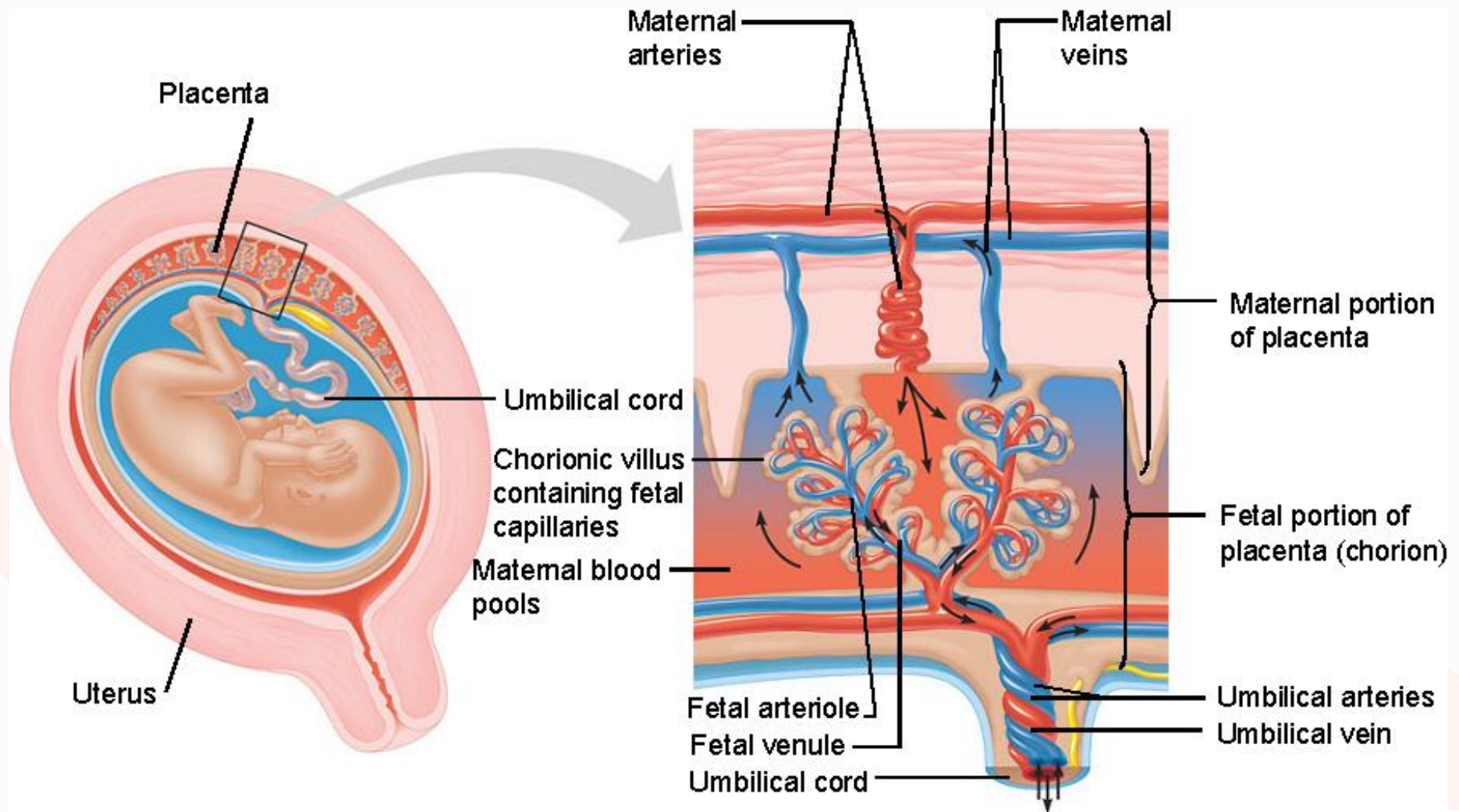


* Per 100,000.

ACRONYMS: CS = Congenital syphilis; P&S = Primary and secondary syphilis.

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Pregnancy Outcomes in Untreated Syphilis

Pregnancy Outcome	Early Syphilis	Late Syphilis
Stillborn	25%	12%
Neonatal Death	14%	9%
Syphilitic Infant	41%	2%
Nonsyphilitic Infant	20%	77%

Ingraham NR Acta Derm Venereol. 1959, 31 (Suppl 24) 60

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**Which factors
put US women at
risk of acquiring
syphilis?**



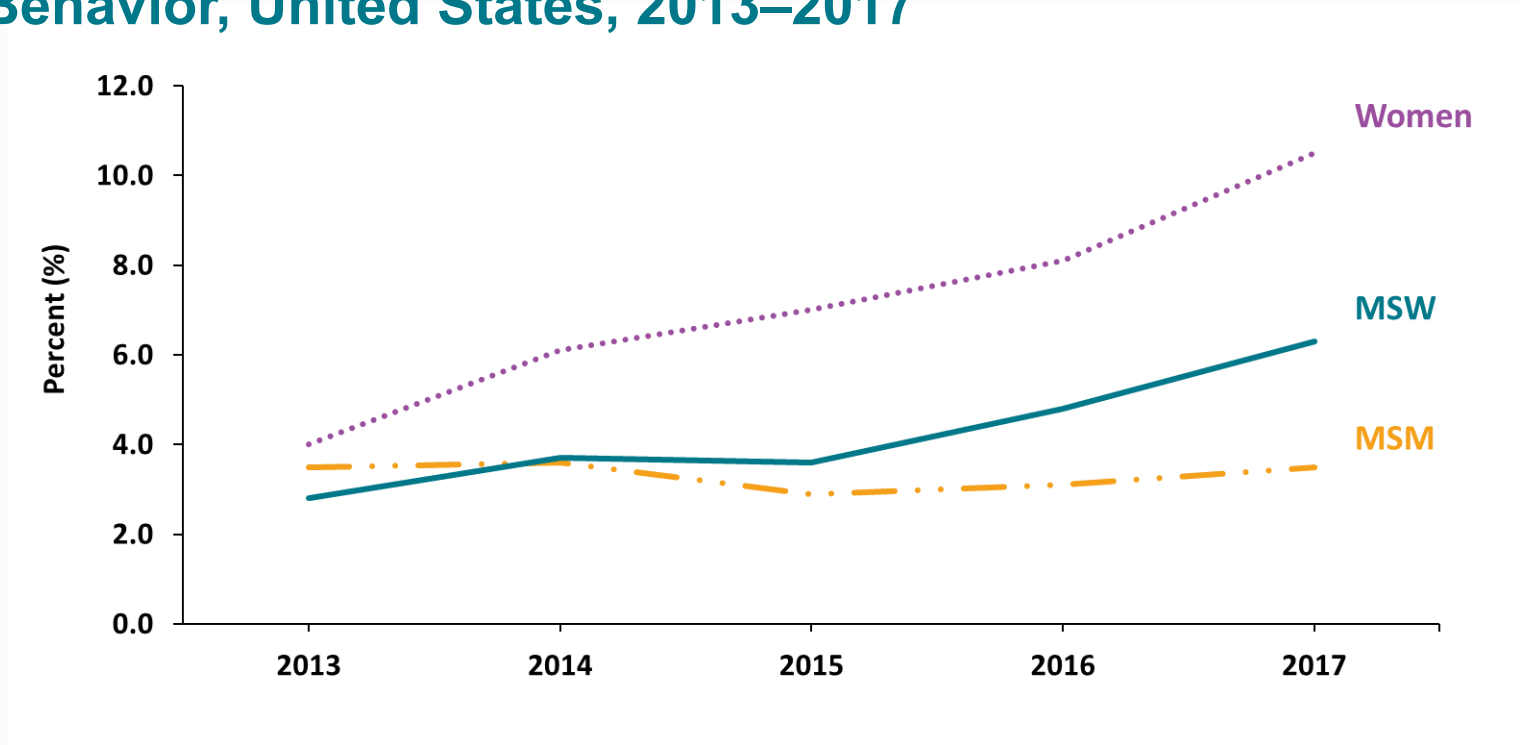
Downstream CS Prevention During Pregnancy Occurs through Four Primary Prevention Opportunities

Factors Associated with Congenital Syphilis (CS) Cases:

Mothers of Reported Congenital Syphilis Cases (n=628), 2016

Missed Prevention Opportunities	%	N
Prenatal Care: Received late or no prenatal care	34%	215
Screening: Received prenatal care, but not screened in time to treat CS	8%	51
Treatment: Positive initial screening test, but inadequate treatment for CS	18%	111
Re-screening: Negative initial screening test, but later infected and not diagnosed until delivery	16%	101

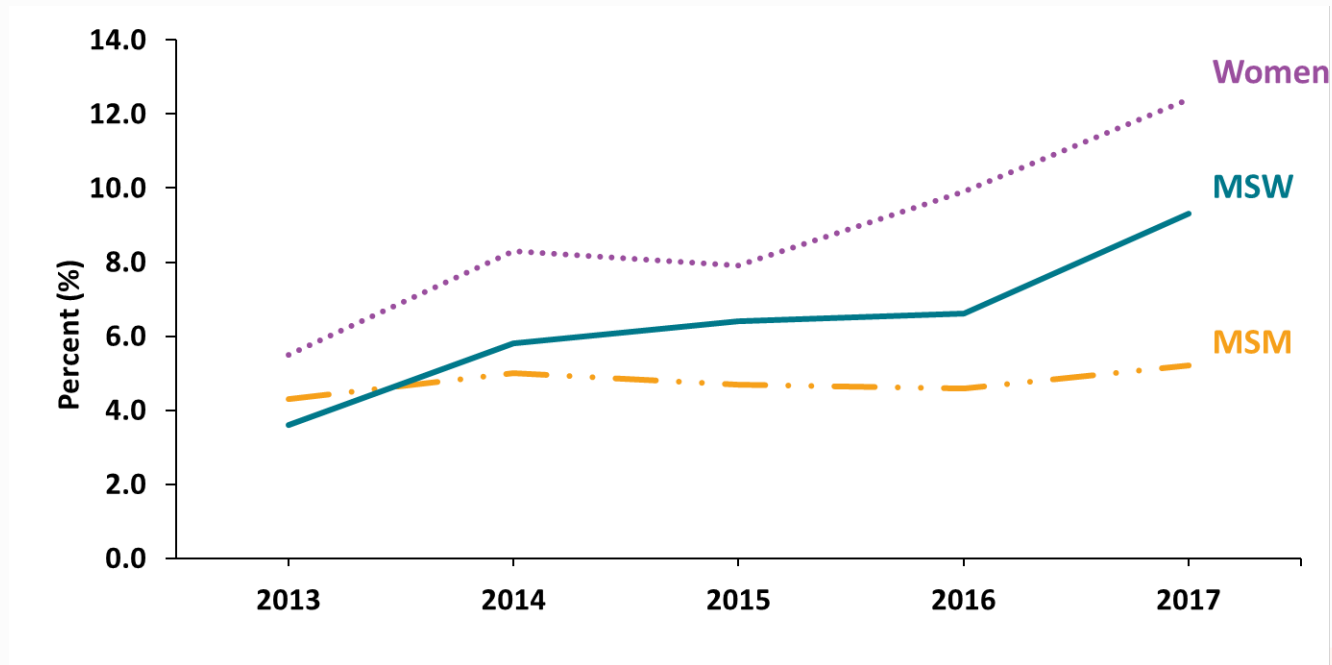
Reported Injection Drug Use* Among Reported Primary and Secondary Syphilis Cases by Sex and Sexual Behavior, United States, 2013–2017



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

Abbreviations: MSM = gay, bisexual, or other men who have sex with men; MSW = men who have sex with women only.

Reported Sex with a PWID* Among Reported Primary and Secondary Syphilis Cases by Sex and Sexual Behavior, United States, 2013–2017



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

Abbreviations: MSM = gay, bisexual, or other men who have sex with men; MSW = men who have sex with women only; PWID = person who injects drugs.

CDC Guidelines

Syphilis Screening in Pregnancy

- Screen in 1st Trimester
- Screen in 3rd Trimester if at increased risk

Syphilis Screening in Pregnancy

Legal requirements for syphilis screening among pregnant women by time of test and state, 2018

X = Screening Required

O = Screening Required only if at increased risk

State	First Visit	Third Trimester	Delivery
<i>Alabama</i>	X	O	X
<i>Florida</i>	X	X	O
<i>Georgia</i>	X	X	O
<i>Kentucky</i>	X		
<i>Mississippi</i>			
<i>North Carolina</i>	X	X	X
<i>South Carolina</i>	X		
<i>Tennessee</i>	X	O	

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Screening Syphilis

Pregnant Women	<p>All pregnant women at the first prenatal visit¹¹</p> <hr/> <p>Retest early in the third trimester and at delivery if at high risk¹²</p>
Men Who have Sex With Men (MSM)	<p>At least annually for sexually active MSM¹³</p> <hr/> <p>Every 3 to 6 months if at increased risk⁷</p>
Persons with HIV	<p>For sexually active individuals, screen at first HIV evaluation, and at least annually thereafter^{14,15,16}</p> <hr/> <p>More frequent screening might be appropriate depending on individual risk behaviors and the local epidemiology¹³</p>

First Line Syphilis Treatment

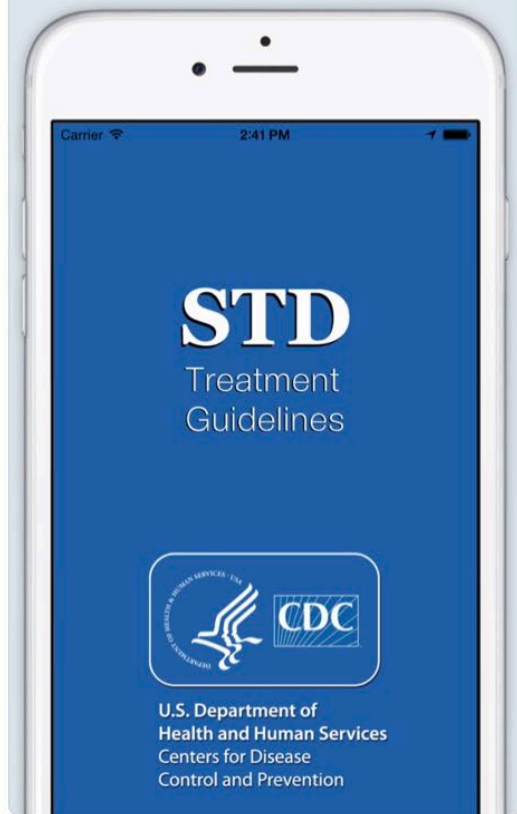
- Primary, secondary, or early latent (<1 year)
 - Benzathine penicillin G 2.4 million units IM in a single dose
- Latent (> 1 year, latent of unknown duration)
 - Benzathine penicillin G 2.4 million units IM in 3 doses each at 1 week intervals (7.2 million units total)
- Pregnancy
 - Penicillin. Treat with regimen appropriate for stage of syphilis
- Neurosyphilis
 - Aqueous crystalline penicillin G, 18-24 million units per day, administered as 3-4 million units IV every r hours or continuous infusion for 10-14 days
- Congenital Syphilis: Refer to the STD Treatment Guidelines

Objectives

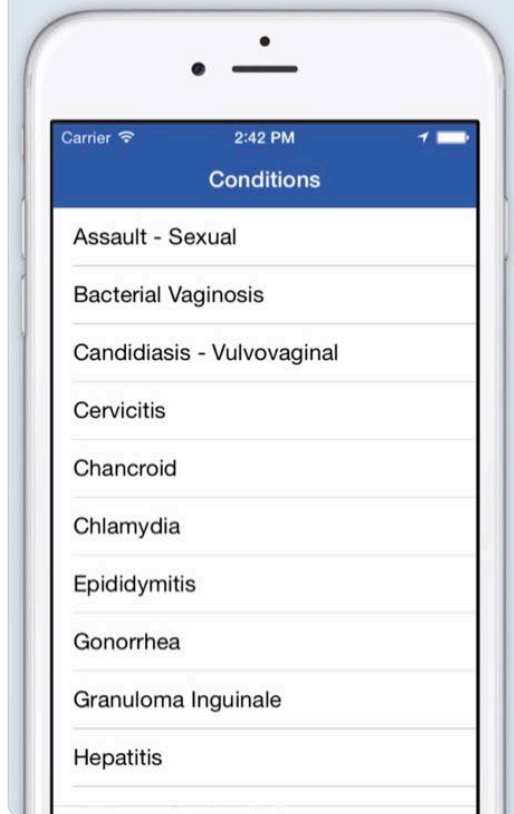
- Describe the current landscape of STI in the US and Southeast
- Discuss the STI and HIV syndemic and **rates of STIs among persons living with HIV**
- Identify practical ways to address the STI epidemic in clinical care
 - **Know the screening and treatment guidelines**



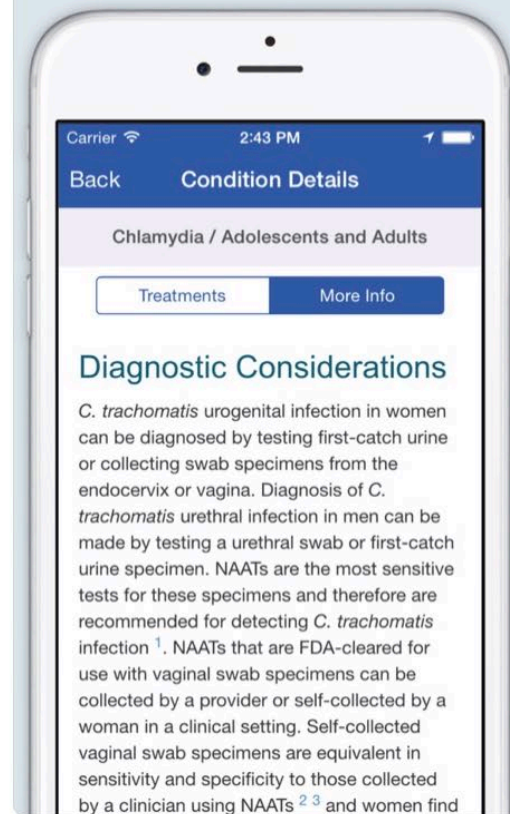
Designed and Developed by CDC



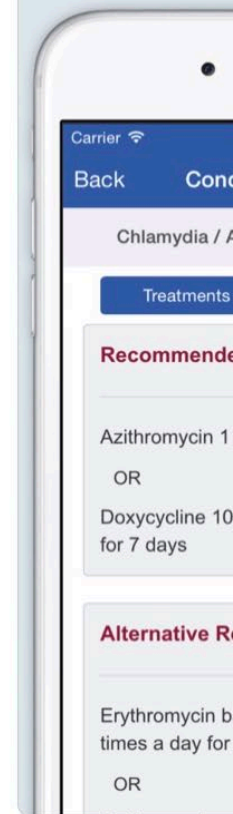
Fast Access to Conditions



Explore Related Content



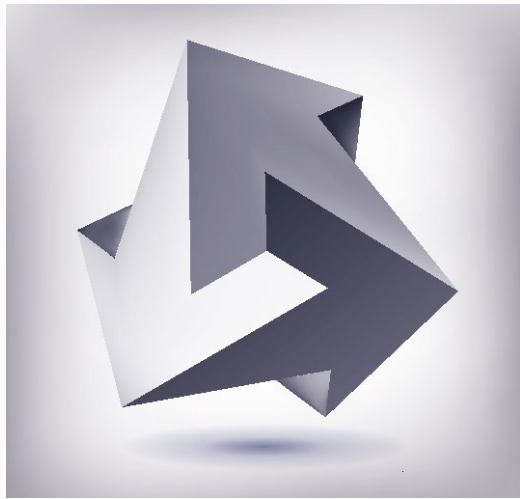
View Treatments



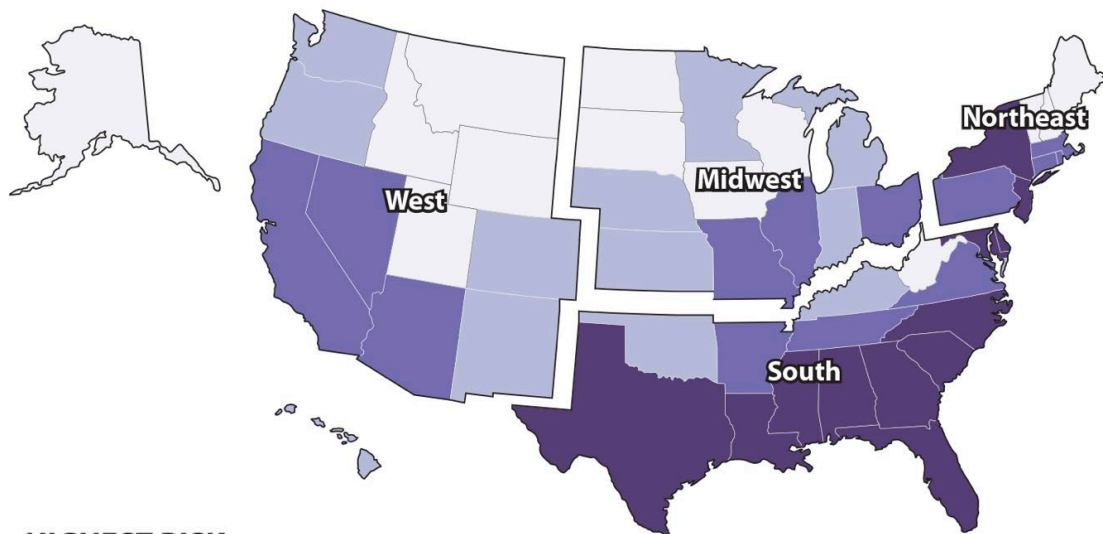
Screen, Manage, and Treat
According to the STD Treatment
Guidelines

Objectives

- Describe the current landscape of STI in the US and Southeast
- **Discuss the STI and HIV syndemic and** rates of STIs among persons living with HIV
- **Identify practical ways to address the STI epidemic in clinical care**
 - Know the screening and treatment guidelines



Lifetime Risk of HIV Diagnosis by State



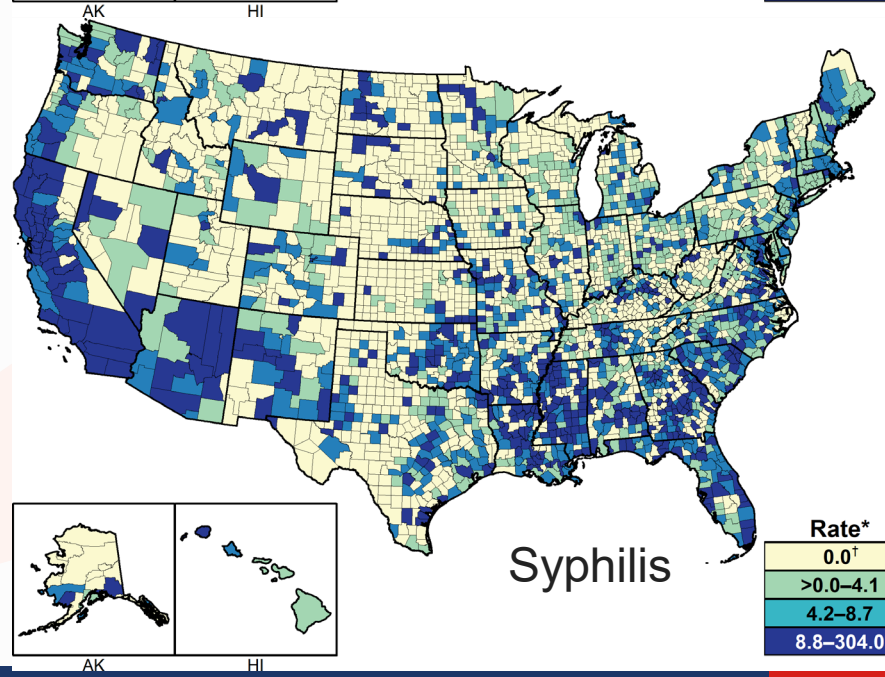
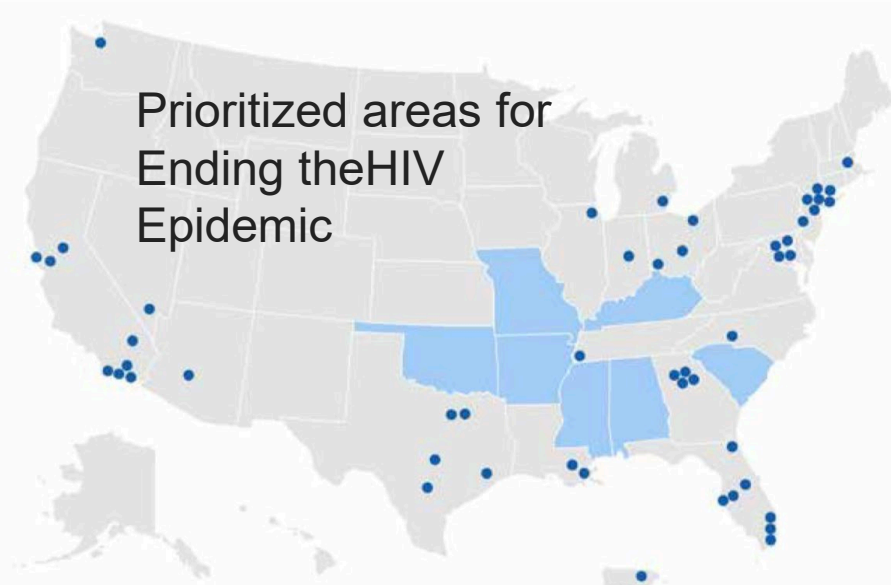
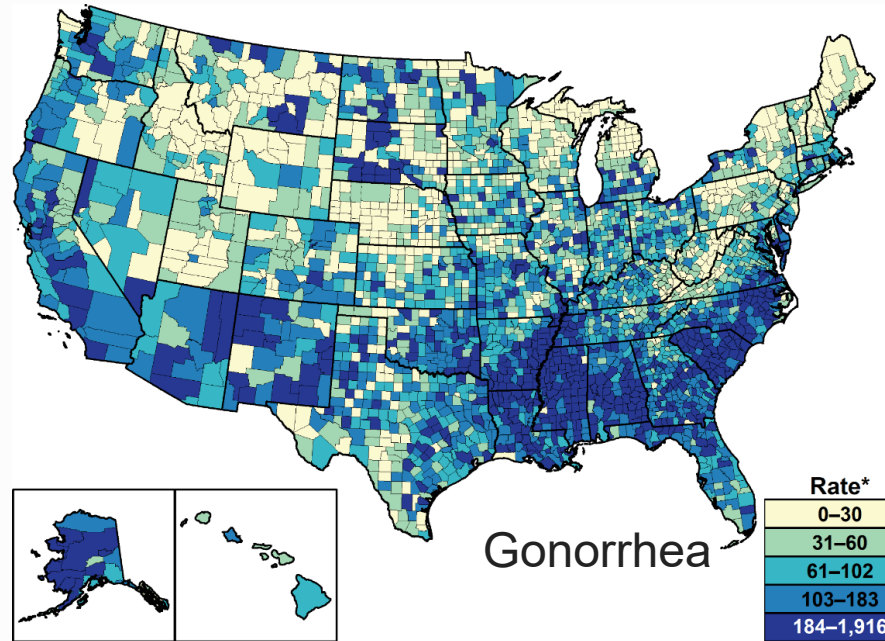
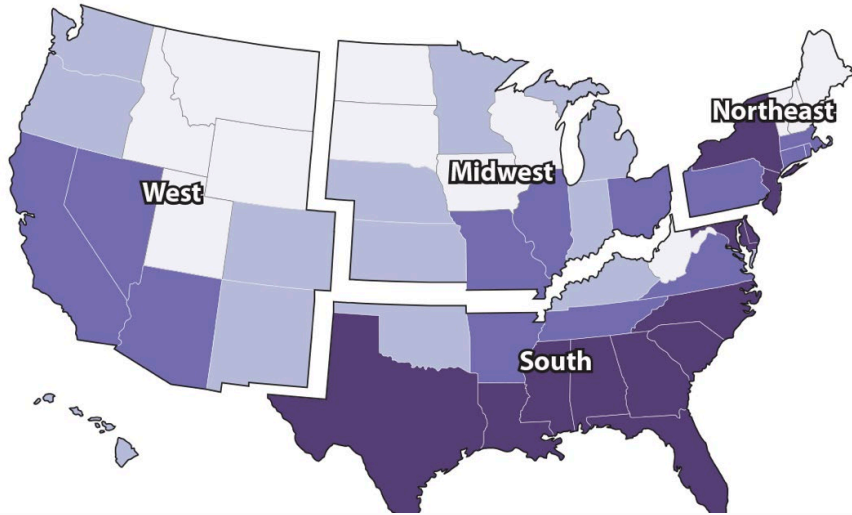
HIGHEST RISK

LOWEST RISK

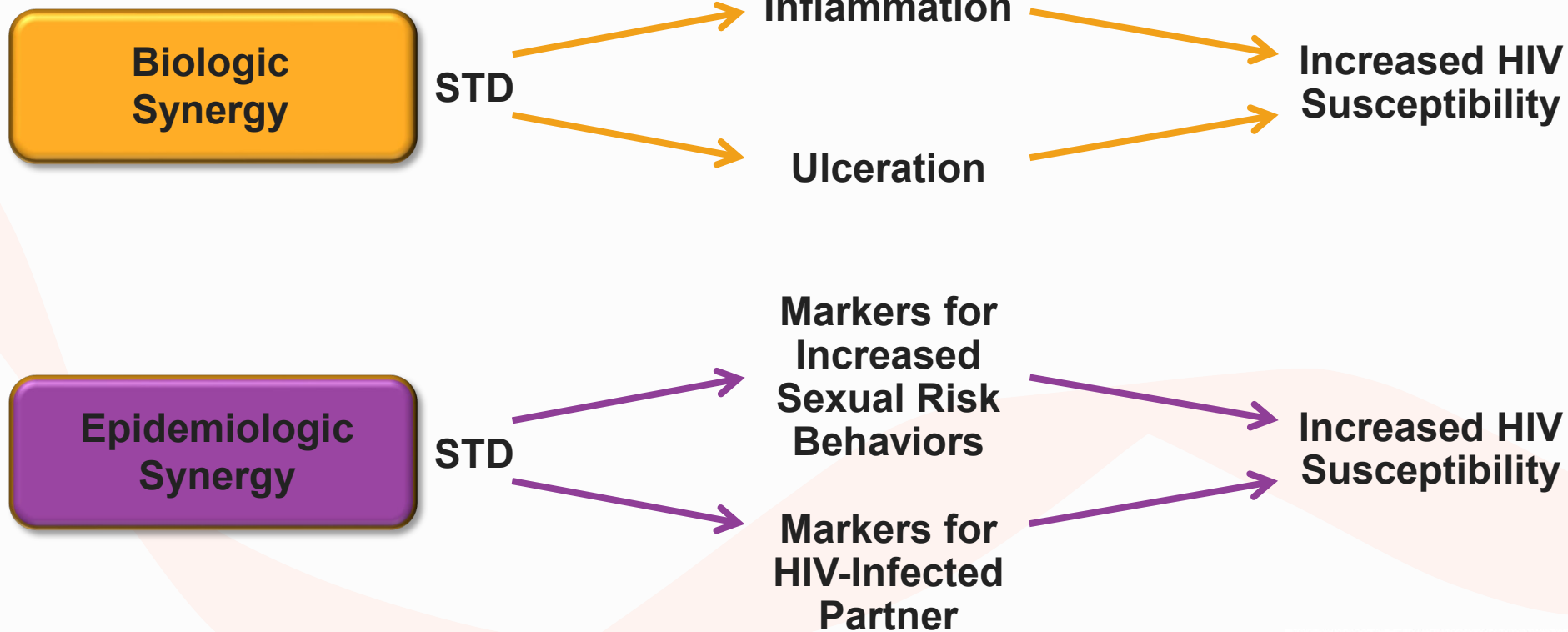
State	One in "n"	State	One in "n"	State	One in "n"	State	One in "n"
District of Columbia	13	Nevada	98	Michigan	167	West Virginia	302
Maryland	49	Illinois	101	Oklahoma	168	Wisconsin	307
Georgia	51	California	102	Kentucky	173	Iowa	342
Florida	54	Tennessee	103	Indiana	183	Utah	366
Louisiana	56	Pennsylvania	115	Washington	185	Maine	373
New York	69	Virginia	115	Colorado	191	Alaska	384
Texas	81	Massachusetts	121	New Mexico	196	South Dakota	402
New Jersey	84	Arizona	138	Hawaii	202	New Hampshire	411
Mississippi	85	Connecticut	139	Oregon	214	Wyoming	481
South Carolina	86	Rhode Island	143	Minnesota	216	Vermont	527
North Carolina	93	Ohio	150	Kansas	262	Idaho	547
Delaware	96	Missouri	155	Nebraska	264	Montana	578
Alabama	97	Arkansas	159			North Dakota	670

Source: Centers for Disease Control and Prevention

Lifetime Risk of HIV Diagnosis by State



STI and HIV: Biologic and Epidemiologic Interactions That Facilitate HIV Transmission/Acquisition



Mayer KH, et al. *Am J Reprod Immunol*. 2011;65:308-316.
Mayer KH, et al. *J Int AIDS Soc*. 2018;21(7):e25164.

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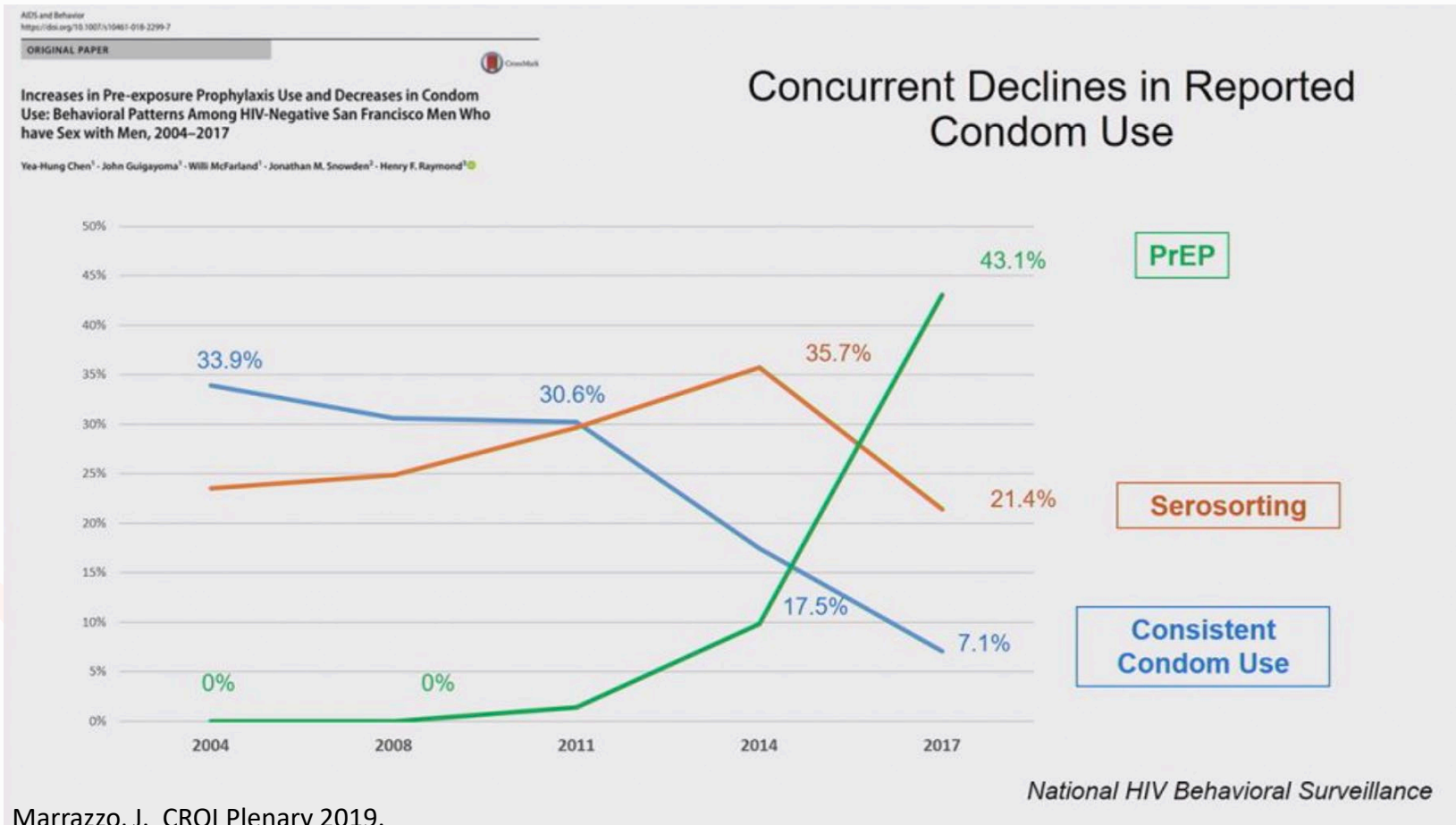


When taken consistently,
PrEP reduces risk of
HIV infection by
90-100%
among cisgender MSM,
heterosexual men & women,
and transgender women.

(**84%** among people who
inject drugs)

Grant RM, et al. *NEJM*. Dec 2010;363(27):2587-99
Baeten JM, et al. *NEJM*. Aug 2012;367(5):399-410
Grant RM, et al. *Lancet Inf Dis*. Sep 2014;14(9):820-9
Martin M, et al. *AIDS*. Apr 2015;29(7):819-24

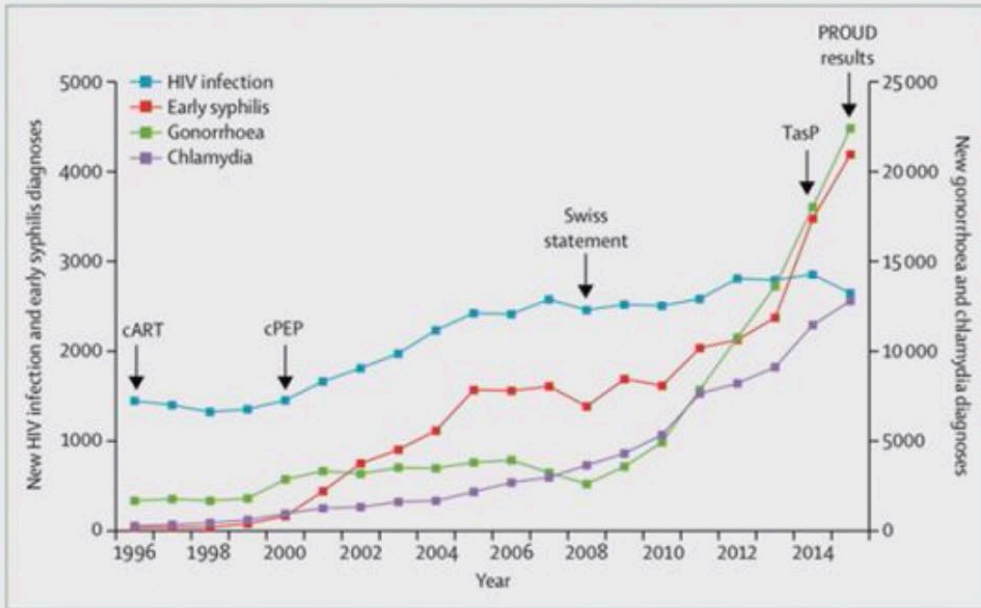
Condom Use is Declining



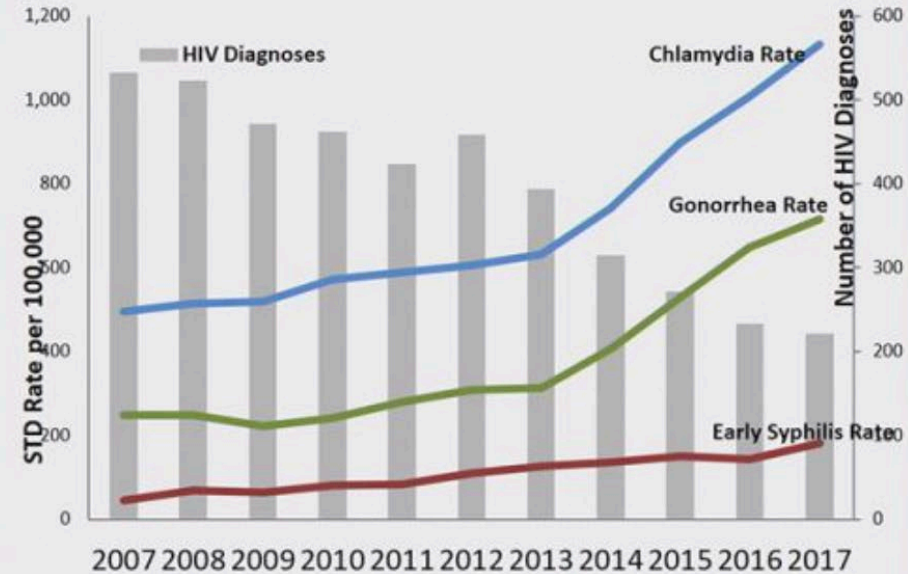
Marrazzo, J. CROI Plenary 2019.

HIV Rates are Stable & STI Rates are Increasing

MSM in England



San Francisco, U.S.

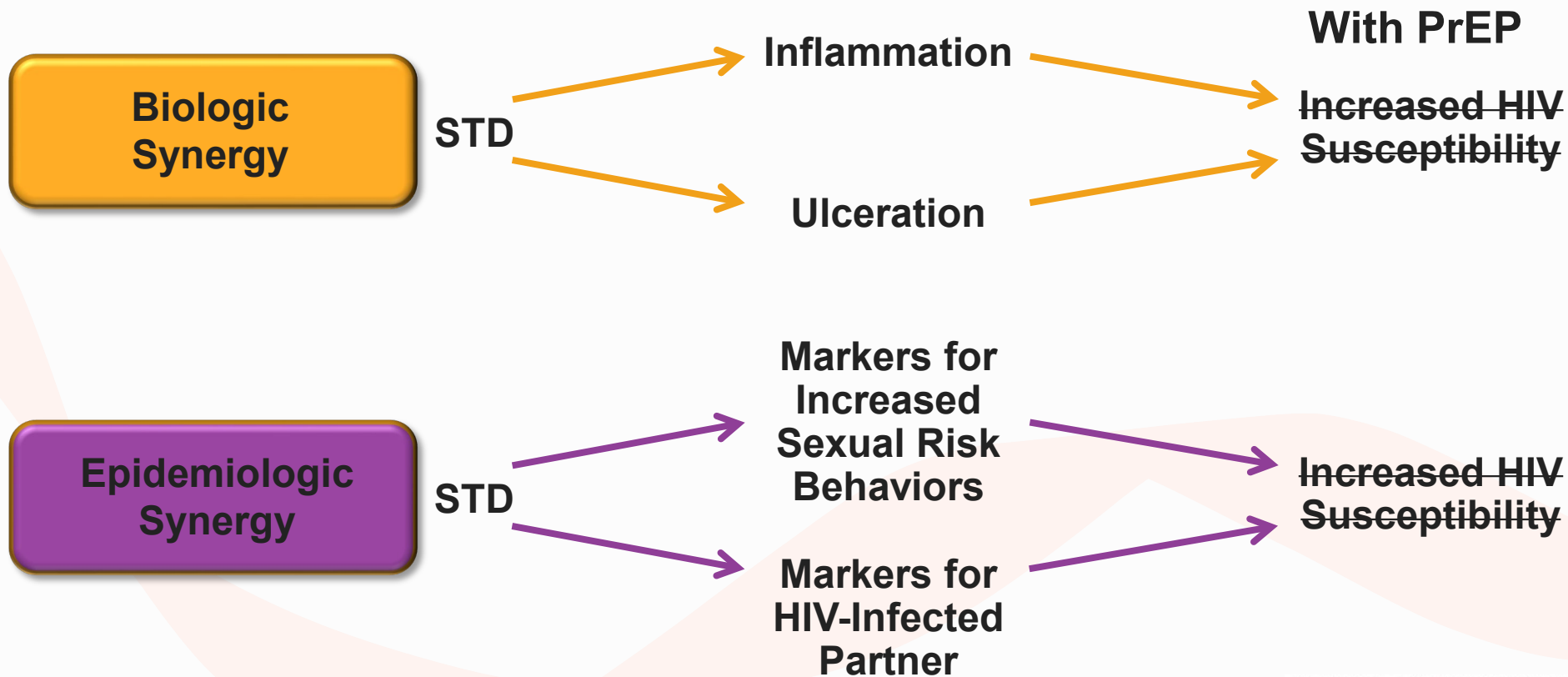


Unemo, M. et al. Lancet 2017

Susan Philip, MD SFDPH

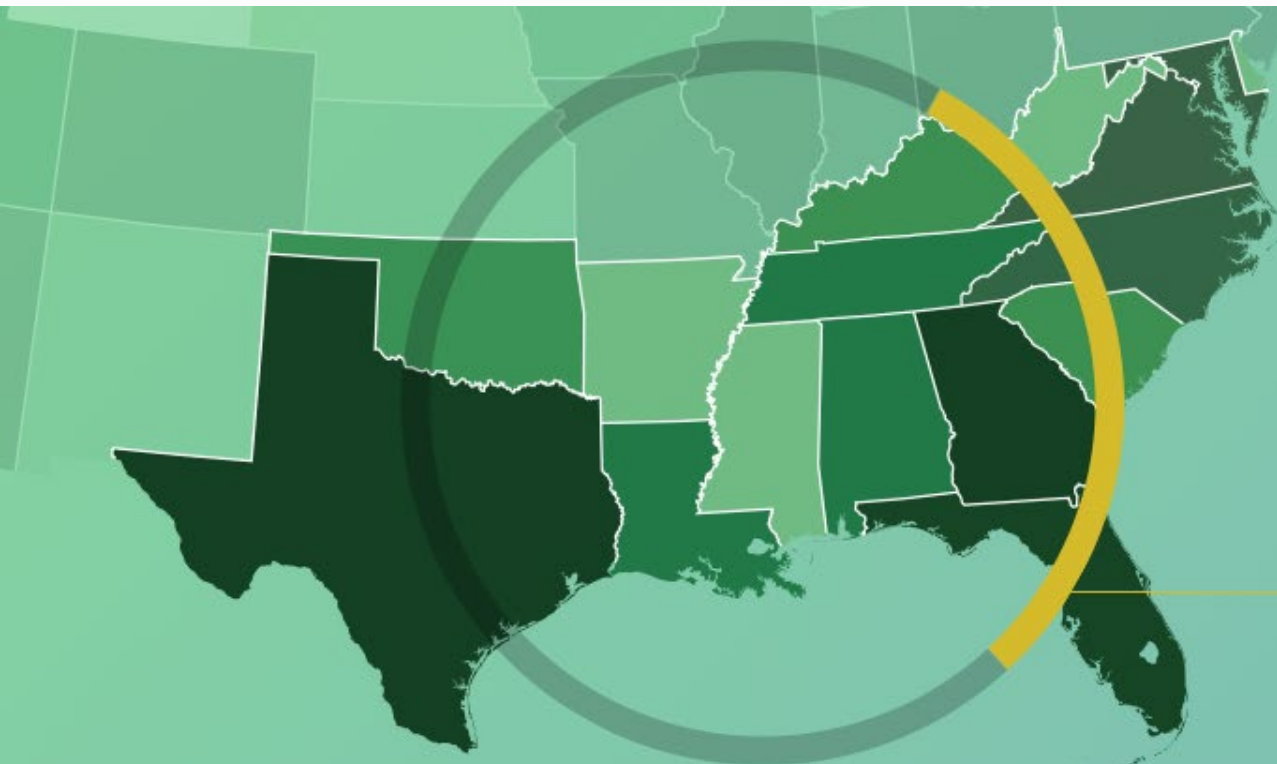
Marrazzo, J. CROI Plenary 2019

STI and HIV: Biologic and Epidemiologic Interactions That Facilitate HIV Transmission/Acquisition



Mayer KH, et al. *Am J Reprod Immunol*. 2011;65:308-316.
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The South accounted for **more than half** of all new HIV diagnoses in the U.S. in 2016, yet only

30% of all PrEP users

Number of Persons Using PrEP by State, 2016

0-26	27-55	56-82	83-148	149-210	211-323	324-526	527-941	942-1700	1701+
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The science is clear: with HIV, undetectable equals untransmittable

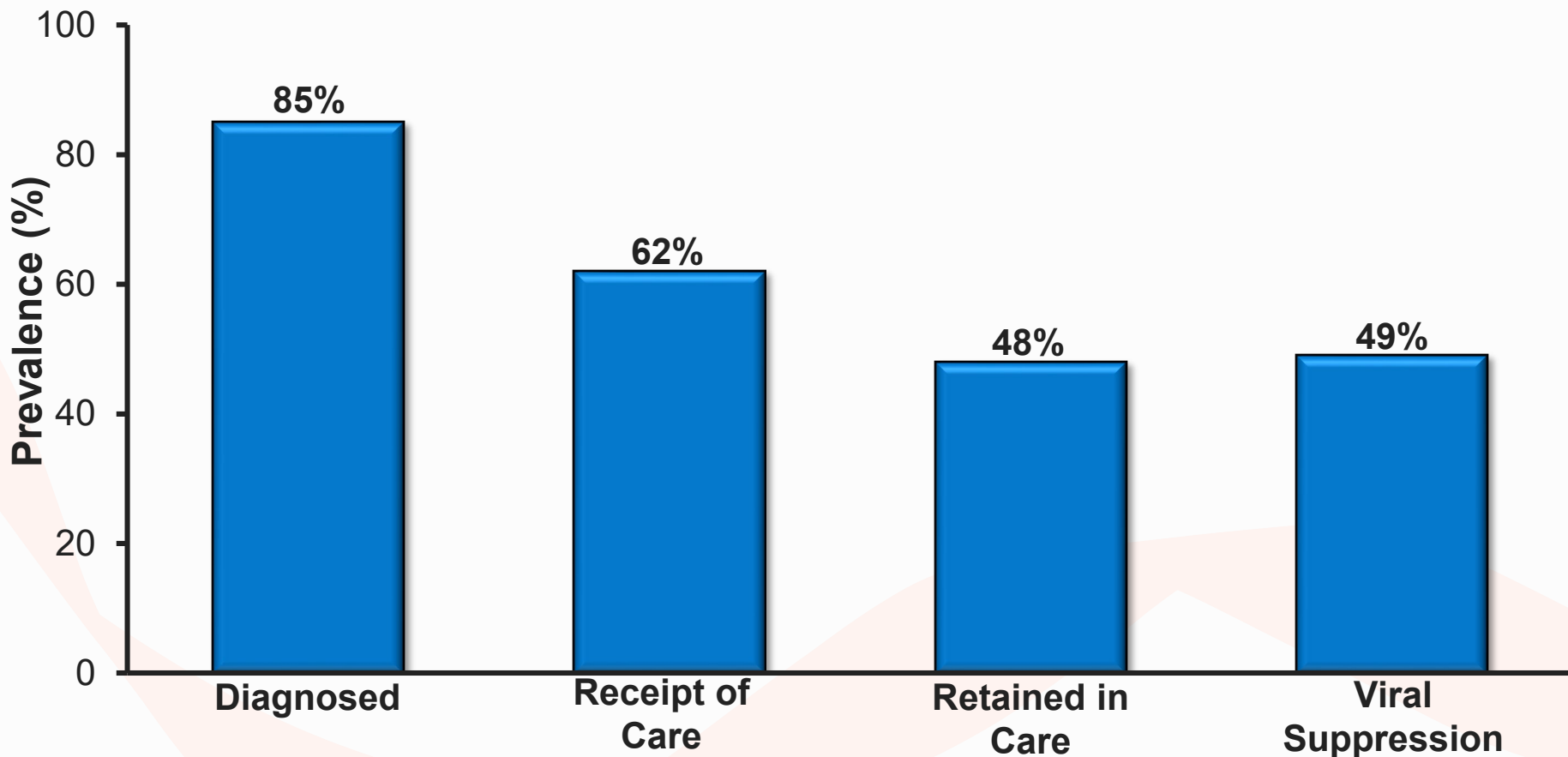
NIH officials discuss scientific evidence and principles underlying the U=U concept.



<https://www.nih.gov/news-events/news-releases/science-clear-hiv-undetectable-equals-untransmittable>

Many Persons With HIV Are Not Engaged in HIV Care, on Treatment, or Virally Suppressed

PLWH (Diagnosed or Undiagnosed; Year-End 2014)



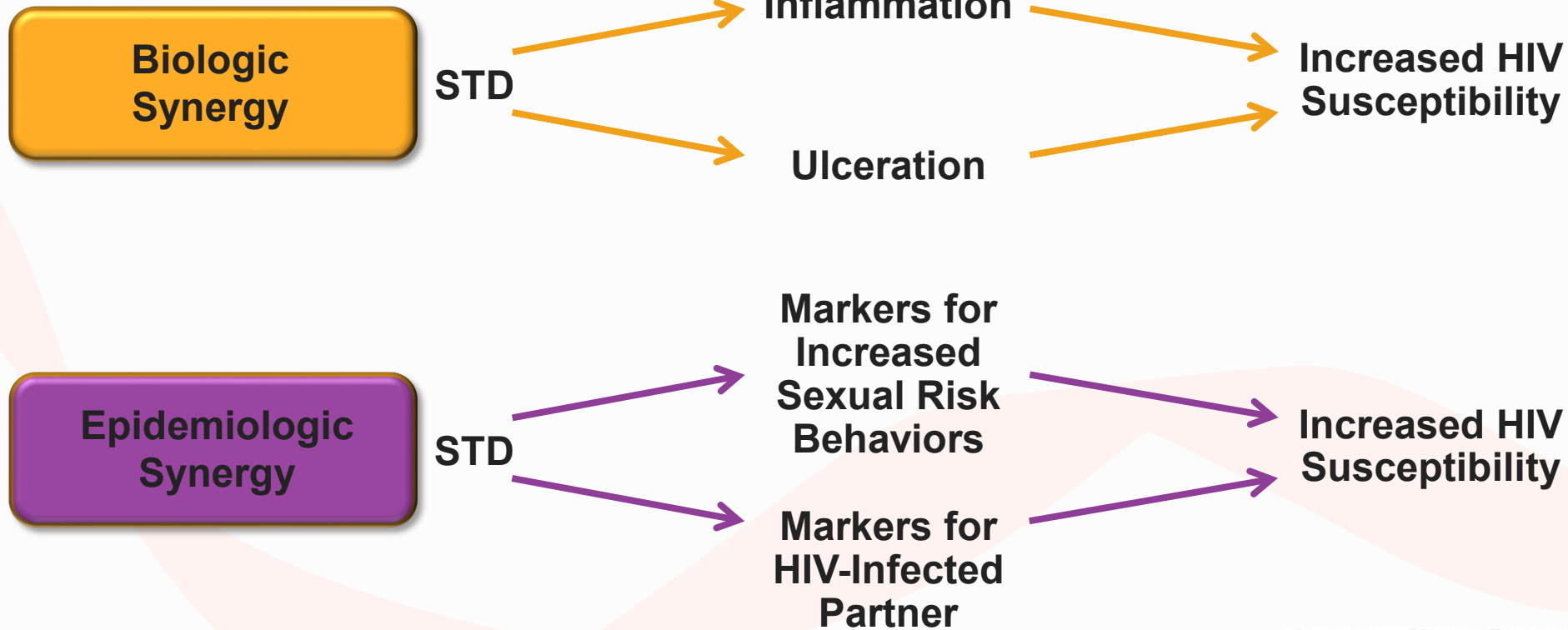
Receipt of medical care: ≥ 1 test (CD4 or HIV RNA level) in 2014.

Retained in care: ≥ 2 tests (CD4 or HIV RNA level) ≥ 3 months apart in 2014.

Viral suppression: HIV RNA < 200 copies/mL on most recent viral load test in 2014.

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For now, the synergy exists...



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Practical
ways to
address
the STI
epidemic
in clinical
care

Screen, Manage, Treat STI
according to the CDC STD
Guidelines (App)

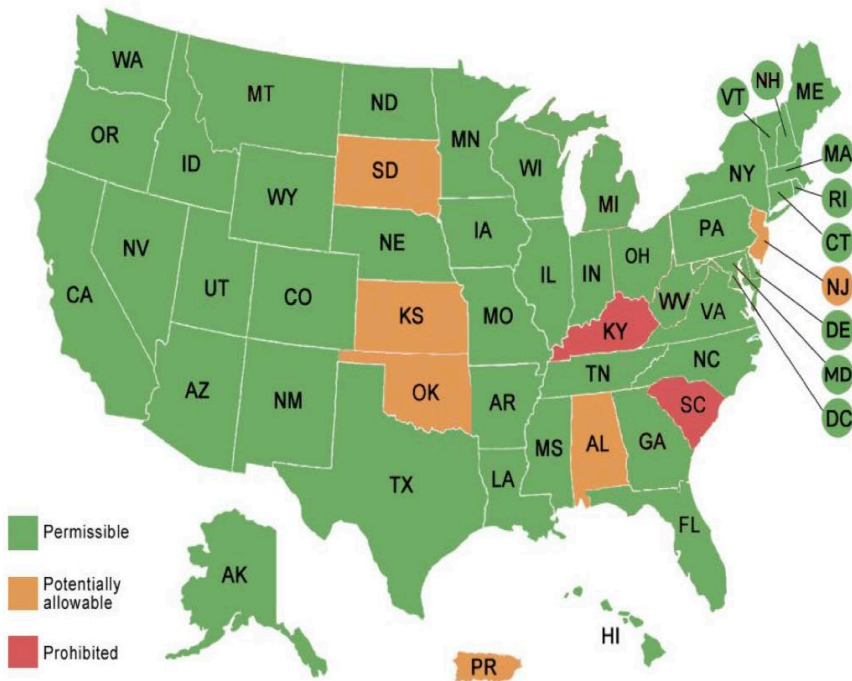
Expedited Partner Therapy

Let your Patients Do the Work

Use your Resources

Know the EPT Laws in your state and when appropriate prescribe EPT.

<https://www.cdc.gov/std/ept/legal/default.htm>



- EPT is the clinical practice of providing individuals with medication or a prescription to deliver to their sexual partner(s) as presumptive treatment for STI, without completing a clinical assessment of those partners.
- Supported by several national organizations
- Effectiveness demonstrated in several clinical trials

EPT Laws in TN

🚫 Nurses practicing at primary health centers shall not issue drugs for treatment of STDs without prior examination by physician. Tenn. Code Ann. § 63-7-124(c) (for all other STDs).

➕ EPT by physicians authorized for chlamydia only. Tenn. Comp. R. & Regs. 1050-2-.13(9)(d), 0880-2-.14(9)

➕ For the treatment of Chlamydia trachomatis, physicians may provide “an effective and safe treatment to the partners of patients infected with C. trachomatis, who for various reasons may not otherwise receive appropriate treatment.” As such, physicians may “provide to the treated patient non-named signed prescriptions, or dispense to the patient, the appropriate quantity and strength of azithromycin sufficient to provide curative treatment for the total number of unnamed ‘partners’ as defined in subparagraph (b) and indicated by the patient.” Tenn. Comp. R. & Regs. 0880-2-.14(9)(a)-(d)

<https://www.cdc.gov/std/ept/legal/tennessee.htm>

Let your patients do the work



UW PTC

The NNPTC provides:

Clinical training

STD clinical
consultations

Resources and tools
for STD treatment

Visit: www.nnptc.org



National Network of
STD Clinical Prevention
Training Centers



GOT A TOUGH STD QUESTION?

Get FREE expert STD clinical consultation at your fingertips



Ask your question

National STD
experts review

Response within 1-5
business days,
depending on urgency

Log on to www.STDCCN.org for medical professionals nationwide

Objectives

- Describe the current landscape of STI in the US and the Southeast
- Discuss the STI and HIV syndemic and rates of STIs among persons living with HIV
- Identify practical ways to address the STI epidemic in clinical care



nvanwagoner@uabmc.edu