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Effectiveness of lockdown policy to control spreading of Coronavirus disease 2019 (COVID-19)

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Abstract:
Background*: The objective of this study is to evaluate the effectiveness of lockdown policy in controlling spreading of Coronavirus disease (COVID-19). The coronavirus disease is an infectious disease caused by a newly discovered strain of coronavirus, a type of virus known to cause respiratory infections in humans. The COVID-19 will cause the infected patients exhibits fever, cough, fatigue, shortness of breath, and loss of smell and taste. The virus is primarily spread between humans in close contactvia small droplets produced by coughing and sneezing.*
Materials and Methods*: This study selected Malaysia as country for study because this country keen to implements policy in reducing COVID-19 spreading. This study evaluated the process of lockdown procedure that limiting movement of citizen to reduce close contact between humans. Observation periods are selected from 15th February 2020 until 21st July 2020 involving 158 daily observations. This study monitors active cases of patients that infected by COVID-19. The active cases of Coronavirus disease (COVID-19) is highly important to monitoring to make sure all medical facilities are meet the requirement to treat the patients that infected. In addition, this study also evaluated the effectiveness of the lockdown policy to suppressing total cumulative deaths because of Coronavirus disease (COVID-19) in Malaysia.*
Results*: The maximum active case in Malaysia is 2596 cases on 5th April 2020.Malaysia achieved minimum active cases 63 cases on 9th July 2020.Malaysia proved that lockdown method can reduce the spreading of Coronavirus disease.Next, the number of deaths keep increasing starting with 2 cases on 17th March 2020 until reached 123 cases in 21st July 2020. This number is considered as low value comparing to total confirmed COVID-19 cases which is 8,800. This study shows only 1.39 % of death occurrence that shows efficiency of lockdown procedure in Malaysia. Therefore, lockdown procedure that implemented in Malaysia is an effective method to reducing spreading of COVID-19.*
Conclusion and recommendation*:The implementation of lockdown policy can control the infection of Coronavirus disease (COVID-19). The important implication of this study is, it helps policy makers in Malaysia to get the feedback of their policy in controlling the spreading the Coronavirus disease (COVID-19). The positive result helps policy makers to evaluate and improve their policy to become more effective and appropriate towards combating the spreading of Coronavirus disease (COVID-19). The further study can be extended to analyze the impact of Coronavirus disease (COVID-19) towards unemployment and economic.*
Key Word*:Coronavirus disease; Lockdown policy; Spreading COVID-19; Government policy.*

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I. Introduction

Coronavirus disease (COVID-19) is affecting 213 countries and territories around the world. In Malaysia, the data shows the increasing number of new COVID-19 cases. As reported by Minister of Health Malaysia, the higher number of new COVID-19 cases was recorded on 5th April 2020with total cases is 2596.Therefore, government of Malaysia takes a serious action in order to protected the spread of COVID-19 among Malaysian citizen. On 16thMarch 2020, Prime Minister of Malaysia was announced to implement a Movement Control Order (MCO). The main objective of MCO is to protect the spread of COVID-19 virus and reducing the number of new COVID-19 cases. On 9th July 2020, the data show the reducing number of new COVID-19 casesthat is 63 cases. It is show that the MCO can reducing the spread of COVID-19 virus. However, the MCO give a big impact on the economic, social and education sectors in Malaysia. Therefore, on 27thMarch 2020, Government of Malaysia was announced Prihatin Rakyat Economic Stimulus Package 2020 (PRIHATIN Package) worth RM250 billion (Povera, 2020). Theaims of PRIHATIN Package is to protect the welfare of the people and to support businesses including Small and Medium Enterprises as well as strengthen the country's economy to weather the effects of the COVID-19 pandemic.

II. Literature Review

COVID-19 is an infectious disease cause by a new discovered of coronavirus. Coronavirus is a type of virus known to cause respiratory infections in humans. The first case was detected in Wuhan, China than this virus was spreadquicklyto all countries (Yu, et al., 2020; Hamdan, et al., 2020).COVID-19 has changed the life of human, which constitutes a social legacy that will result in further social change (Ratten, 2020; World Health Organization, 2020).The COVID-19 pandemic continues to spread around the world and give impact into economic harm cause of restrictions on a wide range of economic activities. Around the world, many countries have imposed stringent mitigation policies to reduce contagion and contain the spread of the virus since March 2020. The economic impacts of these measures are not yet known in most countries but are expected to be dire with immediate loss of economic activities followed by possible medium-term and long-term economic effects(Zhang, et al., 2020).

COVID-19 give a significant impact into all sectors worldwide. Study by Zhang, et al., (2020) regarding the impact of COVID-19 on China's macroeconomy and agri-food system. They found that the GDP decreased by 6.8% in the first quarter of 2020 compared with that in 2019 and the agri-food system employment recovery slower than that of other sectors.Inegbedion, (2020) examine the implication of COVID-19 lockdown for food security and show that the COVID-19 lockdown can significantly constrain farm labor, transportation and security.While food security can be threatened by insufficient labor, transportation, farmers' morale and farm coordination. Wen, et al., (2020) examine how the outbreak may alter Chinese tourists' lifestyle choices, travel behavior and tourism preferences in the short and long term.They found that the COVID-19 will likely affect Chinese travelers' consumption patterns, such as the growing popularity of free and independent travel, luxury trips and health and wellness tourism.

According to Jallow, et al., (2020) UK was put under lockdown on the 23 March.The lockdown introduces strict measures put into place including the restriction for unnecessary working from offices, and only leaving houses if it is deemed essential.They suggested that the lockdown is proving to be difficult to manage projects as staff members are working from home. This leads to delays on a project activity as many staff members cannot physically go on site and conduct works becausemanagers are difficult to manage their teams. However, technological tools such as video chat and meetings via online platforms have proven to be most effective in communications with project teams.

In Malaysia, the first case of COVID-19 was detected on 24 January 2020. Several phases were implemented in Malaysia and found that the number of new COVID-19 cases was reduced. Below is the MCO implement in Malaysia Malaysian Dutch Business Council, (2020):

- Phase 1 - Movement Control Order (MCO) from 18th till 31st March 2020
- Phase 2 - Movement Control Order (MCO) from 01st till 14th April 2020
- Phase 3 - Movement Control Order (MCO) from 15th till 28th April 2020
- Phase 4 - Movement Control Order (MCO) from 29th till 3rd May 2020
- Phase 5 - Conditional Movement Control Order (CMCO) from 4th till 11th May 2020
- Phase 6 - Conditional Movement Control Order (CMCO) from 12th May 2020 till 9th June 2020
- Phase 7 - Recovery Movement Control Order (RMCO) from 10th June till 31th August 2020

Several recommendations were suggestedin order to avoid the spread of COVID-19 virus such asfrequent hand washing, social distancing (maintainingphysical distance from others, especially from those withsymptoms), covering coughs and sneezes with a tissue orinner elbow and keeping unwashed hands away from theface. It is also suggested to used masks. This is becauseuntil now there is no vaccine or specific antiviral treatmentfor COVID-19 (Abu Bakar and Rosbi, 2020(a)).

As suggested by World Health Organizationto prevent the spread of COVID-19, people should always wash hands frequently. Regularlywash hands with an alcohol-based hand rub or wash hand with soap and water can protect people from anyvirus. Peoples are suggested to maintain the social distancing at least 1 meter distance between person to person,who is coughing or sneezing. Besides that, people also encouraged to avoid touching eyes, nose and mouth because handstouch many surfaces and can pick up viruses. Then, people need to practice respiratory hygiene inorder to make sure people follow good respiratory hygiene. This means covering the mouth and nose with bentelbow or tissue when people cough or sneeze. Then dispose used tissue immediately (Abu Bakar and Rosbi, 2020(b)).

III. Evaluation of Government policy using lockdown methodwith statistical findings

This section describes the methodology of government implemented to control the spread of Coronavirus disease by lock-down method. Figure 1 shows the spreading chain of coronavirus disease. The spreading chain starting with patient A that received the virus from contaminated area Thiscoronaviruswas originally transmitted from animals to people. The patients show signs of infection include fever, cough, shortness of breath and breathing difficulties.

Then the spreading chain develop to second generation of coronavirus patients.The virus is spread from person to person through small respiratory droplets. When a person coughs or sneezes, these droplets can also land on nearby surfaces. Next, the third generation of patients appears when there is close contact with infected second generation. This process creates the huge increment of infected people from spreading of Coronavirus disease.

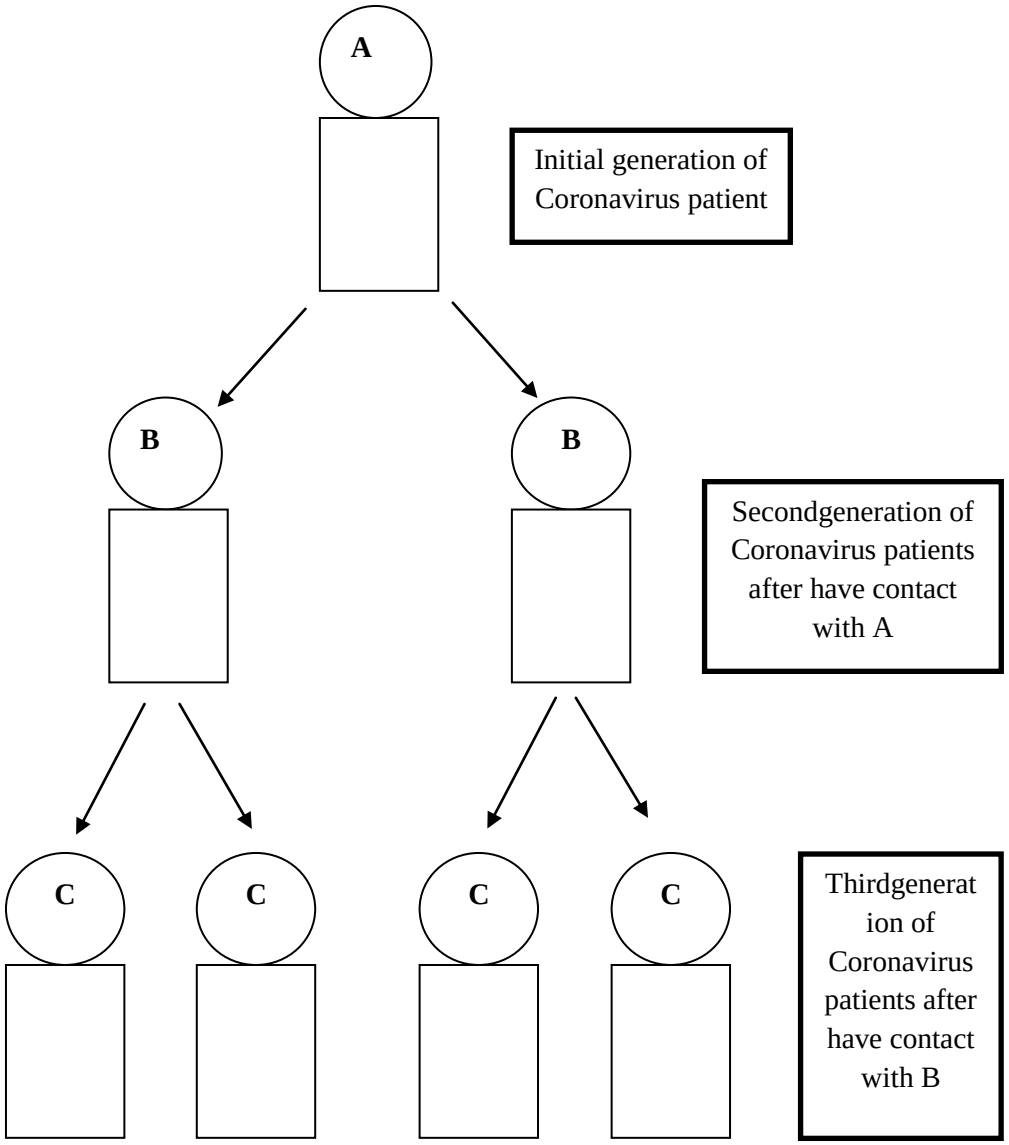

Figure 1: Spreading chain of Coronavirus disease (COVID-19)

In reducing the spreading of coronavirus disease, the government of few countries start to implement lock-down methods to control movement and interaction of their citizens. This solution is one of the methods to reduce interaction and contact between humans in preventing the spreading the Coronavirus disease. Figure 2 shows the mechanism of lock-down procedure to cut-off the chain of spreading method with stopping all movement activities including social and economic activities.

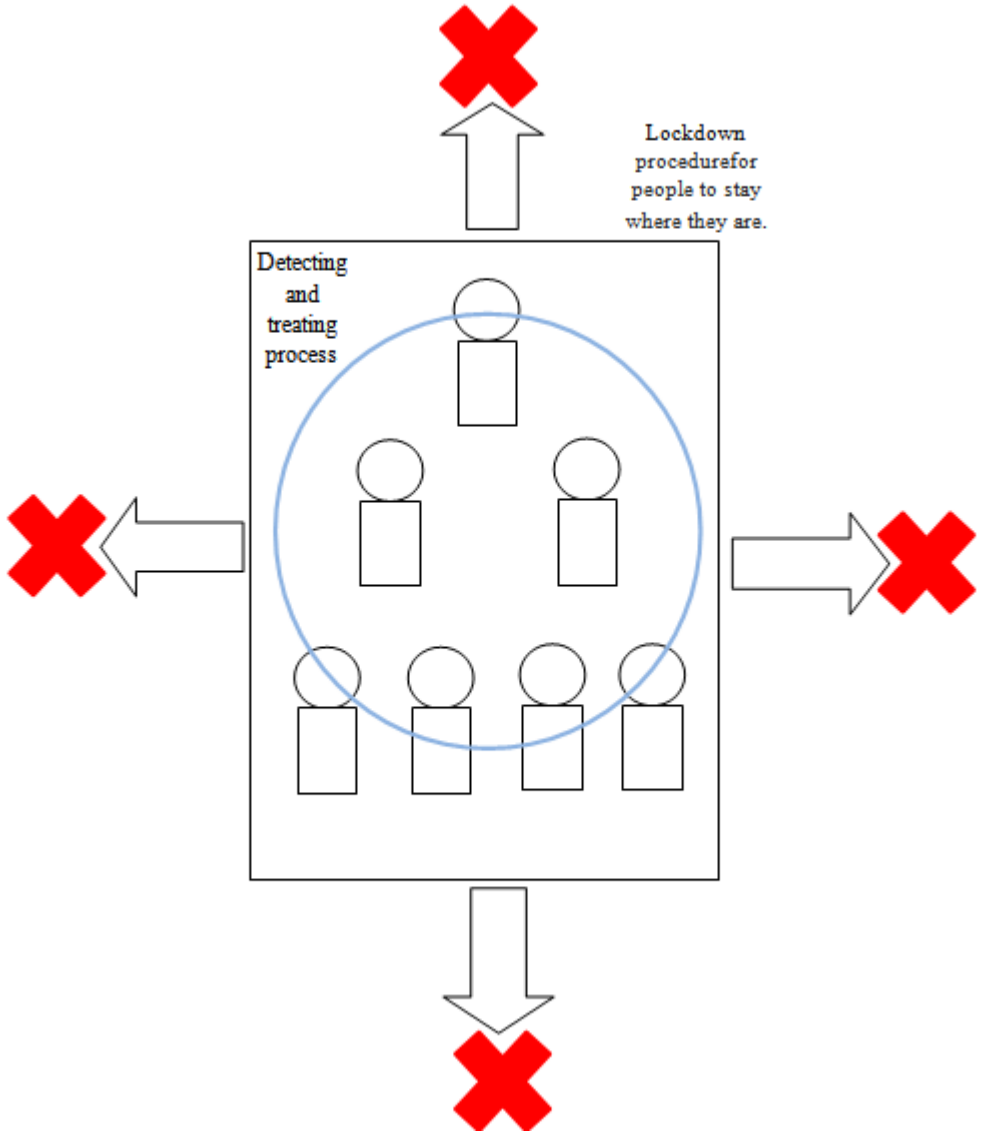

Figure 2: Mechanism of lockdown to stop COVID-19 spreading

In validating the finding statistically, this study using collected data for country in East Asian namely Malaysia. Malaysia implemented movement control order using three main phases in controlling the movement of citizens including tourists. Table 1 shows the phases of movement control order that implemented to reducing the spreading of COVID-19.

Table 1: Phases of movement control order in Malaysia

Stage of movement control order	Period	Activities
Phase 1 :Movement Control Order	18 March 2020-12 May 2020	1. General prohibition of mass movements and gatherings across the country. 2. Restrictions on the entry of all tourists and foreign visitors into the country. 3. Closure of all government and private premises except those involved in essential services
Phase 2:Conditional Movement Control Order	13 May 2020-9 June 2020	1. Most economic sectors and activities are allowed to operate while observing the business standard operation procedures.
Phase 3:Recovery Movement Control Order	10 June 2020-31 August 2020	1. A wide range of businesses and activities have been allowed to resume operations. Reopening economic sections to stimulates positive development. 2. The interstate travel is allowed. 3. Social distancing and standard operational procedure are highly stated as important aspects to control spreading of COVID-19.

Figure 3 shows the dynamic behavior of active COVID-19 cases. The daily observations start at 15th February 2020 until 21st July 2020 that involved 158 observations.The first observation on 15th February 2020, number of active cases is 15. Then, COVID-19 cases increasing until achieved maximum value of 2596 cases on 5th April 2020. Movement control order introduced to reduce the spreading of COVID-19 on 18th March 2020. Therefore, from the maximum point, the number of active cases decreasing until achieved minimum value of 63 cases on 9th July 2020. The significant decrement in active cases of COVID-19 indicates the government policy using lockdown approach is an appropriate approach in combating COVID-19.

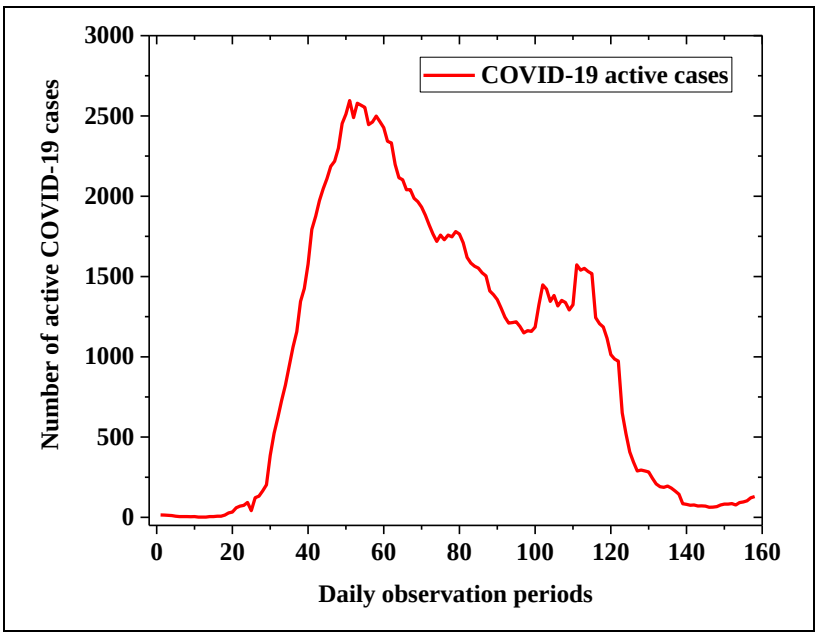

Figure 3: Number of active COVID-19 cases

Figure 4 shows total deaths because of coronavirus disease (COVID-19). The daily observation periods involving 158 observations starting form 15 February 2020 until 21 July 2020. On 15 February 2020, the total deaths because of COVID-19 is zero. On 17th March 2020, there are two deaths that occurred in Malaysia because of COVID-19. Next, the number of deaths keep increasing until reach 123 cases in 21st July 2020. Figure 4 shows slow increments starting from 70th daily observation on 24th April 2020. Therefore, government policy of lockdown method is effective towards controlling the spreading of Coronavirus disease (COVID-19).

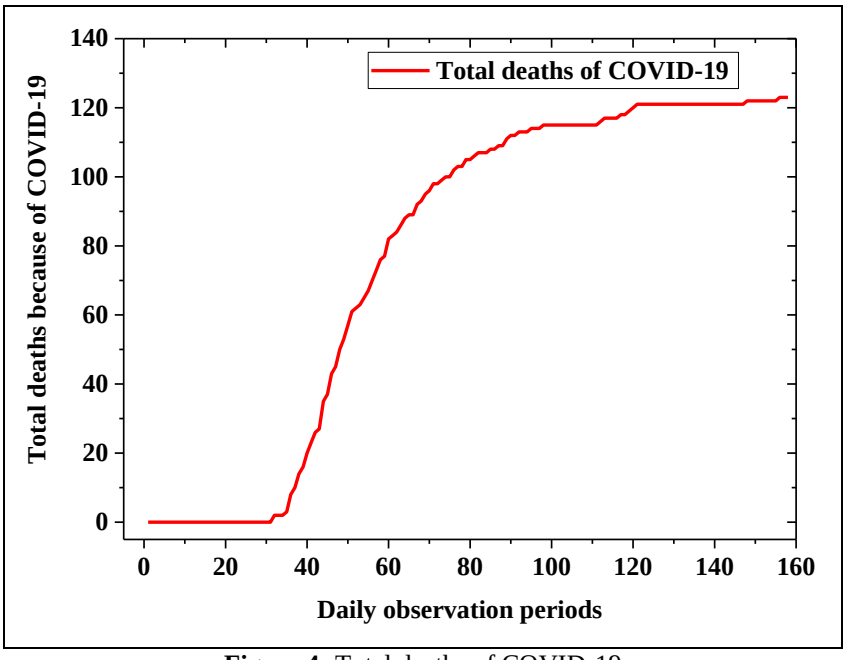

Figure 4: Total deaths of COVID-19

Next, this study evaluated the trend analysis for total deaths cases of COVID-19. Table 2 shows the data that developed for trend analysis. The total deaths accumulation because of COVID-19 increased to 123. Then, this study also analyzed the percentages of changes that calculated using Equation (1).

$$\Delta Death = \frac{D_i - D_{i-1}}{D_{i-1}} \times 100\% \quad \text{.....} \quad (1)$$

Table 2: Death accumulation with range of observation period

Observation data number	Period	Death accumulation	Percentages of changes
1	17th March 2020 - 5th April 2020	61	
2	6th April 2020 - 25th April 2020	37	-39.34%
3	26th April 2020-15th May 2020	14	-62.16%
4	16th May 2020-4th June 2020	3	-78.57%
5	5th June 2020-24th June 2020	6	+100%
6	25th June 2020-14th July 2020	1	-83.33%
7	15th July 2020-21st July 2020	1	0%

Next, this study illustrated the trend of dynamic behavior for total deaths is shown in Figure 5. The trend of deaths is represented by Equation (2).

$$y = 122.43e^{-0.729x} \quad \text{.....} \quad (2)$$

In Equation (2), the parameters are described as below:
y: Accumulation of deaths because of COVID-19,
x: Observation range
Equation (2) shows exponential value is -0.729. Therefore, negative value indicates the growth of deaths approaching stable condition which is value of zero. Therefore, the lockdown policy gives positive impacts in combating the spreading of Coronavirus disease (COVID-19).

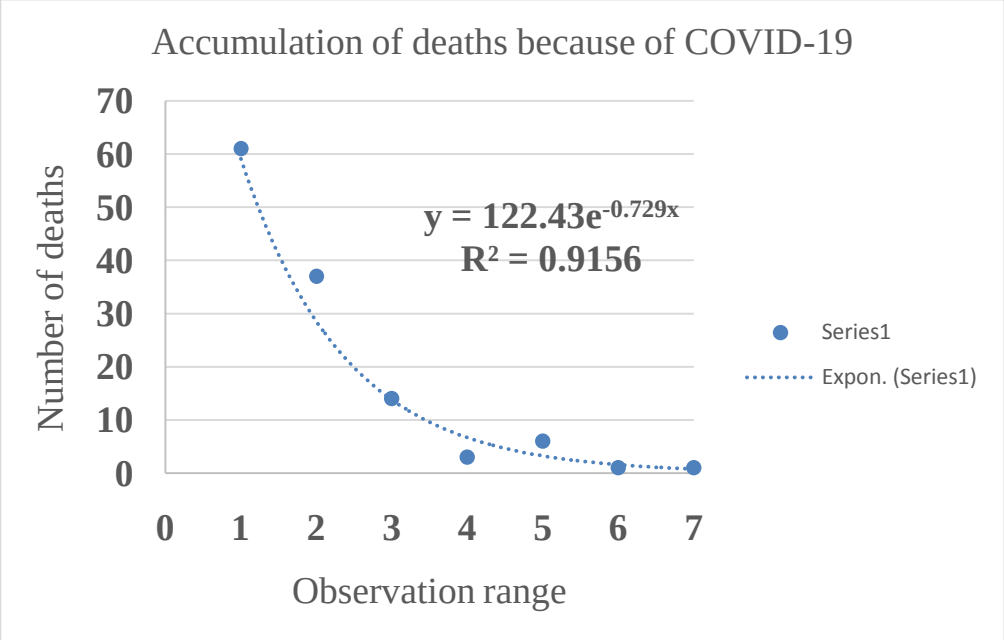

Figure 5: Trend analysis

Then, this study performed the analysis for forecasting of active case of COVID-19. Figure 6 shows the changes of active cases for COVID-19 approaching to zero value. This analysis proved that lockdown policy helps Malaysia to control spreading of COVID-19 efficiently.

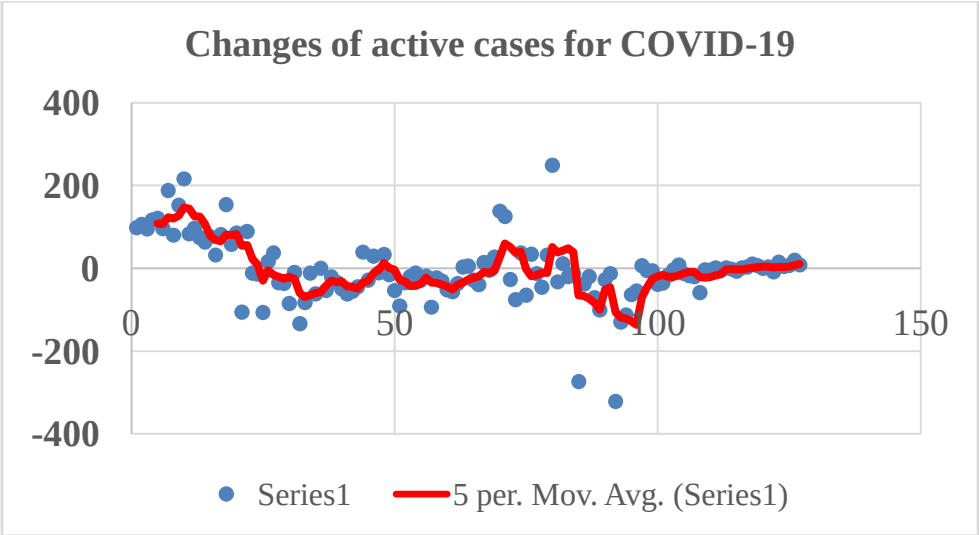

Figure 6: Forecasting method using moving average

IV. Conclusion

COVID-19 is an infectious disease caused by a newly discovered strain of coronavirus, a type of virus known to cause respiratory infections in humans.This study evaluated the infection status ofCOVID-19 by 21 July 2020 in Malaysia. The objective of this study is to evaluate the impact of government policy through lockdown method to control the spreading COVID-19.

The main finding of this study is described as follow:

i. The daily observation period is starting from 15th February 2020 until 21st July 2020. Malaysia is selected as the study area because this country shows good initiative from government to control spreading of COVID-19.

ii. The maximum active case in Malaysia is 2596 cases on 5th April 2020.The active cases of COVID-19 is highly important to monitoring to make sure all medical facilities are meet the requirement to treat the patients that infected. Malaysia proved that lockdown method can slowed down the spreading of COVID-19. This finding is supported by data that Malaysia achieved minimum active cases 63 cases on 9th July 2020.

iii. Then, this study also proved the lockdown policy is effective policy by using total cumulative deaths because ofCOVID-19 in Malaysia. By 21st July 2020, the total cumulative of deaths in Malaysia due to COVID-19 is 123. This value is considered very low compared to total confirmed case in Malaysia. The total confirmed case is 8,800 cases. The death percentage is 1.39% that indicates the lockdown policy can suppress the spreading of COVID-19.

iv. Next, this study performed trend analysis for prediction and evaluation of spreading rate of COVID-19 in Malaysia. Cumulative death rates represented by using exponential function. Result shows negative value exponential. Therefore, the growth of death cases convergent to zero value. This concluded that lockdown approach is an effective method to reducing the growth of deaths because of CIVID-19.

The important implication of this study is, it helps policy maker in Malaysia to get the feedback of their policy in controlling the spreading the COVID-19. The positive result helps policy makers to evaluate and improve their policy to become more effective and appropriate towards combating the spreading of COVID-19. The further study can analyze the impact of COVID-19towards unemployment and economic.

References

[1]. Abu Bakar, N. and Rosbi, S. (2020). Impact of Coronavirus Disease 2019 (COVID-19) to Equity Market and Currency Exchange Rate. *IOSR Journal of Economics and Finance, 11*(2), 17-26.

[2]. Abu Bakar, N. and Rosbi, S. (2020). Effect of Coronavirus disease (COVID-19) to tourism industry. *International Journal of Advanced Engineering Research and Science, 7*(4), 189-193.

[3]. Zhang, Y., Diao, X., Chen, K.Z., Robinson, S. and Fan, S. (2020). Impact of COVID-19 on China's macroeconomy and agri-food system – an economy-wide multiplier model analysis. *China Agricultural Economic Review*, Vol. ahead-of-print No. ahead-of-print.

[4]. Inegbedion, H. E. (2020). COVID-19 lockdown: implication for food security *Journal of Agribusiness in Developing and Emerging Economies*, Vol. ahead-of-print No. ahead-of-print.

[5]. Ratten, V. (2020). Coronavirus (covid-19) and social value co-creation. *International Journal of Sociology and Social Policy*, Vol. ahead-of-print No. ahead-of-print

[6]. Wen, J., Kozak, M., Yang, S. and Liu, F. (2020). COVID-19: potential effects on Chinese citizens' lifestyle and travel. *Tourism Review*, Vol. ahead-of-print No. ahead-of-print.
[7]. Hamdan Mansour, A., Al Shibi, A.N., Khalifeh, A.H. and Hamdan Mansour, L.A. (2020). Health-care workers' knowledge and management skills of psychosocial and mental health needs and priorities of individuals with COVID-19. *Mental Health and Social Inclusion*, Vol. ahead-of-print No. ahead-of-print.
[8]. Yu, X., Liu, C., Wang, H. and Feil, J.-H. (2020). The impact of COVID-19 on food prices in China: evidence of four major food products from Beijing, Shandong and Hubei Provinces. *China Agricultural Economic Review*, Vol. ahead-of-print No. ahead-of-print.
[9]. Jallow, H., Renukappa, S. and Suresh, S. (2020). The impact of COVID-19 outbreak on United Kingdom infrastructure sector. *Smart and Sustainable Built Environment*, Vol. ahead-of-print No. ahead-of-print.
[10]. Povera, A. (2020). RM250 billion stimulus package announced. Available at https://www.nst.com.my/news/nation/2020/03/578692/rm250-billion-stimulus-package-announced
[11]. Malaysian Dutch Business Council, (2020).available at: https://www.mdbc.com.my/mco-updates/
[12]. World Health Organization (WHO) (2020).available at:https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public
[13]. Minister of Health Malaysia (2020) available at: http://covid-19.moh.gov.my/

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