

**A MATHEMATICAL MODEL FOR SIMULATING P.VIVAX
MALARIA TRANSMISSION, INCLUDING THE PHENOMENA OF
TRANSMISSION BLOCKING IMMUNITY IN HUMANS**

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We have developed a multi-state mathematical model to simulate P.vivax malaria transmission with naturally acquired transmission blocking immunity in humans. The model accounts for the following phenomena,

- (a) transmission blocking immunity, with boosting through reinfection within a four month period.
- (b) relapses caused by upto two broods of hypnozoites, and
- (c) daily varying infectivity of patients.

A total of 21 diseases and non disease states in the human and three in the mosquito were considered. This model is a multi state mathematical model in the manner first developed by Dietz et al (1974). Data from a field study conducted at Kataraggama in southern Sri Lanka, was used as a test case to develop and refine the model. Using this model it was possible to reliably simulate P.vivax malaria transmission with transmission blocking immunity in the human population. This model can also be used to quantify the effect of naturally occurring transmission blocking immunity on malaria transmission and to assess the impact of control strategies based on future transmission blocking malaria vaccines.

References: 1. Dietz, K., Molineaux, L., & Thomas, A. (1974).
A malaria model tested in the African Savannah.
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