

AGENT-BASED SIMULATION OF HEALTH INFORMATION SECURITY THREATS: A CYBERSECURITY PERSPECTIVE

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ABSTRACT

The threats to health information security are evolving. For the first time, the 2015 Ponemon Benchmark Study on Privacy and Security of Healthcare Data reveals that criminal attacks are the greatest threat to health information security and privacy (Ponemon, 2015). We contend that this constitutes an important inflection point for the security of health information. In the U.S. there is strong national interest in promoting the adoption of information technology (IT) in the health sector. For example, the Health Information and Economic and Clinical Health (HITECH) Act mandated adoption of health IT. However, the digitized health ecosystem brings risks to information security and privacy.

The aggregation of individuals' health records is a valuable tool for improving health outcomes, and the adoption of health IT provides unprecedented opportunities for a data-centric approach to healthcare. However, the information silo problems addressed in health information repositories poses a new threat to security. This is true because security is largely a game of trade-offs and economic incentive: the greater the value of the target, the more resources an adversary can afford to expend to breach the asset.

To help understand the implications of the emerging cyber threat-vector, we simulate the interaction of cyber adversaries and health information targets using the Agent-based modeling platform NetLogo (Wilensky, 1999). Our simulations should help researchers and practitioners understand the interaction of economic incentive and information security threats.

REFERENCES

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- Wilensky, U. (1999). "Netlogo (and Netlogo User Manual)." *Center for Connected Learning and Computer-Based Modeling, Northwestern University*. <http://ccl.northwestern.edu/netlogo>.