Interdisciplinary Research Review
Volume 15, Number 4, Pages 34 – 37

Early lockdown policy for COVID-19 in China during first quarter of 2020

Suchit Muangkasem

Siam University, Faculty of Medicine, Bangkok, Thailand

Abstract

Threat posed by COVID-19, infectious disease that spread globally on 2019-20, is characterized to pandemic level as announced on 11 March 2020 from World Health Organization(WHO), director himself. As spread of disease overload to medical department resources, self-isolation becomes necessary to balance out between increasing infected patient and available medical officer. And to ensure such policy, forced isolated strategy from government, may refer as "the lockdown" or "national quarantine", starts to put an act over the world. Objective was to examine the effect of "lockdown" occurring in Wuhan as related to the reducing of overall new cases and deaths related to COVID-19 compare to other countries. Dataset used in this paper received from European Centre for Disease Prevention and Control (ECDC) from December 31, 2019, through March 31, 2020. The purpose was to determine whether country to country variation increasing new case associated with the timing, duration of the lockdown interventions. On 31 December 2019, WHO received an official report about cluster of mystery infected patients, later known as COVID-19. As a result, China became center of this pandemic and had been staying number one in total infected case compared to other country since then. The first lockdown took place in Wuhan on 21 January 2020 which put massively forced isolation to citizen. The result proof success as number of daily infected from peak 15000 to around hundreds. As 29 march 2020, the total confirmed case in China also dropped down from number one ranking.

Keywords: 2019-nCoV, Covid-19, Wuhan, outbreak, lockdown, pandemic.
Article history: Received 17 April 2020 Accepted 8 August 2020

1. Introduction

Without pharmaceutical way to deal with the spread of disease during pandemic, burden on health care services and critical infrastructure goes up significantly. So there is no pharmaceutical, such as forced isolated strategy or lockdown, that potentially provide a valuable time for vaccine and antiviral medication production and distribution, also known as Flattening the pandemic curve [1, 2]. Optimally, appropriate implementation of non-pharmaceutical interventions would decrease the infected cases but there are differences in performance and outcome that carry from performing the "lockdown" on each country that worth discussion.

In practical, to carry on the "lockdown", it obviously causes an instant impact negatively on overall economy [3]. This results in quality, strictness and timing on "lockdown" put a heavy burden on decision-making from government since stake on both economy and save life are both high. As during the 1918-1919 influenza pandemic, research on mortality data in US urban area have proven forced isolated strategy from government, or the lockdown, is necessary in saving life in pandemic situation by Markel [4]. For standard "lockdown", things are school closer, public gathering ban, isolation, quarantine. In addition, there are also less strict policies such as business hours restricted, streetcars' capacity limited, staggered business hours, signs with cover coughs, staggered business hours, warning signs posted in theaters, schoolchildren given information to take home, warned not to gather in groups. Though it is hard to defer effect on each policy used, data leans more to the timing on initiate the "lockdown". This is due to state of emergency help alert citizens and increase their awareness, to extend that even cities that never officially closed their schools reported a student absenteeism rate over 45% at the peak of its epidemic. Overall, cities that implemented "lockdown" earlier experienced associated delays in the time to peak mortality, reductions in the magnitude of the peak mortality, and decreases in the total mortality burden.

On 11 March 2020, World Health Organization (WHO) officially announced an infectious disease outbreak that spread globally on 2019-20, initially named as 2019-nCoV [5] and later changed to COVID-19 [6], to be characterized as pandemic level [7]. As it is not something that occurs frequently, however, it is nec-

*Corresponding author; email: suchit@siam.edu

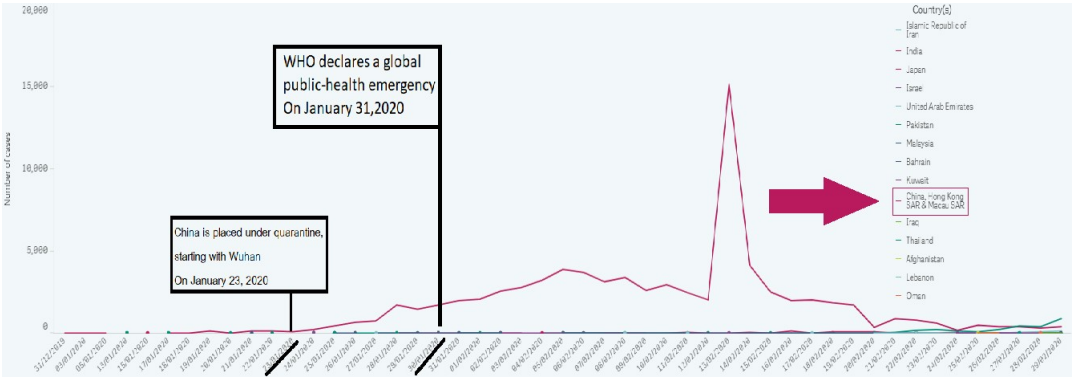

Figure 1: Distribution of the daily report of new infected cases from all Asian countries up until February 2020.

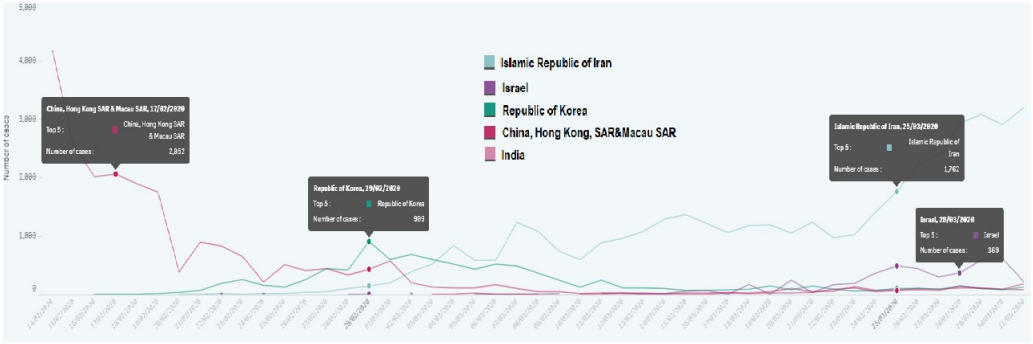

Figure 2: Distribution of the daily report of new infected cases on Top 5 in Asian countries after peak February until March 2020.

Table 1. Characteristics of COVID-19 on case study countries in Asia (during first quarter 2020).

Country	First reported cases date	Date of the first lockdown	14-Cumulative reported case per 100,000		
			On 29/02/20	On 31/03/20	's first peak date
China	12/31/19	22/01/20	0.9	0.08	15/02/20
S. Korea	20/01/20	20/02/20	5.67	2.86	09/03/20
Israel	21/02/20	11/03/20	0.08	50.27	31/03/20
Iran	19/02/20	-	0.47	32.40	31/03/20
Italy	31/01/20	08/03/20	1.46	121.95	31/03/20
Spain	31/01/20	07/03/20	0.07	162.89	31/03/20
France	24/01/20	16/03/20	0.07	56.66	31/03/20
Germany	23/01/20	-	0.05	67.52	31/03/20
USA	20/01/20	21/03/20	0.02	48.90	31/03/20

essary to define state of pandemic which led to life and dead on massive population [8]. WHO is also aware of this and getting better at notify state of emergency quicker in every new occur pandemic as shown in comparison to event on outbreak on severe acute respiratory syndrome (SARS) during 2002-03 [9]. At that time, it took around 3 month to issue the notification compare to the current COVID-19 which took only one month from the first patient found. This notification plays a big part on encourage each government to start the lockdown on their country at ease. As to help contribute on how important of the early lock down, in this paper, we study its effect related to COVID-19 during first quarter of 2020.

2. Experiment Design

In this section, we will discuss about data source, reason behind area of focus. Dataset used in this paper was offered by European Centre for Disease Prevention and Control (ECDC) from December 31, 2019, through March 28, 2020 [10]. On 15 April 2020, coronavirus COVID-19 is now affecting 210 countries [11]. To observe an impact outcome, it is required to consider the choices on case study countries. Figure 1 shows distribution of the daily report of new infected cases from all Asian countries. The data represent the new COVID-19 infected case on each date. It showed that China is the only country that actively found new case in Asia during first two months by far during January-February 2020. However, at the end of

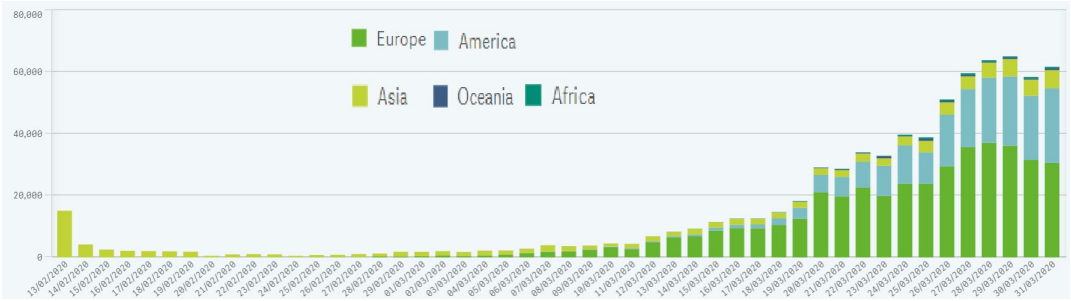

Figure 3: Distribution of the daily report of new infected cases on globally after peak February until March 2020.

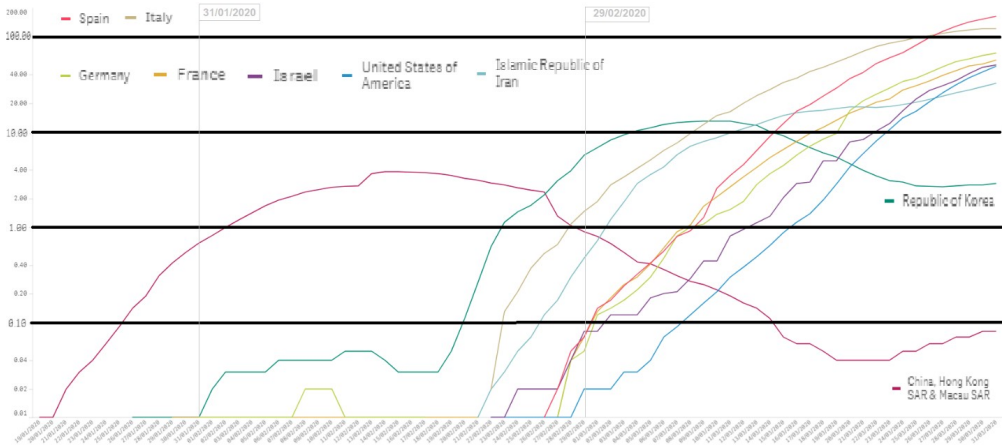

Figure 4: Distribution of the report of 14-day cumulative number of reported cases per 100,000 population using Logarithmic scale (First quarter 2020).

February, there was a sign of increasing numbers from other countries.

This emphasizes in Figure 2 which shows notable 5 countries that have new infected reach out. These are India, Israel, Islamic Republic of Iran, Republic of Korea (or South Korea) and China. However, India statistics, including other non-top 5, appears to have less new cases compared to those top 4 countries. As a result, we will focus on these 4 countries as representatives of Asia.

However, as the pandemic reaches out globally, there are reported infected cases outside Asia. During March 2020, both Europe and America showed a significant increase in new infected cases, which overcame those in Asia. Based on data, I picked the top 5 countries excluding Asia, using the same selection criteria used in Figure 2. Those countries are Italy, France, Spain, Germany and the United States of America as represented in Figure 3. As data shown in Figure 2 and 3, these emphasize the threatening worldwide crisis, caused by COVID-19.

Next, I discuss about method used in this paper. In Figure 4, 14-cumulative number of reported cases per 100,000 population of selected group country is shown. “14 days” is the standard quantity of days for a quarantine using this COVID-19 [12]. The Logarithmic scale is here to make data more compact to view.

As Markel [4] purposed the parameter call “public health response time (PHRT)” as the time in days (either positive or negative) between the dates when weekly excess death rate (EDR) first exceeds twice the baseline pneumonia. But due to COVID19 has low fatality rate [13], I decide to emphasize variation around new infected case.

Table1 contains the first reported cases date, along with the first lockdown policy in each country. Due to difficulty to identify wording of “lockdown” from each government, therefore in this paper, any act to forced mass isolation on citizen such as national quarantine, curfew or etc, could refer as “lockdown” as to list in this table [5, 7, 14 – 16]. 14-Cumulative reported cases per 100,000’s first peak date is mentioned as to define the effect of lockdown policy

3. Discussion

On 13 February 2020, China reached peak of 15,000 new cases. But in overall, it is later shown as a good sign that China have proven to be the first country that was able to sustain new cases over the pass value from date 15 February 2020 as shown in Table1. The second country is Republic of Korea. This country did not announce the form of lockdown to citizen but did put a massive lockdown to 9000 of military

force on 21 February 2020 [15]. Similar to China, Republic of Korea also passed the peak of 14-Cumulative reported cases on 9 March 2020.

On the other hand, other countries were slow to react to the first reported infected case in their countries well enough, compared with China and Korea as shown in Figure 4. This results in no sign of decreasing in terms of daily new infected cases during March 2020. Up until now, COVID-19 has killed more people than SARS and MERS combined [13] due to its spread nature.

Nevertheless, there was a proposed theory proving increase in fatality rate by economic failure caused by lockdown [17] which has the potential to harm more than the spread COVID-19. It could be an arguable statement in the sense of fatality comparison which could lead to the next research topic. However, despite not undergoing lockdown, individual responsibility, such as wearing a mark [18] or hand hygiene [19], is strongly recommended and has become a common practice globally.

4. Conclusion

The first lockdown took place in Wuhan on 21 January 2020 which put massively forced isolation on citizens. The result proof success as the number of daily infected from peak 15000 to around hundreds. As of 28 march 2020, the total confirmed cases in China also drop down from number one ranking.

Acknowledgment

I would like to acknowledge with much appreciation to European Centre for Disease Prevention and Control (ECDC) for providing useful information and dashboard tools used in this research.

References

[1] P. R. Saunders-Hastings, S. Krewski, Reviewing the history of pandemic influenza: Understanding patterns of emergence and transmission, Pathogens 5(4) (2016) 66.

[2] P. Gourinchas, Flattening the pandemic and recession curves, Mitigating the COVID Economic Crisis: Act Fast and Do Whatever (2020): 31.

[3] A. Fernando, A. David, L. Francesco, A simple planning problem for COVID-19 lockdown (April 6, 2020), University of Chicago, Becker Friedman Institute for Economics Working Paper No. 2020-34.

[4] H. Markel, H. B. Lipman, J. A. Navarro, et al., Nonpharmaceutical interventions implemented by US cities during the 1918-1919 influenza Pandemic, JAMA. 298(6) (2007) 644-654.

[5] World Health Organization, Novel Coronavirus(2019-nCoV) Situation Report, pp. 1-5, 21 Jan 2020.

[6] World Health Organization, Novel Coronavirus(2019-nCoV) Situation Report - 22, pp. 1-7, 11 Feb 2020.

[7] World Health Organization, Novel Coronavirus(2019-nCoV) Situation Report - 51, pp. 1-9, 11 Mar 2020.

[8] World Health Organization, Avian influenza: assessing the pandemic threat, January 2005. WHO/CDS/2005.29.

[9] C. Ewen, C. David, M. Smriti, S. Emma, T. Jeff, The coronavirus pandemic in five powerful charts, Nature 579 (2020).

[10] European Centre for Disease Prevention and Control, https://www.ecdc.europa.eu/en, (accessed 15 April 2020).

[11] Countries where COVID-19 has spread, https://www.worldometers.info/coronavirus/countries-wherecoronavirus-has-spread/, (accessed 15 April 2020).

[12] World Health Organization, Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19): interim guidance, 19 March 2020, No. WHO/2019- nCoV/IHR Quarantine/2020.2. World Health Organization, 2020.

[13] Mahase, Elisabeth, Coronavirus: covid-19 has killed more people than SARS and MERS combined, despite lower case fatality rate, (2020).

[14] Holly Secon, Aylin Woodward and Dave Mosher, A comprehensive timeline of the new coronavirus pandemic from China's first COVID19 case to the present, https://www.businessinsider.com/coronaviruspandemic-timeline-history-major-events-2020-3, (accessed 9 April 2020).

[15] Coronavirus: South Korea emergency measures as infections increase, https://www.bbc.com/news/world-Asia-51582186, 21 February 2020, (accessed: 15 April 2020).

[16] Rothe, Camilla et al., Transmission of 2019-nCoV infection from an asymptomatic contact in Germany, The New England Journal of Medicine 382(10) (2020): 970-971.

[17] L. Hirschhorn, Principal Emeritus, Pandemic lockdown must fail: Save lives without crippling the economy, (accessed: 15 April 2020).

[18] Considerations for wearing masks help slow the spread of COVID-19, U.S. Centers for Disease Control and Prevention, 16 July 2020, (accessed 6 August 2020).

[19] Hand hygiene recommendations guidance for healthcare providers about hand hygiene and COVID-19, U.S. Centers for Disease Control and Prevention, 17 May 2020, (accessed 6 August 2020).