A Project Report on

Covid-19 Impact Analysis

Submitted in partial fulfillment of the requirements for the award of the degree of

Master of Science

in

Data Science and Big Data Analytics

by

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UNIVERSITY OF MUMBAI

Academic Year 2020-2021

Acknowledgement

This Project Report entitled ***"Covid-19 Impact Analysis"*** Submitted by ***"Mohammed Sarfaraz Mansoori" (41677)*** is approved for the partial fulfillment of the requirement for the award of the degree of ***Master of Science*** in ***Data Science and Big Data Analytics*** from ***University of Mumbai.***

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Date:

CERTIFICATE

This is to certify that the project entitled ***"Covid-19 Impact Analysis"*** submitted by ***"Mohammed Sarfaraz Mansoori" (41677)*** for the partial fulfillment of the requirement for award of a degree ***Master of Science*** in ***Data Science and Big Data Analytics***, to the University of Mumbai, is a bonafide work carried out during academic year 2020-2021.

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Place: B. K. Birla College (Autonomous), Kalyan

Date:

Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

_____

(Signature)

Mohammed Sarfaraz Mansoori (41677)

Date:

Abstract

The COVID-19 viral pandemic is a once-in-a-lifetime worldwide phenomenon that is also a deeply personal experience with far-reaching consequences. On September 20, 2021, viral deaths in the United States surpassed the 675,446 total from the 1918 Spanish flu, the previous worst pandemic-related fatality total in the United States. The pandemic has caused havoc in all countries. communities and had a far-reaching detrimental impact on global economic growth in 2020.not seen in quite a century According to estimates, the virus slowed worldwide economic growth in 2020 to an annualised rate of roughly -3.2 percent, with a 5.9 percent recovery expected in 2021. Global Trade is expected to dip by 5.3 percent in 2020, but to increase by 8.0 percent in 2021.

According to consensus forecasts, the economic downturn in 2020 will be less severe than previously anticipated, thanks in part to fiscal and monetary policies implemented by governments in 2020. Economic growth in most countries fell sharply in the second quarter of 2020, but quickly recovered. Since the third quarter, the trend has been mostly positive. Despite a decrease, the total global the economic consequences continue to mount. The prolonged nature of the health crisis is particularly concerning. influencing the global economy in ways that go beyond traditional measures, with potentially long-term and far-reaching consequences. Economic forecasts reflect the continuing risks to a long-term global recovery posed by a resurgence of infectious diseases, as well as potential inflationary pressures associated with pent-up consumer demand fueled by an increase in personal savings. On the supply side, shortages reflect persistent labour market disruptions, production and supply chain bottlenecks, disruptions in global energy markets, and shipping and transportation constraints, all of which contribute to inflationary pressures.

The human costs in terms of lives lost will have a long-term impact on global economic growth, in addition to the costs of increased poverty, upended lives, derailed careers, and increased social unrest. According to some estimates, 65 million to 75 million people may have fallen into extreme poverty by 2020, with 80 million more undernourished than at prepandemic levels. Furthermore, according to some estimates, the decline in global trade in 2020 will exact a particularly heavy economic toll on trade-dependent developing and emerging economies.

Index

Sr.No.			Pg No.
1		Introduction	1
2		Literature review	3
3		Background	6
	3.1	Material and Method	8
	3.2	Project System Architecture (Diagrammatic representation)	10
	3.3	Technology configurations	11
	3.4	Feasibility study	12
4		The global consequences of the covid-19 outbreak	13
5		Results	15
	5.1.	Code/ Code efficiency	16
	5.2	Graphical representation of the Data	22
	5.3	Numerical representation of Data	26
6		Conclusion and Future scope	27
		Bibliography	30
		Appendices	31
		Appendix-A Pandemics: A historical perspective	32
		Appendix-B COVID-19: A novel experience	33
		Acknowledgement	35
		Publication	36

1. INTRODUCTION

The World Health Organization (WHO) has declared a pandemic of the novel coronavirus known as COVID-19 (also known as SARS-CoV2). The rapid 'globalization' of a 'non-curable' (as of now) pandemic is something the world has probably never seen before. Since the first reported case in December 2019 in Wuhan, China's seventh-largest city, is where most virus research is taking place. investigating epidemiological, demographic, and clinical concerns (Stoye, 2020).

The economic impact of the outbreak is known colloquially as 'Coronanomics' (Eichengreen, 2020). The outbreak appears to cause a 'de-globalization' process by forcing countries to close borders, preventing normal flows of goods, capital, and people, and temporarily shutting down businesses and production. As a result, the outbreak is expected to have massive and far-reaching economic consequences worldwide (Baldwin and di Mauro (eds.), 2020). A small body of scholarly research depicts early indications and estimates of likely economic consequences.

Based on previous experience, studies estimate that the COVID-19 pandemic could reduce global GDP growth in the short term; however, if the GDP drop in the first half of 2020 is offset by faster growth in the second half, the overall economic impact could be relatively minor (to a few tenths of a percentage point). However, the magnitude of the loss and the rate of economic recovery are determined by policy responses (Lee and McKibbin, 2012). Many predict that the economic impact of the pandemic will be greater than that of the 2008-09 financial crisis and similar to that of the 1929-1933 Great Depression, with shocks threatening about 22% of US GDP. which were impacted by the outbreak, will be discussed in the paper.

The outbreak of Covid-19 resulted in numerous restrictions, which had a significant impact on the global economy. The increase in Covid-19 cases had a negative impact on almost all countries. This analysis will look at how to assess the economic effects of Covid-19. Walk through the Covid-19 Impacts Analysis task in Python in this project.

2. LITERATURE REVIEW

According to the International Monetary Fund's (IMF) October 2021 World Economic Outlook, global economic growth fell to an annualised rate of around -3.2 percent in 2020, with a recovery of 5.9 percent projected for 2021 and 4.9 percent projected for 2022. 17 The IMF also concluded that advanced economies would face continued economic challenges due to supply shortages into 2022, while prospects for low-income developing economies "had darkened considerably" due to disparities in vaccine access and economic policy support. Because of the effects on developing economies, the pandemic-related recession is said to be more global in nature than the global financial crisis of 2009-2010. In its most recent forecast, the IMF predicted that different geographic regions of the global economy would recover at different rates, reflecting differences in vaccination rates, the extent of policy support, and various structural conditions, such as tourism's role in the economy.

Various key economic and financial indicators had recovered from the depths of the pandemic-related economic recession by late October 2021, though not all parts of the global economy had recovered to pre-COVID-19 pandemic levels. 18 Furthermore, a resurgence in viral cases, as well as the emergence of new and more virulent strains of the COVID-19 virus, caused some institutions to lower their economic growth projections for 2021 in late 2021. 19 Although vaccination rates in various developed economies, particularly the United States, increased, developing economies struggled to get access to vaccines and their populations vaccinated, and thus to return their economies to pre-pandemic levels. Financial market indices had mostly recovered from the losses suffered in March and April 2020, international oil prices had surpassed pre-pandemic levels, pressure on the dollar had generally subsided, and labour markets appeared to be stabilizing.

By the fall of 2021, prior to the end of pandemic-related unemployment assistance in the United States, consumers in the United States and Europe appeared to have adjusted to pandemic restrictions by relying on unemployment benefits, personal savings, and credit to sustain their consumption activities. Personal consumption expenditures generally increased and decreased in response to the virus's spread and partial business closures. Increased household and business spending, on the other hand, increased demand for a wide range of products, including housing, food, energy, and new and used cars and trucks, which were constrained by supply shortages, and raised U.S. consumer and producer prices in September, which rose at monthly rates of 0.4 percent and 0.5 percent, respectively, or at annual rates of more than 4.8 percent and 6.0 percent.

Long-term labour market damage could be problematic, with a large portion of the labour force unable or unwilling to return to pre-pandemic jobs in some sectors. Workers who were unemployed during the crisis were reportedly reconsidering returning to their previous jobs and exploring other options, which could slow the

economic recovery. According to reports, employment in the United States child-care sector was down more than 137,000 workers in August 2021 compared to March 2020 levels, preventing 1.6 million women who are mothers of children under the age of 17 from returning to the labour force. Similarly, economies may face long-term costs as a result of children being denied in-person education for more than a year, which may result in lower academic performance and graduation rates, as well as delayed entry into the labour market. Kristalina Georgieva, Managing Director of the International Monetary Fund (IMF), warned on March 31, 2021, that an emerging market debt crisis could occur as the global economy begins to recover and interest rates rise, potentially causing capital outflows from developing economies.

3. BACKGROUND

The coronavirus epidemic has become humanity's largest struggle against the virus this century. The damages to human health, money, and welfare caused by World War II and other epidemics around the world are already very large. Case fatality rate (CFR) defines the measurements of severity attributable to disease that are lethal within their specific time period. Furthermore, COVID-19 is wreaking havoc on the world economy. According to the WHO, the first incidence of human coronavirus pneumonia was recorded in December 2019 in the Chinese city of Wuhan, and it spread fast throughout the country. Within a month, it morphed into an epidemic, resulting in a huge number of deaths. So far, the disease has rocked the world, spreading to over 190 nations, including all 50 states in the United States. COVID-19 was declared a World Health Emergency by the World Health Organization (WHO) in January 2020. The focus of relocation switched from China to Europe, mainly Italy, in early March, but by April 2020, the focus had shifted to the United States, where the number of illnesses has been rapidly increasing.

The world's primary concern at the moment is saving people's lives. Lockdown and social isolation are the only options to controlling the virus's transmission, which is tightly enforced in many nations throughout the world. However, the falling economy cannot be ignored, and many world-class firms are on the verge of failure as a result. For example, lockdowns have prohibited many companies such as travelling to contain infections, causing this business to come to a standstill on a global scale.

3.1 Materials and Methods

Materials:

- The dataset we're utilising to assess the effects of covid-19 was obtained from Kaggle. It contains information on the following topics: the country code, the names of all the countries, the date of the record, the Human Development Index of all the countries, the daily covid-19 cases, the daily deaths due to covid-19, the stringency index of the countries, the population of the countries, and the GDP per capita of the countries.
- The data we're using includes information on covid-19 instances and their economic impact from December 31, 2019, to October 10, 2020.
- These data will be used to create a visual representation of how the COVID-19 pandemic has spread around the world. There are several approaches to examining the COVID-19 outbreak. We relied on the following sources for our research:
  - **Graph Plots:** We show the top ten countries with the greatest number of covid-19 cases. It will be an ideal sample for studying the economic effects of covid-19. The graph plots will be useful in observing the most recent COVID-19 outbreak trends.

Methods:

Data Collection Process

As stated in the dataset section, our dataset contains the fields country code, name of all nations, date of record, Human Development Index of all countries, and Daily covid-19 instances, daily deaths due to covid-19, country stringency indexes, country populations, country GDP per capital. The data we're using includes information on covid-19 instances and their economic impact from December 31, 2019, to October 10, 2020. Based on these fields, we visually depicted the data in a variety of ways, including a bar chart and a pie chart. The graphs show the total number of deaths and cases in each of the countries with the highest number of covid-19 cases.

Data Preparation

The dataset we're using here has two data files. The raw data is in one file, and the converted data is in the other. However, we must use both datasets for this assignment because they each include equally relevant information in distinct columns. So, go over both datasets one by one.

Creating Additional Columns

After preprocessing and cleaning the above data, we created an additional data field by dividing the sum of all the samples related to the human development index, GDP per capita, and population.

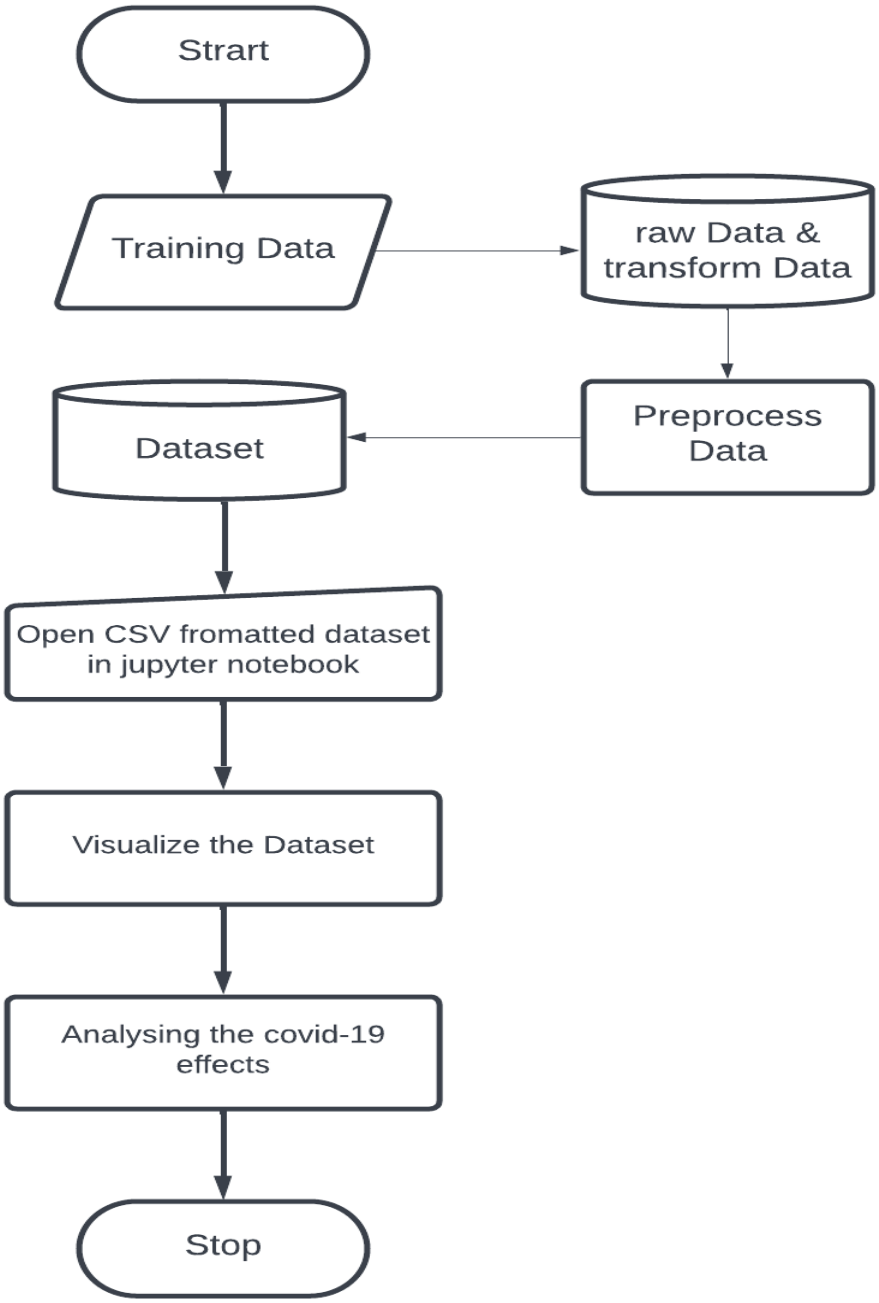
Additional Derived Data

Similarly, additional data such as the top ten countries affected by the COVID-19 outbreak.

3.2 Project System Architecture (Diagrammaticrepresentation):

System Flowchart:

System flowcharts are a way of displaying how data flows in a system and how decisions are made to control events. To illustrate this, symbols are used. They are connected together to show what happens to data and where it goes.



3.3 Technology Configurations

Tool

- Jupyter Notebook

Jupyter Notebook is an open-source web application that provides a computing environment that is interactive. It generates papers (notebooks) by combining inputs (code) and outputs into a single file. It provides a single document that includes:

- Visualizations
- Equations in mathematics
- Statistical simulation
- Text narrative
- Any other type of rich media

Users may build, display the findings, and add information, charts, and formulas to make work more comprehensible, repeatable, and shared using this one document method.

For Coding

- Python

Python is used to examine data. Python may be used to investigate a wide range of data types. Prepare data for study, perform simple statistical analysis, generate relevant data visualisations, forecast future trends based on data, and much more!

Concept

- Impact analysis

Influence analysis is performed to determine the extent of an economic impact.

3.4 Feasibility study

A type of system analysis is a feasibility study. A system is a description of the relationships between the inputs of labour, machines, materials, and management methods, both within and outside of an organisation. Similarly, buildings can be viewed as a collection of spaces and inputs that interact with one another as well as the physical, social, and economic surroundings. Systems analysis is a set of methodologies used to comprehend and enhance manufacturing processes. While systems analysis is typically applied to current organisations and production techniques, feasibility studies are used to assess the viability of projects. In economic terms, feasibility studies simplify real-world models by focusing on specific characteristics of alternative schemes.

Five Areas of Feasibility?

Technical Feasibility:
A technical feasibility study is a comprehensive examination of the project's input, processes, output, fields, programmes, and procedures. It is a very useful tool for long-term planning and troubleshooting. The technological feasibility assessment should primarily complement an organization's financial information.

Economic Feasibility:
The most popular method for measuring the efficiency of a new project is economic feasibility analysis. It is also referred to as cost analysis. It aids in determining the profit vs investment expected from a project. The most important considerations in this field of study are cost and time.

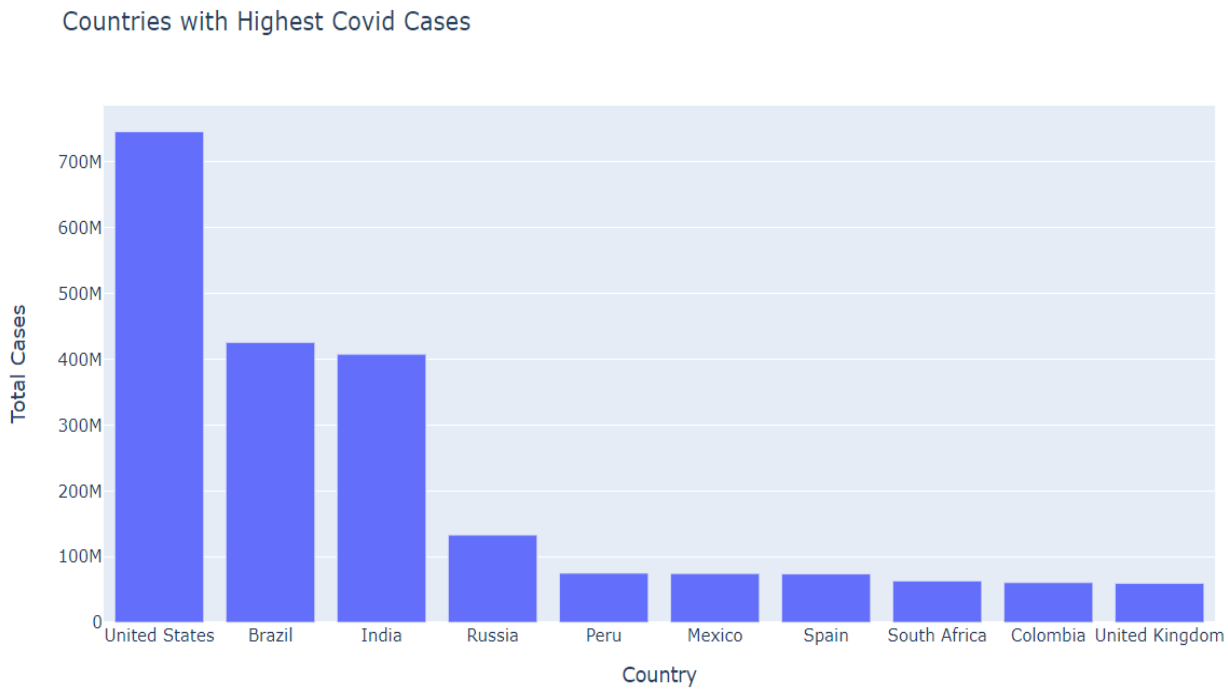
Legal Feasibility:
Law and Legal Definition Feasibility Study An organisation conducts a feasibility analysis to examine whether a specific activity makes economic and operational sense. A study of this type is typically intended to provide an overview of the key concerns concerning a proposed course of action.

Operational Feasibility:
The measure of fixing difficulties with the help of a new proposed system is referred to as operational feasibility. It aids in capitalising on possibilities and meeting the needs specified during the project's development. It ensures that both management and users support the initiative.

Scheduling Feasibility:
The degree to which a deadline for a strategy, plan, project, or process is practical and doable is referred to as schedule feasibility.

4. The Global Consequences of the COVID-19 Outbreak

The corona virus was discovered on December 31, 2019 in Wuhan City, Hubei Province, China. In the previous few months, the number of cases in Wuhan City alone has risen to 4000 (uncertainty range: 1000-9700). The pandemic did not stay in Wuhan, Hubei Province, or China, but expanded globally, with COVID-19 instances confirmed on every continent (excluding Antarctica). The number of confirmed cases has risen to 78,000, and the outbreak has already affected more than a million individuals. The COVID-19 pandemic not only killed over 3,000 people, but it also impacted various sectors. The travel industry has been one of the most affected businesses because the COVID-19 outbreak is largely due to sick travelers flying overseas. This has resulted in travel restrictions in order to control the spread. Multiple countries are concerned about the potential of infected individuals being transported and have implemented airport inspections. Many industries become interconnected and interdependent as a result of globalization's interaction and interconnection of people, businesses, and nations. As a result, an outbreak impacting one business may have a significant impact on other industries that are linked to it. In this section, we looked at the tourism industry, restaurants and leisure (industry), entertainment industry, travel industry, and sports industry. Each of these businesses may be significantly impacted by the pandemic. The study may also be beneficial in predicting how other businesses related to the industries under investigation will be influenced for future research.



5. RESULTS

5.1 Code/ code efficiency

Analysing the Covid-19 effects by importing the relevant Python libraries

```
import pandas as pd
import plotly.express as px
import plotly.graph_objects as go

# Importing the datasets
data = pd.read_csv("transformed_data.csv")
data2 = pd.read_csv("raw_data.csv")
print(data)
```

There are two data files in the dataset we're using here. One file contains the raw data, while the other has the transformed data. So, let's go over both datasets individually:

```
print(data.head())
print(data2.head())
```

After getting my first impressions of both datasets, I realized that we needed to merge them by establishing a new dataset. But, before we construct a new dataset, consider how many samples of each country are contained in the existing collection:

```
data["COUNTRY"].value_counts()
```

Let us examine the mode value:

```
data["COUNTRY"].value_counts().mode()
```

Let's create a new dataset by combining the necessary columns from both datasets:

```
# Aggregating the data
code = data["CODE"].unique().tolist()
country = data["COUNTRY"].unique().tolist()
hdi = []
tc = []
td = []
sti = []
population = data["POP"].unique().tolist()
```

```
gdp = []
for i in country:
    hdi.append((data.loc[data["COUNTRY"] == i, "HDI"]).sum()/294)
    tc.append((data2.loc[data2["location"] == i, "total_cases"]).sum())
    td.append((data2.loc[data2["location"] == i, "total_deaths"]).sum())
    sti.append((data.loc[data["COUNTRY"] == i, "STI"]).sum()/294)
    population.append((data2.loc[data2["location"] == i, "population"]).sum()/294)
aggregated_data = pd.DataFrame(list(zip(code, country, hdi, tc, td, sti,
population)),
                               columns = ["Country Code", "Country", "HDI",
                                          "Total Cases", "Total Deaths",
                                          "Stringency Index", "Population"])
print(aggregated_data.head())
```

It will be an excellent sample for research into the economic effects of covid-19. So, let's sort the data according to the total number of Covid-19 cases:

```
# Sorting Data According to Total Cases

data = aggregated_data.sort_values(by=["Total Cases"], ascending=False)
print(data.head())


# Top 10 Countries with Highest Covid Cases

data = data.head(10)
print(data)
```

Now I'll add two more columns to this dataset (GDP per capita before Covid-19, GDP per capita during Covid-19):

```
data["GDP Before Covid"] = [65279.53, 8897.49, 2100.75,
                            11497.65, 7027.61, 9946.03,
                            29564.74, 6001.40, 6424.98, 42354.41]
data["GDP During Covid"] = [63543.58, 6796.84, 1900.71,
                            10126.72, 6126.87, 8346.70,
                            27057.16, 5090.72, 5332.77, 40284.64]
print(data)
```

Analyzing the Spread of Covid-19

Let's now examine the distribution of covid-19 in each of the nations with the greatest number of cases. I'll start by looking at all the nations where COVID-19 cases are most prevalent:

```
figure = px.bar(data, y='Total Cases', x='Country',
          title="Countries with Highest Covid Cases")
figure.show()

fig = go.Figure()
fig.add_trace(go.Bar(
    x=data["Country"],
    y=data["Total Cases"],
    name='Total Cases',
))
fig.add_trace(go.Bar(
    x=data["Country"],
    y=data["Total Deaths"],
    name='Total Deaths',
    marker_color='indianred'
))
fig.update_layout(barmode='group', xaxis_tickangle=-45)
fig.show()
```

Consider the percentage of overall deaths and total cases in each of the countries with the most covid-19 cases:

```
# Percentage of Total Cases and Deaths
cases = data["Total Cases"].sum()
deceased = data["Total Deaths"].sum()
labels = ["Total Cases", "Total Deaths"]
values = [cases, deceased]
fig = px.pie(data, values=values, names=labels,
           title='Percentage of Total Cases and Deaths', hole=0.5)
fig.show()
```

The following formula can be used to calculate the death rate of Covid-19 cases:

```
death_rate = (data["Total Deaths"].sum() / data["Total Cases"].sum()) * 100
print("Death Rate = ", death_rate)
```

Another important column in this dataset is the stringency index. It is a compilation of response indicators such as school closures, job closures, and travel restrictions. It indicates how rigorously countries follow these precautions to limit the spread of covid-19:

```
fig = px.bar(data, x='Country', y='Total Cases',
        hover_data=['Population', 'Total Deaths'],
        color='Stringency Index', height=400,
        title= "Stringency Index during Covid-19")
fig.show()
```

Analyzing Covid-19 Impacts on Economy

Let us now look into the economic implications of covid-19. In comprehending the economic slowdowns caused by the covid-19 epidemic, the GDP per capita is the most important determinant. Consider the GDP per capita in the countries with the most covid-19 cases prior to the outbreak:

```
fig = px.bar(data, x='Country', y='Total Cases',
          hover_data=['Population', 'Total Deaths'],
          color='GDP Before Covid', height=400,
          title="GDP Per Capita Before Covid-19")
fig.show()
```

Consider the GDP per capita during the rise in covid-19 instances:

```
fig = px.bar(data, x='Country', y='Total Cases',
          hover_data=['Population', 'Total Deaths'],
          color='GDP During Covid', height=400,
          title="GDP Per Capita During Covid-19")
fig.show()
```

Let us now examine GDP per capita before and after covid-19 to see how covid-19 affects GDP per capita:

```
fig = go.Figure()
fig.add_trace(go.Bar(
   x=data["Country"],
   y=data["GDP Before Covid"],
   name='GDP Per Capita Before Covid-19',

))
fig.add_trace(go.Bar(
   x=data["Country"],
   y=data["GDP During Covid"],
   name='GDP Per Capita During Covid-19',
   marker_color='indianred'
))
fig.update_layout(barmode='group', xaxis_tickangle=-45)
fig.show()
```

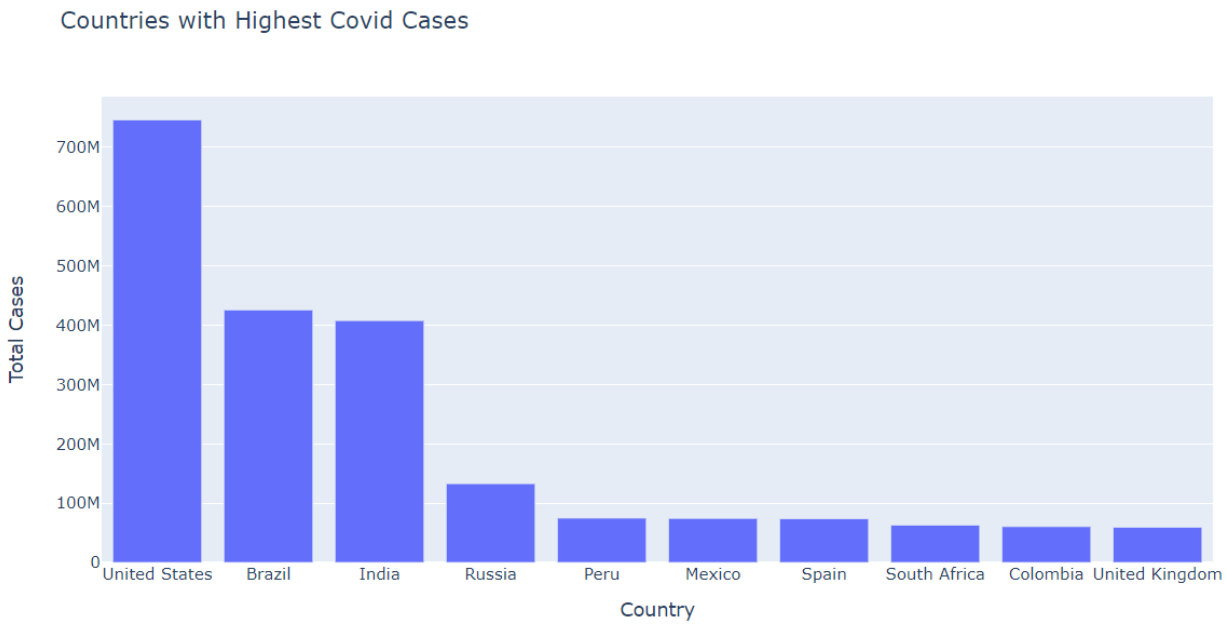
Human Development Index is another major economic aspect. It is a statistical composite measure of indicators such as life expectancy, education, and per capita income. Let us look at how many countries spent their funds on human development:

```
fig = px.bar(data, x='Country', y='Total Cases',
        hover_data=['Population', 'Total Deaths'],
        color='HDI', height=400,
        title="Human Development Index during Covid-19")
fig.show()
```

5.2 Graphical representation of the Data

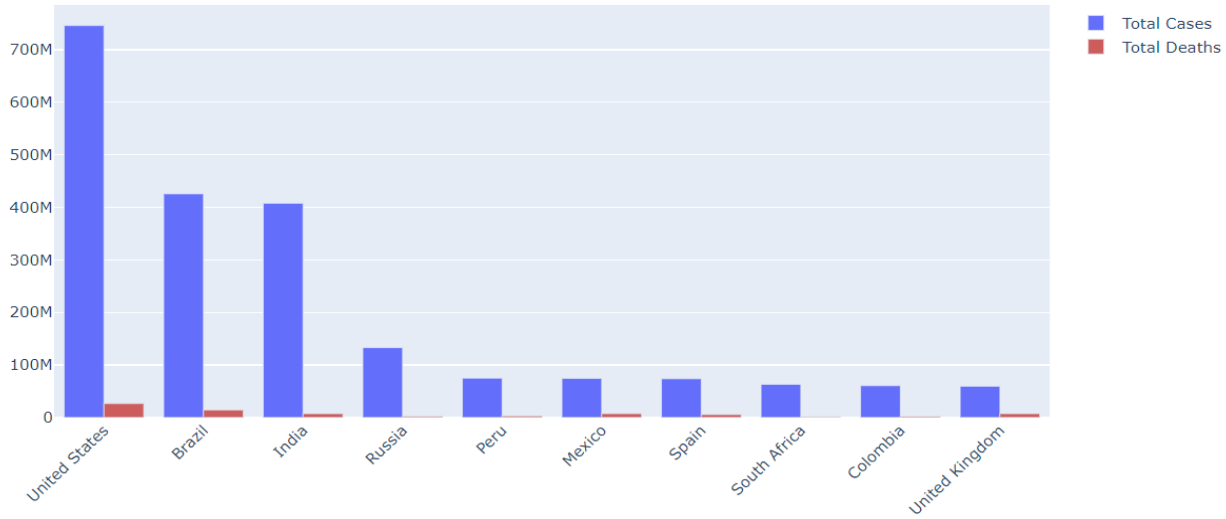
Analyzing the Spread of Covid-19

1. Examine the prevalence of covid-19 in each of the countries with the highest number of cases. I'll begin by looking at all of the countries where COVID-19 cases are most common:



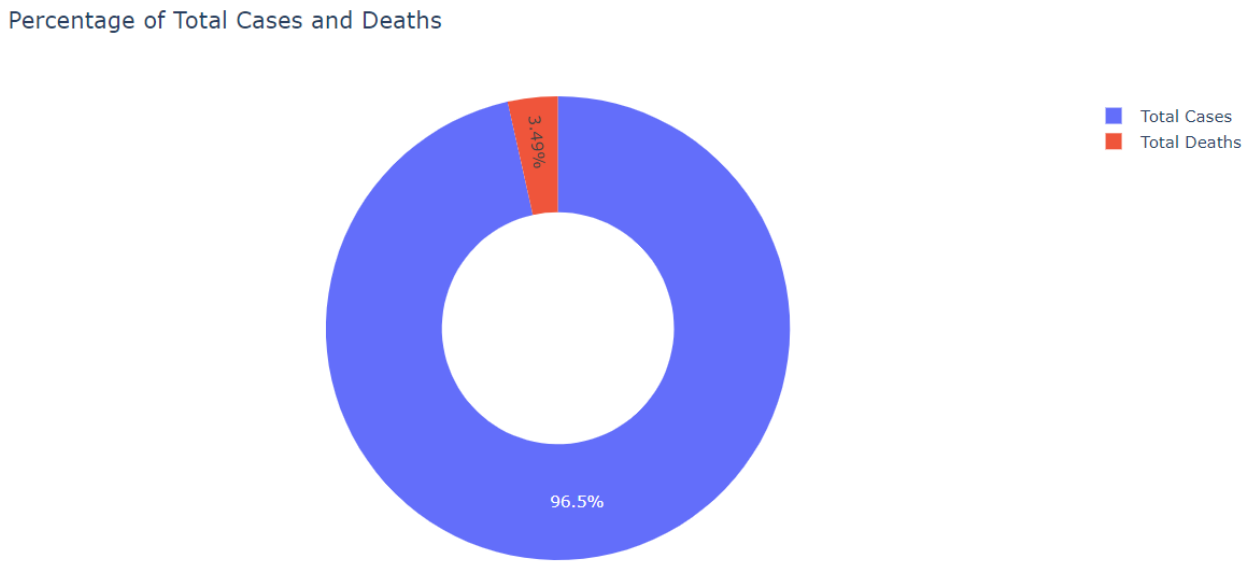
In terms of deaths, the USA is in the top, followed by Brazil and India in second and third place, and the overall number of cases of covid-19. One thing to note is that, when compared to the overall number of cases, the death rates in South Africa, Russia, and India are quite low.

2. Compare the overall numbers of cases and fatalities in each of these nations:



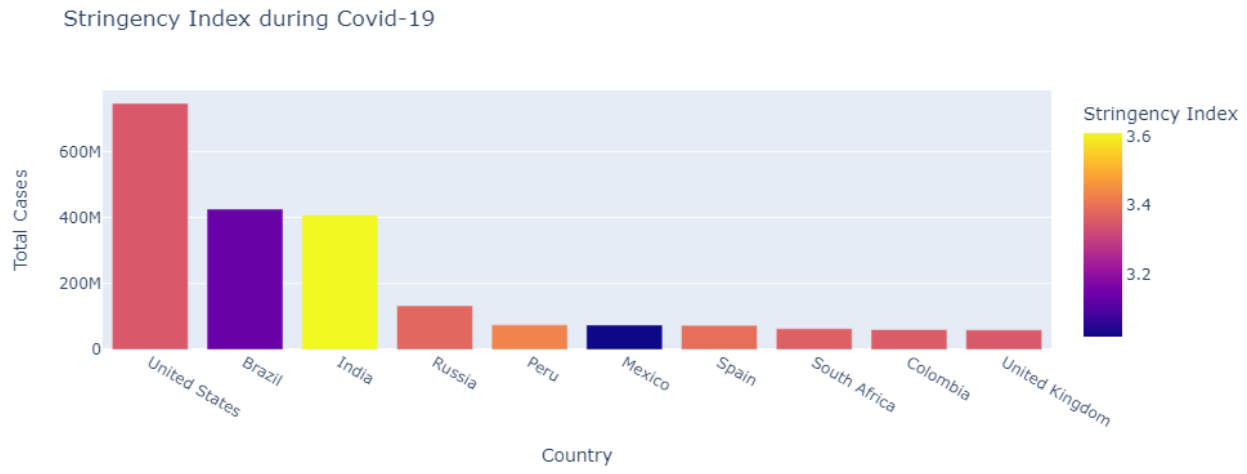
The majority of cases are from the United States, while South Africa having the fewest deaths from the Corona Virus.

3. The percentage of overall deaths and total cases in each of the nations with the largest number of covid-19 cases:



Corona caused 96.5 percent of all cases worldwide, and 3.49 percent of those who were affected died.

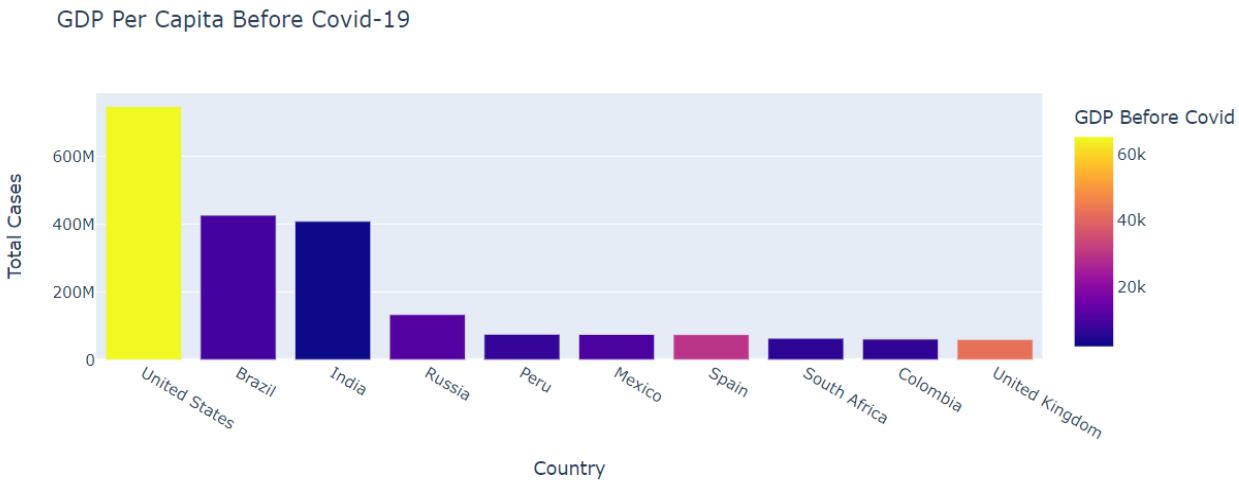
4. The stringency index is another crucial column in this dataset. It is a synthesis of response indicators such as school closures, employment closures, and travel prohibitions. It demonstrates how carefully countries adhere to these steps to restrict the spread of covid-19:



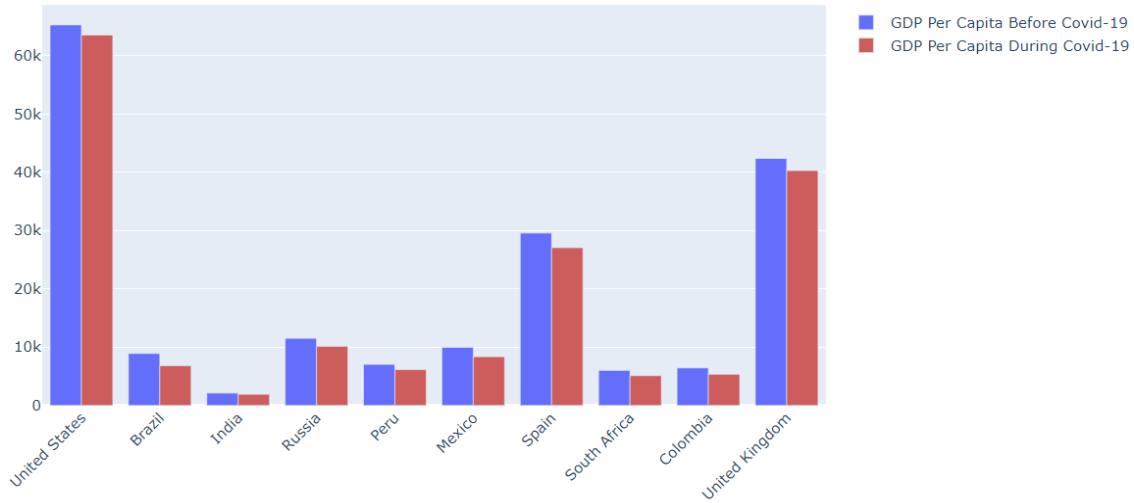
During the outbreak of covid-19, India is performing well in the stringency index.

Analyzing Covid-19 Impacts on Economy

1. Look into the economic implications of covid-19. In comprehending the economic slowdowns caused by the covid-19 epidemic, the GDP per capita is the most important determinant. Consider the GDP per capita in the countries with the most covid-19 cases prior to the outbreak:

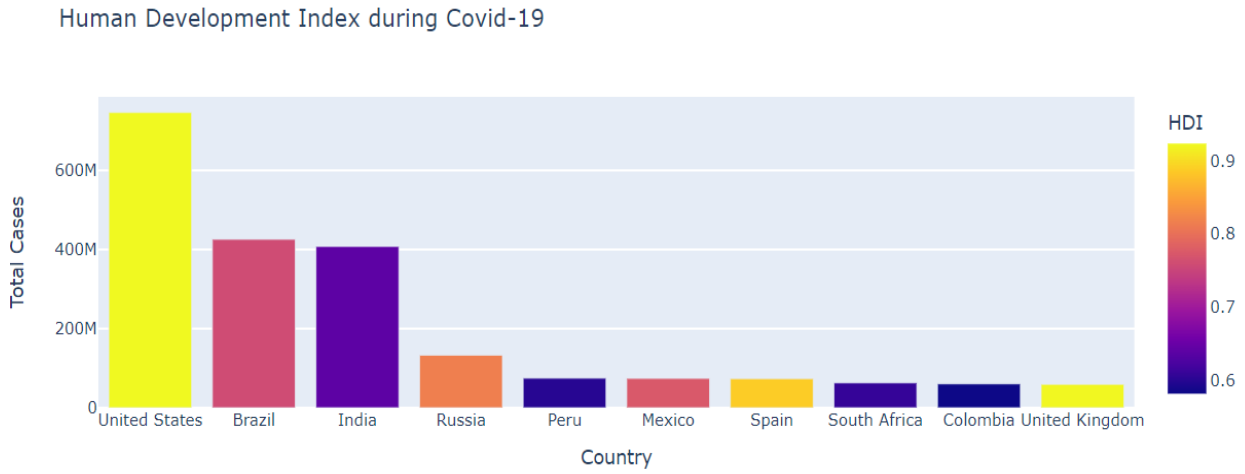


2. examine GDP per capita before and after covid-19 to see how covid-19 affects GDP per capita:



GDP per capita is falling in all nations with the highest number of covid-19 cases.

3. Human Development Index is another major economic aspect. It is a statistical composite measure of indicators such as life expectancy, education, and per capita income. Let us look at how many countries spent their funds on human development:



Among the top ten countries, the United States spends the most on human development, while Columbia spends the least on human development.

5.3 Numerical representation of Data

1. Transformed_data.csv

	CODE	COUNTRY	DATE	HDI	TC	TD	STI	POP	GDPCAP
0	AFG	Afghanistan	2019-12-31	0.498	0.0	0.0	0.0	17.477233	7.497754
1	AFG	Afghanistan	2020-01-01	0.498	0.0	0.0	0.0	17.477233	7.497754
2	AFG	Afghanistan	2020-01-02	0.498	0.0	0.0	0.0	17.477233	7.497754
3	AFG	Afghanistan	2020-01-03	0.498	0.0	0.0	0.0	17.477233	7.497754
4	AFG	Afghanistan	2020-01-04	0.498	0.0	0.0	0.0	17.477233	7.497754

2. Raw_data.csv

	iso_code	location	date	total_cases	total_deaths	\
0	AFG	Afghanistan	2019-12-31	0.0	0.0	
1	AFG	Afghanistan	2020-01-01	0.0	0.0	
2	AFG	Afghanistan	2020-01-02	0.0	0.0	
3	AFG	Afghanistan	2020-01-03	0.0	0.0	
4	AFG	Afghanistan	2020-01-04	0.0	0.0	

	stringency_index	population	gdp_per_capita	human_development_index	\
0	0.0	38928341	1803.987	0.498	
1	0.0	38928341	1803.987	0.498	
2	0.0	38928341	1803.987	0.498	
3	0.0	38928341	1803.987	0.498	
4	0.0	38928341	1803.987	0.498	

	Unnamed: 9	Unnamed: 10	Unnamed: 11	Unnamed: 12	Unnamed: 13
0	#NUM!	#NUM!	#NUM!	17.477233	7.497754494
1	#NUM!	#NUM!	#NUM!	17.477233	7.497754494
2	#NUM!	#NUM!	#NUM!	17.477233	7.497754494
3	#NUM!	#NUM!	#NUM!	17.477233	7.497754494
4	#NUM!	#NUM!	#NUM!	17.477233	7.497754494

3. Aggregated data

	Country Code	Country	HDI	Total Cases	Total Deaths	\
0	AFG	Afghanistan	0.498000	5126433.0	165875.0	
1	ALB	Albania	0.600765	1071951.0	31056.0	
2	DZA	Algeria	0.754000	4893999.0	206429.0	
3	AND	Andorra	0.659551	223576.0	9850.0	
4	AGO	Angola	0.418952	304005.0	11820.0	

	Stringency Index	Population
0	3.049673	17.477233
1	3.005624	14.872537
2	3.195168	17.596309
3	2.677654	11.254996
4	2.965560	17.307957

6. CONCLUSION AND FUTURE SCOPE

Conclusion

Covid-19 economic threats- regardless of size, developed or developing, as the eventual result remains unpredictable. Uncertainty is generating a worldwide erosion of public confidence. If consumer and producer confidence is lost, and a large demand shock combined with massive supply-side supports cannot be deployed in a timely manner, the economy is likely to suffer. In the current situation, sickness recovery takes precedence above economy. However, as evidence of economic adversity develops, it would be prudent to begin formulating and implementing tough and inventive long-term policy responses. Alternatively, waiting for the pandemic to stop before taking appropriate measures may be too late, and an economic depression may become inescapable. Given the available literature and analysis of this research, some critical areas require further investigation.

In summary, if the virus is not prevented in the short term, the long-term impact on global economy would be far more disastrous. As a result, the government and international organisations must work together to lessen the economic ramifications of the virus's effects in the future. As we discussed in this research paper, the top ten economies in the world have already suffered significant loss of life owing to COVID-19 infection. As a result, their governments have already taken action in the form of partial and total lockdown and social isolation, and they should be applauded for their efforts in stopping the infection.

In this study, we looked at the proliferation of covid-19 across countries as well as its impact on the global economy. We found that the covid-19 outbreak resulted in the most covid-19 cases and deaths in the United States. The stringency index of the United States is a primary factor for this. It is rather low in comparison to the population. We also looked at how each country's GDP per capita was affected by the covid-19 pandemic. Python was used to do an effect analysis on covid-19.

Future Scope

A risk assessment for the COVID-19 epidemic is required in the future. Several industries may suffer as a result of the pandemic; thus, several observations can be made by evaluating their prior and present data. This could result in some risk assessment and risk management. Furthermore, we would like to monitor the patterns of various other industries that may have been touched by the outbreak in the future, such as the fashion, real estate, and supply chain industries.

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APPENDICES

Appendix-A. Pandemics: A historical perspective

The earliest documented pandemic, Black Death in 1331, is considered the most expensive epidemic, with 75 million deaths out of 450 million worldwide. The Spanish flu in 1918 was classed as "severe," and it was followed by the Asian flu in 1957 and the Hong Kong flu in 1968. The 2009 H1N1 pandemic was the first pandemic of the twenty-first century, killing over 2 million people. According to the table below, every pandemic has resulted in millions of deaths. Historical traces of pandemics.

Pandemic event	Start year	End year	Death
Black Death	1331	1353	75,000,000
Italian Plague	1623	1632	280,000
Great Plague of Seville	1647	1652	2,000,000
Great Plague of London	1665	1666	100,000
Great Plague of Marseille	1720	1722	100,000
First Cholera Pandemic	1816	1826	100,000
Second Cholera Pandemic	1829	1851	100,000
Russia Cholera Pandemic	1852	1860	1,000,000
Global Flu Pandemic	1889	1890	1,000,000
Sixth Cholera Pandemic	1899	1923	800,000
Encephalitis Lethargica Pandemic	1915	1926	1,500,000
Spanish Flu	1918	1920	100,000,000
Asian Flu	1957	1958	2,000,000
Hong Kong Flu	1968	1967	1,000,000
H1N1 Pandemic	2009	2010	203,000

This table summarises the historical record of significant pandemic occurrences that resulted in at least 100,000 deaths. We can see that the Spanish Flu killed the most people, followed by the Black Death.

Alfani and Murphy (2017) and Jorda et al. (2020)

Appendix B. COVID-19: A novel experience

The COVID-19 pandemic, the second of the twenty-first century, has captivated policymakers' attention and is poised to become the world's most catastrophic pandemic to date. In the framework of past pandemics, Ferguson et al. (2020) regarded COVID-19 as the most dangerous pandemic since the 1918 Spanish flu. The lack of medicinal innovations will add to the mortality toll, potentially making COVID-19 the deadliest pandemic catastrophe of the twenty-first century.

As of September 17, 2020, COVID-19 had infected 213 countries, with 937,391 fatalities and 29,737,453 confirmed cases reported by the WHO. The top 10 worst-affected countries in terms of COVID-19 occurrences are listed in the table below. According to the data, the United States had the greatest impact on the world, ranking first in terms of confirmed cases and deaths. In terms of confirmed cases, India is the second most impacted country, and third in terms of fatalities. Brazil has the third highest number of confirmed cases and the second highest number of fatalities. Furthermore, six of the top ten countries in terms of confirmed cases are also rated in terms of fatalities. Surprisingly, China does not rank in terms of confirmed cases or fatalities, indicating better COVID conditions and medical facilities. Major economies such as the United States, India, Russia, Mexico, and Spain have witnessed the harshness of COVID-19 and may face additional economic effects in the future. Among the top ten economies, significant economies such as the United States (central economies), Russia (oil-exporting countries), and India (one of the Asian giants and a large market) would lead to further declines in output, investment, and consumption, leading in a global economic slowdown. COVID-19 statistics and country rankings

Countries	Confirmed cases	No. of fatalities	Ranking 1	Ranking 2
United States of America	6,530,324	194,434	1	1
India	5,118,253	83,198	2	3
Brazil	4,382,263	133,119	3	2
Russia	1,085,281	19,061	4	12
Peru	738,020	30,927	5	7
Colombia	728,590	23,288	6	11
Mexico	676,487	71,678	7	4
South Africa	653,444	15,705	8	13
Spain	614,360	30,243	9	9
Argentina	577,338	11,910	10	15

This table includes the number of confirmed cases and deaths caused by COVID-19 up to September 17, 2020. Ranking 1 is determined by the number of confirmed cases, whereas ranking 2 is determined by the number of fatalities caused by this disease.

WHO emergency dashboard.

Acknowledgement

I have great pleasure in presenting the report on **Covid-19 Impacts Analysis.** I take this opportunity to express my sincere thanks towards my guide **Prof. Esmita Gupta** Department of IT, B. K. Birla College (Autonomous) for providing the technical guidelines and suggestions regarding line of work. I would like to express my gratitude towards his constant encouragement, support and guidance through the development of project.

I thank **Prof. Esmita Gupta** Head, Department of IT, B. K. Birla College (Autonomous) for her encouragement during progress meeting and providing guidelines to write this report.

I thank the entire staff of B. K. Birla College (Autonomous) for their invaluable help rendered during this course work. I wish to express my deep gratitude towards all my colleagues of B. K. Birla College (Autonomous) for their encouragement.

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Publication

Paper entitled **“Paper Title”** is presented at **“International Conference/Journal Name”** by “Author Name”.