Proceedings of the ISymRU 2021
Medicine and Public Health: Poster Presentation

Visualization of Doubling times and Comparison of Control measures for COVID-19 in Sri Lanka and China

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Abstract

Coronavirus disease 2019 (COVID-19) is an emerging infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Epidemic doubling time is a measure of disease transmissibility and characterizes the sequence of intervals at which the cumulative incidence doubles. These metrics could be used to integrate real-time information regarding the epidemic's spread over time. This study aims to analyze the effect of control measures on the COVID-19 pandemic in Sri Lanka evaluating the fluctuation of calculated doubling times (td, in days) of cases and deaths with time by comparing the corresponding epidemic data with China in hope of benefiting from fighting against the pandemic. This was a descriptive study. The data of cumulative incidence of cases and deaths related to COVID-19 in Sri Lanka and China were extracted, doubling times were calculated and compared about key events during the corresponding period and the control measures implemented in the two countries. The calculated doubling times for the total number of cases in Sri Lanka were *td1=60, td2=19, td3=12, td4=13, td5=23, td6=105, td7=40, td8=14, td9=27, td10=43, td11=102, td12=40* and *td13=81* whereas the doubling times for China were *td1=1, td2=2, td3=2, td4=2, td5=4, td6=3, td7=4, td8=7* and *td9=397*. Doubling times for the total number of deaths in Sri Lanka were *td1=2, td2=3, td3=31, td4=175, td5=13, td6=10, td7=106, td8=44, td9=53, td10=70, td11=23, td12=44* and *td13=33* while for the China; doubling times for deaths were obtained as *td1=5, td2=3, td3=2, td4=0, td5=3, td6=2, td7=1, td8=4, td9=4, td10=6, td11=9* and *td12=59*. After the first case in Sri Lanka, the government imposed stringent public health measures and social distancing leading to a drastic drop in the transmission rate at the beginning showing a high doubling time. The second wave was largely due to local transmissions and their contacts and the government-controlled the spread of the pandemic by imposing an island-wide quarantine curfew. With the spread of the Delta variant, the previously controlled pandemic became more virulent, thus leading to an aggressive third wave. Doubling timelines for both cases and deaths in China indicate a gradual increase in doubling times which in turn confirms an efficient national COVID-19 control policy and economic strategies implemented in China. The findings of the study show that China's COVID-19 control measures are more effective since their doubling time in both cases and deaths are getting higher remarkably with time. Although Sri Lanka has shown successful disease management at the beginning of the pandemic, the implementation of strict control measures would be more beneficial.

Keywords: *China, control measures, COVID-19, doubling time, Sri Lanka*

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