

The Origin, Diffusion and a Comparison of Ordinary Differential Equations Numerical Solutions Used by SIR Model in Order to Predict SARS-CoV-2 in Nordic Countries

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Abstract : SARS-CoV-2 virus is currently one of the most infectious pathogens for humans. It started in China at the end of 2019 and now it is spread in all over the world. The origin and diffusion of the SARS-CoV-2 epidemic, is analysed based on the discussion of viral phylogeny theory. With the aim of understanding the spread of infection in the affected countries, it is crucial to modelize the spread of the virus and simulate its activity. In this paper, the prediction of coronavirus outbreak is done by using SIR model without vital dynamics, applying different numerical technique solving ordinary differential equations (ODEs). We find out that ABM and MRT methods perform better than other techniques and that the activity of the virus will decrease in April but it never cease (for some time the activity will remain low) and the next cycle will start in the middle July 2020 for Norway and Denmark, and October 2020 for Sweden, and September for Finland.

Keywords : forecasting, ordinary differential equations, SARS-COV-2 epidemic, SIR model

Conference Title : ICMID 2020 : International Conference on Microbiology and Infectious Diseases

Conference Location : Oslo, Norway

Conference Dates : June 25-26, 2020