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Samuel Cho* (sc43@princeton.edu) and **Simon A. Levin**. *Mean-field game analysis of epidemiological model with adaptive human behavior.*

Managing epidemics with public policy is to motivate people to behave differently for the societal good. We focus on contact between people which drives the spread of many diseases, but also is inherently tied to day-to-day utility.

We pose a mathematical model of this problem as a mean-field game. In addition to the SIR dynamics, each subpopulation chooses a contact rate to maximize its value function, considering the tradeoff between present and future utility. We can compute the mean-field equilibrium, which is the fixed point of the coupled system of Bellman equation and the SIR differential equations.

We compare the mean-field equilibrium with the socially optimal solution, as well as analyze the resulting policy implications to managing an epidemic. (Received January 28, 2020)