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للصحة العامة
ABU DHABI PUBLIC
HEALTH CENTRE

SCIENTIFIC RESEARCH MONITORING ON COVID-19

3 AUGUST 2020

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https://www.doh.gov.ae/ar/covid-19/Healthcare-Professionals/Scientific-Publication

SCIENTIFIC RESEARCH MONITORING ON COVID-19 (ISSUE 183)

مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

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
Update

WHO
Report

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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Clinical Features

Global Evaluation of Echocardiography in Patients With COVID-19

Clinical Features

Extra Pulmonary Manifestation of COVID-19

Diagnosis

Test Sensitivity is Secondary to Frequency and Turnaround Time for COVID-19 Surveillance

Treatment

Treatment with Hydroxychloroquine, Azithromycin, and Combination in Patients Hospitalized with COVID-19

WHO SITUATION REPORT 2 AUG 2020

- WHO has published a COVID-19 Preparedness and Response Progress Report. The report highlights the progress made from 1 February to 30 June 2020 under the three objectives outlined in the Strategic Response and Preparedness Plan: scaling up international coordination and support, scaling upcountry preparedness and response by pillar and accelerating research and innovation.

- A new report by the Economic Commission for Latin America and the Caribbean and the WHO Regional Office for the Americas has highlighted that economies in the Region will only be revived if the COVID-19 curve is flattened. The report highlights that convergence and coordination between health, economic, social and productive policies are required to control the COVID-19 pandemic.

- A team of Russian laboratory experts is providing support to Tajikistan's COVID-19 response. The team from Rospotrebnadzor, Russian Federation, an active member of the Global Outbreak Alert and Response Network, will assess Tajikistan's existing laboratory system, including the flow of information, and suggest steps to strengthen the COVID-19 laboratory data management system.

EPIDEMIOLOGY

FROM 21 JAN TO 2 AUG 2020

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

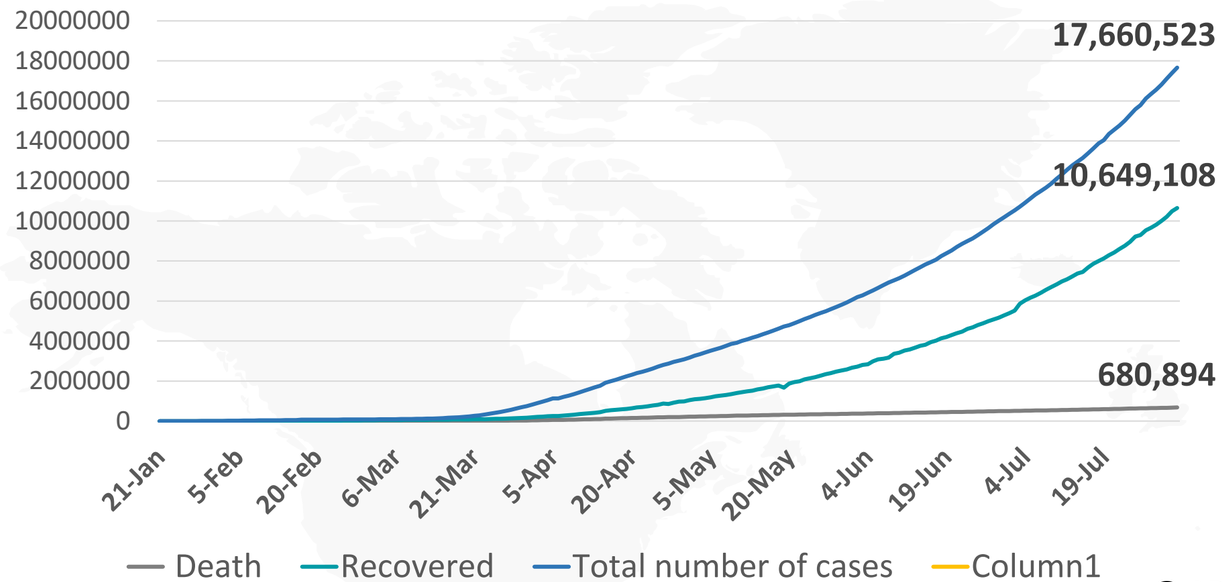


Figure 3: Total Number of Death Due to COVID-19 (China and result of the world)

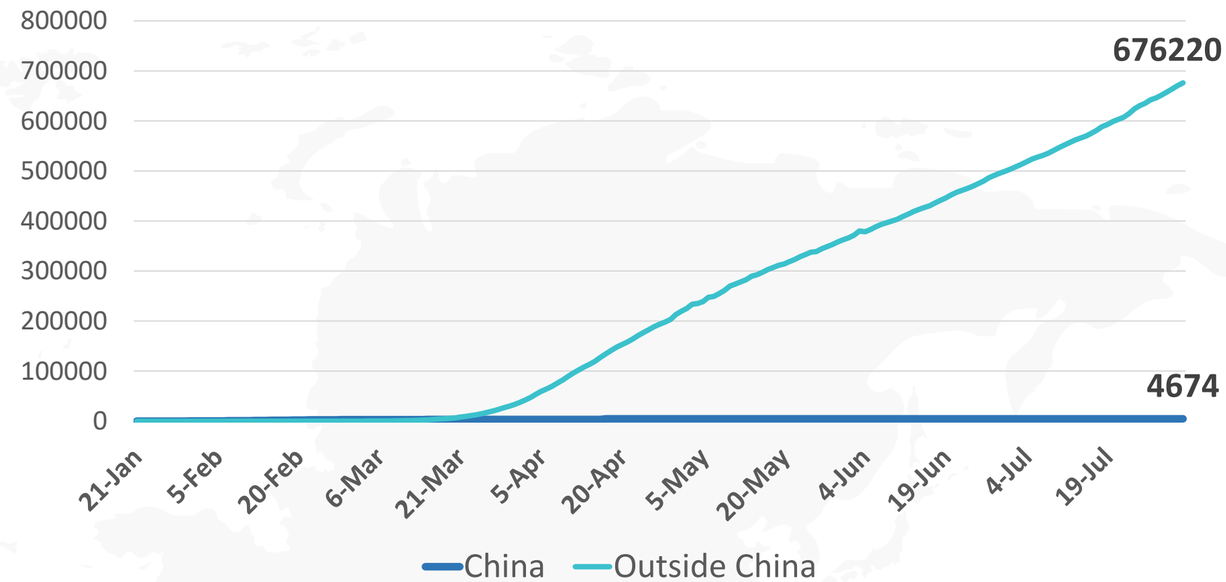


Figure 2: Daily New Infected COVID-19 Cases (China and rest of the world)

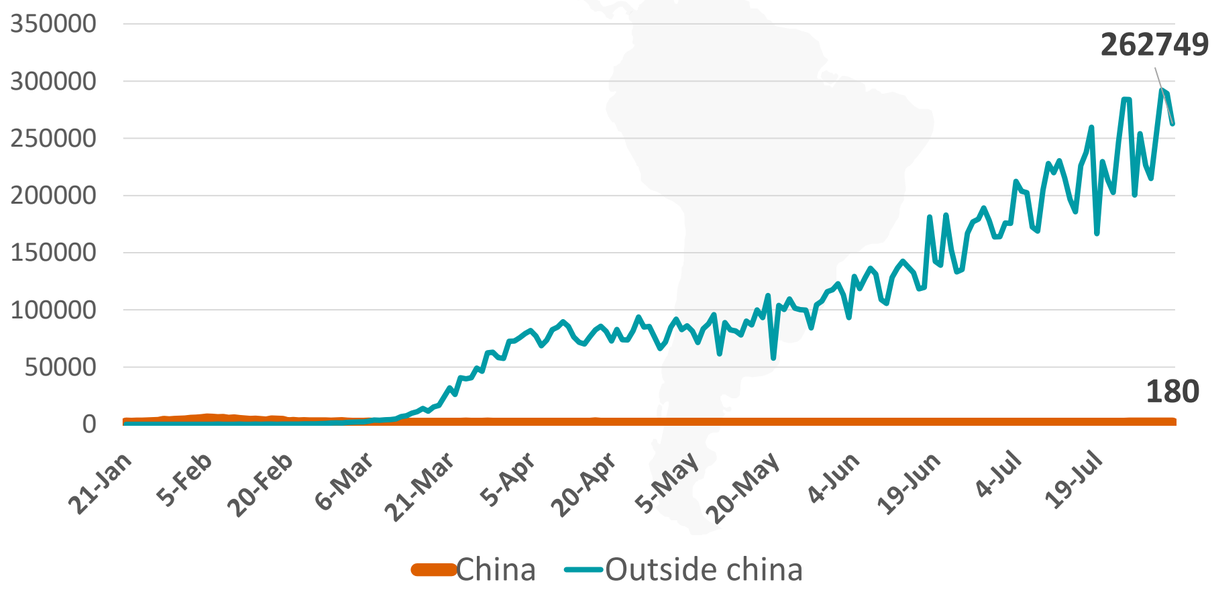
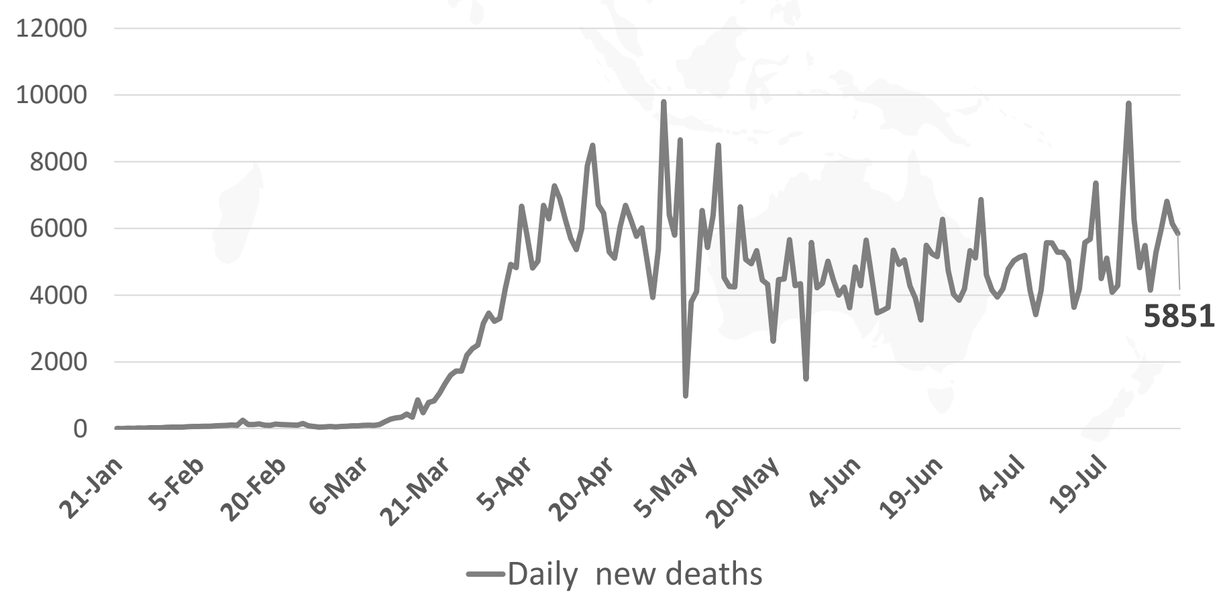


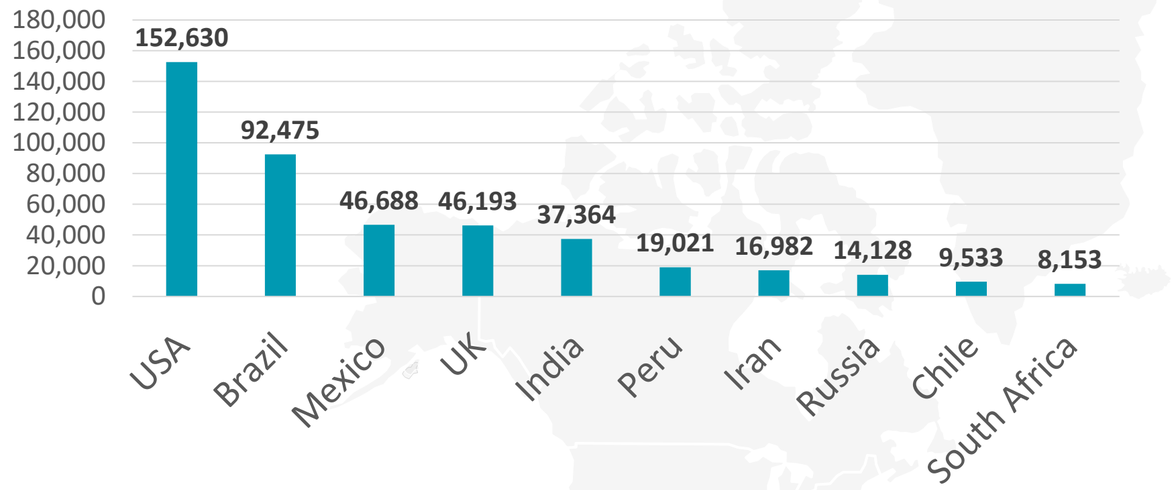
Figure 4: Global Daily New Deaths Due to COVID-19 (China and rest of the world)



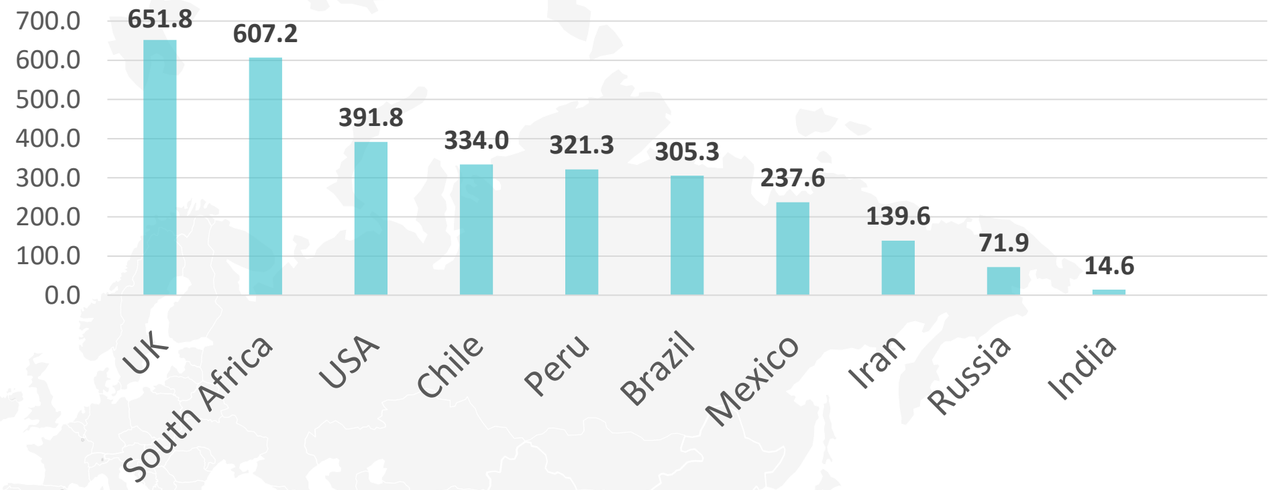
Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

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

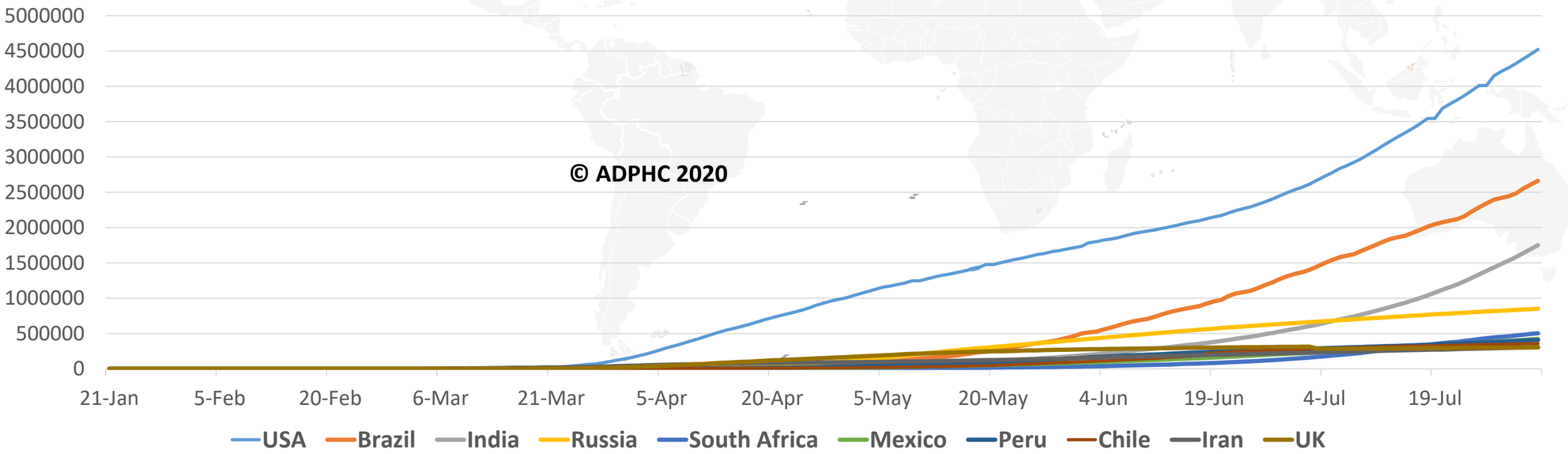
TOTAL DEATHS



DEATHS PER MILLION



TOTAL INFECTED CASES



USA	4,523,888
Brazil	2,662,485
India	1,750,723
Russia	850,870
South Africa	503,290
Mexico	424,637
Peru	407,492
Chile	357,658
Iran	306,752
UK	303,956

Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

EPIDEMIOLOGY

FROM 21 JAN TO 2 AUG 2020

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ABU DHABI PUBLIC HEALTH CENTRE

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

Daily Tests

47,716.3 Average Tests

482.5 per 100k population

0.6% Positive Rate

Daily Cases

298.0 Average Cases

3.0 per 100k population

Daily Recovered

347.6 Average Recovered

3.5 per 100k population

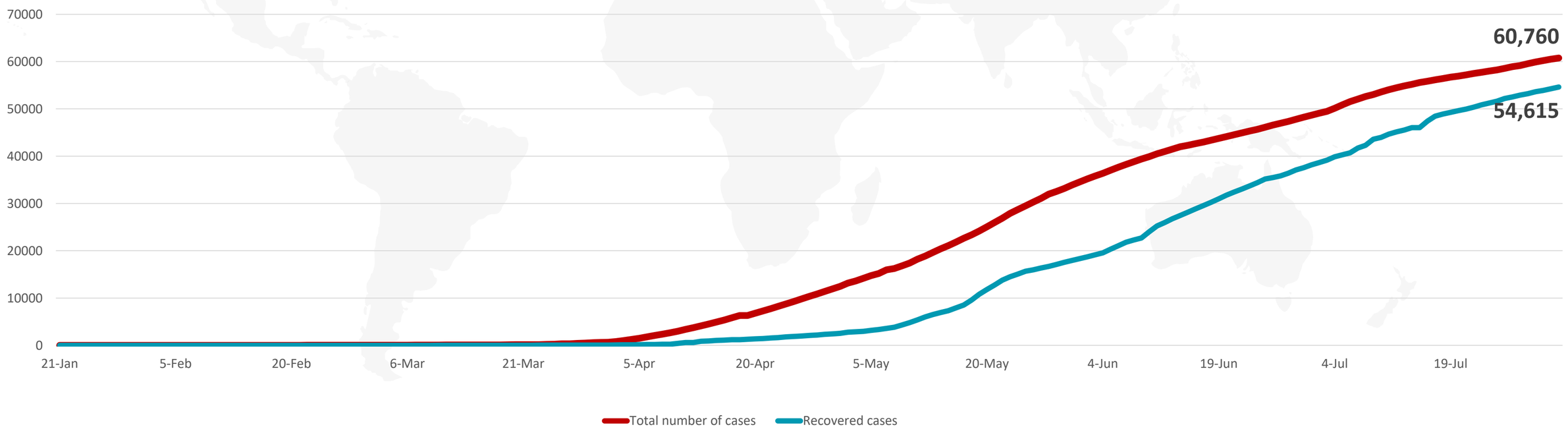
Daily Deaths

1.0 Average Deaths

0.0 per 100k population

0.3% Case Fatality Rate

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



Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: FCSA, WHO,

EPIDEMIOLOGY

Date: 2 AUG 2020

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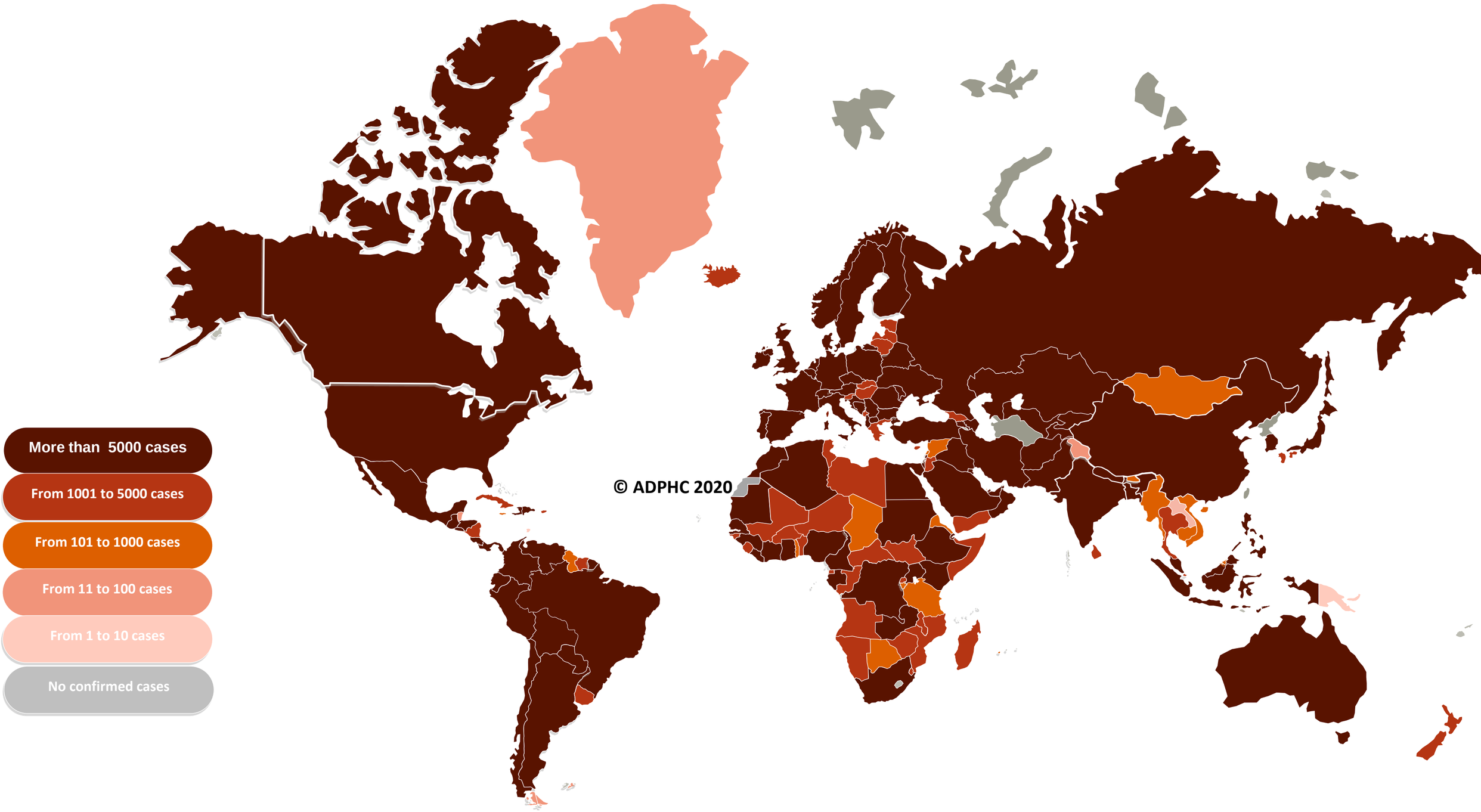
Figure 7A: Global Distribution of COVID-19 Cases



Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

EPIDEMIOLOGY

Date: 2 AUG 2020

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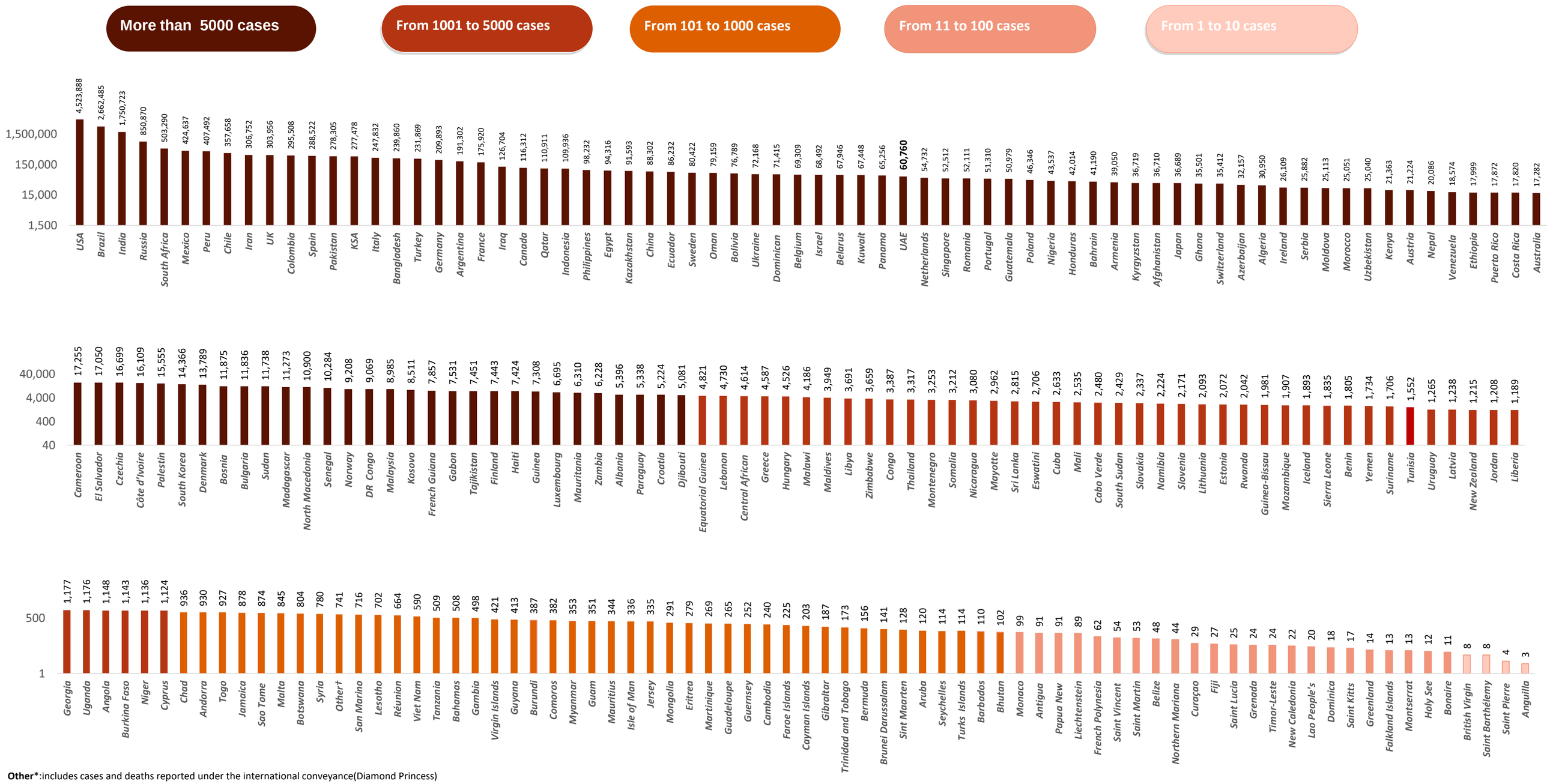
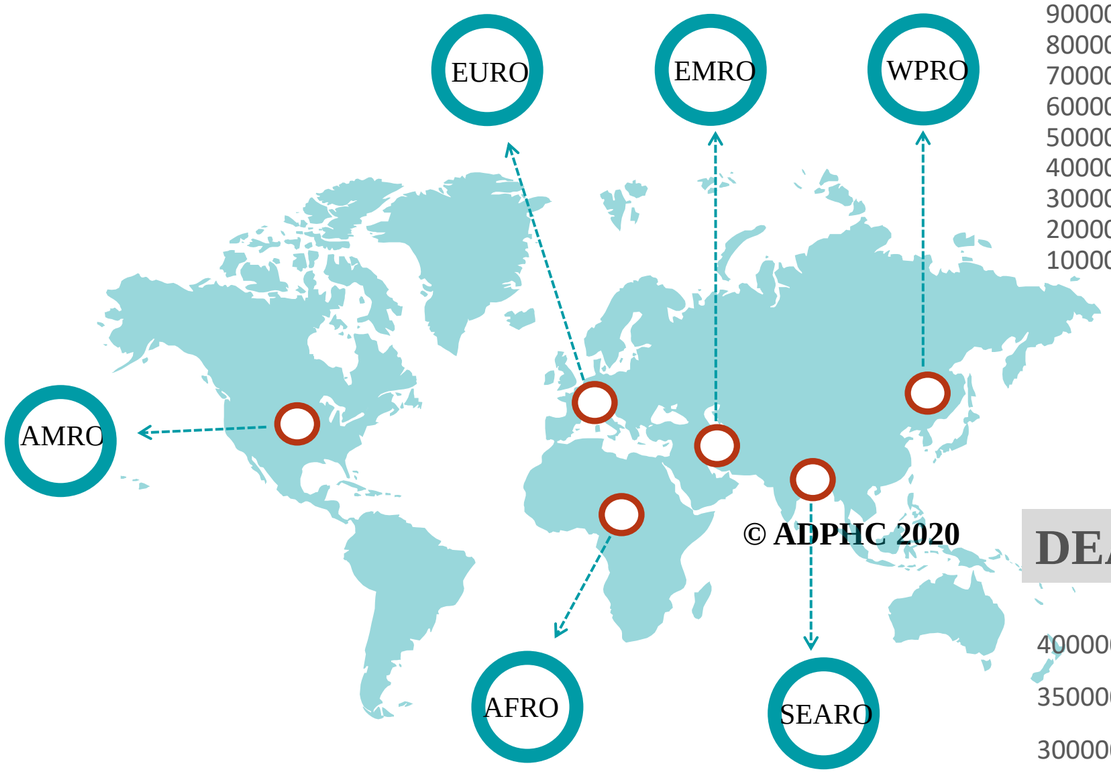
Figure 7B: Bar Chart Illustrates the Global Distribution of COVID-19 Cases



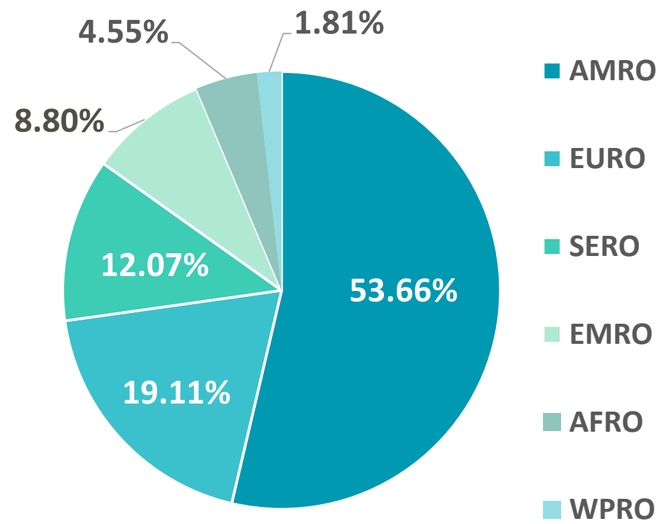
Other*:includes cases and deaths reported under the international conveyance(Diamond Princess)

Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

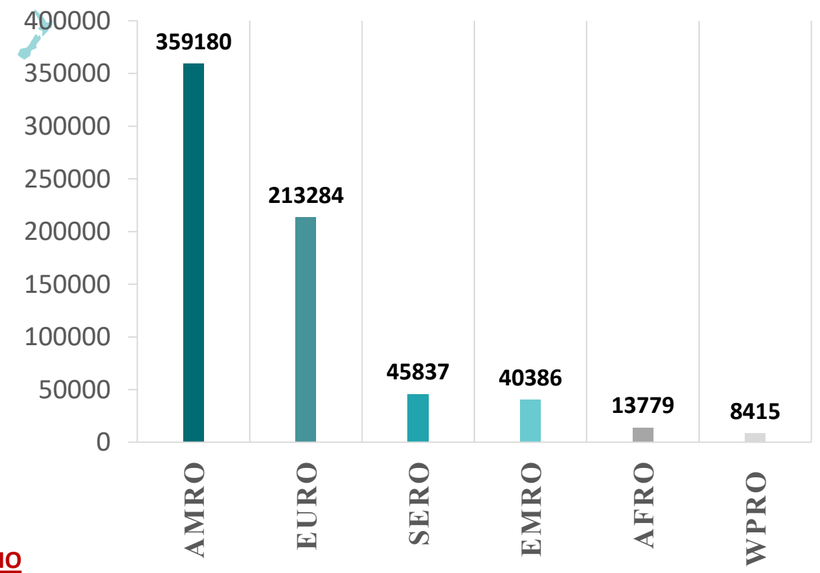
Figure 8: Global Distribution of COVID-19 Cases per Region

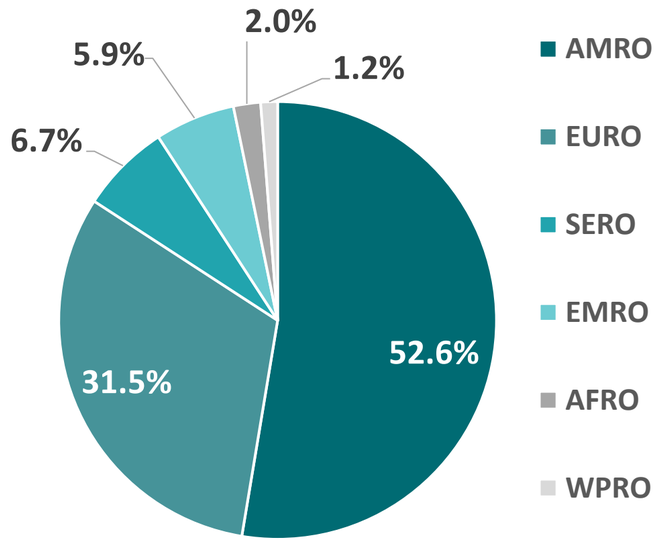


INFECTED



DEATHS





Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

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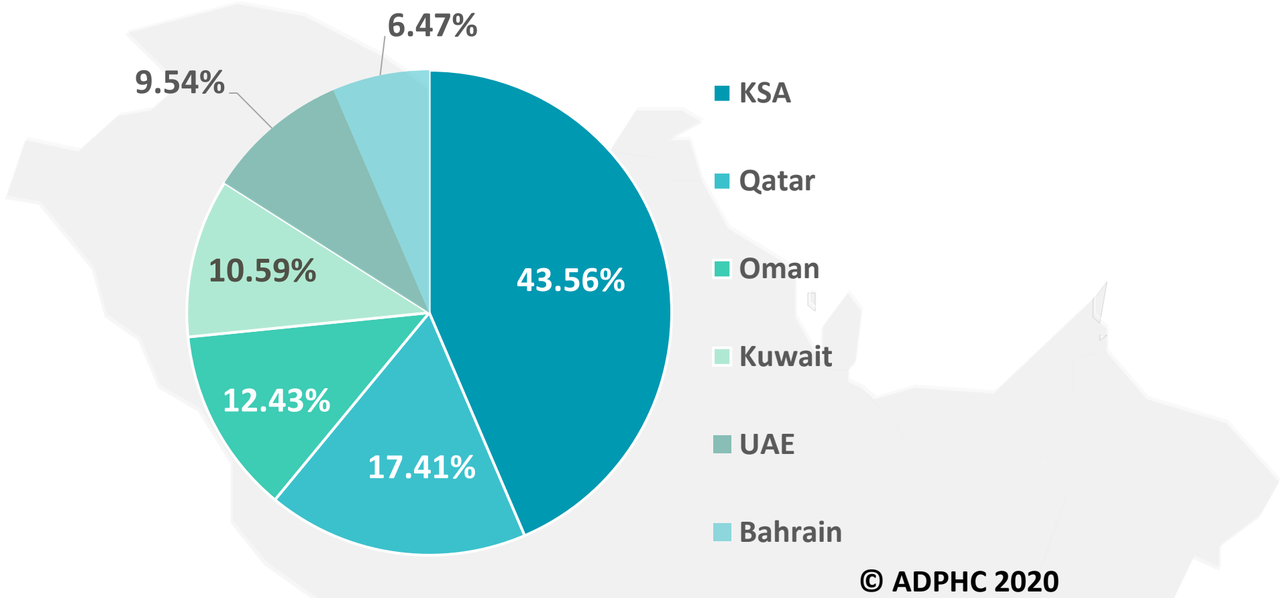
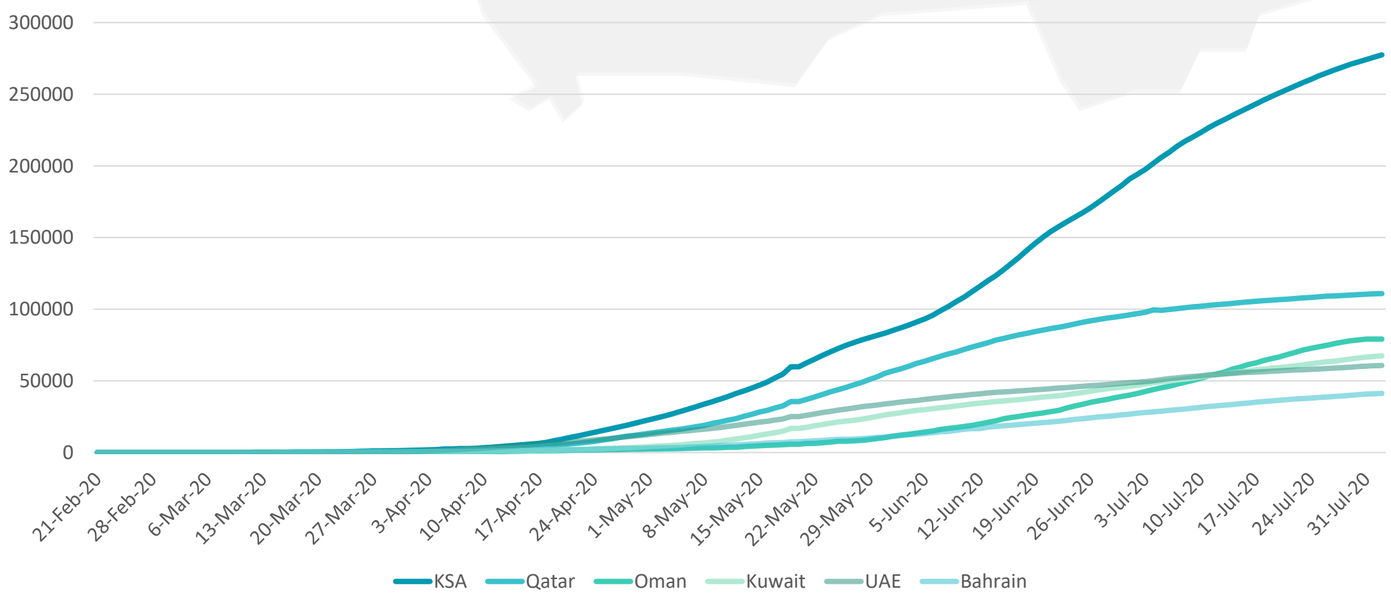
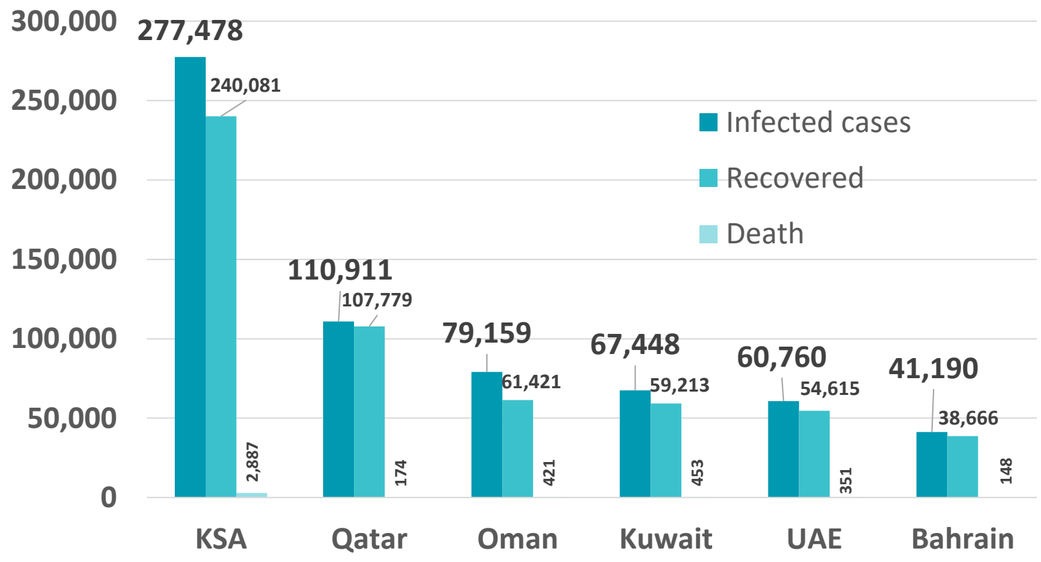
Figure 9: Comparative Analysis of the Distribution of COVID-19 Cases in GCC Countries

TOTAL NUMBER OF INFECTED CASES

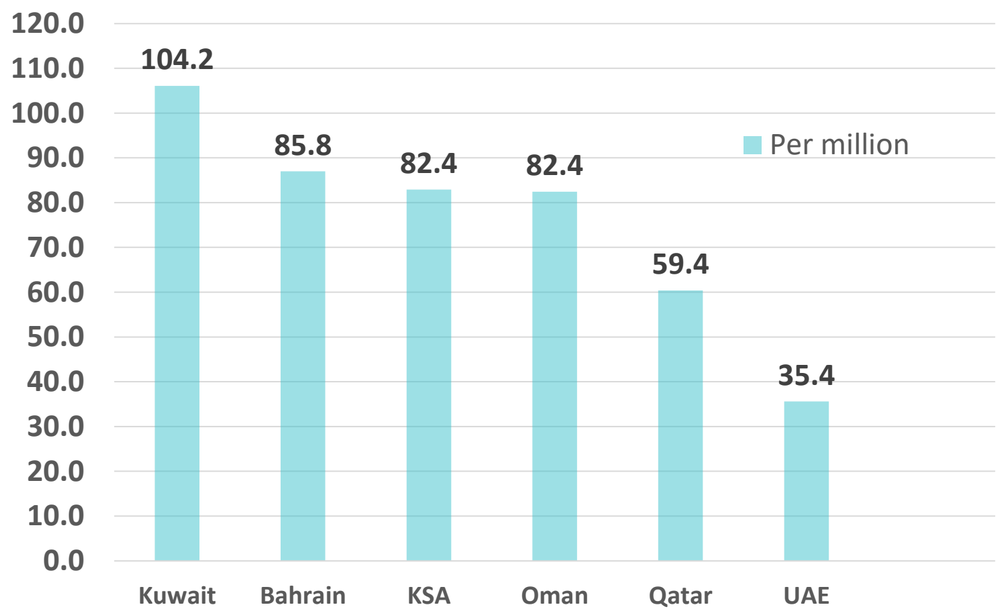




TOTAL NUMBER OF INFECTED, RECOVERED AND DEATHS



DEATHS PER MILLION



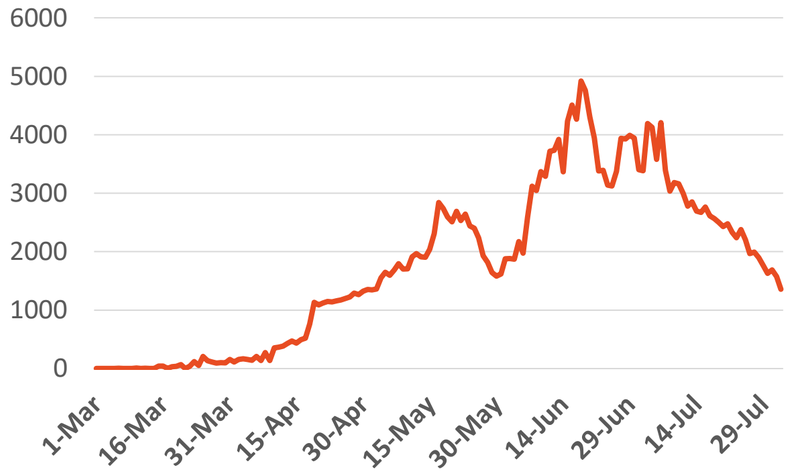
Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

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

UAE

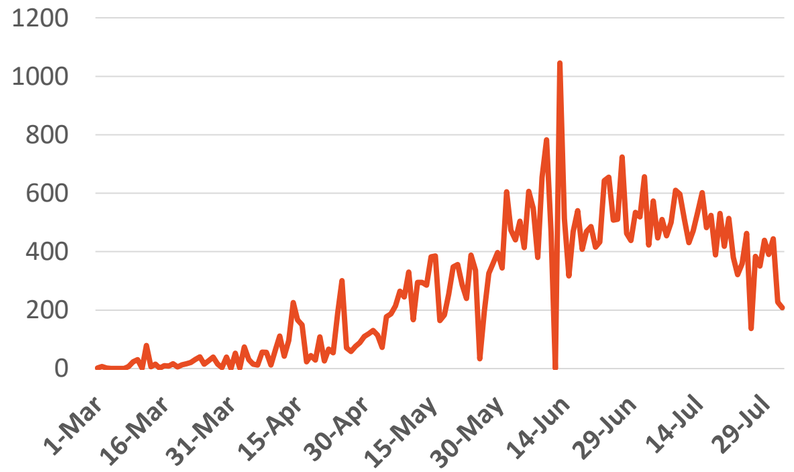
Source : National Emergency Crisis and Disaster Management Authority

KSA



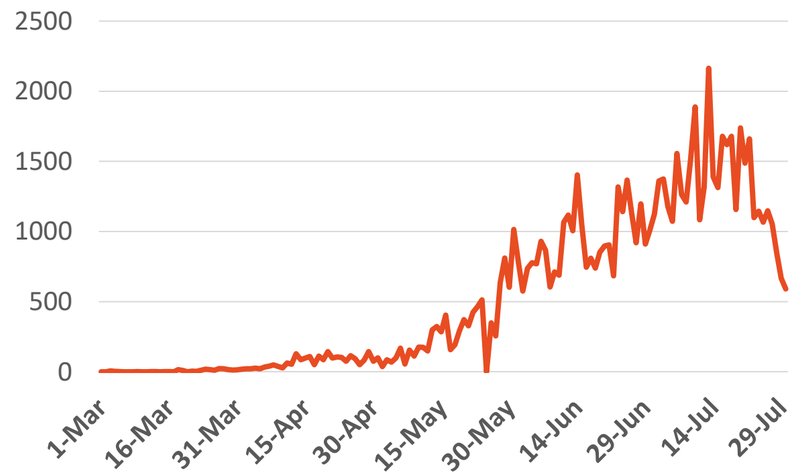
Source : KSA ministry of health

Bahrain



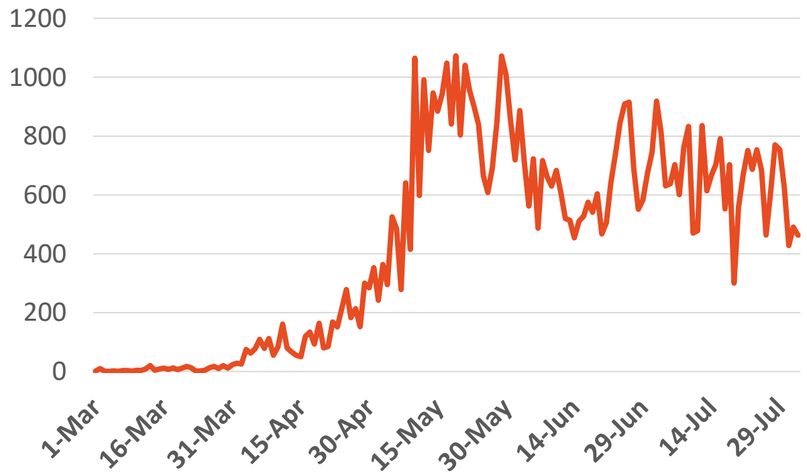
Source :WHO

Oman



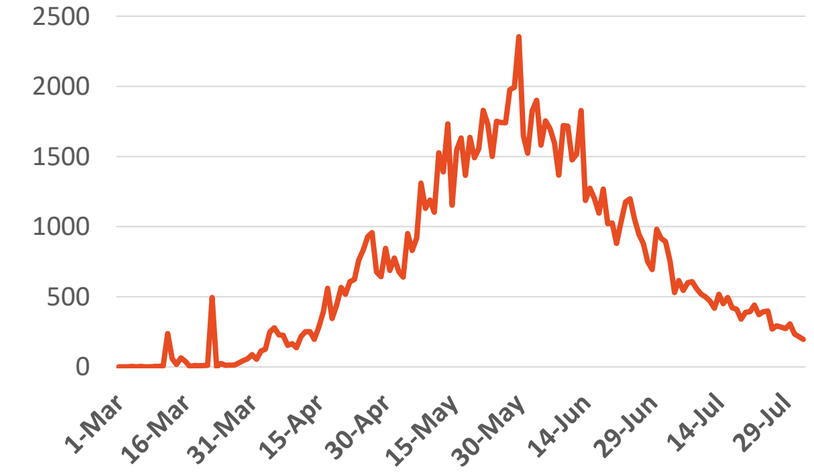
Source :Oman ministry of health

Kuwait



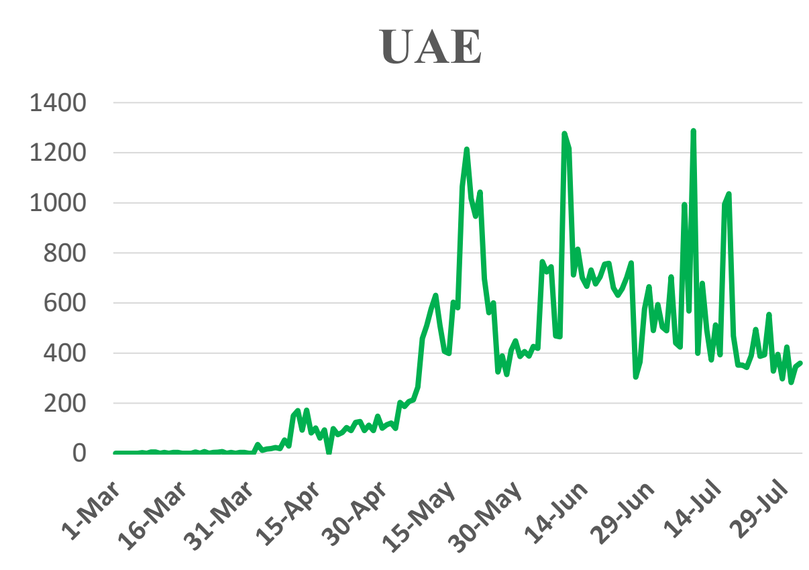
Source : Kuwait ministry of health

Qatar

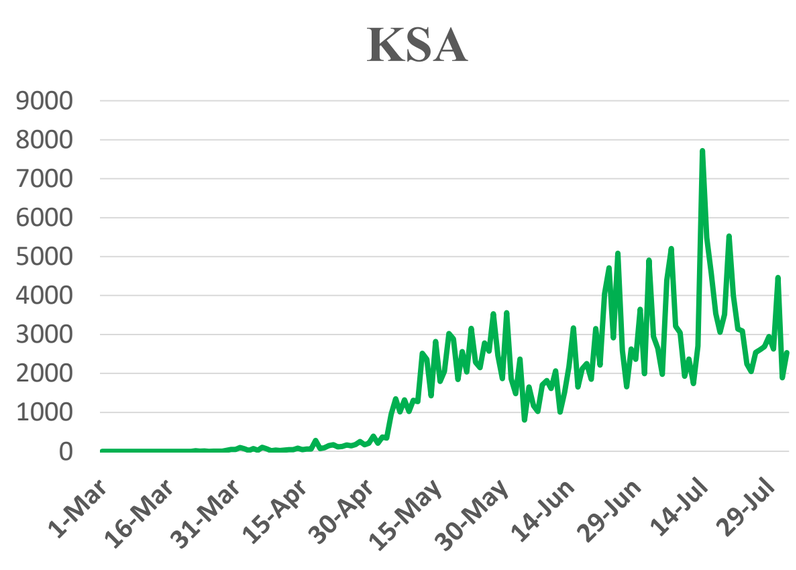


Source : Qatar ministry of health

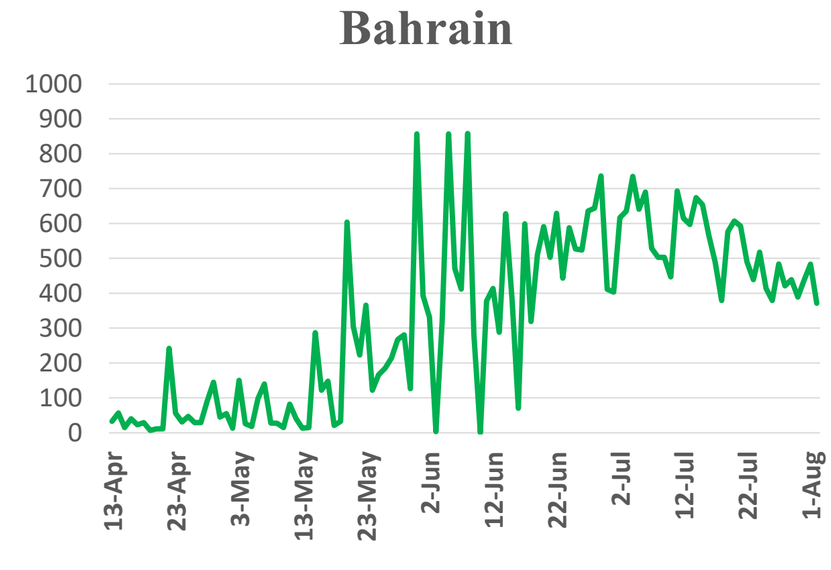
Figure 11: Comparative Analysis of the Distribution of COVID-19 Newly Recovered Cases in GCC Countries



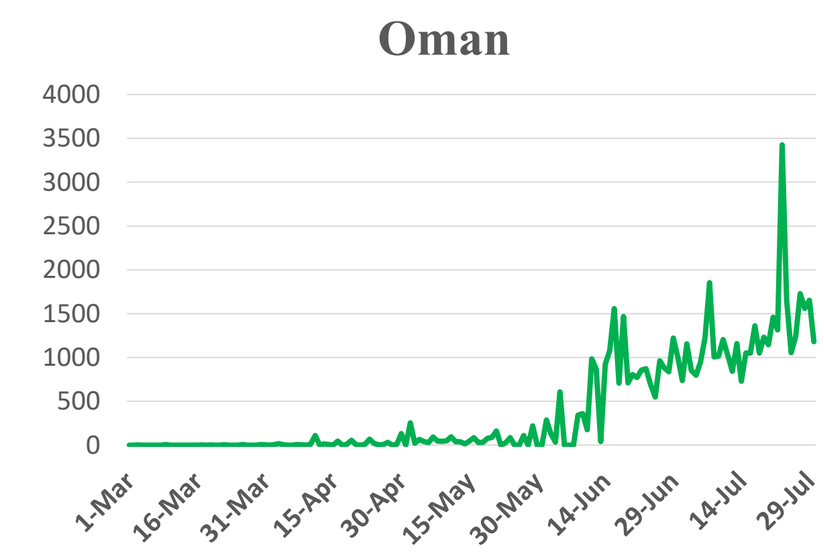
Source : National Emergency Crisis and Disaster Management Authority



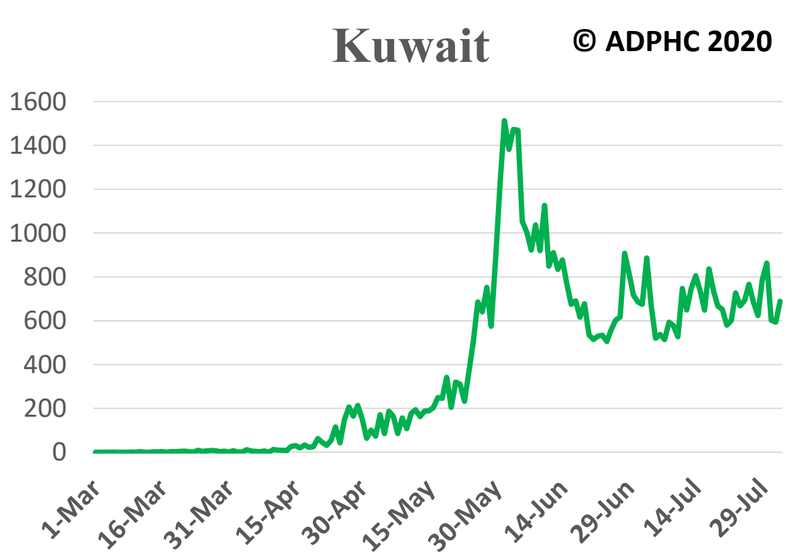
Source : KSA ministry of health



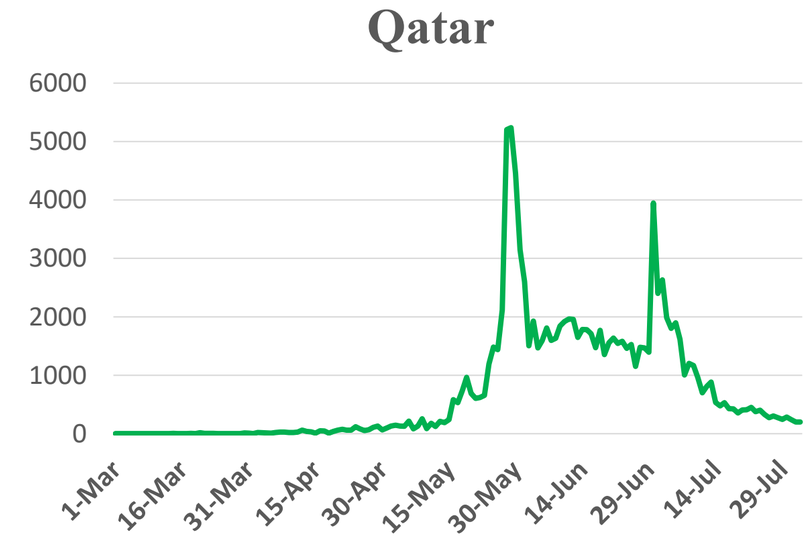
Source : GCCStat



Source :Oman ministry of health



Source : Kuwait ministry of health

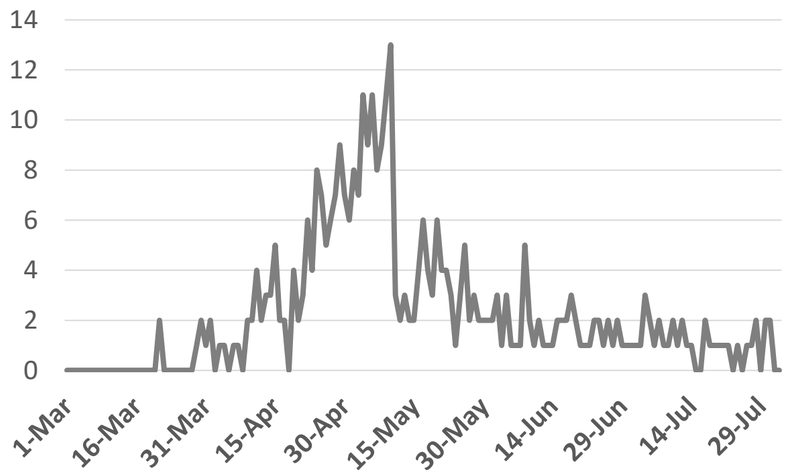


Source : Qatar ministry of health

Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

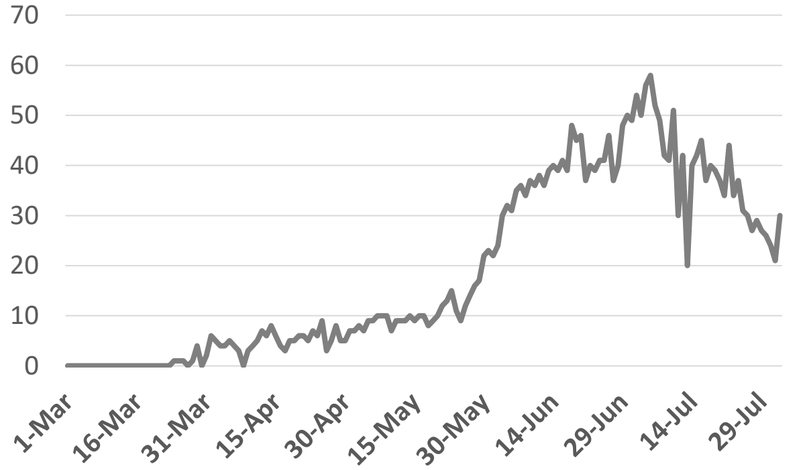
Figure 12: Comparative Analysis of the Distribution of COVID-19 New Death Cases in GCC Countries

UAE



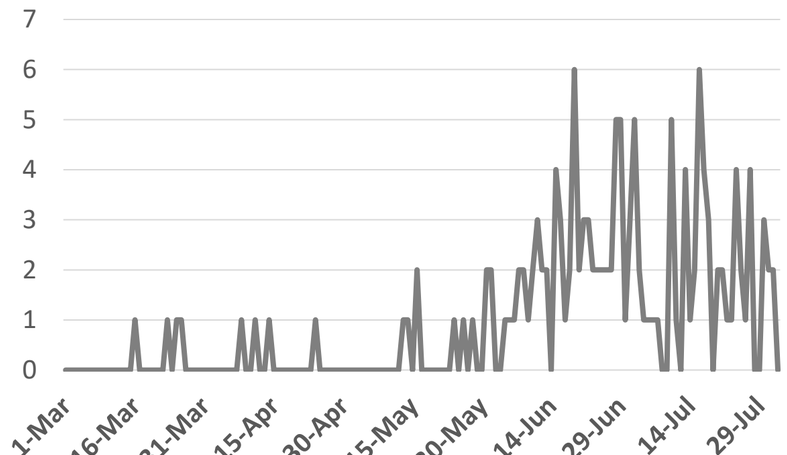
Source : National Emergency Crisis and Disaster Management Authority

KSA



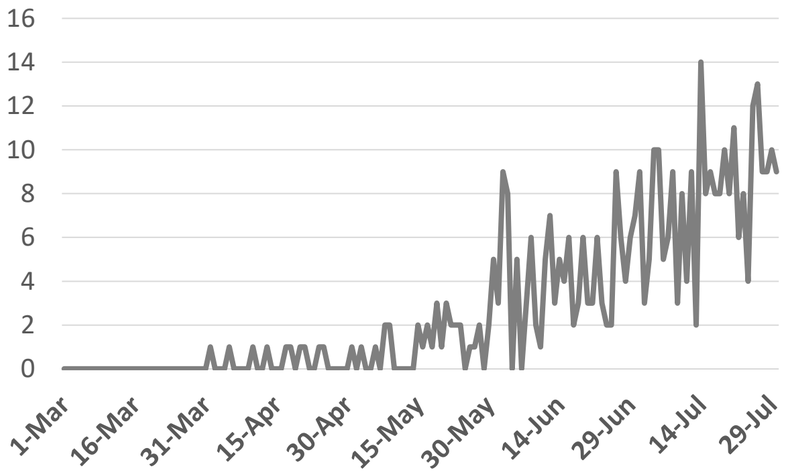
Source : KSA ministry of health

Bahrain



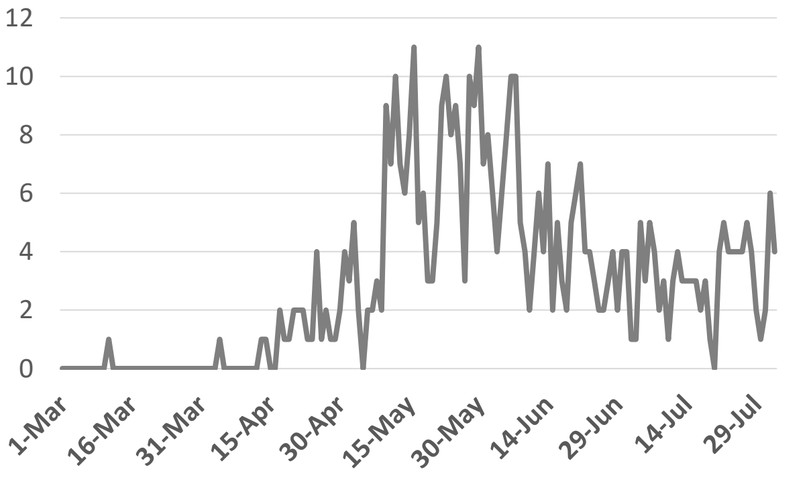
Source :WHO

Oman



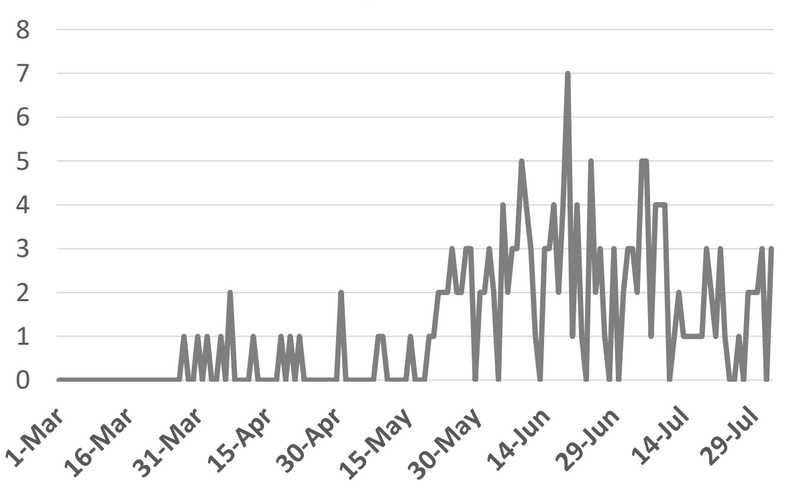
Source :Oman ministry of health

Kuwait



Source : Kuwait ministry of health

Qatar



Source : Qatar ministry of health

CLINICAL FEATURES

Article 1 Global Evaluation of Echocardiography in Patients With COVID-19

Published 18 June 2020 European Society of Cardiology

Early case reports suggest that COVID-19 can cause a wide range of cardiac conditions that include acute myocardial infarction. The authors of this study sought to prospectively describe the cardiac abnormalities in patients with COVID-19. In this international survey, the investigators captured echocardiography findings in patients with presumed or confirmed COVID-19 between 3 and 20 April 2020. They analyze the data to identify predictors of echocardiographic abnormalities.

A total of 1216 patients with a mean age of 62 years (70% male) from 69 countries were included in the study. Overall, 667 (55%) patients had an abnormal echocardiogram. Left and right ventricular abnormalities were reported in 479 (39%) and 397 (33%) patients, respectively, with evidence of new myocardial infarction in 36 (3%), myocarditis (inflammation of the heart) in 35 (3%), and takotsubo cardiomyopathy (temporary heart condition that is brought on by stress found to be common in COVID19 pts) in 19 (2%).

Severe cardiac disease, such as severe ventricular dysfunction or tamponade. was observed in 182 (15%) patients. Additionally, in **those without pre-existing cardiac disease (n = 901**), the echocardiogram was abnormal in 46%, and 13% had severe disease. Independent predictors of left and right ventricular abnormalities were distinct, including elevated natriuretic peptides and cardiac troponin (markers of heart damage in the blood)

The authors concluded that cardiac abnormalities were observed in half of all COVID-19 patients undergoing echocardiography. Abnormalities were often unheralded or severe.
Abnormalities were often undiscovered, and imaging changed management in one-third of patients.

EXTRA PULMONARY MANIFESTATIONS OF COVID-19

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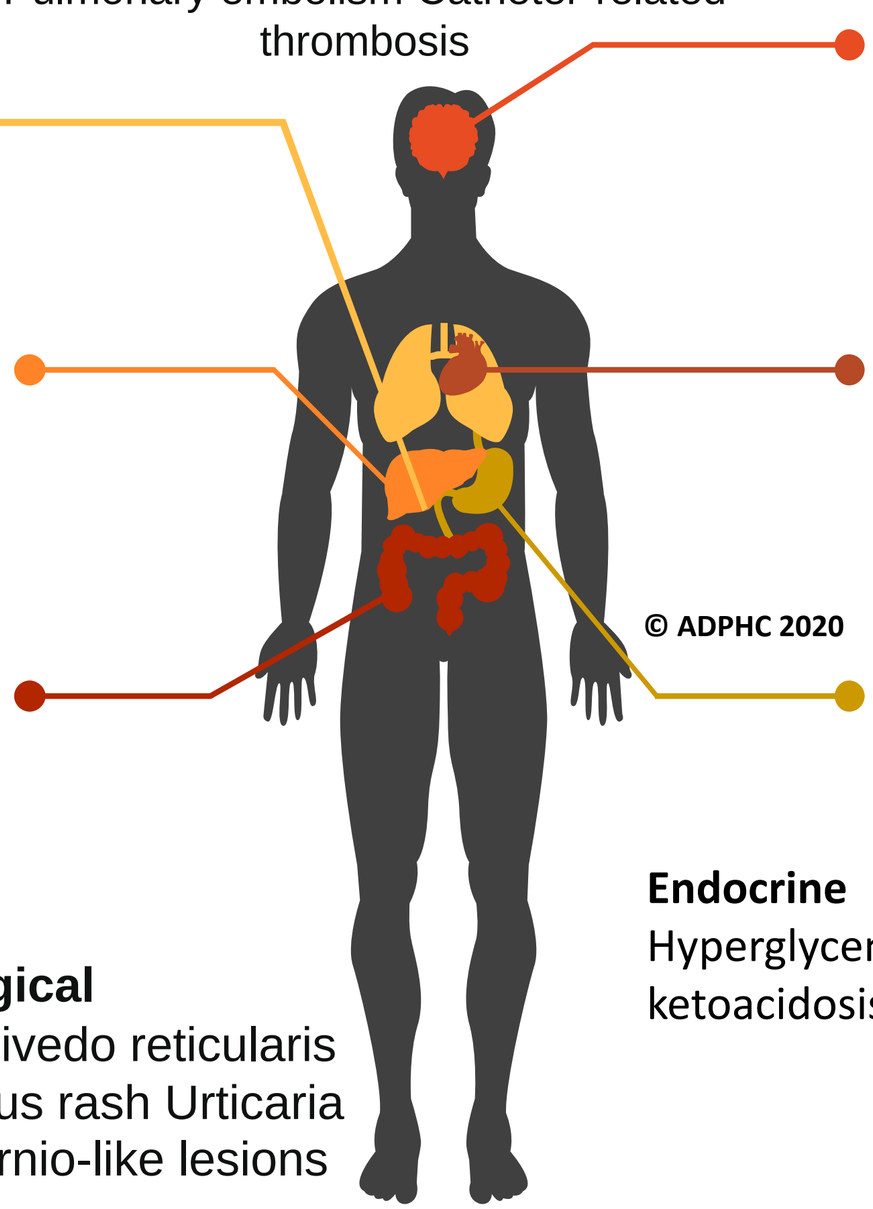
Thromboembolism
CVA (stroke)
Deep vein thrombosis
Pulmonary embolism Catheter-related thrombosis

Renal
Acute kidney injury
Proteinuria Hematuria

Hepatic
Elevated aminotransferases
Elevated bilirubin

Gastrointestinal
Diarrhea
Nausea/vomiting
Abdominal pain Anorexia



Neurologic
Headaches Dizziness
Encephalopathy Guillain-Barré Ageusia Myalgia
Anosmia Stroke

Cardiac
Takotsubo cardiomyopathy
Myocardial injury/myocarditis
Cardiac arrhythmias
Cardiogenic shock
Myocardial ischemia
Acute cor pulmonale

Endocrine
Hyperglycemia Diabetic ketoacidosis

Dermatological
Petechaie Livedo reticularis
Erythematous rash Urticaria
Vesicles Pernio-like lesions

Data resources: nature.com

Article 2

Test Sensitivity Is Secondary to Frequency and Turnaround Time for COVID-19 Surveillance

Published 28 June 2020 MedRxiv

A team from Harvard have developed surveillance effectiveness model studying considering test sensitivities, frequency, and sample-to-answer reporting time using two types of epidemiological models called agent-based model and mixed model.

- The researcher assumes that there might be minimal differences in effective surveillance using viral detection tests of different sensitivities such as RT-qPCR with a limit of detection (**LOD) at 10^3 cp/ml** compared to often cheaper or faster assays with higher limits of detection (i.e**., around 10^5 cp/ml**) such **as point-of-care nucleic acid LAMP and rapid antigen tests.**

Results:

- Dramatic reductions in total infectiousness of the individuals were observed by testing daily or every third day, ~ 60% reduction when testing weekly, and < 40% under biweekly testing
- Testing frequency was found to be the primary driver of population-level epidemic control, with only a small margin of improvement provided by using a more sensitive test.

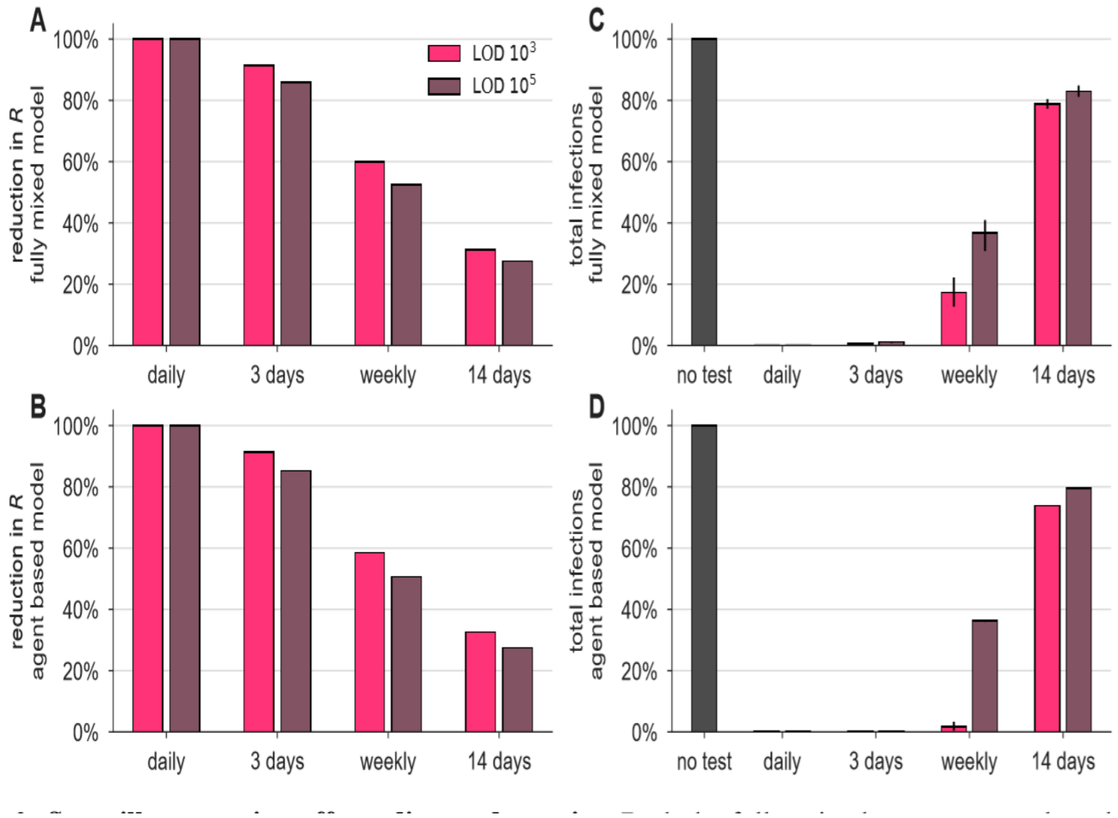


Figure 1: The graphs show that both models are affected by surveillance programs and more frequent testing reduces the effective reproductive number *R*.

DIAGNOSIS

Continued

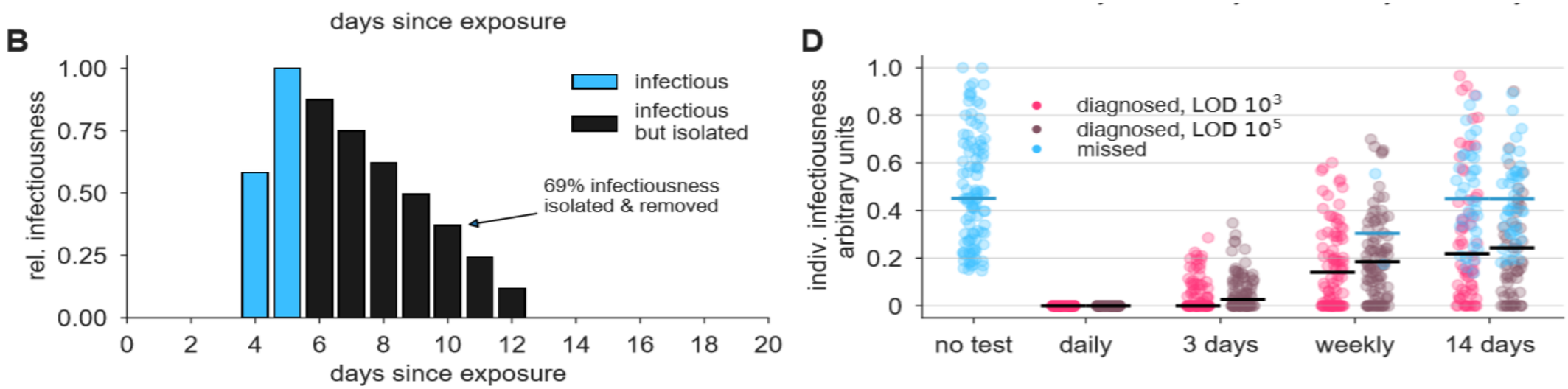


Figure 2: Infectious period is highly to be missed during surveillance in asymptomatic infectious period of a patient (day 4-6 after exposure) this is shown to be reduced by use of either test LOD10^3 or LOD10^5, but the reduction is noted to be different when frequency changes.

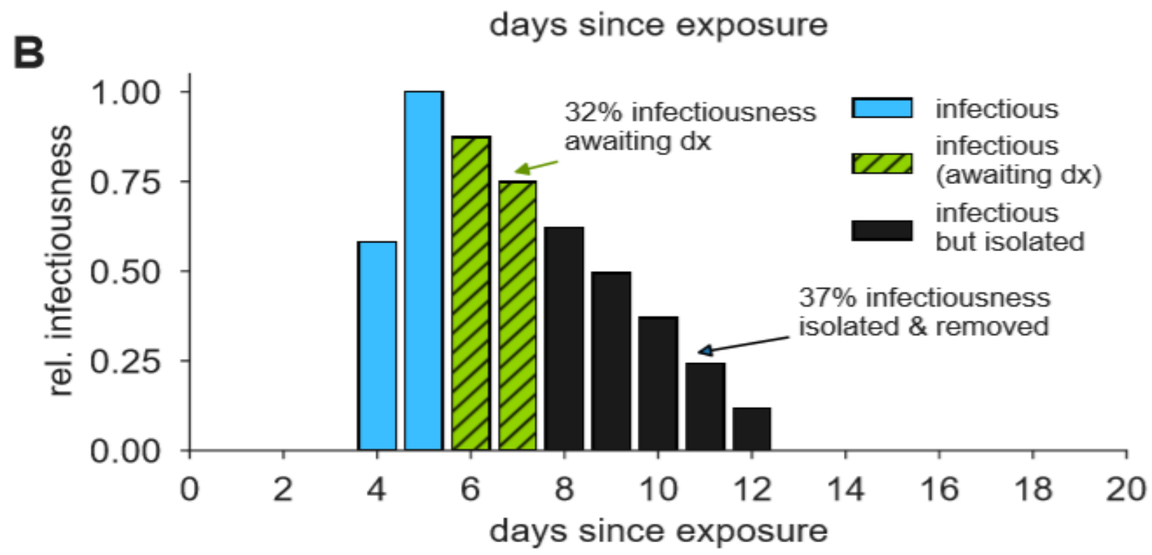


Figure3: Shows that delay in reporting of a test, may lead to more infectious cases and lower epidemiological control.

DIAGNOSIS

Continued

Conclusion

- The authors suggest that the FDA, other agencies, or state governments, encourage the development and use of alternative faster and lower-cost tests for surveillance purposes, even if they have poorer limits of detection. If the availability of point-of-care or self-administered surveillance tests leads to faster turnaround time or more frequent testing, the study results suggest that they would have high epidemiological value.
- The authors claim that high sensitivity testing will subject some individuals to unnecessary quarantine days. For instance, the infrequent use of a sensitive test will not only identify those with a low viral load at the beginning of the infection, who must be isolated to limit the viral spread but those in the recovery period, who still have detectable virus or RNA but are below the infectious threshold. Isolating this second group of patients will have no impact on the viral spread but will incur costs of isolation.
- **Effective surveillance** depends on time to first detection and **outbreak control**, depends largely on the frequency of testing and the speed of reporting, and is only marginally improved by high test sensitivity.
- surveillance should prioritize accessibility, frequency, and sample-to-answer time; analytical limits of detection should be secondary.

Study limitation

- The sensitivity of a test may depend on factors beyond LOD, including manufacturer variation and improper clinical sampling, though the latter may be ameliorated by different approaches to sample collection, such as saliva-based testing.

TREATMENT

مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

Article 3

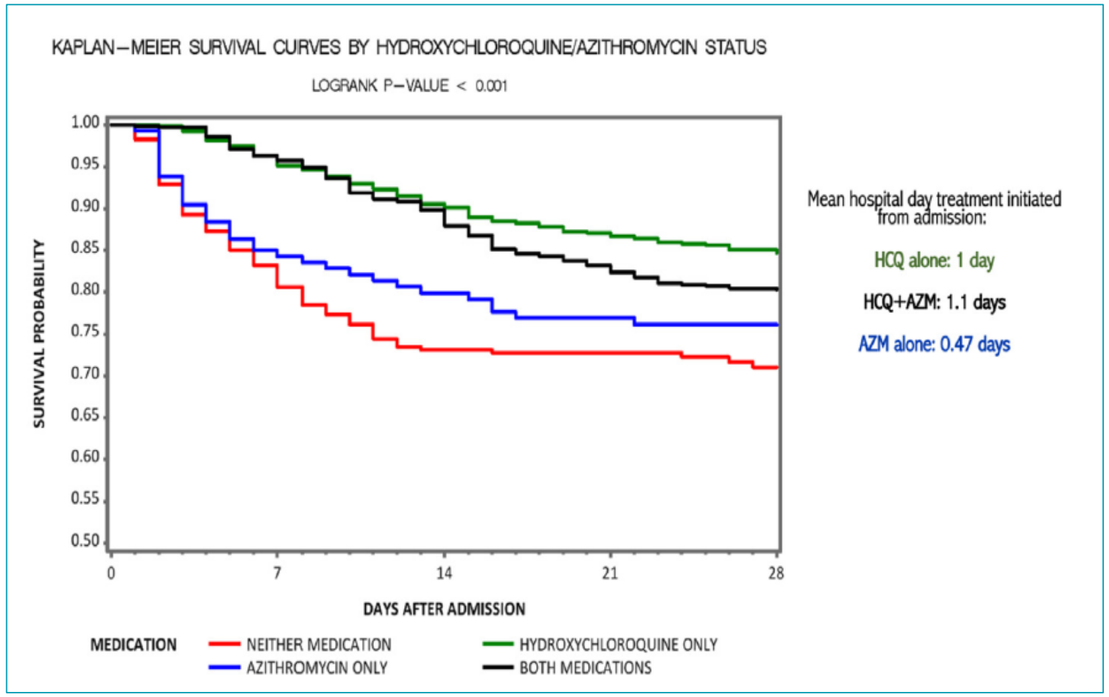
Published

Treatment with Hydroxychloroquine, Azithromycin, and Combination in Patients Hospitalized with COVID-19

28 June 2020 International Journal of Infectious Diseases

This Multi-center retrospective observational study aimed to study the impact of HCQ with/out azithromycin in hospitalized COVID-19 patients at six large hospitals (The Henry Ford Health System) in the US.

- Data on 2,541 patients from March 10, 2020, to May 2, 2020, were analyzed.
- Exposure: Receipt of HCQ alone, HCQ + AZM, AZM alone, or neither.
- The primary outcome was in-hospital mortality.



Results

- Median total hospitalization time of 6 days (IQR: 4–10 days), the median age was 64 years
- median time to follow-up of 28.5 days (IQR:3–53).
- Overall in-hospital mortality was 18.1%
- **HCQ + AZM** mortality 157/783 (20.1%)
- HCQ alone was 162/1202 (13.5%)
- azithromycin alone mortality was 33/147 (22.4%)
- neither drug was 108/409 (26.4%).
- No patient had documented torsades de pointes.
- Predictors of mortality were age>65 years, white race, CKD, reduced O2 saturation level on admission, and ventilator use during admission.
- HCQ provided a 66% hazard ratio reduction, and HCQ + AZM 71% compared to neither treatment ($p < 0.001$).
- Conclusions: In this multi-hospital assessment, when controlling for COVID-19 risk factors, treatment with HCQ alone and in combination with azithromycin was associated with a reduction in COVID-19 associated mortality.