Florida Department of Health
Division of Disease Control and Health Protection
Bureau of Public Health Laboratories

2019 HIV Diagnostics Conference
March 27, 2019

Performance of the Syphilis Reverse Algorithm Using the Abbott Architect Syphilis TP (ASTP) and its Role in a "Blended" Diagnostic Application in Florida's Public Health Testing Population

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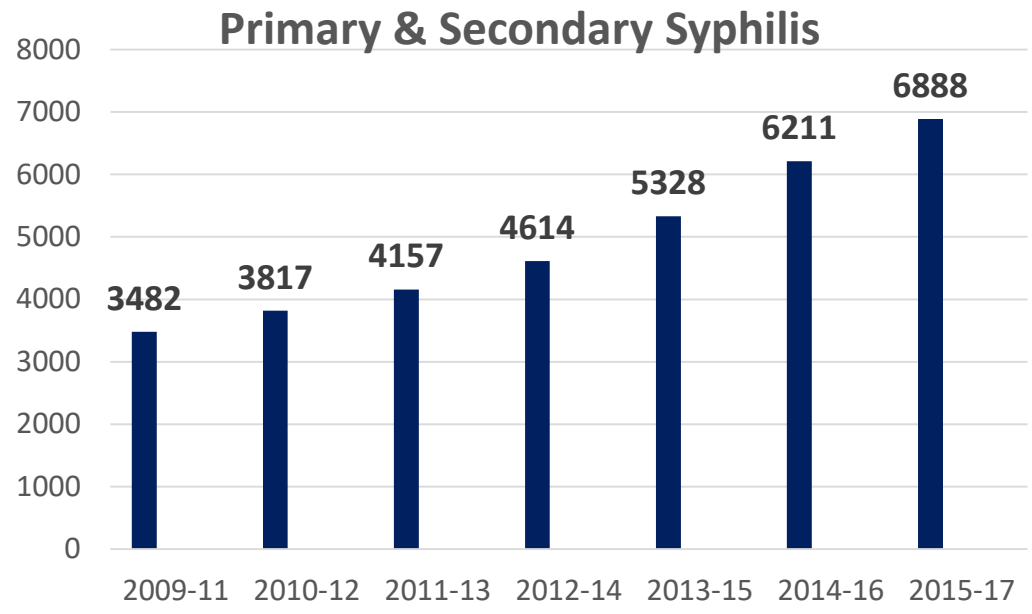
Conflict of Interest statement: I do not have any financial relationship with commercial entities to disclose.

Primary and Secondary Syphilis in Florida

Infectious Syphilis Cases, Rate Per 100,000 Population, 3-Year Rolling				
Year	Count	Denom	Rate	MOV (+/-)
2015-17	6,888	60,684,582	11.4	0.3
2014-16	6,211	59,708,725	10.4	0.3
2013-15	5,328	58,792,029	9.1	0.2
2012-14	4,614	58,013,205	8.0	0.2
2011-13	4,157	57,375,076	7.2	0.2
2010-12	3,817	56,880,960	6.7	0.2
2009-11	3,482	56,473,866	6.2	0.2
2008-10	3,266	56,168,961	5.8	0.2
2007-09	2,997	55,849,639	5.4	0.2
2006-08	2,691	55,375,391	4.9	0.2



From 2009-11 to 2015-2017 there was a 97.8 % increase in the 3 year rolling average for Primary & Secondary Syphilis

In 2017 the rate for Primary and Secondary Syphilis was 11.6 cases per 100,000
Nationally the Rate was 9.5 cases/100,000

http://www.flhealthcharts.com/charts/OtherIndicators/NonVitalSTDDataViewer.aspx?cid=0144

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3 Locations – Jacksonville, Miami and Tampa

Jacksonville Serology	2018 Total Tests
Syphilis (Traditional Algorithm) – RPR/EIA/TP-PA	61,646
Hepatitis A, Hepatitis B (Surface Antigen, Surface Antibody and Core), and Hepatitis C	67,478
HCV RNA NAAT (diagnostic and viral load)	2,957
Chlamydia trachomatis Amplified Testing	92,728
Neisseria gonorrhea Amplified Testing	92,728
Rubella screen (qualitative only)	1,749
QuantiFeron QFT-TB Plus	1,694

OBJECTIVE

To compare the performance and sensitivity of the syphilis Reverse Algorithm with the Traditional Algorithm for detecting primary and secondary (P&S) infectious syphilis cases in the Florida public health population.

METHOD

- A retrospective study of individuals who self-referred at county public health clinics for syphilis testing.

- All specimens were processed through the Traditional Algorithm.
  - Primary screening performed with the Rapid Plasma Reagin (RPR) Card Test; all reactives were tested semi-quantitatively to yield a titer.
  - All initial reactive specimens were confirmed by the TrepSure EIA.
  - Any discordant RPR/EIA specimens were tested by the Treponema pallidum Particle Agglutination (TP-PA) assay.

METHOD (cont.)

All specimens were also processed through the Reverse Algorithm

- **Primary screening performed with the Abbott ARCHITECT Syphilis TP CMIA (ASTP).**
- **All initial reactive specimens were confirmed by RPR.**
- **Any discordant ASTP/RPR specimens were tested by TP-PA.**

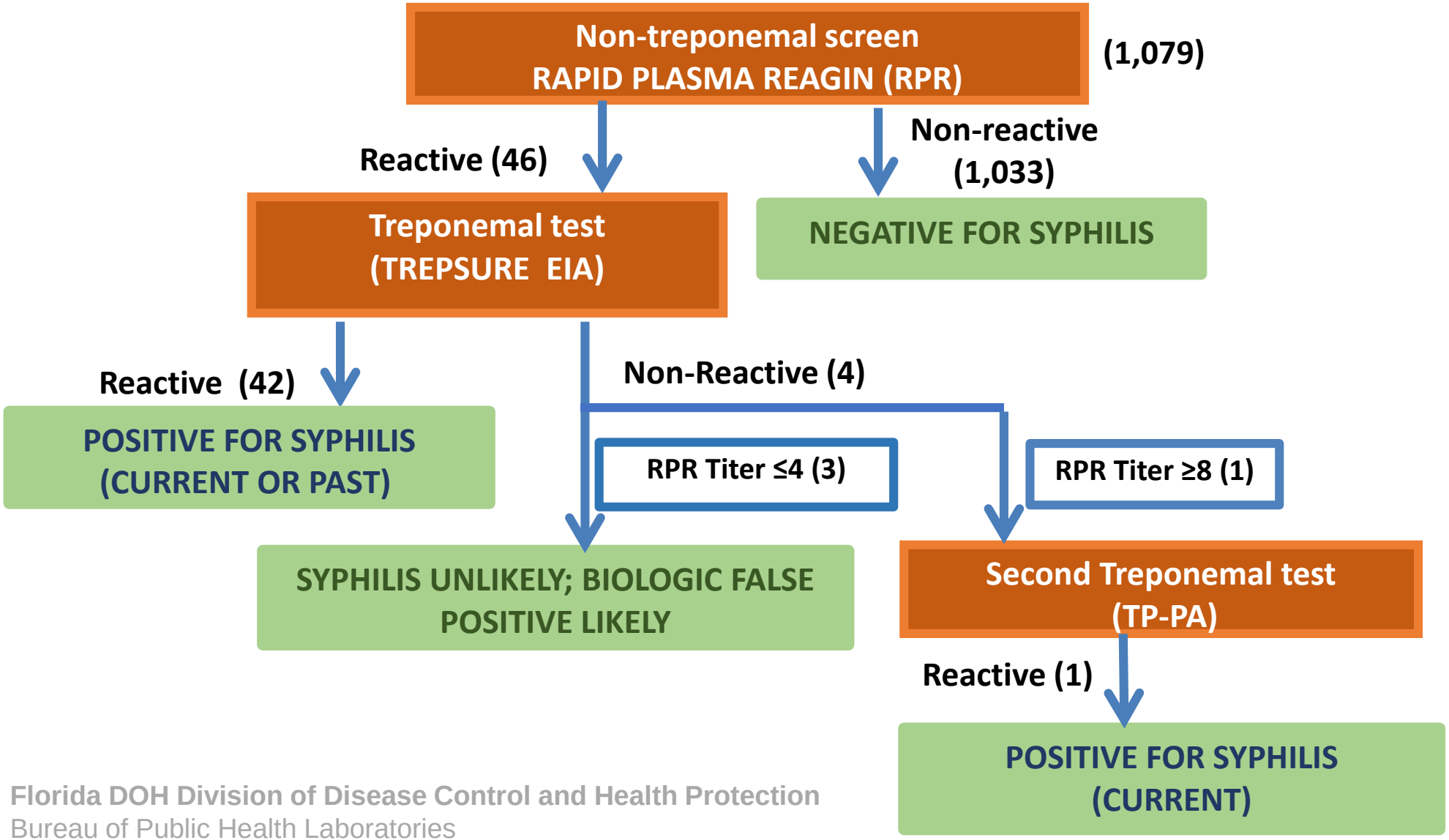
METHOD (cont.)

- Positive syphilis cases were determined by two concordant reactive treponemal tests OR one treponemal reactive and one non-treponemal reactive test.

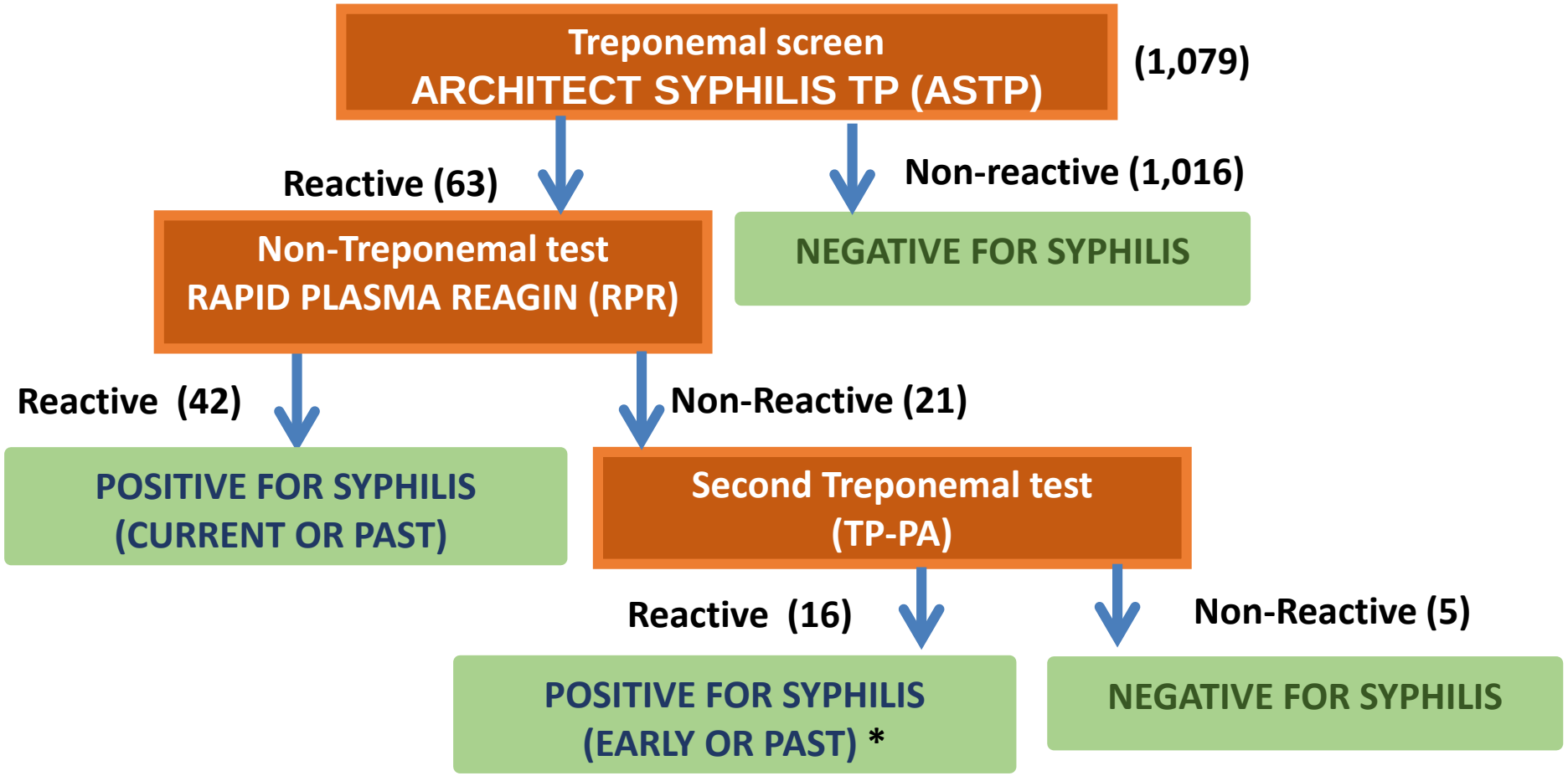
- To differentiate between past/latent or early infections, clinical and treatment data from the Florida Department of Health Surveillance Tools and Reporting System (STARS)* database was reviewed.
  - If STARS did not indicate a latent, sero-fast or treated status, a positive syphilis case was classified as a P&S infection.

*Formerly referred to as Patient Reporting Investigation Surveillance Manager (PRISM)

Traditional Algorithm Results



Reverse Algorithm Results



*P&S Infections, Treatment Naïve (11); Past Syphilis with Documented Care (5)

Conclusion

Total = 1,079	Reverse Algorithm ASTP screen/RPR/TP-PA (95% CI)	Traditional Algorithm RPR screen/EIA/TP-PA (95% CI)
Positive syphilis cases (infectious and non-infectious), N=59	**58/59 = 98.3% (95% - 100%)**	**43/59 = 72.9% (61.7% - 84.1%)**
No laboratory evidence of syphilis, N=1020	**1020/1020 = 100% (99.7% - 100%)**	**1017/1020 = 99.7% (99.3% - 100%)**

Conclusion (cont.)

STARS review of the 42 cases positive in both Reverse and Traditional Algorithms:

- **11 were P&S infections**
- **31 were either latent (21) or past/ treated (9) or sero-fast (1)**

STARS review of the 16 additional cases positive with Reverse Algorithm only:

- **11 were P&S infections**
- **5 were past syphilis (with documented linkage to care)**

Discussion

- **The Reverse Algorithm may identify as much as a 2-fold increase in P&S cases per year.**

- **Early detection and treatment averts new P&S syphilis cases and lowers healthcare costs, but transition to the Reverse Algorithm will result in higher analytical testing cost for the laboratory.**

Discussion (cont.)

To offset additional costs, the FBPHL plans to implement a "blended" syphilis algorithm:

- **RPR only testing will be performed for individuals with history of syphilis or for treatment follow-up.**
- **Reverse Algorithm will be performed for routine syphilis screening (with signs/symptoms), prenatal, neonatal and contact cases.**

Discussion (cont.)

Barriers to Implementation of a "blended" syphilis algorithm:

- **Fiscal concerns – difficult to forecast how many RPR only vs. Reverse Algorithm tests will be ordered by providers.**
- **IT issues – extensive changes required for ELO by providers and ELR by the laboratory.**
- **Need for provider notification about the algorithm change and guidance to end users as to how and when to order appropriate test(s).**

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Thank you

Acknowledgements:

Sally Fordan, FBPHL Retrovirology Supervisor
Berry Bennett, FBPHL Technical Consultant
Dan Petkas, Abbott Laboratories

Yolanda Totten, BS, MT (AAB)
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