

Abstract

Tuberculosis, an airborne infectious disease, remains a major threat to public health in Kenya. In this study, we derived a system of non-linear ordinary differential equations from the SLICR mathematical model of TB to study the effects of hygiene consciousness as a control strategy against TB in Kenya. The effective basic reproduction number (R_0) of the model was determined by the next generation matrix approach. We established and analyzed the equilibrium points. Using the Routh-Hurwitz criterion for local stability analysis and comparison theorem for global stability analysis, the disease-free equilibrium (DFE) was found to be locally asymptotically stable given that $R_0 < 1$. Also by using the Routh-Hurwitz criterion for local stability analysis and Lyapunov function and LaSalle's invariance principle for global stability analysis, the endemic equilibrium (EE) point was found to be locally asymptotically stable given that $R_0 > 1$. Using MATLAB ode45 solver, we simulated the model numerically and the results suggest that hygiene consciousness can help in controlling TB disease if incorporated effectively.