1077-92-2714 **Calistus Ngeh Ngonghala*** (cnngonghala@nimbios.org), NIMBioS, 1534 White Ave., Suite 400, University of Tennessee, Knoxville, TN 37996-1527. *Health safety nets can break cycles of poverty and disease: a stochastic ecological model.*

The persistence of extreme poverty is increasingly attributed to dynamic interactions between biophysical processes and economics, though there remains a dearth of integrated theoretical frameworks that can inform policy. Here, we present a stochastic model of disease-driven poverty traps. Whereas deterministic models can result in poverty traps that can only be broken by substantial external changes to the initial conditions, in the stochastic model there is always some probability that a population will leave or enter a poverty trap. We show that a "safety net", defined as an externally enforced minimum level of health or economic conditions, can guarantee ultimate escape from a poverty trap, even if the safety net is set within the basin of attraction of the poverty trap, and even if the safety net is only in the form of a public health measure. Whereas the deterministic model implies that small improvements in initial conditions near the poverty-trap equilibrium are futile, the stochastic model suggests that the impact of changes in the location of the safety net on the rate of development may be strongest near the poverty-trap equilibrium. (Received September 22, 2011)