

Covid-19 Epidemic Dynamic Including Barriers of Circulation

Sebastião Gomes¹ and Igor Monteiro¹

¹Federal University of Rio Grande

May 6, 2020

Abstract

In this article we analyze the evolutionary dynamics of the novel coronavirus epidemic (covid-19) using observed data from several cities and places in the world. We have used a SIR-type (Susceptible, Infectious and Recovered) model improved with some adaptations in order to increase its predictive skills, i.e., we have included the circulation restriction effect and considered a phenomenon we have called adherence zone, generating the Modified SIR model (ModSIR). Comparing the results produced with ModSIR with real observations obtained for several places in the world we have found that ModSIR presented good predictive skill, as long as combined with good enough parametric identification. At the end of this article we present a study in which we simulated an epidemic in a hypothetical city of 211000 inhabitants. We have extracted several useful conclusions by analyzing some epidemic scenarios in which we evaluate epidemic control by adopting the circulation restriction as a control variable.

Hosted file

scpgomes.pdf available at <https://authorea.com/users/317341/articles/447447-covid-19-epidemic-dynamic-including-barriers-of-circulation>











