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**Max Martin\*** (max.martin@westpoint.edu), PO Box 2735, West Point, NY 10997, and **Emily Rhodes, Paul Goethals, Kathryn Newhart and Jason Vogel.** *Optimization of Sewage Sampling for Wastewater-based Epidemiology through Stochastic Modeling.* Preliminary report.

The proliferation of the SARS-CoV-2 global pandemic has brought to attention the need for epidemiological tools that can detect diseases in specific geographical areas through non-contact means. Such methods may protect those potentially infected and public health officials while allowing quarantining to prevent the spread of the disease. Wastewater sampling analysis has been previously studied as a plausible solution that can detect pathogens, even from asymptomatic patients. However, many challenges exist in wastewater sampling such as identifying a representative sample for a population, determining the appropriate sample size, and establishing the right time and place for samples. This research involves the development of a stochastic model for optimizing various wastewater sampling parameters. Different and distinct scenarios are evaluated using Monte Carlo simulation. The results of this study allow us to continue evaluating how efficient wastewater sampling may provide an earlier warning of infection and prevent the further spread of viruses. Prevention measures such as wastewater-based epidemiology can greatly strengthen a nation's health security by preventing the spread of viruses that can cripple political, economic, and social systems. (Received January 24, 2022)