1046-92-1486   **David J Gerberry*** (`gerberry@math.purdue.edu`), Department of Mathematics, 150 N. University Street, West Lafayette, IN 47907. *Bifurcations in an SEIQR Model for Childhood Diseases.*

Explaining the recurrent outbreaks of childhood diseases has long been a topic of discussion in the modeling community. Initial explanations concluded that stochastic and/or seasonal forces gave rise to sustained oscillations. Feng and Thieme showed that deterministic factors alone could lead to periodic solutions.

In this work, we extend the model of Feng and Thieme to include a latent class. We are able to prove the existence of supercritical Hopf bifurcations and hence sustained oscillations. Through this extension, we are able to gain more insight into the behavior of solutions in three-dimensional parameter space. We are also able to prove the existence of homoclinic bifurcation in a biologically feasible unfolding of a simplified version of our model. (Received September 15, 2008)