HIV AND BACTERIAL STI IN PREGNANCY

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UAB MEDICINE
Knowledge that will change your world

Financial Disclosure

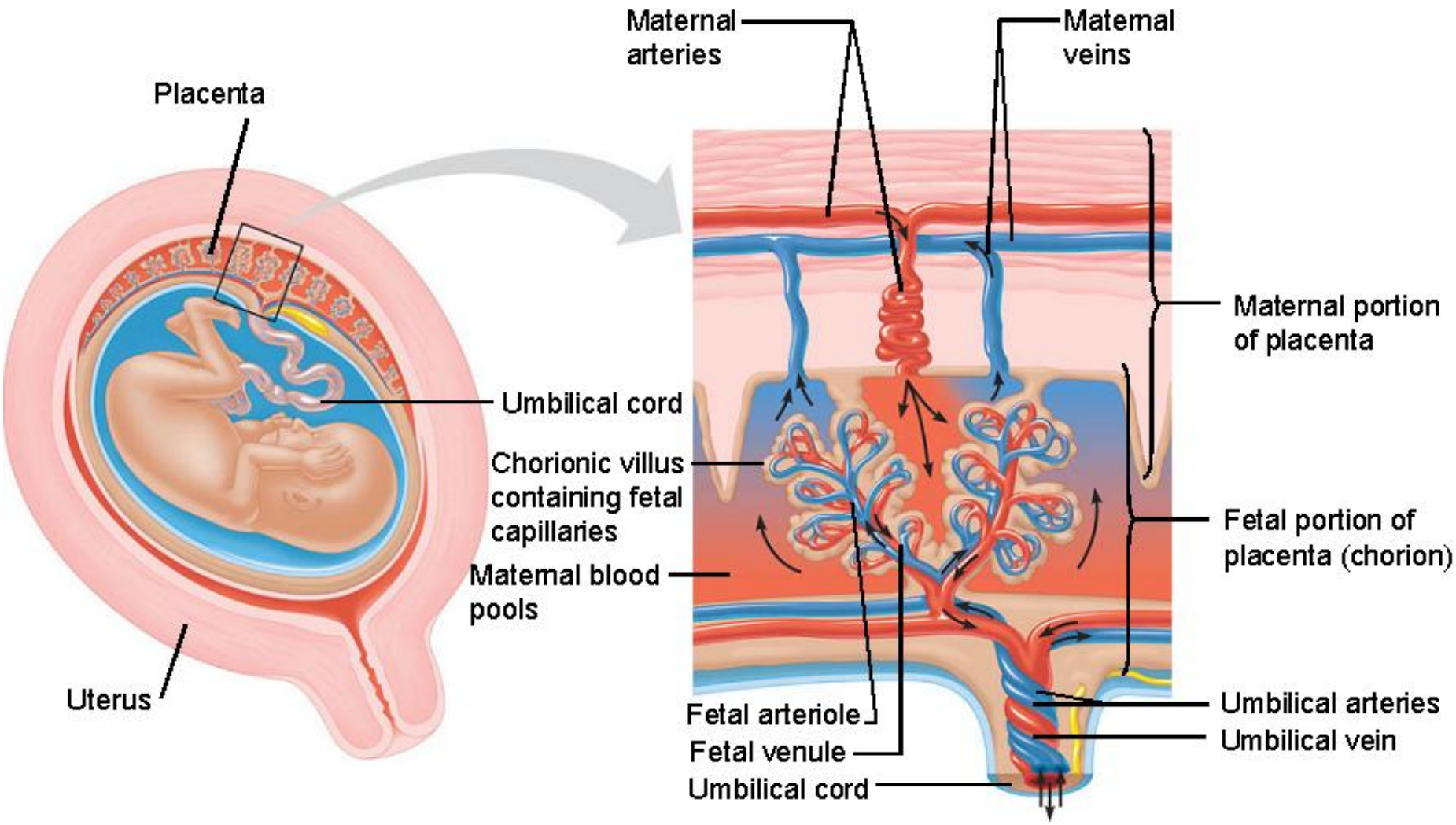
- NIH/NICHD funding – K23 HD090993-01
- CDC Division of STD Prevention – Medical Consultant

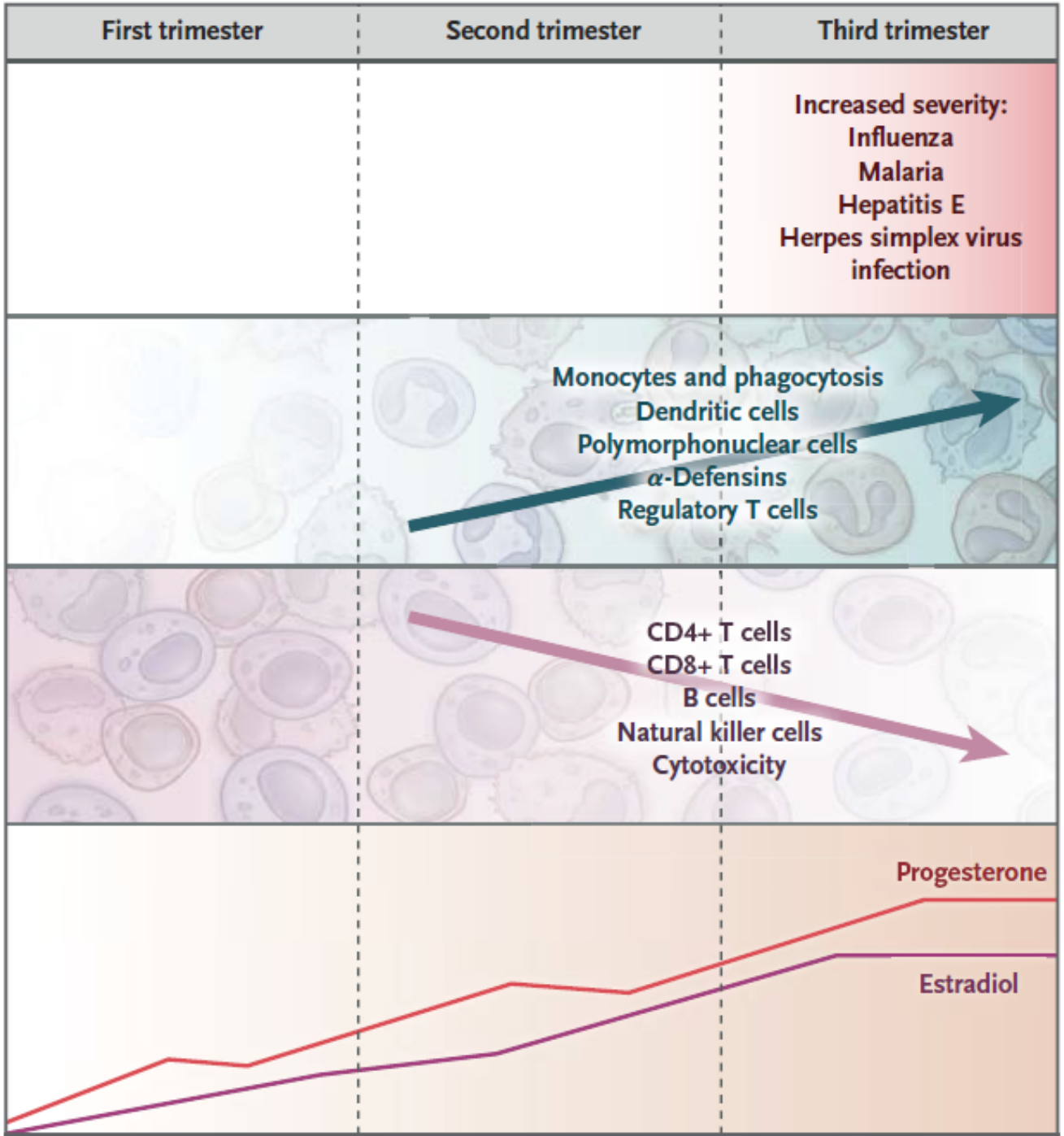
Outline

- HIV
- Pre-exposure Prophylaxis (PReP)
- Chlamydia
- Gonorrhea
- Syphilis
- Trichomonas
- Bacterial Vaginosis
- Mycoplasma genitalium
- Immunizations

What is different about pregnant women?

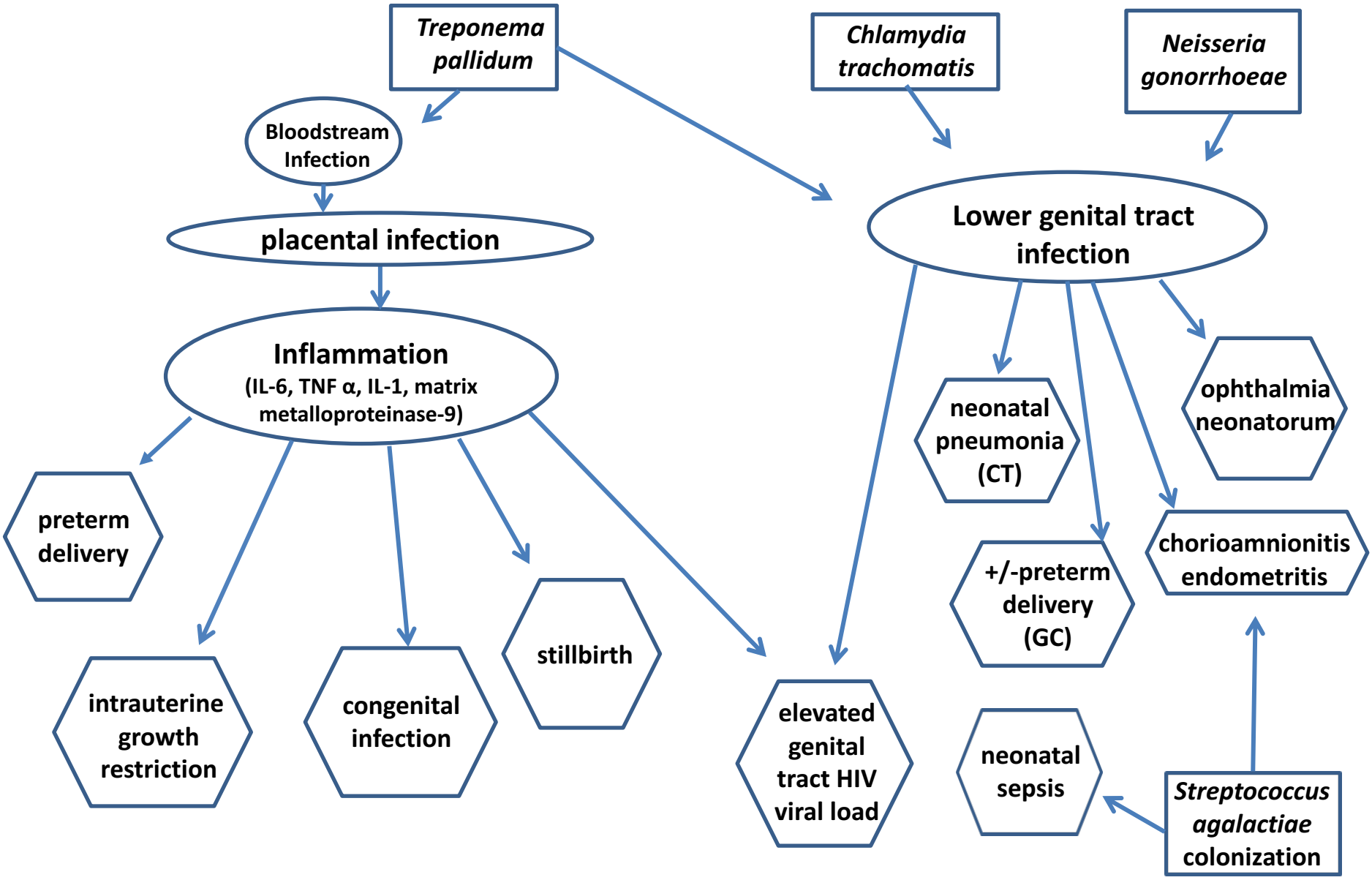
- Sexually active
- Increased susceptibility to infection
- Unique maternal and fetal risks and outcomes


Maternal arteries
Maternal veins
Placenta
Maternal portion of placenta
Umbilical cord
Chorionic villus containing fetal capillaries
Fetal portion of placenta (chorion)
Maternal blood pools
Uterus
Fetal arteriole
Umbilical arteries
Fetal venule
Umbilical vein
Umbilical cord



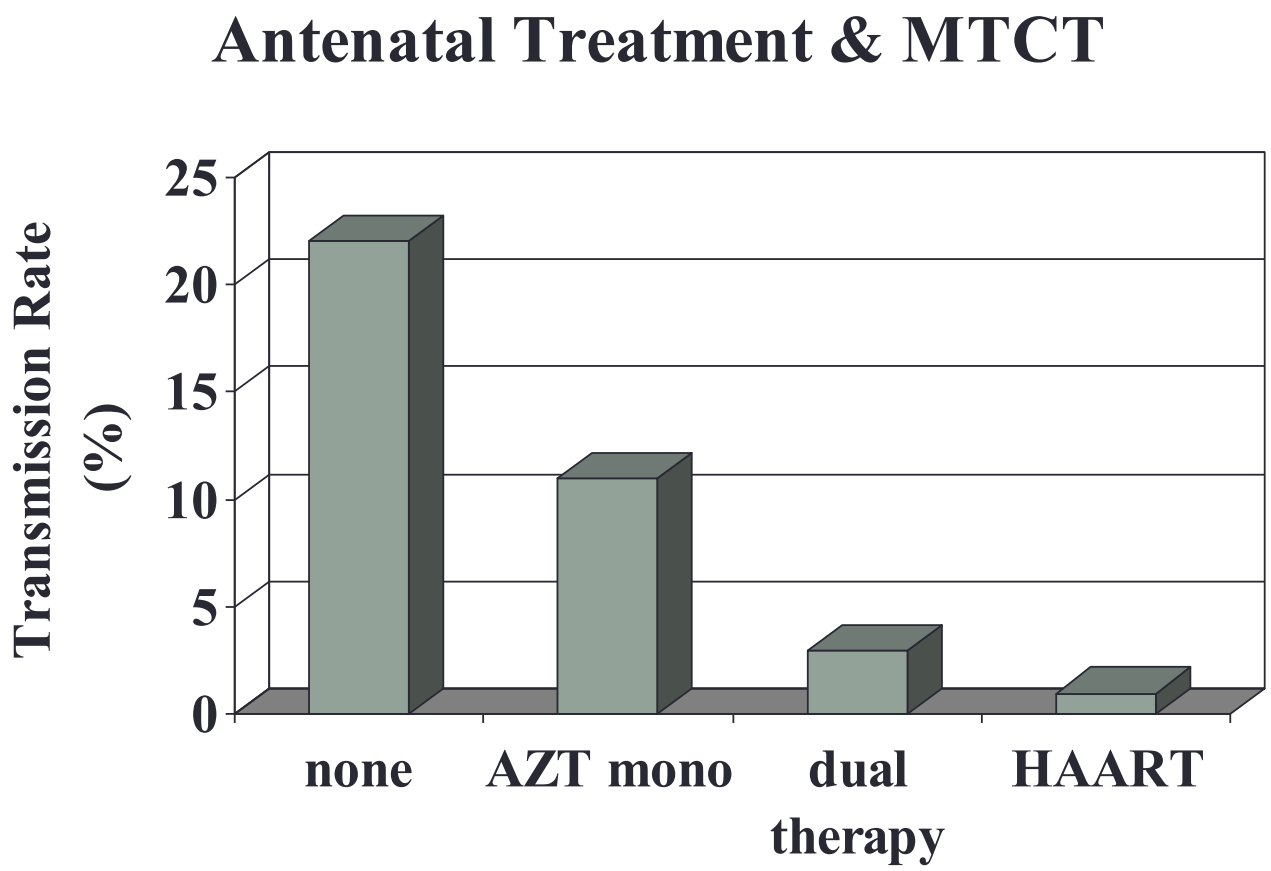
Kourtis NEJM 2014

HIV and Bacterial STI Coinfections in Pregnancy



HIV in Pregnancy

HIV in Pregnancy



Cooper JAIDS 2002;29

No Perinatal HIV-1 Transmission From Women With Effective Antiretroviral Therapy Starting Before Conception

Laurent Mandelbrot,[1,2,5,8] Roland Tubiana,[9,10] Jerome Le Chenadec,[2] Catherine Dollfus,[11] Albert Faye,[5,12] Emmanuelle Pannier,[8,13] Sophie Matheron,[5,14] Marie-Aude Khuong,[17] Valerie Garrait,[18] Veronique Reliquet,[19] Alain Devidas,[20] Alain Berrebi,[21] Christine Allisy,[22] Christophe Elleau,[23] Cedric Arvieux,[24] Christine Rouzioux,[6,15] Josiane Warszawski,[2,3,4] and Stéphane Blanche[7,16]; for the ANRS-EPF Study Group[a]

- 8075 mother-infant pairs
- Followed prospectively in France 2000-2011.
- Cohort analyzed according to maternal viral load at delivery and timing of ART initiation.
- 56/8075 vertical transmissions (0.7%).
- None among 2651 women with VL <50 before conception

Postpartum Retention in HIV Care among HIV-infected Women in the South

Kelly A. Smith, Jodie Dionne-Odom, Inmaculada Aban, Martin Rodriguez, Marsha Sturdevant,

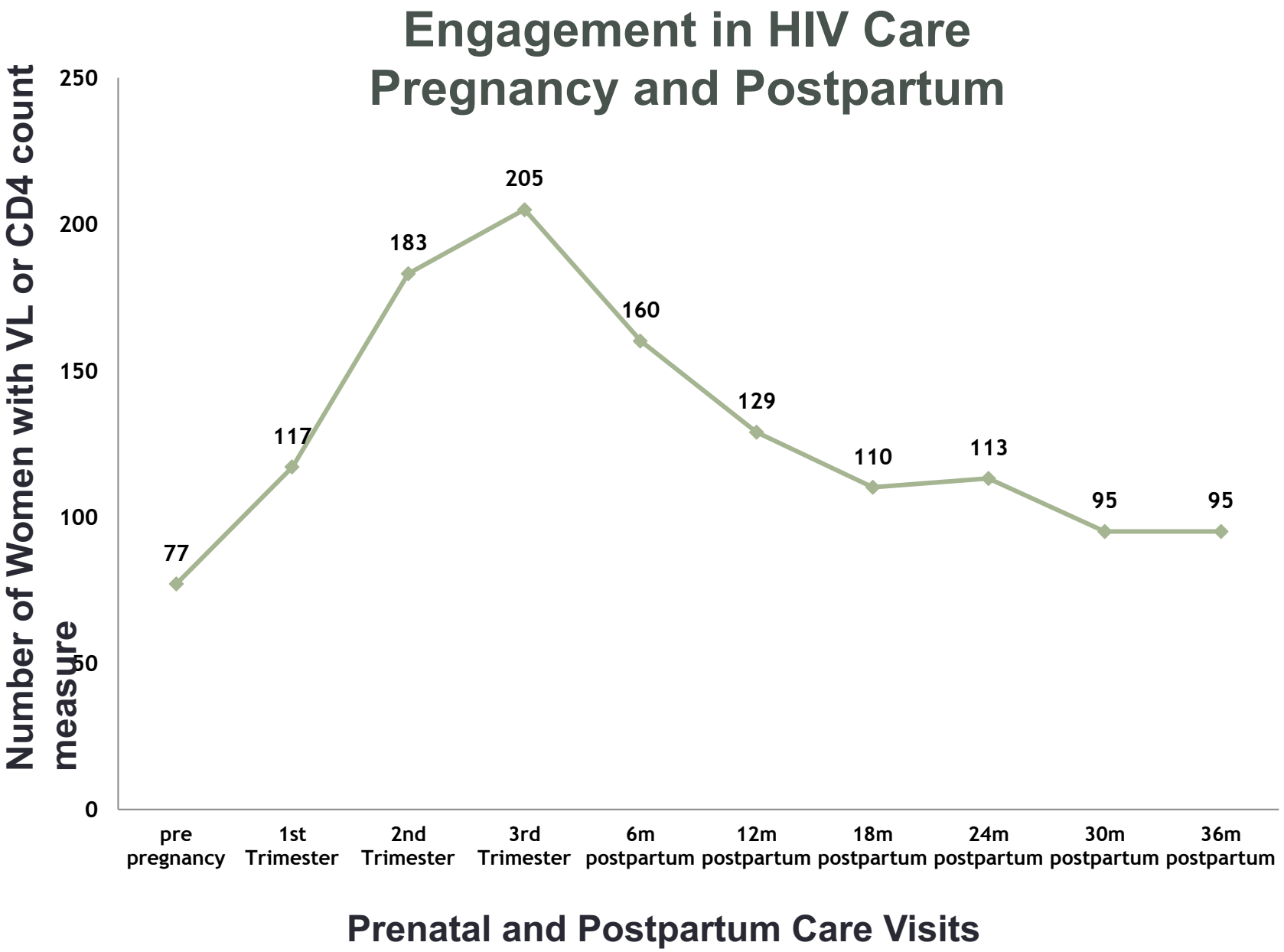
Mirjam-Colette Kempf

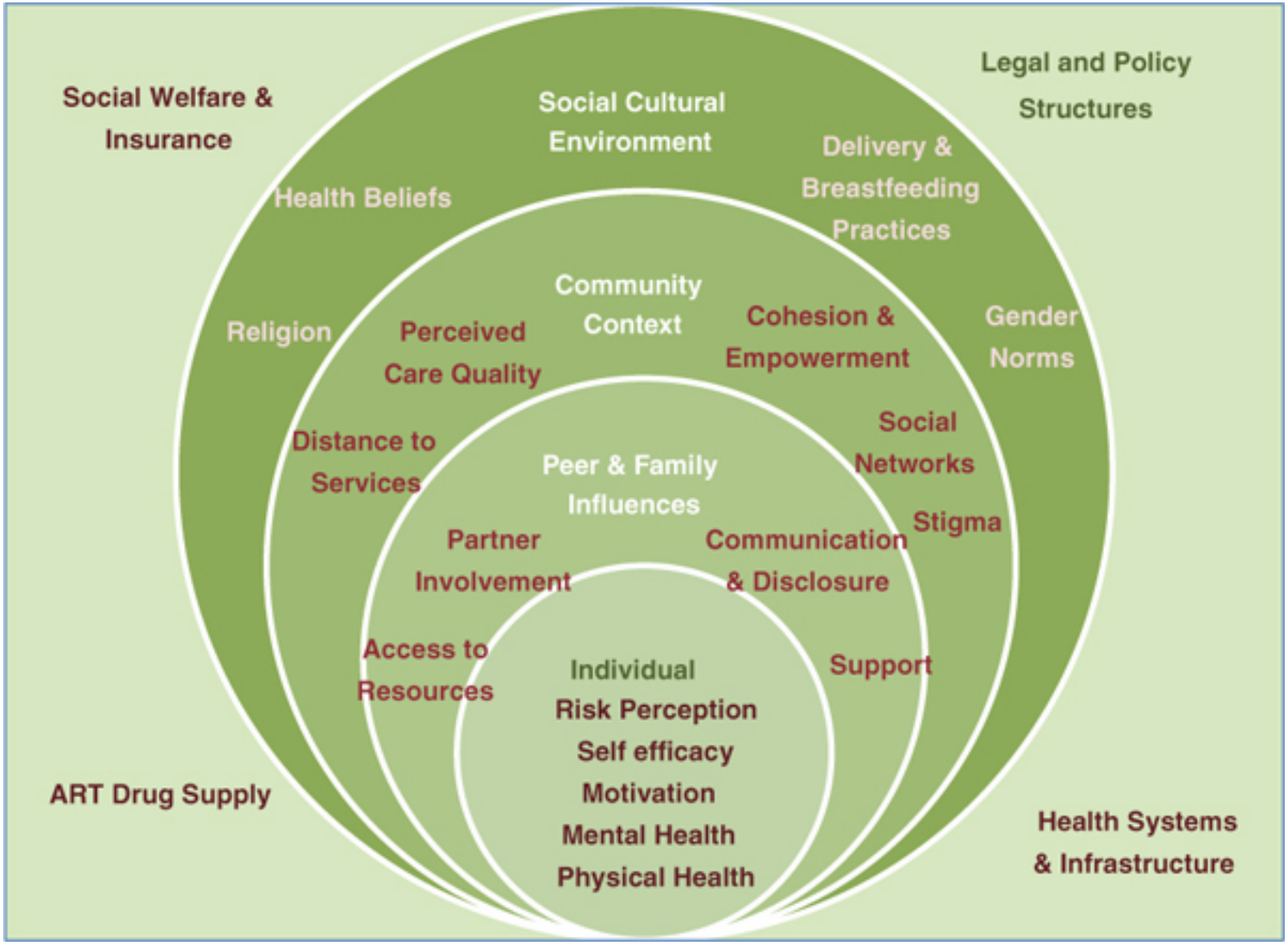
UAB CFAR CENTER FOR AIDS RESEARCH

9th International Conference on HIV TREATMENT AND PREVENTION ADHERENCE

UAB THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

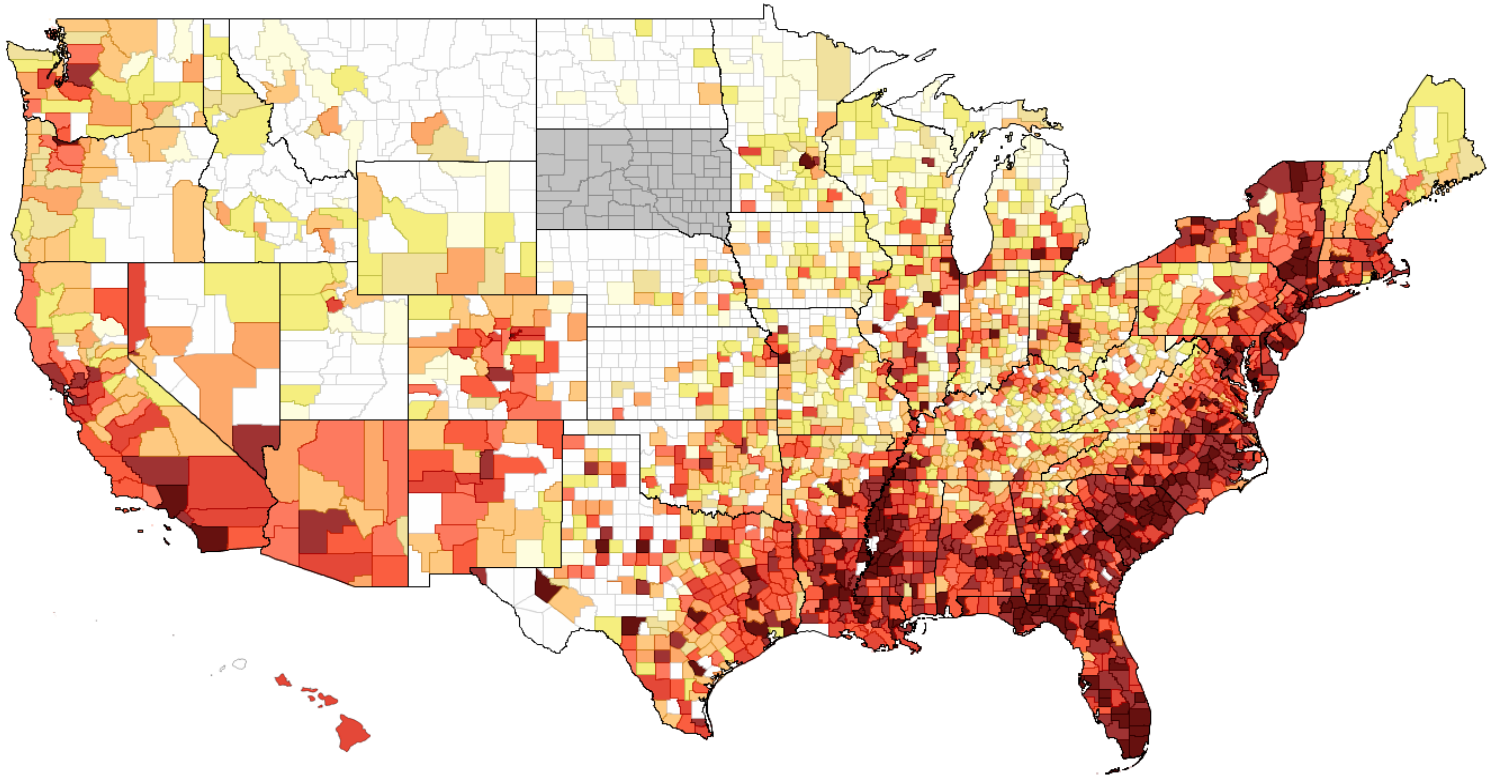
Knowledge that will change your world


Engagement in HIV Care
Pregnancy and Postpartum
Number of Women with VL or CD4 count measure
250
200
150
100
50
0
77
117
183
205
160
129
110
113
95
95
pre pregnancy
1st Trimester
2nd Trimester
3rd Trimester
6m postpartum
12m postpartum
18m postpartum
24m postpartum
30m postpartum
36m postpartum
Prenatal and Postpartum Care Visits



Busza JAIS 2012

Rates of Persons Living with Diagnosed HIV, by County, 2013



AIDSVu

Rates of Persons Living with Diagnosed HIV, by County, 2013

0 - 40	41 - 60	61 - 70	71 - 90	91 - 110	111 - 140	141 - 190	191 - 260	261 - 410	411+

Data not shown *

Data not released to AIDSVu**

Rates displayed are the number of cases per 100,000 people.

*Data not shown to protect privacy because of a small number of cases and/or a small population.

**State health department, per its HIV data re-release agreement with CDC, requested not to release data to AIDSVu.

NOTE: There are no county-level maps for Alaska, District of Columbia, and Puerto Rico because there are no counties in these states.

The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

COMMITTEE OPINION

Number 635 • June 2015 *(Replaces Committee Opinion Number 418, September 2008)*

Committee on Obstetric Practice and HIV Expert Work Group

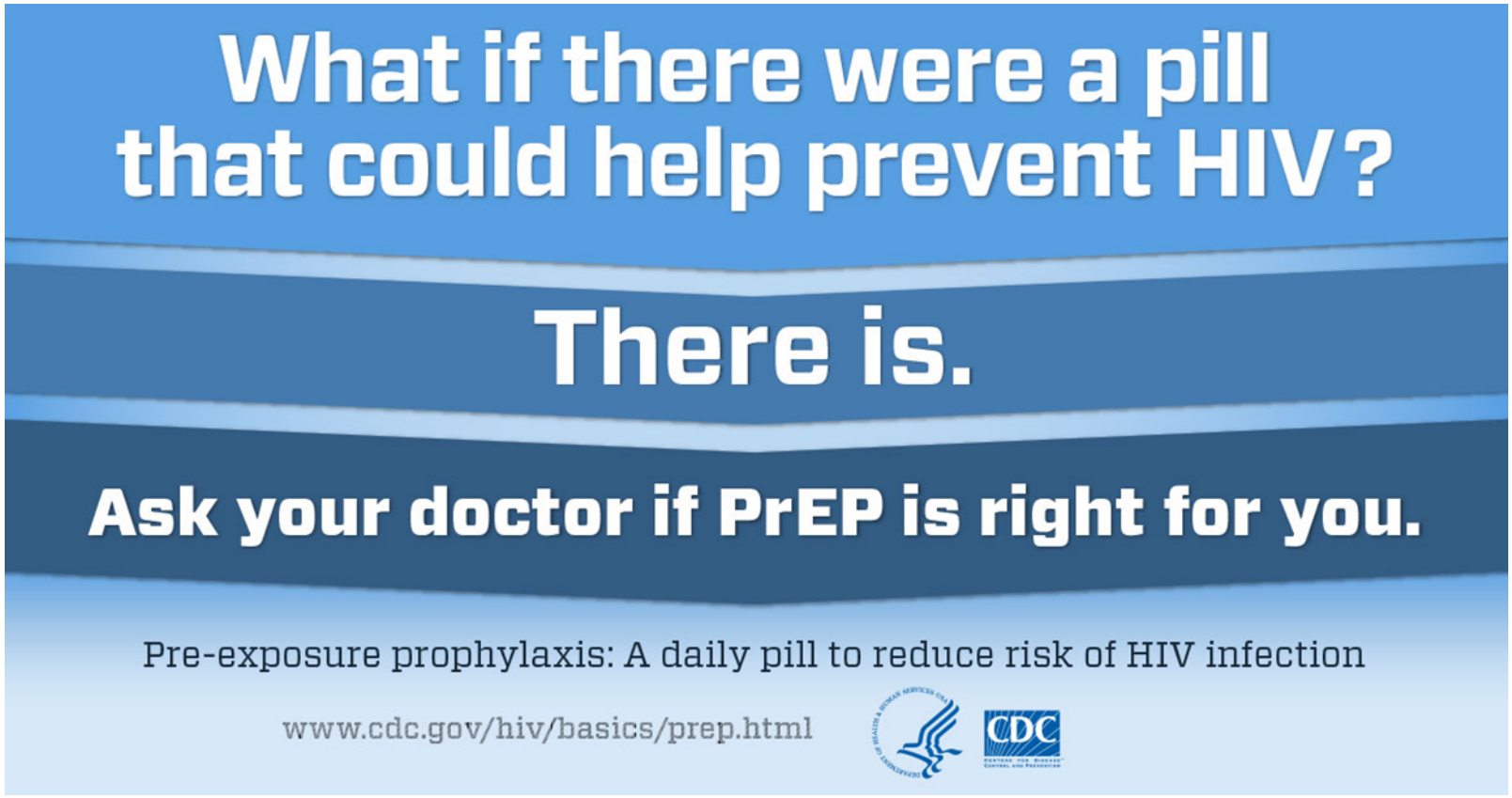
This document reflects emerging clinical and scientific advances as of the date issued and is subject to change. This information should not be construed as dictating an exclusive course of treatment or procedure to be followed.

Prenatal and Perinatal Human Immunodeficiency Virus Testing: Expanded Recommendations

1. Opt-out HIV test as early as possible during routine prenatal care
2. Repeat HIV in 3rd trimester (ideally before 36 weeks) for women "at risk" or in high HIV prevalence/incidence area
3. Opt out rapid screen at delivery if not tested previously (or not documented)

Who is “high risk” for acquiring HIV?

- STI in past year.
- IVDA in patient or partner.
- Exchange of sex for money or drugs.
- New sex partner during pregnancy.
- More than one sex partner.
- Partner with HIV-infection.
- Partner at risk of HIV-infection.


What if there were a pill that could help prevent HIV?
There is.
Ask your doctor if PrEP is right for you.
Pre-exposure prophylaxis: A daily pill to reduce risk of HIV infection
www.cdc.gov/hiv/basics/prep.html
CDC

PReP: pre-conception and pregnancy

For Discordant Couples:

- The couple should be counseled and only attempt conception after the HIV-infected partner has initiated antiretroviral therapy and have achieved sustained suppression of plasma viral load below the limits of detection **(AI)**.
- Administration of antiretroviral pre-exposure prophylaxis 30 days before and 30 days after conception for HIV-uninfected partners may offer an additional tool to reduce the risk of sexual transmission, particularly if the HIV-infected partner's plasma viral load is unknown or detectable **(BII)**. It is not known whether pre-exposure prophylaxis for the uninfected partner confers additional benefit when the infected partner receiving antiretroviral therapy has demonstrated sustained viral suppression.

2016 HIV Perinatal Guidelines:
https://aidsinfo.nih.gov/guidelines/html/3/perinatal-guidelines/0

Table 1 Longitudinal studies presented in 2014–2015 examining the safety of peri-conception daily oral PrEP use among HIV-seronegative women

Study name Lead author	Study design	Population	Daily oral PrEP agent	PrEP adherence (plasma TDF in random sample)	Safety data on pregnancy outcomes	Safety data on infant outcomes
FEM-PrEP Callahan 2015 [11, 12]	Randomized trial	2120 women from Kenya, South Africa and Tanzania; 125 pregnancies	FTC/TDF	24 %	• Pregnancy incidence of 11.4 FTC/TFD and 7.7 placebo; higher pregnancy incidence in FTC/TDF group is related to poor adherence to oral contraceptives • Of 115 pregnancies with outcome data, 30 had some complication, no difference observed by arm (vaginal bleeding was most common complication)	No data collected
Partners PrEP Study Mugo 2014 [4, 13]	Randomized trial	1785 women from Kenya and Uganda; 431 pregnancies	Separate arms f or FTC/TDF and TDF	81 % FTC/TDF 83 % TDF	• No difference in rates of pregnancy incidence per 100 person-years (FTC/TDF 8.8 [$p=0.39$ versus placebo]; TDF 11.9 [$p=0.22$ versus placebo]; placebo 10.0) • No significant difference in rates of pregnancy loss (FTC/TDF 42.5 % [$p=0.16$ versus placebo]; TDF 27.7 % [$p=0.46$ versus placebo]; placebo 32.3 %)	• Preterm birth (FTC/TDF 8.7 % [$p=0.85$ versus placebo]; TDF 2.5 % [$p=0.16$ versus placebo]; placebo 7.7 %) • Congenital anomaly (FTC/TDF 8.5 % [$p=0.51$ versus placebo]; TDF 4.9 % [$p=0.86$ versus placebo]; placebo 7.6 %) • No difference in 1-year infant growth parameters
VOICE Bunge 2015 [14, 15]	Randomized trial	3019 women from Uganda, South Africa and Zimbabwe included to study oral PrEP agents; 452 pregnancies	Separate arms for FTC/TDF and TDF	29 % FTC/TDF 30 % TDF	• No difference in pregnancy incidence per 100 person-years (FTC/TDF 8.0; TDF 7.4; placebo 7.9) • No difference in pregnancy loss (FTC/TDF: 3 % TDF 0 %; placebo 6 %) • No difference in any pregnancy outcomes (premature birth, stillbirth, spontaneous abortion, ectopic pregnancy, or elective abortion)	Ten (10) instances of small for gestational age (breakdown by arm not provided)

Heffron Curr HIV/AIDS Reports 2016

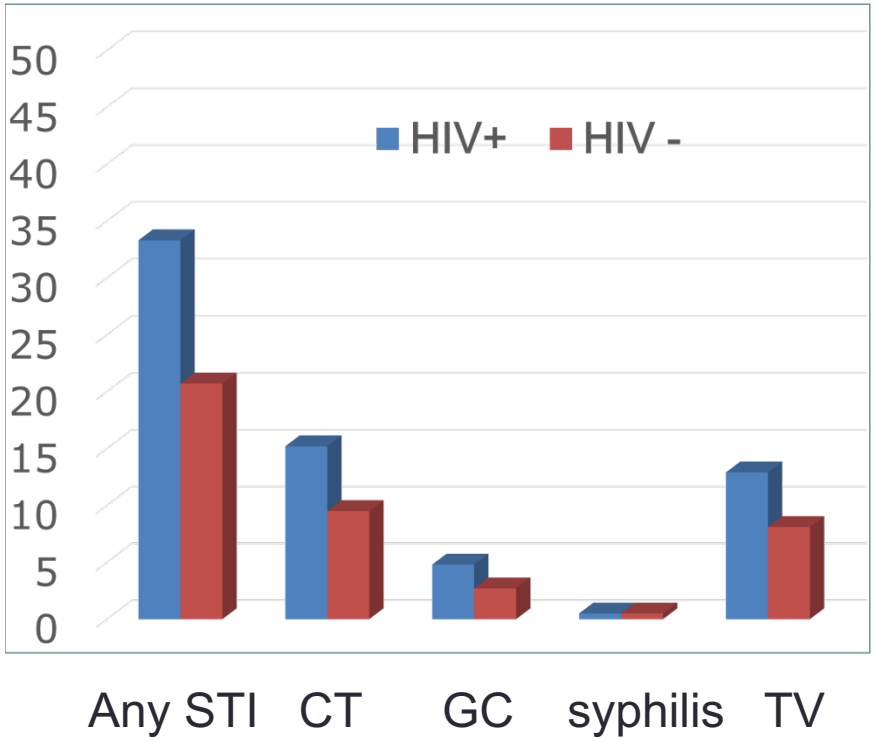
Bacterial Sexually Transmitted Infections

HIV/STI Coinfection in Pregnancy in the Southeastern US

Jodie Dionne-Odom[1], Michelle Khan[2], Ying Tang[1], Suzanne Wallace[1], Jeanne Marrazzo[1], Alan Tita[1], Jeff Szychowski[1], Cherry Neely[1], Karen Fry[1], Marilyn Crain[1]
[1]University of Alabama at Birmingham, Birmingham, AL; [2]Kaiser Permanente, San Leandro, CA

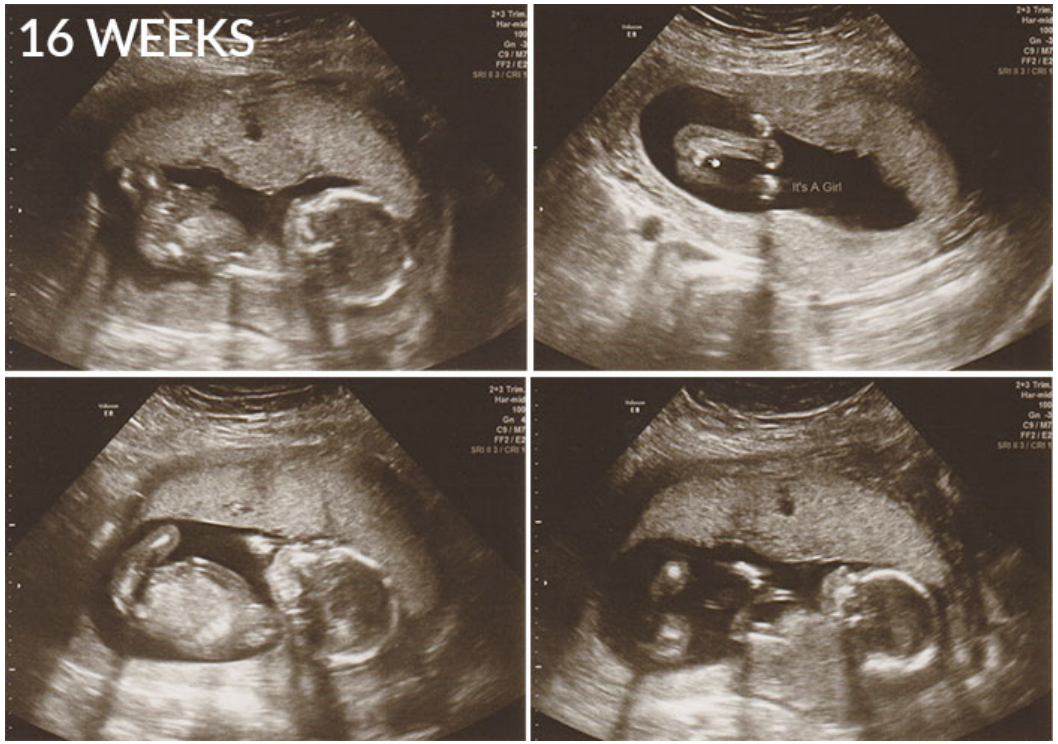
STIs Detected During Pregnancy by HIV Status (2000-2014)

Characteristic	HIV-infected N=210 n (%)	HIV-uninfected N=222 n (%)	p-value
STI			
Any STI	70 (33.3)	46 (20.7)	0.003
Chlamydia	32 (15.2)	21 (9.5)	0.10
Gonorrhea	10 (4.8)	6 (2.7)	0.26
Syphilis	1 (0.5)	1 (0.5)	>0.99
Trichomonas	27 (12.9)	18 (8.1)	0.11
Other Infections			
Hepatitis B	11 (6)	2 (1.2)	<0.01
Hepatitis C	5 (2.4)	4 (1.8)	>0.99
Vag Candidiasis	32 (18)	11 (6.8)	<0.01
UTI	42 (23.9)	41 (24.7)	0.86



CASE #1

23 year old AAF G1P0 is 16 weeks pregnant. She has chlamydia detected by NAAT and reports monogamy with her current male partner.

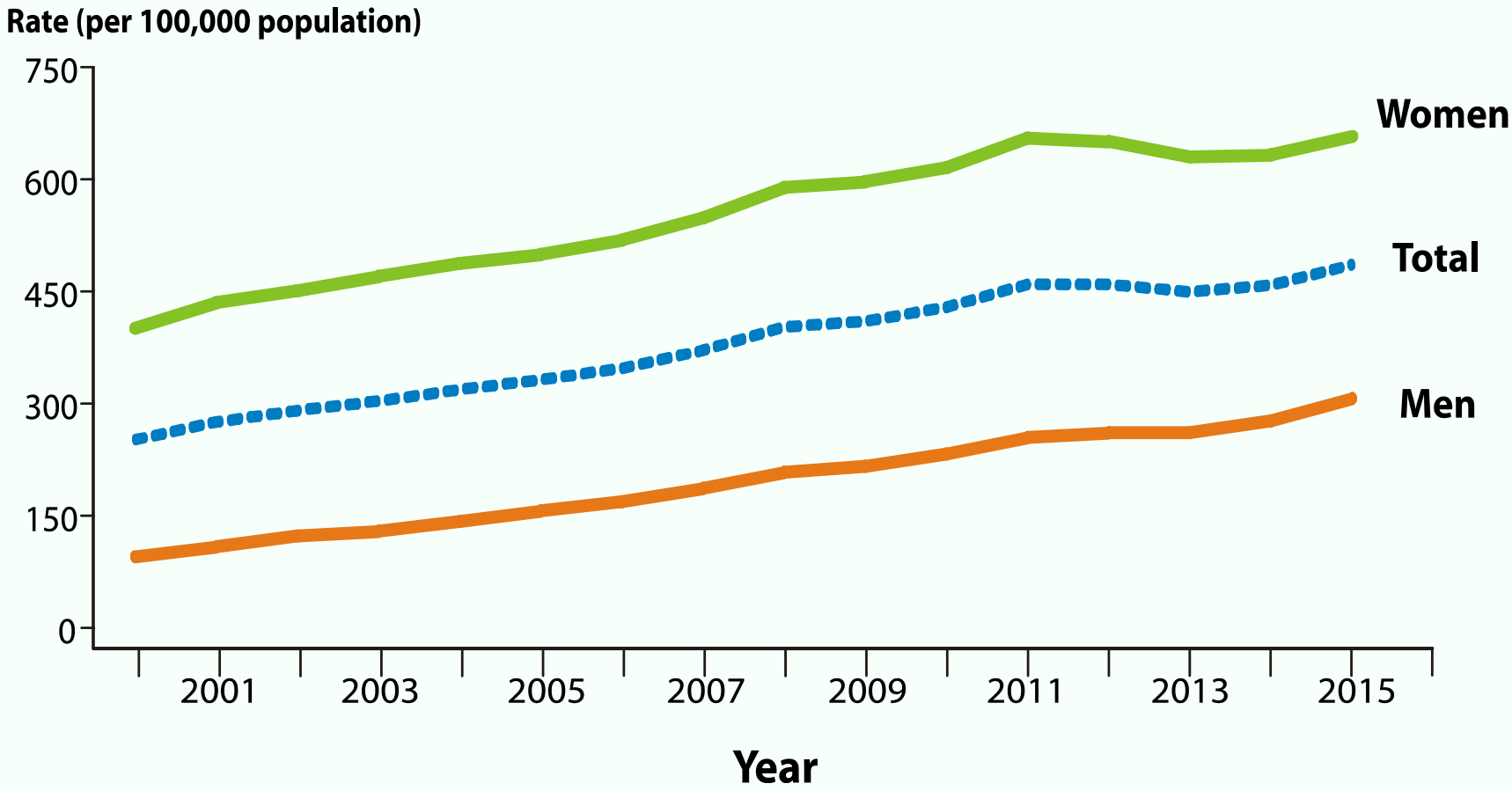


1. What is the recommended antibiotic therapy?

2. Do you need to order any follow up testing?

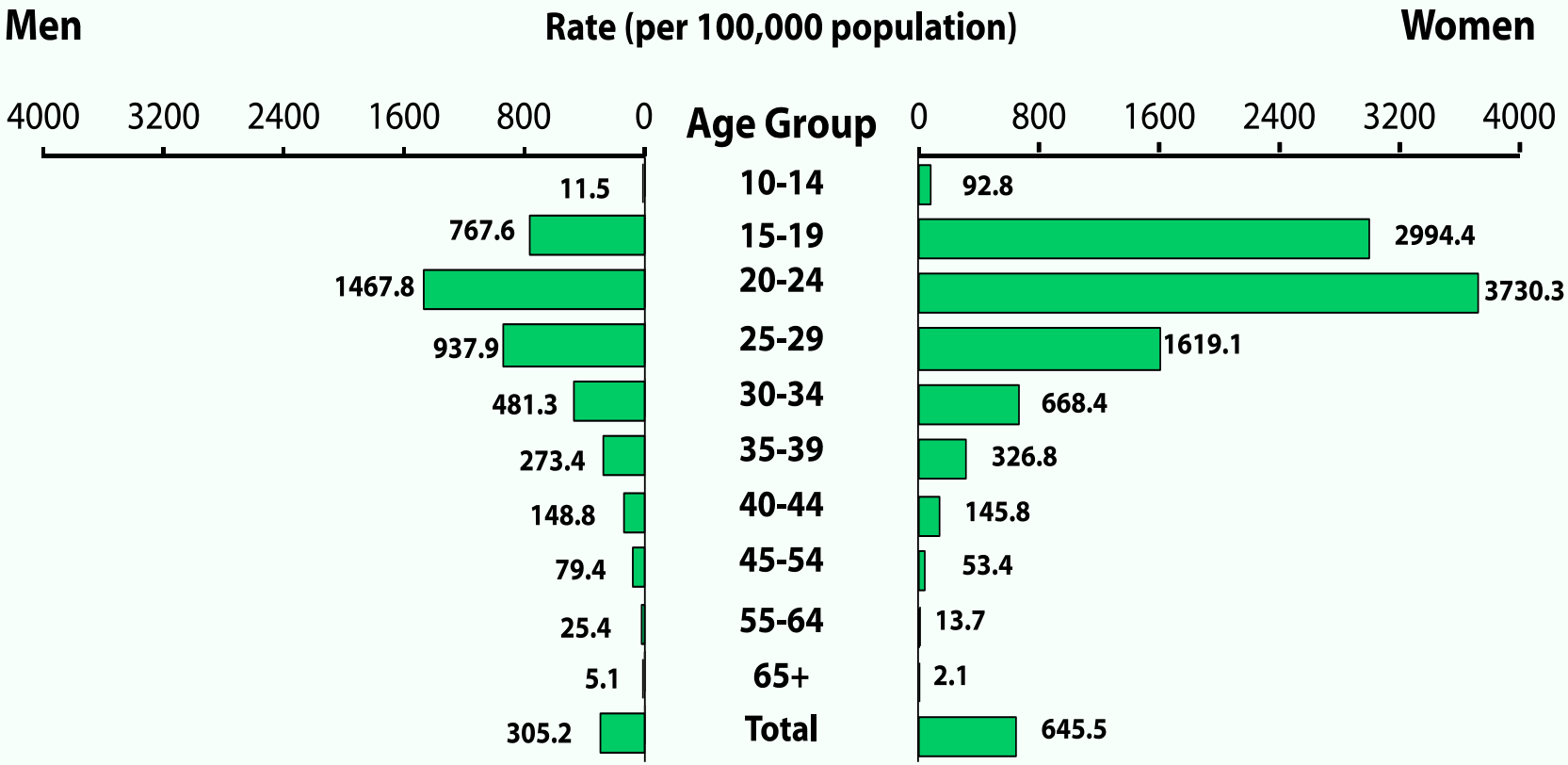
3. Any other recommendations?

Chlamydia — Rates of Reported Cases by Sex, United States, 2000–2015

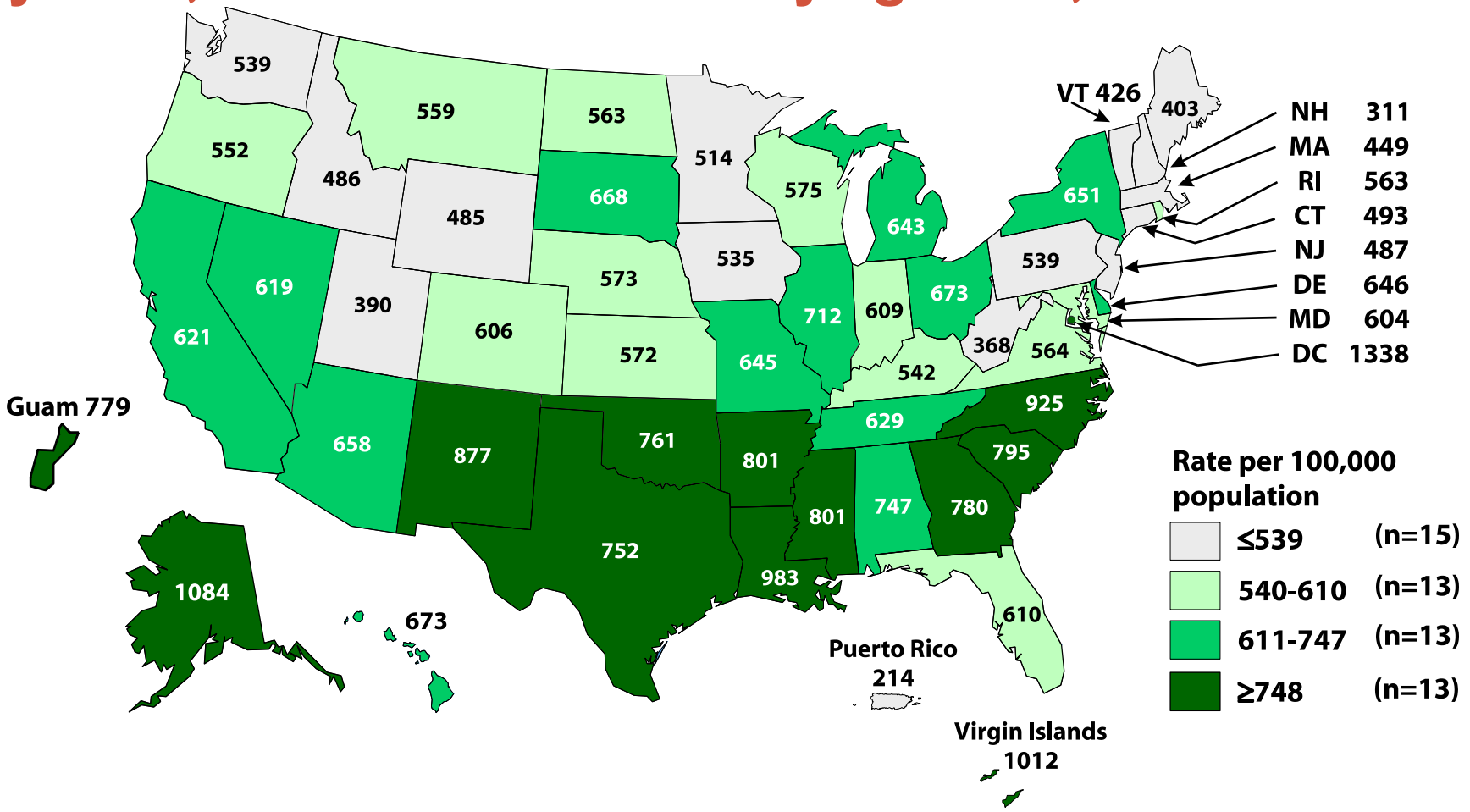


NOTE: Data collection for chlamydia began in 1984 and chlamydia was made nationally notifiable in 1995; however, chlamydia was not reportable in all 50 states and the District of Columbia until 2000. Refer to the National Notifiable Disease Surveillance System (NNDSS) website for more information: https://wwwn.cdc.gov/nndss/conditions/chlamydia-trachomatis-infection/.

Chlamydia — Rates of Reported Cases by Age Group and Sex, United States, 2015

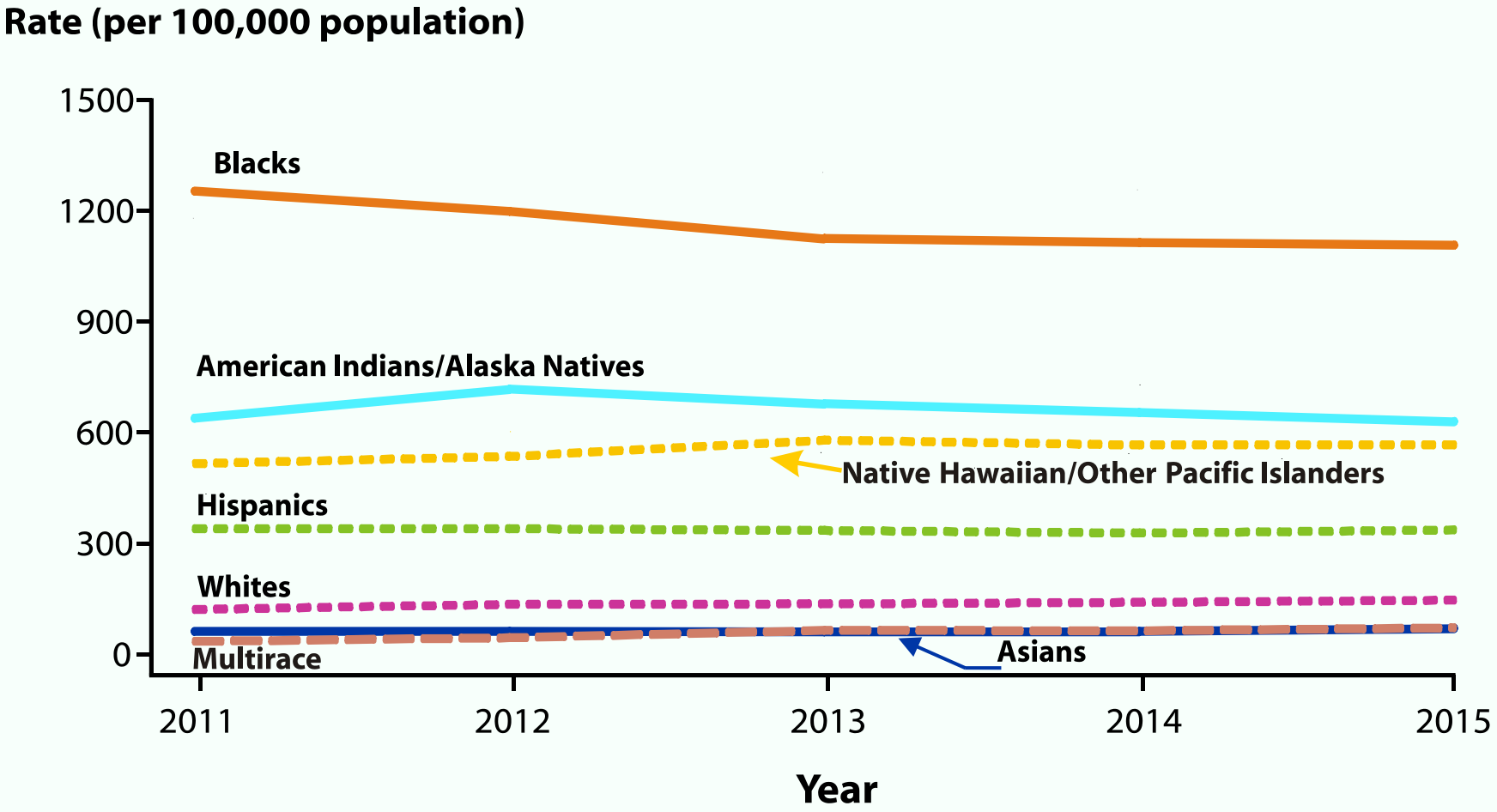


Chlamydia — Rates of Reported Cases Among Women by State, United States and Outlying Areas, 2015



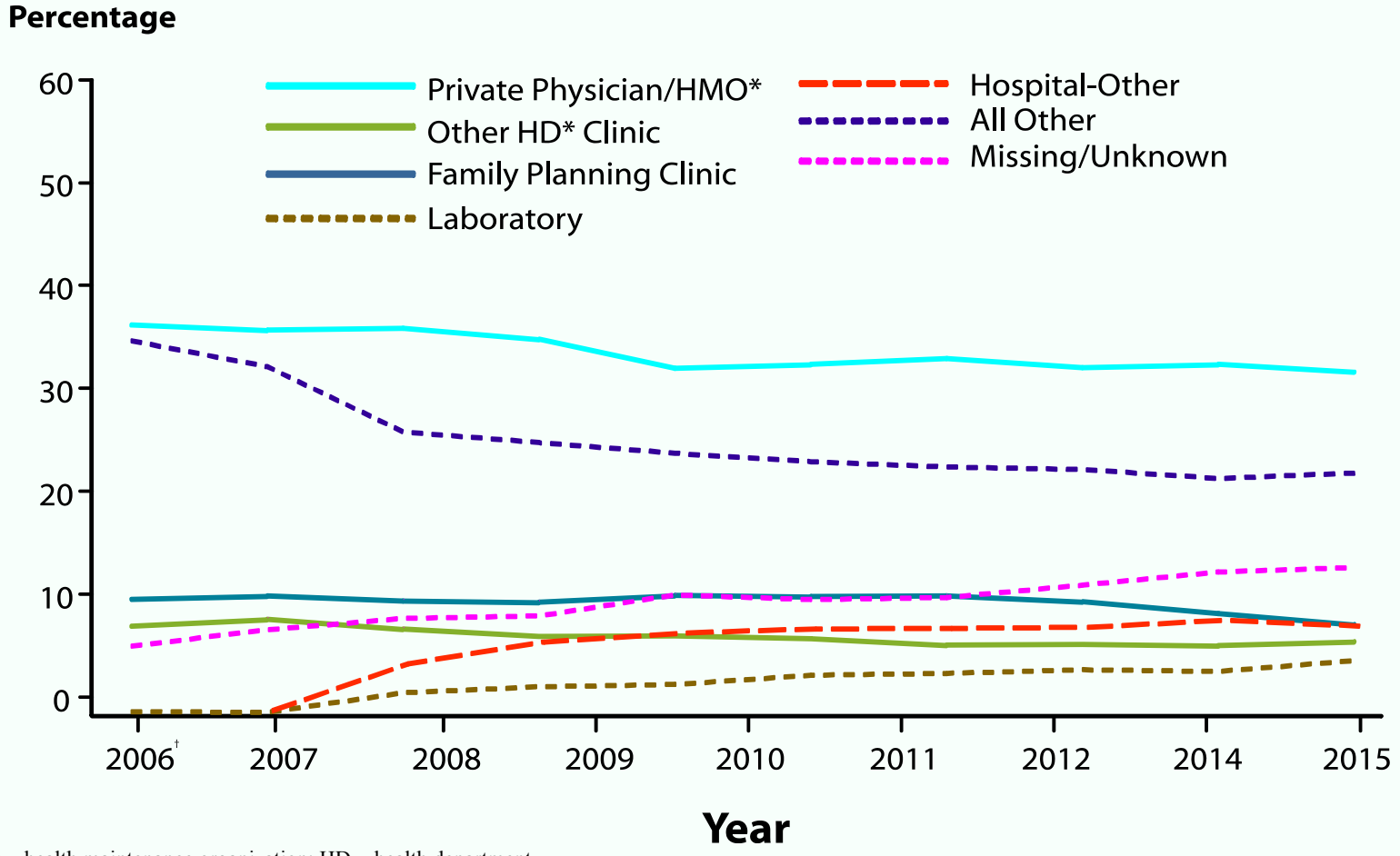
NOTE: The total rate of reported cases of chlamydia among women in the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 640.8 cases per 100,000 females.

Chlamydia — Rates of Reported Cases by Race/Ethnicity, United States, 2011–2015



NOTE: Includes 45 states reporting race/ethnicity data in Office of Management and Budget compliant formats during 2011–2015 .

Chlamydia — Reported Cases Among Women by Reporting Source, United States, 2006–2015



* HMO = health maintenance organization; HD = health department.

† The variable "Hospital-Other" (i.e., other hospital clinics/facilities) was not added as a response option for reporting source until calendar year 2007; therefore, there are no data available for the "Hospital-Other" variable in 2006.

NOTE: All Other includes: Drug Treatment, Tuberculosis Clinic, Correctional Facility, Blood Bank, Labor and Delivery, Prenatal Care, National Job Training Program, School-based Clinic, Mental Health Provider, Indian Health Service, Military, Emergency Room, STD Clinic, and HIV Counseling and Testing Site.

CT Recommendations

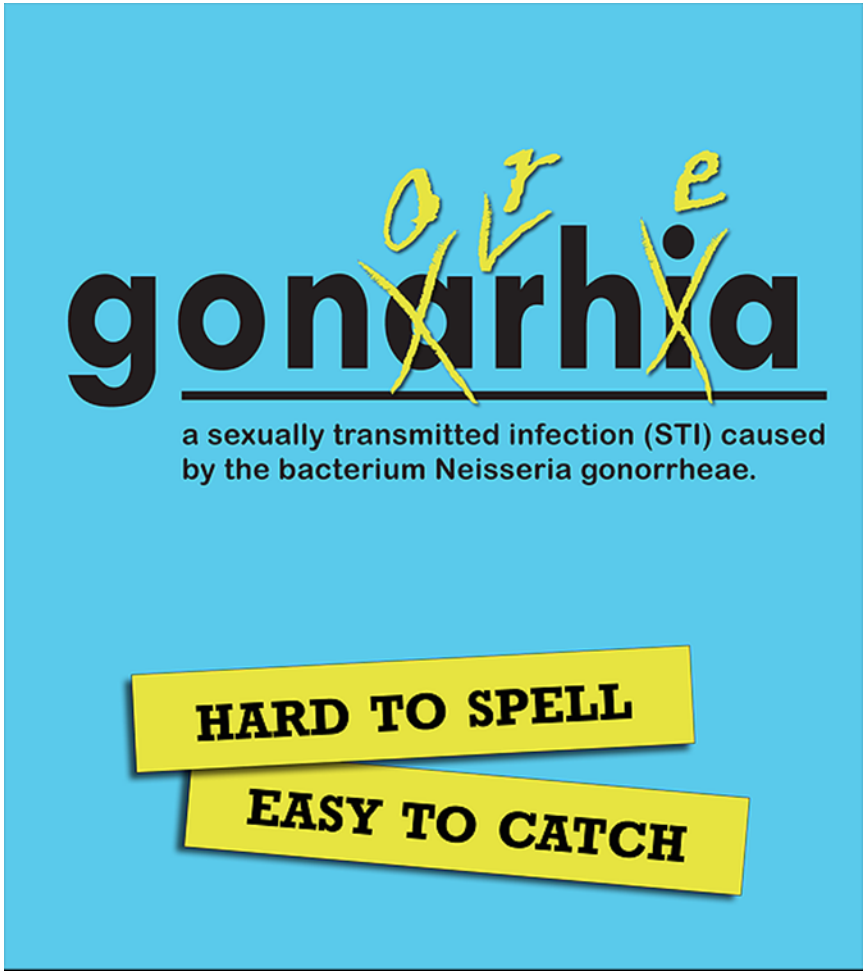
- Infection Outcomes:
  - Ophthalmia neonatorum (5-12 days),
  - Infant pneumonia (1-3 months).

- Screening:
  - At initial visit
  - Repeat in 3rd trimester if <25 years old or >25 with increased risk

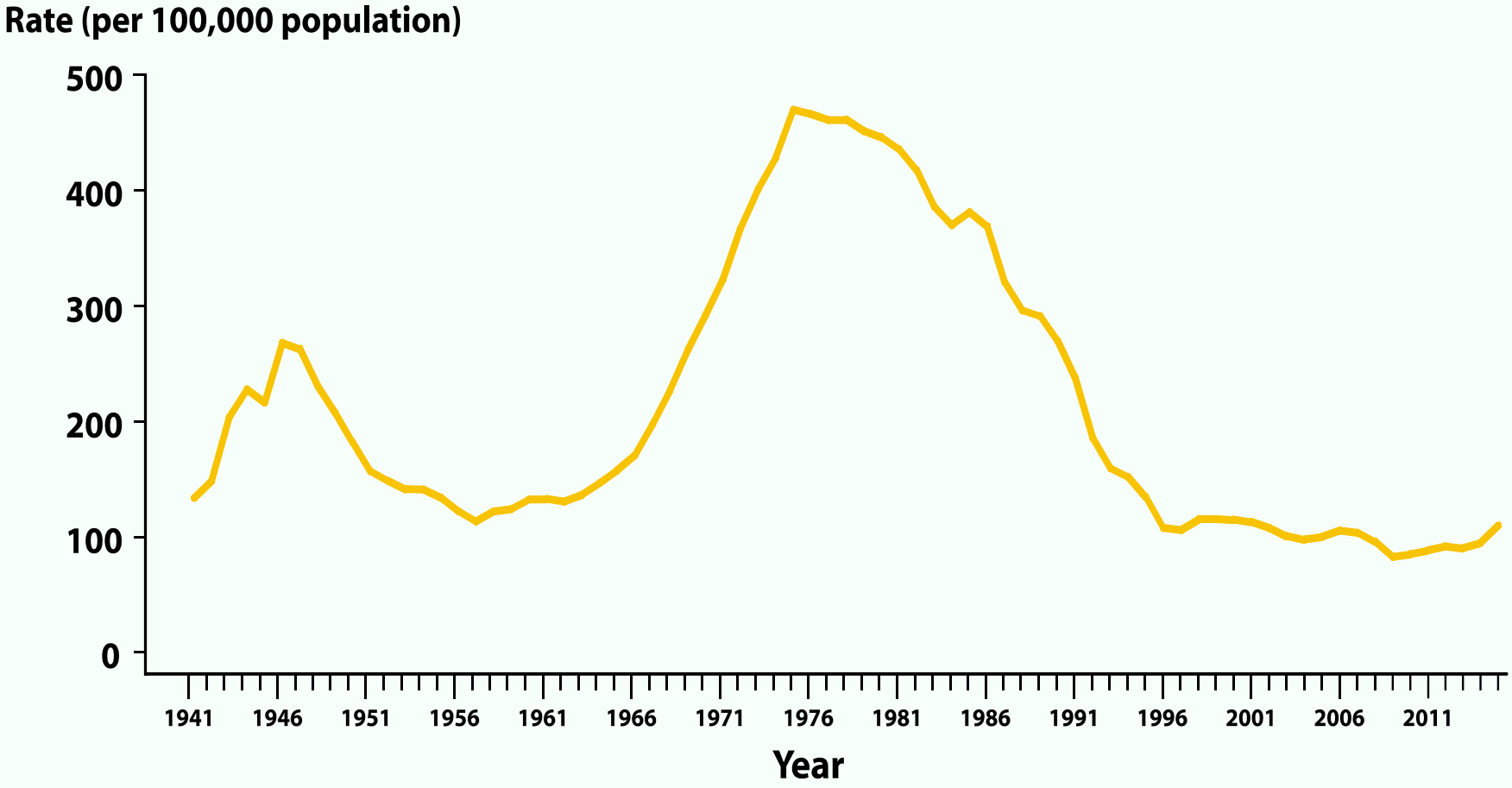
- Treatment: azithromycin 1 gram PO x 1 (95% efficacy).
  - Doxycycline is contraindicated during 2nd – 3rd trimesters.
  - Amoxicillin has been moved to an alternative regimen (80% efficacy)
  - Recommend partner therapy.

- Test of Cure after 4 weeks (re-infection is common).
- Repeat testing in 3 months.
- 3rd Trimester HIV screening test

Gonorrhea

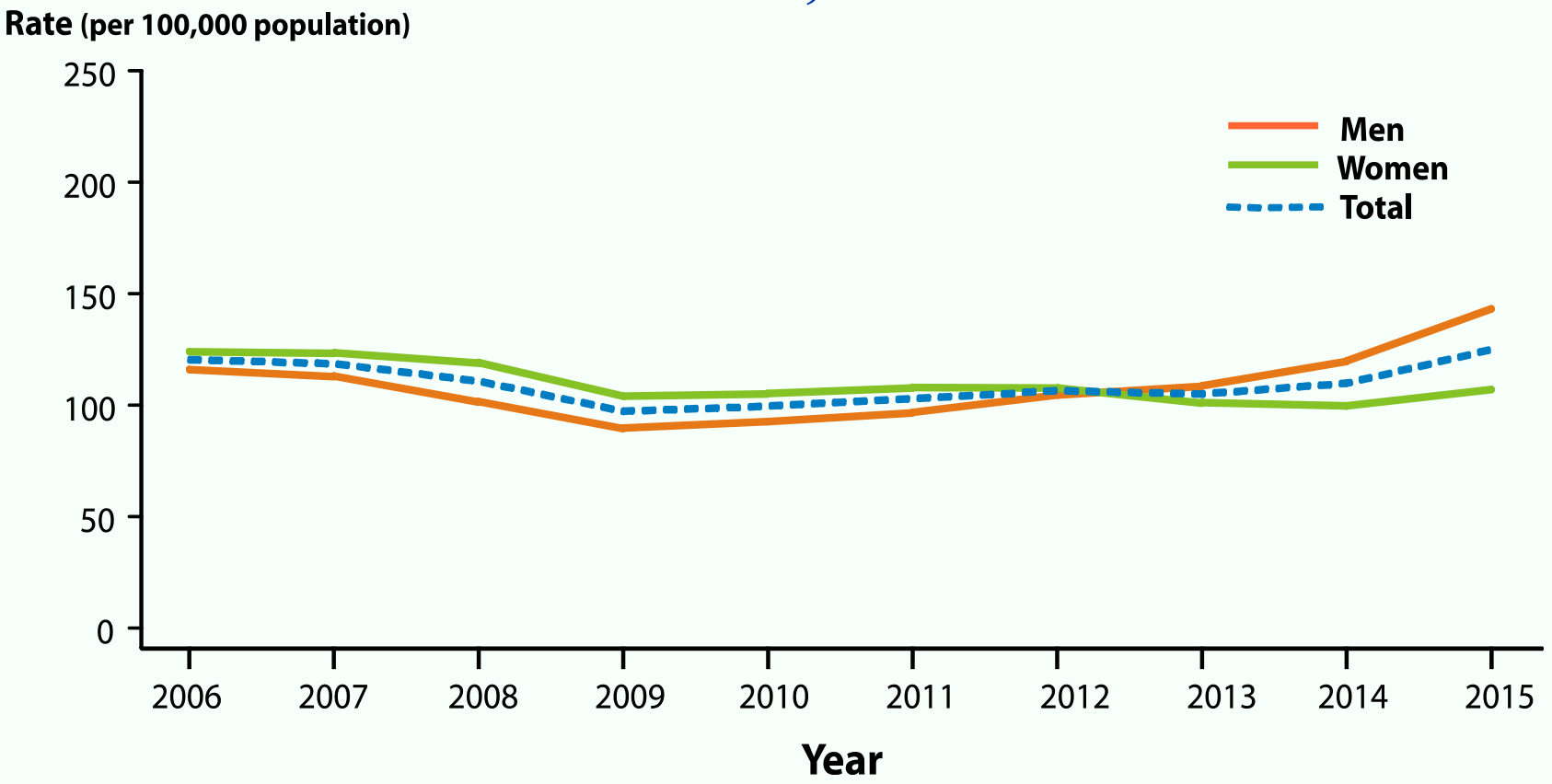

gonorrhea
a sexually transmitted infection (STI) caused by the bacterium Neisseria gonorrheae.
HARD TO SPELL
EASY TO CATCH

Gonorrhea — Rates of Reported Cases by Year, United States, 1941–2015

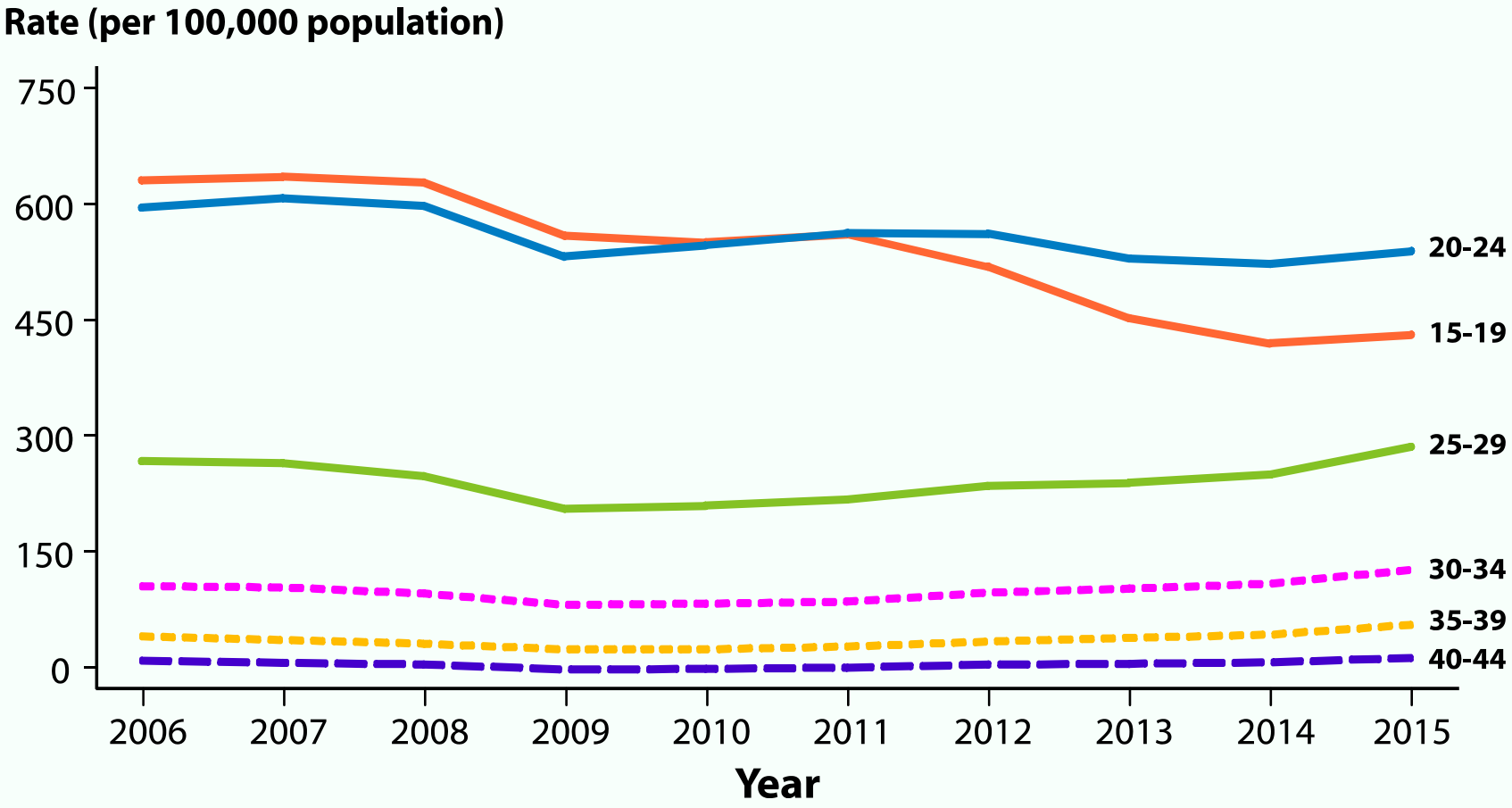


NOTE: Data collection for gonorrhea began in 1941; however, gonorrhea became nationally notifiable in 1944. Refer to the National Notifiable Disease Surveillance System (NNDSS) website for more information: https://wwwn.cdc.gov/nndss/conditions/gonorrhea/ .

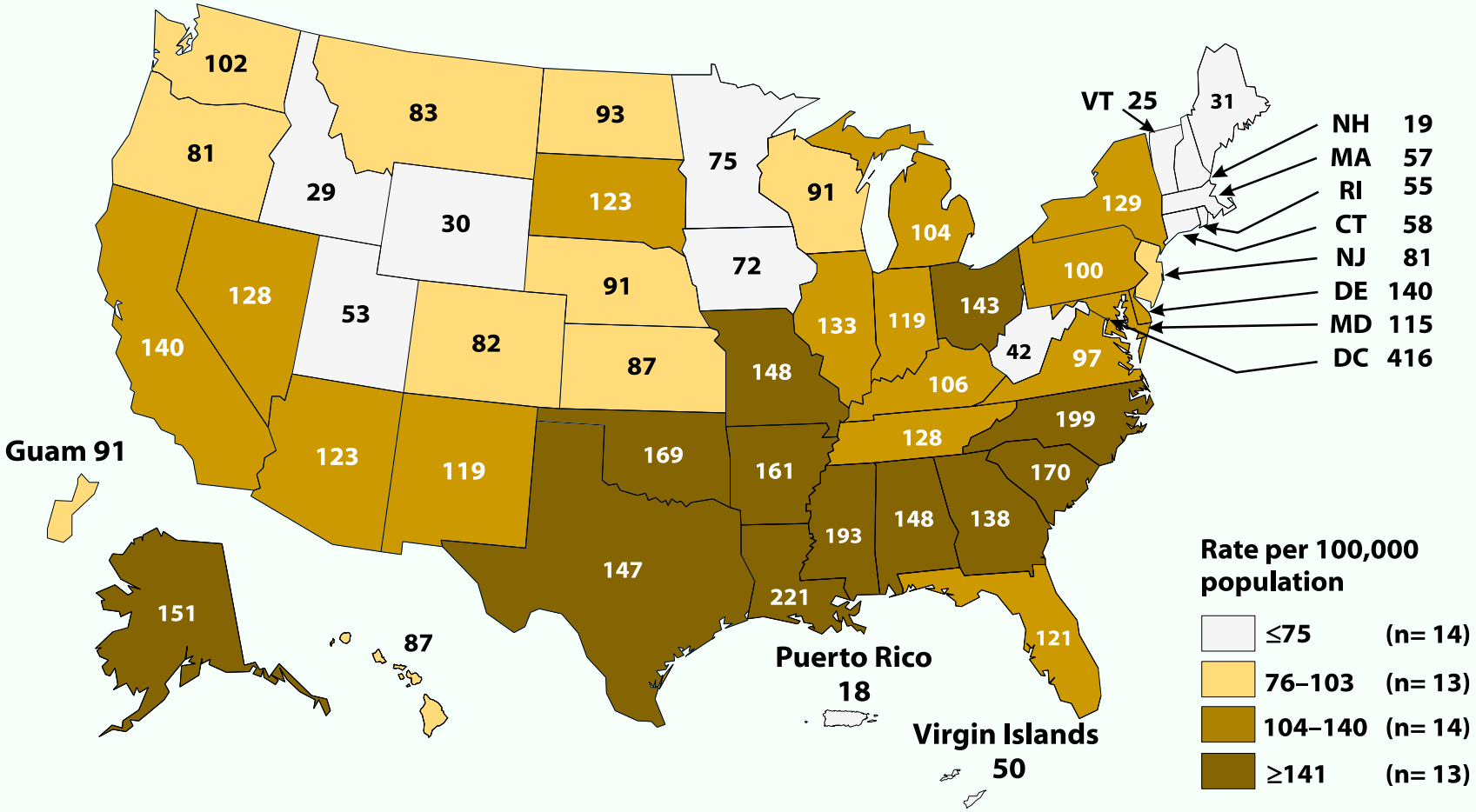
Gonorrhea — Rates of Reported Cases by Sex, United States, 2006–2015



Gonorrhea — Rates of Reported Cases Among Women Aged 15–44 Years by Age Group, United States, 2006–2015

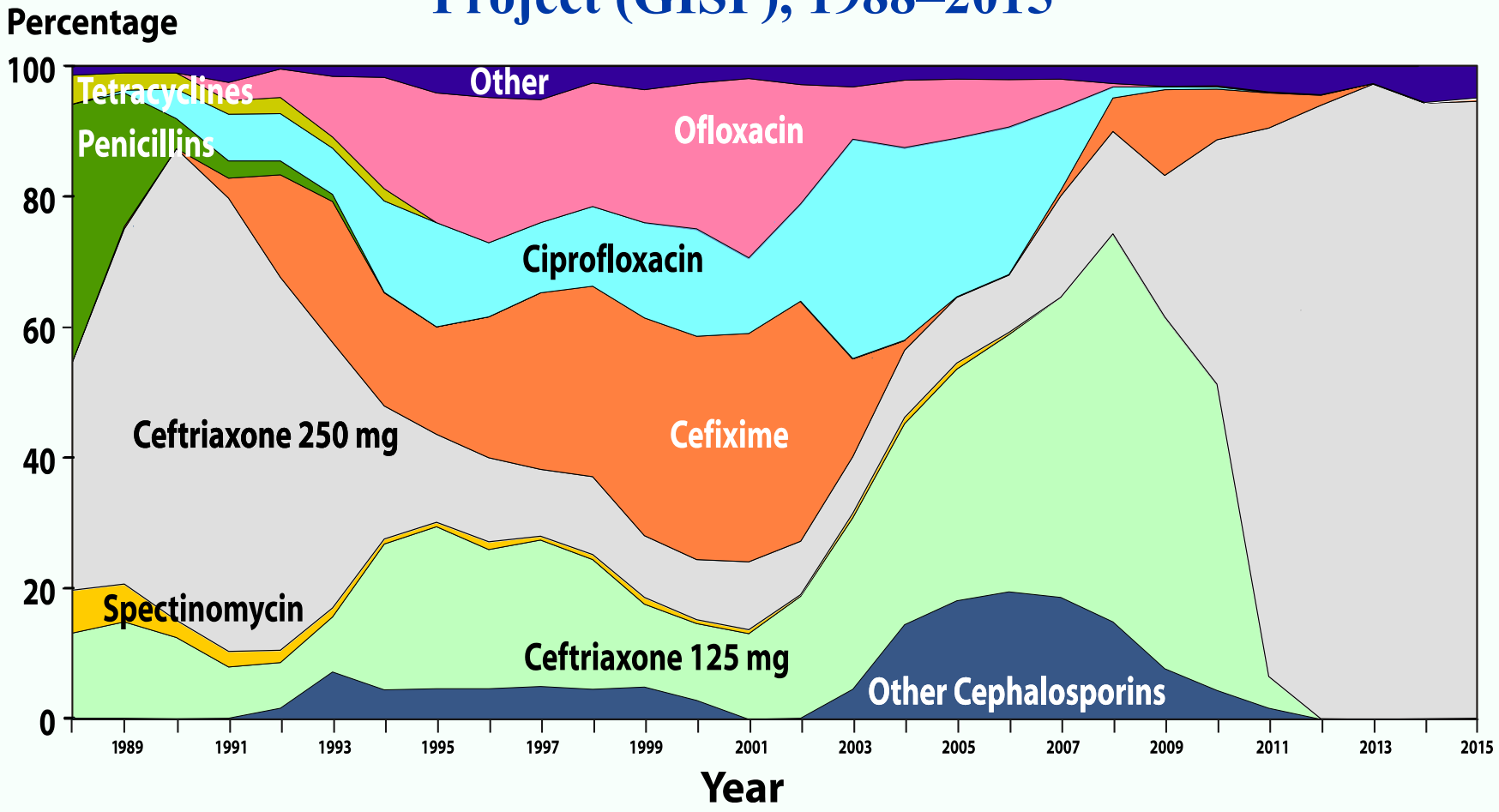


Gonorrhea — Rates of Reported Cases by State, United States and Outlying Areas, 2015



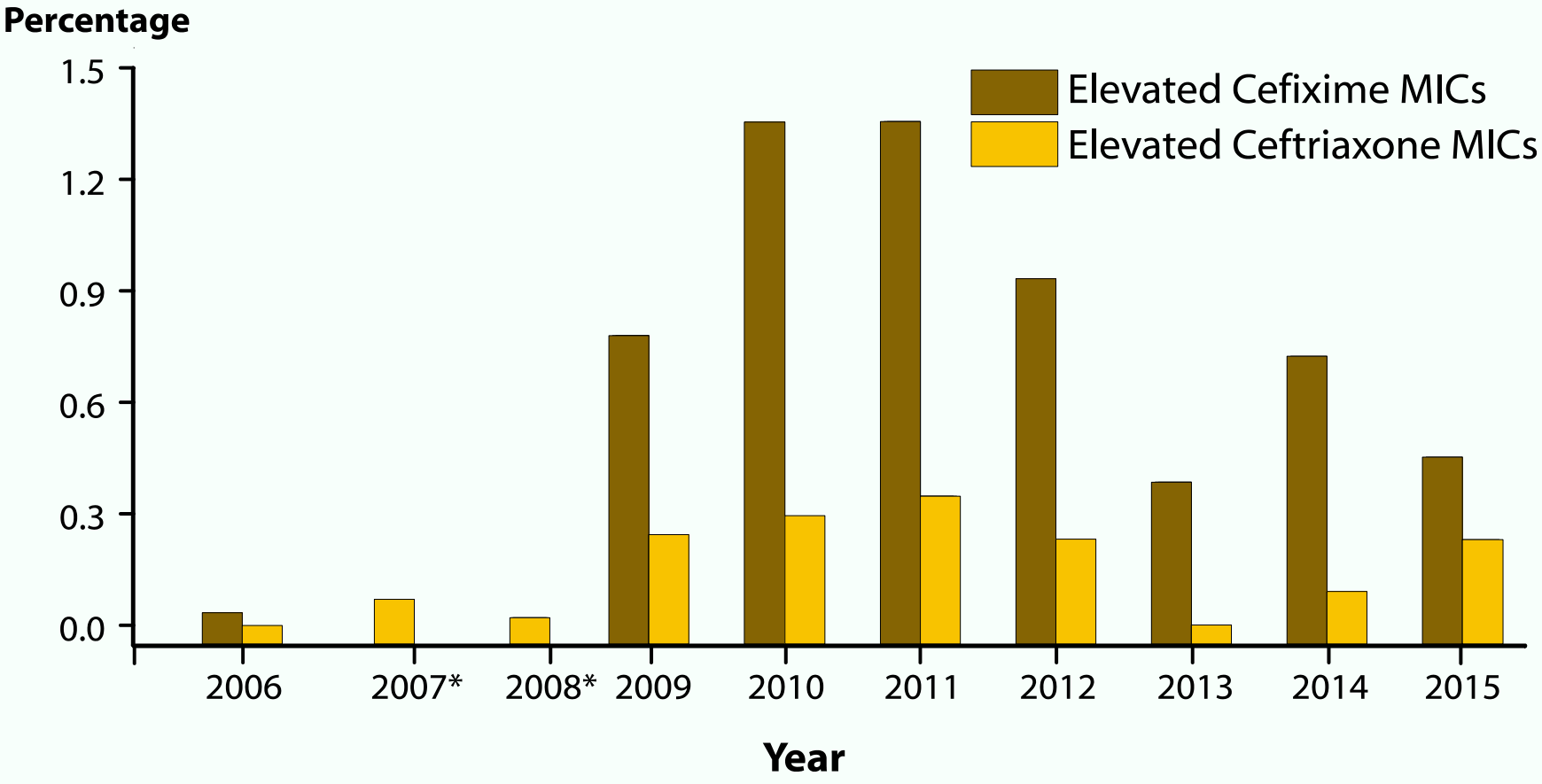
NOTE: The total rate of reported cases of gonorrhea for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 122.7 cases per 100,000 population.

Distribution of Primary Antimicrobial Drugs Used to Treat Gonorrhea Among Participants, Gonococcal Isolate Surveillance Project (GISP), 1988–2015



NOTE: For 2015, "Other" includes clinical trial study drugs (2.7%), azithromycin 2g (1.5%), no therapy (0.6%), and other less frequently used drugs (0.1%).

Neisseria gonorrhoeae — Percentage of Isolates with Elevated Ceftriaxone Minimum Inhibitory Concentrations (MICs) (≥0.125 µg/ml) and Elevated Cefixime MICs (≥0.25 µg/ml), Gonococcal Isolate Surveillance Project (GISP), 2006–2015



* Isolates not tested for cefixime susceptibility in 2007 and 2008.

GC Recommendations

- Neonatal Outcomes: preterm delivery, neonatal sepsis, ophthalmia neonatorum

- Screening:
  - At initial visit
  - Repeat in 3rd trimester if <25 years old or >25 with increased risk

- Treatment: ceftriaxone 250 mg IM x 1 + azithromycin 1 gm.
- If allergic: spectinomycin 98% effective but N/A in US.
  - Consult with specialist in Infectious Diseases.

Is there a true association between GC/CT infection and preterm labor or low birthweight?

- Infection is an important cause of spontaneous preterm labor (especially before 30 weeks).
- GC acquisition in pregnancy has been associated with preterm birth (aOR 2.1, 95% CI 1.02-3.97).
- CT infection during pregnancy has been associated with low birthweight (aOR 2.07, 95% CI 1.01-4.24).

Lamont Frontiers in Immunology 2015; Johnson STD 2011; Martin JAMA 1982

Chlamydia trachomatis and *Neisseria gonorrhoeae* in HIV-infected Pregnant Women and Adverse Infant Outcomes

Kristina Adachi, MD, Jeffrey D. Klausner, MD, MPH,*† Jiahong Xu, MS, MPH,‡ Bonnie Ank, BA,* Claire C. Bristow, PhD, MPH, MSc,† Mariza G. Morgado, PhD,§ D. Heather Watts, MD,¶ Fred Weir, PhD,‖ David Persing, MD, PhD,‖ Lynne M. Mofenson, MD,** Valdilea G. Veloso, MD,§ Jose Henrique Pilotto, MD,†† Esau Joao, MD,‡‡ Glenda Gray, MD,§§ Gerhard Theron, MD,¶¶ Breno Santos, MD,‖‖ Rosana Fonseca, MD,*** Regis Kreitchmann, MD,††† Jorge Pinto, MD,‡‡‡ Marisa M. Mussi-Pinhata, MD,§§§ Mariana Ceriotto, MD,¶¶¶ Daisy Maria Machado, MD,‖‖‖ Yvonne J. Bryson, MD,* Beatriz Grinsztejn, MD, PhD,§ Francisco I. Bastos, MD, PhD,§ George Siberry, MD, MPH,** and Karin Nielsen-Saines, MD, MPH,* for the NICHD HPTN 040 Study Team*

TABLE 1. Adverse Infant Outcomes by Sexually Transmitted Infection Status Among Infants Born to HIV-infected Pregnant Women

	Total (N = 1373), n (%)	CT and NG (N = 35), n (%)	CT Only (N = 214), n (%)	NG Only (N = 28), n (%)	No STI (N = 1096), n (%)	*P**
Low birth weight						
≥2500 g	1129 (82.2)	20 (57.1)	176 (82.2)	22 (78.6)	911 (83.1)	0.001
<2500 g	244 (17.8)	15 (42.9)	38 (17.8)	6 (21.4)	185 (16.9)	
Gestational age						
≥37 wk	1225 (89.2)	25 (71.4)	191 (89.2)	25 (89.3)	984 (89.8)	0.008
<37 wk	148 (10.8)	10 (28.6)	23 (10.8)	3 (10.7)	112 (10.2)	

Adachi Ped Inf Dis Jnl 2016 – NICHD HPTN 040

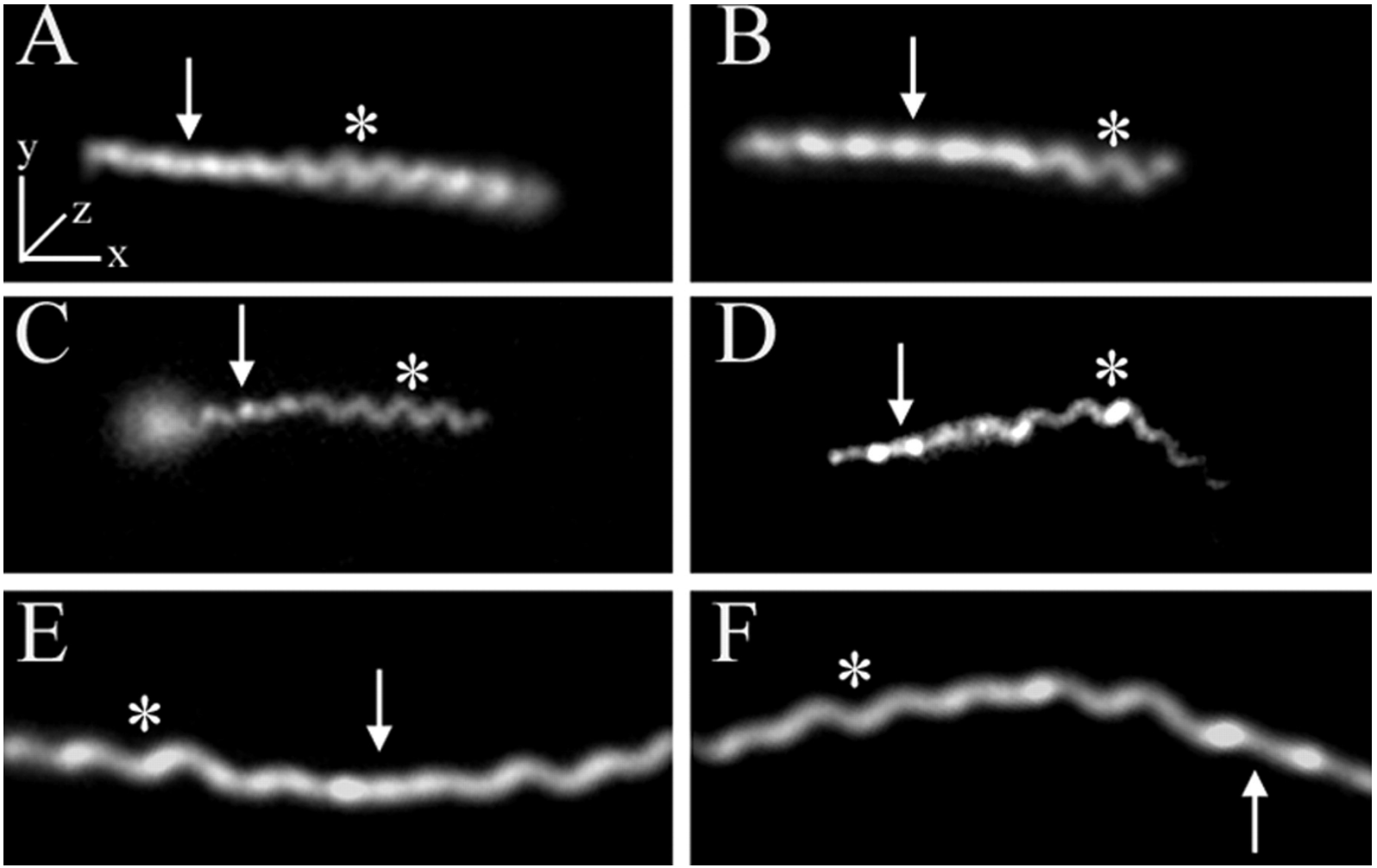
Table 3. Relationship of CT/NG with Adverse Infant Outcomes with/without Adjusting for Infant HIV Infection Status

Adverse Infant Outcomes	Unadjusted (Predictor = Any CT/NG)		After Adjusting for HIV status (Predictor – Any CT/NG + HIV Status)	
	OR (95% CI)	p-value	OR (95% CI)	p-value
Any Adverse Infant Outcomes (yes)	1.36 (1.04 - 1.78)	0.02	1.35 (1.03 - 1.76)	0.03
Sepsis (yes)	1.24 (0.65 - 2.34)	0.51	1.19 (0.62 - 2.26)	0.60
Pneumonia (yes)	1.23 (0.69 - 2.19)	0.48	1.16 (0.65 - 2.10)	0.61
Low birth weight <2500g	1.33 (0.96 - 1.85)	0.086	1.32 (0.95 - 1.83)	0.099
Gestational age <37 weeks	1.31 (0.88 - 1.96)	0.18	1.31 (0.87 - 1.95)	0.19
Death (yes)	0.96 (0.44 - 2.10)	0.91	0.88 (0.40 - 1.96)	0.76

CT= *Chlamydia trachomatis*. NG= *Neisseria gonorrhoeae*. OR: odds ratio. CI: confidence interval.

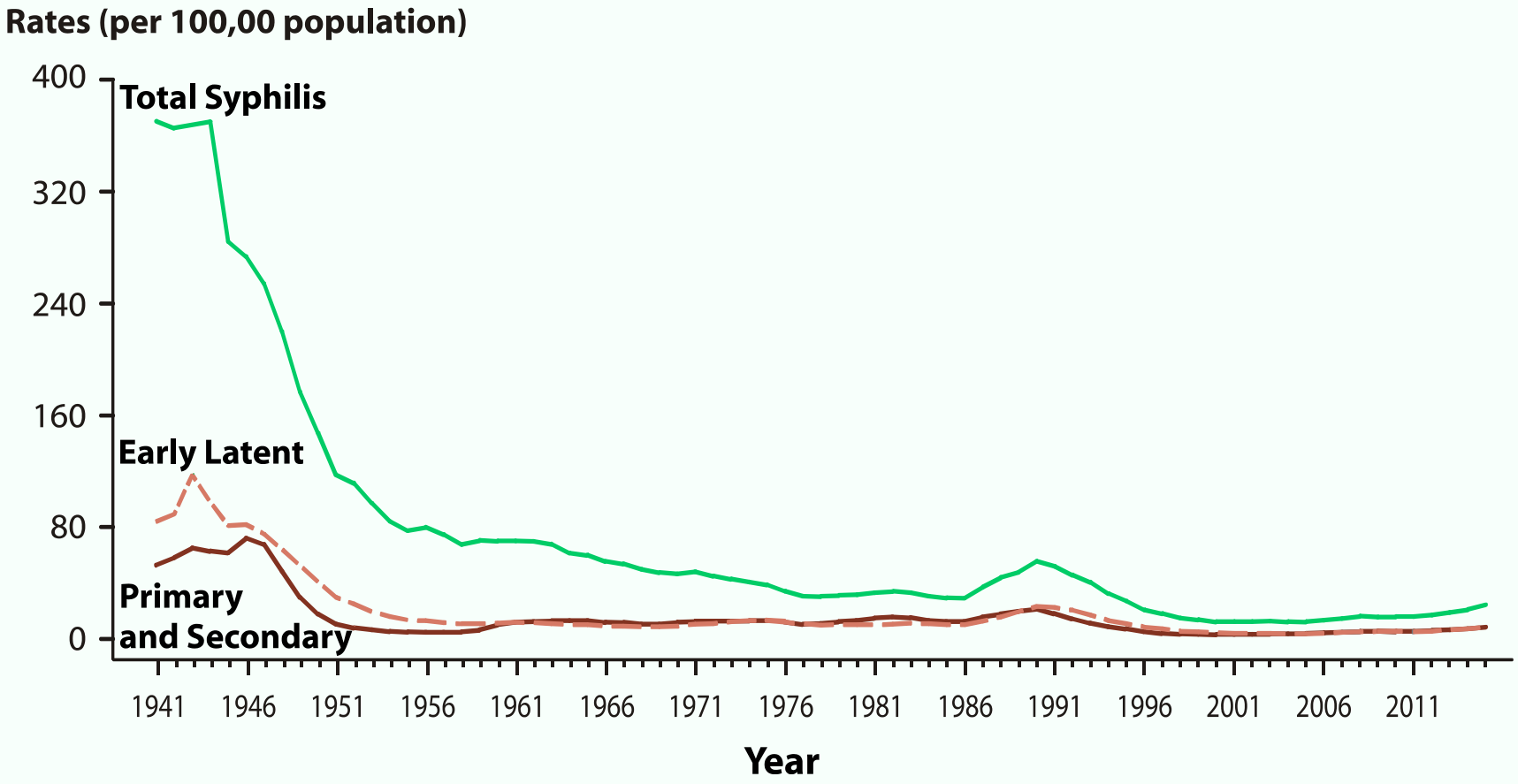
Adachi Ped Inf Dis Jnl 2016

Syphilis



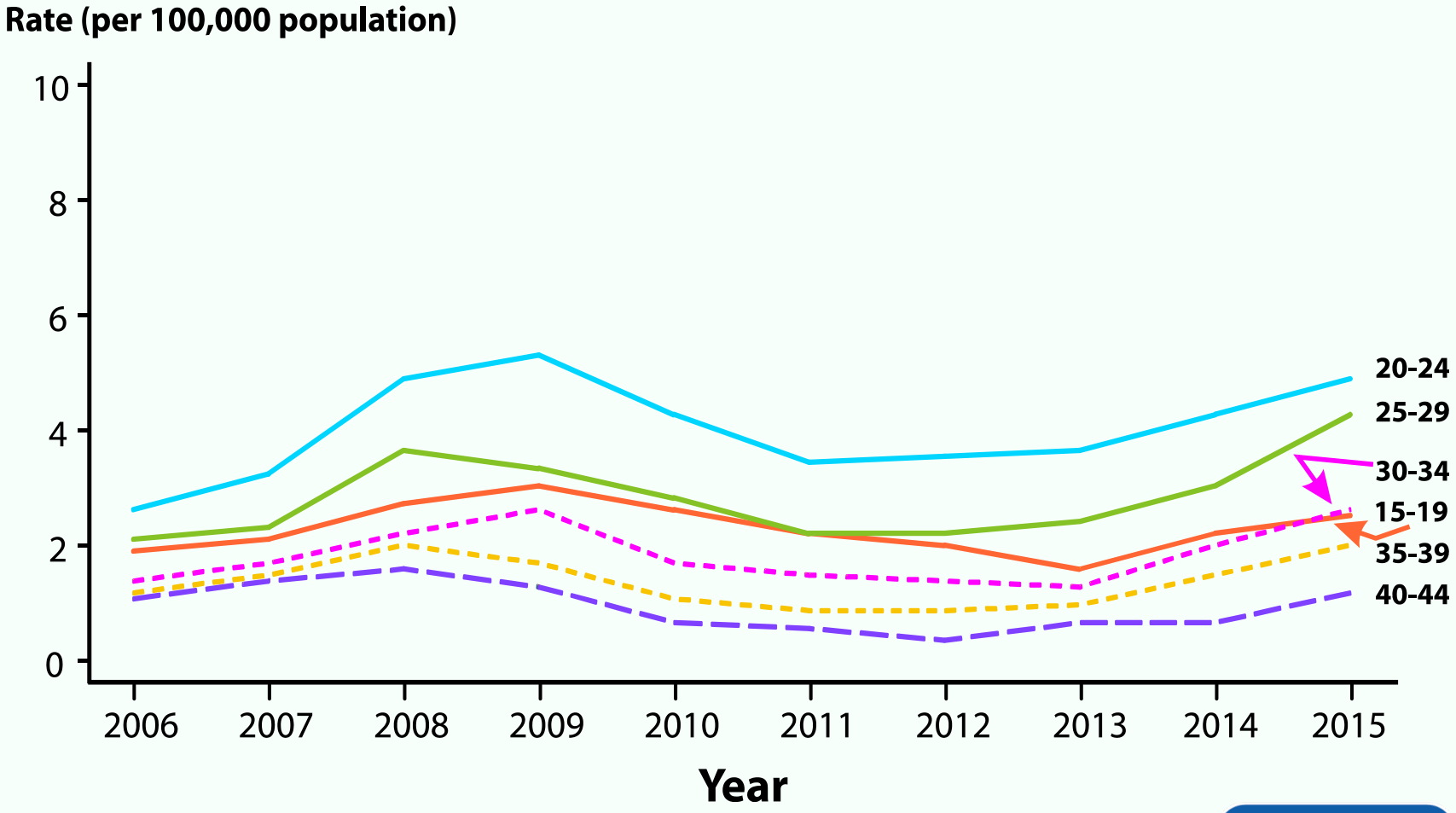
Jacques Izard et al. J. Bacteriol. 2009;191:7566-7580

Syphilis — Rates of Reported Cases by Stage of Infection, United States, 1941–2015

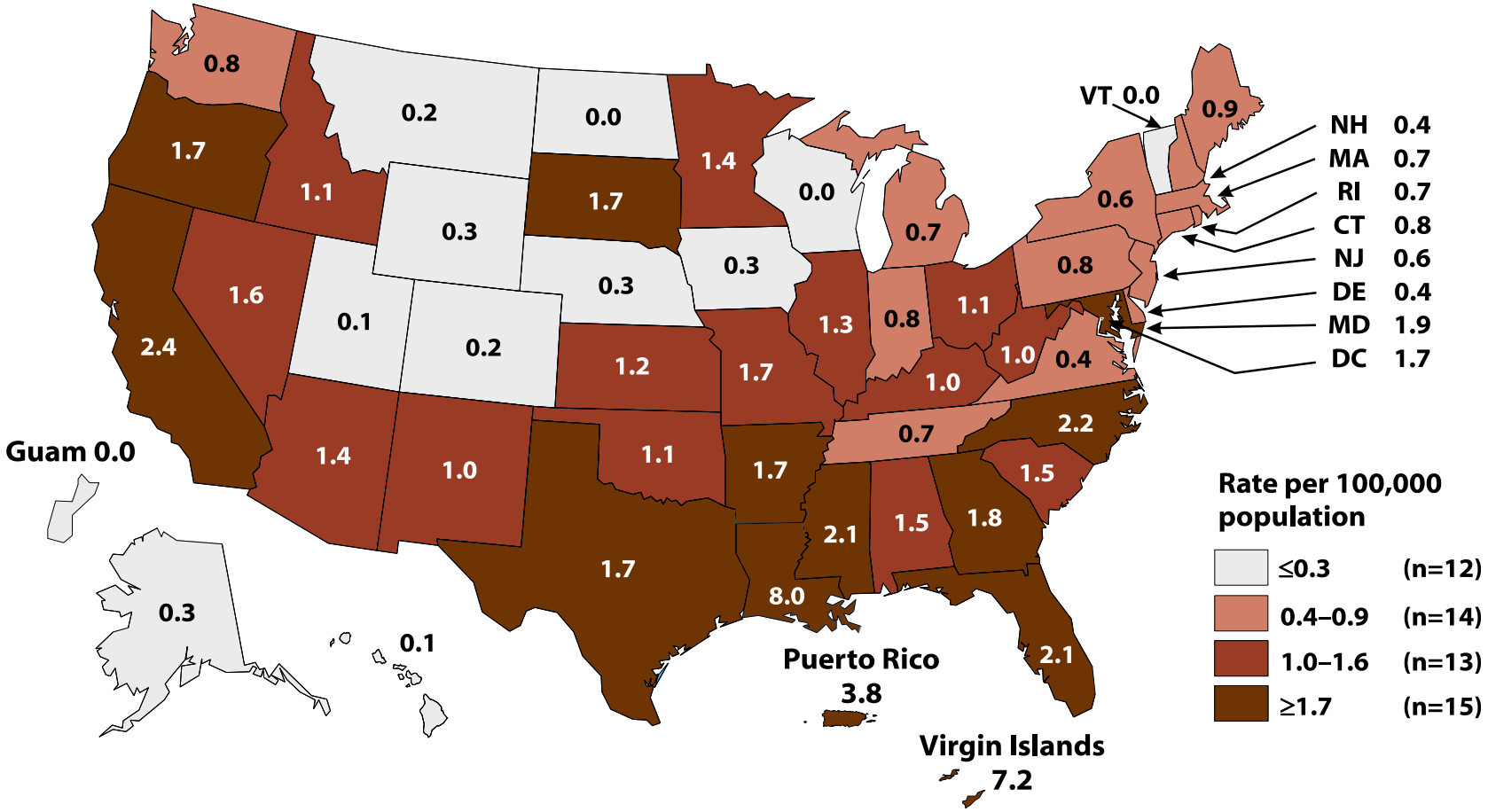


NOTE: Data collection for syphilis began in 1941; however, syphilis became nationally notifiable in 1944. Refer to the National Notifiable Disease Surveillance System (NNDSS) website for more information: https://wwwn.cdc.gov/nndss/conditions/syphilis/.

Primary and Secondary Syphilis — Rates of Reported Cases Among Women Aged 15–44 Years by Age Group, United States, 2006–2015



Primary and Secondary Syphilis — Rates of Reported Cases Among Women by State, United States and Outlying Areas, 2015



NOTE: The total rate of primary and secondary syphilis among women in the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 1.4 cases per 100,000 females.

Syphilis in Pregnancy

- Transplacental infection can occur anytime during pregnancy.
  - 60-90% of women with early infection.
  - 98% preventable if detected and treated appropriately

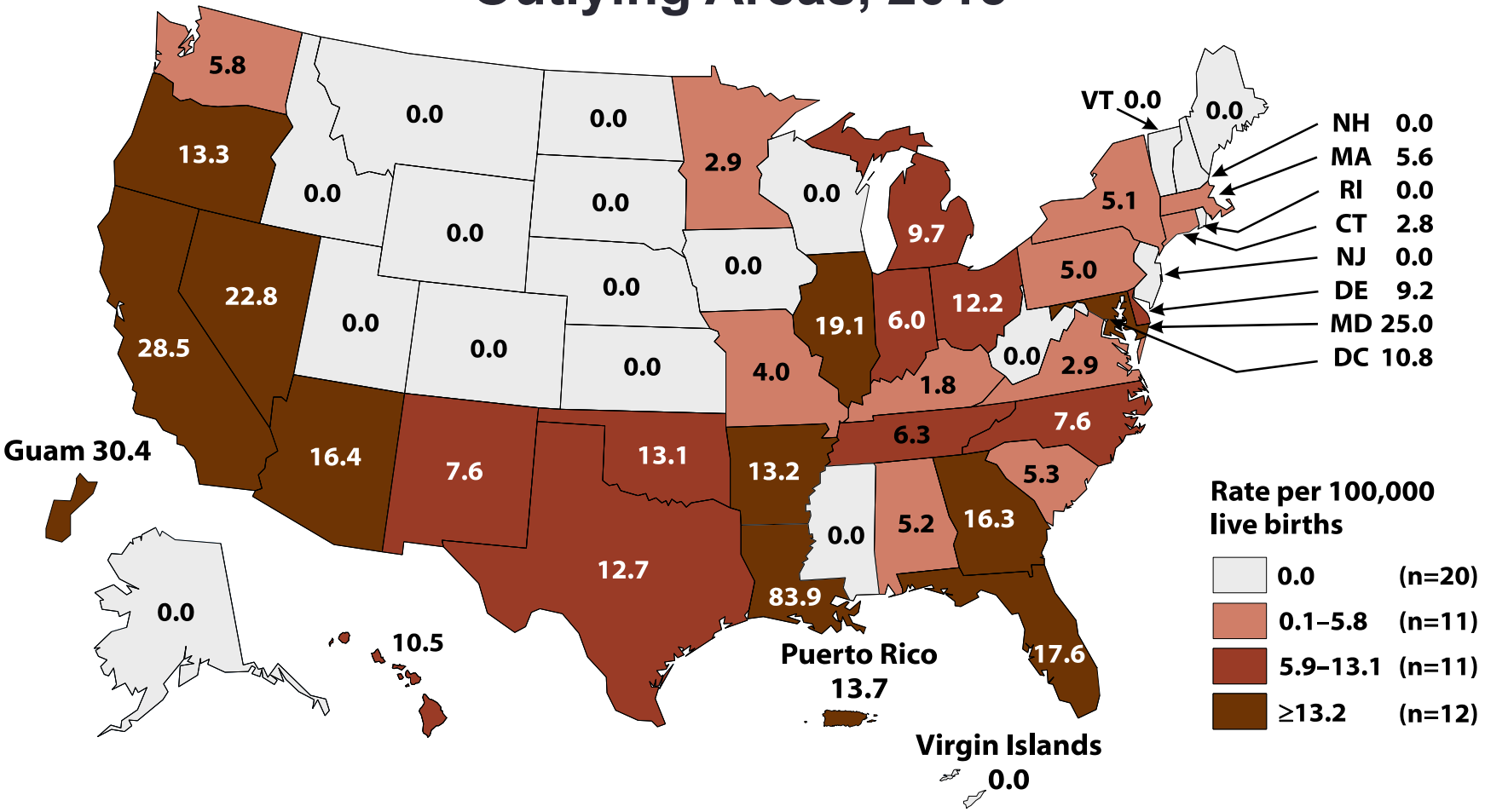
- In women with HIV, syphilis infection is associated with a 2 fold increased risk MTCT (Yeganeh Peds ID Jnl 2015)

Case #2

- 37 year old WF with well controlled HIV is 37 weeks pregnant.
- She comes for a routine follow up visit and has no complaints.
- She is tolerating boosted atazanavir (400/100) with tdf/ftc and reports no missed doses.
- Her husband is HIV-infected and on ART as well.
- Labs: CBC, BMP normal
- LFTS: BR 2.9, direct BR 0.5, indirect BR 2.4.
- CD4 429 (39%), HIV viral load <20
- RPR 1:64

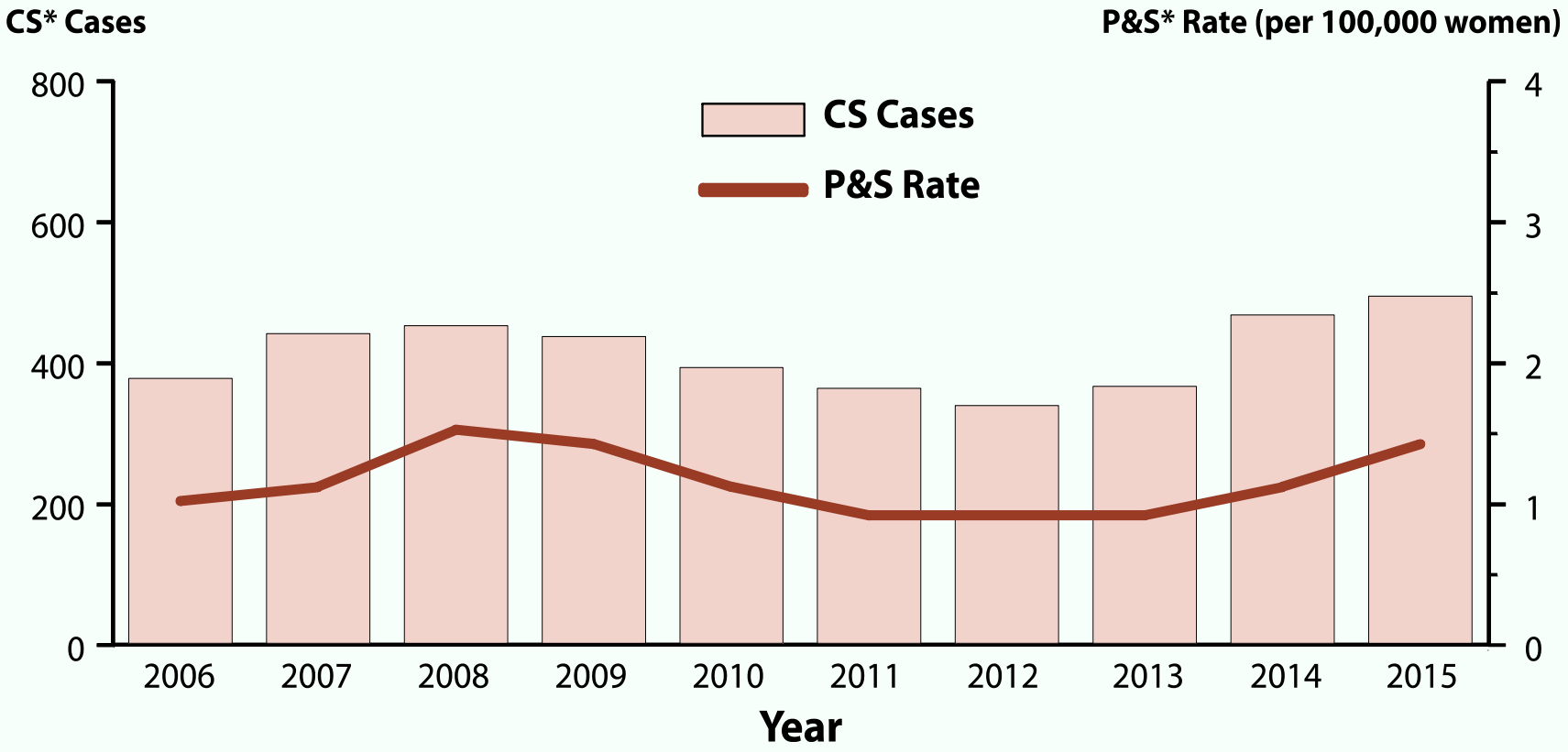
- What do you do next?

Congenital Syphilis — Rates of Reported Cases Among Infants by Year of Birth and State, United States and Outlying Areas, 2015



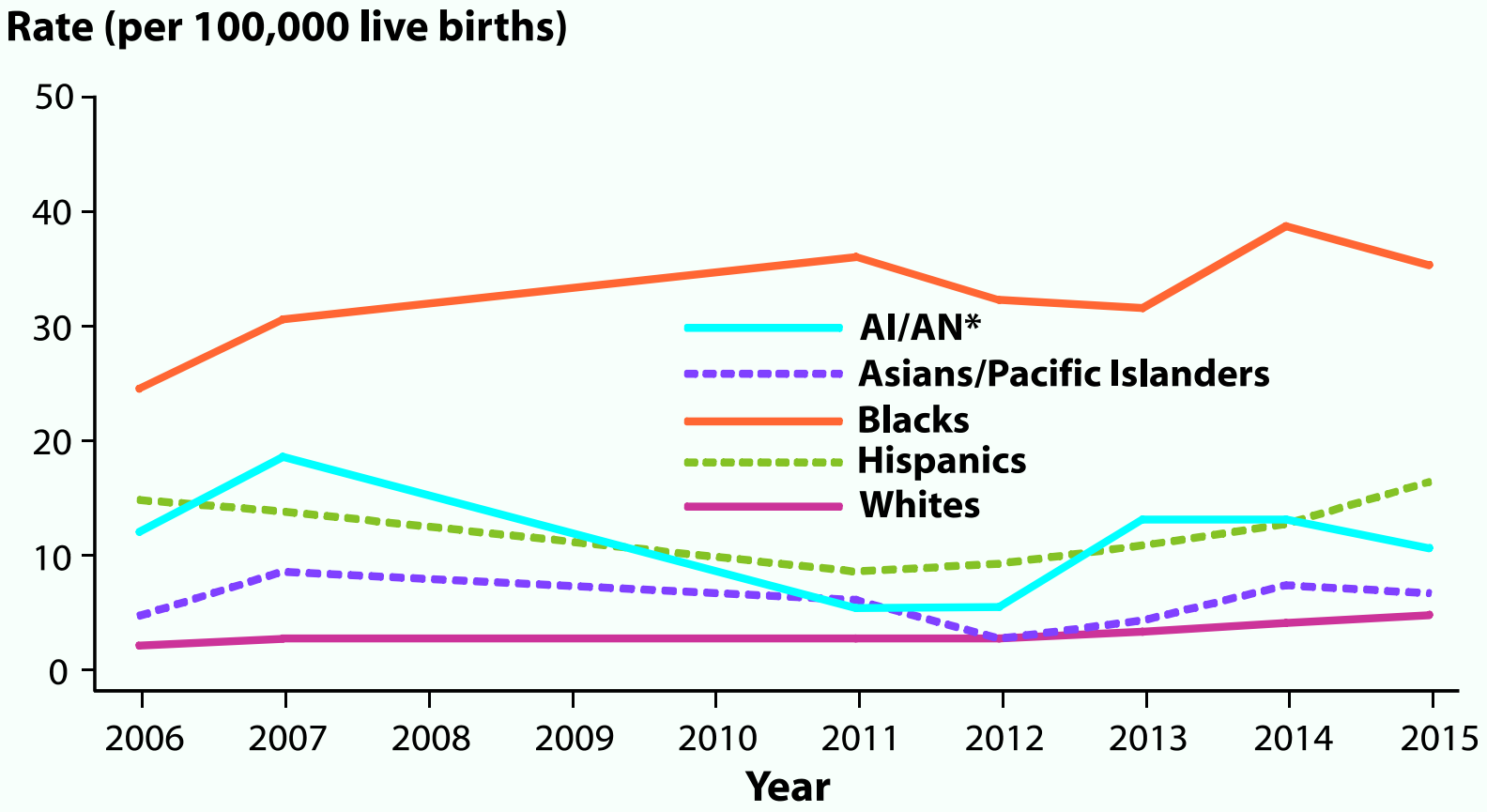
NOTE: The total rate of congenital syphilis for infants by year of birth for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 12.4 cases per 100,000 live births.

Congenital Syphilis — Reported Cases by Year of Birth and Rates of Primary and Secondary Syphilis Among Women, United States, 2006–2015



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

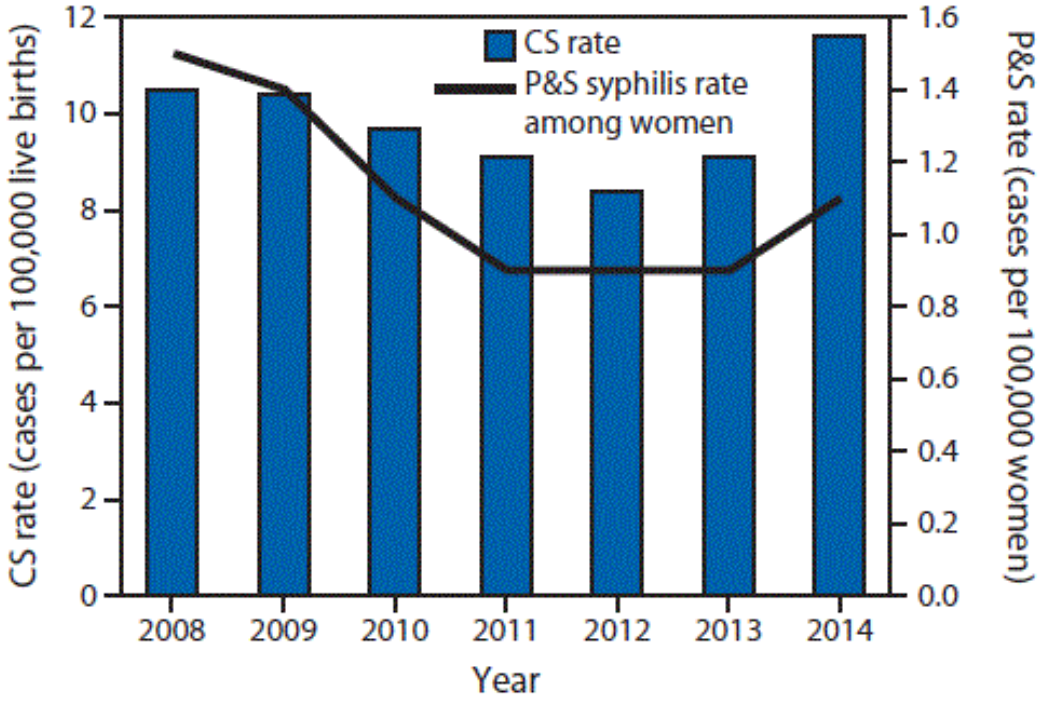
Congenital Syphilis — Rates of reported Cases Among Infants, by Year of Birth and Mother's Race/Ethnicity, United States, 2006–2015



* AI/AN = American Indians/Alaska Natives.

NOTE: National Center for Health Statistics bridged race categories are presented to allow the display of data across several years.

FIGURE. Congenital syphilis (CS) rate* among infants aged <1 year and rate of primary and secondary (P&S) syphilis among women† — United States, 2008–2014§



- 458 cases of congenital syphilis were reported in 2014.
- 22% had no prenatal care.

Bowen MMWR Nov 2015

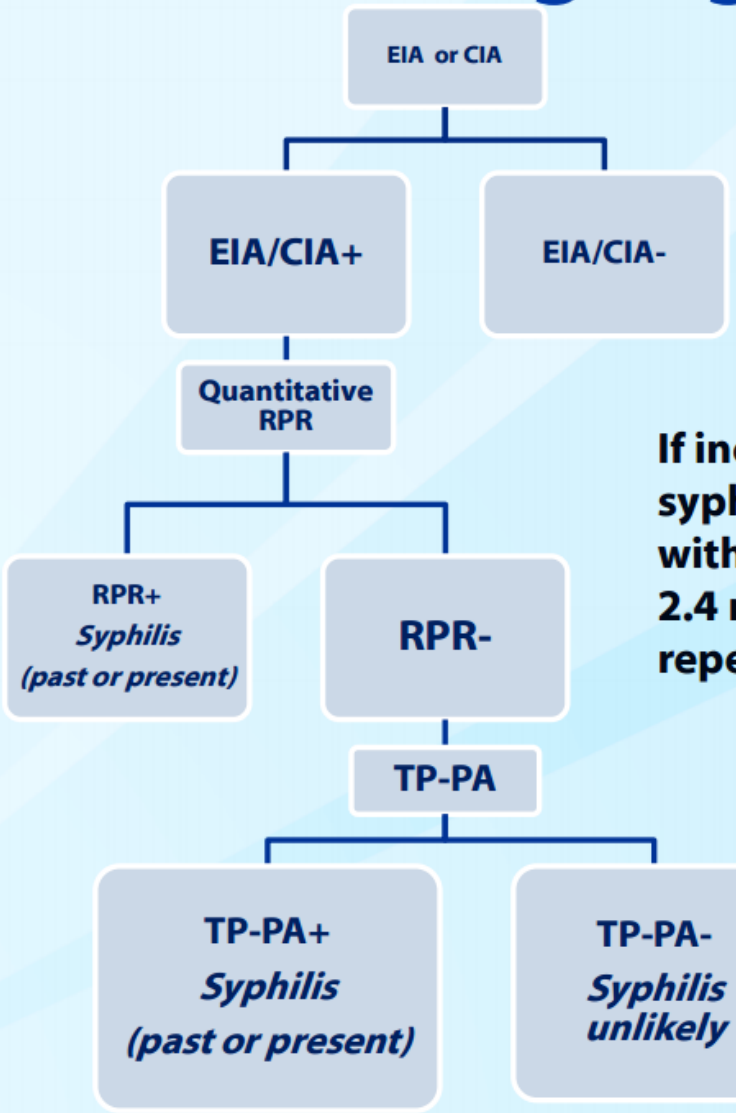
Syphilis Recommendations

- Infection Outcomes: Stillbirth, neonatal death, congenital syphilis, low birth weight.

- Screening:
  - First prenatal visit
  - Repeat screen at 28-32 weeks.
  - Repeat screen at delivery for women at increased risk or live in communities with increased prevalence.

- Treatment: Benzathine penicillin 2.4 MU IM
  - 98% effective at preventing congenital disease among women who deliver after 20 weeks.
  - Desensitize if allergic to penicillin and infection is early.
  - Jarisch-Herxheimer reaction can induce early labor or cause fetal distress.

Reverse Screening Algorithm



Evaluate clinically, determine if treated for syphilis in the past, assess risk of infection, and administer therapy according to guidelines if not previously treated.

If incubating or primary syphilis is suspected, treat with benzathine penicillin G 2.4 million units IM x 1 and/or repeat in 2-4 weeks.

If at risk for syphilis, repeat RPR in 2 to 4 weeks.

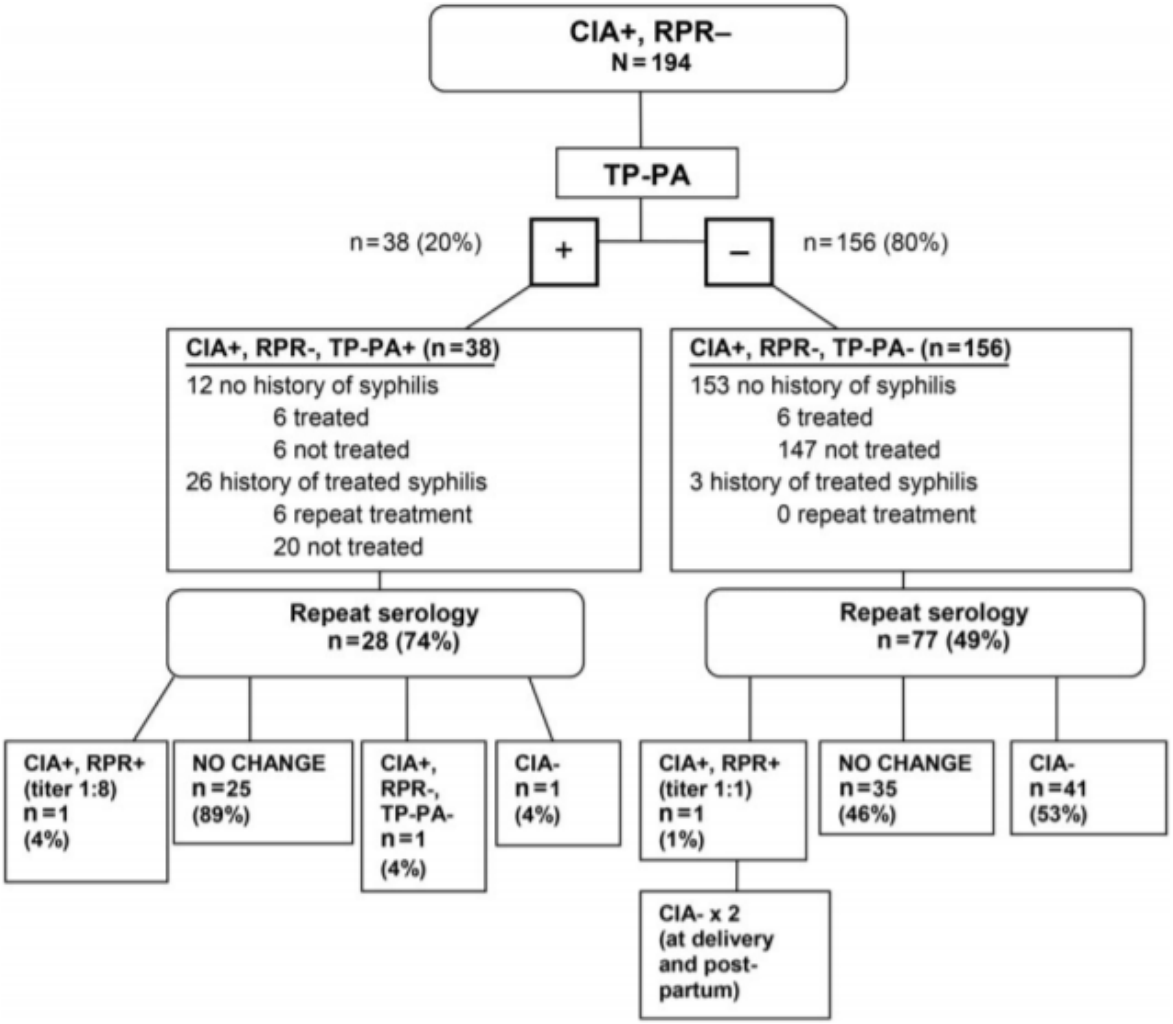


Figure 1. Serology results and clinical management after prenatal screening with the treponemal chemiluminescence immunoassay (CIA). Abbreviations: RPR, rapid plasma reagin test; TP-PA, *Treponema pallidum* particle agglutination assay.

Mmeje CID 2015

2:40

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TREATMENTS

< Penicillin Shortage Could Be A Problem For People With Syphilis

May 23, 2016 · 4:29 AM ET

Transcript

DAVID GREENE, HOST:

Since it first came on the scene in the early 1940s, penicillin has made syphilis a thing of the past - almost. But as NPR's Rae Ellen Bichell reports, the penicillin shortage is coinciding with a rise in the disease.

Evaluation for Syphilis Exposed Infants

- Review maternal RPR titers and treatment history
- Physical exam
  - 2/3 of infected neonates are asymptomatic at birth.
- Bloodwork:
  - RPR (not TPHA)
  - HIV test (DNA PCR)
- If RPR is positive, check CBC, CSF, XR of long bones.
- Treatment: PCN G IV x 10 days.

Case #2 = Probable Congenital Syphilis

CDC Case Definition:

Case classification

Probable: a condition affecting an infant whose mother had untreated or inadequately treated* syphilis at delivery, regardless of signs in the infant, or an infant or child who has a reactive non-treponemal test for syphilis (Venereal Disease Research Laboratory [VDRL], rapid plasma reagin [RPR], or equivalent serologic methods) AND any one of the following:

- Any evidence of congenital syphilis on physical examination (see Clinical description)
- Any evidence of congenital syphilis on radiographs of long bones
- A reactive cerebrospinal fluid (CSF) venereal disease research laboratory test (VDRL) test
- In a nontraumatic lumbar puncture, an elevated CSF leukocyte (white blood cell, WBC) count or protein (without other cause)

Trichomonas

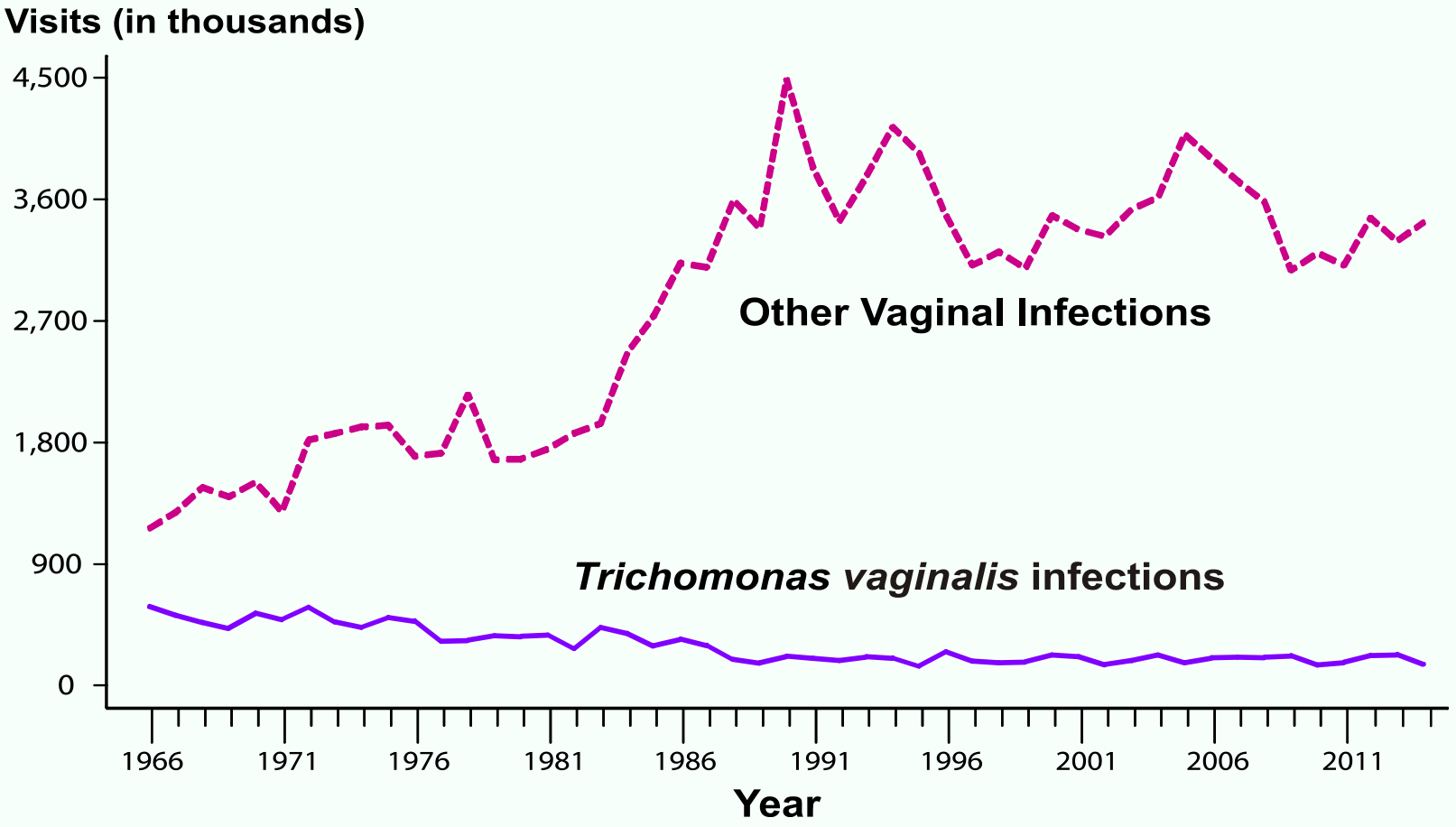
- Outcomes: Infection with *T. vaginalis* has been associated with premature rupture of membranes, preterm labor and low birthweight infants. 2-3 fold increased risk of HIV acquisition.

- Screening: screening and treatment during pregnancy has not consistently been associated with improved perinatal morbidity.
  - HIV-infected pregnant women should be screened at the 1st prenatal visit and retested 3 months later.

- Pregnant women should be tested if symptomatic.

- Treatment: metronidazole 2gm PO x 1.
  - If HIV-infected: metronidazole 500 mg po bid x 7 days
  - Good safety outcomes in more recent trials.

Trichomonas vaginalis and Other Vaginal Infections Among Women — Initial Visits to Physicians' Offices, United States, 1966–2014



NOTE: The relative standard errors *Trichomonas vaginalis* infection estimates range from 16% to 21% and for other vaginal infection estimates range from 8% to 13%.

SOURCE: National Disease and Therapeutic Index, IMS Health, Integrated Promotional Services™, IMS Health Report, 1966–2014. The 2015 data were not obtained in time to include them in this report.

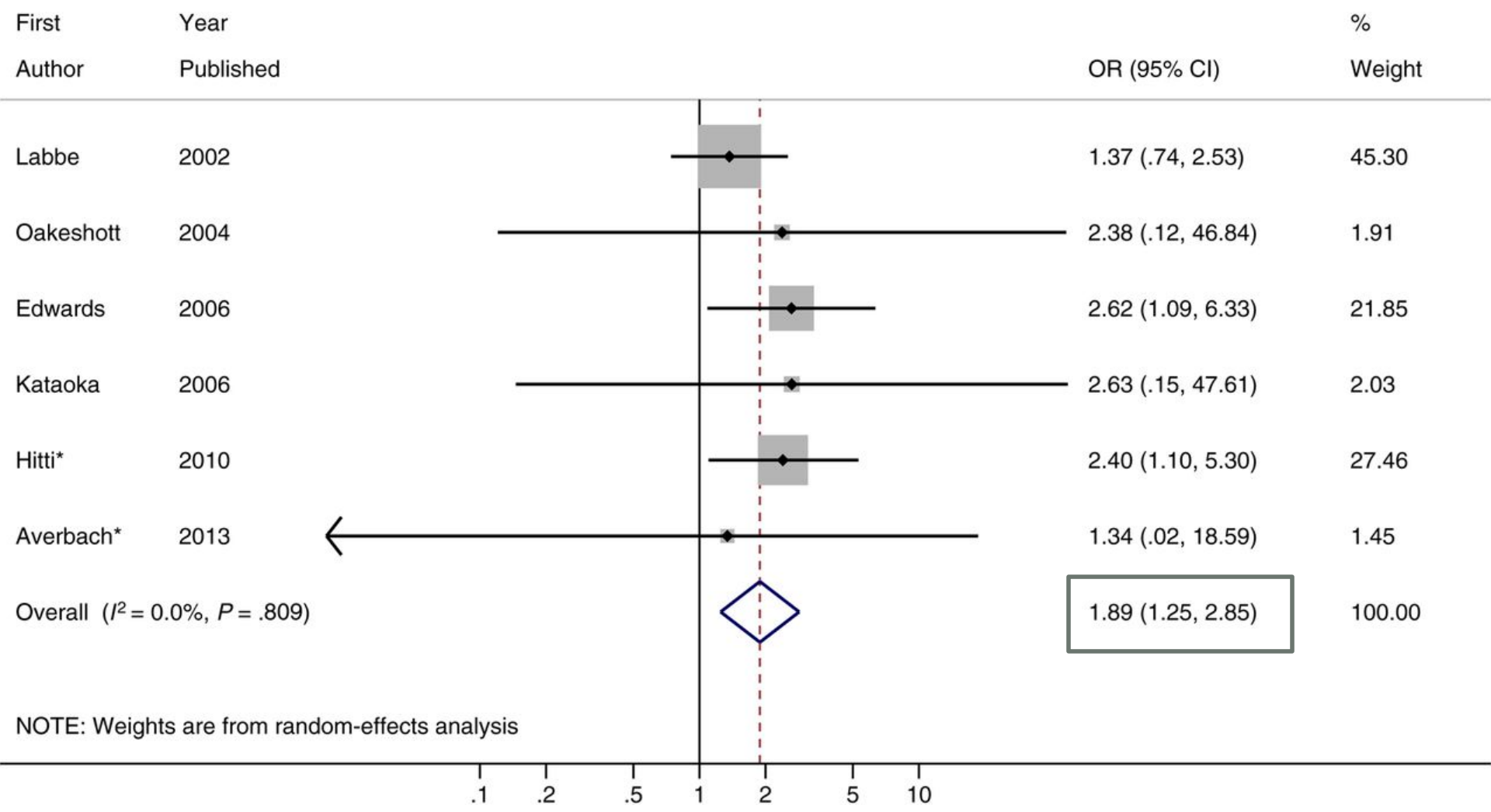
Bacterial Vaginosis

- Outcomes: Symptomatic BV has been associated with premature rupture of membranes, preterm labor, preterm birth, intra-amniotic infection and post-partum endometritis.

- Screening: not currently recommended
  - Possible role for treatment among women with asymptomatic infection who are at high risk of preterm labor
    - 7 trials: 4 showed benefit, 2 showed no benefit, 1 showed harm.

- Treatment: metronidazole 500 mg po bid x 7 days or metronidazole gel 0.75% 5 gm intravaginally qd x 5 days or clindamycin cream 2%, 5 gm intravaginally qhs x 7 days
  - Same treatment options as non-pregnant women.
  - Oral or vaginal treatment is allowed during pregnancy.
  - Reassuring pregnancy and neonatal safety outcomes.

Forest plot of the association between Mycoplasma genitalium and preterm birth
***Adjusted effect estimate (crude effect estimate in all other cases).**



Rebecca Lis et al. Clin Infect Dis. 2015;61:418-426

Immunization & Pregnancy

Vaccines help keep a pregnant woman and her growing family healthy.

Vaccine	Before pregnancy	During pregnancy	After pregnancy	Type of Vaccine
Hepatitis A	Yes, if indicated	Yes, if indicated	Yes, if indicated	Inactivated
Hepatitis B	Yes, if indicated	Yes, if indicated	Yes, if indicated	Inactivated
Human Papillomavirus (HPV)	Yes, if indicated, through 26 years of age	No, under study	Yes, if indicated, through 26 years of age	Inactivated
Influenza IIV	Yes	Yes	Yes	Inactivated
Influenza LAIV	Yes, if less than 50 years of age and healthy; avoid conception for 4 weeks	No	Yes, if less than 50 years of age and healthy; avoid conception for 4 weeks	Live
MMR	Yes, if indicated, avoid conception for 4 weeks	No	Yes, if indicated, give immediately postpartum if susceptible to rubella	Live
Meningococcal: • polysaccharide • conjugate	If indicated	If indicated	If indicated	Inactivated Inactivated
Pneumococcal Polysaccharide	If indicated	If indicated	If indicated	Inactivated
Tdap	Yes, if indicated	Yes, vaccinate during each pregnancy ideally between 27 and 36 weeks of gestation	Yes, immediately postpartum, if not received previously	Toxoid/ inactivated
Tetanus/Diphtheria Td	Yes, if indicated	Yes, if indicated, Tdap preferred	Yes, if indicated	Toxoid
Varicella	Yes, if indicated, avoid conception for 4 weeks	No	Yes, if indicated, give immediately postpartum if susceptible	Live

Conclusions

- Vertical transmission of HIV can be prevented with early diagnosis and good access/adherence to ARV therapy.
- Rates of bacterial sexually transmitted infections (STI) are increasing in the US.
- STI are frequent among pregnant women with HIV.
- Understanding STI risk among women requires careful history taking about sexual partners and behaviors.
- *Chlamydia trachomatis* and syphilis (*T. pallidum*) are highly susceptible to antibiotics but resistance to gonorrhea (*N. gonorrhoeae*) is increasing.
- Since most STI in women are asymptomatic, screening is key to reducing rates of negative birth outcomes.

HIV/STI Screening in Pregnancy in High-prevalence Areas

Test	Timing and Population
HIV Testing (Opt-Out)	Entry to prenatal care, 3rd trimester, Rapid test at delivery if not documented prior.
Chlamydia	Entry to prenatal care, 3rd trimester
Gonorrhea	Entry to prenatal care, 3rd trimester
Syphilis	Entry to prenatal care, 28-32 weeks, at delivery. (and any stillbirth after 20 weeks)
Trichomonas	HIV+ women: Entry to care and 12 weeks later
Bacterial Vaginosis	Not currently recommended
Mycoplasma genitalium	Not currently recommended

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Questions?