1065-92-96 **David Chan*** (dmchan@vcu.edu), Dept. of Mathematics and Applied Mathematics, PO Box 842014, Richmond, VA 23284, and **Jean M Tchuenche**, **Christinah Chiyaka**, **Ghislaine Mayer** and **Amanda Matthews**. *A Mathematical Model for Antimalarial Drug Resistance.*

We formulate and analyze a mathematical model for malaria with treatment and three levels of resistance in humans. The model incorporates both sensitive and resistant strains of the parasites. Analytical results reveal that the model exhibits the phenomenon of backward bifurcation (co-existence of a stable disease-free equilibrium with a stable endemic equilibrium), an epidemiological situation where although necessary, having the basic reproduction number less that unity, it is not sufficient for disease elimination. Through quantitative analysis, we show the effects of varying treatment levels in a high transmission area with different levels of resistance. Increasing treatment has limited benefits in a population with resistant strains, especially in high transmission settings. Thus, in a cost-benefit analysis, the rate of treatment and percentage to be treated become difficult questions to address. (Received September 05, 2010)