

An age-structured ODE model is presented to investigate the role of Intermittent Preventive Treatment (IPT) in averting malaria-induced mortality in children, and its related cost in promoting the spread of anti-malarial drug resistance. IPT, a malaria control strategy in which a full curative dose of an antimalarial medication is administered to vulnerable asymptomatic individuals at specified intervals, has been shown to reduce malaria transmission and deaths in children and pregnant women. It can also promote drug resistance spread. The model includes drug-sensitive and drug-resistant strains as well as human hosts and mosquitoes. The basic reproduction and invasion reproduction numbers for both strains are derived. Numerical simulations include individual and combined effects of IPT and treatment of symptomatic infections on the prevalence of both strains and the number of lives saved. Our results suggest that while IPT can indeed save lives, particularly in high transmission regions, certain combinations of drugs used for IPT and to treat symptomatic infection may result in more deaths when resistant parasite strains are circulating. A sensitivity analysis indicates outcomes are most sensitive to the reduction factor of transmission for the resistant strain, rate of immunity loss, and the natural clearance rate of sensitive infections.