

Abstract

Malaria is an infectious disease transmitted between humans through bites of female *Anopheles* mosquito and caused by the plasmodium parasite. To describe the dynamic of Malaria, mathematical model are used and mathematical equation are derived from human and mosquito population compartments. In this study our goal is to understand the those parameter which plays vital role in the spread of endemic malaria disease and try to estimate exact solution and to prevent and control the disease apply different strategies by mathematical modeling. On the basic mathematical modeling technique leading to a system of ODEs develop a malaria model. To understand the dynamic of disease, we calculated disease free equilibrium points, endemic points and local and global stability analysis. By using next generation method, we calculated reproduction number R_0 at DFEs. To estimate the effect of parameters on reproduction number we also discuss sensitivity analysis. For three controls strategies to control the disease by reducing objective functional, we use Pontryagin maximum principle. In the last, Numerical simulations are included to represent the results by graphs.