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**Colin Pawlowski\*** (colin.pawlowski@yale.edu), **Matthew McDermott**, **Emma Hartman**, **Ryo Kimura**, **Jessica Ginepro** and **Dylan Shepardson**. *Novel Properties of Deterministic and Stochastic SIR Models*.

Compartmental differential equation models are among the most established disease models in mathematical epidemiology. In particular, the SIR model, first formulated by Kermack and McKendrick, serves as the theoretical foundation for many current disease models. We investigate the asymptotic properties of several stochastic variations of the basic, deterministic SIR model. We perform sensitivity analysis on input parameters such as the rate of infection and the basic reproductive number (the expected number of secondary infections per infected individual). For a compartmental stochastic implementation of the SIR model restricted to certain parameter ranges, we find distributions of the final epidemic size to be normal, with standard deviations given by the basic reproductive number and the total population size. (Received September 18, 2013)