

Abstract

In this thesis, we consider a variation of an SEIR model to understand transmission and control dynamics of an epidemic disease due to Ebola virus. The basic SEIR model is extended to include hospitalization compartment along with quarantine and vaccination compartments as per requirement of analysis and control of disease. To study dynamics of the disease, a reproduction number R_0 for the model is also computed by Next Generation Method. In addition to this, we also present and solve the corresponding fractional model for the Ebola Virus Disease (EVD). As a control strategy, the Pontryagin Maximum Principle is employed to set up an optimal control problem with an objective to minimize a cost functional for disease control. Finally numerical simulation is given by using Matlab to support our results.