1027-92-170 **Sophia R.-J. Jang*** (`jang@louisiana.edu`), Department of Mathematics, University of Louisiana at Lafayette, Lafayette, LA 70504-1010. *Backward bifurcation in a discrete SIS model with vaccination.*

A simple discrete SIS model with vaccination is proposed. Its dynamics depend on a lumped parameter, R_{vac}, the basic reproductive number of the disease with vaccination. The model exhibits the classical threshold behavior when vaccination is totally ineffective. When vaccination is partially effective, a backward transcritical bifurcation may occur at $R_{vac} = 1$. In this case, the model also undergoes a saddle node bifurcation at certain parameter values when $R_{vac} < 1$. The disease can persist for $R_{vac} > 1$ and can be eradicated for $R_{vac} < 1$ if a forward transcritical bifurcation occurs at $R_{vac} = 1$. However, the disease may persist even when $R_{vac} < 1$ if a backward bifurcation occurs at $R_{vac} = 1$. (Received February 26, 2007)