



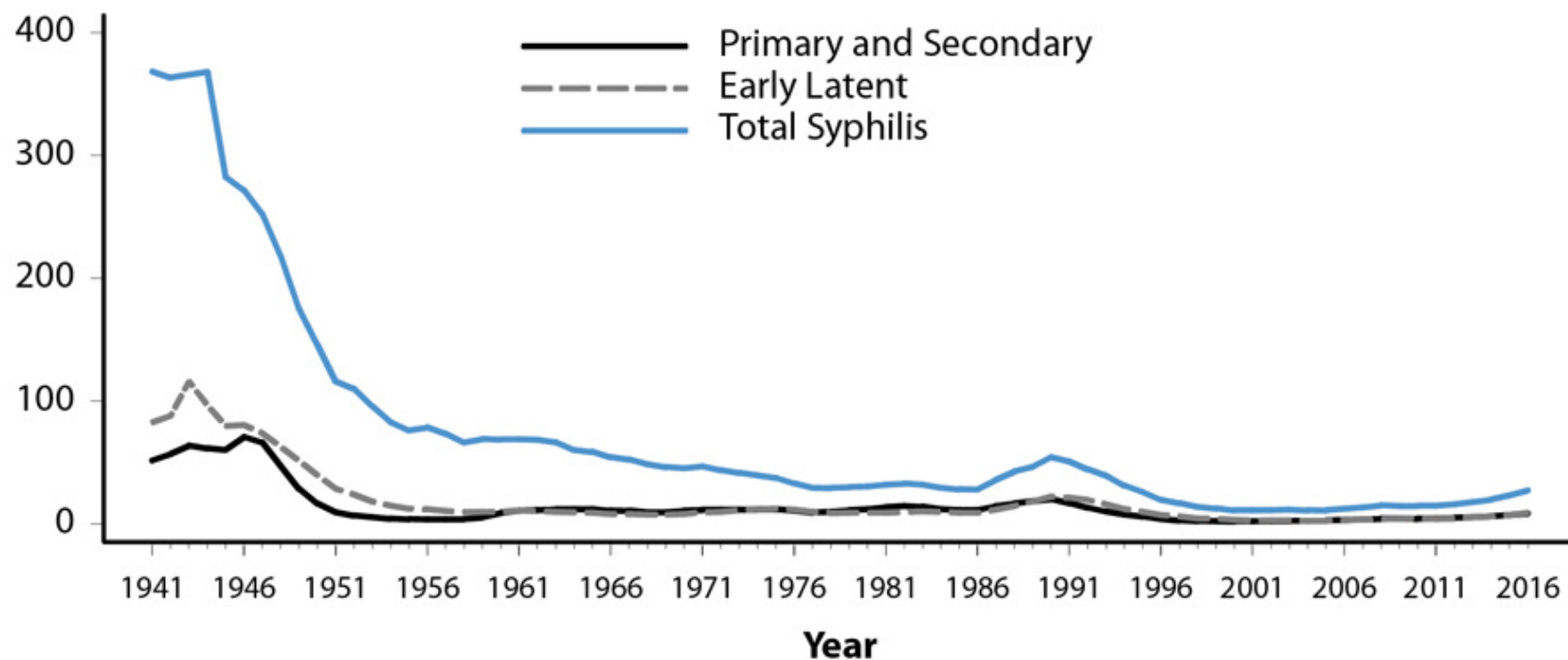
# Preventing and Managing Congenital Syphilis Infections

Jeanne S. Sheffield, MD  
Maternal-Fetal Medicine  
Johns Hopkins Medicine

Figure 30. Syphilis — Rates of Reported Cases by Stage of Infection, United States, 1941–2016



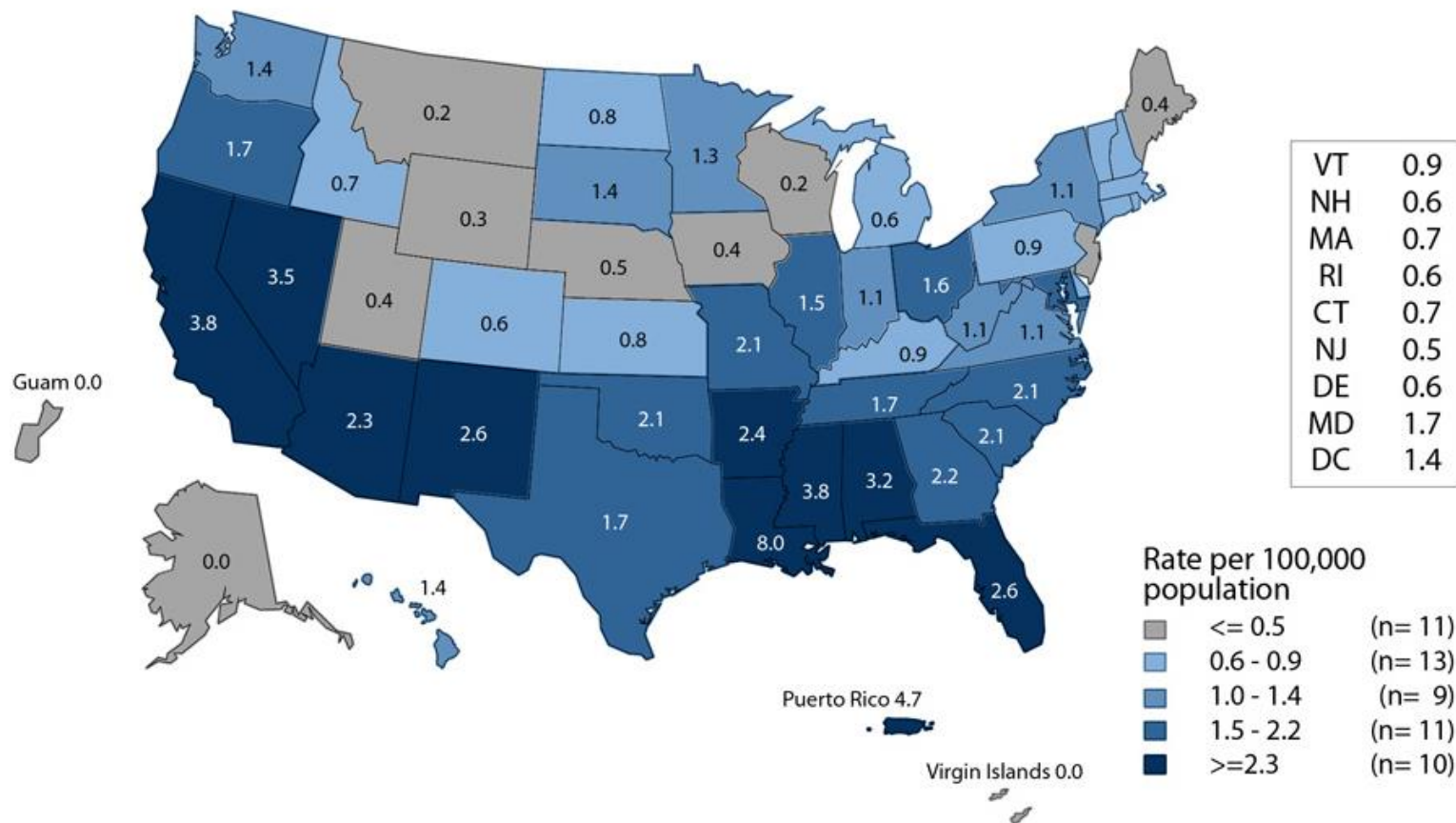
Rate (per 100,000 population)



2016 Sexually Transmitted Diseases Surveillance

**17.6% increase from 2015 overall**  
**All stages (total) highest since 1993**

Figure H. Primary and Secondary Syphilis — Rates of Reported Cases Among Women by State, United States and Outlying Areas, 2016



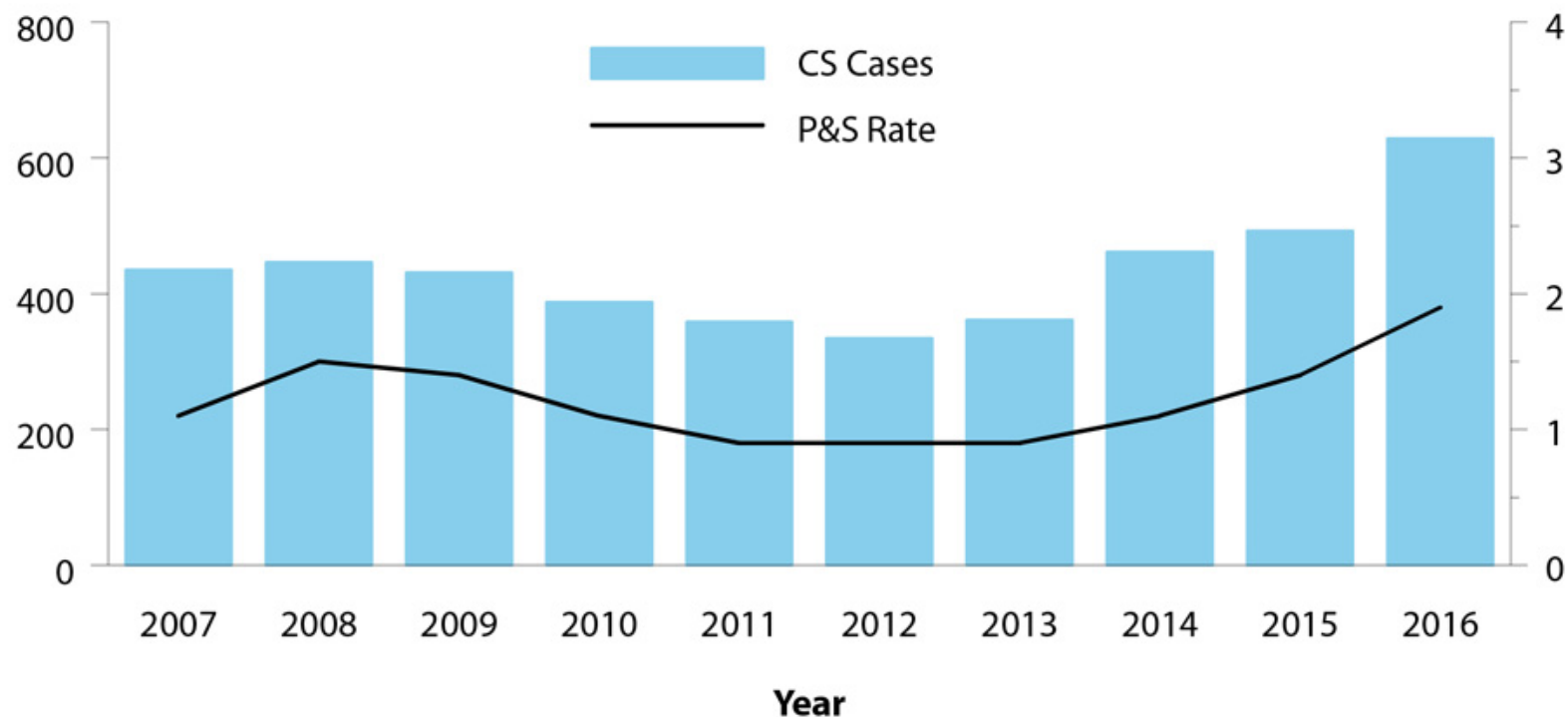
**35.7% increase from 2015 in women**

Figure 44. Congenital Syphilis — Reported Cases by Year of Birth and Rates of Reported Cases of Prima Secondary Syphilis Among Women, United States, 2007–2016



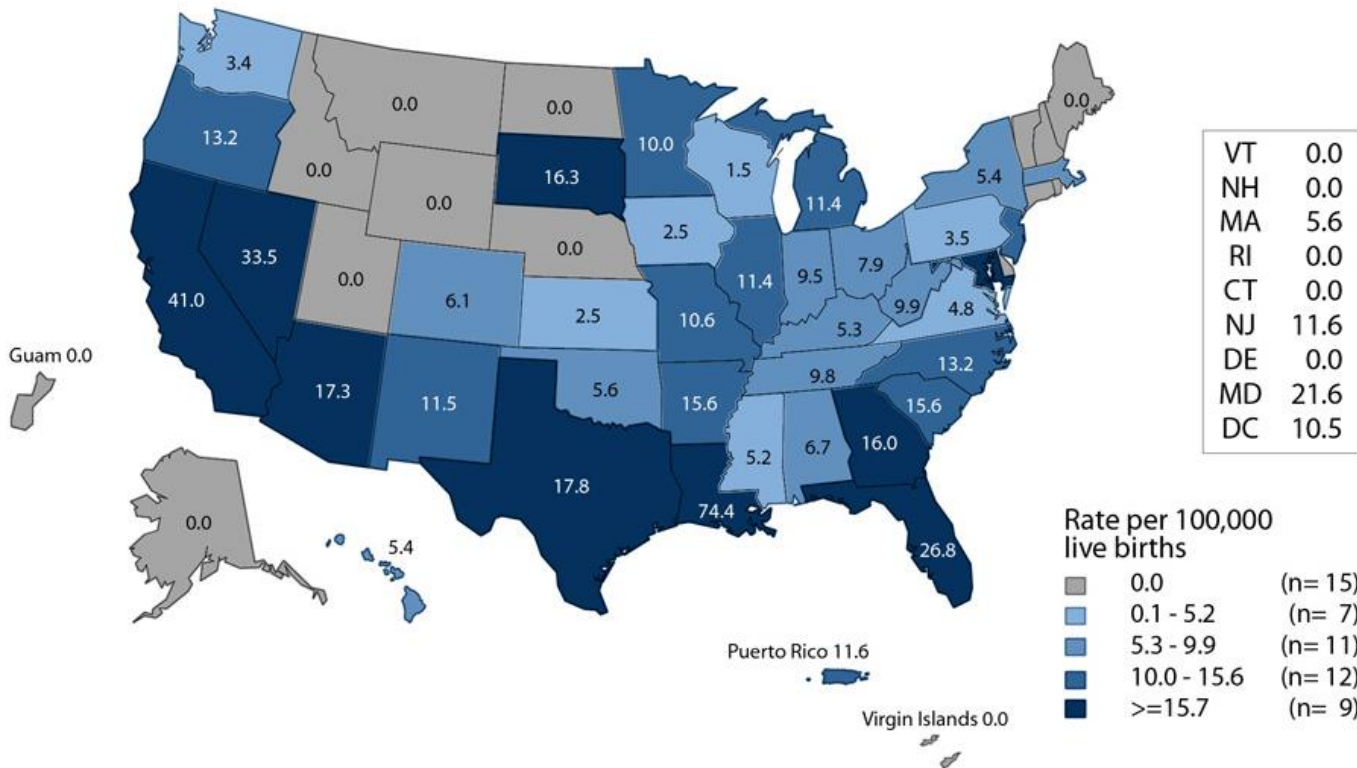
**CS\* Cases**

**P&S\* Rate (per 100,000 women)**



2016 Sexually Transmitted Diseases Surveillance

Figure I. Congenital Syphilis — Rates of Reported Cases Among Infants by Year of Birth and State, United States and Outlying Areas, 2016



**27.6% increase from 2015**  
**86.9% increase from 2012**

# Definition of Congenital Syphilis for Surveillance

- Infants born with syphilis
- Stillbirths born to mothers with syphilis
- Infants born to mothers with untreated or inadequately treated syphilis

# Proven or Highly Probable CS

Any neonate with:

- an abnormal physical examination that is consistent with congenital syphilis;  
OR
- a serum quantitative nontreponemal serologic titer that is fourfold higher than the mother's titer;\*\*  
OR
- a positive darkfield test or PCR of lesions or body fluid(s).

\*\* The absence of a fourfold or greater titer for a neonate does not exclude congenital syphilis.



# Possible CS

Any neonate who has a normal PE and a serum quantitative nontreponemal serologic titer  $\leq$  fourfold the maternal titer and one of the following:

- mother was not treated, inadequately treated, or has no documentation of having received treatment;  
OR
- mother was treated with erythromycin or a regimen other than those recommended in these guidelines \*\*  
OR
- mother received recommended treatment <4 weeks before delivery.

\*\* A women treated with a regimen other than recommended in these guidelines should be considered untreated.





# Congenital Syphilis Less Likely

Any neonate who has a normal physical examination and a serum quantitative nontreponemal serologic titer equal to or less than fourfold the maternal titer and **both** of the following are true:

- mother was treated during pregnancy, treatment was appropriate for the stage of infection, and treatment was administered >4 weeks before delivery and
- mother has no evidence of reinfection or relapse.



# Congenital Syphilis Unlikely

Any neonate who has a normal physical examination and a serum quantitative nontreponemal serologic titer equal to or less than fourfold the maternal titer and **both** of the following are true:

- mother's treatment was adequate before pregnancy and
- mother's nontreponemal serologic titer remained low and stable (i.e., serofast) before and during pregnancy and at delivery (VDRL <1:2; RPR <1:4).



# Why is Congenital Syphilis on the Rise?

- There was a 36% increase when comparing 2015 to 2011
  - 56% increase in primary and secondary syphilis rates during the same time period
  - 22% of the cases in 2014 had no prenatal care
    - If they had prenatal care, 43% did not receive prenatal treatment
      - 16% not tested
      - 39% seroconverted during pregnancy
    - 17% were treated <30 days prior to delivery

**Table 40. Congenital Syphilis — Reported Cases and Rates of Reported Cases by State<sup>†</sup>, Ranked by Rates, United States, 2015**

Rank*	State <sup>†</sup>	Cases	Rate per 100,000 Live Births
1	Louisiana	53	83.9
2	California	141	28.5
3	Maryland	18	25.0
4	Nevada	8	22.8
5	Illinois	30	19.1
6	Florida	38	17.6
7	Arizona	14	16.4
8	Georgia	21	16.3
9	Oregon	6	13.3
10	Arkansas	5	13.2
11	Oklahoma	7	13.1
12	Texas	49	12.7
	<b>U.S. TOTAL<sup>†</sup></b>	<b>487</b>	<b>12.4</b>
13	Ohio	17	12.2
14	Hawaii	2	10.5
15	Michigan	11	9.7
16	Delaware	1	9.2
	<b>HP 2020 TARGET</b>		<b>9.1</b>
17	New Mexico	2	7.6
18	North Carolina	9	7.6
19	Tennessee	5	6.3
20	Indiana	5	6.0
21	Washington	5	5.8
22	Massachusetts	4	5.6
23	South Carolina	3	5.3
24	Alabama	3	5.2
25	New York	12	5.1
26	Pennsylvania	7	5.0
27	Missouri	3	4.0
28	Virginia	3	2.9
29	Minnesota	2	2.9
30	Connecticut	1	2.8
31	Kentucky	1	1.8

# Congenital Syphilis

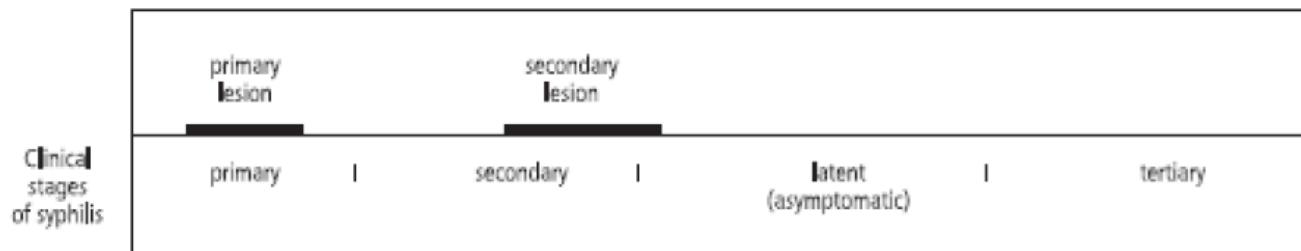
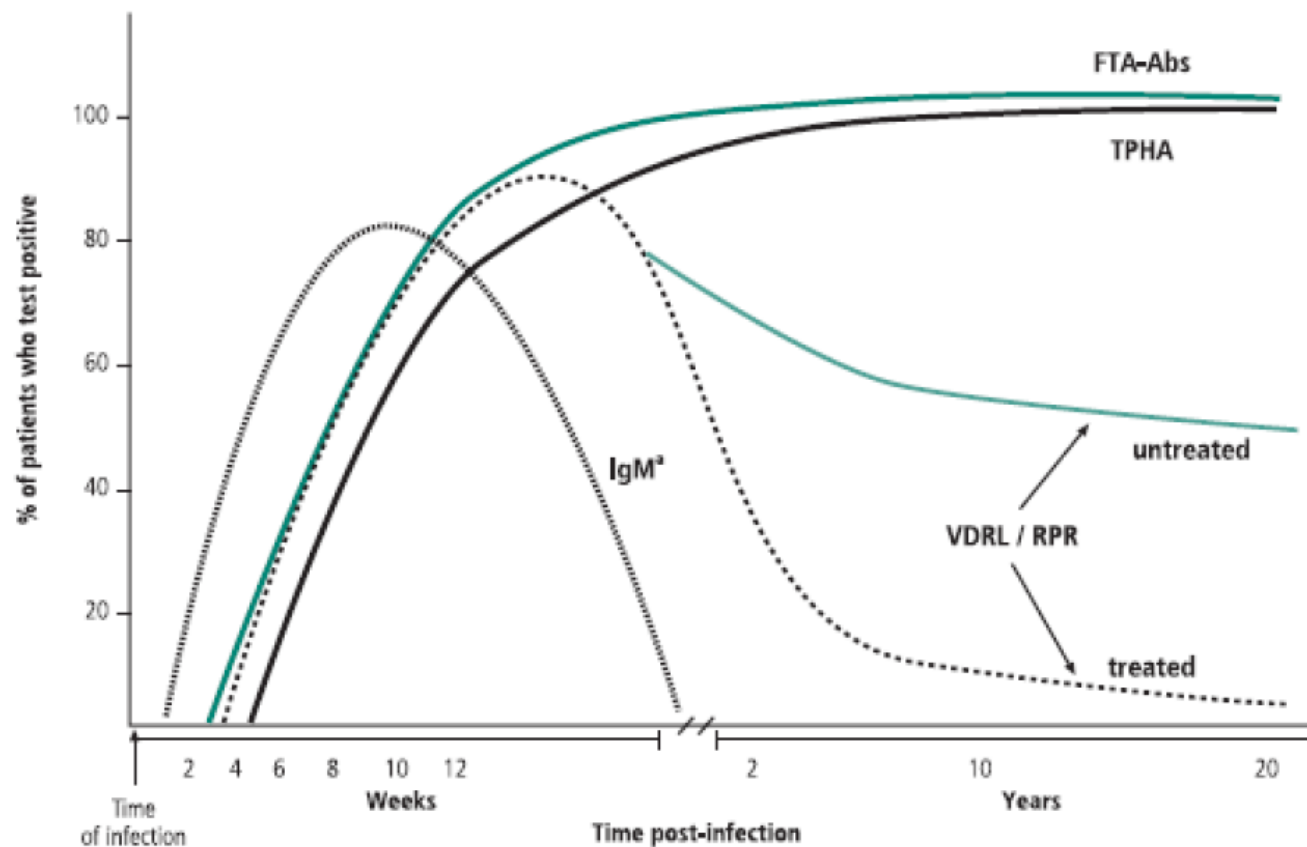
- *T. pallidum* is transmitted across the placenta from a pregnant woman to her fetus
- May occur during any stage of syphilis and in any trimester
- Manifestations may not be noted at birth
  - Early lesions inflammatory
  - Late lesions immunologic and destructive

# Congenital Syphilis

- The diagnosis is surprisingly difficult
  - All infants born to mothers with reactive syphilis serology should have an RPR or VDRL performed on the serum (not umbilical cord sample)
  - No adequate IgM available at this time
  - Physical exam : hydrops, HSM, jaundice, rhinitis, pseudoparalysis, skin rash
  - Examine the placenta and umbilical cord
  - Darkfield microscopy if suspicious lesions or available body fluids

# Serologic Testing for Syphilis

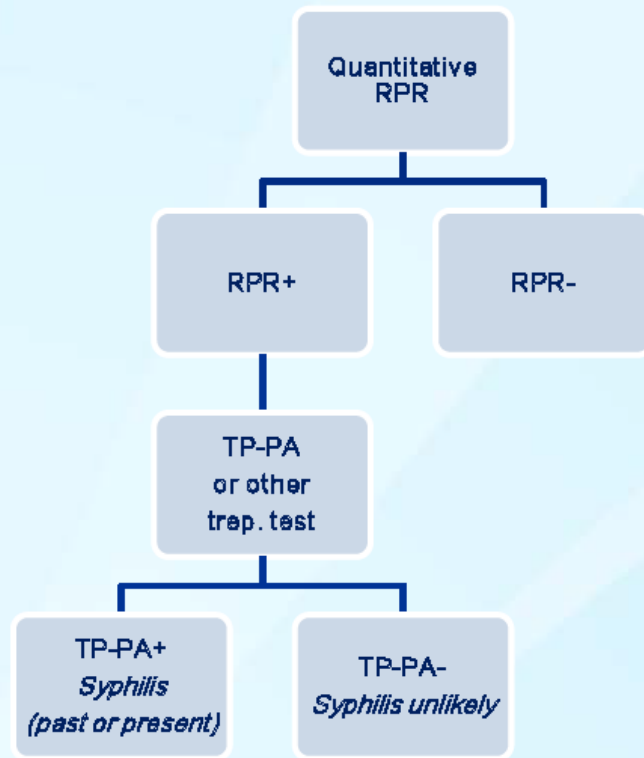
- Serologic detection requires the detection of two types of antibodies
  - Non-treponemal antibodies
    - Directed against lipoidal antigens
    - RPR and VDRL, TRUST
  - Treponemal antibodies
    - Antibodies directed against *T. pallidum* proteins
    - TP-PA, MHA-TP, FTA-ABS, EIAs, CIAs, MBIA



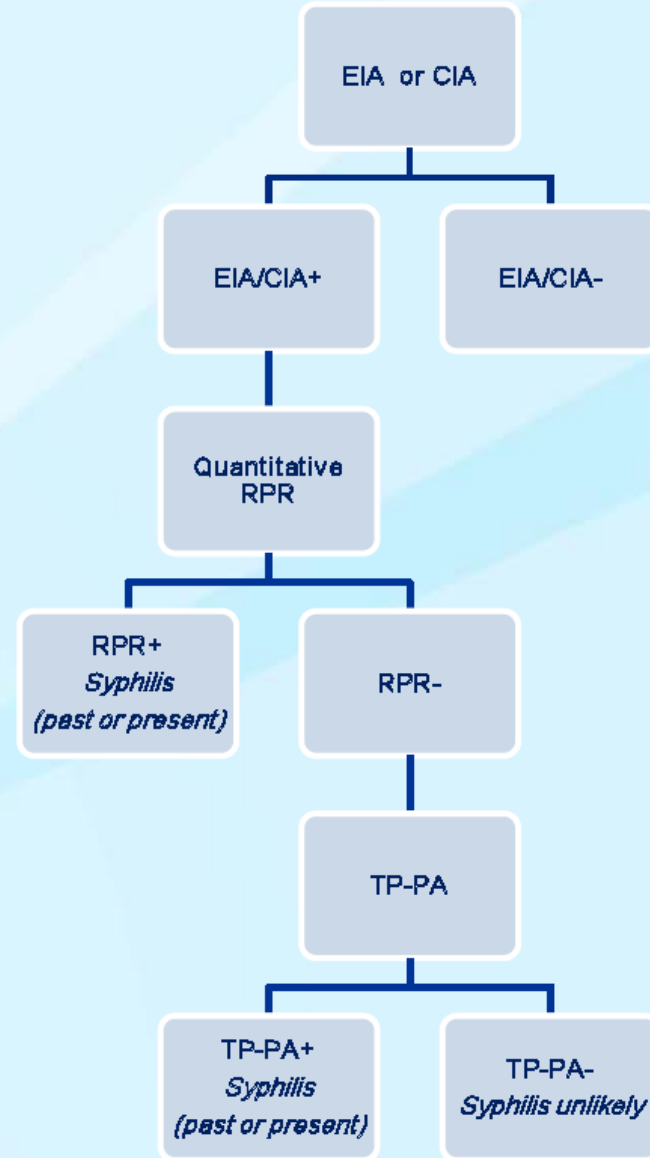


# Syphilis serologic screening algorithms

## Traditional



## Reverse sequence



# Benefits (and Problems) of Each

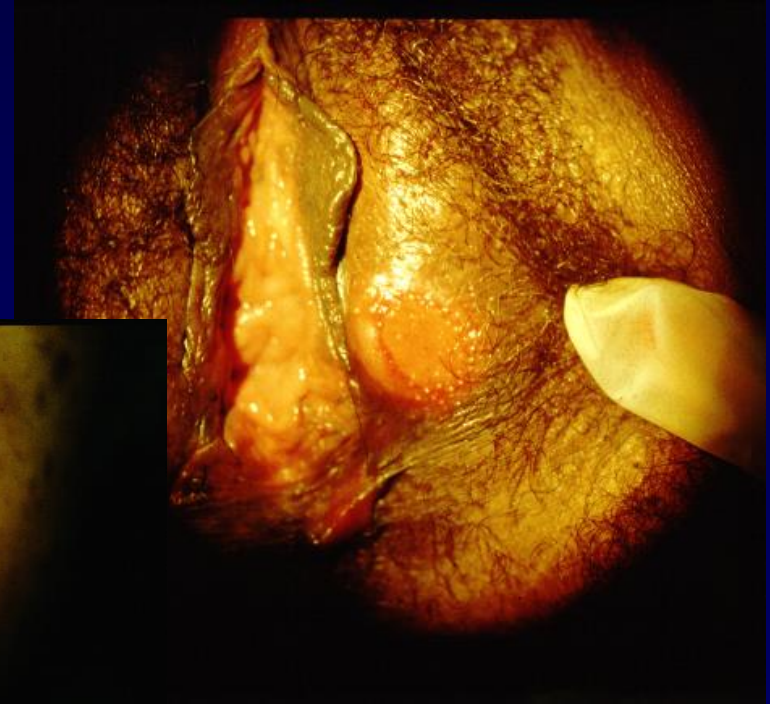
- Traditional
  - Detects active infection
  - High rate of biologic false positives so needs confirmation
  - Can miss early primary and treated infection
- Reverse sequence algorithm
  - Detects early and treated infection
  - Non-treponemal test needed to detect active infection
  - EIAs and CIAs are nonspecific with high false positive rate







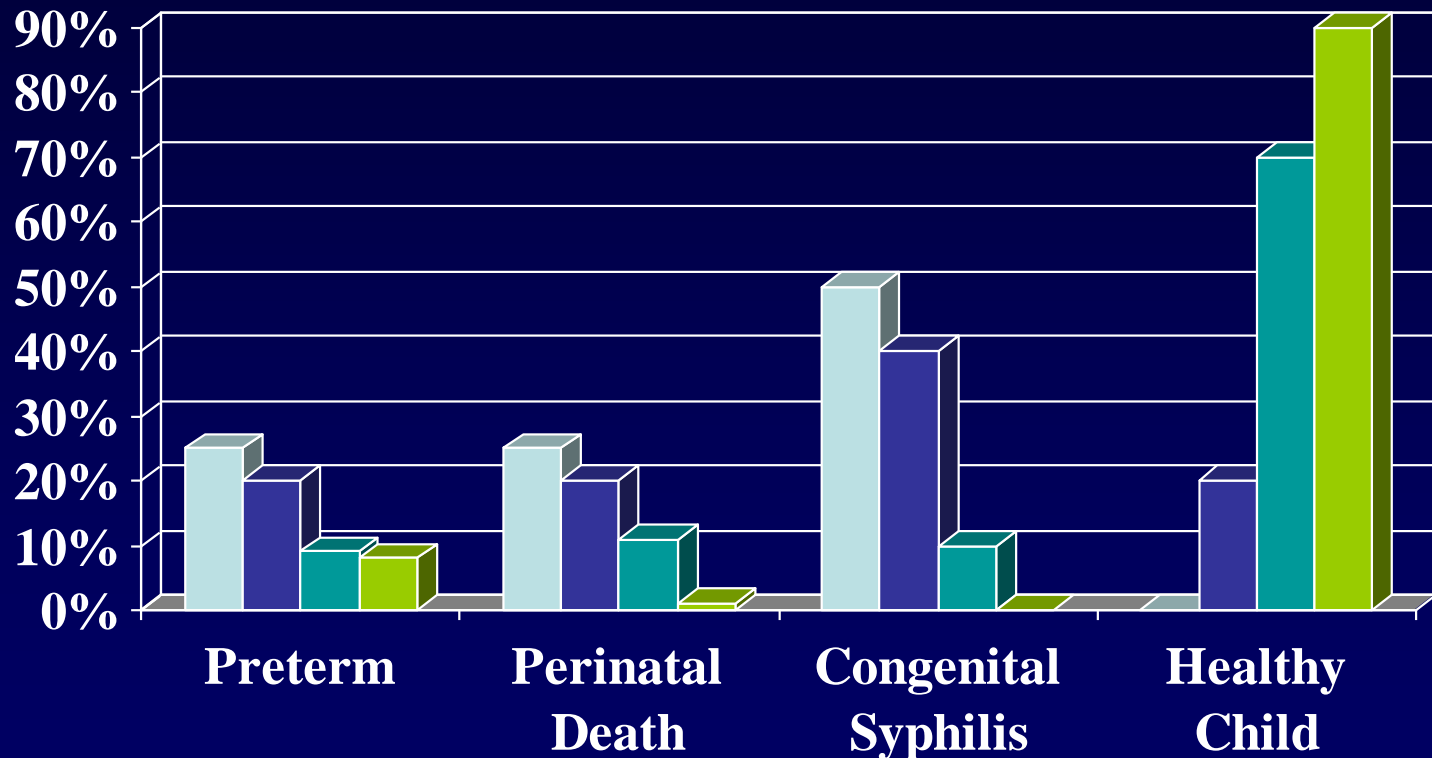
The only way to prevent congenital syphilis is to prevent or at least treat maternal syphilis



# Identification of pregnant women infected with syphilis

- Screen ALL pregnant women
  - First prenatal visit
  - In many states, screen again at 28 weeks and then again at delivery in high prevalence communities
- No infant should ever be discharged from the hospital without confirmation of negative maternal serology
- Screen anyone who delivers a stillborn infant after 20 weeks gestation

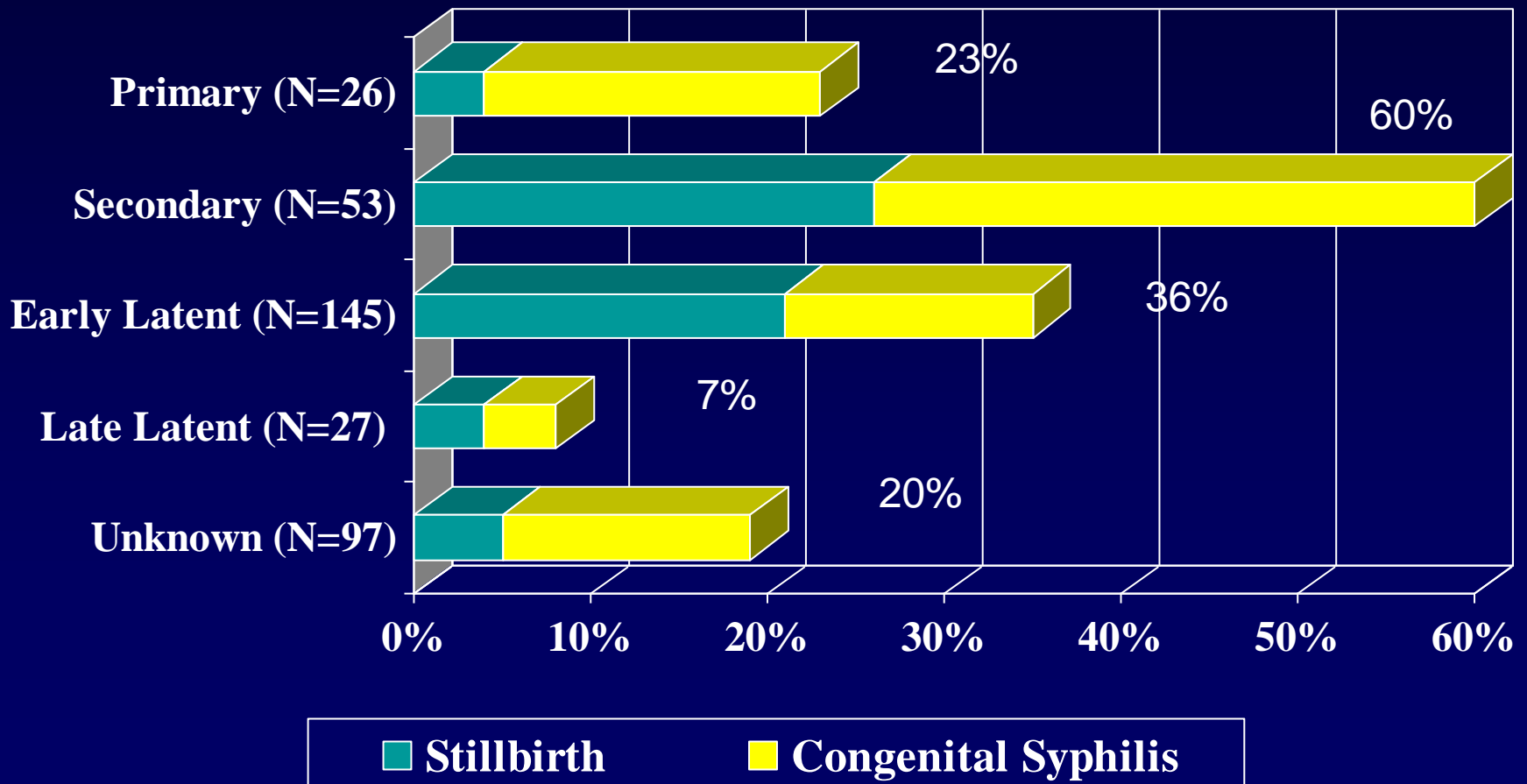
# Pregnancy Outcome in Relation to Maternal Stage of Infection



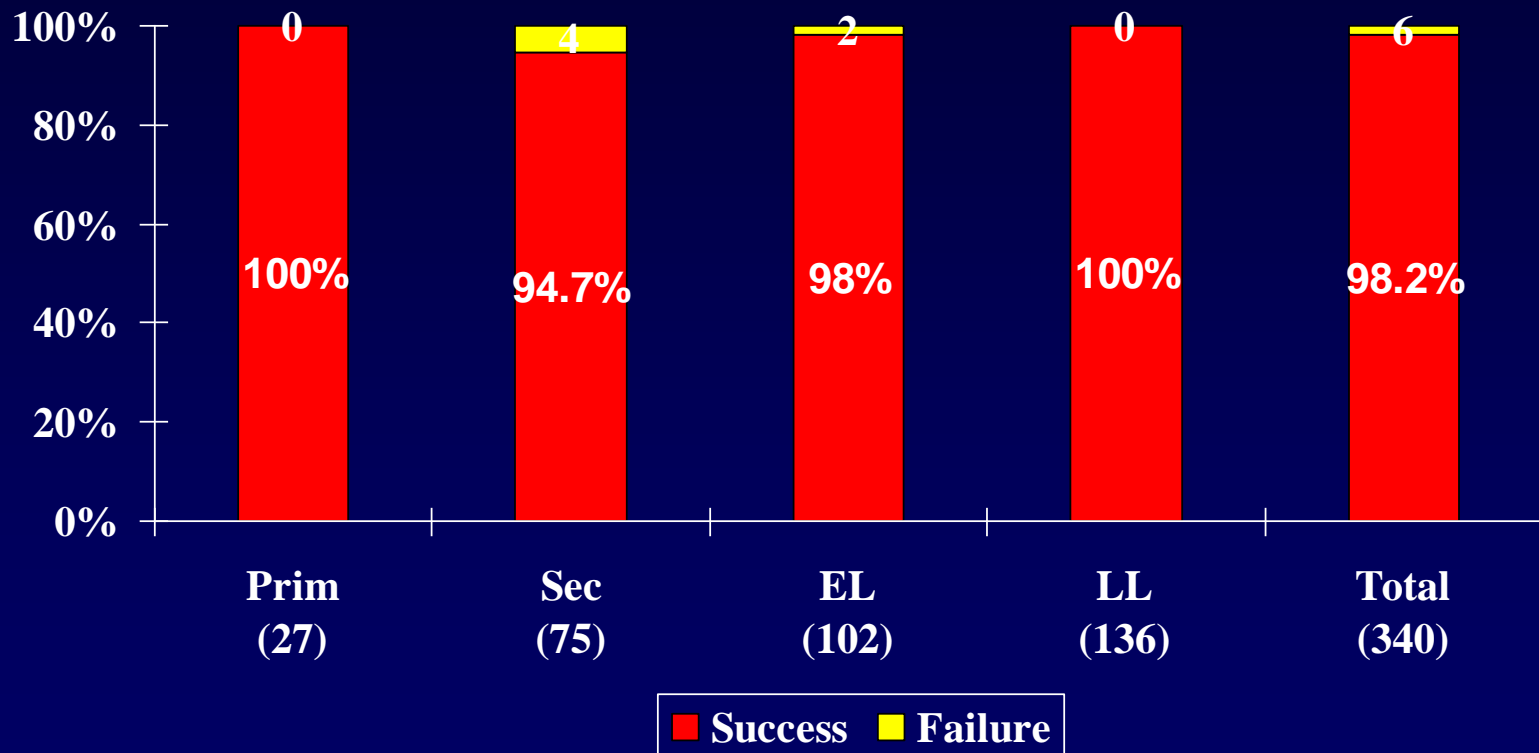
■ Primary or Secondary ■ Early Latent ■ Late Latent ■ Uninfected



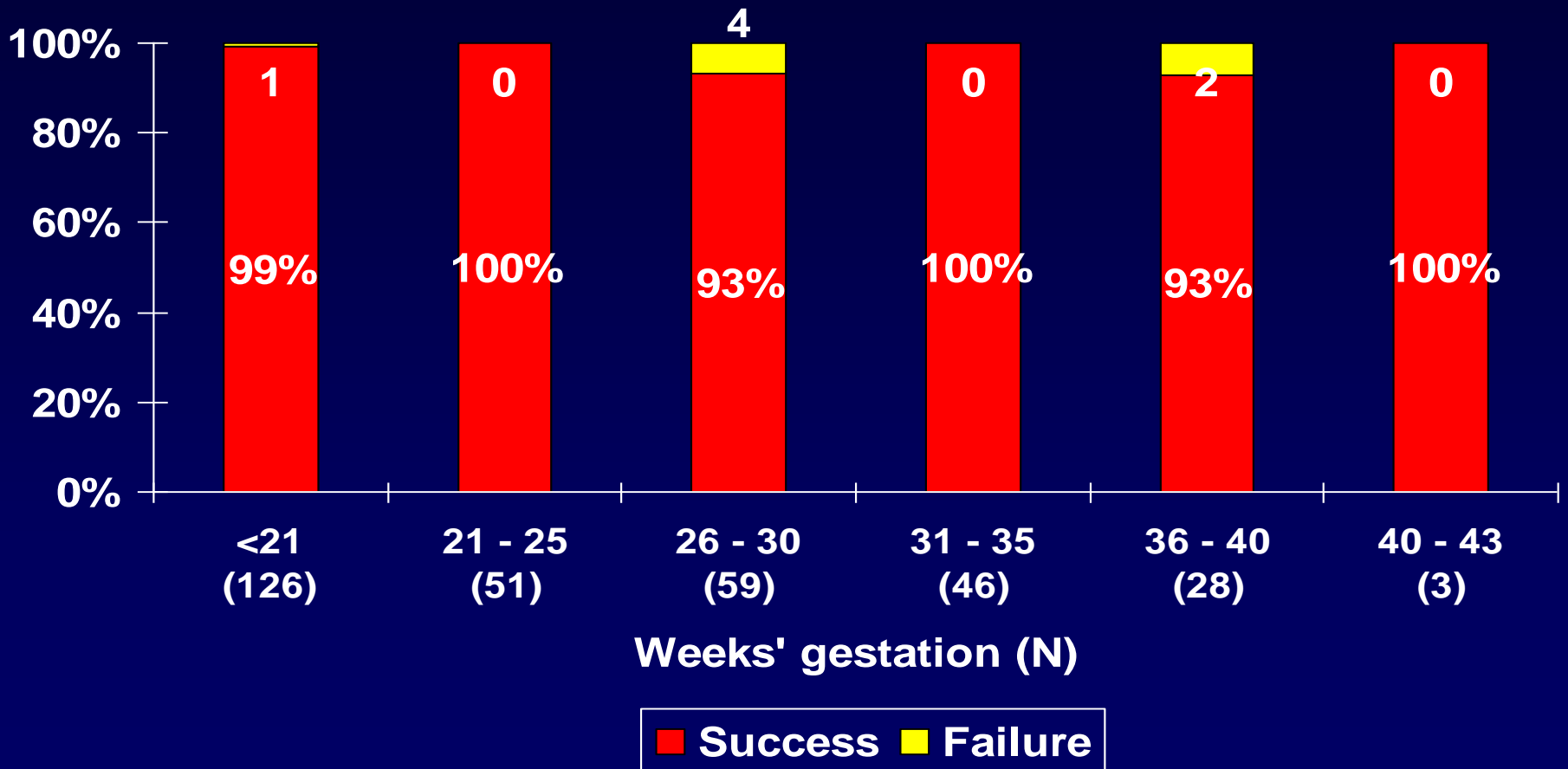
# Congenital Syphilis at Parkland Hospital 1988 to 1998



# Syphilis Therapy Efficacy by Stage



# Syphilis Treatment Efficacy by Gestational Age

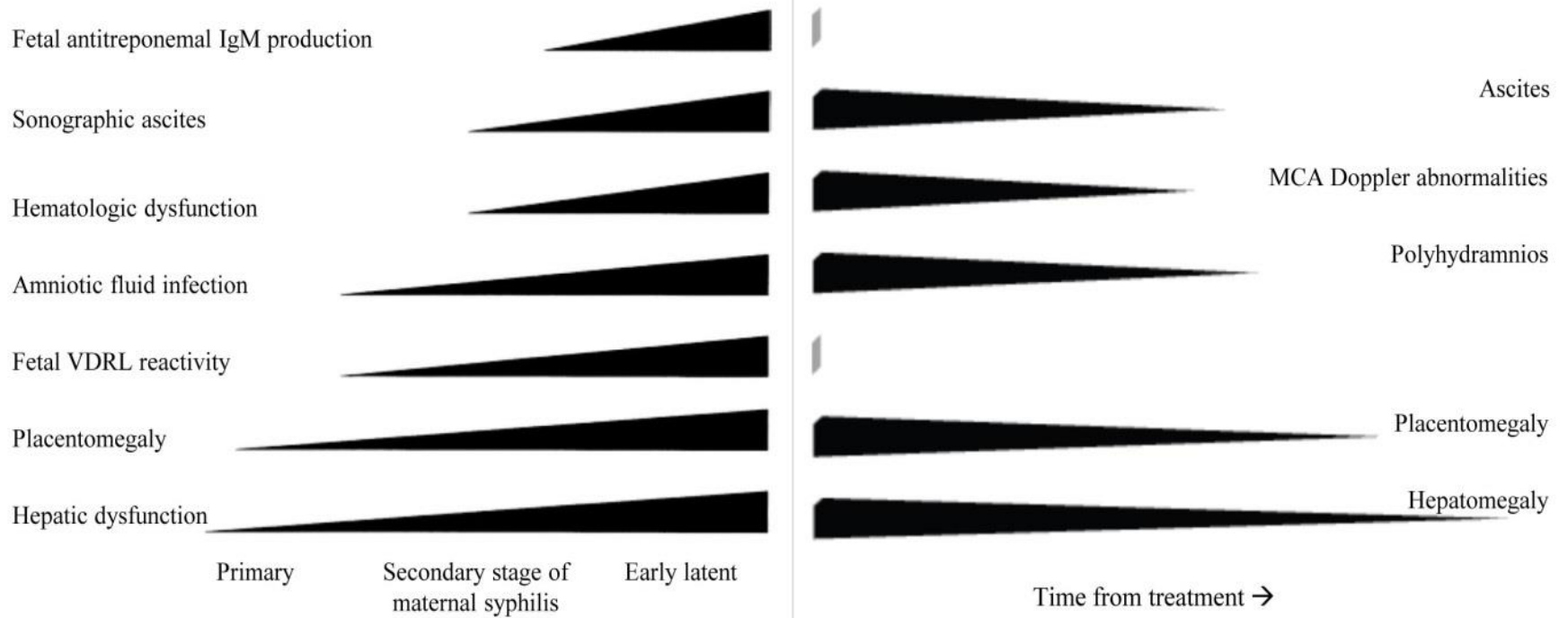


Alexander JA, et al. Obstet  
Gynecol 1999; 93:5-8

# Congenital Syphilis Following Maternal Treatment in Pregnancy

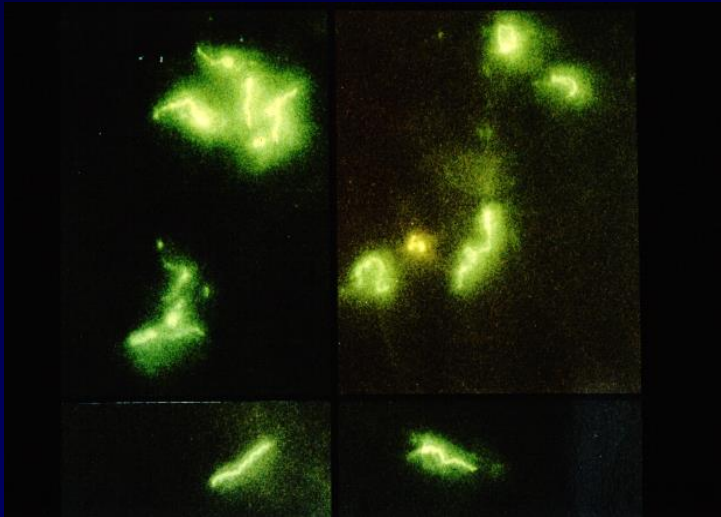
- Case:control study of women receiving antepartum syphilis therapy.
- Delivery of an infected infant was associated with
  - High VDRL titers at treatment and delivery
  - Earlier maternal stage of syphilis
  - Interval from treatment to delivery
  - Delivery of an infant  $\leq 36$  weeks gestation

# Treatment



# “He who knows Syphilis, knows Medicine”

Sir William Osler(1849-1919)



Ricard Tennant Cooper (1912)  
Wellcome Library, London

# Final Message

- The State and Local Health Departments are your allies in the fight against both CZS and Congenital Syphilis
  - Do not hesitate to contact them with any questions. They are there to help with contact notification, researching prior treatment and helping interpret results
  - If they contact you regarding a possible case, follow up with them
  - These are reportable diseases