1073-92-148 **Marisa C Eisenberg*** (meisenberg@mbi.osu.edu), 378 Jennings Hall, 1735 Neil Ave., The Ohio State University, Columbus, OH 43210. *Exploring cholera dynamics and transmission pathways using identifiability and parameter estimation.*

Cholera is a waterborne intestinal infection which causes profuse, watery diarrhea, vomiting and dehydration. A major public health question involves understanding the modes of cholera transmission. In particular, given data for an outbreak, can we determine the role and relative importance of direct (person-to-person) vs. environmental (waterborne) routes of transmission? To examine this issue, we explored the identifiability and parameter estimation of a differential equation model of cholera dynamics. We used a computational algebra approach to establish whether it is possible to determine the transmission rates from case data (i.e. whether the transmission rates are identifiable).

Our results show that both direct and environmental transmission routes are identifiable, though they become practically unidentifiable with fast water dynamics. Adding measurements of pathogen shedding or water concentration can improve identifiability and allow more accurate estimation of waterborne transmission parameters, as well as the basic reproduction number. Parameter estimation for a recent outbreak in Angola suggests that both transmission routes are needed to explain the observed cholera dynamics. I will also discuss some ongoing applications to the current cholera outbreak in Haiti. (Received July 31, 2011)