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Transmission dynamics and oscillations in a model of West Nile virus.

West Nile virus is a typical vector-borne disease transmitted to humans and animals by *Culex* mosquitoes. For the virus, avian birds serve as amplification hosts, yet vector mosquitoes play a critical role in the disease transmission. To investigate the role of mosquitoes in transmission dynamics of West Nile virus, we formulate a system of delay differential equations with a standard incidence rate to model the interaction between mosquitoes and birds. Our analysis shows that the mosquito population can force the system to oscillate, while incidental interaction between mosquitoes and birds would not cause oscillations. This result indicates that the population of mosquitoes is the fundamental driving factor for the oscillation in disease transmission when the impact of temperature is taken into consideration. (Received September 24, 2018)