Test, Treat, Trace: Geospatial Analysis of STI Trends Across the Western Tidewater Health District

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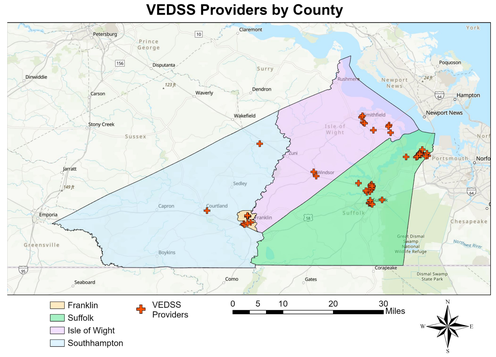
Issues Identified

- **Data Gaps:** Current surveillance methods for Sexually Transmitted Infections (STIs) are significantly lacking, and could be improved.
- **STI Trends:** How many people are becoming infected, and are they receiving treatment?
- **Environmental Variables:** Do other public health concerns, such as urban heat or weather, impact STI trends?

Goals and Methods

- Establish baseline trends between January 1st, 2025 and June 1st, 2026 using data via the Virginia Electronic Disease Surveillance System (VEDSS).
- Create a reporting mechanism to improve STI surveillance data from providers using REDCap surveys.
- Apply novel analyses of social and environmental risk factors using Geospatial Information Systems (GIS), R and satellite imagery.

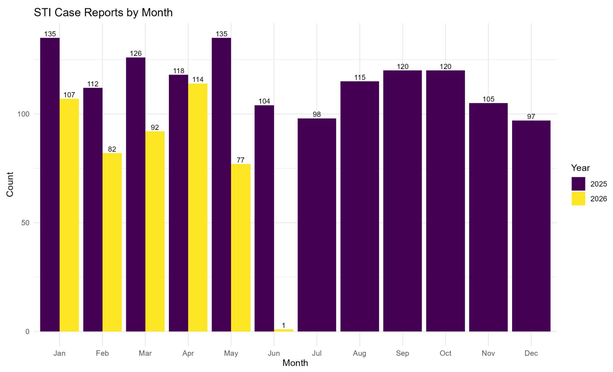
VEDSS Providers by County



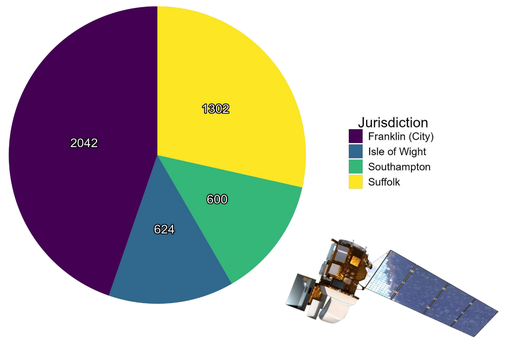
Outcomes

- User-friendly R script for automatic data visualization

STI Case Reports by Month

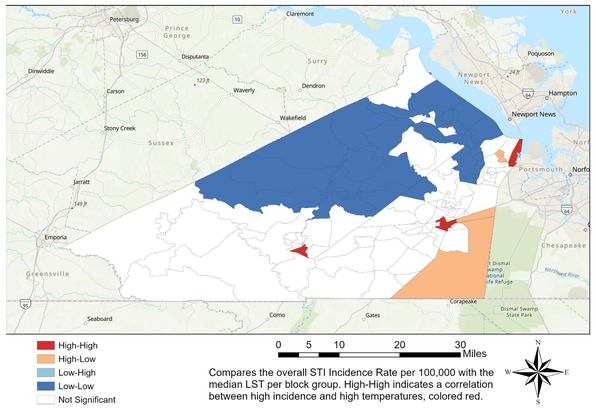


STI Incidence Rate per 100,000

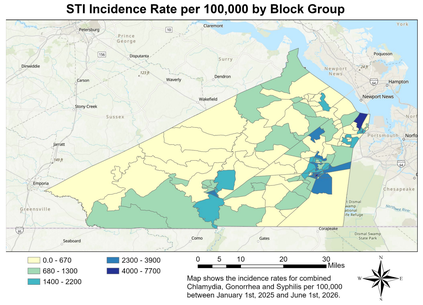


- Cartographic products highlighting correlations and differences among STI incidence rates and land surface temperature (LST) across the district

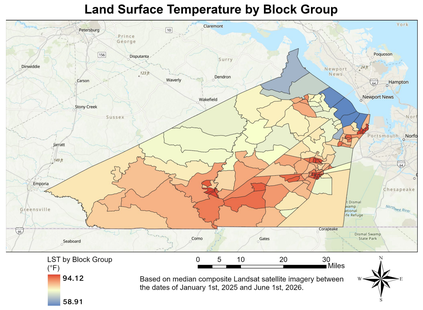
Lee's L Correlation between STI Incidence Rate and LST



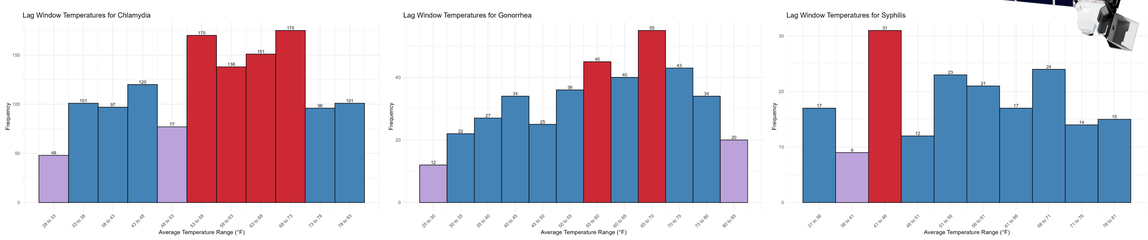
STI Incidence Rate per 100,000 by Block Group



Land Surface Temperature by Block Group



- Analysis of air temperature patterns and STI incidence



- **Recommendation:** REDCap Survey for providers to improve STI data collection by including overlooked data such as partner or treatment history.

Challenges

- **Lack of provider follow-up:** Despite outreach attempts, low response made it difficult to determine treatment rates.
- **Poor surveillance data:** Many VEDSS STI reports are minimal, limiting our ability for analysis.
- **Data mismatch:** Land surface temperature observed by satellite imagery differs from air temperature observed by weather stations.

Takeaways

- The cities of Franklin and Suffolk held the highest incidence rates *and* the highest median LST with relatively low proportions of providers based on population.
- On average, there were 109 new STI cases per month across the district.
- The overall STI incidence rate for the entire district was 1,106 per 100,000.
- Environmental data, such as temperature, is often overlooked but may be correlated with STI trends.

Acknowledgments

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