1125-92-790 **F. B. Agusto*** (fbagusto@gmail.com), Ecology and Evolutionary Biology, University of Kansas, Lawrence, KS 66045. *The Transmission Dynamics of a Within-and Between-Hosts Malaria Model.* Preliminary report.

In this paper, we developed a novel deterministic coupled model tying together the effects of within-host and population level dynamics on malaria transmission dynamics. The unique feature of this model is the way the coupling and feedback are done using the various life-history stages of the malaria parasite both in the human host and the mosquito vector. The coupled and the within-human host models have locally asymptotically stable infection- and parasite-free equilibria when the associated reproduction numbers are less than unity; while the population-level model, exhibits backward bifurcation, where the stable disease-free equilibrium coexists with a stable endemic equilibrium. Numerical exploration of the coupled model using a linear function of the mosquito biting rate as feedback functions reveal oscillations which dampen with increasing biting rate amidst the parasite populations within a human host in the presence of the host immune response. We also observed that the oscillations and damping effect observed in the within-human host dynamics feedback into the population level dynamics; which in turn amplifies the oscillations in the parasite population within the mosquito host. (Received September 11, 2016)