Original Research Article

ESTIMATED NUMERICAL RESULTS FOR THE DETERMINISTIC MODEL OF THE UNDER FIVE YEARS PNEUMONIA IN KENYA

 C. G. NGARI[1*], G. P. POKHARIYAL[2] AND J. K. KOSKE[1]

[1]School of the Biological and Physical Sciences, Moi University, Eldoret, Kenya.

[2]School of Mathematics, University of Nairobi, Nairobi, Kenya.

Abstracts

In this paper the numerical results are estimated for childhood pneumonia deterministic model, using Kenyan data. The estimates of data and parameters from Kenya Health information system, ministry of Health of Kenya and UNICEF for the years 2012 and 2013 were fitted in the developed model using Matlab software. The estimated numerical value for control reproduction number (R_c) and basic reproduction number (R_o) were obtained as 9.31808 and 22.5914 respectively, by substituting estimated parameters in the expression for the determined analytical results. The herd immunity was estimated as 95.57% using the basic reproduction number. Impact of treatment value was found to be found to be positive. Sensitivity analysis of the control reproduction number indicates that improved vaccination drug's efficacy, attaining herd immunity, higher treatment rates and lower effects of environment are the best intervention strategies to lower impact of the pneumonia of the children under the age of five years in Kenya.

Keywords :

Control reproduction number; basic reproduction number; herd immunity and sensitivity analysis.