مركز أبوظبي
للصحة العامة
ABU DHABI PUBLIC
HEALTH CENTRE

SCIENTIFIC RESEARCH MONITORING ON COVID-19

21 JULY 2020

For accessing the full series of published scientific reports please visit the following link:
https://www.doh.gov.ae/ar/covid-19/Healthcare-Professionals/Scientific-Publication

SCIENTIFIC RESEARCH MONITORING ON COVID-19 (ISSUE 171)

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.

Click on icon to view content

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).

Treatment

Interferon-α2b Treatment for COVID-19

Public Health Response

Assessing the Impact of Coordinated COVID-19 Exit Strategies Across Europe

Immunology

Longitudinal Evaluation and Decline of Antibody Responses in SARS-CoV-2 Infection

WHO SITUATION REPORT 20 JULY 2020

- As the pandemic deepens economic and social stress, the risk of gender-based violence intensifies, with serious consequences for mental health of those at risk. . WHO Regional Director for the Americas, Dr Carissa F. Etienne **emphasized the need for integrating psychosocial support and mental health services as part of the COVID-19 response.**

- **More than one million patients have recovered from COVID-19 in the Eastern Mediterranean Region since 29 January 2020**.

- During health emergencies, one of WHO's most vital roles is to gather data and research from around the world, evaluate it, and advise countries on how to respond by working closely with experts from around the world. **More than 100 documents have been published by WHO on COVID-19 since January 2020**. You can find a summary of WHO's role in a pandemic and of the key documents that have been issued here. Today we include two reports in the 'Subject in Focus' below. The first describes 'COVID-19 and Indigenous peoples in the region of the Americas'. The second provides an update on 'Partner coordination'.

EPIDEMIOLOGY

FROM 21 JAN TO 20 JUL 2020

مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

Figure 1: Total number of infected, recovered , and death cases

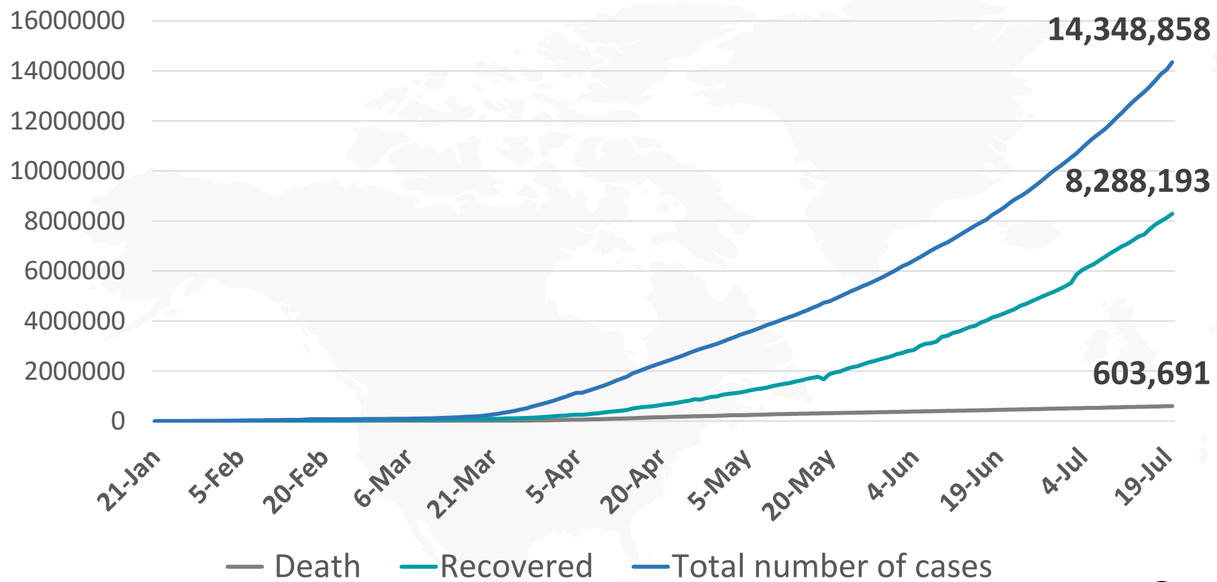


Figure 3: Total number of death due to COVID-19 (china and the result of the world)

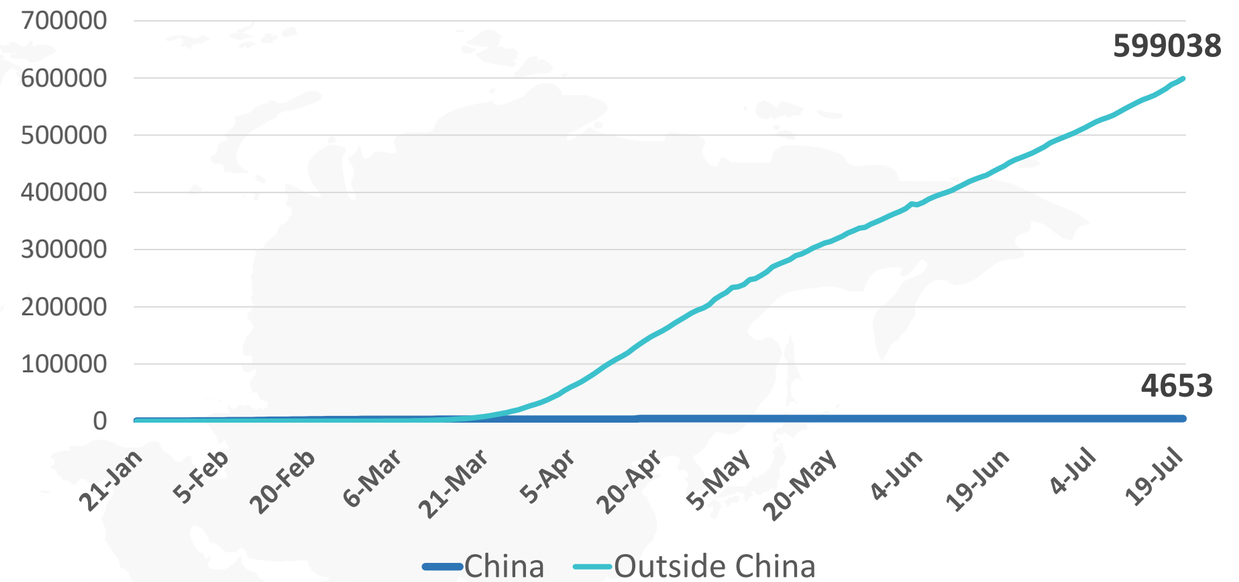


Figure 2: Daily new infected COVID-19 cases (china and the rest of the world)

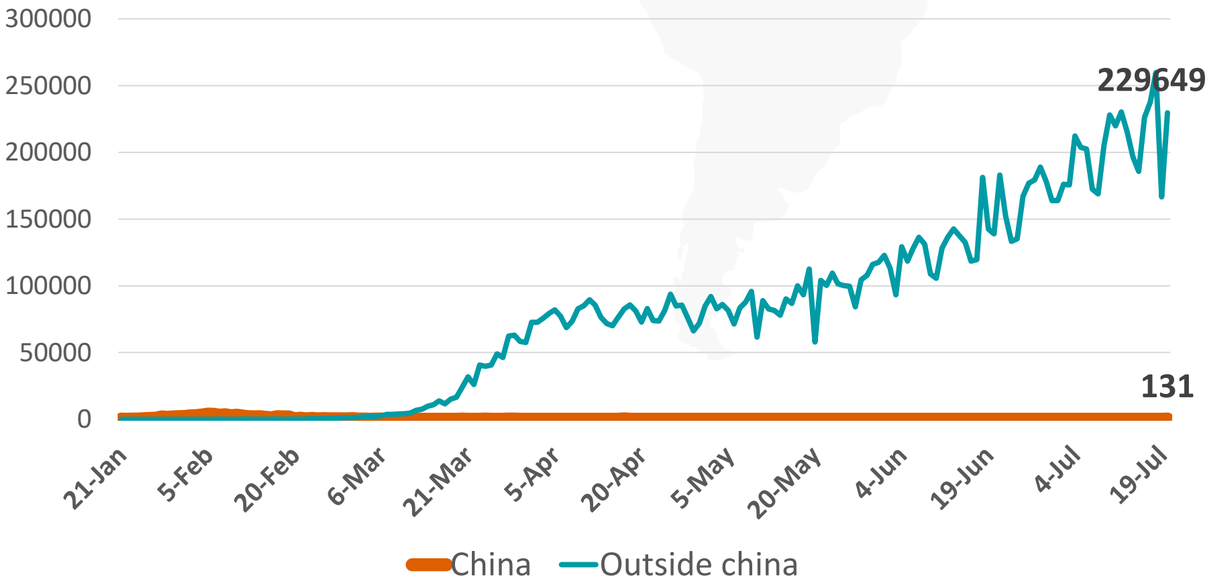
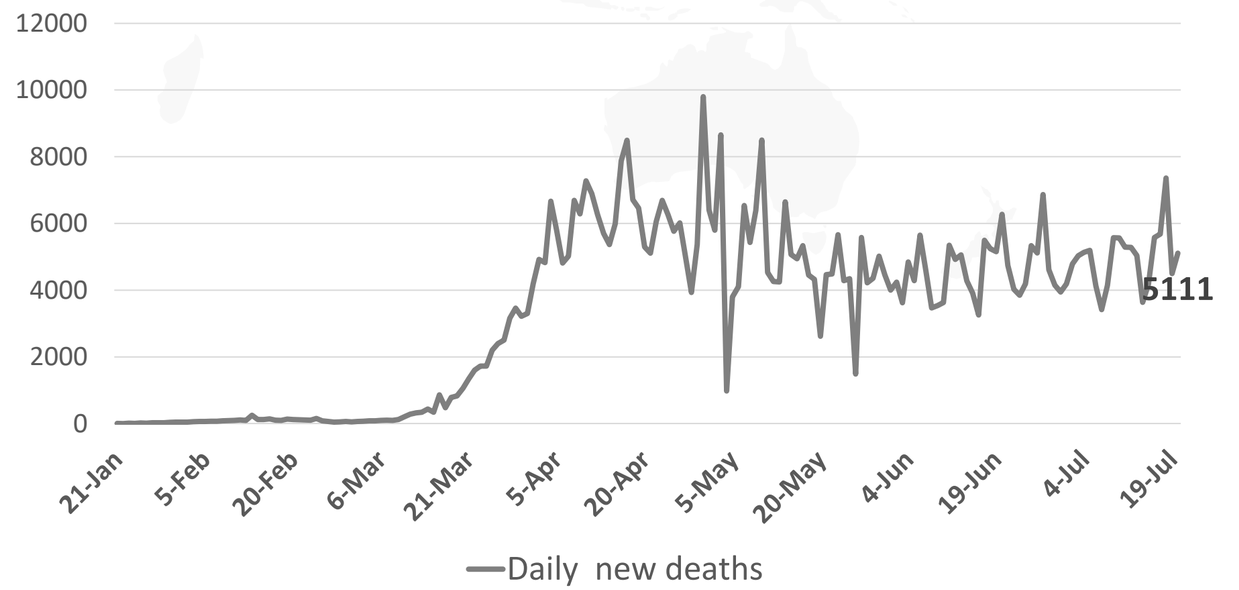


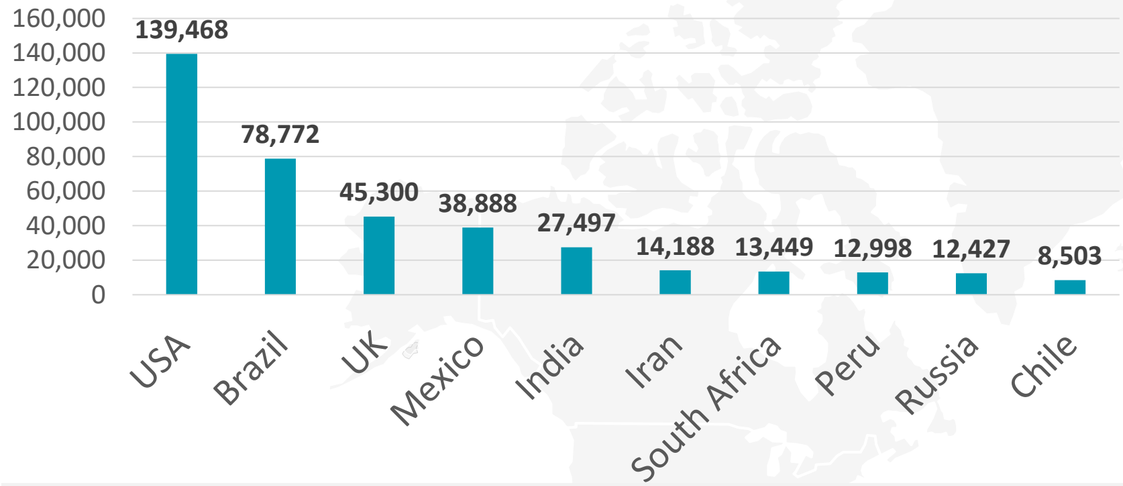
Figure 4: Global daily new deaths due to COVID-19 (china and rest world)



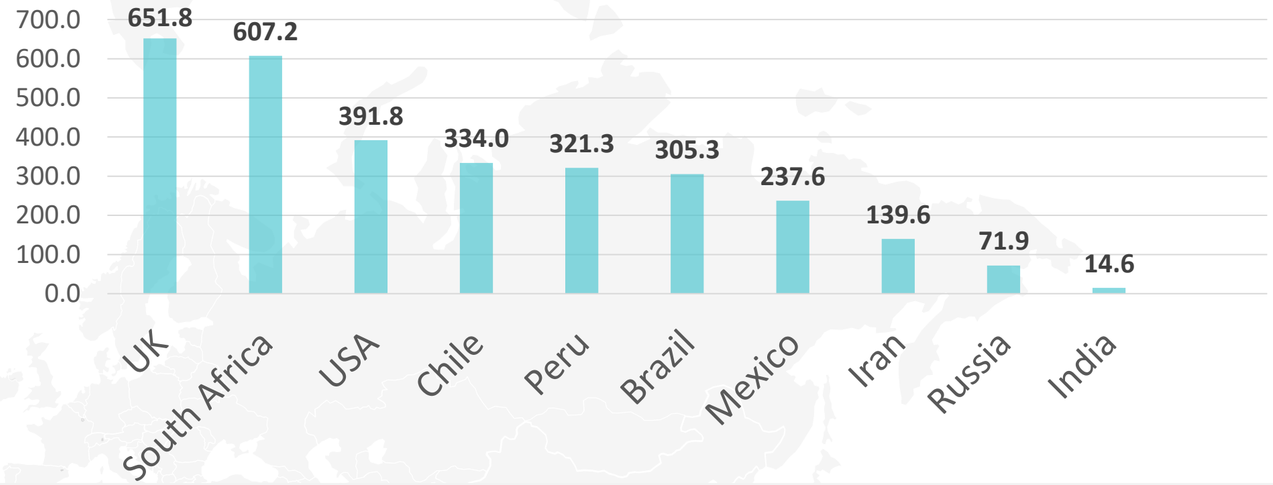
Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

Figure 3: Top 10 countries in the total number of cases due to COVID-19

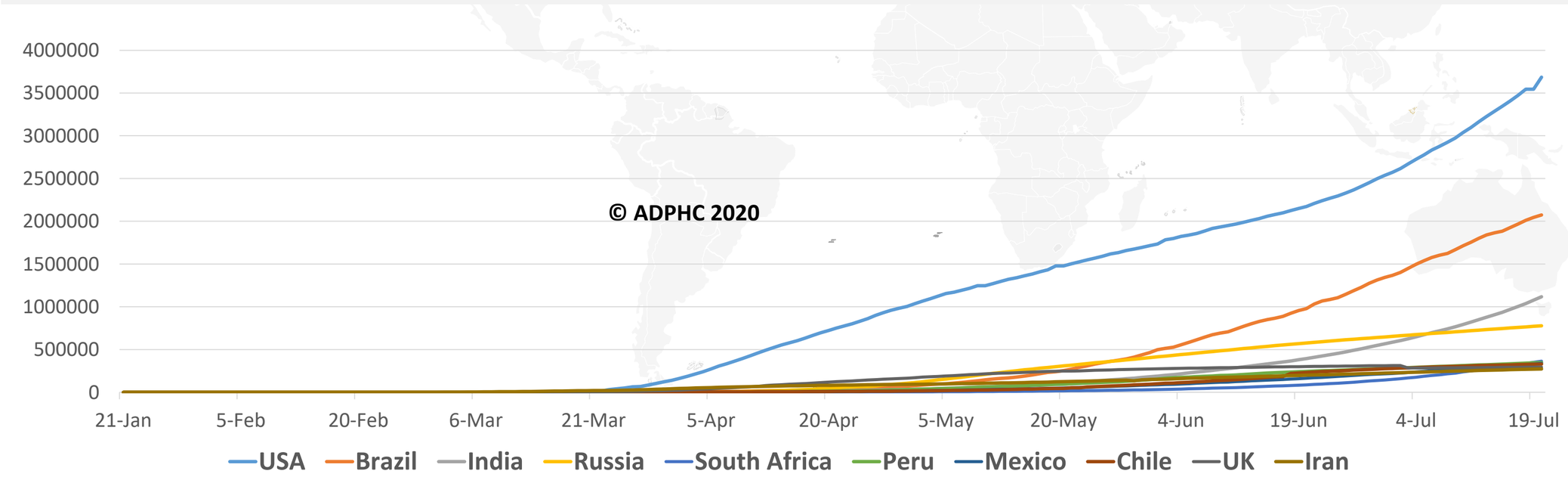
TOTAL DEATHS



DEATHS PER MILLION



TOTAL INFECTED CASES



USA	3,685,460
Brazil	2,074,860
India	1,118,043
Russi	777,486
South Africa	364,328
Peru	349,500
Mexico	338,913
Chile	330,931
UK	294,796
Iran	273,788

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

EPIDEMIOLOGY

FROM 21 JAN TO 20 JUL 2020

مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

Figure 5: COVID19 STATUS IN THE UAE (Federal Competitiveness and Statistics Authority dashboard)

Daily Tests

45,815.0 Average Tests
463.2 per 100k population
0.6% Positive Rate

Daily Cases

285.0 Average Cases
2.9 per 100k population

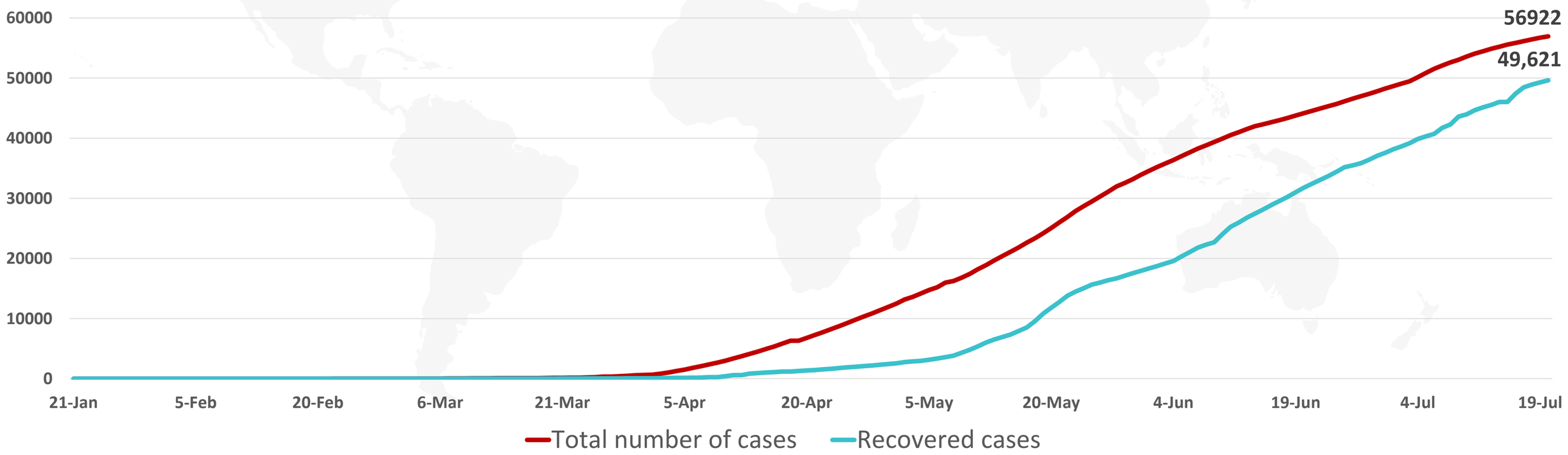
Daily Recovered

586.9 Average Recovered
5.9 per 100k population

Daily Deaths

0.9 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



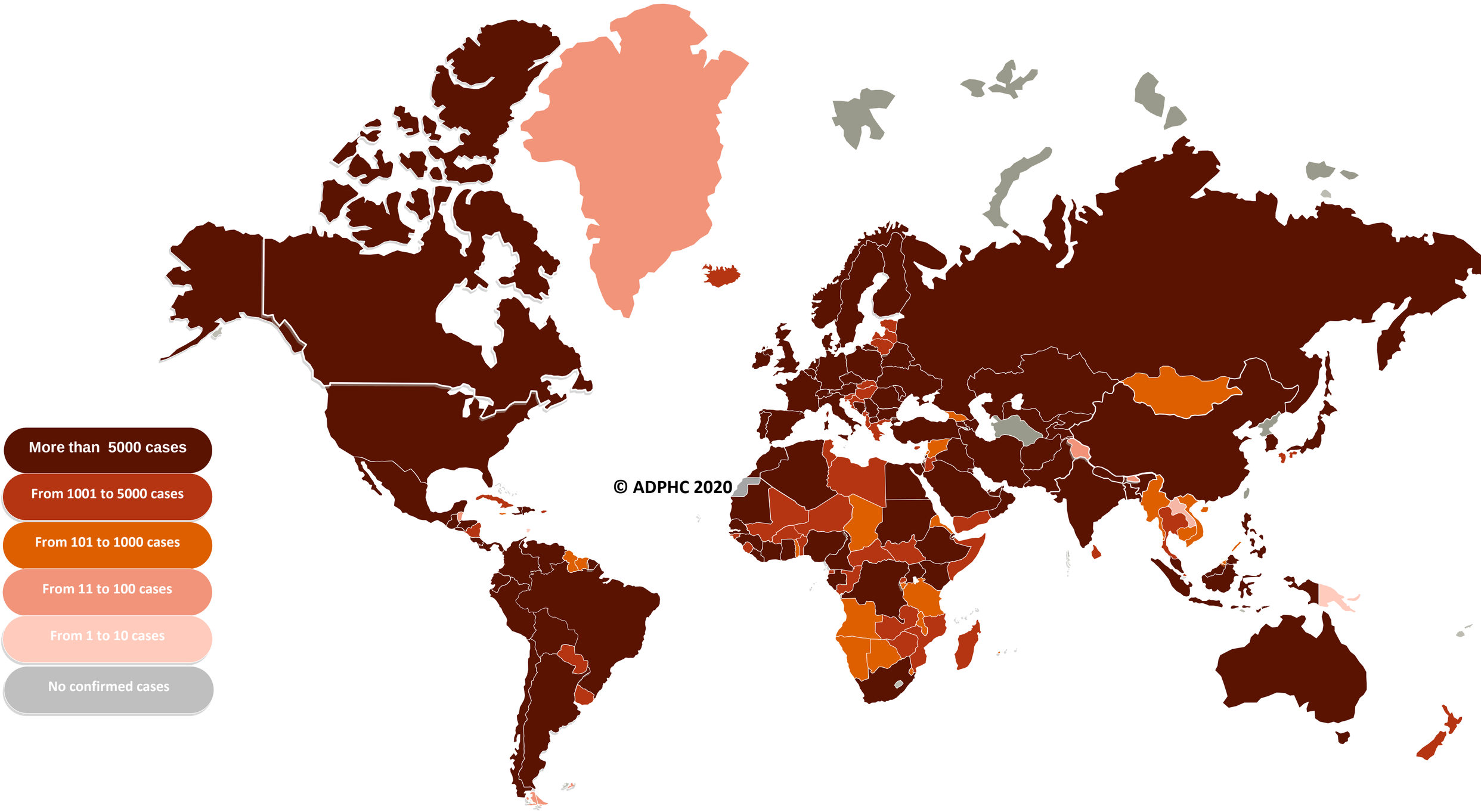
Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: FCSA, WHO,

EPIDEMIOLOGY

Date: 20 JUL 2020

مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

Figure 7A : Global distribution of COVID-19 cases



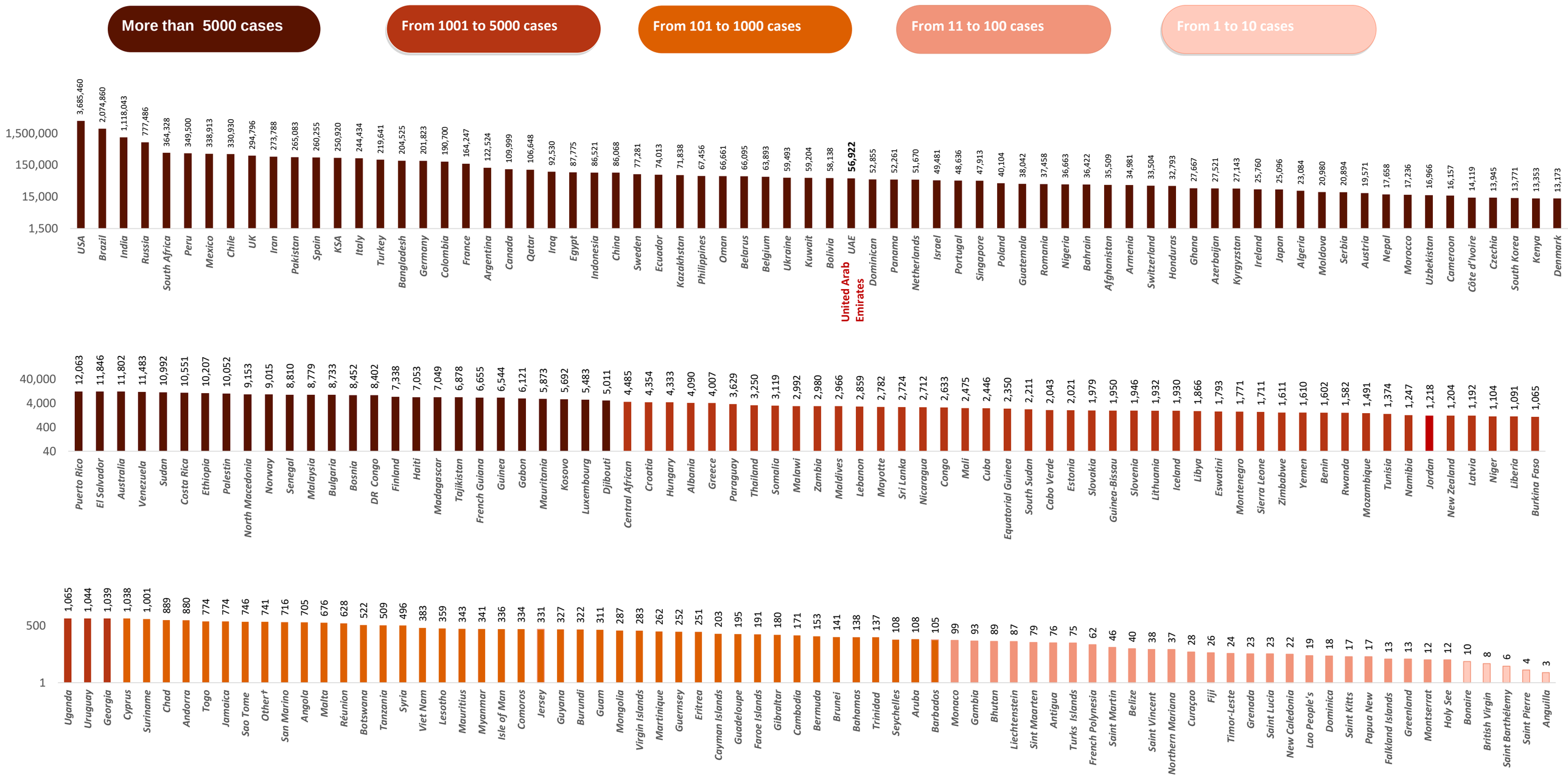
Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

EPIDEMIOLOGY

Date: 20 JUL 2020

مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

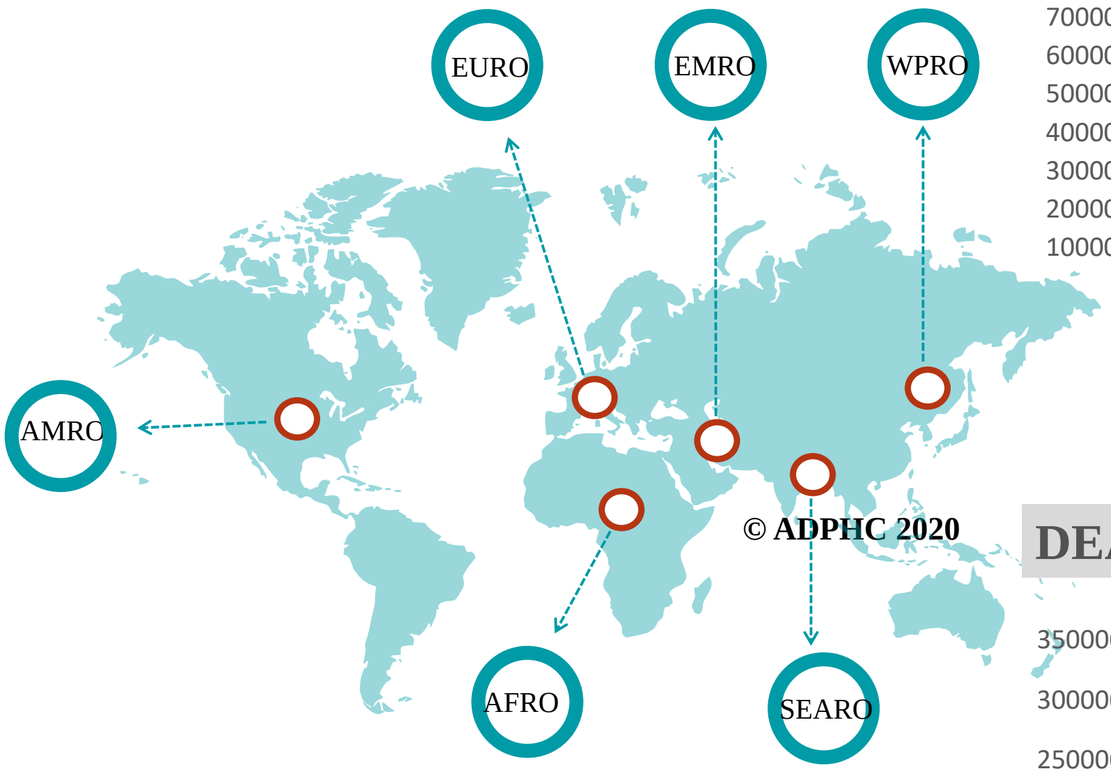
Figure 7B: Bar chart illustrate the global distribution of COVID19 cases



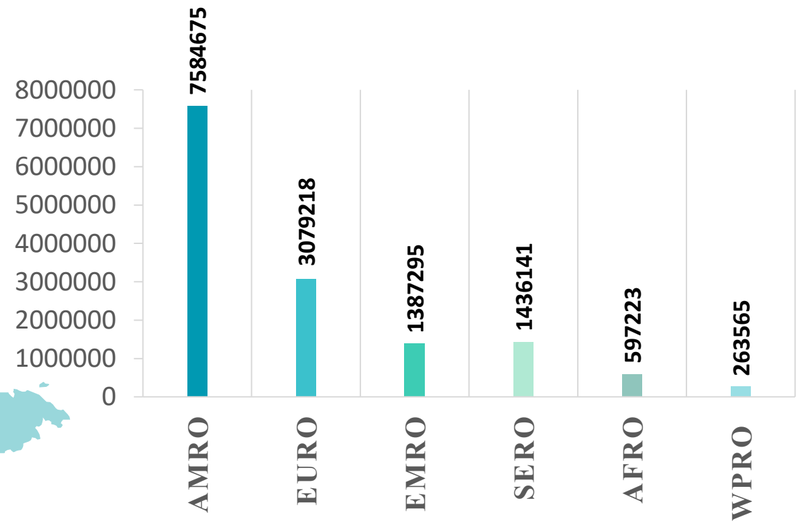
Other*:includes cases and deaths reported under the international conveyance(Diamond Princess)

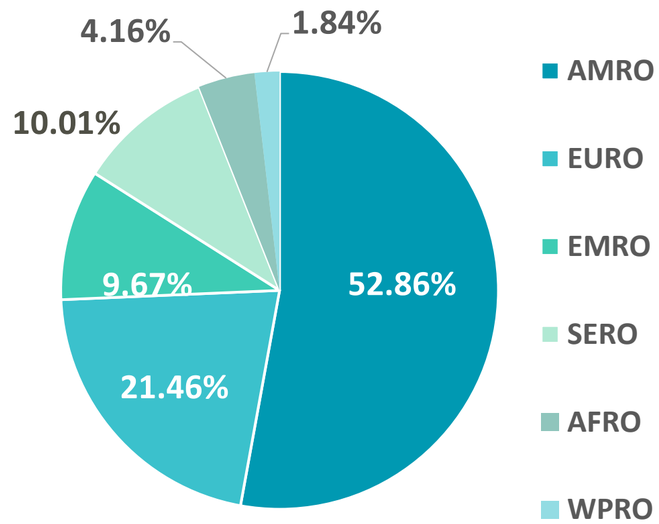
Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

Figure 8: illustrate the Global distribution of COVID19 cases per region

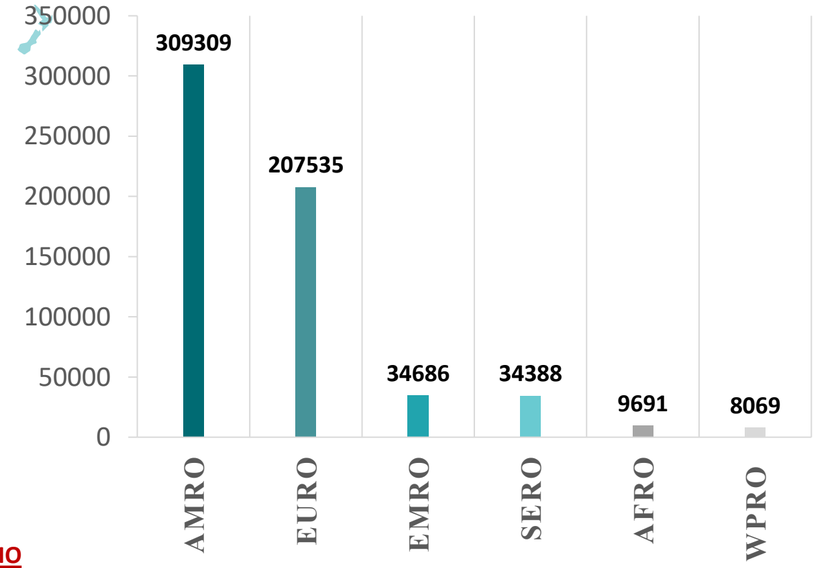


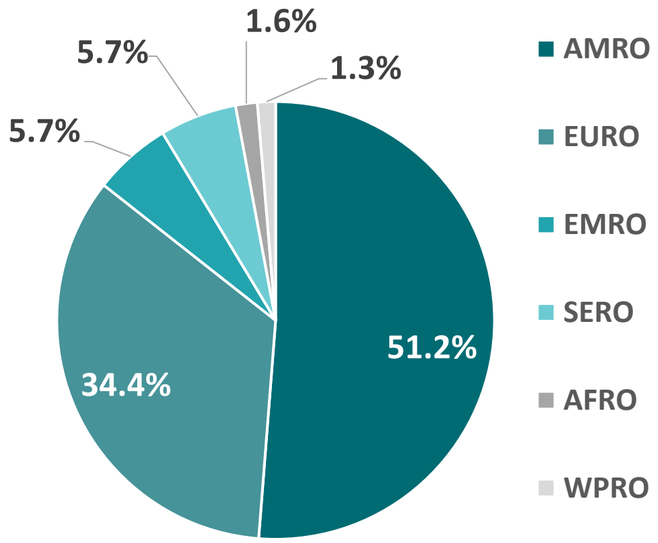
INFECTED





DEATH

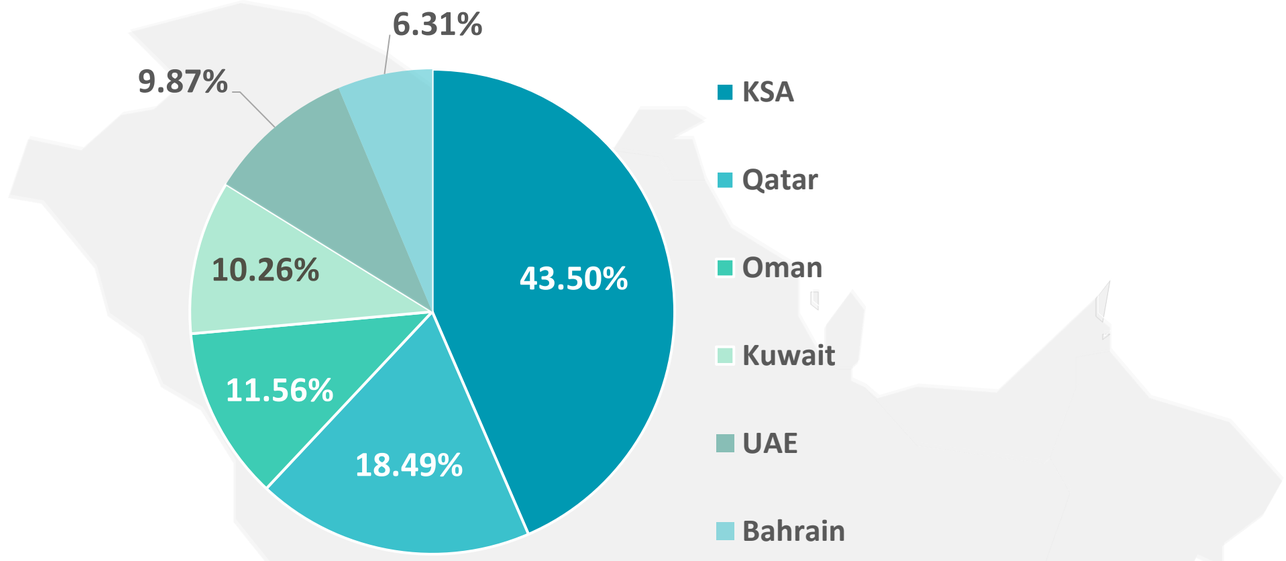


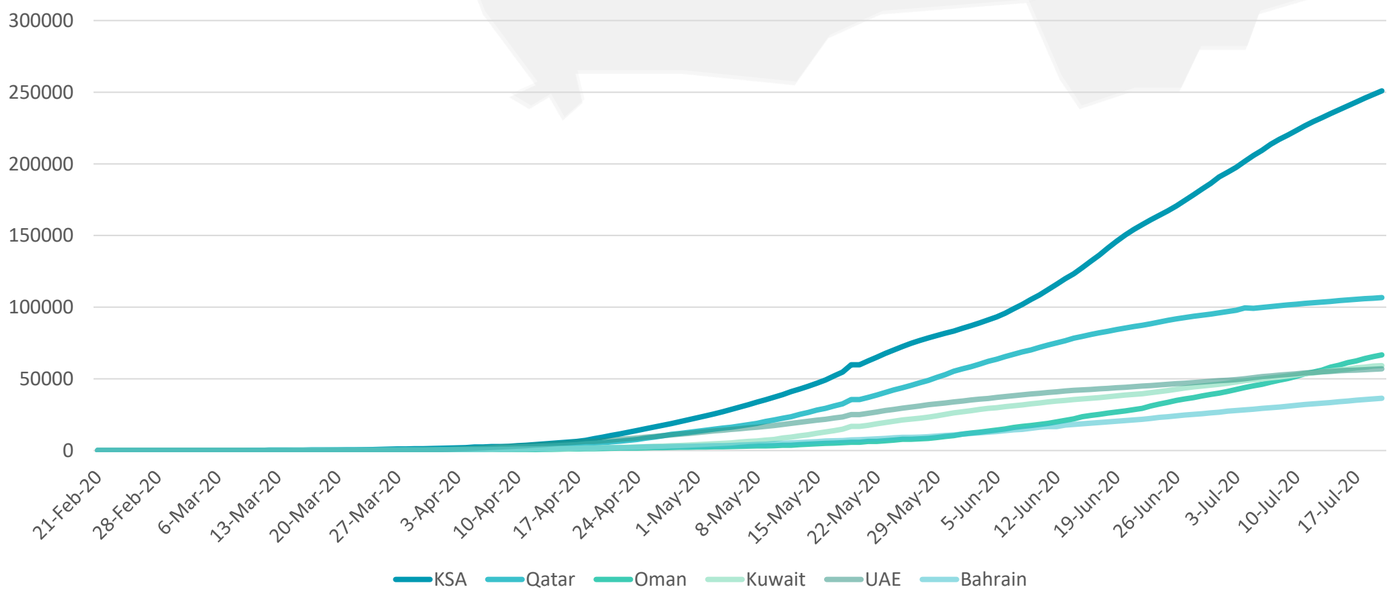


Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

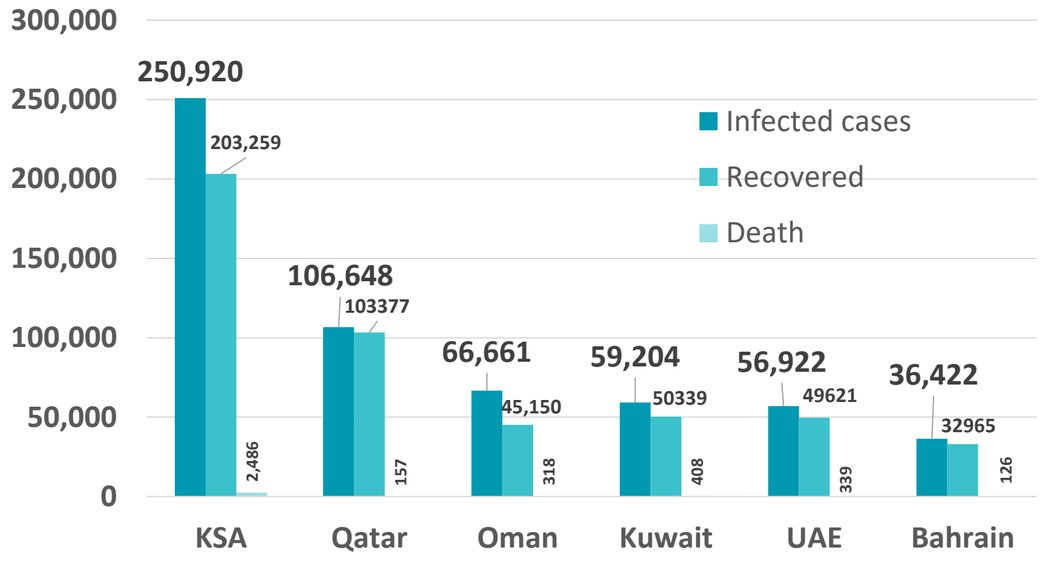
Figure 9: Comparative analysis of the distribution of COVID19 cases in GCC countries

TOTAL NUMBER OF INFECTED CASES

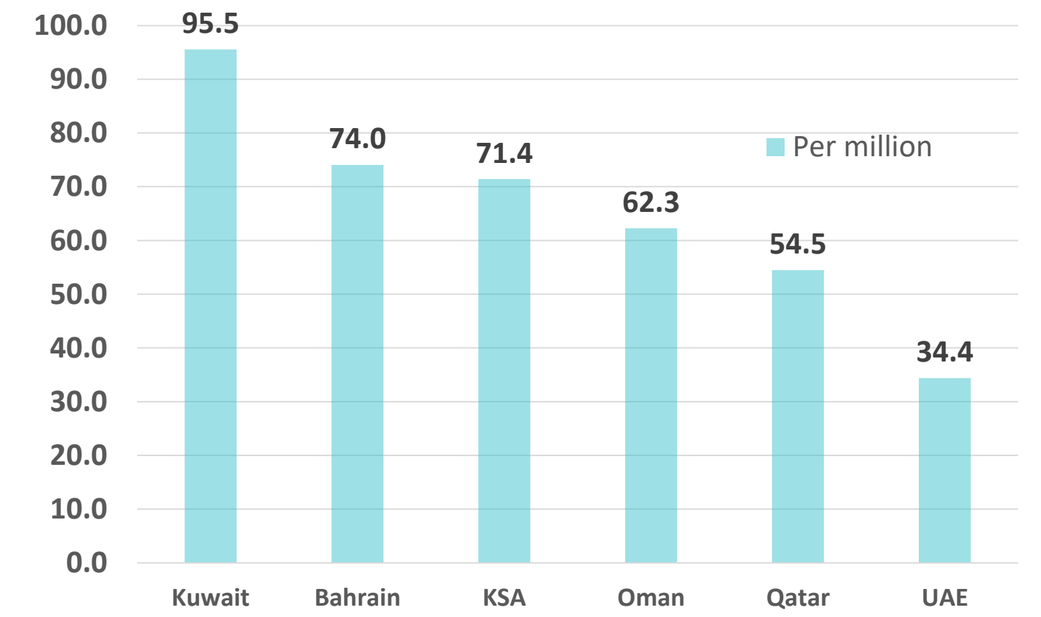




TOTAL NUMBER OF INFECTED, RECOVERED AND DEATHS



DEATH PER MILLION



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

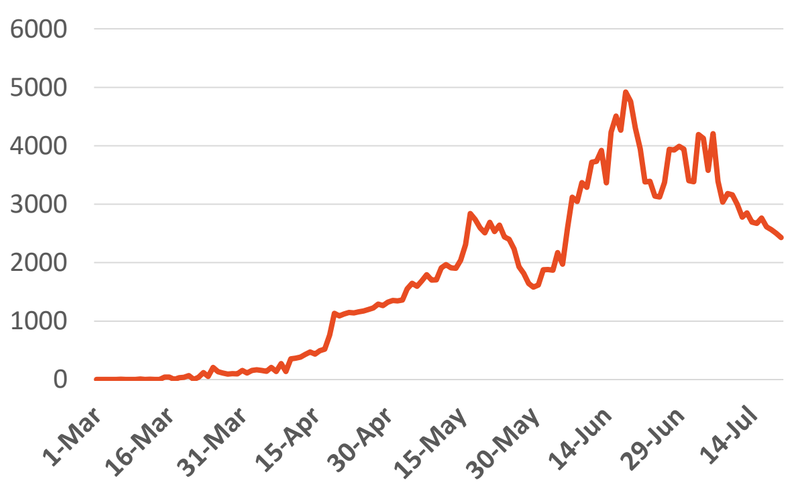
مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

Figure 10: Comparative analysis of the distribution of COVID19 new cases in GCC countries

UAE

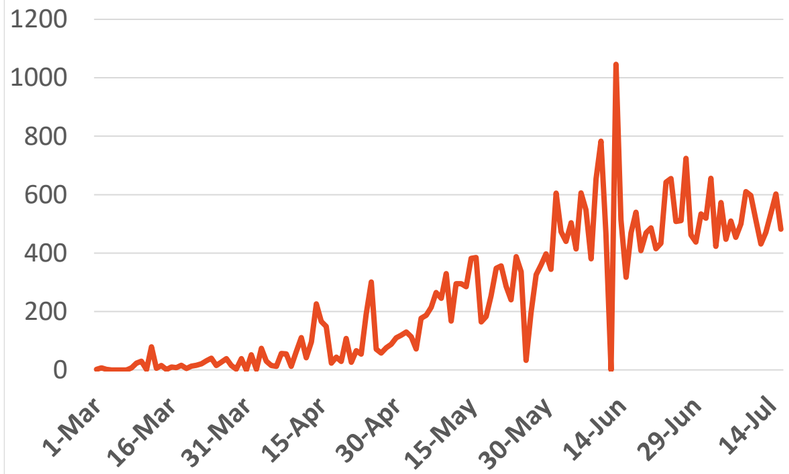
Source : National Emergency Crisis and Disaster Management Authority

KSA



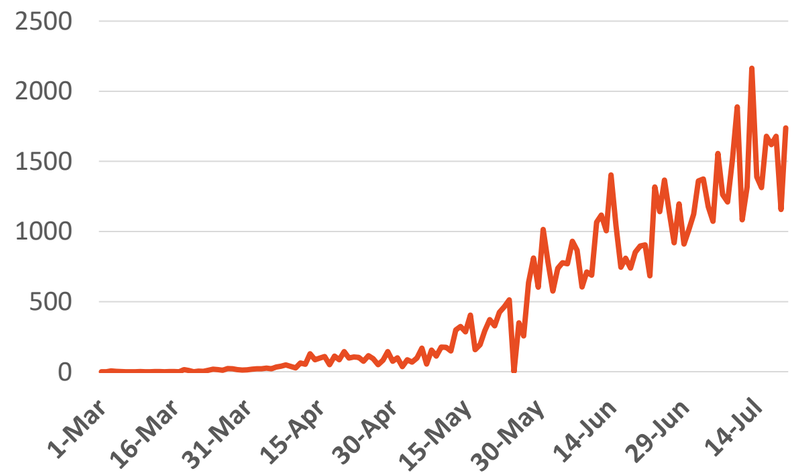
Source : KSA ministry of health

Bahrain



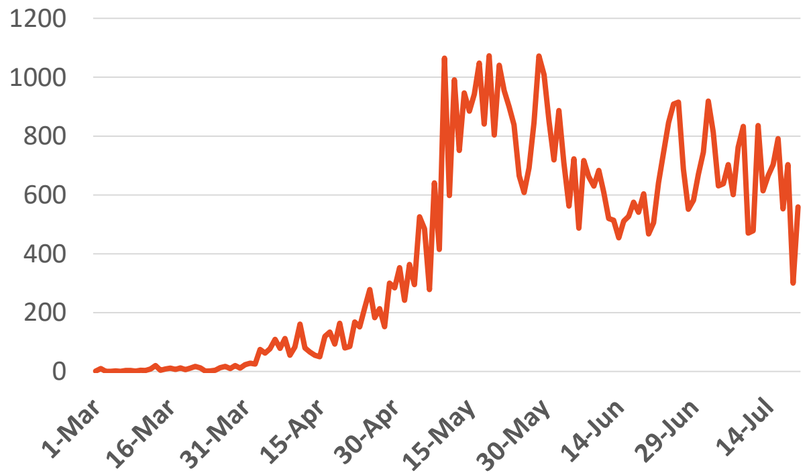
Source :WHO

Oman



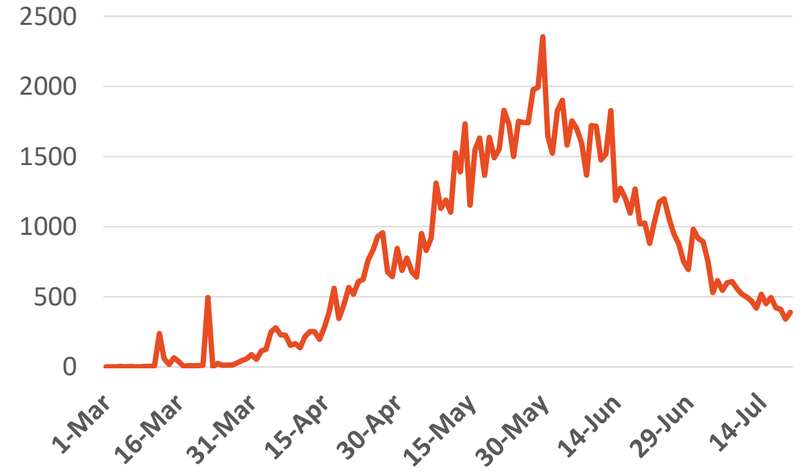
Source :Oman ministry of health

Kuwait



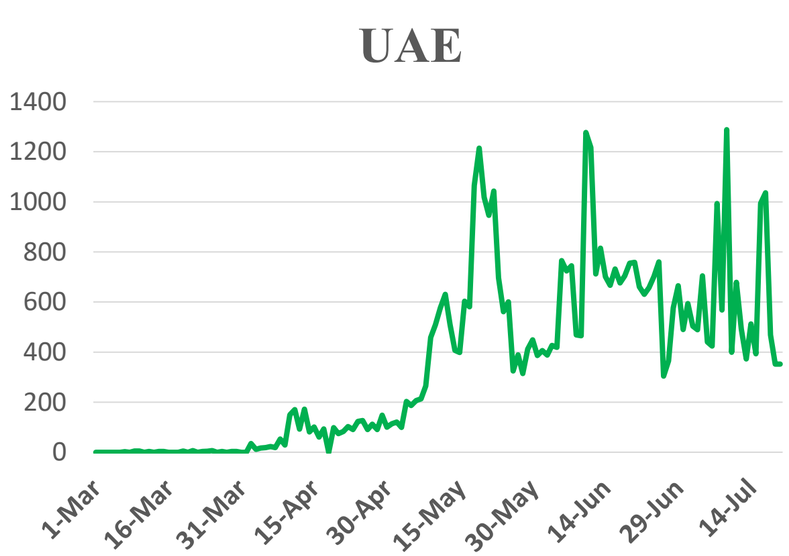
Source : Kuwait ministry of health

Qatar

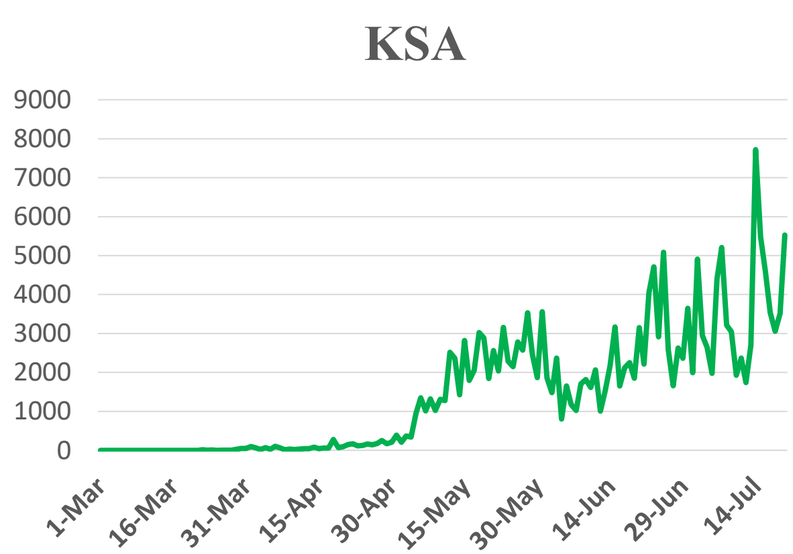


Source : Qatar ministry of health

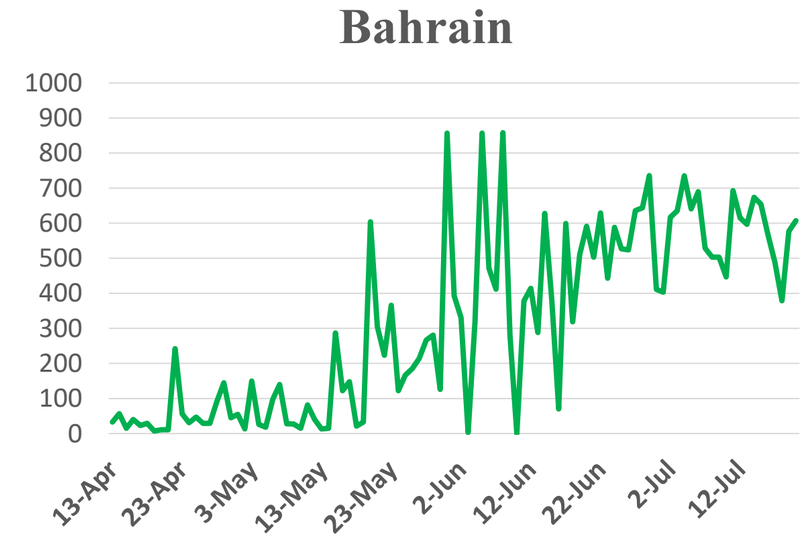
Figure 11: Comparative analysis of the distribution of COVID19 newly recovered cases in GCC Countries



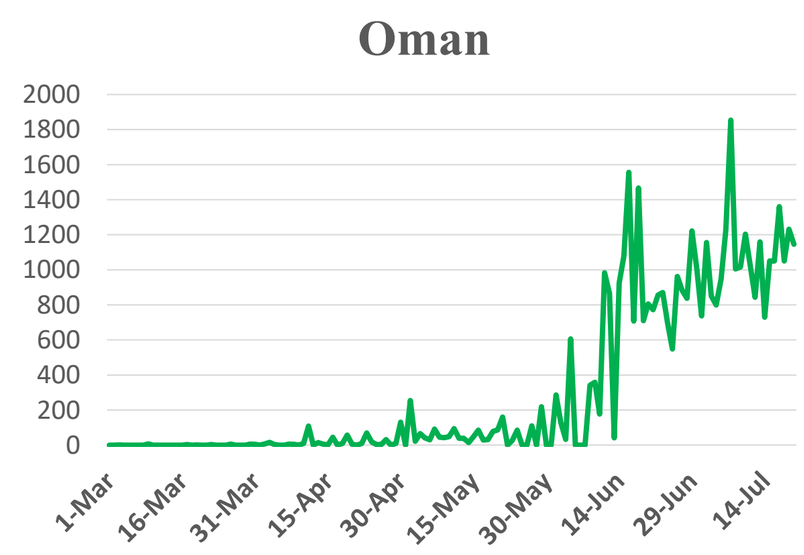
Source : National Emergency Crisis and Disaster Management Authority



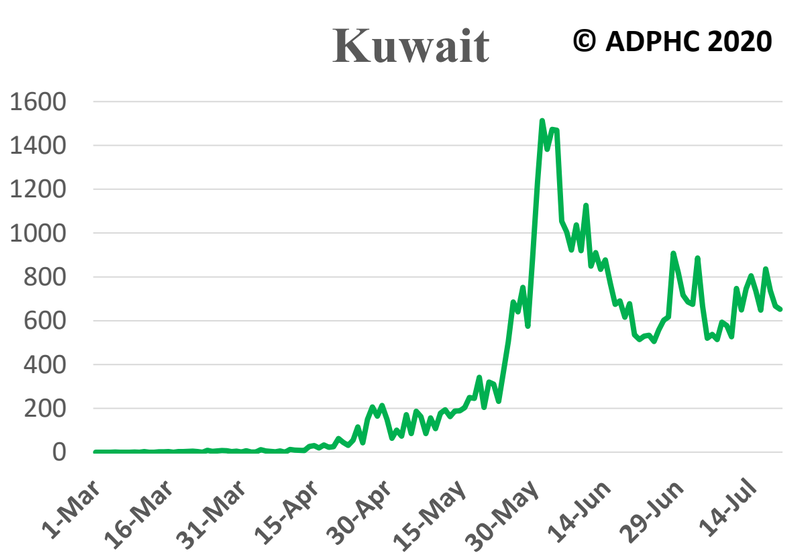
Source : KSA ministry of health



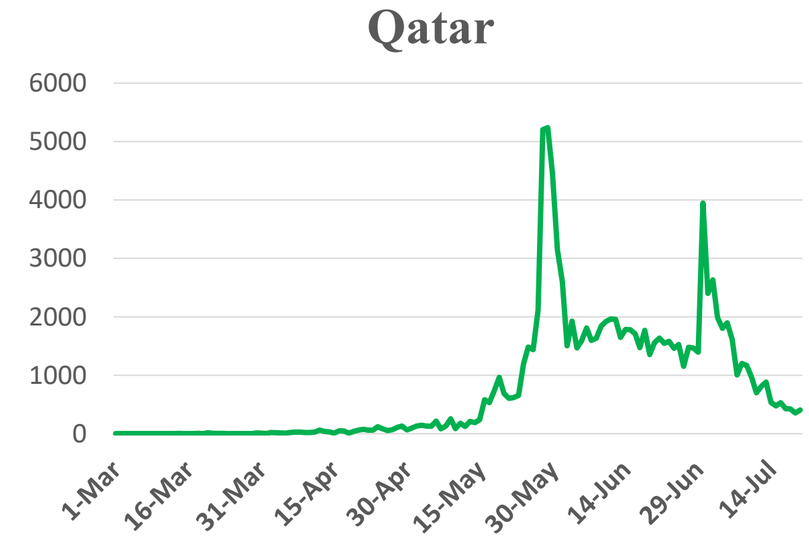
Source : GCCStat



Source :Oman ministry of health

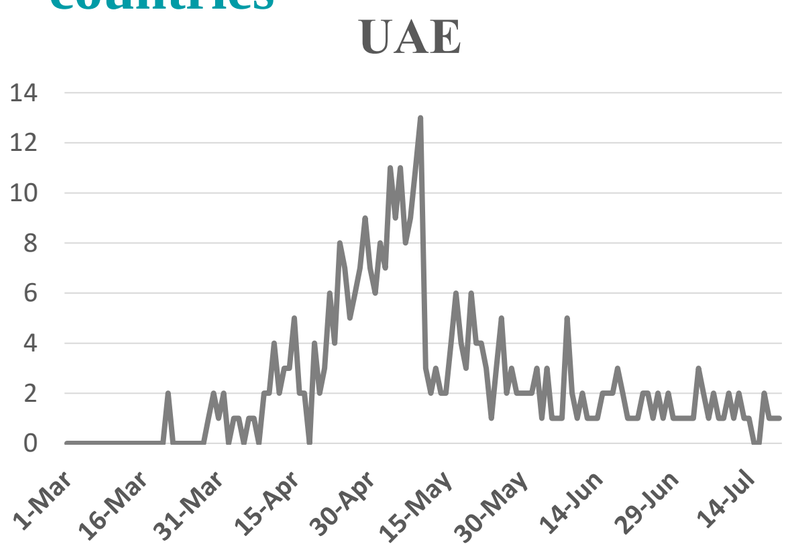


Source : Kuwait ministry of health

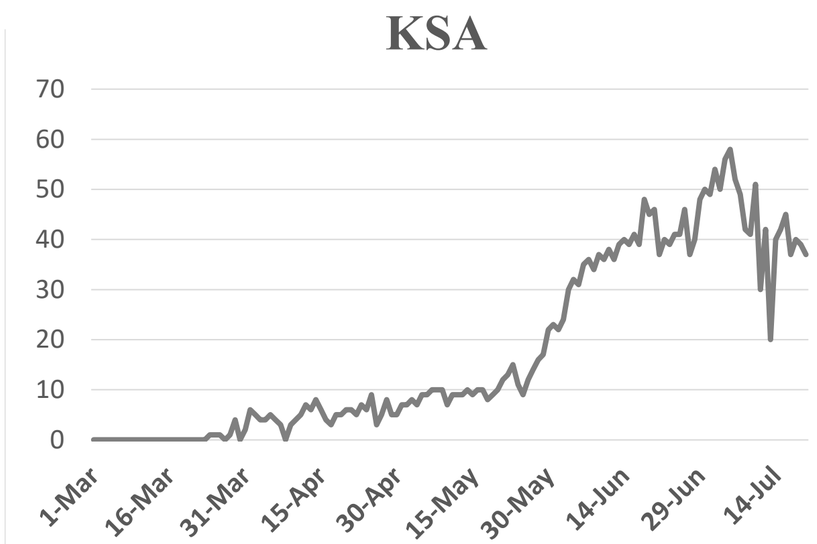


Source : Qatar ministry of health

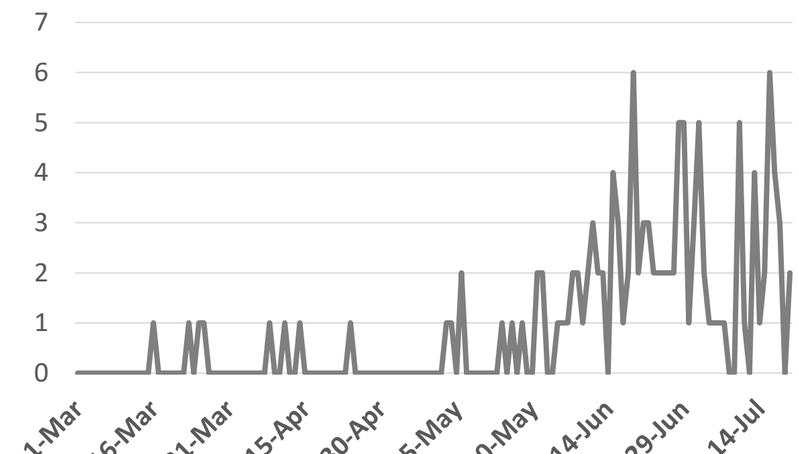
Figure 12: Comparative analysis of the distribution of COVID19 newly death cases in GCC countries



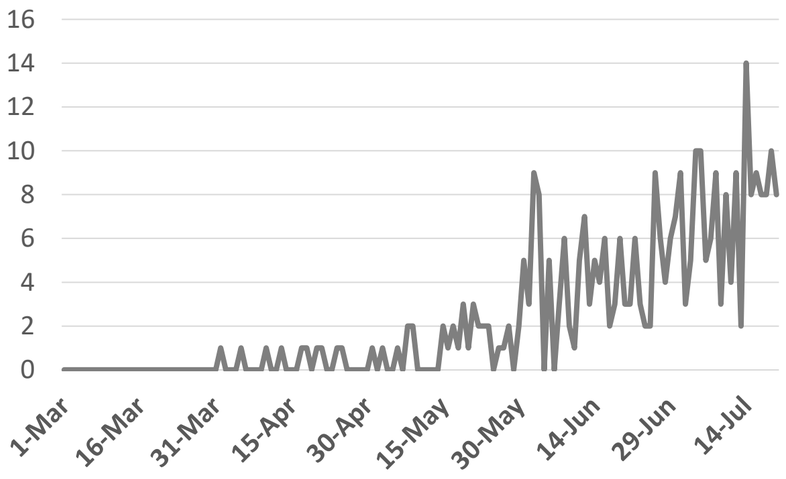
Source : National Emergency Crisis and Disaster Management Authority



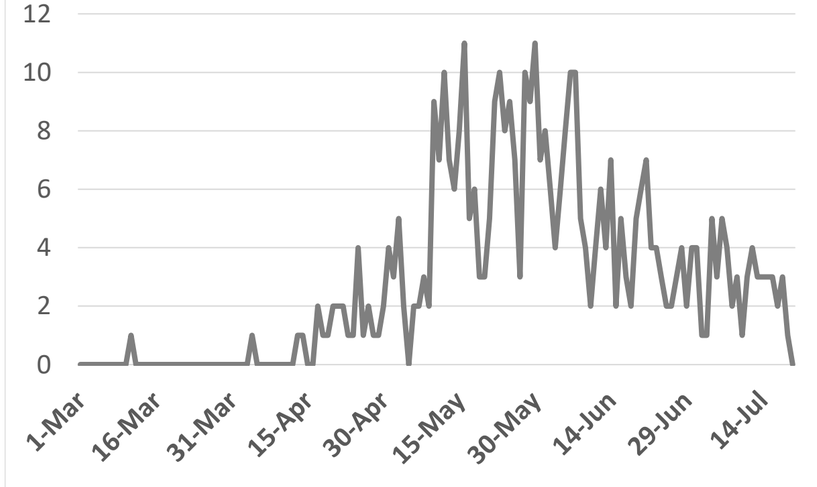
Source : KSA ministry of health



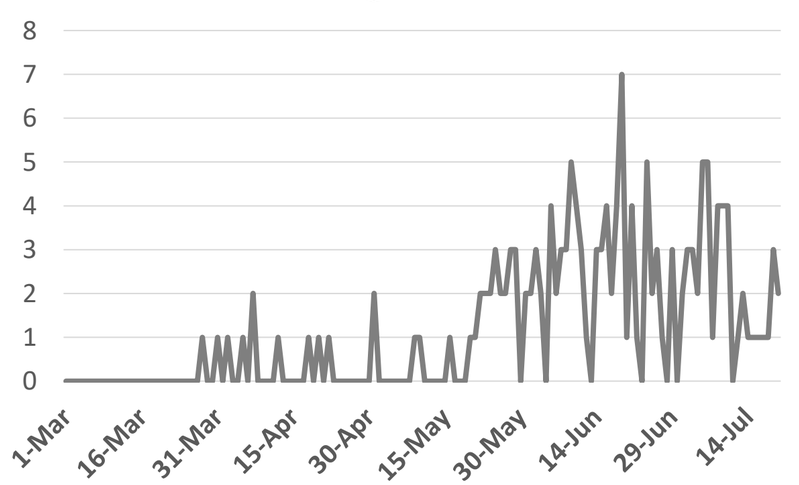
Source :WHO



Source :Oman ministry of health



Source : Kuwait ministry of health



Source : Qatar ministry of health

TREATMENT

Article 1: Interferon-α2b Treatment for COVID-19

Published 15 May 2020 Frontiers in Immunology

- A cohort study in Wuhan on 77 patients confirmed with COVI19 and admitted to the hospital between January 16–February 20, 2020,

- The aim of the study was to assess the viral clearance and inflammatory marker of the participant after the receiving either of the following drugs: IFN-α2b alone, ARB. or a combination of IFN-α2b plus ARB,

TABLE 1 | Demographics and clinical characteristics of patient cohort.

	IFN *n* = 7	IFN+ARB *n* = 46	ARB *n* = 24	*P*-value
Age, years	41.3 (27–68)	40.4 (25–80)	64.5 (37–73)	<0.001
Male (%)	0 (0.0%)	20 (43.5%)	11 (45.8%)	0.076
Co-morbidities (%)[a]	14.3%	15.2%	54.2%	0.002
Symptoms on admission:				
Fever (%)	57.1%	58.7%	70.8%	0.632
Cough (%)	42.9%	50.0%	54.2%	0.888
Fatigue (%)	14.3%	23.9%	37.5%	0.422
Myalgia (%)	14.3%	13.0%	29.2%	0.228
Headache (%)	14.3%	6.52%	4.17%	0.590
Pharyngalgia (%)	0.00%	13.0%	8.33%	0.742
Chest pain (%)	14.3%	6.52%	20.8%	0.134
Expectoration (%)	14.3%	8.70%	20.8%	0.281
Nausea (%)	0.00%	0.00%	4.17%	0.403
Diarrhea (%)	14.3%	4.35%	20.8%	0.081
Days from symptom onset to hospital admission[b]	8.0 [5.5, 15.5]	6.5 [3.0, 10.0]	10.0 [4.5, 19.5]	0.087
Days from symptom onset to treatment[b]	8.0 [6.5, 16.0]	17.0 [10.0, 22.0]	8.0 [5.0, 11.0]	0.004

TREATMENT

Continued

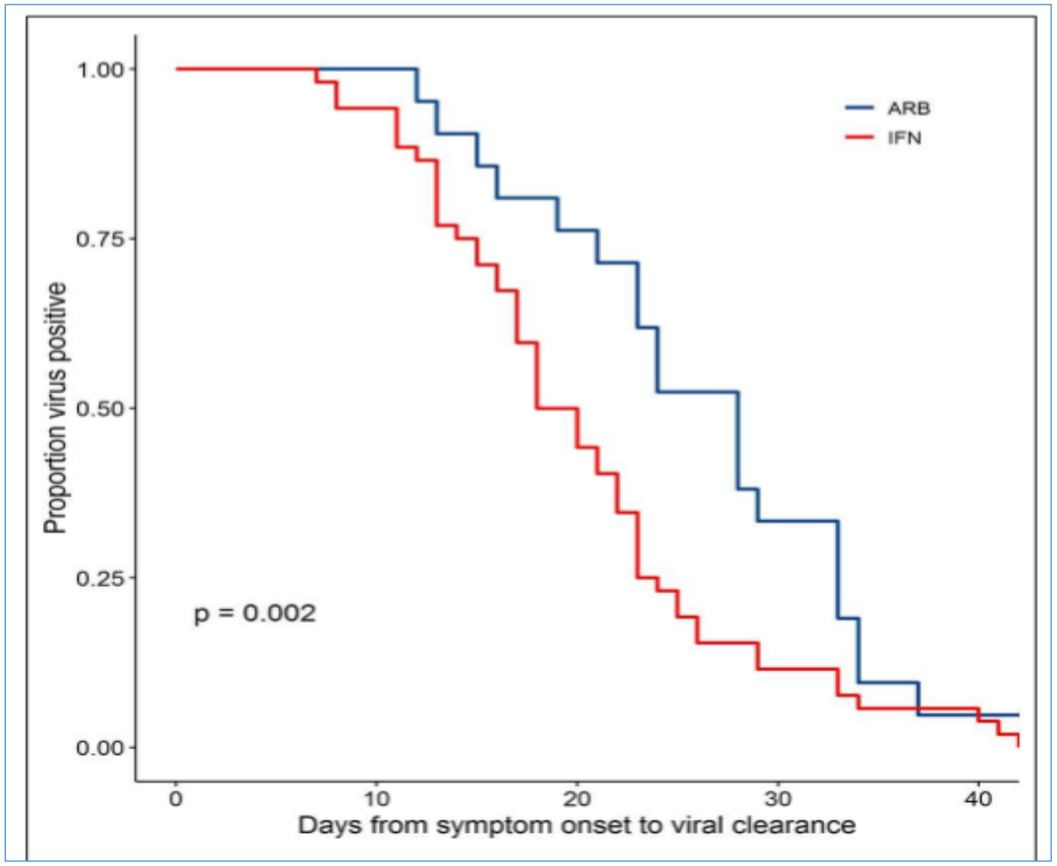
Results

- Treatment with IFN-α2b, whether alone or in combination with ARB, **accelerated viral clearance** when compared to ARB treatment alone. Mean days to viral clearance **were 27.9 for ARB alone treated patients, 21.1 days.**

- Researchers observed a clear distinction of **serum IL-6 levels (an inflammatory marker)** between cases treated with IFN (i.e., IFN alone or IFN + ARB) and cases treated with ARB alone.

- On average patients in the ARB only group had higher IL-6 levels than the patients treated with IFN alone or a combination of IFN + ARB, by 33.5 pg/mL

- Study limitations:
  - Small study
  - Nonrandomized
  - Unbalanced demographics between treatment arms that were of unequal size



PUBLIC HEALTH RESPONSE

مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

Article 2: Assessing the Impact of Coordinated COVID-19 Exit Strategies Across Europe

Published 20 July 2020 SCIENSE

Summarized by subject matter expert

This article examined the impact of lifting or easing various control measures across European countries.

Background

Non-pharmaceutical interventions such as social distancing policies and lockdown measures have resulted in the rates of new COVID-19 cases to decline across Europe. However, countries require guidance on how to ease restrictions while minimizing the risk of resurgent outbreaks.

Methodology

- Using mobile phone data and metapopulation models of infection transmissionevidence base for coordinated exit strategies across Europe.
- Baseline probability of moving between European regions was estimated using the Vodafone data in Spain and Italy and the continental Google dataset.
- The spread of COVID-19 was simulated over 6 months starting 4 April 2020, while making various assumptions about where and when control measures would be relaxed or reinstated in synchronized (all countries implemented lockdowns at the same time) and unsynchronized (half of all countries were under lockdown at any time) scenarios.

Findings

- Lifting control measures early, resulted in second epidemic occurring much earlier. France lifting their measures early led to the earliest second epidemic, 35 days earlier than if all countries lifted their measures simultaneously.
- If Germany lifts control measures early, then infection resurgence will be high in neighboring countries first because of high connectivity among the countries.
- **Synchronized cycles of control measures were always more likely to end community transmission over 6 months**, and generally lowered transmission further than if unsynchronized.
- Synchronizing four cycles of three week-long lockdowns led to local elimination COVID-19 cases in 90% of simulations, while unsynchronized cycles only led to elimination 5% of the time.
- **The only simulations where unsynchronized measures had fewer cases than synchronized measures at the end of simulation was with 2 cycles of 3 week-long lockdowns, which occurred because enough people were infected under unsynchronized model and that herd immunity reduced transmission.**

PUBLIC HEALTH RESPONSE

Continued

Public Health Message

- Intergovernmental organizations such as the World Health Organization have stressed the importance of international solidarity in terms of sharing resources and expertise in combating COVID-19.
- One country ending control measures before others could mean disease resurgence across Europe as much as 5 weeks earlier, reducing the time available to expand test-and-treat and to develop new therapeutics or vaccines.
- Certain countries are particularly important to resurgence of infection, such as France, Germany, Italy, and Poland because of heterogeneities in mobility reduction, baseline mobility patterns, and population sizes.
- Synchronized interventions across all countries meant that cases could be driven down more quickly. The synchronized scenario approximates what could happen if countries set case thresholds for lifting control measures regionally, while the unsynchronized scenario simulates what could happen if countries only consider case numbers within their boundaries.
- Coordination will be key to an effective, equitable response to COVID-19. This means not just sharing resources, but also ensuring that exit strategies account for neighboring countries and regions.

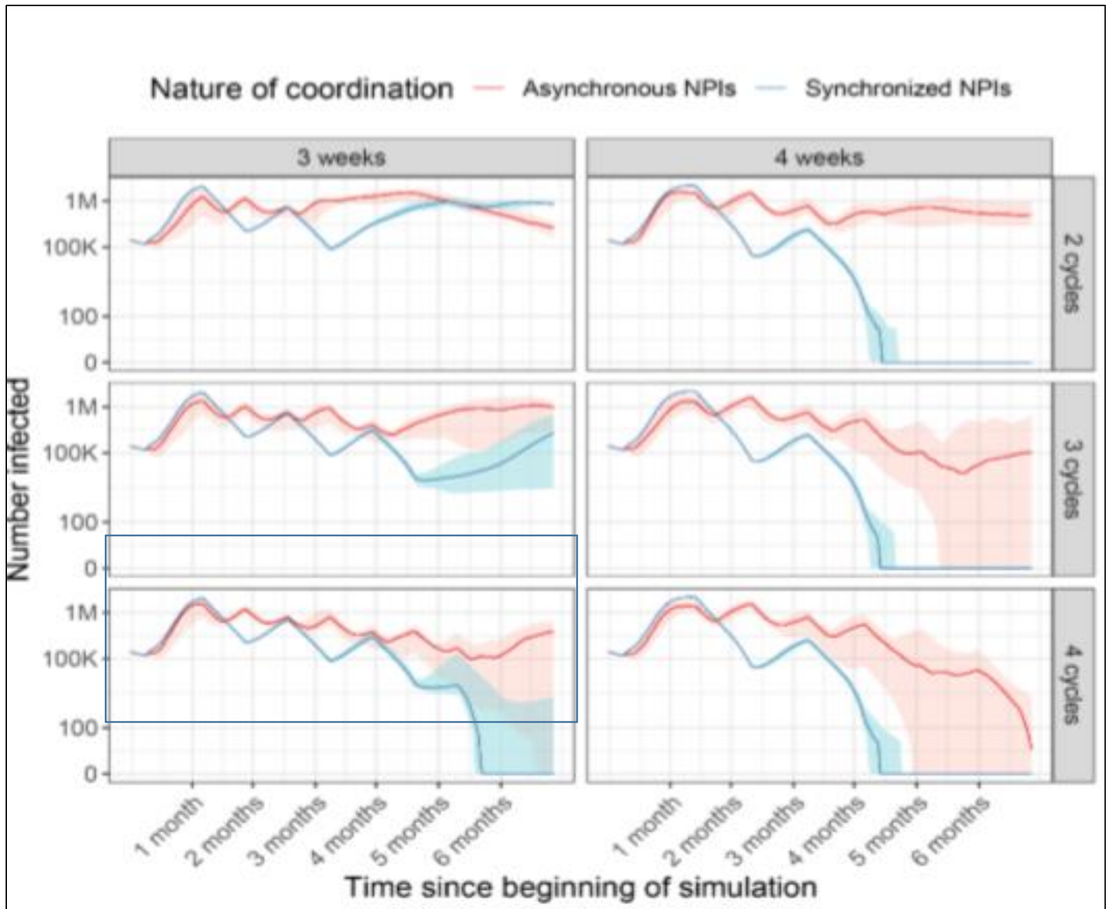


Fig. 4. Cases over time, when NPIs are synchronized and unsynchronized across all European countries. Rows vary the number of on-off cycles that occur, and columns indicate the number of on-off cycles implemented. For example, 4 weeks with 2 cycles (top right) indicates we simulated two cycles of 4 weeks on lockdown, 4 weeks off lockdown for each country. Red: Cases when European countries do not synchronize NPI timing. Blue: Cases when European countries are all synchronized in NPI timing. Shaded areas indicate intervals in which 95% of simulations fell within, over 200 simulations.

IMMUNOLOGY

Article 3: Longitudinal Evaluation and Decline of Antibody Responses in SARS-CoV-2 Infection

Published 20 July 2020 SCIENSE

Summarized by subject matter expert

This study examined the antibody response after the COVID-19 infection.

Background

- Antibodies are proteins produced by your immune system in response to an infection. The types include:
  - **Immunoglobulin M (IgM):** First antibody the body makes when it fights a new infection.
  - **Immunoglobulin G (IgG):** Most common antibody. It's in blood and other body fluids and protects against bacterial and viral infections. IgG can take time to form after an infection or immunization.
  - **Immunoglobulin A (IgA):** Found in the linings of the respiratory tract and digestive system, as well as in saliva (spit), tears, and breast milk.
- There are 2 main types of antibody tests:
  - **Binding antibodies:** The tests detect whether you have developed **any antibodies** in response to a COVID-19 infection. But they don't indicate how extensive or effective your immune response is.
  - **Neutralizing antibodies:** The tests detect a subgroup of antibodies that may inactivate the virus. This test is done after you test positive for binding antibodies.
- Antibody responses to COVID-19 can be detected in most infected individuals 10-15 days following the onset of symptoms. However, it is not yet known how long these antibody responses will be maintained or whether they will provide protection from re-infection.

Methodology

- The samples of 65 confirmed cases of COVID-19 were collected and analyzed over many time points post onset of symptoms up to 94 days.
- ELISA protocol was used for the detection of antibodies.
- A severity score was assigned to patients based on the maximal level of respiratory support they required during their period of hospitalization.
- This study included the full breadth of COVID-19 severity, from asymptomatic infection to those requiring extra corporeal membrane oxygenation (ECMO) for severe respiratory failure

IMMUNOLOGY

Continued

Findings

- The presence of IgA, IgG and IgM antibodies was detected in more than 90% of the confirmed cases.
- 52% of individuals showed the presence of all three antibodies at the same time - synchronous seroconversion. Although, approximately 10% showed the presence of at least 1 antibody – singular seroconversion.
- The peak was 20 days for IgM, and 30 days for IgA after symptoms onset., followed by a rapid decline in the IgM and IgA responses.
- For some individuals sampled at time points >60 days after symptoms, the IgM and IgA responses were approaching baseline.
- Patients with more severe disease showed significantly higher IgA and IgM but not IgG compared with less severe patients.
- Neutralizing antibody responses correlated with disease severity, showing that a higher viral load may lead to more severe disease and generate a stronger antibody response through increased levels of viral antigen.
- Increased neutralization potency was observed with increasing days after symptoms onset with all individuals reaching a peak after an average of 23.1 days (range 1-66).
- **After 40 days of symptoms onset, these neutralizing antibodies started to decline.**
- **For some asymptomatic patients, neutralizing antibodies were not present after 40 days.**
- **A steady decline in neutralization was accompanied by a decline in IgG binding to all antigens within the time window studied.**
- It is suggested that SARS-CoV-2 infection may generate only a temporary antibody response that rapidly declines.
- Further studies using sequential samples from these individuals is required to fully determine the longevity of the neutralizing antibodies response and studies determining the neutralizing antibodies threshold for protection from re-infection are needed.

THANK YOU

ADPHCAE ADPHC_AE ADPHC_AE ADPHC.AE ADPHC-AE 056 2312171