

# Abstract

*In this work, we purposed the extension of SEIR model for Rubella virus. We first formulate the model in classical differential equations that describes spread of Rubella disease. The boundedness and positivity of the system solution are given to show that proposed model is well posed. We found DFE and EE explicitly. We established local and global stability at these equilibria by using basic reproduction number. We used PMP as a control approach to provide OCP with the aim to minimize objective functional. It is also shown that RK4 method cannot maintain boundedness and positivity of the solutions while nonstandard finite difference scheme (NSFD) maintains all vital characteristics of the continuous system. Additionally provided are numerical simulations that are accompanied by graphical results representations.*