

1135-VN-1700 **Feng Fu** (fufeng@gmail.com), 27 N. Main Street, 6188 Kemeny Hall, Hanover, NH 03755, and
Xingru Chen*, 27 N. Main Street, Hanover, NH. *Social learning can promote population optimal use of antibiotics.*

Antibiotics treatment of bacterial infections is commonly believed to benefit individual patients and also to suppress the overall epidemic of diseases on the population level. Yet, the presence of high treatment coverage intensifies the selective pressure favoring the emergence of resistant strains. High demand for antibiotics driven by self-interest is not necessarily aligned with the social optimum of antibiotics consumption. Under certain conditions, this can lead to the tragedy of the commons in antibiotics overuse. To address this issue, we propose a mathematical model that incorporates a feedback loop between prescription behavior and the resistance evolution. Our model results provide practical rationale for why we should adjust our prescription usage in response to the underlying dynamics of resistance evolution as well as for how we can increase public awareness of the consequences of resistance in order to take prompt actions to curb the irrational use of antibiotics. (Received September 24, 2017)