

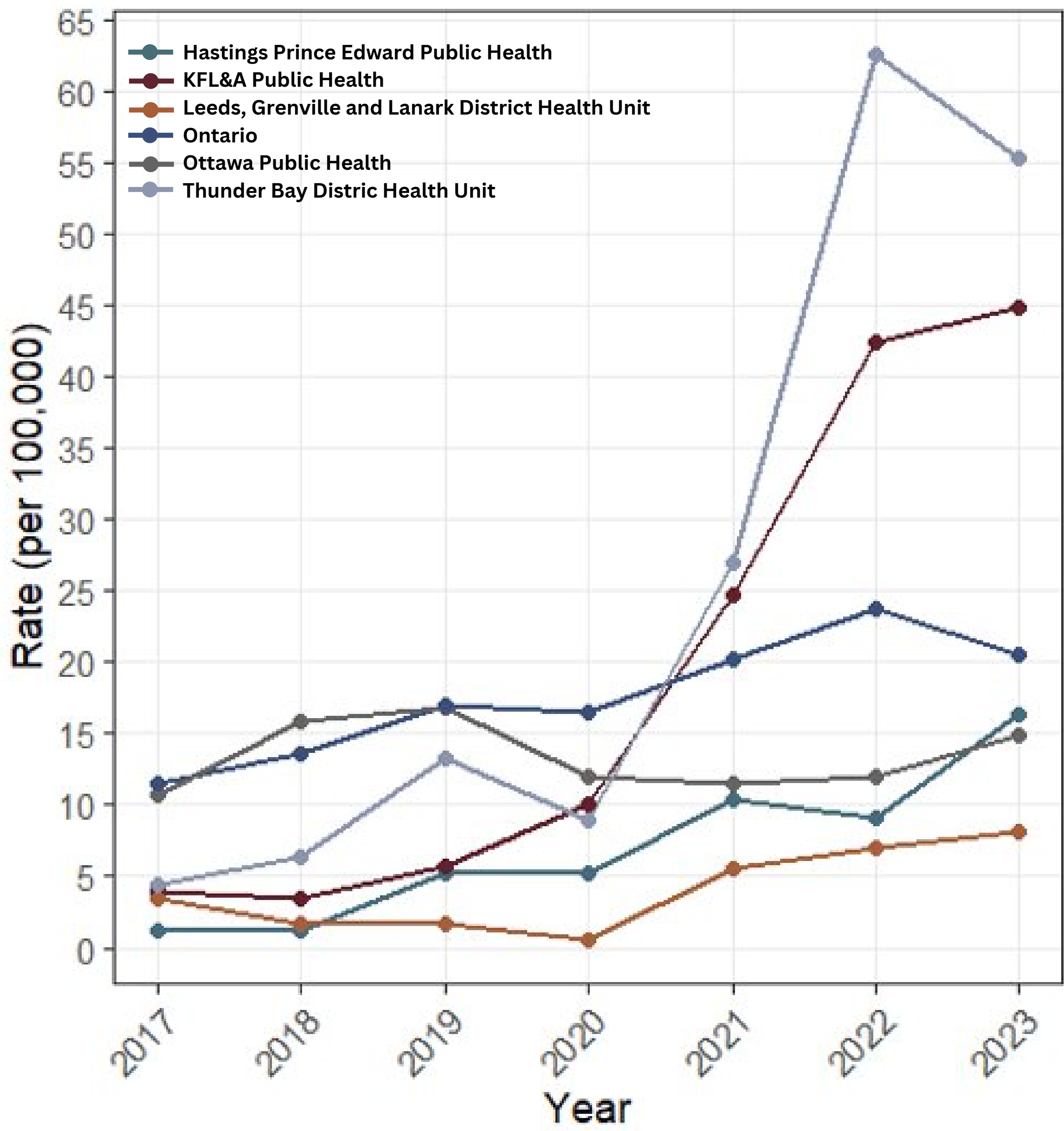
Syphilis Point of Care Rapid Testing and Immediate Treatment Evaluation (SPRITE) in 5 Ontario Public Health Units: Determining Real World Accuracy of Point-of-Care Tests

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Background

Public health units (PHUs) in Ontario have experienced a dramatic spike of infectious syphilis (1). Underserved populations, such as people who are experiencing homelessness or use drugs, are at increased risk for syphilis and other sexually transmitted and bloodborne infections (2)



Infectious syphilis rate by selected Public Health Units (confirmed cases, Public Health Ontario ID Query 2017 to 2023)

Methods

Using point-of-care tests (POCTs) outside a clinical setting represents a low-barrier method to reach undiagnosed and underserved populations.

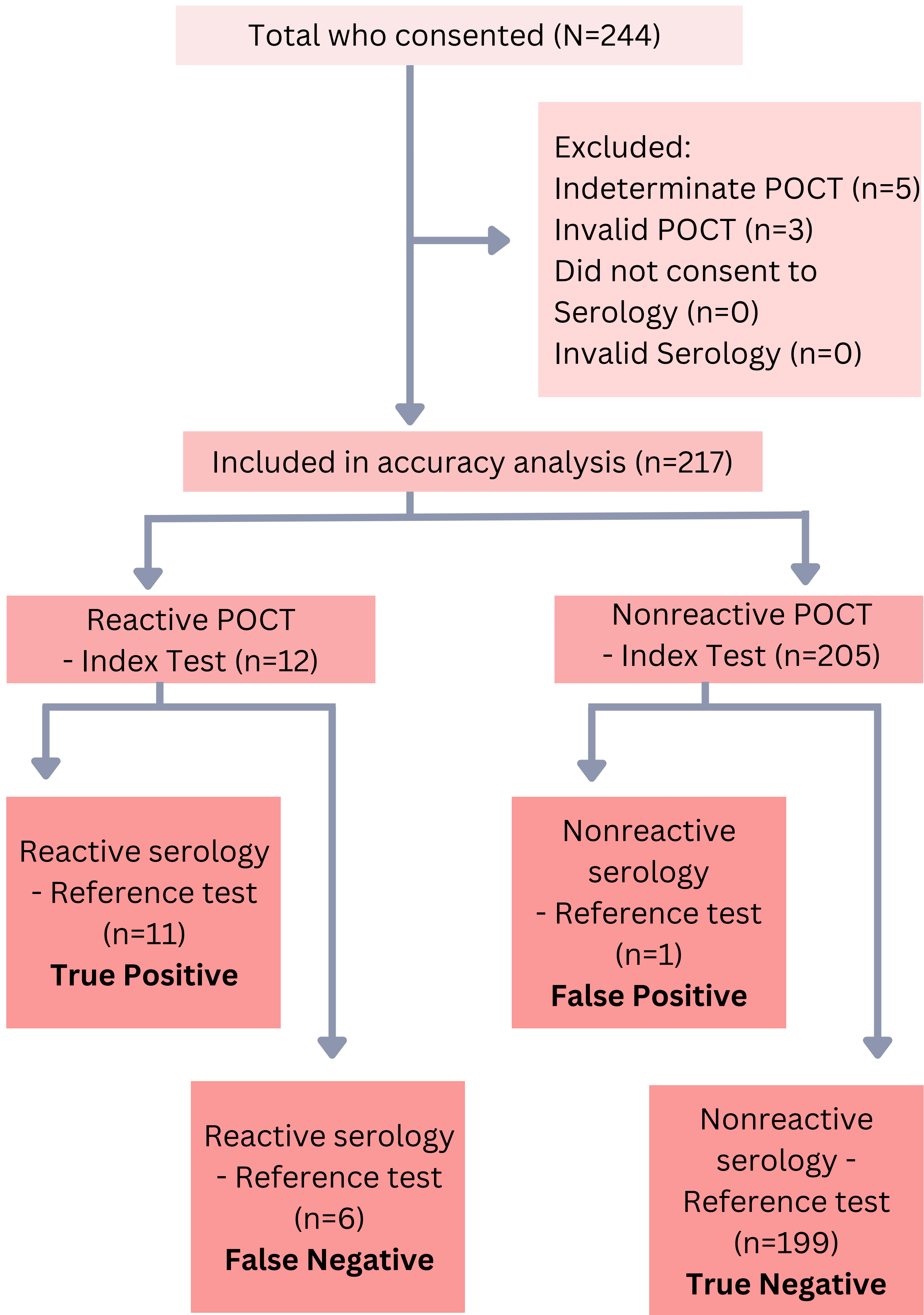
- The SPRITE study includes five Ontario PHUs:
- Kingston, Frontenac and Lennox & Addington Public Health (KFL&A PH)
 - Hastings Prince Edward Public Health (HPEPH)
 - Leeds, Grenville and Lanark District Health Unit (LGLDHU)
 - Thunder Bay District Health Unit (TBDHU) and
 - Ottawa Public Health (OPH)

As part of existing public health outreach programs and scheduled blitz events at community-based organizations the implementation and accuracy of INSTI® Multiplex HIV1/2 & Syphilis Antibody POCTs is being evaluated.

Results

From June 23, 2023 to March 11, 2024 , 87 different events, blitzes, and outreach activities were held. 244 POCTs were conducted with 232 unique individuals across HPEPH (44, 18%), KFL&APH (108, 44%), LGLDHU (28, 11.5%) and TBDHU (64, 26%).

Participant exclusions and confirmed sample size for syphilis POCT performance



Accuracy Measures

Performance Statistics*	% (95%CI)
Index Prevalence- POCT	5.5 (2.9, 9.5)
Reference Prevalence- Serology	7.8 (4.6, 12.2)
Sensitivity	64.7 (38.3, 85.8)
Specificity	99.5 (97.2, 100)
Positive Predictive Value	91.7 (61.5, 99.8)
Negative Predictive Value	97.1 (93.7,98.9)

Syphilis POCT Performance Statistics (95% confidence intervals), SPRITE June 23, 2023 to March 11, 2024 n=217*

*Accuracy results are currently underpowered

Syphilis Positive Cases

Of the 11 syphilis true positives:

Seven had RPRs $\geq 1:8$ dilutions, four had RPRs $< 1:8$ dilutions or nonreactive.

Seven were new infections (63.6%, 7/11 true positives).

Five were treated at POC (71.4%, 5/7 new infections).

Of the six syphilis false negatives

Two had RPR dilutions $< 1:8$. Four had nonreactive RPRs.

One was a new infection.

HIV Results

Accuracy was 100%, with the POCT correctly identifying all cases of HIV (n=3, for a prevalence of 1.4%). These were determined to be previously identified cases.

Conclusion

Accuracy results are currently underpowered, and are presented for monitoring purposes. However, lower sensitivity indicates that some cases are being missed; specifically, the test appears to have difficulty detecting RPRs less than 1:8. This has consequences for identifying very early infections or latent infections. Evaluating the accuracy of low-barrier interventions in community settings is vital to inform future decision-making.

1. Public Health Ontario. Infectious Syphilis and Early Congenital Syphilis in Ontario: Focus on 2022 Public Health Ontario;2024.
2. Centre for Communicable Diseases and Infection Control, Canada PHAo. Syphilis in Canada, Technical Report on Epidemiological Trends, Determinants and Interventions. Ottawa: Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada;2022.