



Statistical Analysis for Socio-Economic Impacts of Covid-19 Pandemic

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Abstract

The evolved corona virus has affected the worldwide situation today, as it was first stroked Wuhan in Mainland China in midst of November. Various causes have been seen in the countries such as economic loss, loss in healthcare, loss in industrial sector, the declining in the percentage of GDP of the country as a whole. In our study, we have analyzed the data on the basis of impact of COVID-19 on the GDP and Unemployment Rate in the United States, China and India. The United States was considered to be as the largest economy in the world but due to hitting of viral infection, there is a downfall in the GDP of the country which further has increased the Unemployment rates in the US. In China, after having control and getting recovered from COVID-19 pandemic it has started the recreation of the Economy. Although, the unemployment rate in China also got decreased at the peak level of infection in Wuhan but later the mitigation steps were taken by the Chinese government. In India, the corona virus spread was initially reported in the midst of January. The infection rate was multiplying at a very rapid rate in India similar to the China and US. As India is a developing nation, the GDP and Unemployment rates fluctuates at a regular time interval. India being a second most population per density nation has been largely impacted by the COVID-19 pandemic and increased the unemployment which is of major concern. As a result of which, we have compared India with respect to the US and China to mitigate the impact of COVID-19 pandemic.

Key words – Covid-19; Unites States; China; India; social- distancing; Economy; Unemployment; GDP (Gross Domestic Product)

Introduction

GDP (Gross Domestic Product) is the term which propels that what is the health of the country's economy. It further elucidates that all the values been added to all the finished

goods as well as various services around the borders of a specific country within a given specific period and also includes the products been produced by the individuals of a country and the other foreigners in their specific borders [1, 2]. As accounted by the

International Monetary Fund, the United States is the world's largest economy holder followed up by the other two which are China and Japan [3]. If we look even closer, amongst the top economies in the world there is a common in both Nominal and PPP methods i.e, The United States. It constitutes almost one- fourth of the world economy [4, 5]. Accordingly, it is having the world's highest number of deaths from COVID 19. [6]. Reports are stating that United States is still lacking some basic strategy planning techniques so as to adopt and put a control on

the epidemic and recreating the economic status [7].

In the Asian region, India also claimed the complete lockdown strategy with effect from 24 Mar 2020, at that time the data of the death individuals were somewhat 10 deaths in a country of 1.3 billion people and the hospitality status is also not so jammed with the infected patients comparative to US [8]. Unlike the other Asian countries there was an ignorance of this alarming stage and continuously reporting the people of US that everything was under control [9]. This shows the hyper- partisan and the characteristics of irresponsibility allies in the

Congress following up the lead of Trump, hence cutting down the funds to World Health Organization (WHO) in the very midst of the Pandemic. So the record is very clear; measures taken by the China not so early but yes after analyzing the heavy destruction to its entire economy to control the epidemic while US didn't[11]. The United Kingdom, under Prime Minister Boris Johnson made himself landed in the ICU and similarly the graph for Europe is also having a worst trajectory [10].

Amongst all regions throughout the globe, the US was reported as the first country having suspects of COVID-19 infection, after the outbreak of coronavirus in Wuhan in December 2019 [12, 13]. After having the first case been reported, health emergency was confirmed in the US (Washington) on 21 January 2020 who was having a travel history to China. It has been recorded that US is a larger platform for the immigration of the

individuals from US to China and various reports depicts the tourists coming to the regions of China and spending billions of dollars in the country[14]. The US was reported with a first death case on 29 February 2020 with a corona virus infection [15]. Following up this, another case was found to be in the regions of Washington and Oregon which gives intimation to an alarming stage of the pandemic [16]. Impact on the tourism is not only because of the corona pandemic but also due to the US-China trade war stroked in 2018, as a result of which it left the deep impact on tourism with a great loss as analyzed from the economists and their prediction models [17].

Amongst the affected zones of the US, most affected is the New York reporting highest number of COVID-19 infected cases. The deaths recorded in the New York almost contributes 40% of the total deaths in the whole country due to which there is activation of National Guard and the government has announced it as a declaration of the disaster for that state [18, 15]. There were announcement regarding emergency alert for the COVID-19 pandemic resulting in avoiding the several imports such as approval of the corona virus kits, commanding travel restrictions and making the individuals of US to evacuate from the countries trailing from the coronavirus so as to reduce the further community transmission.

As stated earlier, the quarantine/ social distancing was for only 2 weeks now it was extended and was declared by the US government till dated 30 April 2020 [19, 15]. It can be noted that US companies are

dependent on the India and Europe for the imports of Pharmaceuticals and this sector is also majorly affected by the pandemic of COVID-19.

Active Pharmaceutical Ingredients (API) is been majorly imported from the India around (18%), from the European Union around (EU 26%) and from China it is around 13%. From this, the officials of US Food and Drug Administration (FDA) noted that APIs been importing from the India and European Union have a saving between approx. 30-40% of the total costs for the Pharmaceutical industries of US and European Union [15].

Largely, China is considered to be as the major imported for the manufactured medical instruments in the states of US setting a benchmark value of around 39.3% [20]. Discussed earlier, states of China are been majorly affected from infection of COVID-19, in fact the borders are also been sealed ultimately leading to a supply loss along with the revenue loss to the US manufacturers and assemblers [21]. Companies of US are scrambling for the same as their dealings have been seriously devastated and having the 30% resume in the working people in the business of China post the corona virus outbreak [22]. So, the basic effect caused is the problems been facing in the importing of the products from China [23]. Many of the brands and companies are searching for the tools and parts for the complete manufacturing of the outputs but in that case also big industries such as Apple, Caterpillar and various other firms getting disturbed.

Looking to the present scenario been affected with the pandemic COVID19 facing the high demand but there is low supply due to which

the components have reached the prices with 30% than the products imported from China [22]. A group of distinct pneumonia cases were counted in Wuhan, a city having around 11 million residents and the place is also prominent for the largest center of transport in the Central China province. Confirmation for the novel corona virus [24, 25] was recognized as an agent been responsible for causing inter-transmission of viral disease amongst *homo-sapiens* [26, 27]. Presently there is no vaccine designed for the treatment to prevent from infection of corona virus. In order to prevent further inter community spread all the facility contributing to transport service was shut down in the Wuhan city on 23 January 2020. Later, to keep the citizens free from contamination, this quarantine seems to be the biggest quarantine (i.e. movement restriction) even in the history of human. On 23 January 2020, China announced social distancing measures as an emergency step addition to banning the travel in the Wuhan, school were closed, entertainment places were shut, no social gatherings after been confirmed with the various suspects of confirmed corona virus, but then also after accounting such hard measures this pandemic aroused in the entire globe [28].

Furthermore, travel restrictions were made with effect from early February to the China from the other countries such as USA, France, Italy, Russia, Australia; flights were made limited by the action of the government [29-34]. Based on this literature, it is quite difficult to predict the perception of the risks with this new corona virus similar to Spanish Flu in its virology behavior and as well as with the symptoms could also be very high,

especially when there is no vaccine, no treatment for the infection in the early stage. The decision of the Chinese government was hard and effective as the quarantine leads to no community transmission of the corona virus, the cases been confirmed were from other countries as proclaimed by the health authorities [35]. All the market places were shut, schools and universities were remained closed and breaks were prolonged. Initially people were permitted to visit marketplaces but later the situations become tightened [35]. China has set some examples in the model prepared for the overcome of the pandemic and using various technologies to mitigate the impacts of COVID-19 [36]. Working as a helping hand, robotics was used to minimize the effect of pandemic as in hospitals spraying the disinfectant for sanitization, doubling up as the worker in the hospitals, working in restaurants as waiters, medical companies using a few robotic devices for the transportation of the medical devices. Monitoring for new cases was performed from drones, satellites, designed health applications, artificial intelligence, big data and facial recognition. [36] Although the loss occurred in the COVID-19 pandemic, affected the major industries as the China is the largest supplier in the chain of trading and business. The China's original equipment manufactured material (OEM) is exported to other major country regions as a raw supplier in the chain of business and economy [37].

Majority of the original equipment manufacturers (OEM) did an amendable job by increasing their work in production of the distinct and new products. When the production mass was decreasing continuously in the China during mid-

February, retooling was started by the automobile industries and various other industries producing medical face masks, this kept a positive impact on lowering the spread of COVID-10 in the community and on the other hand the Chinese government was creating a revenue to the country along with reputation for the company. Various measures were taken by the China to mitigate the spread of COVID-19.

To increase the production of the food supplies, medical equipment's, construction of the large hospital platform workforces were called off from the remote places to recreate the situation on the normal aspects [37]. During the infection prevailing in the Wuhan shutting down of the industries and even most part of the Mainland China were remained closed for a period. This mitigated the impact of corona virus on the further transmission in the Mainland China. When the entire globe was fighting with the covid-19 outbreak, China was about to recover from the pandemic and the Chinese government was ready to send the health experts team to Italy, Spain and other countries for medical help during crisis. The main reason for the declination of the US economy was not declaring the complete lockdown in the country as the virus was pathetically hitting the population, this leads to a sharp fall in stock markets in the US and leading to unemployment in the country.

In the Early of March, the newly cases were reduced at a good extent in China and the economy was climbing in the upward direction as the work was on the track. Allowing the population in the quarantine state and complete lockdown led to overcome

the further impact of Corona virus in the Mainland China. As slowly depriving from the virus impact, China started rebuilding its economy by opening the industries, manufacturing companies, buying the shares from other countries.

After hitting the China, the first case of corona virus in India was reported in the state of Kerala. India is the second most populated country in the world and this infection can cause a severe damage to the population of India. There could be same chances of spread of corona virus in India also having social gatherings as the India is a religious country having a high rate of religious tourism. All the tourism hotspots in India are reported to be closed after the national lockdown announced in India by the Prime Minister Shri Narendra Damodar Das Modi on 22 March 2020. Moreover to that, a 21 day lock down was also implemented from 26 March 2020 to 14 April. Before the country on lockdown, there were several cases with positivity reported along with several deaths in the distinct states of country. First death due to corona virus in India was reported on 12 March 2020 in the state of Karnataka.

Seeking to the scenario of the infection majorly spreading throughout the country the lockdown was further extended till 3 May 2020. According to the census data, reported dead cases are almost 600 in the entire nation India till dated 20 April 2020. India is also adopting some measures and building a strategic planning for the mitigation of pandemic COVID-19. Majorly affected regions of corona virus in the India are Rajasthan, Maharashtra, Telangana, and Kerala. Corona virus has a major impact on

the country India by clearing the circuit of the trading with China as the importing has been closed for a period due to which manufacturing companies, pharmaceutical companies, electronics and auto parts companies are facing problem. India is providing the largest platform to China for importing the business and trading including almost 50 percent of the top five items such as some of the auto parts, machinery parts in the industries, chemical in their organic form and many of the medical instruments for health care sectors.

The objective of the paper is to compare GDP of Major Countries like the USA, China and India before and after the Impact of Covid-19 Pandemic.

Material and Methods

I. Data Materials

We have done the data collection from the various business and trading portals for the GDP and Unemployment rates been faced after and before the COVID-19 pandemic prevailing in the country [38-47]. This electronic survey comprises the data till March 2020. The portals have been regularly updated with the authenticated information regarding a particular data of the country. The graphs have been plotted for the data values for GDP and Unemployment taken from the Data Source websites and with the help of Microsoft-Excel bar-graph is plotted for the US, China and the India.

II. Data Analysis

The data information retrieved from the electronic portals regarding the GDP and

Unemployment rate in the various countries around the globe. In “**Fig.1**”, the illustration of a block diagram summarizing the impacts on the economy of the US, China and India from COVID-19. As there is major impact of COVID-19 on economy by disturbing the cycle of industries, manufacturing industries, healthcare, IT sectors, pharmaceutical sectors. As the data mentioned below in the tables express the figures of GDP for the USA, China and India along with data census of Unemployment Rate in the respective countries corresponding to the graphs been plotted in the Microsoft Excel.



Fig. 1 Block Diagram depicting the outcomes of the COVID-19 Pandemic in different nations such as (a) China (b) United States (c) India

In the given below “**Table I**”, Impact on the Economy of US can be inferred as in concordant years the overall GDP for the US according to forecast survey done during the pandemic, it has been reduced to 20140.00 USD Billions from 21200 USD Billions i.e. almost 1060.00 USD Billions. Whereas, in case of Unemployment Rates in the “**Table II**”, figures has been affected severely due to impact of COVID-19 Pandemic. In the past year April 2019 the unemployment rate according to the census was 3.6% and in the year 2020 during the pandemic the figures forecasted are to be 4.4% i.e it has increased almost 0.8%, which is of major concern.

If we analyze the Economy of China from the “**Table III**”, it can be inferred that from 2017- 2020 the overall GDP for the China according to forecast survey done during the pandemic, it has been increased to 15100.00 USD Billions from 14200 USD Billions i.e. almost 900.00 USD Billions. Whereas, in case of unemployment rates in china as shown in “**Table IV**”, depicts that In the past year, April 2019 the unemployment rate according to the census was 3.61% and in the February 2020 after the recovery from pandemic the figures forecasted are to be 4.2% i.e it has increased almost 0.59%.

Similarly, in context to India the impact on economy depicted in “**Table V**”, shows the figure according to forecast survey done during the pandemic, it has been increased to 2950.00 USD Billions from 2800 USD Billions i.e. almost 150.00 USD Billions. In case of unemployment rate affected from Pandemic can be inferred from “**Table VI**”, in the past year, March 2019 the unemployment rate according to the census was 6.7% and in the March 2020 during the pandemic the figures forecasted are to be 8.4% i.e it has increased almost 1.69%.

Table I. GDP of the US (Source- Trading Economics)

Frequency (in Years)	Figures in USD Billions
2017	19485.39
2018	20544.34
2019	21200.00
2020	20140.00

Table II. Figures showing Unemployment Rate of the USA (Source- Trading Economics)

Frequency (in Months)	Figures in Percent (%)
Apr 2019	3.6
May 2019	3.6
Jun 2019	3.7
Jul 2019	3.7
Aug 2019	3.7
Sept 2019	3.5
Oct 2019	3.6
Nov 2019	3.5
Dec 2019	3.5
Jan 2020	3.6
Feb 2020	3.5
Mar 2020	4.4

Table III. GDP of the China (Source- Trading Economics)

Frequency (in Years)	Figures in USD Billions
2017	12143.49
2018	13608.15
2019	14200.00
2020	15100.00

Table V. GDP of the India (Source- Trading Economics)

Frequency (in Years)	Figures in USD Billions
2017	2652.24
2018	2718.73
2019	2800.00
2020	2950.00

Table IV. Figures showing Unemployment Rate of the China (Source- Trading Economics)

Frequency (in Months)	Figures in Percent (%)
Apr 2019	3.61
May 2019	3.61
Jun 2019	3.61
Jul 2019	3.61
Aug 2019	3.61
Sept 2019	3.61
Oct 2019	3.61
Nov 2019	3.62
Dec 2019	3.62
Jan 2020	3.62
Feb 2020	4.2

Table VI. Figures showing Unemployment Rate of the India (Source- Trading Economics)

Frequency (in Months)	Figures in Percent (%)
Mar 2019	6.7
Apr 2019	7.4
May 2019	7.0
Jun 2019	7.9
Jul 2019	7.3
Aug 2019	8.2
Sept 2019	7.2
Oct 2019	8.1
Nov 2019	7.2
Dec 2019	7.6
Jan 2020	7.2
Feb 2020	7.8
Mar 2020	8.4

From this, we can interpret that GDP which comprises the national economy of a whole country is been affected from the outbreak of corona virus spread in the USA, China and India comparatively to past three years. The loss in food security in the country is not as such been reported. The values of GDP mainly comprise of the effect on industries, healthcare, manufacturing companies, oil based sectors, IT sectors, Travels and Tourism industry, etc. Similarly, the data for the Unemployment Rate in respective countries could also be analyzed from the figures entered in the tabular form.

Results

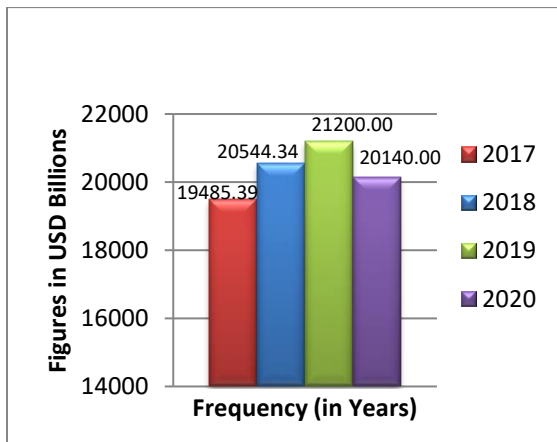


Fig.1 Variation in the GDP of the US can be inferred from the bar graph representation. (Source- The data is collected from the Trading Economics and is cross referenced with Statista.com)

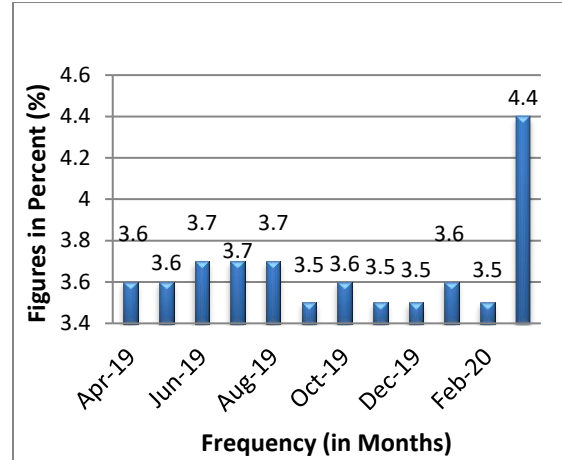


Fig.2 The increase in the unemployment rate of the US from the impact of COVID-19 Pandemic can be seen in the above mentioned bar graph representation. (Source- The data is collected from the Trading Economics and is cross referenced with Statista.com)

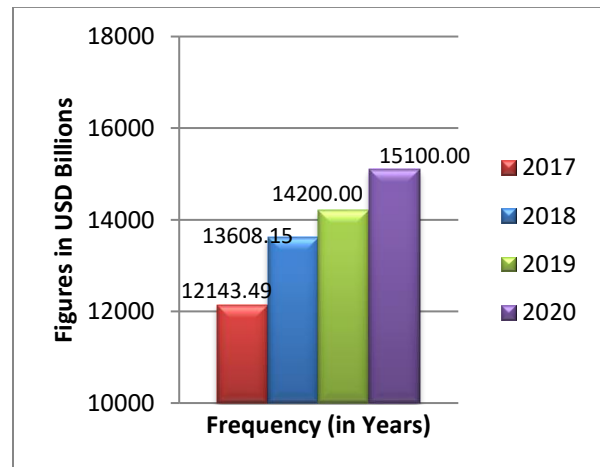


Fig.3 Increase in the GDP of China can be inferred from the bar graph representation. (Source- The data is collected from the Trading Economics and is cross referenced with Statista.com)

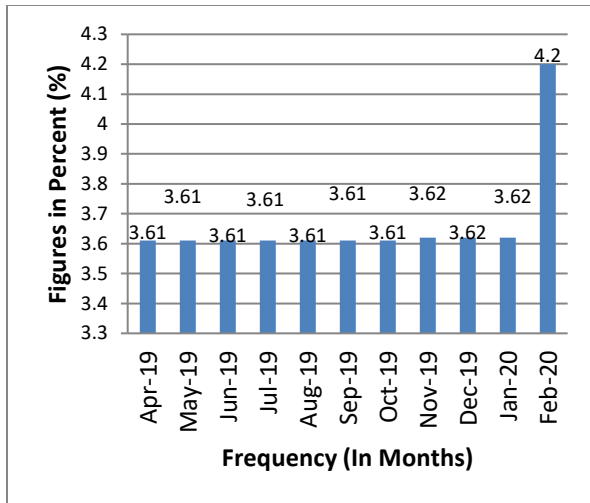


Fig.4 There is an increase in the rate of unemployment rate of the China due to COVID-19 pandemic due to which there is a variation. (Source- The data is collected from the Trading Economics and is cross referenced with Statista.com)

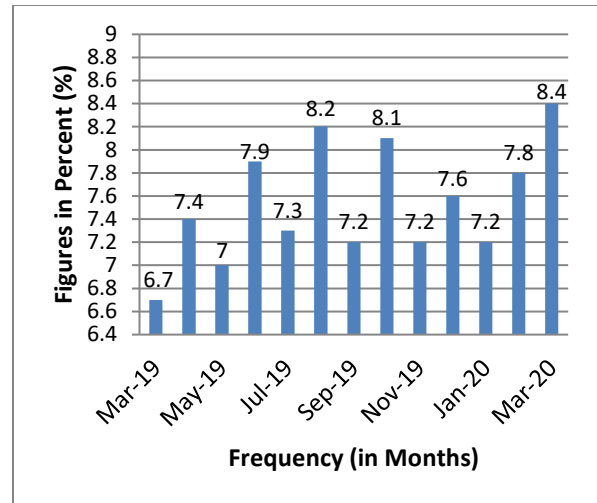


Fig.6 Bar graph representation mentioned above depicts the variation in the unemployment rate of India before and after the impact of COVID-19. (Source- The data is collected from the Trading Economics and is cross referenced with Statista.com)

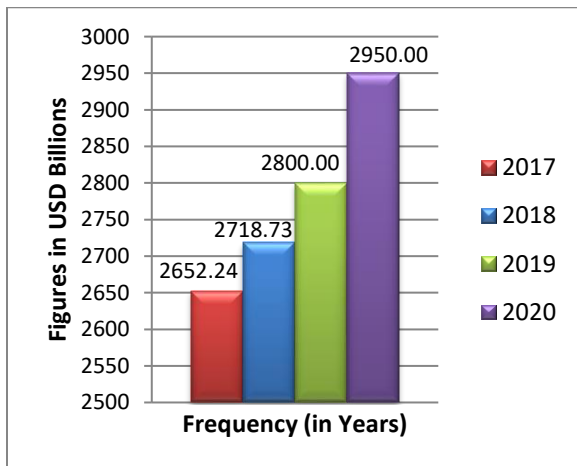


Fig.5 Impact of COVID-19 on the GDP of India can be seen in the above mentioned bar graph representation. (Source- The data is collected from the Trading Economics and is cross referenced with Statista.com)

Discussion

There is a major impact of COVID-19 pandemic on world's economy globally. Each and every country is facing different challenges to cope up with the corona virus disease. As per the electronic survey been done till March 2020 for the comparison of GDP and Unemployment rates in the China, USA and India depicts that there is a huge loss in the economy as a whole whether it may be a corporate sector or may be the industrial companies. Implementations of nation-wide lock down in the Mainland China set the example for other countries fighting with corona virus disease.

The residents of Mainland China followed the social distancing very seriously and in a very rightful manner as the market places, restaurants, tourism from outer countries, industries even the cities which were majorly

devastated were completely closed instead of the food markets and valuable stores such as health care and pharmacy stores.

After recovering from the disease, China started recreating the economic status of the country by opening the industries, manufacturing companies and majority of the parts were having the life again on the track. Meanwhile, during the lock-down also, the China planned for a strategic technique of fighting with corona virus, the manufacturing of the face medical masks not by the medical industries but even from the manufacturing industries, disinfectant production from chemical industries, construction of a large bed sized hospital care for the suffering patients, sending the

team of doctor's to other countries also such as Italy, Spain and France for the medical and social help of the country in this situation.

The China has set various examples for other countries and proved that social distancing is the only primary means to stop the further community spread of this corona virus disease. The mitigation steps taken by the China to combat COVID-19 had leded it to again restart the economy. Taking the scenario of the US, the Trump didn't completely declare for the lock-down in the cities of US which is showing presently its demerits. Earlier, the US was considered to have the largest economy in the world but there is a sharp decrease in its economy due to which there is arousal of the unemployment rate in the US. Many of the residents in US have left their jobs and sitting at their places with no job status due to the fear of this pandemic COVID-19. Similarly with the US also, there is a sharp downfall in

the import of the manufactured materials from the China and various machinery parts including auto parts, instrumentation parts of healthcare. The present situation of the US is very critical till dated 20 April 2020 as the confirmed cases has crossed around more than 0.7 million as per the census data with the death of around 41000. As per the analysis done for the US economy and its health status during this infection, if the social distancing nation-wide would be followed properly and in a rightful manner the situation would be prevented from becoming as critical it is at present. Furthermore, taking the scenario of India the economy of the country is smaller than these two powerful nations.

Measures taken by the China has given some ideology to the Indians to adopt the strategy in the similar manner and they are doing the same. But the situation in India is that it is a developing country, the Unemployment in the country is already higher than these two nations so the pandemic might cause a severe damage to the economy of the country. India is considered as the second largest populated country per density around the globe. Most of the people are from working class (labour class) will be having a loss of work during this current situation of the pandemic. They are having the fear of the disease procuring them and have made their psychology very clear about the scenario that it will kill them completely.

The data from the census has been predicted that there might be food insecurity and the poverty might rise up if the measure wouldn't be taken for mitigating the pandemic situation. Government of India should make

certain make certain plans and strategy to make these people clear about the corona virus disease so that there should be no severe loss to the community and economy. Testing of the suspects should be done at a very broad level and critically examining the patients by visiting their places so as to compensate the situation of the residents in the country.

Problems regarding food insecurity should also be fulfilled by taking appropriate measures. As per the studies, done by the analysts and researchers are individually focusing on the impacts of COVID--19 pandemic like in economy, travel and tourism, healthcare, mental health and psychology but in our study we have made the analysis on comparative study of the impacts of COVID-19 in the US, China and India. The study done in this paper states the effects on the economy of the China, US and India and the ideology can be set for the same to mitigate the effects of COVID-19.

Conclusion

The study which we have done inferences not from a research experiment aspect but from electronic survey and statistical analysis of the variations and the data of the reports. As the data been analyzed depicts that the lockdown strategy that is implemented by the China is good enough and the country has set an example to fight against this pandemic during this critical stage. Whereas, the US didn't announced for the complete lockdown in the nation as they were introduced with the alarming stage of this pandemic but they took the situation casually due to which the major loss can be seen in the nation. India is a developing country so the GDP as well as the

Unemployment Rate in India vary on short term basis but the positive aspect of the country is adopting the suggested measures by the China in Wuhan during the pandemic. So we can conclude that the social distancing and lockdown strategy should be practiced genuinely to fight against COVID-19 pandemic.

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