

Oscillation in Mathematical Epidemiology

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In 1799, Noah Webster connected the timing of influenza outbreaks to seasonality, volcanic eruptions, and earthquakes. Data sets from even earlier times and from around the globe showed periodic behavior in smallpox and other diseases. In the past one hundred years, mathematical models of epidemic oscillation have included approaches such as differential equations, difference equations, periodic forcing, delay terms, age structure, networks, and stochasticity. This talk takes a tour through oscillation models, both historical firsts and current-day approaches. Along the way, we address two key questions: How might we select models for understanding certain diseases? And which models best answer our students' questions, at different educational levels, about models as representatives of real-world oscillatory phenomena?