

# COVID-19 SPREAD ANALYSIS



The coronavirus (COVID-19) pandemic has had a significant impact on public health and has created an urgent need for data-driven insights to understand the spread of the virus. By analyzing the coronavirus dataset, we aim to gain valuable insights into the spread and impact of the virus, providing valuable information for public health responses and decision-making.

# DATA OVERVIEW

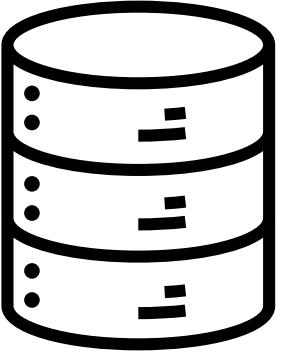
Table: covid\_data

Number of records: 78,386 entries



## Columns:

Province	varchar(255)
Country_Region	varchar(255)
Latitude	float
Longitude	float
Date	date
Confirmed	int
Deaths	int
Recovered	int
...	...
...	...
...	...



# DATA OVERVIEW

start_date	end_date
2020-01-22	2021-06-13

Start Date of Collecting  
Corona Data:

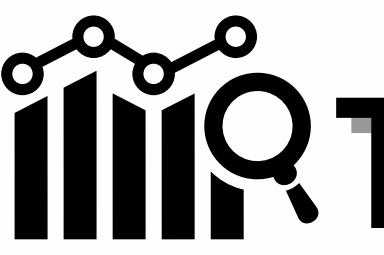
**2020-01-22**

End Date of Collecting  
Corona Data:

**2021-06-13**

**18 Months**





# TEMPORAL ANALYSIS

## 2020

### Monthly average recorded cases

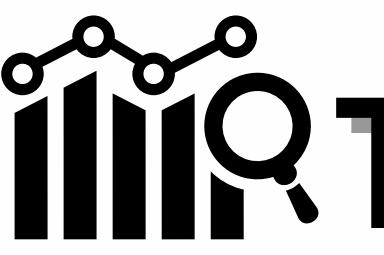
	Month	avg_confirmed_cases	avg_deaths_cases	avg_recovered_cases
▶	2020-01	4.1455	0.1234	0.0929
	2020-02	15.2960	0.5936	7.0320
	2020-03	161.1303	8.6607	27.8739
	2020-04	505.8004	41.5223	171.6422
	2020-05	574.8498	30.2809	318.2964
	2020-06	859.2281	29.8175	548.7916
	2020-07	1432.3611	35.1096	983.0582
	2020-08	1611.8429	37.5367	1299.2947
	2020-09	1784.5874	34.7773	1438.9067
	2020-10	2412.1996	36.7583	1420.6431
	2020-11	3592.1944	56.7634	1985.3446
	2020-12	4050.4397	71.2183	2497.8850



## 2021

### Monthly average recorded cases

2020-12	4050.4397	71.2183	2497.8850
2021-01	3911.2285	84.1837	1919.6370
2021-02	2433.3636	69.1649	1558.3917
2021-03	2916.7972	59.1998	1652.2859
2021-04	4699.3552	78.4387	3074.7851
2021-05	4005.2541	76.7803	4007.5078
2021-06	2508.6324	66.2622	2769.4496



# TEMPORAL ANALYSIS

## 2020

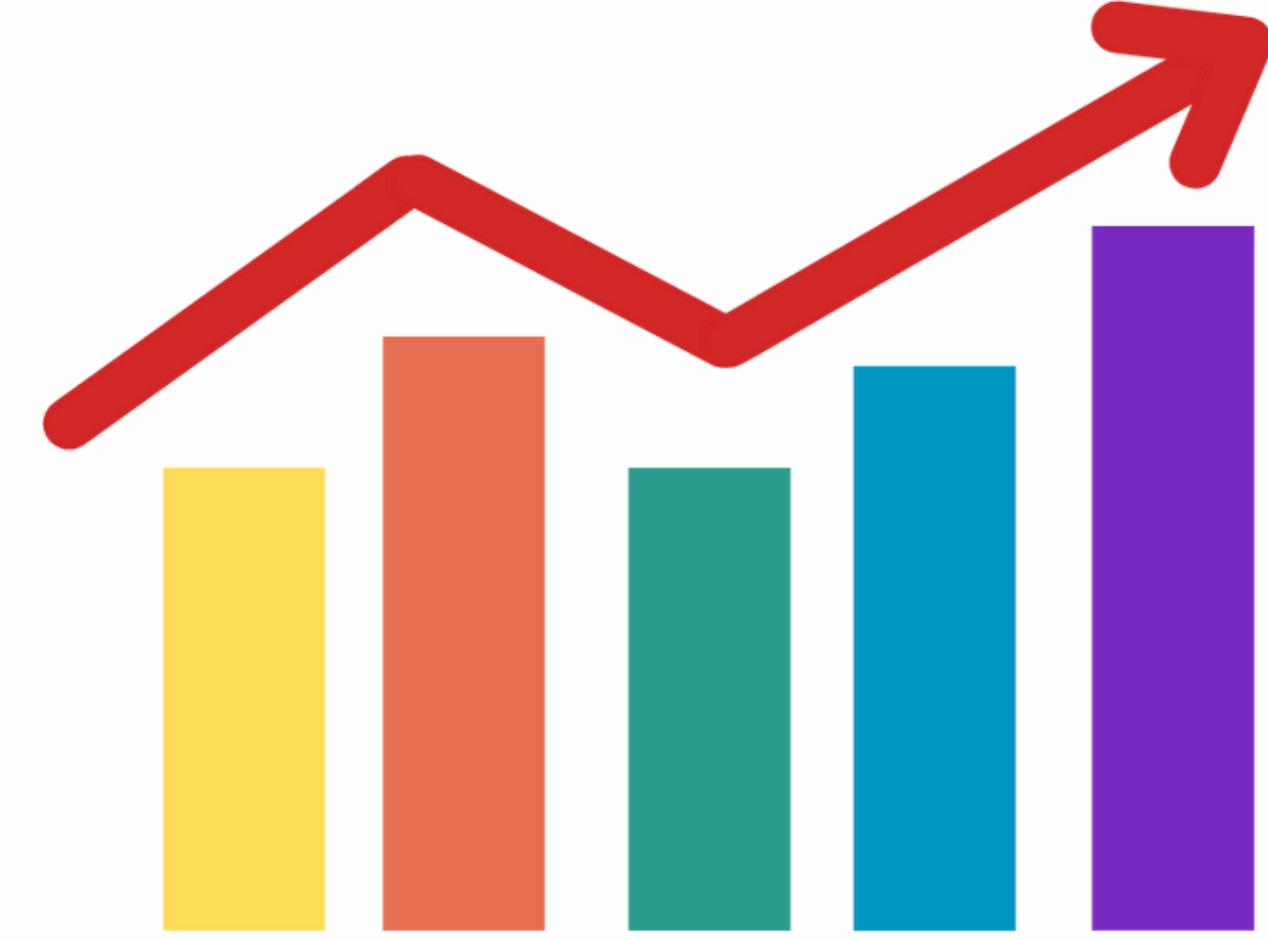
### Monthly total recorded cases

Month	total_confirmed_cases	total_deaths_cases	total_recovered_cases
2020-01	6384	190	143
2020-02	68312	2651	31405
2020-03	769236	41346	133070
2020-04	2336798	191833	792987
2020-05	2744333	144561	1519547
2020-06	3969634	137757	2535417
2020-07	6838092	167613	4693120
2020-08	7694938	179200	6202833
2020-09	8244794	160671	6647749
2020-10	11515841	175484	6782150
2020-11	16595938	262247	9172292
2020-12	19336799	339996	11924903

## 2021

### Monthly total recorded cases

2021-01	18672205	401893	9164347
2021-02	10492664	298239	6719785
2021-03	13924790	282620	7888013
2021-04	21711021	362387	14205507
2021-05	19121083	366549	19131842
2021-06	5022282	132657	5544438





# TEMPORAL ANALYSIS

Despite these monthly averages and totals observed, The mode “most frequent” value for the number of recorded cases in confirmed, deaths, and recovered cases per month was always ZERO

## Confirmed

Month	confirmed_records	Frequency
2020-01	0	1373
2020-02	0	3926
2020-03	0	2148
2020-04	0	1409
2020-05	0	1607
2020-06	0	1453
2020-07	0	1388
2020-08	0	1260
2020-09	0	1282
2020-10	0	1258
2020-11	0	1190
2020-12	0	1220
2021-01	0	1200
2021-02	0	1147
2021-03	0	1238
2021-04	0	1092
2021-05	0	1294
2021-06	0	565

## Deaths

Month	deaths_records	Frequency
2020-01	0	1530
2020-02	0	4374
2020-03	0	3815
2020-04	0	2512
2020-05	0	2779
2020-06	0	2745
2020-07	0	2714
2020-08	0	2535
2020-09	0	2349
2020-10	0	2355
2020-11	0	2170
2020-12	0	2180
2021-01	0	2120
2021-02	0	1867
2021-03	0	2077
2021-04	0	1970
2021-05	0	2096
2021-06	0	894

## Recovered

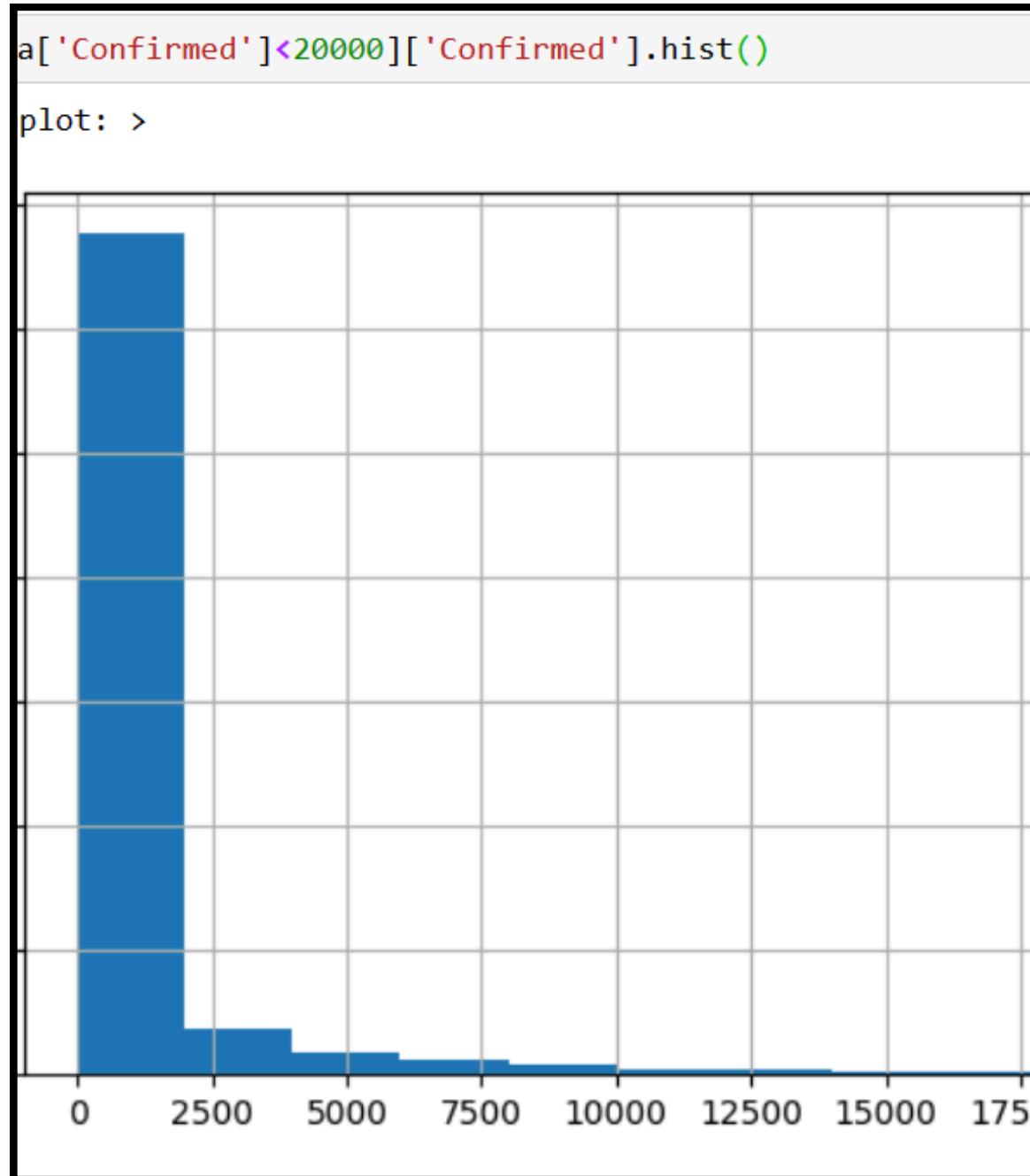
Month	recovered_records	Frequency
2020-01	0	1511
2020-02	0	4072
2020-03	0	3868
2020-04	0	2070
2020-05	0	1976
2020-06	0	2011
2020-07	0	2018
2020-08	0	1874
2020-09	0	1770
2020-10	0	1892
2020-11	0	1750
2020-12	0	1822
2021-01	0	1790
2021-02	0	1638
2021-03	0	1932
2021-04	0	1834
2021-05	0	1928
2021-06	0	853



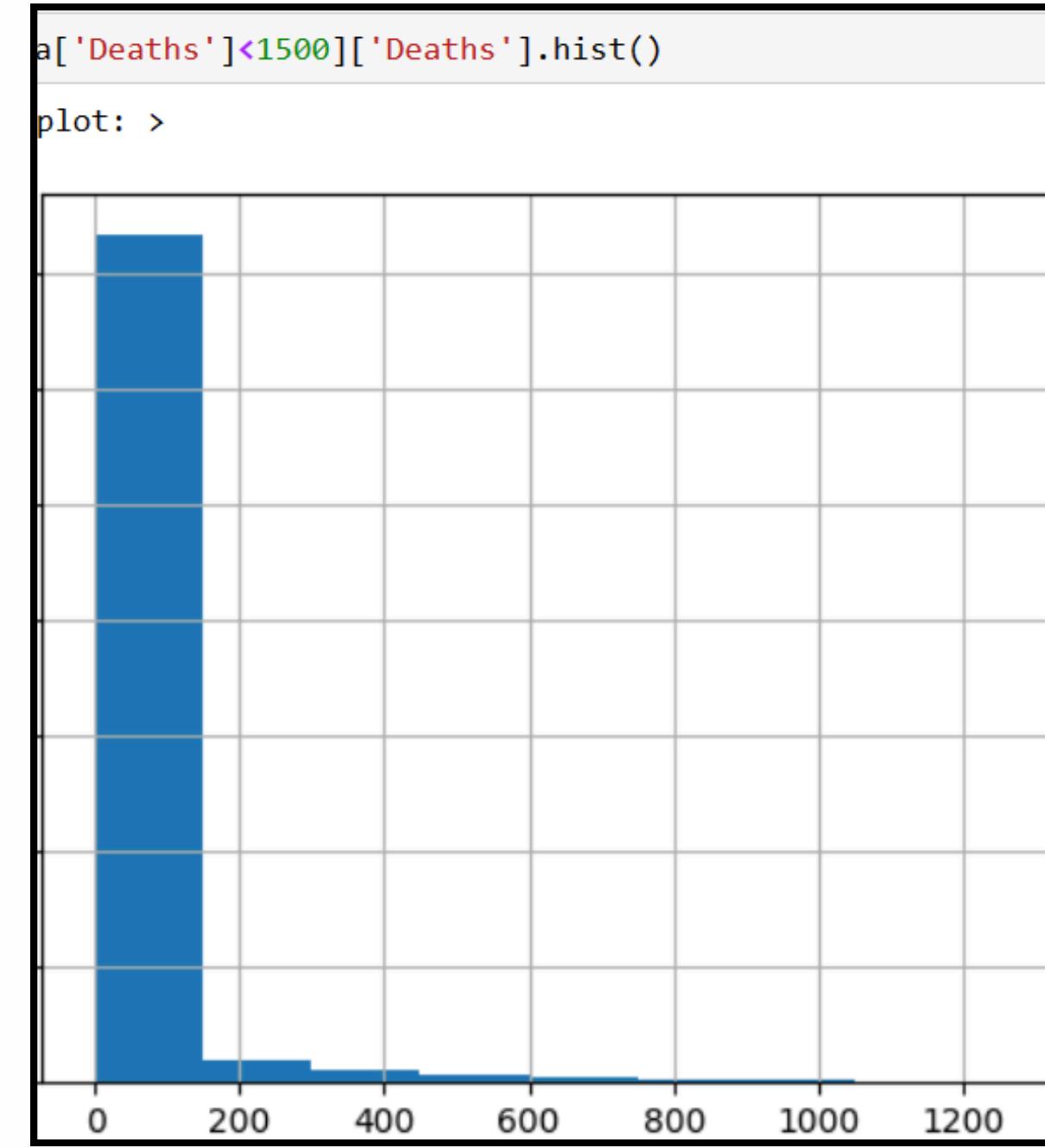
# CORONAVIRUS DISTRIBUTION

After eliminating the outliers, I could display a valid histogram for the spread of corona cases recorded.

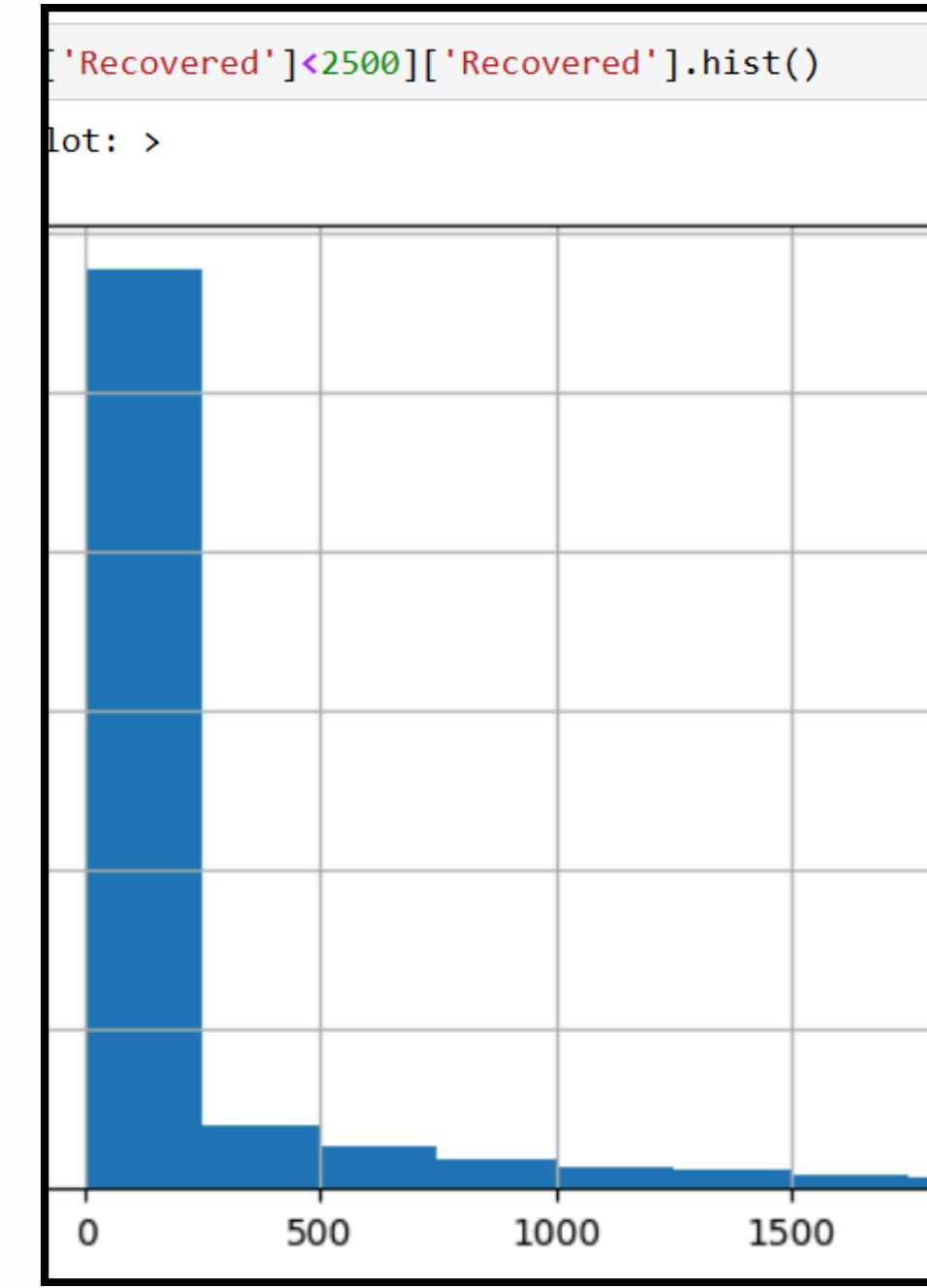
**Confirmed**



**Deaths**



**Recovered**





# CONFIRMED MONTHLY SPREAD



## Monthly confirmed cases spread

2020

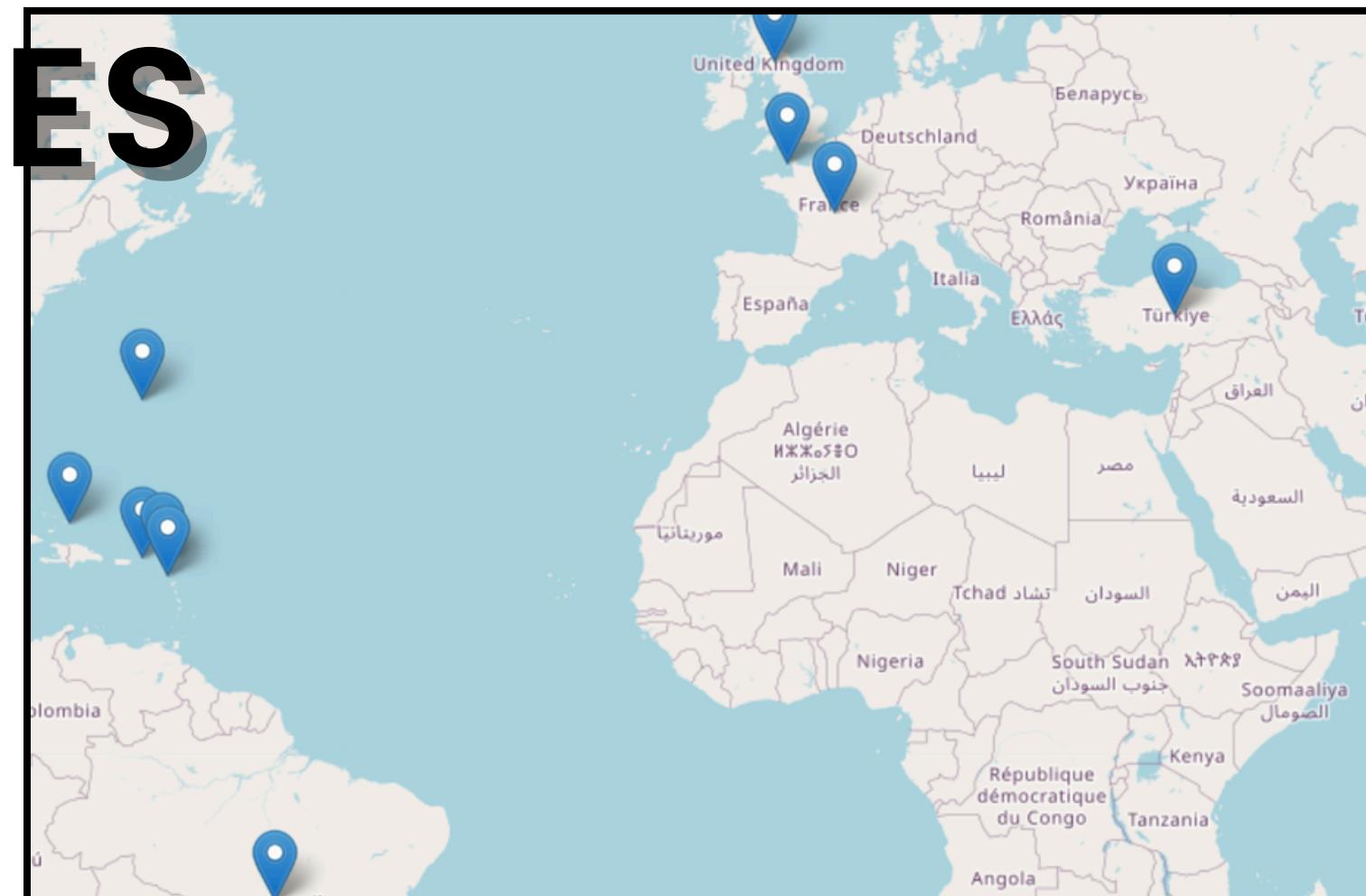
2021

Month	totalConfirmedCases	averageConfirmedCases	varianceConfirmedCases	stdevConfirmedCases
2020-01	6384	4.1455	4832.911310507683	69.51914348226452
2020-02	68312	15.2960	78489.44618653238	280.15967980159525
2020-03	769236	161.1303	1026414.1786678263	1013.1210088966798
2020-04	2336798	505.8004	7012063.272294189	2648.030073902898
2020-05	2744333	574.8498	6063580.339194553	2462.4338243279863
2020-06	3969634	859.2281	13779211.570030754	3712.036041046848
2020-07	6838092	1432.3611	46914022.88886134	6849.381204814151
2020-08	7694938	1611.8429	54408583.16090782	7376.217401955275
2020-09	8244794	1784.5874	69314698.6016606	8325.544943225073
2020-10	11515841	2412.1996	68988159.04707989	8305.91109072809
2020-11	16595938	3592.1944	195815877.8115701	13993.4226625072
2020-12	19336799	4050.4397	459885446.66320175	21444.93988481203
2021-01	18672205	3911.2285	316304694.1457216	17784.95696215545
2021-02	10492664	2433.3636	79587921.44429906	8921.206277421179
2021-03	13924790	2916.7972	83725265.48297499	9150.151118040345
2021-04	21711021	4699.3552	501013206.38703865	22383.324292585286
2021-05	19121083	4005.2541	628647609.3315454	25072.84605567436
2021-06	5022282	2508.6324	110932776.67203951	10532.462991724182



# COUNTRIES WITH HIGHEST CONFIRMED CASES

US, India and Brazil scored the highest countries with confirmed cases according to our data

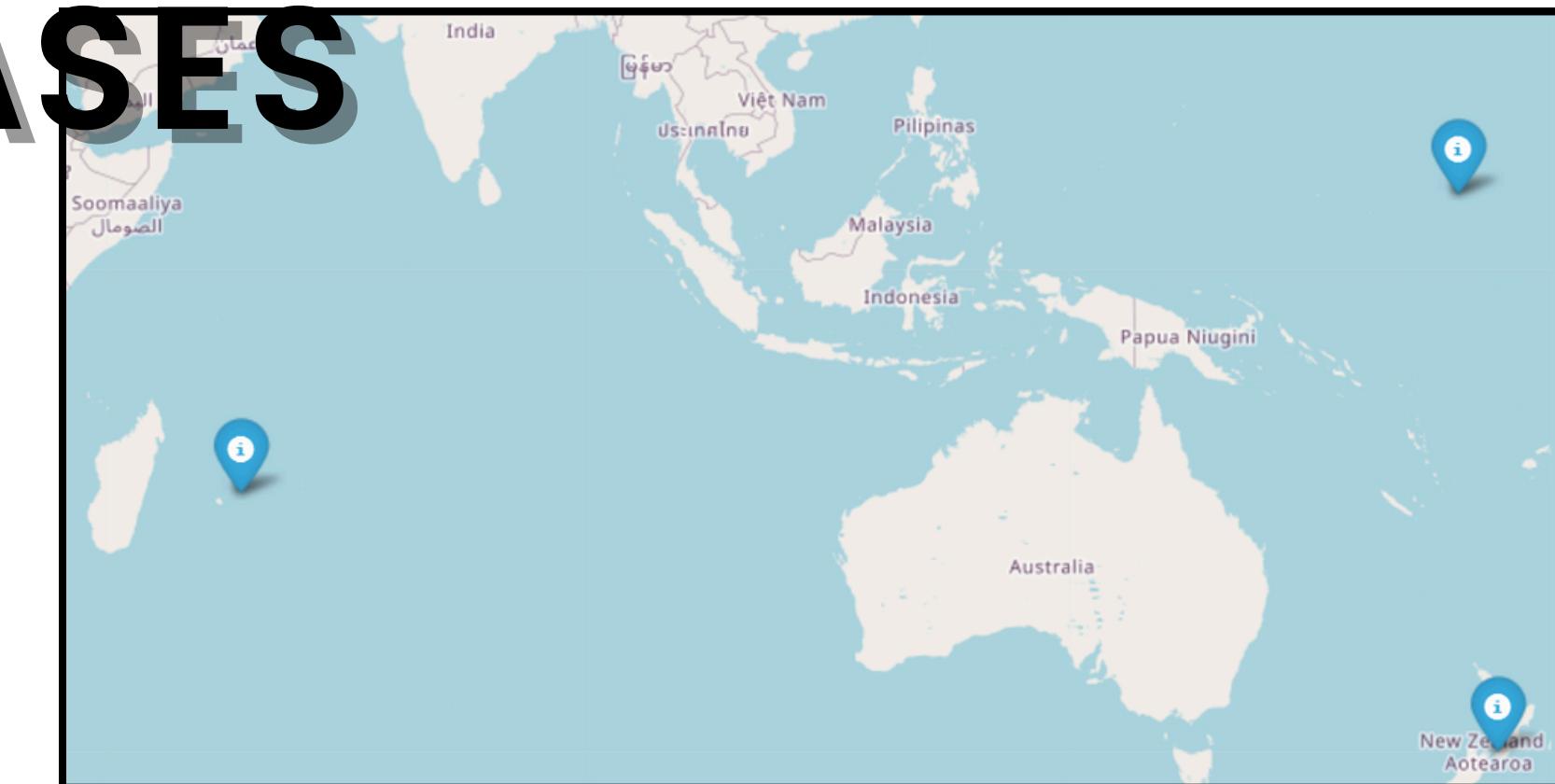


Country_Region	total_confirmed_cases	total_recovered_cases	total_deaths_cases	recovered_pct	deaths_pct
US	33461982	6303715	599769	18.8384	1.7924
India	29460523	28089649	370730	95.3467	1.2584
Brazil	17412766	15400169	487401	88.4418	2.7991
France	6106009	345440	109914	5.6574	1.8001
Turkey	5330447	5202251	48721	97.5950	0.9140
Russia	5148499	4745756	124314	92.1775	2.4146
United Kingdom	4582386	9407	128045	0.2053	2.7943

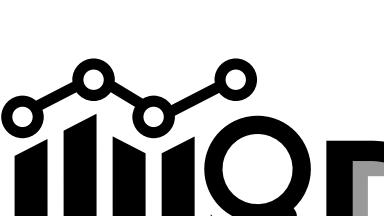


# COUNTRIES WITH LOWEST CONFIRMED CASES

Kiribati, Samoa, Dominica and New Zealand scored the lowest with confirmed cases



Country_Region	totalConfirmed_cases	totalRecovered_cases	totalDeaths_cases	recovered_pct	deaths_pc
Kiribati	2	0	0	0.0000	0.0000
Samoa	3	3	0	100.0000	0.0000
Marshall Islands	5	4	0	80.0000	0.0000
Dominica	189	188	0	99.4709	0.0000
Tanzania	509	183	21	35.9528	4.1257
Mauritius	1675	1247	18	74.4478	1.0746
Bhutan	1813	1467	1	80.9156	0.0552
New Zealand	2714	2658	26	97.9366	0.9580



# DEATHS MONTHLY SPREAD



## Monthly death cases spread

2020

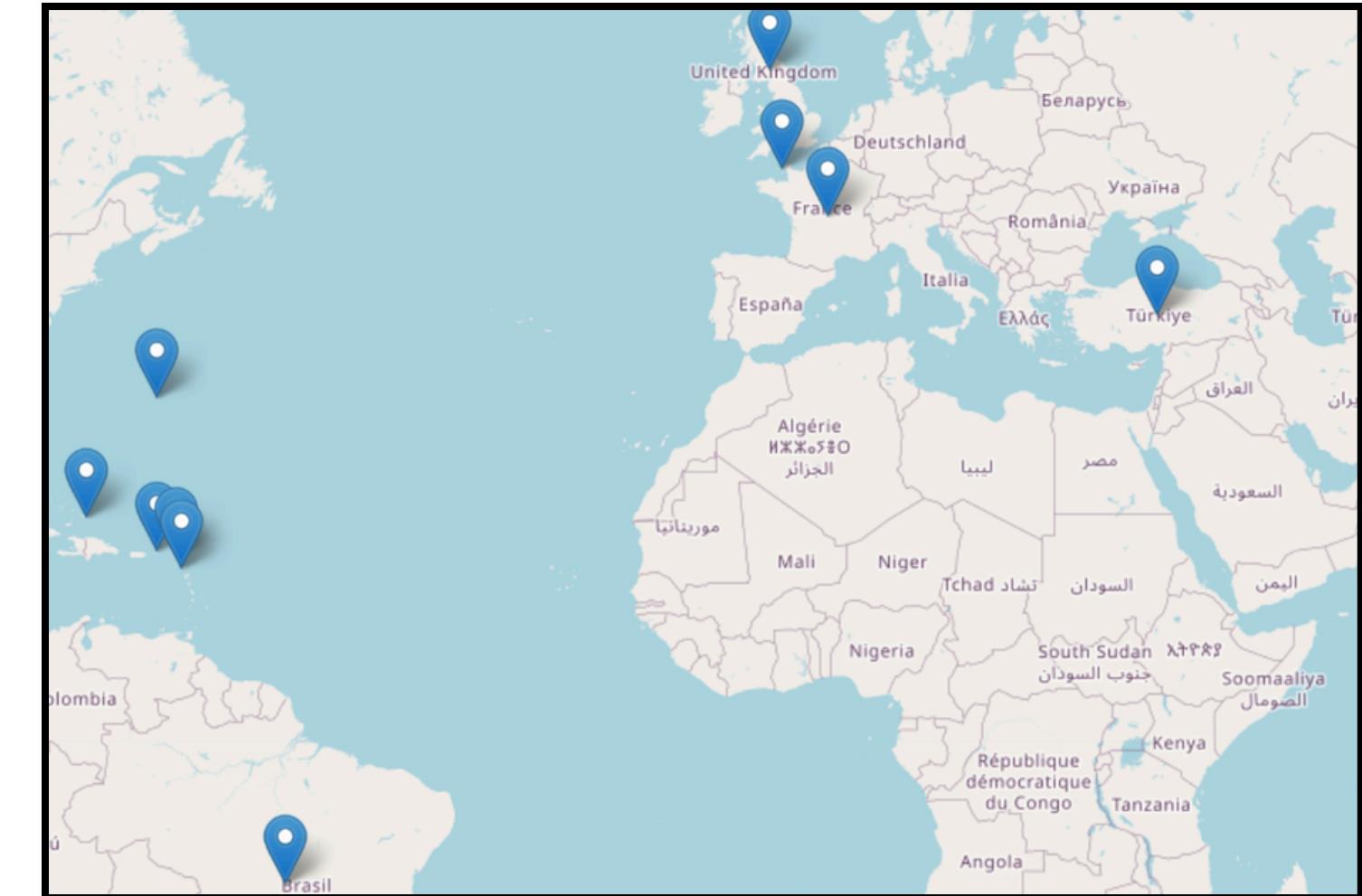
2021

Month	total_deaths_cases	average_deaths_cases	variance_deaths_cases	stdev_deaths_cases
2020-01	190	0.1234	4.245817169843138	2.0605380777464752
2020-02	2651	0.5936	68.3218488238449	8.265703165723101
2020-03	41346	8.6607	3900.7922648320746	62.45632285711411
2020-04	191833	41.5223	40504.26811767955	201.25672191924312
2020-05	144561	30.2809	20684.911671085658	143.8225005730524
2020-06	137757	29.8175	16929.445709928572	130.11320344195886
2020-07	167613	35.1096	21140.154944373826	145.39654378414167
2020-08	179200	37.5367	23272.99645685882	152.55489653517785
2020-09	160671	34.7773	20102.7692237308	141.78423475030925
2020-10	175484	36.7583	17580.07101972725	132.589860169348
2020-11	262247	56.7634	27773.793596962234	166.6547136955995
2020-12	339996	71.2183	65345.36920134891	255.6274030720277
2021-01	401893	84.1837	102758.43231925515	320.55956126631935
2021-02	298239	69.1649	68478.87146663864	261.6846794648832
2021-03	282620	59.1998	54385.969702527414	233.20799665218905
2021-04	362387	78.4387	94611.47092309907	307.58977701331213
2021-05	366549	76.7803	131769.4693132085	363.00064643635073
2021-06	132657	66.2622	112963.67298959807	336.1006887669201



# COUNTRIES WITH HIGHEST DEATH CASES

US, India and Brazil scored the highest countries with death cases according to our data



Country_Region	total_confirmed_cases	total_recovered_cases	total_deaths_cases	recovered_pct	deaths_pct
US	33461982	6303715	599769	18.8384	1.7924
Brazil	17412766	15400169	487401	88.4418	2.7991
India	29460523	28089649	370730	95.3467	1.2584
Mexico	2454176	2058707	230150	83.8859	9.3779
Peru	2003625	1964943	188708	98.0694	9.4183
United Kingdom	4582386	9407	128045	0.2053	2.7943
Italy	4245020	3958441	127033	93.2491	2.9925



# COUNTRIES WITH LOWEST DEATH CASES

Samoa, Dominica, and Kiribati scored ZERO death cases according to our data



Lowest_Country_with_Death_Cases	number_of_death_cases
Samoa	0
Dominica	0
Kiribati	0
Marshall Islands	0
Bhutan	1



# Recovered Monthly Spread

## Monthly recovered cases spread

2020

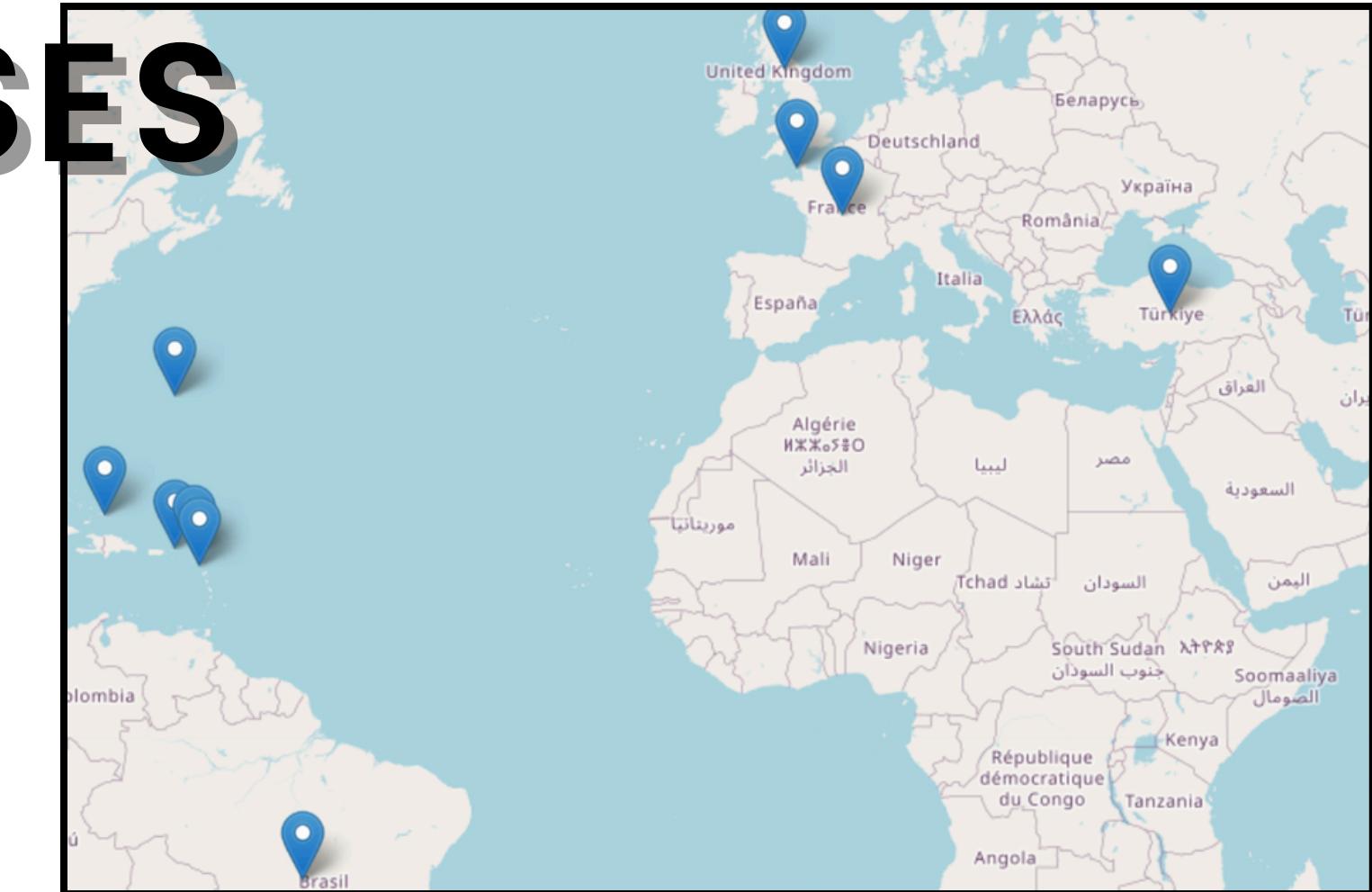
2021

Month	total_recoverd_cases	average_recoverd_cases	variance_recoverd_cases	stdev_recoverd_cases
2020-01	143	0.0929	2.633585343228195	1.6228325062150422
2020-02	31405	7.0320	12446.6619841429	111.5646090126385
2020-03	133070	27.8739	40113.18979639222	200.28277458731247
2020-04	792987	171.6422	769893.0319414467	877.4354859141763
2020-05	1519547	318.2964	1978206.4175948969	1406.4872617961732
2020-06	2535417	548.7916	6530172.493132202	2555.420218502664
2020-07	4693120	983.0582	24843877.85333294	4984.363334803447
2020-08	6202833	1299.2947	40170422.19780621	6338.014057873824
2020-09	6647749	1438.9067	57023566.44389443	7551.394999858929
2020-10	6782150	1420.6431	73731702.50184019	8586.716631043568
2020-11	9172292	1985.3446	50727618.87346639	7122.332404027938
2020-12	11924903	2497.8850	326694724.1038681	18074.69845125689
2021-01	9164347	1919.6370	31493700.11602569	5611.924813825083
2021-02	6719785	1558.3917	24427411.60468984	4942.409493828879
2021-03	7888013	1652.2859	34897391.64112127	5907.401428811256
2021-04	14205507	3074.7851	224419585.15055594	14980.640345143993
2021-05	19131842	4007.5078	755175531.756431	27480.45726978412
2021-06	5544438	2769.4496	233034407.39031225	15265.46453241146

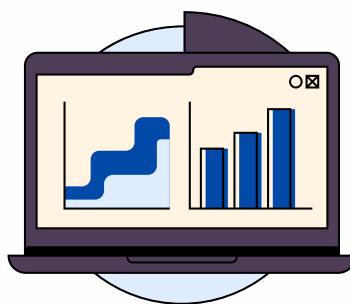


# COUNTRIES WITH HIGHEST RECOVERED CASES

India and Brazil, then comes US are the countries that scored the highest countries with recovered cases according to our data



Country_Region	total_confirmed_cases	total_recovered_cases	total_deaths_cases	recovered_pct	deaths_pct
India	29460523	28089649	370730	95.3467	1.2584
Brazil	17412766	15400169	487401	88.4418	2.7991
US	33461982	6303715	599769	18.8384	1.7924
Turkey	5330447	5202251	48721	97.5950	0.9140
Russia	5148499	4745756	124314	92.1775	2.4146
Italy	4245020	3958441	127033	93.2491	2.9925



# YEARLY ANALYSIS [2020 VS. 2021]

Assuming Granularity in our collected data, Max confirmed cases as captured in 2020, Having more than 80 thousands of corona cases.

But, interestingly, The deaths cases were at their maximum in 2021.

Year	maxConfirmedCases	maxDeathsCases	maxRecoveredCases
2020	823225	3752	1123456
2021	414188	7374	422436

- In both years, we were lucky to record zero corona cases!

Year	minConfirmedCases	minDeathsCases	minRecoveredCases
2020	0	0	0
2021	0	0	0



# CONCLUSION

The analysis of the coronavirus dataset has provided valuable insights into the spread and impact of the virus.

## Key Findings:

- The total number of confirmed cases, deaths, and recoveries each month.
- The average, variance, and standard deviation of confirmed cases, providing an understanding of the spread pattern.
- The most affected countries in terms of confirmed cases, deaths, and recoveries.
- The monthly trend of the virus spread, highlighting the areas of concern and improvement.

These insights helped in better understanding the dynamics of the pandemic and can help in formulating effective strategies for its containment and mitigation.

*Thank You*