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Management of COVID-19 in Different Countries

Abstract

Covid-19 is a category B type infection, but it has created a serious threat across the globe because the pandemic spread more quickly than any other in history. Before the spring festival, the epidemic in China just begun. Different measures, including mobilization of health care workers, building new hospitals and imposing the lockdown, were undertaken to minimize the spread. In South Korea, the measures were implemented under strong and coordinated government leadership. The developing countries, including India and Iran, have taken the steps like travel limitations, specified hospitals, testing laboratories, quarantine facilities, awareness campaigns and lockdown, which aided a great deal in taking the flooding tide of diseases back to a controllable level. Also, educational institutions, industrial establishments and hospitality services for other patients were suspended for the sake of critically ill Covid-19 patients.

Key Words: Management Strategy, Flattening the Curve, Raise the Line, Containment Strategy, Lockdown Implementation, Socioeconomic Aspects

Introduction

A novel coronavirus emerged from the city of Wuhan, China, which has led to a worldwide pandemic that causes worldwide public health emergency around the world. (WHO. Coronavirus disease (COVID-19) pandemic, 2020)

This novel coronavirus leads to mild symptoms and also causes severe illnesses in the immunocompromised geriatric and pediatric population. (Guan W-jie et al., 2020)

Management of Covid-19

Two parts of the equation;

- Flatten the curve
- Raise the line

Flatten the Curve

For many countries, in order to control the fleeting number of coronavirus cases and deaths, the majority is relying on to "flatten the curve". Lack of interventional measures may lead to a huge surge in

the number of Covid-19 cases, and the curve will keep getting steeper. In fact, this level of augmentation may already be happening since the number of patients infected in Italy, and Spain follows a mounting trend. When the numbers are taken from an exponential distribution, it has been indicated that they follow Benford's Law (BL). Henceforth, if the current control measures are fortunate and we flatten the curve, then the number of infections or deaths will not obey Benford's Law. Therefore, BL may be useful for analyzing the effects of the current control measures and may be helpful to answer the question, "How flat is flat enough?" Here, we used an epidemic growth model in the presence of interventions to explain the possibility for a flattened curve. Upon investigation from ten different countries with exponential growth, South Korea was highly successful in flattening the curve. (Lee, K.-B., Han, S., & Jeong, Y., 2020)

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Raise the Line

While deprivation of humanity this novel virus, we also appreciate the positive effects on our profession. From the aspect of the local level of practitioners to our worldwide societies, there has been an overwhelming effort of amicable unity to put forward and follow the most preferred clinical guidelines for coming up with patient care with optimal safety. Additionally, as a practitioner, we have elevated the level of compassion, ethics, and professional interaction during these hard times. (Holt, G. R., 2020)

Management of Covid-19 Across Countries

Covid-19 has affected more than 50 million people across the world. The world is facing health, economic and social challenges as it continues to affect humanity.

Korea

Introduction

In South Korea, the number of novel coronavirus cases raised exponentially on February 29, with a track record of 909 novel infectious patients. (Korea Central Disease Control Headquarters, 2020). In spite of the continued emergence of new confirmed cases, Korea was able to, fortunately, flatten the curve in just 20 days. It is pandemic management health policies that were distinct from the international measures, particularly containment and mitigation strategies (WHO, 2009), (Nicoll A, Coulombier, 2009). All

interventions and strategies were executed under well-built and coordinated government leadership. For explaining the interventions adopted by Korea, the article attempts to address the following questions. First of all, how does Korea embrace the interventions listed in the containment strategy while reducing the measures prioritization cost? Secondly, how does Korea successfully integrate both containment and mitigation strategies simultaneously?

Background

The key aspect to the Korean government's success in fighting COVID-19 lies with the latest digital technologies (DTs). The rapid and efficacious implementation of DTs facilitates both containment as well as mitigation strategies and their sub-policy measures. (Heo K, et al., 2020)

Epidemiological Characteristics

The Korea Centers for Disease Control and Prevention (KCDC) reported the basic epidemiological characteristics of 7755 Covid-19 patients in South Korea as of 13 March 2020 using surveillance data retrieved from the KCDC-operated National Notifiable Disease Surveillance System. The case mortality was 0.1% among the age groups of 30–39 and 40–49 years, then raised to 0.4% (50–59 years), 1.5% (60–69 years), 5% (70–79 years) and 8.5% (≥ 80 years). Out of 63 cases, 96.8% were found to be immuno-compromised with co-existing diseases. (Jun Yong Choi, 2020)

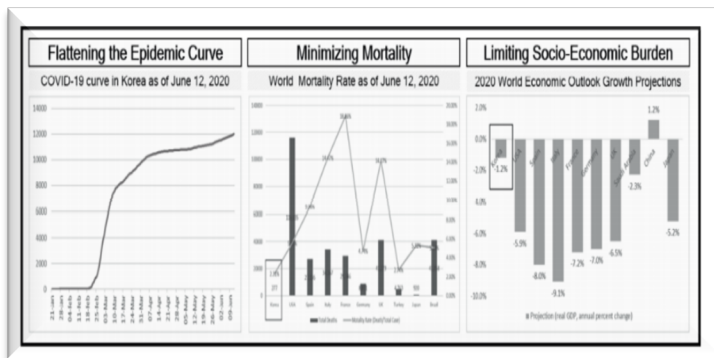


Figure: Achievement Level of Korea in COVID-19 Policy Objectives. (Worldometers.info, 2020) (International Monetary fund, 2020)

Mitigation and Containment Strategies

The healthcare workers were allowed to telemedicine pattern during the quarantine. If needed, local hospitals conduct medical examinations and treatments through video conferences with main

hospitals. When symptoms of confirmed patients are exasperated, local hospitals send them to concerned Covid-19 treatment hospitals. For mild patients, hospital nurses use video calls to check their daily

conditions and further the emergence of symptoms. If patients show symptoms not related to Covid-19, nurses direct them to visit the National Security Hospitals that follow separate treatment processes of respiratory from non-respiratory patients to prevent nosocomial infections of Covid-19. (Heo K et al.,2020).

- Government-Corporation-Researchers Network
- Mobile Applications by Partnership between Government and Private Sectors
- Agile Governmental Actions on COVID-19 Diagnostic Kit
- AI Installation for Chest Radiography Detection
- Innovative Walk-through Testing Center (K-Walk-Thru)

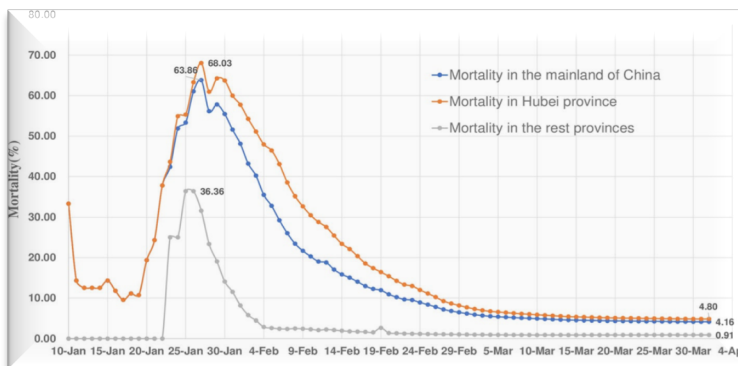
The DT-based policy measures and strategies succeed Korea helped Korea succeed in this pandemic. Korea does not prioritize measures on the basis of cost-effectiveness. Korea has proved that with the use of DTs, interventions and strategies can be integrated simultaneously and successfully.

China

Background

This situation is critical as the disease spread faster through the respiratory droplets such that its reproduction number is almost 570% (95% Confidential interval: 3.8–8.9) (Sanche, Lin, Xu, 2020).

Previously on 1st April 2020, almost 81589 cases were identified (67,802 cases reported in Hubei, and 13,787 in areas other than this), 97895 cases were suspected, and 709570 were the intimate contacts that had been reported which were clinically noted in the mainland. About 3318 patients lost their life (In Hubei, almost 3199 patients died, and in other areas, about 119 died). The overall death rate was around 4.16% in the interior of China. In Hubei Province, 4.80% of people and in other areas, 0.91% of people expired. In Hubei Province, the mortality rate was high up to 68.03% than any other territory as medical resources were relatively insufficient; but with prevention and control, the improvement was seen, and mortalities declined to about 4.16%. (Xu, TL, Ao, MY., Zhou, X, 2020)



Graph Showing Mortality Rate Comparison. (Xu, TL, Ao, MY., Zhou, X, 2020)

From January 11 to June 6, 2020, the appropriate data was collected about the infestation in the continent of China, and the details were accessible at local functional internet sites like the nhc.gov website. This includes:

1. The policies formed by the government.
2. All the Record of statistical data either it is about identified cases, doubtful cases, close contacts, data about mortality and patients that retrieved in the state.
3. The data of moving of different groups of individuals of China that make up a population

that was gathered from Baidu emigration. (Xu, Ao, Zhou, 2020).

The following statements were implemented:

1. Detection of the active cases.
2. Immediately diagnose the cases and manage them accordingly.
3. Checkup should be stern, and in any case the patient is identified, isolation is necessary.
4. Issuance of proper direction that will help the public to understand the situation and follow the instructions carefully.
5. Highly Effective policies should be made a decision and activate the public health

system, and society should be completely involved.

Management

Epidemiological investigations were done, and necessary decision regarding the health of the public was devised by authorities that cover the explanation of viral pneumonia outbreak. Then the contact tracing was done, and the case is finding, isolation and quarantine. China's seafood market of Huanan was closed on 1st January 2020, and steps like disinfection and proper environmental sanitation were done. Clinical observation of direct contacts was also done to get proof that disease can spread from one human to another. The early tests were performed that include virus isolation and RNA sequencing. PCR detection kits were given to perform the complicated procedure for the corona testing. ([Zhou, Yang, Wang, Hu, Zhang, 2020](#)).

Active Case Surveillance

The government designated the fever clinic and medical institutions to receive patients with fever. In order to find out doubtful or true cases, the body temperature was checked on many stations like on airport, quay, turnpikes, entry of underground railway. The certificate that ensures that the person is healthy is required by daily employees in companies, academic centres or institutions that were affiliated with the government. ([Zazhi, 2003](#)).

Contact tracing is done until the positive coronavirus patient was identified and the prior routes of travelling of the true cases were found out in order to spread awareness in people who might be unconsciously in direct contact with the patient through the internet service.

Case Diagnosis

The Hubei province followed the instructions provided by the government, and the cases were found out and recovered according to proper recognition, treatment and regulation of COVID-19. ([Lin, Za Zhi, 2020](#)).

Involvement of the Public

The public awareness programme was held to teach the public the precise manner of wearing a mask as the viral infection is transmitted easily via humans and animals, so self-protection is important. ([Bushman, Worby, Chang, Kraemer, 2020](#)).

From the night of 22nd January 2020, leaving traffic of Wuhan City was closed for one day until the 23rd January. Other 17 cities in Hubei Province were also sealed from January 27 except Shennongjia. People stayed in their homes where the curfew was not imposed and was only put under the 24 h lockdown. Only one person was allowed to go out and buy important stuff, while others were allowed on the condition if they provide a certificate that is issued by appointed agencies. The government-assigning personnel in the Fuxingcheng area, Xianning City and Hubei state, provide people with the basic necessities so they don't go out. Many community organizations were also functional. ([Deng, Peng, 2020](#)).

Gatherings like working, visiting, and school activities were totally prohibited. The Chinese spring break was also extended from 30th January to 2nd February with a reduced number of attendees. According to the situation of the local epidemic, schools reopening dates as well as work-resumption were also delayed avoiding the maximal passenger flow, and most of the projects were shifted online. The ethnic and tourism swapping activities were closed and approved by the COVID-19 prevention and control group.

The flights to Hubei Province were cancelled from 23rd January 2020 by the Civil Aviation Administration of China until 28th March 2020.

Disinfection was made essential in places where the gathering was too much. The food markets and enterprises of catering were also disinfected. Proper cleaning of vehicles was done and disinfecting the residential areas etc. Special care was provided to pregnant women, children and elderly people as they were at more risk of catching the infection. The schools, hospitals, children welfare office, prison, nursing homes were paid full attentiveness to work control, plans or announcements that the government had passed.

Complete Activation of the Public Health System

The entire 30 states converted to level 1 public health emergency response on 25th January, except the Hong Kong area of Macao, Taiwan and Tibet. These cities launched a major crisis after the detection of the first outsider patient with coronavirus on 28th January. In addition, the Hubei state, Tibet and the organization of Hainan also find out the potential threat in the start while depending on the widespread illness, the Guangdong and Zhejiang areas, the emergency situation was on level 1. Until 6th June, no

area was there that has declared a major emergency reaction. The two provinces were those who may require assistance from external organizations, 26 states were on low impact incident, and three were on the fourth level. These levels are set in such a form that moving down to level 4 becomes extremely mild. The government has taken steps to guide the public and prevent the disease from the spread.

Provision of Guidance to Public

Press conferences on a daily basis were held, and the Government issue the guiding principles, including emergency psychological crisis intervention in the Covid-19 epidemic on 26th January 2020. (Cao, Fang, Hou, Han, Xu, Dong, 2020).

The public was made aware online and offline as well, as recently published books on COVID-19 were available. The WHO or local authorities served the information through internet sites that were in different languages.

Raising the curve

Hospital Preparation and Construction

The labor and resources of different material were set by the government other than policies. During this infectious period, many areas to monitor temperature, most of the hospitals and institutions where medicine is studied were prepared for COVID-19 patients to directly observe the patients, to diagnose, isolate, quarantine, and to provide treatment. In the short time period of 14 days, two medical institutes were constructed named Huoshenshan and Leishenshan to control the epidemic in Wuhan city, which got functional from February, playing an important role in the epidemic situation. In sequence, Fangcang hospitals were built by the government of Wuhan on February 3. On 25th February 2020, to overcome the shortage of sickbeds, about 30,000 sickbeds provided in hospitals such as in Fangcang hospitals, almost the same amount of beds is provided. In the isolation area, 10000 beds were placed, and 8000 beds in Wuhan isolation stations were present for any critical situation. (Qian, Ren, Wang, Guo, Fang, Wu, 2020).

Goods and Materials

Hubei Province has a shortage of protective equipment and medical consumables throughout the disease prevention and control, but medical supplies, including clothing raised from ten thousand to 170000 per day, and the number of N95 breathing apparatus increased from thirty-six thousand to three

lakh per day from 22nd February 2020 with the help of public donations. The public donations of 2104.63 million yuan from the Red Cross Society of China were provided for charity. According to the sources, the financial appropriation reached up to 1104800 million yuan on 4 March 2020. Hospitals monetary concerns for carrying all the cost burden of COVID-19 diagnosis and treatment. There was no salary cut if the patient is in quarantine. (Xu, Ao, Zhou, 2020).

Mobilization of Medical Workers

As the Hubei Province lacked resources so the 330 medical teams that include 40 000 persons and thousands of health workers from other provinces had been sent to go there on March 5, 2020. If the death of medical workers has occurred due to SARS-COV- 2, they will obtain corresponding compensation after proper identification. In the challenging situation of the corona virus, the pay was increased that was free of individual income tax. The government noticed civil services in case if someone neglects his duty would get punished.

India

Epidemiology

In India, the Covid-19 occurred/prevalled due owing to the nexus with abroad rather than transmission within the country. India reported initial cases on 30th January. (S. Patrikar, Armed forces, 2020). The cases began to increase exponentially within no time.

Lockdown Implementation

To control this spread, the Ministry of Health and Family Welfare (MoHFW) implemented travel advisory restrictions, including the imposition of self-quarantine rules for 14 days to all international travellers entering the country. Additionally, travel visas were restricted until 15th April for other countries (R. C. Khanna, 2020). Various interventions such as social distancing to decrease the rate and extent of disease transmission in a community were strictly followed (A. Kumar, 2020), which eventually led to minimizing the morbidity and mortality rate. India enforced a four-phased-lockdown of 68 days till the 31st of May. India reached its first 1 lac infectious cases figure on the 18th of May and crossed 8.5 lacs on July 11, 2020. In doing so, the results were like there was a decrease in a visit to grocery and pharmacy, parks, transit to the station, and workplaces by half, respectively (J. Saha, 2020).

Approaches and Measures

Critically ill patients were demanding immediate oxygen supply in order to minimize the death ratio due to hypoxia in patients. Indian government-endorsed practices like regular hand washing necessitate hand sanitizer usage, avoid touching eyes, nose and mouth with dirty hands, dodge distance travelling or crowd gathering. A real-time PCR test (rtPCR), Point-of-Care molecular diagnostic assays, rapid antigen-antibody detection test for early detection were the various testing facilities being utilized during the pandemic. Without proper vaccination, minimizing the Covid-19 cases would be a real challenge.

Socio-Economic Impact of Covid-19

This lockdown imposed a negative economic impact. The economy slated \$640 million loss. After the first lockdown phase, within a week or two, demand for electricity reduced to 30%, petroleum demand decreased by 70%, and railway transportation was under 36%. The overall unemployment rate was counted to be 26% across India. (*Social, economic impact of COVID-19 outbreak in India*).

Management of Covid-19

The Indian government enforces massive preparedness on the medical front, enable unprecedented measures to address unprecedented challenges, and promoted inter-state coordinated efforts.

- Surveillance and screening: At airports, seaports, land borders, a total of 3.7 million passengers were screened.
- Restrictions: Visa and travel restrictions were imposed on foreign nationals, and later on, all the visas were suspended along with the flights.
- Nation-wide lockdown: on March 25, the entire country was put under lockdown.
- Integrated disease surveillance program (IDSP): Passengers arriving in India were placed under daily surveillance through the IDSP network and monitored through a national online portal.
- The lockdown period was utilized to trace and isolate +ve cases and their contacts, and it led to the flattening of covid-19 cases.
- Financial assistance: Senior citizens, widows, the physically challenged, routine workers were provided financial assistance worth 23 billion USD across the country.

- Relief camps: 38,000 relief camps equipped with food and shelter were organized for the migrant workers.
- Safe movement of migrant labors towards their destination ensuring essential supplies, rations, food packages for them.
- A national hospital preparedness effort mounted to ensure the availability of isolation beds, critical care management and infection prevention. Dedicated hospitals, labs, collection points were established.
- The government ensured Personal Protective Equipment (PPE) availability to health care providers (HCPs) within the hospitals, strict instructions for the general public to follow the standard operating procedures (SOPs), avoid unnecessary outgoing, social distancing, wearing a mask in public, and for the victim to self-quarantine oneself at home. (*Embassy of India, Ukraine*)

Individual Behavior in Community

Covid-19 marginally improved healthy meal consumption behavior. There was a reduction in physical activity coupled with an increase in daily screen time in the community among men and in upper-socio-economic strata. Quarantine life made the life stressful, and people suffered a lot from anxiety. (*Impact of Covid-19 on lifestyle-related behaviors- a cross-sectional audit of responses, Sakshi Chopra, 2020*).

Containment Strategy

The Delhi government will revamp 261 containment zones and set their boundaries. Plans are prepared to revise the strategies. Contact-tracing is expanded beyond the family members of infected people. Faculty members and students of the final year of MBBS are involved in this activity. Rapid tests are conducted, and quick sample collection is done to assess the scale of the spread of covid-19. The law enforcement agencies will spearhead efforts to punish those violating norms and social distancing. Epidemiologists will be on duty for monitoring the collection, sampling and testing. (*Revamped action plan for Delhi to fight Covid-19, Hindustan Times, New Delhi, June 22, 2020*)

Iran

Epidemiological Curves

In Iran, the nation faced a terrible outcome owing to Covid-19 (SARS-CoV-2) pandemic. The first infectious case was reported on the 19th of February; the evidence showed that the merchant movement

from China is the sole reason for this pandemic spread in Iran. (*How Iran became a new epicentre of the coronavirus outbreak, The New Yorker, March 2020*)

Management by the Government

The Covid-19 outbreak generated panic and anxiety among the public. The Iranian government banned travelling between cities. Restrictions implemented to cause a decrease in prevalence, but then restrictions were eased, which once again raised the curve of new cases along with the death rate. In spite of this fact, the government kept the economy open as it suffered badly in the past due to US sanctions; further, the GDP dropped by 15% during 2020. (*Wikipedia, updated 2020*)

Effect on Hospitals

Amid the Covid-19 pandemic, Health care professionals in different provinces of the state lack the basic PPE for themselves. Earlier, the hospitals faced an Oxygen supply shortage for severely affected Covid-19 patients. Also, the life facing medicines were in a shortage within hospitals of some provinces. People rushed to the stores to buy masks, gloves and hand sanitisers.

Socioeconomic Aspects

The measures like stopping mass gatherings, closure of educational institutes, national screening program, and social distancing cause a shortage of management to some extent. It had the potential to reduce public fear. (*COVID-19 Pandemic in Iran and its Impact on Healthcare and Economy*)

Mitigation Strategy

Social distancing and mass gatherings prevention decrease the outbreak spread. Authorities convinced the general public to stay at home and avoid social contact with family and friends. People were encouraged to avoid family gatherings and trips to celebrate the New Year before the Iranian New Year festivals. The measures had a great and desired effect and caused the flattening of the epidemic curve. (*Salimi R., 2020*)

Containment Strategy

To achieve the desired result and to flatten the curve, widespread testing should be performed to intervene in new transmission chains and keep these clusters under control. Second, premature end to restrictions due to economic pressure can cause other waves of Covid-19 infection with varying duration and intensity. Third, the government must provide financial support to the public and delay in receiving support timely might lead to more depression and anxiety and can prevent effective action. Finally, the shortage of medical facilities and the further waves of infection can increase the mortality risk among health care workers.

Conclusion

While giving the concluding remarks pertaining to the efforts of developed, developing and underdeveloped countries, we can say that China put a huge effort in controlling this pandemic by effectively minimizing the morbidity and mortality rate. In order to flatten the curve, strategic policies were made in which lockdown was imposed, and people were quarantined in their homes. For raising the curve, special consideration was given to Hubei province, and Huoshenshan and Leishenshan institutes were constructed within 14 days in Wuhan city. Considering South Korean experience, it recommends changing the disaster management paradigm by placing DTs on the front. DTs should be considered as a prerequisite element. DTs, being facilitators and integrators of containing and mitigating strategies, allows government's policies to be functional with individual behaviors, allowing them to know about the government's intentions and a government to assist individuals. Iran has made consistent and resilient efforts to defeat the outbreak and slow down the spread of this pandemic. India is coping up with the current economic issues alongside handling a huge population during the covid-19 lockdown.

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