1116-92-170   **Fiona Zhang**, **Benjamin Morin*** (`brmorin@asu.edu`), **Eli Fenichel** and **Gerardo Chowell**.
An Economic-Epidemiological Model with Personal Vaccination Efficacy Memory.

Mathematical models have been used to, predict epidemic outcomes, optimize public policy, and understand transmission dynamics generally of influenza. A prevalent form of modern disease prevention is vaccination. Decisions to vaccinate take into account costs (i.e., time and money) and benefits (i.e., reduced chances of infection). The model studied here considers memory in the form of decision-based outcomes; vaccination history as a weight on the decision to vaccinate before each epidemic. We use an SEIR (influenza-like) compartmental model of differential equations with a subset of the population undertaking vaccination. Individuals make decisions based on a utility function that takes into account vaccination cost, disease cost, and an individual's disease-vaccination history, e.g., how often vaccination has resulted in successful disease prevention. We've found that in terms of vaccination coverage that memory has resulted in both oscillatory and convergent behaviors. We analyze the sensitivity of outcomes with respect to both economic and epidemiological parameters, the "length" of an individual's memory, the way he or she uses that memory to inform projections on the future, and how incorporating the disease-vaccination history of peers influences one's decisions. (Received August 11, 2015)