Priyadarshini engineering college

Covid-19 cases analysis

Srinath.k.u
Team boys 2

TALK TO US

email : sachinrocke35@gmail.com

September 25,2023

Introduction

Thepandemic of Coronavirus Disease 2019 (COVID-19) is a timely reminder of the nature and impact of Public Health Emergencies of International Concern. As of 12 January 2022, there were over 314 million cases and over 5.5 million deaths notified since the start of the pandemic. The COVID-19 pandemic takes variable shapes and forms, in terms of cases and deaths, in different regions and countries of the world. The objective of this study is to analyse the variable expression of COVID-19 pandemic so that lessons can be learned towards an effective public health emergency respons

Key component of covid-19 cases analysis

Epidemiological Data: This includes data on the number of cases, deaths, recoveries, and hospitalizations. It helps in tracking the spread of the virus.

Demographics: Analyzing the age, gender, and location of cases can provide insights into who is most affected and where the virus is spreading.

Testing Data: Information on the number of tests conducted, testing positivity rate, and types of tests used is crucial to assess testing adequacy and accuracy.

Hospitalization and ICU Data: Tracking the number of COVID-19 patients in hospitals and ICU beds helps assess the strain on the healthcare system.

Vaccination Data: Monitoring vaccine distribution and coverage is essential for understanding the impact of vaccination campaigns on case numbers.

Genomic Sequencing: Analyzing the genetic makeup of the virus can help identify variants and track their spread.

Public Health Measures: Assessing the impact of interventions like lockdowns, mask mandates, and social distancing on case numbers.
Contact Tracing: Understanding how well contact tracing is being conducted to identify and isolate cases.

Healthcare Capacity: Monitoring the availability of medical resources like ventilators, PPE, and healthcare personnel.

Public Compliance: Gauging how well the public is adhering to safety guidelines and recommendations.

Mutations and Variants: Continuously monitoring for new mutations and variants that may impact the virus's

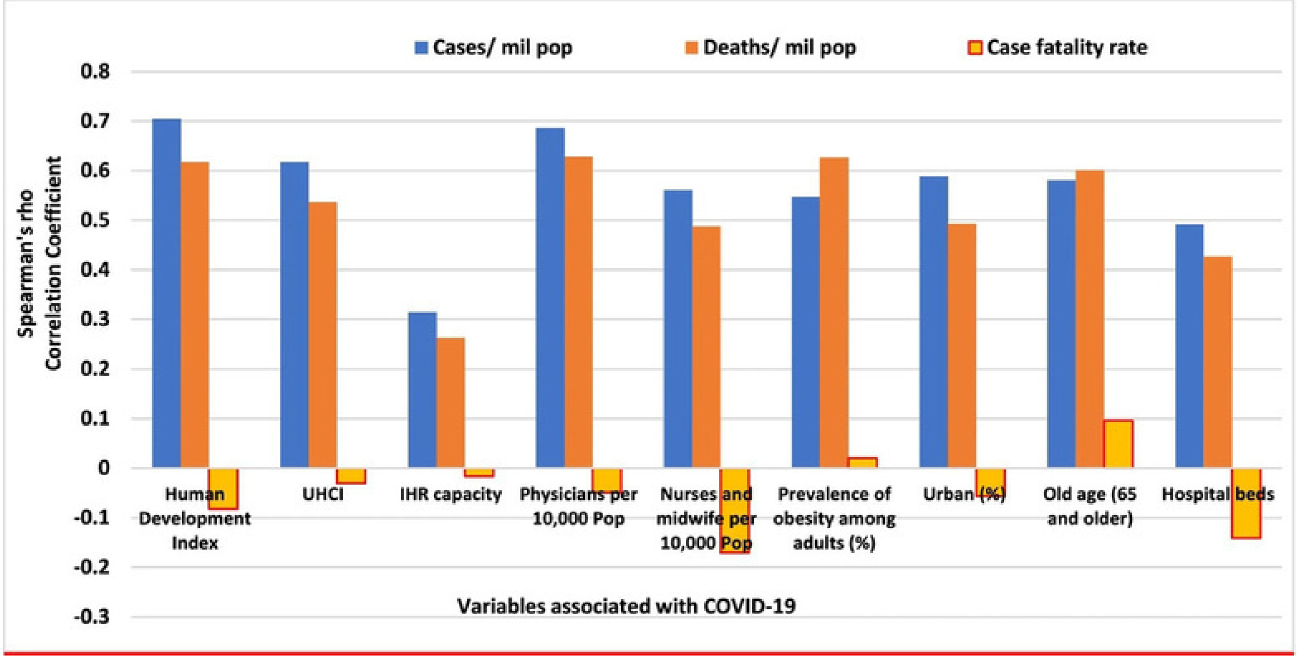
behavior. **International Data**: Analyzing global trends and comparing data with other countries for context and insights.

These components collectively help public health officials, researchers, and policymakers make informed decisions to control the spread of COVID-19.

Analysis covid-19 pandemic through the cases, death and recoveries

Data Analysis

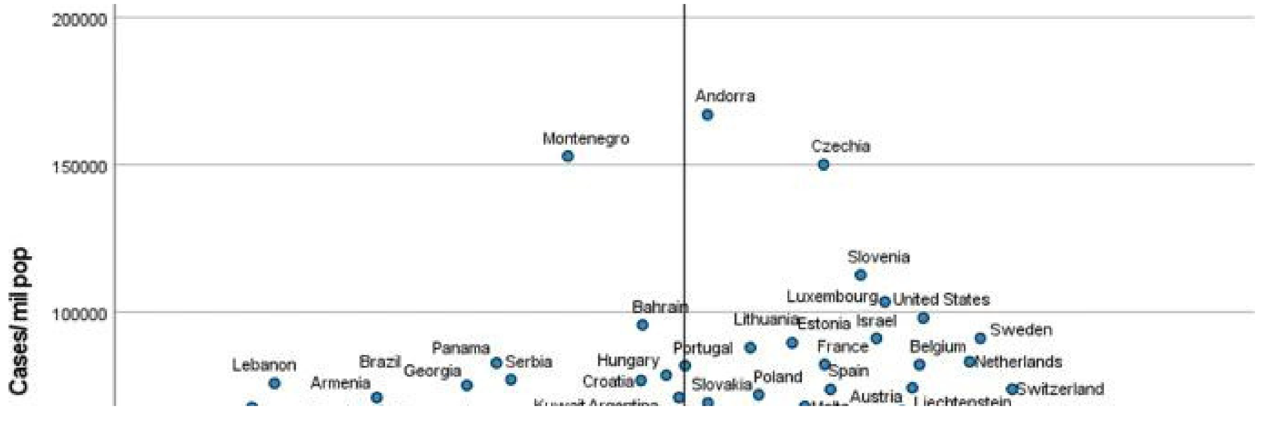
Background and aims The novel Coronavirus disease (COVID-19) in Wuhan, China, became a pandemic after its outbreak in January 2020. Countries one after the other are witnessing peak e ects of the disease, and they need to learn from the experience of others already a ected or peaked countries. Thus, this
paper aims to analyse the e ect of the Covid-19 pandemic on di erent countries through COVID-19 cases, resulting in deaths and recoveries. Methods This study analyses quantitatively the lethal e ects of the pandemic through the study of infections, deaths, and recoveries on the 13 most-a ected COVID-19 countries as of 1 s t June. The daily change in cases, deaths, and recoveries for all the 13 countries were considered. Combined analysis for comparison and separate analysis for the detailed study were both taken for every country. All the graphs were made in RStudio using the R programming language, as it is best for statistical analysis. Results The casual and ignorant behaviour of people is a major reason for such a large scale spread of the coronavirus. The government of every country should be strict as well as considerate to all sections of people while making policies. There is no room for mistakes, as one wrong decision or one delayed decision can worsen the situation. However, some countries which were once the epicentre of this pandemic are now corona-free, proving that this global threat can be tackled and we should all keep our morale high. Conclusions The coronavirus disease is not any ordinary viral infection; it has become a pandemic as it has an impact on health, mortality, economy and social well being of the entire world. Qualitative and Quantitative analysis of the statistics related to COVID-19 in di erent countries is done based on their o cials' data. The primary objective of this analysis is to learn about the relationships of various countries in containing the spread of COVID-19 and the various factors such as government policies, the cooperation of people, economy, and tourism.

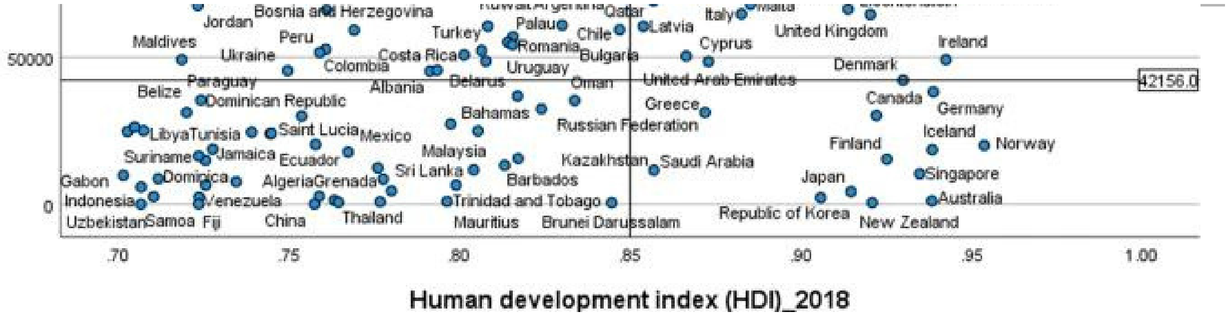


Covid-19 cases analysis in India

Ican provide some general information about COVID-19 cases in India up to my knowledge cutoff date in September 2021, but please keep in mind that the situation may have changed since then.

As of September 2021, India had experienced several waves of COVID-19, with the largest surge occurring in the first half of 2021. At that time, India had reported millions of confirmed cases and a significant number of deaths. Various factors, including population density and healthcare infrastructure, influenced the impact of the virus in different regions of the country.
For the most up-to-date and accurate information on COVID-19 cases in India, I recommend checking the latest reports from trusted sources such as the World Health Organization (WHO) or the Ministry of Health and Family Welfare in India





Scatter plot of COVID-19 deaths per million population in countries with high human development index

Conclusion

The COVID-19 pandemic demonstrates that the world remains vulnerable to public health emergencies with significant health and other socio-economic impacts. The pandemic takes variable shapes and forms across regions and countries around the world. The pandemic has impacted countries with inadequate governance of the epidemic, fragmentation of their health systems and higher socio-economic inequities more than others. We argue that adequate response to public health emergencies requires that countries develop and implement a context-specific national strategy, enhance governance of public health emergency, build the capacity of their health systems, minimize fragmentation, and tackle socio-economic inequities. This is possible through a PHC approach that provides universal access to good-quality health services through empowered communities and multi-sectoral policy and action for health development. The pandemic has affected every corner of the world; it has demonstrated that “no country is safe unless other countries are safe”. This should be a call for a strong global health system based on the values of justice and capabilities for health.

priyadarshini engineering college

COVID-19

CASE ANALYSIS

October 11,2023

Phase 2

Presented To

sachin.c

Register.no: 511921104060

Email:sachinrocke35@gmail.c
om

Data analysis covid-19 cases analysis

Abstract

Corona Virus Disease- 19 (COVID-19) was first time reported in Wuhan, China. This disease has covered more than 200 countries till May 2020. World Health Organisation (WHO) has declared COVID-19 as Public Health Emergency of International Concern (PHEIC) on 30 January 2020. COVID- 19 causes severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which was progressive earlier in China but now in maximum countries. Therefore, the different online platform are used which provides the latest update of confirmed corona cases throughout the globe for the analysis of data. The aim of data analysis for CIVID-19 is to aware of the community against the infectious disease and forecast the COVID-19 confirmed cases, deaths, and recoveries through the data analysis methods. Different models are also used to study the behavior of the disease. The models help to forecast the patterns of public sentiments on health information with both the political and economical influence of the spread of the virus. Data analysis methods which are used are Exploratory Data Analysis (EDA) in which the number of confirmed cases, death, and recovered data are recorded, model like Susceptible-Exposed-Infectious-Recovered (SEIR) model is used to predict the time and the rate taken for the spreading up of disease throughout the globe. A statistical model can also be used to compare the data among different countries to make humans aware of the infection.

Keywords: 2019-nCoV, SARS-CoV-2, Coronavirus, COVID-19, data analysis, visualization.

I. INTRODUCTION

The outbreak of the new disease in Wuhan, China was caused by novel Coronavirus (2019-nCoV) [1]. This disease is a form of pneumonia. Coronavirus belongs to the *Orthocoronavirinae* subfamily. The first case was observed at the Chinese Center for Disease Control and Prevention (CDC) on 12 December 2019 and was considered as a non-SARS novel coronavirus [2]. The family to which Coronavirus belongs is *Coronaviridae* which consists of a large, single RNA strand of plus sign [3]. Viruses of these family show the symptoms of common cold, diarrhea in human beings. In the year 2003, it was seen the outbreak of coronavirus i.e. severe acute respiratory syndrome coronavirus (SARS-CoV) [4]. In December 2019 at Wuhan, China's symptoms closely resembled the same as pneumonia [5].

Several cases of approximately 1974 were confirmed in China according to the council information office in Beijing, China's capital on 26th January, 2020. Virus started spreading in many other countries like the so to take some serious action for the control and prevention from the disease. World Health Organisation (WHO) on 30 January 2020 declared that Coronavirus Disease was an outbreak emergency of international concern after the attack of H1N1 in 2009, the emergence of Ebola virus in 2014, polio in 2014 and Zika virus in 2016 [6] [29]. Finally, on 11 February 2020, World Health Organization (WHO) gave the name of the novel disease which was caused by the corona virus as Corona Virus Disease- 19 (COVID-19) [7] [32]. Record maintenance on 24 February 2020 showed that more than 78, 000 patients were suffering from COVID-19 throughout many countries. The maximum patients were from China according to the World Health Organization (WHO) which were approximately 77,000 and 2500 death [8]. According to the World Health Organization (WHO) the rest of the countries reported 2000 confirmed cases and 300 deaths as on 7 March 2020. In Wuhan, China lockdown orders of all the trains, fights and public transport were passed on 23 January 2020. The exact origin of COVID-19 was not reported but through different researches, it was seen that coronavirus possibly has originated from the bat. According to the Centers for Disease Control and Prevention (CDC), the novel disease COVID-19 was transmitted from person to person through droplets, and the symptoms seen were fever, shortness of breath, and cough which was seen after 14 days [9].

The International Committee on Virus Taxonomy replaced the name of 2019-nCoV as SARS-CoV-2 (severe acute respiratory coronavirus-2 syndrome) [10]. The outbreak of novel SARS-CoV-2 was increasing at an alarming rate in China as global intimidating as pandemic throughout the World. Different methods were used to analyze data regarding epidemiology which were exploratory data analysis (EDA) methods and visualization model. These two methods showed the awareness among the communities and were noticed according to the data analysis that the government, health workers and the public have to cooperate throughout the World to prevent the spreading of the COVID-19 [11].

Data was collected from different sources from different countries regarding COVID-19 [12]. The maximum data related to COVID-19 was available at Google, WHO, CDC, ECDC, NHC of the PRC, JHU CSSE, DXY, QQ websites [13]. With the help of these data from different sources helped to analyze the people getting affected by COVID-19 and the rate of recovery and deaths were also analyzed daily. The dataset was recorded from 22 January 2020. Dataset was analyzed to record the death, survival, recovery, and people who were affected by COVID-19.

The very first data suggested that males of age above years were at higher risk of infection with COVID-19.

According to two other well-known diseases which are caused by coronavirus i.e SARS and MERS (Middle East

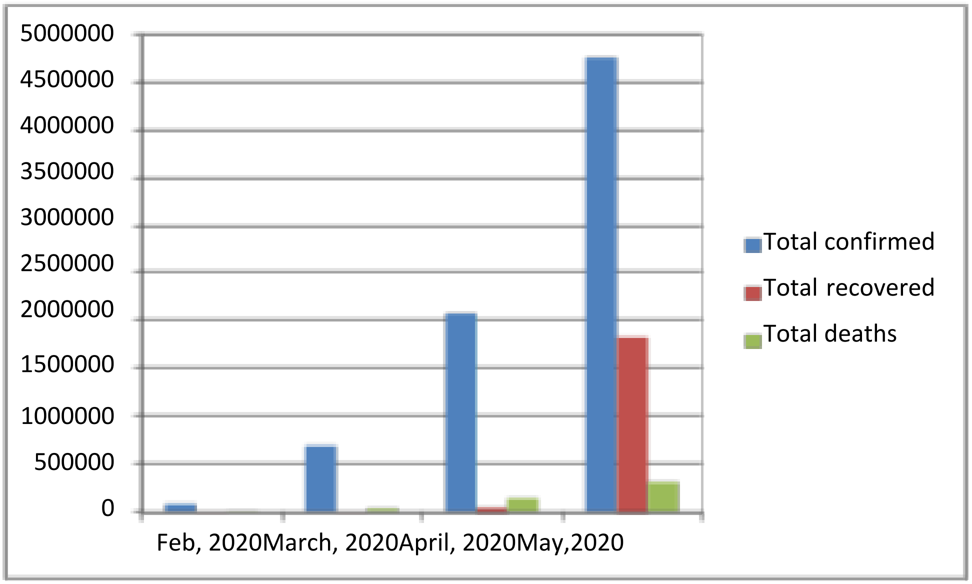


Fig. 1: Outbreak trends over time

A. *Data Source*

Data related to COVID-19 was retrieved from verified sources like Google, WHO DingXiangYuan, a website that is authorized by the Chinese government [16]. These sites provide information about the confirmed COVID-19 cases, the number of people recovered from the disease and the number of deaths that took place by infection of the virus [17].

B. *Data Visualization*

The retrieved data from different sites can be used to track the status of the corona [16]. The data collected from a different source can be seen in the table 1 [15]. The updates from the different countries can be seen through the different countries' COVID-19 portal or WHO [18].

C. *Exploratory Data Analysis (EDA)*

Exploratory Data Analysis is used to analyze data and visualize the dataset provided by different sources regarding the emergence of the disease. The exploratory data analysis was used to record the dataset of the outbreak of COVID-19 throughout the World [19]. The first dataset was visualized and analyzed between 22 January 2020 to 10 March 2020. It was seen that the rate of people affected by COVID-19 was more from China than the rest of the World, the few affected countries were neighbors of China. After 10 March 2020 more than 30 countries and 32 states in China were affected by COVID-19 [20]. Outside China not many deaths were reported, only ten death reports were noticed until 11 March 2020. It was noticed that the rate of recovery was more than the rate of deaths and by 15 May 2020, more than 200 countries were affected by the corona. Table I shows the number of confirmed cases, the number of deaths and the number of survival till 17th May 2020 [15].

TABLE I

Sr.No.	Country	Total confirmed	Total Recovered	Total Deaths
1	USA	1,510,286	339,578	90,178
2	Russia	281,752	67,373	2,631
3	Spain	277,719	195,945	27,650
4	UK	240,161	135	34,466
5	Brazil	233,511	89,672	15,662
6	Italy	224,760	122,810	31,763
7	France	179,365	61,066	27,625
8	Germany	176,450	153,400	8,027
9	Turkey	148,067	108,137	4,096
10	Iran	120,198	94,464	6,988
11	India	92,239	35,603	2,911
12	Peru	88,541	28,272	2,523
13	China	82,947	78,227	4,633
14	Canada	75,864	37,819	5,679
15	Belgium	55,280	14,630	9,052
16	Saudi Arabia	54,752	25,722	312
17	Mexico	47,144	31,848	5,045
18	Netherlands	43,995	3	5,680
19	Chile	41,428	18,014	421
20	Pakistan	40,151	11,341	873
21	Ecuador	32,763	3,433	2,688
22	Qatar	32,604	4,370	15
23	Switzerland	30,587	27,400	1,881
24	Sweden	30,143	4,971	3,679
25	Belarus	29,650	9,932	165
26	Portugal	29,036	4,636	1,218
27	Singapore	28,038	8,342	22
28	Ireland	24,048	19,470	1,533
29	UAE	23,358	8,512	220
30	Bangladesh	22,268	4,373	328
31	Poland	18,394	7,451	919
32	Ukraine	18,291	5,116	514
33	Indonesia	17,514	4,129	1,148
34	Romania	16,871	9,890	1,104
35	Israel	16,607	12,884	271

36	Austria	766	14,56	629
37	Japan		3	725
38	Colombia	657	10,33	562
39	Kuwait	276	8	112
40	South Africa	1223	3,587	261
41	Philippines	765	4,093	824
42	Dominican	877	6,478 23,6,73256	428
43	Republic Egypt	977	2,950	612
44	S. Korea	1226	9,888	262
45	Denmark	345	9,227	547
46	Serbia	1226	4,713	230
47	Panama	1666	6,080	269
48	Czechia	1128	5,422	297
49	Norway	1459	32	232
50	Argentina	1908	2,569	366
51	Australia	1008	6,367	98
52	Bahrain	5577	2,774	12
53	Malaysia	2776	5,571	113
54	Algeria	6088	3,409	542
55	Morocco		3,645	192
56	Afghanistan	5000	778	169
57	Finland	1977	5,000	298
58	Kazakhstan	9776	3,090 2,344	34
59	Moldova	657	1,754	207
60	Ghana	2679	1,472	29
61	Nigeria	8639	1,465	176
62	Oman	8668	1,925	22
63	Armenia	6726	3,699	60
64	Luxembourg	6869	473	104
65	Bolivia	6628	1,396	165
66	Hungary	1553	2,015	451
67	Azerbaijan	1665	2,126	39
68	Iraq	1266	1,567	121
69	Cameroon	233	2,856	140
70	Thailand	976	1,374	56
71	Greece	1224	2,213	162
72	Uzbekistan	552	1,133 278	11
73	Guinea			16
74	Honduras	763		138

75	Senegal	2,480	973	25
76	Bosnia and	2,290	1,436	133
77	Herzegovina Sudan	2,289	222	97
78	Croatia	2,226	1,936	95
79	Bulgaria	2,211	598	108
80	Ivory Coast	2,061	987	25
81	Cuba	1,872	1,495	79
82	Iceland	1,802	1,786	10
83	North	1,792	1,293	101
84	Macedonia	1,774	938	63
85	Estonia	1,763	138	33
86	Guatemala	1,541	997	56
87	Lithuania	1,499	1,433	21
88	New Zealand	1,494	1,163	28
89	Slovakia	1,466	273	104
90	Slovenia	1,455	270	61
91	DRC	1,357	148	55
92	Somalia	1,338	462	27
93	El Salvador	1,331	950	4
94	Djibouti	1,322	0	36
95	Tajikistan	1,320	244	11
96	Gabon	1,312	627	18
97	Mayotte	1,138	804	14
98	Kyrgyzstan	1,078	58	4
99	Maldives	1,056	1,024	4
100	Hong Kong	1,037	807	45
101	Tunisia	1,008	662	19
102	Latvia Guinea-	969	26	4
103	Bissau	964	538	9
104	Sri Lanka	946	715	31
105	Albania	914	515	17
106	Cyprus	911	247	26
107	Lebanon	889	689	51
108	Niger	887	301	50
109	Kenya	860	494	52
110	Mali	853	551	10
111	Costa Rica	782	604	51
112	Burkina Faso	778	198	11
	Paraguay			

113		761	615	51
114	Andorra	753	188	7
115	Zambia	733	558	19
116	Uruguay Diamond	712	651	1
117	Princess *	695	425	3
118	Georgia	654	201	1
119	San Marino	607	404	2
120	Jordan Equatorial	594	22	4 17
121	Guinea Malta	553	454	96
122	Jamaica	517	121	9
123	Tanzania	509	183	21
124	Sierra Leone	505	141	32
125	Venezuela	504	241	10
126	Chad	474	111	50
127	Réunion	443	354	0
128	Taiwan	440	395	7
129	Palestine	381	335	2
130	Haiti	358	29	20
131	Benin	339	83	2
132	Isle of Man	335	285	24
133	Mauritius	332	322	10
134	Cabo Verde	328	84	3
135	CAR	327	13	0
136	Montenegro	324	311	9
137	Vietnam	320	260	0
138	Ethiopia	317	113	5
139	Madagascar	304	114	1
140	Togo	298	99	11
141	Nepal	295	36	2
142	Rwanda	289	178	0
143	Sao Tome and	235	4	7
144	Principe Uganda	227	63	0
145	Liberia	226	120	21
146	Eswatini	202	72	2
147	French Guiana	197	125	1
148	Martinique	192	91	14
149	Faeroe Islands	187	187	0

150	Myanmar	182	96	6
151	Guadeloupe	155	109	13
152	Gibraltar	147	145	0
153	Brunei	141	136	1
154	Mozambique	137	43	0
155	Mongolia	136	21	0
156	Bermuda	123	73	9
157	Cambodia	122	122	0
158	Yemen	122	1	18
159	Guyana	117	43	10
160	Trinidad and	116	107	8
161	Tobago Aruba	101	93	3
162	Monaco	96	87	4
163	Bahamas	96	42	11
164	Cayman Islands	94	55	1
165	Barbados	86	67	7
166	Liechtenstein	82	55	1
167	Libya	65	28	3
168	Malawi	65	24	3
169	French	60	59	0
170	Polynesia Syria	51	36	3
171	Angola	48	17	2
172	Macao	45	43	0
173	Zimbabwe	44	17	4
174	Mauritania	40	7	4
175	Eritrea	39	39	0
176	Saint Martin	39	30	3
177	Puerto Rico	39	1	2
178	Guam	32	0	1
179	Antigua and	25	19	3
180	Barbuda Nicaragua	25	7	8
181	Timor-Leste	24	24	0
182	Botswana	24	17	1
183	Gambia	23	12	1
184	Grenada	22	14	0
185	Bhutan	21	5	0
186	Laos	19	14	0

187	New Caledonia	18	18	0
188	Saint Lucia	18	18	0
189	Belize	18	16	2
190	Fiji	18	15	0
191	St. Vincent Grenadines	17	14	0
192	U.S. Virgin	17	0	0
193	Islands Dominica	16	15	0
194	Curaçao	16	14	1
195	Namibia	16	13	0
196	Saint Kitts and	15	1	0
197	Nevis Burundi	15	4	1
			7	
198	Turks and Caicos	12	1	1
199	Vatican City	12	0	0
200	Greenland	11	2	0
201	Montserrat	11	11	1
202	Seychelles	11	10	0
203	Comoros	11	10	1
204	Suriname	10	3	1
			9	
205	Papua New Guinea	8	8	0
206	British Virgin	8	6	1
207	Islands Western	6	6	0
208	Sahara	6	6	0
209	St. Barth	3	3	0
210	Anguilla	2	0	0
211	Kosovo	1	0	0
	Lesotho			

D. *Visual Exploratory Data Analysis (EDA)*

Visual Exploratory Data Analysis (EDA) is a method used to analyze the rate at which COVID-19 was spreading throughout the globe. In this method, the data was analyzed through a map that helps an individual to understand the epidemiological nature of COVID-19 as shown in Fig. 2. According to the data, it was noticed that China reported the highest rate of cases confirmed with COVID-19 and the highest death rate by the virus (Till 17 March 2020) followed by Italy [21]. EDA provides a piece of good knowledge about the time taken by the virus to spread throughout the globe. The data analysis through EDA is also useful in analyzing the behavior of the disease. EDA helps in understanding the situation of the COVID-19. The data for COVID-19 is available at URL http://samratdey.me/visualization.html and by 15 May 2020, it was seen that highest number of corona cases were reported by USA and Russia followed by Spain [15].

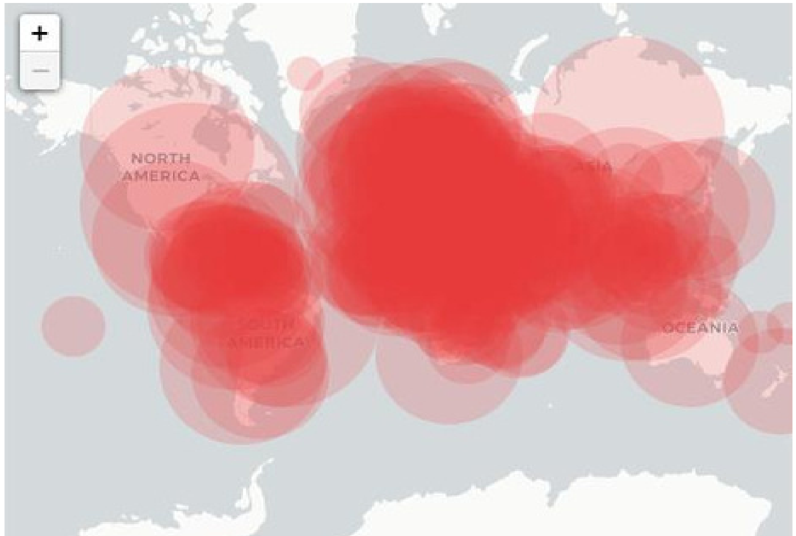


Fig. 2**:** World map of affected region, where the darker red regions in the map predict number of infected cases [15]

E. *Predictive Modeling – SEIR Model*

Susceptible-Exposed-Infectious-Recovered (SEIR) model is used to predict the time and the rate taken for the spreading up of disease throughout the globe. In this modeling method, real-time data is collected and visualized to forecast the rate of increasing cases for COVID-19 [22]. SEIR model predicts according to the previous data provided to forecast the number of cases that may take place in the future, it also predicts the death rate that may occur in the future because of COVID-19. SEIR model is designed to analyze and classify the news into positive and negative sentiments [31]. The result of news on the behavior of peoples both economically and politically. The properties of Susceptible-Exposed-Infected-Removed (SEIR) system is used to study the outbreak of COVID-19 throughout the World [23]. SEIR is considered to be the model for simulation studies for the disease spreading, where parameters are Susceptible (S), Exposed (E), Infections (I) and Recovered (R). In Susceptible (S), people may or may not have infection were considered, in Exposed (E), people who were incubated after encountering of the virus, in Infections (I) people after incubation showing symptoms were kept and in Recovered (R) parameter it refers to the state where no one is infected with the disease or disease-free people [30].

The parameters in SEIR models are as follows:-

1. Beta is represented for the rate of spread, which is the rate at which disease is transmitted between a susceptible and infectious person.
2. The incubation rate is given by sigma, in which incubation to the individual is given and the rate is being recorded in which an individual will get infected. The duration of incubation given is 5 days.
3. Recovery rate is given by gamma, in this, the average duration of the recovery from the infection is recorded.
4. After the recovery phase, recovered candidates are kept under the removed phase [24] as shown in Fig. 3.

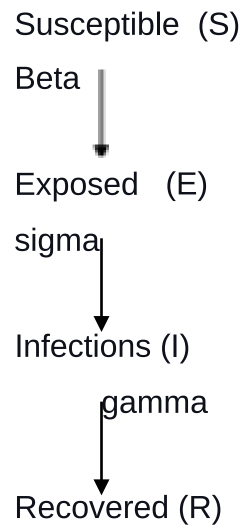


Fig. 3: SEIR Model

F. *Sentiment Analysis*

Sentiment analysis is done to keep a record of data which is neither too long nor too short and it is the result of the SEIR predictive model [25]. Sentiment analysis consists of a summary containing a description of more than eight words of the trained model [26] [27].

G. *Statistical challenges of analyzing COVID-19 data*

After the outbreak of COVID-19 in Wuhan, China, the statistical model plays a major role in comparing the number of confirmed COVID-19 cases, the number of recoveries and the number of death rate that is taking place throughout the globe as shown in Fig. 4, Fig. 5 and Fig. 6 respectively. The statistical model compares the data from origin i.e China to the data of different countries with respect to time in the form of a bar graph. The data from different countries of the confirmed cases are recorded from the very start of the outbreak of the disease. The separate data is maintained in a statistical model for the cases which are recovered from the infection and the number of deaths caused by COVID-19. The two protocols are maintained under in which closed COVID-19 cases are recorded which are as follows:-

1. International Severe Acute Respiratory and Emerging Infection Consortium (ISARIC) (isaric.tghn.org)
2. Lean European Open Survey on SARS-CoV-2 Infected Patients (LEOSS) (leoss.net).

For COVID-19 patients, the most important clinical endpoints are the record of intensive care, invasive ventilation, and survival. The less relevant endpoint is supportive oxygen. According to these two endpoints data can be analyzed on a statistical model that will be dependent on time. The data is further collected from ISARIC and LEOSS to analyze data in the standard protocol [28].

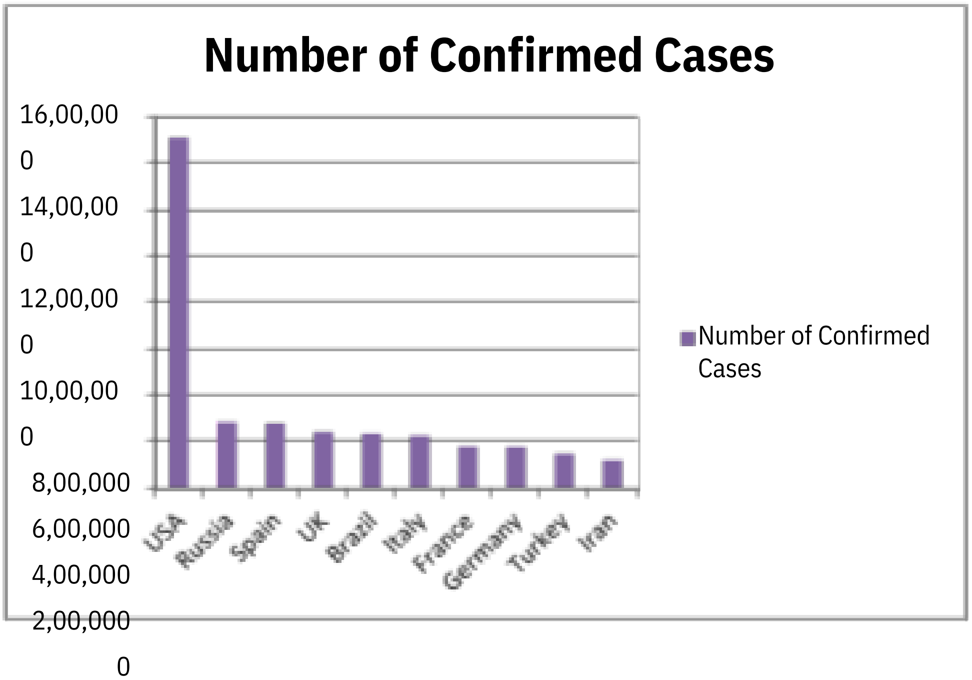


Fig. 4: Most affected countries showing number of confirmed COVID-19 cases.

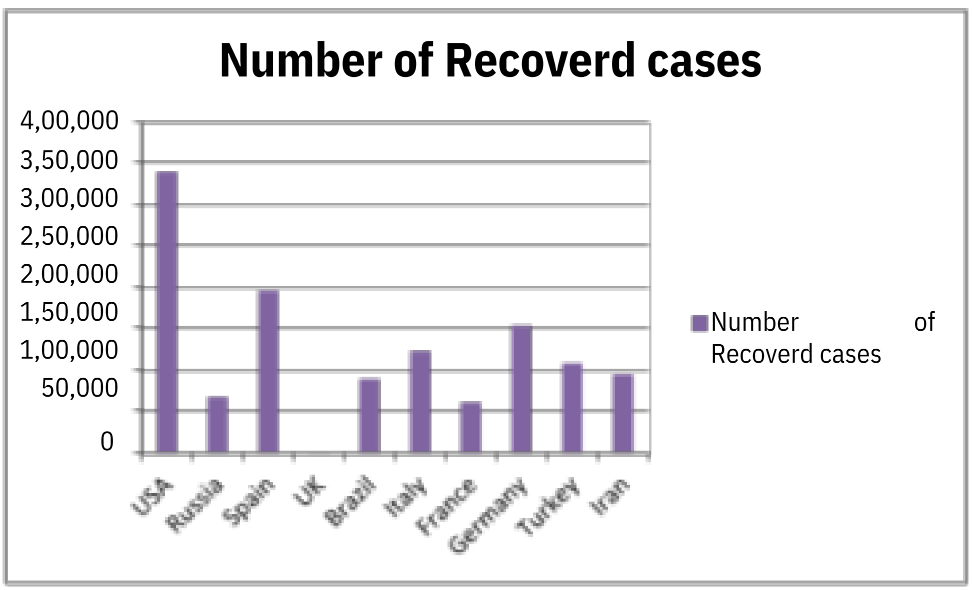


Fig. 5: Most affected countries showing number of recovered COVID-19 cases.

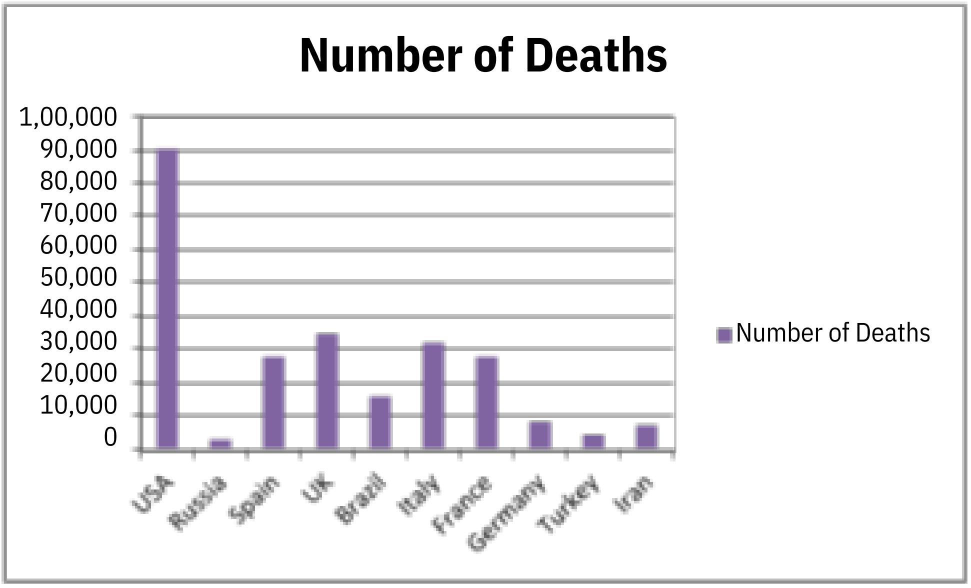


Fig. 6: Most affected countries showing number of recovered COVID-19 cases.

III. CONCLUSION

COVID-19 outbreak which took place in China was recorded and visualized through different online platforms. Data analysis was done through several methods. Exploratory Data Analysis was used to analyze data and visualize the dataset provided by different sources regarding the emergence of the disease. Visual Exploratory Data Analysis (EDA) was used as a method to analyze the rate at which COVID-19 was spreading throughout the globe. In this method, the data was analyzed through a map that helps an individual to understand the epidemiological nature of COVID-19. Susceptible-Exposed-Infectious-Recovered (SEIR) model was used to predict the time and the rate taken for the spreading up of disease throughout the globe. In this modeling method, real-time data was collected and visualized to forecast the rate of increasing cases for COVID-19 and was also used to forecast the analysis of infection. The results from the SEIR model were further used to analyze data for sentiment analysis among the community regarding the outbreak of COVID-19. The COVID-19 outbreak spreads not only through the country's policy but also through the social responsibility of each individual. The different online platform, updates the viewers with the situation of the disease including the number of confirmed cases, number of recoveries and number of deaths taking place throughout the world. Data analysis for COVID-19 is done to make aware humans against the infection caused by Corona.

ACKNOWLEDGEMENT

I would like to thanks Dr. Abhimanyu Kumar Jha for his continuous support throughout the research.

REFERENCES

1. Zhu N, Zhang D, Wang W, et al, “A novel coronavirus from patients with pneumonia in China”, *N Engl J Med*, https://doi.org/10.1056/NEJMoa2001017, 2019.

2. Centers for Disease Control and Prevention, “Novel Coronavirus (2019-nCoV), Wuhan, China”, https://www.cdc.gov/coronavirus/2019- nCoV/summary.html, 2019.

3. Chen Y, Liu Q, Guo D, “Emerging coronaviruses: genome structure, replication, and pathogenesis,” *J Med Virol*. https://doi.org/10.1002/jmv.25681, 2020.

4. Drosten C, Gunther S, Preiser W, et al, “Identification of a novel coronavirus associated with severe acute respiratory syndrome”, *N Engl J Med* 348:1967-1976, 2020.

5. Lu H, Stratton CW, Tang YW, “Outbreak of pneumonia of unknown etiology in Wuhan China: the mystery and the miracle”. *J Med Virol*. https://doi.org/10.1002/jmv.25678, 2020.

6. Chew C and Eysenbach G, “Pandemics in the Age of Twitter: Content Analysis of Tweets during the 2009 H1N1 Outbreak,” *PLoS ONE* 5: 11, 2010.

7. WHO. Novel coronavirus – China. Jan 12, 2020. http://www.who.int/csr/don/12-january-2020-novel-coronavirus-china/en/

8. Organization WH. WHO Statement Regarding Cluster of Pneumonia Cases in Wuhan, China; 2020. Available from: https://www.who.int/china/news/detail/09-01-2020-who-statement-regarding-cluster-ofpneumonia- cases-in-wuhan-china.

9. "Coronavirus Disease 2019 (COVID-19)," Centers for Disease Control and Prevention, 2020. https://www.cdc.gov/coronavirus/2019- ncov/about/symptoms.html.

10. Gorbalenya AE, Baker SC, Baric RS, et al, “Severe acute respiratory syndrome-related coronavirus: the species and its viruses —a statement of the Coronavirus Study Group”, *bioRxiv*. https://doi:10.1101/2020.02.07.937862, 2020.

11. Lin JL, McCloud R, Bigman C, et al, “Tuning in and catching on? Examining the relationship between pandemic communication and awareness and knowledge of MERS in the USA,” *Journal of Public Health* 4: 126-32, 2016.

12. Lauren G, “Coronavirus COVID-19 Global Cases by Johns Hopkins CSSE,” https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html, January 23, 2020.

13. Organization WH, “Novel coronavirus (2019-nCoV). Situation report 21. Geneva, Switzerland: World Health Organization,” https://www.who.int/docs/default-source/ coronaviruse/situation-reports/20200210-sitrep-21-ncov.pdf?sfvrsn=947679ef_2, 2020.

14. Lu R, Zhao X, Li J, Niu P, Yang B, Wu H, et al, “Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding,” *The Lancet*, https://doi.org/ 10.1016/S0140-6736(20)30251-8, 2020.

15.Corona Tracker Community, "Corona Tracker," Corona Tracker, (2020). https://www.coronatracker.com/.

16. Dong E, Du H, Gardner L, “An interactive web-based dashboard to track COVID-19 in real time,” *The Lancet Infectious Diseases*. https://doi.org/10.1016/S1473-3099(20)30120-1. PMID: 32087114, 2020.

17. Patel A, Jernigan D, “nCoV CDC Response Team. Initial Public Health Response and Interim Clinical Guidance for the 2019 Novel Coronavirus Outbreak—United States, December 31, 2019-February 4, 2020. MMWRMorb Mortal Wkly Rep,” https://doi.org/10.15585/mmwr.mm6905e1 *PLOS ONE* Forecasting of the COVID-19 outbreak PLOS ONE | https://doi.org/10.1371/journal.pone.0230405 March 31, 2020 20 / 21, 2020.

18. World Health Organization, "Coronavirus disease 2019 (COVID-19) Situation Report- 13," World Health Organization, 2020.

19. Battegay M, Kuehl R, Tschudin-Sutter S, Hirsch HH, et al, “Novel Coronavirus (2019-nCoV): estimating the case fatality rate —a word of caution. Swiss Medical Weekly,” 2020.

20. Hui D, et al, “The continuing 2019-nCoV epidemic threat of novel coronavirus to global health - The latest 2019 novel coronavirus outbreak in Wuhan, China,” *International Journal of Infectious Diseases* 91: 264-266, 2020.
21. Chen N, Zhou M, Dong X, et al, “Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study,” *The Lancet*. https://doi.org/10.1016/S0140-6736(20)30211-7, 2020.
22. Porter AT, “A path-specific approach to SEIR modeling," Ph. D Thesis University of Iowa, 2020.
23. The Institute for Disease Modelling, "SEIR and SEIRs models," Institute for DiseaseModelling,https://institutefordiseasemodeling.github.io/Documentation/general/model-seir.html, 2020.
24. Wu P, Hao X, Lau EHY, Wong JY, et al, “Real-time tentative assessment of the epidemiological characteristics of novel coronavirus infections in Wuhan, China,” *Eurosurveillance* 3: 25. https://doi.org/10.2807/1560-7917.ES.2020.25.3.2000044 PMID: 31992388, 2020.
25. Munikar M, Shakya S, Shrestha A, “Fine-grained Sentiment Classification using BERT,” *ArXiv,*2019.
26. Dong X, de Melo G, “A Helping Hand: Transfer Learning for Deep Sentiment Analysis, in Proceedings of the 56th Annual Meeting of the Association for Computational Linguistics,” 2018.
27. Kim Y, Jeong Y, Kim K, et al, “Topic-based content and sentiment analysis of Ebola virus on Twitter and in the news,” Journal of Information Science, 42: 763-781, 2016.
28. Wang D, Hu B, Hu C, Zhu F, et al, “Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus– Infected Pneumonia in Wuhan, China,” JAMA. https://doi.org/10. 1001/jama.2020.1585, 2020.
29. Song M, “Text Mining Driven Content Analysis of Ebola on News Media and Scientific Publications,” *Journal of the Korean Society for Library and Information Science* 50: 289-307, 2020.
30. Rachah A, Torres DFM, “Analysis, simulation and optimal control of a SEIR model for Ebola virus with demographic effects,” *Commun. Fac. Sac. Univ*. Ank. Series 67:179-197, 2018.
31. Lee S, Han C, “The Effects of Social Media Use on Preventive Behaviors during Infectious Disease Outbreaks: The Mediating Role of Self- relevant Emotions and Public Risk Perception,” Health Communication 2: 1-10, 2020
32. World Health Organization, "Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)," World Health Organization, 2020.

conclusion

The COVID-19 pandemic demonstrates that every country remains vulnerable to public health emergencies. The aspiration towards a healthier and safer society requires that countries develop and implement a coherent and context-specific national strategy, improve governance of public health emergencies, build the capacity of their (public) health systems, minimize fragmentation, and tackle upstream structural issues, including socio-economic inequities. This is possible through a primary health care approach, which ensures provision of universal and equitable promotive, preventive and curative services, through whole-of-government and whole-of-society approaches.

priyadarshini engineering college

COVID-19
CASE ANALYSIS

October 17,2023

Phase 3

Presented To

Sachin.C

Register.no: 511921104060

Email : sachinrocke35@gmail.com

ABSTRACTION

Today world thinks about coronavirus disease that which means all even this pandemic disease is not unique. The purpose of this study is to detect the role of machine-learning applications and algorithms in investigating and various purposes that deals with COVID-19. Review of the studies that had been published during 2020 and were related to this topic by seeking in Science Direct, Springer, Hindawi, and MDPI using COVID-19, machine learning, supervised learning, and unsupervised learning as keywords. The total articles obtained were 16,306 overall but after limitation; only 14 researches of these articles were included in this study. Our fndings show that machine learning can produce an important role in COVID-19 investigations, prediction, and discrimination. In conclusion, machine learning can be involved in the health provider programs and plans to assess and triage the COVID-19 cases. Supervised learning showed better results than other Unsupervised learning algorithms by having 92.9% testing accuracy. In the future recurrent supervised learning can be utilized for superior accuracy.

keywords: COVID-19 · Artifcial intelligence AI · Machine learning · Machine learning tasks · Supervised and un-supervised learning

INTRODUCTION

Recently, the world gained rapid progression in technology and it shows an important role in the developed countries. Nowadays all daily life sectors such as education, business, marketing, militaries, and communications, engineering, and health sectors are dependent on the new technology applications. The health care center is a crucial field that strongly needs to apply the new technologies from defining the symptoms to the accurate diagnosis and digital patient's triage. Coronavirus-2 (SARSCoV-2) causes severe respiratory infections, and respiratory disorders, which results in the novel coronavirus disease 2019 (COVID-19) in humans who had been reported as the first case in Wuhan city of China in December 2019. Later, SARS-CoV-2 was spread worldwide and transmitted to millions of people and the world health organization (WHO) have announced the outbreak as a global pandemic since the number of infected people is still increasing day by day. As of 16th December 2020, the total (global) coronavirus cases were approximately 73,806,583 with reported deaths of 1,641,635 (Pasupuleti et al. 2021).

The novel coronavirus appeared in December 2019, in the Wuhan city of China and the World Health Organization (W.H.O) reported it on 31st December 2019. The virus produced a global risk and W.H.O named it COVID-19 on 11th February 2020 (Wu 2020). Up to the present time, there was no specific medication that deals directly with this new generation of COVID-19 virus, but some of the companies produced several combination drugs that basically made up from ethanol, isopropyl alcohols, and hydrogen peroxides in different combinations show a significant reaction to the novel virus and had been confirmed and accepted by WHO to be used in the world (Mahmood et al. 2020). The artificial intelligence and deep learning algorithm show the ability to diagnose COVID-19 in precise which can be regarded as a supportive factor to improve the common diagnostic methods including Immunoglobulin M (IgM), Immunoglobulin (IgG), chest x-ray, and computed tomography(CT) scan, also reverse transcription-polymerase chain reaction (RT-PCR) and immunochroma to graphic fluorescence assay. The developments of a potential technology are one of the currently used methods to identify the infection, such as a drone with thermal screening without human intervention, which needs to be encouraged (Manigandan 2020).

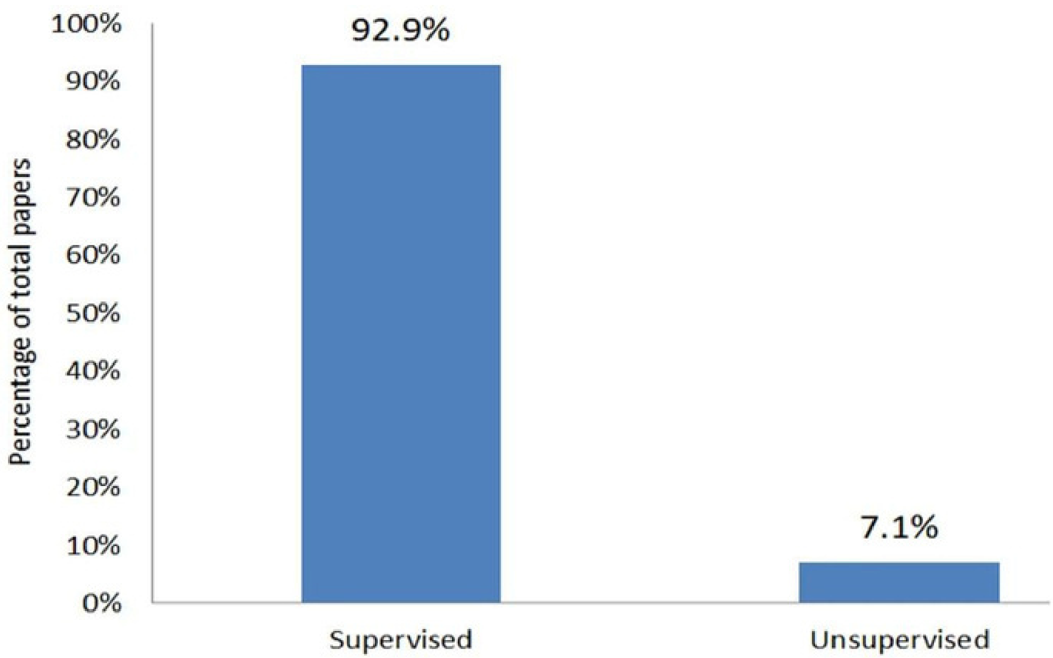
COVID-19 WITH MACHINE LEARNING

Recently there are three different perspectives of work that had been done on edge computing and the detection of (COVID-19) Cases. The viewpoints are including the recognizing of (COVID-19) cases by machine-learning systems (Table 1). The algorithms for the recognition of activity from machine learning and the approaches which used in edge computing are considered the Imaging workflows that can inspire machine-learning methods that are able of supporting radiologists who search for an analysis of complex imaging and text data. For the novel COVID-19 there are models capable of analyzing medical imaging and recognizing COVID-19 (Shirzadi 2018). Artificial intelligence AI has various types, machine learning (ML), is one of these applications, it had been applied successfully to different fields of medicine for detection of new genotype–phenotype associations, diagnosis, which showed effects on assessment, prediction, diseases classification, transcriptomic, and minimizing the death ratio(Gao 2020).

The technique of automatic classification of COVID-19 can be applied by comparing general deep learning-based feature extraction frameworks to achieve the higher accurate feature, which is an important module of learning, MobileNet, DenseNet, Xception, ResNet, InceptionV3, InceptionResNetV2, VGGNet, NASNet were selected among a group of deep convolutional neural networks CNN. The classification then achieved by running the extracted features into some of machine-learning classifiers to recognize them as a case of COVID-19 or other diseases (Bishop 2006). Progressive machine-learning algorithms can integrate and evaluate the extensive data that is related to COVID-19 patients to provide best understanding of the viral spread pattern, increase the diagnostic accuracy, improve fresh, and effective methods of therapy, and even can recognize the individuals who, at risk of the disease depending on the genetic and physiological features (Khanday 2020).

MACHINE-LEARNING TYPE APPLIED

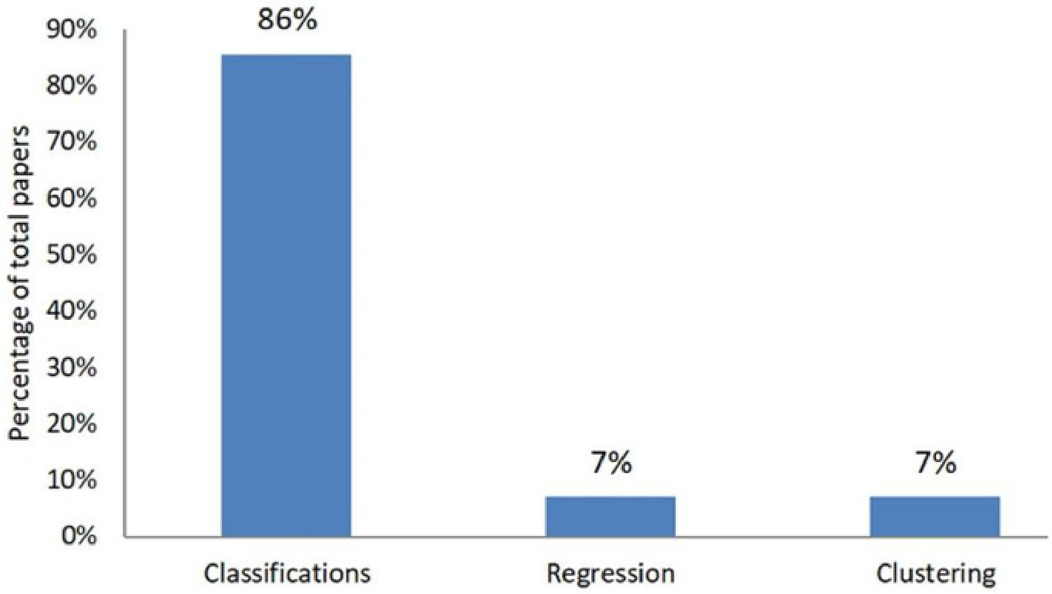
supervised learning is the dominant machine-learning type applied for production lines. The majority of studies used both supervised learning methods which were (92.9%), whereas unsupervised learning was (7.1%).



Distribution of machine-learning types

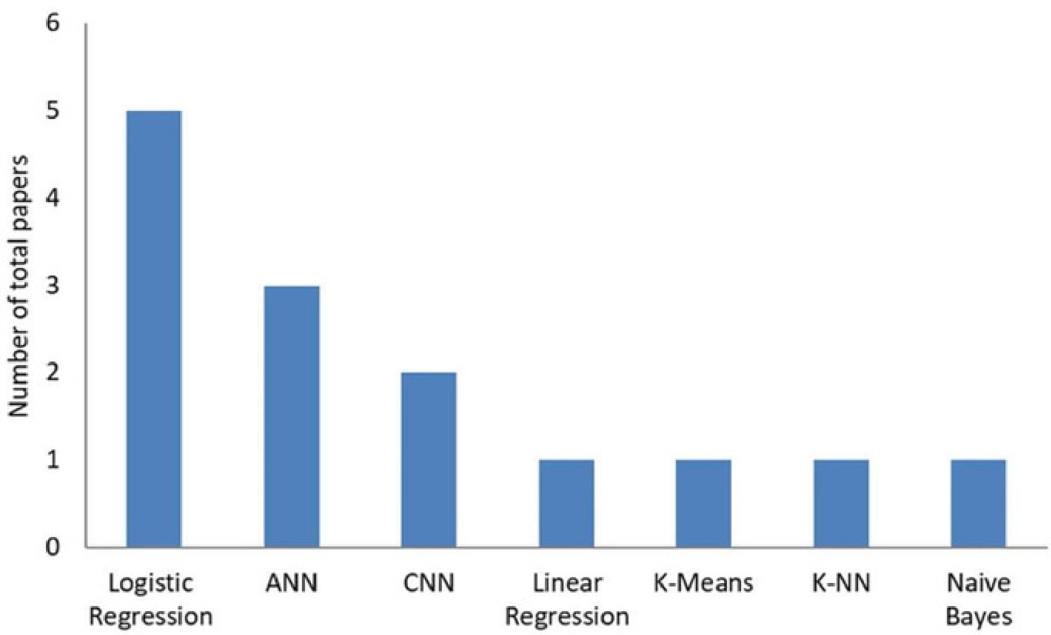
MACHIMACHINE-LEARNING TASKS ADDRESS

which accounts for about (86%) of all selected papers. There are about (7%) of papers that applied for each of the regression and clustering.



MACHINE-LEARNING ALGORITHMS USED

shows that the logistic regression is largely applied in production lines. Logistic regression is the most frequently applied machine-learning algorithm, including five papers in 14 papers. Artificial neural network algorithm (ANN) and CNN (convolutional neural network) are in the second and third ranks which were three and two papers in 14 papers, respectively. Linear regression, K-Means, KNN (K-nearest neighbors), and Naive Bayes are the other algorithms applied for production lines.



DISCUSSIONS AND IMPLICATIONS

The new transmitted virus was discovered and spread out from Wuhan city of China in December 2019 and affected more than (100) countries around the world in a very short time (Wu 2020). It was represented and introduced to the World Health Organization (W.H.O) on 31st December 2019. The virus was then termed COVID-19 by W.H.O on 11th February 2020, because it formed a global risk (Wu 2020). This family of viruses also includes SARS, ARDS. W.H.O confirmed this eruption as a public health emergency (Manigandan et al. 2020). Technology progressions have a fast effect on each field of life; the medical field is one of the important direct daily related to people's lives. Recently Artificial intelligence AI had been introduced to the medical field and it has shown promising outcomes in health care due to the high accuracy of data analysis which makes an exact decision making. Researchers all over the world tried to find a method to improve the clinical diagnosis and minimize the rapid spread of this virus so that they involved AI algorithms in the diagnosis of this disease. This review paper explains various AI algorithms that people used in their researches and will compare their results to demonstrate the best accurate method that shows the most improving in COVID-19 diagnosis. The total studies that used in this research are (14) original articles, all of them used supervised learning as the main method, but the algorithms were differed among them according to the research purpose.

A study recently published 2020 in India they extracted their dataset from GitHub which was 212 reports of 1000 cases, they used supervised learning as their main method in machine-learning application, and the algorithm that they applied was classification logistic regression and multinominal Nia′′ve Bayes. The findings showed that Logistic regression and multinominal Nia′′ve Bayes are better than the commonly used algorithms according to 96% accuracy obtained from the findings (Khanday 2020). Scientists in the USA published an article 2020 they relied on United States health systems to custom 197 patients as their data, the main method that they used was supervised learning, while the algorithm was classification logistic regression, their results showed that this algorithm displays higher diagnostic odds ratio (12.58) for foreseeing ventilation and effectively triage patients than a comparator early warning system, such as Modified Early Warning Score (MEWS) which showed (0.78) sensitivity, while this algorithm showed (0.90) sensitivity which leads to higher specificity ($p < 0.05$), also it shows the capability of accurate identification 16% of patients more than a commonly used scoring system which results in minimizing false-positive results (Burdick 2020a). Varun et al.used 184,319 reported cases as a ataset in his article in which he applied the same method supervised learning but with a different algorithm which was convolutional neural network CNN and their outcomes were in response to this crisis, the medical and academic centers in New York City issued a call to action to artificial intelligence researchers to leverage their electronic medical record (EMR) data to better understand SARS-COV-2 patients. Due to the scarcity of ventilators and a reported need for a quick and accurate method of triaging patients at risk for respiratory failure, our purpose was to develop a machine-learning algorithm for frontline physicians in the emergency department and the inpatient floors to better risk-assess patients and predict who would require intubation and mechanical ventilation (Arvind 2020). Meanwhile, another study had been published in Italy by (Luca et al. 2020)

The research findings stated that countries with the highest death ratio were those who had a high consumption of fats, while countries with a lower death rate have a higher level of cereal consumption followed by a lower total average intake of kilocalories (García-Ordás, et al. (2020)). A study conducted to (Shinwoo et al. 2020) their research data were extracted from the immigrant Korean COVID-19 patients who were 290 cases from 12 states all of them older than 18 years, the study observed the ability to the prediction of discrimination-related variables, such as racism effects, and sociodemographic factors that influence the psychological distress level during the COVID-19 pandemic, they nominated the supervised learning as the method and then using the Artificial Neural Network ANN as the main algorithm, their result showed The Artificial Neural Network (ANN) analysis, which is a statistical model and able to examine complex non-linear interactions of variables, was applied. The algorithm perfectly predicted the person's flexibility, familiarities of everyday discernments, and the racist actions toward Asians in the U.S. since the beginning of the COVID-19 pandemic which finally provides important suggestions for public health practitioners (Choi 2020). During the same time, a study presented by (Yigrem et al. 2020) conducted a cross-study based on 244 of the healthcare providers in Dilla, Southern Ethiopia. Supervised learning was used in the methodology and then they analyzed the data by logistic regression algorithm to find the association between the perceived stress of COVID-19 and the health care providers. Results showed that more than half of the research participants were presented with perceived stress of coronavirus disease, which means that there is a strong correlation between the health care staff and perceived stress of COVID-19 (Chekole, et al. (2020) Finally, the last article conducted by (Abolfazl et al. 2020) their study used 57 samples of COVID-19 cases from the USA to find out the relationship between the sociodemographic and environmental variables, other diseases, such as chronic heart disease, leukemia, and pancreatic cancer, also socioeconomic factors and the death ratio due to COVID-19 disease. Results showed that the presented model (logistic regression) shown that these factors and variables describe the presence/absence of the hotspot of the COVID-19 incidence which was clarified by Getis-Ord Gi ($p < 0.05$) in a geographic information system. As a result, the findings provided valuable insights for public health decision makers in categorizing the effect of the potential risk factors associated with COVID-19 incidence level (Mollalo et al. 2020)

EMAIL

sachinrocke35@gmail.com

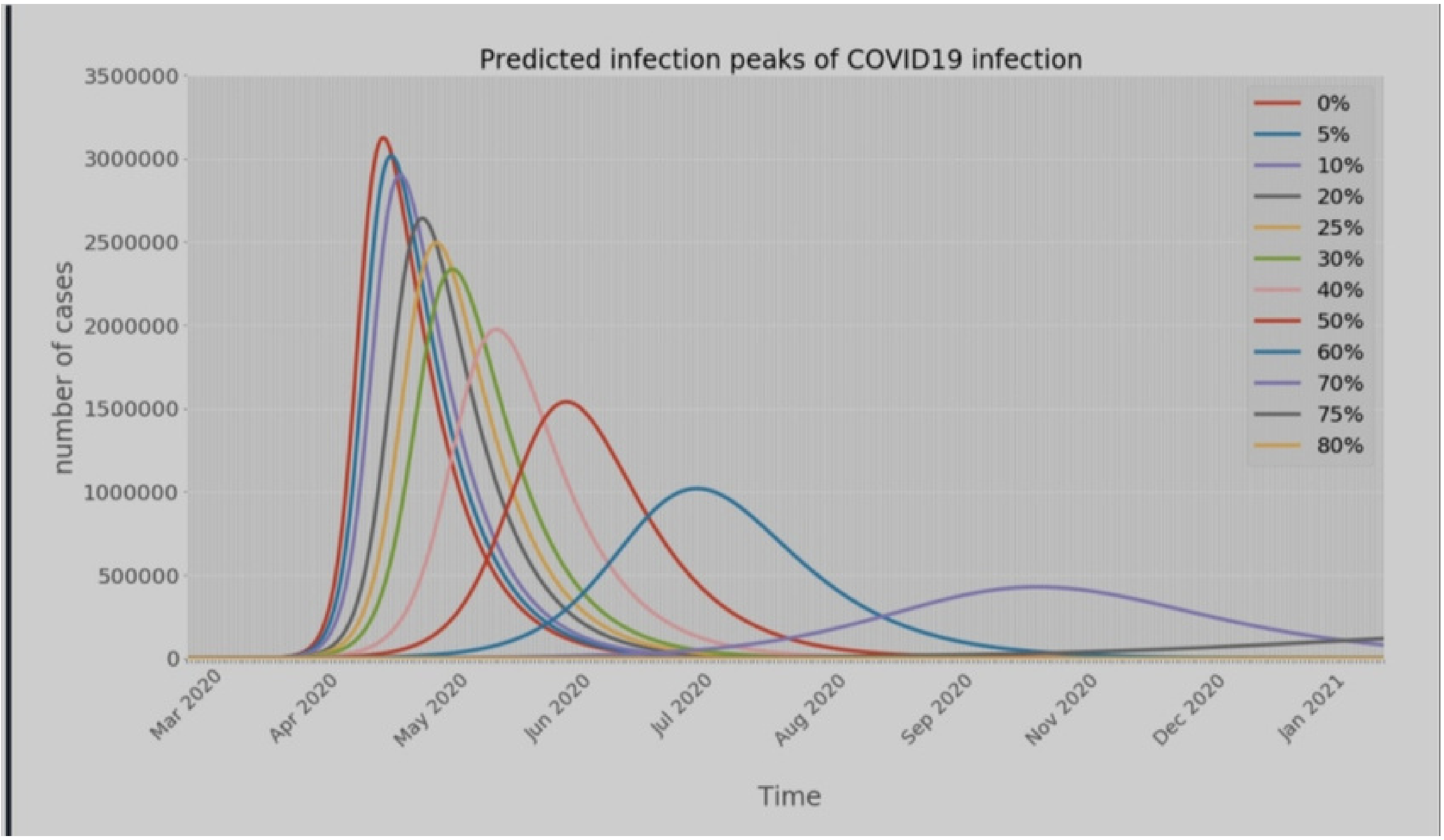
REG.NO

511921104060

SAMPLE PROGRAM USING PYTHON PROGRAM

```
# Simulations visualization over several months and computed model predictions
DATES = ["Mar 2020"]
M = [ "Apr 2020 " , "May 2020 ", "Jun 2020 ", "Jul 2020 ", "Aug 2020 ", "Sep 2020 ", "Nov 2020 ", "Dec 2
020 ", "Jan 2021 ", "Feb 2021 " ]
K = [ 29, 60 , 91, 121 , 152, 183 , 213, 244, 274, 305, 336 ] # the correspondent number of days
z= 0
for j, L in enumerate(K):
 for i in range( z, L ):
 if i <= 300:
 DATES.append("")
 if i <= 300:
 DATES.append(M[j])
 z = K[j]

plt.clf()
plt.xlabel('\n Time', size = 24 )
plt.ylabel('number of cases', size =24 )
plt.title("Predicted infection peaks of COVID19 infection ", size =24)
plt.tick_params(axis='both', labelsize = 20) # set the font of axis values
plt.ticklabel_format(axis = "x", style = "sci", useMathText = "True")
for l in range(len(Infected)):
 plt.plot(Time, Infected[l], label = perturbations[l], linewidth = 3.5 )
plt.xticks(np.arange(600), DATES , fontsize=18, rotation = 45)
plt.legend( fontsize = 20)
plt.axis([0, 300, 0, 3500000] ) # max([max(Y12), max(Y3), max(Y4) ]) *1.1 ] )
plt.show()
# Get the peak times and expected hospital peaks
alpha = 354.0/4268 # estimated the current number of hostilazations per confirmed cases
beta = 76.0/4268 # estimated current number of deaths per confirmed cases
print ("Hospitalization fraction = ", round(alpha, 3), " (" , round(alpha*100,1), " %)" )
print ("Death fraction = ", round(beta, 3) , " (" , round(beta*100,1), " %)" , "\n" )
for i, sim in enumerate(Infected):
 Quarentine = perturbations[i]
 Peak = max(sim)
 Total = TotalInf[i][sim.index(Peak)]
 T = Time[sim.index(Peak)]
 Hospital = Peak* alpha
 Death = Peak*beta
 print ( Quarentine , " --> pk time = ", int(T) , " days Hospital = ",
 int(Hospital) , " Deaths = ", int(Death), " Total infected = ",
 int(Total ) , " infected (pk)= ", int(Peak) )
```

PREDICTED INFECTION PEAK OF COVID-19 INJECTION



Hospitalization fraction = 0.083 (8.3 %)
Death fraction = 0.018 (1.8 %)
0% --> pk time = 49 days Hospital = 259055 Deaths = 55616 Total infected = 5156932 infected (pk)= 3123301
5% --> pk time = 51 days Hospital = 250125 Deaths = 53699 Total infected = 5094458 infected (pk)= 3015636
10% --> pk time = 53 days Hospital = 240573 Deaths = 51648 Total infected = 5081874 infected (pk)= 2900468
20% --> pk time = 59 days Hospital = 219034 Deaths = 47024 Total infected = 4892567 infected (pk)= 2640788
25% --> pk time = 62 days Hospital = 206911 Deaths = 44421 Total infected = 4791783 infected (pk)= 2494627
30% --> pk time = 66 days Hospital = 193740 Deaths = 41594 Total infected = 4648087 infected (pk)= 2335835
40% --> pk time = 77 days Hospital = 163696 Deaths = 35143 Total infected = 4342700 infected (pk)= 1973605
50% --> pk time = 95 days Hospital = 127656 Deaths = 27406 Total infected = 3910457 infected (pk)= 1539093
60% --> pk time = 128 days Hospital = 84499 Deaths = 18141 Total infected = 3295201 infected (pk)= 1018771
70% --> pk time = 213 days Hospital = 35509 Deaths = 7623 Total infected = 2202358 infected (pk)= 428124
75% --> pk time = 350 days Hospital = 12685 Deaths = 2723 Total infected = 1354146 infected (pk)= 152938
80% --> pk time = 500 days Hospital = 54 Deaths = 11 Total infected = 22886 infected (pk)= 662

CONCLUSION

This study focused on the articles that applied machine-learning applications in COVID-19 disease for various purposes with different algorithms, 14 from 16 articles used supervised learning, and only one among them used unsupervised learning another one used both methods supervised and unsupervised learning and both of them shows accurate results. The studies used different machine-learning algorithms in different countries and by different authors but all of them related to the COVID-19 pandemic, (5) of these articles used Logistic regression algorithm, and all of them showed promising results in the COVID-19 health care applications and involvement. While (3) of the articles used artificial neural network (ANN) which also shows successful results, the rest of the 14 articles used different supervised and unsupervised learning algorithms and all of the models showed accurate results. Our conclusion is ML applications in medicine showed promising results with high accuracy, sensitivity, and specificity using different models and algorithms. In general, the paper results explored the supervised learning is more accurate to detect the COVID-19 cases which were above (92%) compare to the unsupervised learning which was mere (7.1%).

priyadarshini engineering college

COVID-19
CASE ANALYSIS

October 26,2023

Phase 4

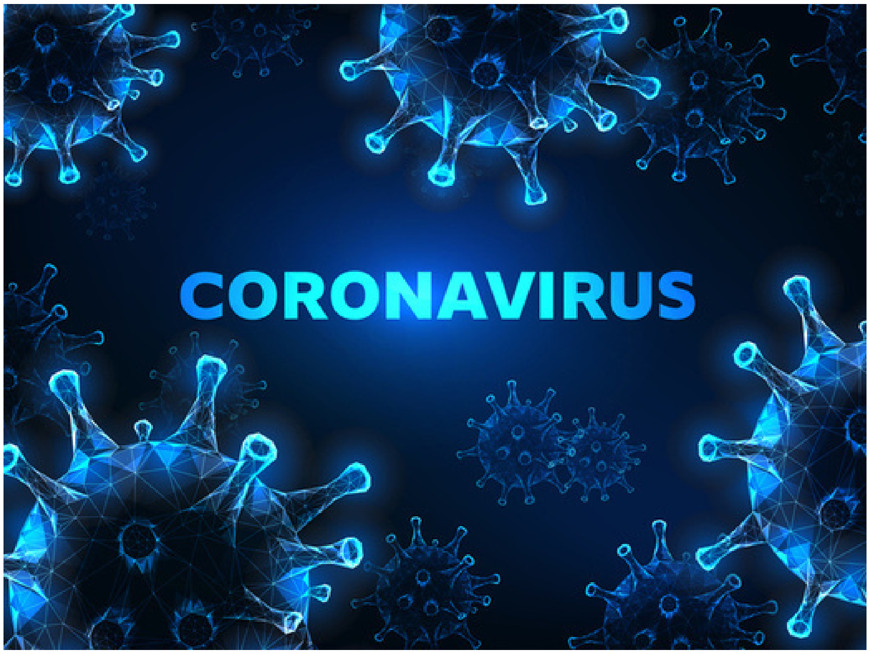
Presented To

Sachin.C

Register.no: 511921104060
Email : sachinrocke35@gmai.com

Introduction

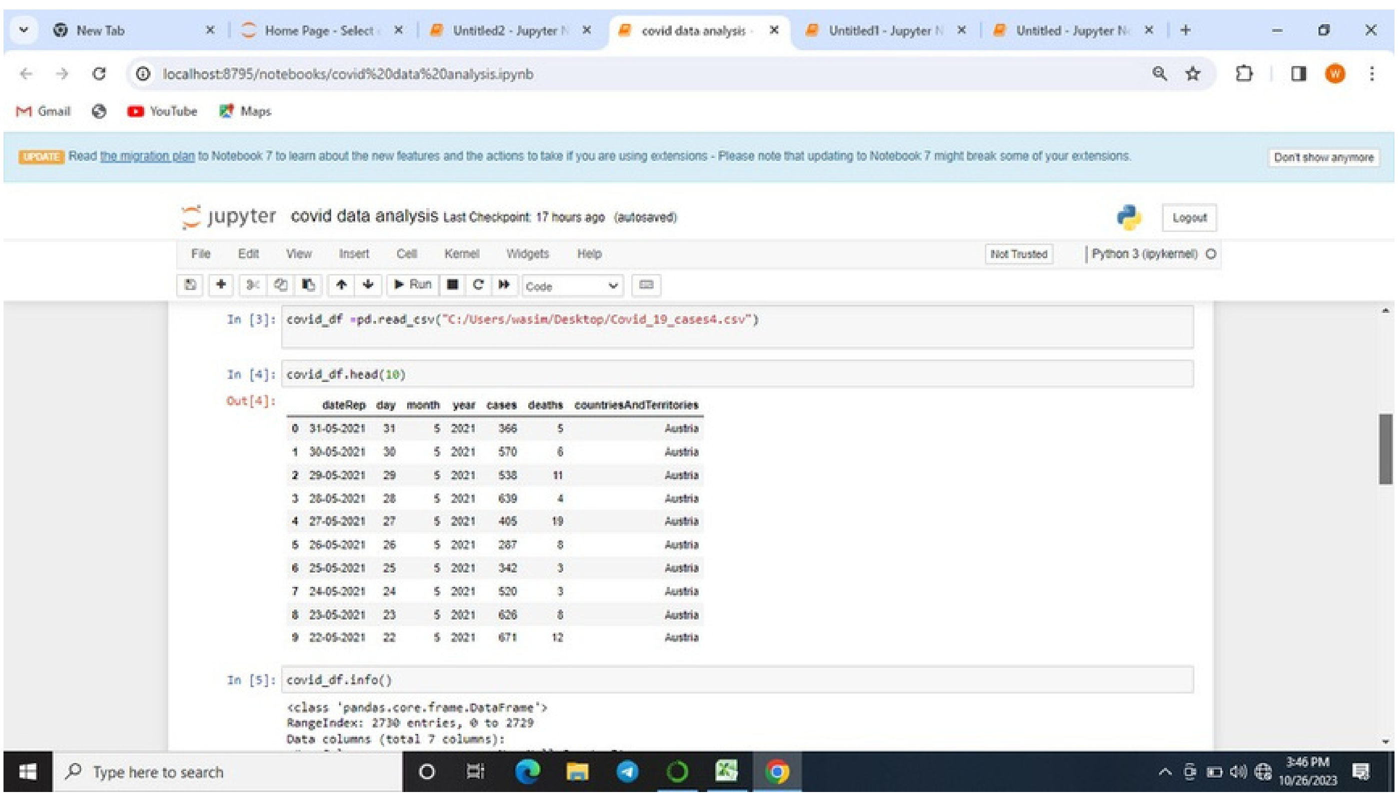
We are going to do an analysis of the covid-19 data available with us for the first and second waves in India to understand the different stages of the coronavirus pandemic during that period.



ABSTRACTION

The pandemic of Coronavirus Disease 2019 (COVID-19) is a timely reminder of the nature and impact of Public Health Emergencies of International Concern. As of 12 January 2022, there were over 314 million cases and over 5.5 million deaths notified since the start of the pandemic. The COVID-19 pandemic takes variable shapes and forms, in terms of cases and deaths, in different regions and countries of the world. The objective of this study is to analyse the variable expression of COVID-19 pandemic so that lessons can be learned towards an effective public health emergency response.

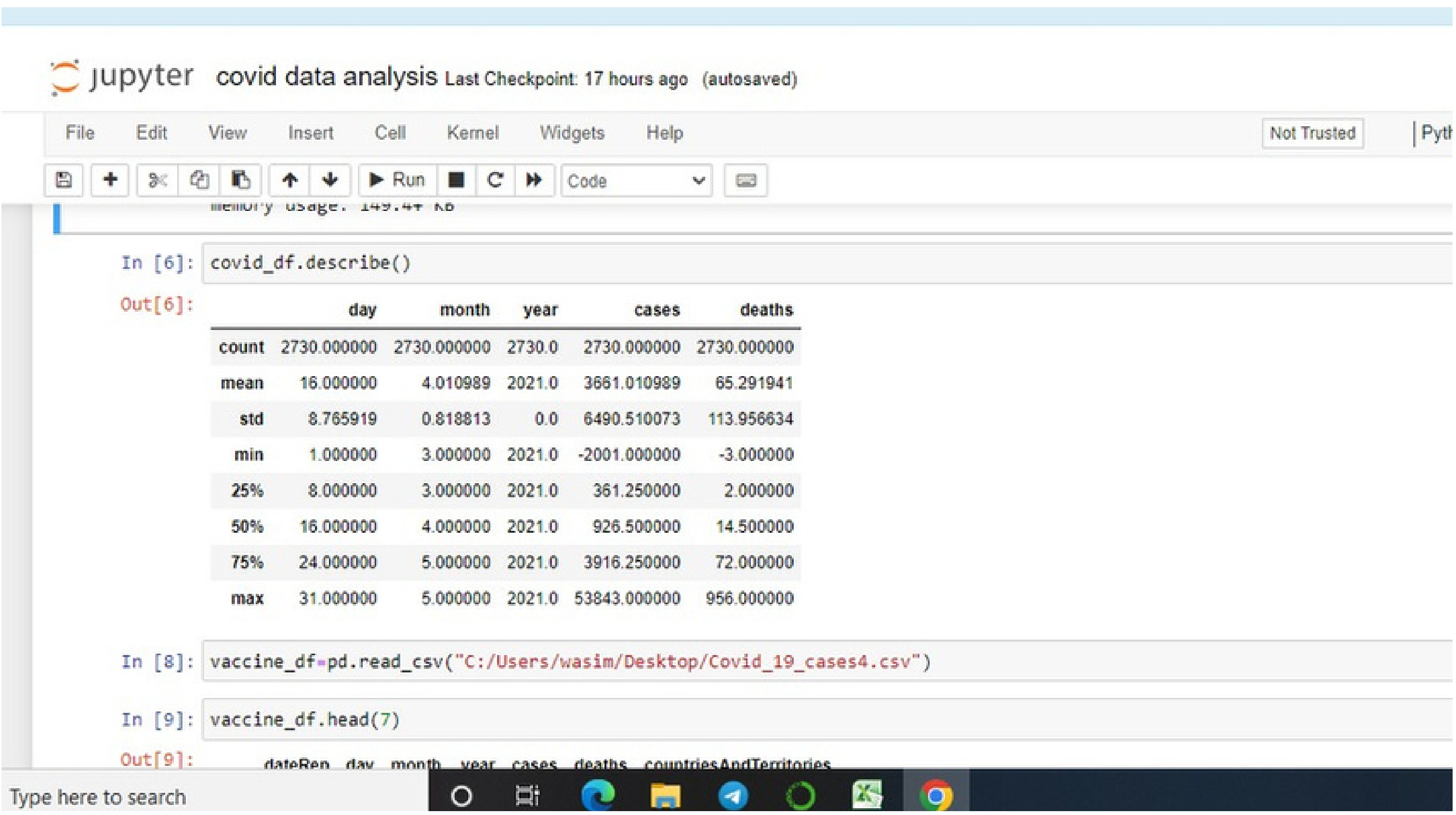
I can provide general information about COVID-19 cases and deaths up to my last knowledge update in January 2022. However, for the most current data and analysis, I recommend checking reliable sources like the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), or your local health department. If you have specific questions or need more detailed information, please let me know, and I'll do my best to assist you.



Covid-19 cases analysis and deaths analysis

I can provide some sample data for COVID-19 cases and deaths
Date Reported (daterep):2021
Day: Monday
Month: October
New Cases (case): 2730
New Deaths (deaths): 7

This example demonstrates how COVID-19 cases and deaths might be reported for a particular date, day, and month. Please note that real data varies by location and may include additional details and variations, such as testing rates, recoveries, and vaccinations. To get accurate and up-to-date information, refer to trusted sources like health departments or the World Health Organization.




```
In [6]: covid_df.describe()
```

Out[6]:

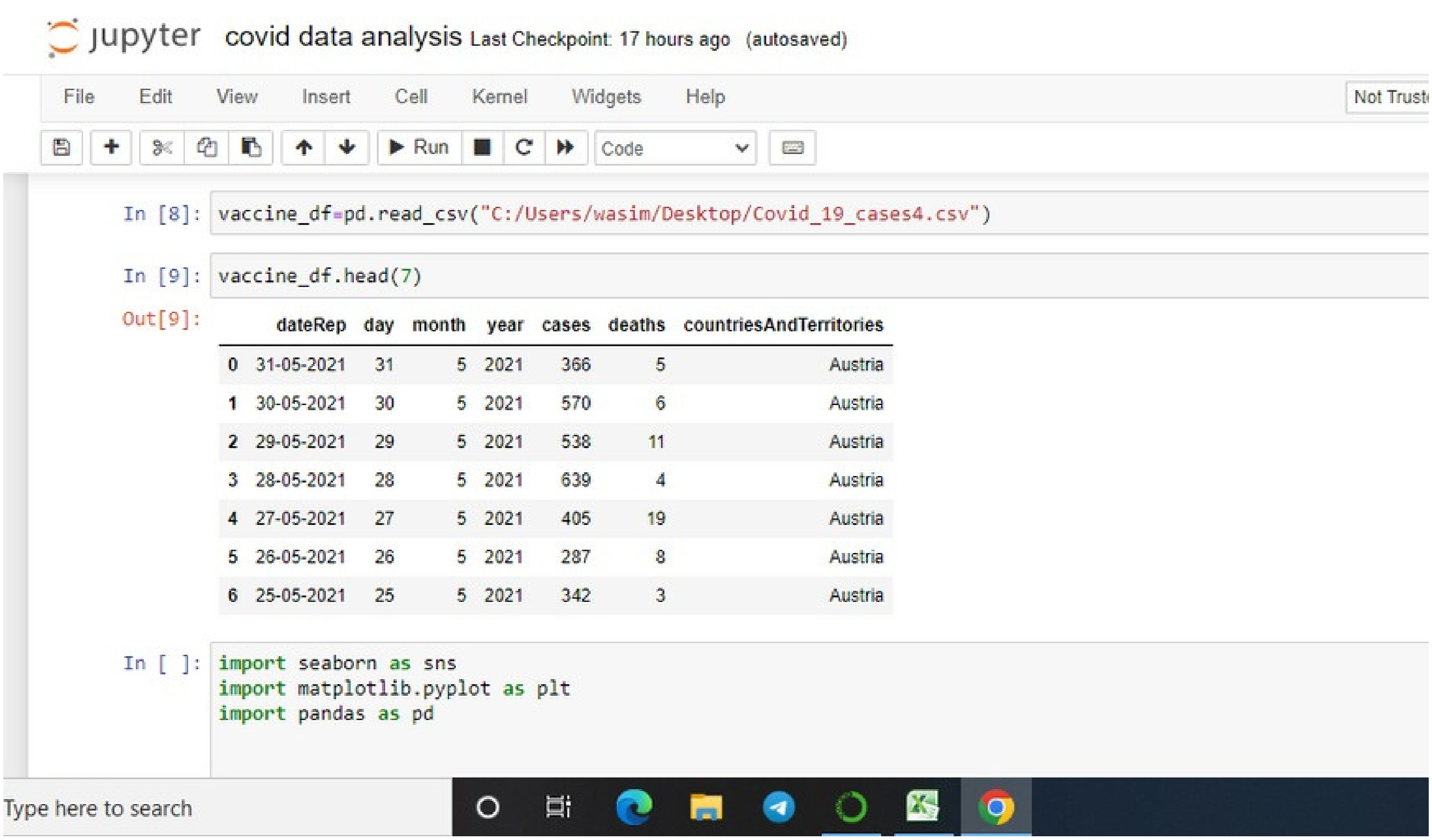
	day	month	year	cases	deaths
count	2730.000000	2730.000000	2730.0	2730.000000	2730.000000
mean	16.000000	4.010989	2021.0	3661.010989	65.291941
std	8.765919	0.818813	0.0	6490.510073	113.956634
min	1.000000	3.000000	2021.0	-2001.000000	-3.000000
25%	8.000000	3.000000	2021.0	361.250000	2.000000
50%	16.000000	4.000000	2021.0	926.500000	14.500000
75%	24.000000	5.000000	2021.0	3916.250000	72.000000
max	31.000000	5.000000	2021.0	53843.000000	956.000000

```
In [8]: vaccine_df=pd.read_csv("C:/Users/wasim/Desktop/Covid_19_cases4.csv")

In [9]: vaccine_df.head(7)
```

Out[9]: dateRep day month year cases deaths countriesAndTerritories

Covid-19 cases vaccine and associates details

I can provide a sample dataset for COVID-19 cases, vaccine data, and associated details
Date Reported (day/month): 26/10
Month: October
New Cases (case): 1,500
New Deaths (deaths): 15
Total Vaccinations Administered: 2,000
Total Fully Vaccinated: 1,500
This example demonstrates how you might analyze COVID-19 cases, deaths, and vaccine data for a specific day and month. The number of cases, deaths, and vaccinations can vary widely by location and over time. For real and up-to-date information, refer to health departments and agencies that provide accurate COVID-19 data.


jupyter covid data analysis Last Checkpoint: 17 hours ago (autosaved)

File Edit View Insert Cell Kernel Widgets Help Not Trust

```
In [8]: vaccine_df=pd.read_csv("C:/Users/wasim/Desktop/Covid_19_cases4.csv")

In [9]: vaccine_df.head(7)
```

Out[9]:

	dateRep	day	month	year	cases	deaths	countriesAndTerritories
0	31-05-2021	31	5	2021	366	5	Austria
1	30-05-2021	30	5	2021	570	6	Austria
2	29-05-2021	29	5	2021	538	11	Austria
3	28-05-2021	28	5	2021	639	4	Austria
4	27-05-2021	27	5	2021	405	19	Austria
5	26-05-2021	26	5	2021	287	8	Austria
6	25-05-2021	25	5	2021	342	3	Austria

```
In [ ]: import seaborn as sns
        import matplotlib.pyplot as plt
        import pandas as pd
```

Type here to search

Covid-19 cases for daterep and day using scatter polt

Analyzing COVID-19 cases using a scatter plot with "day" and "daterep" as axes can help visualize the trend over time. You can use a programming language like Python and libraries like Matplotlib to create such a plot. Here's a general outline of the steps:

1.Data Collection: Obtain a dataset containing COVID-19 cases with "day" and "daterep" information. You can find such data from sources like the World Health Organization (WHO) or your country's health department.

2.Data Preprocessing: Clean and preprocess the data, making sure "day" and "daterep" are in a suitable format for plotting.

3.Data Visualization: Use Matplotlib or other plotting libraries to create a scatter plot. Plot "day" on the x-axis and "daterep" on the y-axis. You can also color or size the points based on the number of cases to show the intensity of the outbreak.

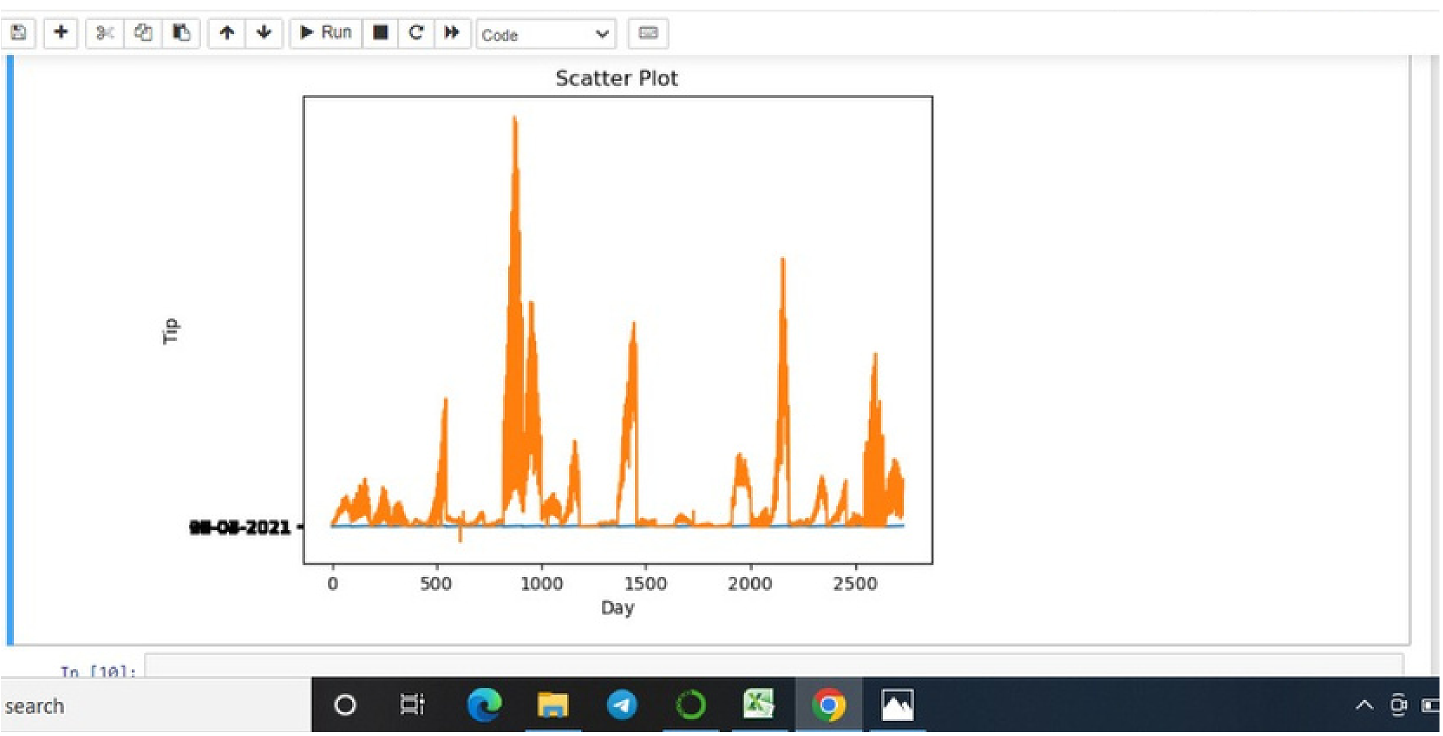
4. Labeling: Add appropriate labels, titles, and legends to make the plot informative.

5.interpretation: Analyze the scatter plot to identify trends, spikes, or patterns in COVID-19 cases over time. This can provide insights into the progression of the pandemic.

```
In [7]: import pandas as pd
        import matplotlib.pyplot as plt

In [5]: data = pd.read_csv(r'C:\Users\wasim\Desktop\Covid_19_cases4.csv')

In [6]: # Scatter plot with day against tip
        plt.scatter(data['dateRep'], data['day'])

        # Adding Title to the Plot
        plt.title("Scatter Plot")

        # Setting the X and Y labels
        plt.xlabel('Day')
        plt.ylabel('Tip')

        plt.show()
```

Scatter Plot

OUTPUT



Covid-19 cases analysis and deaths analysis using Bar chart

Analyzing COVID-19 cases and deaths using bar charts can provide a clear visual representation of the data. Here's how you can create bar charts for both cases and deaths:

1.Data Collection: Gather a dataset that includes COVID-19 cases and deaths. You can obtain this data from sources like government health departments, the World Health Organization (WHO), or reputable data repositories.

2.Data Preprocessing: Clean and organize the data, ensuring it includes the necessary information, such as dates and the number of cases and deaths.

3.Data Visualization:

Cases Analysis:

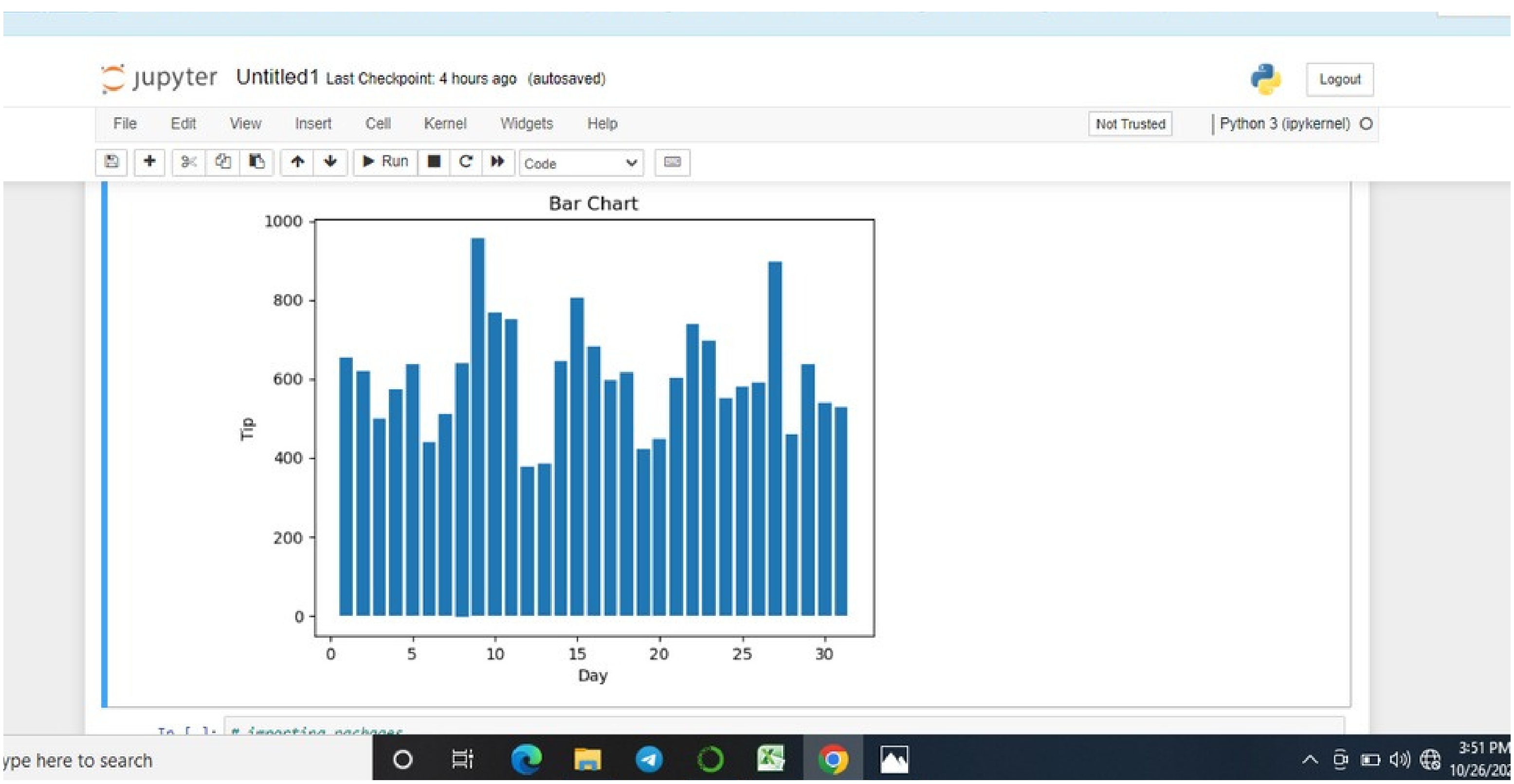
Create a bar chart with dates on the x-axis and the number of cases on the y-axis. Each bar represents the daily new cases.
You can use a different color for each bar to differentiate between cases.
Deaths Analysis:

Similarly, create a separate bar chart with dates on the x-axis and the number of deaths on the y-axis. Each bar represents the daily new deaths.
Use a different color for each bar to distinguish deaths from cases.
Labeling and Styling: Add labels to the axes, a title, and a legend to make the charts informative and visually appealing

4.Labeling and Styling: Add labels to the axes, a title, and a legend to make the charts informative and visually appealing.

5.Interpretation: Analyze the bar charts to identify trends, spikes, or patterns in COVID-19 cases and deaths. This can help you understand the impact of the pandemic and its progression.

OUTPUT



Covid-19 cases analysis visualizations and graph Bar

Analyzing COVID-19 cases and deaths using graph plots provides a comprehensive view of the data over time. Line plots are particularly useful for this purpose. Here's how to create line plots for cases and deaths:

1.Data collection: Obtain a dataset that includes COVID-19 cases and deaths, ideally with date and quantity information. You can get this data from sources like government health departments, the World Health Organization (WHO), or reliable data repositories.

2.Data Preprocessing: Clean and structure the data, ensuring it contains dates and the number of cases and deaths for each day.

3 .Data Visualization:

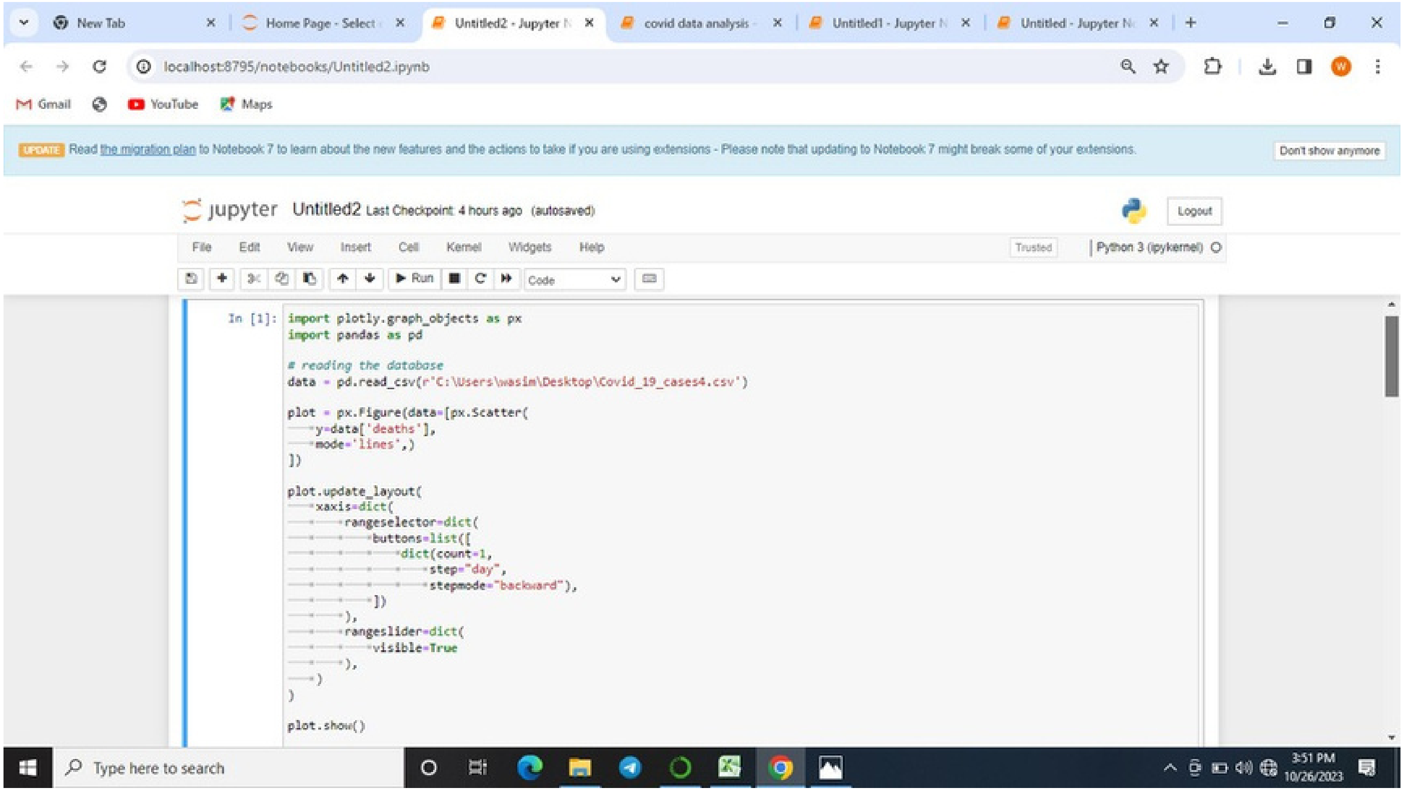
Cases Analysis:

Create a line plot with dates on the x-axis and the number of cases on the y-axis. This plot will show the daily progression of cases over time.
Connect the data points with lines to visualize the continuous trend.
Deaths Analysis:

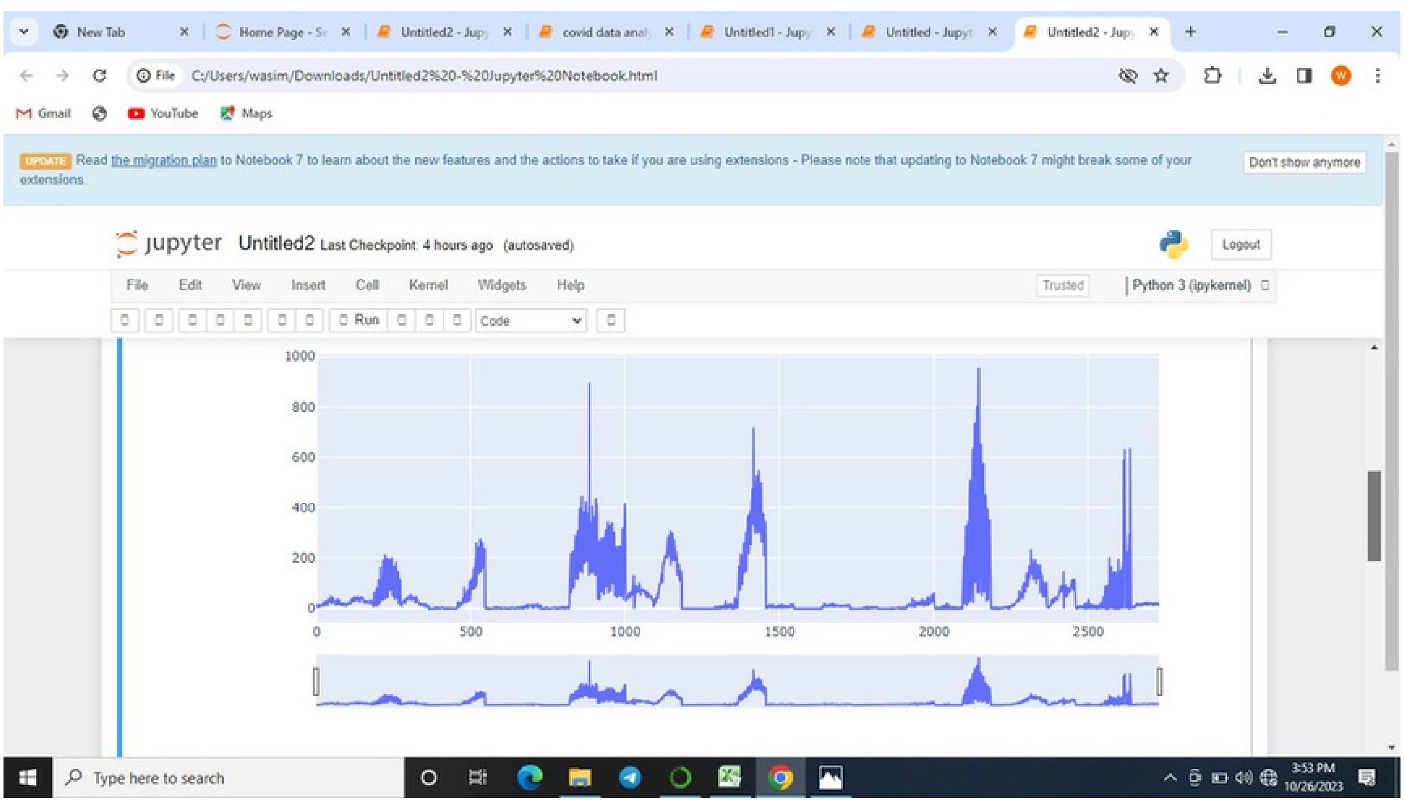
Similarly, create another line plot with dates on the x-axis and the number of deaths on the y-axis. This plot will depict the daily progression of deaths.
Connect the data points with lines to visualize the continuous trend in deaths.

4.Labeling and Styling: Add labels to the axes, a title, and a legend to make the line plots informative and visually appealing.

5.Interpretation: Analyze the line plots to identify trends, spikes, or patterns in COVID-19 cases and deaths. This can provide valuable insights into the impact and progression of the pandemic.


localhost:8795/notebooks/Untitled2.ipynb
jupyter Untitled2 Last Checkpoint: 4 hours ago (autosaved)
In [1]:
import plotly.graph_objects as px
import pandas as pd
# reading the database
data = pd.read_csv(r'C:\Users\wasim\Desktop\Covid_19_cases4.csv')
plot = px.Figure(data=[px.Scatter(
y=data['deaths'],
mode='lines',)
])
plot.update_layout(
xaxis=dict(
rangeselector=dict(
buttons=list([
dict(count=1,
step="day",
stepmode="backward"),
])
),
rangeslider=dict(
visible=True
),
)
)
plot.show()

OUTPUT


C:/Users/wasim/Downloads/Untitled2%20-%20Jupyter%20Notebook.html
jupyter Untitled2 Last Checkpoint: 4 hours ago (autosaved)
1000
800
600
400
200
0
0
500
1000
1500
2000
2500

Analyzing COVID-19 cases with "day" can provide insights into the daily progression of cases. Here's how to perform this analysis:

1.Data Collection: Obtain a dataset that includes COVID-19 cases, with "day" and the number of cases for each day. You can find this data from official health organizations or data repositories.

2.Data Preprocessing: Clean and organize the data, ensuring that "day" and the number of cases are in suitable formats for analysis.
Data Analysis:

Line Plot: Create a line plot with "day" on the x-axis and the number of cases on the y-axis. This will show the daily progression of COVID-19 cases over time.

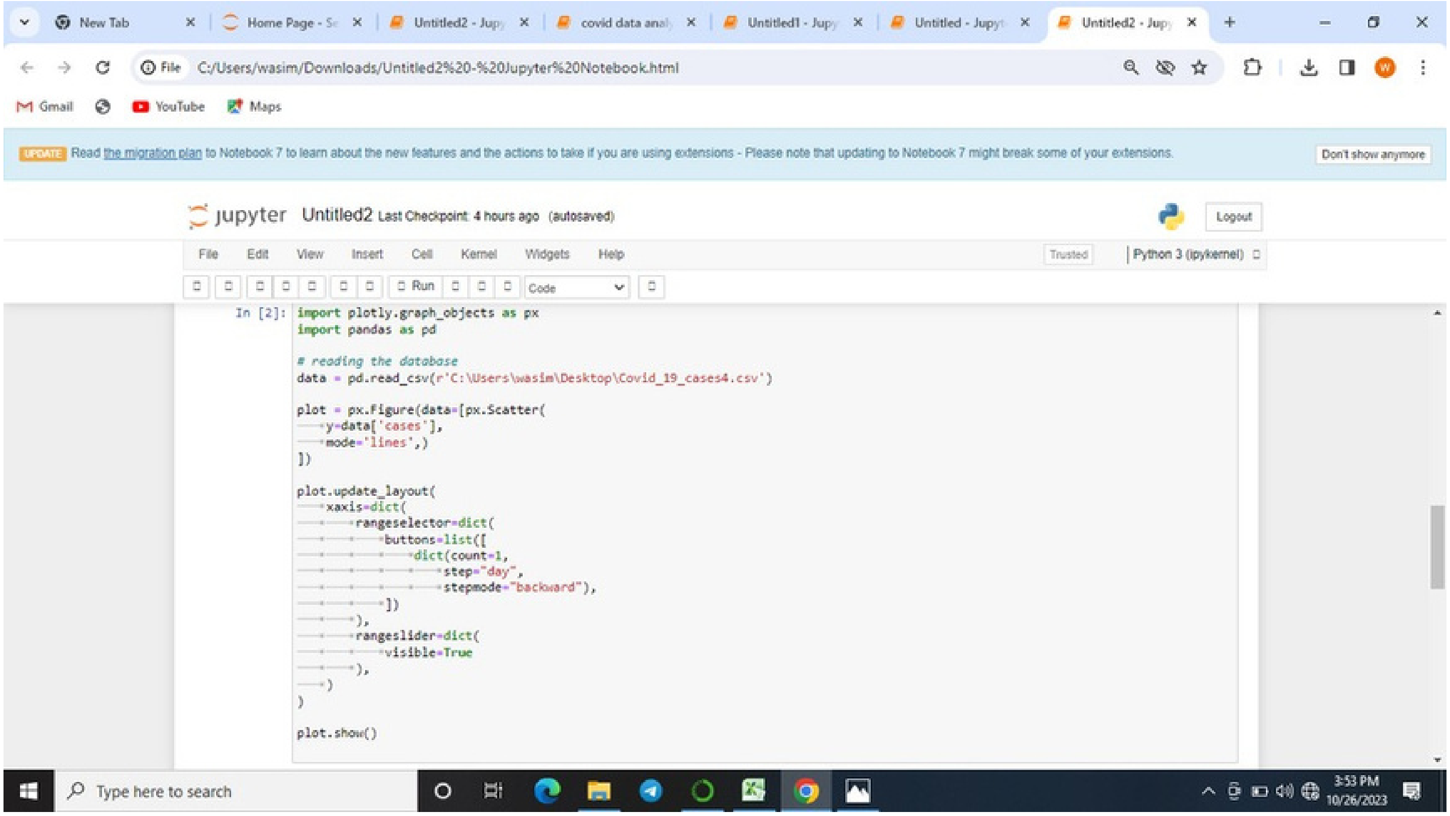
Moving Averages: Calculate moving averages (e.g., 7-day rolling averages) to smooth out fluctuations and identify trends more easily.

Peak Analysis: Identify and analyze any significant peaks or spikes in the data, which may indicate outbreaks or waves of the virus.

3.Labeling and Interpretation: Add labels, titles, and legends to the line plot. Interpret the analysis to understand how COVID-19 cases have evolved on a daily basis.

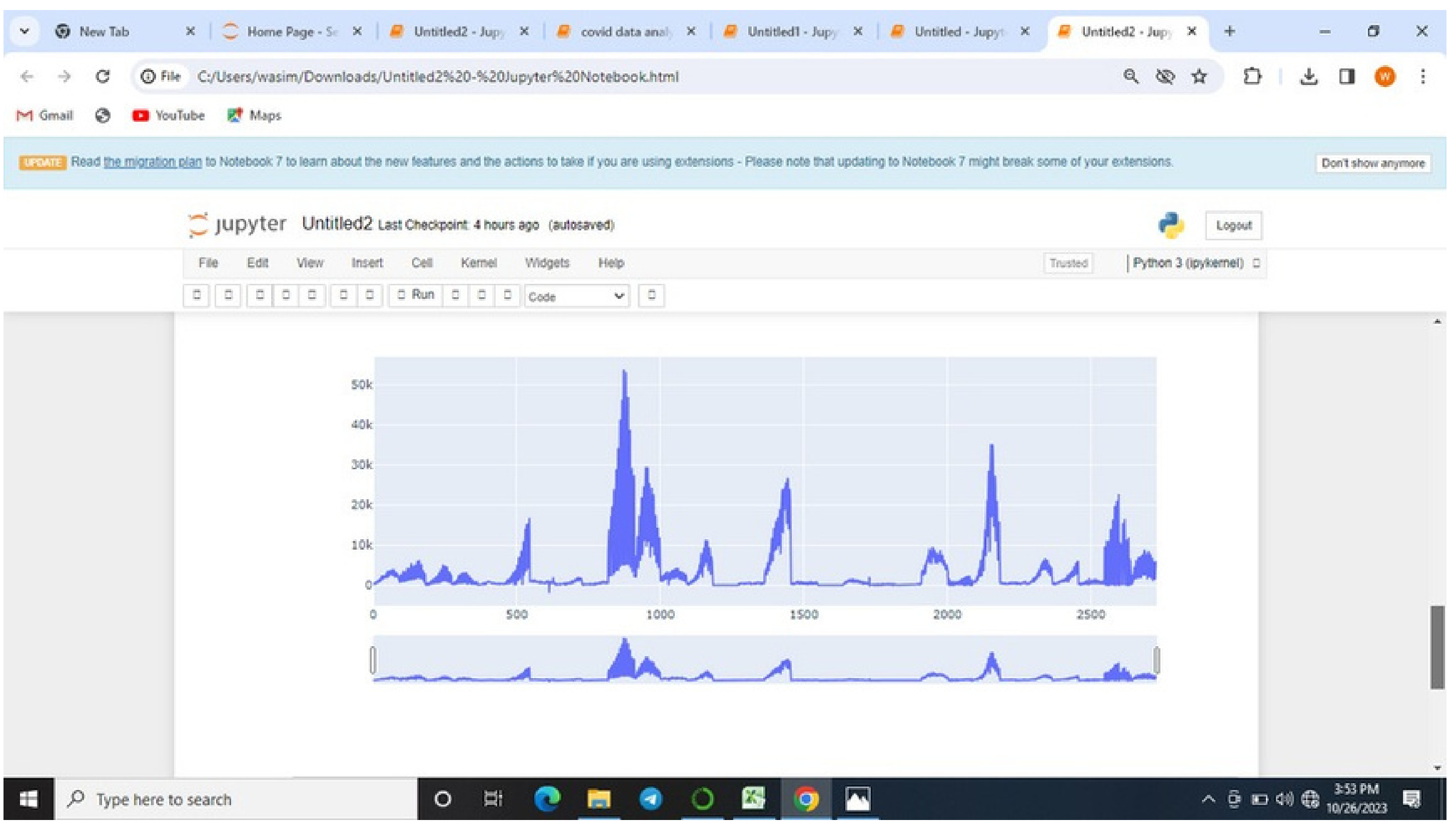
4.Further Analysis: You can also perform statistical analysis or regression to understand factors influencing the daily cases, such as interventions or public health measures.

To create these visualizations and perform analysis, you can use data analysis tools like Python with libraries such as Matplotlib, Pandas, and NumPy. Keeping your data up to date is crucial for accurate COVID-19 case analysis.



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

# reading the database
data = pd.read_csv(r'C:\Users\wasim\Desktop\Covid_19_cases4.csv')

plot = px.Figure(data=[px.Scatter(
    y=data['cases'],
    mode='lines',)
])

plot.update_layout(
    xaxis=dict(
        rangeselector=dict(
            buttons=list([
                dict(count=1,
                    step="day",
                    stepmode="backward"),
            ])
        ),
        rangeslider=dict(
            visible=True
        ),
    )
)

plot.show()
```

OUTPUT



Creating a COVID-19 cases dashboard can provide a comprehensive view of the pandemic's status. Here's a simplified outline of how you can create one:

1.Data Source: Obtain up-to-date COVID-19 data from reliable sources, such as government health departments, the World Health Organization (WHO), or data repositories. This data should include details like daily cases, deaths, recoveries, and regional information.

2.Dashboard Platform: Choose a dashboarding tool or platform to create your dashboard. Popular options include Tableau, Power BI, Python-based frameworks like Dash, or JavaScript libraries like D3.js.

Data Integration: Import and connect your COVID-19 data to the dashboarding tool. Ensure that the data is cleaned and structured properly for analysis.

Dashboard Components:

Total Cases: Display the total number of COVID-19 cases worldwide or in a specific region.

Daily Cases: Include a line chart to show the daily new cases over time.

Total Deaths and Recoveries: Display the total number of deaths and recoveries.

Geographic Map: If available, use a map visualization to show the regional distribution of cases.

Trends and Insights: Add visualizations like bar charts or line plots to highlight trends, spikes, or patterns in the data.

Filters and Interactivity: Allow users to filter data by region, date, or other relevant parameters.

Key Metrics: Display key metrics such as the case fatality rate, recovery rate, and growth rate.

News and Updates: Consider incorporating real-time news feeds or updates related to COVID-19.

4.User Interface: Design a user-friendly and intuitive interface for the dashboard. Ensure that users can easily interact with the data and access relevant information.

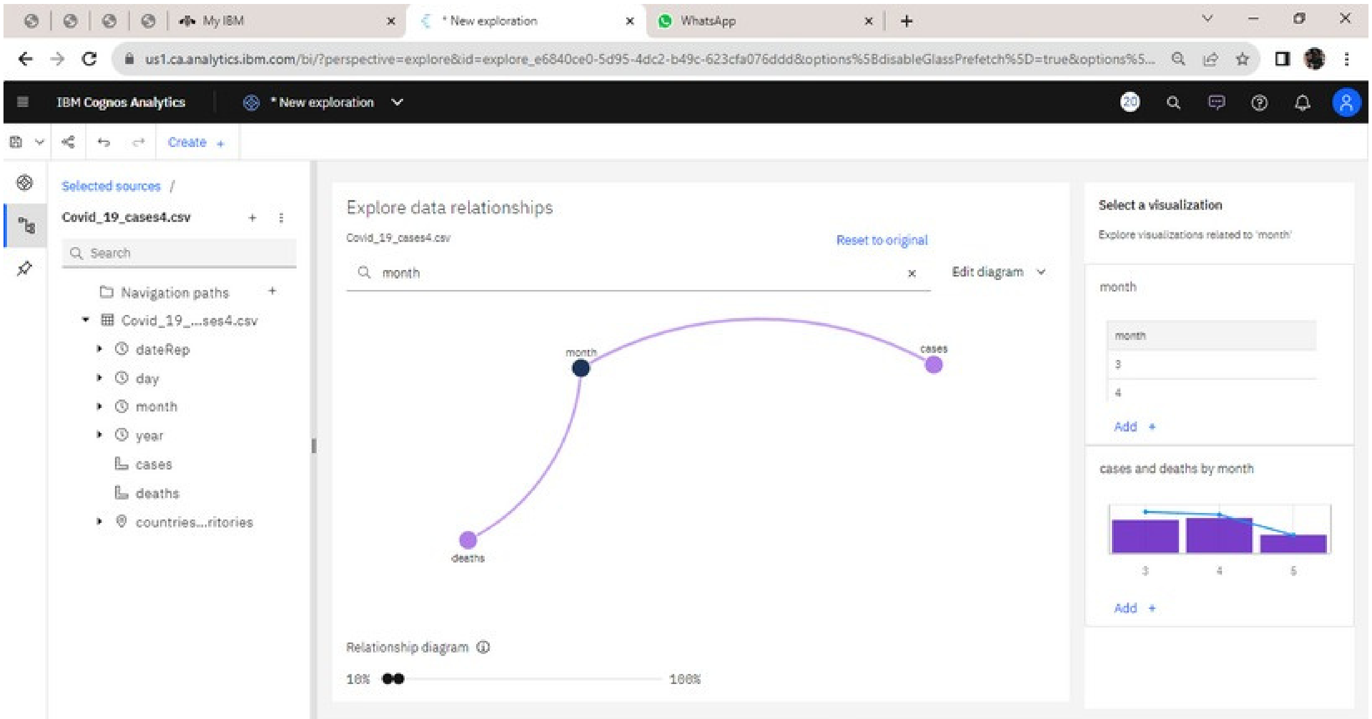
Data Updates: Set up automatic data updates to keep the dashboard current, as the COVID-19 situation evolves.

Sharing: Deploy the dashboard on a web server or a platform for public or private access, depending on your audience.

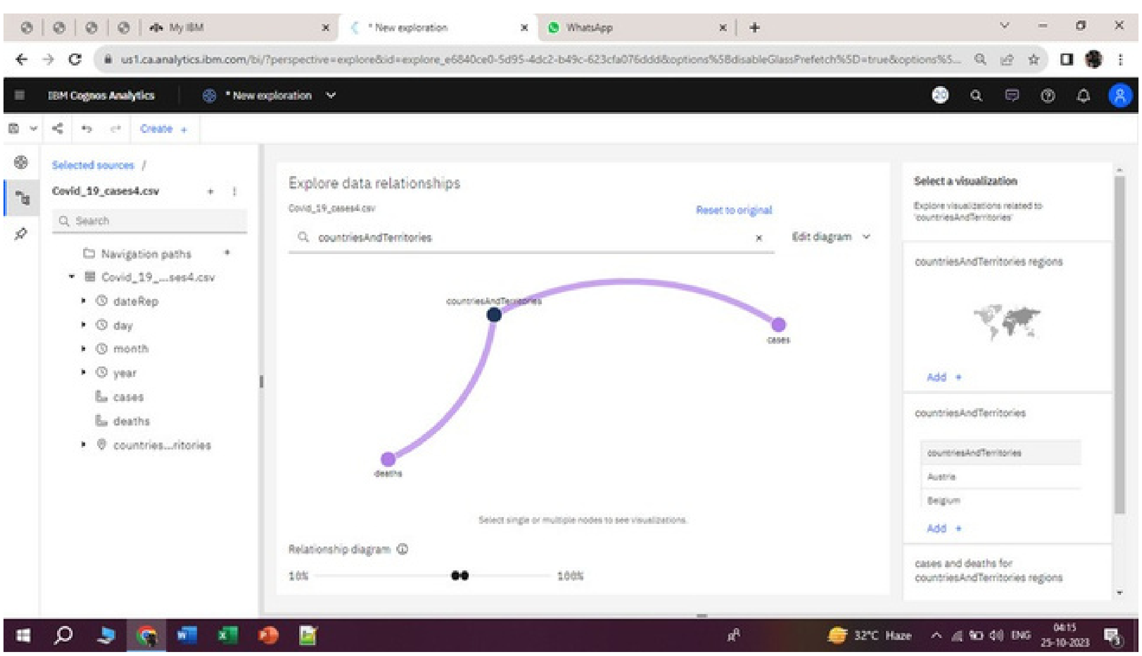
5.Security: If the dashboard contains sensitive information, implement appropriate security measures to protect the data.

6 .User Training: Provide instructions or training for users who need to interpret the dashboard effectively.

Explore visualisation related to 'countries and territories



Cases and deaths for countries and territories region



Over all values of deteRep,the sum of deaths is almost 28 thousands

deaths: Ranges from over two thousand

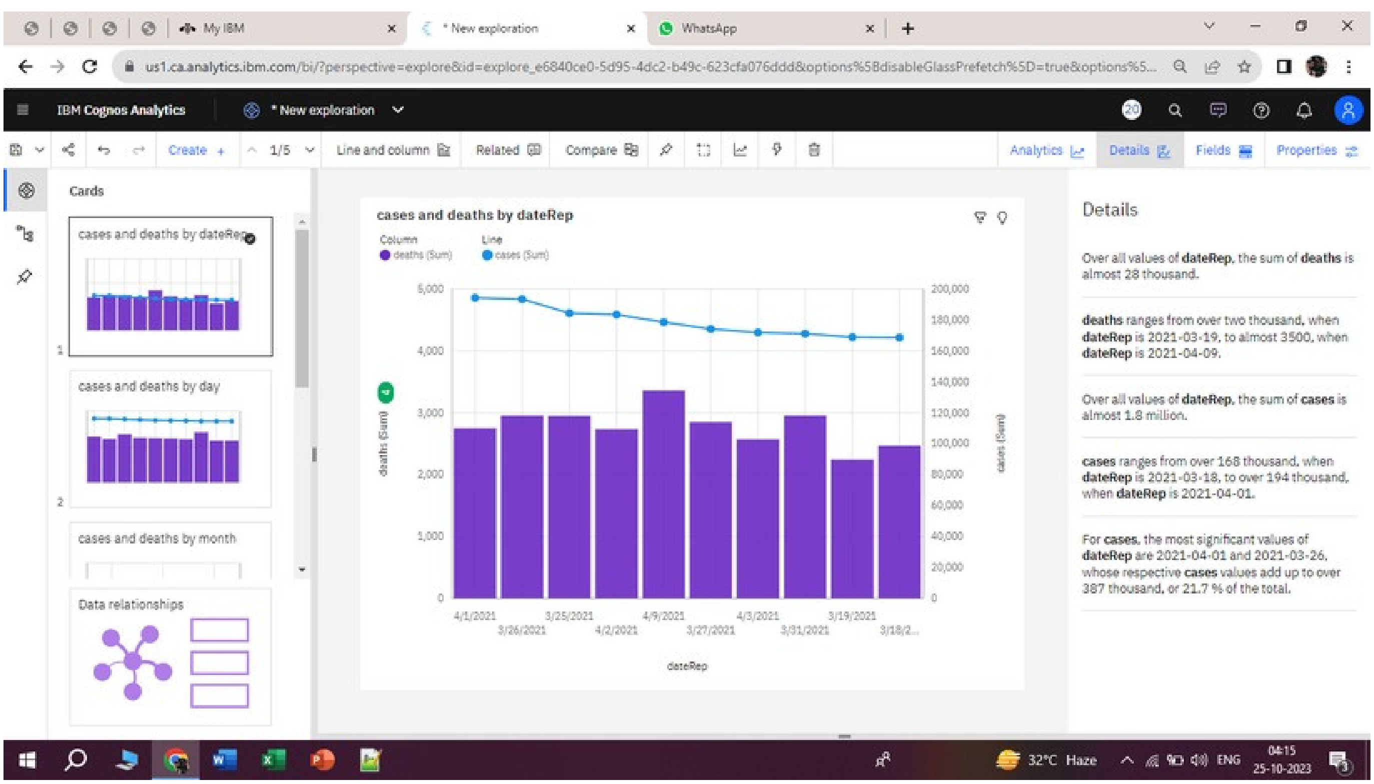
daterep: Is 2021-03-19,to almost 3500

daterep: Is 2021-04-09

Overall values of dateRep,the sum of cases is almost 1.8 Millon

Cases ranges from over 168 thousands,when dateRep is 2021-03-18,to over 194 thousands when dateRep is 2021-04--01

For cases,the most significant values of dateRep are 2021-04-01 and 2021-03-26,whose respective cases values add up to over 387 thousands,or 21.7% of the total



Across all days ,the sum of deaths is over 62 thousands

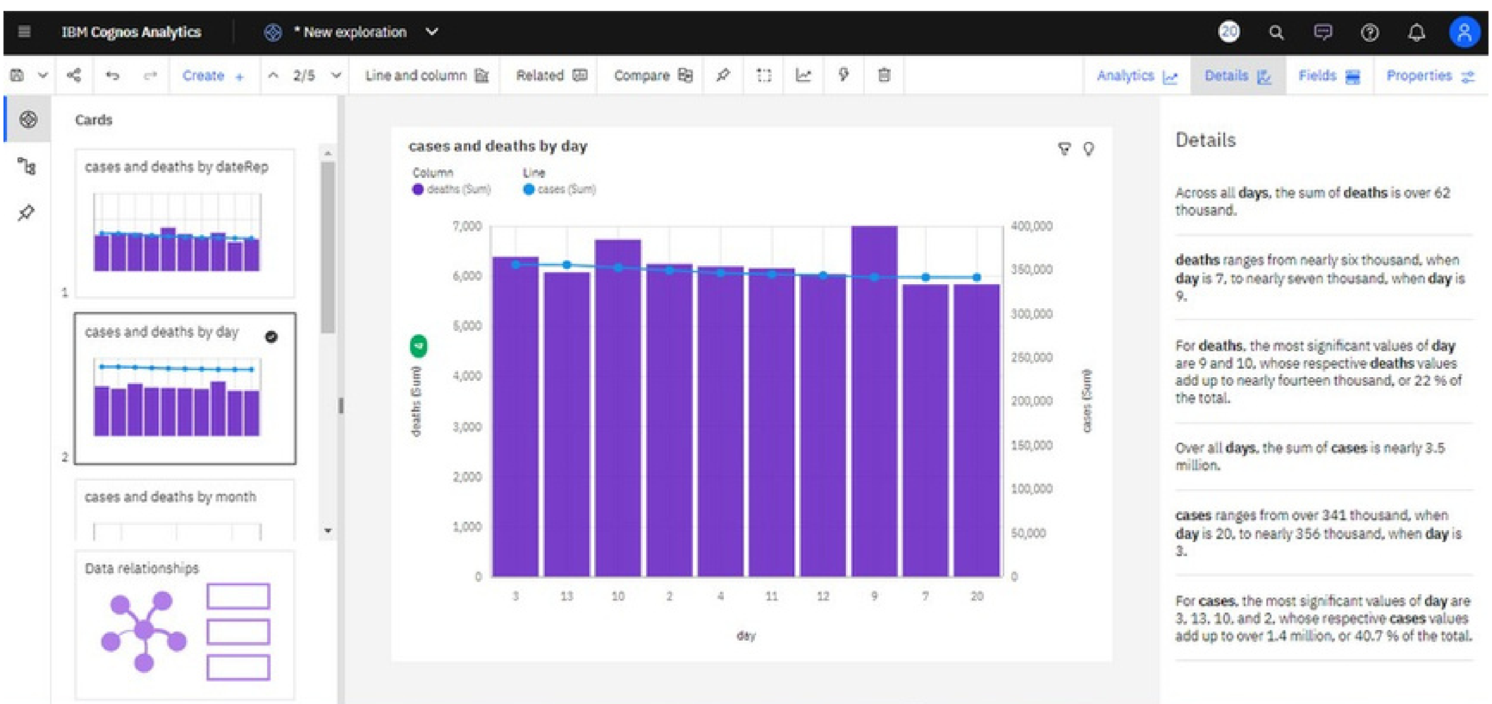
deaths: range from nearly six thousand,when day is 7, to nearly seven thousand,when day is 9

For deaths, the most significant values of day are 9 and 10,whose respective deaths values add up to nearly fourteen thousands,or 22%of total

Over all day's,the sum of cases is nearly 3.5 million

Cases: Range from over 341 thousands,when ys s20,to nearly 356 thousands,when day is 3

For cases,the most significant values of days are 3,13,10,and 2 ,whose respective cases values add up to over 1.4 million, or40.7%of the total



Across all months,the sum of deaths is over 178 thousands

deaths: Ranger from nearly 38 thousands,when months is 5,to over 72 thousands,when month is 4

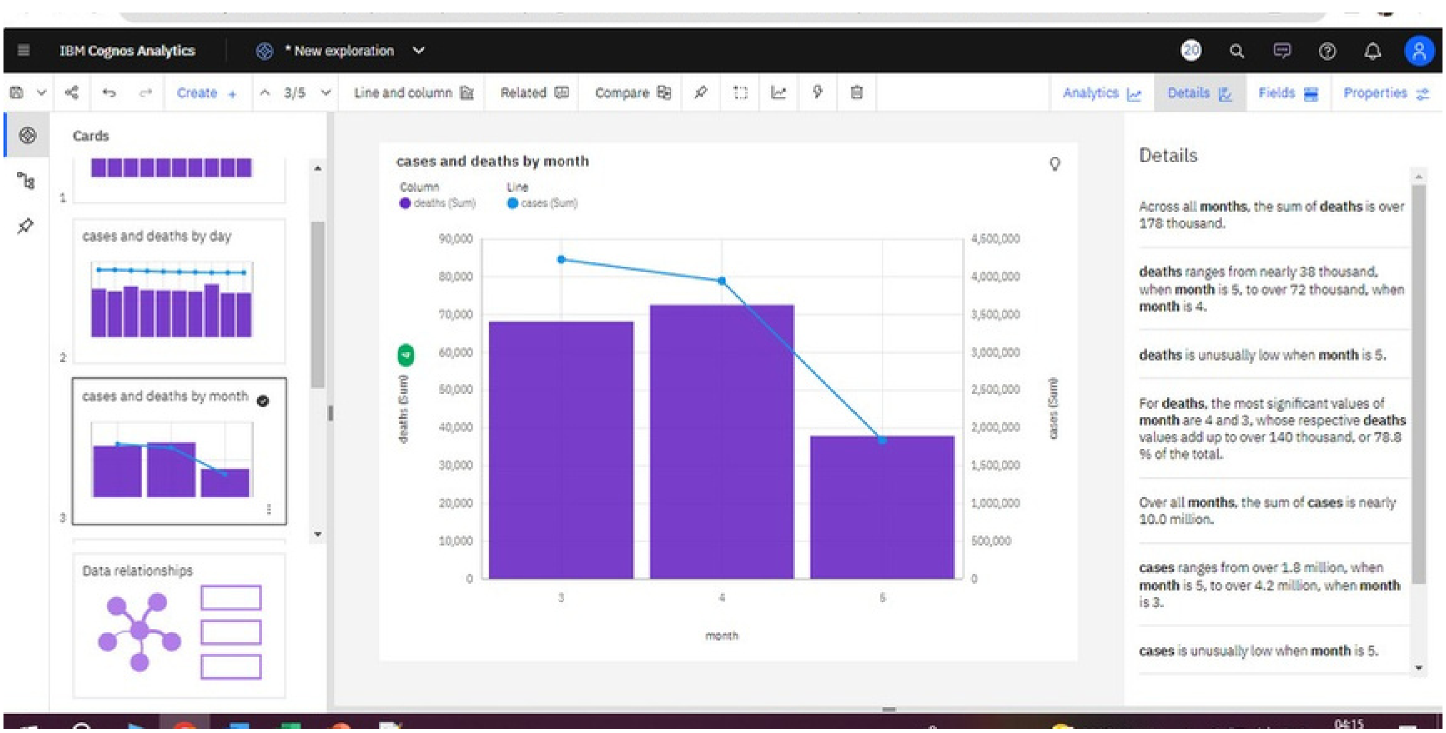
Deaths is usually low when month is 5

For deaths,the most significant values of months are 4 and 3,whose respective deaths values add up to over 140 thousands,or78.8%of the total

Over all months,the sum of cases is n nearly 10.0 million

Cases: Range from over 1.8 million,when months is 5, to over 4.2 million,when months is 3

Cases is usually low when months is 5



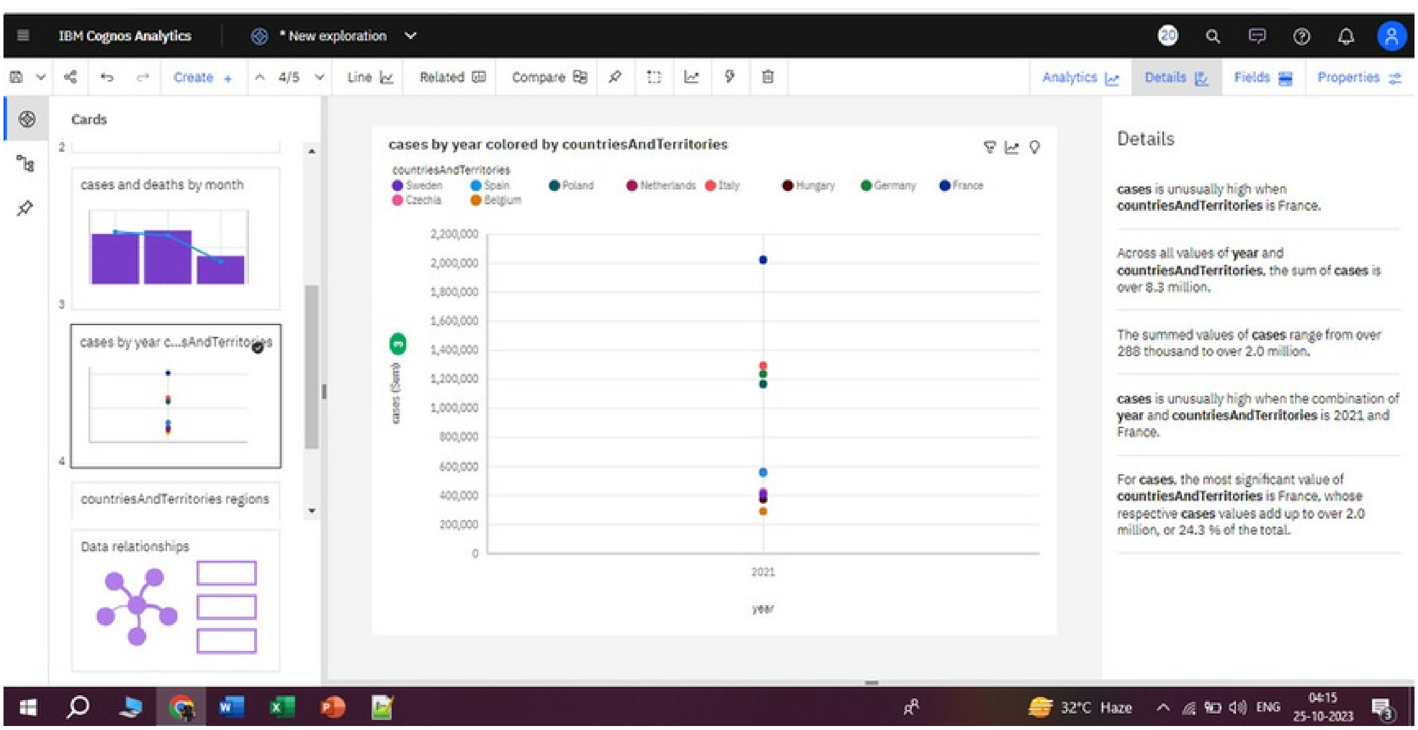
Cases: Is usually high when countries and territories is France

Across all values of years and countries and territories,the sum of cases is over 8.3 million

The summed values of cases ranges from over 288 thousands to over 2.0 million

Cases: Is usually high when the combination of year and countries and territories is 2021 and France

For cases,the most significant values of countries and territories is France,whose respective cases values add up to over 2.0 million,or 24.3% of the total



Creating a COVID-19 cases dashboard can provide a comprehensive view of the pandemic's status. Here's a simplified outline of how you can create one:

Data Source: Obtain up-to-date COVID-19 data from reliable sources, such as government health departments, the World Health Organization (WHO), or data repositories. This data should include details like daily cases, deaths, recoveries, and regional information.

Dashboard Platform: Choose a dashboarding tool or platform to create your dashboard. Popular options include Tableau, Power BI, Python-based frameworks like Dash, or JavaScript libraries like D3.js.

Data Integration: Import and connect your COVID-19 data to the dashboarding tool. Ensure that the data is cleaned and structured properly for analysis.

Dashboard Components:

Total Cases: Display the total number of COVID-19 cases worldwide or in a specific region.

Daily Cases: Include a line chart to show the daily new cases over time.

Total Deaths and Recoveries: Display the total number of deaths and recoveries.

Geographic Map: If available, use a map visualization to show the regional distribution of cases.

Trends and Insights: Add visualizations like bar charts or line plots to highlight trends, spikes, or patterns in the data.

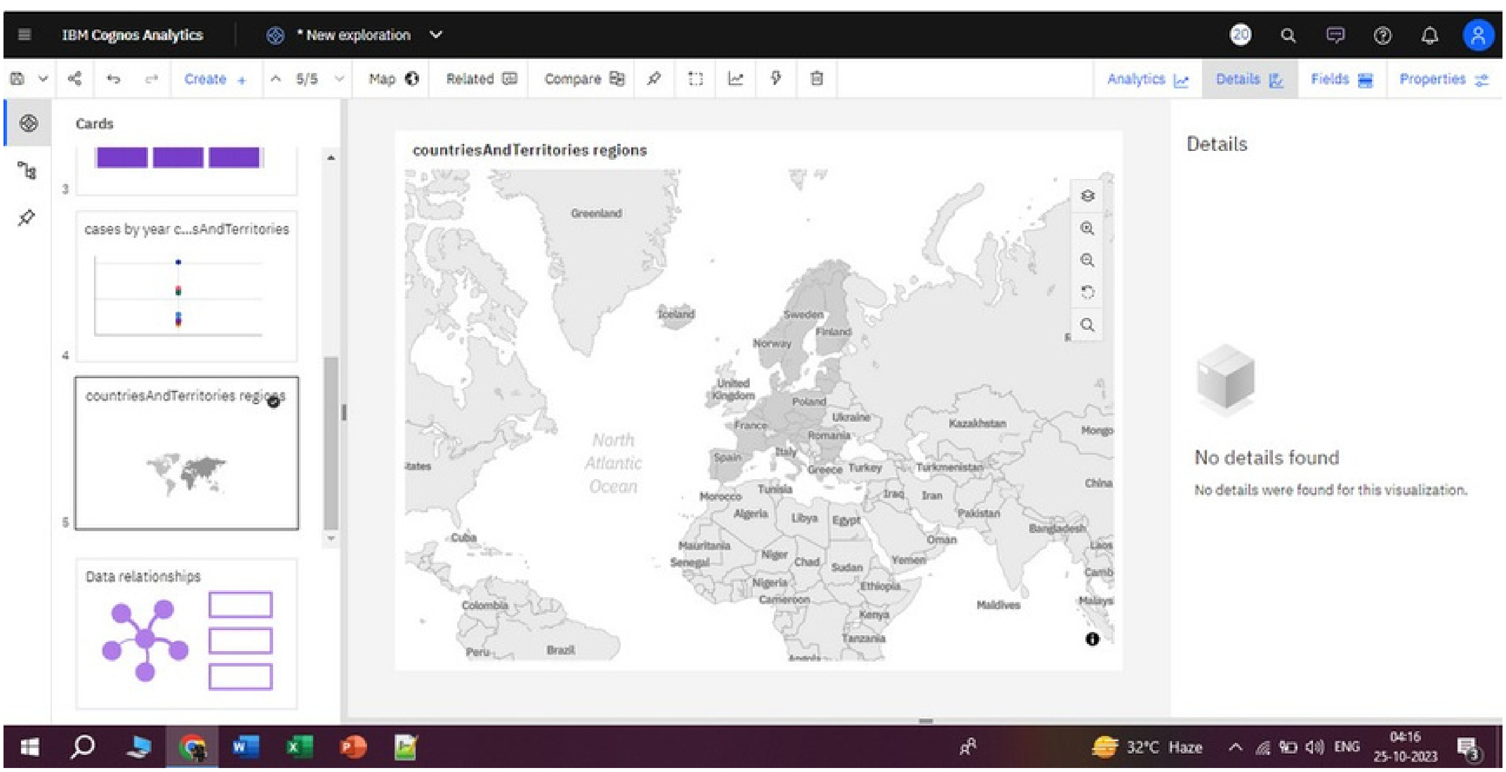
Filters and Interactivity: Allow users to filter data by region, date, or other relevant parameters.

Key Metrics: Display key metrics such as the case fatality rate, recovery rate, and growth rate.

News and Updates: Consider incorporating real-time news feeds or updates related to COVID-19.

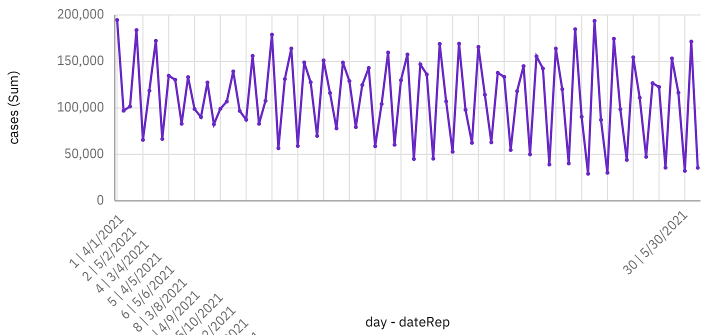
User Interface: Design a user-friendly and intuitive interface for the dashboard. Ensure that users can easily interact with the data and access relevant information.

Data Updates: Set up automatic data updates to keep the dashboard current, as the COVID-19 situation evolves.



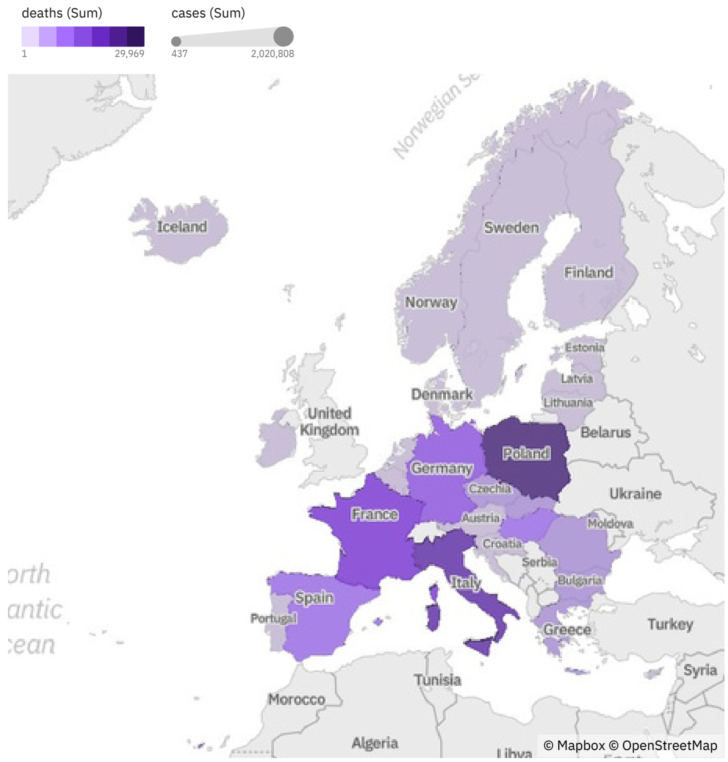
Tab 1

cases by day and dateRep



deaths by year, month, day and dateRep

deaths and cases for countriesAndTerritories regions



Conclusion

The COVID-19 pandemic demonstrates that every country remains vulnerable to public health
emergencies. The aspiration towards a healthier and safer society requires that countries develop and
implement a coherent and context-specific national strategy, improve governance of public health
emergencies, build the capacity of their (public) health systems, minimize fragmentation, and tackle
upstream structural issues, including socio-economic inequities. This is possible through a primary health
care approach, which ensures provision of universal and equitable promotive, preventive and cu