

SCIENTIFIC RESEARCH MONITORING ON COVID-19

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SCIENTIFIC RESEARCH MONITORING ON COVID-19

(ISSUE 207)

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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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

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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Management

Prone Positioning for Acute Respiratory Distress Syndrome (ARDS)

Epidemiology

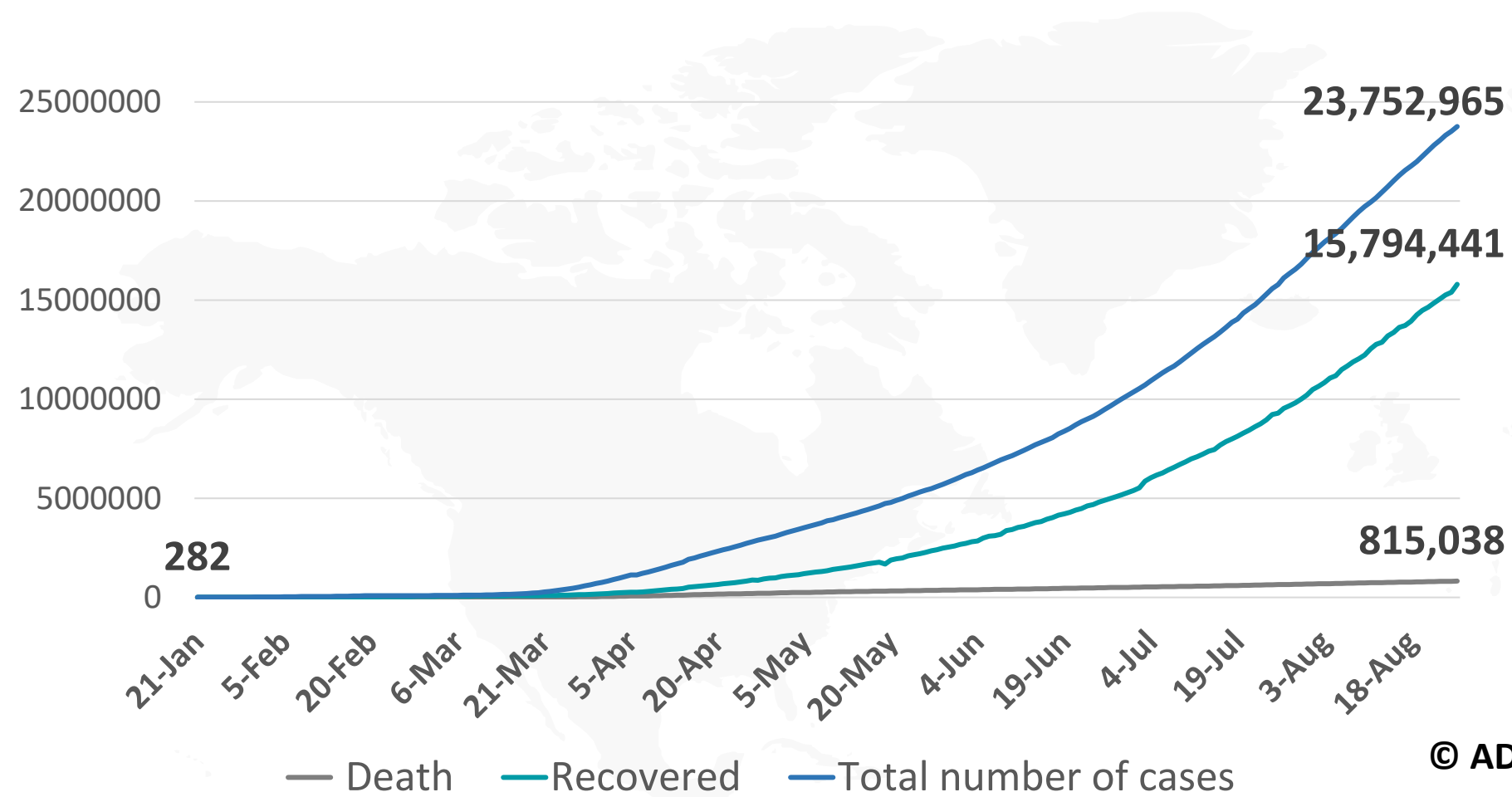
Epidemiology of COVID-19 Among Incarcerated Individuals and Staff in Massachusetts Jails and Prisons

Diagnosis

The COVID-19 XPRIZE and the Need for Scalable, Fast, and Widespread Testing



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)

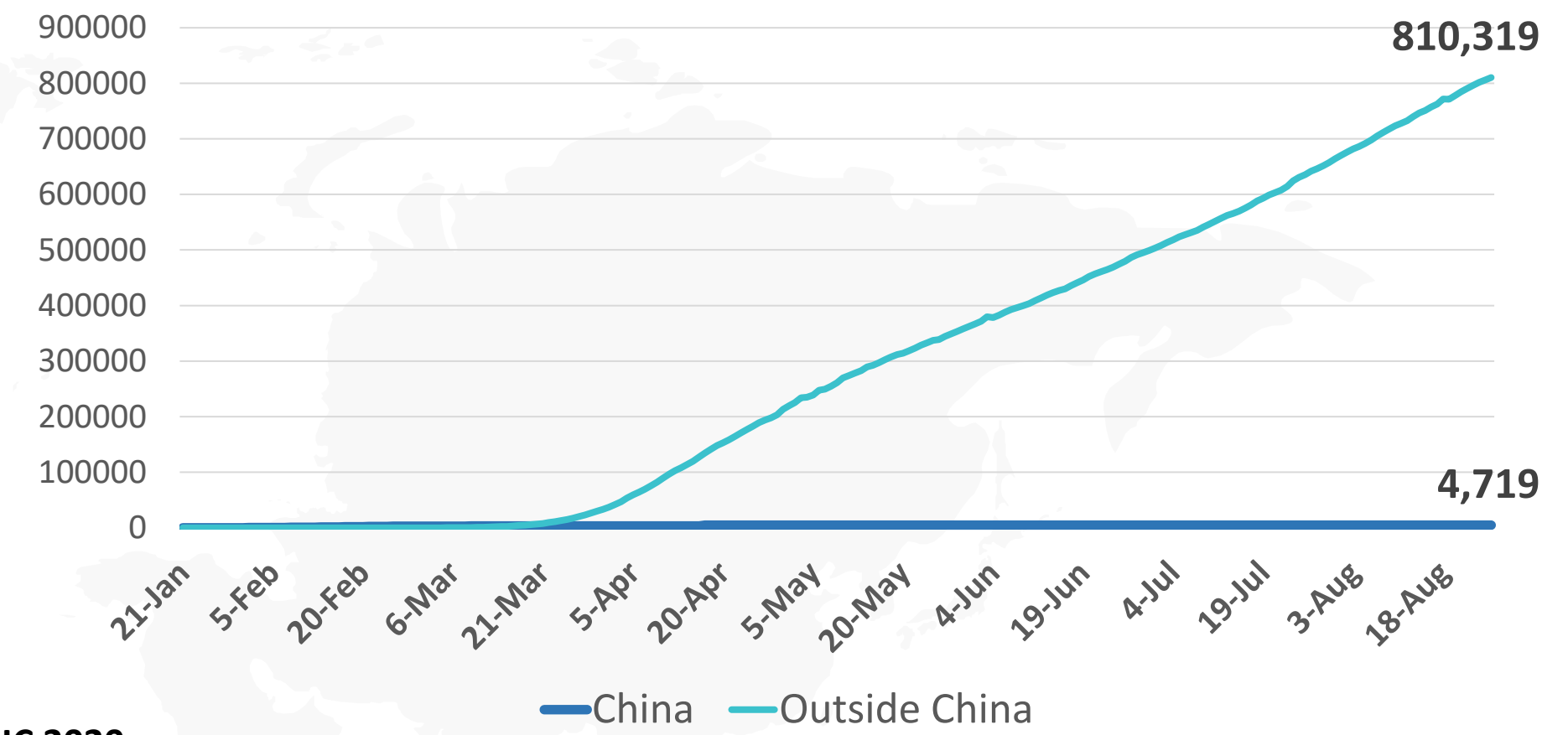


Figure 2: Daily New Infected COVID-19 Cases (China and rest of the world)

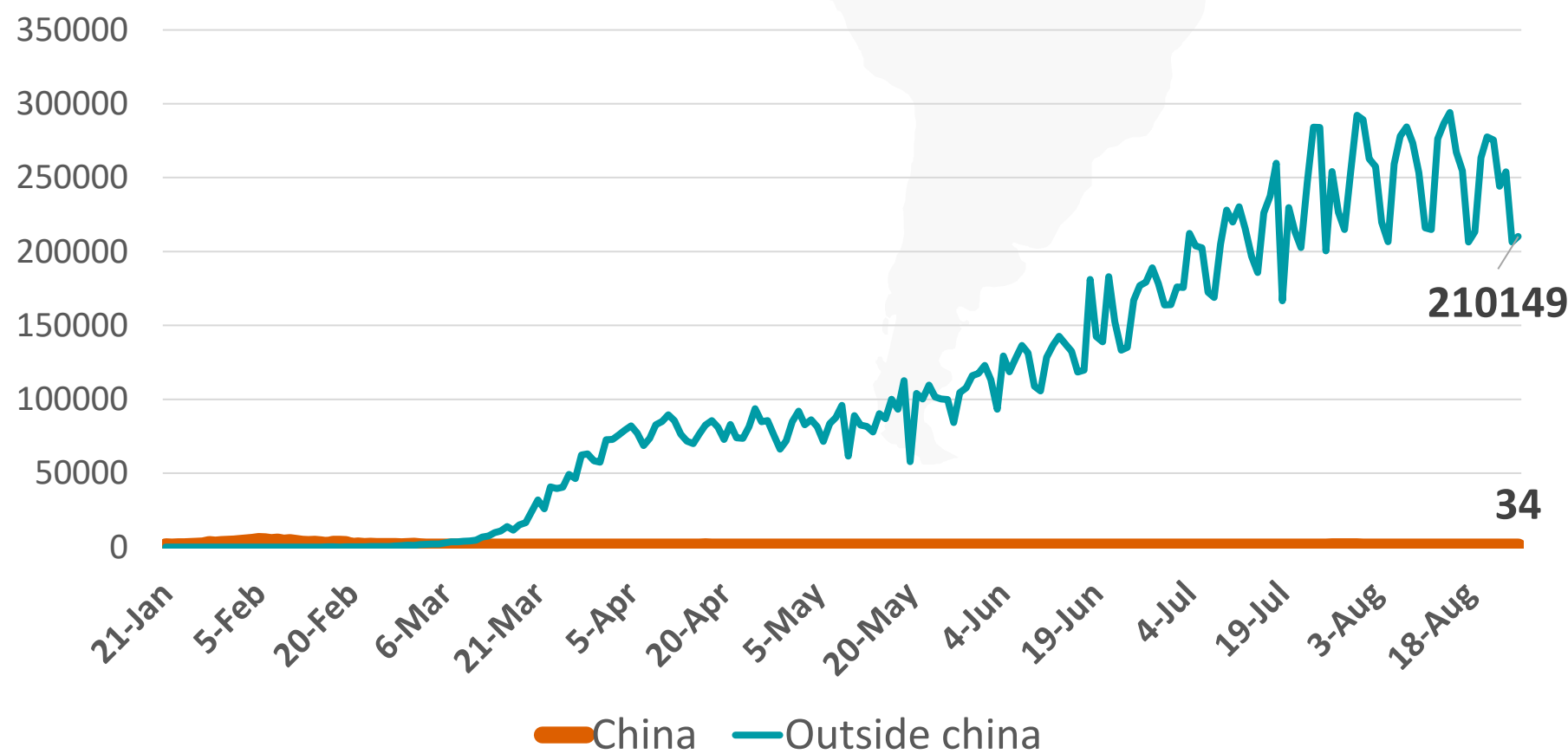


Figure 4: Global Daily New Deaths Due to COVID-19 (china and rest of the world)

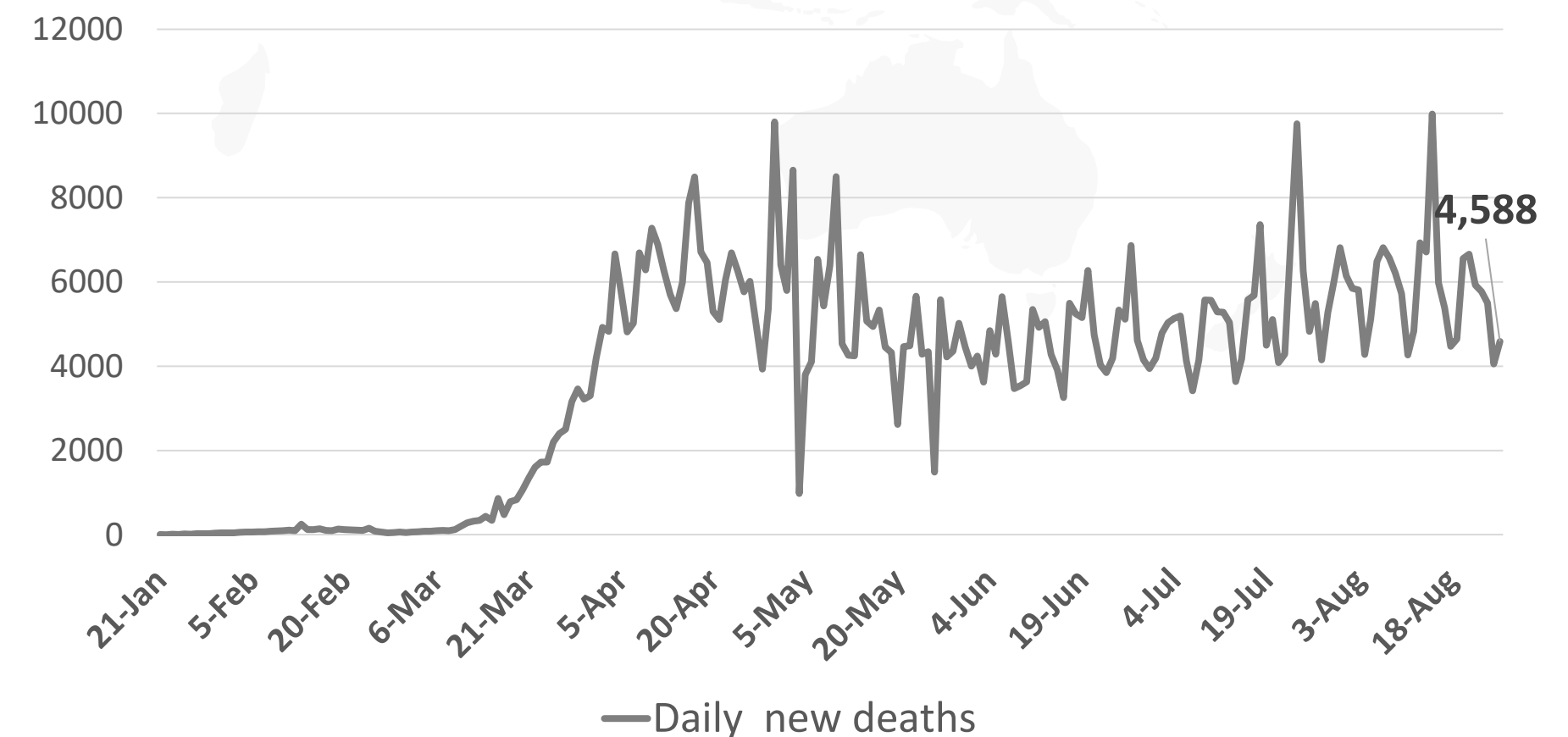
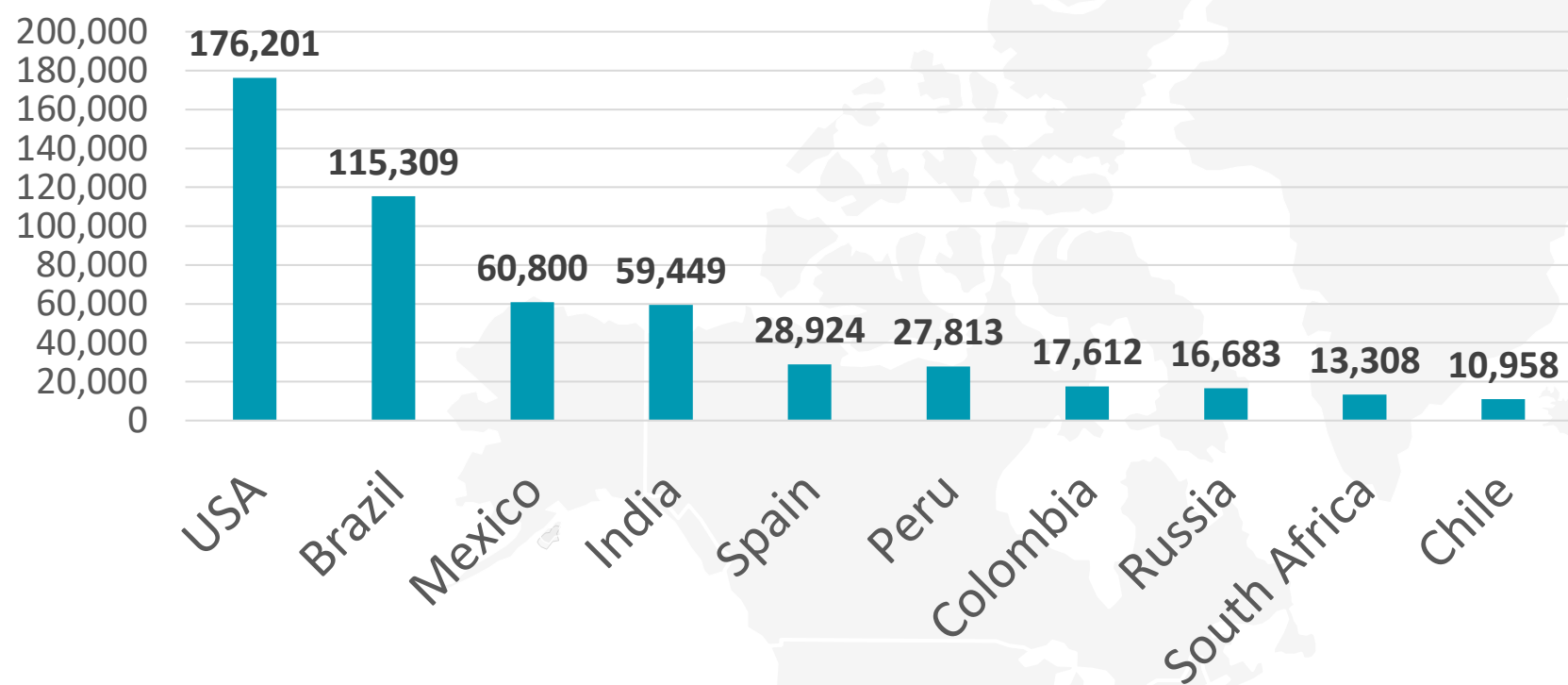
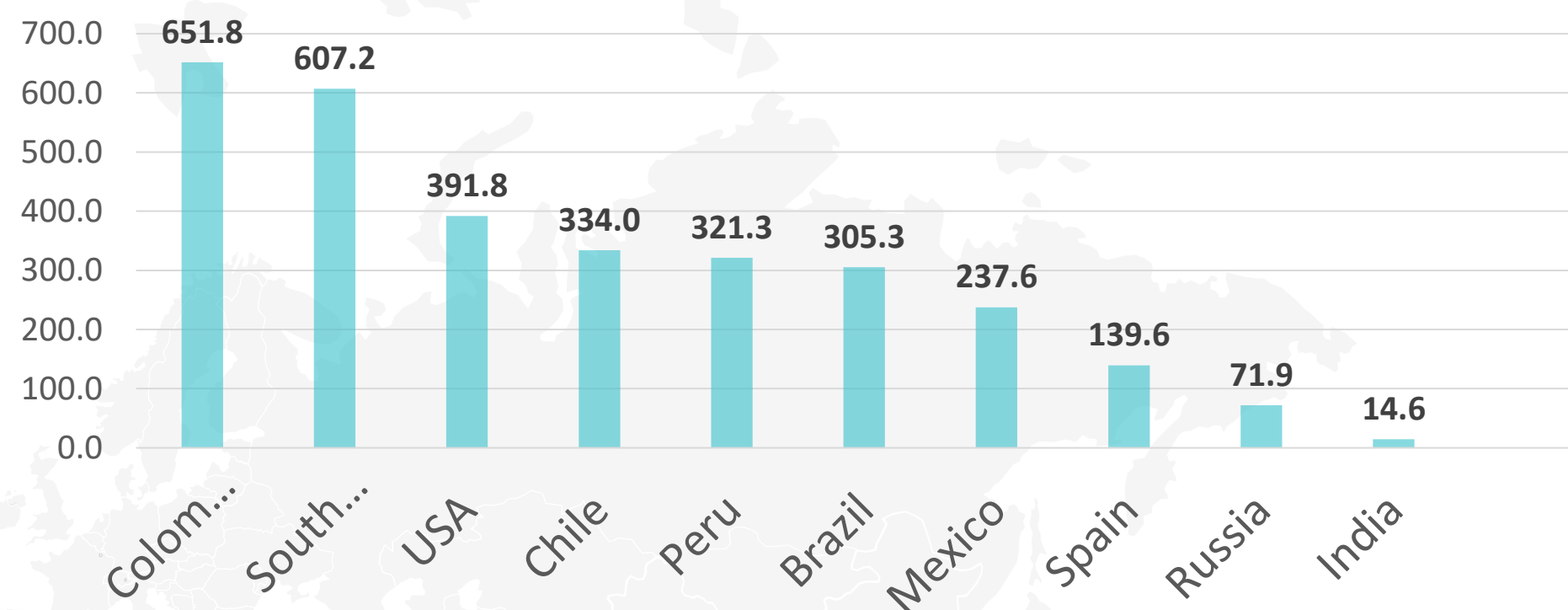


Figure 5: Top 10 Countries in the Total Number of Cases Due to COVID-19

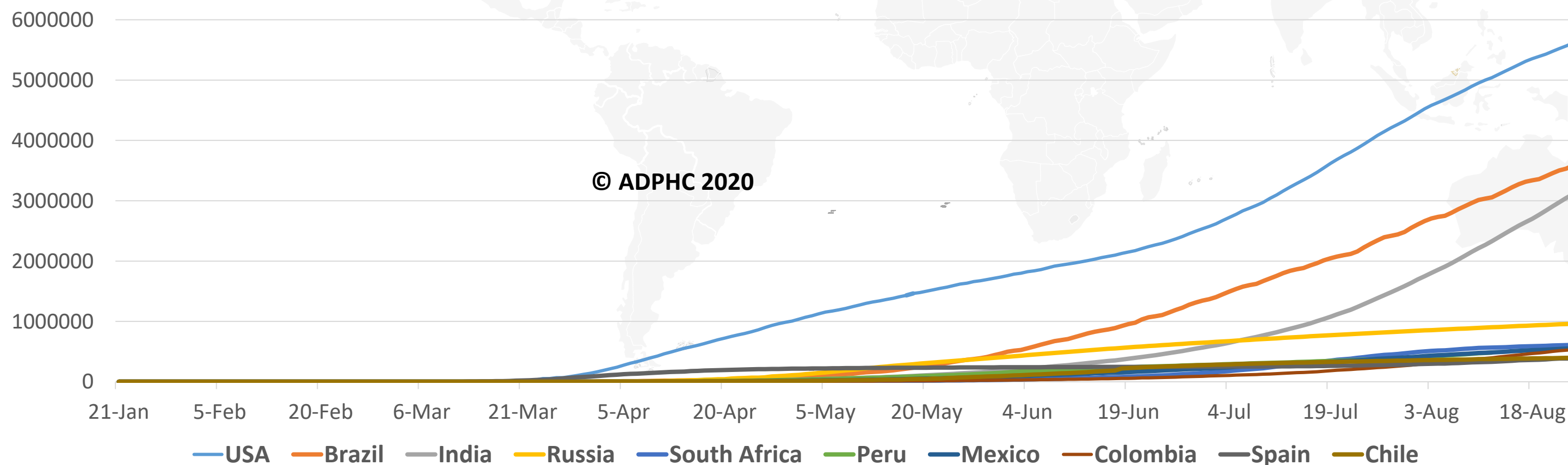
TOTAL DEATHS



DEATHS PER MILLION

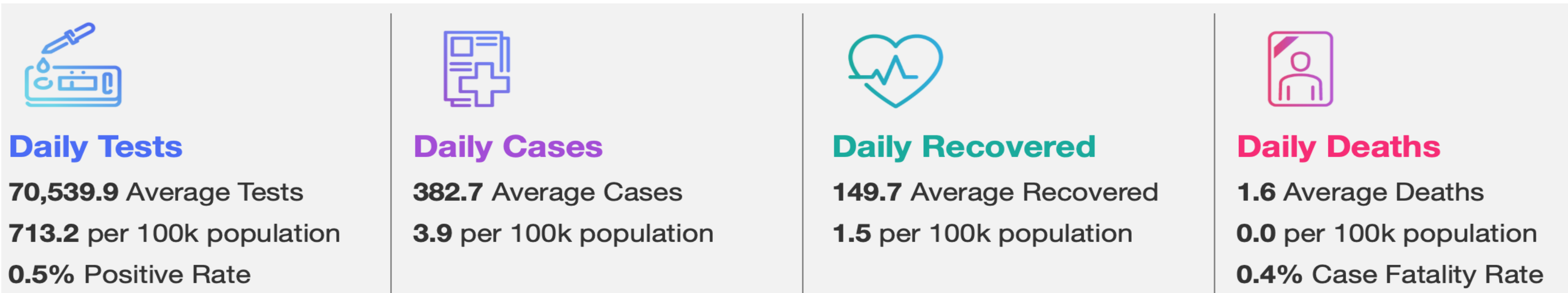


TOTAL INFECTED CASES



USA	5,682,811
Brazil	3,622,861
India	3,234,474
Russia	970,865
South Africa	613,017
Peru	600,438
Mexico	563,705
Colombia	551,696
Spain	412,553
Chile	400,985

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

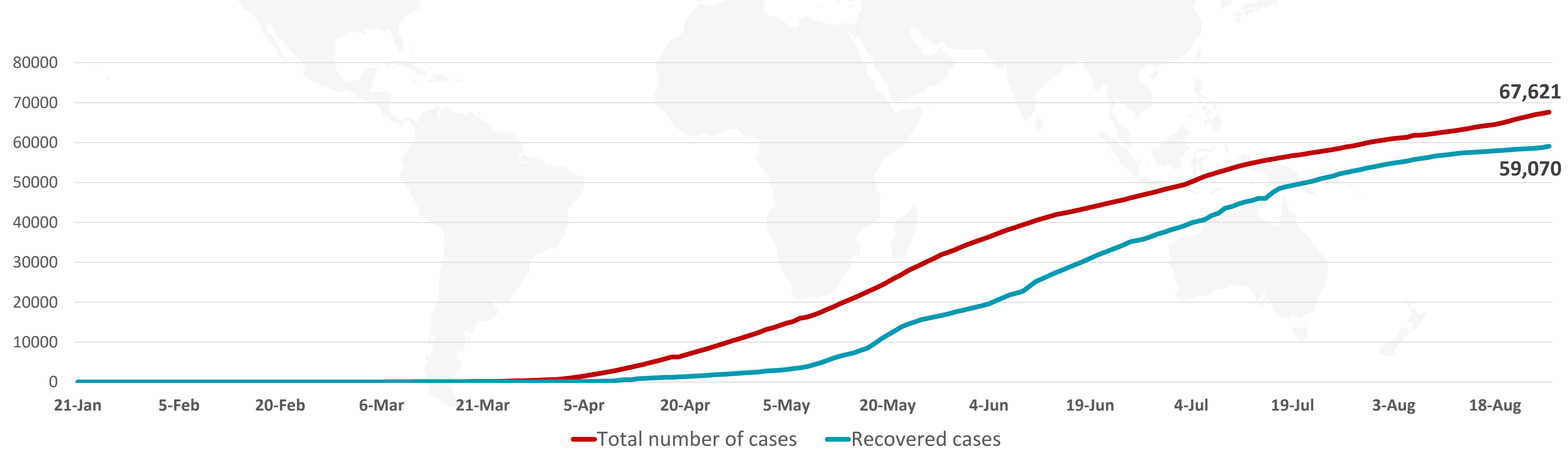
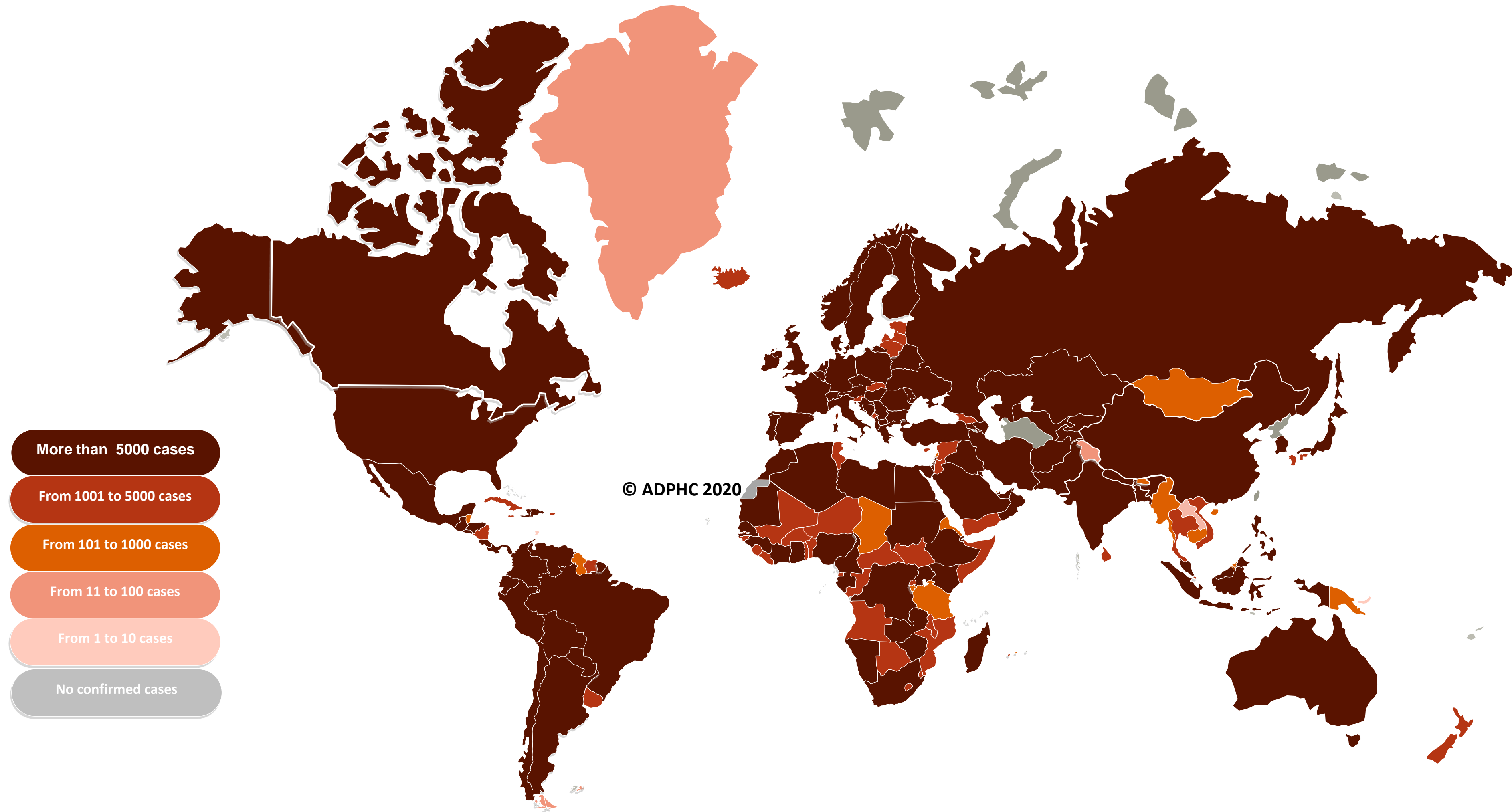


Figure 7A : Global Distribution of COVID-19 Cases



More than 5000 cases

From 1001 to 5000 cases

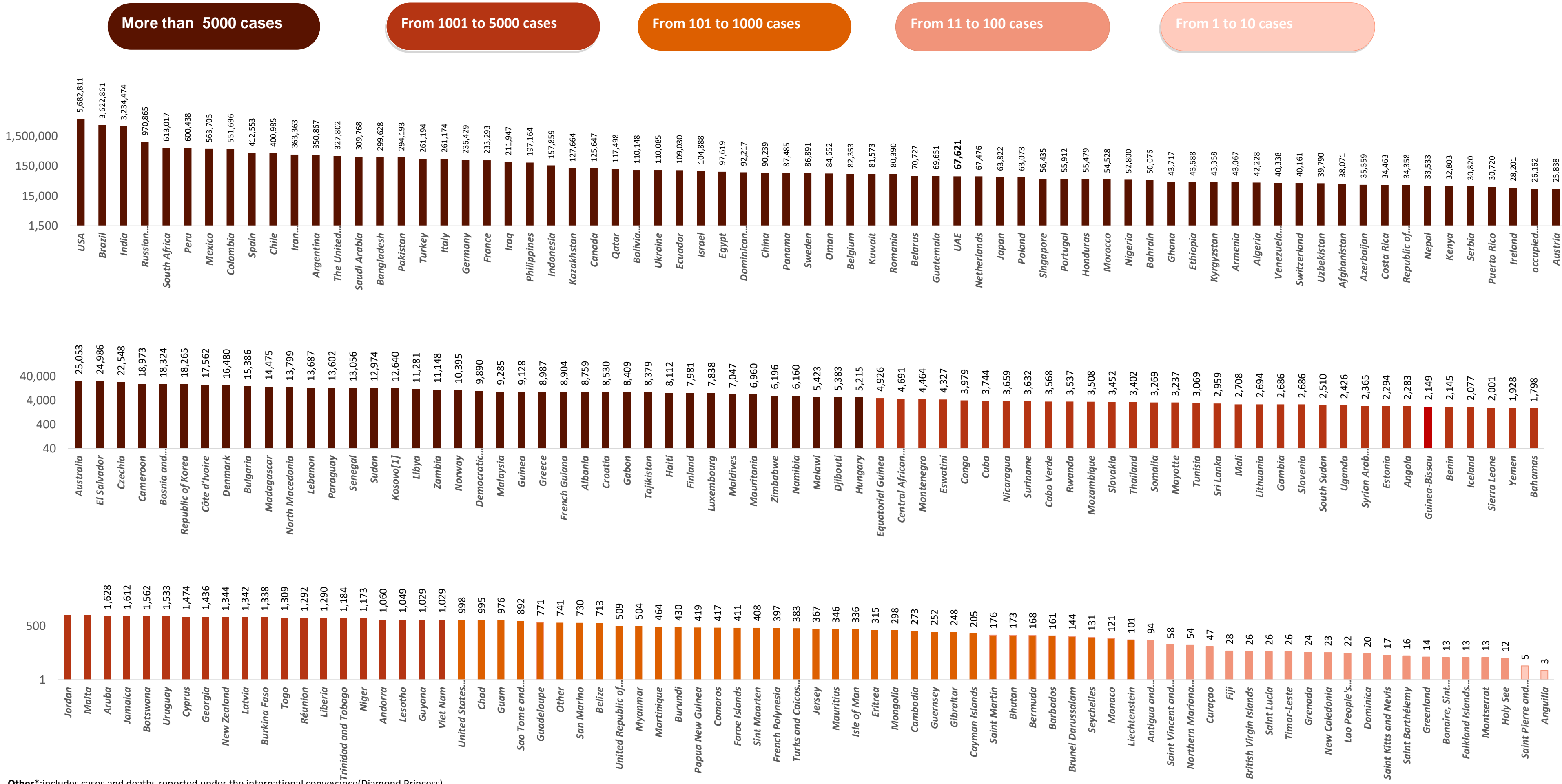
From 101 to 1000 cases

From 11 to 100 cases

From 1 to 10 cases

No confirmed cases

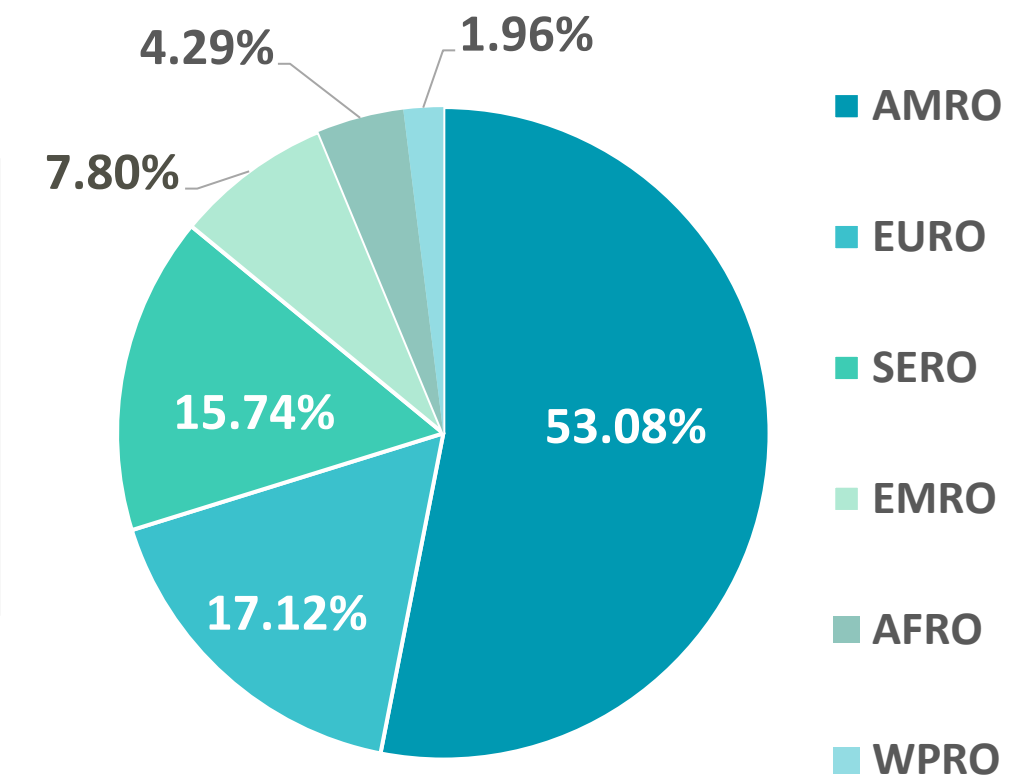
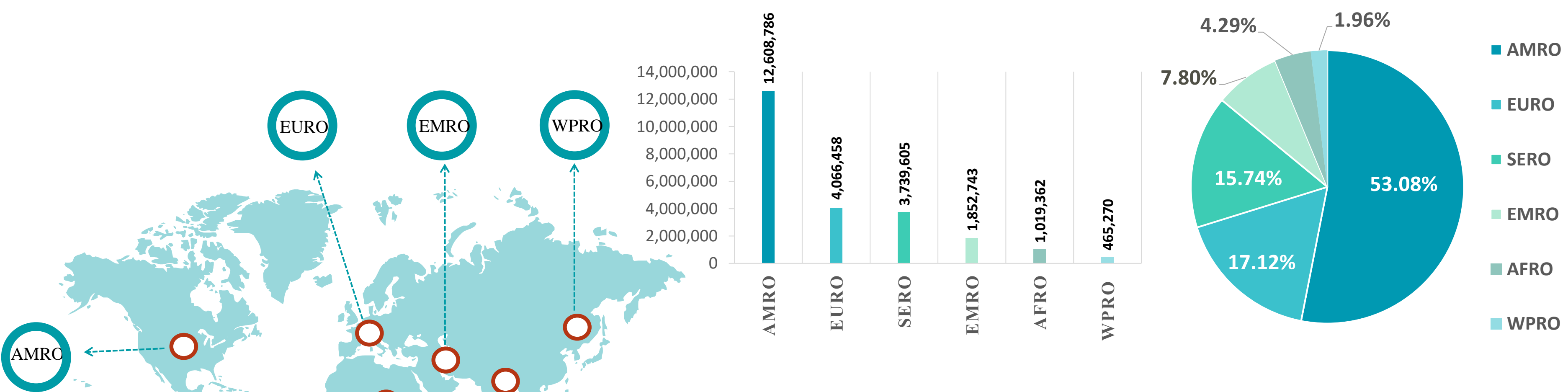
Figure 7B: Bar Chart Illustrates the Global Distribution of COVID19 Cases



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

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

INFECTED



DEATHS

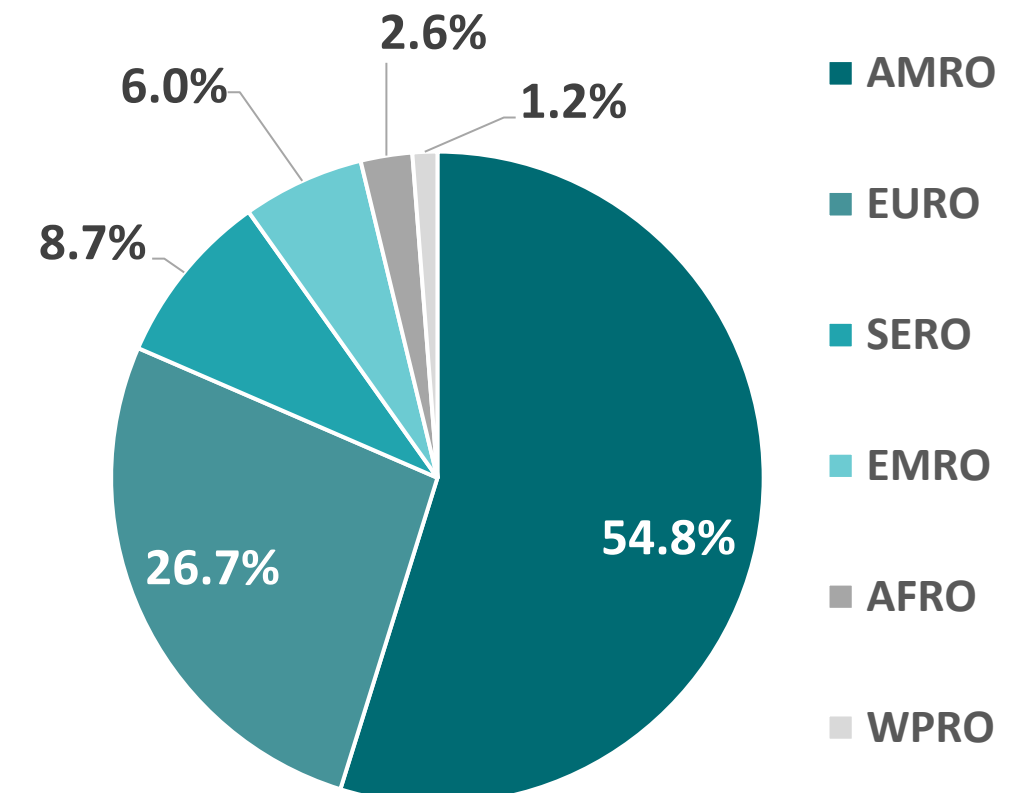
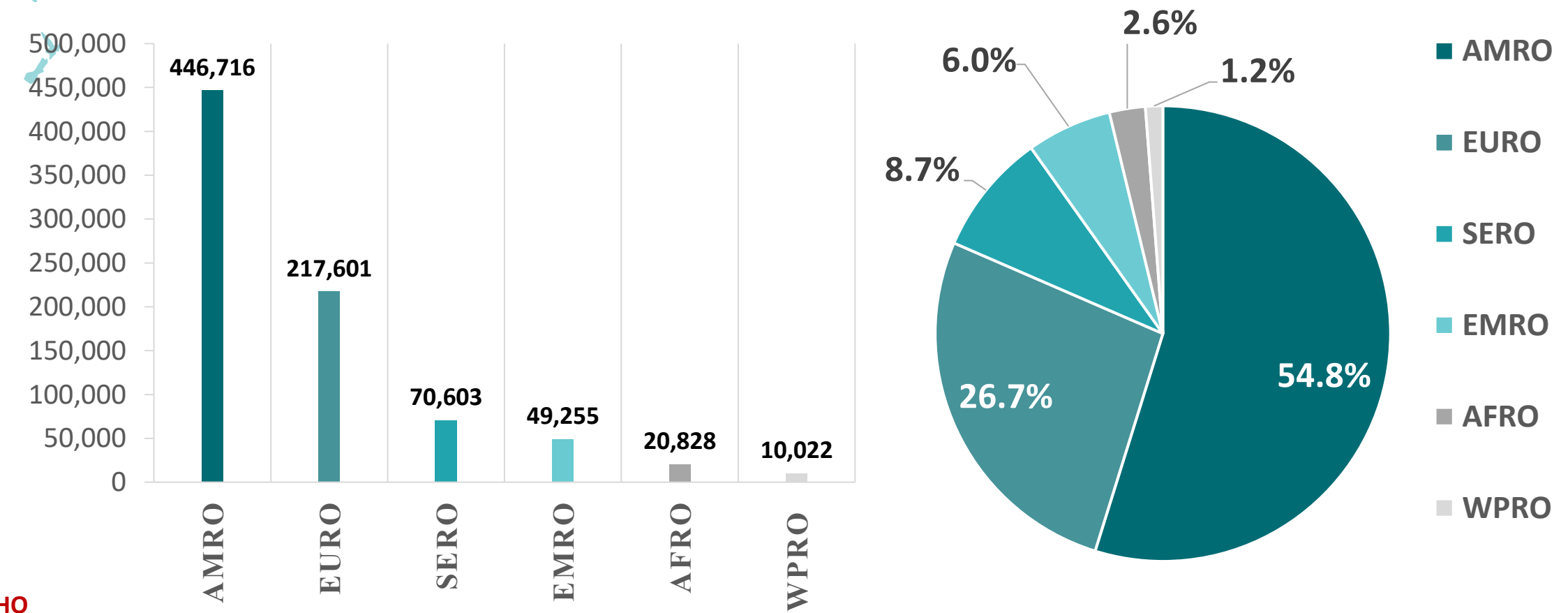
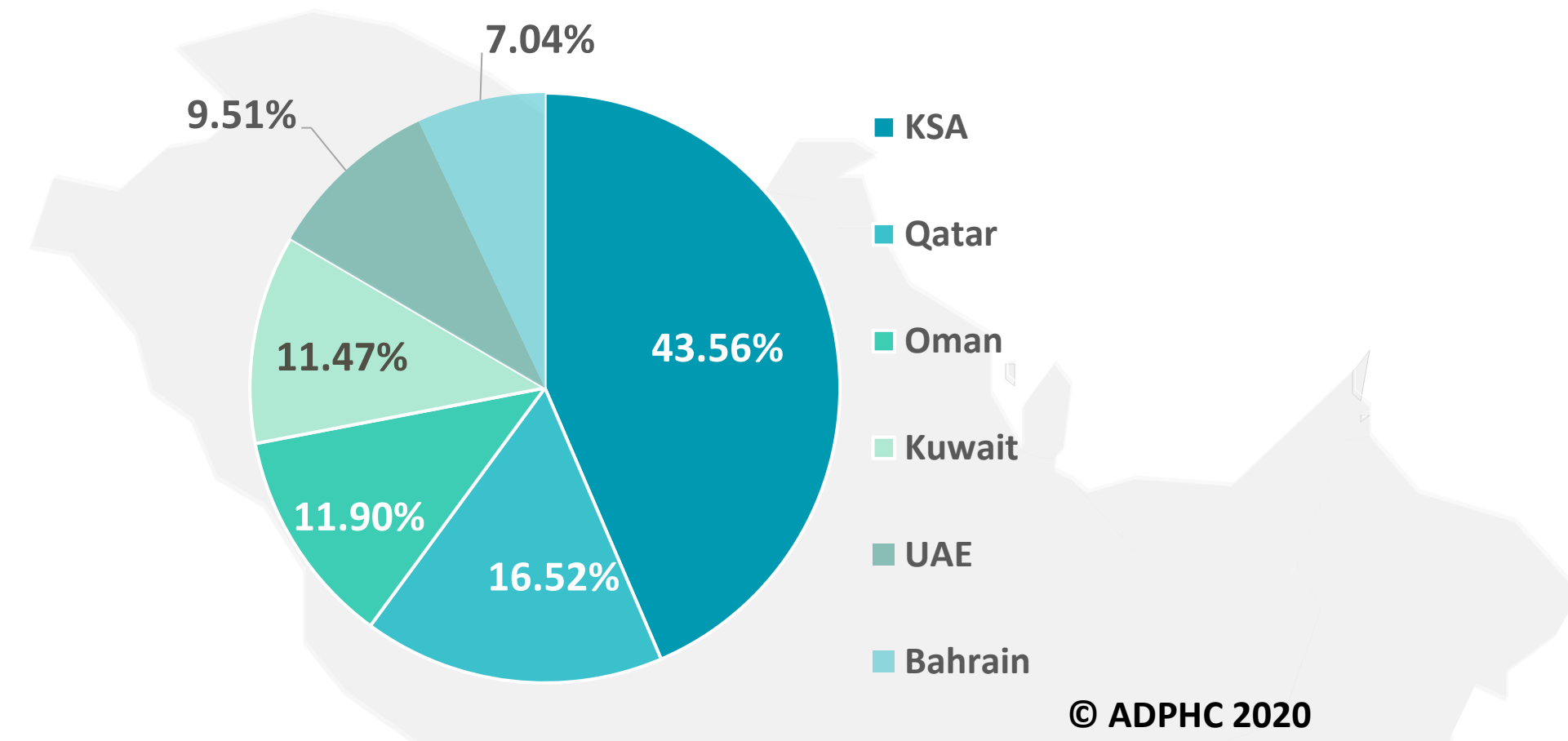
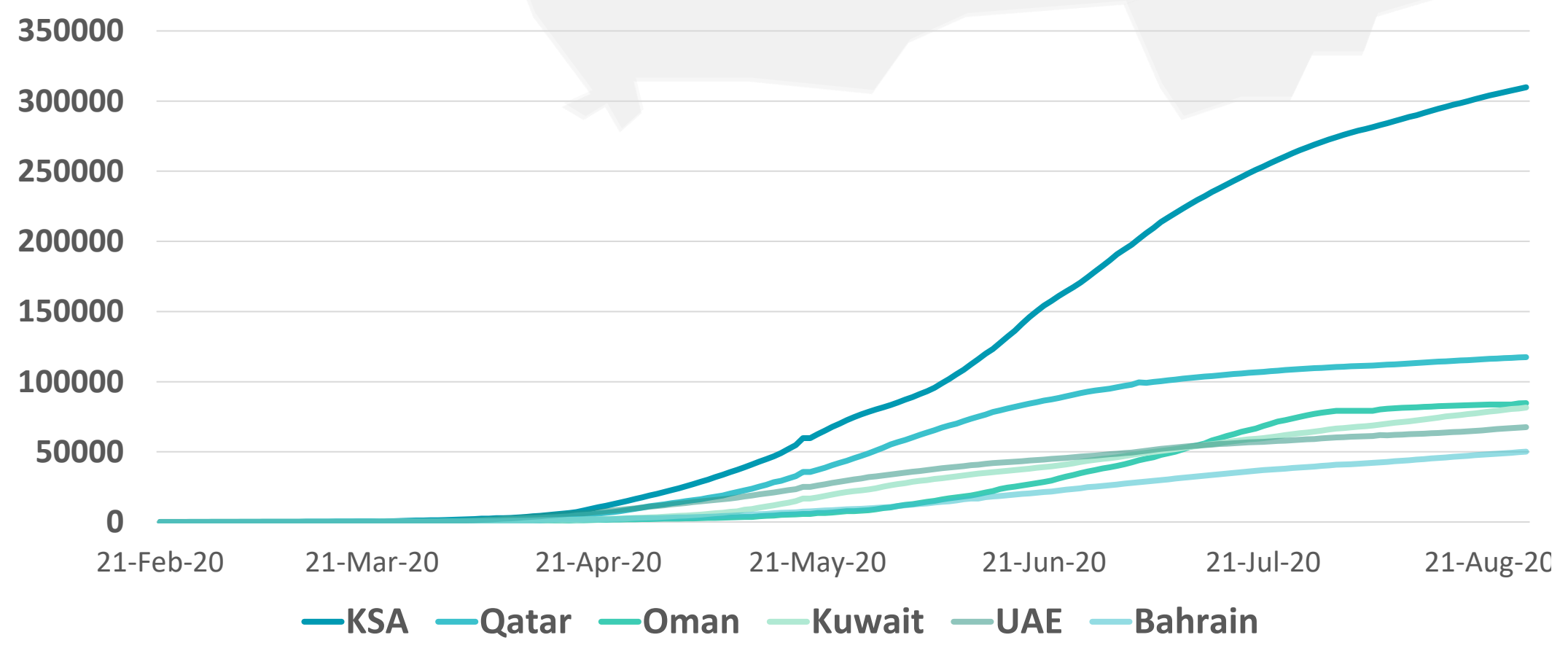
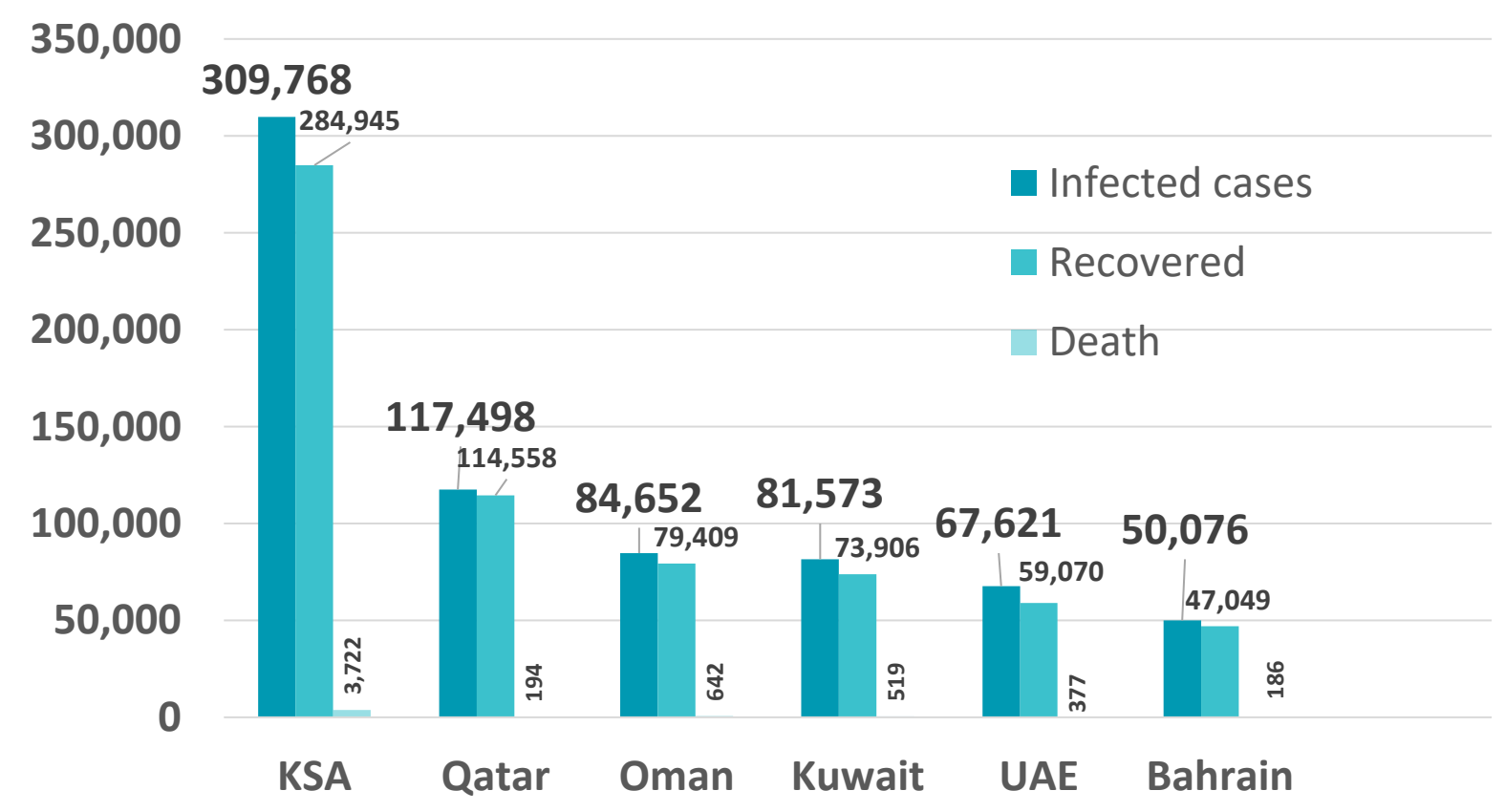


Figure 9: Comparative Analysis of the Distribution of COVID-19 Cases in GCC Countries

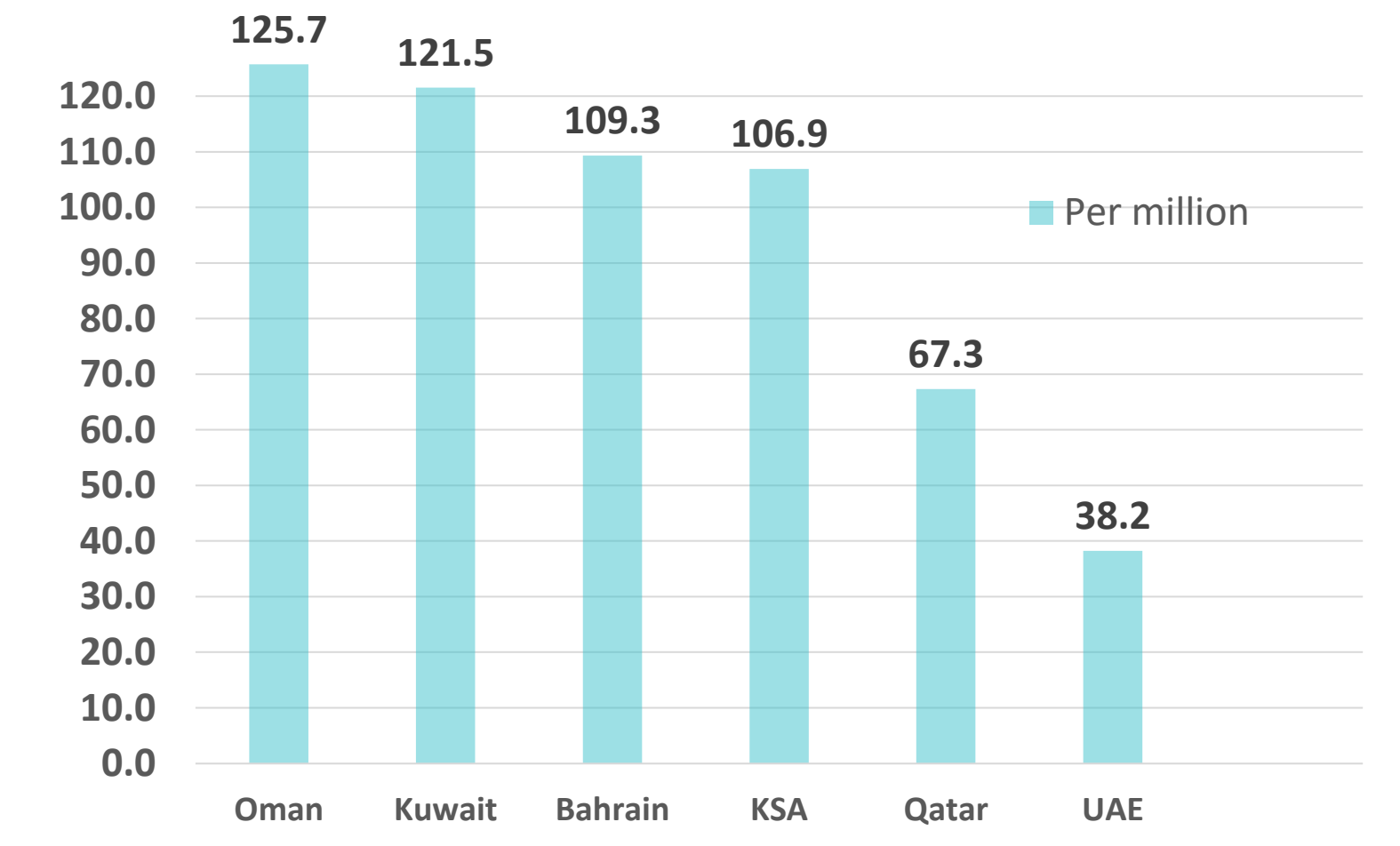
TOTAL NUMBER OF INFECTED CASES



TOTAL NUMBER OF INFECTED, RECOVERED AND DEATHS



DEATHS PER MILLION



Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: [WHO](https://www.who.int)

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

UAE



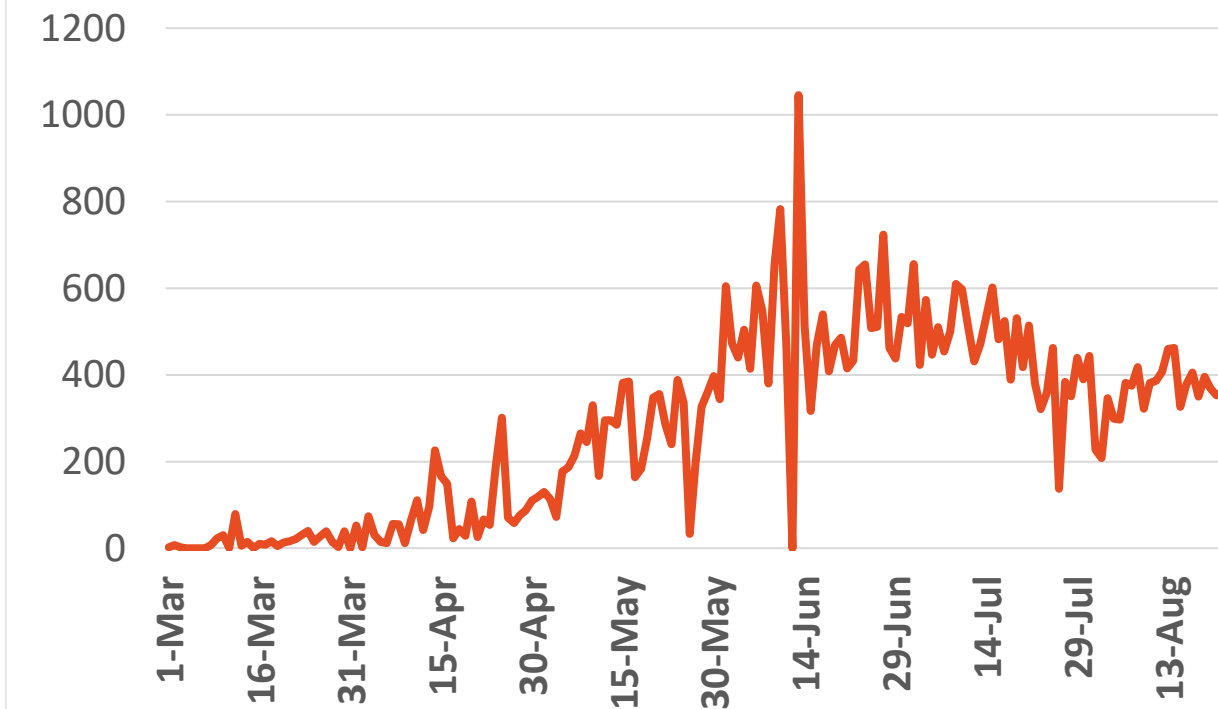
Source : National Emergency Crisis and Disaster Management Authority

KSA



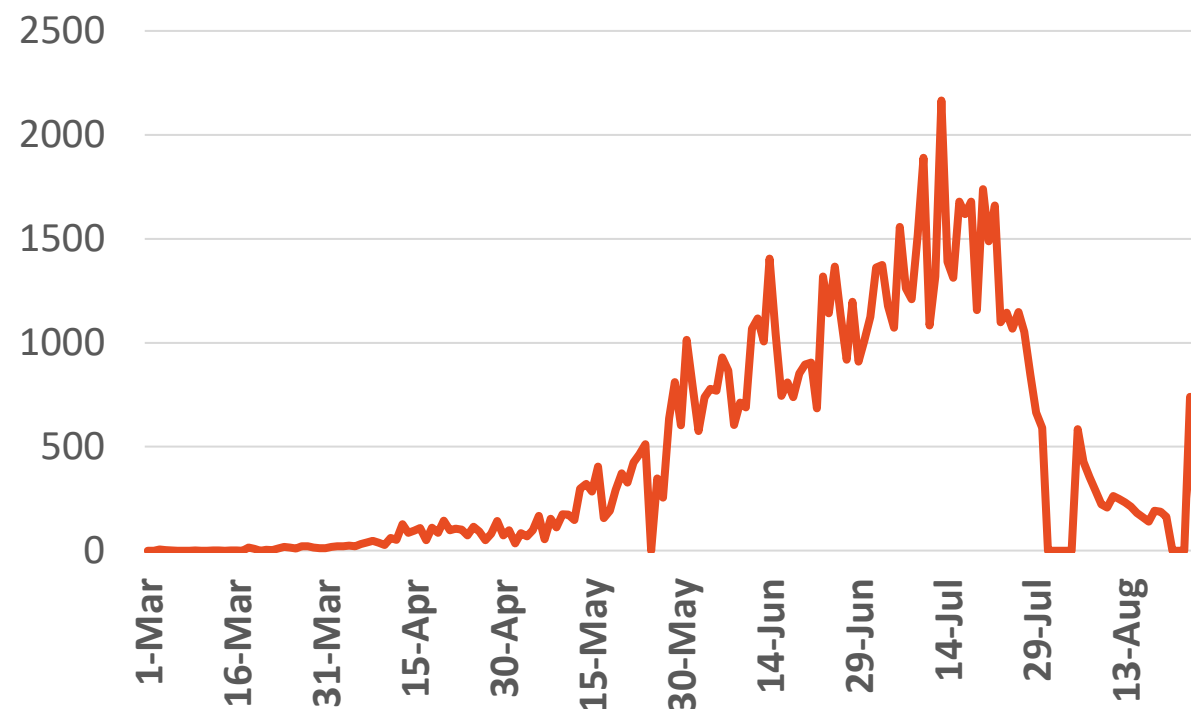
Source : KSA ministry of health

Bahrain



Source :WHO

Oman

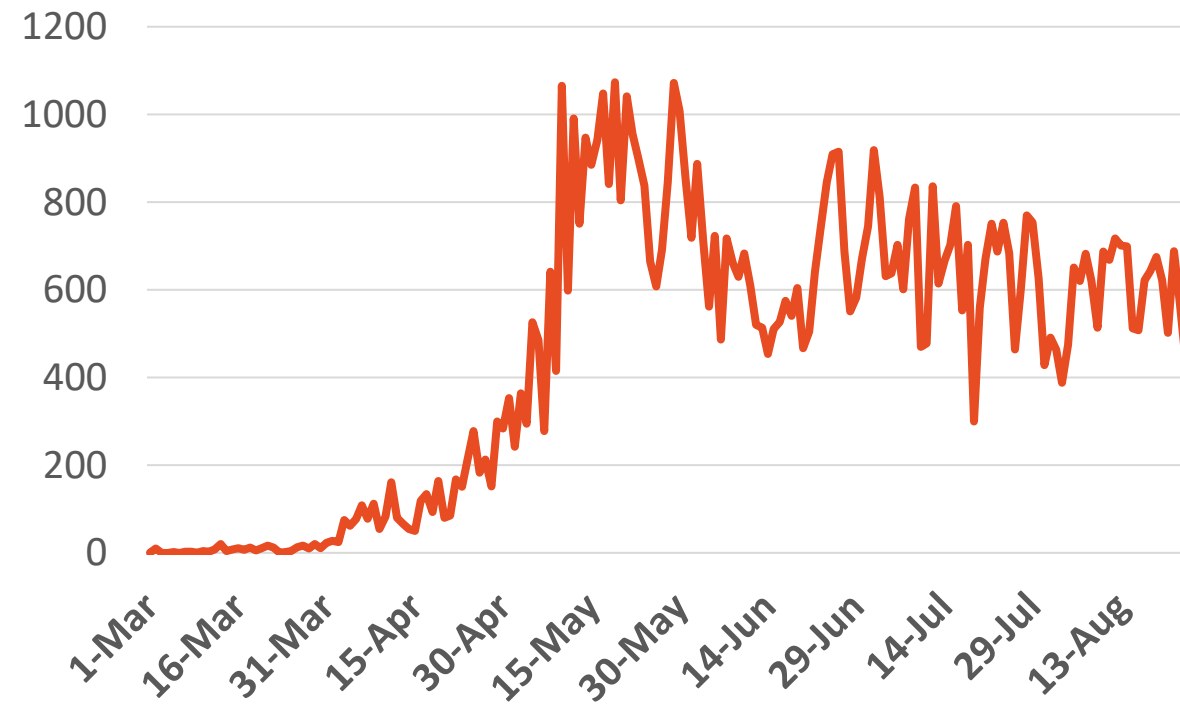


Source :Oman ministry of health

*No announced statistic data from 31 July to 4 August & from 21 to 23 August
*No announced statistic data on weekends and official holidays.

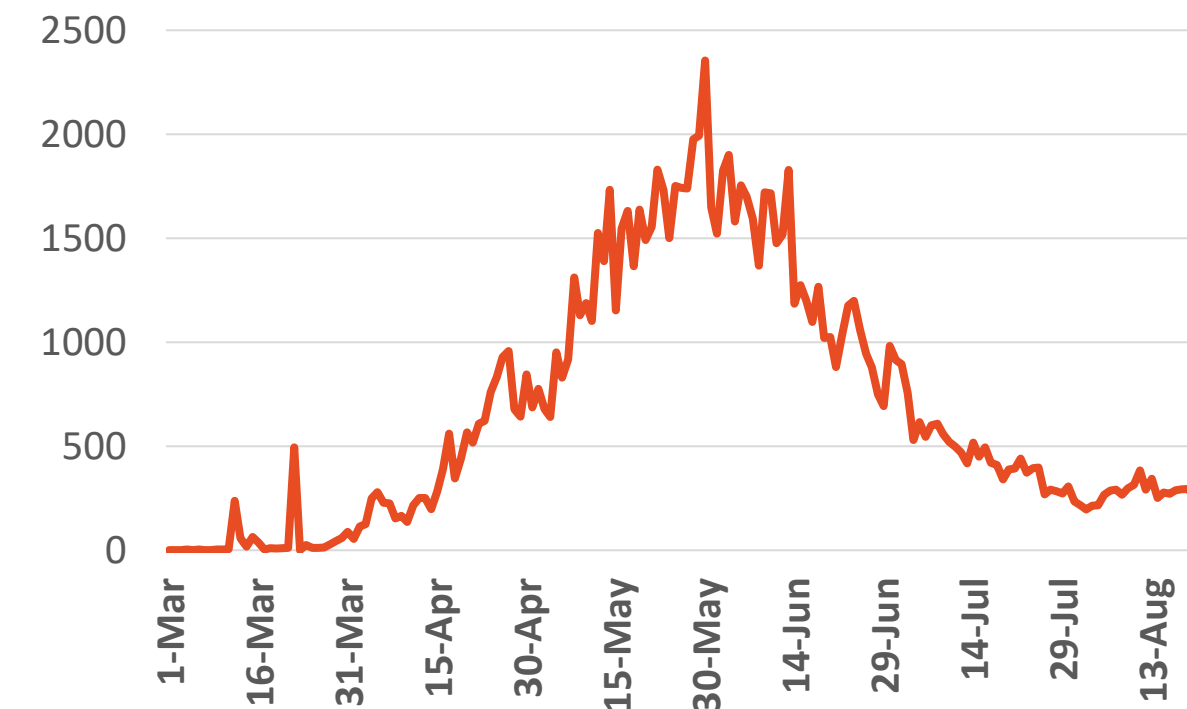
Kuwait

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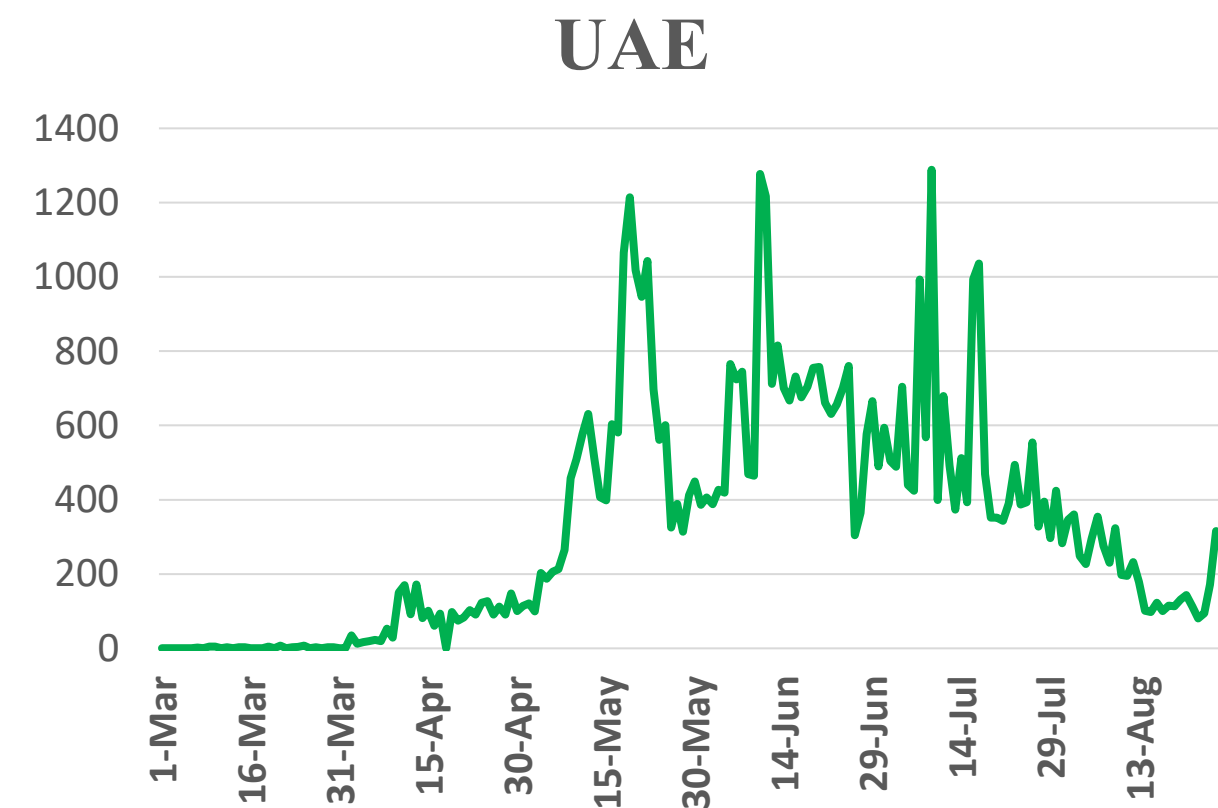
Source : Kuwait ministry of health

Qatar

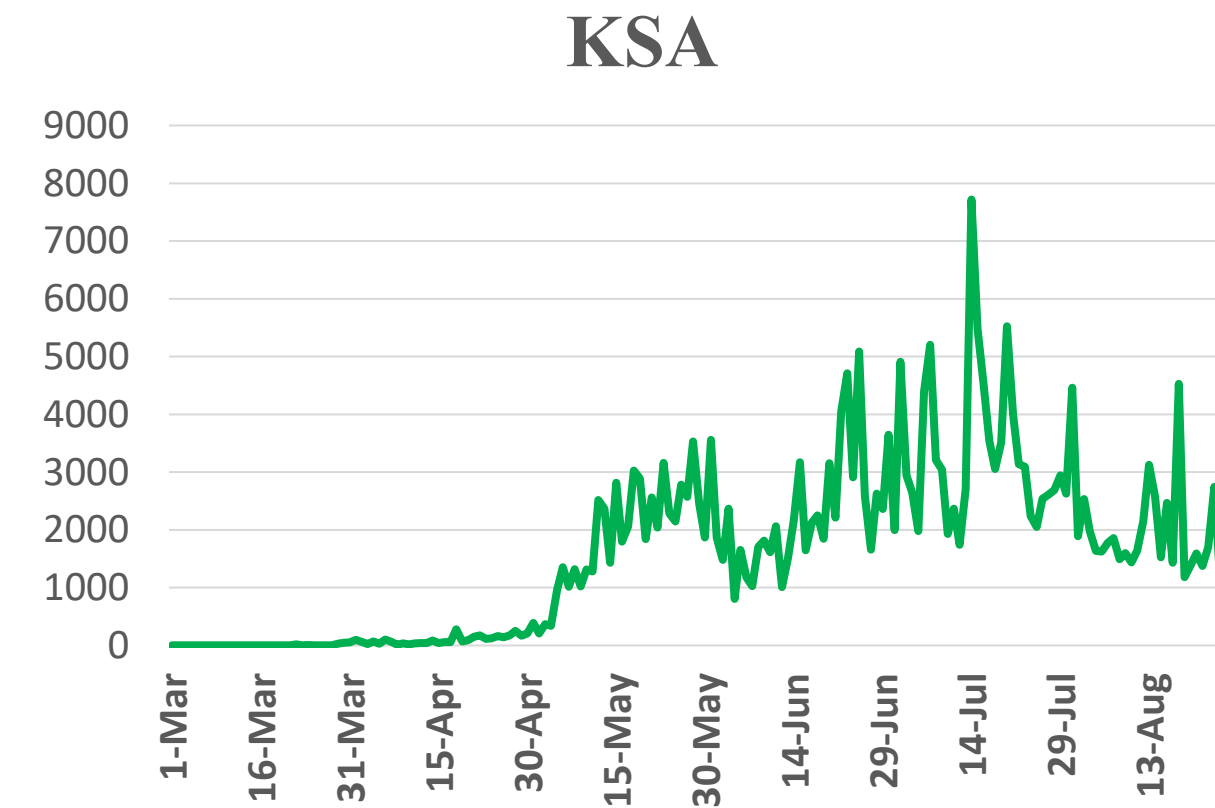


Source : Qatar ministry of health

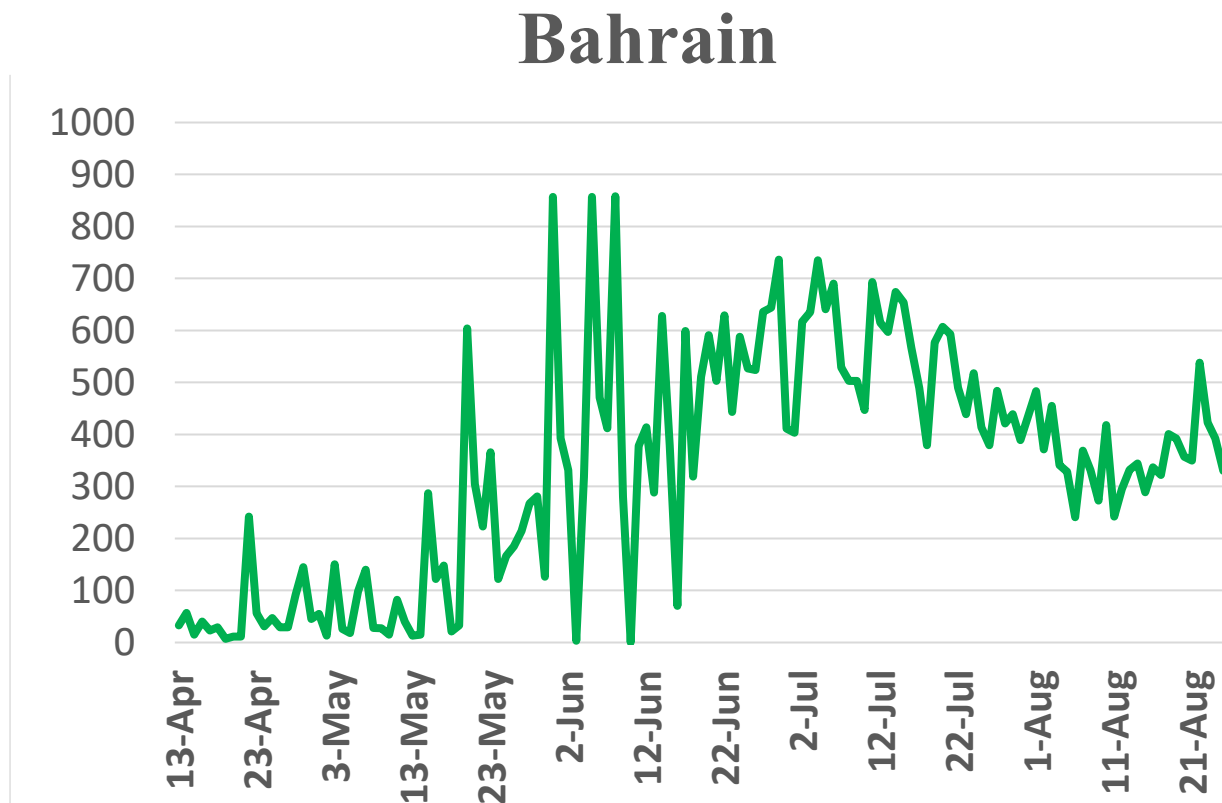
Figure 11: Comparative Analysis of the Distribution of COVID-19 Newly Recovered Cases in GCC Countries



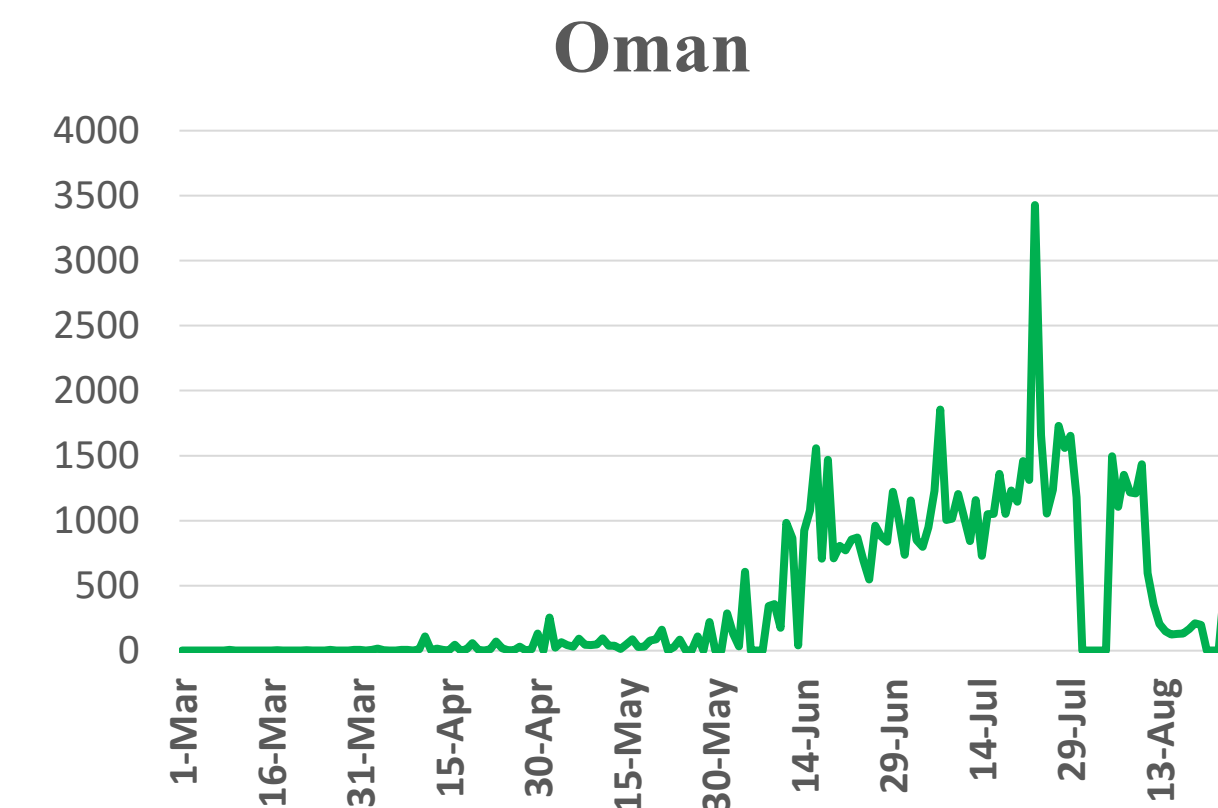
Source : National Emergency Crisis and Disaster Management Authority



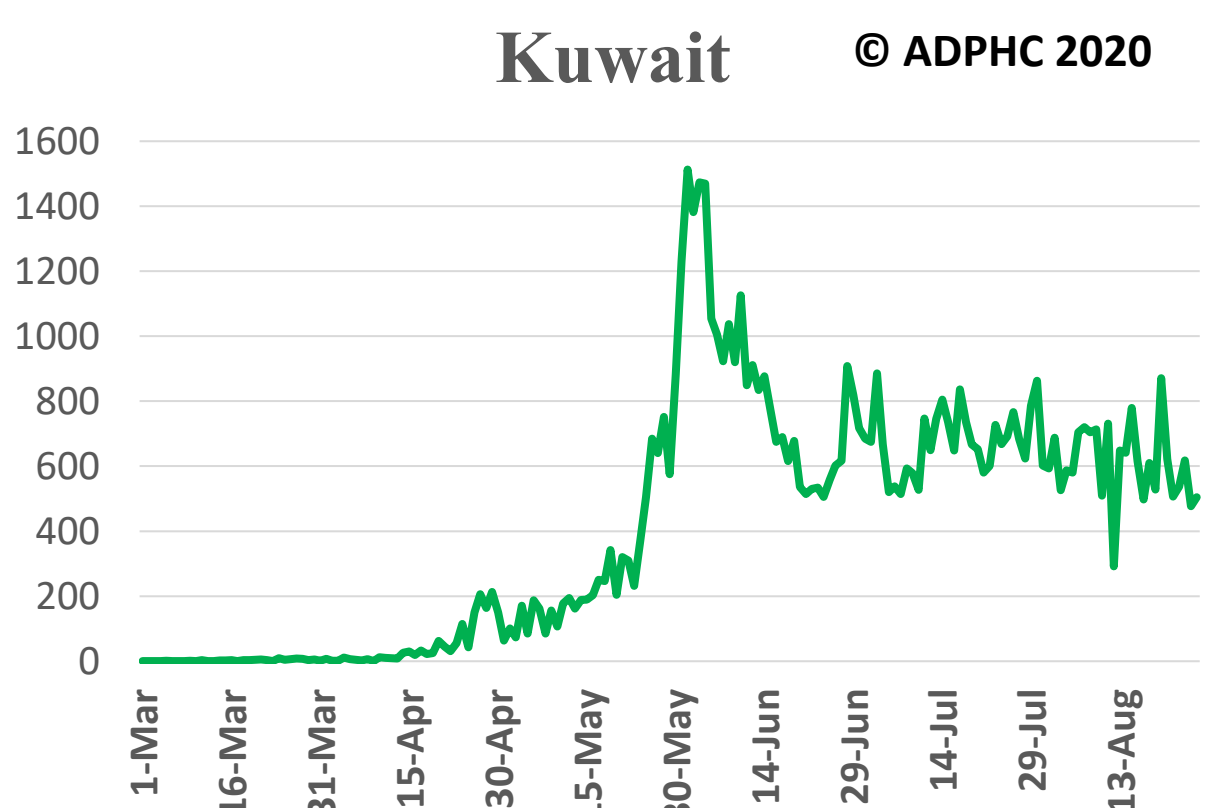
Source : KSA ministry of health



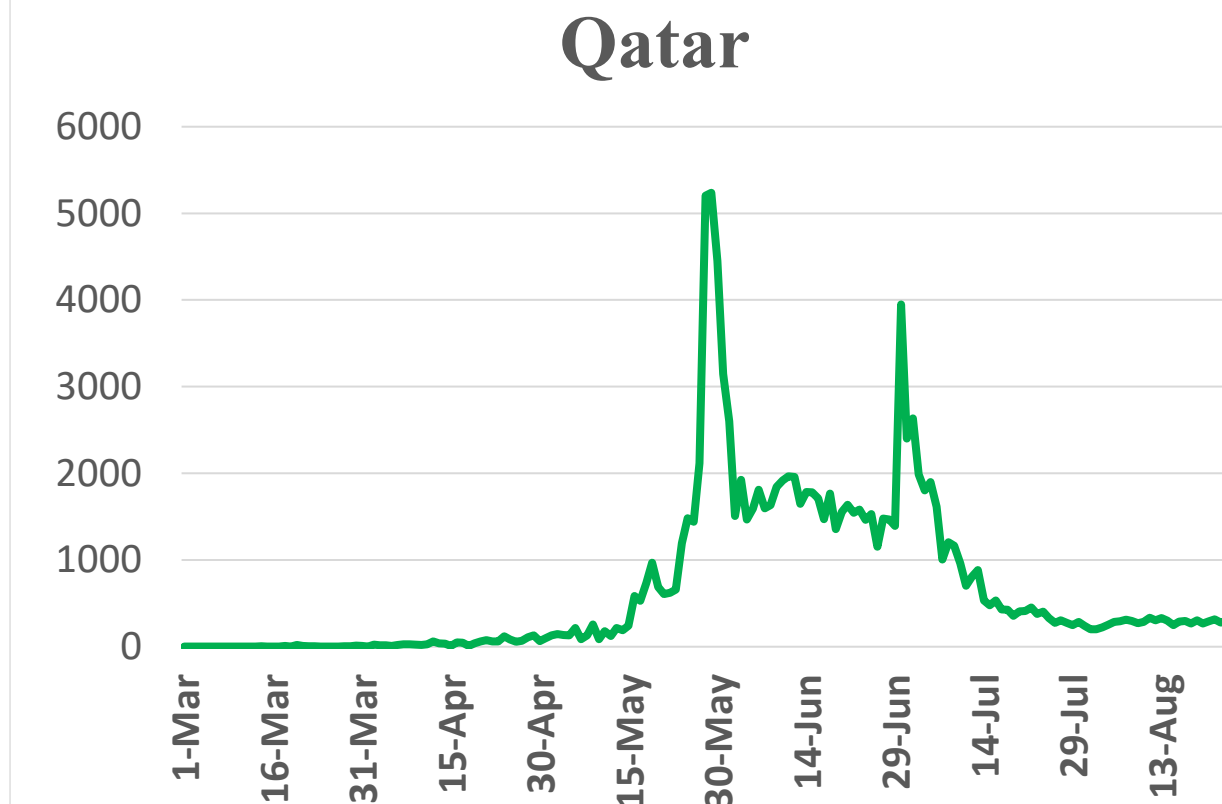
Source : GCCStat



Source : Oman ministry of health



Source : Kuwait ministry of health



Source : Qatar ministry of health

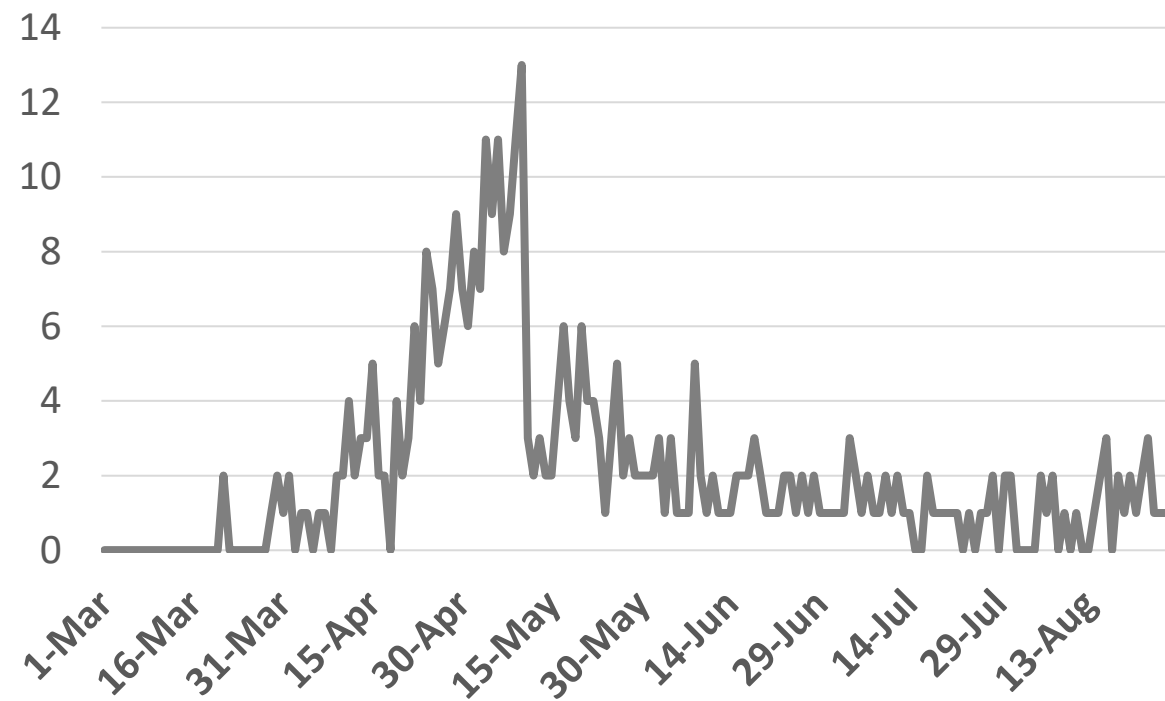
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*No announced statistic data on weekends and official holidays.



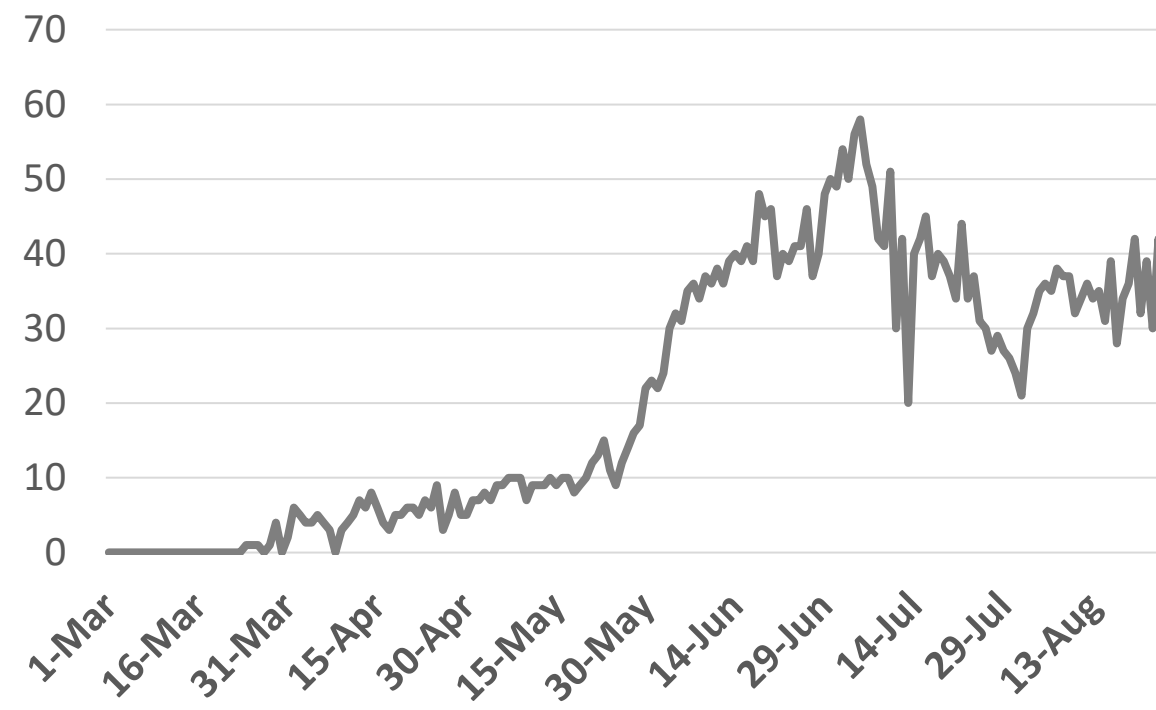
Figure 12: Comparative Analysis of the Distribution of COVID-19 New Death Cases in GCC Countries

UAE



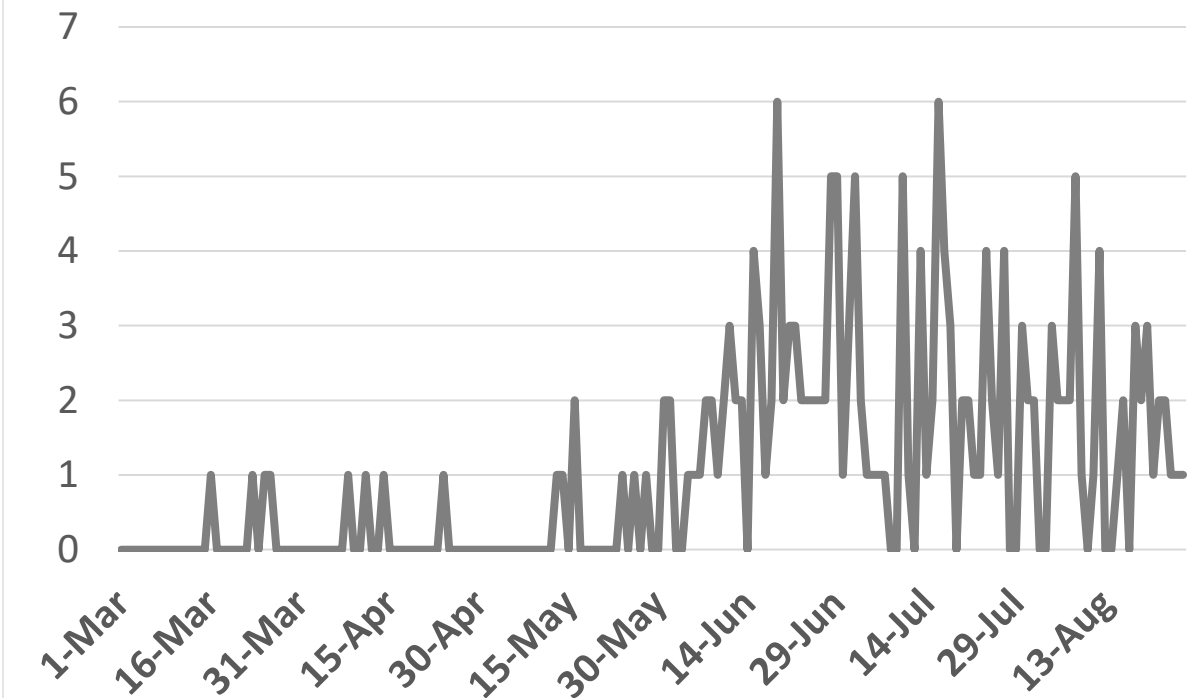
Source : National Emergency Crisis and Disaster Management Authority

KSA



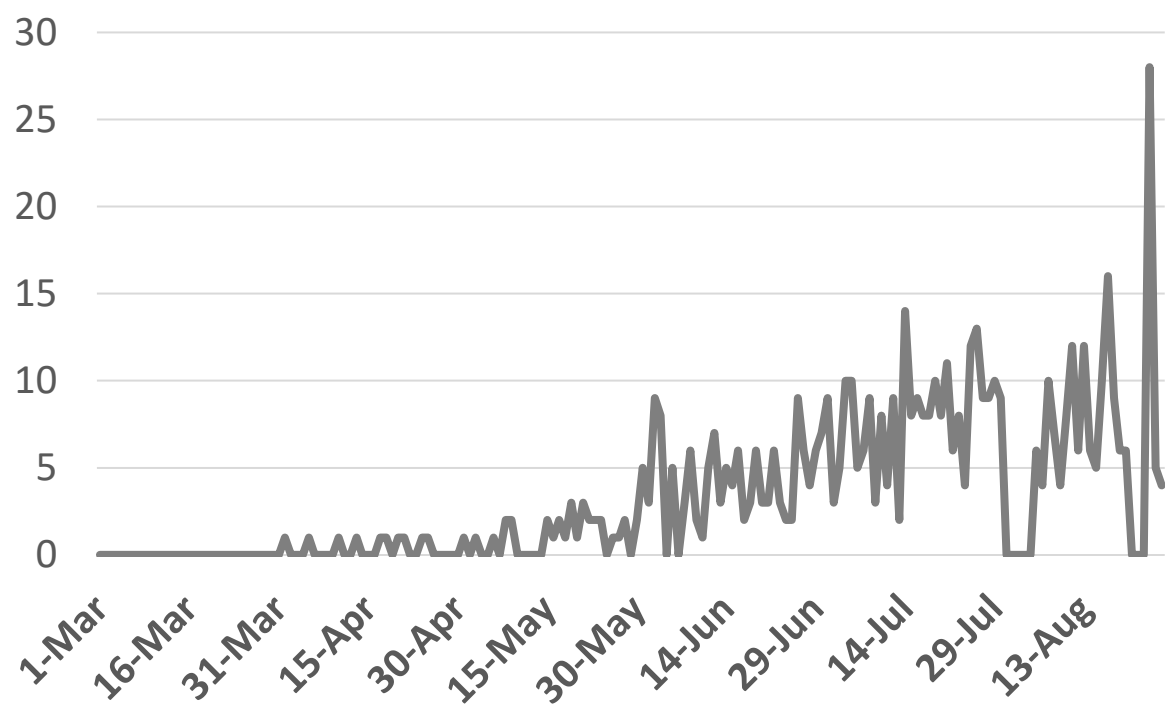
Source : KSA ministry of health

Bahrain



Source :WHO

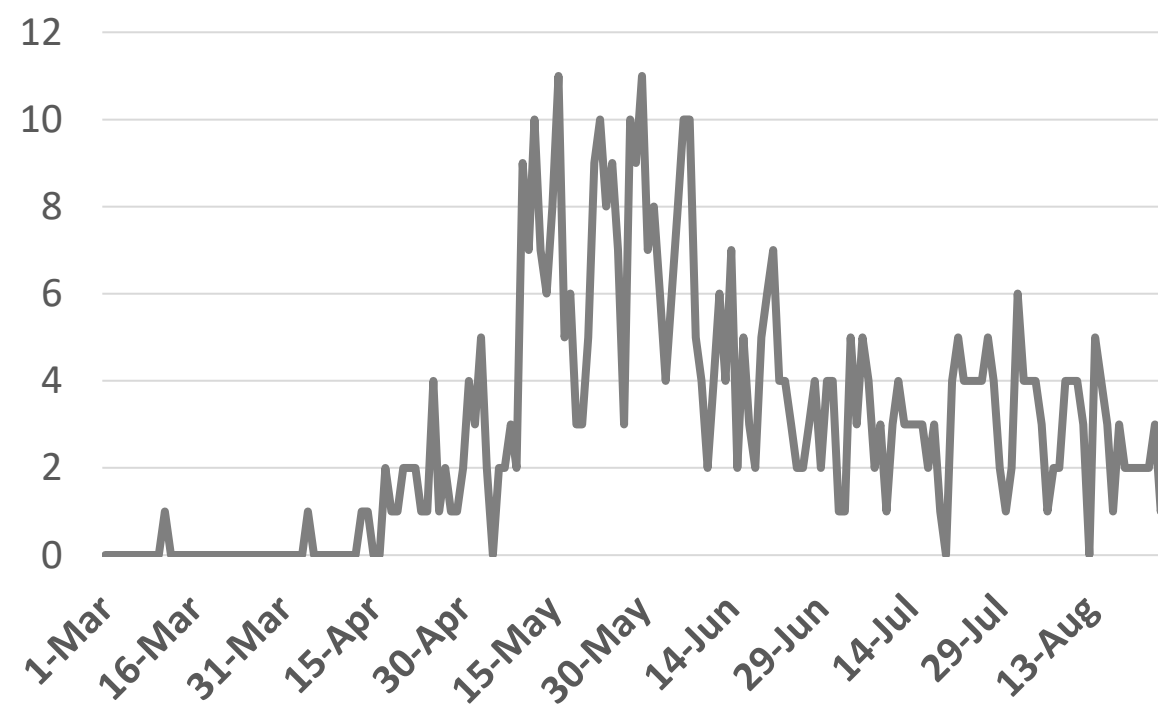
Oman



Source :Oman ministry of health

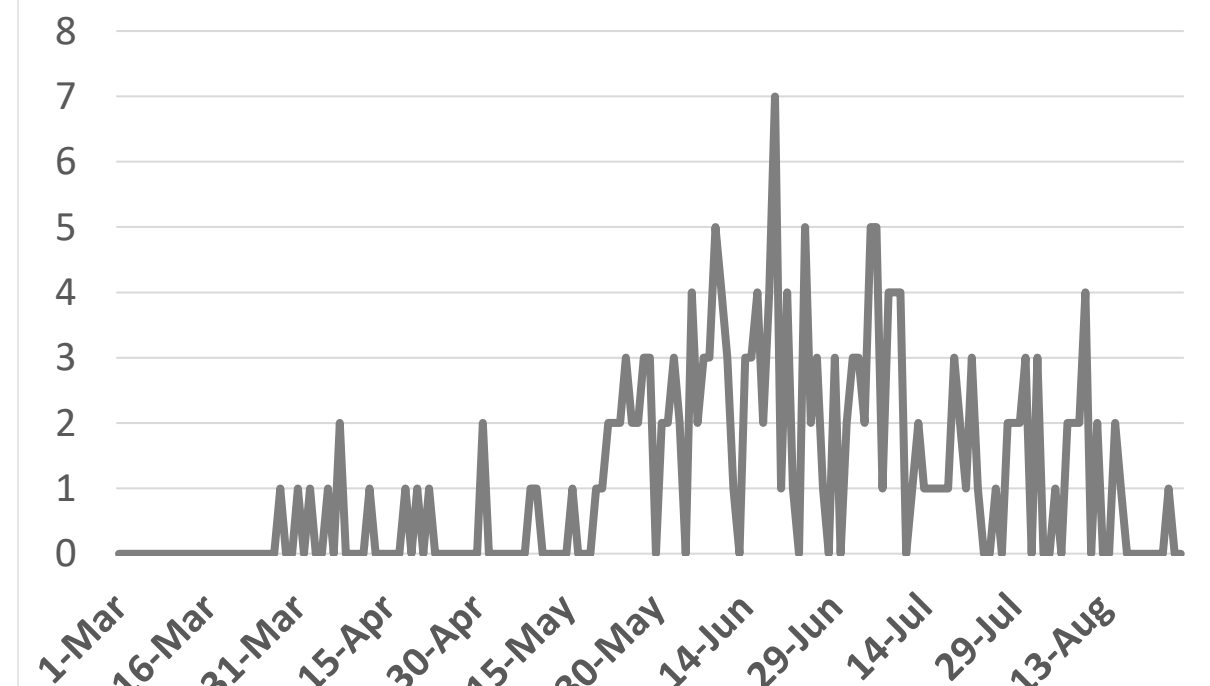
Kuwait

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Source : Kuwait ministry of health

Qatar



Source : Qatar ministry of health

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Article 1 Prone Positioning for Acute Respiratory Distress Syndrome (ARDS)

Published

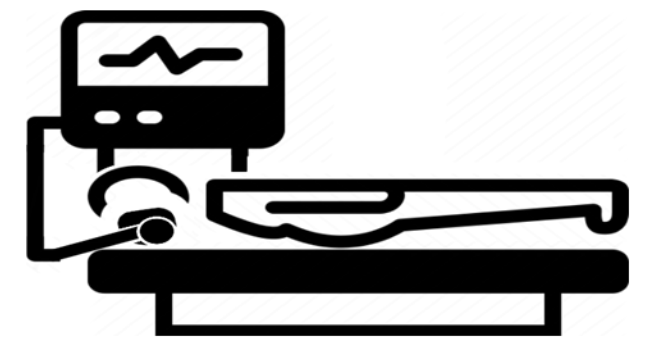
21 August 2020 [JAMA](#)

This article discusses the benefits and challenges of using prone positioning technique¹ (shown in Figure 1) in patients that develop ARDS as a result of severe COVID-19 infection.

- To help patients with ARDS breath better, hospitals may place awake COVID-19 patients in the prone position (**Figure 1**) for at least 12 hours per day and closely monitor them for worsening respiratory status and symptoms.
- To safely position the patient, a team of trained clinicians (respiratory therapist, nurses, & physician) are required.
- Proning sessions continue until there is a sustained improvement or no improvement in oxygen levels.

Benefits	Challenges
Improves lung function by reducing lung compression	Will not fit all patients (some may worsen)
Improves gas exchange, and reduce imbalance between blood and airflow	Dislodge of devices and tubes might occur with changing position
Reduces risk of ventilator-induced lung injury	Difficulty to perform procedures and CPR ³
Might improve heart function in some patients, thus improve oxygen delivery to the body	Increased pressure on shoulders, chest, knee, and face may lead to pressure ulcers and nerve injury
Better drainage of secretions from the lungs	

Figure 1: An illustration of the Prone Positioning technique



¹ Reposition patients to lie on their abdomen in a monitored setting (generally used for sedated patients who require a ventilator)

² Acute Respiratory Distress Syndrome

³ Cardiopulmonary Resuscitation

Article 2 Epidemiology of COVID-19 Among Incarcerated Individuals and Staff in Massachusetts Jails and Prisons

Published

21 August 2020 [JAMA](#)

This study describes the COVID-19 burden among incarcerated populations in Massachusetts and the association between county jails and state prisons with decarceration and testing rates.

Methodology

- Data reported from 16 Massachusetts Department of Corrections (MA DOC) facilities and 13 county-level systems from April 5 through July 8, 2020, was used.
- Baseline facility populations were used to calculate cumulative testing and laboratory-confirmed case rates per 1000 persons.

Results

- There were 14,987 incarcerated individuals across the Massachusetts facilities.
- By July 8, 2020, 1,032 confirmed cases of COVID-19 were reported among incarcerated individuals (64.3%) and staff (35.7%), equivalent to 44.3 cases per 1000 persons (Table).
- 2.91 (95% CI, 2.69-3.14) times higher than the rate among the Massachusetts general population.
- 4.80 (95%CI, 4.45-5.18) times than the rate among the US general population.
- Incidence of COVID-19 cases were lower in county facilities (35.71 cases per 1000 persons) than in MA DOC facilities (52.36 cases per 1000 persons).
- Facilities with higher testing rates had higher case rates (Figure, A).

- Testing rate across all county jails was 254 per 1000 persons, with a case rate of 36 cases per 1000 persons, whereas MA DOC facilities had a testing rate of 1,093 per 1000 persons and a case rate of 52 cases per 1000 persons.
- The proportion of positive tests among incarcerated individuals in county facilities was higher (14%) than in (Figure, B):
- MA DOC facilities (5%) and general Massachusetts (9%).
- US (8%) populations. Case incidence was higher among systems that released a lower proportion of their baseline population.
- The MA DOC case rate was 52 cases per 1000 persons with a population decrease of 9% compared with all county jails, which had a case rate of 36 cases per 1000 persons and decreased their overall population by 21%.

Conclusion

- Rates of COVID-19 in Massachusetts jails and prisons are alarmingly high and require urgent action.
- Access to testing without coercion, decarceration, and contact tracing are necessary to decrease harm from COVID-19 to incarcerated people and their communities.

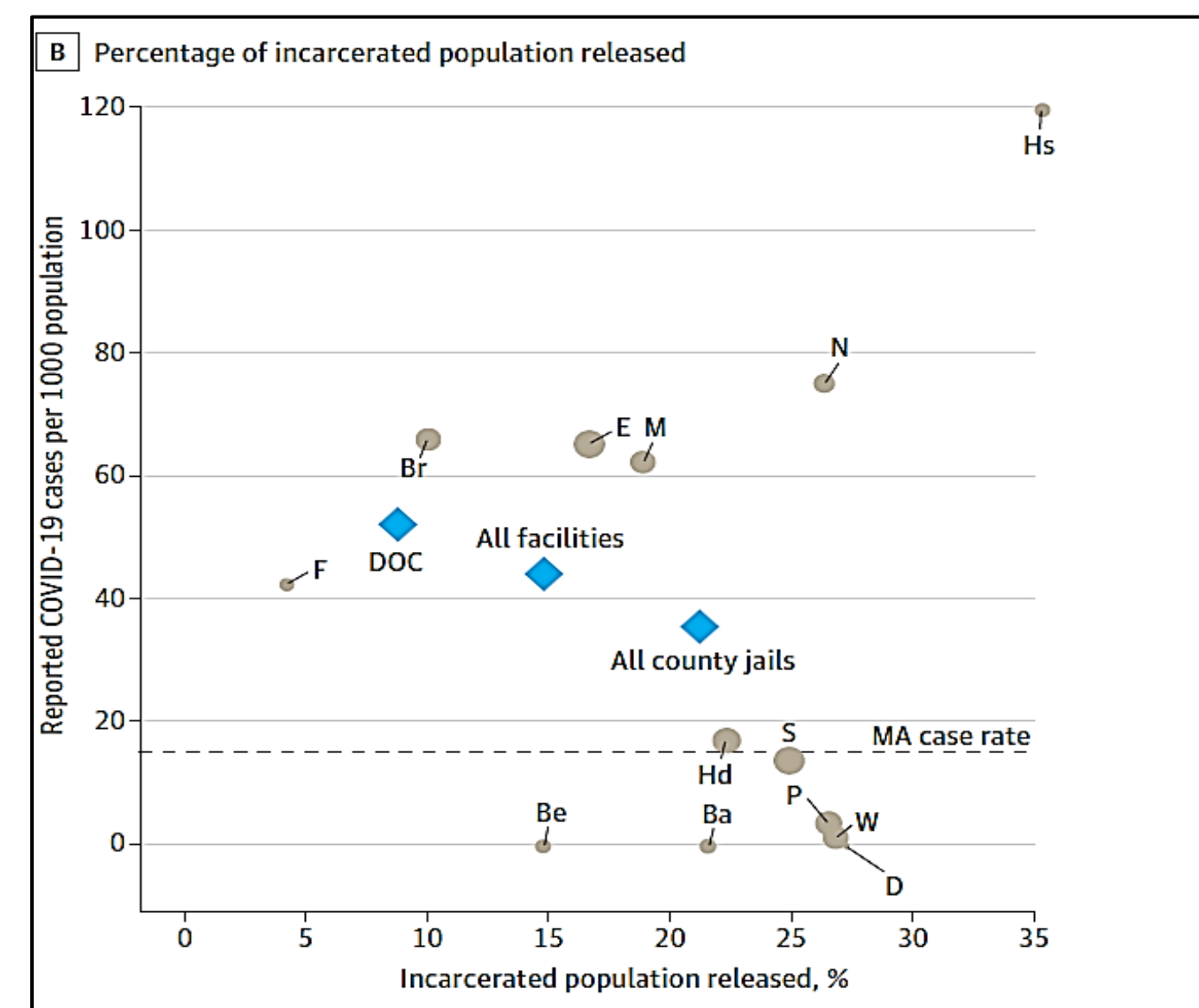
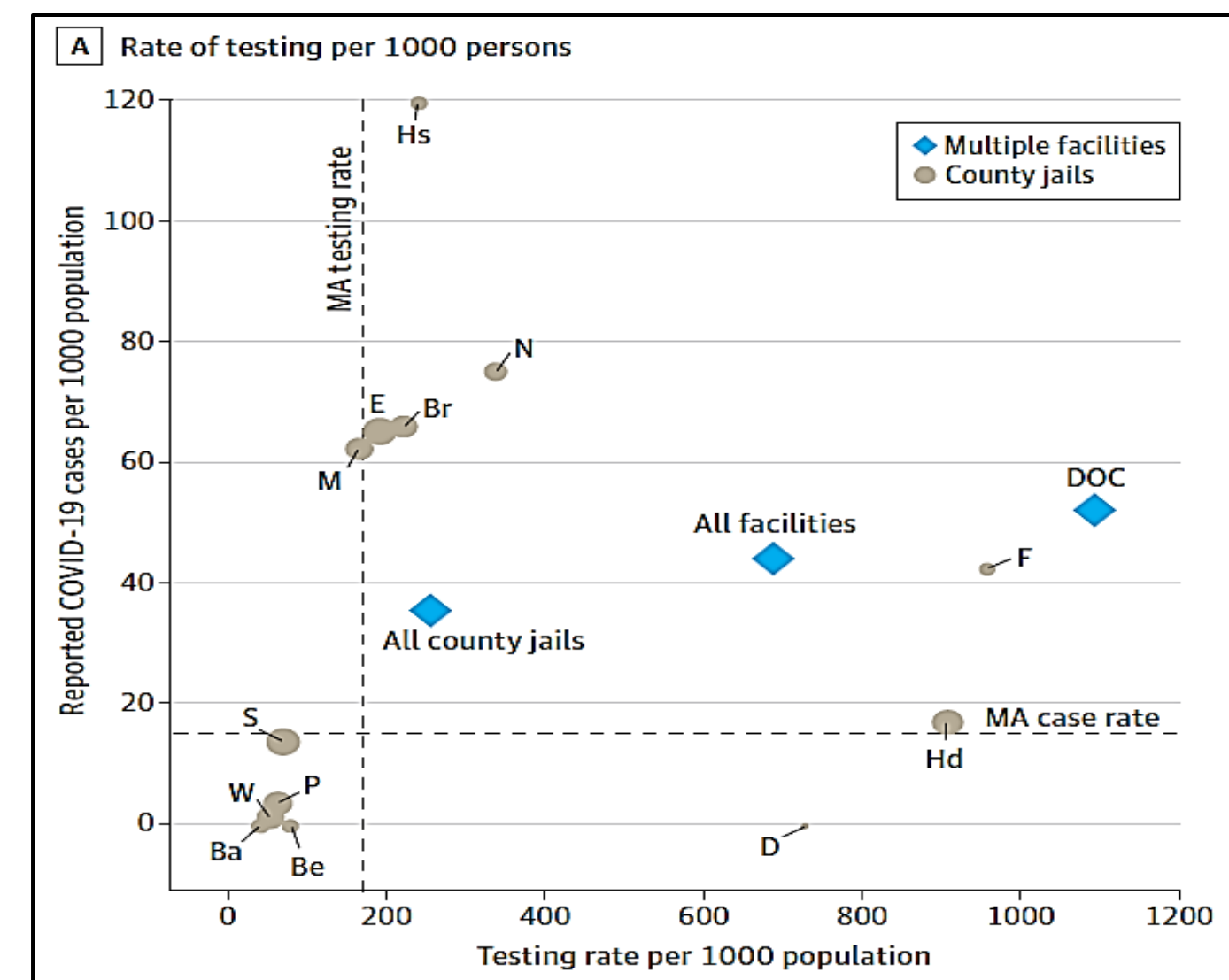


EPIDEMIOLOGY

Continued

Table. Rates of Confirmed Cases of COVID-19 and Testing by Carceral System Compared With the General Population in Massachusetts and the United States^a

Characteristic	United States (n = 329 915 897)	Massachusetts State (n = 6 892 503)	All MA carceral facilities (n = 14 987)	MA DOC: state prison system (n = 7735)	County carceral facilities (n = 7252)
Staff					
Total cases	NA	NA	368	193	175
Proportion of staff among all cases, % ^b	NA	NA	36	32	40
Incarcerated individuals					
Total cases, No.	3 042 503	104 961	664	405	259
Total tested, No. ^c	37 395 666	1 157 023	10 298	8455	1843
Positive tests, %	8	9	6	5	14
Cumulative case rate per 1000 persons	9.22	15.23	44.31	52.36	35.71
Incarcerated population compared with state					
RD (95% CI)	NA	NA	29.08 (25.71-32.45)	37.13 (32.03-42.23)	20.49 (16.14-24.84)
RR (95% CI)	NA	NA	2.91 (2.69-3.14)	3.44 (3.11-3.79)	2.35 (2.07-2.65)
Incarcerated population compared with United States					
RD (95% CI)	NA	NA	35.08 (31.71-38.45)	43.14 (38.04-48.24)	26.49 (22.14-30.84)
RR (95% CI)	NA	NA	4.80 (4.45-5.18)	5.68 (5.14-6.26)	3.87 (3.42-4.37)



Article 3

The COVID-19 XPRIZE and the Need for Scalable, Fast, and Widespread Testing

Published

20 August 2020 [Nature](#)

This editorial expressed the urgent need for exploration of a standardized virology test.

- Approved tests for use are currently unstandardized in FDA1, EUA2 and IFU3 documents.
- As of 27 July 2020, FDA1 had done an analysis and revealed a wide range of Limit of Detection (LoD) 4. There is an increase of getting 13% wrong result with every increase of 10-fold in LoD4.
- Unclear/missing key attributes of many tests are either:
 - Primer sequence
 - Protocol steps
 - Viral gene targets
- In order to pass the minimum threshold for approval, most approved EUA2 use large multipliers on their own LoD4.
- The article addressed the following issues with the current testing methods:
 - It is difficult to compare result directly
 - Difficulty in understanding how a test will translate into a clinical setting
 - No independent assessment of test abilities (pros and cons)
 - No consistent sample type used across the EUA2
 - Therefore a comprehensive benchmarking effort on all methods on the market would be helpful.
 - National-level testing to decrease and control infection rates would require fast test results (within 1 day), easy processing, and a low cost per test so anybody could easily pay for multiple tests a week

¹ FDA: Food and Drug Administration

² EUA: Emergency Use Authorization

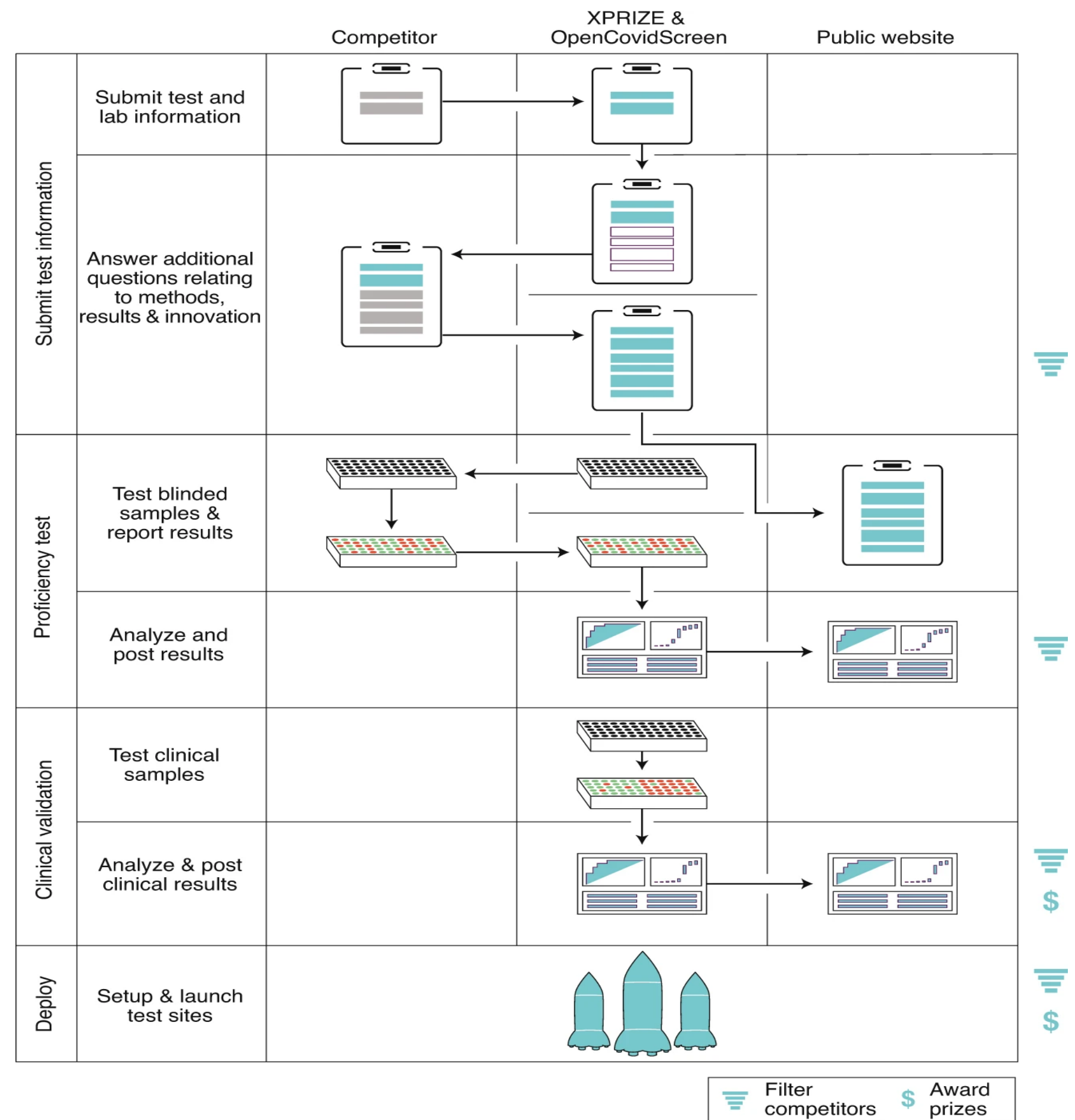
³ IFU: Instructions for Use

⁴ LoD: a test with a Limit of viral Detection at 10^3 concentration means the test is more sensitive than a test which can detect the virus in a higher concentration like with 10^5

Continued

- The COVID-19 XPRIZE competition was designed to identify economically viable, high-quality and scalable testing option.
- Competitors will be selected upon their results, methods, cost, scalability and speed, and will go through the steps shown in (Figure 1).
- Top teams will be awarded and selected to set up and deploy testing sites. Then their test will be coordinated with government, industry, and non-profit efforts.
- The competition is open to all around the world. It will help regions to rise testing capacities.
- The competition site: [OpenCovidScreen](https://www.opencovidscreen.com)

Figure 1: The steps of the XPRIZE/ OpenCovidScreen competition.



THANK YOU

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