Education

Health expenditure - a gain or a loss during covid-19

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Abstract

Pandemics create destruction in the economy where it undergoes a fall in GDP growth, unemployment, deficits of government due to pulling down of productive processes and many such terrible situations depending upon the scale and pernicious effects of the disease. When any specific country suffers from such a situation, its economy is affected surely, but due to today's developing and friendly environment towards trade and other policies favoring relations with other neighboring countries, it brings a major change in other economies as well. Therefore, it's necessary to have a proper focus on the economic actions of our own country or state as well as those of our neighborhoods.

A similar situation emerged at the end of 2019 when an infectious disease later named Corona and renamed COVID-19 affected people's lifestyles and lives all over the world. It was a severe condition because of which a nationwide lockdown to prevent the spread of such a disease was announced by the central government. Although everyone involved in major decision making tried their best, there were differences in the countries and even states of the respective countries in the situations that were prevailing. Therefore, our study has tried to observe the pattern mainly in health expenditure during the period of 2019–2021 (a period of massive loss), limiting our base to only four such Indian states, but the findings can be generalized as well if taken in broader terms. As we are well aware of the famous saying, "Exceptions always exist", so in that case, the study might fail, but overall it can be viewed as impressive.

Keywords: COVID-19, Per capita health expenditure, Vaccination impact

1. Introduction

According to the World Health Organization (WHO), COVID-19 confirmed cases as of September 6, 2022 were 4,44,66,862 the estimated number of deaths was 5,28,030, or roughly 1.187% of the total number of cases stated [1]. According to the World Bank study released in 2021 and WHO data sources, the total number of cases makes up approximately 3.12% of the world's population.

According to verifiable papers, the terrible epidemic that caused the Indian economy's GDP contribution to decrease during 2020 and beyond was COVID, it was believed that, it had its origins in Wuhan, a city in China. On February 11, 2020, the virus was renamed by the World Health Organization to COVID-19 before it was identified as a Coronavirus. According to the Health Ministry, the first case in India was discovered in Kerala on January 30, 2020, after the patient returned from Wuhan University in China. Taking into account health it was a significant issue in India at the time since the government was concerned about how the situation was deteriorating rapidly and how many people were passing away. Health is a state concern, under the Indian Constitution. However, the establishment of public healthcare infrastructure is also significantly influenced by the federal government. The Union and state governments should work together to offer individuals access to quality healthcare and preventive health services, but as of right now, they are not required to do so by the constitution. Healthcare spending is increasing across India. In absolute terms, CSR spending on healthcare increased by 12% across India, from Rs 4,886 crore in 2019-20 to Rs 5,474 crore in 2020-21 [2]. Surprisingly, the share of spending in the education sector fell from 36% in 2019-20 to 31% in 2020-21.17-Jun-2022, Manish Kumar, an AIIMS Delhi sanitation worker under former Union health minister Harsh Vardhan, led the first vaccination drive in India on January 16, 2021. As of September 7th, 2022, India's vaccination drive has made significant progress, with 68.39 people fully vaccinated with the last dose of the primary series per 100 populations, and 12.3 people boosted per 100 populations.

Pragyan Deb et al. (2021) discussed about the state- level health and economic impact of COVID-19 in India. Khetrapal et al. (2020) found that there will be a need for greater financial investment by the countries to reinvent and reinvigorate health systems and use them as an opportunity to improve access. Rajiv Raman et al. (2021) presented "Impact of healthcare services during lockdown" that predicted Impact of economic slowdown, unemployment and financial constraints in each household with time as people's responses focus on livelihood rather than lives. Dr Kanchan Mukherjee et al. (2021) examined before, during and beyond COVID-19 on healthcare innovations in India. Ronnie Thomas et al. (2021) discussed the economic and catastrophic health expenditure associated with hospitalizations in Kerala, South India. N Ravichandran et al. (2020) considered Modernizing India's Healthcare Infrastructure and contributed his view that it requires

modernization and a 'new normal' scenario requiring appropriate resources and facilities to achieve the country's health objectives. Aditya Kumar et al. (2021) studied demand for Grants 2021-22 Analysis Health and Family Welfare, concluding by sharing his opinion that in 2021-22, the Ministry has an allocation of Rs 73,932 crore. Under the Ministry, the Department of Health and Family Welfare accounts for 96% of the Ministry's allocation at Rs 71,269 crore whereas the Department of Health Research has been allocated Rs 2,663 crore. Smt. Nirmala Sitharaman (2022) presented the economic survey regarding "vaccination should be treated as a macro-economic indicator". Jahidur Rahman Khan (2020) according to them, study suggests that population density, underlying burden of NCDs, and low health expenditure on their own may not be as strong predictors of COVID-19 fatality as some current commentary suggests. Beyer et al. (2020) took research on COVID-19 and public health in India. Kirtti Kumar Bebarta et al. (2022) analysed health expenditure due to hospitalization treatment in India and commented that multivariate analysis showed that utilization of private hospitals was a key determinant of incurring catastrophic expenditure.

Going through the journey of reading these articles we all got motivation to have some knowledge about the topic and under the guidance of our professor we initiated this project taking relatable topics and tried finding about the current scenario of states because of COVID- 19 pandemic. But learning about that only will not give us much of the essence of impact so we decided to work on the data of health expenditure and related factors. Thus, our study will try to showcase some useful insights why there is variation in performance of states during the period 2019-2022.

2. Methodology

This research is constructed on the basis of secondary data available as open sources on WHO, PSRINDIA, MY GOV etc. All the data used is directly imported from these websites only and then adjusted as per the requirements of our analysis.

We have tried to keep the data of our study comparable by using excel and basic knowledge of some concepts like percentages and per capita. Some of the presented data (graph or table) is adjusted for the population size of the respective state so as to have an equitable comparison. Others are adjusted on the basis of their per capita GDP to analyse the health expenditure increment before and during the pandemic to gain some useful insights.

3. Literature review

Pandemic is a situation where whole country or even the world suffers from a widespread infectious disease caused by any reason. Similar situation arose in the end of 2019 or more accurately in the beginning of 2020, the situation was under control till the point WHO realised that it's not that easy to handle this virus named CORONA. That was the turning point for every country there were many disputes regarding its origin but later the studies revealed the truth. This was the time where after few months everyone was having pressure to keep the public of the individual states and even for the entire country to safe and also keeping the deficits along with other major concerns like GDP growth of the economy and so on. In April 2020 according to ILO in the paper by Omir Kumar et al. that even unemployment might also be affected and estimated 2.5 crores jobs loss in the economy [3]. Not only this power sector also faced around 3% fall in supply in psr report [4].

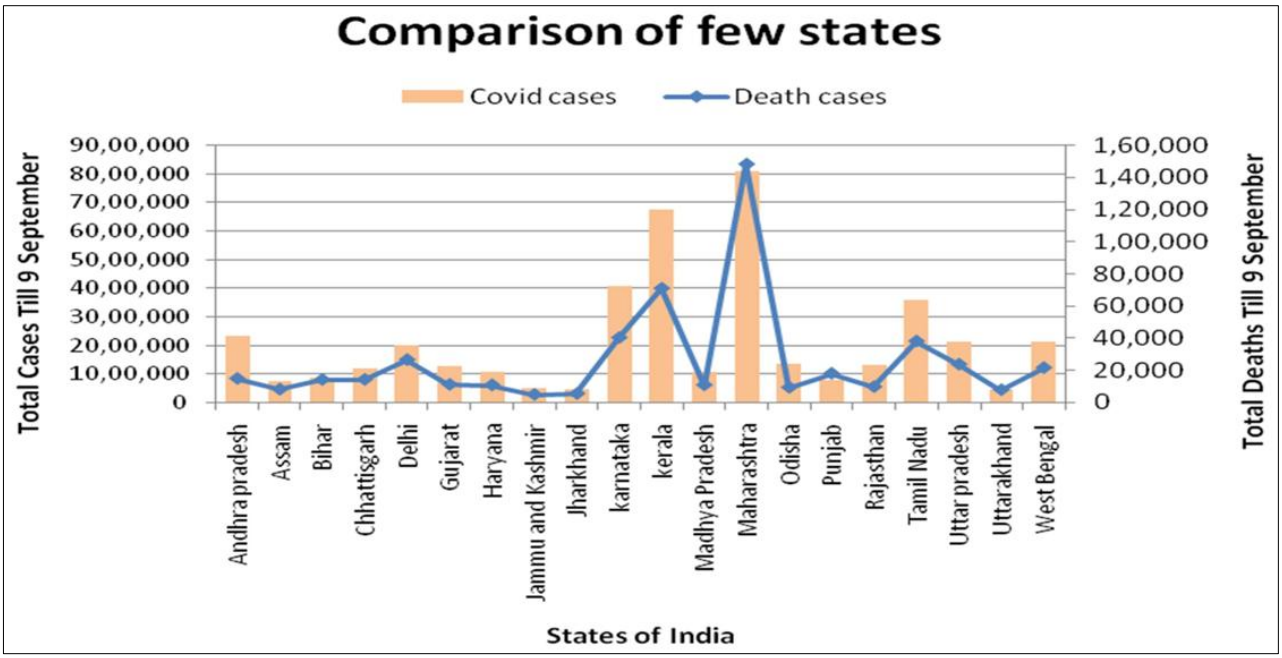
4. Objectives

The key objectives of our study are:

- To find about health expenditure during COVID-19 in few selected states of India
- To capture the relevance and precautionary effect of vaccination
- To analyse the health condition of citizens during the duration
- To study what policies were implemented to safeguard the states

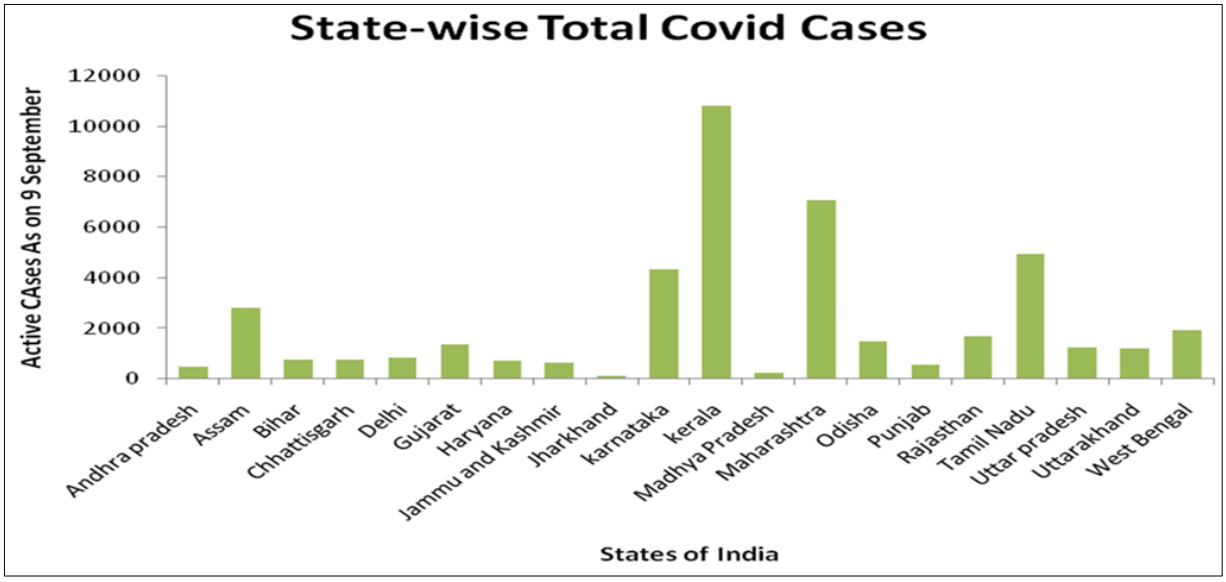
5. Analysis of COVID-19 cases

As per the recent data available on world health organization (WHO) the pandemic created disaster for human life as well as the economy of the world. The pandemic increases the death rate and reduces the life expectancy of human beings. In India the pandemic influenced every sector and daily life of the citizens of India. Government takes initiative to deal with the pandemic. India is quasi federal (sometimes act as federal and sometimes unitary) but in pandemic both union and state government work as federal and fight together against this pandemic COVID 19 or Coronavirus.



Source: My GOV - #IndiaFightsCorona COVID-19 in India, Vaccination, Dashboard, Corona Virus Tracker | mygov.in

The above graph shows that Maharashtra has the most total COVID cases and death cases, with 81,08,442 and 1,48,280 cases, respectively, dated until September 9, 2022. Kerala, Karnataka, and Tamil Nadu were also severely affected, with estimated active cases and death cases being moderate in these states. The pandemic affected every part of the country, irrespective of the more populated states or the largest states. Arunachal Pradesh, with a population of 1.53 million, was also affected by the pandemic, with a total of 66,757 cases and the lowest death rate compared to the other larger states 296. The strategy to tackle the pandemic was formed Triaging and Monitoring the Patients, vaccination, imposing restrictions on mobility of people and material things to halt the spread of virus which can transmit via air, touch etc.



Source: My GOV - #IndiaFightsCorona COVID-19 in India, Vaccination, Dashboard, Corona Virus Tracker | mygov.in

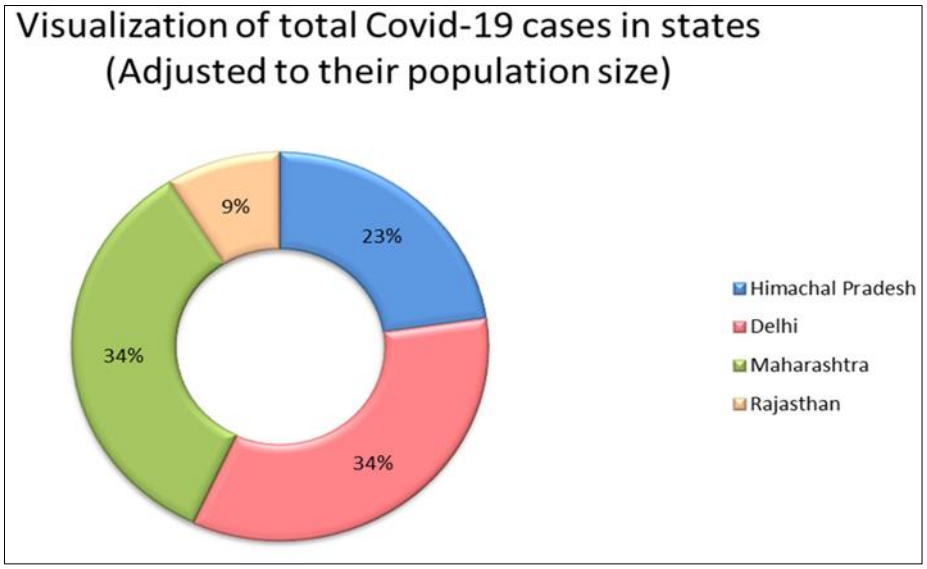
The result of this graph depicts about active COVID -19 cases in India as per the overwhelming health systems across states. As per the graph Kerala has the highest number of active COVID-19 cases followed by states like Maharashtra, Tamil Nadu, Karnataka and Assam as on 9 September 2022. These current cases vary from state to state depending on their health expenditure and strategies formed during the period. There were even few states where we can see a smaller number of active COVID-19 cases such as Jharkhand, Madhya Pradesh, Andhra Pradesh, etc. but from this we can't be sure they were actually that much negligible or it was due to less populated states. The reason for these variations may depend on various factors such as better health facilities in some states than others or population density of the states, etc.

From the projected data available on My Gov. site the total active cases of above listed states in graph counted to around

44,033 and among them Kerala counts to highest percentage of cases on the date i.e. 24.53% whereas it was just 0.26% in Jharkhand.

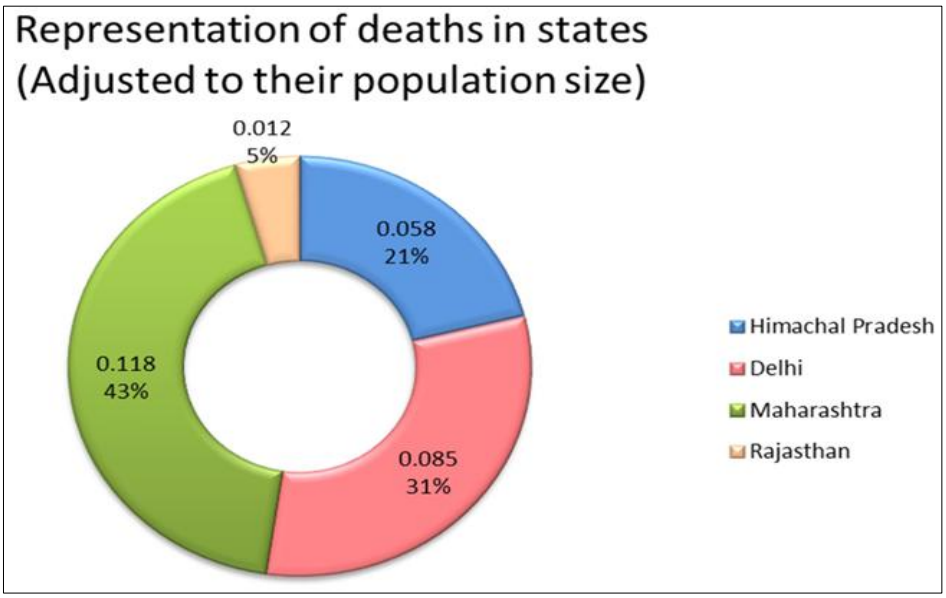
6. Comparison of four varied states

According to WHO data on COVID-19 cases published on their website, two states performing poorly and two performing moderately well in dealing with the pandemic situation have been considered to further investigate what factors contributed to such variations in the number of cases and increased death rates. Delhi, Maharashtra, Himachal Pradesh, and Rajasthan will be worked on further, with the first two performing poorly and the latter two performing well.



Source: My GOV - #IndiaFightsCorona COVID-19 in India, Vaccination, Dashboard, Corona Virus Tracker | mygov.in List of states with Population, Sex Ratio and Literacy Census 2011

We considered the total COVID cases of these four states, and it is clear that among these four states, Delhi (pink) and Maharashtra (green) have the most cases, covering nearly 34% of the area each (among above mentioned states only). Some may believe it is because they have different population sizes, which may affect the data and percentages represented in this chart. To keep the data similar in terms of population so that the graph can be properly visualized, we first converted the number of cases to percentage terms with respect to the state's projected population (2021- 2022) and then presented it in this form.



Source: My GOV - #IndiaFightsCorona COVID-19 in India, Vaccination, Dashboard, Corona Virus Tracker | mygov.in List of states with Population, Sex Ratio and Literacy Census 2011

According to official government guidelines, India is preparing for the COVID-19 outbreak, and avoiding specific crisis actions or understating its significance will have extremely serious consequences. Even so, we can relate to our state's

situation not improving much, as Maharashtra still has an estimated death rate of 0.11% in this period (of population size), as well Delhi has a high death rate when compared to the other two states i.e. Himachal Pradesh and Rajasthan, which have only 0.05% and 0.012% of their total cases registered respectively, respectively. The factor that could explain why the progress of respective states is so disparate is health expenditure (many more factors can influence such changes, but we will further research on health expenditure to capture the approximate factor).

7. Health expenditure a possible factor

Table shown below contains four rows and five columns, where the names of all states are mentioned in the first. The second row shows data on average GDP of respective states during the period 2016 to 2019, with digits in cores. Similarly, the third row includes information on GDP of time period 2019-2021 taken as average. These states are not directly comparable due to a variety of factors, including population size, schemes implemented, and so on. As a result, in the next two rows of the table, we calculated the per capita expenditure before COVID and during COVID to compare about the expenditure in much more similar way. And in the last section of the table it is visible that increase in expenditure is considered for studying about their conditions. All the above data is sourced from open available data on ministry of statistics and personal response system of India.

States	GDP (2016-19)	GDP (2019-21)	Per capita expenditure before	Per capita expenditure after	Increase in expenditure
Delhi	6,81,649.00	3,99,155.00	0.809	1.724	0.915
Maharashtra	23,76,865.00	16,12,006.50	0.531	1.131	0.6
Rajasthan	8,37,013.00	4,78,956.00	1.193	2.948	1.755
Himachal Pradesh	1,37,875.67	78,261.00	1.396	3.684	2.288

Source: Budgets (prsindia.org) Health and welfare expenditure of each state GDP of Indian states - StatisticsTimes.com for the purpose Gdp data

We can looking to the data presented in the table showing that Himachal Pradesh and Rajasthan have a negative or inverse relationship between health expenditure and COVID-19 cases, which appears to be verifiable because, according to the literature review, if a country or state invests in their health sector, the people in that area have much better health. Last column of last two rows indicates the registered data for Himachal Pradesh and Rajasthan that there was incredible increase in their expenditure to health sector improvement to keep their people safe.

However, the main source of concern is that two of the four states where the relation is still inverse but in opposite terms. Here we are considering Delhi and Maharashtra, that they have not invested much in health sector which is clearly the result having more drastic and worse situation during COVID-19 they faced. However, this strengthens our literature as well as figures from the other two states, implying that other factors may influence the number of cases varying in these states, but improving hospitality conditions is most important in such times of struggle. It's the government's responsibility to take initiatives to address this situation. There can be many more factors influencing the result we got here so moving towards the study on vaccination drives conducted by these states.

8. Comparison based on vaccination drives

The table presented below depicts the information of vaccination drive initiated by the central government to prevent spreading up of disease. Here we can dive into the data and can realise the difference of vaccines taken by people in respective states.

States	Population Projection (2021-2022)	Percentage of First dose	Percentage of second dose	Percentage of Booster dose
Delhi	3,20,66,000	56.96312917	48.73721699	9.62918044
Himachal Pradesh	73,16,708	90.60055424	85.99648913	28.01485313
Rajasthan	7,82,30,816	72.77053329	64.67121217	8.395474234
Maharashtra	12,54,11,000	72.99599317	60.83986732	7.030197511

Source: My GOV - #IndiaFightsCorona COVID-19 in India, Vaccination, Dashboard, Corona Virus Tracker | mygov.in for vaccination dose List of states with Population, Sex Ratio and Literacy Census 2011

The first number in front of states represents the projected population for the period 2021-2022. The next 3 columns show the value of dosage 1 and 2 along with the booster dose in percentage terms. The data clearly predicts how responsible people are and how much the government is concerned, stating the highest overall 1st dosage of vaccination in Himachal Pradesh and the least in Delhi.

The second dose is also higher in Himachal Pradesh than in Rajasthan and Maharashtra. Even after approximately the same percentage of first doses in the bottom two states according to the table, still cases were high. This may be because the population of Maharashtra became more lenient towards the importance of vaccines. Even though Delhi was still experiencing high temperatures, people were not paying much attention to vaccine regulations, with only 48% of the population receiving the second dose.

Then comes the booster dose. It may be possible that people are more adaptive to the running circumstances still if the government has started providing a third vaccine on their own expenditure (for free). But people are not taking it seriously as

results show that only around 5% to 10% have taken this precautionary dosage, where as in Himachal Pradesh it is almost 28%. So we can infer that the role of vaccination also provides some insights that it's not important to just spend on the health sector. Along with that, proper policies and awareness by the government are important. Not only government residents should be self-responsible for their health in order to live a healthy life.

9. Differences in other factors among states

As we are well aware, not only vaccination and health expenditure are necessary for better performance; other factors also have an important impact on variation in the situation in states. Few of them we have tried mentioning below [5];

- **Beds facilities:** When we compare the hospital beds available in these four states according to a published report by Princeton University, we can adjust for population size and find that Himachal Pradesh fared much better than the other three states, with approximately 0.2% of available beds for people, including both private and public. In addition, the availability of ICU beds during this period was limited to Himachal but still higher than the other three states lacking adequate bed facilities.
- **Migrants:** If one considers the data on reverse migrants, we can have a clear image that this factor might also have a significant role in worsening the situation. As per the count among these four states, Maharashtra and Rajasthan had the most in-migrants. These people might be the hosts of disease and can transfer that to others as well.
- **Malnutrition:** If a child is facing a situation of malnutrition, he has high chances of being sick, as studies predict, and if we look at their future impact on health, it might be harmful for them as they might have more chances of coming into contact with diseases. So we can cover this profile under the human development index, which shows that about 40% of people suffer from malnutrition problems in Rajasthan, followed by Maharashtra with 37%, and so on. This also has an impact on situational damage to states, so anyone having broader knowledge can dive into this factor as well to get a more accurate impact on health during a COVID pandemic.
- **Policies:** Individual states battled the situation in their own ways, which also had more or less of an impact on the severe conditions the public faced. The Delhi government began disinfecting all vehicles as much as possible, while Maharashtra issued an order closing schools and other public places. The Rajasthan government also enforced some restrictions on travel and formed rapid response teams at college and district level. Similarly, in Himachal, COVID e-pass software was developed to track inter-state movements. There were many other such policies taken into action which have improved or worsened the situation in their own way, depending on the circumstances prevailing.

The above-mentioned reason might or might not be significant once a proper study on them is conducted but as we had a limited scope so these are not generalized, they are just provided to give our viewers the idea in which they can further take our study. Thus, there can be many more such factors influencing the overall situation of people which states have faced now. And there always exist a scope of having a better situation while handling such pandemics if there are good policies, infrastructure, proper involvement of both government and their public etc.

10. Conclusion

Here we end our study because of limited resources and other constraints, and we can conclude that during our analysis we have made literature prevailing before more relevant by providing some useful data and graphs. Therefore, our research on the topic provides that it's always better to have better health infrastructure in the state so that any battle against disease can be fought with ease without sacrificing the lives of people on a large scale. As we all know, the public are the major asset for the government as well as for the economy, although it's not just a matter of being concerned about the economy giving more importance than one's life, still. We refer to them as assets because they are the ones who will work more efficiently if they are provided with better health care services, increasing their efficiency by working in the economy and contributing to overall growth. Thus, this sector should be given priority and proper investments should be made to improve facilities along with having more advancement in the research and development sector. In a nutshell, we can say that in an emerging economy, public health is a significant part of the government's responsibility to give the utmost care. In the end out study reveals that there can be more reasons why states have such differences but a major role is of health facilities provided by the state to the public and that to available to all sections of the society.

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