Abstract

The present study provides an in-depth analysis of the SEIHR model as it pertains to the epidemiology and control of the Rubella virus. The model initially formulated the classical differential equation that represents the transmission of the rubella disease. The applicability of the given model is demonstrated by the boundedness and positivity of the system solution. This study examines the stability of our model with respect to the Disease-Free Equilibrium (DFE) and the Endemic Equilibrium (EE). Local and global stability were attained at these equilibria by the utilization of the fundamental reproduction number. The utilization of (PMP) was implemented as a control mechanism to facilitate the delivery of Optimal Control Problem with the primary purpose of decreasing functional-level objectives. The administration of vaccinations to individuals who were vulnerable to the infection was implemented as a time-dependent control measure. This intervention resulted in a notable reduction in the number of individuals who were exposed to the infection, as well as those who were ill. In addition to graphical representations of outcomes, mathematical simulations are also provided.