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CORONA: Causing an Oppressive, Ruthless and Ob-Noxious Affliction

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Abstract: ***This paper includes the generation, causes & effects and data analysis of COVID-19. It also includes the technologies trying to help in this crisis. It explains some of the visualization libraries used for the data analysis.***
It came by surprise that COVID-19 being a China born disease, spread worldwide and caused a Pandemic. All the countries are facing this life-taking disease since half a year and more. There have been some serious consequences due to COVID-19 virus. People are scared. An urgent remedy is required to protect the world, people are solely relying on various technologies for help, like Artificial Intelligence, Nanotechnology, Gene Editing etc.
Keywords: COVID-19, analysis, crisis, Pandemic, consequences, remedy, Artificial Intelligence, Nanotechnology, Gene Editing.

I. INTRODUCTION

COVID-19 or SARS CoV-2 was detected in the Wuhan city of China in 2019, December. This city has a total of 10-12 million total population. Till date, more than Two Hundred [200] countries have been under the negative effect Corona and there have been a total of Eight Hundred Thousand (8, 00,000) deaths and more. There are more than Three Lakh Twenty Five Thousand [3, 25,000] and more confirm cases. As this is a Pandemic disease, it is important to know the origins of this virus, the clinical symptoms and the risk factors it carries with itself.

1) *Coronavirus:* These are large group of viruses which cannot be seen through naked eyes. CORONA refers to a crown-shaped virus. It can affect a quite nice range of birds, mammals and human beings. To be specific, this virus is not new, it has just outgrown itself.

Crown Shaped Corona Virus

II. HISTORY

The type of Coronavirus causing COVID-19 is new, it is called SARS-CoV-2, and it originated from bats.
Let's know about the types of Coronavirus in the last Two decades [20 years].

A. SARS (Severe Acute Respiratory Syndrome)

Emerging from China (Guangdong), it severely affected Twenty Six [26] countries and it had more than Eight Thousand [8000] positive cases.

B. MERS (Middle East Respiratory Syndrome)

Emerging from the Middle East in 2012, it caused Eight Sixty Six [866] deaths and it had more than Twenty Five Hundred [2500] cases globally.

C. SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2)

It emerged in Wuhan city, China in December 2019. It is the respiratory illness which is responsible for the COVID-19 worldwide Pandemic.

A, B, C all three types of Coronavirus originated in bats and now have the ability to affect people.

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III. SYMPTOMS

There are a lot of signs and symptoms which have been noted:

A. Common Signs and Symptoms

1) Fever
2) Difficulty in Breathing
3) Fatigue
4) Cough
5) Loss of Taste
6) Muscle Pain
7) Chills etc.

Some people may be asymptotic but still suffering from Coronavirus.

B. Severe Signs and Symptoms

1) Chest Pain
2) Blue Lips
3) Difficulty in Waking up.

IV. RISK FACTORS & DIAGNOSIS

A. A group of people is more prone to COVID-19 than a single person.
B. Older generation (> 60 years) are having greater risks.
C. People having Obesity or other diseases like – Diabetes, Heart/Lung disease, Weak Immune System, High Blood Pressure etc are always more prone to this virus.

There are two types of Laboratory tests done to diagnose the disease.

1) *PCR (Polymerase Chain Reaction) Test:* This test detects the RNA (genetic material) of Coronavirus. If the virus is in a human body, we will know. The procedure generally requires a nose and throat swab. If a person has positive PCR test, this means the virus is actively infecting in his/her body. But, this is not an accurate test.
2) *Antibody Test:* With this test, the antibodies to the virus can be detected. Antibodies are usually made by a person's immune system to fight with such diseases, generally bacterial/viral.

V. DATA ANALYSIS

Python is one of the most preferred data visualization language. It is more than a decade old but has got various libraries specifically used for data visualization.

The libraries used in Coronavirus analysis are – Matplotlib and Altair (for data visualization), Pandas (for analysation). Here are their functions:

A. Matplotlib

It is the most commonly and widely used library. When required to sense data, use Matplotlib. It has a set of default styles. It creates quality charts and graphs very easily. It uses the module "Pyplot". So, to import this library into any programming, use `import matplotlib.pyplot as plt`

Various data frames have been used to print specific graphs for data analysation like-

1) plt.title () – Its used for setting up a title.
2) plt.bar () – Its used for creating a bar graph.
3) plt.plot () – Its used to plot a line chart.
4) plt.xlabel / plt.ylabel – It's used to label x and y axis.

B. Pandas

Pandas is an open-source language; it provides high performance and quality analysis of data. It is used to load a specific dataset into a programming environment. It is efficient and used for various functions like-

1) *Data Alignment*
2) *Reshaping Datasets*
3) *Finding missing data*
4) *Merging Data*
5) *Group/Pivot datasets etc.*

It is used in Covid-19 analysis for loading different datasets, changing format and reshaping of data i.e. Data Analysis. It can be imported as- import pandas as pd

C. Altair

It is a library specifically designed to visualize statistical data. In this library, complete description of visual appearance is allowed. It can be imported as-import altair as alt

Altair uses a fundamental object named 'chart' which can accept a dataframe. There are various ways to plot an altair graph – point, line, circle, bar etc.

1) Analysis

Datasets used for the COVID-19 data analysis is downloaded from-
https://github.com/CSSEGISandData/COVID -19/tree/master/csse_covid_19_data/csse_covid_19_time_series

The dataset shows COVID-19 confirmed cases, total deaths and recoveries taking place globally. Data has been reshaped, regrouped and analyzed into a common table containing – 'Date', 'Country', 'Confirmed', 'Deaths', 'Recovered' and 'Active_Cases'.

Active Cases were found out by doing the calculation-

Active cases = Confirmed – Deaths – Recovered {- => Subtract}

The final table has been visualized through various combination and graphs to find the final conclusion.

Final Table looks like →

```
Group_data
```

	Date	Country/Region	Confirmed	Deaths	Recovered	Active_Cases
0	2020-01-22	Afghanistan	0	0.0	0.0	0.0
1	2020-01-22	Albania	0	0.0	0.0	0.0
2	2020-01-22	Algeria	0	0.0	0.0	0.0
3	2020-01-22	Andorra	0	0.0	0.0	0.0
4	2020-01-22	Angola	0	0.0	0.0	0.0
...	...	...	...	...	...	...
44363	2020-09-13	West Bank and Gaza	30574	221.0	20082.0	10271.0
44364	2020-09-13	Western Sahara	10	1.0	8.0	1.0
44365	2020-09-13	Yemen	2011	583.0	0.0	0.0
44366	2020-09-13	Zambia	13539	312.0	12260.0	967.0
44367	2020-09-13	Zimbabwe	7526	224.0	5678.0	1624.0

44368 rows × 6 columns

VI. TECHNOLOGIES USED FOR TREATING COVID-19

COVID TREATING TECHNOLOGIES IN WORLD		
S.No	Technology	Impacts/Developments
1	Artificial Intelligence	Detection and prediction
2	Nanotechnology	Drug delivery and screening test
3	Robots	Tasking and minimize human contact
4	Synthetic Biology	Vaccines and Antibodies
5	Blockchain	Innovative solutions and Tracking
6	Drones	Technical Tasks
7	Open Source Technologies	Research about Covid impacts
8	Gene Editing Technologies	Diagnosis and Treatment

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Main two COVID-19 helping technologies can be explained as-

A. Artificial Intelligence

1) Artificial Intelligence is the simulation of humans, i.e. making the machines intelligent so that they can think and act like human beings.

2) It is mainly used to detect Coronavirus through-

a) Wearable Sensors: Detecting temperature

b) Lung Scans: Detecting visual signs of Covid-19

3) It provides an open source information for tracking Covid-19 spread.

4) AI in the form of drones can help in medical supplies and sanitization.

B. Nanotechnology

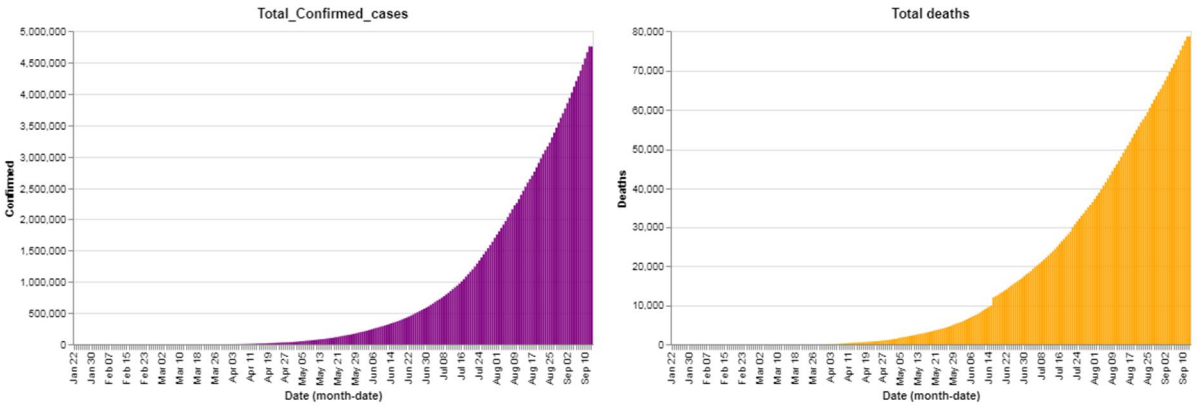
1) It is a field which uses nano-sized particles and devices to diagnose and drug delivery keeping Covid-19 in mind.

2) It has been used by various scientists across the world to create a vaccine for Covid-19 including Scientists at University of Washington's Institute for Protein design.

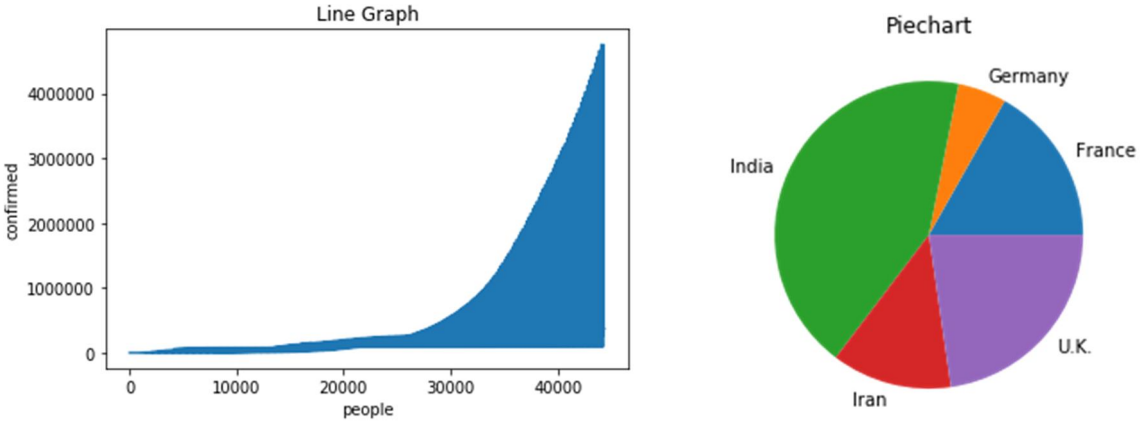
3) Nanotechnology is applied purely for health purposes.

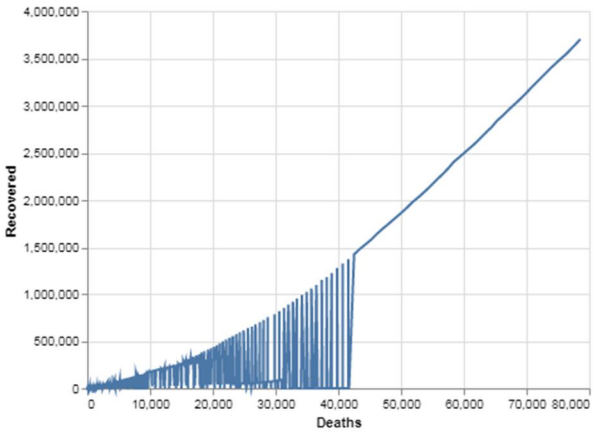
Other technologies provide us with many other health benefits and ease written in the above table.

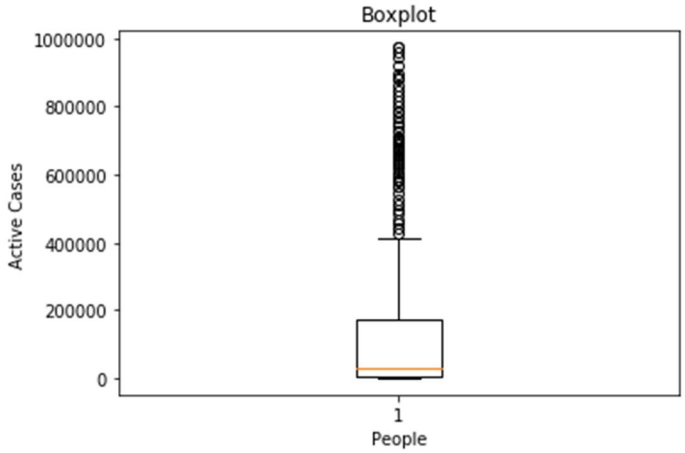
VII. RESULTS/CONCLUSIONS

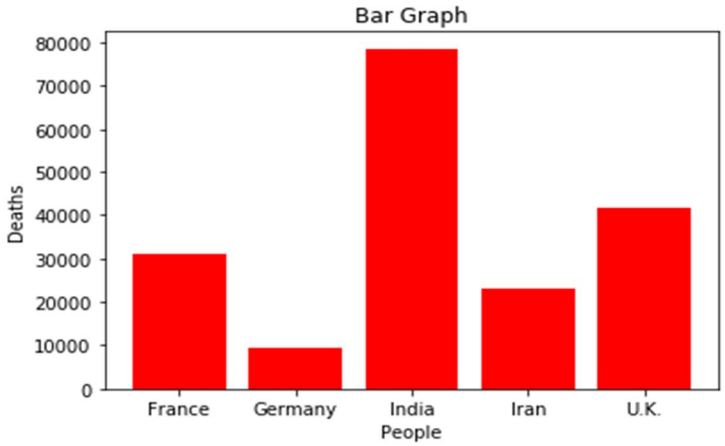


Altair Chart









Covid-19 data analysis helped in picturing the entire data into various graphs to understand a final conclusion. It can be concluded that Covid-19 has destroyed a lot of countries in the worst way possible. People are scared, sick and dying. India, till date, has second highest number of total cases [6, 573, 678] and more. Technology is playing an important role in the treatment and prevention of COVID-19 but without a vaccine, this virus cannot be stopped. As COVID-19 evolves, technology is multiplying and giving continuous attempts to stop this worldwide spread and improve healthcare. Artificial Intelligence, Drones & Robots help in tracking down the disease; Open-Source Technologies can sustain government and healthcare efforts; at the same time Nanotechnology and Gene Editing technologies are continuously trying to make the situation better by finding alternate solutions. COVID-19 has adversely affected all the sectors of the world, each country is suffering, people are scared; yet the faith in science is still present.

VIII. ACKNOWLEDGMENT

I would not have been able to complete this research paper without my professors and my peers for clearing all my doubts in between. I would also like to acknowledge the contributors for creating the IEEE Latex style files which have been used in the preparation of this paper.

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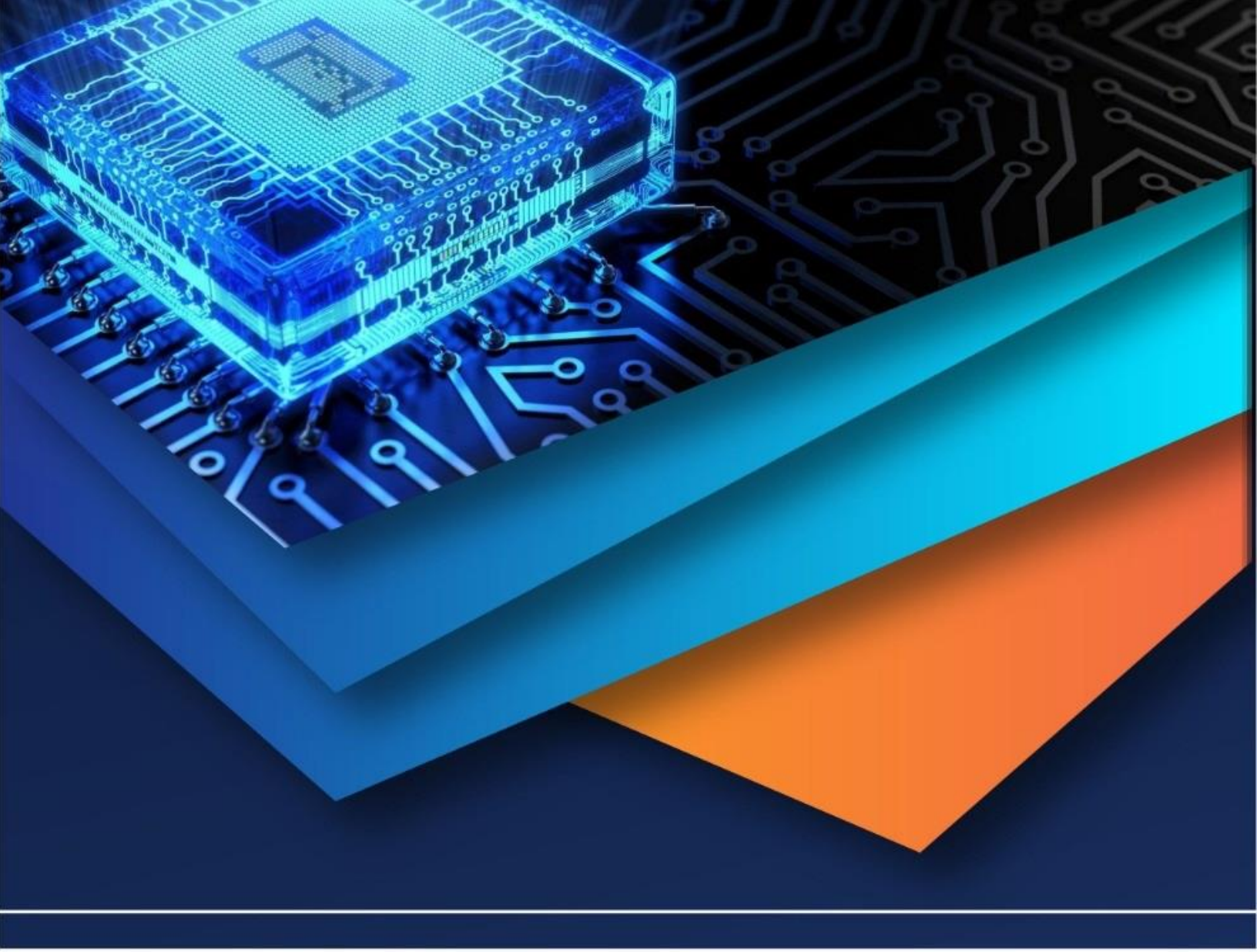

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