May 18th, 12:00 PM - 12:30 PM

On the trajectory of gonorrhea in the US: an application of generalized compartmental models

Scott Greenhalgh
Siena College, sgreenhalgh@siena.edu

Anna Dumas
Siena College, am22duma@siena.edu

https://scholarscompass.vcu.edu/bamm/2022/wed/8

On the trajectory of gonorrhea in the US: an application of generalized compartmental models

Scott Greenhalgh[1*], Anna Dumas[1]

1. Department of Mathematics, Siena College, Loudonville NY.

Mathematical models of disease transmission have provided researchers and public health officials with critical insights into the progression, control, and prevention of disease spread. Of these models, one of the most fundamental is the SI differential equation model. However, this ubiquitous model has one significant and rarely acknowledged shortcoming: it is unable to account for a disease's true infectious period distribution. In this talk, we demonstrate an innovative take on differential equation compartmental models to predict gonorrhea incidence in the United States. We illustrate how to incorporate higher statistical moments of the infectious period distribution into model dynamics, and thereby a means to truly study their effect on the trajectory of disease outbreaks. The significance of our work is that it maintains model formulations as systems of ODEs, and thus does not require a complete overhaul of existing theory while addressing one of the main limitations of traditional compartmental models of infectious disease transmission.