

SCIENTIFIC RESEARCH MONITORING ON COVID-19

23 DECEMBER 2020

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SCIENTIFIC RESEARCH MONITORING ON COVID-19

(ISSUE 323)

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

No 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.

For further inquiries you may communicate with us as PHP@adphc.gov.ae

RESEARCH UPDATES

The views and opinions expressed in this report are those of the authors and do not reflect the official policy or position of the Abu Dhabi Public Health Center (ADPHC).

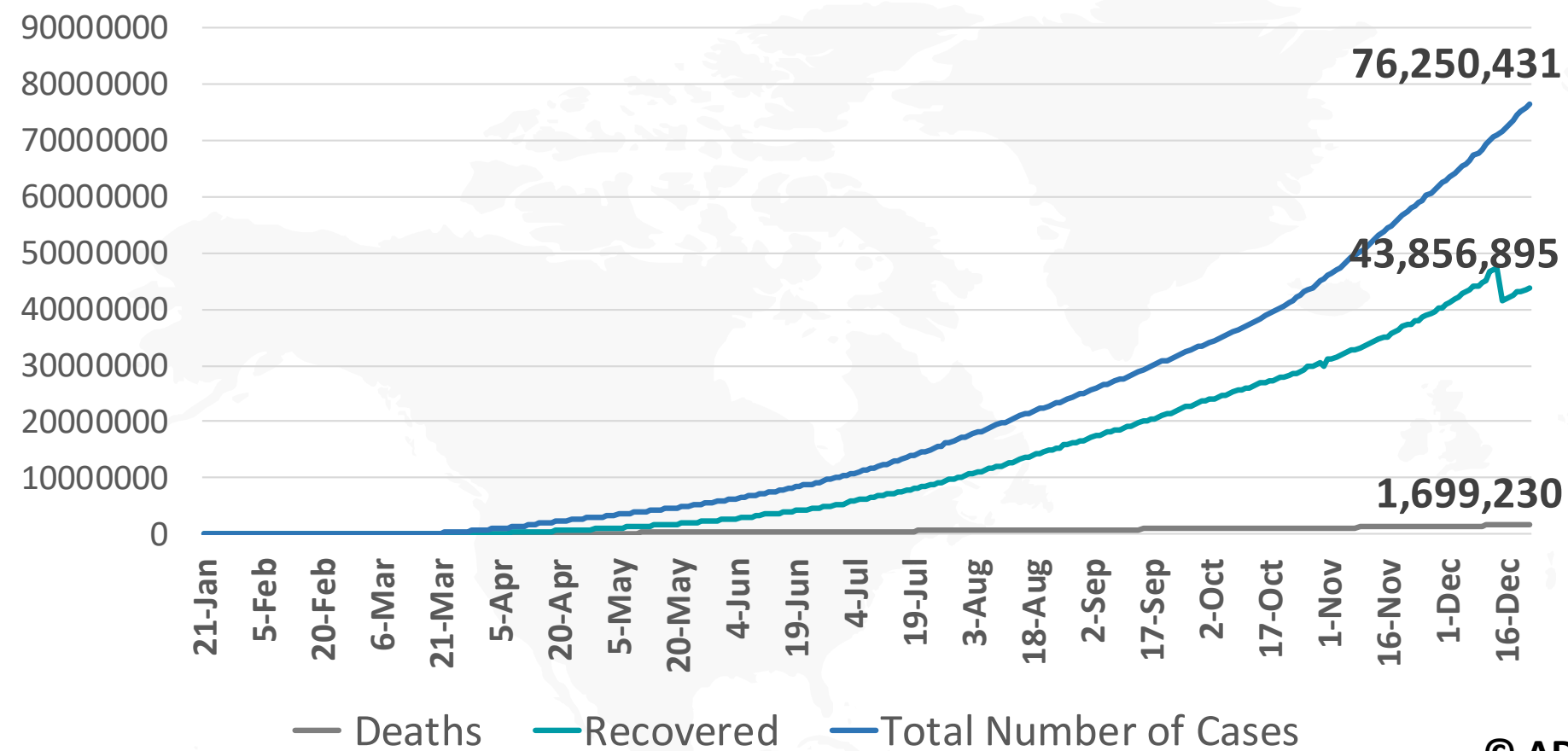
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**Public health
response**

**Additional information on the
UK detected new variant of
SARS-COV2**



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



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

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

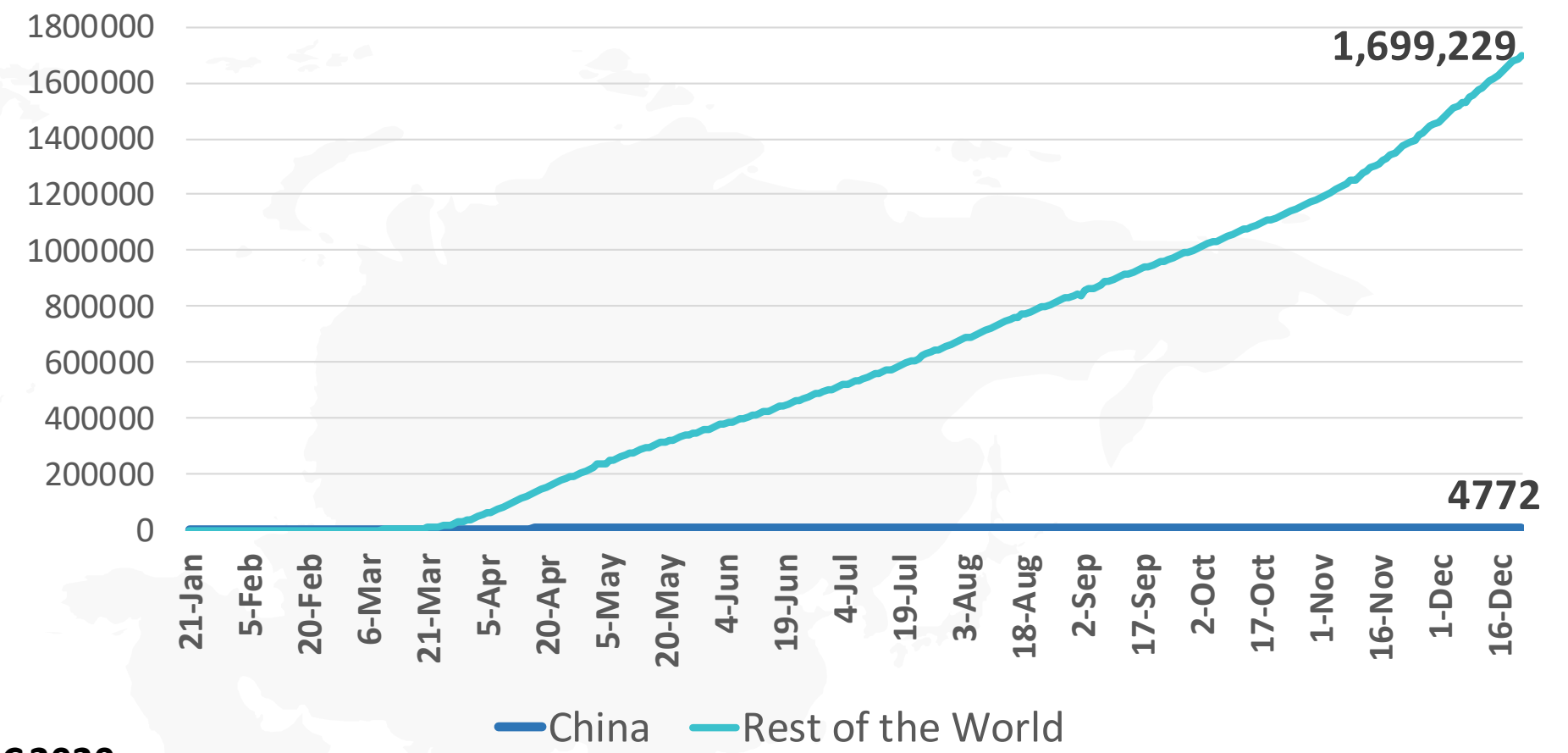


Figure 2: Daily New Infected COVID-19 Cases (China and rest of the world)

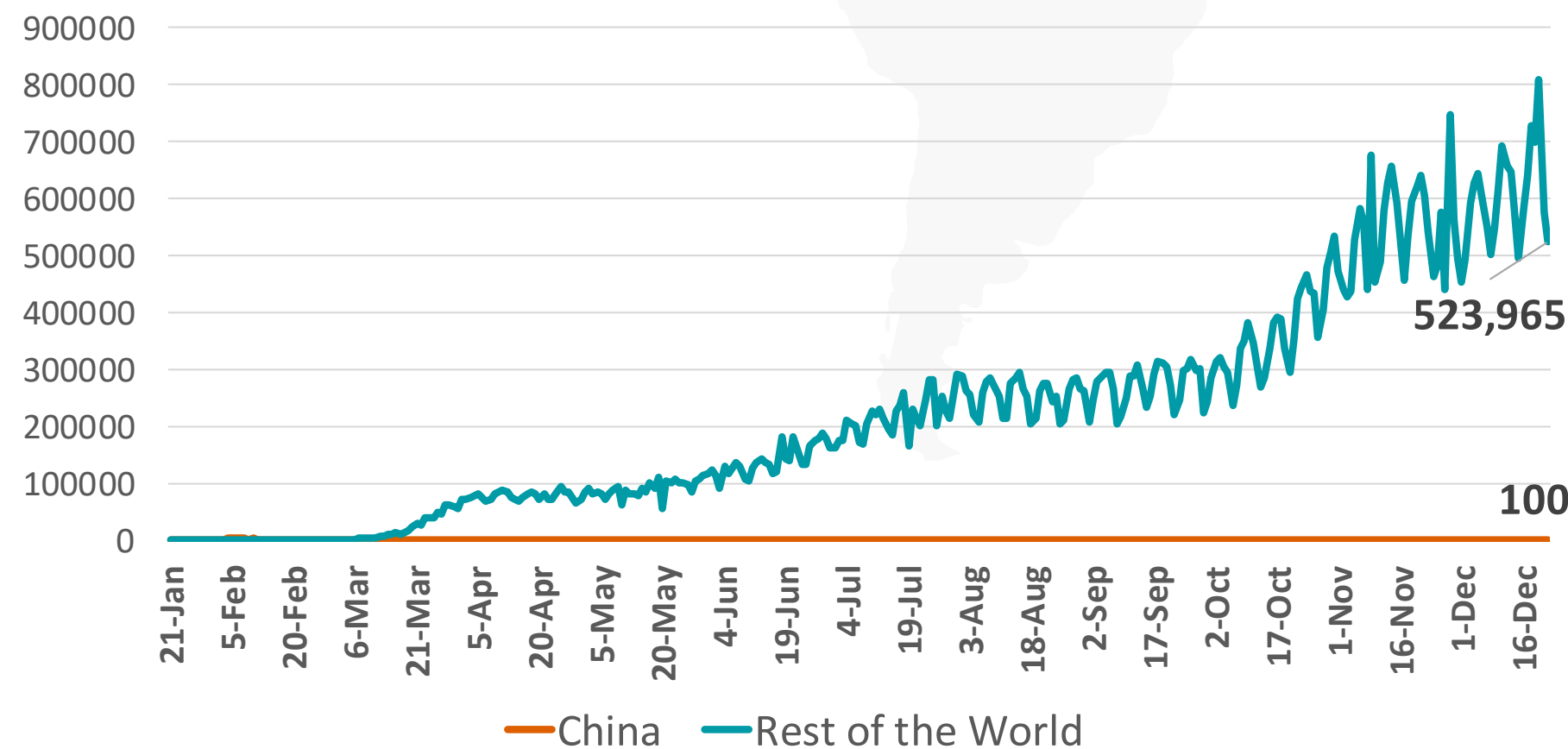


Figure 4: Global Daily New Deaths Due to COVID-19

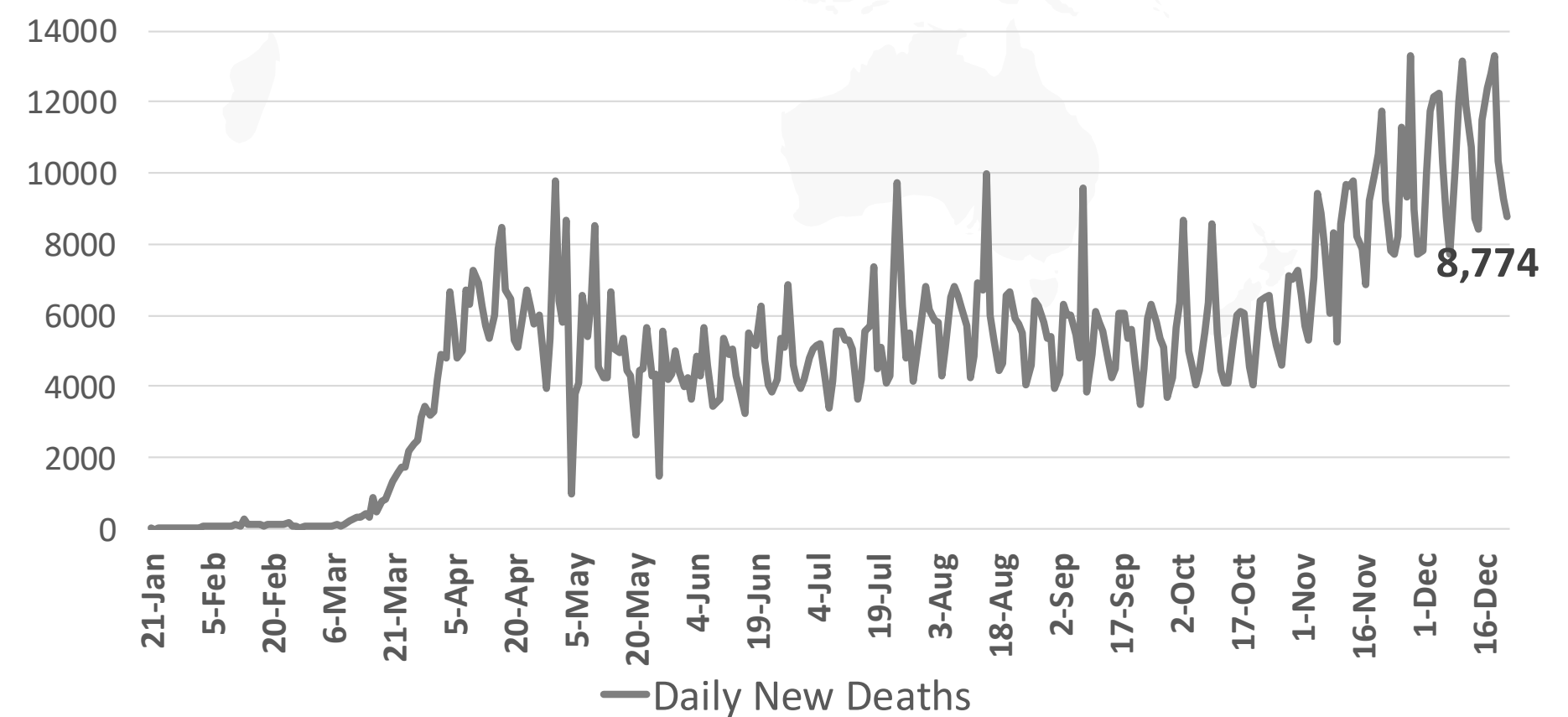
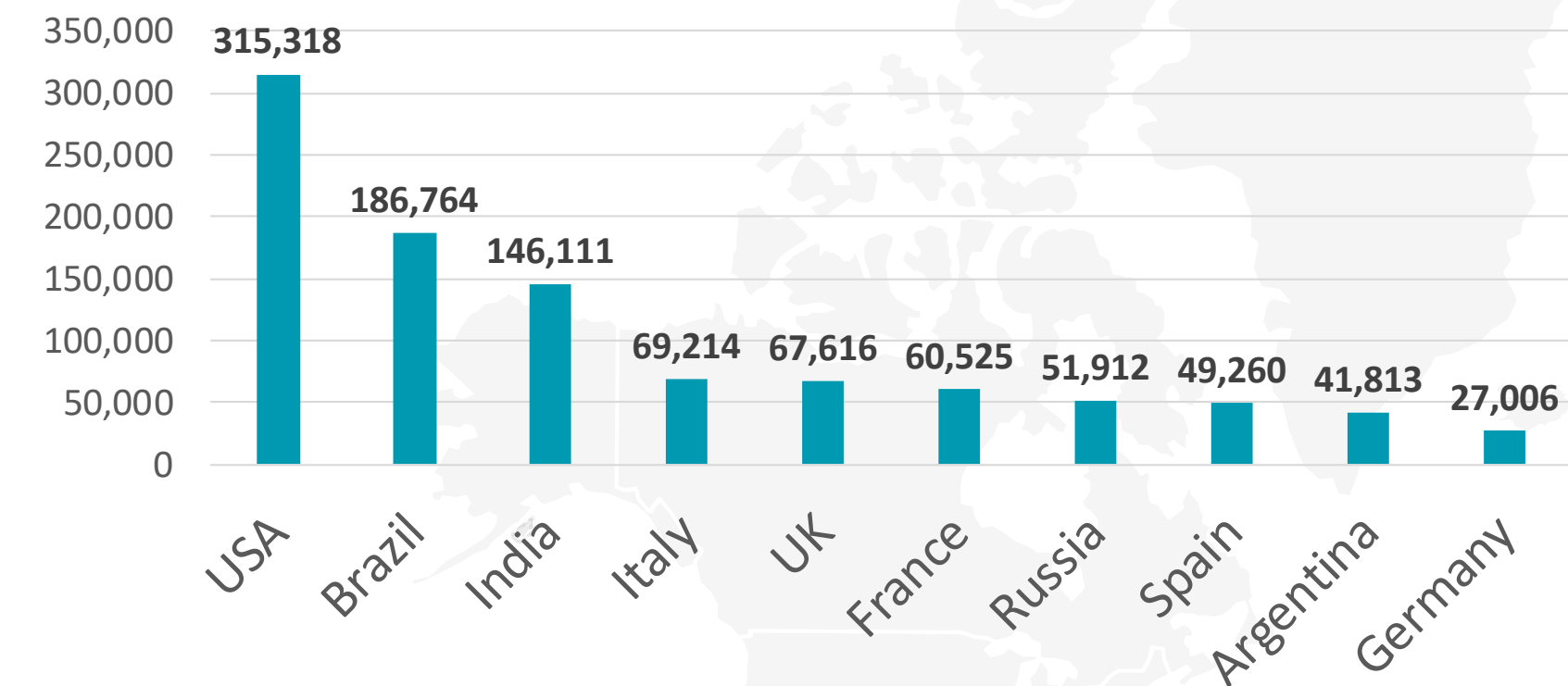
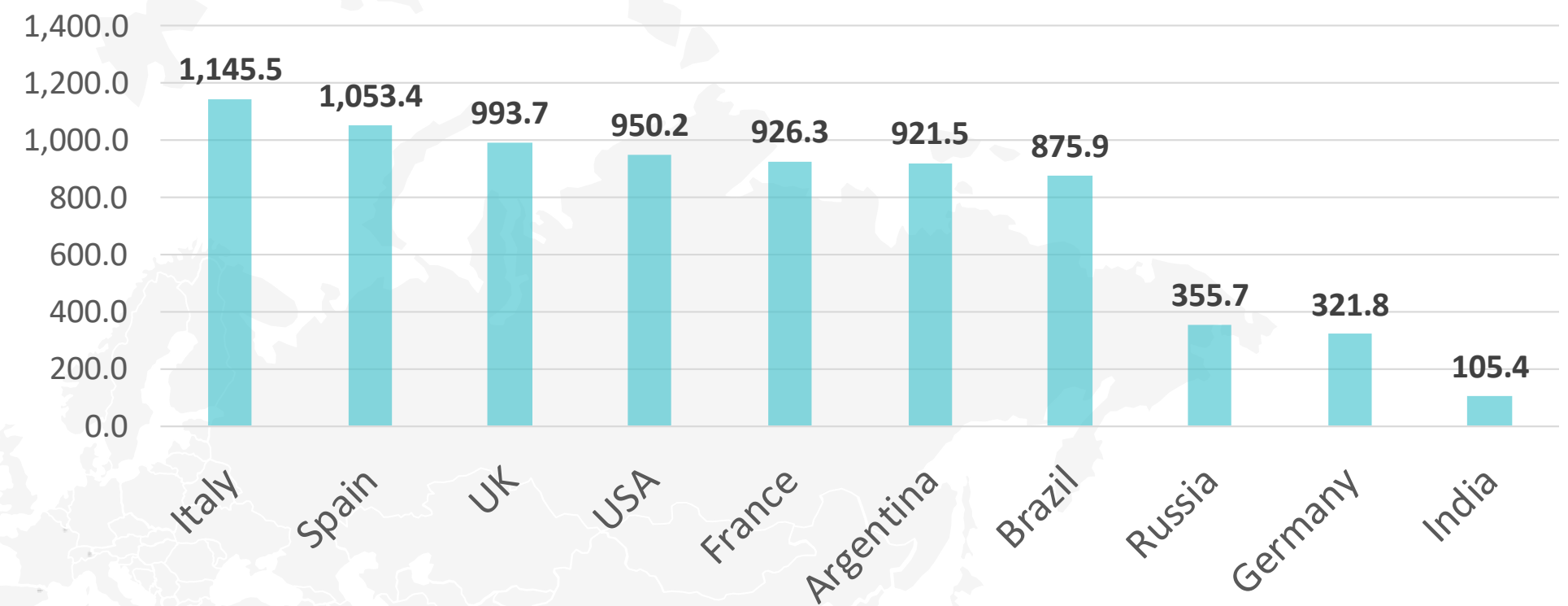


Figure 5: Top 10 Countries in the Total Number of Cases Due to COVID-19

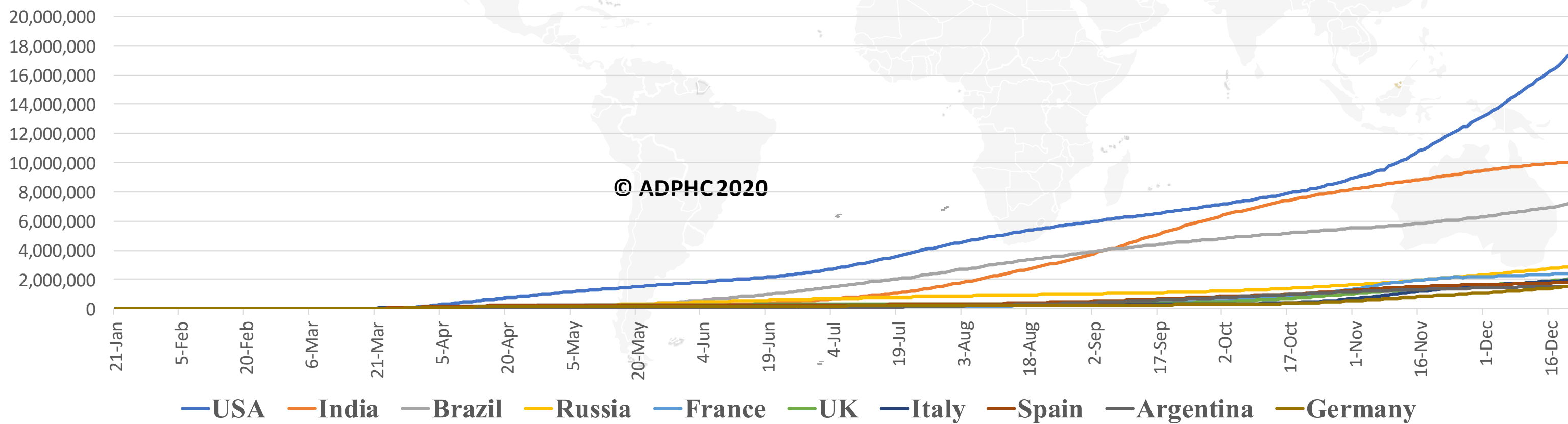
TOTAL DEATHS



DEATHS PER MILLION

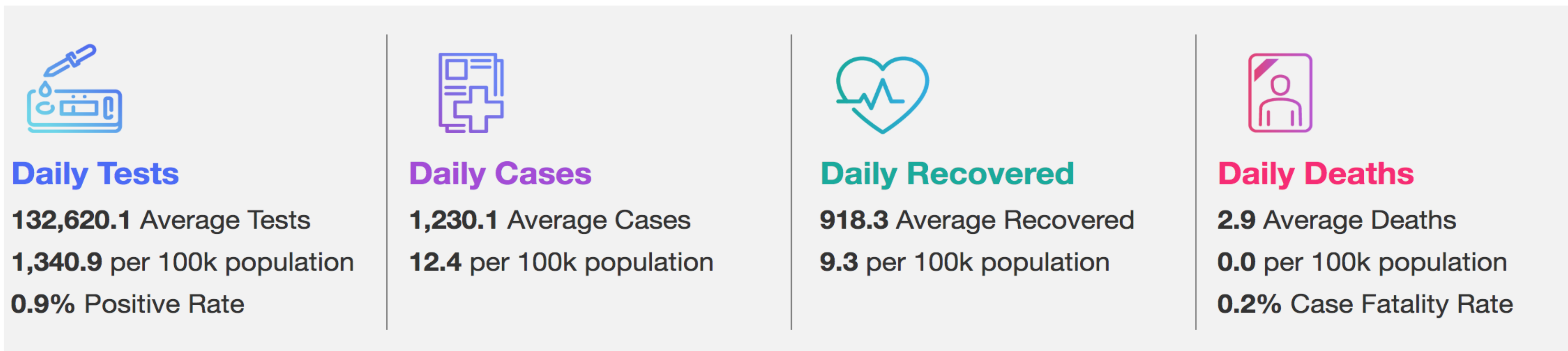


TOTAL INFECTED CASES



USA	17,712,290
India	10,075,116
Brazil	7,238,600
Russia	2,906,503
France	2,436,873
UK	2,073,515
Italy	1,964,054
Spain	1,819,249
Argentina	1,541,285
Germany	1,530,180

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



TOTAL NUMBER OF INFECTED AND RECOVERED CASES DUE TO COVID-19 REPORTED BY THE UAE

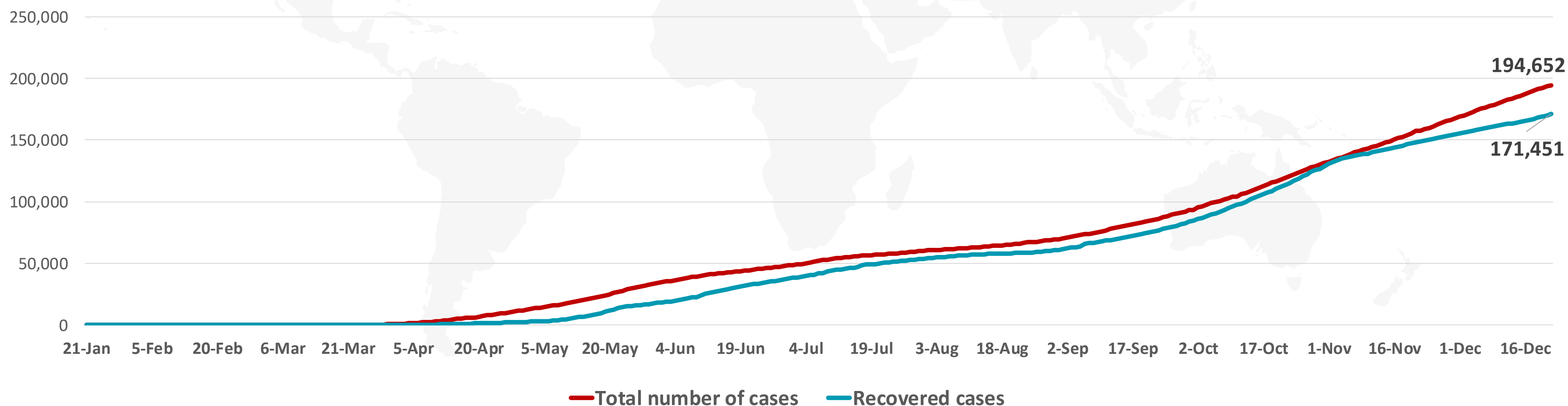
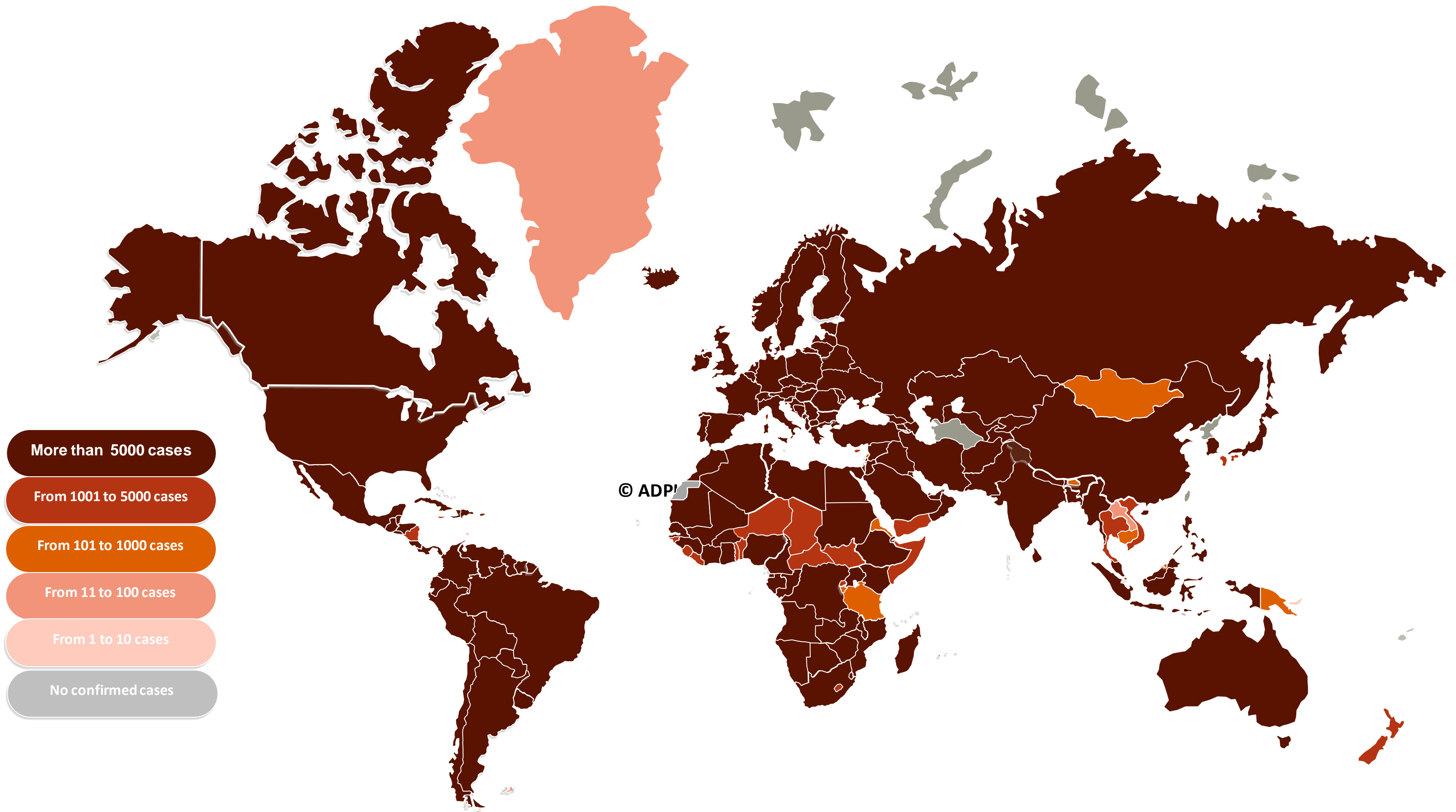


Figure 7A : Global Distribution of COVID-19 Cases



More than 5000 cases

From 1001 to 5000 cases

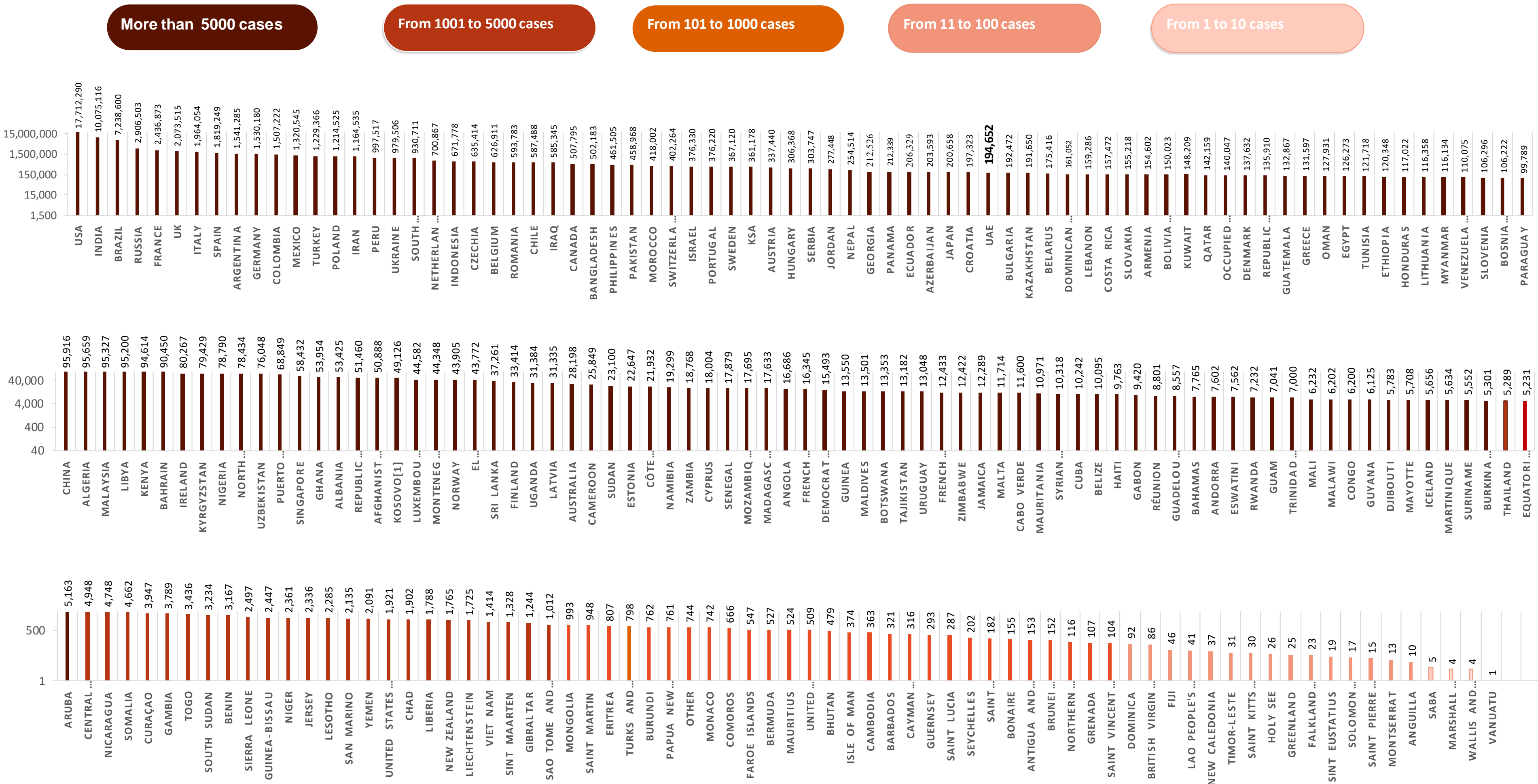
From 101 to 1000 cases

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)

Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: [WHO](#)

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

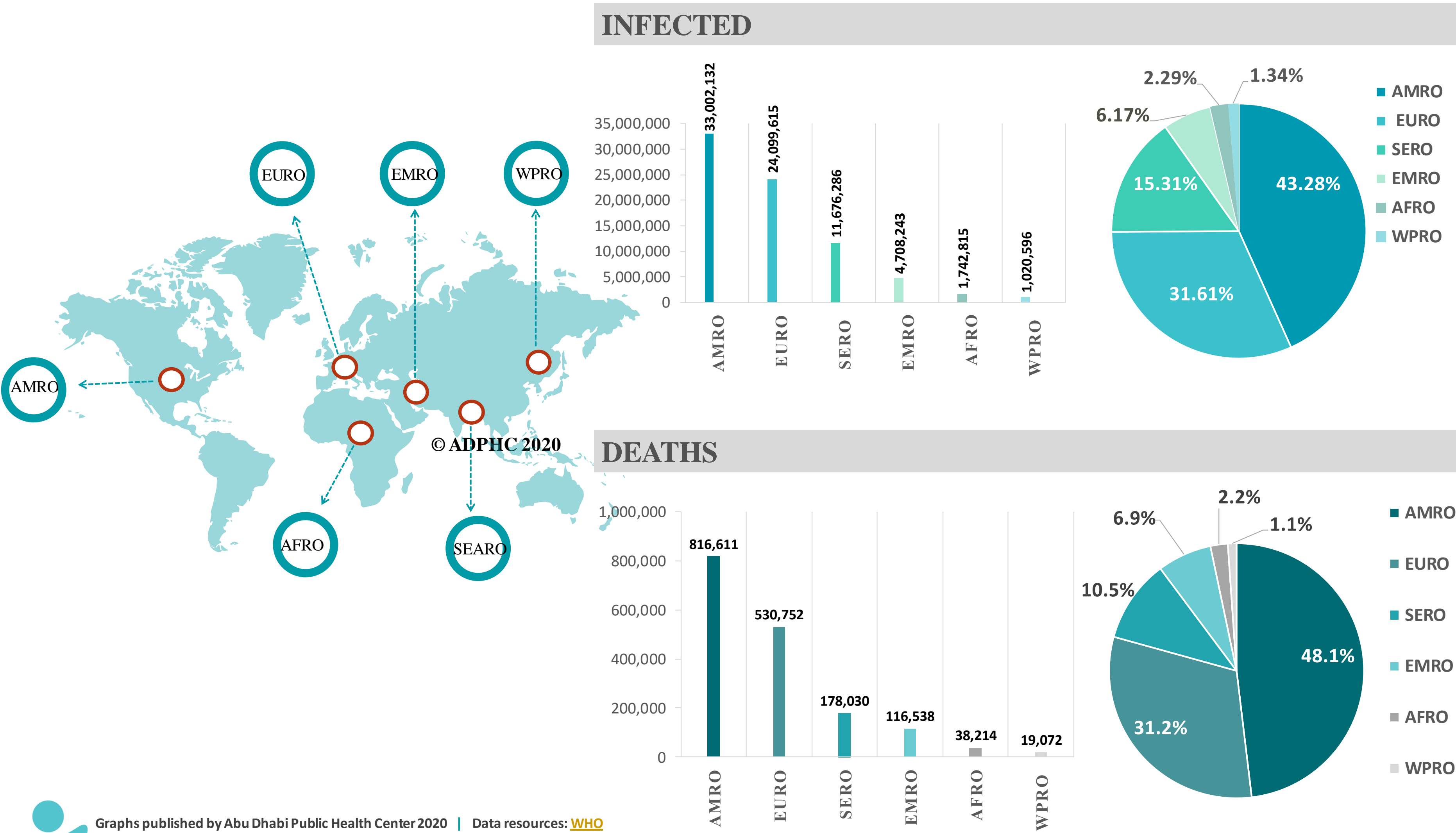
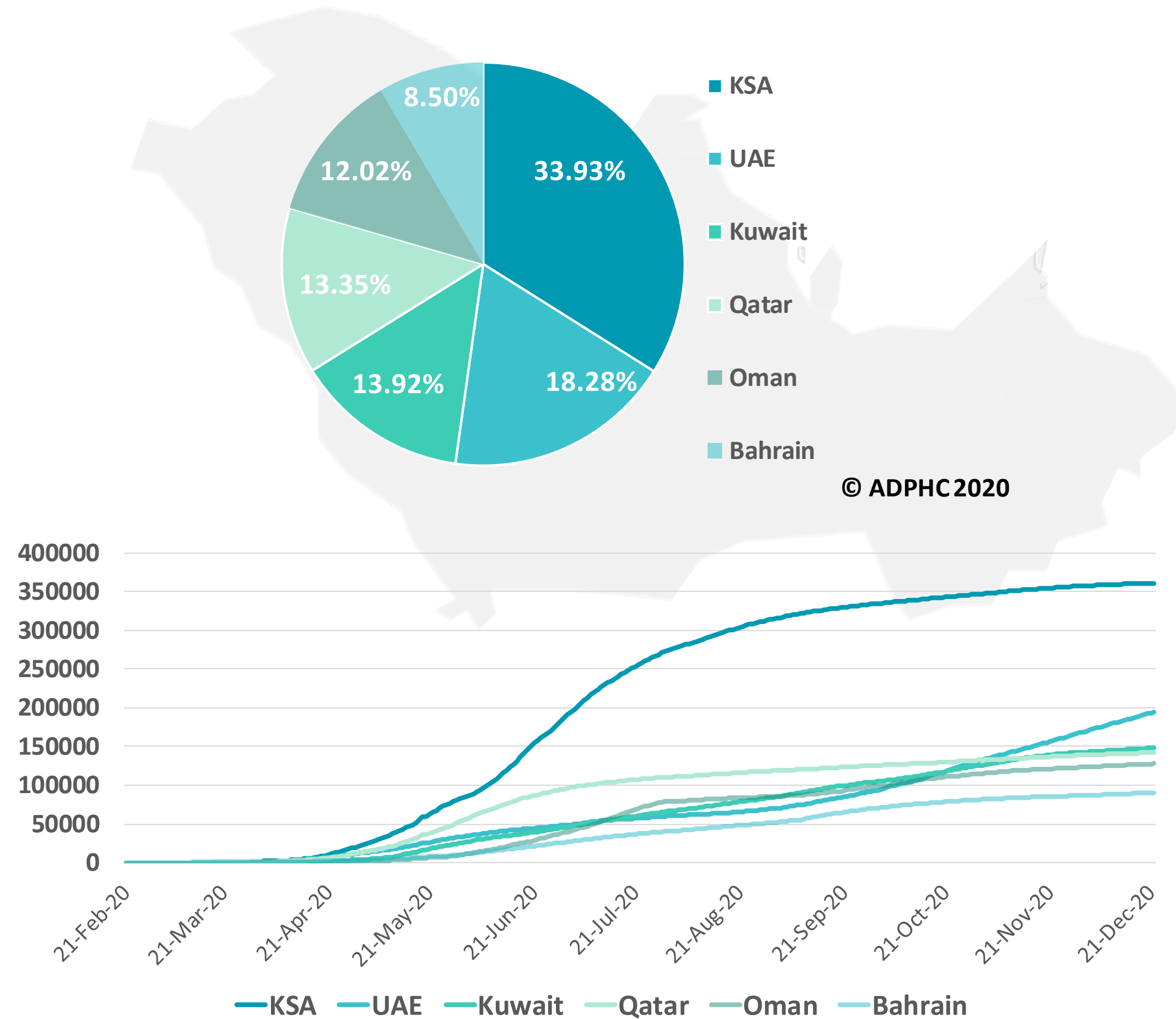
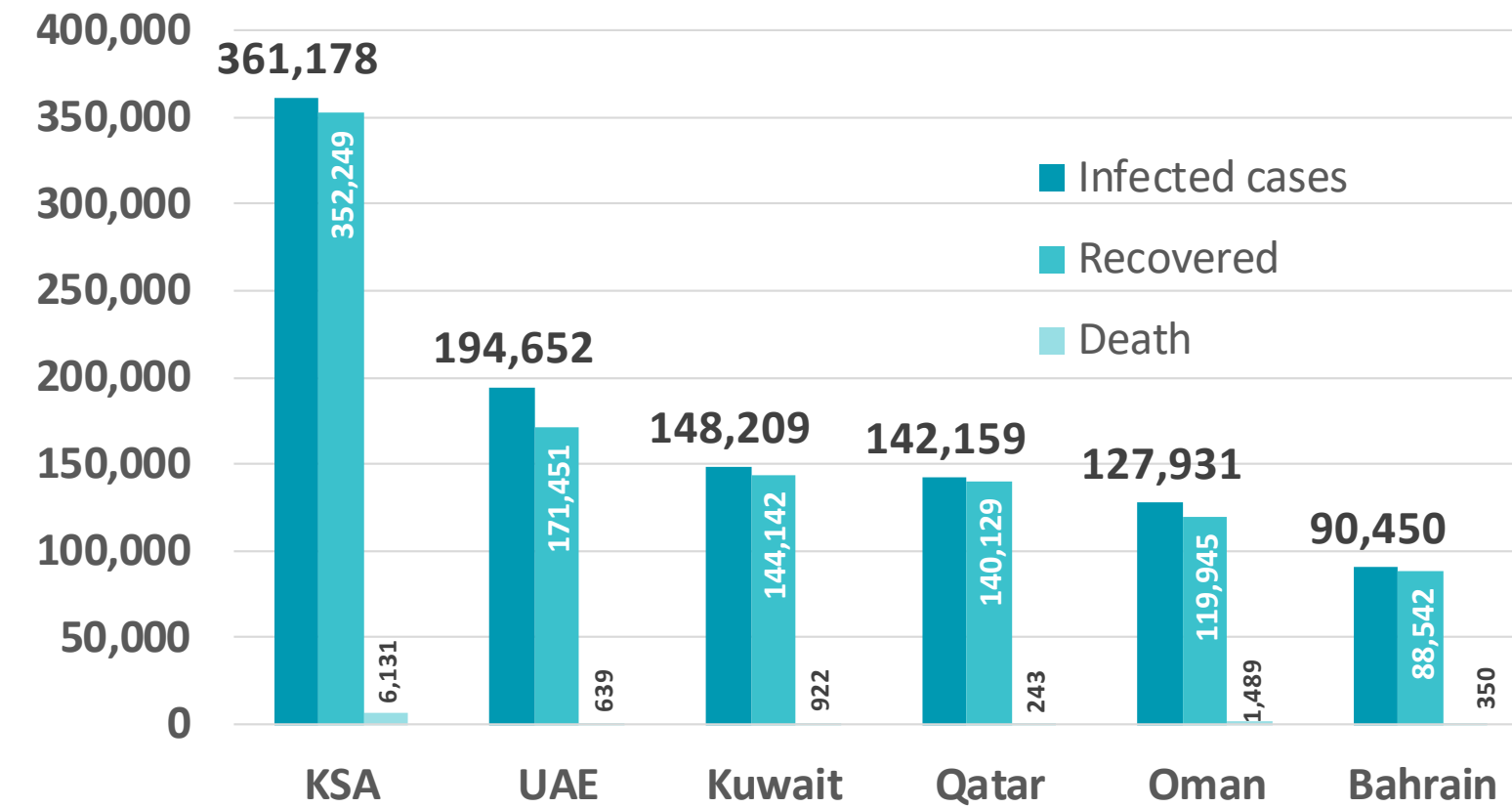


Figure 9: Comparative Analysis of the Distribution of COVID-19 Cases in GCC Countries

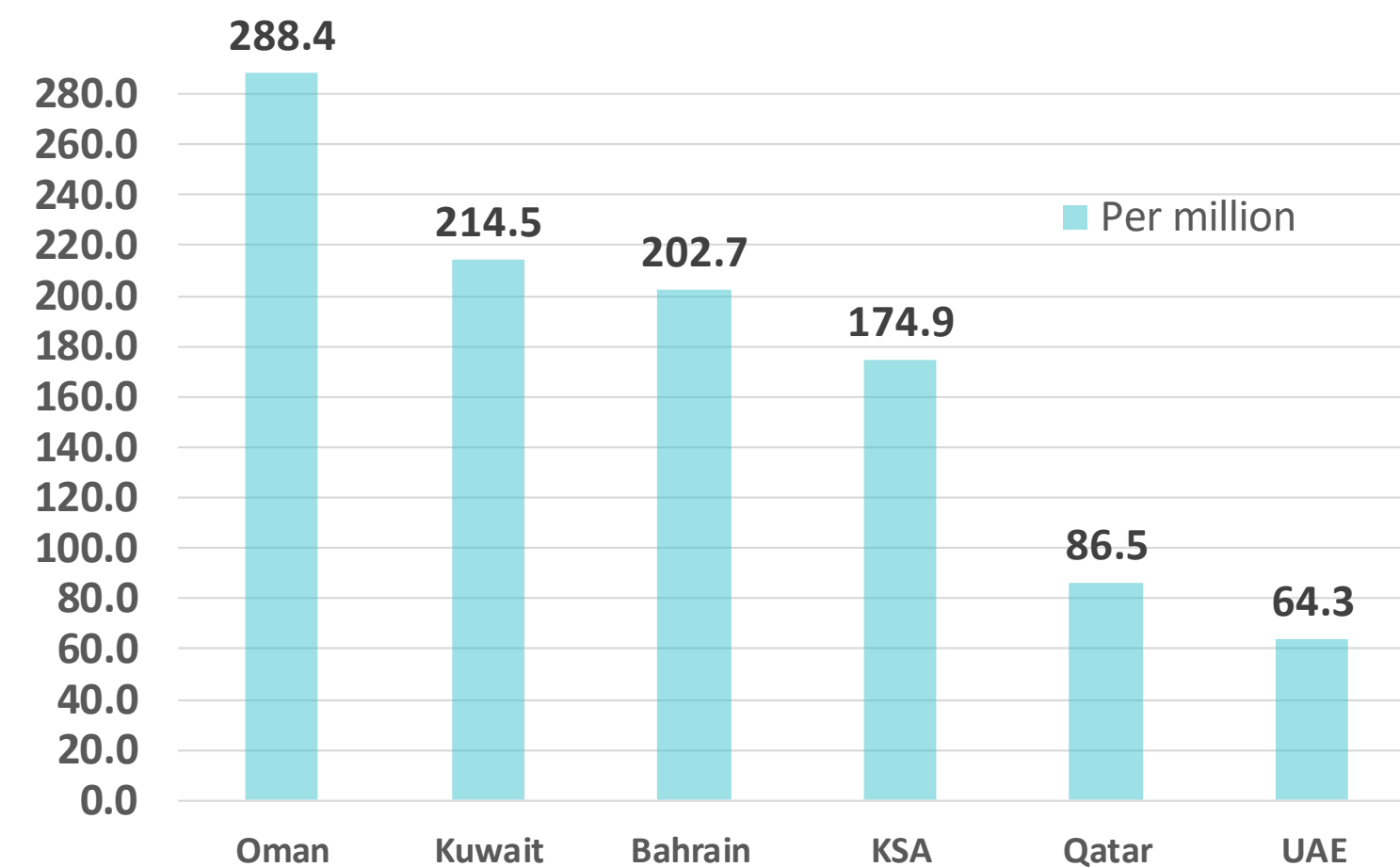
TOTAL NUMBER OF INFECTED CASES



TOTAL NUMBER OF INFECTED, RECOVERED AND DEATHS



DEATHS PER MILLION



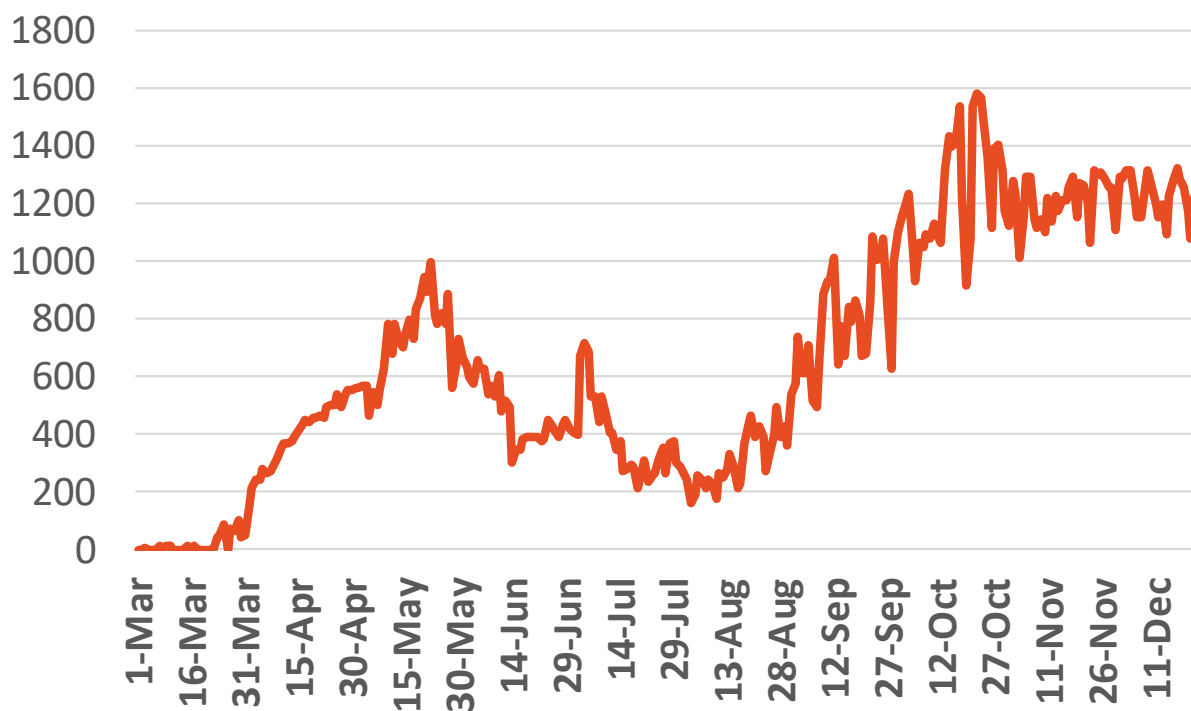
Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: [John Hopkins](#), [WHO](#)

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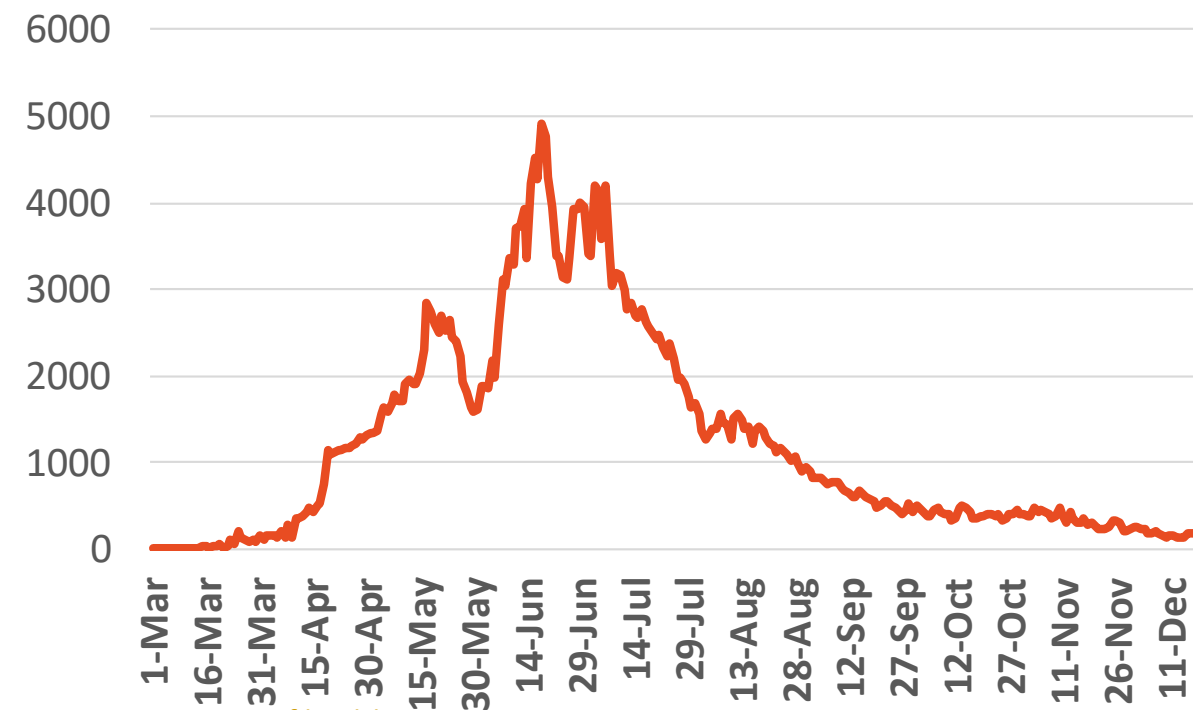
Figure 10: Comparative Analysis of the Distribution of COVID-19 New Cases in GCC Countries

UAE



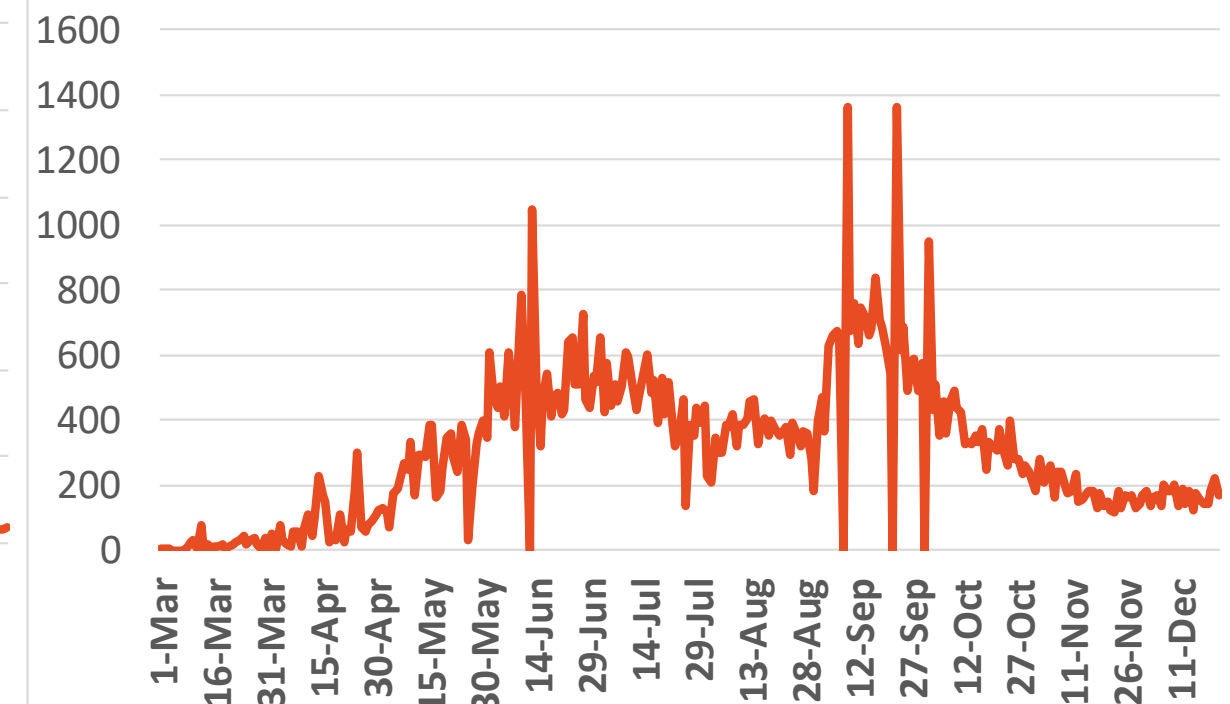
Source : National Emergency Crisis and Disaster Management Authority

KSA



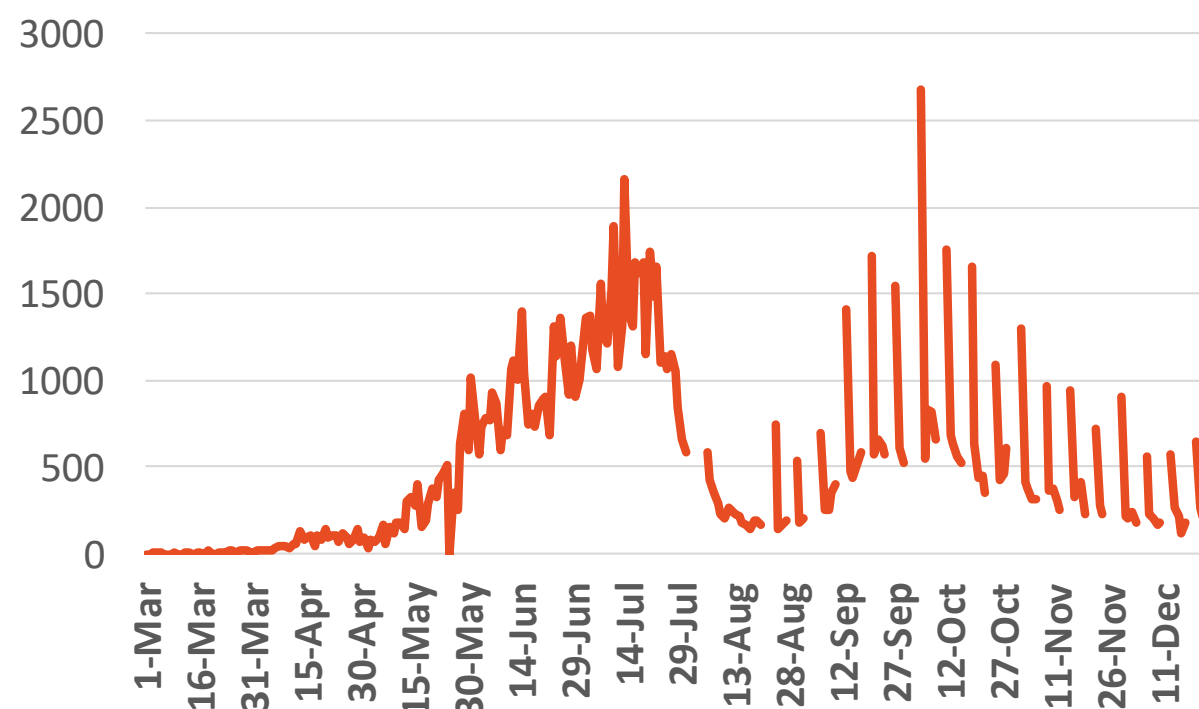
Source : KSA ministry of health

Bahrain



Source :WHO

Oman



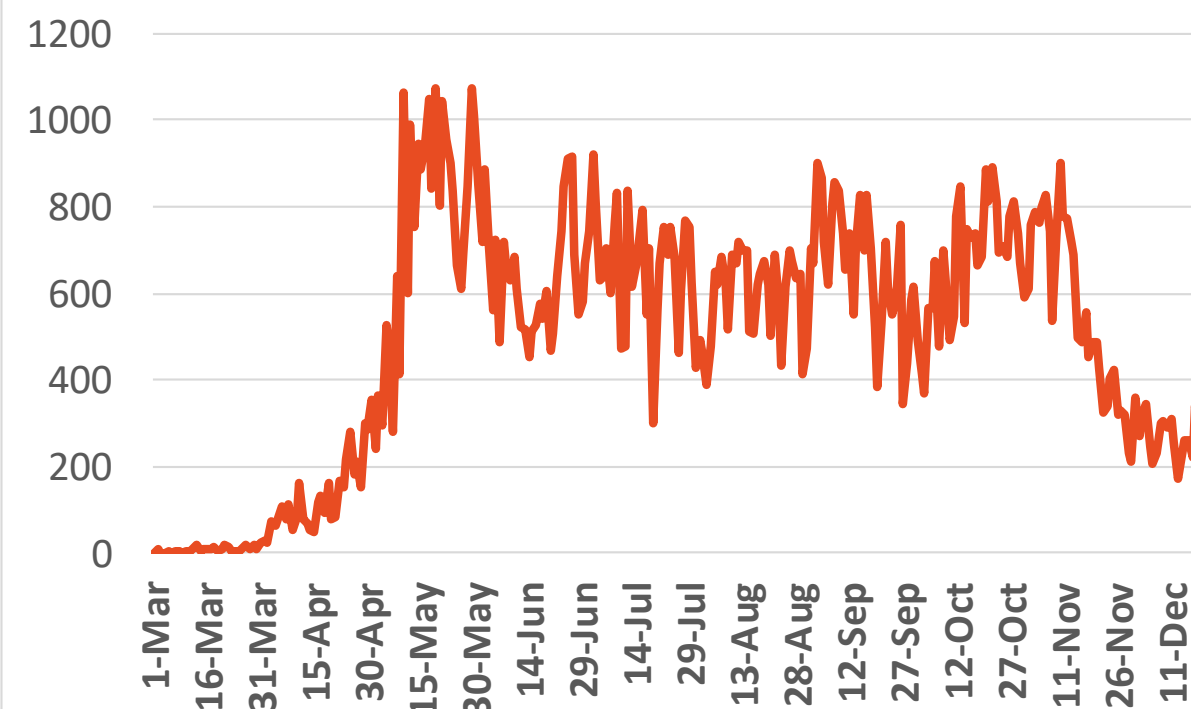
Source :Oman ministry of health

*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, 6,7,13,14,17,20,21,25,26,6 DEC

*No announced statistic data on weekends and official holidays.

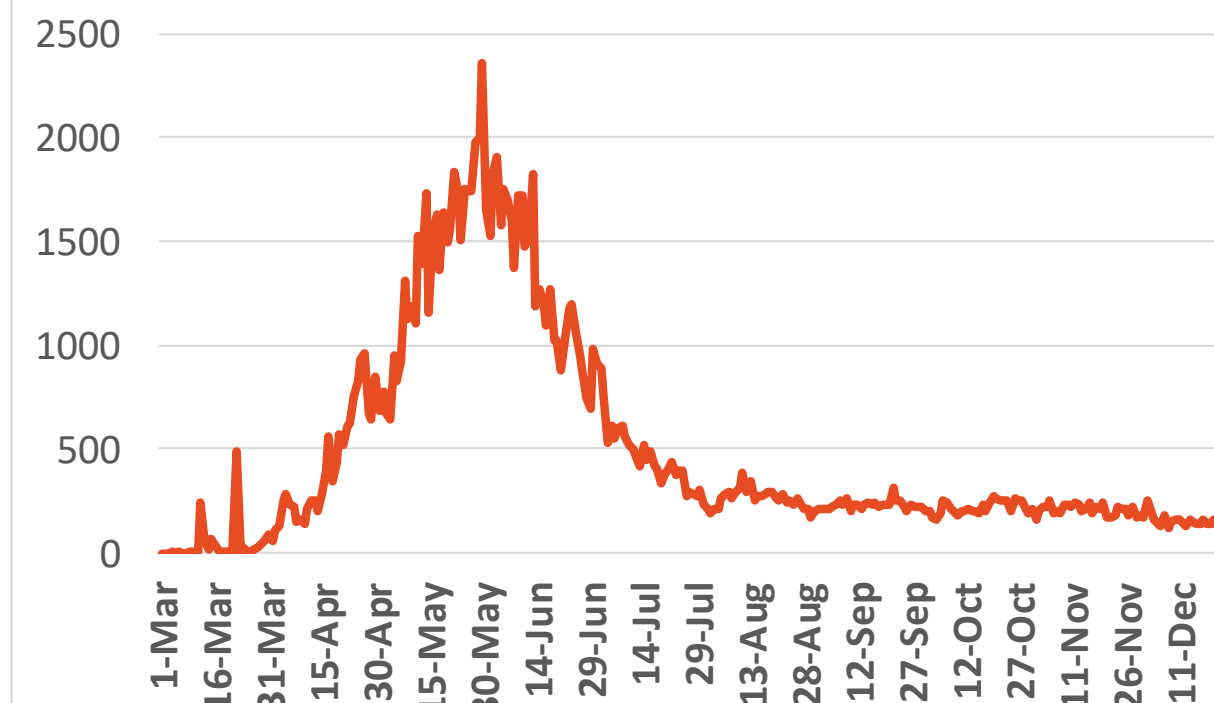
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Kuwait



Source : Kuwait ministry of health

Qatar



Source : Qatar ministry of health

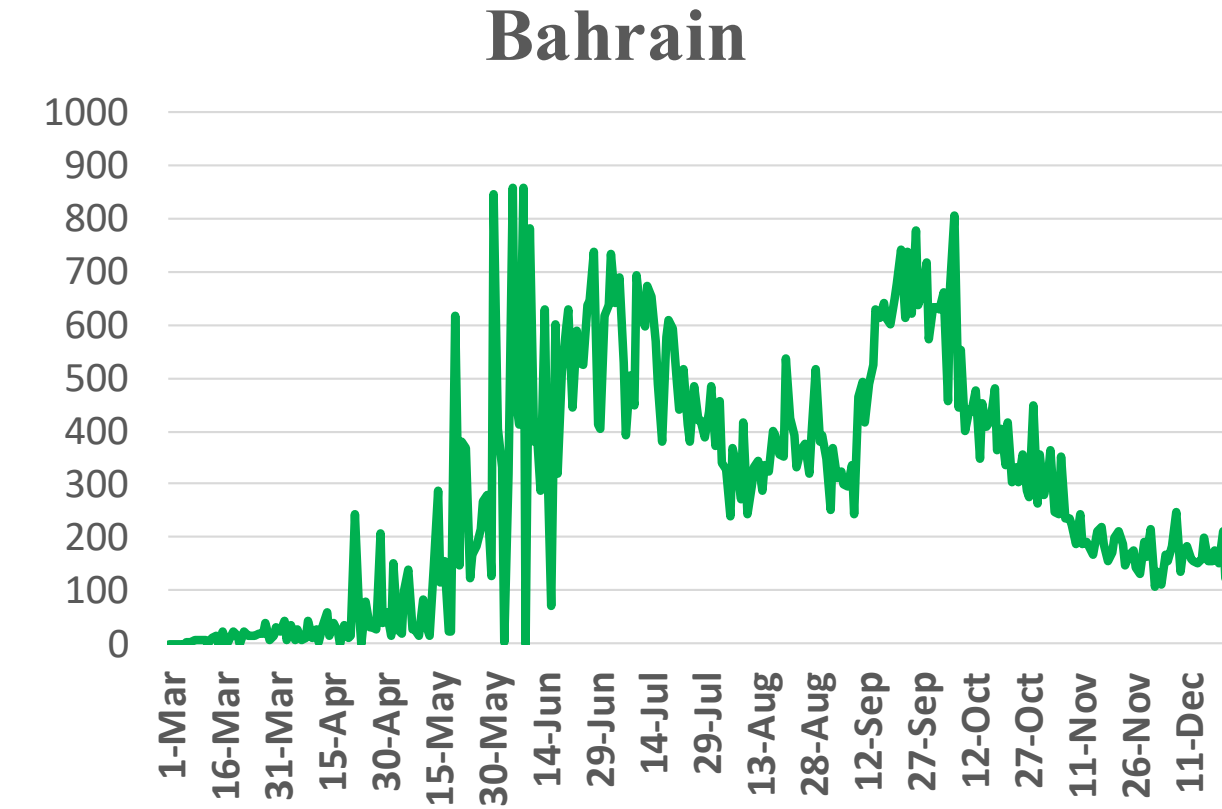
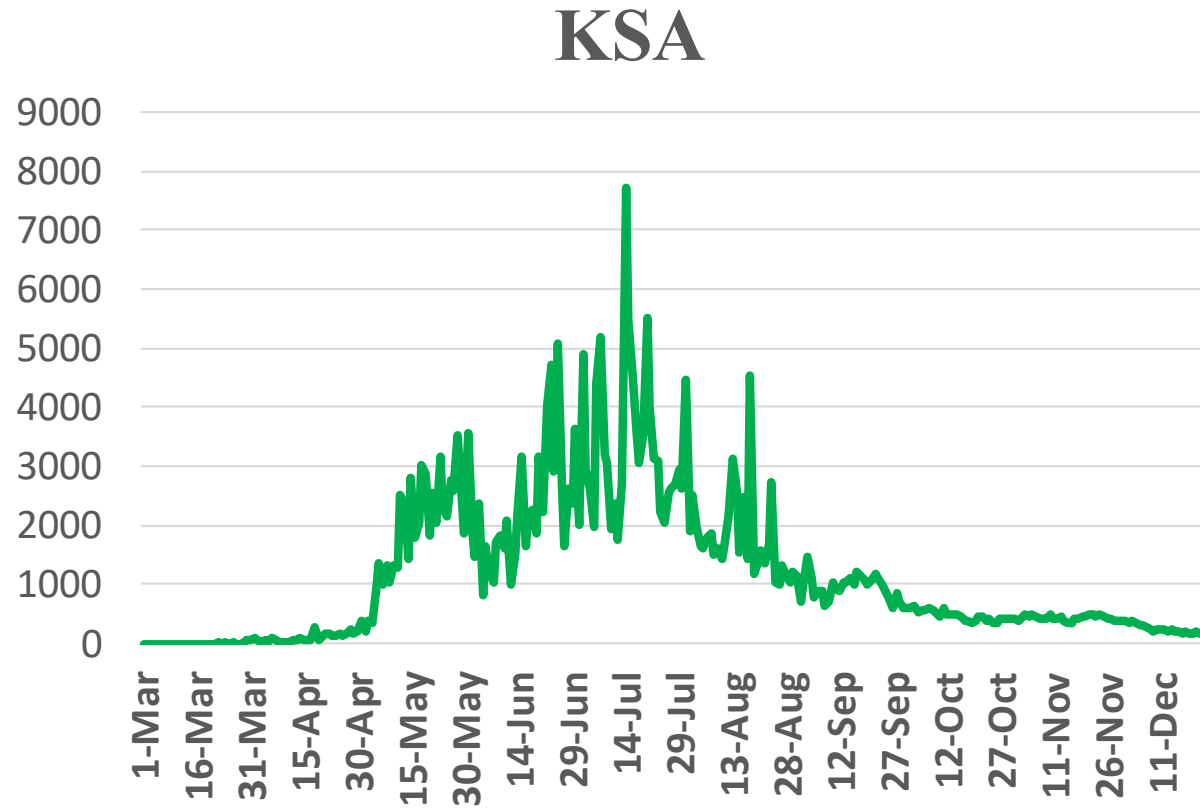
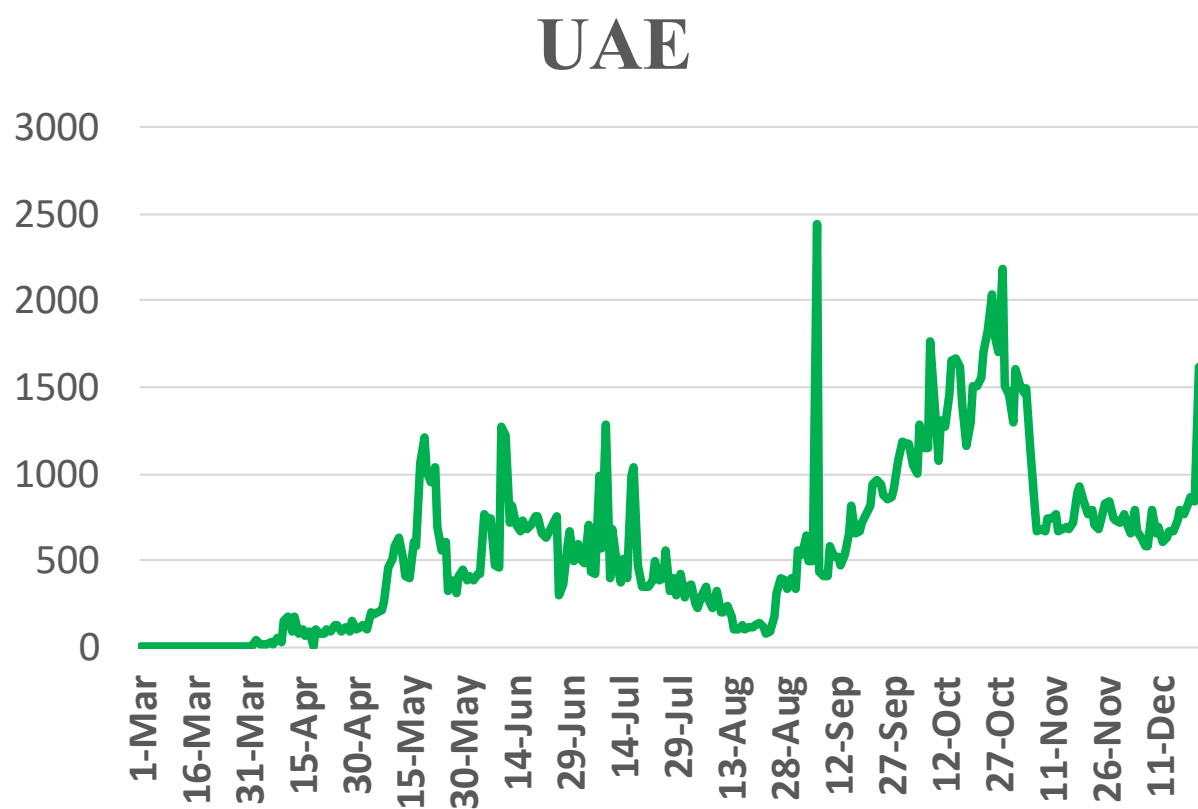


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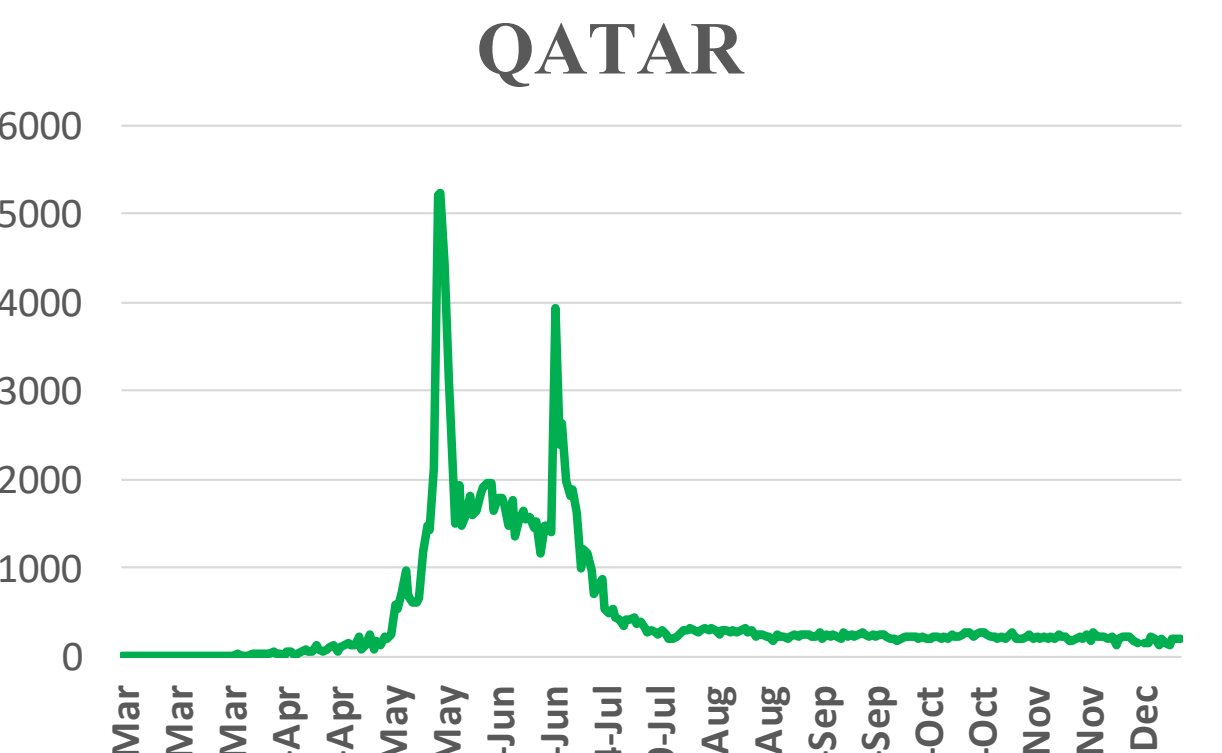
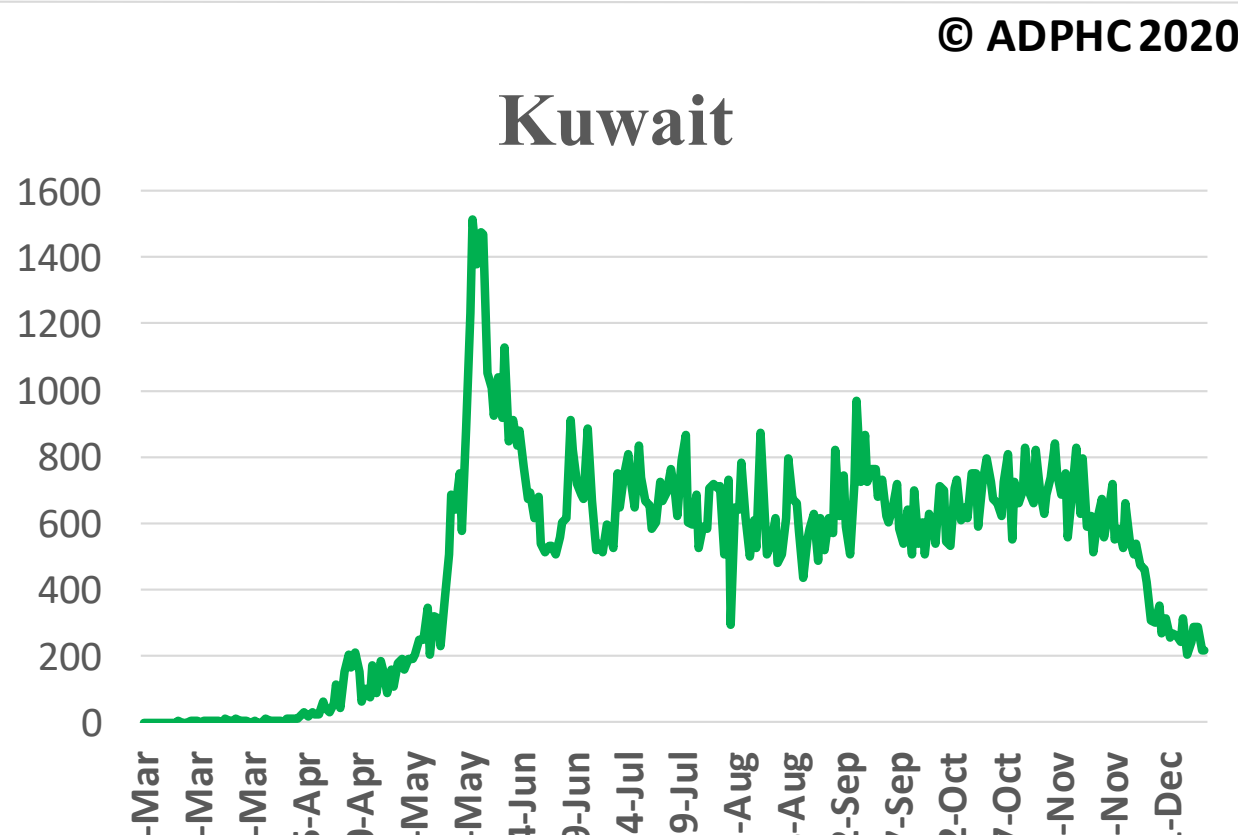
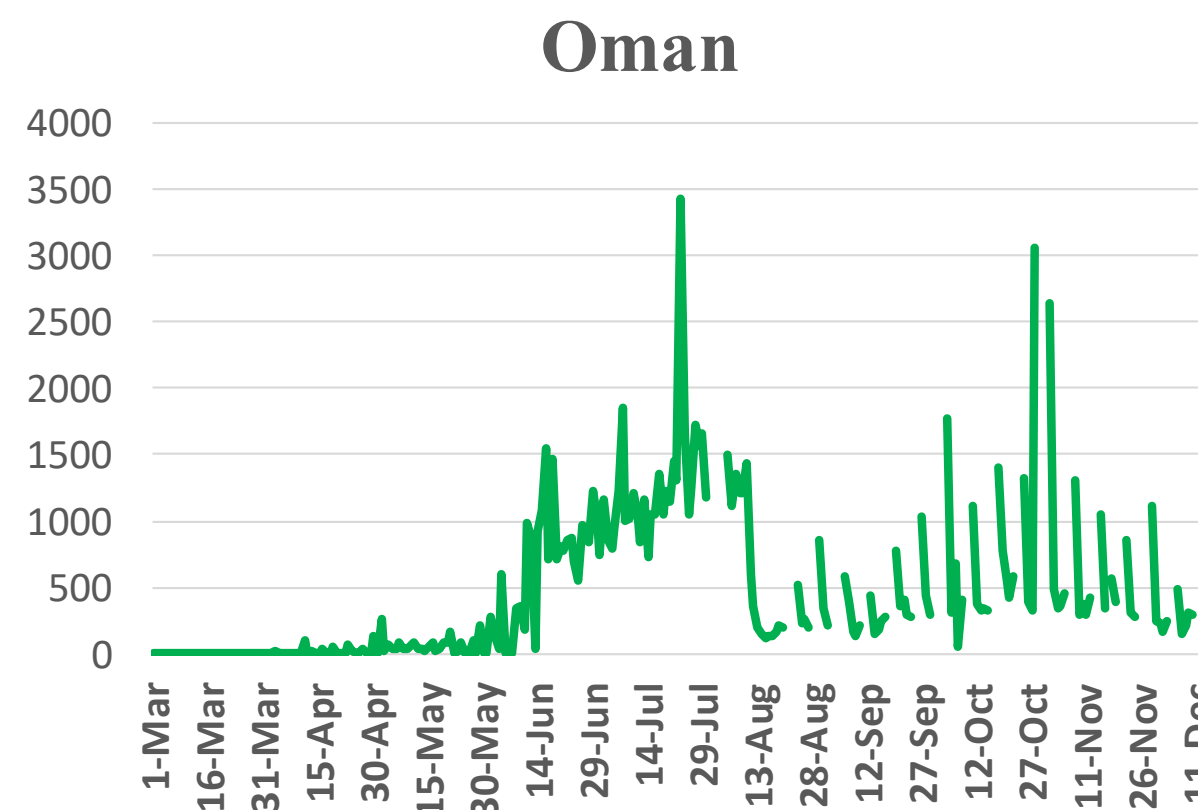
Figure 11: Comparative Analysis of the Distribution of COVID-19 Newly Recovered Cases in GCC Countries



Source : National Emergency Crisis and Disaster Management Authority

Source : KSA ministry of health

Source : Bahrain ministry of health



Source : Kuwait ministry of health

Source : Qatar ministry of health

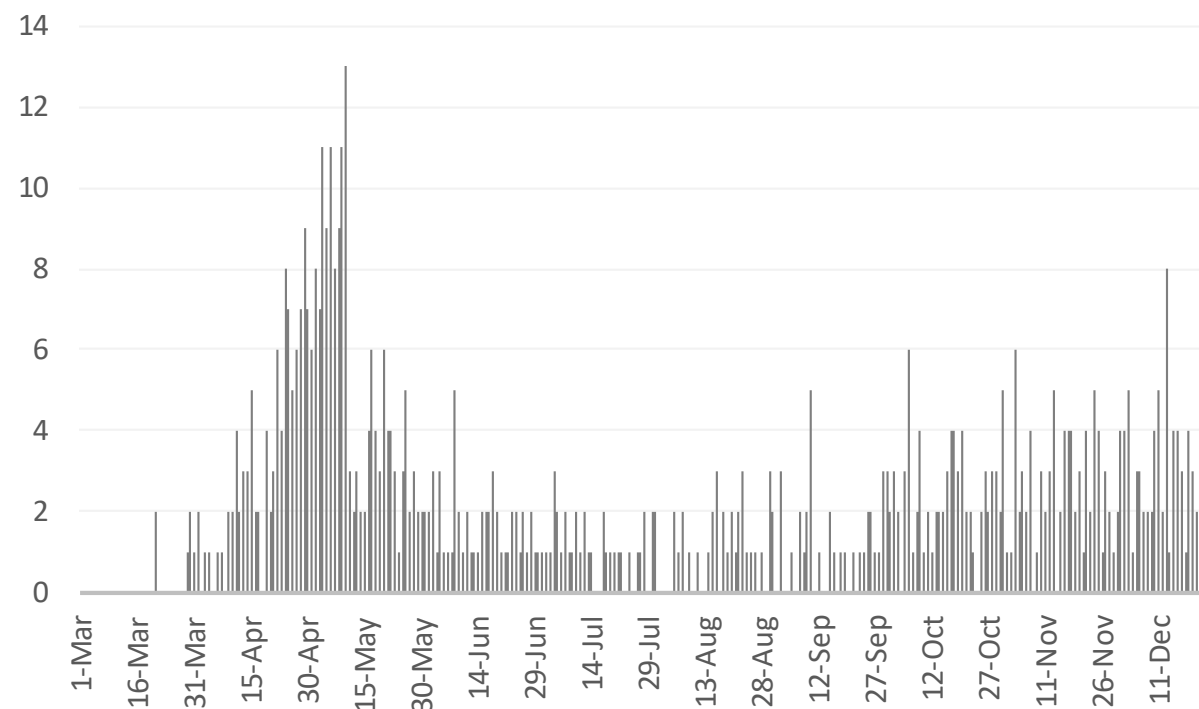
*No announced statistic data from 31 JUL 4 AUG, 21,23,28,30 AUG 2, 4 5,11,12,18,19,25,26,30 SEP,1,2,9,10,16,17,23,24,30,21 OCT, 6,7,13,14,17,20,21, 25,26,6 DEC

*No announced statistic data on weekends and official holidays.



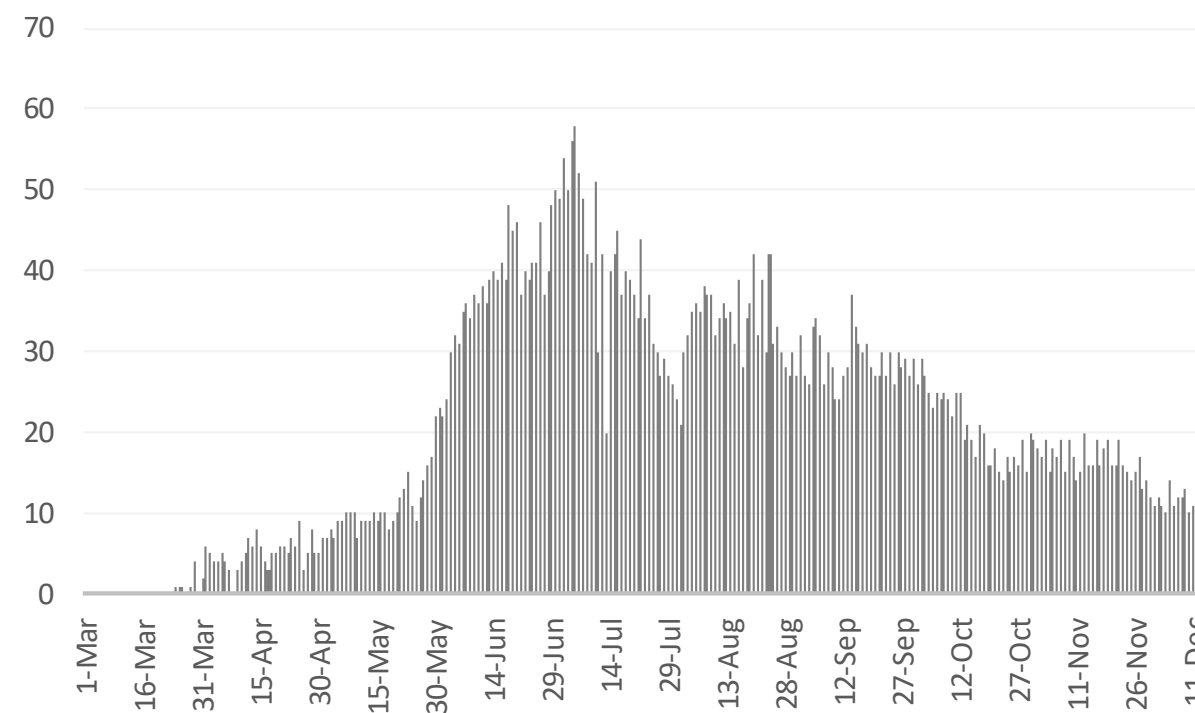
Figure 12: Comparative Analysis of the Distribution of COVID-19 New Death Cases in GCC Countries

UAE



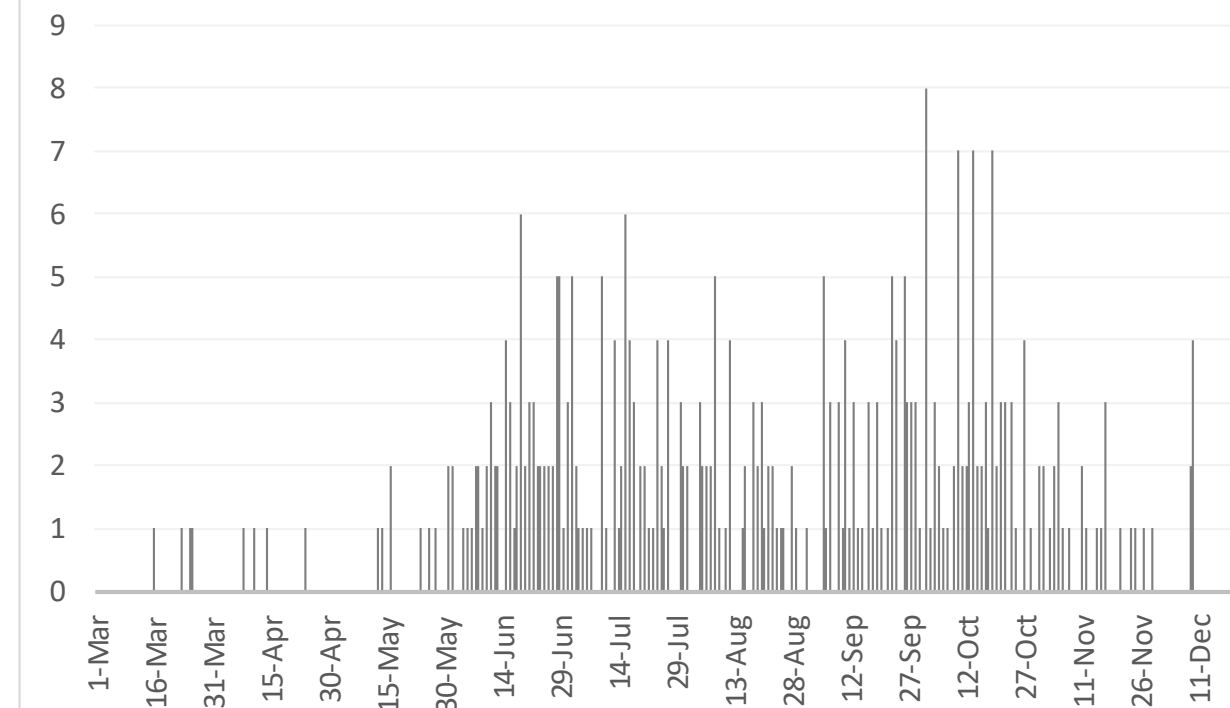
Source : National Emergency Crisis and Disaster Management Authority

KSA



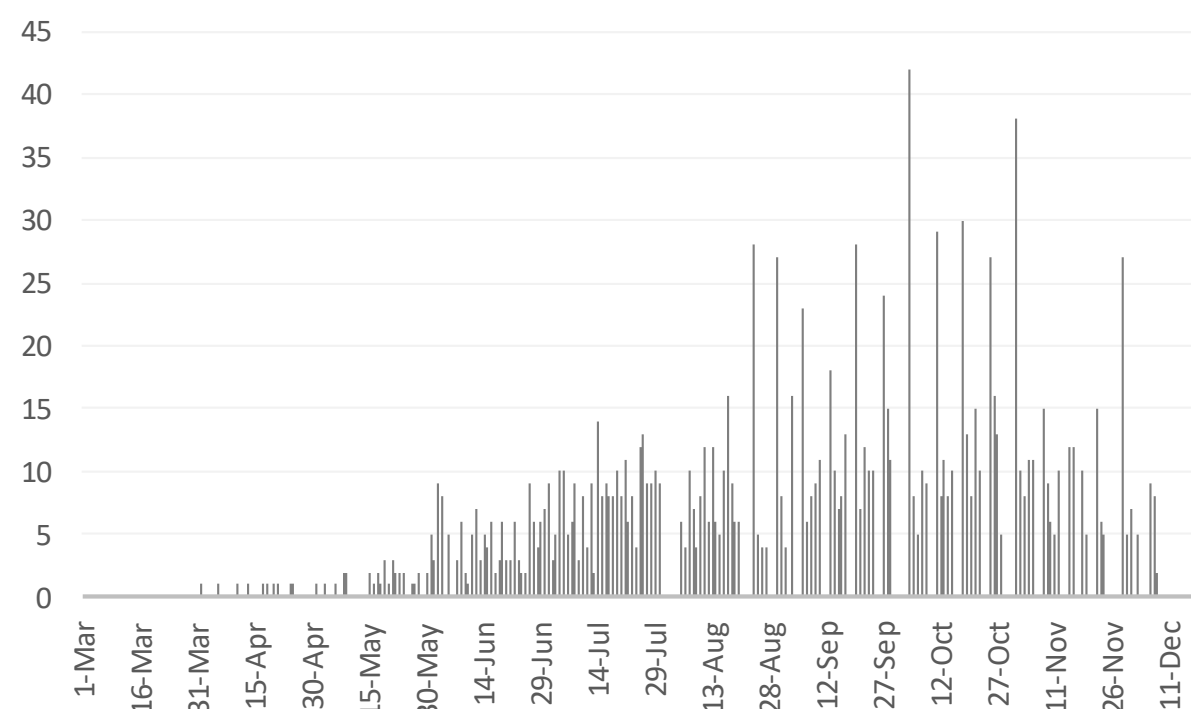
Source : KSA ministry of health

Bahrain



Source :WHO

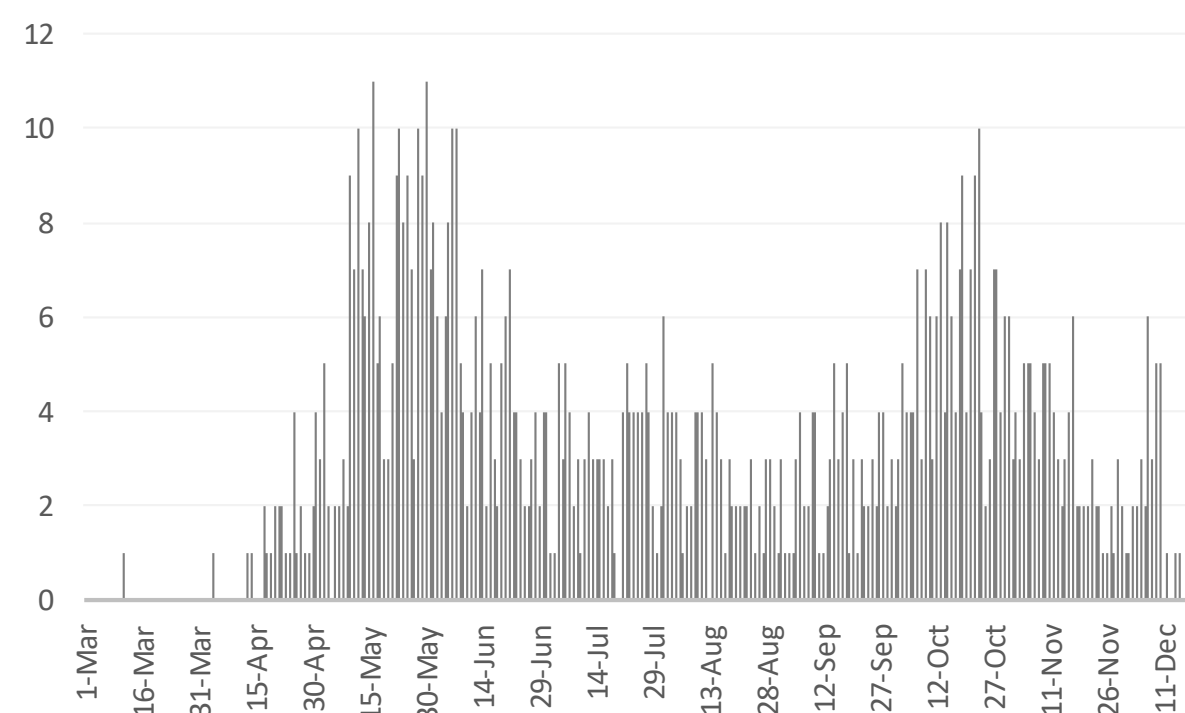
Oman



Source :Oman ministry of health

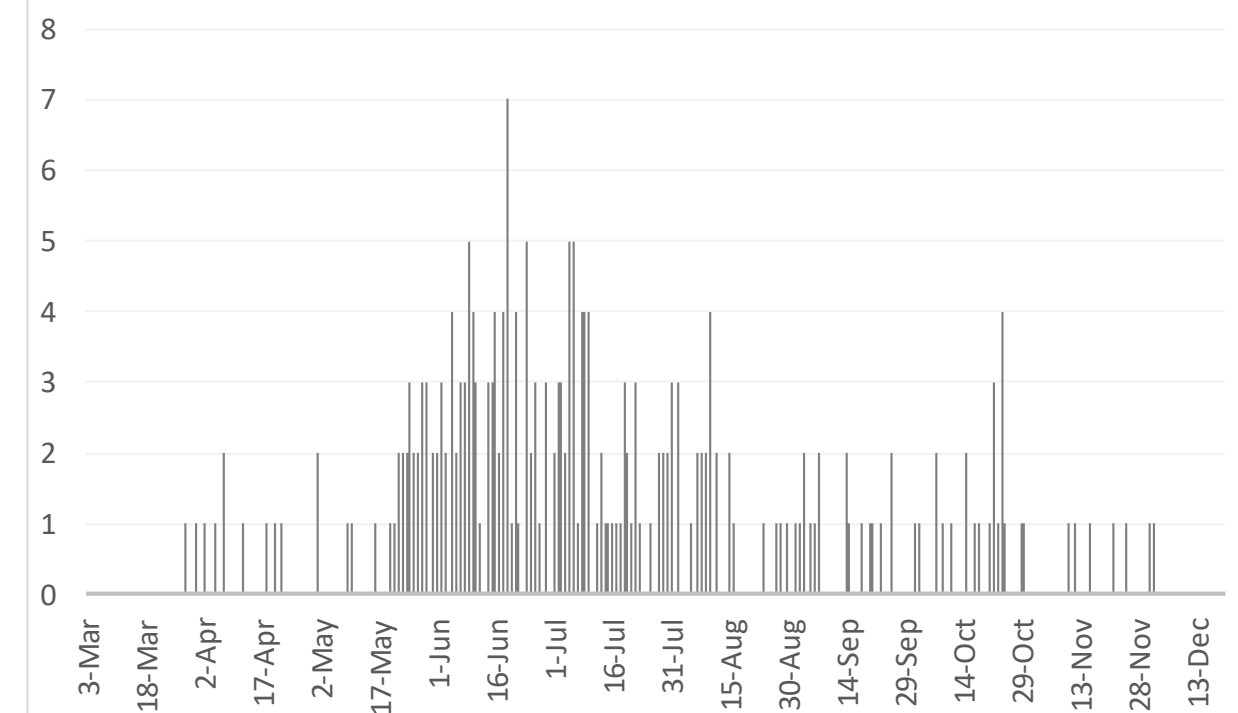
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Kuwait



Source : Kuwait ministry of health

Qatar



Source : Qatar ministry of health

*No announced statistic data from 31 JUL 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, 6,7,13,14,17,20,21,25,26,6 DEC
*No announced statistic data on weekends and official holidays.





Article 1

Investigation of novel SARS-COV-2 Variant of Concern 202012/01

Published

21 DEC 2020 , [PHE website](#)

- **Location:** The cluster has spread geographically. As of 20 December 2020, the regions in England with the largest number of confirmed cases with the variant are London, South East and East of England regions.
- **Distribution timeline:**
- Of the 962 cases in the cluster, data was available for 915 individuals; most specimen dates were in November (828/915) followed by October (79/915), with a small number of cases in September (4/915). Distribution of cases by patient sex is similar (51% female, 49% male). By age, just under 90% of individuals are aged <60 years
- S- gene concern:
- The UK has a high throughput national testing system for community cases based in a small number of large laboratories. Three of these laboratories use a three target assay (N, ORF1ab, S) from Thermo Fisher (TaqPath). Currently more than 97% of pillar 2 PCR tests which test negative on the S-gene target and positive on other targets are due to the VOC (Variant Of Concern)

Table 2. Percent of all Pillar 2 Δ 69-70 sequences by week that are the new variant, B.1.1.7.

Week beginning	Percent new variant of all Δ 69-70
2020-10-12	5%
2020-10-19	15%
2020-10-26	32%
2020-11-02	54%
2020-11-09	78%
2020-11-26	86%
2020-11-23	94%
2020-11-30	96%



Continued

Genomic characteristics of the VOC:

- The new variant is defined by 23 mutations:
- 13-non synonymous mutations, 4 deletions and 6 synonymous mutations.
- The non-synonymous mutations include a series of spike protein mutations (Table 1).
 - Other notable mutations include a stop codon in **ORF8**.
 - There are 6 synonymous mutations with 5 in **ORF1ab** (C913T, C5986T, C14676T, C15279T, C16176T), and one in the M gene (T26801C).
 - **This is an unusually large number of mutations in a single cluster.**
- Note the N501Y mutation have been assessed in the modelling study of transmissibility. (*Please read the note in the risk assessment on page 18*)

Table 1

gene	nucleotide	amino acid
ORF1ab	C3267T	T1001I
	C5388A	A1708D
	T6954C	I2230T
	11288-11296 deletion	SGF 3675-3677 deletion
spike	21765-21770 deletion	HV 69-70 deletion
	21991-21993 deletion	Y144 deletion
	A23063T	N501Y
	C23271A	A570D
	C23604A	P681H
	C23709T	T716I
	T24506G	S982A
	G24914C	D1118H
Orf8	C27972T	Q27stop
	G28048T	R52I
	A28111G	Y73C
N	28280 GAT->CTA	D3L
	C28977T	S235F



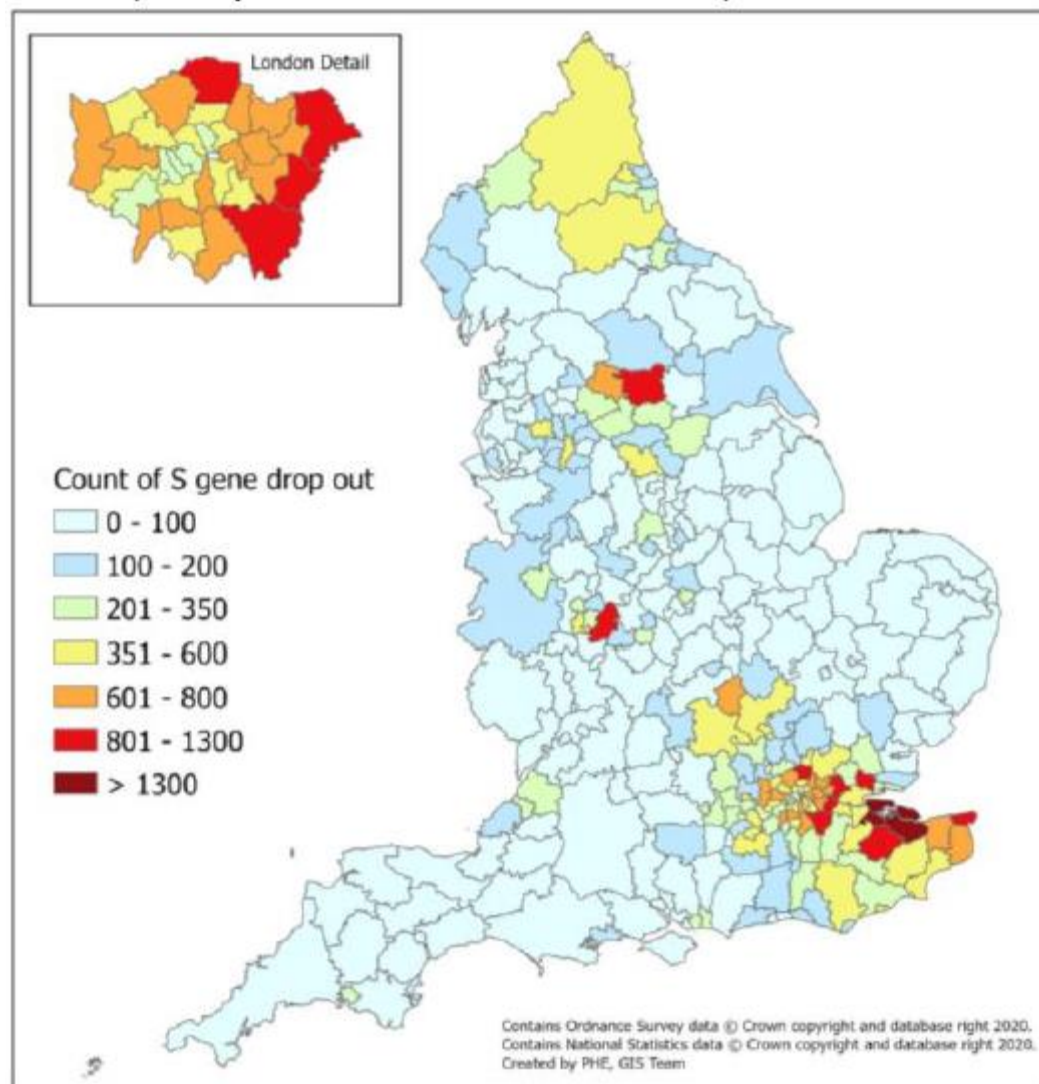
Article 2

Published

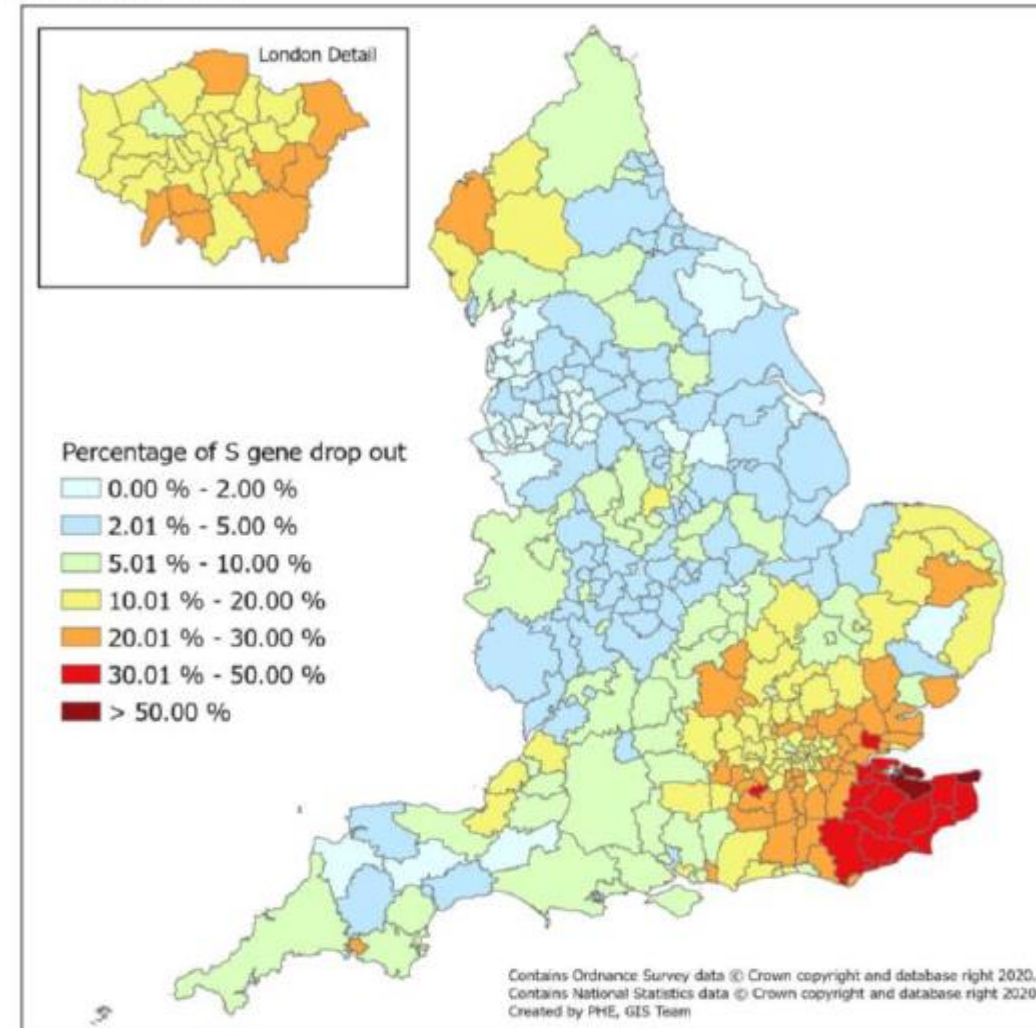
New evidence on VUI 202012/01 and review of the public health risk assessment

Data corrected as December 15, 2020 [PHE website](#)

Number of confirmed cases of S gene target failure reported by MK, AP and GG Lighthouse labs (1 September – 13 December)



Proportion (%) of S-gene target failure cases in comparison to all COVID-confirmed cases from MK AP and GG Lighthouse labs (1 September – 13 December)





Article 3

UK confirmed case numbers

*Cases confirmed by sequencing are likely to underrepresent total number of cases

**No new genomics data reported from COG-UK in the last 24 hours

VUI-202012/01 cases identified* (data correct as of 15:00 hrs 16/12/2020).

Total confirmed cases in the UK	New cases	% change
1439	4	<0.01
Total presumptive cases in the UK	New presumptive cases	% change
36	0	0

N501Y cases identified* (data correct as of 15:00 hrs 16/12/2020).

Total confirmed cases in the UK	New cases	% change
550	53	10.7





Risk assessment results of the UK new Variant of SARS-COV2



Risk Assessment

Indicator	Risk assessment framework				Assessment (Confidence*) and rationale
Zoonotic emergence	Animal reservoir identified but no evidence of transmission from animals to humans	Sporadic transmission from animals to humans	Frequent transmission from animals to humans		NOT APPLICABLE No evidence of a zoonotic reservoir at present.
Transmissibility between humans	No demonstrated person to person transmission	Limited human case clusters	Established human to human transmission, which appears similar to wild type virus	Transmissibility appears greater than the wild type virus	RED (LOW CONFIDENCE OR MODERATE CONFIDENCE?) Preliminary modelling suggests this lineage has a high growth rate, potentially higher than other lineages co-circulating. This is biologically plausible since N501Y is in a position which could affect the receptor binding affinity of spike protein. Additional epidemiological investigations, continued surveillance and phenotypic studies are required to increase the confidence in this finding.
Infection severity	Evidence of less severe clinical picture or lower infection fatality than from wild type SARS-CoV-2 infections	Similar clinical picture and infection fatality to wild type SARS-CoV-2 infections OR experimental animal data suggesting potential for increased disease severity humans	More severe clinical picture or higher infection fatality than from wild type SARS-CoV-2 infections (limited to specific risk groups)	More severe clinical picture or higher infection fatality than from wild type SARS-CoV-2 infections	INSUFFICIENT INFORMATION There is no systematic data on this at present, and investigations are being urgently undertaken into deaths and hospital admissions amongst cases infected with the variant.
Susceptibility and immunity – natural infection	Evidence of no antigenic difference from other circulating wild type virus	Structural data suggesting antigenic difference from other circulating wild type virus	Experimental evidence of functional evasion of naturally acquired immunity	Evidence of frequent infection in humans with known prior infection with earlier virus variant.	AMBER (LOW CONFIDENCE) The N501Y variant in the spike receptor binding domain suggests that this variant may be antigenically distinct. There is no neutralisation data from polyclonal sera. The small number of possible reinfections in the variant cluster may support this but comparisons to reinfection rate in other lineages are required. Urgent neutralisation data is required.
Vaccines	Evidence of no structural or antigenic difference in vaccine targets	Structural data suggesting difference in vaccine target epitopes	Experimental evidence of functional evasion of vaccine derived immunity	Evidence of frequent vaccine failure or decreased effectiveness in humans	INSUFFICIENT INFORMATION There is insufficient information to assess the risk of evasion of vaccine derived immunity. Urgent neutralisation data is required.
Drugs and therapeutics	Evidence of no structural or antigenic difference in therapeutic targets	Structural data suggesting difference in therapeutic target epitopes	Experimental evidence of reduced drug susceptibility	Evidence of frequent drug or therapeutic failure or decreased effectiveness in humans	INSUFFICIENT INFORMATION There is insufficient information to assess the risk of reduced drug susceptibility. Consideration should be given to evaluation.

Comment: Additive model(unweighted): increase in R_t of 0.39 [0.24-0.55]. Multiplicative model: relative increase in R_t of 48% [27%-74%]

→ For example, under the additive assumption, an area with an R_t of 0.8 without the new variant would have an R_t of 1.19 [1.04-1.35] if only N501Y was present

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