

STABILITY ANALYSIS OF A GENERALIZED SEIR EPIDEMIC MODEL WITH LIMITED RESOURCE FOR TREATMENT

DEEPTI MOKATI

Department of Applied Mathematics and Computational Science,
S.G.S. Institute of Technology and Science Indore (M.P.), India

ABSTRACT

This paper addresses an SEIR epidemic model with limited resource for treatment and generalized it to study the dynamic behavior of the model. It is assumed that the treatment rate is proportional to the number of patients as long as this number is below a certain capacity and it becomes constant when that number of patients exceeds this capacity. Existences of disease-free and endemic equilibria for the model are investigated. In this paper stability for the system of differential equations for the generalized model has been studied and it is shown that this kind of treatment rate leads to the existence of multiple endemic equilibria where the basic reproduction number plays a big role in determining their stability.

KEYWORDS: SEIR Epidemic Model, Treatment Rate, Equilibrium, Stability Criteria, Basic Reproduction Number