Abstract

Title: Incorporating Interventions to an Extended SEIRD Model with Vaccination: Application to COVID-19 in Qatar

Elizabeth Amona, Edward Boone, Ghanam Ryad.

The Covid-19 outbreak of 2020 has required many governments to develop mathematical-statistical models of the outbreak for policy and planning purposes. This work provides a tutorial on building a compartmental model using Susceptibles, Exposed, Infected, Recovered, Deaths, and Vaccinated (SEIRDV) status through time. A Bayesian Framework is utilized to perform both parameter estimation and predictions. This model uses interventions to quantify the impact of various government attempts to slow the spread of the virus. Furthermore, it demonstrates how to add a Vaccine parameter to the model which is inactive until the time the vaccine is deployed. Predictions are also made to determine when the peak Active Infections will occur.