Modeling the effects of insecticides resistance on malaria vector control in endemic regions of Kenya

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Abstract

We present a model to investigate the effects of vector resistance to control strategies. The model captures the development of resistance as well as loss of resistance in mosquitoes and how these affect the progress in malaria control. Important thresholds were calculated from mathematical analysis and numerical results presented. Mathematical results reveal the existence of the disease free and endemic equilibria whose existence and stability depends on the control reproduction number, Rc. The disease persist when the Rc>1 and dies out when Rc<1. Control strategies use and adherence needs to be highly efficacious to thwart the effects of insecticides resistance. Moreover, it is not enough to just eradicate resistant mosquitoes.