CONTROL OF COVID-19: A COUNTER FACTUAL ANALYSIS

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Abstract

The counter factual study represents that how a nation like India with special reference to Himachal Pradesh, can adopt, adapt and adept significant national and international approaches followed by the countries and regions to address the COVID-19 pandemic. The paper analyses the two strategies Strategy 1: People being encouraged to stay at home and indulge in frequent washing of their hands and maintaining hygiene; Strategy 2: From rate cuts to quarantines, public officials being pushed to respond to the corona virus along with three Levels (I,II,III) of stringency in the India in general and Himachal Pradesh in specific and its impact on the Covid-19 containment has also been analysed.

The average rate of, COVID-19 tests per million, New Cases, Cases Recovered, Active Cases (%), Recovery rate (%) and Mortality rate (%) has been studied in detail against the stringency parameters. The data represents the position prior to Covid-19 pandemic, the achievement over the period of time via timely intervention and stringent strategies. The study represents that India is lucky to learn from the experience of other countries who are fighting or have fought COVID -19 pandemic. The data availability and experiences of other countries in hand although challenges of India are different, still India could replicate the best practices followed by the nations such as South Korea and China besides the indigenous Kerala model. Bringing further the point, it is pertinent to mention that Wuhan was under complete lock down, entirely cut off from the rest of China, till the number of positive cases were reduced to

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Zero. South Korea was so aggressive in its Covid-19 testing that almost every citizen was screened to rule out undetected and asymptomatic cases. Is India Going In the right direction in its fight against Covid-19?

Keywords: *Counter Factual Analysis, Stringency Index, Mortality rate, Strategy, Active/Confirmed Cases.*

1. Introduction

A time when every country believed it was invincible and were busy exploring opportunities of more wealth and riches for their respective nation, a virus brought the whole world down to its knees and forced the nations including the powerful (nuclear) ones to resort to severe steps of lockdown, self-isolation and quarantine to contain the corona virus. The fact is well proved by the failure of the healthcare system of most developed counties such as Italy, USA, Spain and France, to save their citizens from COVID-19. These countries are found with high infection as well as high morbidity rate as compared to the other countries of the world. A brief about corona virus and medical aspects:

• Corona viruses belong to a large family of viruses, some causing illness in people and others that circulate among animals, including camels, cats, bats, etc. Rarely, animal corona viruses may evolve and jump species to infect people and then spread between people as witnessed during the outbreak of Severe Acute Respiratory Syndrome (SARS, 2003) and Middle East Respiratory Syndrome(MERS, 2014).

• The etiologic agent responsible for current outbreak ofSARS-CoV-2 is a novel corona virus closely related to SARS-Corona virus. In humans, the transmission of SARS-CoV-2 can occur via respiratory secretions (directly through droplets from coughing or sneezing, or indirectly through contaminated objects or surfaces as well as close contacts).

• SARS-CoV-2 is a new Corona virus, with first infections detected in humans late in 2019. The emergence of SARS-CoV-2 has led to a large outbreak in China and is currently causing outbreaks in many countries. The disease spectrum ranges from uncomplicated upper respiratory tract infections to severe viral pneumonia with multi-organ failure and death. It can be

transmitted by droplets from asymptomatic or oligosymptomatic patients and possibly through aerosols in health care environments.

• Current estimates of the incubation period of COVID range from 2-14 days with refinement over the time, climate and country. Most common symptoms include fever, fatigue, dry cough and breathing difficulty.

• As per analysis of the biggest cohort reported by Chinese Center for Disease Control and Prevention (CDC), about 81% of the cases are mild, 14% require hospitalization and 5% require ventilator and critical care management. The deaths reported are mainly among elderly particularly those with co-morbidities besides the younger population below the age of ten years.

• Till today, no specific medicine has been identified or invented for the treatment of the disease COVID-19 because of mutation in strain CoV-19. Few drugs that are contextually used for its treatment include Hydroxychloroquine and azithromycin, lopinavir; ritonavir, remdesivir, tocilizumab, corticosteroids and certain nucleotide as inhibitors.

• Although World Health Organization (WHO) has also not strongly recommended any specific drug for its treatment, hence, clinical management of COVID-19 with a specific medicine is still under investigation. The whole world is struggling to bring out a specific treatment schedule against COVID-19 at this time point.

On 31st December 2019, the World Health Organization (WHO) China Country Office was informed of cases of pneumonia of unknown etiology (unknown cause) detected in Wuhan City, Hubei Province of China. On 7thJanuary 2020, Chinese authorities identified a new strain of Corona virus as the causative agent for the disease. The virus has been renamed by WHO as SARS-CoV-2 and the disease caused by it as COVID-19. The disease since its first detection in China has now spread to over 200 countries/territories.

World Health Organisation (WHO) on 11th March, 2020declared COVID-19 was a pandemic and urged nations to take all possible steps within their means to contain the virus from spreading. The focus of spread was in China, which later shifted to Europe, North & South America, Asia, Australia

and Africa. WHO has advised countries to take a whole-of-government, whole-of-society approach, and build a comprehensive strategy to prevent infections, save lives and minimize the impact.

2.   Health Care System in India

India too has its fair share of, clusters and large outbreaks which had it not been contained at the right time, the risk of further spread would remain very high. India, being the 2nd largest populous country, where, the healthcare system is severely suffering due to lack of infrastructure (0.7 hospital beds per 1000 people), medical equipment and doctors (doctor: population ratio is 1: 1800 instead of 1:1000), is surprisingly far from the predicted high rate of infection and mortality under COVID-19. The whole world is keenly watching, ow India is successfully saving its people (since large portion of its population suffer from less hygienic life style) from COVID-19.

As per government, two key factors are believed to have controlled the high infection rate in India. They are stringent social distancing via lockdown in the entire country and promotion of health and hygiene among citizens (regularly washing hands with soap and/or to sterilize with alcohol-based sterilizers/sanitizers). Additionally, other associated societal or daily life activities supporting the above two steps are also imposed by the Government on its citizens. The above two steps appeared to be highly effective in nature.

India is fully aware that it cannot afford sufficient clinical care to all infected, in case major portion of total 1.3 billion population will contract COVID-19. Nonetheless, the results are quite impressive for India as even though being the 2nd most populous country. India, as compared to other progressive countries, is not at all under the grip of the disease. India declared a very strict social distancing for 21 days, and allowed only emergency services such as security, health and food chain to be available. Social distancing was very stringent during those 21 days (though many opine it as harsh), however, so far it has yielded a positive result. The police was deployed on roads to keep people confined to their houses besides imposing curfew and total ban on movement of public traffic except for essential and emergency

services. India was applauded by World Health Organization (WHO), United States of America (USA) etc. for the strategies that enabled the government to give a checkmate to both the rate of infection and mortality in India.

Apparently, it is concluded that social distancing is highly important at this point of time to control the rate of infection of COVID-19 along with clinical management in India, to offer time to the researchers to come up with suitable medicine or vaccine against CoV-19 infection. Perhaps a strict social distancing gives India a prize value of 0.2 deaths per million people (rolling data) under COVID-19, which is quite low in comparison to other countries. May be this is the reason, there was a high chance for India and other countries to extend (as USA has adopted) the lockdown period to 45 days instead of 21 days, and it is implemented. Other nations who have not maintained social distancing must take a page from the lessons learnt in India, that to observe a harsh social distancing covering their entire nation to fight COVID-19 disease.

Every Indian state had put in her efforts to tackle the COVID-19 medical emergency and Himachal Pradesh too has made its road map of handling the pandemic. As compared to the top most COVID-19 affected states, Himachal Pradesh is in a far better off position because of its timely medical intervention and other stringent steps.
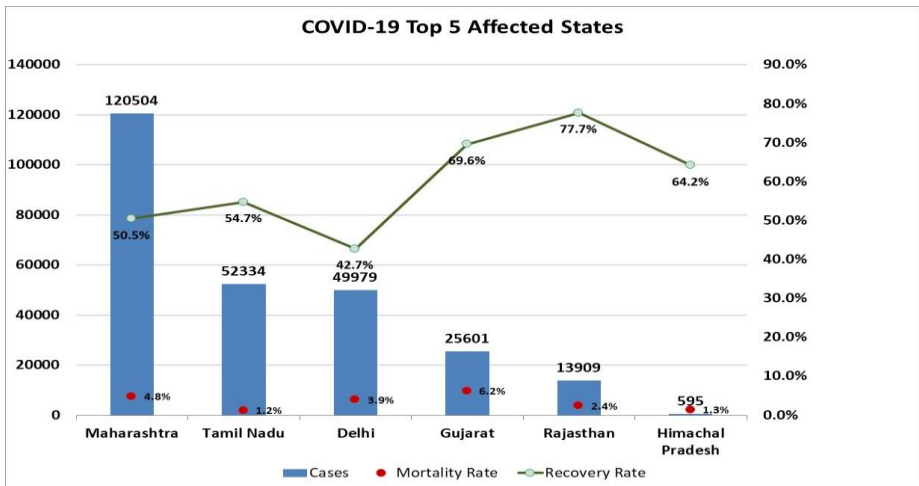
Updated: 18th June 2020

The graph represents the comparison of top 5 COVID-19 affected states with that of the state of Himachal Pradesh. The population of Himachal Pradesh is

nearly 68.6 lakhs persons (2011 census) spread across 55673 Sq. Km area. The state has successfully contained the spread of the virus with its proactive strategies and measures. Maharashtra the worst hit state with COVID cases to the tune of 120504, mortality rate of 4.8% and recovery rate of 50.5% while Himachal Pradesh, as on June 18, 2020 have a mere 595 confirmed cases which make up 0.16% of the total confirmed cases in India. The first confirmed case was detected on March 08 which suggests that in the last 50 days the cases haven't spiked compared to those in cities like Mumbai, Delhi. The overall increase in the daily cases has been quite low which is worth mentioning. It is important to note that the recovery rate of Himachal Pradesh is 64.2%. almost similar to states like Gujarat, Rajasthan that claim to be ahead, with respect to health and other infrastructure had a recovery rate of 69.6% and 77.7% respectively, were not able to contain the spread of the pandemic. It shows how meticulous planning and execution can enable one to have an exceptional recovery rate and contain the virus before it takes a fatal turn.

3.   Objectives

The objectives of this paper include:

• To study the significant national and international approaches adopted by the countries and regions to address the COVID-19 pandemic with emphasis on Himachal Pradesh with a view to check the spread of disease.

• To examine and analyse the national and international approaches adopted by the countries and regions to curtail the spread of COVID-19 pandemic and the techniques adopted for treatment of the infected population besides preparedness for the prospective infections.

• To find out the variations in different approaches to address and control the COVID-19 pandemic.

• To suggest the lessons for future in such disaster situations with a view of preparedness and mitigate them.

4.   Research Methodology

The work is a commentary paper with analytical research based on secondary data. The significant national and international approaches adopted by the countries and regions have been examined as model. The approaches followed have been analysed with counter factual analysis.

The cases have been analysed on two main approaches i.e. Diagnostic Approach based on Extensive Testing and Surveillance vis-à-vis Preventive Approach based on Social Distancing and Lock Down followed by the countries and regions.

5.   The Factual Position

The different models have been presented as cases below:

5.1   *Avoiding COVID-19 Infection and Spread*

Strategy: *People are being encouraged to stay at home and indulge in frequent washing of their hands.*

Many countries have mandated that people quarantine at home, in a bid to limit all forms of social contact in order to control the spread of the fatal virus. According to the World Health Organization (WHO), most people who become infected with COVID-19, experience mild illness and recover, though it can be more serious for others (the elderly and the already ill/poor immunity are at particular risk). WHO recommends that people frequently wash their hands with either soap and water or alcohol-based hand rub, and that they maintain distance of at least two yards (six feet) between themselves and anyone who is coughing or sneezing - as this can spray small liquid droplets that contain the virus. WHO also recommended that people should avoid touching their eyes, nose, and mouth, as there is high probability that their hands are infected with viruses transferred from various surfaces. Person with fever, cough, or breathing-difficulty is advised to seek medical help immediately. According to the WHO, there is no evidence that masks alone can protect people from falling sick, however, they advise that those taking care of an infected person should use. In a bid to bust some corona virus-related myths, the WHO says -it is safe to receive

packages from China, and that existing pneumonia vaccines provide no protection.

India:

The World Health Organization praised India for its tough and timely efforts to control the spread of corona virus. There has been no community transmission of corona virus since the country went into lockdown, and the growth factor of cases has declined by 40%, according to recent press briefings from the Union Health Ministry.

Since 24thMarch, 2020, India has been under a nation-wide lockdown and hence the death toll due to the corona virus virus disease 2019 (COVID-19) in India was 356 persons as on 14th Apr, 2020, the lockdown has now been extended by the Government to at least May 31, to curb the spread of the virus. India is not among the worst-hit countries, but its grossly under-funded and patchy public health system, with huge variations between different states, poses special challenges for the country's disease containment strategy. Over the past few weeks, there have been several reported instances of patients trying to flee from isolation wards in government hospitals and hide travel history. Many with exposure to suspected cases of COVID-19 and infected persons have also tried to dodge the mandatory home quarantine. An overstretched public health-care system forces millions of Indians to turn to the unregulated private health-care sector. The Indian government's expenditure on health as a percentage of GDP still hovers around 1.5%, one of the lowest in the world. For around 52% of households in urban areas, and 44% of households in rural areas, the private sector is the main source of health care when they are sick, according to government data.

India, under lockdown, fought back against COVID-19 with a "cluster containment strategy" to contain the disease within a defined geographic area by early detection of cases, breaking the chain of transmission and thus preventing its spread. India's 'cluster-containment' strategy means focusing on early detection of cases and demarking areas as Red, Orange and Green zones has enabled the health authorities to monitor the containment zones and bring in relaxation in lockdown norms in case no new cases are

reported. As per a statement issued by the Indian Health Ministry, India will be following a strategic approach taking into account different possible scenarios – travel-related cases, local transmission of COVID-19, large outbreaks amenable to containment, and widespread community transmission of COVID-19.

Most of the credit goes to the states that are aggressively fighting the battle with the virus. Different states have tried to follow varied strategies to handle the pandemic at their respective level like, Kerala flattened the curve via the creation of a contagion route map. Odisha's susceptibility to natural disaster gave it an advantage in crisis preparedness which in turn enabled the state to handle the pandemic efficiently.

Himachal Pradesh:

The state of Himachal Pradesh urged its natives to stay at home and indulge in hygienic practices like regular washing of hands and maintaining cleanliness. The Health Department and designated test centres started the testing of its natives. The total persons tested in the state were 59214 out of which 58063 persons were reported negative, only 595 cases were confirmed positive, 382 patients recovered but unfortunately 6 patients lost their lives till 18th June, 2020.
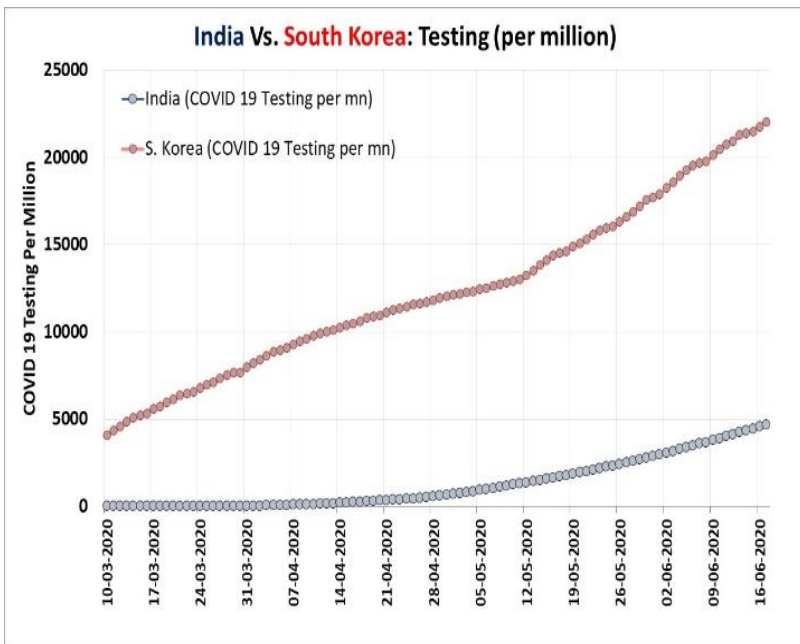
Sr. No.	Particulars	Persons in Numbers
1.	Persons tested	59214
2.	Persons Negative	58063
3.	Persons Positive	595
4.	Migrated Out Cases	4
5.	Active Cases in the State	205
6.	Recovered Patients in the State	382
7.	Deaths Due to COVID-19	6

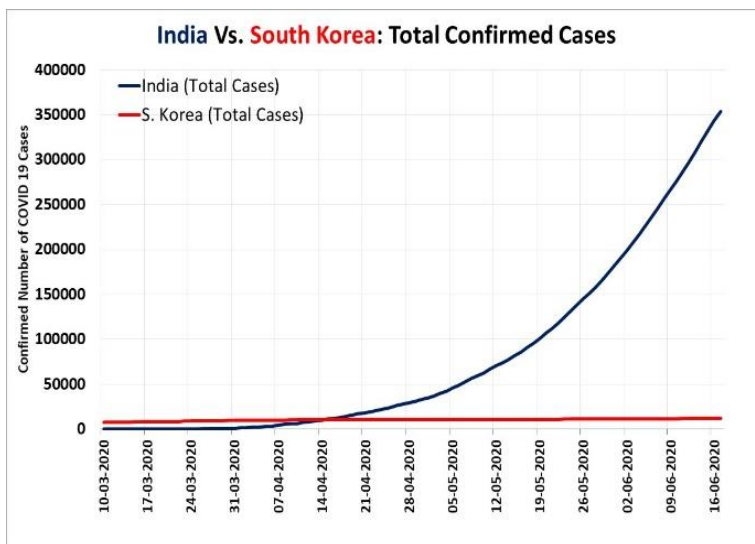*Source: http://covidportal.hp.gov.in/As on 18th June, 2020*

5.2   Government Response to COVID-19

Strategy: *From rate cuts to quarantines, public officials are being pushed to respond to the corona virus.*

Government of hundreds of countries and territories with confirmed cases of COVID-19 sought to proactively soften its impact at a relatively early stage. South Korea, for example, managed to administer tests for the corona virus to a relatively large part of its population in short order, and authorities there have aggressively sought to implement a contact-tracing regime to identify and isolate those most at risk. Officials in Iceland have placed a strong emphasis on mass testing, while the Czech Republic moved relatively swiftly from border closures, to a nation-wide quarantine, to a mandate that any essential outdoors activity had to be done while wearing a mask. Mobility restrictions have helped curb the spread of the corona virus, but have also led to dramatic declines in business - prompting calls for government relief. In the US, lawmakers approved a $484 billion relief package that includes aid for small businesses, and European Union leaders agreed on a €540 billion corona virus aid package. Some large businesses have pleaded for financial relief, raising the prospect of bailouts similar to what was administered amid the global financial crisis more than a decade ago.

Source: https://www.worldometers.info/coronavirus/

India Vs. South Korea: Total Confirmed Cases

Source: https://www.worldometers.info/coronavirus/

The above graphs represent (the time period between 10thMarch,2020 – 18th June,2020)a comparison of COVID tests per million population by South Korea with that of India. The testing in South Korea increased at a steady rate per million of its population while India did not undergo rapid testing of her citizens until April end. During the month of March, India had only a handful of confirmed COVID cases and was better off than South Korea. In the month of April, India showed an upward trend in the number of confirmed cases while South Korea showed a stable position. The total confirmed cases of COVID-19 patients in South Korea were far less as compared to India. South Korea maintained the range of 10,000 persons while that of India shot up to more than 50,000 persons during the same time period.

India:

India followed China's example of implementing a lockdown to contain the spread of the novel corona virus but allowed more international travel concessions for people. This kind of relaxations come with its inherent risks and repercussions. The Health Ministry has recommended universal screening of all international flights, cancellation of biometric, filling of Self reporting Forms.

India followed WHO-prescribed patient management guidance which included interim clinical care guidance for hospitalised patients and home care guidance for those with milder infection which may be treated at home in isolation when health system is strained. It has also recommended isolation across India besides ensuring protective gears, medicines and other essential services. The Ministry of Health and Family Welfare (MoHFW), Government of India, is taking all possible measures to prevent, detect and reduce transmission of COVID-19 across the country. The country took all possible efforts to strengthen health system as well as wellbeing of the public officials and health worker by equipping health care workers with evidence based materials, resources, protection guidelines and tools required to safely and effectively manage the infection.

Health Service Provider toolkit for designated Hospitals and General health facilities were developed to assist the health care staff. The objective behind the tool kit was to make all possible information available to minimise risk of our health care staff to help them serve the community in a better way. The kit contained guidance from MoHFW and WHO on infection prevention and control in health care facilities. The Ministry provided the Containment Action Plan to all states. Senior officers were deputed to states and union territories to continuously review the preparedness and provide required guidance in the containment effort. The District Magistrate were appointed as the nodal officers for the containment operations under the provision of Disaster Management Act. All concerned public officials were roped in to manage the crisis both efficiently and effectively.

The Kerala Case

The state of Kerala has been doing exceptionally well (graph below) as compared to the state of Himachal Pradesh, because it has learnt from its past experience of having successfully dealt with the fatal Nipah virus outbreak 2 years ago. The Nipah experience offered precious lessons to the state vis-a-vis handling of medical emergency. Kerala has efficiently utilised its lessons and is a front-runner in containing the pandemic by building a robust health infrastructure and developing trust of the natives in the health mechanism. As per a spokesperson, "COVID 19 treatment is currently focused in government hospitals. In most parts of the country, these

hospitals have been underfunded, not patronised by the rich and powerful; their staff are demoralised. This does not change overnight. Trust in government is an important component in an emergency health response. Kerala has always been proud of the technical quality of its government hospitals. Since 2005, the state government investment has gone up considerably. The Aardram project of Kerala government has further raised the profile of government hospitals; substantial investments have been made. With limited information coming from the rural parts of the country, only the coming weeks will show the real impact of the current measures."

Source: https://www.worldometers.info/coronavirus/
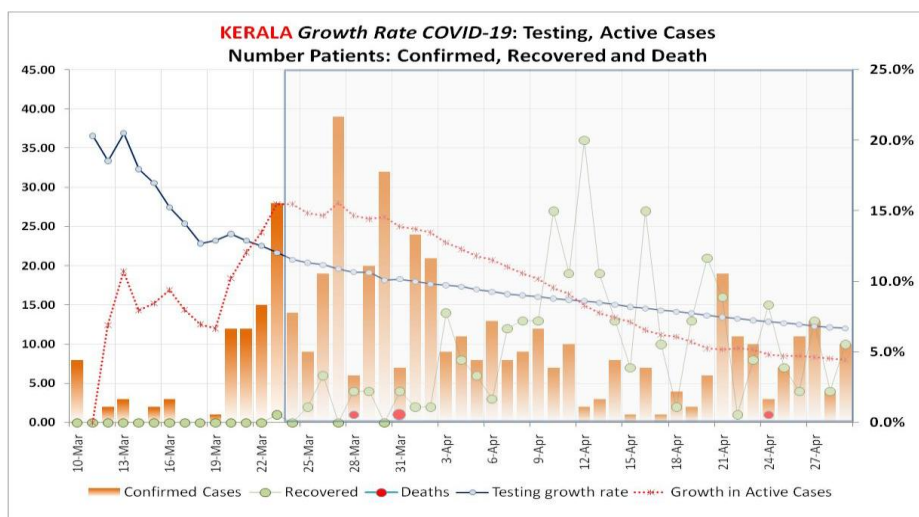
Himachal Pradesh:

The state got into war mode the day it reported its first two cases. Though section 144 of the Criminal Procedure Code prohibiting a gathering of more than four people was already in force in vulnerable pockets, a state wide curfew was imposed on March 23, a day before Hon. Prime Minister Narendra Modi announced a countrywide lockdown. Schools and religious institutions were closed earlier with hospitals only treating emergency cases. Six hospitals were designated for Covid-19 treatment. Rigorous contact mapping of all the positive cases was also done. A new challenge emerged when those with Jamaat links started testing positive. After a warning that all Markaz attendees disclose their status or face action, more than 1,000 such

people and their primary contacts were quarantined. Strict vigil was maintained at the borders and anyone entering HP was kept in institutional quarantine for 14 days. Panchayati Raj representatives were entrusted with the task to inform the authorities about anyone concealing information about outsiders in hiding. Authorities in HP shared contact numbers of their counterparts with people stranded outside the state who called the Himachal helpline number for help. Strict curbs were imposed on the movement of vehicles and persons even during curfew relaxation with a curfew e-pass system launched.

Further, Deputy Commissioners and Superintendents of Police were directed to extend all possible facilities to the people kept in quarantine centres including ensuring proper social distancing must be ensured in these centres. The officials were asked to identify some hotels, guest houses and Dharamshalas for keeping the people under quarantine so that they could be provided with better facilities. The Deputy Commissioners were asked to make the home delivery system for providing essential commodities to people more effective to ensure proper distancing among the masses. In rural areas, the government involved Panchayati Raj Institutions to provide delivery of essential commodities to the people nearer to their localities and to ensure the public vigilance for reporting the people coming from outside to their localities. Volunteers were urged to come forward for home delivery of essential items to the people. Further, the Tehsildars, Naib Tehsildars, Kanungoes and Patwaris due to retire in April, 2020 were given one-month extension to continue their support in the field. Police Department ensured to honour valid passes provided by the competent authorities and avoid un-necessary harassment of people
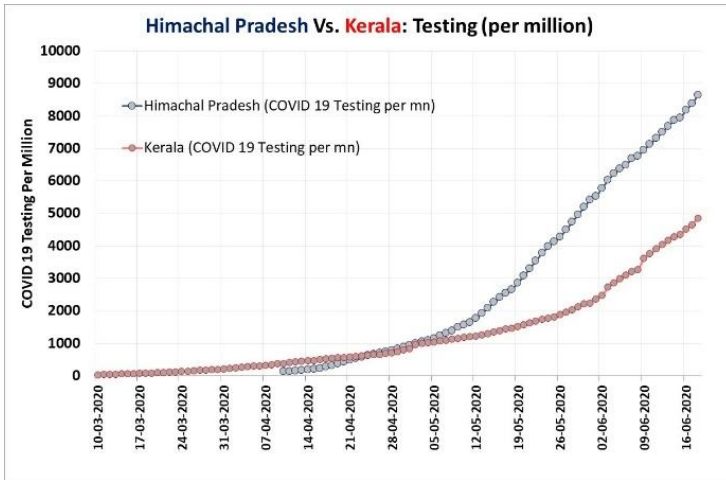
The Health Department adopted a three-pronged strategy, it activated an integrated disease surveillance programme to strengthen and decentralise laboratories, allowing authorities to monitor the disease trend and response to the outbreak. Four labs conducted Covid-19 tests. Rapid response teams were pressed into service after years. The government also launched a massive Active Case Finding Campaign. More than 8,000 two-member teams moved door-to-door to screen people for influenza-like illness (ILI), connecting with about 70 lakh people. Of this, authorities identified 10,000 with ILI symptoms, who were tested for Covid-19. Testing was ramped up

due to 15 mobile sample collection vans. The authorities arranged for home delivery of essential items including medicines, through 1,706 authorised shops and vendors, and were able to reach out to about 12.82 lakh people. Ration was provided to migrant labourers and poor people with the help of various NGOs.

Strict vigilance and restrictions on movement of people were the two important measures that helped Himachal Pradesh control its rising number of novel corona virus cases. The biggest factor that helped to control the situation was strict vigilance. Himachal Pradesh sealed its border and while other states were implementing the lockdown, went ahead and imposed curfew in the state.

The state was in a good position with reported 42 cases and there had been no new case for the past ten days although two new cases were reported only on 4th and 5th May, 2020. Out of the 42 cases, only two were active cases while unfortunately, two patients died. According to list of Red, Orange and Green Zones earmarked by the central government, zero districts were under the Red Zone, six districts under the Orange Zone and six districts under the Green Zone as on 10th May, 2020.The state was able to achieve this because it went for Active Case Finding. The strategy even found favour with Hon. Prime Minister of India, who told other states to emulate the same. The Prime Minister of India through video conferencing with the state heads, also urged other states to follow this model of active case tracing as much as possible. Under the campaign for active-case tracing, the state government collected data of every individual in the state by roping in Asha workers. Nearly 16,000 health care workers went from door-to-door to collect data. Besides this, all those who showed symptoms were tested for Covid-19.

However, the war is not yet over, especially after HP opened its borders allowing residents stranded outside to return. Now students and workers who are returning home from other states are put in quarantine and tested for Covid-19.

Source: https://www.worldometers.info/coronavirus/

Source: https://www.worldometers.info/coronavirus/
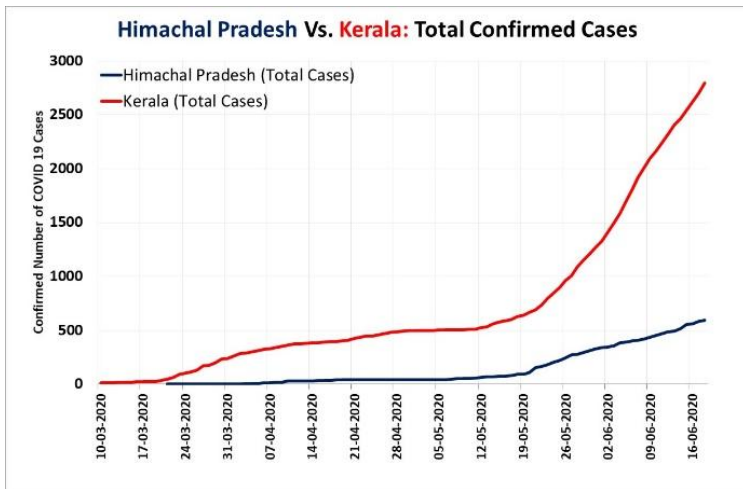
6. Counter Factual Analysis

In the counterfactual analysis, the outcomes of the intervention are compared with the outcomes that would have been achieved if the intervention had not been implemented. The method of counterfactual impact evaluation allows to identify which part of the observed actual improvement (e.g. increase in income) is attributable to the impact of the

intervention (since such improvement might occur not only due to the intervention but also due to other factors, e.g. overall economic growth).

In its simplest form, counterfactual impact evaluation (CIE) is a method of comparison which involves comparing the outcomes of interest of those having benefitted from a policy or programme (the "treated group") with those of a group similar in all respects to the treatment group (the "comparison/control group"), the only difference being that the comparison/control group has not been exposed to the policy or programme. The comparison group provides information on "what would have happened to the members subject to the intervention had they not been exposed to it", the counterfactual case.

The case for counterfactual impact evaluation is based on the need to collect evidence and determine whether policy objectives have been met and, ultimately, whether the resources were used efficiently. The interventions with detail are produced below:

Date	Interventions
March 12, 2020	Advisory regarding mass gatherings in view of COVID-19
March 18, 2020	Preventive measures to be taken to contain the spread of Novel Corona virus (COVID-19)
March 23, 2020	Recognizing the importance of social distancing –All interstate movement of public and private stage and contract carriages including taxies, auto rikshaws
March 26,2020	Guidelines regarding Model Micro-Plan for containment of Local Transmission of COVID-19
March 29,2020	Letter for Corona Mukt Himachal App along with Guidance
March 30, 2020	Orders for Active Case Finding in Districts for COVID and under COVID Regulations
March 31, 2020	Extension of Lock Down Orders

Source: National Health Mission, HP

Table: CFA- Tests Conducted, New Cases, Average daily recovery, mortality rate

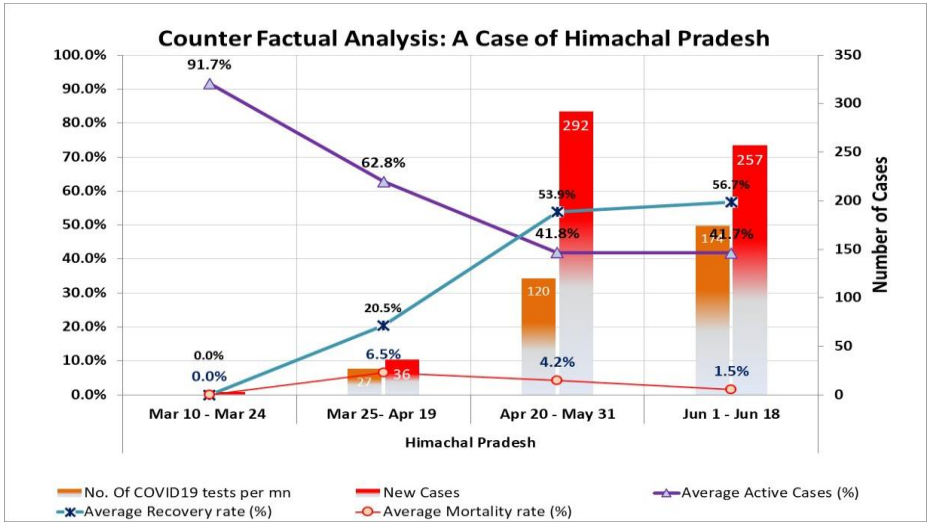| Phases	State	No. of days	COVID19 Test per mn	New Cases	Cases Recovered	Deaths	Active Cases (%)	Recovery rate (%)	Mortality rate (%)
Phases	**Himachal Pradesh**	100	121	588	378	8	50.2%	42.3%	4.2%
Phase-I	Mar 10 - Mar 24	15		3	0	0	91.7%	0.0%	0.0%
Phase-II	Mar 25- Apr 19	26	27	36	16	2	62.8%	20.5%	6.5%
Phase-III	Apr 20 - May 31	42	120	292	102	4	41.8%	53.9%	4.2%
Phase-IV	Jun 1 - Jun 18	17	174	257	260	2	41.7%	56.7%	1.5%
	Kerala	100	47	354210	251240	15571	69.3%	27.1%	2.8%
Phase-I	Mar 10 - Mar 24	15	1	462	24	10	85.1%	7.5%	1.6%
Phase-II	Mar 25- Apr 19	26	11	15395	2827	497	86.9%	10.2%	2.9%
Phase-III	Apr 20 - May 31	42	61	166431	145916	8325	62.2%	34.7%	3.1%
Phase-IV	Jun 1 - Jun 18	17	106	171922	102473	6739	45.8%	51.4%	2.9%
	India	100	47	2686	1324	21	52.6%	46.8%	0.6%
Phase-I	Mar 10 - Mar 24	15	7	94	1	0	99.9%	0.1%	0.0%
Phase-II	Mar 25- Apr 19	26	16	295	269	3	70.9%	28.5%	0.6%
Phase-III	Apr 20 - May 31	42	40	869	320	7	23.3%	76.0%	0.7%
Phase-IV	Jun 1 - Jun 18	17	142	1428	734	11	55.5%	43.7%	0.8%
	South Korea	100	181	4685	10553	225	26.9%	71.1%	2.0%
Phase-I	Mar 10 - Mar 24	15	192	1524	3260	66	82.3%	16.7%	1.0%
Phase-II	Mar 25- Apr 19	26	157	1624	4535	114	35.6%	62.6%	1.8%
Phase-III	Apr 20 - May 31	42	163	807	2380	36	10.6%	87.1%	2.3%
Phase-IV	Jun 1 - Jun 18	17	254	730	378	9	8.1%	89.6%	2.3%

Source: https://www.worldometers.info/coronavirus/

The table represents the impact of three stage/level restriction strategy- work place closure, social distancing and lock down measures adopted by India vis-à-vis South Korea with special reference to the Indian state of Himachal Pradesh and Kerala. The table represents how the restrictions were imposed at three levels.

- The first level (I) (restriction) recommendation to impose lockdown with maximum relaxation (as per need) India went into the level one restriction in the year 2020 from March 10 to March 24 where the recovery rate was 7.4% and mortality rate was1.6% while that of South Korea's first level restriction was from March 10 to March 21 where the recovery rate was 11.0% and mortality rate was 0.9%.

- The second level (II) of restriction with limited relaxation was imposed in India from April 20 – May 6,2020 which resulted in a recovery rate of 23.2% and mortality rate of 3.2%,South Korea adopted the second level of restriction in two phases (time period) March 22 – April 5,2020 & April 20

– May 6, 2020 which resulted in recovery rate of 67.3% and mortality rate of 1.9%.

- The third level (III) and most stringent (strict) restriction was imposed by India from March 25 – April 19, 2020 which led to a recovery rate of 9.2% and mortality rate of 2.8% while South Korea underwent the third level restriction from April 6 – April 19, 2020 which resulted in recovery rate of 69.9% and mortality rate of 2.0%.

- The table also shows a comparative data of Himachal Pradesh and Kerala (states of India) with India as a whole. The recovery rate of Himachal Pradesh during the three level restriction from March10 – May 6, 2020 - level I,II,III enforced during different time periods was 0.0%, 61.4%and 17.6% respectively while that of the country (India) as a whole was 7.4%, 23.2%, 9.2% respectively. The average recovery rate of Himachal Pradesh was 32.3% while that of the country was 12.9%. This commendable recovery rate enabled the state to contain the virus and preventing it from becoming a community spread.

- The mortality rate of Himachal Pradesh during level I,II,III was 0.0%, 2.6%, 5.3% respectively while that of the whole country was 1.6%, 3.2%, 2.8% respectively. The average mortality rate of Himachal Pradesh was 4.0% and that of India is 2.6%.

- The state of Kerala has a recovery rate and mortality rate of 35.5% and 0.4% respectively while Himachal Pradesh is pretty close to Kerala with recovery rate and mortality rate of 32.3% and 4.0% respectively. Kerala has had faced a fatal virus Nipah infection in its state two years ago and ever since the Nipah experience Kerala had built a robust a health infrastructure to handle such type of other viral infections. They have an upper hand in containing COVID because of their past encounters with such viral infections while Himachal Pradesh has never ever faced such medical emergency in the past. But, the state of HP is putting its best foot forward to contain the pandemic with all possible acumen.

Source: https://www.worldometers.info/coronavirus/

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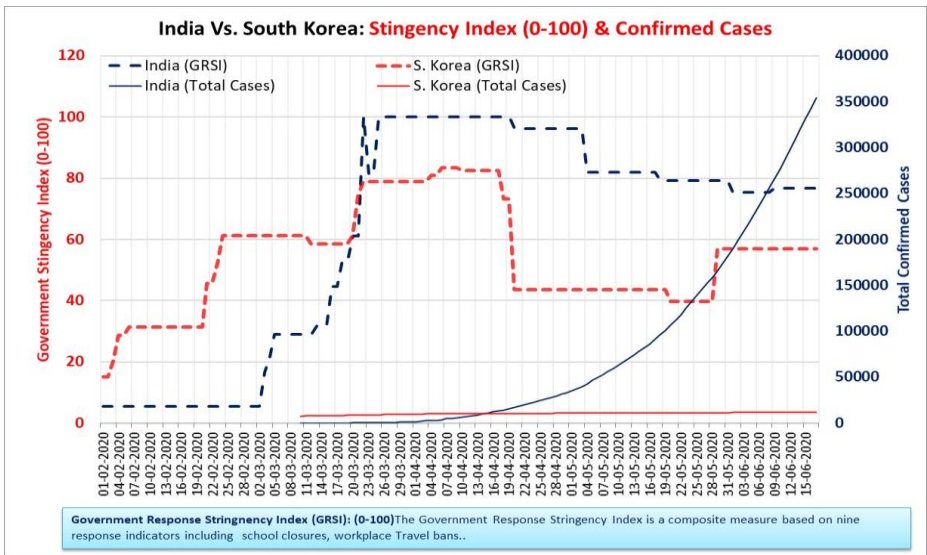
The graph represents the stringent measures adopted by both India and South Korea (1st Feb'20 to 1st May'20) with reference to indicators like complete lockdown, closure of educational institutions, work place, travel ban, mass gathering etc.

- In the month of February, India followed a relaxed/no restriction approach in the wake of the detection of COVID-19 within its domestic territory, while South Korea had already put level II restrictions/recommendations in the wake of COVID-19 situation in China. It had Drive-through testing centres in place to cater to the testing requirements.

- By March end India followed a very stringent (complete lockdown) by bringing in Level III restriction while South Korea stuck to its level II restrictions and continued with rapid testing which enabled them to maintain the confirmed cases to the tune of 10000.

- When the stringency was at its peak, India experienced maximum spurt in cases because it was during this time that India undertook massive rapid testing regime while South Korea was steadily conducting rapid tests and putting its infected cases into self-isolation or dedicated quarantine centres for medical attention.

- South Korea steadily followed its Level II restrictions thereby allowing its economy to continue working. Although it did shift to stringent Level III but only for a short duration of two weeks but again reverted back to Level II as it seemed more feasible from the economic point of view.

7. Findings

The counter factual analysis of Himachal Pradesh represented that –

- The timely intervention by the authorities at different time periods since 10thMarch – 6th May, 2020 enabled it to contain the spread.

- The average number of active cases in the state was at 88.9% and average mortality rate was at 0.0% when only Level I- limited advisory in the form of recommendation was exercised.

- During the period from 25th March – 19th April Level III when strict implementation of lockdown was exercised the State of Himachal Pradesh, the average number of active cases fell to 67.3% while the state

started it detection of active cases by conducting rapid tests. The average mortality rate was at 5.3%.

- The period ranging from 20th April – 6th May, Level II represents relaxation with lock down showed further fall in average active cases to 36.0% while the average mortality rate fell to 2.6%.

- It can be deduced from the study that the average recovery rate (61.4%) showed huge improvement with limited restriction i.e Level II as compared to Level I and Level III 0.0% and 17.6% respectively. Also the number of COVID test per million increased during the level II restriction period.

8. Suggestions

India now is exploring ways to exit the corona virus lockdown, will the government, and most importantly the people, follow the South Korea route?

Lessons learnt from South Korea

- South Korea reorganised its medical system by started Public health hotline system to minimise people to people infection at hospitals.

- If found infected, patients received medical care in quarantined environment.

- Contact tracing. Early and mass testing. In about six weeks 3,00,000 people were tested leading to early detection and self-isolation to prevent infection.

- Drive-through testing sites that not only reduced the testing time but also protected medical staff.

- Mandatory face masks and mass production of test kits to conduct massive tests

- Focus on severe cases to reduce mortality rather than diverting attention to mild cases.

- E-governance and full utilisation of IT infrastructure.

- Medical expense cover for COVID patients and paid leave to the infected alongwith basic living expenses to the poor thereby ensuring social security and less need to leave residences or shelters.

- Transparent information dissemination via publications to develop trust among the citizens.

- No severe restrictions/minimum restrictions to ensure the requisite functioning of the economy and its activities.

Lessons learnt from Kerala

- Evolved Virus protocol with WHO
- Covid-19 control room put in place as early as 24 Jan 2020.
- Frequent Mockdrills to be on guard, in case another fatal outbreak happens.
- Creation of Rapid response teams.
- Robust public and private health model.
- Culture of Grass root democracy with proactive village council working hand in hand with health workers.
- Student volunteers who proactively worked as a support system alongwith government mechanism to combat Covid-19
- First state inIndia to buy rapid test kits and conduct tests on a large scale.
- First state to get permission from ICMR to test plasma therapy treatment of foreign tourists.
- Community kitchens to feed the guest migrant workers and the poor. Mid-day meals delivered to the doorstep of school children.

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