مركز أبوظبي
للصحة العامة
ABU DHABI PUBLIC
HEALTH CENTRE

SCIENTIFIC RESEARCH MONITORING ON COVID-19

15 NOVEMBER 2020

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SCIENTIFIC RESEARCH MONITORING ON COVID-19 (ISSUE 286)

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

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 (1/2)

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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Vaccine

Challenges in Creating Herd Immunity to SARS-CoV-2 Infection by Mass Vaccination

Public Health Response

Offline: Managing the COVID-19 Vaccine Infodemic

Public Health Response

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Vaccine

SARS-CoV-2 Immunity: Review and Applications to Phase 3 Vaccine Candidates

EPIDEMIOLOGY

FROM 21 JAN TO 14 NOV 2020

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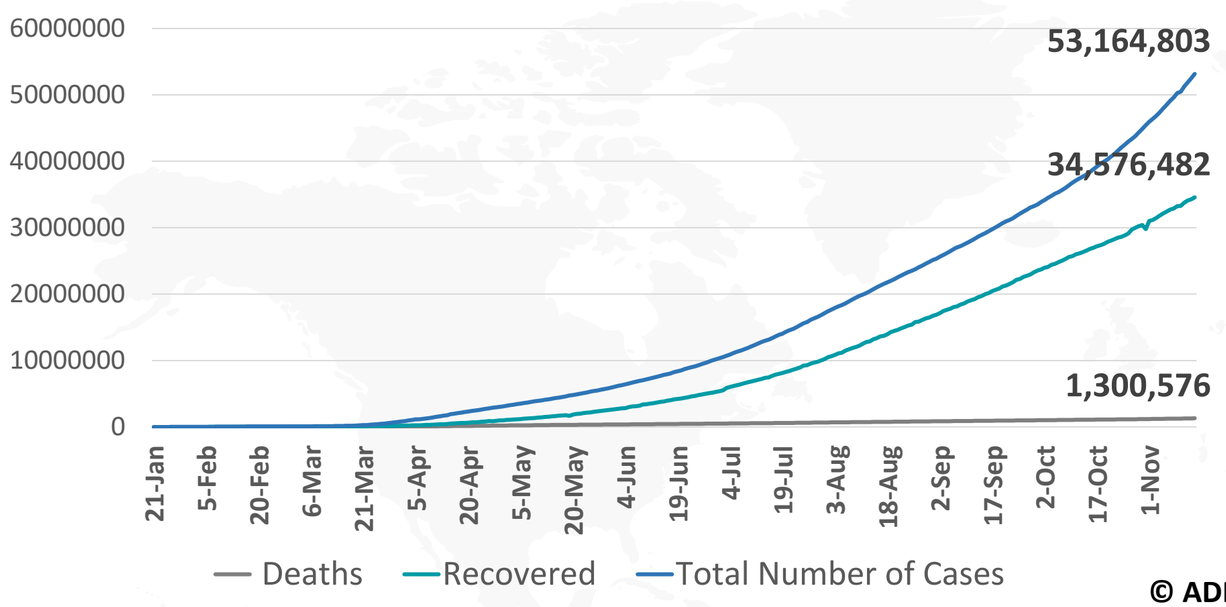
Figure 1: Total Number of Infected, Recovered, and Death Cases



Note: the number of recovered cases in 31th October recorrected from 30 million to 29 million in Johns Hopkins website

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

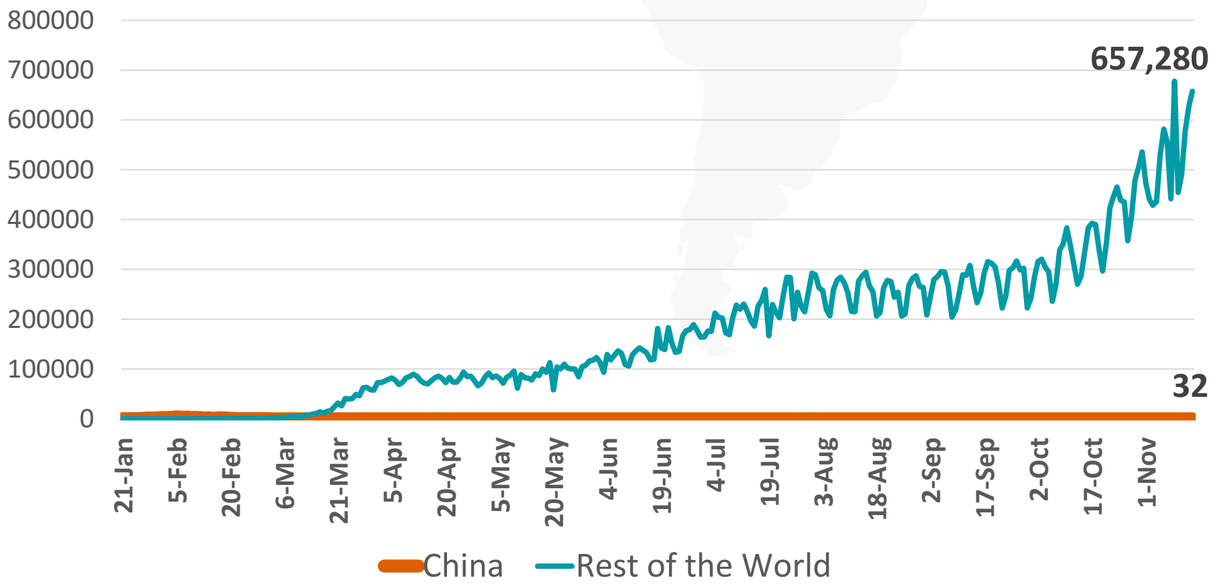


Figure 3: Total Number of Death Due to COVID-19 (china and result of the world)

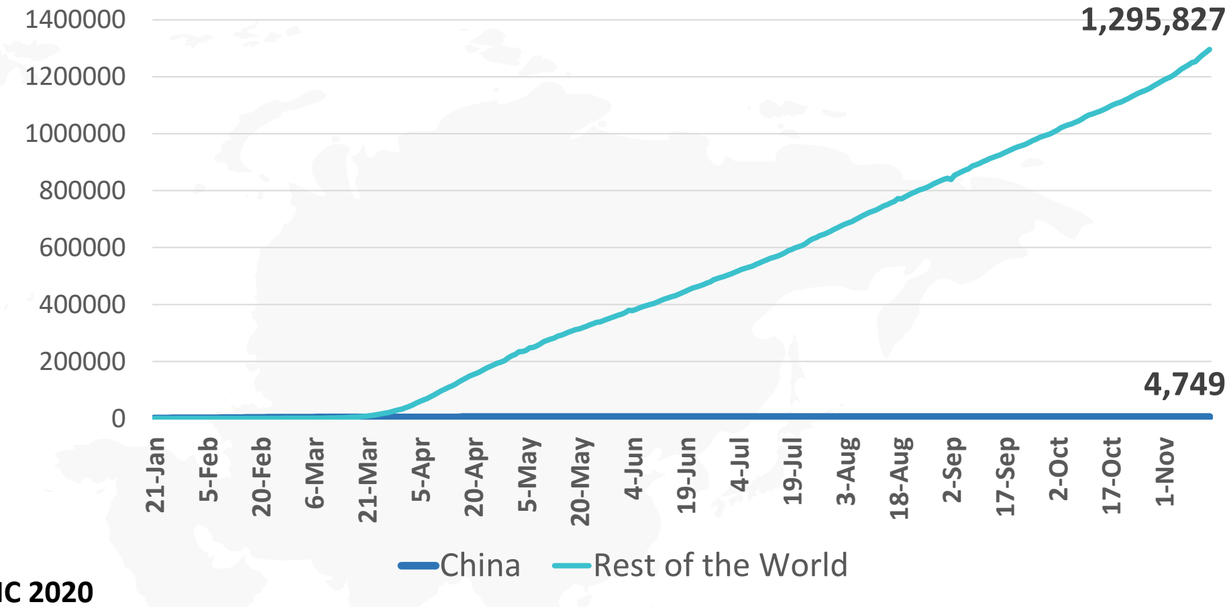
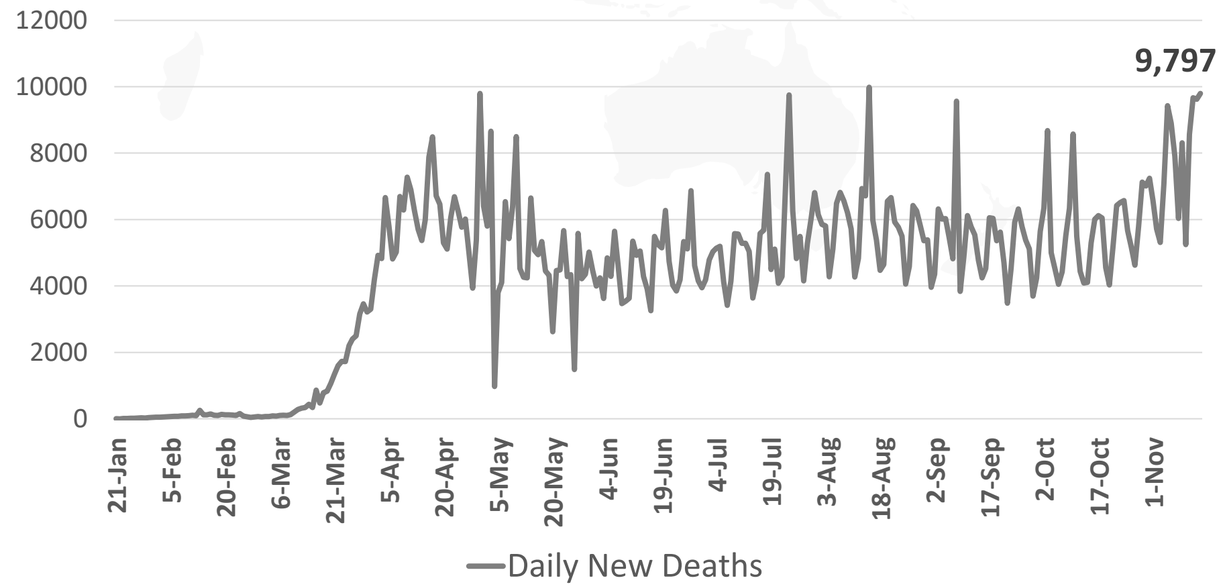


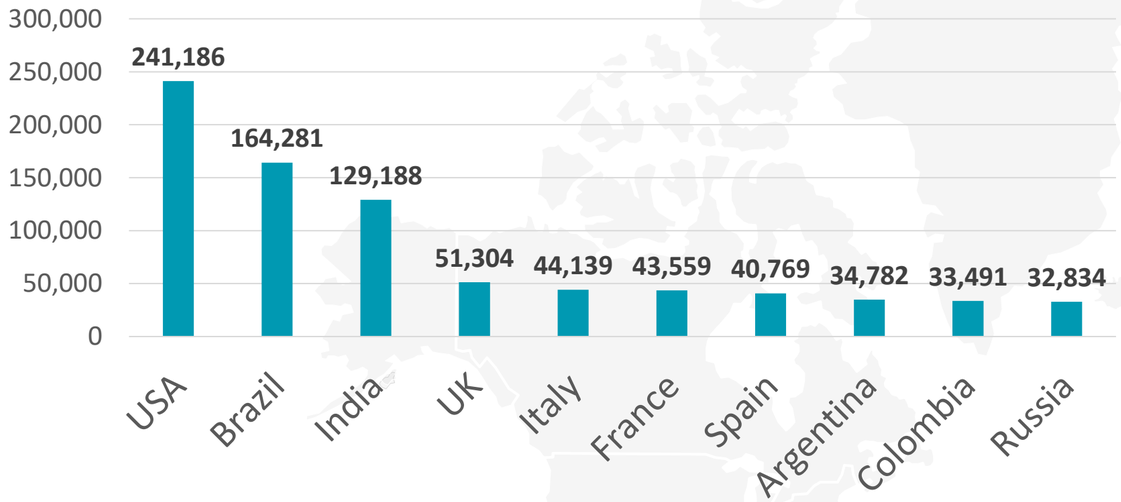
Figure 4: Global Daily New Deaths Due to COVID-19 (china and rest of the world)



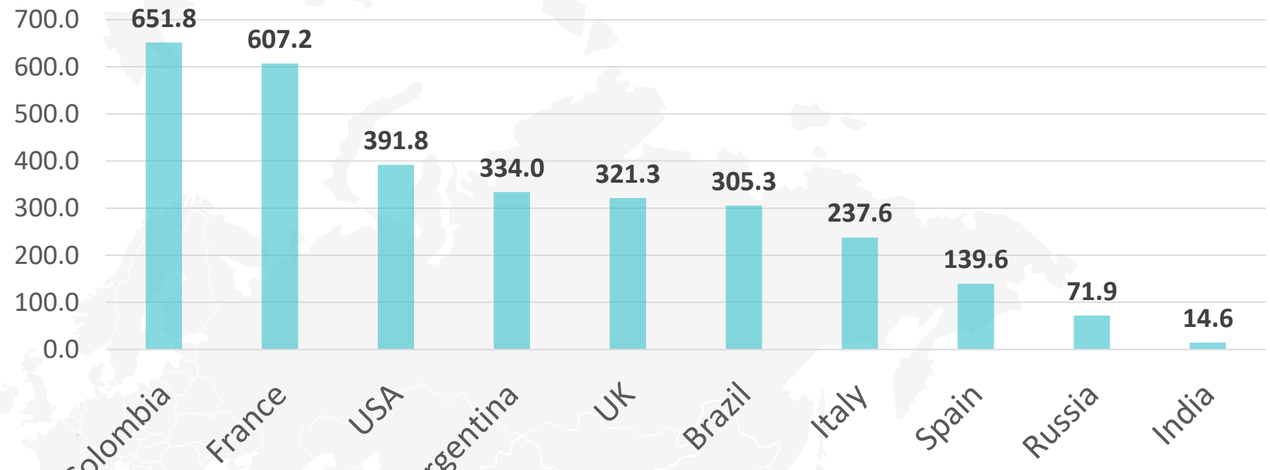
Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: John Hopkins, WHO

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

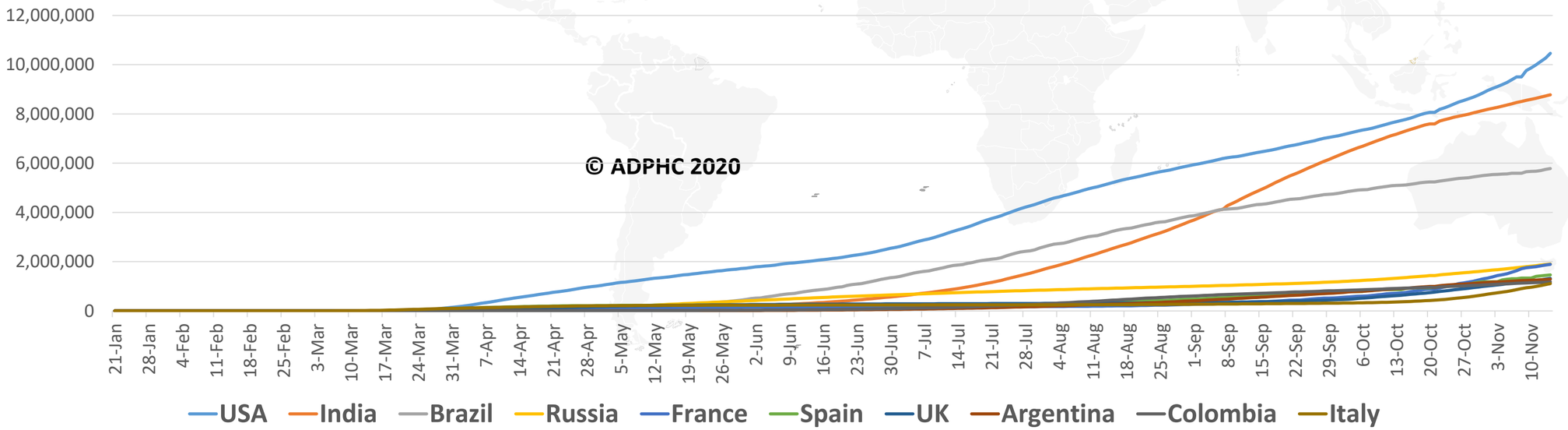
TOTAL DEATHS



DEATHS PER MILLION



TOTAL INFECTED CASES



USA	10,460,365
India	8,773,479
Brazil	5,781,582
Russia	1,903,253
France	1,886,286
Spain	1,458,591
UK	1,317,500
Argentina	1,284,519
Colombia	1,174,012
Mexico	1,107,303

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

EPIDEMIOLOGY

FROM 21 JAN TO 14 NOV 2020

مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

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

Daily Tests

124,236.6 Average Tests

1,256.1 per 100k population

0.9% Positive Rate

Daily Cases

1,157.6 Average Cases

11.7 per 100k population

Daily Recovered

707.6 Average Recovered

7.2 per 100k population

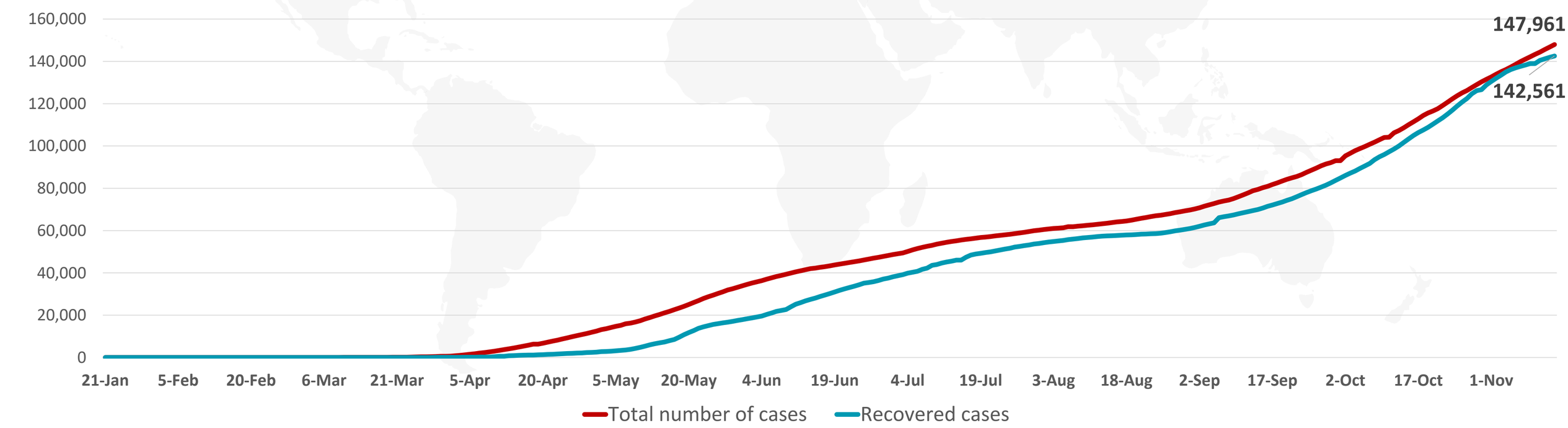
Daily Deaths

2.0 Average Deaths

0.0 per 100k population

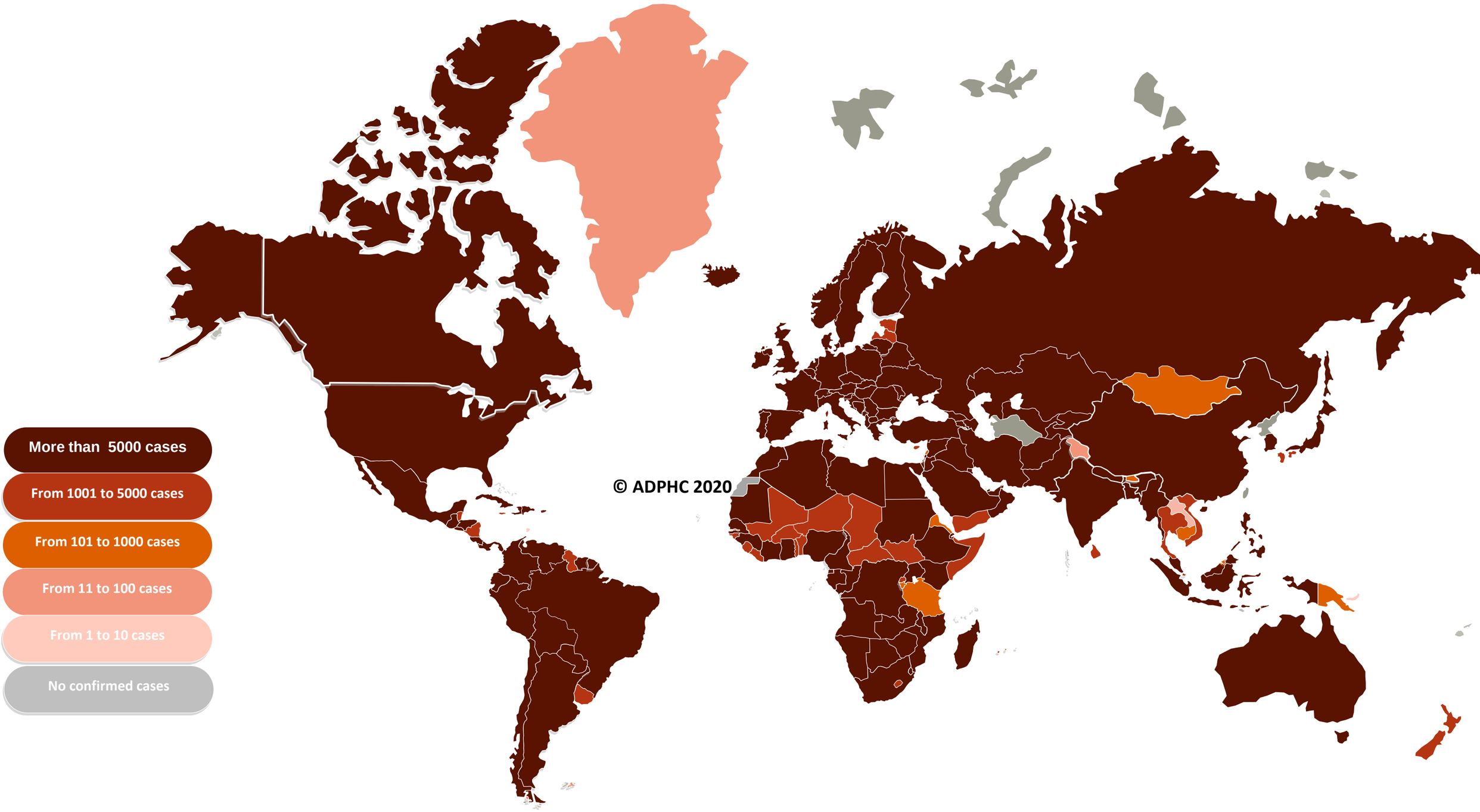
0.2% Case Fatality Rate

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, John Hopkins

Figure 7A : Global Distribution of COVID-19 Cases



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

EPIDEMIOLOGY

Date: 14 NOV 2020

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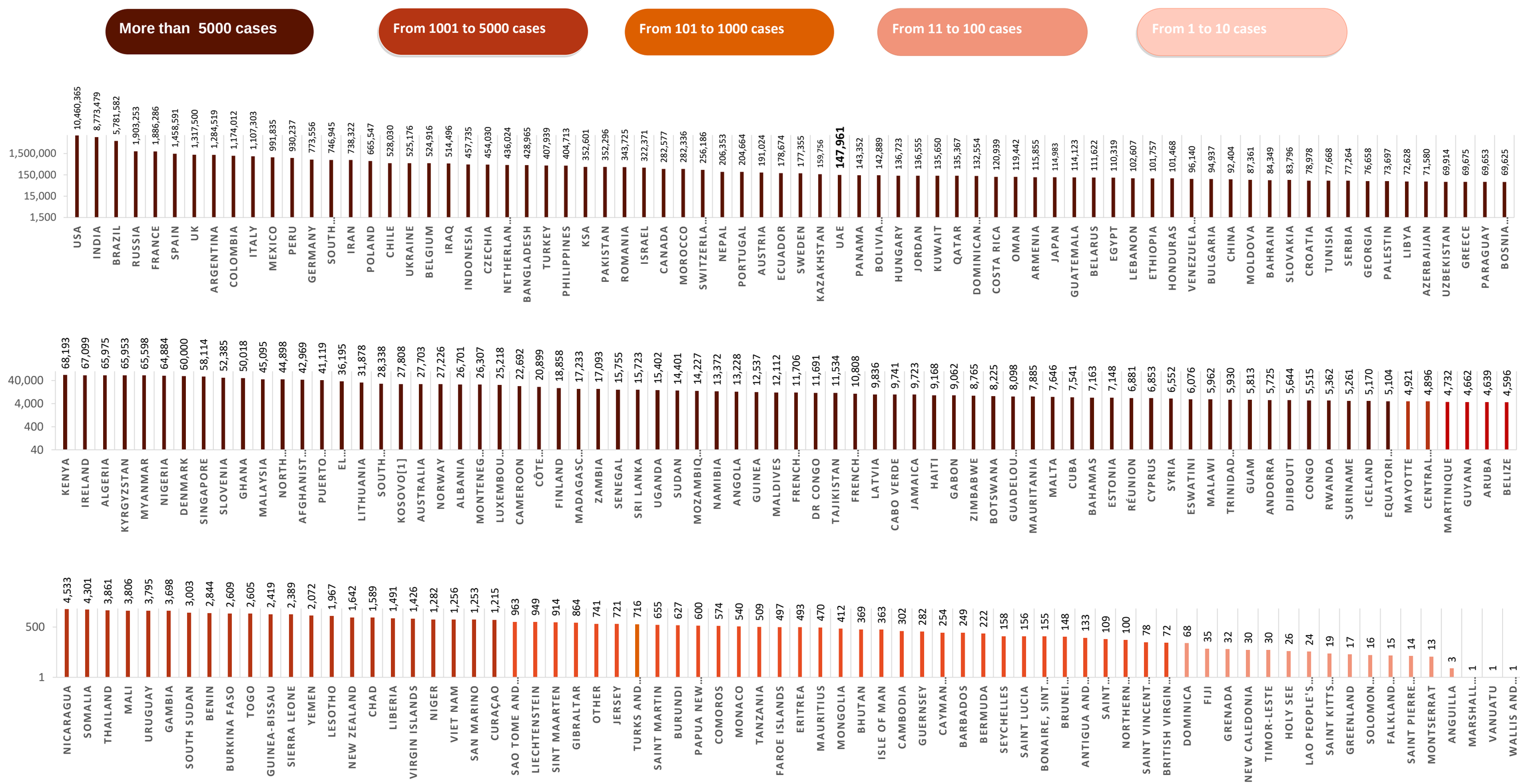
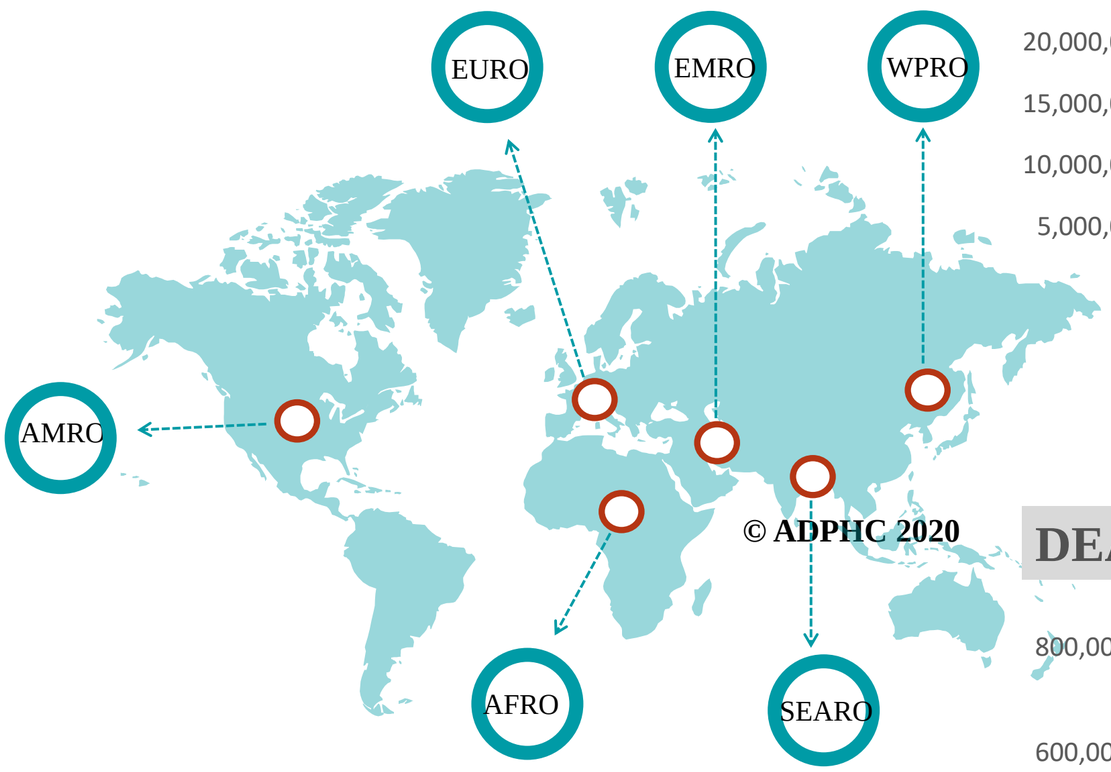
Figure 7B: Bar Chart Illustrates the Global Distribution of COVID19 Cases



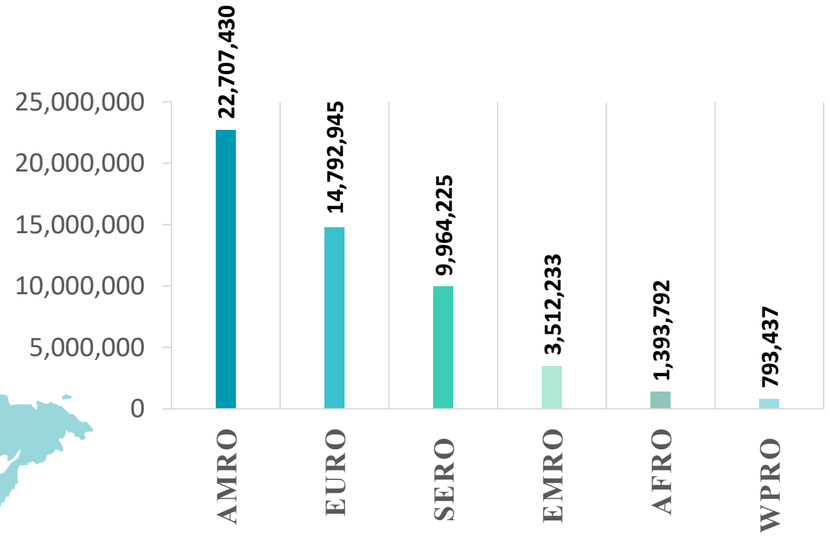
Other*:includes cases and deaths reported under the international conveyance(Diamond Princess)

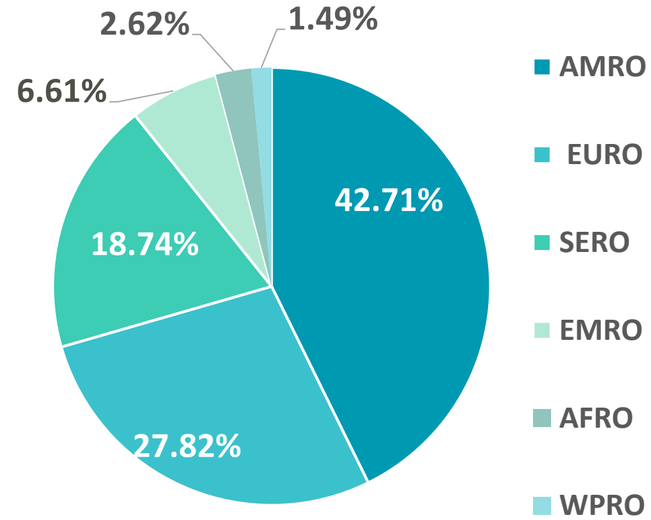
Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

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

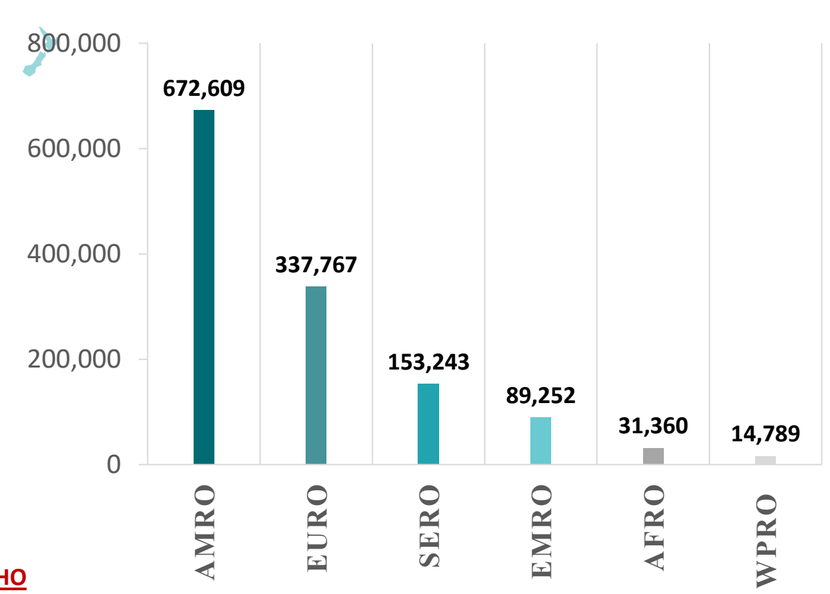


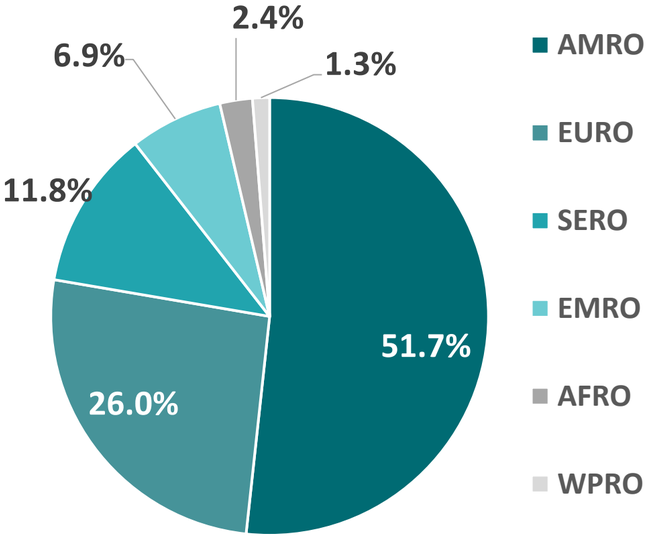
INFECTED





DEATHS

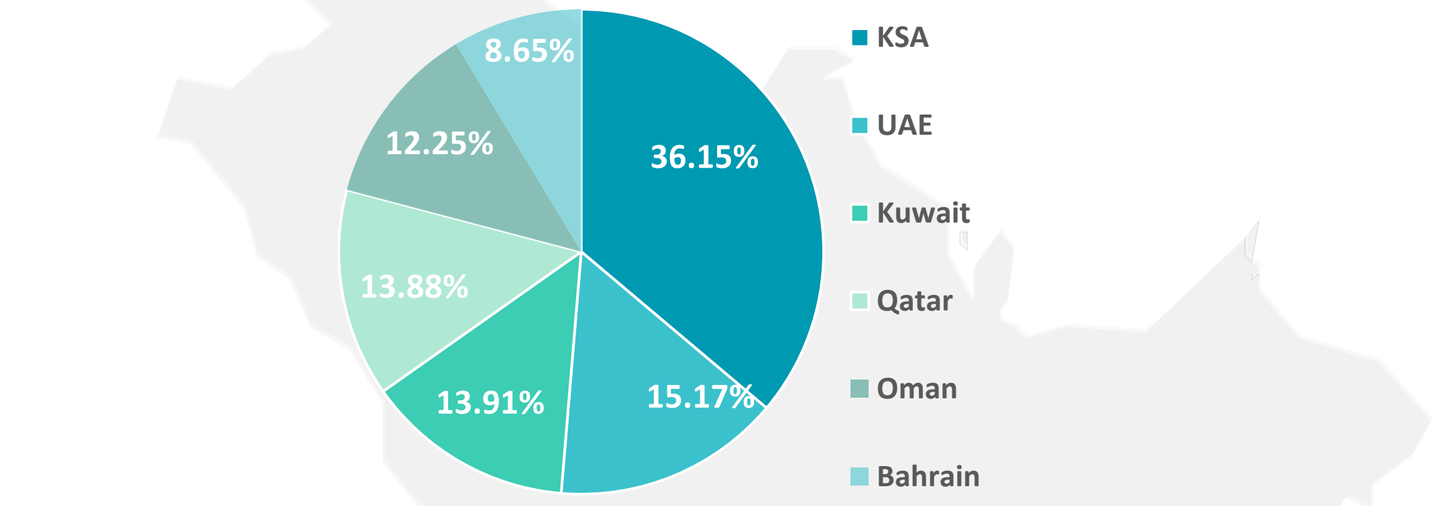


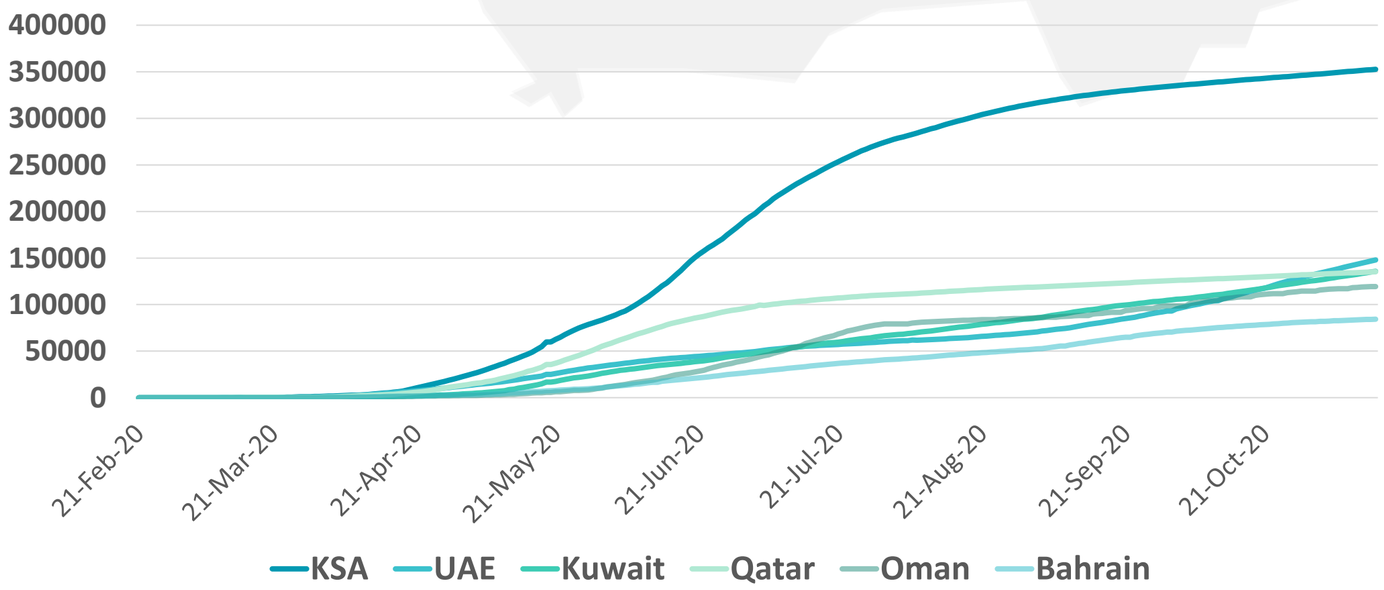


Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: WHO

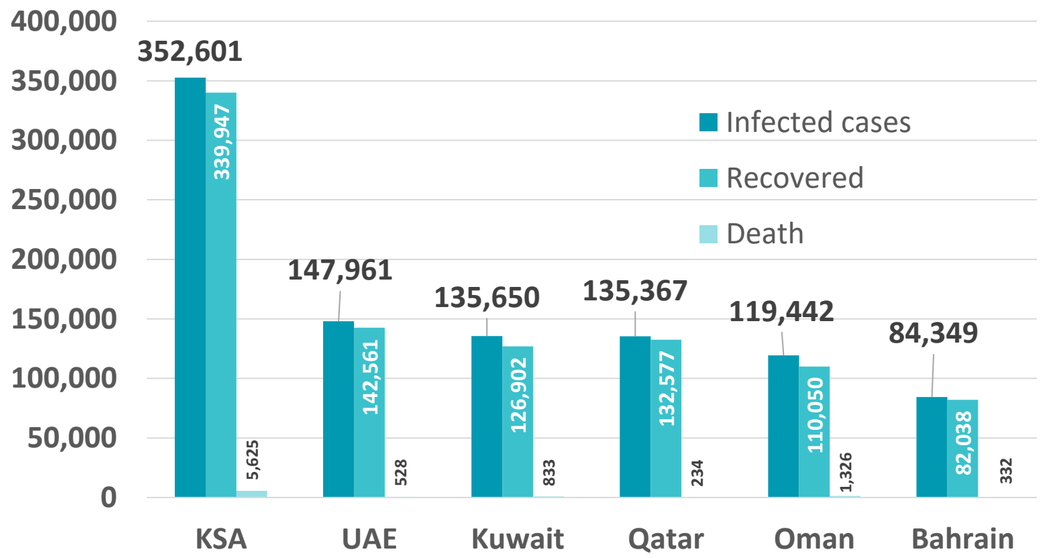
Figure 9: Comparative Analysis of the Distribution of COVID-19 Cases in GCC Countries

TOTAL NUMBER OF INFECTED CASES

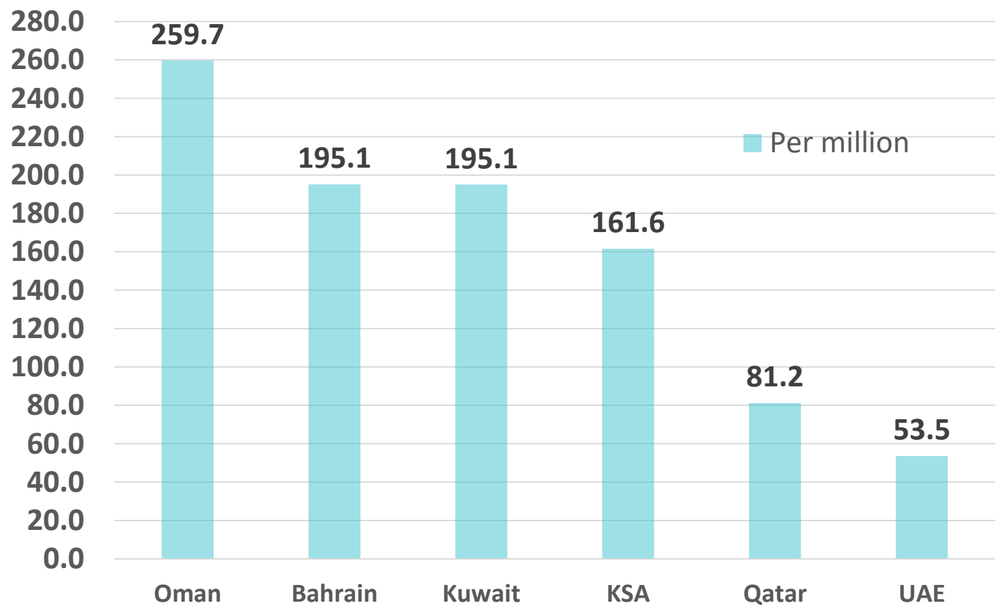




TOTAL NUMBER OF INFECTED, RECOVERED AND DEATHS

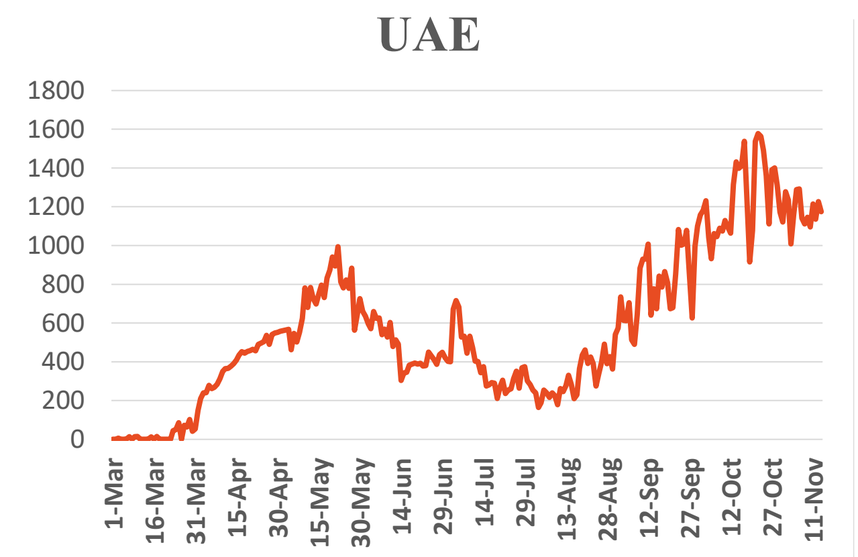


DEATHS PER MILLION

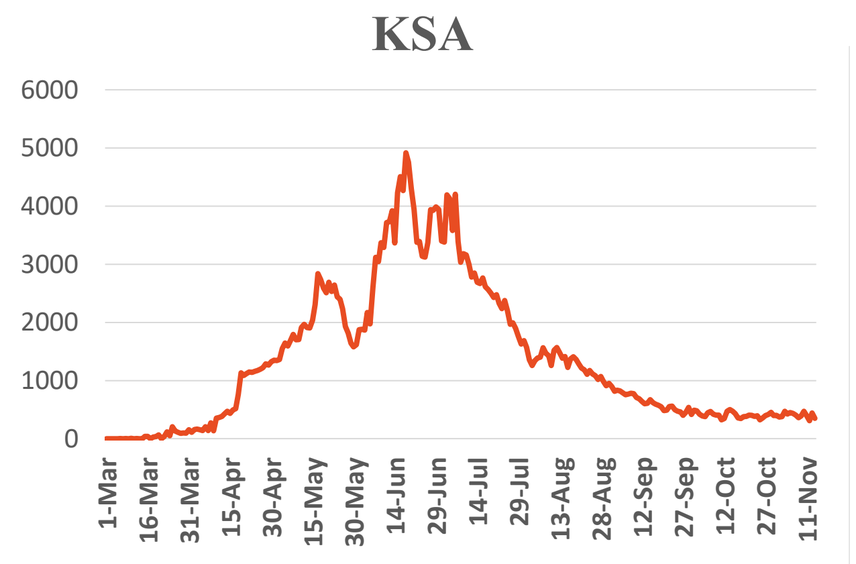


Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: John Hopkins, WHO

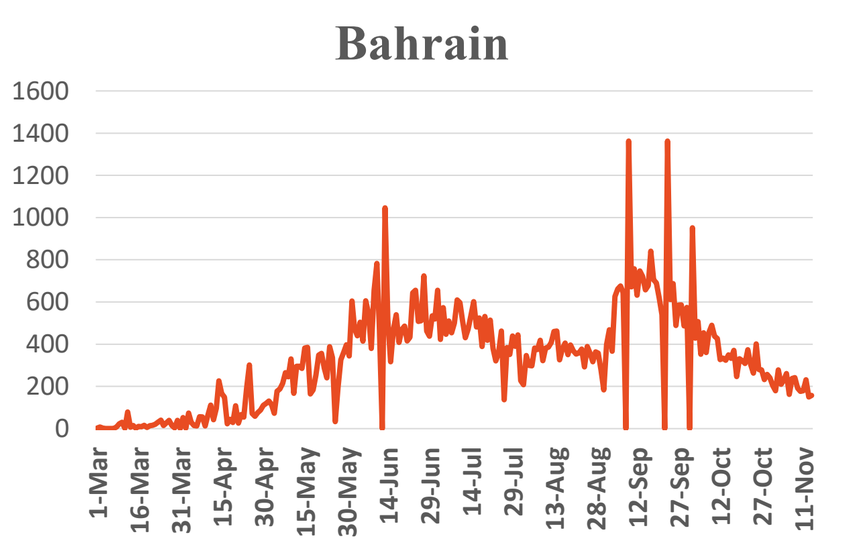
Figure 10: Comparative Analysis of the Distribution of COVID-19 New Cases in GCC Countries



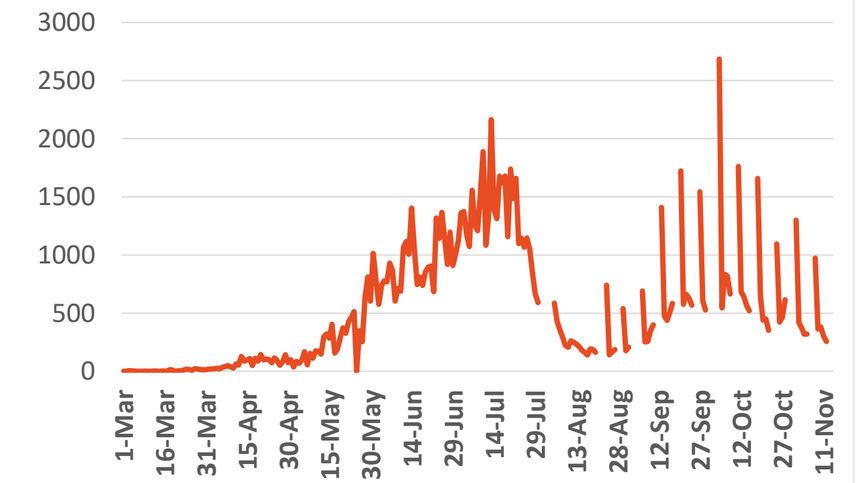
Source : National Emergency Crisis and Disaster Management Authority



Source : KSA ministry of health



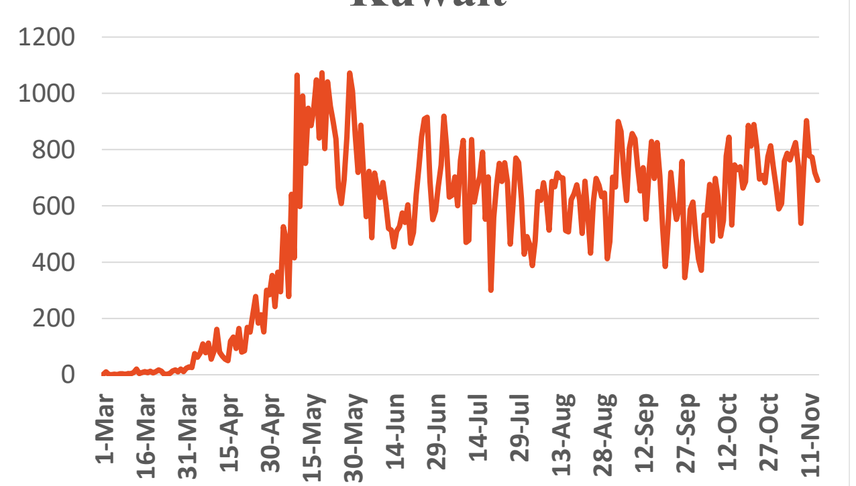
Source :WHO



Source :Oman 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 NOV

*No announced statistic data on weekends and official holidays.

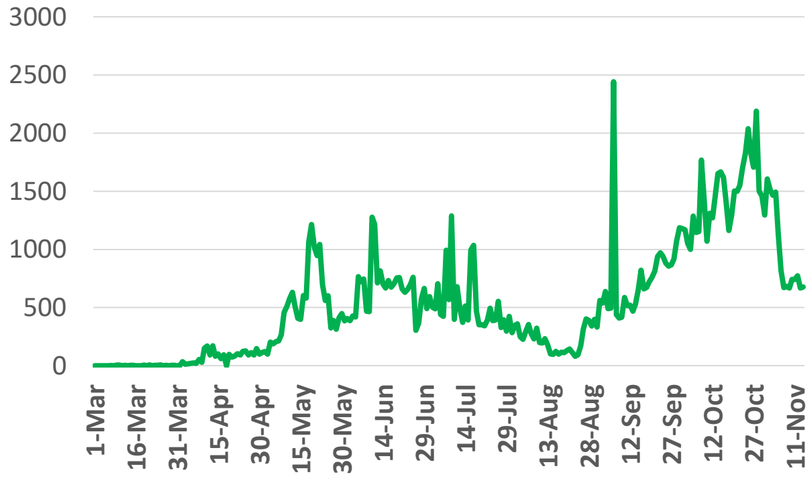


Source : Kuwait ministry of health

Source : Qatar ministry of health

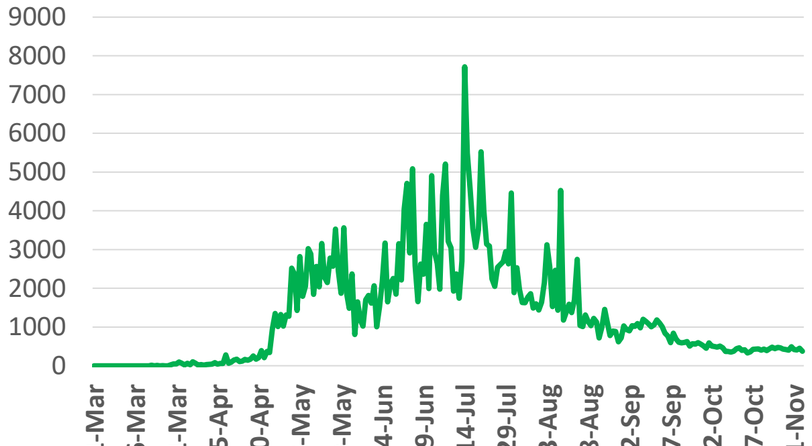
Figure 11: Comparative Analysis of the Distribution of COVID-19 Newly Recovered Cases in GCC Countries

UAE



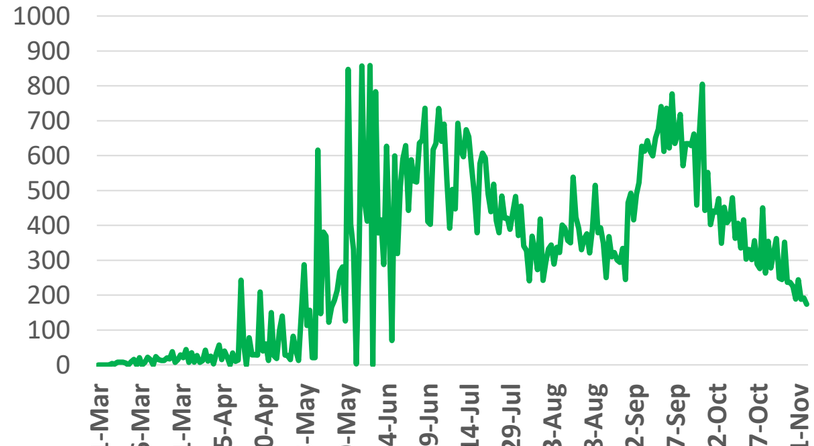
Source : National Emergency Crisis and Disaster Management Authority

KSA



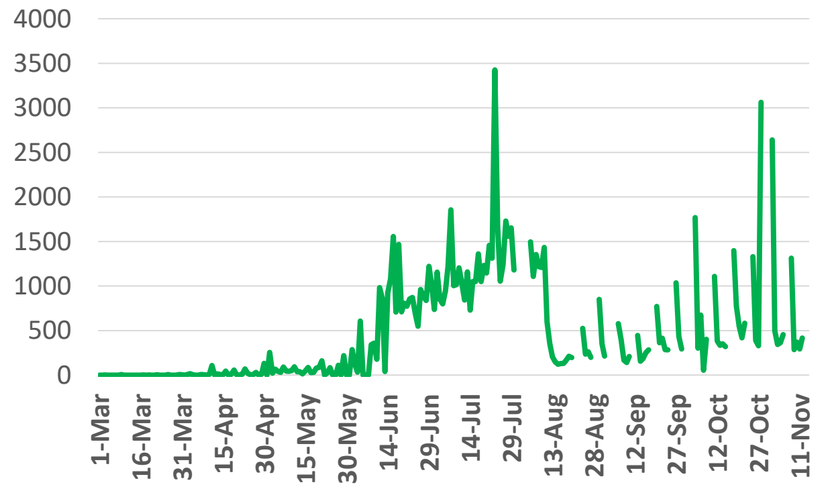
Source : KSA ministry of health

Bahrain



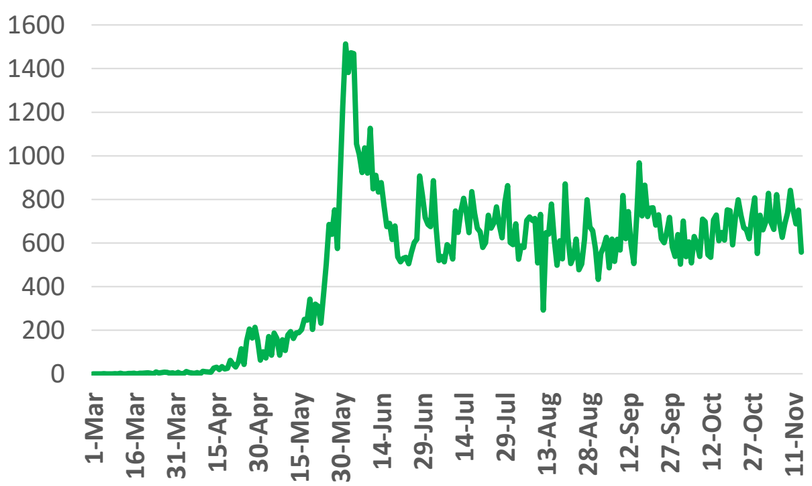
Source : Bahrain ministry of health

Oman



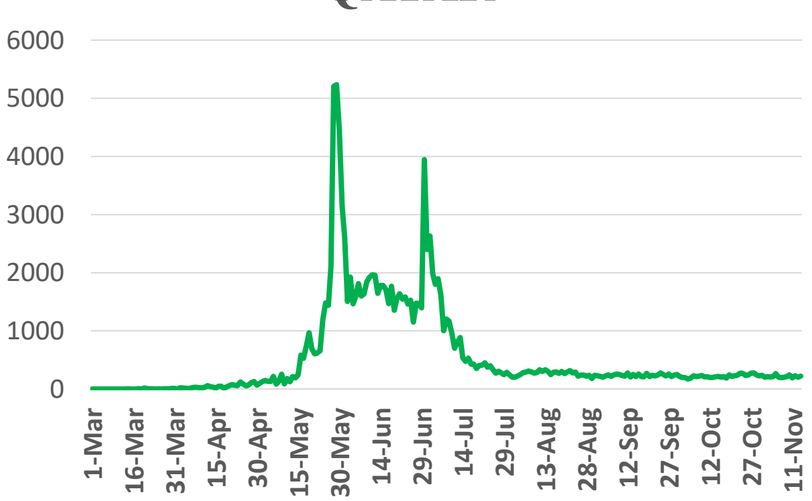
Source :Oman ministry of health

KUWAIT



Source : Kuwait ministry of health

QATAR



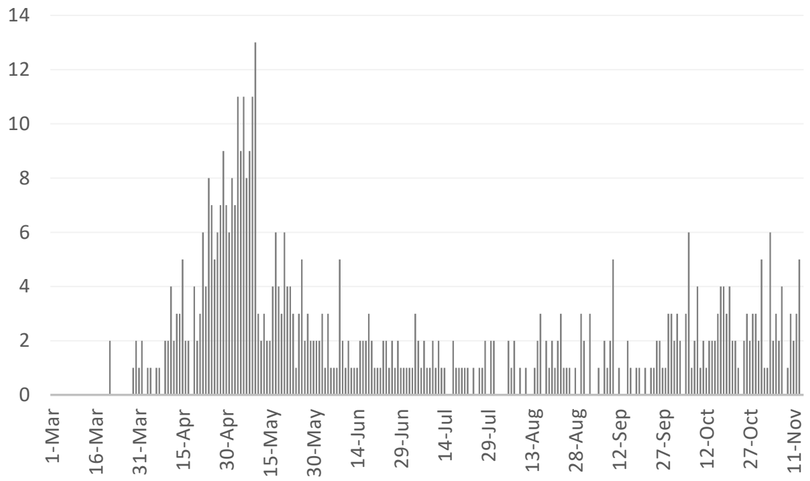
Source : Qatar ministry of health

*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 NOV

*No announced statistic data on weekends and official holidays.

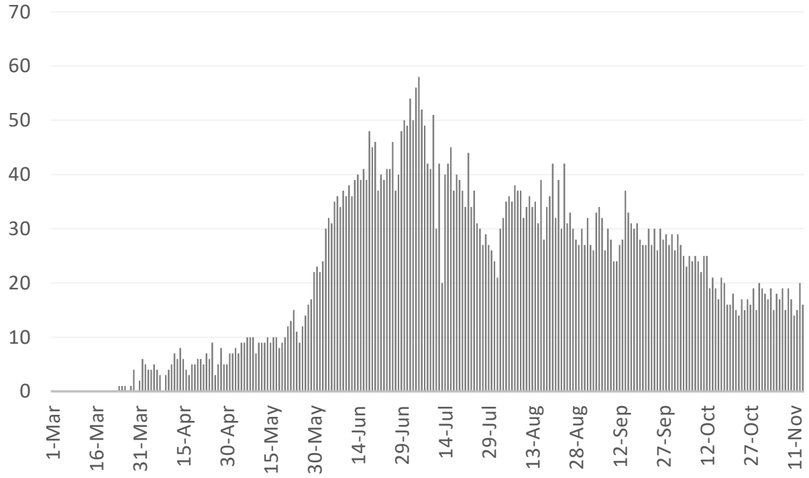
Figure 12: Comparative Analysis of the Distribution of COVID-19 New Death Cases in GCC Countries

UAE



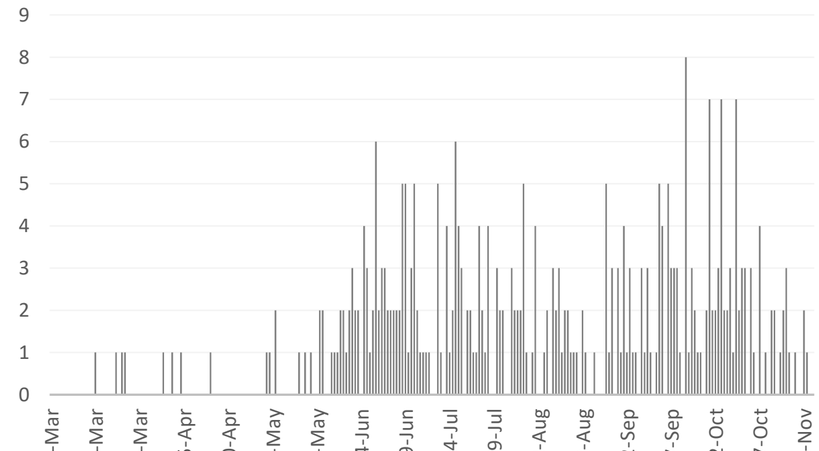
Source : National Emergency Crisis and Disaster Management Authority

KSA



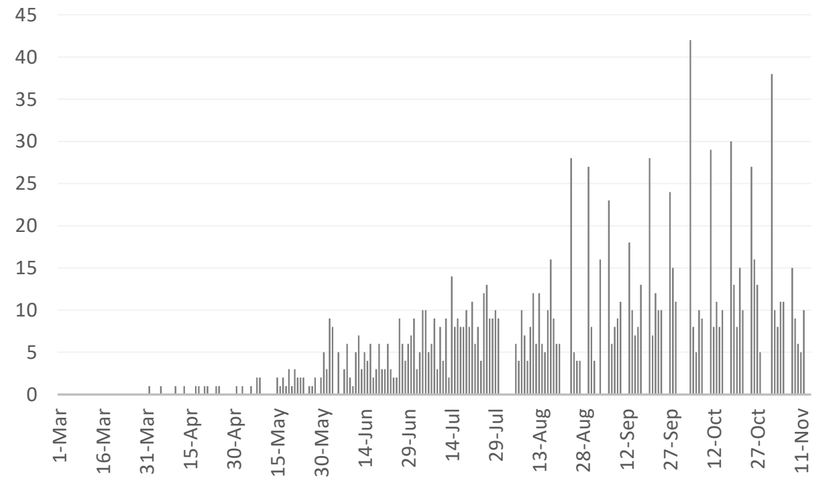
Source : KSA ministry of health

Bahrain



Source :WHO

Oman



Source :Oman ministry of health

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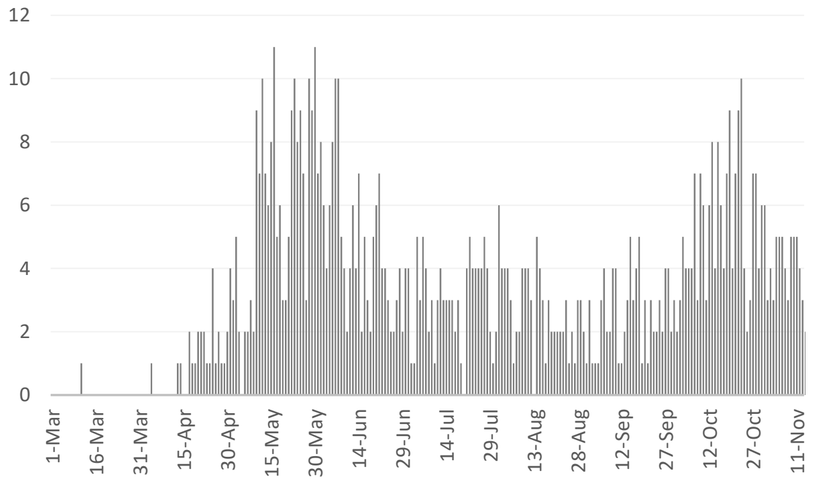
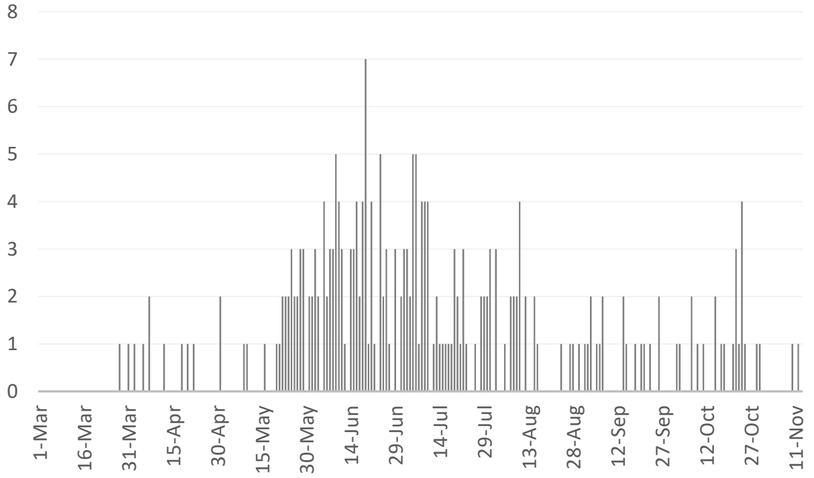
*No announced statistic data on weekends and official holidays.

Kuwait



Source : Kuwait ministry of health

Qatar



Source : Qatar ministry of health

Article 1

Contact Tracing: Digital Health on the Frontline

Published November, 2020, THE LANCET

- In the United Kingdom (UK), Kendall et al. (2020) reported a significant decrease in COVID-19 incidence and reproduction number (R) immediately after launching the Test and Trace contact tracing program on the Isle of Wight. The highest R (1.3) before the program was launched on May 5 reduced to the lowest R (0.5) on June 14 indicated that Test and Trace interventions could have a positive impact in controlling the epidemic.

- Braithwaite et al. (2020) reported that control of COVID-19 will require a high population uptake of contact tracing apps (56%-95%). In the United States (US), a survey was conducted by Microsoft Research to measure the relationship between effectiveness and installing the app. They reported that >60% of the respondents would install an app that reduces their infection rate by 50% and >75% would be willing to install an app that reduces their infection rate by 97%. Therefore, transparent analysis of the efficacy of contact tracing apps is required to better engage the public and improve the effectiveness of contact tracing programs.

- Effectiveness and uptake of technology are not the only factors to determine the success of a contact tracing program. Other factors include if users self isolate and get tested quickly. Given the scale and speed of the pandemic, digital contact tracing is vital to reduce the second wave of COVID-19. Contact tracing needs to be adopted widely and integrated into public health strategies to allow for quarantine and widespread rapid testing.

Article 2

Elective Care and Health Services Research in the COVID-19 Era

Published November 5, 2020, THE JAMA

- Whaley et al. (2020) evaluated the association of the COVID-19 pandemic with the delivery of primary and elective specialty care utilizing a national database of claims from individuals with employer-based insurance and reported substantial decreases in colonoscopy and mammography rates as well as a 50% decrease in testing for hemoglobin A1c. This study indicated dramatic changes in elective care; however, it reflected only a narrow view of the significant changes in health care in the United States (US) in response to the pandemic.

- Telemedicine encounters were less frequent among individuals living in areas with lower income and more residents who belong to minority racial and ethnic groups. More research is needed to understand the implications and consequences of the shift from in-person to virtual ambulatory care.

- It is crucial to understand the sustainability of the current health care financing model for telemedicine and the implications for access to primary care even after the pandemic. It is necessary to learn how the response to the pandemic can inform policies to make care more accessible. Such evidence will be essential for structuring a new normal that not only preserves but also advances preventive and primary care and evolves in new ways to provide care such as telemedicine in a way that is efficient and promotes equity.

PUBLIC HEALTH RESPONSE

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Article 3

Published November 4, 2020, THE JAMA

Reimagining Cardiac Rehabilitation in the Era of Coronavirus Disease 2019

- Cardiac rehabilitation integrates patient education, behavior modification, and physical exercise. In the United States (US), cardiac rehabilitation reduces spending on future hospitalizations for patients with a recent acute myocardial infarction by approximately $900 per patient over 21 months. Uptake has been disappointing yet. Less than a third of eligible patients attended a single session before this pandemic. Supply and demand challenges have delayed the uptake, and both need to be addressed to expand this therapy.

- Increasing supply needs finding qualified physicians and physical facilities. Cardiac rehabilitation is usually delivered in inpatient or outpatient settings; however, home-based cardiac rehabilitation may be appropriate for some patients. While the telehealth facilitates virtual delivery of cardiac rehabilitation, modifying the payment model is essential to its long term success. The current fee for service model requires that cardiac rehabilitation be provided at an outpatient center. Introducing a payment model with increased flexibility (e.g. a bundled prospective payment) would have more benefits.

- Increasing referral rates requires addressing barriers to physician referrals and patient participation. Only one-third of the eligible patients are referred for cardiac rehabilitation. For physicians, key barriers include a lack of awareness of cardiac rehabilitation's benefits and an inconvenient referral process. Educating physicians about its evidence base and implementing automatic referrals from electronic health records may increase referrals. Furthermore, educating patients about the benefits of cardiac rehabilitation may improve involvement in patients who receive referrals. Home-based cardiac rehabilitation will reduce waiting times, allow flexible schedules, and eliminate the need to travel.

Article 4

Unexpected Health Insurance Profits and the COVID-19 Crisis

Published November 3, 2020, THE JAMA

- In the United States (US), sharp declines in elective care during the COVID-19 pandemic have reduced health care expenditures and contributed to earnings of the health insurance companies that are twice as large as those earned last year. Under US law, insurers must return a large portion of these excess revenues back to individuals, families, and employers. The federal government and state insurance commissioners can take several steps to ensure that insurance company premiums are used as intended to treat illness and save lives or are returned to those who paid the bills.

- Regulators can demand greater transparency around how the excess premiums are spent. Regular reports can include premium revenues, average health care expenditures per policyholder during the pandemic, expenditures during the same period in last year, and how much was spent in key categories of health care.

- Insurers could be permitted to offer support to underfunded public health departments to evaluate COVID-19 response needs including the need for personnel, contact tracing, testing, essential clinical care and hospital preparedness, action to address disparities, and public communication. The government can permit or require insurers to spend a share of the profits on urgent public health needs. At a time of growing fiscal strain, budget deficits, and layoffs, health insurers are well-positioned to be an essential source of support for the communities.

Elective Surgery During the Covid-19 Pandemic

Article 5

Published November 9, 2020, THE NEJM

- During the COVID-19 pandemic, the committee (physicians) must decide if elective surgeries should be deferred. Physician leader will have to consider the effect that deferring the surgeries will have on hospital revenue, as well as negative health consequences to patients. Additionally, the leader must consider the effect that proceeding with these surgeries will have on bed capacity, staffing, limited supplies of PPE, and patients' risk of transmitting COVID-19 while they are in the hospital.

- There are three treatment options based on the published articles, professional experience, published guidelines, and other information sources - a) continue to schedule elective surgical procedures; b) defer all elective surgical procedures; c) proceed with scheduled elective surgical procedures but defer new cases.

- Continuing to schedule elective surgical procedures is reasonable because canceling them later, if necessary, poses little difficulty. Most of the patients undergoing elective surgeries do not need intensive care unit (ICU) beds as well as intensive nursing support, and the rapid turnover of elective surgery cases also minimizes the extra pressure on resources.

- In the United States (US), the Centers for Disease Control and Prevention (CDC) has offered strong guidance to the public about ways to protect against COVID-19 and to health care providers about ways to safely care for patients who do not have COVID-19 and prevent further spread of the disease. These guidelines support the decision to defer elective surgeries.

- Postponing elective surgeries that have already been scheduled could result in worse outcomes for the community. Procedures that have already been scheduled, priority should be given to cases for which a short length of stay is anticipated, cases that have same-day discharges, or time-sensitive surgeries in which patients are likely to have adverse outcomes from further delays.

Article 6

Published

Bidirectional Associations Between COVID-19 and Psychiatric Disorder: Retrospective Cohort Studies of 62,354 COVID-19 Cases in the USA

November 9, 2020, THE LANCET

- In the United States (US), a global federated network (TriNetX Analytics Network) was utilized that captures anonymized data from electronic health records in 54 health care organizations. TriNetX included patients diagnosed with COVID-19 (n=62,354) from January 20 to August 1, 2020. Cohorts of patients were created who had been diagnosed with COVID-19 or a range of other health events. The primary outcome was the incidence of a first psychiatric diagnosis over a period from 14 to 90 days after a diagnosis of COVID-19 represented by hazard ratio (HR) and the estimated probability of an outcome over that period.

- The HR was highest for anxiety disorders, insomnia, and dementia. Similar findings were observed, however, with smaller HRs when relapses and new diagnoses were measured. The incidence of any psychiatric diagnosis in the 14 to 90 days after COVID-19 diagnosis was 18.1%, including 5.8% that was the first diagnosis. The incidence of the first diagnosis of dementia during the 14 to 90 days after COVID-19 diagnosis was 1.6% in people >65 years. A psychiatric diagnosis in the previous year was associated with a higher incidence of COVID-19 [Relative Risk (RR) - 1.65; 95% CI: 1.59-1.71].

- Prospective cohort studies are needed to support and extend the findings. In addition, enhanced psychiatric follow-up needs to be considered for patients who survive COVID-19. Psychiatric history should be queried during the assessment of a patient presenting with COVID-19 symptoms to adjust pre-test probability.

PUBLIC HEALTH RESPONSE

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Continued

	COVID-19	Influenza in matched cohort (n=26 497)		Other respiratory tract infection in matched cohort (n=44 775)		Skin infection in matched cohort (n=38 977)		Cholelithiasis in matched cohort (n=19 733)		Urolithiasis in matched cohort (n=28 827)		Fracture in matched cohort (n=37 841)	
	% (95% CI)	% (95% CI)	p value	% (95% CI)	p value	% (95% CI)	p value	% (95% CI)	p value	% (95% CI)	p value	% (95% CI)	p value
Psychiatric illness	5·8 (5·2–6·4)	2·8 (2·5–3·1)	<0·0001	3·4 (3·1–3·7)	<0·0001	3·3 (3–3·7)	<0·0001	3·2 (2·8–3·7)	<0·0001	2·5 (2·2–2·8)	<0·0001	2·5 (2·2–2·7)	<0·0001
Psychotic disorder	0·1 (0·08–0·2)	0·04 (0·01–0·10)	0·019	0·1 (0·06–0·16)	0·23	0·15 (0·096–0·24)	0·83	0·11 (0·054–0·24)	0·21	0·044 (0·016–0·12)	0·0051	0·16 (0·11–0·24)	0·77
Mood disorder	2·0 (1·7–2·4)	1·1 (0·9–1·3)	<0·0001	1·5 (1·3–1·7)	0·0054	1·7 (1·5–1·9)	0·55	1·6 (1·3–1·9)	0·14	1·2 (1–1·4)	0·00011	1·4 (1·2–1·6)	0·0050
Anxiety disorder	4·7 (4·2–5·3)	2·2 (1·9–2·5)	<0·0001	2·5 (2·2–2·8)	<0·0001	2·4 (2·1–2·7)	<0·0001	2·6 (2·2–3)	<0·0001	1·8 (1·6–2·1)	<0·0001	1·6 (1·4–1·8)	<0·0001
Insomnia	1·9 (1·6–2·2)	0·6 (0·5–0·8)	<0·0001	0·8 (0·7–1·0)	<0·0001	0·89 (0·73–1·1)	<0·0001	1·1 (0·88–1·4)	<0·0001	0·57 (0·43–0·74)	<0·0001	0·7 (0·57–0·85)	<0·0001
Dementia in all participants	0·44 (0·33–0·60)	0·11 (0·06–0·20)	0·00044	0·25 (0·18–0·35)	0·00063	0·28 (0·20–0·39)	0·13	0·24 (0·14–0·38)	<0·0001	0·16 (0·09–0·28)	<0·0001	0·34 (0·25–0·44)	0·14
Dementia (among those ≥65 years)	1·6 (1·2–2·1)	0·66 (0·41–1·1)	0·0043	0·84 (0·61–1·1)	0·00071	0·70 (0·49–1·0)	0·00069	0·58 (0·36–0·94)	<0·0001	0·60 (0·38–0·95)	<0·0001	0·94 (0·68–1·3)	0·0036

p values obtained using a log-rank test. A breakdown of the results for different diagnoses of the anxiety disorders and mood disorders categories is provided in the appendix (pp 26–27).

Table 2: Estimated incidence of first psychiatric diagnoses during the first 14 to 90 days after a diagnosis of COVID-19 compared with other health events

	COVID-19	Influenza		Other respiratory tract infection		Skin infection		Cholelithiasis		Urolithiasis		Fracture	
	% (95% CI)	% (95% CI)	p value	% (95% CI)	p value	% (95% CI)	p value	% (95% CI)	p value	% (95% CI)	p value	% (95% CI)	p value
Psychiatric illness	18·1 (17·6–18·6)	13·3 (12·8–13·7)	<0·0001	14·1 (13·8–14·5)	<0·0001	14·8 (14·4–15·2)	<0·0001	15·1 (14·6–15·6)	<0·0001	13·7 (13·3–14·1)	<0·0001	12·7 (12·4–13·1)	<0·0001
Psychotic disorder	0·94 (0·82–1·1)	0·49 (0·41–0·59)	<0·0001	0·60 (0·53–0·70)	<0·0001	0·92 (0·82–1·0)	0·44	0·72 (0·61–0·86)	0·045	0·44 (0·37–0·53)	<0·0001	0·74 (0·65–0·84)	0·034
Mood disorder	9·9 (9·5–10·3)	7·4 (7·1–7·8)	<0·0001	7·6 (7·3–7·9)	<0·0001	8·6 (8·3–9·0)	<0·0001	9·2 (8·8–9·7)	<0·0001	8·3 (8·0–8·6)	<0·0001	8·1 (7·8–8·4)	<0·0001
Anxiety disorder	12·8 (12·4–13·3)	9·4 (9·0–9·8)	<0·0001	10·1 (9·8–10·5)	<0·0001	10·0 (9·6–10·4)	<0·0001	10·0 (9·6–10·5)	<0·0001	9·5 (9·2–9·9)	<0·0001	7·9 (7·6–8·3)	<0·0001

Table 3: Estimated incidence of all (first and recurrent) psychiatric diagnoses during the first 14 to 90 days after a diagnosis of COVID-19 compared with other health events

Article 7

Published

Challenges in Creating Herd Immunity to SARS-CoV-2 Infection by Mass Vaccination

November 4, 2020, THE LANCET

- During the COVID-19 pandemic, if the results of the phase 3 trials are satisfactory, wide-scale distribution of the vaccines is not expected until mid to late 2021. The impact of vaccination on the transmission of SARS-CoV-2 will start slowly and build up over a few years to reach target coverage levels. The amount of vaccine required for a defined population will depend on evidence from phase 3 trials on efficacy and average duration of vaccine protection. For lower efficacies, the entire population would have to be immunized.

- The proportion of the population that must be vaccinated during the first year is larger than the proportion that must be vaccinated once the system has stabilized after a few years since most of the population will be susceptible as mass immunization starts, but after a few years, hopefully, a high proportion will be immunized such that effective herd immunity is created.

- A well-designed phase 4 trials are essential based on representative and large numbers of those vaccinated and follow-up over time. These longitudinal studies will require careful planning and sustained funding. These studies should be targeted at those vaccinated in high-risk groups such as the individuals >70 years. Since repeated vaccination of individuals as they age is likely to be required for SARS-CoV-2 control, the pharmaceutical industry should focus on improving the efficacy of the initially licensed vaccines.

- If countries do not reach high vaccine coverage, then SARS-CoV-2 will become endemic. Policy makers will have to consider whether to mandate vaccination and to create a certificate to record immunization for educational institutions and workplaces. Given vaccine hesitancy, the creation of herd immunity by vaccination is likely to be challenging in many countries.

Article 8

Published November 7, 2020, THE LANCET

Offline: Managing the COVID-19 Vaccine infodemic

- In the United States (US), doctors are accused of demanding the government punish people who refuse a COVID-19 vaccine. Previous research (conducted with 13,000 people across 19 countries) showed that 14.2% of the respondents completely or somewhat disagreed with the statement that they would accept a vaccine if generally available. In many countries, vaccine hesitancy is sufficiently high to provide community immunity with a challenging goal.

- O'Connor & Weatherall (2019) explained how false beliefs persist, and spread, and emphasized the social character of inaccurate news. The greater the distrust among those with different views, the greater the risk of permanent polarization. If someone's network holds strong anti-vaccine views, they might find it more difficult to arrive at their own independent judgment even if they are inclined to have confidence in a vaccine.

- O'Connor & Weatherall drew conclusions that can be applied to the present crisis:
  - Social media such as Facebook and Twitter must remove false information about a potential vaccine
  - Trusted politicians from all political groups need to speak out in support of vaccine science
  - Vaccine scientists must raise their standards for the work they do
  - Journalists should avoid the unknowingly spread of misinformation
  - Lawmakers can do more to regulate sources of misinformation as they have done for other threats to health such as tobacco.

Article 9

Published November 7, 2020, THE LANCET

Strategy, Coordinated Implementation, and Sustainable Financing Needed for COVID-19 Innovations

- Although innovative approaches are required in response to the COVID-19 pandemic, this innovation alone is insufficient and needs resources and comprehensive strategies to implement in a planned and coordinated way. Additionally, it is essential to evaluate the effectiveness of innovation before implementation in clinical care or emergency situation.

- Digital innovations in health care delivery such as telemedicine and digital health are encouraging; however, they are insufficient if not established in a strategic way that targets areas of greatest need. At the national and global levels, a central strategy and financial resources are required to direct, evaluate, coordinate, prioritize, and integrate the innovations for effective implementation. Additionally, a comprehensive national or global command center would be helpful for all COVID-19 related innovations.

- In the United States (US), there has been insufficient central coordination and command in public health surveillance, response, and innovation. Although Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) and the Rapid Acceleration of Diagnostics (RADx) have been established, it is uncertain how such efforts work together. A lack of coordination between state and local public health departments, for instance, led to difficulties in delivery of contact tracing programs.

- There is an inadequate financing to sustain a coordinated strategy for COVID-19 innovations. The global Access to COVID-19 Tools (ACT) Accelerator, for instance, brings together governments, health organizations, civil society, and foundations to expedite development, ensure equitable allocation, and expand delivery of new COVID-19 tools. However, the ACT Accelerator is dependent on funding from donor countries and foundations that is an inadequate and unsustainable way to finance a global public good. The ACT Accelerator will require long term, predictable, and sustained financing based on global agreement.

TREATMENT

Article 10

Published

Effect of Pre-Exposure Use of Hydroxychloroquine on COVID-19 Mortality: A Population-Based Cohort Study in Patients with Rheumatoid Arthritis or Systemic Lupus Erythematosus Using the OpenSAFELY Platform

November 5, 2020, THE LANCET

In the United Kingdom (UK), an observational, population-based cohort study was conducted using electronic health record data from primary care practices and linked death registrations in the OpenSAFELY platform that covers around 40% of the population in England. Adults aged ≥18 years registered with a general practice for ≥1 year on March 1, 2020, were included.

- The association between hydroxychloroquine use before COVID-19 pandemic (considered March 1, 2020), compared with non-use and risk of COVID-19 mortality among people with rheumatoid arthritis or systemic lupus erythematosus was estimated.
- 194,637 people were diagnosed with rheumatoid arthritis or systemic lupus erythematosus between September 1, 2019, and March 1, 2020. Of these, 30,569 (15.7%) received two or more prescriptions of hydroxychloroquine during the 6 months before the index date.
- There were 547 COVID-19 deaths among people with rheumatoid arthritis or systemic lupus erythematosus between March 1 and July 13, 2020. Of those, 70 used hydroxychloroquine regularly.
- Estimated standardized cumulative mortality was 0·23% among users and 0·22% among non-users. The absolute cumulative risk difference was 0·008%. After adjusting for variables (age, gender, ethnicity, other immunosuppressive drugs, and geographical region), no association was found with COVID-19 mortality [Hazard Ratio (HR)-1.03; 95% CI: 0.80-1.33].

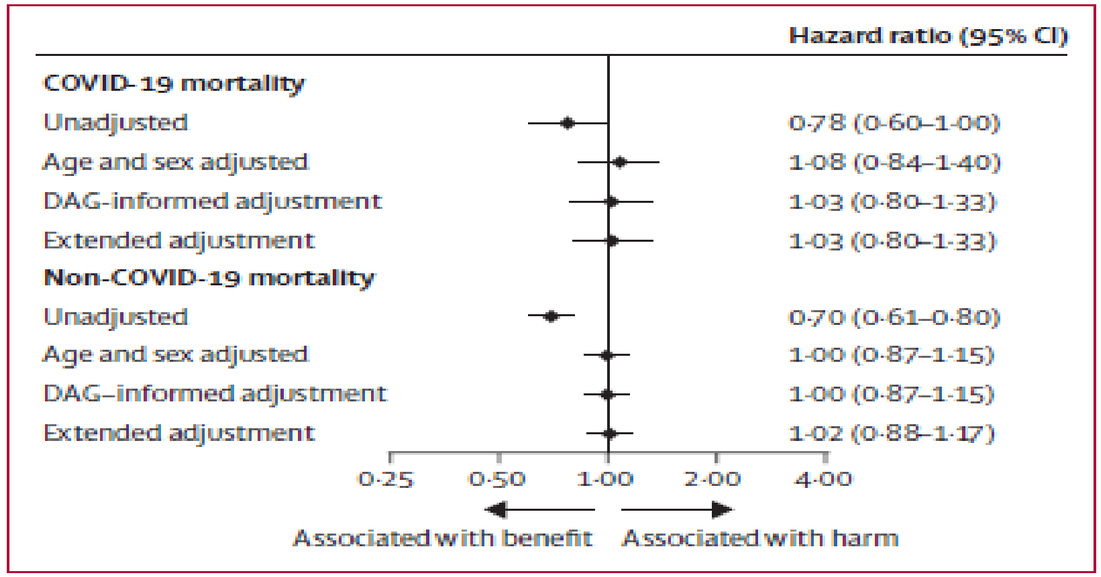

***Figure 4:* Comparisons between hydroxychloroquine use and no hydroxychloroquine use among people with rheumatoid arthritis or systemic lupus erythematosus**
Outcome counts were 70 of 547 deaths among hydroxychloroquine users for COVID-19 mortality and 234 of 2003 deaths among hydroxychloroquine users for non-COVID-19 mortality. DAG=directed acyclic graph.

- The study findings indicated that there was no evidence of a difference in COVID-19 mortality among people who used hydroxychloroquine for the treatment of rheumatoid arthritis before the pandemic. Therefore, completion of randomized trials investigating pre-exposure prophylactic use of hydroxychloroquine for the prevention of severe outcomes from COVID-19 is warranted.

VACCINE

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Article 11

Published October 13, 2020, THE LANCET

SARS-CoV-2 Immunity: Review and Applications o Phase 3 Vaccine Candidates

- During the COVID-19 pandemic, there is a lack of knowledge of post-infection immunity to SARS-CoV-2. Previous research suggested that partially neutralizing antibodies and responses from CD4+ and CD8+ T cells might be associated with COVID-19 severity. Information regarding the durability of immunity and the targets of B-cell and T-cell responses can assist in the development of new vaccines.

- Humoral immune responses to SARS-CoV-2 are mediated by antibodies that are directed to viral surface glycoproteins (spike glycoprotein and nucleocapsid protein). The vital role of neutralizing antibodies is antigen binding and interaction with cells bearing Fc γ-receptors to modulate subsequent immune responses. Functional neutralizing antibodies specific to SARS-CoV-2 that are produced following infection, vaccination, or both are considered important for viral neutralization and viral clearance.

	Vaccine type	Location	Trial number
Phase 1 trials only			
Inovio	DNA (INO-4800)	USA	NCT04336410
Genexine	DNA (GX-19)	South Korea	NCT04445389
Academy of Military Sciences; Suzhou Abogen Biosciences; Walvax Biotechnology	mRNA (ARCoV)	China	..
ReiThera; Lazzaro Spallanzani National Institute for Infectious Diseases	Gorilla adenovirus vector (GRAd-CoV2)	Italy	NCT04528641
Clover Pharmaceuticals; Dynavax Technologies	Protein (SCB-2019)	..	NCT04405908
Vaxine	Protein	Australia	NCT04453852
Medicago; GSK; Dynavax Technologies	Virus-like particle	USA	NCT04450004
University of Queensland; CSL	Proteins	Australia	NCT04495933
Kentucky Bioprocessing	Plant	USA	NCT04473690
Medigen; Dynavax Technologies	Protein (MVC-COV1901)	Taiwan	NCT04487210
Adimmune	Protein (AdimrSC-2f)	Taiwan	NCT04522089
West China Hospital of Sichuan University	Protein	China	NCT04470609
Sanofi; GSK	Protein	..	NCT04537208
Merck; Pasteur Institute	Measles vector	France	NCT04497298
Research Institute for Biological Safety Problems	Inactivated virus (QazCovid)	Kazakhstan	NCT04530357
Themis; Merck; University of Pittsburgh Center for Vaccine Research	Vesicular stomatitis virus-vectored (COVID-19–101)	Belgium; France	NCT04497298
Symvivo	Oral (bacTRL-Spike)	USA; Canada	NCT04334980

VACCINE

Continued

- Previous reports on cellular immunity to SARS-CoV-2 have indicated that proportion of CD38+, HLA-DR+ T cells (CD4+ and CD8+) increases in first 7-10 days of symptoms and start to return to baseline around day 20. According to some reports, an increase in the proportion of SARS-CoV-2-specific T cells seemed to correlate with disease severity. Serious illness has also been linked to a greater reduction in peripheral CD4+ and CD8+ T cell counts as compared with non-serious illness.

- Vaccines that induce protective immune responses are essential for the prevention and alleviation of morbidity and mortality caused by SARS-CoV-2 infection. Current understanding suggests that a balanced humoral and cellular immune response might be important for protection from COVID-19 and the avoidance of vaccine enhanced disease. Multiple phase 3 clinical trials have already been started in various geographical locations. Interim results from these trials will provide an indication of the efficacy and safety of COVID-19 vaccines.

Phase 1 and phase 2 trials			
Imperial College London; Morningside Ventures	Self-amplifying RNA	UK	..
AnGes; Osaka University; Takara Bio	DNA (AG0302-COVID19)	Japan	NCT0452708; NCT04463472
Arcturus; Duke-NUS Medical School	mRNA (LUNAR-COV19)	Singapore	NCT04480957
Johnson & Johnson; Beth Israel Deaconess Medical Center	Adenovirus serotype 26 vector (Ad26.COV2-S)	USA	NCT04436276
Novavax	Nanoparticle (NVX-CoV2373)	USA; South Africa	NCT04533399
Finlay Vaccine Institute	Protein (Soberana 1)	Cuba	..
Vector Institute	Peptide (EpiVacCorona)	Russia	NCT04527575
Bharat Biotech; Indian Council of Medical Research; National Institute of Virology	Inactivated virus (Covaxin)	India	NCT04471519
Anhui Zhifei Longcom Biopharmaceutical; Institute of Microbiology of the Chinese Academy of Sciences	Protein	China	..
Zydus Cadila	DNA (ZyCoV-D)	India	..
Curevac	mRNA (CVnCoV)	Germany, Belgium	NCT04449276, NCT04515147

(Table continues on next page)

VACCINE

Continued

	Vaccine type	Location	Trial number
(Continued from previous page)			
Phase 3 trials			
AstraZeneca; University of Oxford (30 000 participants)	Chimpanzee adenovirus (ChAdOx1/AXD1222)	UK; India; Brazil, South Africa; USA	NCT04516746
Moderna; National Institutes of Health (30 000 participants)	RNA (mRNA-1273)	USA	NCT04470427
Pfizer; BioNTech (44 000 participants)	RNA (BNT162b1 and BNT162b2)	USA	NCT04368728
The Janssen Pharmaceutical Companies of Johnson & Johnson (60 000 participants)	Adenovirus serotype 26 vector (Ad26.COV2.S)	USA; Argentina; Brazil; Chile; Columbia; Mexico; Peru; Philippines; South Africa; Ukraine	NCT04505722
The Gamaleya National Research Centre for Epidemiology and Microbiology; Academy of Military Medical Sciences (40 000 participants)	Adenovirus serotype 5 vector and adenovirus serotype 26 vector (Sputnik V)	Russia	NCT04530396
CanSino Biologics; Academy of Military Medical Sciences (40 000 participants)	Adenovirus serotype 5 vector (Ad5CoV)	China; Pakistan	NCT04526990
Sinovac Biotech (9000 participants)	Inactivated virus (CoronaVac)	Brazil; Indonesia	..
Sinopharm; Wuhan Institute of Biological Products (21 000 participants)	Inactivated virus	The United Arab Emirates; Bahrain; Peru; Morocco; Argentina; Jordan	..
Sinopharm; Beijing Institute of Biological Products (5000 participants)	Inactivated virus (BBIBP-CorV)	The United Arab Emirates	..

Table: **COVID-19 vaccine clinical trials**

THANK YOU

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