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**Divine Wanduku\***, 2400 Interstate Dr., Lakeland, FL 33810. *A Vector-born Disease Scale-Structured Network Delay Stochastic Epidemic dynamic model*. Preliminary report.

A complete stochastic analysis of an SIRS delayed epidemic dynamic model is presented for a vector-born disease in a two-scale structured population. The distributed time delay accounts for the varying incubation period of the infectious agent in the vector. Furthermore, the infectious vector population is proportional to the infectious human population present at the onset of the incubation period. In addition, the disease dynamics is influenced by random environmental perturbations leading to variability in the disease transmission process. The stochastic asymptotic stability of the disease free equilibrium is investigated and the impact on the emergence, propagation and resurgence of the disease is verified. The results of the study are exhibited in different special human mobility patterns. The presented results are demonstrated by numerical simulation results. (Received September 05, 2014)