

# SCIENTIFIC RESEARCH MONITORING ON COVID-19

**04 FEBRUARY 2021**

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# SCIENTIFIC RESEARCH MONITORING ON COVID-19

## (ISSUE 362)



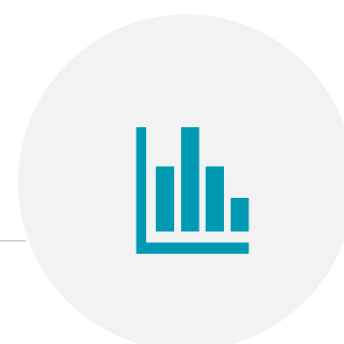
Abu Dhabi Public Health Center (ADPHC) is gathering the latest scientific research updates and trends on coronavirus disease (COVID-19) in a daily report. The report provides summaries on breakthrough or updated research on COVID-19 to allow health care professionals and public health professionals get easy and fast access to information.

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**Research**

New Update



**Statistics**



**Articles**

Summary

Note : All articles presented in this report represent the authors' views and not necessarily represents Abu Dhabi Public Health Center views or directions. Due the nature of daily posting , some minor language errors are expected.

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# RESEARCH UPDATES

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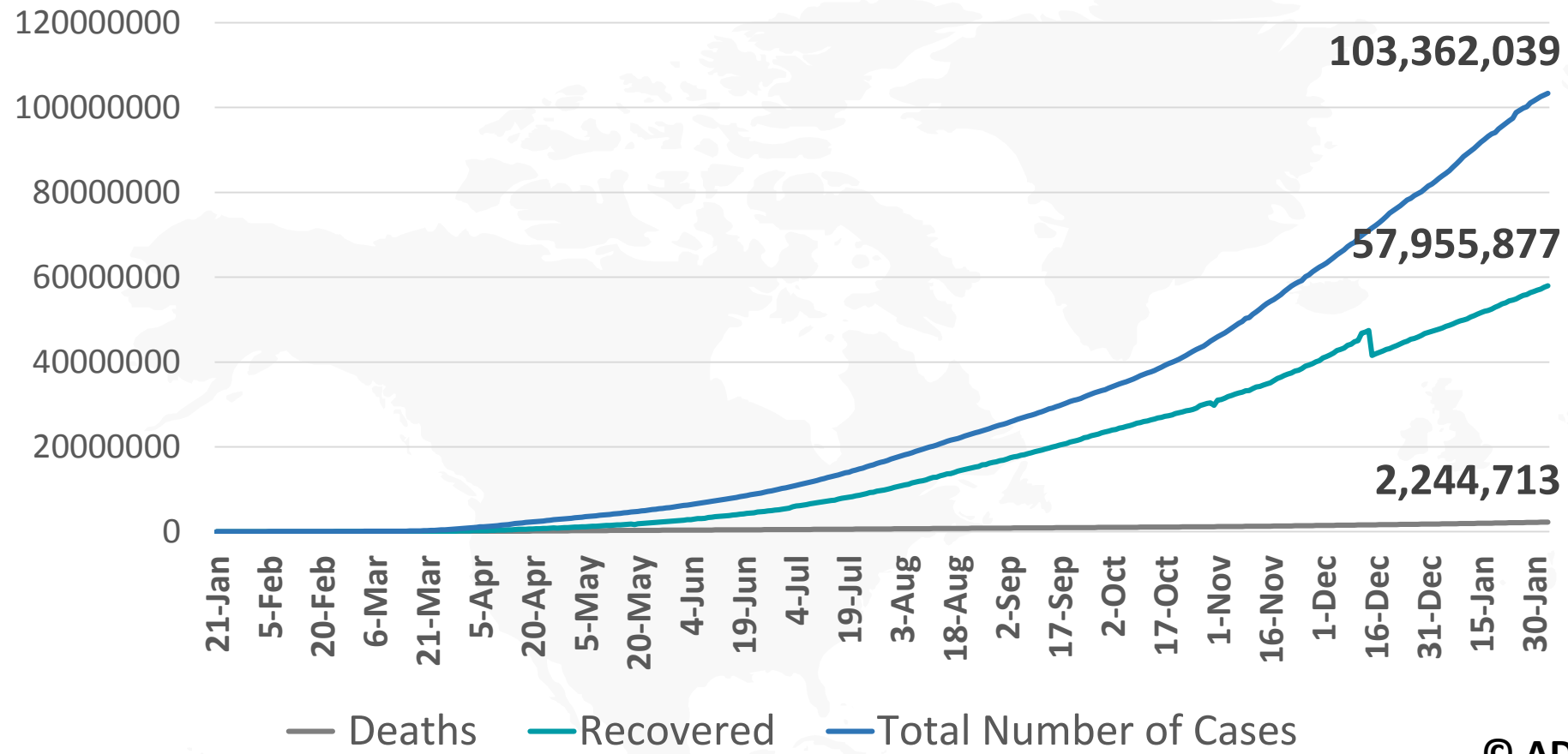
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## New Variant

Special Report on the new variants of SARS-COV2 with focus on the epidemiology of Africa

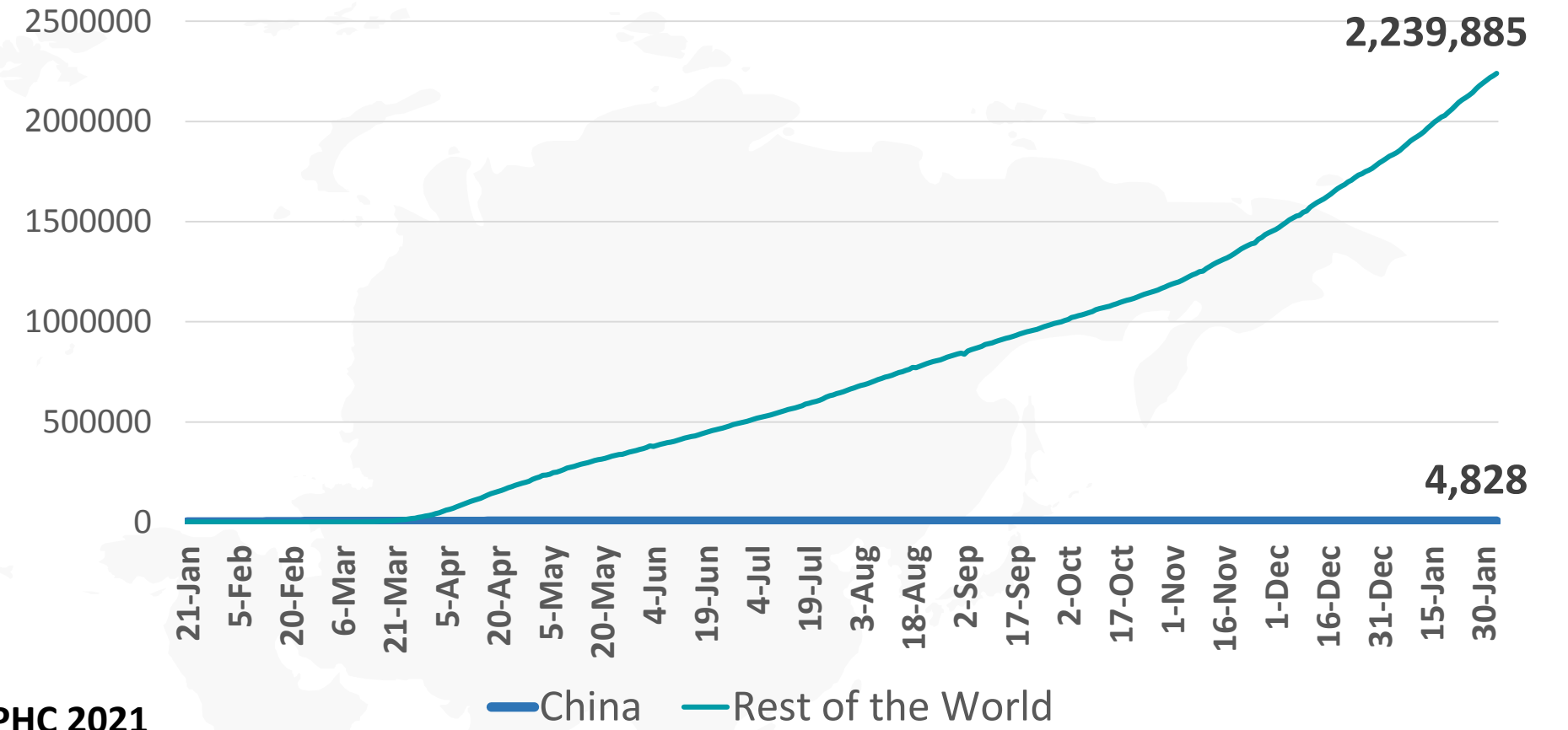


**Figure 1: Total Number of Infected, Recovered, and Death Cases**



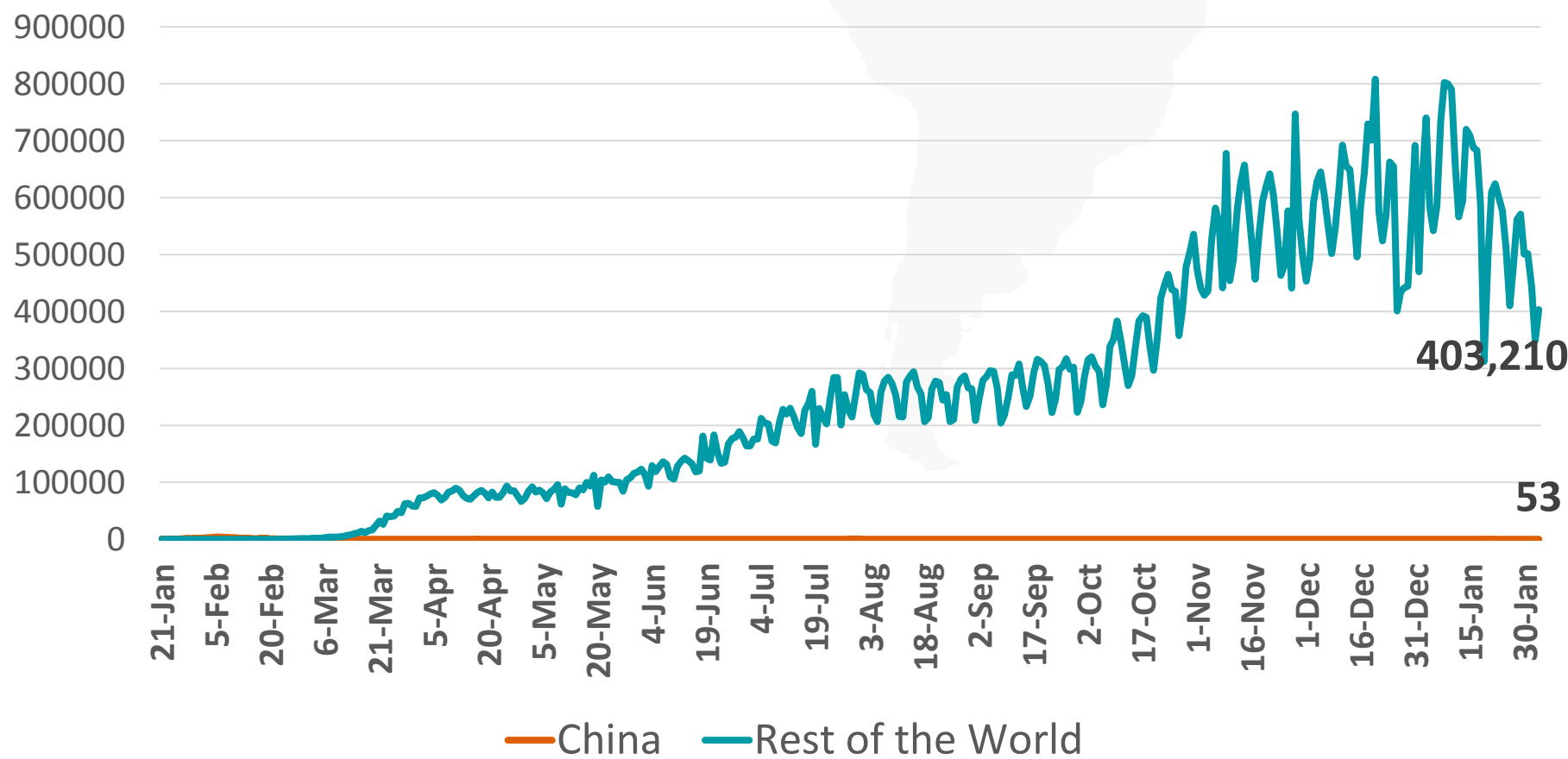
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**Figure 3: Total Number of Death Due to COVID-19 (china and result of the world)**

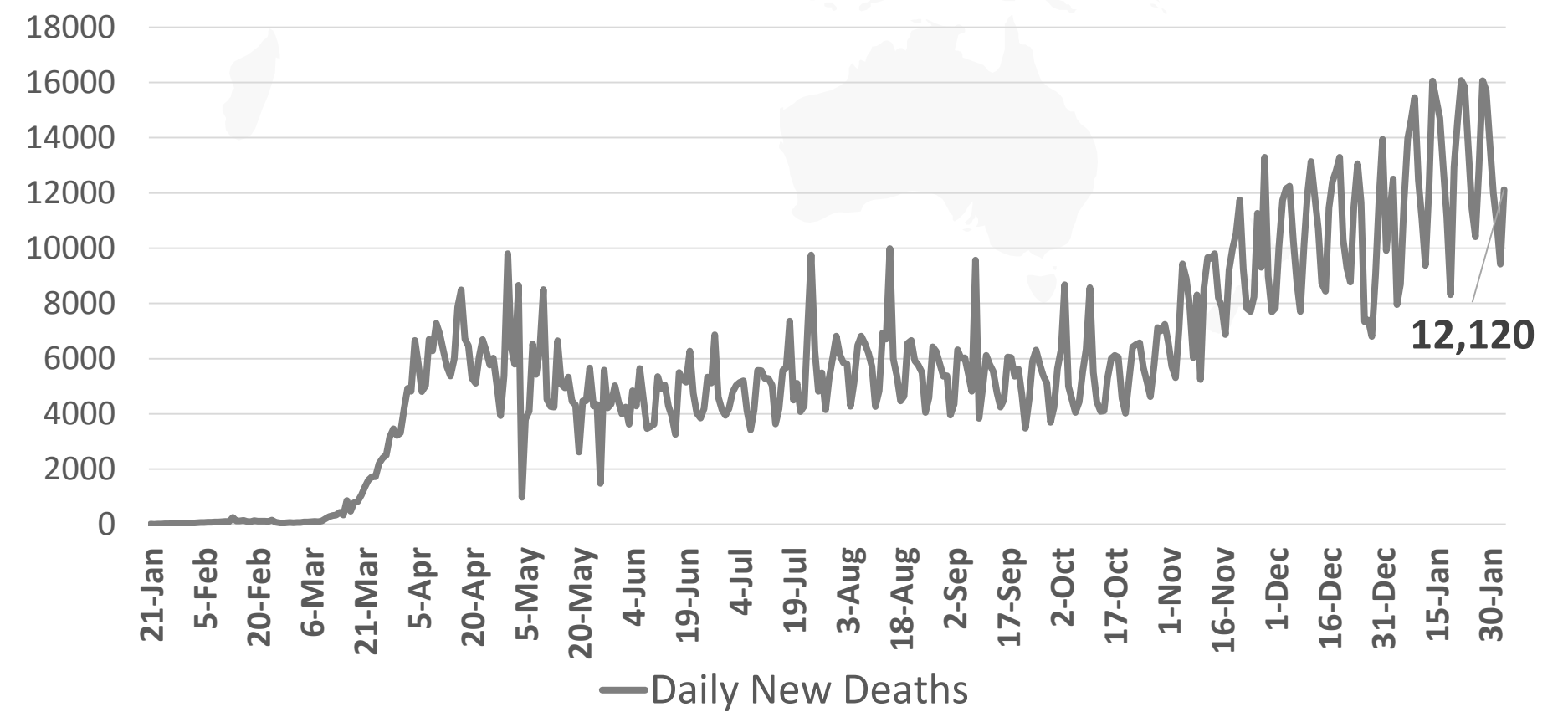


Note: the number of recovered cases in 31<sup>st</sup> October rechecked from 30 million to 29 million, and in 15<sup>th</sup> December rechecked from 47 million to 41 million in Johns Hopkins website

**Figure 2: Daily New Infected COVID-19 Cases (China and rest of the world)**

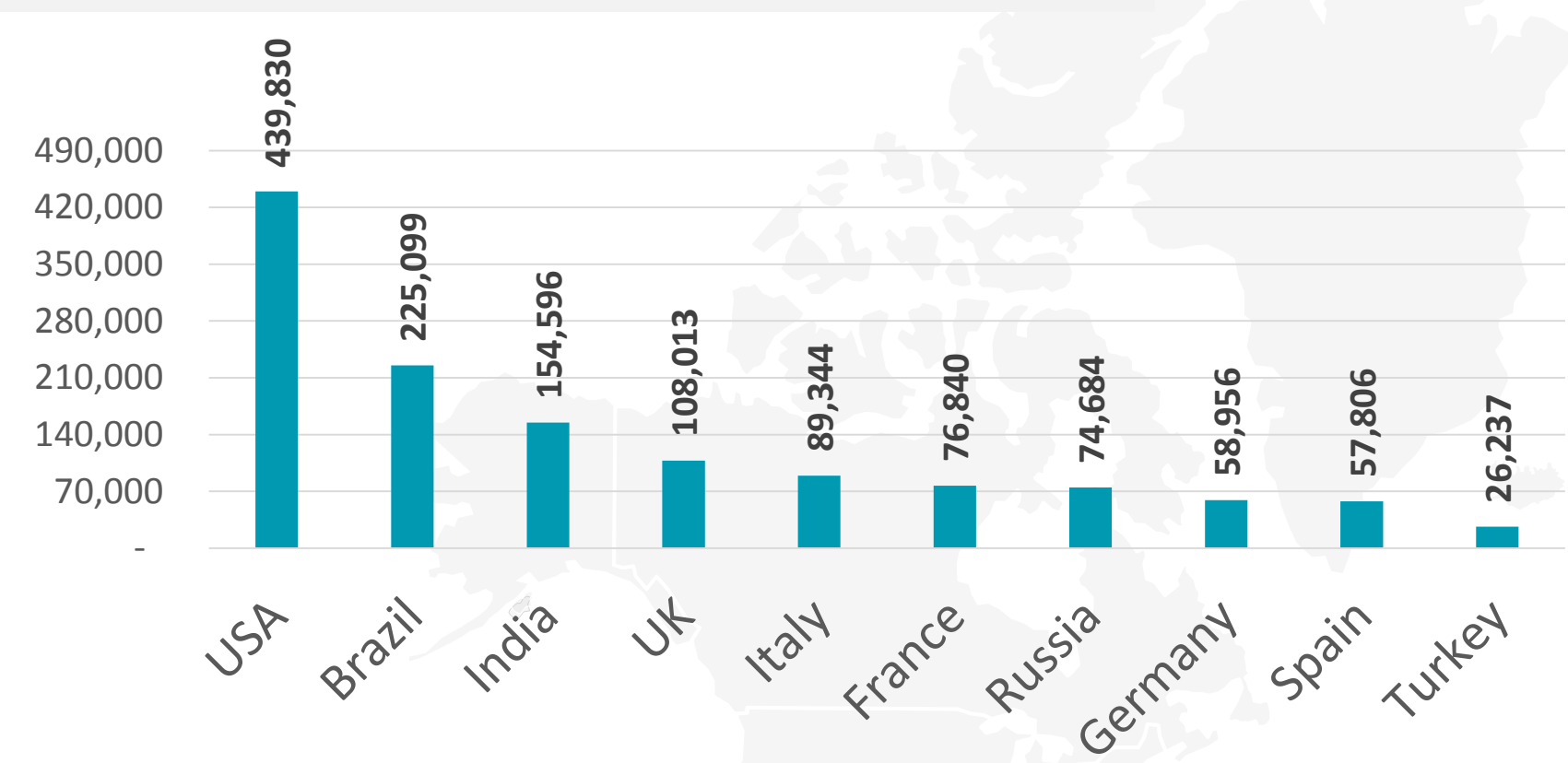


**Figure 4: Global Daily New Deaths Due to COVID-19**

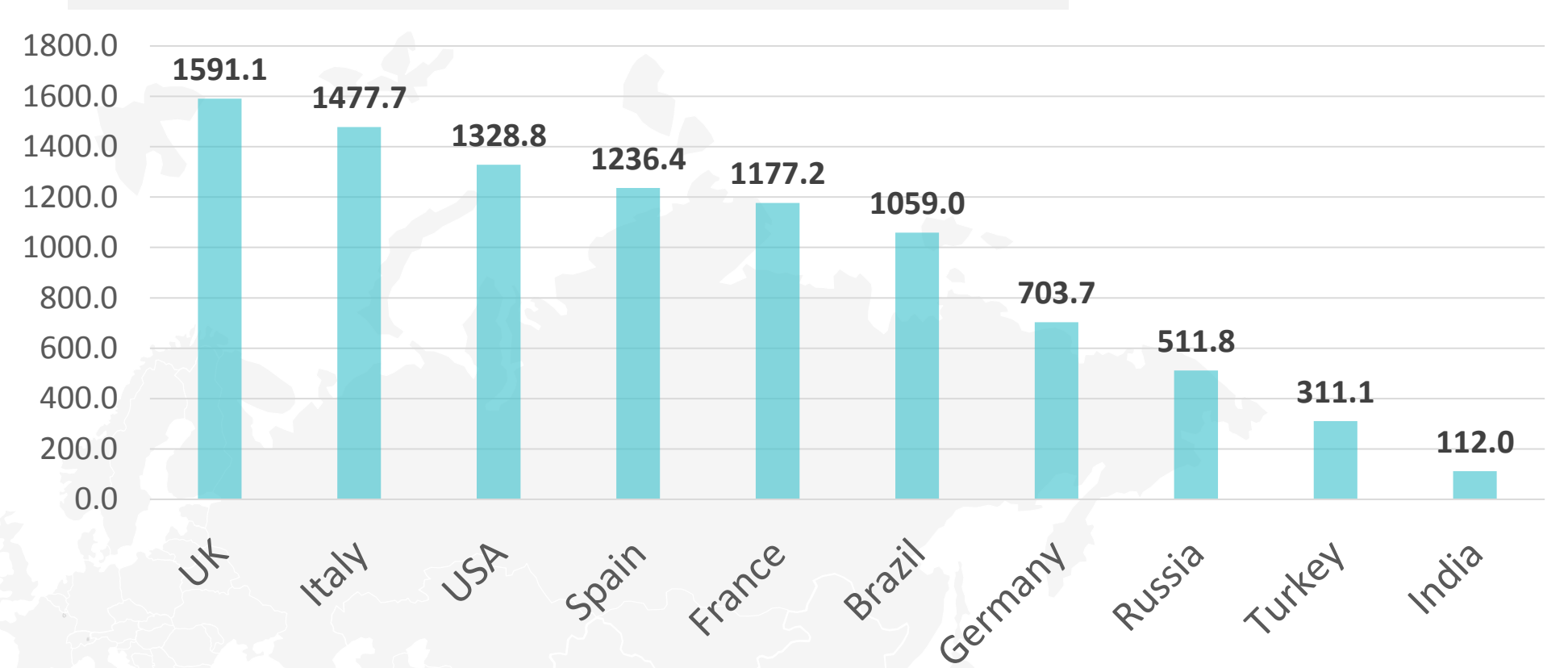


## Figure 5: Top 10 Countries in the Total Number of Cases Due to COVID-19

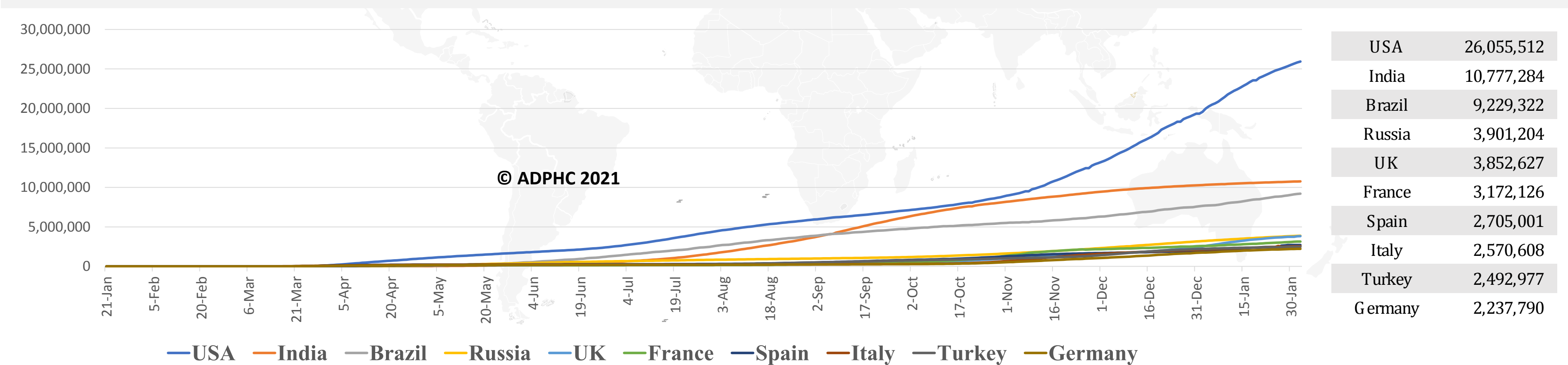
### TOTAL DEATHS



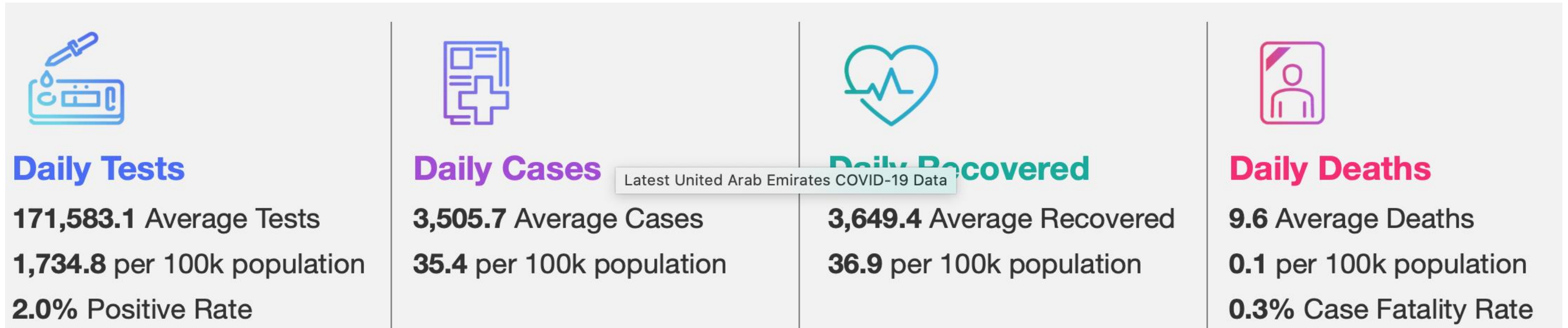
### DEATHS PER MILLION



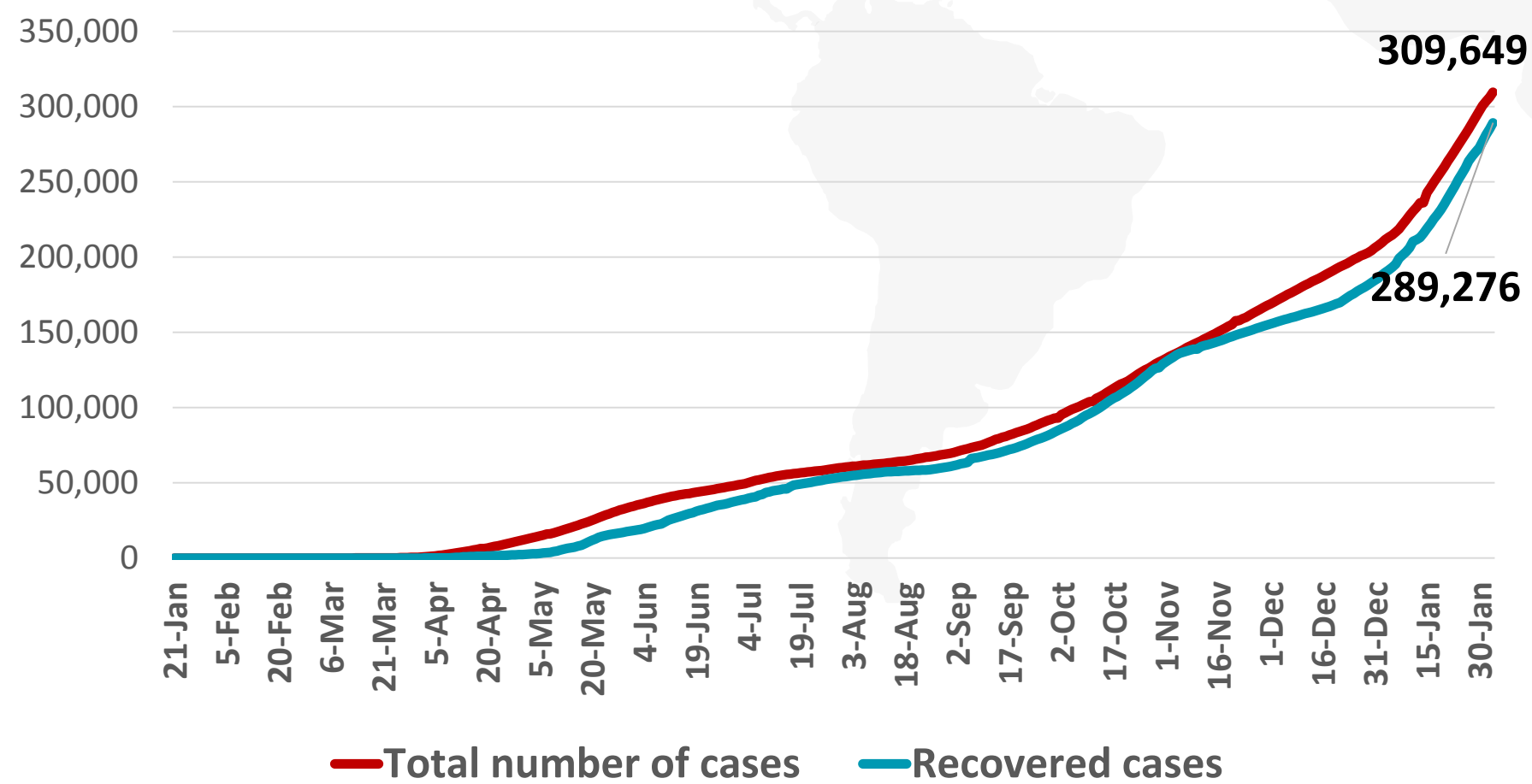
### TOTAL INFECTED CASES



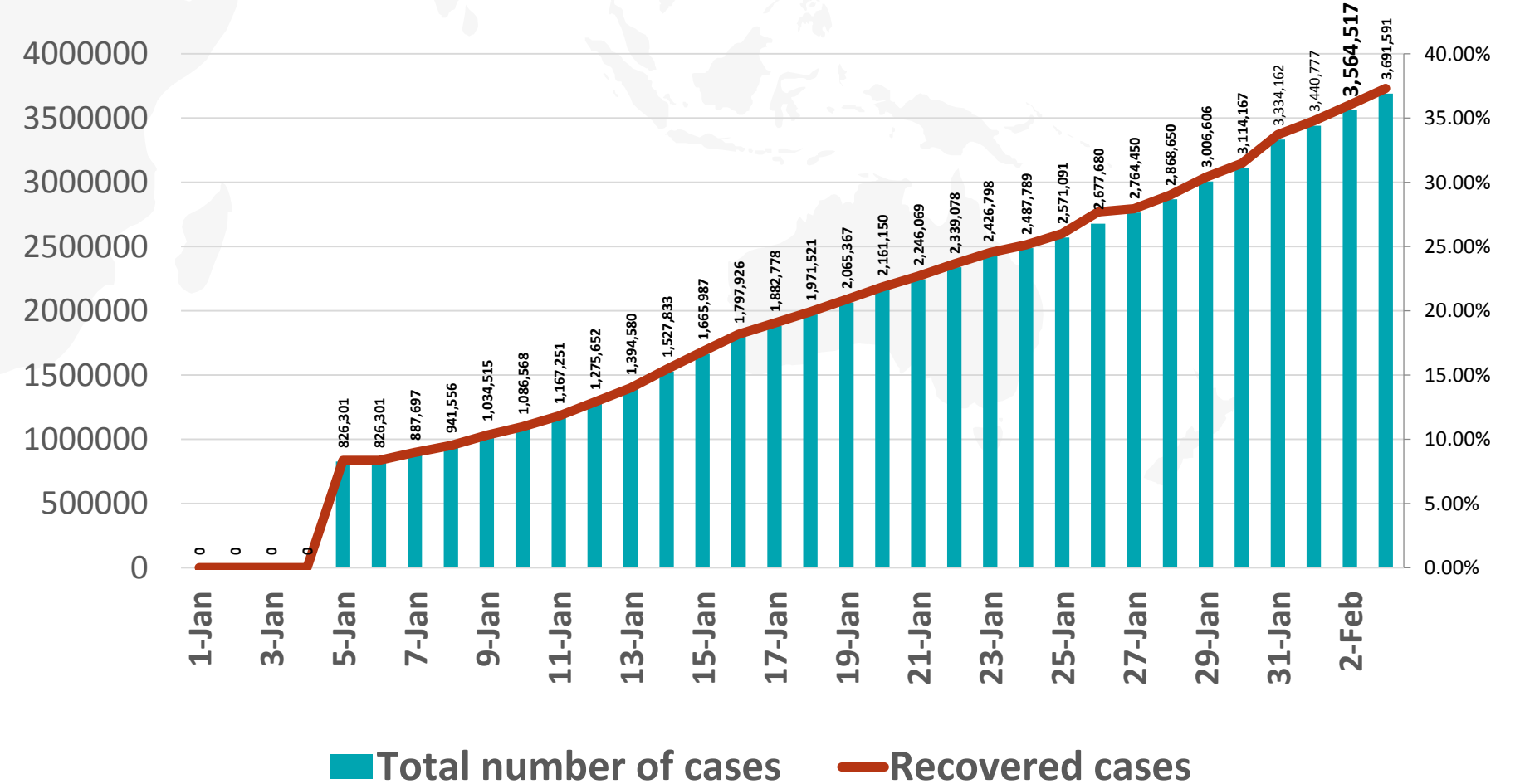
**Figure 6: COVID-19 Status in the UAE** (Federal Competitiveness and Statistics Authority Dashboard)



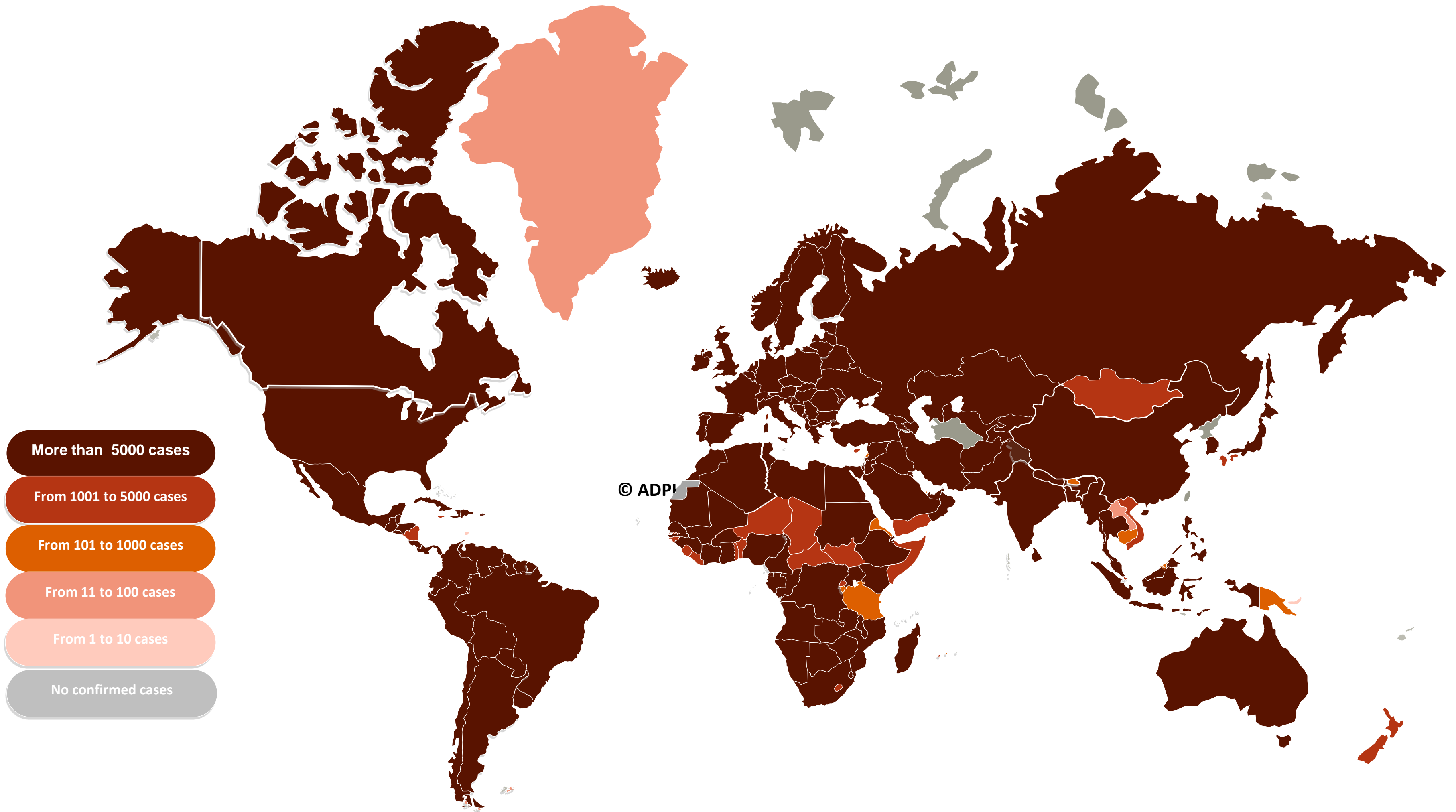
**Figure 6A: TOTAL Number Of Infected And Recovered Cases Due To Covid-19 Reported By The UAE**



**Figure 6 B: TOTAL NUMBER and Percentage of UAE population Vaccinated**



## Figure 7A : Global Distribution of COVID-19 Cases



More than 5000 cases

From 1001 to 5000 cases

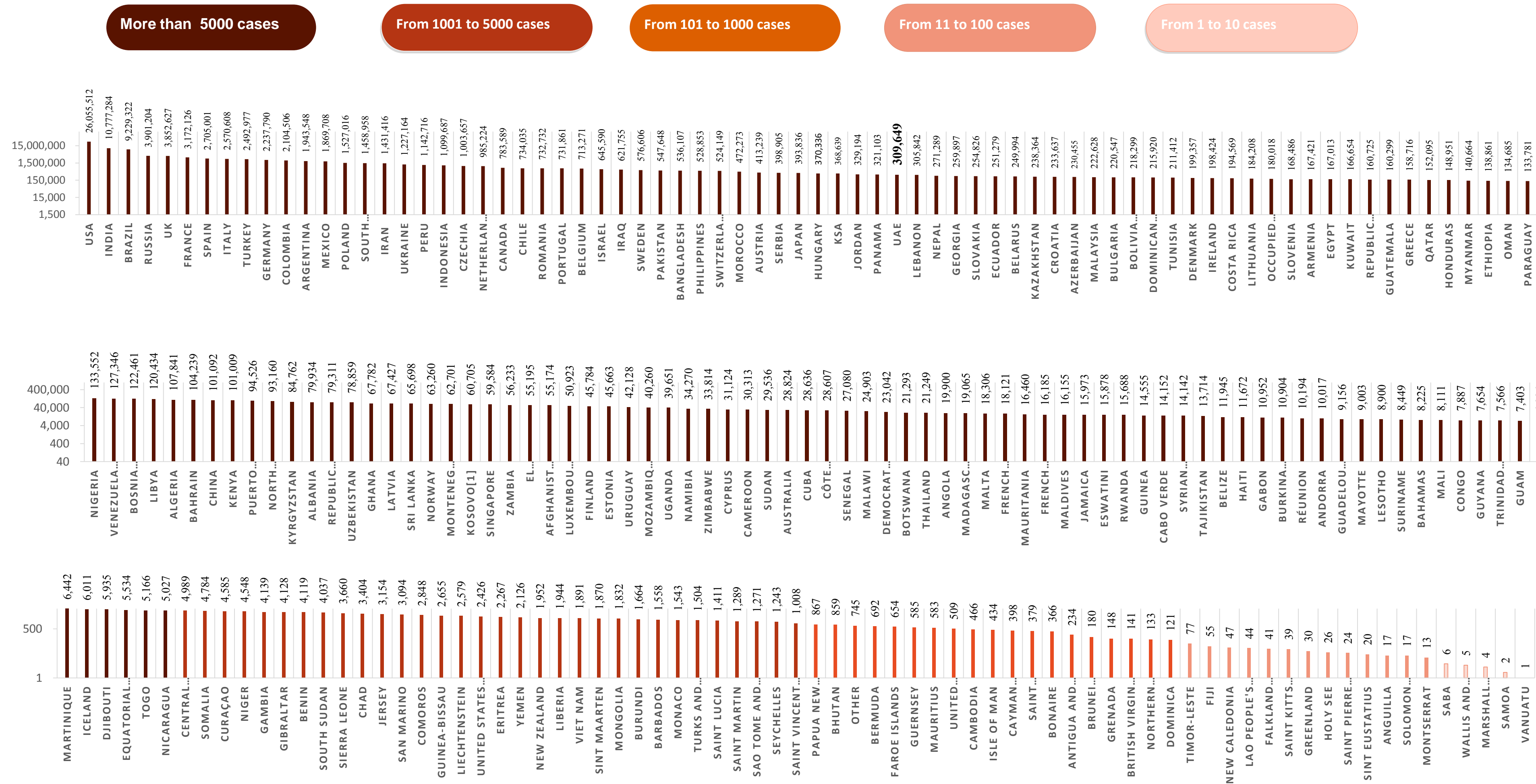
From 101 to 1000 cases

From 11 to 100 cases

From 1 to 10 cases

No confirmed cases

## Figure 7B: Bar Chart Illustrates the Global Distribution of COVID19 Cases



Other\*: includes cases and deaths reported under the international conveyance(Diamond Princess)

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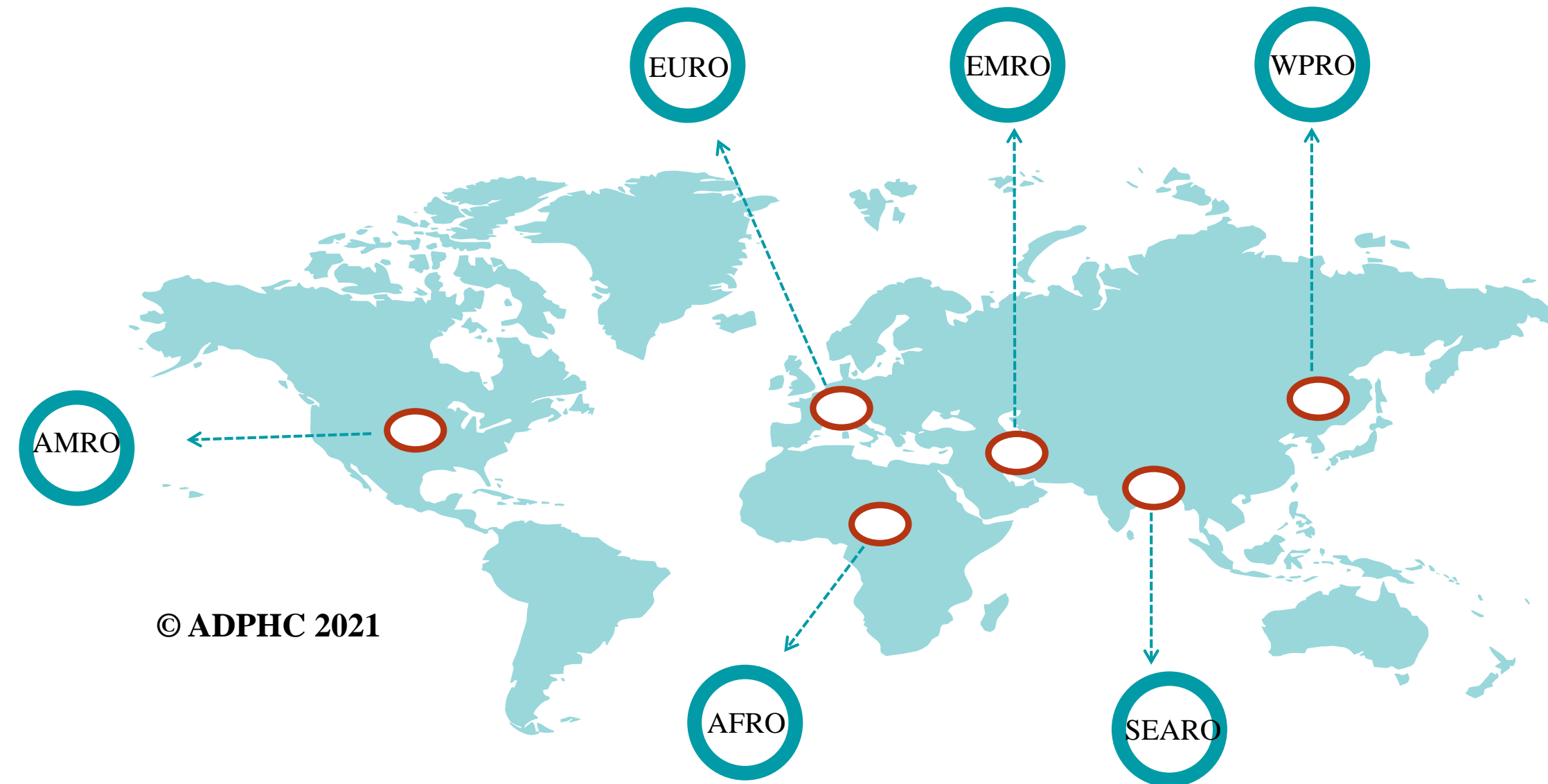
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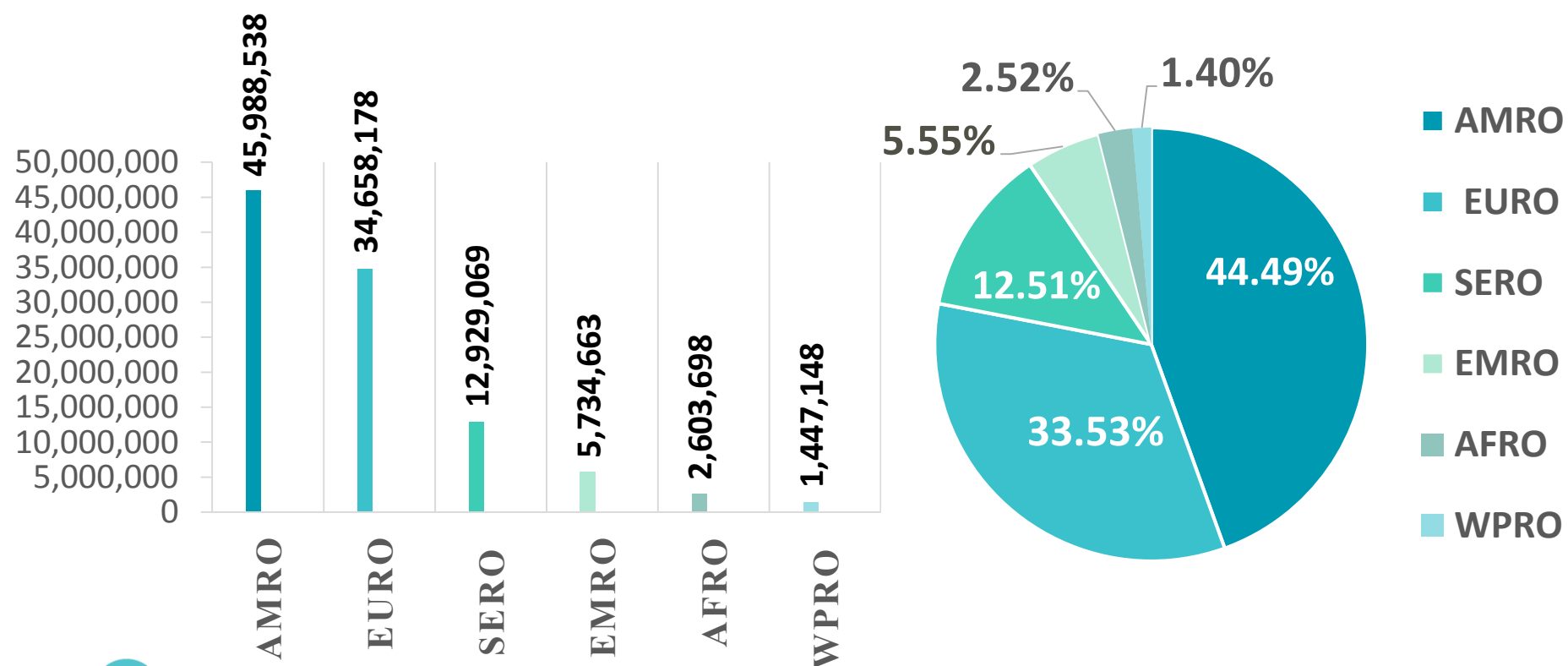
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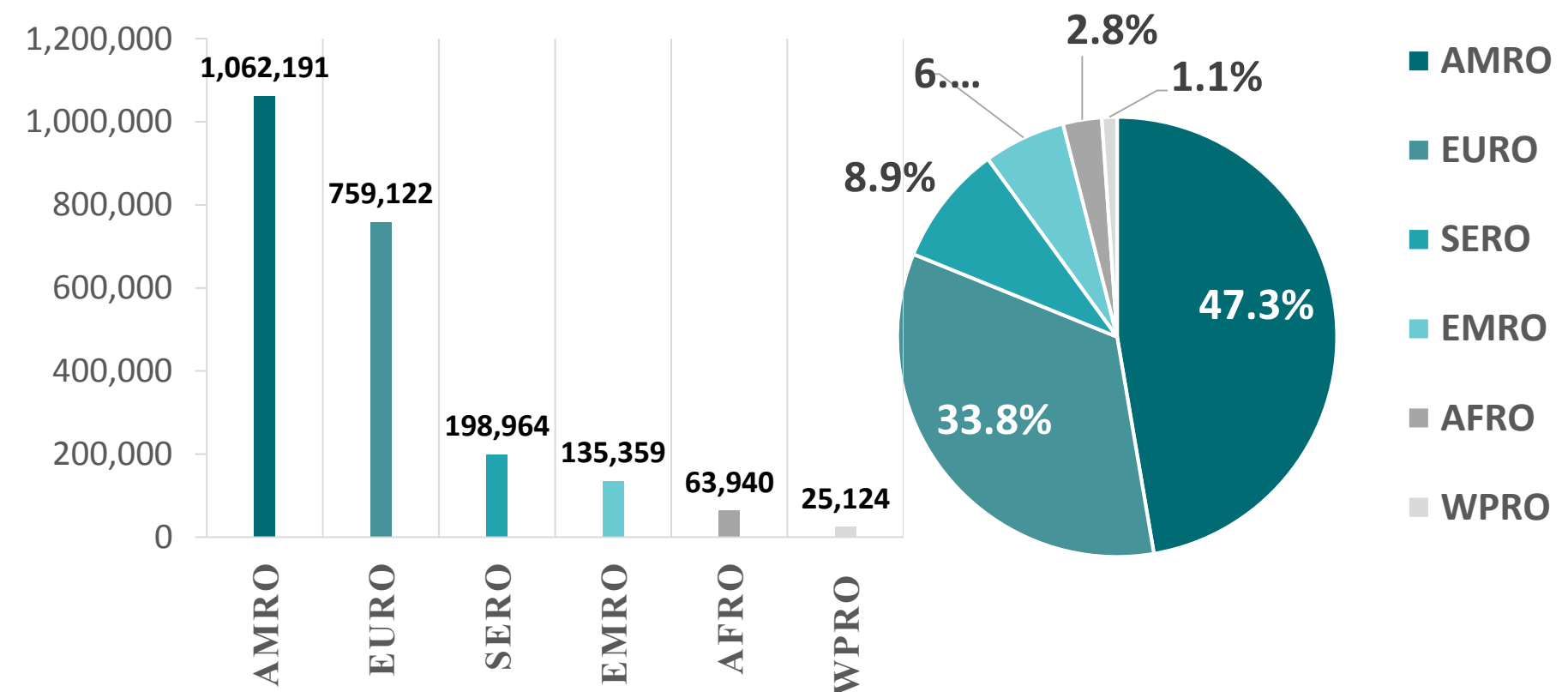
## Figure 8: Global Distribution of COVID-19 Cases per Region



### INFECTED



### DEATHS



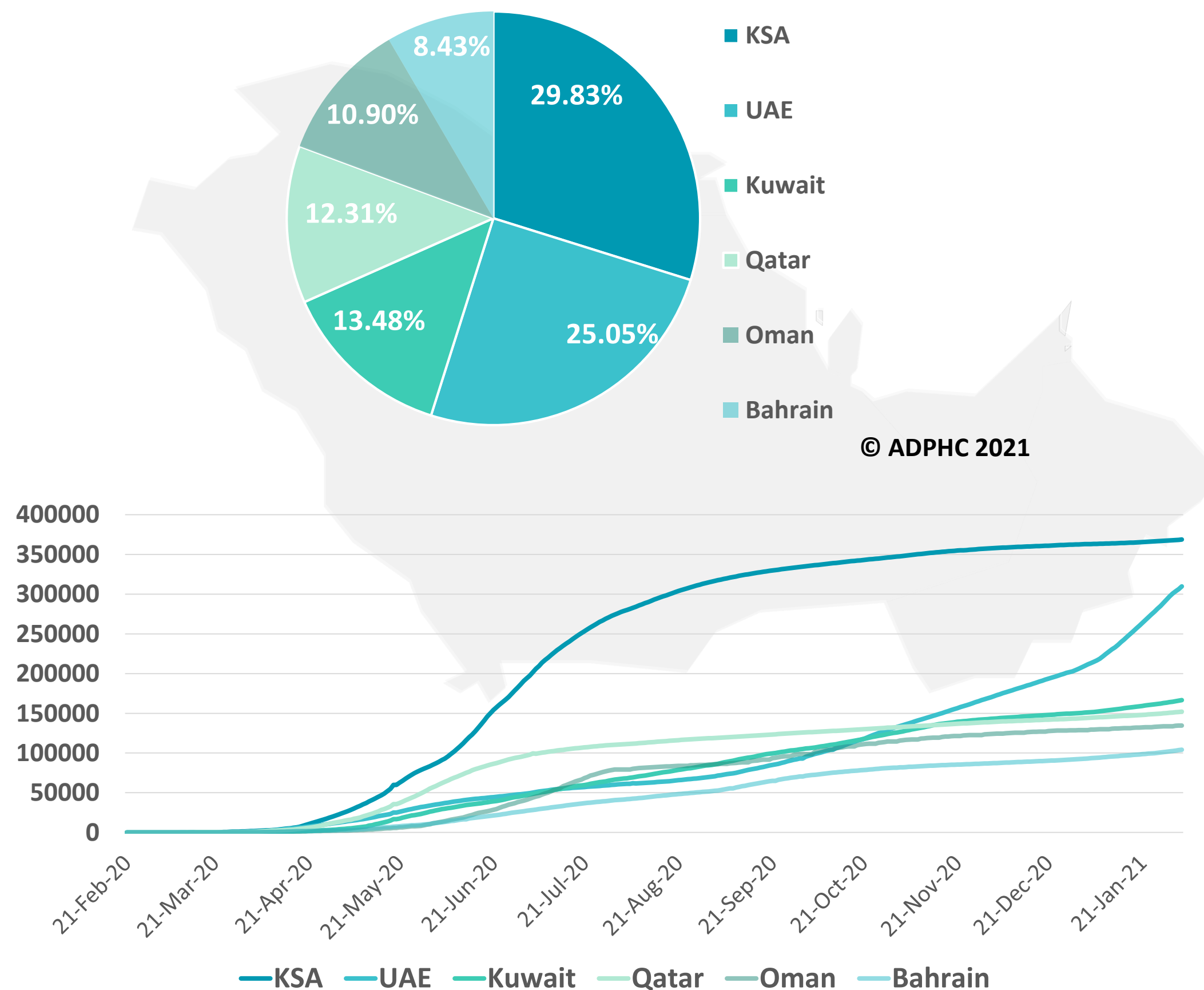
Graphs published by Abu Dhabi Public Health Center 2021 | Data resources: [WHO](#)

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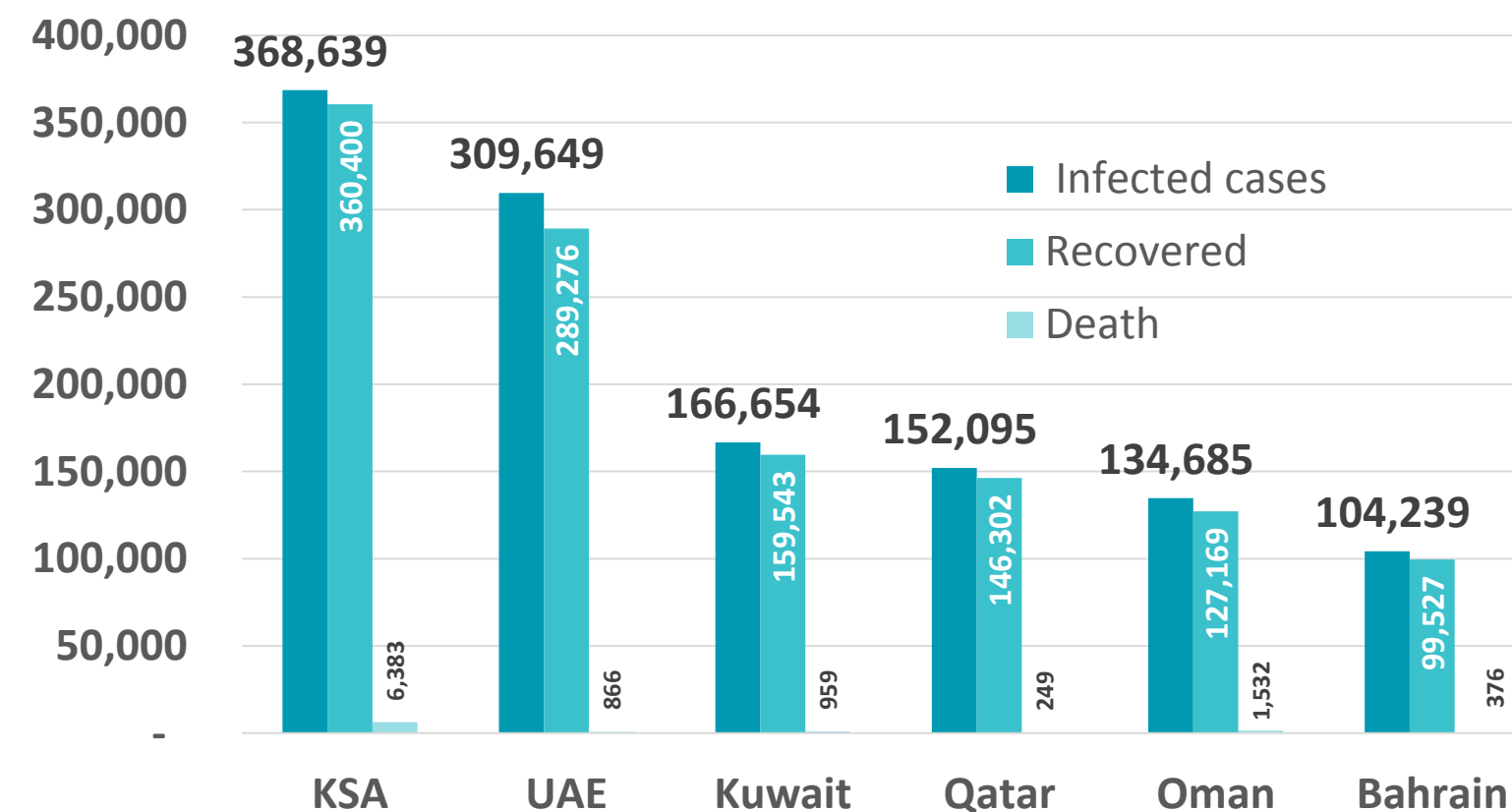
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## Figure 9: Comparative Analysis of the Distribution of COVID-19 Cases in GCC Countries

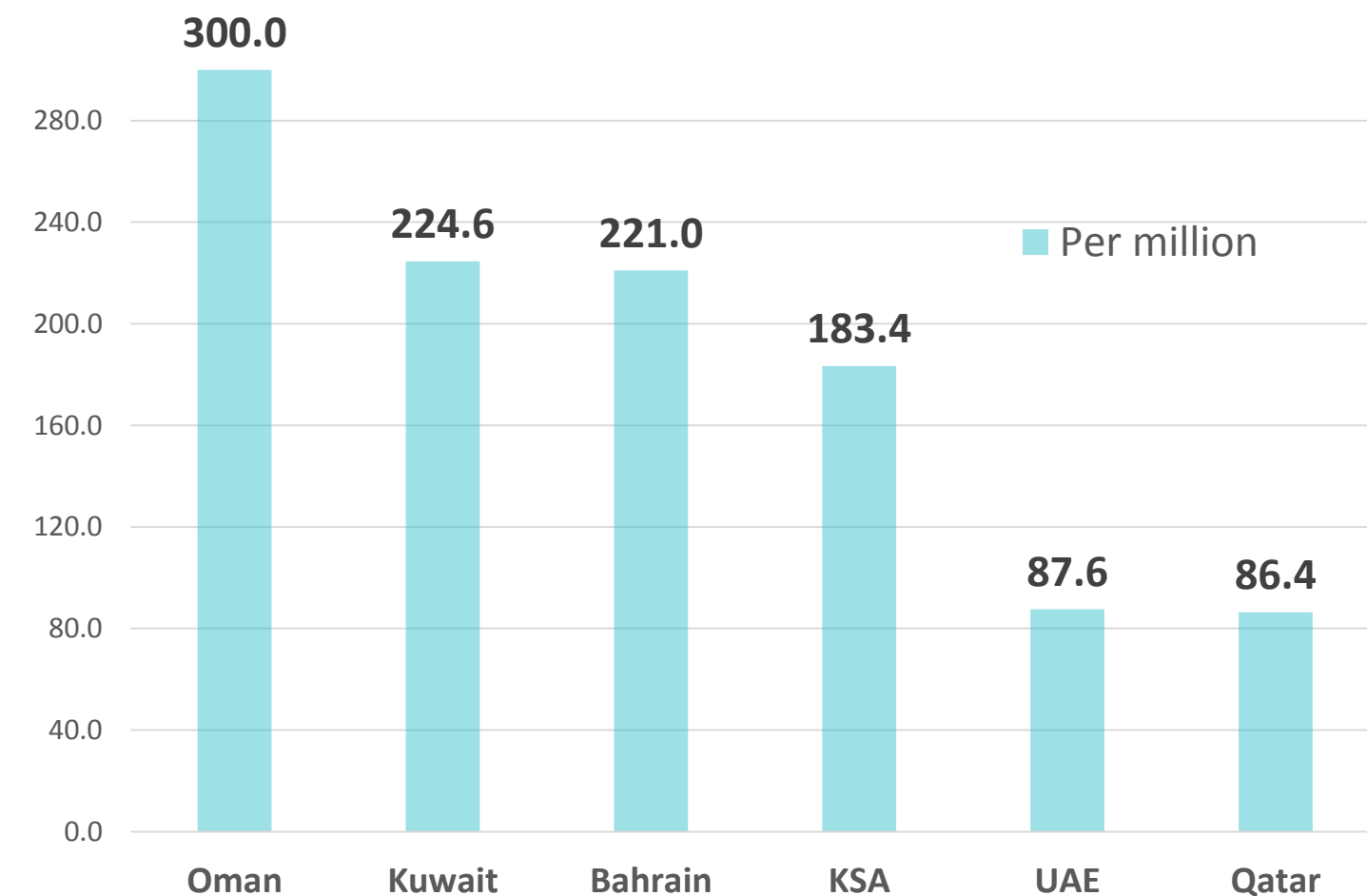
### TOTAL NUMBER OF INFECTED CASES



### TOTAL NUMBER OF INFECTED, RECOVERED AND DEATHS



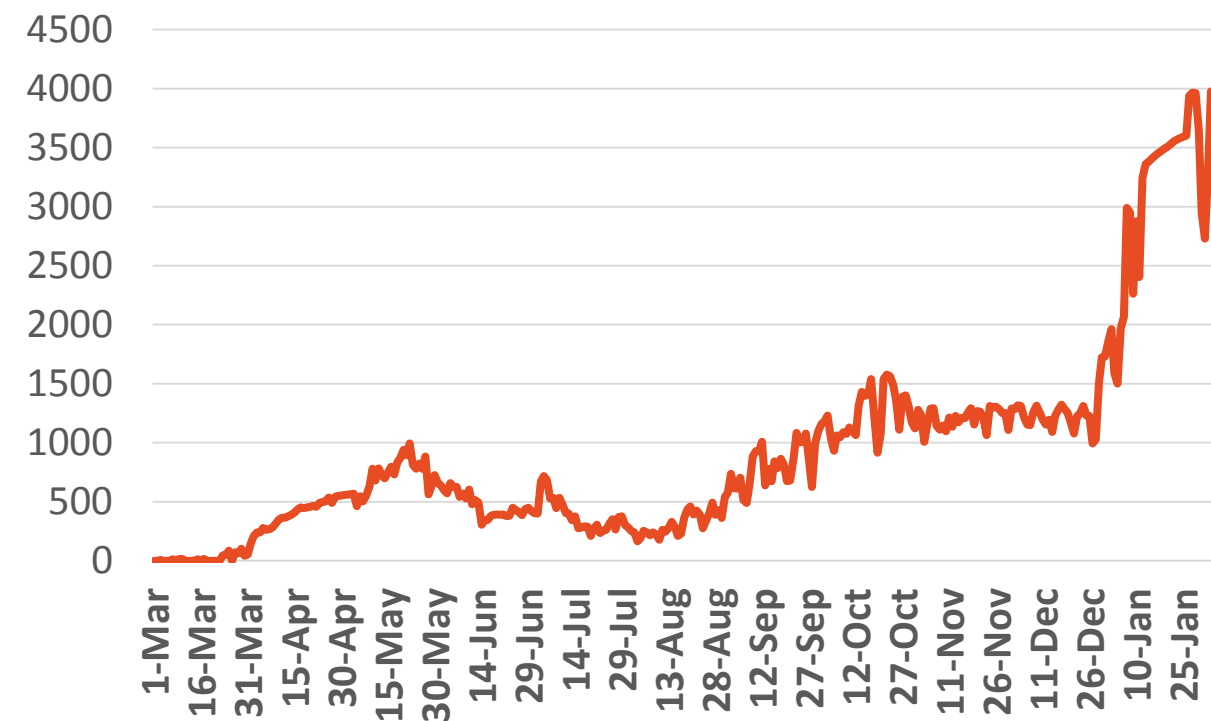
### DEATHS PER MILLION



Graphs published by Abu Dhabi Public Health Center 2021 | Data resources: [John Hopkins](#), [WHO](#)

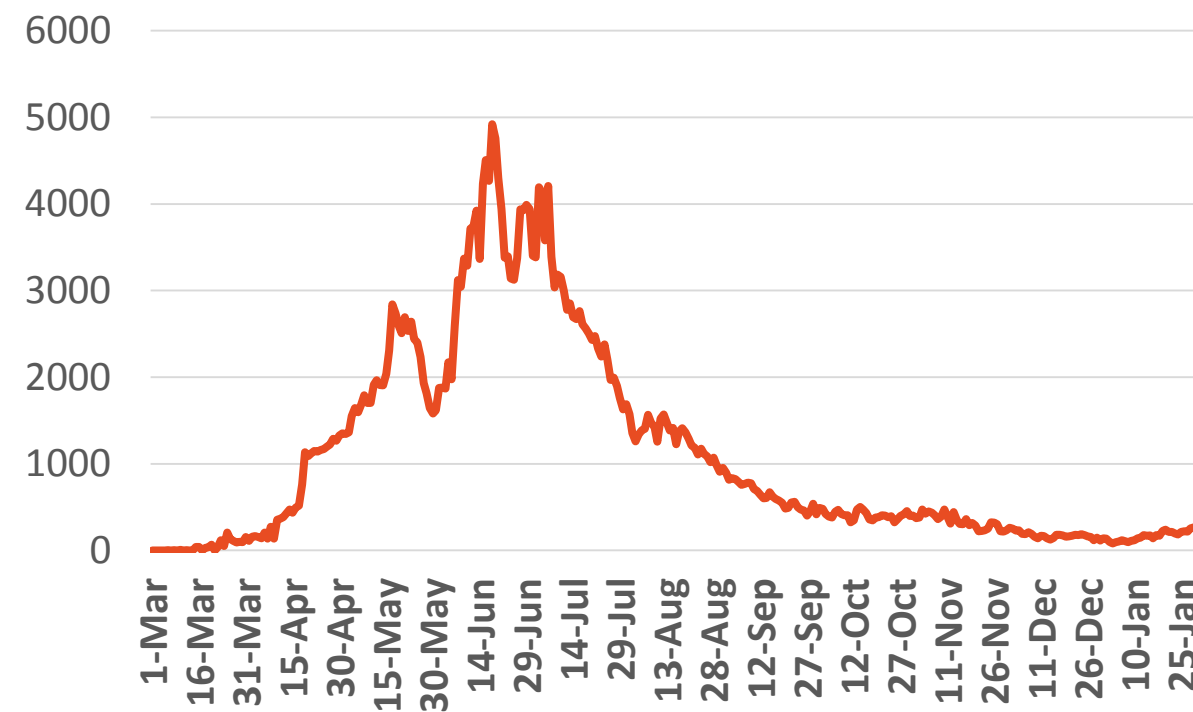
## Figure 10: Comparative Analysis of the Distribution of COVID-19 New Cases in GCC Countries

### UAE



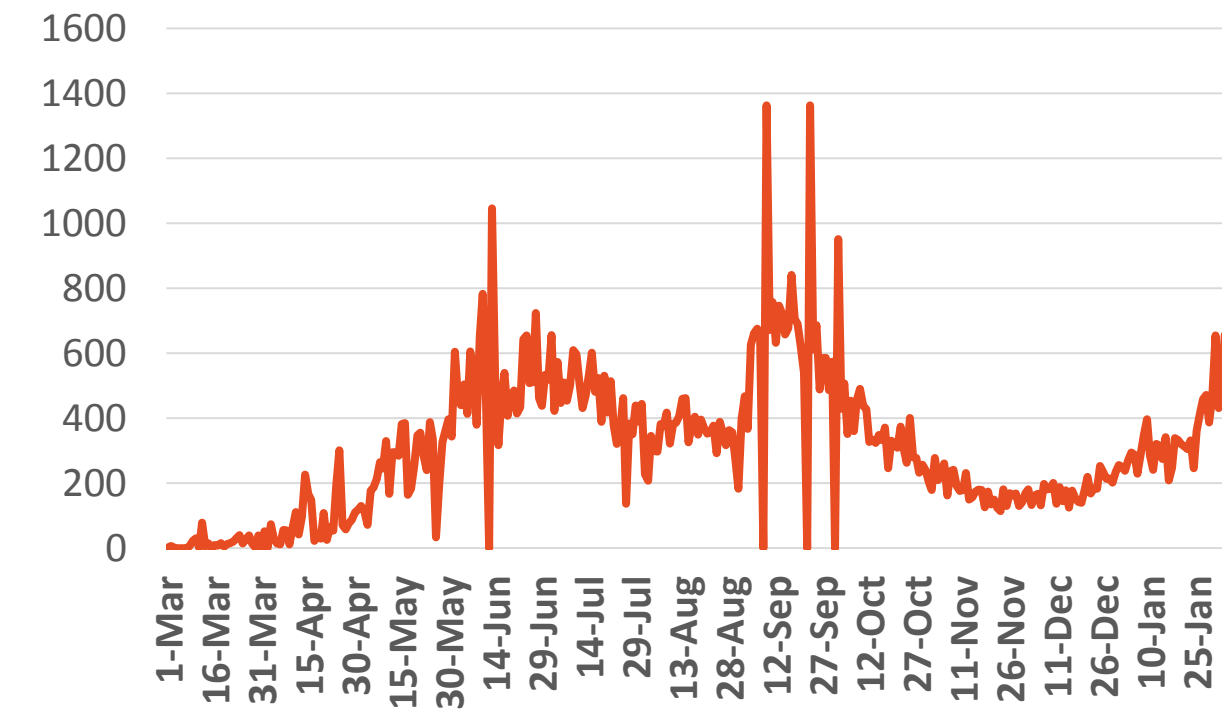
Source : National Emergency Crisis and Disaster Management Authority

### KSA



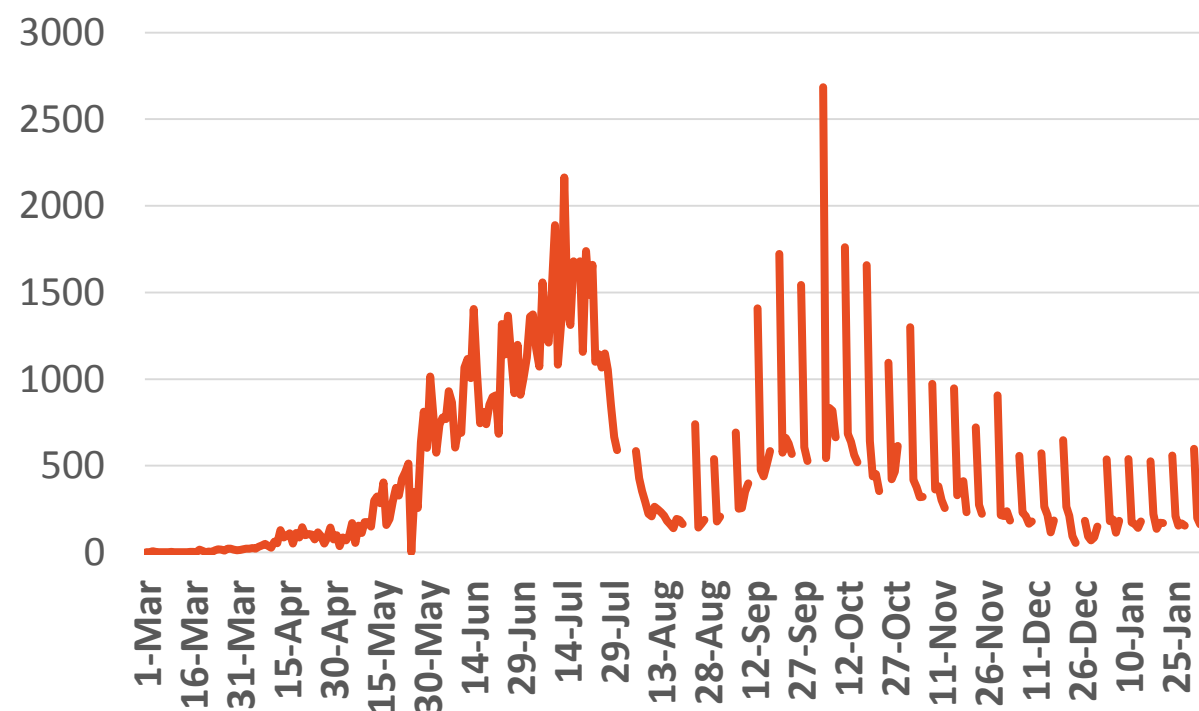
Source : KSA ministry of health

### Bahrain



Source :WHO

### Oman

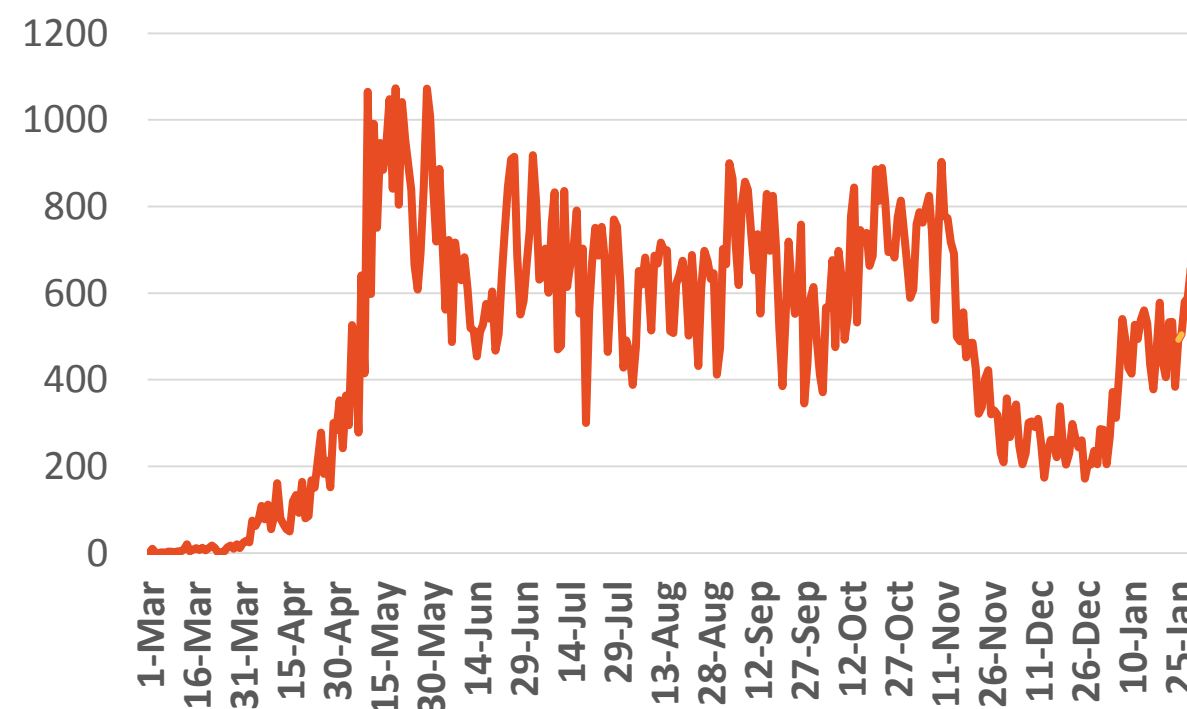


Source :Oman ministry of health

\*No announced statistic data from 31 JUL to 4 AUG, 21,23,28,30 AUG 2020, 5,11,12,18,19,25, 26,30 SEP,1,2,9,10,16,17,23,24,30,21 OCT, 6,7,13,14,17,20,21, 27,28 NOV,4,5,11,12,18,19,25,31 DEC, 1,9,10 JAN 2021  
\*No announced statistic data on weekends and official holidays.

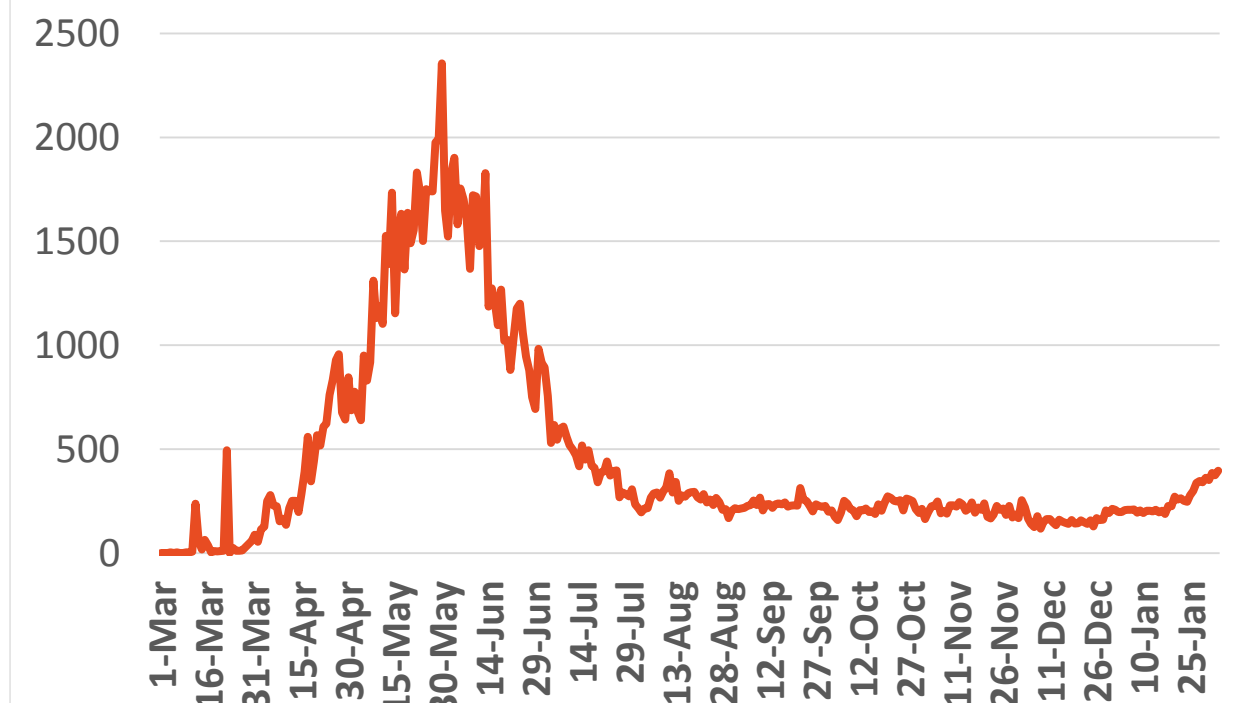
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### Kuwait



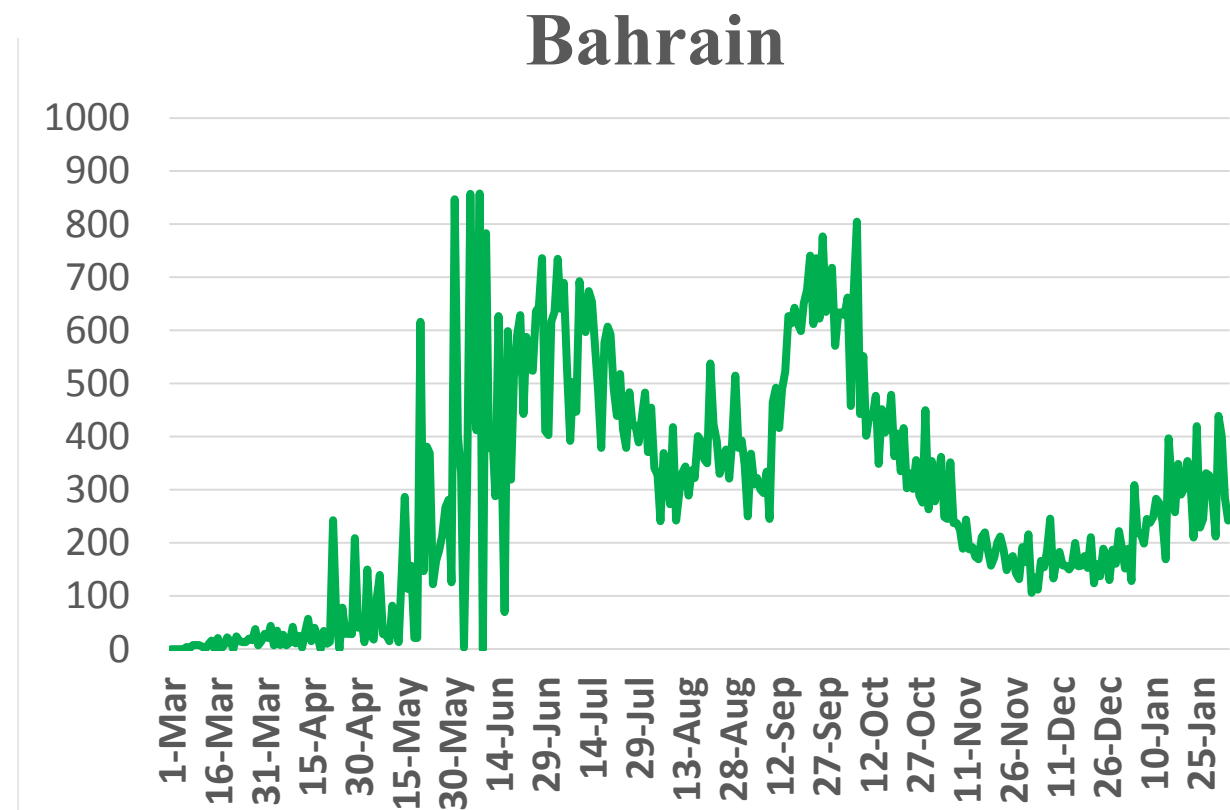
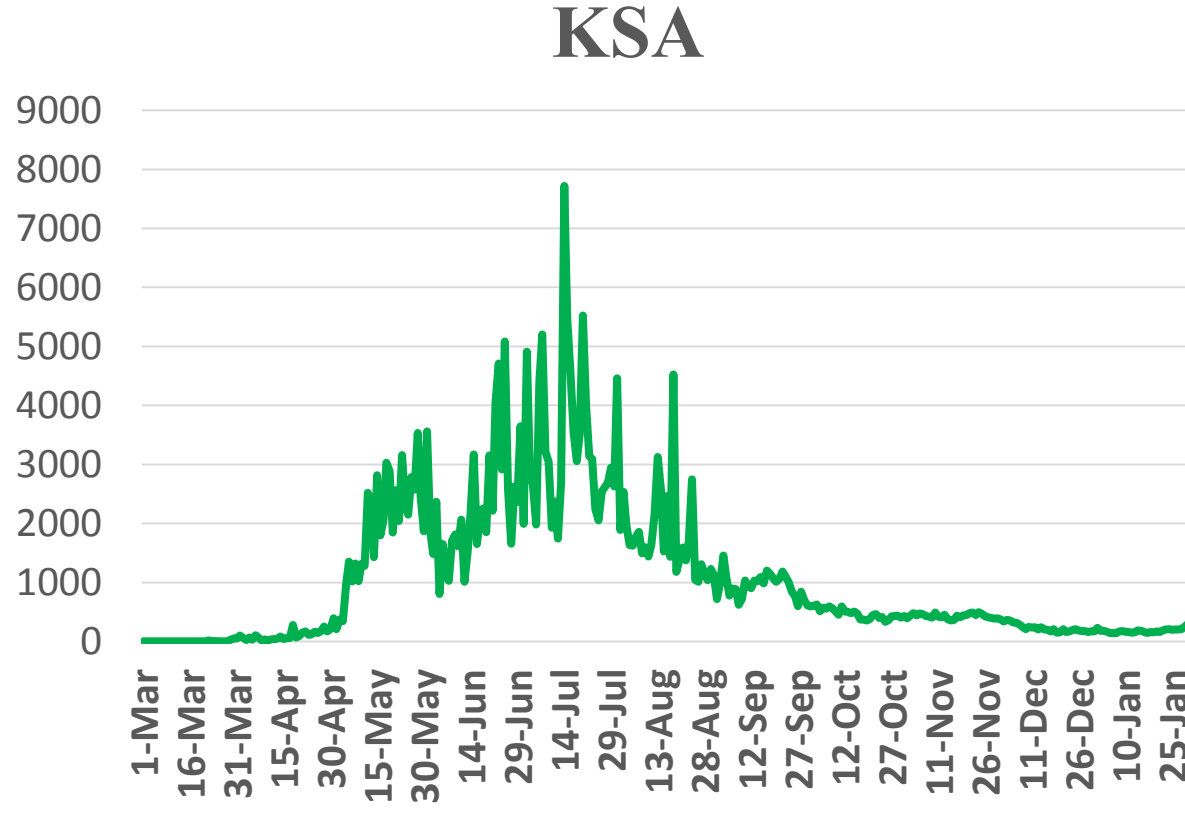
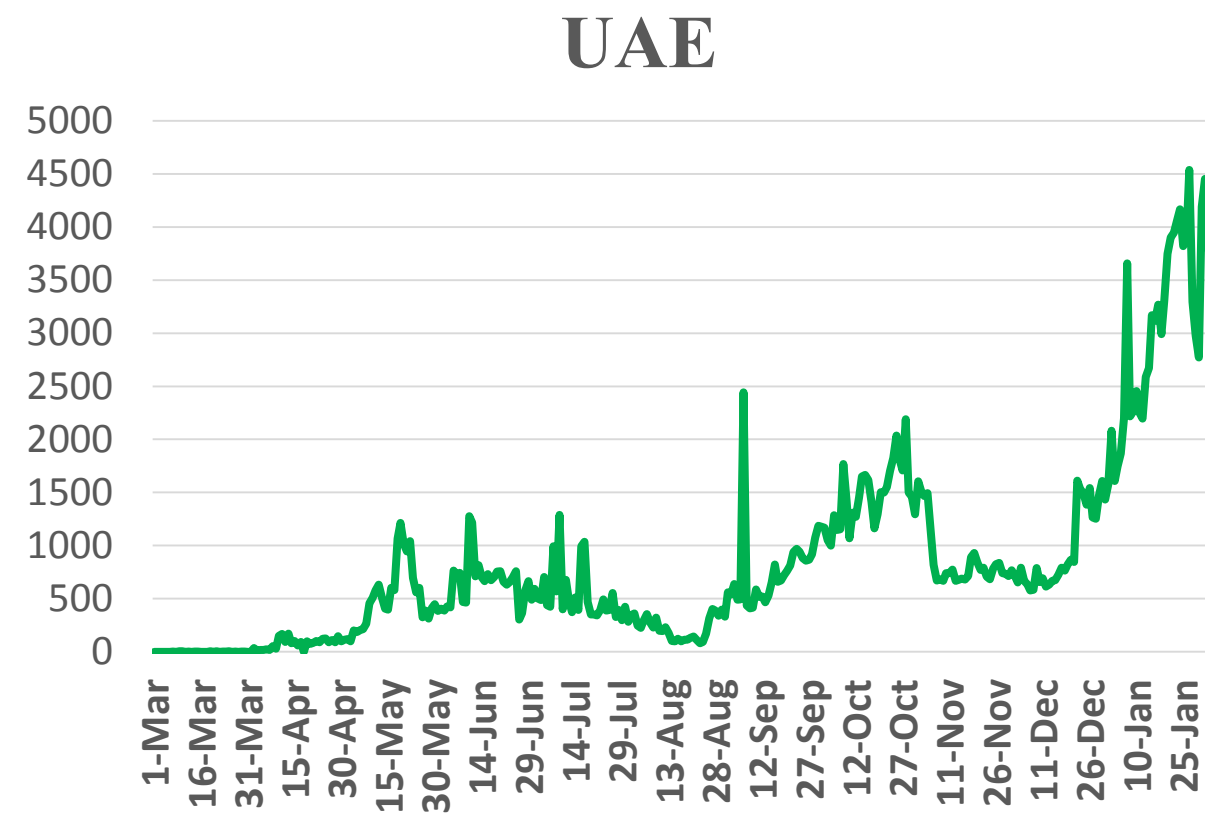
Source : Kuwait ministry of health

### Qatar



Source : Qatar ministry of health

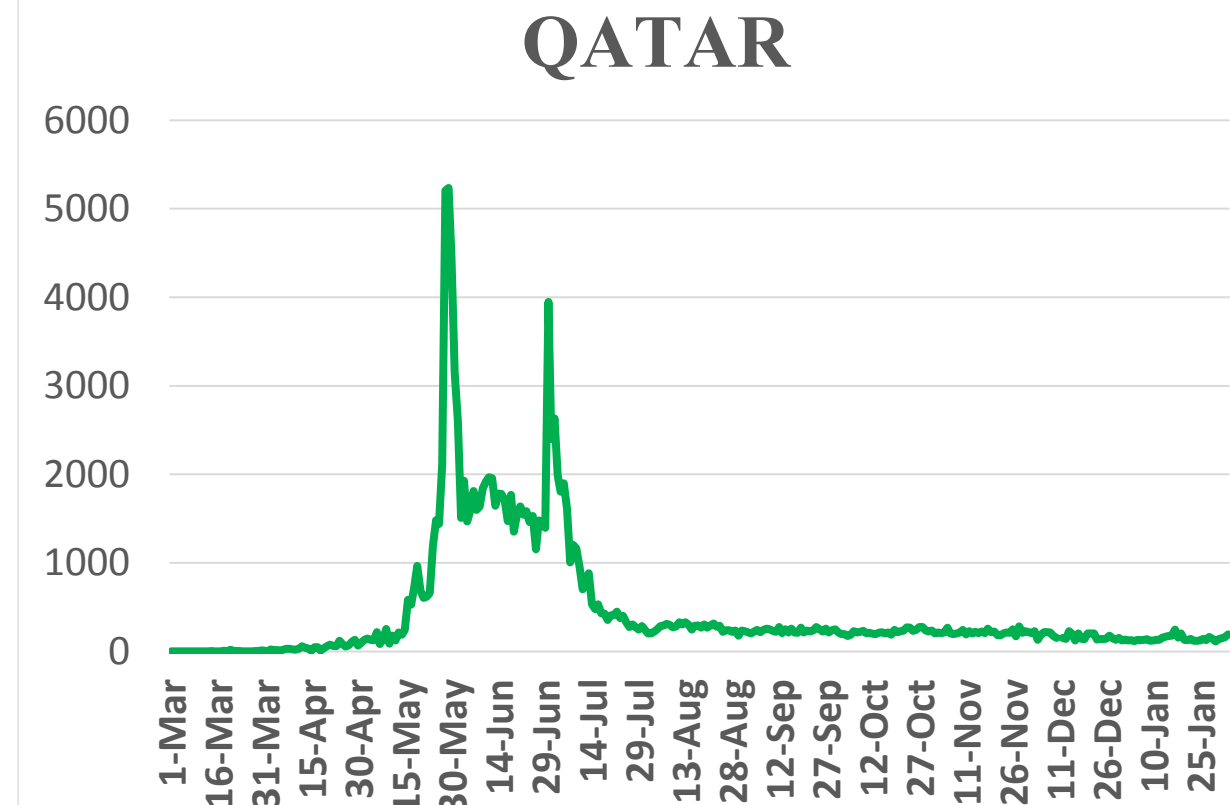
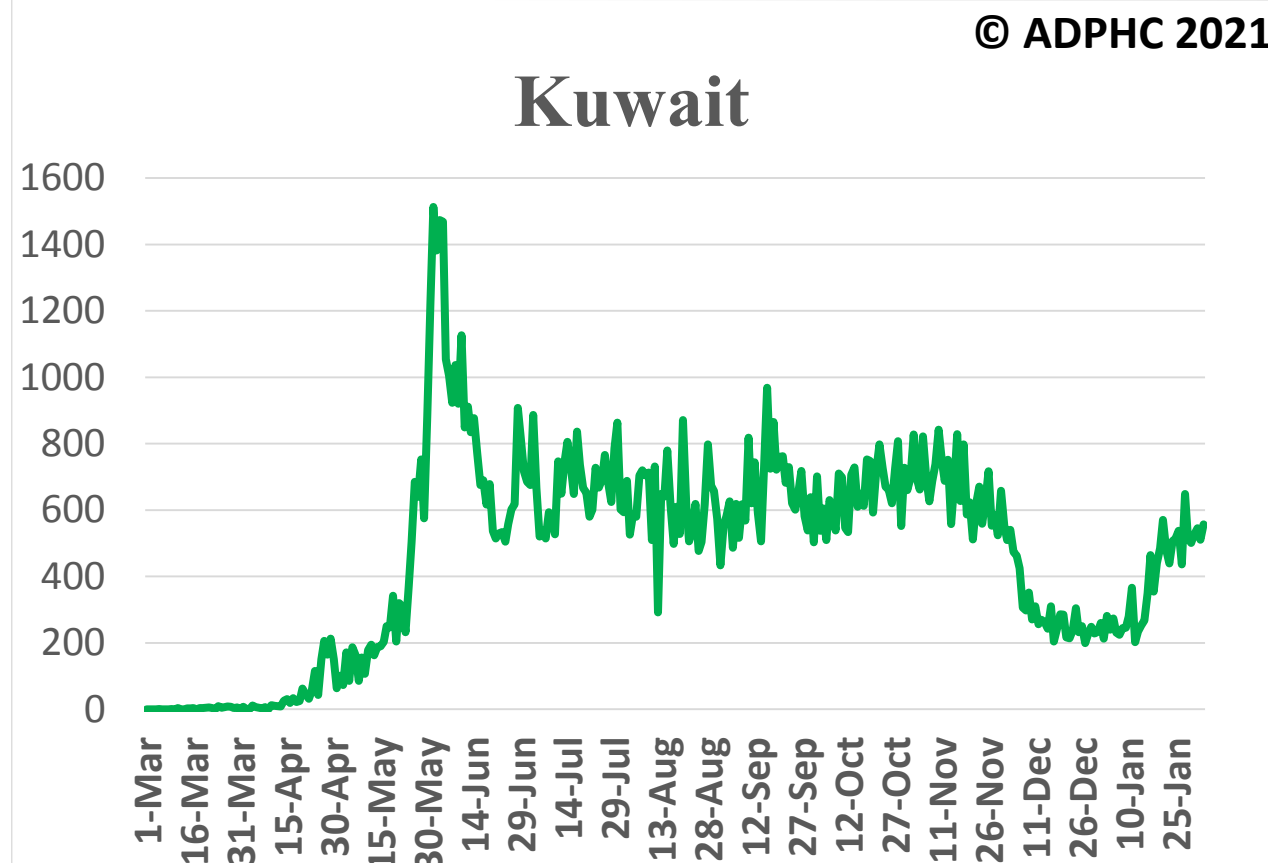
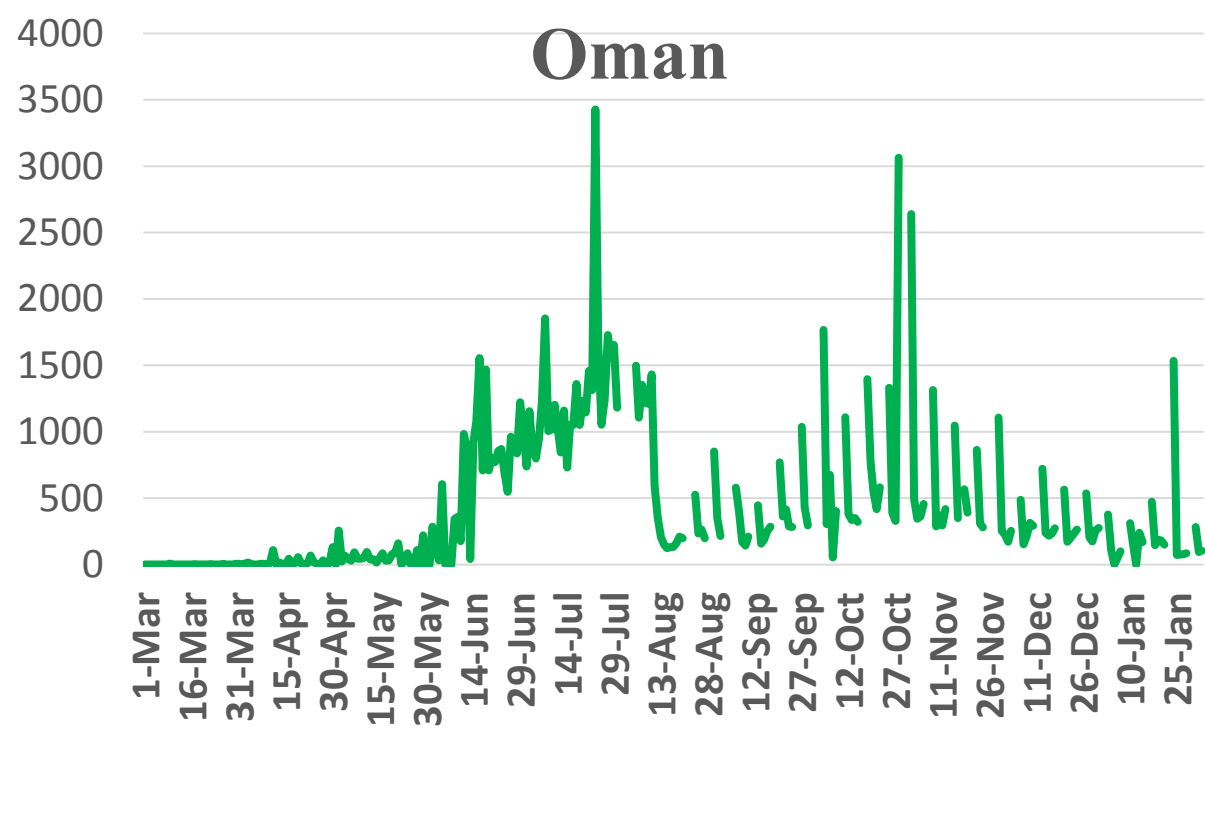
**Figure 11: Comparative Analysis of the Distribution of COVID-19 Newly Recovered Cases in GCC Countries**



Source : National Emergency Crisis and Disaster Management Authority

Source : KSA ministry of health

Source : Bahrain ministry of health



Source :Oman ministry of health

Source : Kuwait ministry of health

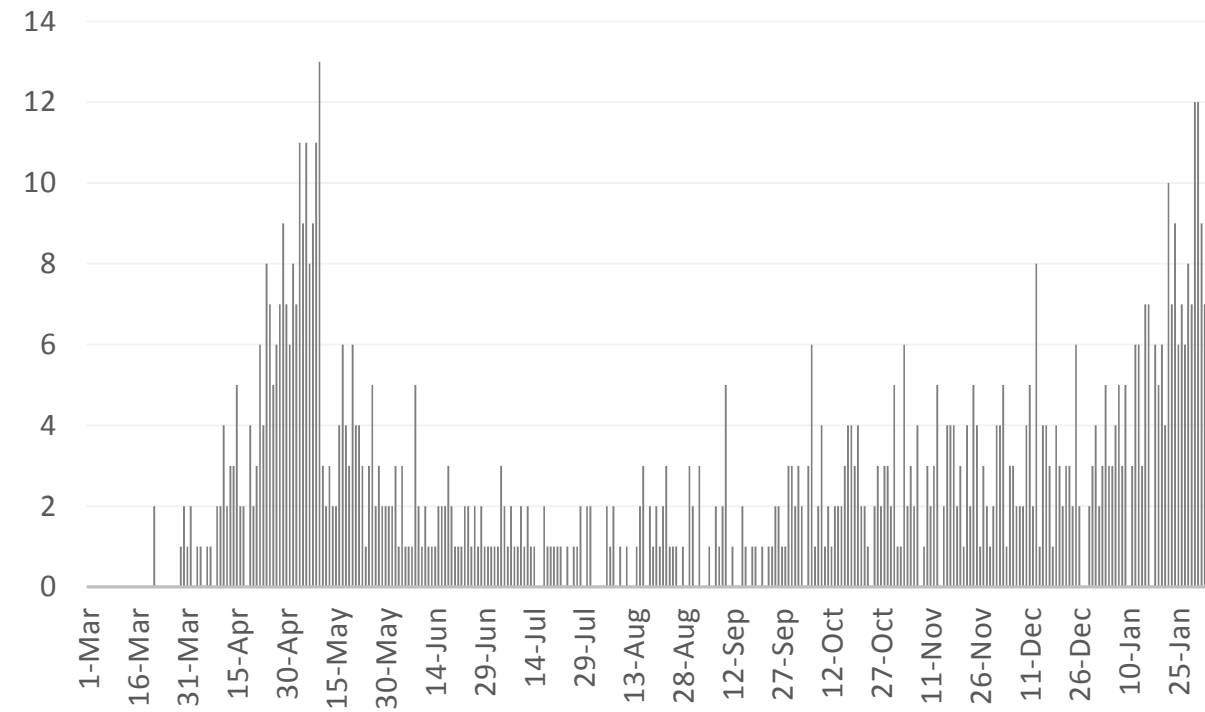
Source : Qatar ministry of health

\*No announced statistic data from 31 JUL to 4 AUG, 21,23,28,30 AUG 2,4- 5,11,12,18,19,25 ,26,30 SEP,1,2,9,10,16,17,23,24,30,21 OCT, 6,7,13,14,17,20,21, ,27,28 NOV,4,5,11,12,18,19,25,31 DEC, 1,9,10 JAN 2021  
\*No announced statistic data on weekends and official holidays.



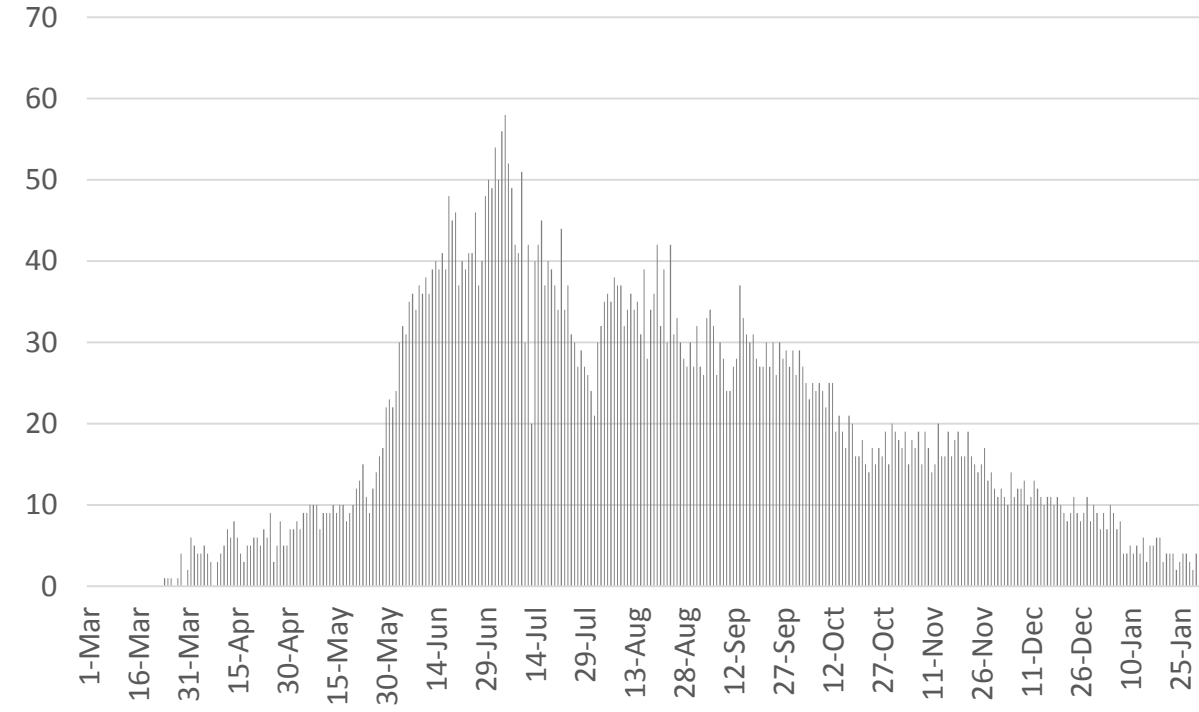
## Figure 12: Comparative Analysis of the Distribution of COVID-19 New Death Cases in GCC Countries

### UAE



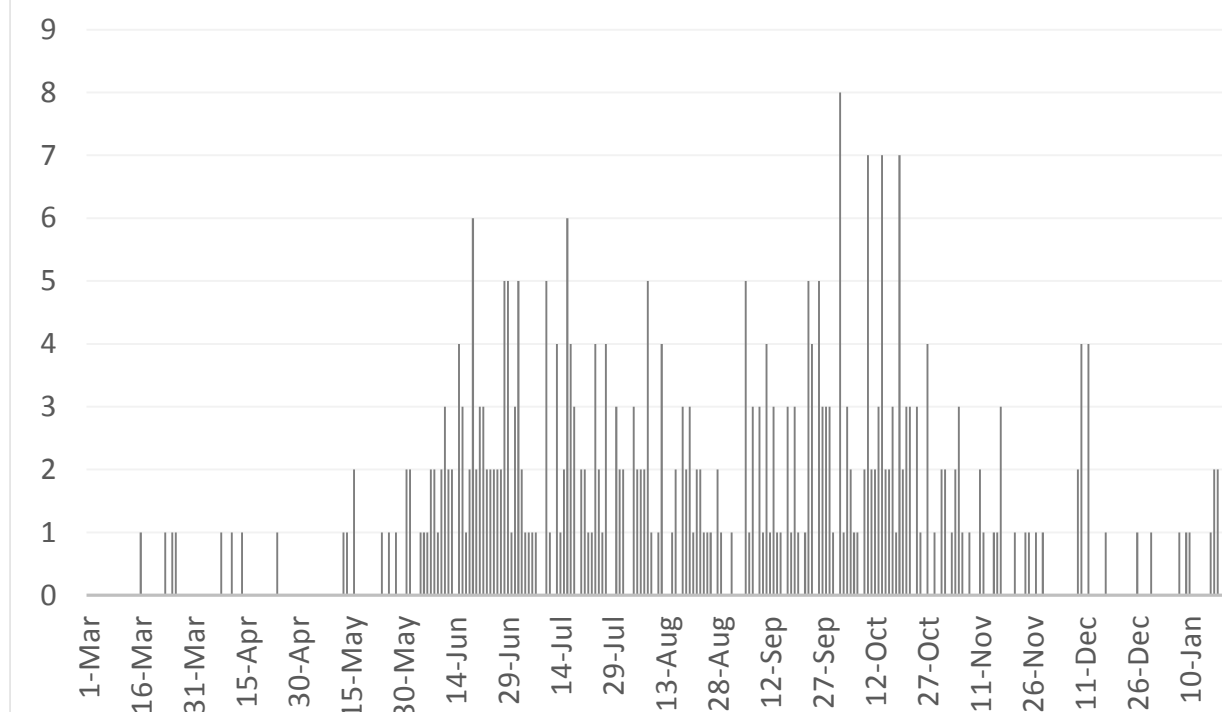
Source : National Emergency Crisis and Disaster Management Authority

### KSA



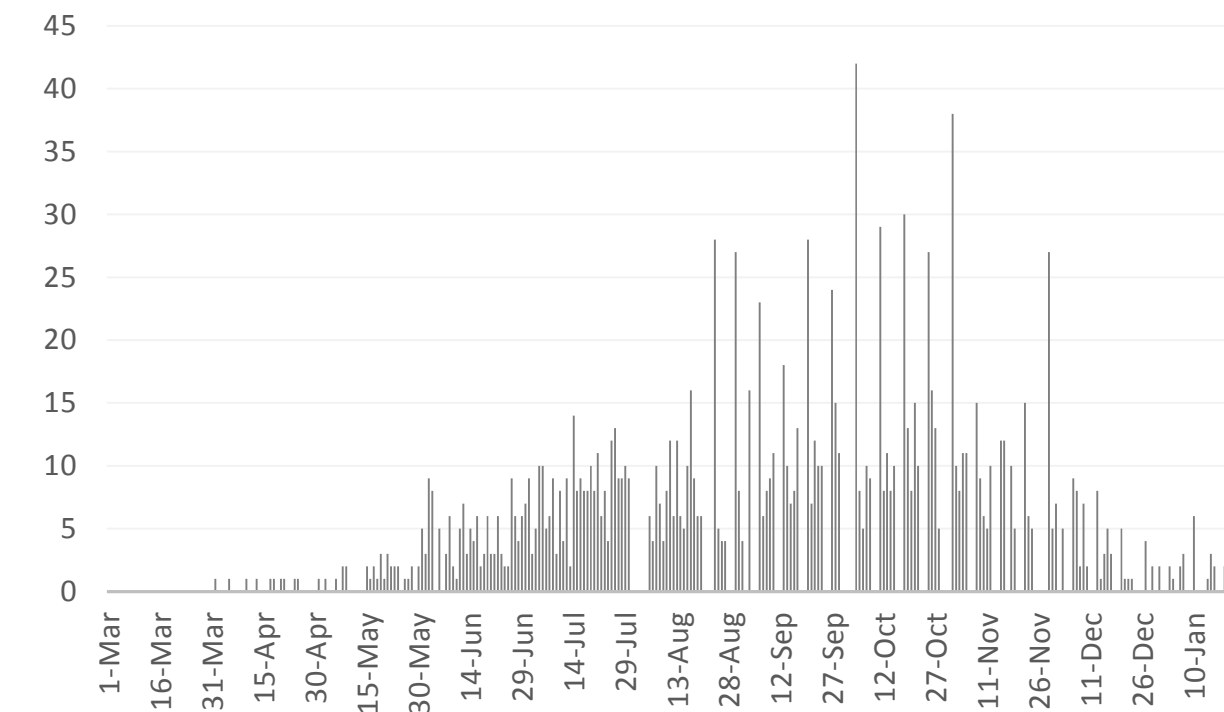
Source : KSA ministry of health

### Bahrain



Source :WHO

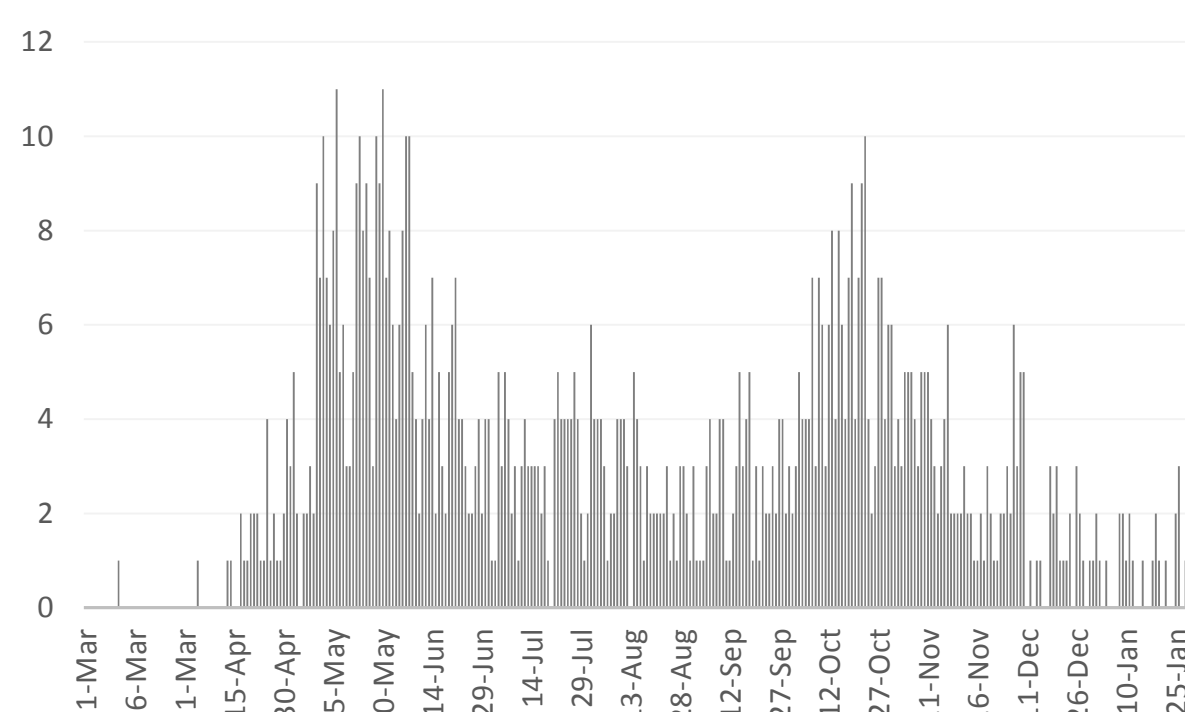
### Oman



Source :Oman ministry of health

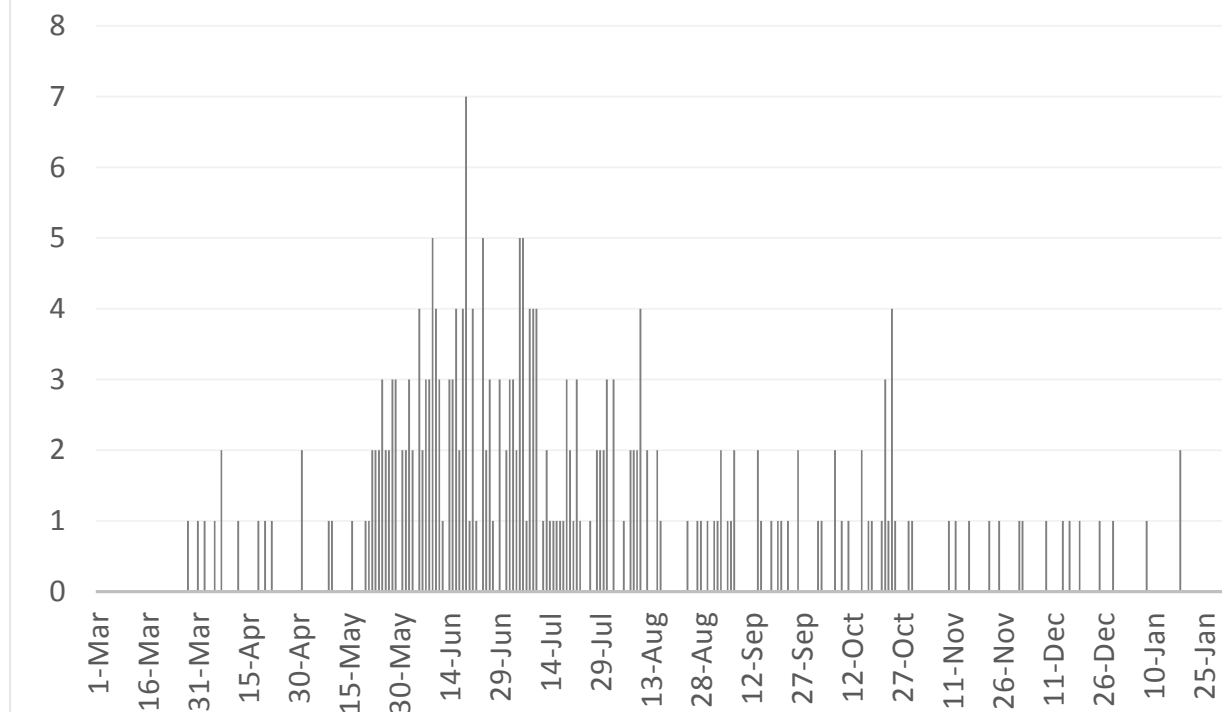
### Kuwait

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Source : Kuwait ministry of health

### Qatar



Source : Qatar ministry of health

\*No announced statistic data from 31 Jul to 4 AUG, 21,23,28,30 AUG 24- 5,11,12,18,19,25 ,26,30 SEP,1,2,9,10,16,17,23,24,30,21 OCT, 6,7,13,14,17,20,21, 27,28 NOV,4,5,11,12,18,19,25,31 DEC,1,9,10 JAN 2021  
\*No announced statistic data on weekends and official holidays.



# EPI-WIN WEBINAR: SARS-COV-2 VARIANTS

Summary of the WHO webinar held on 03/02/2021

## Implications of variants detected in the UK, South Africa and the Brazilian

Function of SARS-CoV-2	Variant detected in United Kingdom	Variant detected in South Africa	Variant detected in Brazil
<b>Transmissibility</b>	increased transmissibility <sup>1</sup>	increased transmissibility <sup>2</sup>	More studies are needed
<b>Disease severity</b>	preliminary data suggests no changes in disease severity <sup>1</sup> , however more studies are needed <sup>3</sup>	preliminary data suggests no changes in disease severity, however more studies are needed <sup>3</sup>	More studies are needed
<b>Vaccines</b>	preliminary data <sup>4</sup> suggests the variant is unlikely to have an impact on the efficacy of approved vaccines	preliminary data <sup>5</sup> suggests vaccines continue to work, however more studies are needed	More studies are needed
<b>Diagnostics</b>	may affect the performance of some diagnostic PCR assays*	More studies are needed	More studies are needed
<b>Therapeutics</b>	More studies are needed	More studies are needed	More studies are needed

- The mode of transmission of the virus has not changed.
- Having of new variant is expected and we will continue to have more strains
- The influenza virus is rapidly evolving comparing to the SARS-COV 2 , SARS-COV2 is relatively more stable
- The same preventive measures continue to be effective and should be implemented.
- For the South African and the UK variant an increase of COVID-19 cases can put pressure on the health system and can lead to an increase in hospitalization and deaths.
- There is no evidence that the new variant affected the vaccines efficacy
- Virus mutations or Variants are being monitored from the start of COVID pandemic through the [GISAID](https://gisaid.org/).

# REPORT ON THE NEW VARIANTS

**Table 1 : The Disruption Of The New Variants**

Variant designation	First identification		No. of current sequence-confirmed cases	No. of countries with sequences
	Location	Date	Worldwide	
B.1.1.7 (20I/501Y.V1)	United Kingdom	Sep 2020	183,343	72
B.1.351 (20H/501Y.V2)	South Africa	Oct 2020	73,195	31
P.1 (20J/501Y.V3)	Brazil and Japan	Jan 2021	3,164	9

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Graphs published by Abu Dhabi Public Health Center 2021 | Data resources: [John Hopkins](#), [cov-lineages](#) & [WHO](#)

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# REPORT ON THE NEW VARIANTS WITH MORE INFORMATION ON SOUTH AFRICA VARIANT

**Table 1 : The different mutations in each variant**

Designation	First identification	Characteristic mutations (protein: mutation)
	Location	
B.1.1.7 (20I/501Y.V1)	United Kingdom	ORF1ab: T1001I, A1708D, I2230T, del3675–3677 SGF
		S: del69–70 HV, del144 Y, <b>N501Y</b> , A570D, D614G, P681H, T761I, S982A, D1118H
		ORF8: Q27stop, R52I, Y73C
		N: D3L, S235F
B.1.351 (20H/501Y.V2)	South Africa	ORF1ab: K1655N
		E: P71L
		N: T205I
		S: <b>K417N</b> , E484K, <b>N501Y</b> , D614G, A701V
P.1 (20J/501Y.V3)	Brazil and Japan	ORF1ab: F681L, I760T, S1188L, K1795Q, del3675– 3677 SGF, E5662D
		S: L18F, T20N, P26S, D138Y, R190S, K417T, E484K, <b>N501Y</b> , start highlightD614Gend highlight, H655Y, T1027I
		ORF3a: C174G
		ORF8: E92K
		ORF9: Q77E

- All mutation on the new variants are including N501Y, in the S protein. These variants carry a constellation of genetic mutations, including in the S protein receptor-binding domain, which is essential for binding to the host cell angiotensin-converting enzyme-2 (ACE-2) receptor to facilitate virus entry.
- The South African and Brazilian variant includes additional E484K mutation.
- Also the South African is different than the Brazilian and the UK variant of having K417N.
- All these mutations have been mentioned in literature to assess the efficacy of vaccine.

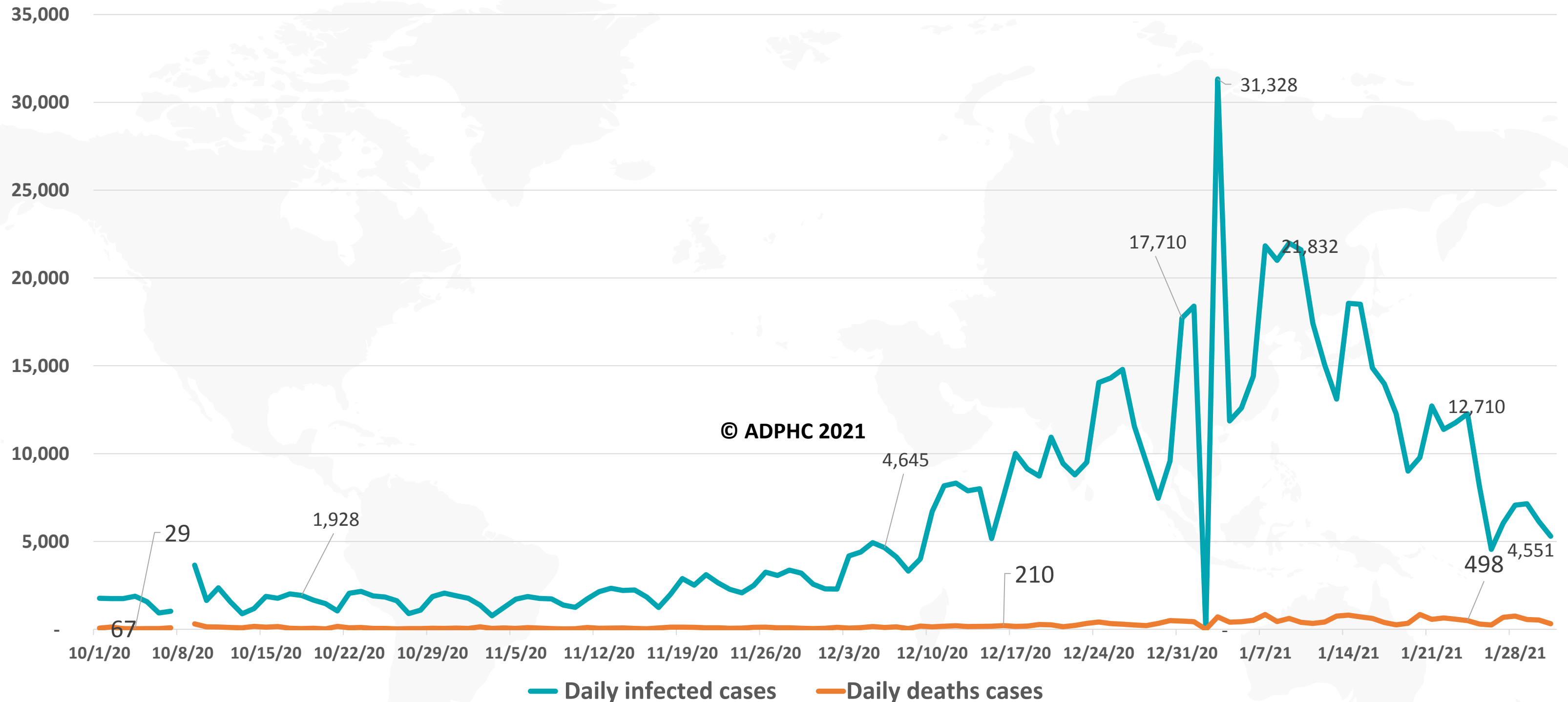
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# SOUTH AFRICA EPIDEMIOLOGICAL UPDATE

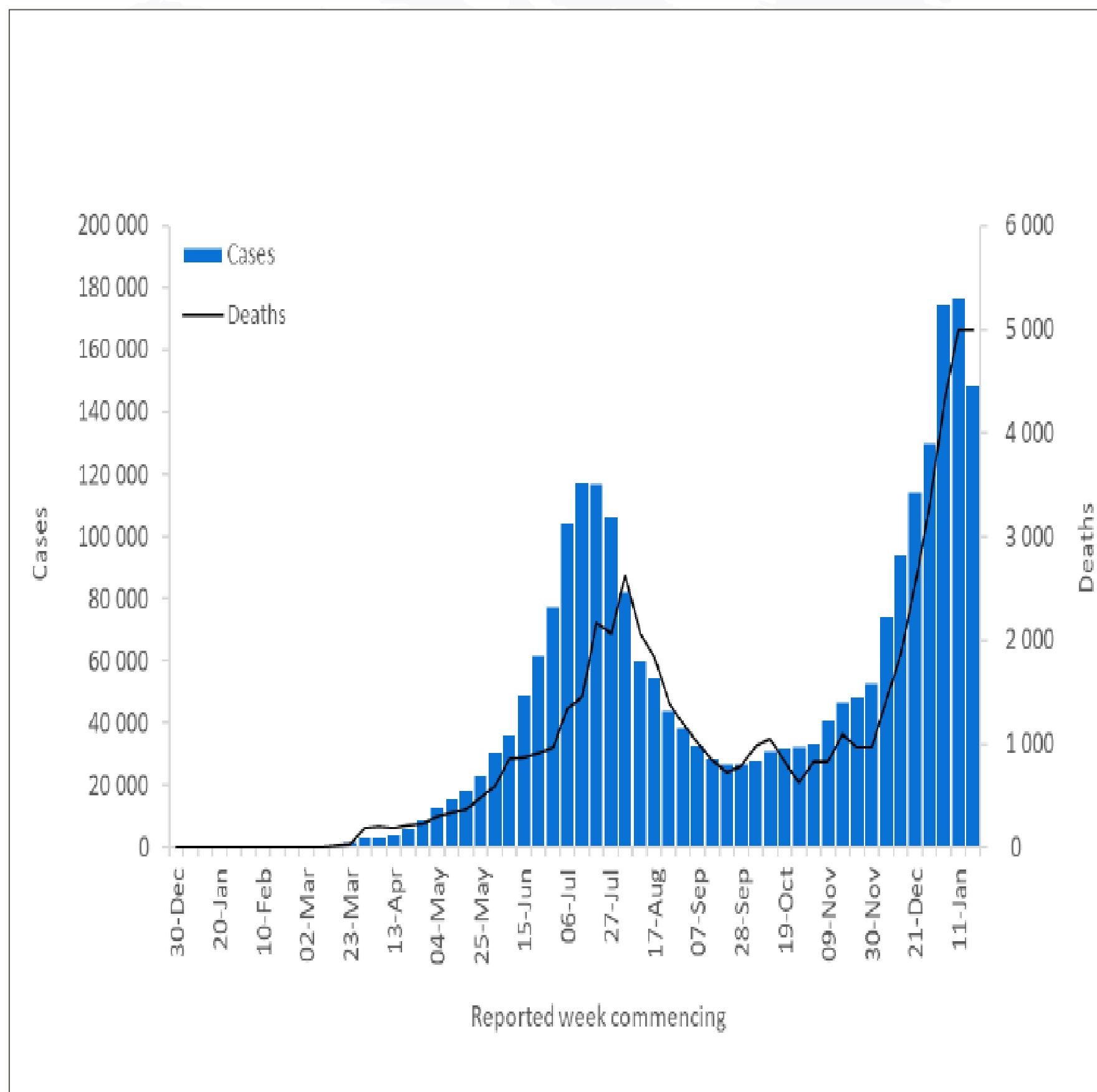
## Number of daily infected and death cases in South Africa from October to 31 January 2021



- On January 11, the border of South Africa was closed until February 15, 2021.
- It is noticed that there is Significant increase in the number of new cases and deaths in South Africa after December 2021.
- According to the WHO's Weekly Epidemiological Status report, South Africa experienced a 29% decline in the number of positive cases and an 8% drop in the number of deaths in the week 27 January 2021.

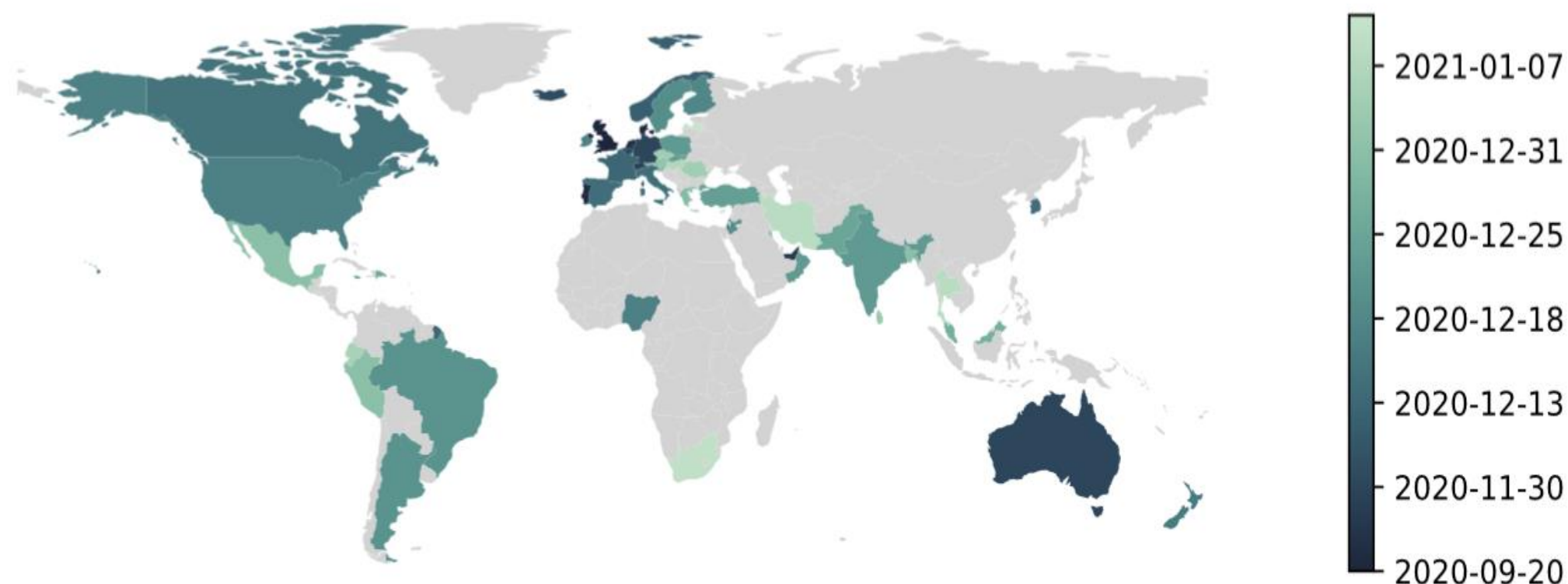
# AFRICAN REGION EPIDEMIOLOGICAL UPDATE

## Situation by WHO Region - African Region - Week 27 January 2021

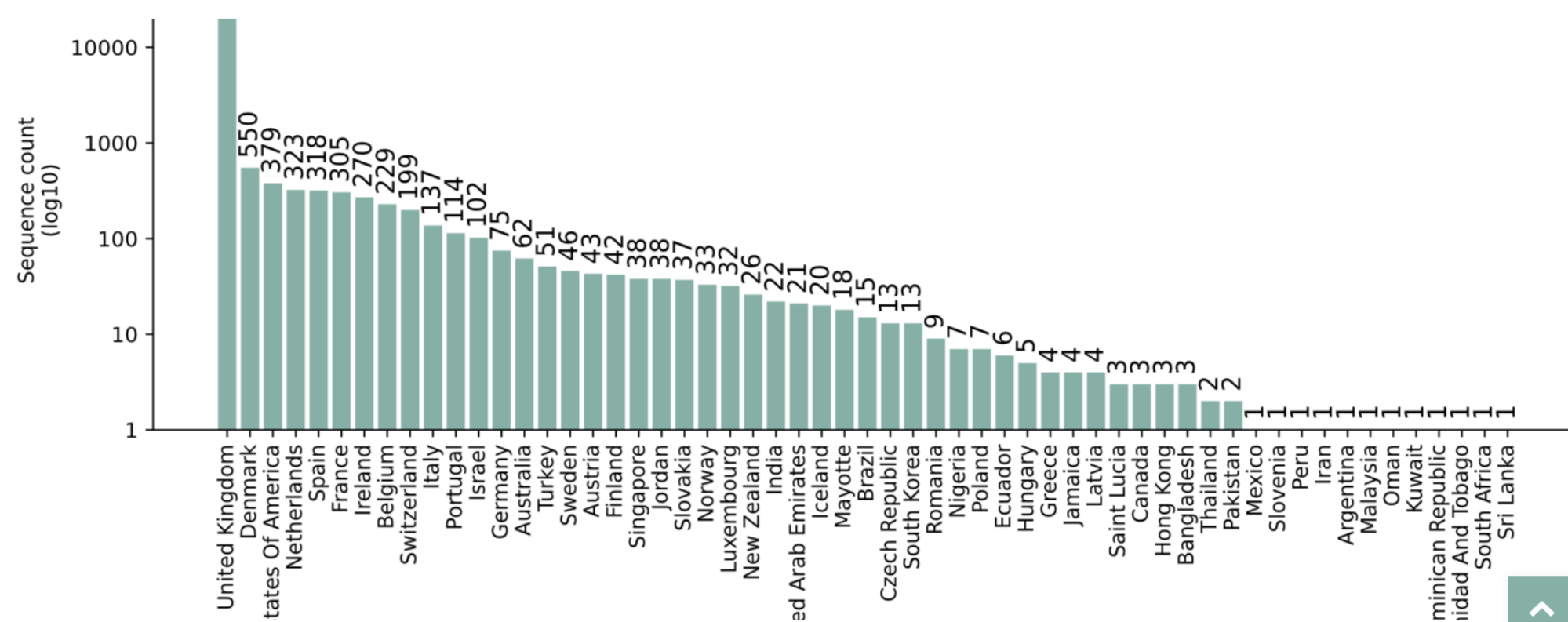


In the past week, the African Region reported over 148 000 cases and just under 5000 deaths, a 16% decrease in cases and similar number of deaths compared to the previous week. This was the first time since mid-September 2020 that weekly cases decreased. The highest numbers of new cases were reported in South Africa (79 180 new cases; 133.5 new cases per 100 000 population; a 29% decrease), Nigeria (11 659 new cases; 5.7 new cases per 100 000; a 2% increase) and Zambia (8518 new cases; 46.3 new cases per 100 000; a 10% decrease). The countries reporting the highest number of new deaths in the past week were South Africa (3723 new deaths; 6.3 new deaths per 100 000; a 8% decrease), Zimbabwe (291 new deaths; 2.0 new deaths per 100 000; a 35% decrease) and Malawi (170 new deaths; 0.9 new deaths per 100 000; a 113% increase).

Countries in which the strain was first discovered (the darker color indicates the seniority of the genetic analysis)



The number of genetic analyzes for countries from the highest to the lowest



## The variant originated from United Kingdom

List of country in which the strain was discovered

Argentina	Iceland	Peru
Australia	India	Philippines
Austria	Iran	Poland
Bangladesh	Ireland	Portugal
Belgium	Israel	Romania
Brazil	Italy	Russia
Bulgaria	Jamaica	Saint Lucia
Canada	Japan	Senegal
Chile	Jordan	Singapore
China	Kuwait	Slovakia
Cyprus	Latvia	Slovenia
Czech Republic	Lebanon	South Africa
Denmark	Luxembourg	South Korea
Ecuador	Malaysia	Spain
Finland	Malta	Sri Lanka
France	Mayotte	Sweden
Gambia	Mexico	Switzerland
Georgia	Morocco	Taiwan
Germany	Netherlands	Thailand
Ghana	New Zealand	Trinidad and Tobago
Greece	Nigeria	Turkey
Hong Kong	Norway	UAE
Hungary	Oman	USA
	Pakistan	Vietnam

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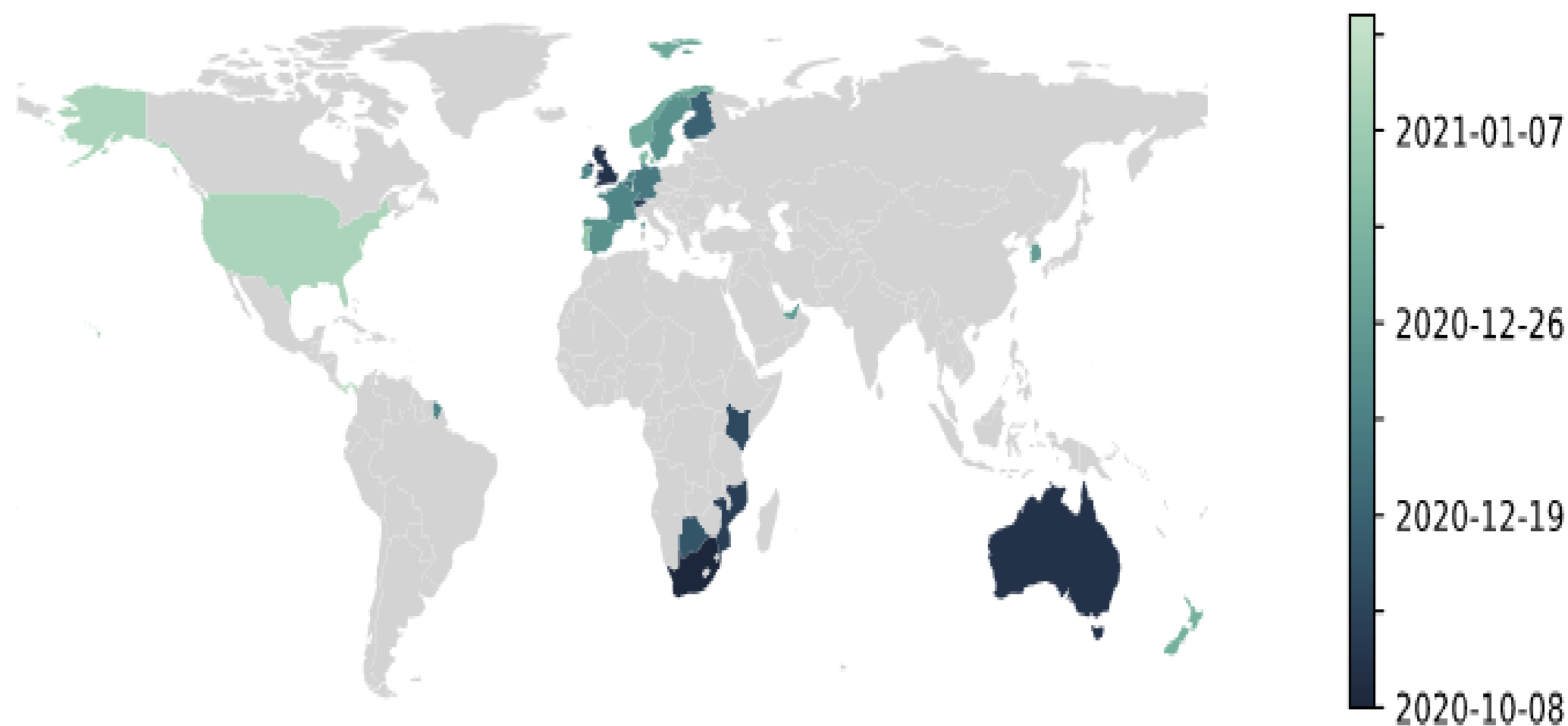
Slides polished by Abu Dhabi Public Health Center 2021 | Data resources: [pango lineages](#)

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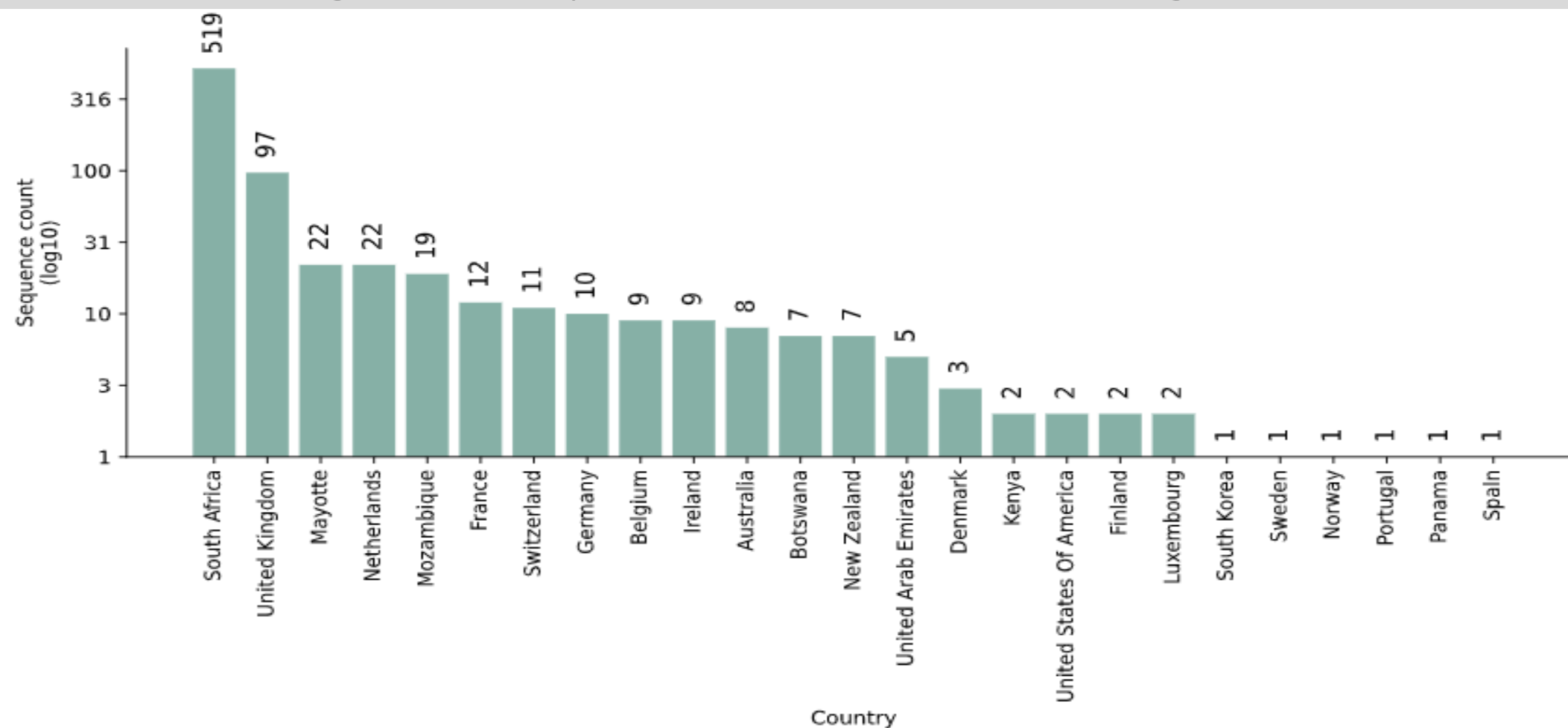
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Countries in which the strain was first discovered (the darker color indicates the seniority of the genetic analysis)



The number of genetic analyzes for countries from the highest to the lowest



## The variant originated from South Africa

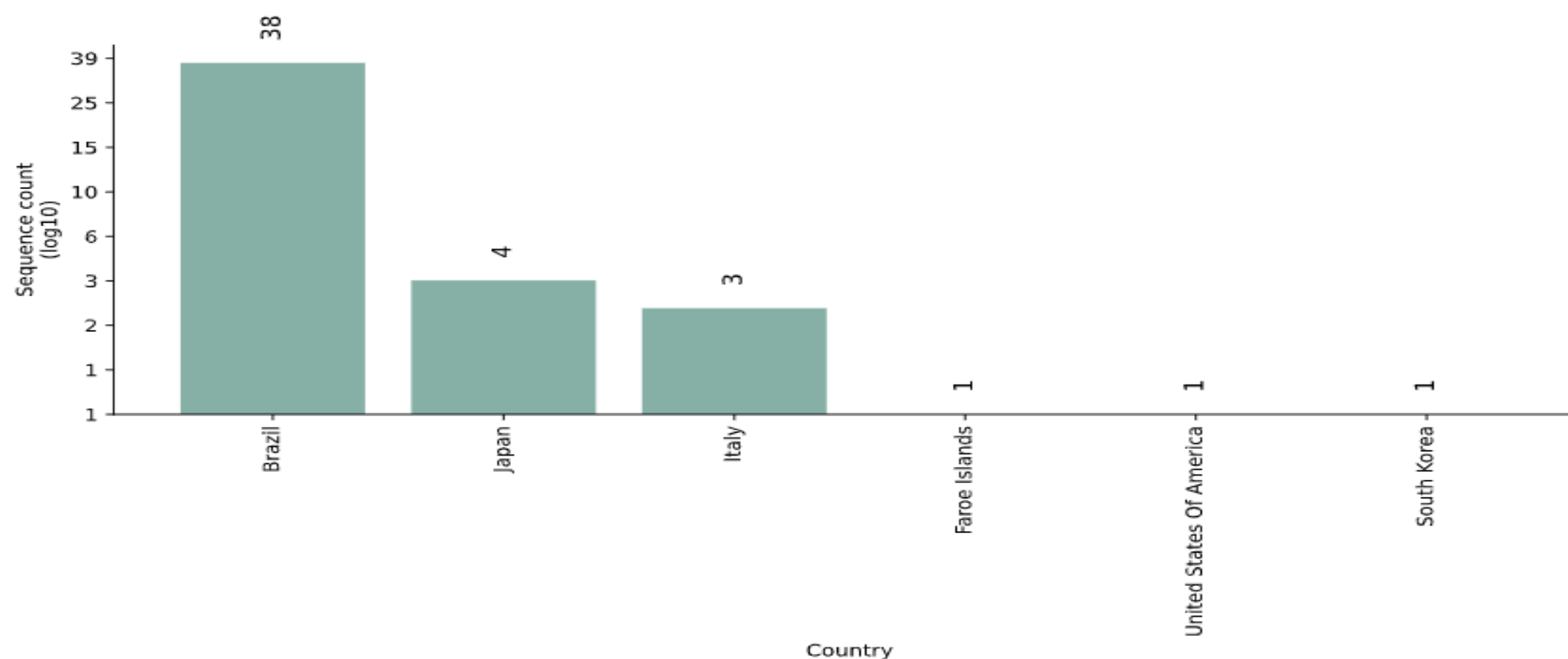
List of country in which the strain was discovered

South Africa	Taiwan
United Kingdom	Germany
Switzerland	Belgium
Finland	South Korea
Zambia	Netherlands
Botswana	Israel
France	New Zealand
Japan	Ghana
Australia	Kenya
Sweden	United Arab Emirates
Austria	Tanzania
Norway	Mozambique
China	Gambia
Ireland	Mayotte
Canada	Panama
	United States of America

Countries in which the strain was first discovered (the darker color indicates the seniority of the genetic analysis)



The number of genetic analyzes for countries from the highest to the lowest



## The variant originated from Brazil

List of country in which the strain was discovered

Brazil
Japan
Italy
South Korea
Germany
Faroe Islands
United States of America
Netherlands
Colombia

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Slides polished by Abu Dhabi Public Health Center 2021 | Data resources: [pango lineages](https://pango.lineages.org/)

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## Article 1

# SARS-CoV-2 Vaccines and the Growing Threat of Viral Variants

Published

January 28, 2021, [JAMA](#)

- Rockefeller University researchers have shown that the relevant N501Y.V2 ( the south African) mutation ) sequence changes within the Receptor Binding Doman modestly **reduce the efficiency with which mRNA vaccine-induced** antibodies neutralize test viruses in the laboratory
- a National Institutes of Health study now shows that NAbs induced by the Moderna mRNA vaccine **are about 6-fold less active against the N501Y.V2 (B1.351) strain.**
  - <https://www.biorxiv.org/content/10.1101/2021.01.25.427948v1.full.pdf>
- It remains unclear whether the reduction in the neutralization sensitivity of the N501Y.V2 strain to vaccine-induced antibodies is enough to seriously reduce vaccine efficacy
- First, mRNA vaccines also induce virus-specific helper T cells and cytotoxic T cells, both of which might be involved in protection against
- Also, the mRNA vaccines, in particular, induce such a strong NAb response that there could be enough “spare capacity” to deal with reductions in the sensitivity of the variant to Nabs.
- In other words, N501Y.V2 (and the related virus from Brazil) may be less sensitive to NAbs, but not to an extent that will cause widespread vaccine failure.
- **vaccines that appear to induce lower levels of NAbs, such as the inactivated vaccines developed in China and India, may be less effective**
- The N501Y change in the B.1.1.7 variant ( the UK variant ) , for example, is sufficient to almost ablate the activity of several nMAbs, and the South African team’s study shows that almost all of the neutralizing Monoclonal Abs tested against N501Y.V2 were now ineffective
  - <https://www.biorxiv.org/content/10.1101/2021.01.18.427166v1>



## Article 2

Published

January 26, 2021, [BMJ](#)

## Covid-19: New UK variant may be linked to increased death rate, early data indicate | The BMJ

- Preliminary analyses suggested that in every 1000 men aged 60 years who were infected with the new variant 13 or 14 might be expected to die, compared with 10 in 1000 infected with the original variant.
- What the analysis so far shows is that the rates of death when you link community testing to death is higher in those with the B.1.1.7 variant than matched people with the other virus variant.
  - But what we have not been able to detect yet is an **increased rate of hospitalisation, or once in hospital, an increased rate of dying with this variant versus another variant**, so that's where the uncertainty lies . . . and that's where the work is needed.”
- an updated matched cohort analysis of 14 939 SGTF cases ( mutation in the UK variant ) and 15 555 comparators from Public Health England identified 65 deaths among non-SGTF cases (0.1%) and 104 deaths among SGTF cases (0.2%), within 28 days of specimen date. **This gave a death risk ratio for VOC infected people versus non-VOC of 1.65 (1.21 to 2.25).**
- separate rapid analysis of data from one NHS trust from the Covid-19 Clinical Information Network (CO-CIN) **did not find an increased risk of death among** people admitted to hospital when it compared patients with proved VOC (n=32) with patients without VOC (n=184) (odds ratio 0.63 (0.20 to 1.69).



For more information on the new variants please visit the below websites

## Vaccines:

Neutralization of N501Y mutant SARS-CoV-2 by BNT162b2 vaccine-elicited sera

<https://www.biorxiv.org/content/10.1101/2021.01.07.425740v1>

SARS-CoV-2 501Y.V2 escapes neutralization by South African COVID-19 donor plasma

<https://www.biorxiv.org/content/10.1101/2021.01.18.427166v1>

Neutralization of SARS-CoV-2 spike 69/70 deletion, E484K, and N501Y variants by BNT162b2 vaccine-elicited sera

<https://www.biorxiv.org/content/10.1101/2021.01.27.427998v1>

Emergence and rapid spread of a new severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2) lineage with multiple spike mutations in South Africa

<https://www.medrxiv.org/content/10.1101/2020.12.21.20248640v1>

mRNA vaccine-elicited antibodies to SARS-CoV-2 and circulating variants

<https://www.biorxiv.org/content/10.1101/2021.01.15.426911v2>

Comprehensive mapping of mutations to the SARS-CoV-2 receptor-binding domain that affect recognition by polyclonal human serum antibodies

<https://www.biorxiv.org/content/10.1101/2020.12.31.425021v1>

Covid-19 Vaccine Resource Center- NEJM

<https://www.nejm.org/covid-vaccine>

## WHO reports:

SARS-CoV-2 Variants

<https://www.who.int/csr/don/31-december-2020-sars-cov2-variants/en/>  
Weekly epidemiological update - 27 January 2021

<https://www.who.int/publications/m/item/weekly-epidemiological-update--27-january-2021>

## others:

Emergence of SARS-CoV-2 B.1.1.7 Lineage — United States, December 29, 2020–January 12, 2021

[https://www.cdc.gov/mmwr/volumes/70/wr/mm7003e2.htm?s\\_cid=mm7003e2\\_e&ACSTrackingID=USCDC\\_921-DM46546&ACSTrackingLabel=MMWR%20Early%20Release%20-%20Vol.%2070%2C%20January%202021&deliveryName=USCDC\\_921-DM46546](https://www.cdc.gov/mmwr/volumes/70/wr/mm7003e2.htm?s_cid=mm7003e2_e&ACSTrackingID=USCDC_921-DM46546&ACSTrackingLabel=MMWR%20Early%20Release%20-%20Vol.%2070%2C%20January%202021&deliveryName=USCDC_921-DM46546)

Covid-19: What new variants are emerging and how are they being investigated? | The BMJ

<https://www.bmj.com/content/372/bmj.n158>

South Africa responds to new SARS-CoV-2 variant - The Lancet

[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)00144-6/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00144-6/fulltext)

Fast-spreading COVID variant can elude immune responses (nature.com)

<https://www.nature.com/articles/d41586-021-00121-z>

FDA Issues Alert Regarding SARS-CoV-2 Viral Mutation to Health Care Providers and Clinical Laboratory Staff

[https://www.fda.gov/news-events/press-announcements/fda-issues-alert-regarding-sars-cov-2-viral-mutation-health-care-providers-and-clinical-laboratory?utm\\_medium](https://www.fda.gov/news-events/press-announcements/fda-issues-alert-regarding-sars-cov-2-viral-mutation-health-care-providers-and-clinical-laboratory?utm_medium)

Variant of concern report

[https://cov-lineages.org/global\\_report.html](https://cov-lineages.org/global_report.html)





# THANK YOU

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