1044-92-191 **C. Cosner**, **J. C. Beier**, **R. S. Cantrell**, **D. Impoinval**, **L. Kapitanski**, **M. D. Potts**, **A. Troyo** and **S. Ruan*** (ruan@math.miami.edu), Department of Mathematics, University of Miami, Coral Gables, FL 33124-4250. *The Effects of Human Movement on the Persistence of Vector-Borne Diseases.* Preliminary report.

We develop spatial models of vector-borne disease dynamics on a network of patches to examine how the movement of humans in heterogeneous environments affects transmission. We show that the movement of humans between patches is sufficient to maintain disease persistence in patches with zero transmission. We construct two classes of models using different approaches: (i) Lagrangian that mimics human commuting behavior and (ii) Eulerian that mimics human migration. We determine the basic reproduction number R0 for both modeling approaches. We show that for both approaches that if the disease free equilibrium is stable (R0 $<$ 1) then it is globally stable and if the disease free equilibrium is unstable (R0 $>$ 1) then there exists a unique positive (endemic) equilibrium that is globally stable among positive solutions. Finally, we prove in general that Lagrangian and Eulerian modeling approaches are not equivalent. As an example, we consider two patches in which the disease dies out in both patches when there is no movement between them. Numerical simulations demonstrate that the disease becomes endemic in both patches when humans move between the two patches. (Received September 01, 2008)