Is Your Unit Prepared?

Identifying, Treating, and Reporting HIV, Congenital Syphilis, and Tuberculosis in Pregnant and Pediatric Patients

Infectious Diseases Webinar

February 15, 2022

12:00 PM – 1:15 PM CST

ALPQC Mission

The Alabama Perinatal Quality Collaborative exists to promote optimal health for Alabama mothers and babies by connecting key health and community stakeholders, sharing opportunities for education and training, and advancing the quality and safety of care through collaborative cooperation, evidence-based practices, and equitable approaches to care.

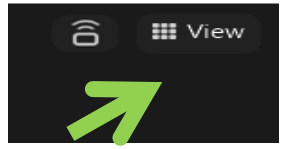
Today's Facilitators

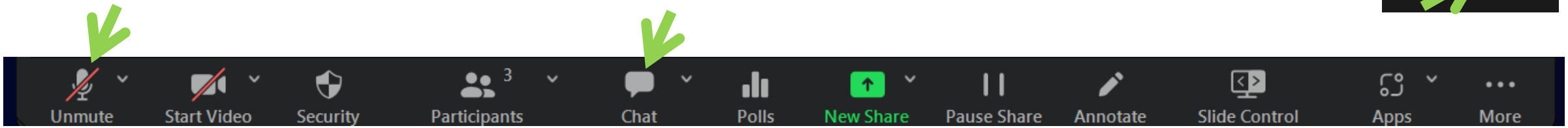
Dr. DeeAnne Jackson, MD, MPH
Medical Director, Newborn Nursery, UAB
Quality Officer, Pediatric Services, UAB
Pediatrics Lead, ALPQC

Dr. Elizabeth Turnipseed, MD, MSPH
Chief of Medical Staff, UAB Medicine
Associate Professor, General Internal Medicine, UAB
Vice Chair, Clinical Affairs, UAB Dept of Medicine
Chair, Alabama's State TB Advisory Council

Remember…

- Please type your name and organization you represent in the chat box and send to ”Everyone.”
- Please click on the three dots in the **upper right corner of your Zoom image**, click “Rename” and put your name and organization. Please also do for all those in the room with you viewing the webinar.
- In the **upper right-hand corner of your screen**, select view to change the layout to ensure you can see presenters and interpreters.
- Attendees are automatically muted to reduce background noise.
- You may enter questions/comments in the “chat” box during the presentation. We will have a Q&A session at the end.
- Slides will be available via email and at http://www.alpqc.org/
- We will be recording this call to share, along with any slides.





Objectives

- Provide attendees with information and actionable recommendations for the identification, treatment, and reporting of HIV, Congenital Syphilis, and Tuberculosis in pregnant and pediatric patients
- Encourage pediatric and obstetric units to adopt standardized techniques in the screening, testing, treatment, and reporting of different infectious diseases
- Help units and providers understand how, when, and where they can request information such as data from local health departments or adjoining clinical care teams working across the maternal-infant dyad.

A Special Thanks…

Dr. S. Cecelia Hutto, MD
Professor & Medical Director of Hospital Infection Control, Division of Pediatric Infectious Disease
University of Alabama at Birmingham & Children's of Alabama

Dr. Jodie Dionne, MD
Associate Professor of Medicine, Division of Infectious Diseases, University of Alabama at Birmingham
Chief of Women's Health, 1917 HIV Clinic
Associate Director of Global Health, UAB Center for Women's Reproductive Health

Dr. Agnes Oberkor, DrPH, MPH, MSN, CRNP
Congenital Syphilis Coordinator
Alabama Department of Public Health

Anthony Merriweather, MSPH
Director, STD Division, Bureau of Communicable Diseases
Alabama Department of Public Health

HIV Infection and Care of Pregnant Women in Alabama

Dr. Audrey Lloyd, MD
Infectious Disease Fellow
Children's of Alabama
University of Alabama at Birmingham

Human Immunodeficiency Virus (HIV) Infection and Care of Pregnant Women in Alabama

Audrey Lloyd, MD
Combined Adult and Pediatric Infectious Diseases Fellow
University of Alabama at Birmingham
Children's of Alabama

Learning Objectives

- State of State --- What is Happening in Alabama?
- HIV Screening in Pregnancy
- HIV Management at Delivery during Pregnancy
- Care of the HIV Exposed Infants

State of State:
What is Happening with HIV in Alabama?

Perinatal HIV Transmission is Preventable

The risk of perinatal HIV infection can be **1% or less**

1. Mother takes antiretroviral (ARV) treatment as prescribed throughout pregnancy and delivery.

2. Baby is treated for 4 to 6 weeks of ARV after birth.

Perinatal HIV in Alabama

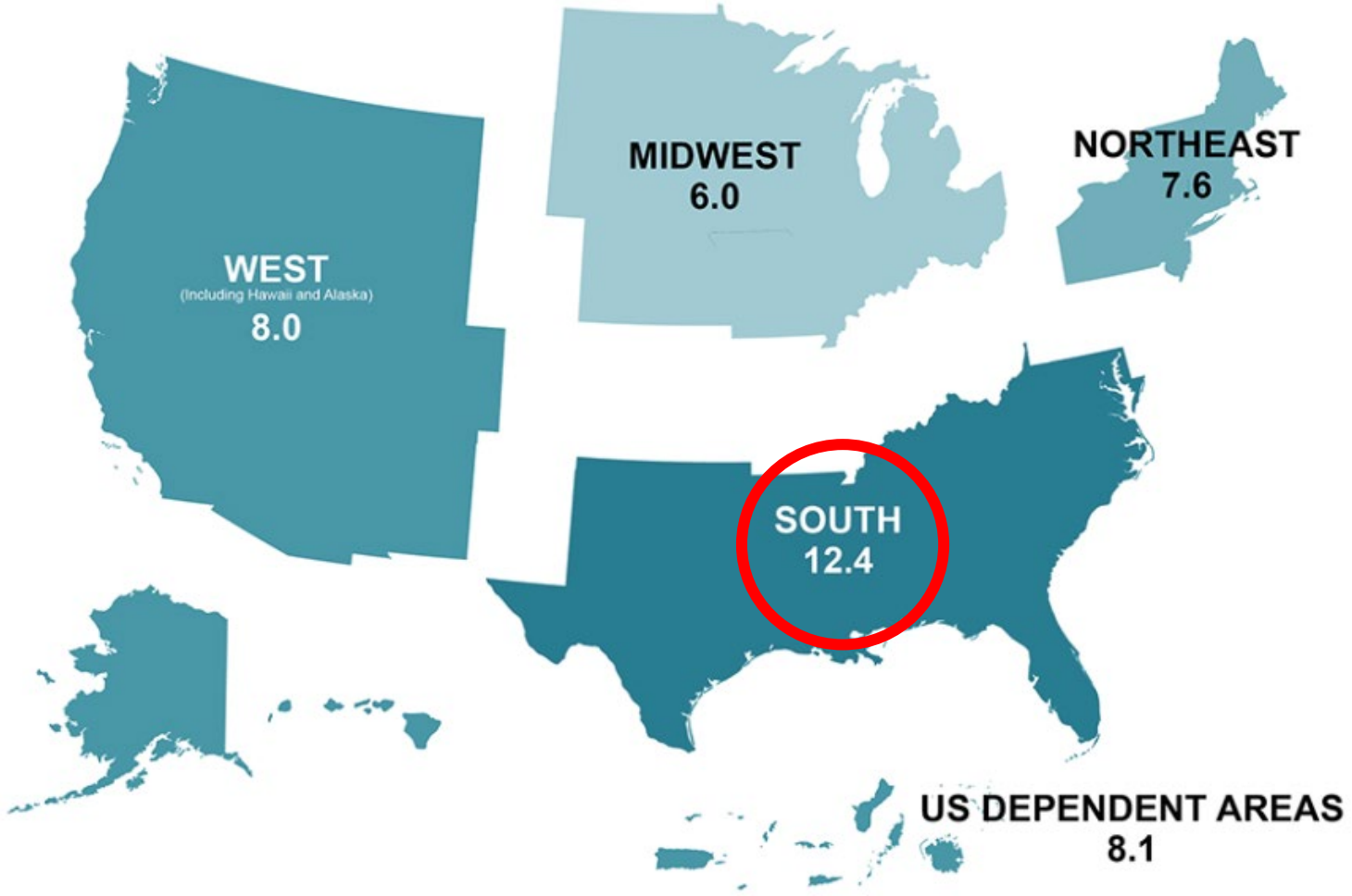
Risk of perinatal HIV remains high in Alabama

- High incidence of new HIV infections

Rate of New HIV Diagnoses by Region, 2020

*Rates are per 100,000 people.

† Among adults, adolescents, and children under the age of 13.



Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2020. *HIV Surveillance Report* 2022;33.

New HIV Diagnoses by Region, 2020

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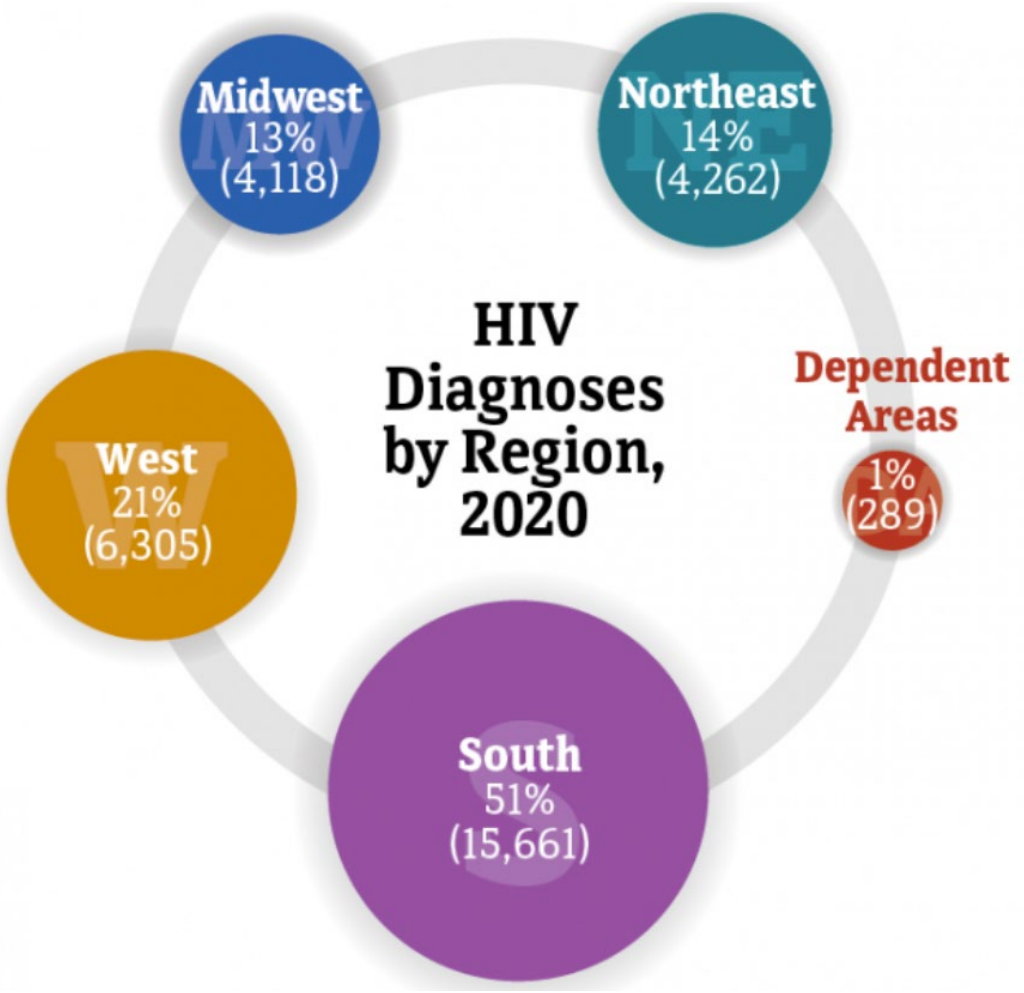

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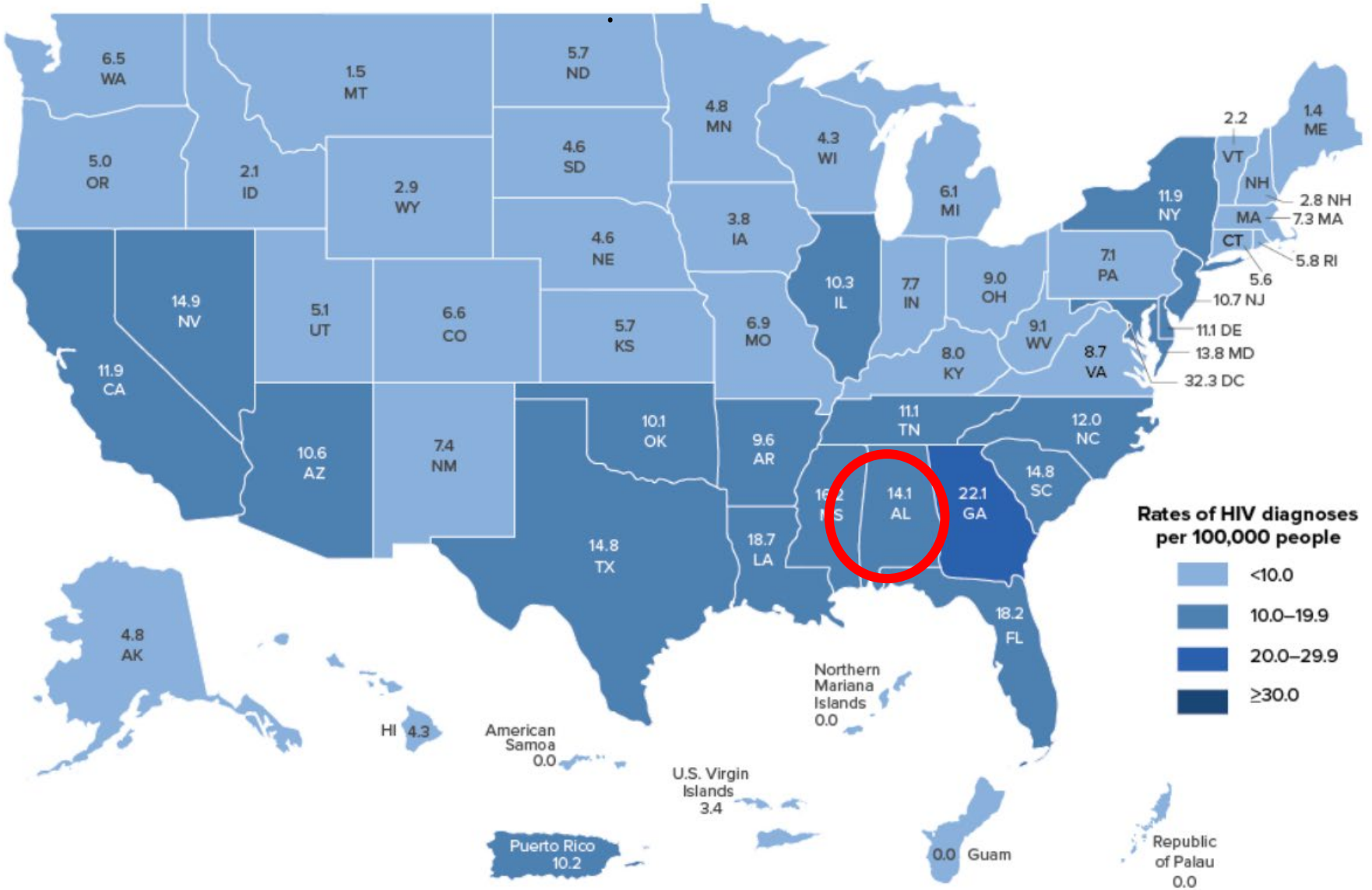
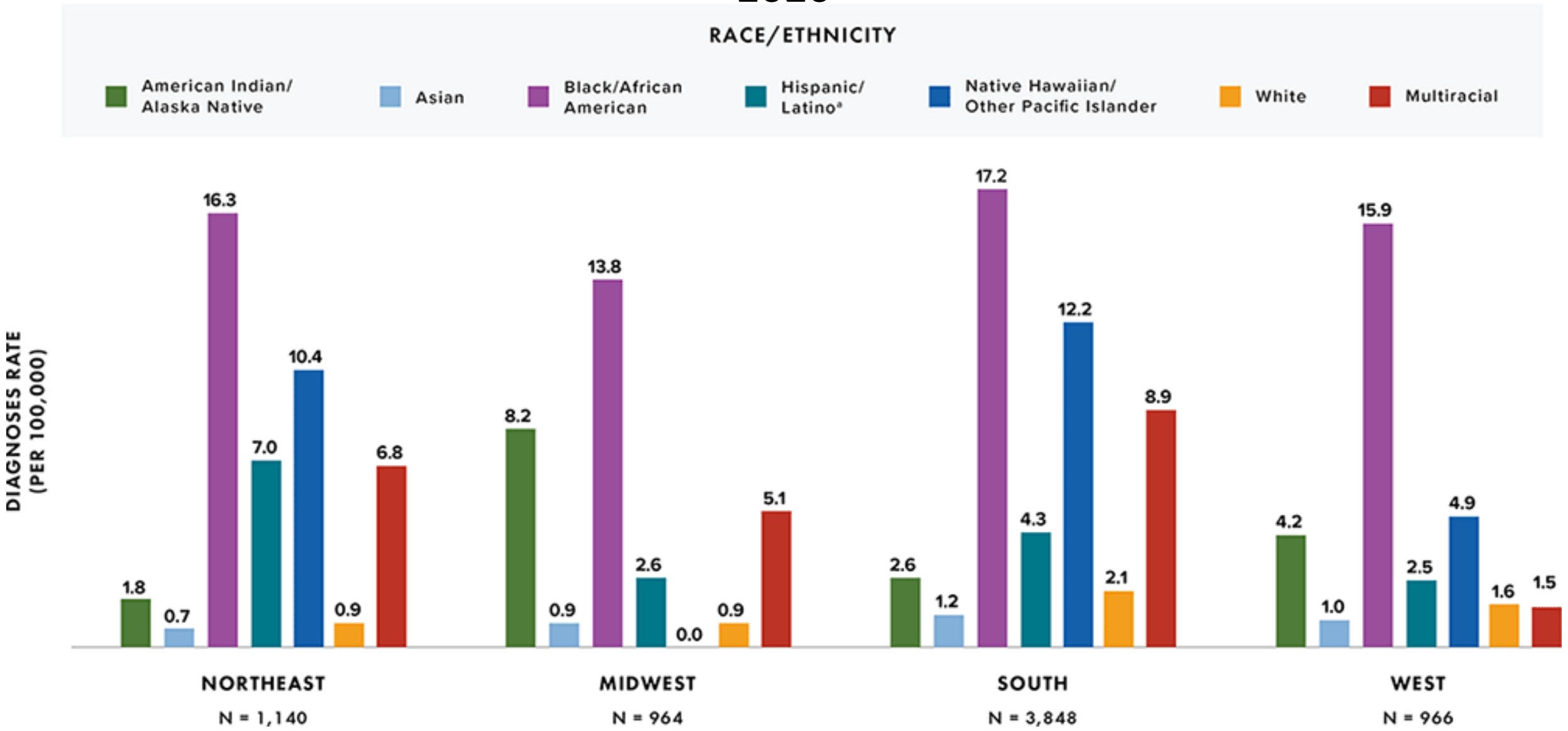


Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2020. *HIV Surveillance Report* 2022;33.

Rate of New HIV Diagnosis by Race/Ethnicity and Region 2020



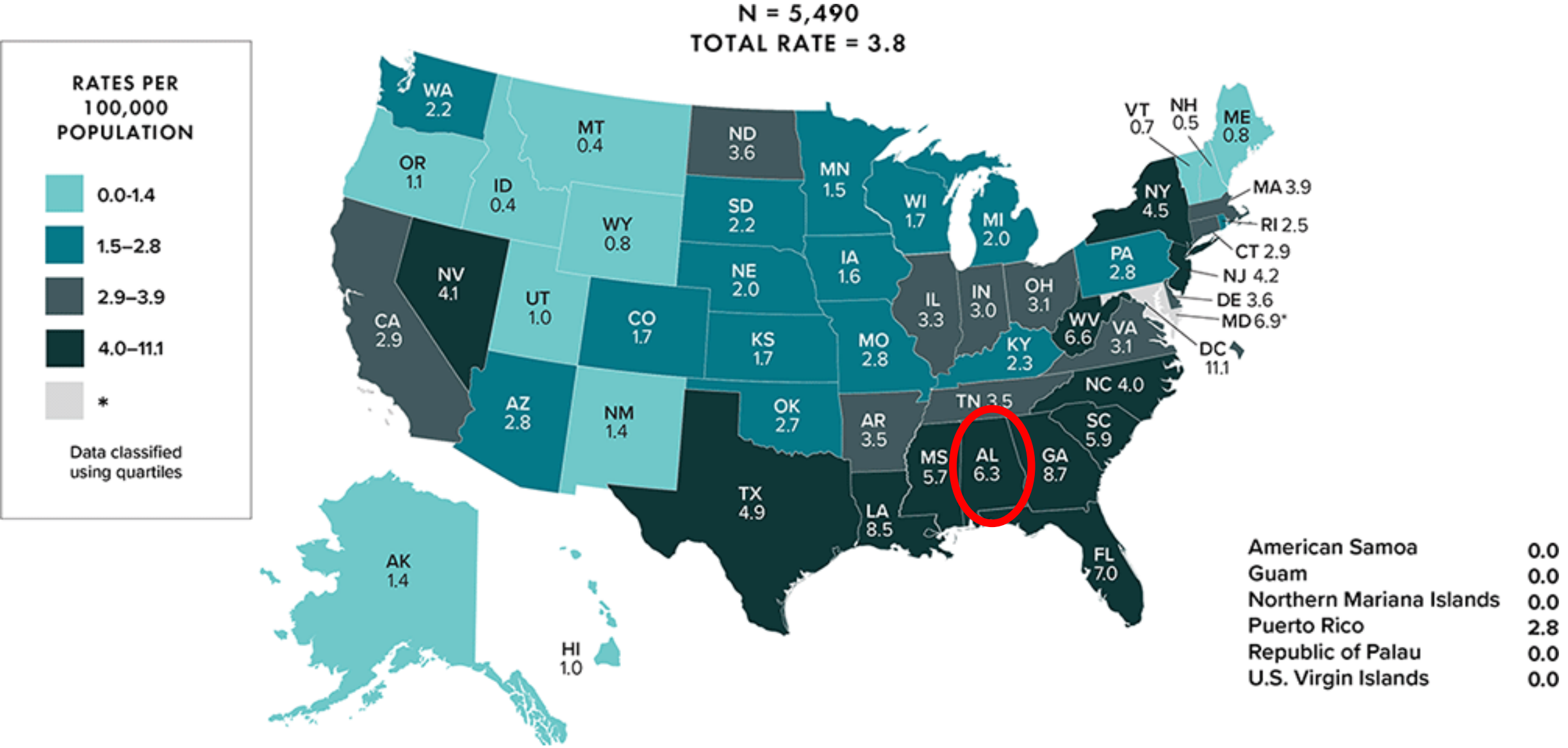
Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2020. *HIV Surveillance Report* 2022;33.

HIV in Alabama

Risk of perinatal HIV remains high in Alabama

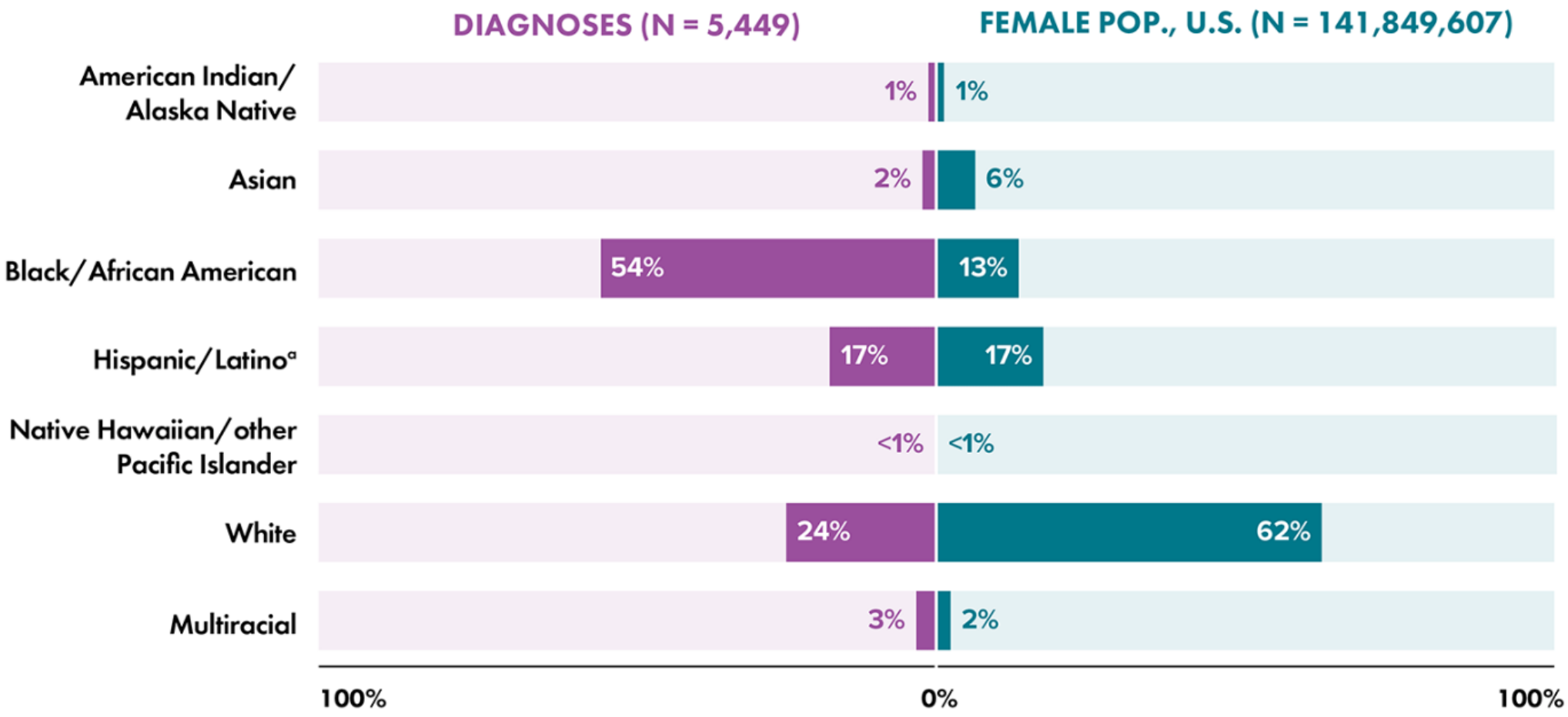
- High incidence of new HIV infections
- High number of women with HIV

Rate of HIV Diagnoses in Women by Region, 2020



CDC, Diagnoses of HIV Infection in the United States and Dependent Areas 2020: Special Focus Profiles
https://www.cdc.gov/hiv/library/reports/hiv-surveillance/vol-33/content/special-focus-profiles.html

Diagnoses of HIV infection among Females by Race/Ethnicity 2020



NOTE. Data for 2020 should be interpreted with caution due to the impact of the COVID-19 pandemic on access to HIV testing, care-related services, and case surveillance activities in state/local jurisdictions.
[a]Hispanic/Latino persons can be of any race.

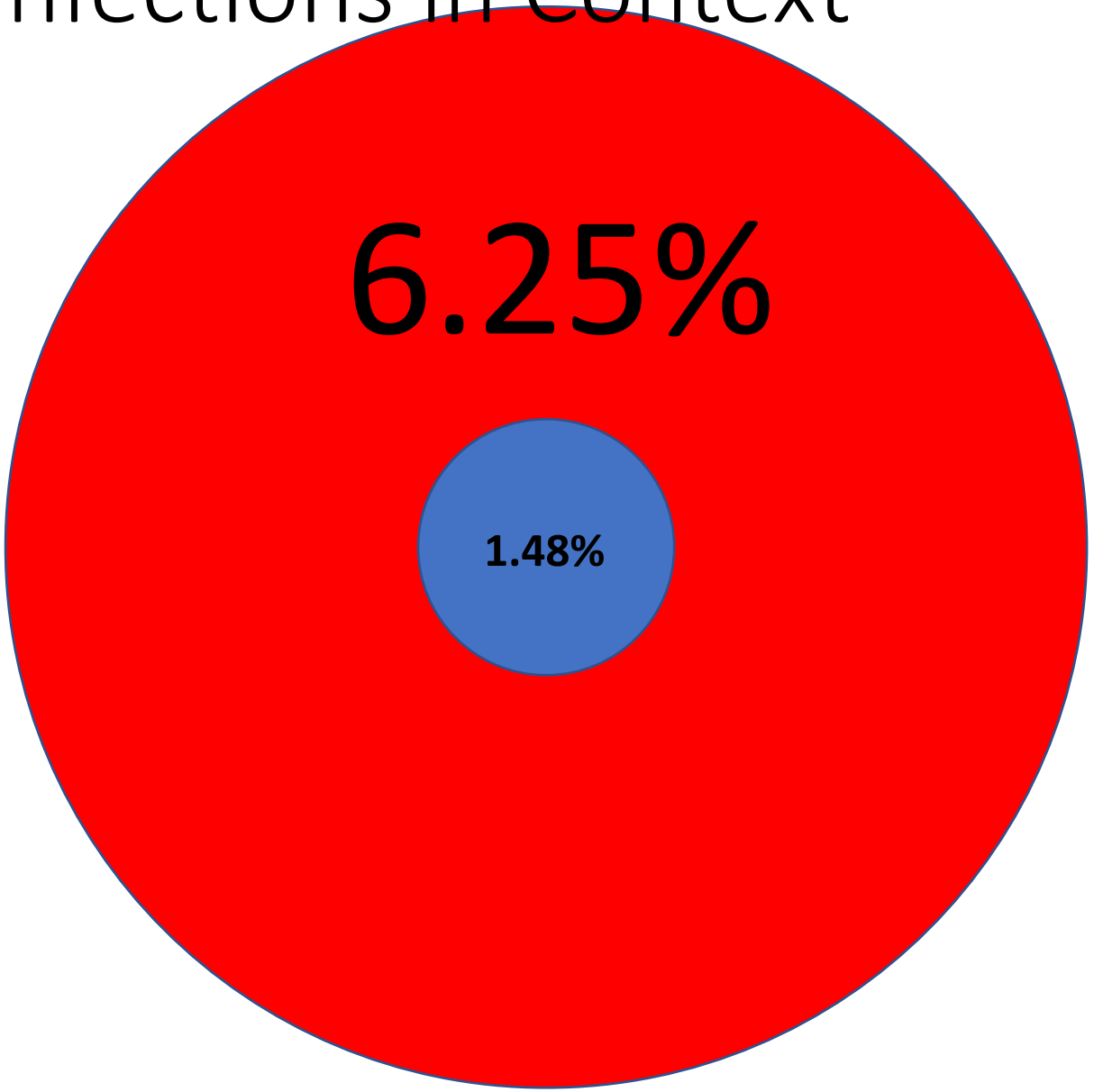
HIV in Alabama

Risk of perinatal HIV remains high in Alabama

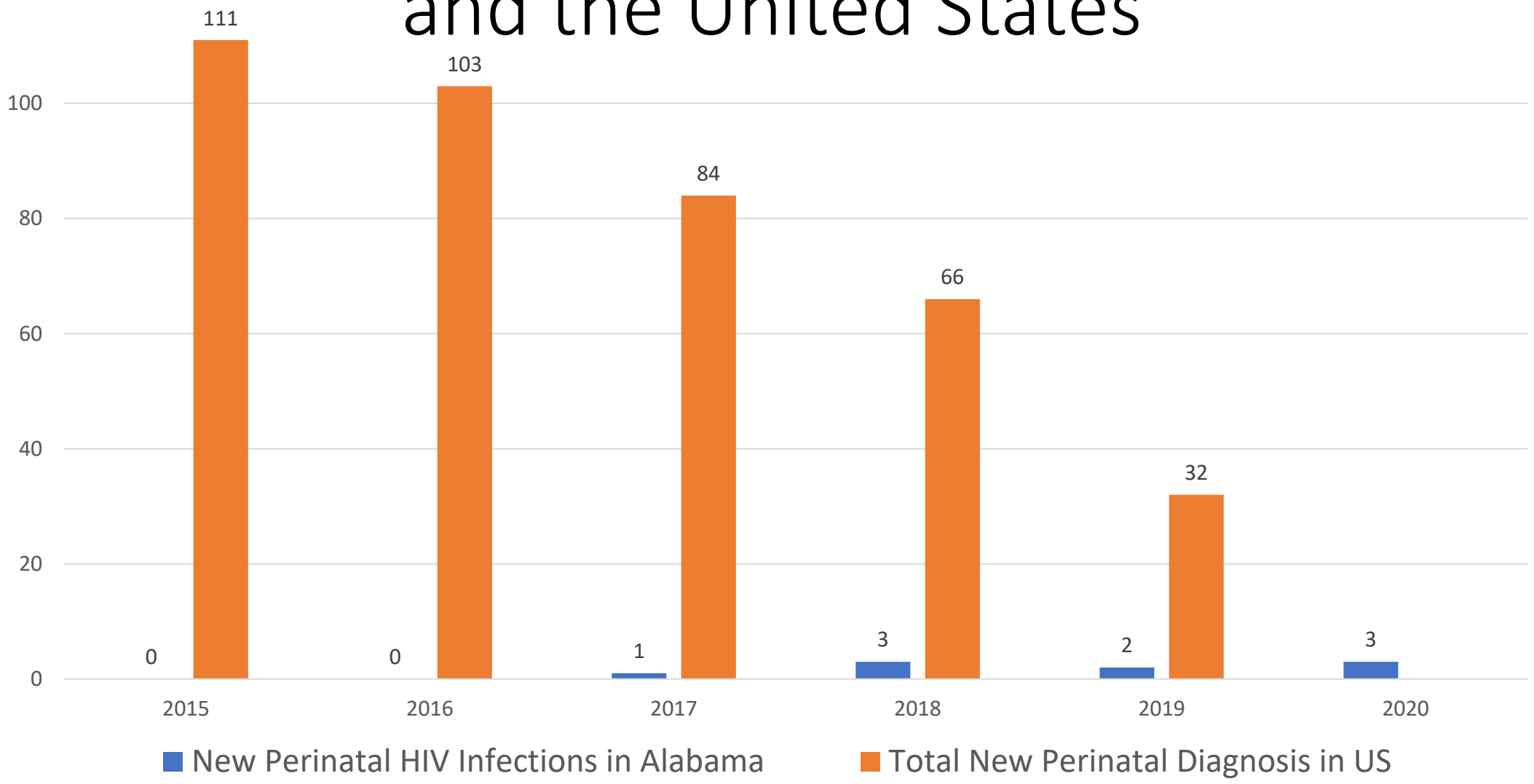
- High incidence of new HIV infections
- High number of women with HIV
- Relatively high number of congenital HIV infections and they are NOT decreasing

Alabama Perinatal HIV Infections in Context

- Perinatal HIV Infection is a NEVER event
- The rate of perinatal HIV has decreased 41% nationally since 2015 but has increased 300% in Alabama
- Alabama makes a disproportionate number of perinatal HIV infections



Perinatally Acquired HIV Trends in Alabama and the United States



Rate of HIV Infection among Infants Born in 2019

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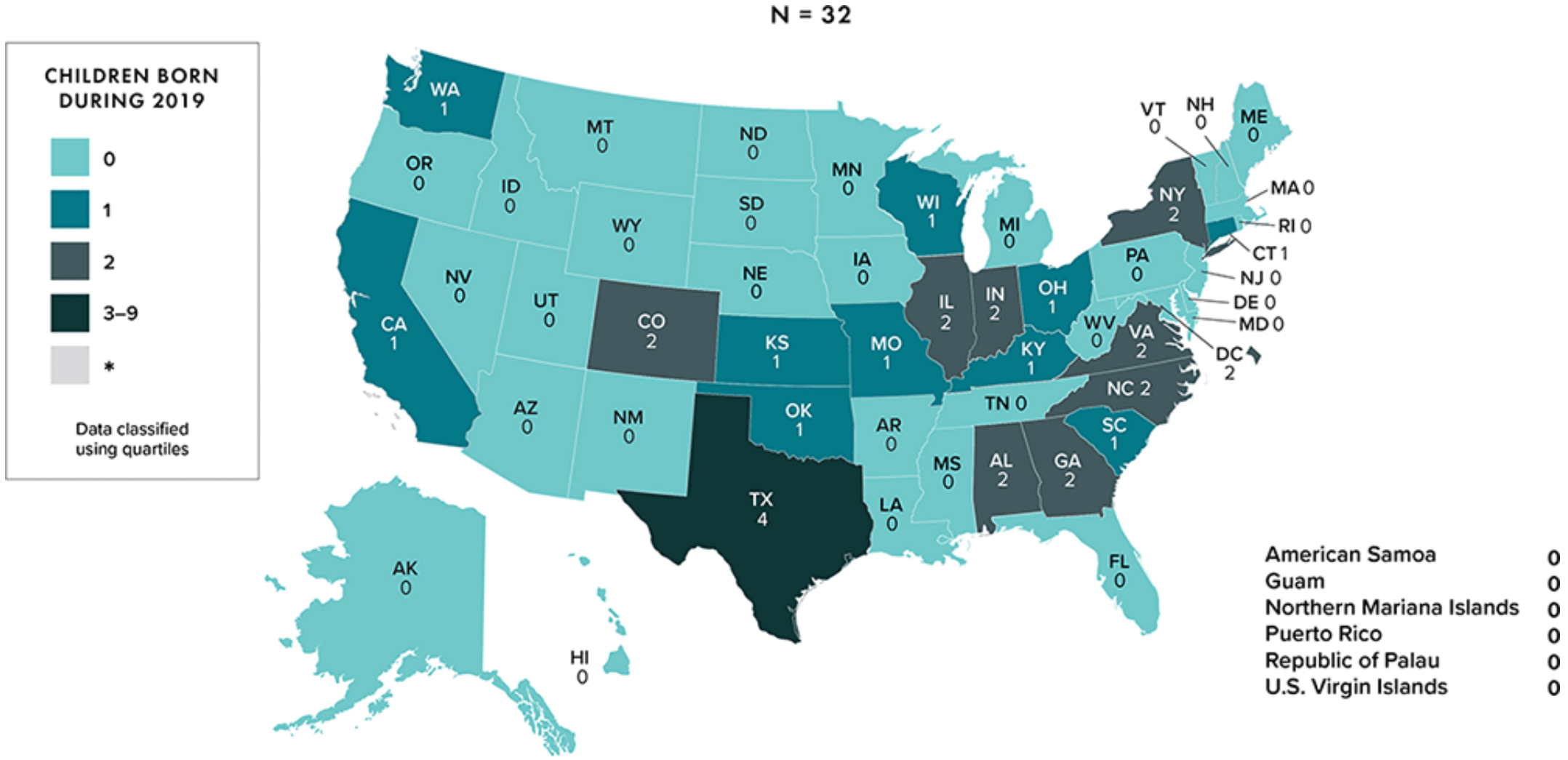

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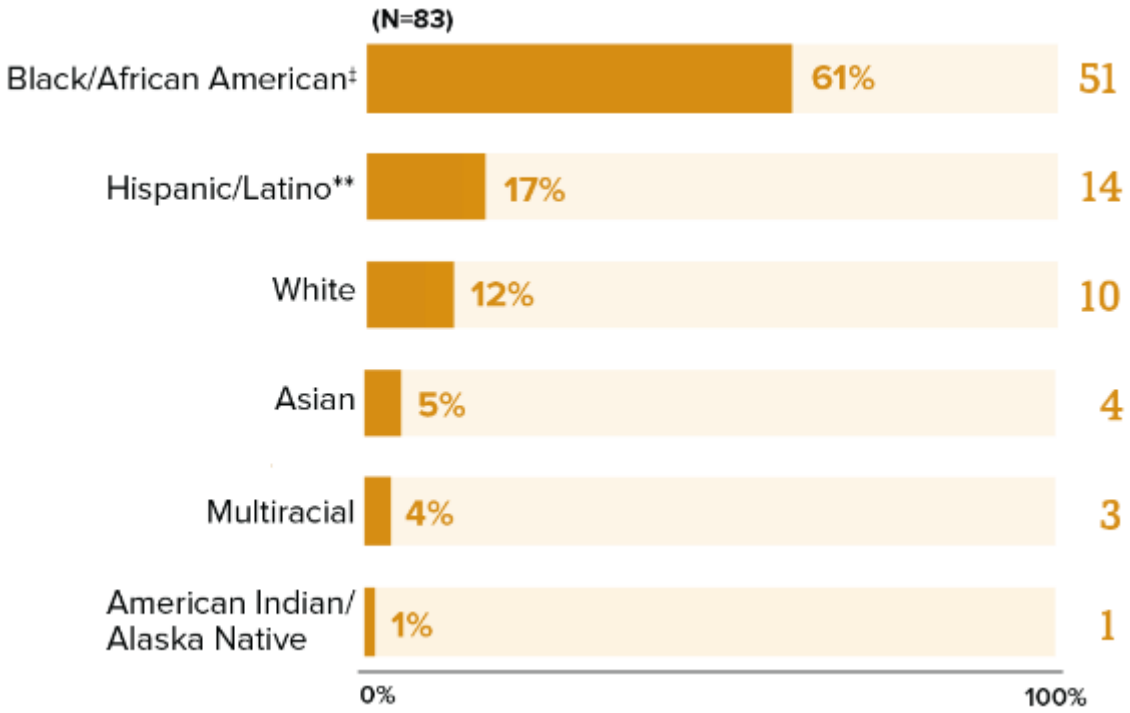
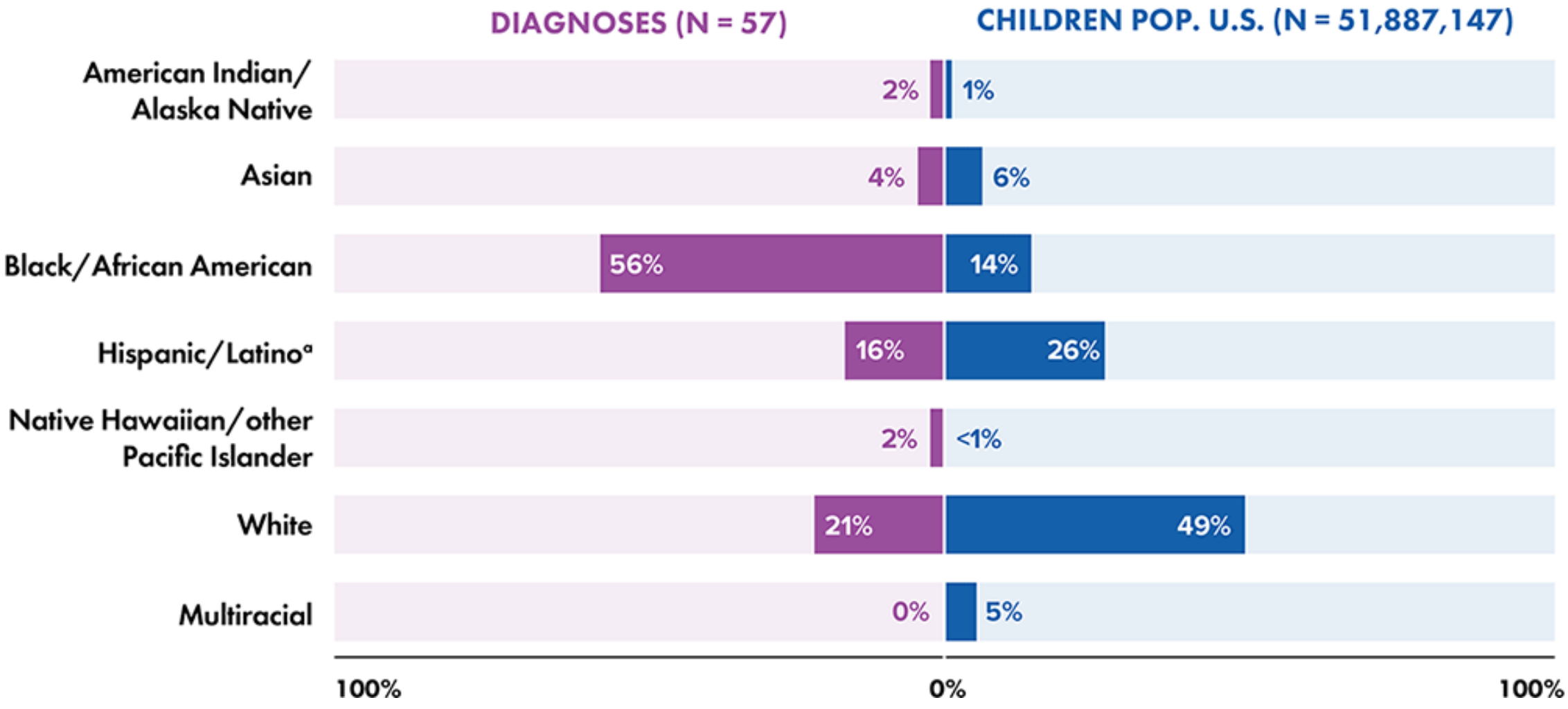
https://www.cdc.gov/hiv/library/reports/hiv-surveillance/vol-33/content/special-focus-profiles.html

New Perinatal HIV Diagnoses in the US and Dependent Areas by Race and Ethnicity, 2019



Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2019. *HIV Surveillance Report* 2021;32.

Demographics of HIV Diagnosis in Children



Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2019. *HIV Surveillance Report* 2021;32.

HIV Screening in Pregnancy

Screening prevents perinatal HIV infection

Alerts

Alabama Medicaid and ADPH Launch Joint Effort to Stop the Rise of Congenital Syphilis in Alabama

9/16/2022

New Screening Recommendations

1st Trimester

- **Initial Prenatal Visit**
- Screen for Chlamydia, Gonorrhea, Syphilis, HBV, HCV, and **HIV infection**
- Regardless of Risk Factors

3rd Trimester

- Between **28-32 weeks** gestation
- Screen for **Syphilis and HIV**
- Regardless of Risk Factors

Labor and Delivery

- **Test all pregnant women at the time of labor and delivery** for Syphilis and **HIV infection**
- Test for HBV if no prior HBV testing or the patient has signs and symptoms of hepatitis.
- Regardless of Risk Factors

National HIV Screening Guidelines

- HIV testing is standard of care for all pregnant women and is a routine component of preconception care.
- All pregnant women in Alabama should receive both **first trimester** and **third trimester HIV screening**.
- Third trimester HIV screening should prior to **36 weeks** to allow time to intervene
- All partners of pregnant women should be encouraged to undergo HIV testing when their HIV status is unknown.

National HIV Screening Guidelines Continued

- All pregnant women should be tested for HIV as early as possible during each pregnancy unless they **opt out** after counseling
- Women who decline testing earlier in pregnancy should be offered testing again during the third trimester.
- If maternal HIV status is unknown at time of labor, a rapid HIV test should be performed immediately.
- Women who were not tested for HIV before or during labor should undergo expedited HIV antibody testing in the immediate postpartum period.

National HIV Screening Guidelines Continued

- Providers should order HIV testing with an immunoassay that is capable of detecting HIV-1 antibodies, HIV-2 antibodies, and HIV-1 p24 antigen (i.e., antigen/antibody combination immunoassay).
  - “4th Generation Screening”

- Decreased “Window Period” then older testing
  - Average of 18 days
  - **95-99.8%** sensitivity at 28 days
  - Decreased false positives

- **Testing should be available 24 hours a day and results available within one hour.**

Pre-exposure Prophylaxis (PreP) in Pregnancy

- Pill taken everyday to decrease risk of HIV acquisition through sex
- Tenofovir disoproxil fumarate/Emtricitabine (TDF/FTC)
  - Truvada
- Uninfected individuals who are trying to conceive, are pregnant, postpartum, or breastfeeding
- Risk factors for acquiring HIV
  - Such as condomless sex with a partner with HIV whose HIV-RNA level is detectable or unknown,
  - Recent sexually transmitted infection (STI)
  - Injection drug use.

HIV Management at Delivery

Management of HIV Infection During Delivery

- At the start of labor, initiate IV zidovudine and administer throughout delivery
- If HIV viral load (VL) is >1000 or HIV VL is unknown within 4 weeks of delivery, consider scheduled cesarean section at 38 weeks
- If unknown, maternal HIV status should be confirmed prior to discharge of the women and/or neonate from the hospital.

Care of the HIV Exposed Infants

Classification of Exposed Infants

Low Risk

Infants born to HIV infected Mothers who:

- Received ARV during pregnancy with viral suppression
  - HIV RNA level <50 copies/mL within 4 weeks prior to delivery
- No concerns related to adherence
- Did not acquire HIV during pregnancy

High Risk

Infants born to HIV infected Mothers who:

- Did not receive prenatal care
- Received no antepartum ARVs or only intrapartum ARV drugs
- Initiated ARV late in pregnancy
  - During the late second or third trimester
- Received a diagnosis of acute HIV infection during pregnancy
- Had detectable HIV viral loads (≥50 copies/mL) close to the time of delivery (within 4 weeks)
  - Includes those who received ARV and did not have sustained viral suppression.

Management of Low-Risk HIV Exposed Infants

- Send HIV-1 DNA or RNA PCR at 24 hours of life*
- Send a CBC prior to discharge
- Start infant on Zidovudine within 6 hours of birth.
  - We will continue for 4 weeks
- Follow-up with Pediatric Infectious Disease (Peds ID)

Management of High-Risk HIV Exposed Infants

- Send HIV-1 DNA or RNA PCR prior to starting ARV. Do NOT delay ARV therapy
- Send a CBC prior to discharge
- Start infant 3 drug therapy within 6 hours of birth
  - Zidovudine
  - Lamivudine
  - Nevirapine or Raltegravir

- Follow-up with Pediatric Infectious Disease (Peds ID)

HIV Testing for Adoptees and Children in Foster Care

HIV testing is recommended for infants and children

- In foster care
- Adoptees

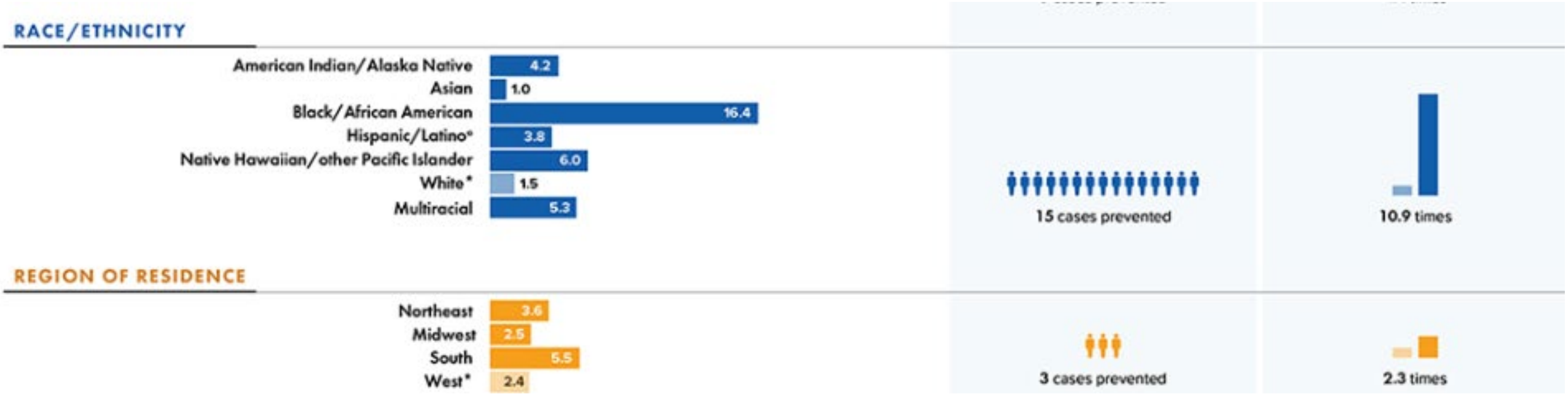
For whom maternal HIV status is unknown

Resources

- Clinicalinfo.hiv.gov for clear guidance on HIV treatment and screening
- National Clinician Consultation Center provides consultations on issues related to the management of perinatal HIV infection 1-888-448-8765; 24 hours a day, 7 days a week.
- Pediatric Antiretroviral Guidelines for antiviral dosing based on gestational age and weight
- Please contact us about HV exposed infants fax records to (205) 934 8658 or email to lorimills@uabmc.edu

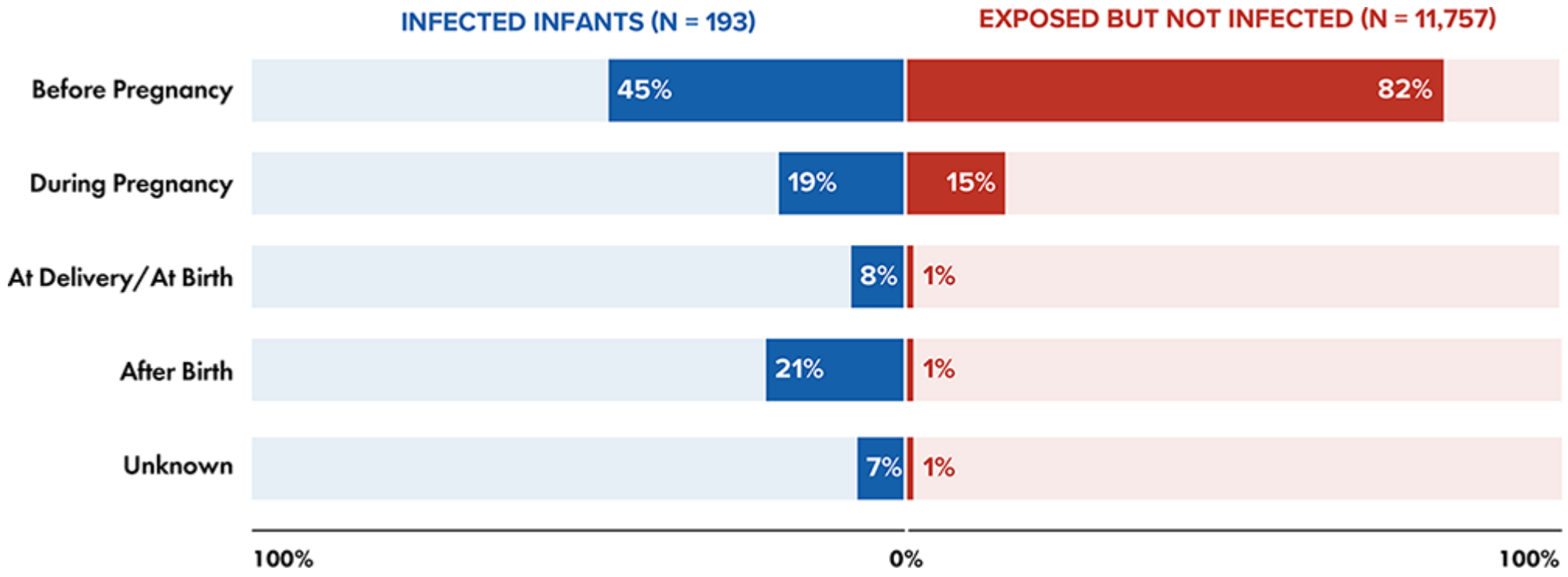
Appendix

Rates and Disparities of HIV Diagnoses among Females 2020



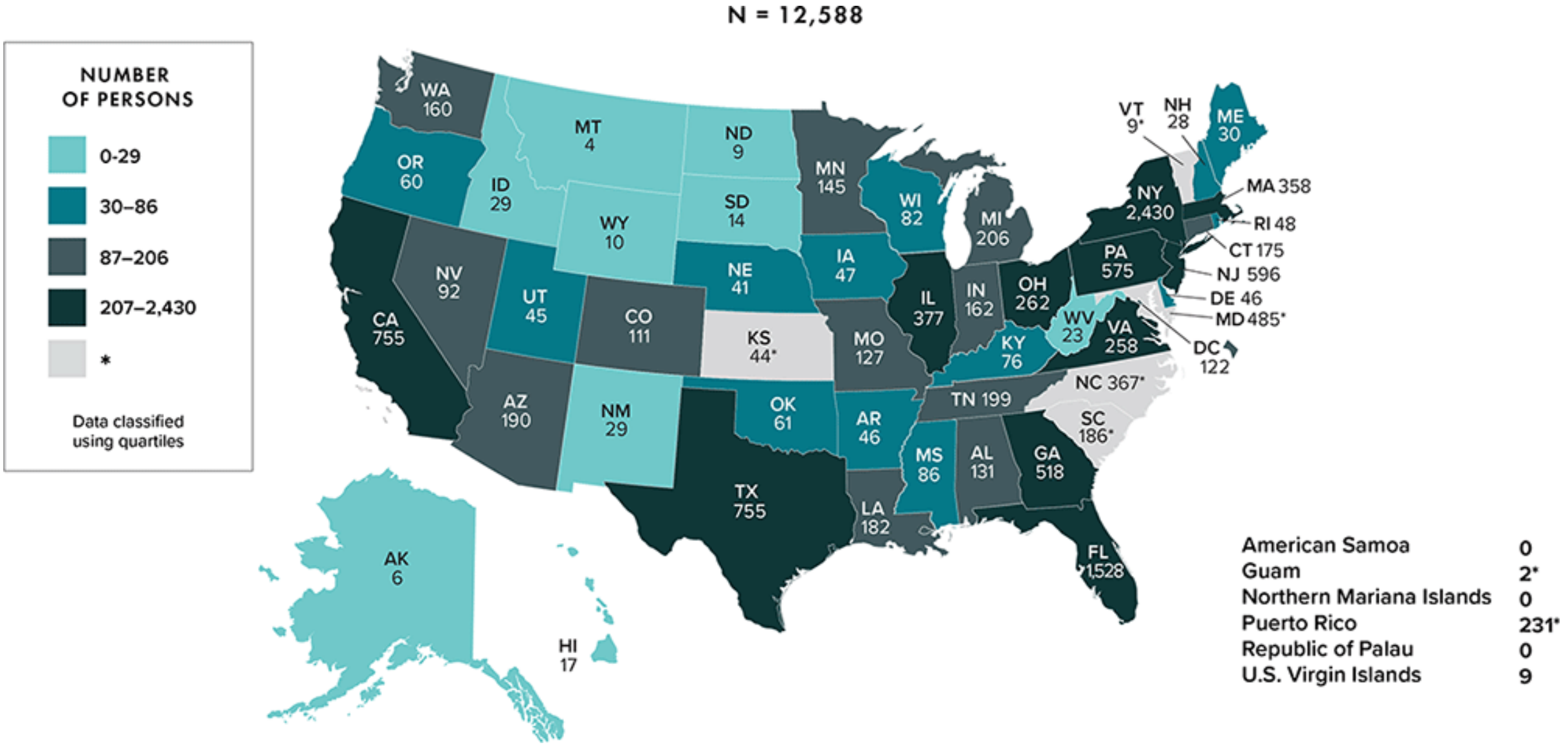
Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2020. *HIV Surveillance Report* 2021;32.

Time of maternal HIV testing among children with diagnosed perinatally acquired HIV infection and children exposed to HIV, birth years 2016–2019



Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2019. *HIV Surveillance Report* 2021;32.

Prevalence of people living with perinatally acquired HIV

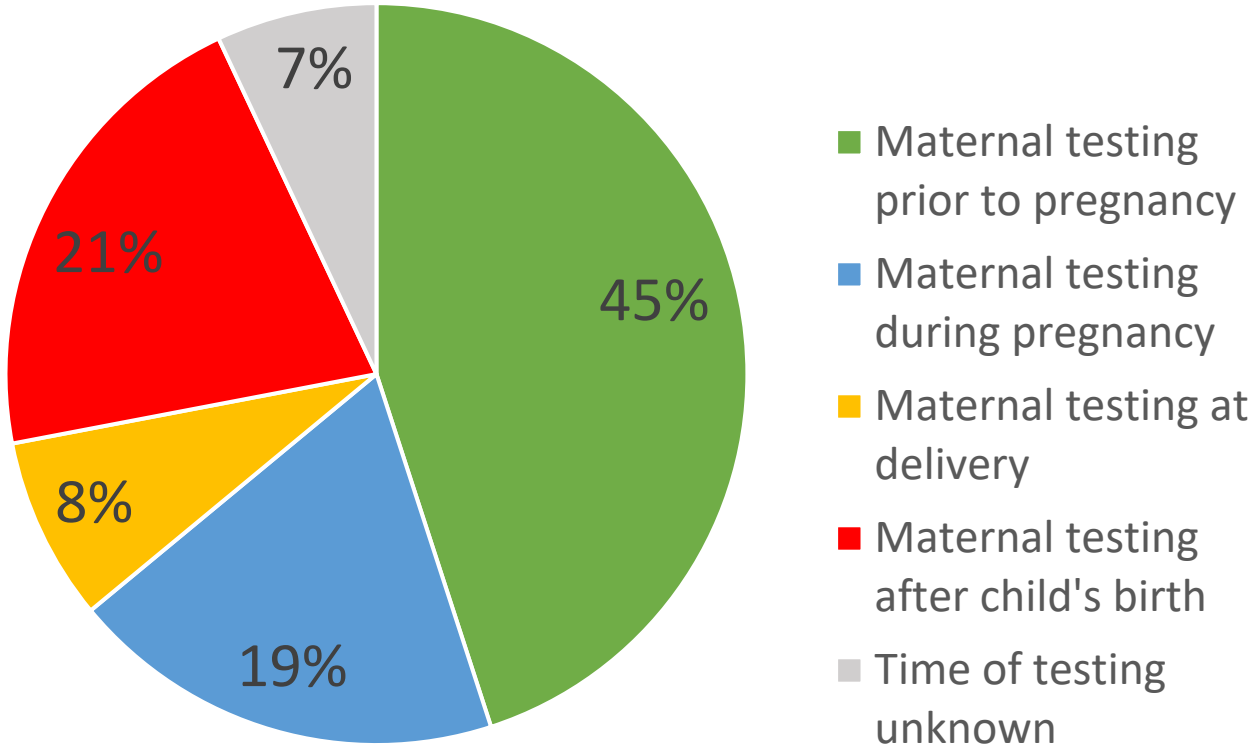


HIV Screening is Essential for Prevention

From 2016 through 2019 in the United States and Puerto Rico

- 11,757 children with perinatal HIV exposure
- 193 children were born with diagnosed, perinatally acquired HIV infection

Timing of maternal HIV testing among children with diagnosed perinatally acquired HIV 2016-2019



Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2019. *HIV Surveillance Report* 2021;32.

Time of maternal HIV testing was as follows:

- 45% were born to mothers who were tested before pregnancy
- 19% were born to mothers who were tested during pregnancy
- 8% to mothers tested at the time of birth
- 21% of children with diagnosed, perinatally acquired HIV infection were born to mothers who were tested after the child’s birth
- 7% were born to mothers whose time of maternal HIV testing was unknown

Congenital Syphilis: Screening in Pregnancy and Neonatal Management

Dr. Claudette Poole, MD, MSPH
Associate Program Director, Pediatric Infectious Diseases Fellowship Program
Children's of Alabama

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM.

Congenital Syphilis

Screening in pregnancy and neonatal management

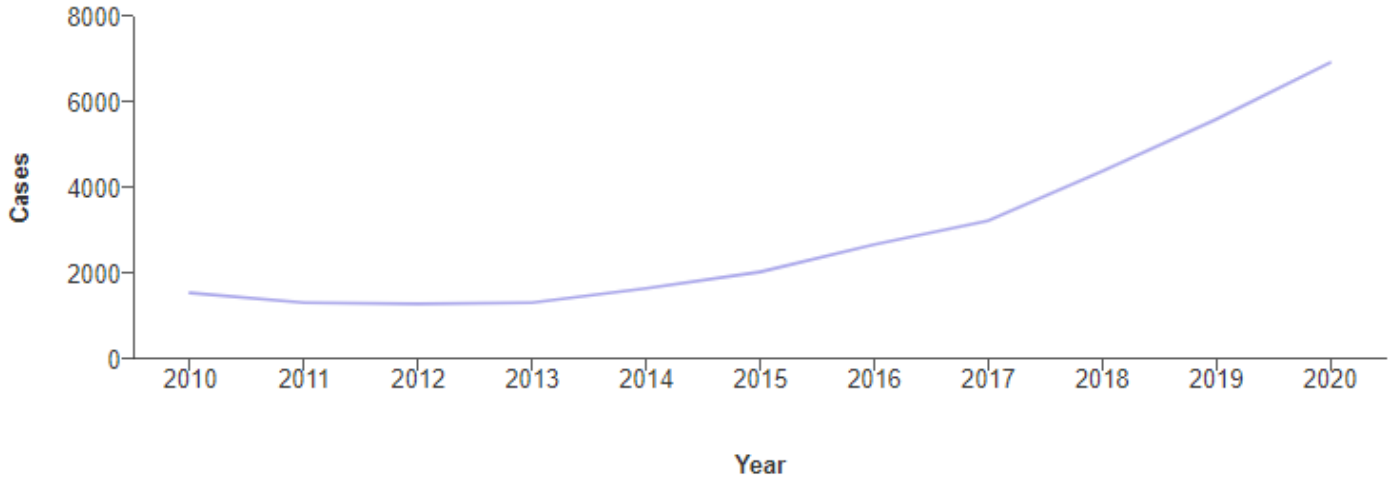
Claudette Poole, MD, MSPH
Assistant Professor of Pediatrics UAB School of Medicine
Division of Pediatric Infectious Diseases

Learning Objectives

1. Understand the algorithms for screening and treatment for syphilis during pregnancy
2. Describe limitations of various syphilis diagnostics
3. Describe the management of a baby born to a mother with a h/o syphilis during pregnancy
4. Recognize importance of close communication between ADPH, obstetrics and neonatal providers
5. Understand the ADPH public health alert

Syphilis in pregnancy is on the rise

Number of primary and secondary syphilis cases among women aged 15 to 44 years, United States[4]

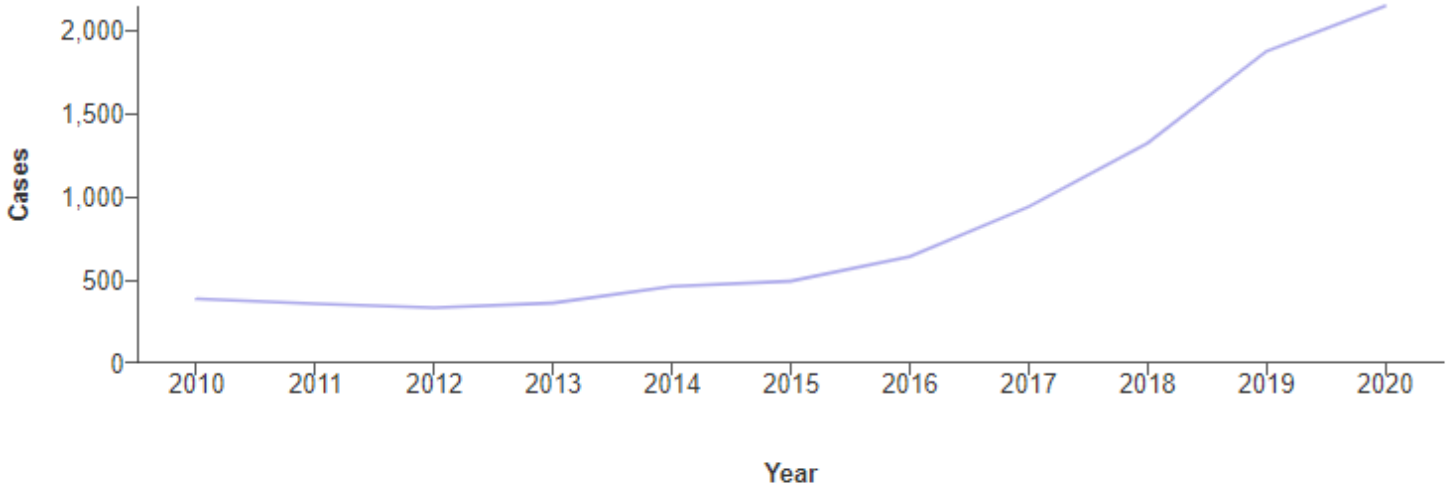


Data Table

	2017	2018	2019	2020
	3232	4390	5600	6924

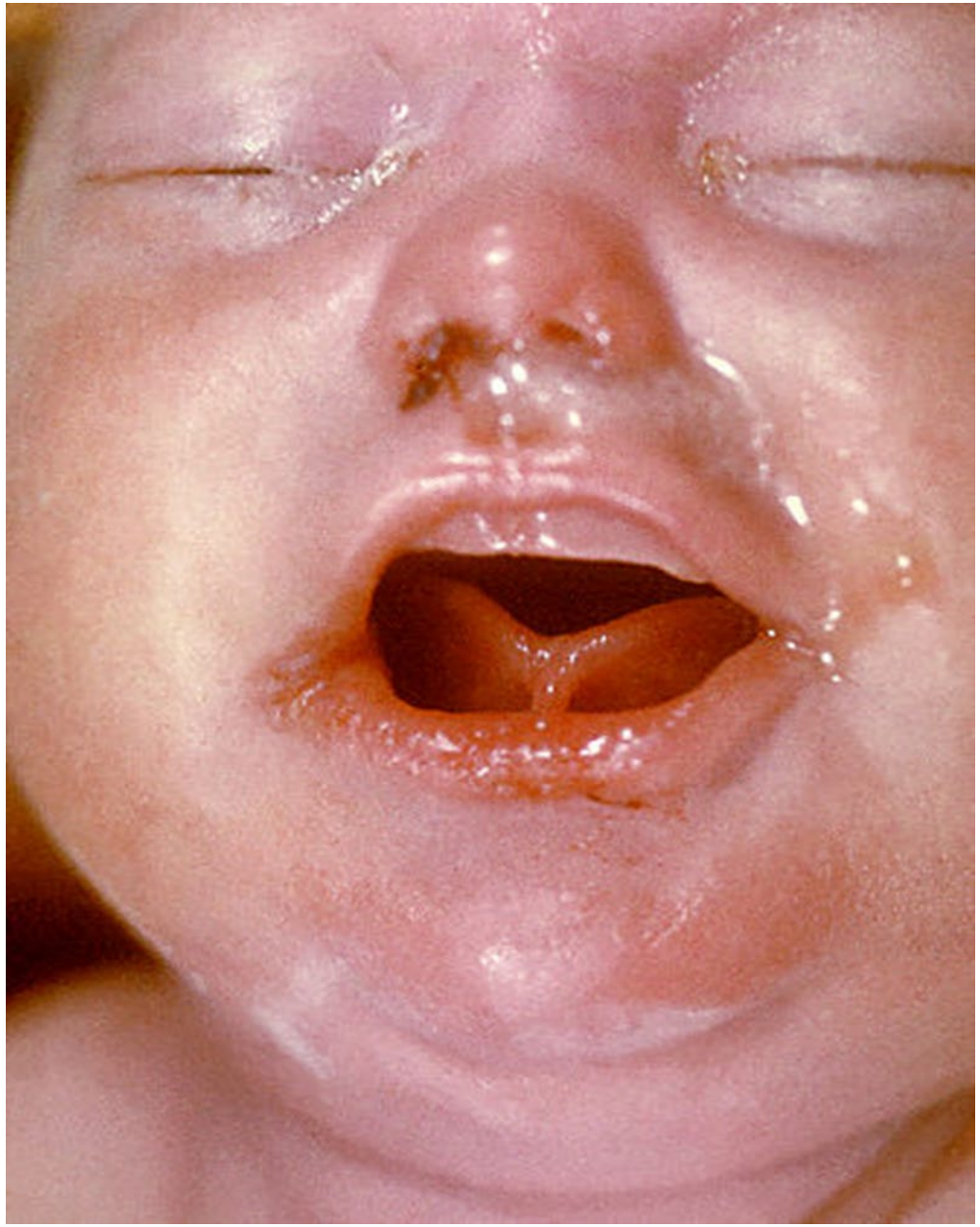
Congenital syphilis is on the rise

Number of congenital syphilis cases, United States[4]



Data Table

	2017	2018	2019	2020
	941	1,323	1,875	2,148



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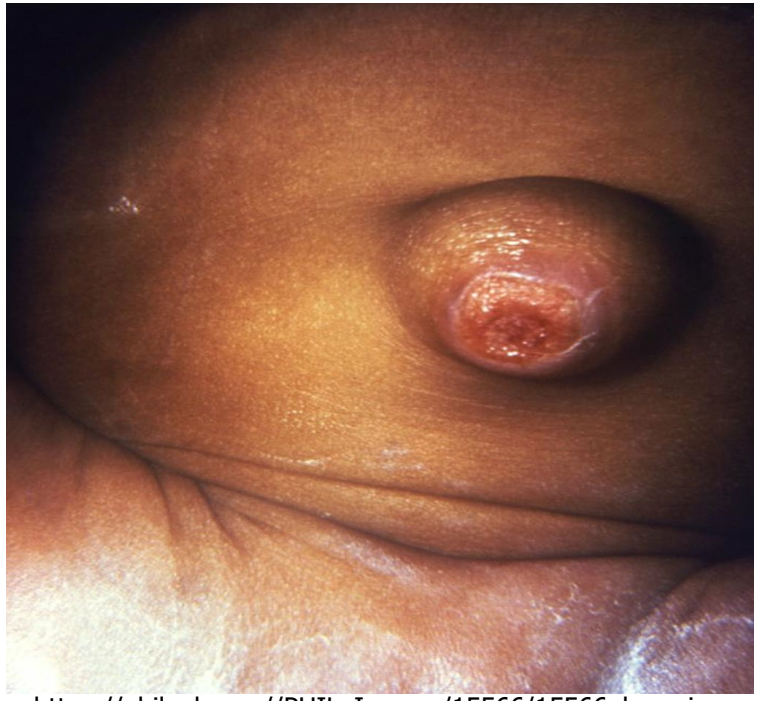
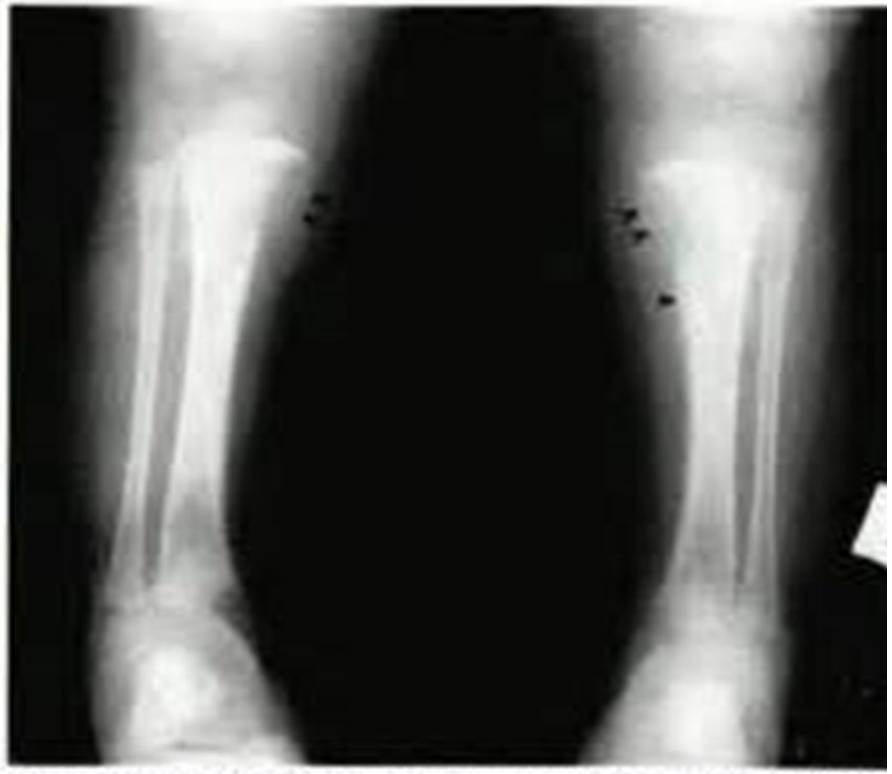


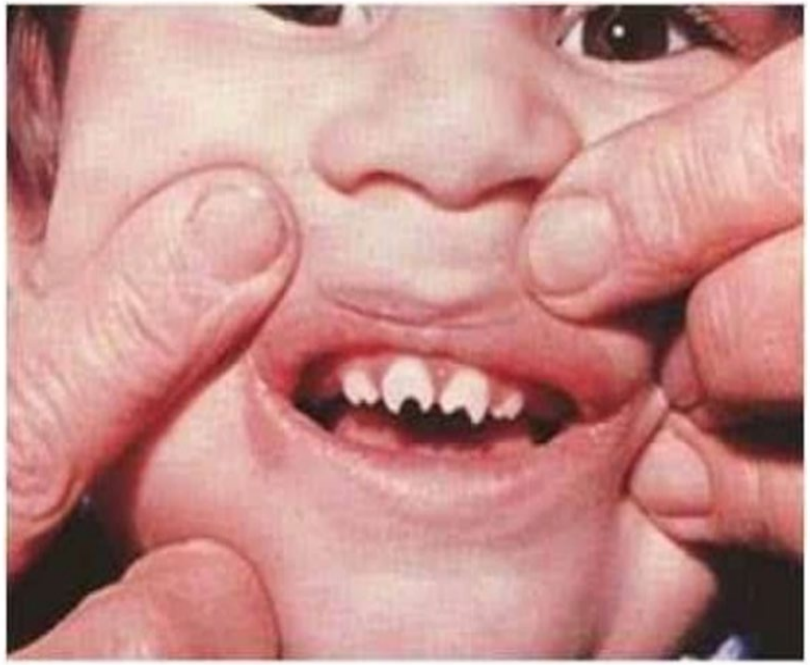
https://phil.cdc.gov//PHIL_Images/15566/15566_lores.jpg

CONGENITAL SYPHILIS
< 2 YEARS

- Most asymptomatic
- Rhinitis "snuffles"
- Rash
- Skeletal abnormalities
- CNS disease



https://www.healio.com/orthopedics/journals/ortho/1983-4-6-4/%7Ba1913b33-0067-4489-8694-7584dbf0e4b6%7D/radiologic-case-study



http://image.slidesharecdn.com/congenitalsyphilis-140810152305-phpapp02/95/congenital-syphilis-35-638.jpg?cb=1407684228

CONGENITAL SYPHILIS > 2 YEARS:
All systems affected (developmental delay, seizures, deafness, visual disturbance, bone and teeth deformities, aortitis)

A 28 year old G2P1 woman is seen for her first antenatal care visit at 20 weeks GA. Her screening labs included a negative Syphilis EIA, a negative HIV, HebB surface Ag positive, negative gonorrhea but positive chlamydia. She received treatment. Should she be retested for syphilis and if so when?

1. No the syphilis EIA is highly sensitive with a very low false negative rate.
2. Yes, a repeat test should be done at the next visit with a non-treponemal test such as the RPR due to limited sensitivity of the treponemal EIA
3. Yes, a repeat treponemal EIA should be done again at 28 weeks GA and again at delivery as this woman has some risk factors for syphilis infection during her pregnancy
4. Yes a repeat treponemal EIA or RPR should be done again at 28 weeks and again at delivery as this is recommended for all pregnant women

A 32 year old G3P2 woman enters antenatal care at 10 weeks GA. Her treponemal EIA is positive. You order a RPR which is negative. What should you do next?

1. No further testing is needed as the negative RPR is more specific and less likely to have false negatives while the treponemal EIA is known to have a high false positive rate.
2. Inquire about her prior syphilis history. If she was previously adequately treated no further testing is needed.
3. Obtain a treponemal specific test such as the TP-PA, if negative then can assume the initial EIA was a false positive, if positive, inquire about prior syphilis history.
4. Obtain a VDRL as this is more sensitive and specific than the RPR

You are covering newborn nursery. A full term infant with a normal physical exam born to a mom who was treated at 22 weeks GA for syphilis with IM penicillin. Her RPR went down from 1:64 to 1:4 and then went up to 1:16 at time of delivery. The infant RPR is 1:4. What should you do for the baby?

1. No further evaluation is needed as the mom was adequately treated for syphilis, it is not unusual to have fluctuations of the RPR during pregnancy post treatment and the infant RPR is < 4 times the maternal RPR.
2. Treat the baby with 10 days of IV penicillin for presumed congenital syphilis due to the fourfold increase in the maternal RPR at delivery.
3. Evaluate the infant with CBC, platelet count, CSF, and long-bone x-rays – if abnormal then treat with 10 days of IV penicillin, if normal then no treatment.
4. Evaluate the infant with CBC, platelet count, CSF, and long-bone x-rays – if abnormal then treat with 10 days of IV penicillin, if normal then single dose of IM penicillin.

"ALL pregnant women should get tested for syphilis and HIV at their
1. first prenatal visit,
2. between 28 and 32 weeks GA
3. and at time of delivery.

So no more "risk assessment"!"

ADPH Prenatal STD testing (updated Aug 5, 2022)

Alabama Prenatal STD Testing

Test (All tests must be FDA approved)	 Initial Prenatal Visit	 Third Trimester	 Labor and Delivery (L&D)
Syphilis	All pregnant persons.	All pregnant persons at 28-32 weeks gestation, regardless of risk factors.	All pregnant persons.
HIV	All pregnant persons not previously confirmed as HIV infected.	All pregnant persons at 28-32 weeks gestation, regardless of risk factors unless previously confirmed as HIV infected.	All pregnant persons unless already confirmed as HIV infected.
Chlamydia	All pregnant persons.	All pregnant persons at 36 weeks gestation if the initial test was positive, have signs and symptoms, or at high risk of infections.	
Gonorrhea	All pregnant persons.	All pregnant persons at 36 weeks gestation if the initial test was positive, have signs and symptoms, or at high risk of infections.	
HBV	All pregnant persons.		All pregnant persons if no prior testing or have signs and symptoms of hepatitis.
HCV	All pregnant persons.		

No Prenatal Care –Patient Presents at Delivery

Test	Labor and Delivery
Syphilis	All pregnant persons.
HIV	All pregnant persons unless already confirmed to be infected with HIV infection.
Chlamydia	All pregnant persons.
Gonorrhea	All pregnant persons.
HBV	All pregnant persons.
HCV	All pregnant persons.

Revised 12/21/22

Understanding Syphilis tests: Essentially 3 types

Non-specific, non-treponemal serology

RPR / VDRL

directed against lipoidal antigens

Manual treponemal specific serology:

FTA-ABS

Fluorescent Treponemal Antibody Absorbed test
manual indirect fluorescence measures IgG and IgM

TP-PA

Treponema pallidum Particle Agglutination assay
manual agglutination assay that measures IgG and IgM

Automated treponemal tests:

EIA

enzyme immunoassay

CIA

chemiluminescence immunoassay

MBIA

microbead immunoassay

RPR and VDRL

Strength	Weakness
• Distinguish new infection from past treated infection • Monitor response to treatment • Titers go up with infection and down with treatment	• Non-specific – other conditions can give a positive RPR • Not sensitive • Delay in response with acute infection

FTA-Abs and TP-PA

Strength

- specific for syphilis – so can confirm that the positive RPR is due to syphilis.
- TP-PA has the highest sensitivity (94 – 96% for primary syphilis, 100% for secondary and 95% for latent syphilis),
- FTA-ABS- less sensitive for primary syphilis (65 – 88%)
- 100% specific

Weakness

- once positive – positive for life - can't distinguish between past treated infection and new re-infection
- Labor intensive – not practical for screening

Automated EIA, CIA, MBIA

Strength	Weakness
• automated high throughput so cost effective for mass screening (as in pregnancy) • Very sensitive: 94 – 96% for primary syphilis and 100% for secondary syphilis, 95 – 100% for early latent and 86 – 98% for late latent	• Not as specific (i.e. can have false positives, especially in low pre-test probability like in pregnancy screening) e.g. Trep-Sure EIA specificity of 78 – 86%) • Can't distinguish between past treated and new infection

Bottom line – especially in screening can't rely on a single test if positive – Will ALWAYS need at least 2 sometimes 3 to make a diagnosis

- So most pregnancy screening will use an automated treponemal test – EIA, CIA or MBIA
- If negative – No syphilis at that time but need to retest during pregnancy!
- If positive need to get a RPR
- If RPR positive – then have made a diagnosis of syphilis in pregnancy – need to decide on stage and treat accordingly and can use RPR for monitoring
- If RPR negative – need to get the TP-PA – if negative – no syphilis at that time.
- If TP-PA positive then have made a diagnosis of syphilis in pregnancy – need to decide on stage and treat accordingly (worth repeating RPR during treatment – will often have a delayed response)

Treatment of syphilis in pregnancy

- Primary, secondary, or early latent syphilis – Benzathine penicillin G 2.4 million units IM at 1 week interval **x 2**
- Late latent or tertiary (no CNS disease) syphilis – Benzathine penicillin G 2.4 million units IM at 1 week intervals x 3 (**must be given at 7 day intervals** if more than 9 days have passed then need to repeat)
- If diagnosed in second half of pregnancy – need to monitor fetus with US for signs of congenital syphilis – may require more treatment
- If diagnosed a treated for syphilis before this pregnancy – but continues to have positive RPR
- CAN ONLY USE PENICILLIN in pregnancy – so if patient allergic need to desensitize and treat.
- If **baby born within 30 days of treatment** = inadequate fetal treatment

Congenital Syphilis

- Spirochetes can cross placenta during all stages of pregnancy
- Infant can be infected during delivery
- Depending on timing of infection – miscarriage, late fetal demise, hydrops fetalis, neonatal death, symptomatic infection at birth, asymptomatic infection at birth leading to late signs and symptoms if left untreated (developmental delay, seizure disorder, deafness, blindness, bone and teeth deformities)

So mom had syphilis during pregnancy and was treated – what to do with baby?

- Was mom treated with penicillin 2 - 3 weeks apart (depending on stage of disease) at least 30 days before delivery? **Need to call and ask the Health Department!**
- What was mom's RPR at diagnosis, after treatment and at time of delivery? **Need to call and ask the Health Department!**
- Need to obtain RPR on infant and do a physical exam

Management of baby after you have called health department and obtained RPR.

- Baby concerning PE / RPR > 4 x mom's = congenital syphilis - do full eval and treat for 10 days
- Baby normal PE and RPR < 4 x mom's and no concern for inadequate maternal treatment / reinfection – **baby does not have CS** -if mom treated before this pregnancy then no treatment for baby, if treated during the pregnancy then 1 x IM dose penicillin to baby to complete treatment to prevent CS
- Baby normal PE and RPR < 4 times mom's – but concern for inadequate maternal treatment or reinfection – then full eval of baby if normal – baby does not have CS but give 1 IM dose penicillin to prevent CS; if eval abnormal – baby has CS -treat 10 days

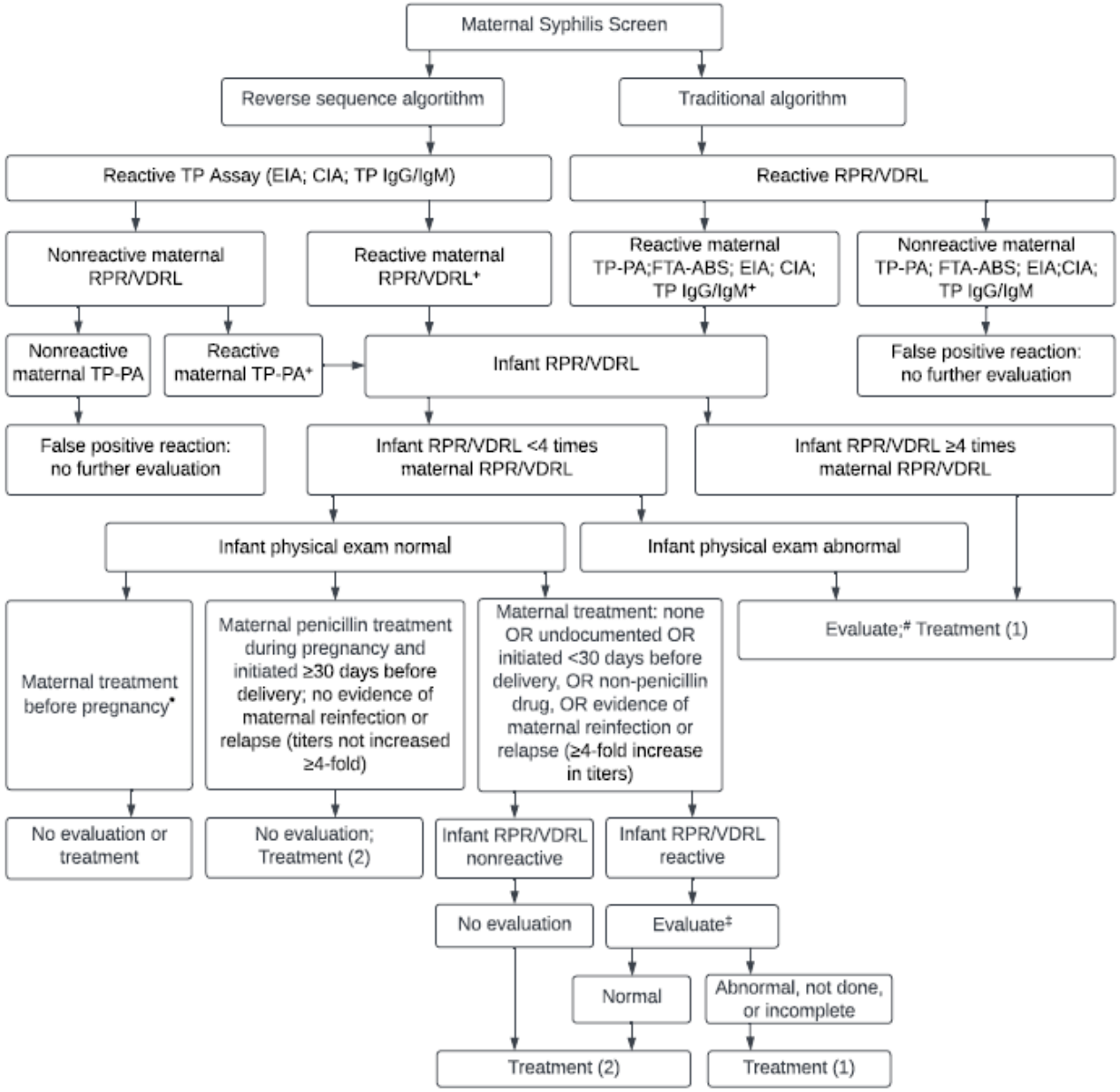
Evaluation of Baby if concern for CS once RPR obtained

- CBC with diff, CSF for white blood cell count, protein and VDRL and long-bone x-rays
- If baby has abnormal PE – tests as indicated (LFT's, abdominal US, neuroimaging, eye exam, ECHO etc.)
- To prevent CS in a baby in whom you've excluded CS – give single dose of IM Benzathine penicillin G 50,000 U/kg
- To treat CS – Aqueous penicillin G 50,000 U/kg IV q 12 hours if < 7 days old, then q 8 hours to complete a total of 10 days. If an interruption in treatment of 1 day, then need to restart whole 10 day course.

Follow-up of babies born to mother with h/o syphilis during pregnancy

- Baby with negative RPR at birth – needs a RPR checked at 3 months – if now positive needs eval and treatment for CS
- Baby with RPR < 4 x mom's and not treated for CS – needs RPR checked at 2 month, 4 month and 6 month check-up – if still positive needs eval and treatment for CS
- Baby treated for CS – needs RPR checked at 4 months, 6 months and 1 year – if persistent needs re-evaluation and referral to ID specialist
- BABIES NEED FOLLOW-UP WITH REPEAT RPRs!!! – this will only happen if the pediatrician knows that there was a maternal history of syphilis

ALGORITHM FOR MANAGEMENT OF INFANTS BORN TO MOTHERS WITH REACTIVE SEROLOGIC TESTS FOR SYPHILIS



+ Test for HIV-antibody. Infants of HIV-infected mothers do not require different evaluation or treatment.
* Women who maintain a VDRL titer ≤1:2 (RPR ≤1:4) beyond 1 year following successful treatment are considered serofast.
# Evaluation consists of hemoglobin/hematocrit, platelet count; CSF examination for cell count, protein, and quantitative VDRL. Other tests as clinically indicated: long-bone x-rays, neuroimaging, auditory brainstem response, eye exam, chest x-ray, liver function tests.
‡ Hemoglobin/hematocrit, platelet count; CSF examination for cell count, protein, and quantitative VDRL; long-bone x-rays

TREATMENT:

(1) Aqueous penicillin G 50,000 U/kg IV q 12 hr (≤1 wk of age), q 8 hr (>1 wk), or procaine penicillin G 50,000 U/kg IM single daily dose, x 10 days
(2) Benzathine penicillin G 50,000 U/kg IM x 1 dose

07/17/2022

Williams JE.P, Graf RJ, Miller CA, et al. Maternal and Congenital Syphilis: A Call for Improved Diagnostics and Education. Pediatrics. 2022;150(3):e2022057927 PEDIATRICS

Tuberculosis in Pregnancy

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THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Tuberculosis in Pregnancy

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Disclosures

- Nothing to disclose

Terminology

TB Infection or Latent TB:

- Evidence of immune response to MTB antigens, without evidence of disease
  - Tuberculin skin test (TST) or Interferon Gamma Release Assay (IGRA)
- Bacilli remain viable and may reactivate to cause TB Disease
  - Lifetime risk of reactivation is 5-10% in the general population
  - Risk is highest in the first 2 years after infection

Shah M, NEJM. 2021

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- Bacilli remain viable and may reactivate to cause TB Disease
  - Lifetime risk of reactivation is 5-15% in the general population
  - Risk is highest in the first 2 years after infection

TB Disease or Active TB:

- Signs/symptoms of disease due to MTB
  - Can affect every organ system (lungs, larynx, kidneys, bone, GI, etc.)

Shah M, NEJM. 2021

Epidemiology

- 1/4 of the world's population is infected with TB
- 10.6 million cases of active TB estimated in 2021
- Leading cause of death from a single infectious agent worldwide
  - 1.7 million deaths estimated annually

WHO Global TB Report. 2022

Epidemiology - USA

- 13 million cases of LTBI estimated (2020)
- 7860 cases reported in 2021 (2.37 cases per 100K people)
  - 67% exclusively pulmonary
- Disproportionately affects ethnic or racial minorities

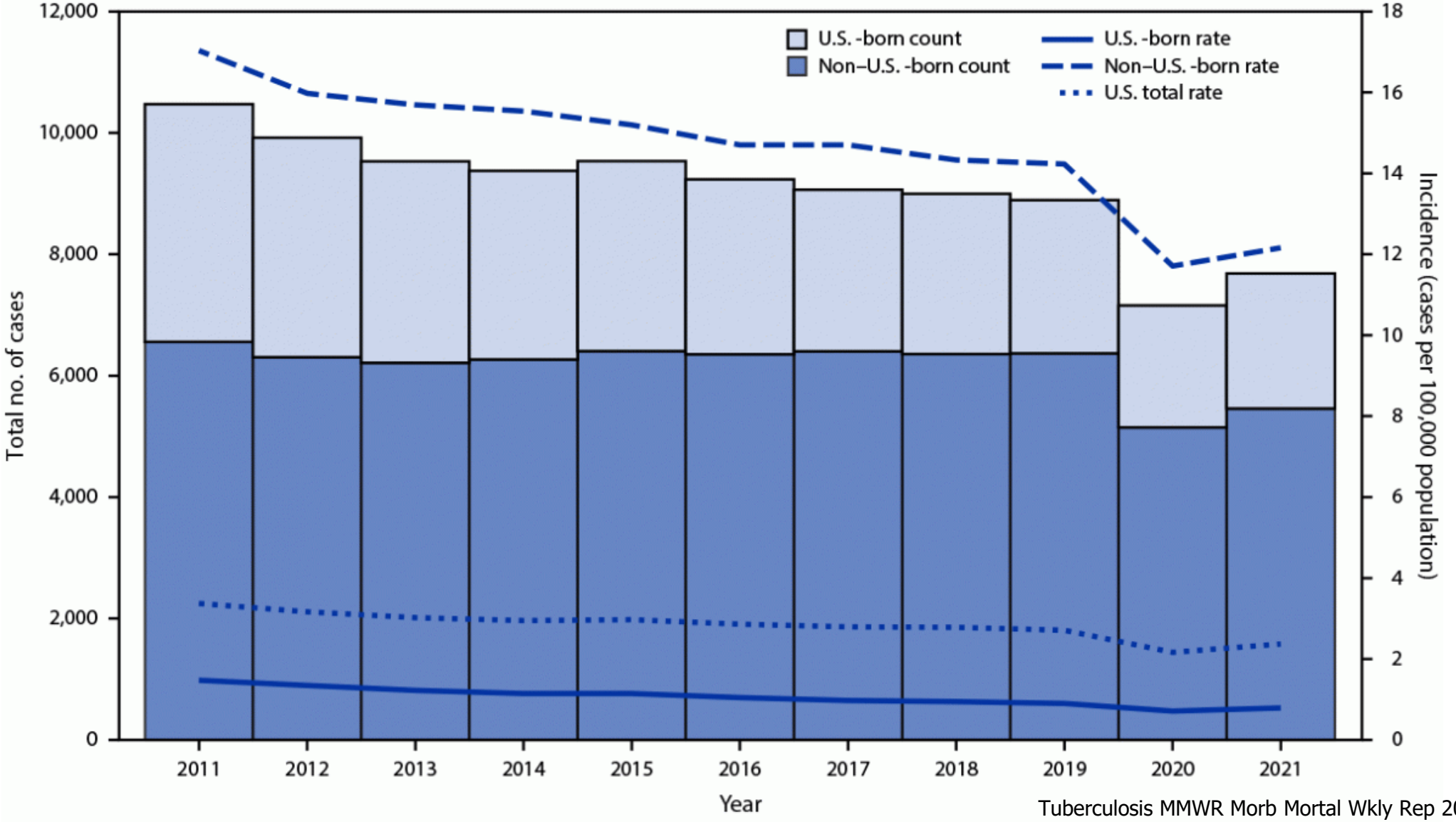
Tuberculosis MMWR Morb Mortal Wkly Rep 2022

Epidemiology - USA

- 70% occur in foreign born persons (15x higher rates)
  - Infection usually acquired prior to immigration
  - 33% of them are diagnosed in people after >20 years in the US

Tuberculosis MMWR Morb Mortal Wkly Rep 2022

Tuberculosis disease case counts and incidence, by patient birth origin — USA, 2011–21



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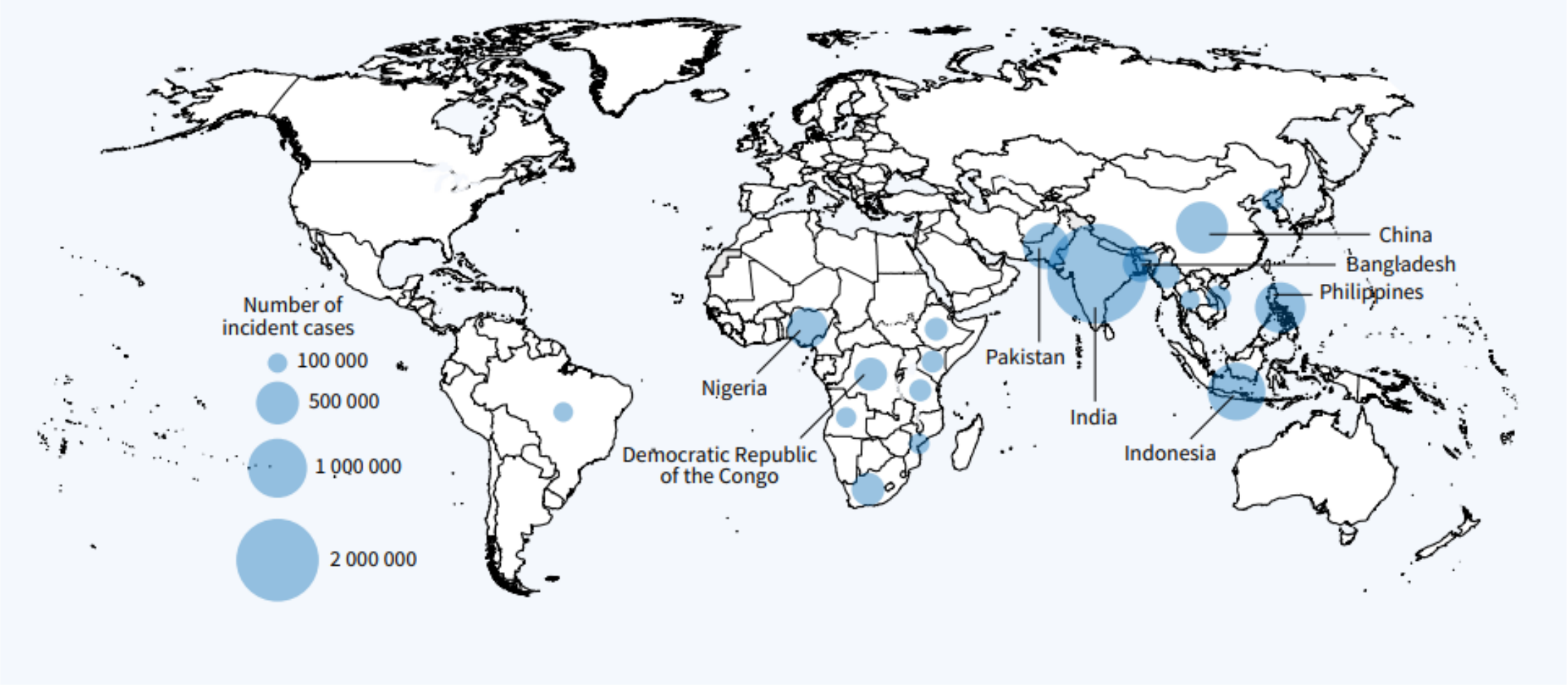
  - 33% of them are diagnosed in people after >20 years in the US

- One in 7 people living in the USA were not born in the country
  - Top 5 countries of origin have moderate, high, or very high burden of TB

Tuberculosis MMWR Morb Mortal Wkly Rep 2022

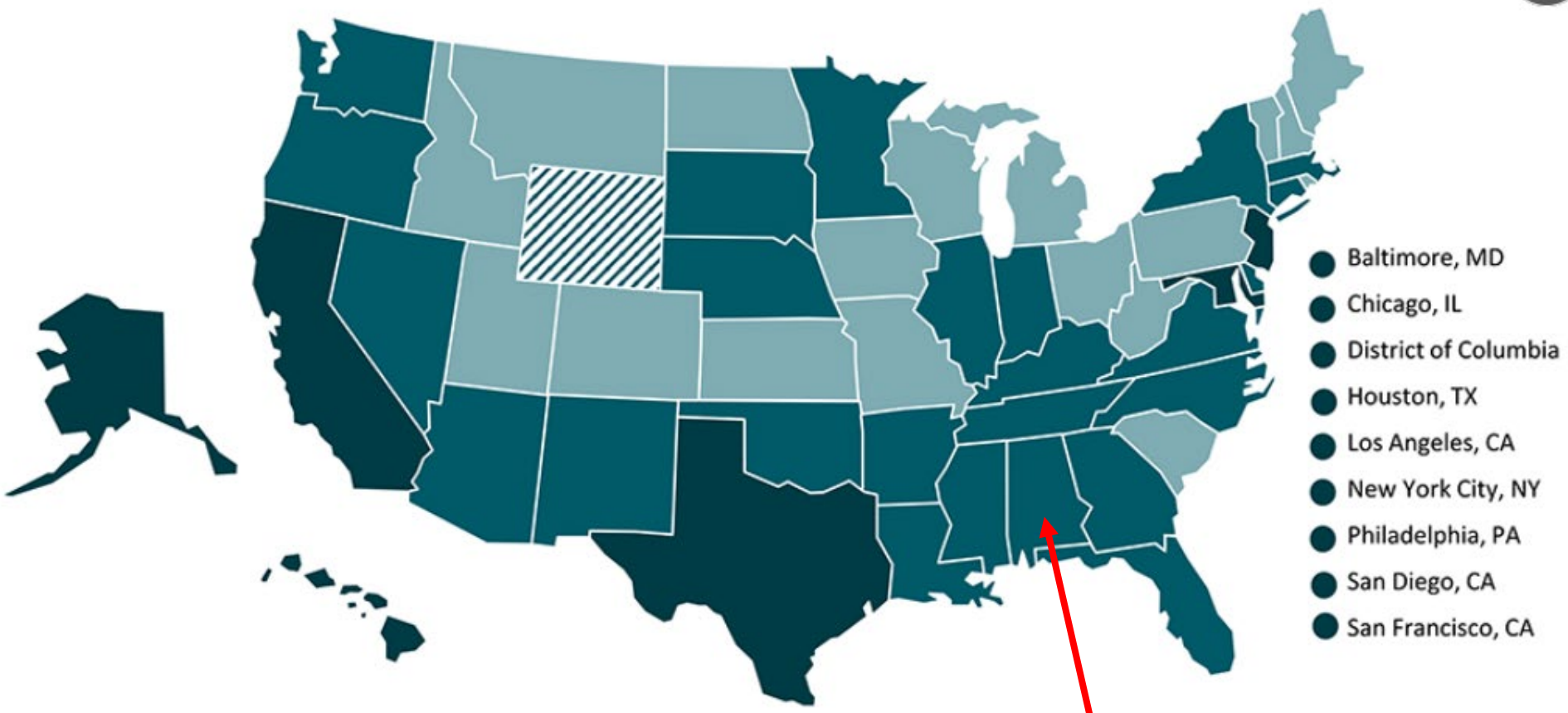
Estimated TB incidence in 2021, for countries with at least 100 000 incident cases

The countries that rank first to eighth in terms of numbers of cases, and that accounted for about two thirds of global cases in 2021, are labelled.



WHO Global TB Report. 2022

Figure 1. Overall TB Incidence,* United States, 2020

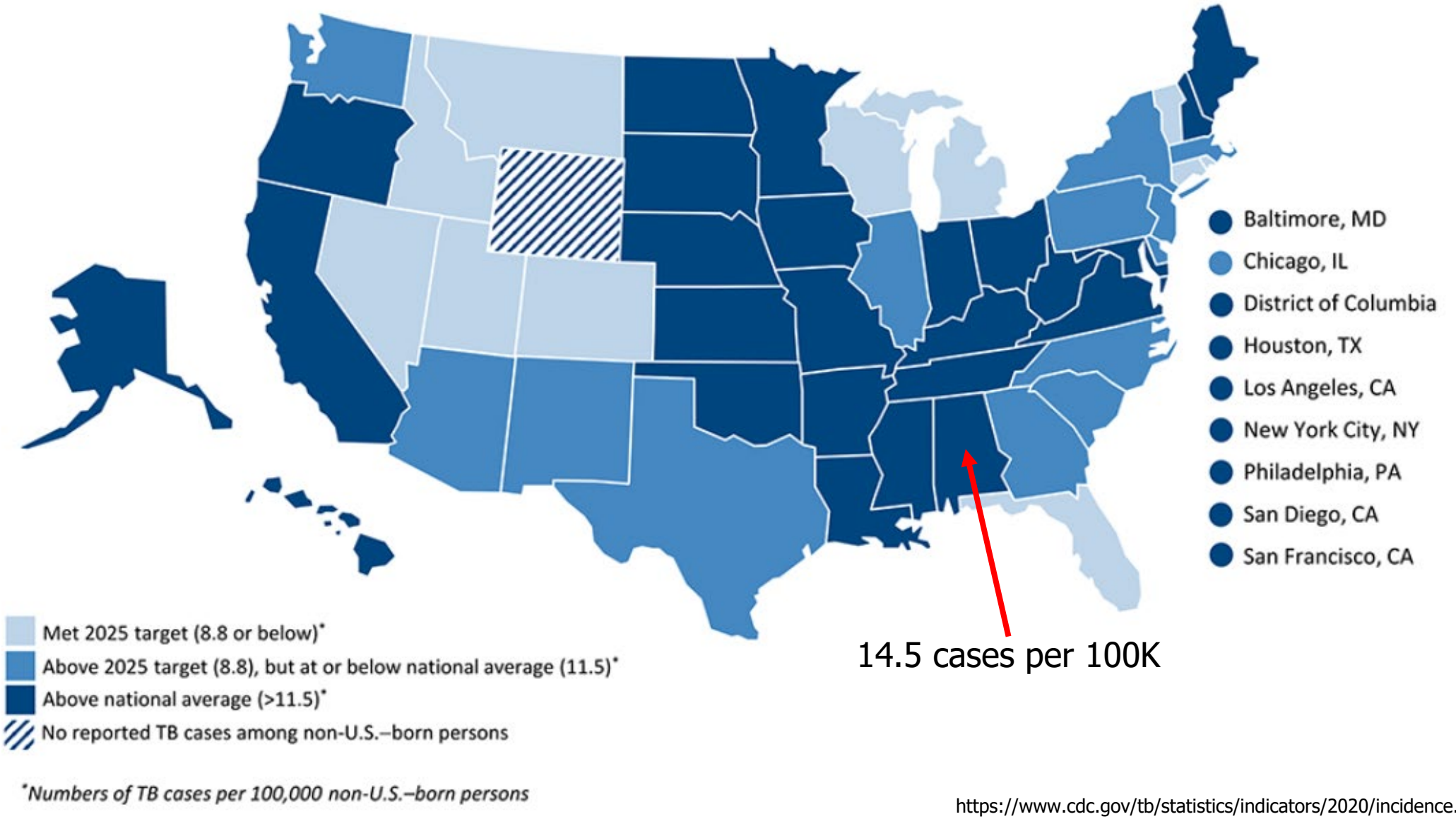


*Numbers of TB cases per 100,000 persons

92 cases in 2021
1.83 cases per 100K

https://www.cdc.gov/tb/statistics/indicators/2020/incidence.htm

Figure 5. TB Incidence,* Non-U.S.–born Persons, United States, 2020



*Numbers of TB cases per 100,000 non-U.S.–born persons

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TB in Pregnancy

- Prenatal care - unique opportunity to identify individuals at risk
- Worldwide: 14-47% of screened pregnant women have a positive TST
  - Most with active disease are unaware of their disease
- USA – no data captured on pregnancy status for women w/TB until 2020

Miele K, Obstet Gynecol. 2020

TB in Pregnancy

- Pregnant women: similar risk for acquiring TB or having disease progression
- Does not affect susceptibility to specific sites of infection
- Similar response to treatment
- Outcomes are worse - affected by delays in diagnosis and treatment

Miele K, Obstet Gynecol. 2020

Screening in Pregnancy

- Screen at initial visit or before pregnancy:
  - Signs/symptoms
  - Risk factors for TB or TB progression

https://www.cdc.gov/tb/topic/populations/pregnancy/default.htm

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- Who should we test for LTBI?
  - Born, lived, or >1 month travel to high TB incidence (>40 per 100K) countries

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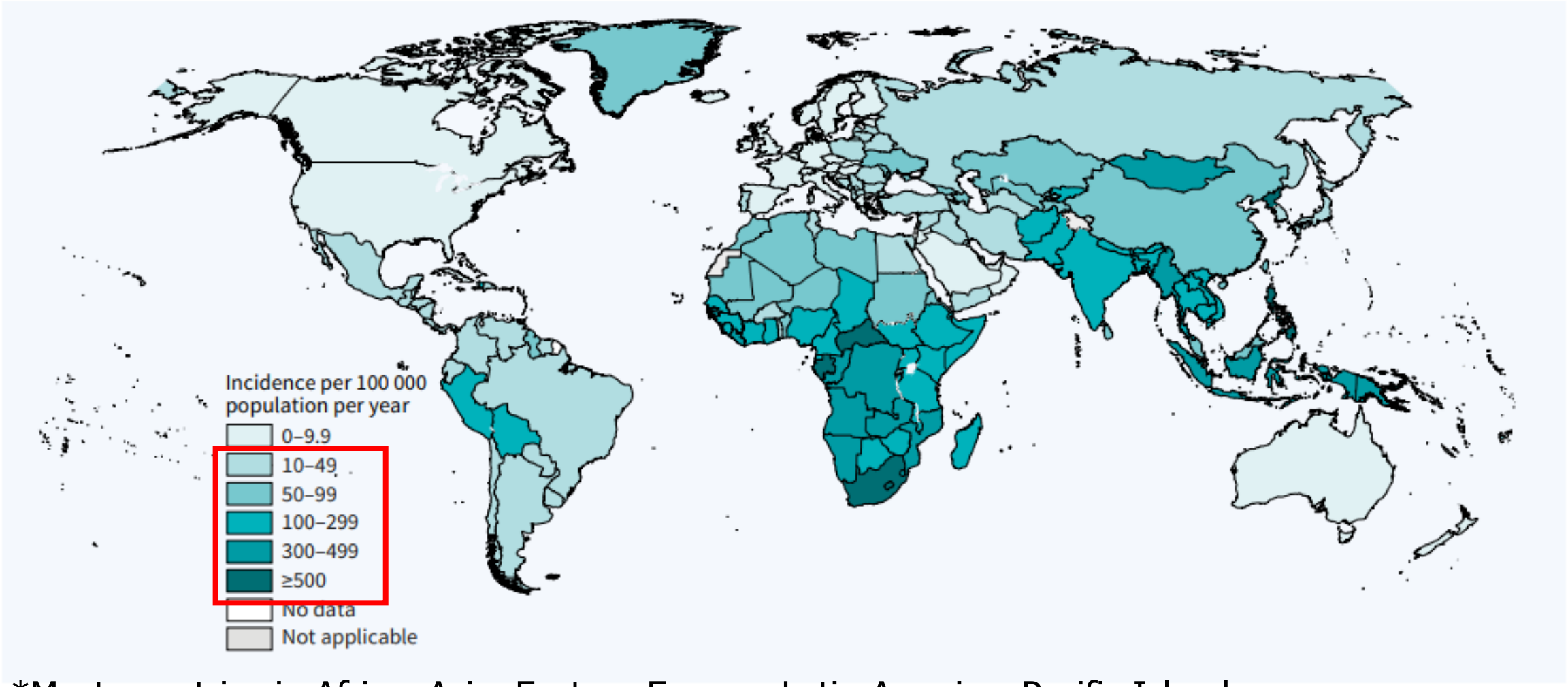
Estimated TB incidence rates, 2021



*Most countries in Africa, Asia, Eastern Europe, Latin America, Pacific Islands

WHO Global TB Report. 2022

Screening in Pregnancy

- Screen at initial visit or before pregnancy:
  - Signs/symptoms
  - Risk factors for TB or TB progression

- Who should we test for LTBI?
  - Born, lived, or >1 month travel to high TB incidence (>40 per 100K) countries
  - Close contact with known active pulmonary TB case
  - Correctional facilities, homeless shelters, nursing homes, hospitals
  - IVDU
  - Living with HIV
  - Immunocompromised

https://www.cdc.gov/tb/topic/populations/pregnancy/default.htm

Testing for LTBI

- Tuberculin Skin Test (TST) - safe and reliable during pregnancy
  - Needs 2 visits
  - Positive 2-10 weeks after exposure

- Interferon Gamma Release Assay (IGRA) – T spot or Quantiferon Gold
  - Advantage of a single visit
  - More specific – lower rates of false positive results
  - Positive 4-7 weeks after exposure

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- If tests are positive, need to rule out active disease → CXR at minimum
- A negative TST or IGRA does not exclude active or latent disease

Testing for LTBI

- Tuberculin Skin Test (TST) – intradermal injection of an inactive TB antigen
  - Measure induration 48-72h after placement
  - 15mm: positive for all patients

https://www.cdc.gov/tb/publications/factsheets/testing/skintesting.htm

Tuberculin Skin Test (TST)

10 mm	5 mm
<5y immigrants from high prevalence countries	HIV
Work/live in congregated settings: • Correctional facilities • Homeless shelter • Nursing homes • Healthcare workers	Immunosuppression • Transplant recipients • Chronic steroids • TNF-alpha inhibitors
Injection drug use	Recent contact w/active pulmonary TB
Children <5 years old	Fibrotic/nodular changes in CXR
Cancer, DM, cirrhosis, severe kidney disease*	
MTB laboratory staff	

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  - Should not change TST interpretation after 5 years

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- IGRA: interpretation is much easier
  - Favored if history of BCG vaccine
  - Results: positive, negative, or indeterminate
  - Repeat if indeterminate results and consider TST if still indeterminate

https://www.cdc.gov/tb/publications/factsheets/testing/skintesting.htm

Treatment for LTBI

Who should we treat during pregnancy?

- Recent exposure
- Known recent (<2 years) conversion of TST/IGRA
- Immunosuppression

- May defer to 2-3 months post delivery if above are absent
  - Need to reassess for active disease prior to therapy

- Decision to treat is based on individual risks and discussion w/patient

Treatment for LTBI

- INH x9 months
- Rifampin x4 months
- INH/rifampin x3 months

- Rifamycin based regimens for LTBI
  - Higher rates of completion plus lower rates of hepatotoxicity
  - Pregnant women excluded from studies

Active TB in Pregnancy

- Manifestations are similar
- Weight loss may be difficult to recognize
- Remember extrapulmonary manifestations

Sobhy S, BJOG. 2017

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Diagnosis:

- CXR: needs appropriate shielding to protect the fetus
- Sputum specimens for AFB smear/culture x3 and/or NAAT
- Additional w/up depending on symptoms

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Sobhy S, BJOG. 2017

Active TB in Pregnancy

Adverse Outcomes	OR (95% CI)
Maternal morbidity	2.8 (1.7-4.6)
Anemia	3.9 (2.2-6.7)
Cesarean delivery	2.1 (1.2-3.8)
Preterm birth	1.7 (1.2-2.4)
Low birth weight	1.7 (1.2-2.4)
Birth asphyxia	4.6 (2.4-8.6)
Perinatal death	4.2 (1.5-11.8)

Sobhy S, BJOG. 2017

Treatment for Active TB

- RIF, INH, Ethambutol for 2 months → RIF and INH for 7 months
- PZA: not routinely used due to lack of data on teratogenicity
- Report to your local health department
  - Directly Observed Therapy (DOT)
  - Contact tracing
- Work closely with an Infectious Disease specialist

Nahid P, CID. 2016
https://www.cdc.gov/tb/topic/populations/pregnancy/default.htm

Medication Side Effects

- INH: hepatotoxicity – risk may be higher in pregnancy
  - Peripheral neuropathy - supplement with pyridoxine (vitamin B6)
  - Rash, pellagra, seizures, neuropsychiatric
- RIF: hepatotoxicity, thrombocytopenia, anemia, rash
- Monitor LFTs at baseline and monthly

Medication Side Effects

- Breastfeeding is considered safe
  - Low drug levels that are not protective for the infant
  - Milk may turn orange if using RIF
  - CDC recommends B6 for infants of mothers on INH

Perinatal Infection

- Congenital TB is rare
  - Associated w/maternal endometrial or disseminated infection
  - Symptoms: resp distress, visceromegaly, low birthweight, lethargy, irritability, poor feeding
  - Evaluate w/TST, CXR, LP, blood/sputum cultures, placenta for AFB/culture
- More commonly acquired after birth
  - 40% of exposed infants will develop serious life-threatening illness within 1 year
- Mortality of about 50%

Prevention of Postpartum Transmission

- TB suspected in mother → separate from child until both are evaluated
- Mother w/active disease should wear a mask until non-contagious
- After evaluation, no need to keep them separated if both are compliant with medications
- If healthy, child should still be treated for LTBI for 3-4 months and have a repeat TST

American Academy of Pediatrics. Red Book 2021

Treatment in Children

- LTBI: RIF for 4 months
- Active TB: RIPE for 2 months, followed by RIF/INH for 4 months

AL Department of Public Health

- https://www.alabamapublichealth.gov/tb/

- Phone: (334) 206-5330
  - Reporting a case
  - Management questions
  - Treatment questions
  - Testing after exposure
  - Where to get medications
  - Consult an expert
  - Education

- CDC resources: https://www.cdc.gov/tb/topic/populations/pregnancy/default.htm

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- (+) LTBI test: assess for active TB (remember extrapulmonary)
- It is always a good idea to call your local health department

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- Jodie A. Dionne, MD, MSPH, FIDSA
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Thank you

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Q & A

Please feel free to **unmute** and ask questions.

You may also enter comments or questions in the “chat” box.

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Thank You!