1154-91-62   **Trevor Lax*** (`tl106@evansville.edu`), Department of Mathematics, University of Evansville, Evansville, IN 47722, and **Gabrielle Wolf** (`gmw3144@g.rit.edu`), School of Mathematical Sciences, Rochester Institute of Technology, Rochester, NY 14623. *Coevolving Network Model for the Diffusion of Opioid Dependence in a Population.*

We study the spread of opioid dependence across a population by employing the framework of coevolving network systems: which are highly pragmatic dynamical systems where the structure of the network coevolves with and is influenced by the dynamics on the underlying network. We aim to study how the interrelation between social network structure and the behavior of individuals affects the diffusion of opioid dependence in a population. We also identify possible social networks based intervention strategies to slow or stop the spread of opioid dependence in communities. We create a simulation to analyze results under various parameter settings highlighting transitions due to the distribution of risk factors and the probability of social selection. Furthermore, we develop a system of differential equations using pair approximations, which takes into account the zeroth and first-order moments (nodes and edges) and approximate the second-order moments (triplets) of the network. The results show that the effect of Social Selection is minimal compared to Social Influence and so we conclude that efforts should heavily focus on reduction of risk factors, as opposed to limiting interaction with drugs or drug-dependent individuals. (Received July 27, 2019)

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