

Applying Grey Prediction for Analyzing COVID-19 Epidemic Trend to Help Medical Organizations with Risk Mitigations

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Abstract

Globally, as of 6:25pm CEST, 1 July 2022, there have been 545,226,550 confirmed cases of COVID-19, including 6,334,728 deaths, reported to WHO. In Taiwan, there have been nearly four million confirmed cases of COVID-19, including more than seven thousand deaths in total, according to CECC announcement. The current anti-epidemic policies need amending in response to the world trend of the economic factor, but Health Administration need to avoid collapses of public health system like the hospitals in Hong Kong in 2022. Due to limited medical resources, Health Administration should understand COVID-19 epidemic trend, appropriately conduct reallocations of limited medical resources in healthcare industry.

Besides, Grey Prediction has been an important analysis for understanding economic trend and future development. The purpose of this paper is to understand the development trend of COVID-19 epidemic for helping medical organizations with risk mitigations. The approach is that the data of COVID-19 confirmed cases around April to June in Taiwan is used through Grey Prediction model to analyze the growth and recession trends. The result shows that Grey Prediction model for analyzing growth trend of COVID-19 has a 29.2% of Mean Error, as well as recession trend of COVID-19 having a 16.9% of Mean Error. Not only can it accurately predict growth trends of COVID-19 epidemic, but also make prediction at the very early stage. According to the prediction of the case study analysis of COVID-19 epidemic, the used date is only a very small number which are 33 people on March 28 to 439 people on April 11. Therefore, the Gray Prediction model can be effectively used to predict the growth and decline epidemic trend for grasping more precise future information, and carrying out the relative medical management of risk mitigation in advance.

Keywords: Grey Prediction, COVID-19, Epidemic Trend, Risk Mitigation, Health Administration.