

1096-92-122

Jin Wang*, Department of Mathematics, Old Dominion University, Norfolk, VA 23529. *Modeling water-borne diseases: Environmental, ecological and climatic interaction*. Preliminary report.

We consider mathematical modeling of a class of water-borne infectious diseases, particularly cholera, where ecological and climatic factors, human-environment interactions, and human-human direct interactions all play important roles in their transmission dynamics. We formulate a general compartmental model based on a system of nonlinear differential equations and investigate the multiple transmission pathways in shaping the epidemics and endemics of the diseases. Realistic case studies are employed to validate the analytical prediction. In addition, we discuss the impacts of seasonal variation and climatic change on disease dynamics, using both mathematical analysis and numerical simulation. (Received August 01, 2013)