



## An Insight of Novel Coronavirus (Covid-19) Cases in Malaysia

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### ABSTRACT

In December 2019, a new severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) epidemic broke out in Wuhan, Hubei Province, China, and quickly spread worldwide. The World Health Organization has named this disease COVID-19. To date (February 9, 2022), a total of 401,176,571 cases of COVID-19; 5,782,794 cases of deaths, and 320,961,162 recovered cases have been reported worldwide. While there are approximately 83,071 active cases in Malaysia, 32,056 have died so far, and 2,824,071 have recovered. The COVID-19 dataset used was from the open data which covers over a certain period during the year 2020 and 2021. The data comprises of the cumulative number of confirmed, recovered, and fatalities cases. These data were used to determine several important insights, such as how the virus spread in Malaysia? How widespread has the virus been in this country? Does COVID-19 national lockdowns and self-isolation affect COVID-19 transmission in this country?

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## 1. INTRODUCTION

Since December 12, 2019, a persistent outbreak of an unknown acute respiratory tract illness has been reported in Wuhan, Hubei Province, China, coming from the Hunan South China Seafood Market [1]. Chinese scientists extracted an unknown viral sample from an infected person on January 7, 2020 and sequenced its genome using the next gene sequencing technology. They discovered that the virus shared 96.3 percent genetic similarity with the Yunnan bat coronavirus RaTG13 and 70% homology that causes severe acute respiratory syndrome (SARS-CoV) [2]. As a result, the World Health Organization (WHO) declared on January 12, 2020, that the cause of the epidemic outbreak was a novel coronavirus discovered in 2019 (2019-nCoV) or SARS-CoV-2, and the disease was named coronavirus disease 2019 (COVID-19) [3]. Compared to many other countries, particularly developed ones, Malaysia handled the COVID-19 epidemic quickly and effectively in the first half of 2020. As of August 2020, there had been 9,340 confirmed COVID-19 cases in the country, with 159 ongoing cases, 9,054 patients recovered and released (97

percent of all cases), and 127 deaths (1.36 percent of total cases) [4].

Since August, the new covid-19 cases have been on a high, and the number of death rates was also increased. As a result, the Movement Control Order (MCO) by states was enforced in January 2021, followed by a total lockdown in June when the graph revealed a drastic increase [5]. Once 90 percent of Malaysia's adults had received their immunizations, the National Recovery Plan was enacted, and the covid-19 rules were relaxed. This paper will look at how the virus spreads in Malaysia. How widespread has the virus been in this country? Is COVID-19 transmission affected by COVID-19 national lockdowns and self-isolation in this country

## 2. LITERATURE REVIEW

The literature for this study summarizes in Table 1.

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**Table 1.** The summary of literature review.

References	Title	Variables Studied/ Research Design	Important Findings	Limitations of Study	Application Area
[6]	Visualizing COVID- 19 Research.	Number of People Infected with COVID, Number of Pneumonia Patients, Number of Social Distancing.	Use to generate a visualization for studying the COVID-19 research landscape and present the open visualization itself, along with the URL where it may be located.	Data visualization	Millions of submissions are abstracted into discrete themes, trend data is extracted, and semantic graphic overviews of rapidly changing corpora are generated at a glance.
[7]	Using Exploratory Data Analysis for Generating Inferences on the Correlation of COVID-19 cases.	Total positive cases, hospitalized patients, tests performed, new positive cases.	To examine the dataset and glean useful information from it, data visualization allows for modifying strategies and business models to be more beneficial.	Data visualization	These outputs are used in conjunction with various algorithms and models to make decisions or create a product that will be beneficial when used in real-time.
[8]	Statistical Explorations and Univariate Timeseries Analysis on COVID- 19 Datasets to Understand the Trend of Disease Spreading and death.	Total covid cases, Total Covid deaths, New cases, New Deaths.	This study supported the hypothesis that social isolation/social distancing might limit the spread of the human coronavirus by lowering its spread factor.	Rather than relying on the univariate trend of timeseries data, the accuracy of LSTM forecasting can be improved by considering additional required parameters.	Trained and tested individual models five times, then averaged the corresponding performance metrics and predicted values.
[9]	Leveraging Data Science to Combat COVID-19: A Comprehensive Review.	Cumulative number of publications.	The term “data science” refers to all techniques and tools that learn from structured and unstructured data, such as artificial intelligence (AI), machine learning (ML), natural language processing (NLP), statistics, algorithms, modelling, simulation, and any other scientific methods.	Data Limitations	Highlighted some of the common challenges we encountered during our systematic reviews, such as data availability and privacy concerns.
[10]	Exploring Large Community- and Clinically-Generated Datasets to Understand Resilience Before and During the COVID- 19 Pandemic.	Pre-COVID-19 Community-Generated Data, Pre-COVID-19 Clinical Documentation Data, During COVID-19 Community-Generated Data.	It was possible to investigate resilience, operationalized as strengths by problem concept, using Omaha System or Simplified Omaha System Terms (MSMH) data.	The limitations of this study are similar to those of all retrospective studies, and results should be interpreted with caution.	The findings emphasized the importance of resilience as a way for communities to work together to address the challenges we face during extreme circumstances.
[11]	Covid-19 Pandemic Data Analysis and Forecasting using Machine Learning Algorithms.	Number of Cases, Number of Active cases, Countries.	The visualizations are made in Python using the matplotlib, seaborn, plotly, and datetime libraries for time series data analysis.	Forecasting with the sigmoid model	Specific feature engineering techniques were used to convert data to a logarithmic scale, which allows for better comparison by removing any data extremities or outliers. In addition, the model can be tuned to forecast long time intervals based on short-term interval predictions.
[12]	COVID-19 Kaggle Literature Organization.	Cluster analysis, Dimensionality reduction and manifold learning, Human-centered computing, Visualization toolkits.	The analysis pipeline consists of several steps to clean the dataset, vectorize it so that machine learning algorithms can use it, obtain labels for the documents, and visualize the results.	Manual Analysis	Walters and Ellis discovered specific information that is not insignificant using the t-SNE plot. For example, several new papers describe the efficacy of various drugs and broad-spectrum antivirals in combating COVID-19 symptoms

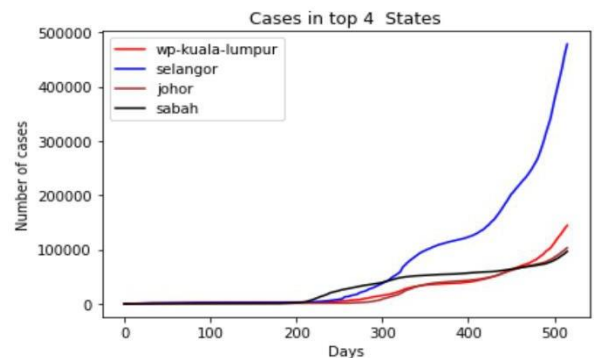
[13]	Analyzing the epidemiological outbreak of COVID-19: A visual exploratory data analysis approach.	Number of people recovered, number of deaths.	An exploratory data analysis with visualizations was conducted to better understand the number of cases reported (confirmed, death, and recovered) in other Chinese provinces and outside China.	Understanding the novel, the SARS-CoV-2 virus is still only found in a small percentage of the world's population.	A map view and a tree map view with an appropriate number to analyze the COVID-19 epidemiological outbreak.
[14]	A critical review of emerging technologies for tackling COVID-19 pandemic.	Search strategy, study selection (inclusion/exclusion criteria), study eligibility, and quality assessment.	COVID-19 data's size, availability, and accessibility improve the performance of AI models, GIS concepts, and IoT applications.	The study excludes COVID-19 asymptomatic patients.	COVID-19 diagnosis models are updated in real time. Assist healthcare providers in administering COVID-19 treatment.
[15]	A Conceptual Model for Geo-Online Exploratory Data Visualization: The Case of the COVID-19 Pandemic.	Number of positive cases, number of death cases.	The conducted descriptive analysis convinced us that many of the characteristics we associated directly with Geo-OEDVs pertain conceptually to different entities that play an essential role in the dashboard/tool conception, realization, and use.	While reviewing the dataset during the second pandemic wave, they discovered no significant changes and advancements in the proposed Geo-OEDV tools compared to the first wave of the COVID-19 pandemic.	To carry out a critical statistical analysis of collected evidence (based on eight high-level parameters) to show the central recurrence, choices, and typologies of platforms freely available on the Web.

### 3. DATA ANALYSIS

The virus spread in Malaysia is steep as the cases increase rapidly. All the state's cases are growing. The top four highest COVID cases are Selangor, Johor, Sabah, and Kuala Lumpur, as given in Table 2. Figure 1 shows that the cases speedily increase in all the states. Selangor has the maximum number of cases as the line graph peaks. In other states as well, the cases rise. The cases in Sabah were fewer, but they quickly grew and came down. Johor and Sabah have comparatively fewer cases than Kuala Lumpur and Selangor.

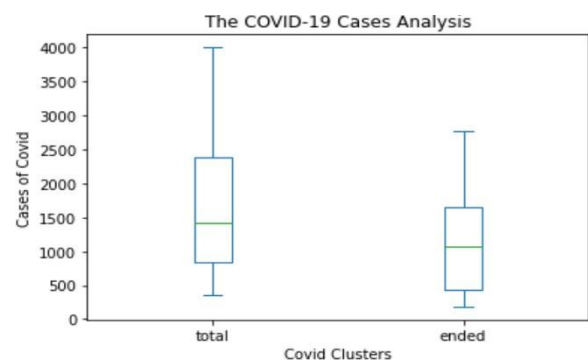
**Table 2:** The total number of cases in different states in Malaysia

State	Total Cases
Perlis	607
Kedah	28,202
Pulau Pinang	36,376
Perak	28,903
Selangor	281,670
Negeri Sembilan	51,851
Melaka	21,009
Johor	74,436
Pahang	15,848
Terengganu	11,721
Kelantan	35,991
Sabah	72,042
Sarawak	68,599
WP-Kuala Lumpur	87,711
WP-Putrajaya	2,550
WP-Labuan	9,087



**Fig. 1.** The states with the highest Covid cases.

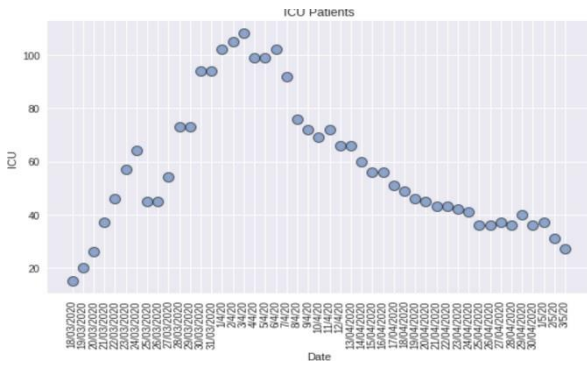
In Figure 2, the median of the total COVID cases is higher than the ended cases. The virus's spread is very intensive, as visualized in the box plot below. The whiskers of the box plot for the total cases show that it is majorly wide speeded from 500 to 4,000 whereas the whiskers for the covid patients ended is from 200 to 2,800.



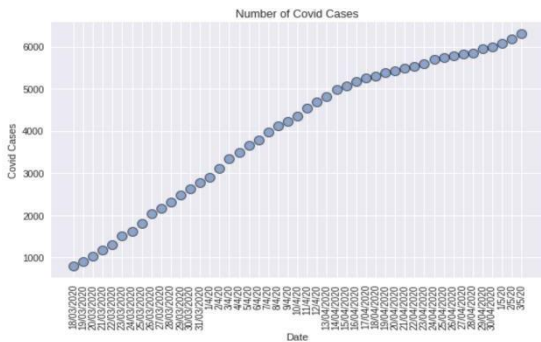
**Fig. 2.** Statistical summary of Covid 19 cases in Malaysia until then end 2021.

**3.1 Phase 1 MCO Implementation**

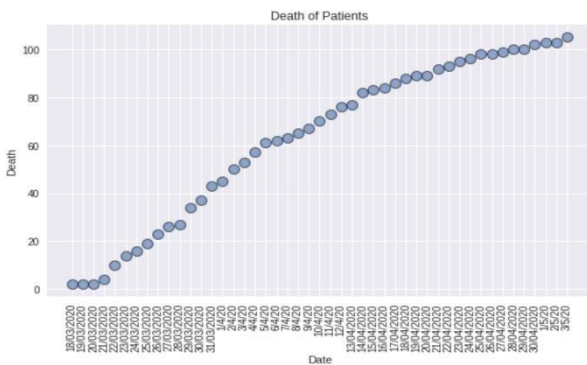
As shown in Figure 4, the covid cases rapidly increase in the phase one MCO. The deaths of the patients peaked as well as shown in Figure 5. The number of ICU patients in the middle of the lockdown increased to its peak and slowly decreased, as shown in Figure 3. The discharged patients at the beginning were deficient and suddenly increased to their maximum level, as shown in Figure 6. The lockdown has impacted as the cases of ICU patients decreased, and the number of patients discharged also increased.



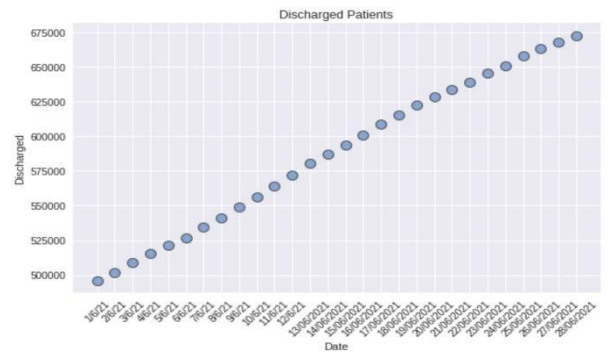
**Fig. 3.** Number of patients in the ICU during phase 1 MCO.



**Fig. 4.** Number of Covid cases during phase 1 MCO.



**Fig. 5.** Number of deaths during phase 1 MCO



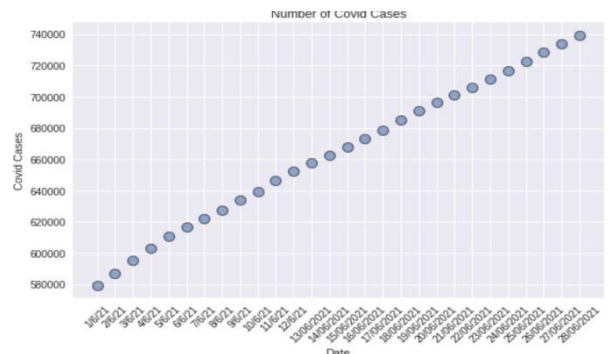
**Fig. 6.** Number of discharged patients during phase 1 MCO.

**3.2 Phase 2 MCO Implementation**

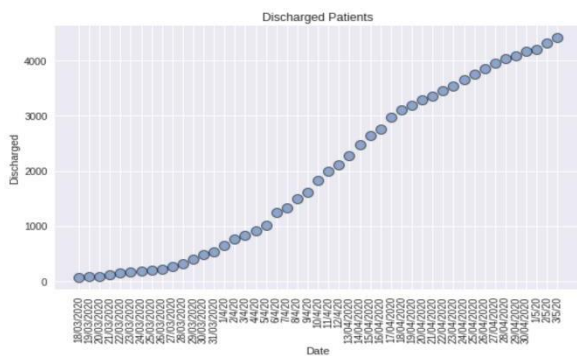
In the phase 2 MCO, as shown in Figures 7, 8, and 9, the deaths of the patients, the number of cases, and discharged patients increased tremendously. In Figure 10, ICU patients rapidly rise to a maximum. In the middle of the lockdown, the number of ICU patients decreases. The MCO implementation also changed the graph as the discharged patients are comparatively very high than the first lockdown.



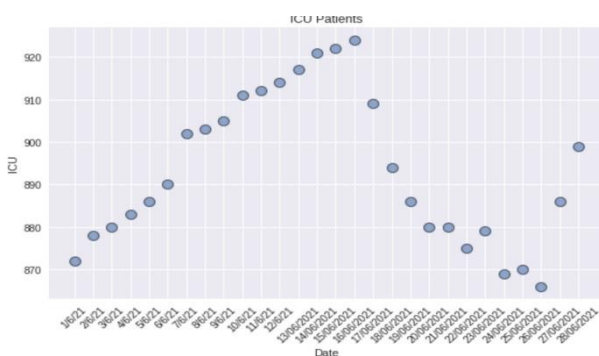
**Fig. 7.** Number of deaths during phase 2 MCO.



**Fig. 8.** Number of Covid Cases during phase 2 MCO



**Fig. 9.** Number of discharged patients during phase 2 MCO



**Fig. 10.** Number of patients in the ICU during phase 2 MCO.

#### 4. CONCLUSION

In conclusion, this study shows the correlation between MCO in reducing the number of covid cases in this country. The MCO successfully reduced the total number of cases in the country that directly impacted the total of deaths and number of patients in the ICU.

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