Modeling the transmission of *Wolbachia* in mosquitoes for controlling mosquito-borne diseases

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*Wolbachia* is a natural parasitic microbe that stops the proliferation of viruses, such as dengue, chikungunya and Zika, inside the mosquito. It has been recently proposed to control mosquito-borne epidemics. However, it is difficult to sustain a stable *Wolbachia* infection in a wild mosquito population because of the reduced fitness of the infected mosquitoes. We develop and analyze a differential equation model to quantify a minimum threshold that must be exceeded for the infection to persist and assess the potential effectiveness of *Wolbachia*-based mitigation strategies.