

**Article Review #2: Measuring the Size and Severity
of the Integrated Cyber Attack Surface Across US County Governments**

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Introduction/BLUF

This article aims to address the issue of there not being proper methods to study cyber vulnerabilities within U.S. County governments. These gaps cause a lack of ability to fully understand how these local governments impact the country as a whole.

Relation/Connection to Social Science Principles

One of the seven social science principles is political science, which includes the study of political decision-making. This social science directly correlates to the article, as researchers aim to see what potential policies can be implemented to increase the nation's cyber resiliency. The article also relates to geography, which is the study of places and the relationship between people and their environments. These researchers study attack areas across counties and states, aiming to find a link between regions and cyber risk. One last social science that this study relates to is psychology, the study of human behavior. Officials within these counties may directly affect the strength of cyber systems based on their perceptions of risk. If they do not believe that they are at great risk, they will not make the necessary decisions for prevention.

Research Question /Hypothesis/ Independent Variable/Dependent Variable

There are a few different research questions that this article aims to address. One of those looking at what policies should be implemented to increase the nation's cyber resiliency; as previously stated, relating to political science. Another research question addressed is looking at how the integrated attack surface varies across geography, service types, and population centers.

The hypotheses proposed by the authors include: Larger counties have larger attack surfaces, and CVE (common vulnerability exposure) density does not correlate to exploitation likelihood. CVE measures attack surface diversity and severity.

Some of the key independent variables in this study include county population and type (urban/rural), geographic region, and the type of online services. The dependent variables include: number of open ports, type of services exposed, EPSS or probability of exploitation scores, and CVSS (common vulnerability) scores.

Types of Research Methods used

This study focuses very heavily on quantitative and empirical data. By using passive reconnaissance tools, they observed the internet-facing footprint of county governments. They also put together a list of county domains and used Python and third-party scanners to investigate hosts and services.

Types of Data Analysis used

One type of data analysis used is correlation analysis, which identifies relationships between population and attack surface size. Another analysis type included is geospatial aggregation, mapping out geographic concentrations of exposure by county or state. Lastly, risk quantification is heavily used, specifically CVSS and EPSS.

Connections to the Concerns or Contributions of Marginalized Groups

People located in rural or smaller counties tend to be at risk due to a lack of budget. They have a lower response capacity and are not as well funded to uphold security as those in larger, more wealthy counties. There are also the people who rely on government services, and government security may harm them disproportionately if the officials involved do not fairly assess cyber risks.

Overall societal contributions of the study/Conclusion

This study effectively creates an open-data method to measure attack surfaces across U.S. counties. Allowing locals to grasp a better understanding of their risk situations and allowing

them to potentially plan against any attacks. Local governments may also have raised awareness to their situations and be persuaded to take their risks more seriously. Overall, this article spreads awareness to these at-risk counties and outlines how local governments can improve overall cyber defense.

Reference

Harry, C., Sivan-Sevilla, I., & McDermott, M. (2025, January 17). *Measuring the size and severity of the integrated cyber attack surface across US county governments*. Oxford Academic. <https://academic.oup.com/cybersecurity/article/11/1/tyae032/7959399>

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