

Behavioral Origins of Epidemiological Bifurcations

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Abstract

In this paper we investigate how epidemiological bifurcations can arise from human behavioral responses in the face of disease risk. The bifurcations can lead to aggregate instability, which introduces the potential for less predictable outcomes from public health policies and a greater chance of unintended consequences. For instance, health policy designed to lower the transmission probability (e.g., public screening, rapid diagnostic services, and prescriptions of preventative therapies) or policies designed to raise the quality-of- life following infection (e.g., public provisioning of curative therapies) may push endemic equilibria from being stable to exhibiting instability or indeterminacy. The latter also have the potential of contributing to self-fulfilling sunspot equilibria, which can contribute to the volatility and unpredictability of the system.