

Hidden Dangers: Analyzing Tick Prevalence and Its Effects on Human Health in the Pittsburgh Region

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Background

Tick-borne diseases, like Lyme disease, are serious public health threats, causing long-term illness or even death. Tick surveillance is key to tracking where ticks live and what pathogens they carry, helping prevent outbreaks (figure 1). Common pathogens include *Borrelia burgdorferi* (Lyme), *Anaplasma*, *Babesia* virus.

Project Description

- Study tick prevalence in local environments (parks, wooded areas, neighborhoods) (figure 1 & 7).
- Identify common tick species and the pathogens they carry.
- Analyze health risks in high-population regions (figure 2).
- Support local health planning efforts.

Methods

- Site Selection: Chose sampling locations across the Pittsburgh Region (figure 3 & 7).
- Tick Collection: Use drag cloths and collection tubes containing ethanol (figures 1, 5 & 6).
- Pathogen Testing: Sent collected ticks to a lab for PCR testing to detect pathogens (*Borrelia*, *Anaplasma*, and *Babesia*) (figure 2).

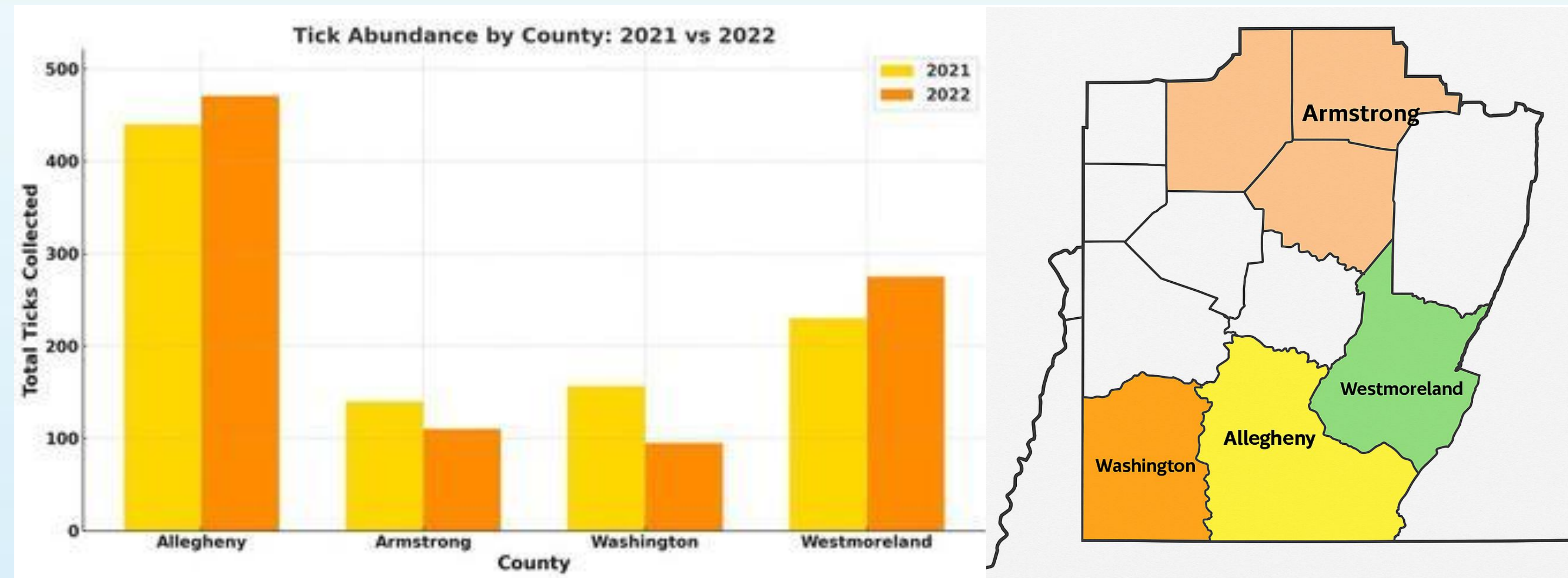


Figure 1: Tick Abundance in Western PA

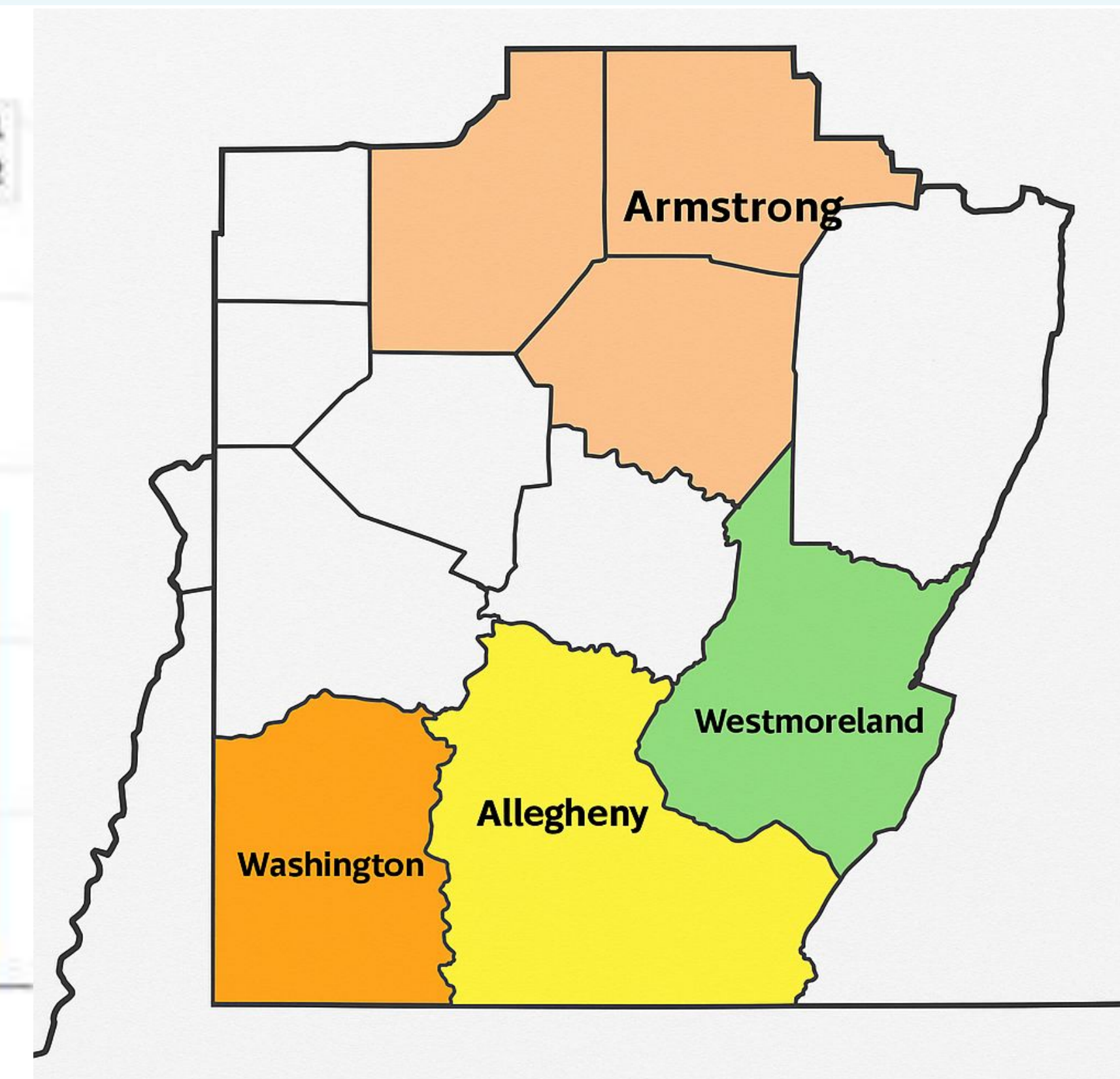


Figure 3: Western PA Counties

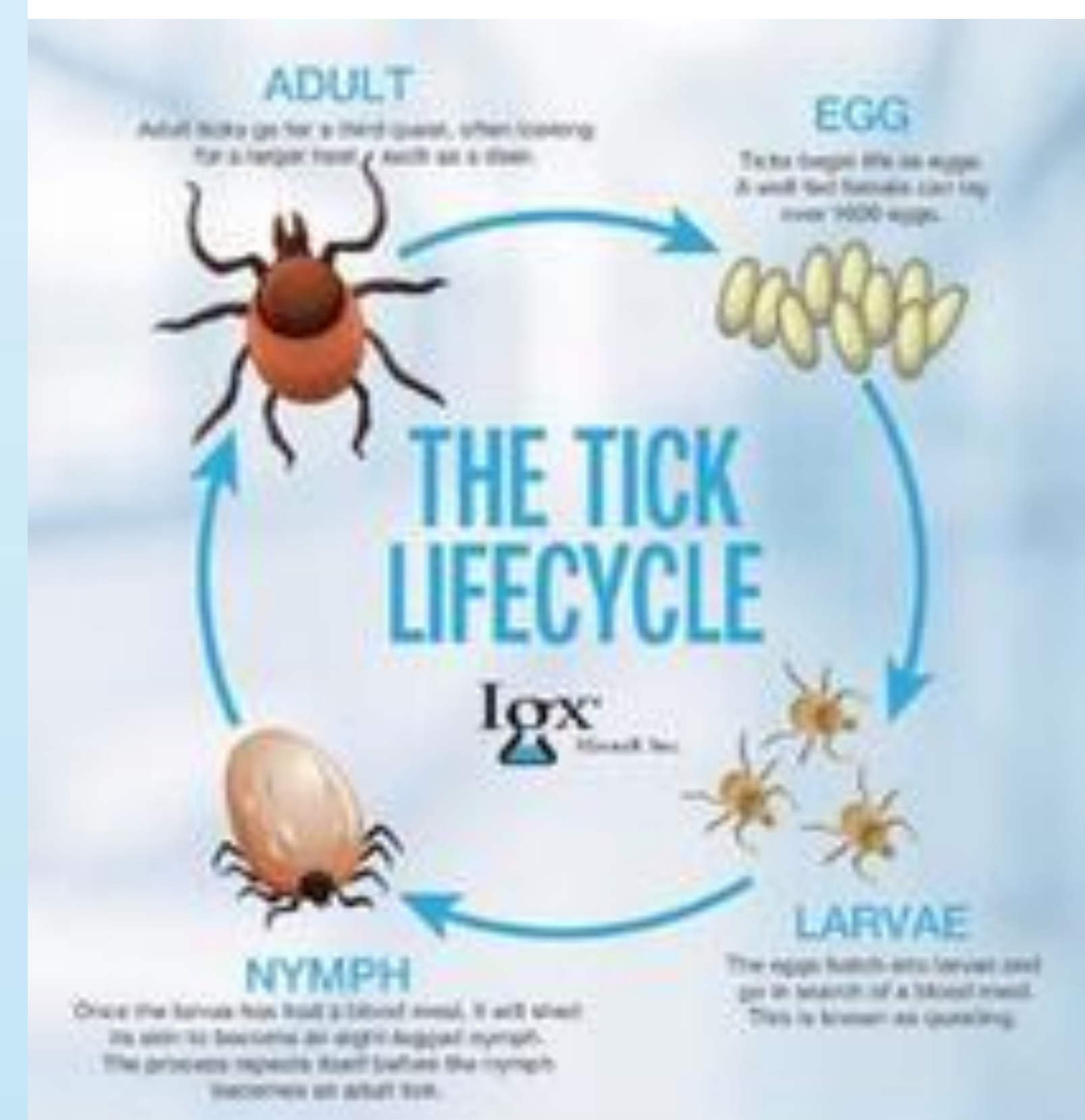


Figure 4: Tick Life Cycle

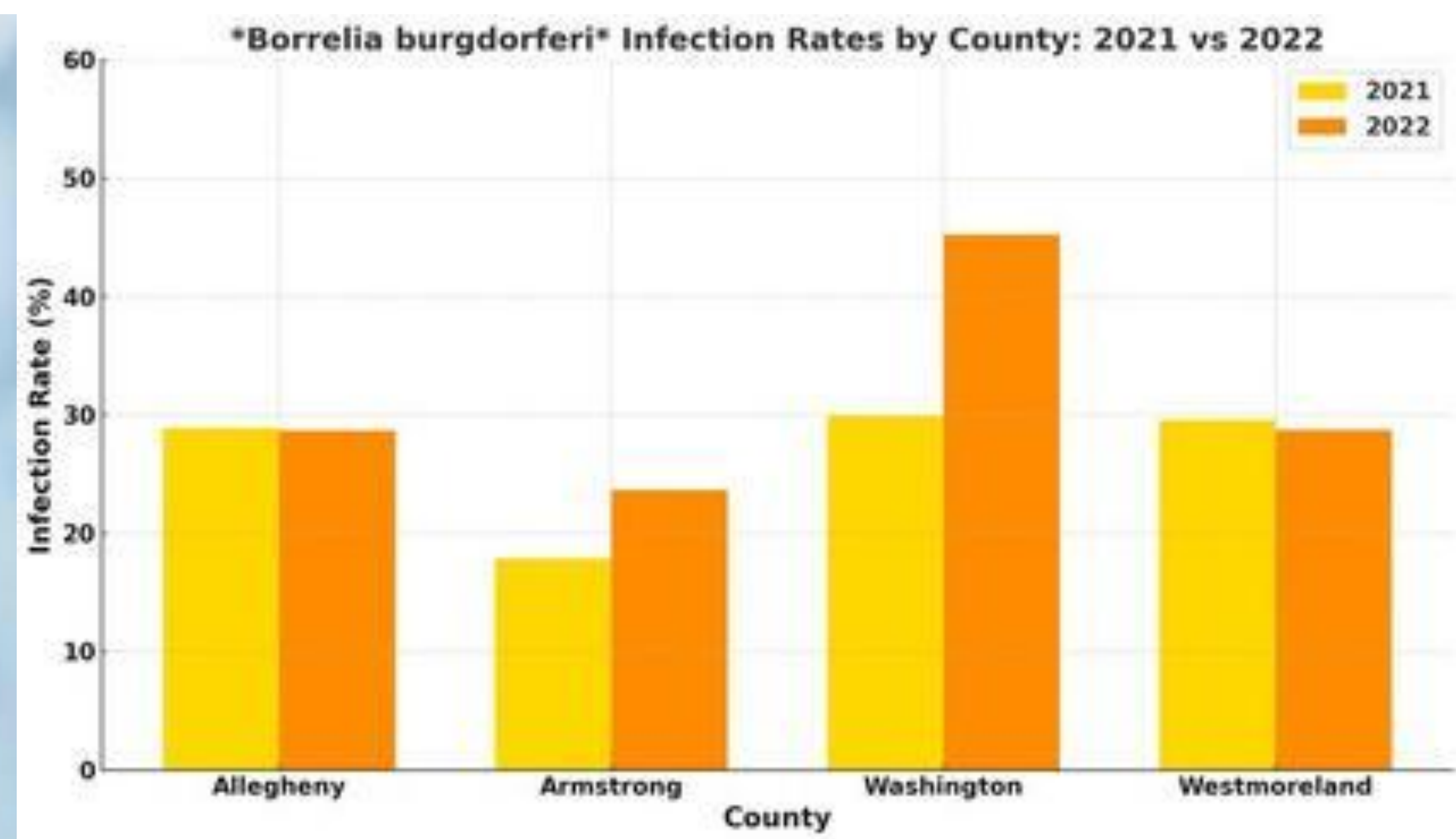


Figure 2: Lyme Infection Rates in Western PA



Figure 5: Tick Collection



Figure 6: Drag Cloth



Figure 7: Tick Collection Site

Significance

These results underscore the importance of ongoing tick surveillance and targeted public health interventions. High infection rates in multiple counties indicate a persistent risk of exposure to Lyme disease and other tick-borne illnesses. Public awareness campaigns, tick bite prevention education, and early diagnostic tools are essential, especially in high-risk regions.

Continued monitoring will help guide interventions and reduce the burden of tick-borne diseases in Western Pennsylvania communities.

Results/Conclusion

- Surveillance covered Allegheny, Armstrong, Washington, and Westmoreland counties. *Borrelia burgdorferi* infection rates in 2021 ranged from 17.9%–29.9%. In 2022, Washington County had the highest rate at 45.3%. Tick abundance stayed highest in Allegheny and Westmoreland counties (figure 1).
- Pathogen testing was done in-house using qPCR.
- Data highlight regional Lyme disease risk (figure 2).

References

- Tufts Lab, University of Pittsburgh. Tick surveillance and qPCR testing data, 2021–2022

Acknowledgments

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