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Suzanne L. Robertson* (srobertson@mbi.osu.edu). *Modeling the spread of waterborne disease: Incorporating heterogeneity in multiple transmission pathways.*

Heterogeneity is a fundamental issue in mathematical epidemiology. We expect many factors influencing disease transmission to vary across populations and across different spatial scales. Many results exist for how heterogeneity affects the spread of disease for SIR type models, where transmission occurs as a result of direct contact with infected individuals. However, waterborne diseases such as cholera may be spread through contact with a contaminated water source as well as through direct person-person transmission. Cholera dynamics are well described by a modified SIR model that incorporates a W compartment to track the concentration of pathogen in the water. We investigate the effect of heterogeneity in multiple transmission pathways on the value of the basic reproductive number R_0 in multiple patch SIWR models. (Received September 20, 2011)