مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

SCIENTIFIC RESEARCH MONITORING ON COVID-19

03 MAY 2021

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SCIENTIFIC RESEARCH MONITORING ON COVID-19

(Issue 421)

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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
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Note : All articles presented in this report represent the authors' views and not necessarily represents Abu Dhabi Public Health Center views or directions. Due the nature of daily posting , some minor language errors are expected.
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RESEARCH UPDATES

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TREATMENT

- Association Between Renin-Angiotensin-Aldosterone System Inhibitors and Clinical Outcomes in Patients With COVID-19 A Systematic Review and Meta-analysis
- Effect of Helmet Noninvasive Ventilation vs High-Flow Nasal Oxygen on Days Free of Respiratory Support in Patients With COVID-19 and Moderate to Severe Hypoxemic Respiratory Failure The HENIVOT Randomized Clinical Trial

PUBLIC HEALTH RESPONSE

- The interplay between COVID-19 restrictions and vaccination

VACCINATION

- Efficacy of ChAdOx1 nCoV-19 (AZD1222) vaccine against SARS-CoV-2 variant of concern 202012/01 (B.1.1.7): an exploratory analysis of a randomised controlled trial

EPIDEMIOLOGY

FROM 21 JAN 2020 TO 02 May 2021

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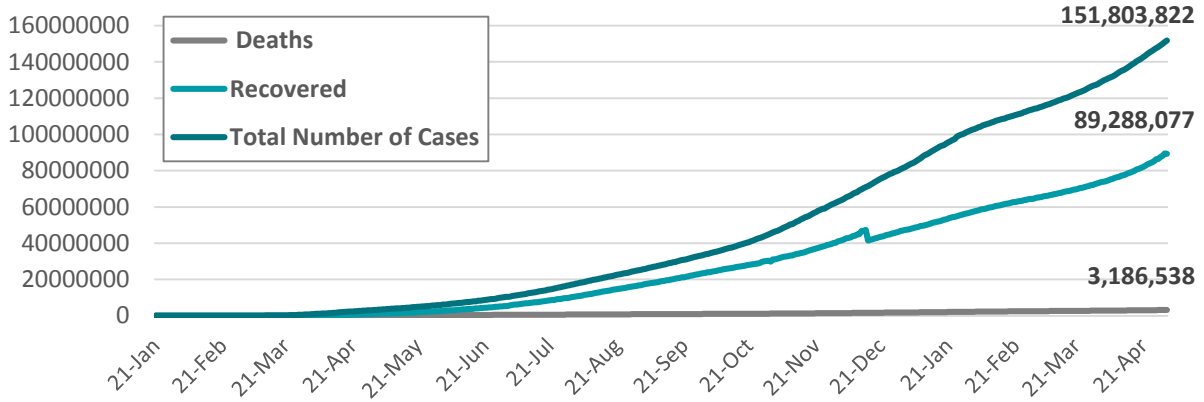
Figure 1: Total Number of Infected, Recovered, and Death Cases



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

Figure 2: Daily New Infected COVID-19 Cases

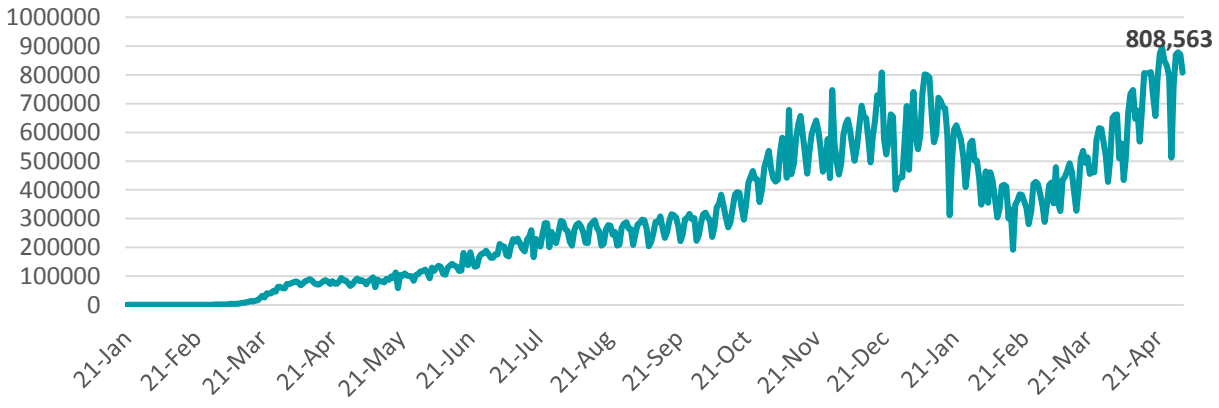


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Figure 3: % of people who received at least one dose of COVID-19 vaccine around the world

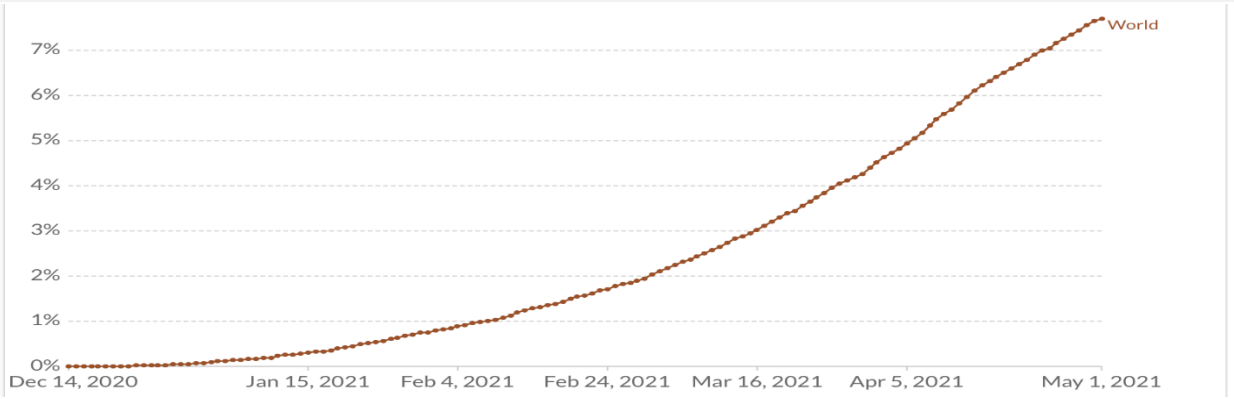
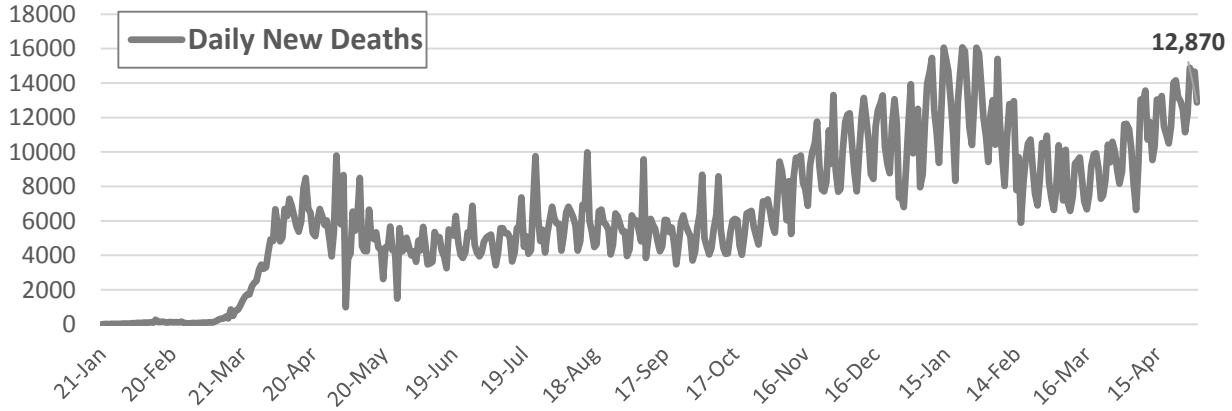


Figure 4: Global Daily New Deaths Due to COVID-19



Graphs published by Abu Dhabi Public Health Center 2021 | Data resources: John Hopkins, WHO Our world in data

EPIDEMIOLOGY

FROM 21 JAN 2020 TO 02 May 2021

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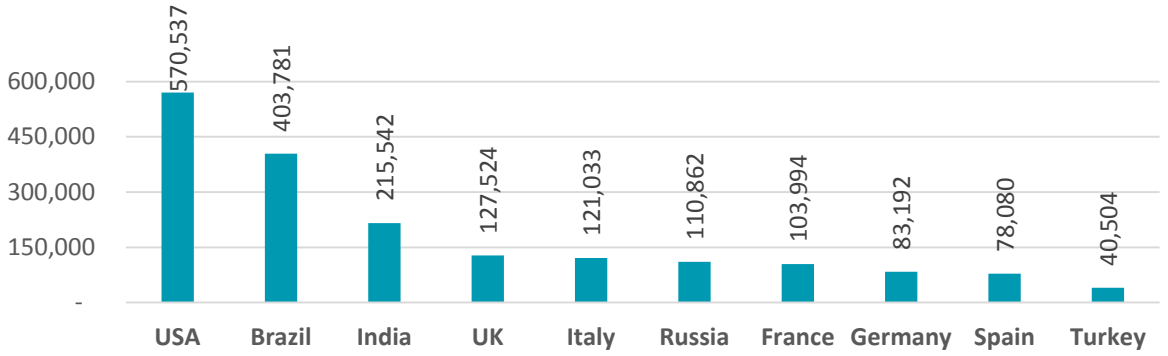
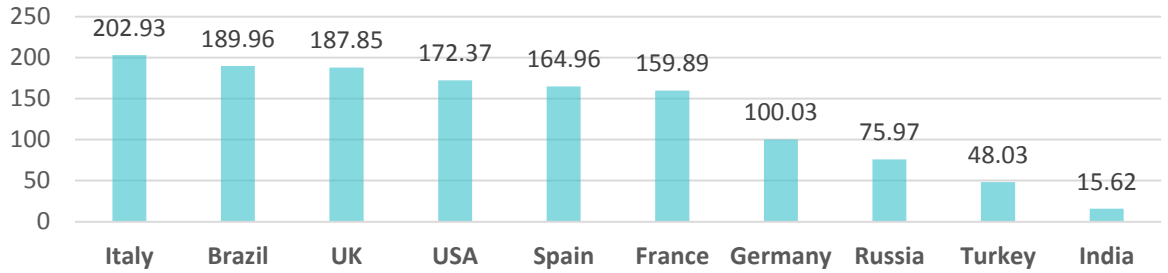
Figure 5: Top 10 Countries in the Total Number of Cases Due to COVID-19

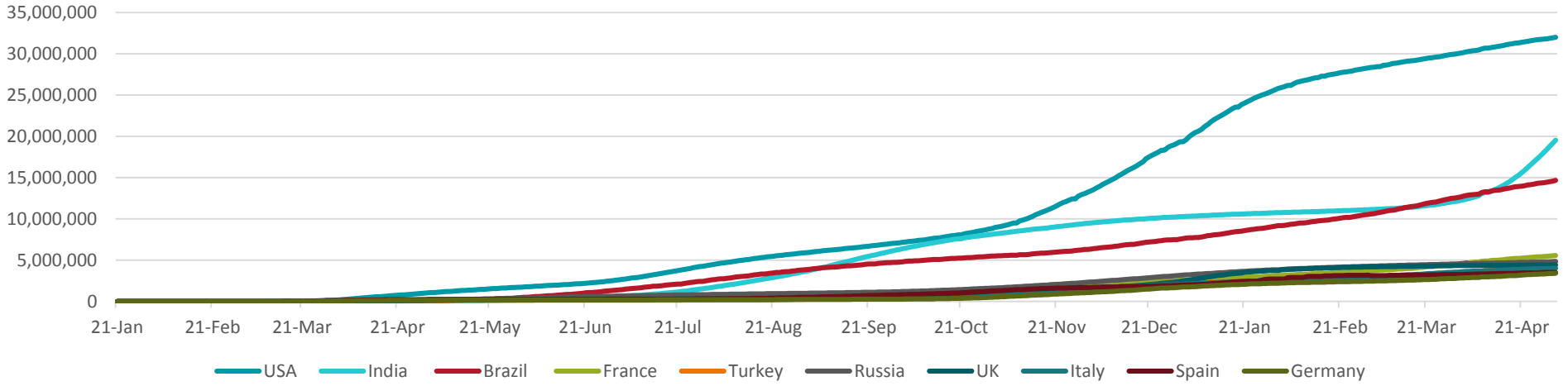
TOTAL DEATHS



DEATHS PER MILLION



TOTAL INFECTED CASES



USA	32,002,328
India	19,557,457
Brazil	14,659,011
France	5,553,806
Turkey	4,849,408
Russia	4,823,255
UK	4,418,534
Italy	4,035,617
Spain	3,514,942
Germany	3,416,822

Graphs published by Abu Dhabi Public Health Center 2021 | Data resources: WHO

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Figure 8: COVID-19 Status in the UAE (Federal Competitiveness and Statistics Authority Dashboard)

Daily Tests
192,407.9 Average Tests
1,945.4 per 100k population
1.0% Positive Rate

Daily Cases
1,865.3 Average Cases
18.9 per 100k population

Daily Recovered
1,734.6 Average Recovered
17.5 per 100k population

Daily Deaths
3.1 Average Deaths
0.0 per 100k population
0.2% Case Fatality Rate

Figure 6A: TOTAL Number Of Infected And Recovered Cases Due To Covid-19 Reported By The UAE

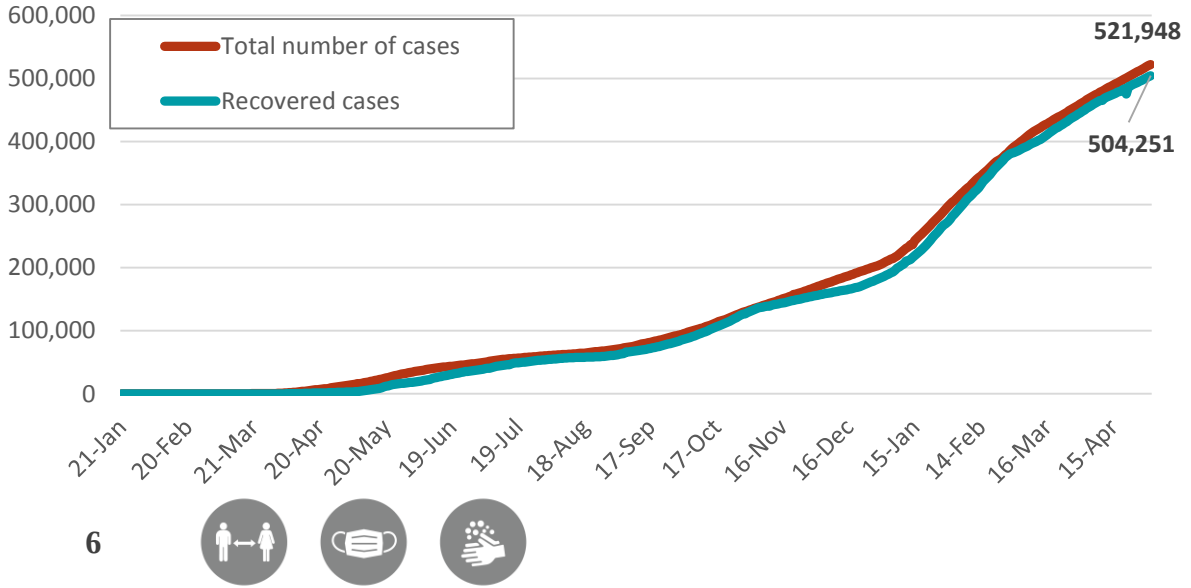
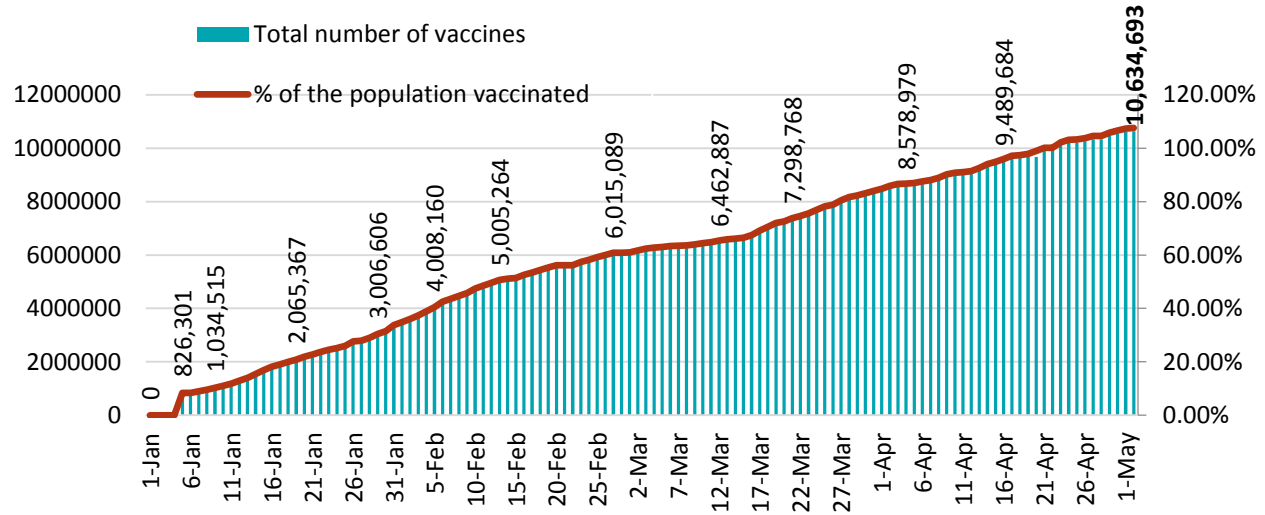


Figure 6 B: TOTAL NUMBER and Percentage of UAE population Vaccinated



Graphs published by Abu Dhabi Public Health Center 2021 | Data resources: FCSA, WHO, John Hopkins, National Emergency Crisis and Disaster Management Authority

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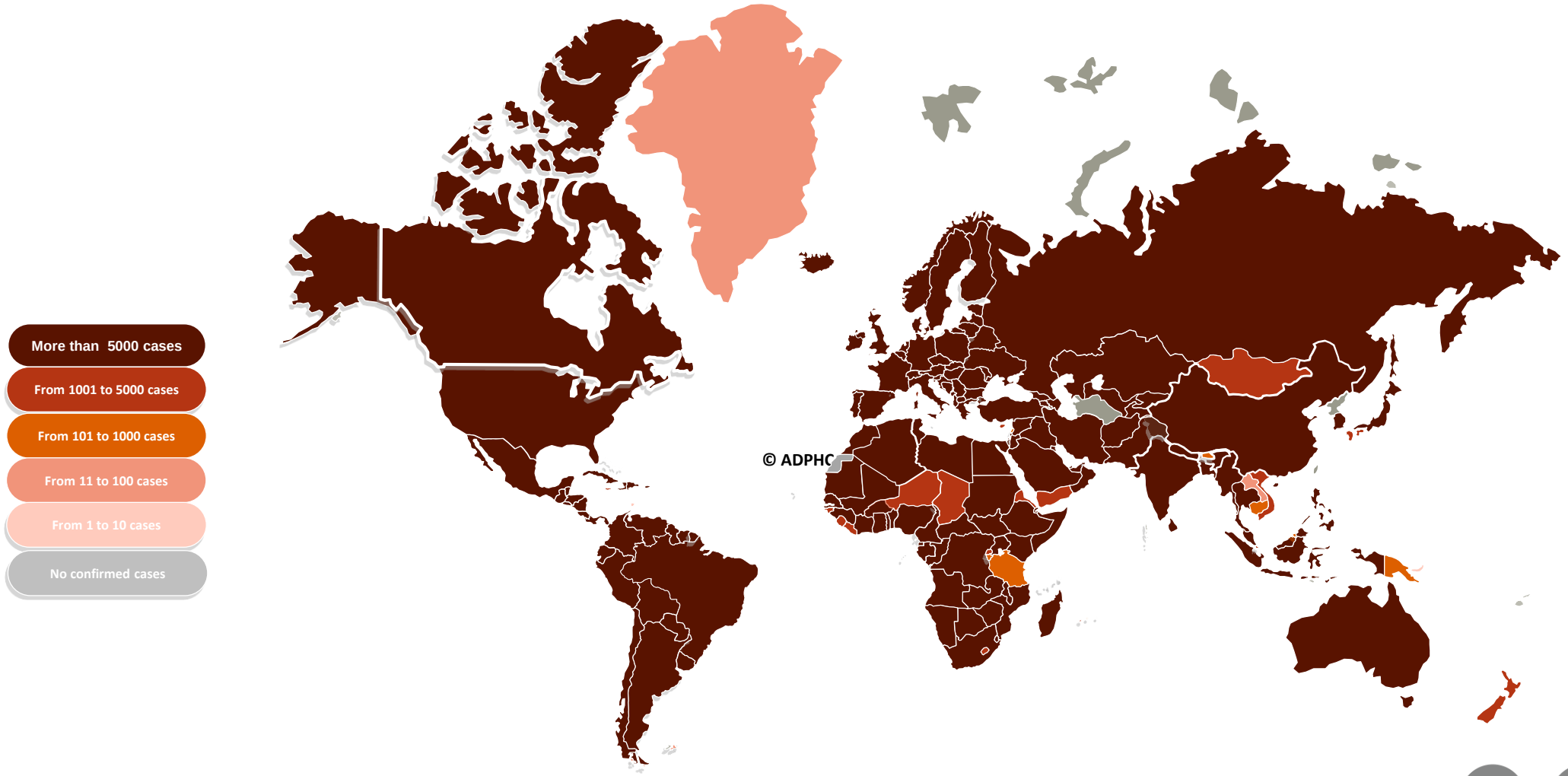
Figure 7A : Global Distribution of COVID-19 Cases



Graphs published by Abu Dhabi Public Health Center 2021 | Data resources: WHO

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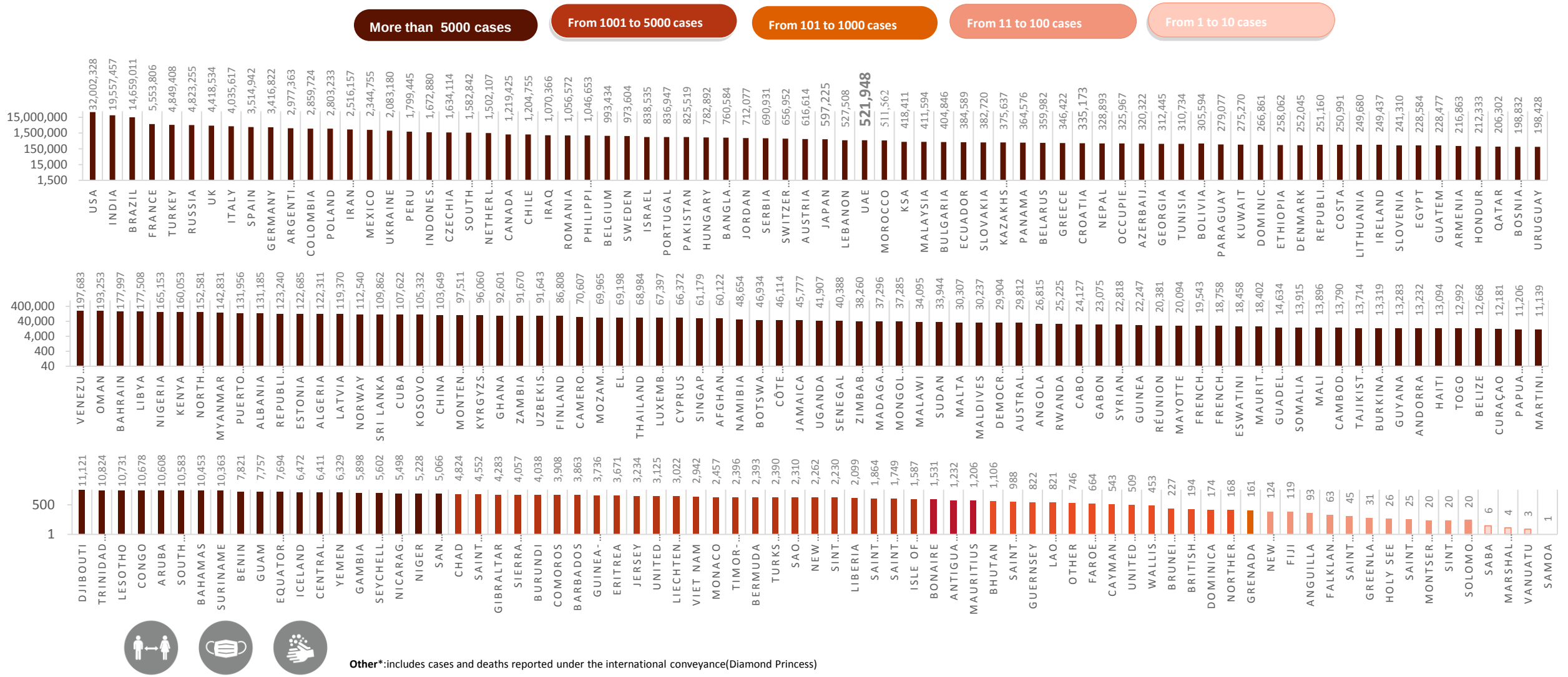
Figure 7B: Bar Chart Illustrates the Global Distribution of COVID19 Cases



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

Graphs published by Abu Dhabi Public Health Center 2021 | Data resources: WHO

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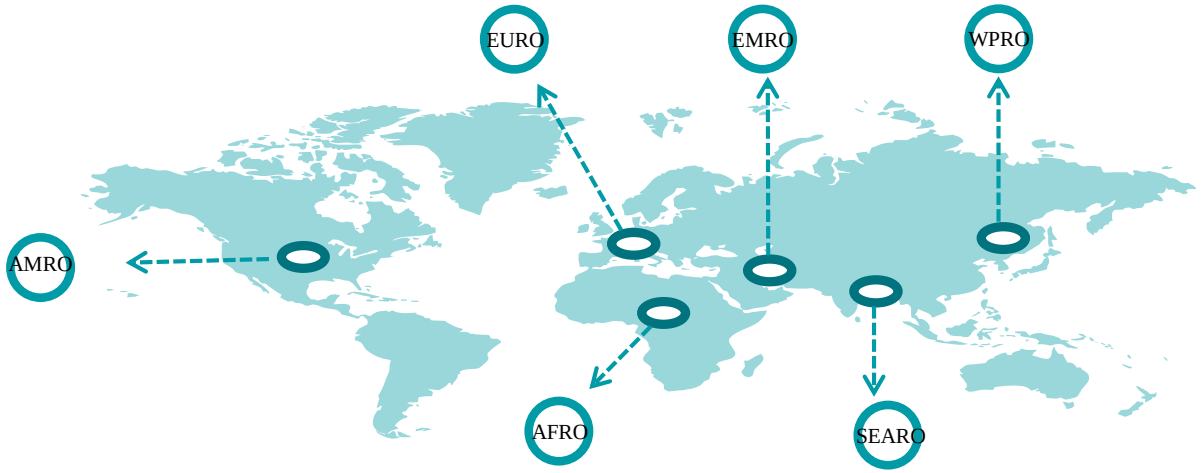
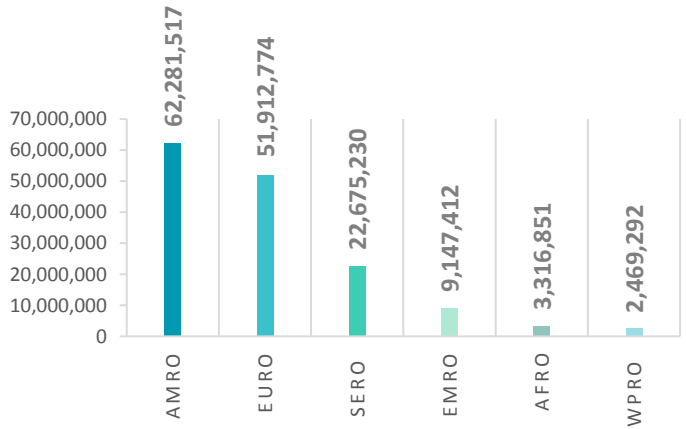
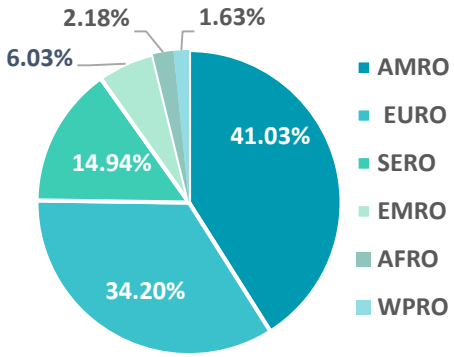
Figure 6: Global Distribution of COVID-19 Cases per Region

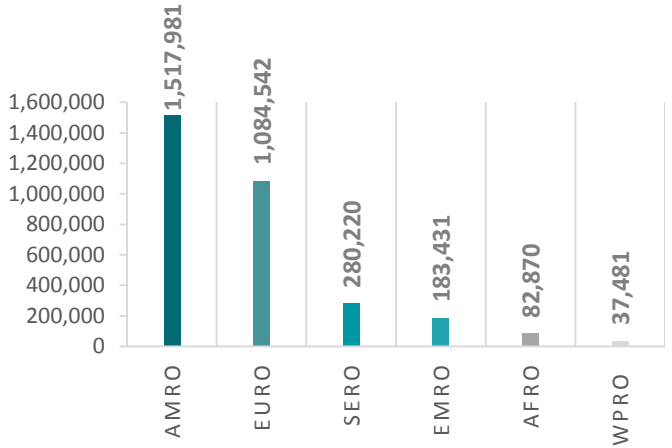


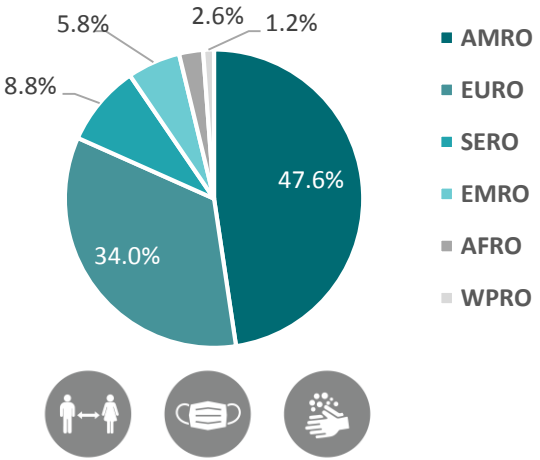
INFECTED





DEATHS





Graphs published by Abu Dhabi Public Health Center 2021 | Data resources: John Hopkins, WHO

EPIDEMIOLOGY

FROM 21 JAN 2020 TO 02 May 2021

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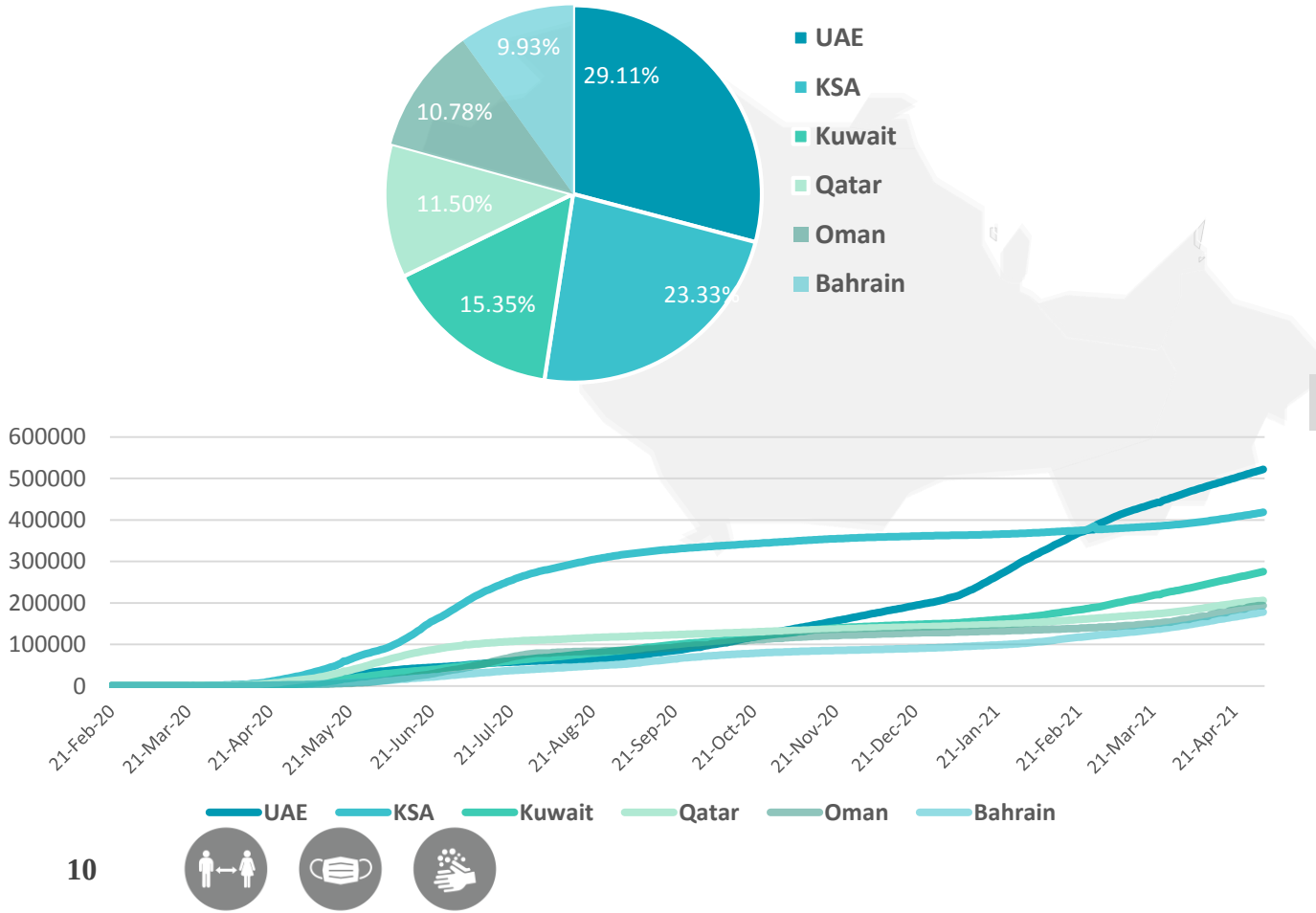
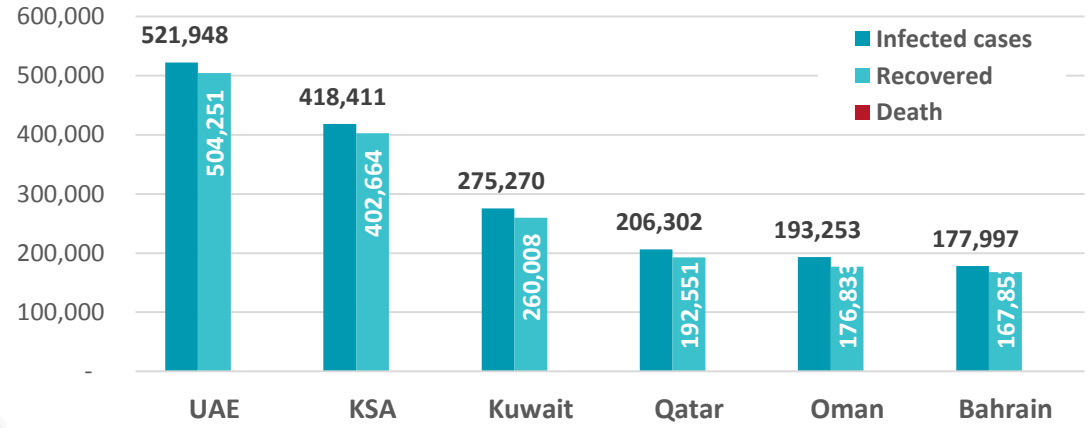
Figure 7: Comparative Analysis of the Distribution of COVID-19 Cases in GCC Countries

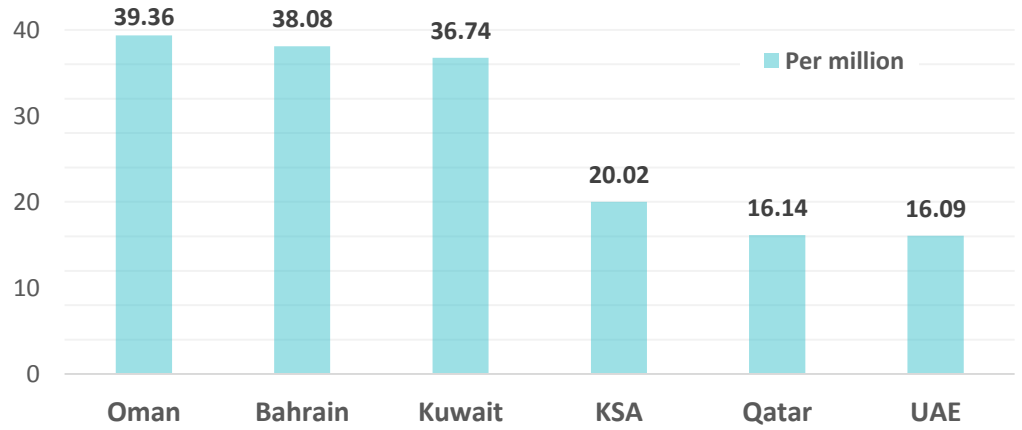
TOTAL NUMBER OF INFECTED CASES



TOTAL NUMBER OF INFECTED, RECOVERED AND DEATHS

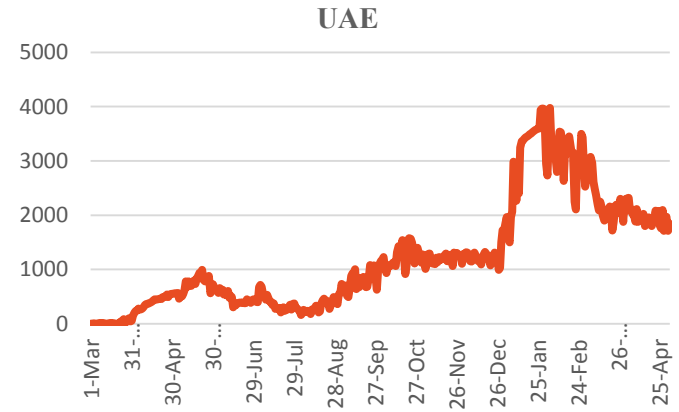


DEATHS PER MILLION

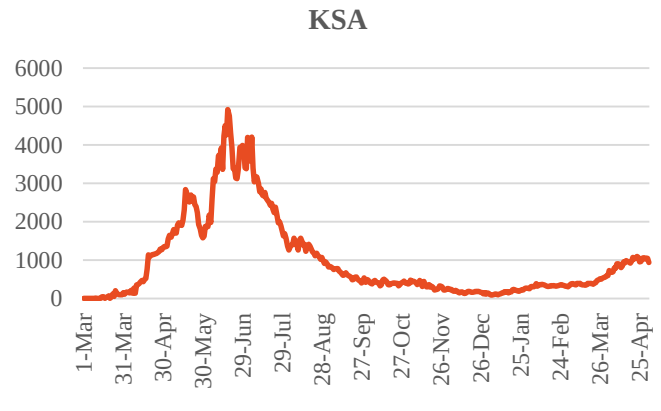


Graphs published by Abu Dhabi Public Health Center 2021 | Data resources: John Hopkins, WHO

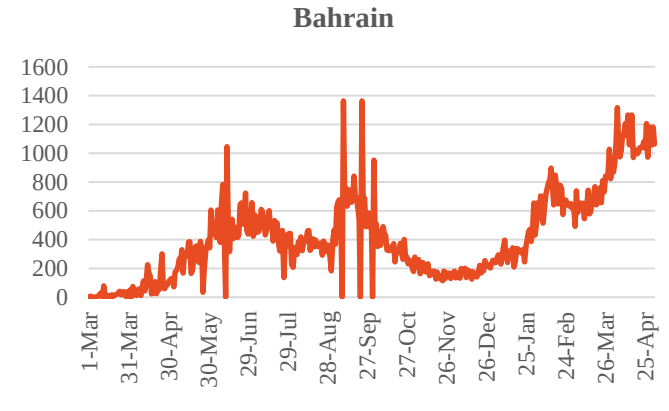
Figure 10: Comparative Analysis of the Distribution of COVID-19 New Cases in GCC Countries



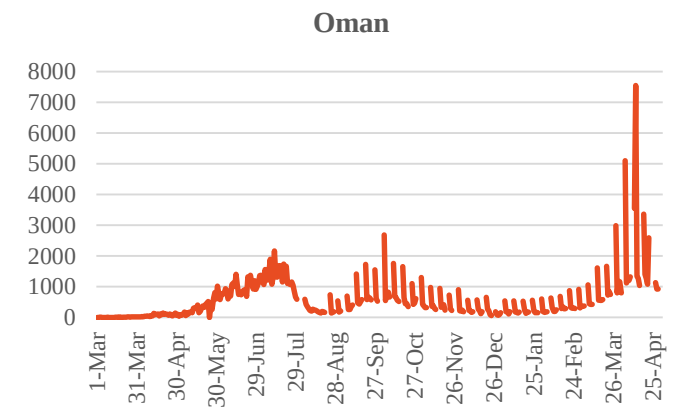
Source : National Emergency Crisis and Disaster Management Authority



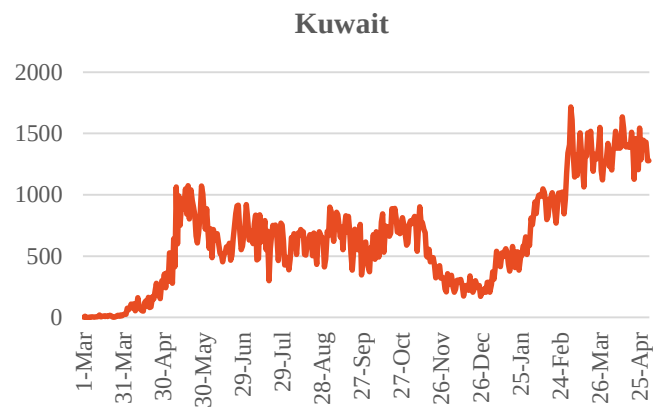
Source : KSA ministry of health



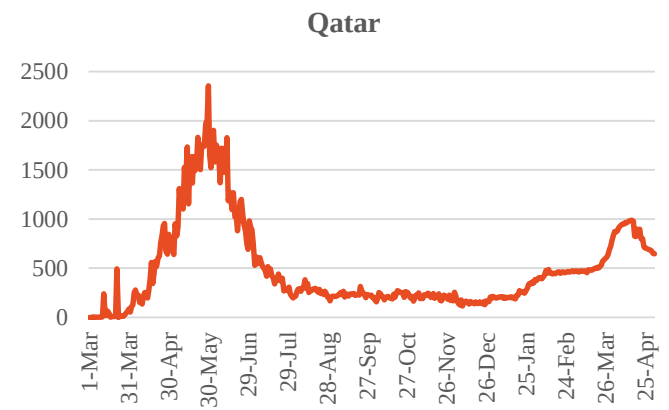
Source :WHO



Source :Oman ministry of health



Source : Kuwait ministry of health



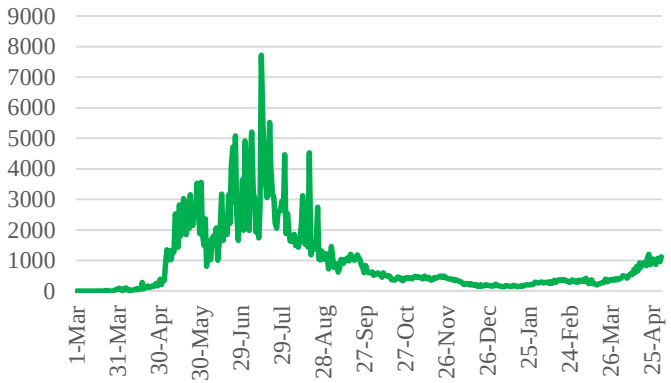
Source : Qatar ministry of health

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

UAE

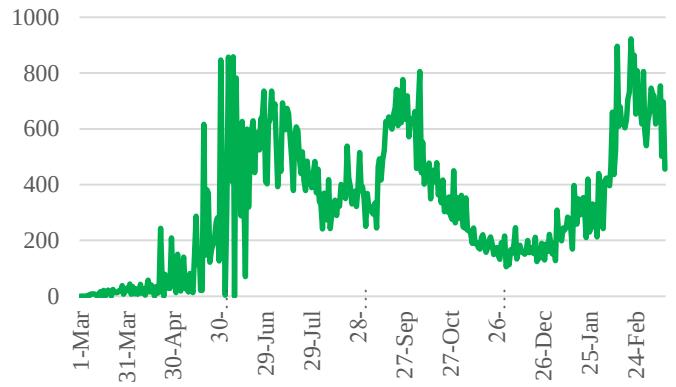
Source : National Emergency Crisis and Disaster Management Authority

KSA



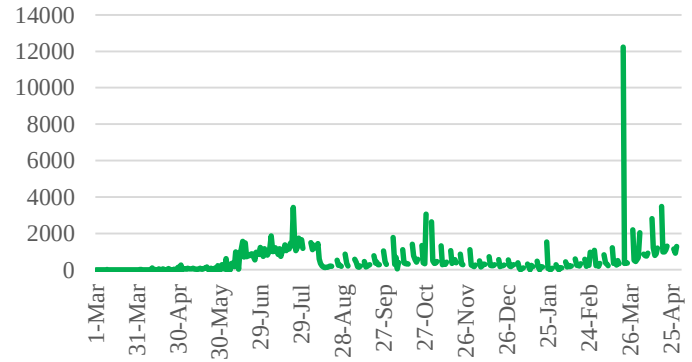
Source : KSA ministry of health

Bahrain



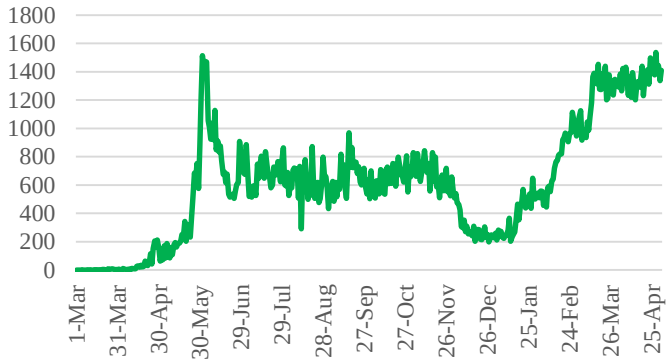
Source : Bahrain ministry of health

Oman



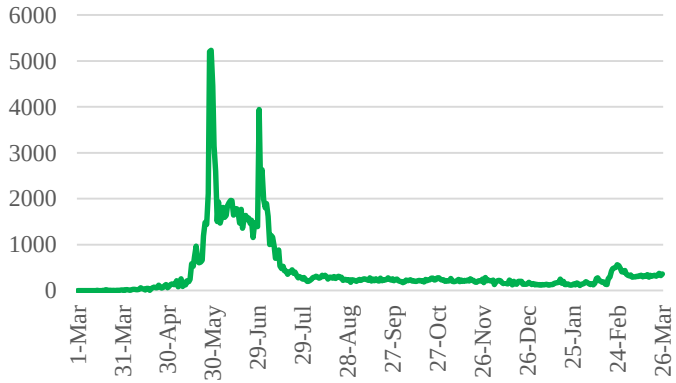
Source :Oman ministry of health

Kuwait



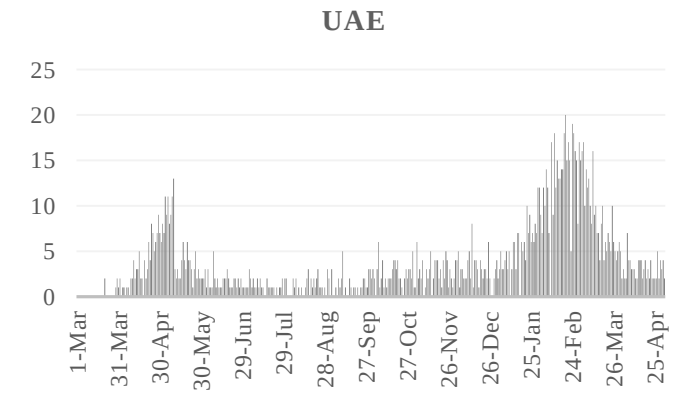
Source : Kuwait ministry of health

QATAR

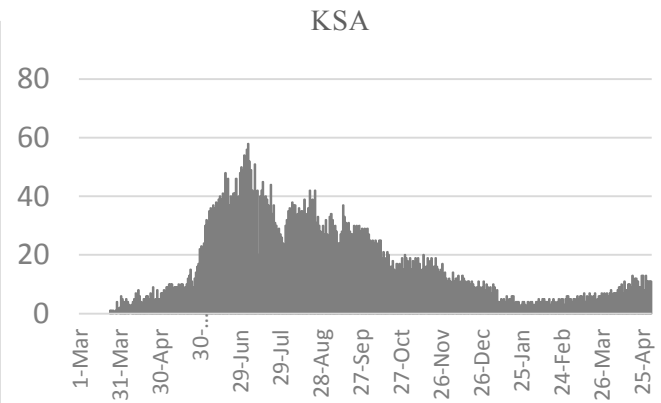


Source : Qatar ministry of health

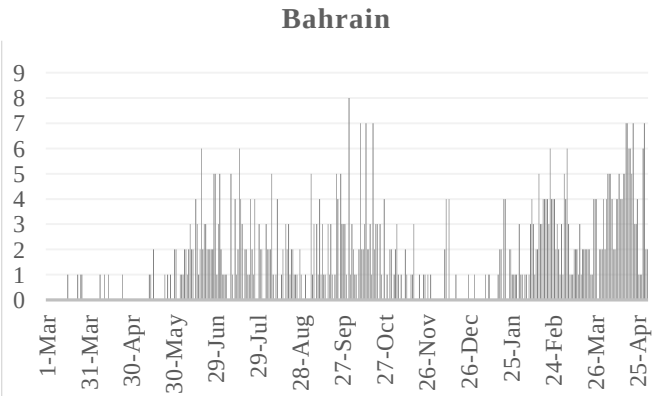
Figure 12: Comparative Analysis of the Distribution of COVID-19 New Death Cases in GCC Countries



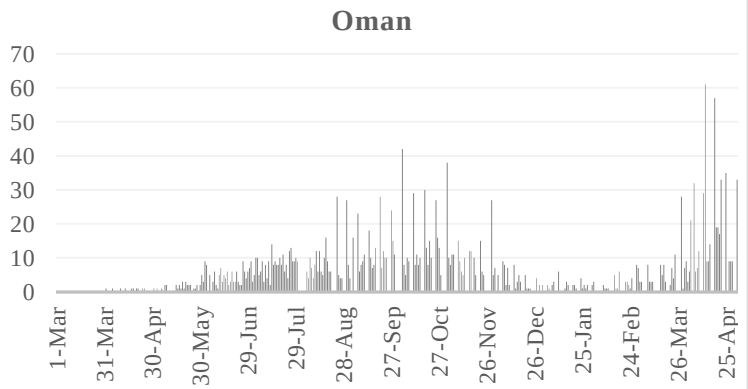
Source : National Emergency Crisis and Disaster Management Authority



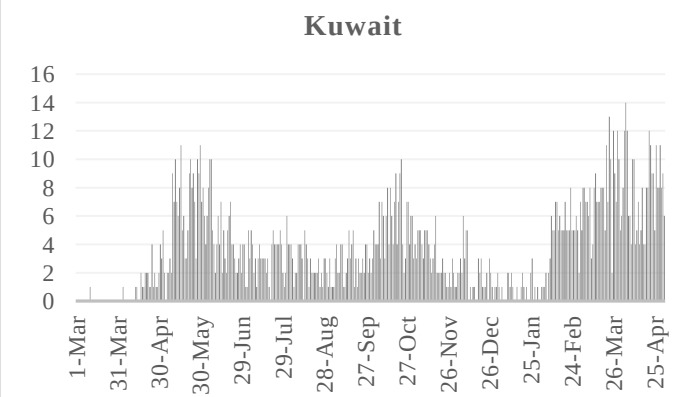
Source : KSA ministry of health



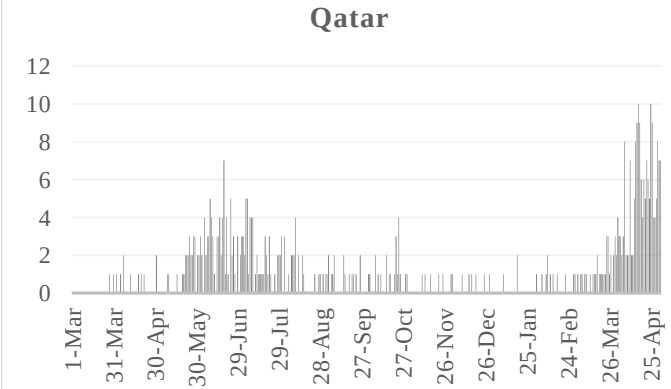
Source :WHO



Source :Oman ministry of health



Source : Kuwait ministry of health



Source : Qatar ministry of health

TREATMENT

مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

Article 1

Published

Association Between Renin-Angiotensin-Aldosterone System Inhibitors and Clinical Outcomes in Patients With COVID-19 A Systematic Review and Meta-analysis

March 31, 2021 in THE JAMA

Summary:

- The study is a systematic review and meta-analysis which compared mortality and severe adverse events AEs associated with receipts vs nonreceipts of mainly angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin receptor blockers (ARBs) medications among patients with COVID-19.
- The study aim to stablish the presence of association between Renin-angiotensin-aldosterone system (RAAS) inhibitors mainly (ACEIs) and (ARBs) "*medication frequently used to treat cardiovascular conditions*" and worse severe clinical outcome of COVID-19 in patients who receive those medications.
- This systematic review and meta-analysis analyzed 52 with 101,949 total number of patients enrolled, 26% of them were receiving ACEIs/ ARBs.

Results:

- Mortality: No increase in the risk of death among those who receive ACEIs/ ARBs compared with who did not.
- A pooled analysis of 17 studies (17,392 participants) using an adjusted analysis of mortality reported reduction on the risk of death among patients receiving ACEIs and ARBs versus non-receiving especially among hypertension sub-group (refer to fig. 2).
- Severe AEs: 23 study (23,129 participants) reported an adjusted risk of severe AEs associated with the receipt of ACEIs/ARBs in a COVID-19 cohort, the result of the analysis of those studies revealed a significant decrease severe AEs in patients who received ACEIs/ ARBs compared to those who did not (refer to fig.4).

Conclusion and Clinical Implication:

- **No higher risk of mortality or severe AEs associated with patients taking ACIEs/ARBs.** Thus, patients prescribed those medications should continue to take them as recommended by their doctors.
- This study also reveled that ACIEs/ARBs maybe associated with protective benefits specially among patients with hypertension, however further research are warranted to confirm this finding.

Continued

Figure 2. Subgroup Analysis of Adjusted Mortality Among Patients Who Did and Did Not Receive ACEIs or ARBs

Source	log OR	SE	OR (95% CI)	Weight, %
Hypertension subgroup				
Conversano et al,[19] 2020	-0.8675	0.5253	0.42 (0.15-1.18)	5.1
Chen et al,[23] 2020	-1.3093	0.2999	0.27 (0.15-0.49)	9.3
Chen et al,[24] 2020	-1.9661	0.7860	0.14 (0.03-0.65)	2.8
Felice et al,[9] 2020	-0.5798	0.6082	0.56 (0.17-1.84)	4.2
Gao et al,[28] 2020	-0.1625	0.5851	0.85 (0.27-2.68)	4.4
Matsuzawa et al,[44] 2020	-1.0217	1.1211	0.36 (0.04-3.24)	1.5
Selcuk et al,[5] 2020	1.2975	0.8156	3.66 (0.74-18.10)	2.6
Xu et al,[58] 2020	-0.2485	0.4546	0.78 (0.32-1.90)	6.1
Yuan et al,[60] 2020	-0.6539	0.4389	0.52 (0.22-1.23)	6.4
Subtotal	NA	NA	0.51 (0.32-0.84)	42.5
Heterogeneity: $T^2=0.23$; $\chi^2=14.62$; df = 8; $P=.07$; $I^2=45.0\%$				
Test for overall effect: $z=2.66$; $P=.008$				
Mixed subgroup				
Bae et al,[20] 2020	-1.2379	1.1575	0.29 (0.03-2.80)	1.4
Fosbol et al,[27] 2020	-0.2000	0.1100	0.82 (0.66-1.02)	14.1
Jung et al,[36] 2020	-0.1278	0.2587	0.88 (0.53-1.46)	10.3
Lopez-Otero et al,[42] 2020	-0.4780	0.6602	0.62 (0.17-2.26)	3.7
Mostaza et al,[46] 2020	-0.7765	0.3763	0.46 (0.22-0.96)	7.6
Shah et al,[54] 2020	-0.1985	0.3062	0.82 (0.45-1.49)	9.1
Zhou et al,[10] 2020	-0.9943	0.2209	0.37 (0.24-0.57)	11.3
Subtotal	NA	NA	0.64 (0.46-0.88)	57.5
Heterogeneity: $T^2=0.09$; $\chi^2=13.26$; df = 6; $P=.04$; $I^2=55.0\%$				
Test for overall effect: $z=2.73$; $P=.006$				
Total	NA	NA	0.57 (0.43-0.76)	100
Heterogeneity: $T^2=0.14$; $\chi^2=32.74$; df = 15; $P=.005$; $I^2=54.0\%$				
Test for overall effect: $z=3.82$; $P=.001$				
Test for subgroup differences: $\chi^2=0.51$; df = 1; $P=.48$; $I^2=0\%$				

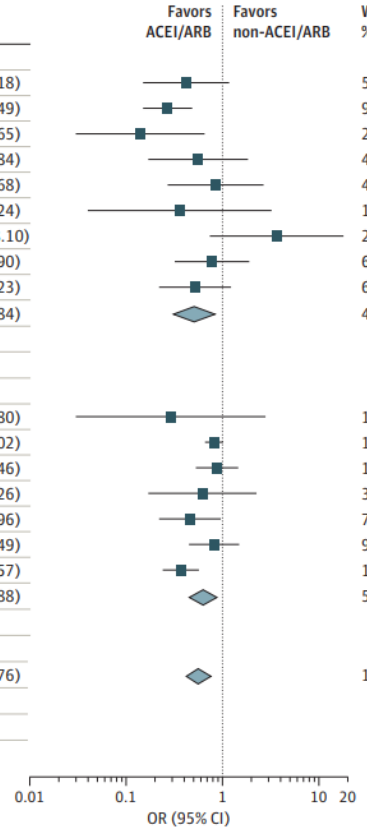


Fig.2: Subgroup analysis of adjusted mortality in 16 studies of patients who did and did not receive ACEIs or ARBs. A total of 7 studies included a mixed subgroup (a sample population with multiple mixed comorbidities), and 9 studies included a hypertension subgroup (a sample population with hypertension). Diamonds represent 95% CIs for subtotal and total ORs. ACEI indicates angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; and OR, odds ratio.

Figure 4. Subgroup Analysis of Adjusted Mortality and Severe Adverse Events Among Patients Who Did and Did Not Receive ACEIs or ARBs

Source	log OR	SE	OR (95% CI)	Weight, %
Hypertension subgroup				
Conversano et al,[19] 2020	-0.8675	0.5605	0.42 (0.14-1.26)	3.2
Bravi et al,[7] 2020	-0.1393	0.2725	0.87 (0.51-1.48)	6.1
Chen et al,[23] 2020	-1.3093	0.2999	0.27 (0.15-0.49)	5.8
Chen et al,[24] 2020	-1.9661	0.7860	0.14 (0.03-0.65)	2.0
Felice et al,[9] 2020	-0.5798	0.6082	0.56 (0.17-1.84)	2.9
Gao et al,[28] 2020	-0.1625	0.5851	0.85 (0.27-2.68)	3.0
Matsuzawa et al,[44] 2020	-1.0217	1.1211	0.36 (0.04-3.24)	1.1
Selcuk et al,[5] 2020	1.2975	0.6087	3.66 (1.11-12.07)	2.9
Xu et al,[58] 2020	-0.2485	0.4546	0.78 (0.32-1.90)	4.1
Yuan et al,[60] 2020	-0.6539	0.4389	0.52 (0.22-1.23)	4.2
Zhang et al,[61] 2020	-0.8916	0.4200	0.41 (0.18-0.93)	4.4
Zhou et al[8] 2020	-1.9661	1.3465	0.14 (0.01-1.96)	0.8
Subtotal	NA	NA	0.55 (0.36-0.85)	40.6
Heterogeneity: $T^2=0.28$; $\chi^2=24.24$; df = 11; $P=.01$; $I^2=55.0\%$				
Test for overall effect: $z=2.69$; $P=.007$				
Mixed subgroup				
Bae et al,[20] 2020	-1.2379	1.1575	0.29 (0.03-2.80)	1.1
Bean et al,[21] 2020	-0.4620	0.1495	0.63 (0.47-0.84)	7.6
Fosbol et al,[27] 2020	-0.1985	0.1107	0.82 (0.66-1.02)	8.0
Gormez et al,[29] 2020	-0.2485	0.5413	0.78 (0.27-2.25)	3.3
Jung et al,[36] 2020	-0.1278	0.2492	0.88 (0.54-1.43)	6.4
Liabeuf et al,[40] 2020	0.5481	0.2696	1.73 (1.02-2.93)	6.2
Lopez-Otero et al,[42] 2020	-0.4780	0.6602	0.62 (0.17-2.26)	2.6
Mehta et al,[6] 2020	0.4947	0.2179	1.64 (1.07-2.51)	6.8
Mostaza et al,[46] 2020	-0.7765	0.3763	0.46 (0.22-0.96)	4.9
Shah et al,[54] 2020	-0.1985	0.3062	0.82 (0.45-1.49)	5.7
Zhou et al,[10] 2020	-0.9943	0.2209	0.37 (0.24-0.57)	6.8
Subtotal	NA	NA	0.79 (0.59-1.07)	59.4
Heterogeneity: $T^2=0.15$; $\chi^2=37.04$; df = 10; $P<.001$; $I^2=73.0\%$				
Test for overall effect: $z=1.54$; $P=.12$				
Total	NA	NA	0.68 (0.53-0.88)	100
Heterogeneity: $T^2=0.19$; $\chi^2=66.95$; df = 22; $P<.001$; $I^2=67.0\%$				
Test for overall effect: $z=3.01$; $P=.003$				
Test for subgroup differences: $\chi^2=1.78$; df = 1; $P=.18$; $I^2=43.9\%$				

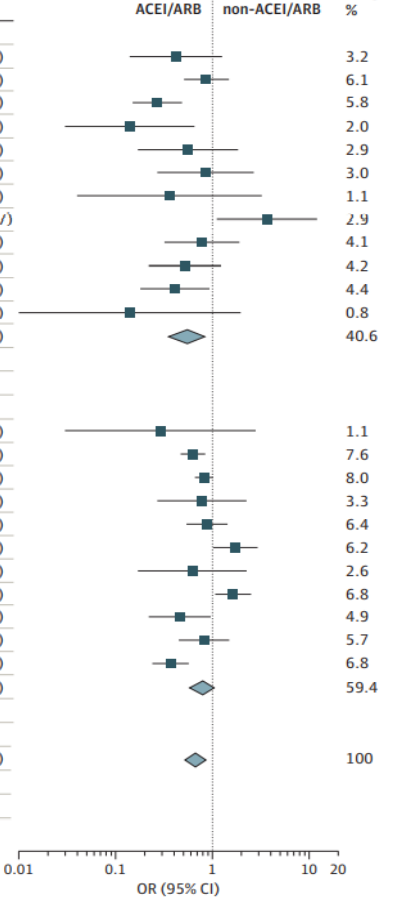


Fig.4: Subgroup analysis of adjusted mortality and severe adverse events in 23 studies of patients who did and did not receive ACEIs or ARBs. A total of 11 studies included a mixed subgroup (sample population with multiple mixed comorbidities), and 12 studies included a hypertension subgroup (defined as a sample population with hypertension). Diamonds represent 95% CIs for subtotal and total ORs. ACEI indicates angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; and OR, odds ratio

TREATMENT

مركز أبوظبي للصحة العامة
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Article 2

Published March 25, 2021 in THE JAMA

Effect of Helmet Noninvasive Ventilation vs High-Flow Nasal Oxygen on Days Free of Respiratory Support in Patients With COVID-19 and Moderate to Severe Hypoxemic Respiratory Failure The HENIVOT Randomized Clinical Trial

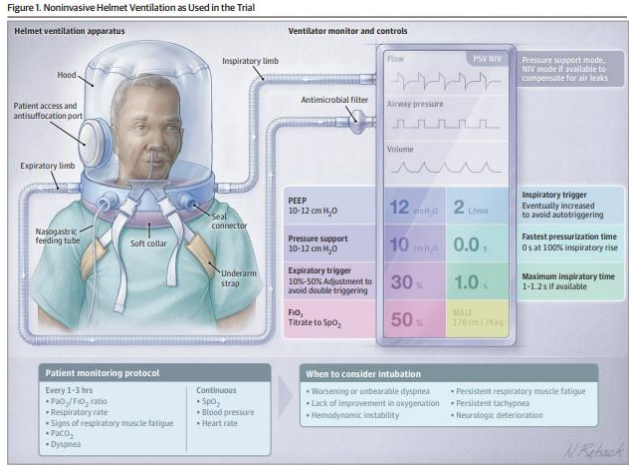
Summary:

- High flow nasal oxygen is the recommended initial treatment for acute hypoxemic respiratory failure and has been widely used in patients with COVID-19.
- This study is a multicenter randomized clinical trial (included 109 patients with COVID-19 and moderate to severe hypoxemic respiratory Failure); was conducted to assess whether helmet noninvasive ventilation "*displayed in the picture*" can increase the day free of respiratory support in patients with COVID-19 when compared to high flow nasal oxygen alone.

Results:

- The results reveled that among critically ill COVID-19 patients with moderate-severe hypoxemic respiratory failure, helmet noninvasive ventilation when compared with high-flow nasal oxygen, resulted in **no significant difference** in the number of days free of respiratory support within 28 days. Secondary outcomes reveled that patients who received helmet noninvasive ventilation had significant lower rate of endotracheal intubation, and higher median number of days free invasive mechanical ventilation, when compared to the other group, however further research is needed to study those outcomes (*please refer to the table*).

Figure 1. Noninvasive Helmet Ventilation as Used in the Trial



Primary and Secondary Outcomes (for the complete table refer to the study)

Outcome	No. (%)		Absolute or mean difference (95% CI)	Odds ratio (95% CI)	P value
	Helmet noninvasive ventilation (n = 54)	High-flow nasal oxygen (n = 55)			
Primary outcome Respiratory support–free days median (IQR)	20 (0 to 25)	18 (0 to 22)	2 (−2 to 6)		*.26*
Secondary outcomes Intubation within 28 d from enrollment	16 (30)	28 (51)	−21 (−38 to −3)	0.41 (0.18 to 0.89)	*.03*
Intubation within 28 d from enrollment, after adjudication of intubation criteria by external experts	15 (28)	28 (51)	−23 (−39 to −5)	0.37 (0.17 to 0.82)	*.02*

PUBLIC HEALTH RESPONSE

مركز أبوظبي للصحة العامة
ABU DHABI PUBLIC HEALTH CENTRE

Article 3

The interplay between COVID-19 restrictions and vaccination

Published March 31, 2021 in THE LANCET

- This article published in the Lancet discusses the interplay between COVID-19 restrictions and vaccination. Despite the importance of human behaviour to the epidemiological trajectory, the integration of these interdependent factors into COVID-19 vaccination models has rarely been done.

- An innovative multilevel epidemiological model was developed by Jentsch and colleagues, accounting for the temporal response of public health authorities in concert with alternative vaccination strategies, integrating population acceptance of non-pharmaceutical interventions using game theory.

- The data-driven analysis used in this study was informed by age-stratified case counts, mobility, and seroprevalence data for Ontario, Canada, over the course of the COVID-19 epidemic. Their simulations show that prioritising young individuals (aged <20 years) for COVID-19 vaccination is never the optimal strategy to minimise deaths. This result is attributed to the assortative mixing patterns, along with the disproportionate fatality rates between young people and older adults.

- Prioritising older people in long-term care homes could be essential in reducing mortality, given their increased vulnerability, the rapid rate of spread within the homes, and that a concerning proportion of care workers are unwilling to be vaccinated. In an extension of their baseline model, Jentsch and colleagues also considered vaccine refusal over the course of the campaign.

- To promote concomitant vaccination uptake and non-pharmaceutical intervention adherence, myriad approaches have proven effective.

- Rapid vaccination in Israel was facilitated by extensive education campaigns regarding vaccine safety and efficacy, establishment of vaccination sites throughout the country, including remote areas, and efficient centralisation of funding and coordination through their national health-care system. 6 weeks into the vaccination campaign, 34·9% of Israel's population had received at least one dose of the vaccine, in contrast to 9·4% in the UK, 7·2% in the USA, 2·8% in France, and 2·4% in Italy.

- The reductions in transmission that are achieved by adherence to non-pharmaceutical intervention and vaccination recommendations also decelerates the evolution of the virus. The emergence of more transmissible variants exacerbates the COVID-19 pandemic, particularly if vaccines are less efficacious against the novel variants. Any erosions in vaccine efficacy make non-pharmaceutical interventions all the more imperative. Reciprocally, fatigue over non-pharmaceutical interventions and the ensuing degradation in adherence requires urgent acceleration in vaccination coverage.

Dr. Mumtaz Meeran, MPH (ADPHC).

VACCINATION

مركز أبوظبي للصحة العامة
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Article 4

Published

Efficacy of ChAdOx1 nCoV-19 (AZD1222) vaccine against SARS-CoV-2 variant of concern 202012/01 (B.1.1.7): an exploratory analysis of a randomised controlled trial

March 30, 2021 in THE LANCET

- This study published in the Lancet provides a report on a post-hoc analysis of the efficacy of the adenoviral vector vaccine, ChAdOx1 nCoV-19 (AZD1222), against the B.1.1.7, a variant of the SARS-CoV-2 that emerged as the dominant cause of COVID-19 disease in the UK from November, 2020

- Volunteers (aged ≥18 years) who were enrolled in phase 2/3 vaccine efficacy studies in the UK, and who were randomly assigned (1:1) to receive ChAdOx1 nCoV-19 or a meningococcal conjugate control (MenACWY) vaccine, provided upper airway swabs on a weekly basis and also if they developed symptoms of COVID-19 disease.

- Swabs were tested by nucleic acid amplification test (NAAT) for SARS-CoV-2 and positive samples were sequenced through the COVID-19 Genomics UK consortium. Neutralising antibody responses were measured using a live-virus microneutralisation assay against the B.1.1.7 lineage and a canonical non-B.1.1.7 lineage (Victoria).

- The efficacy analysis included symptomatic COVID-19 in seronegative participants with a NAAT positive swab more than 14 days after a second dose of vaccine. Participants were analysed according to vaccine received. Vaccine efficacy was calculated as 1 − relative risk (ChAdOx1 nCoV-19 *vs* MenACWY groups) derived from a robust Poisson regression model. This study is continuing.

- The findings showed that laboratory virus neutralisation activity by vaccine-induced antibodies was lower against the B.1.1.7 variant than against the Victoria lineage. Clinical vaccine efficacy against symptomatic NAAT positive infection was 70·4% for B.1.1.7 and 81·5% for non-B.1.1.7 lineages.

- Based on the analysis, the ChAdOx1 nCoV-19 showed reduced neutralisation activity against the B.1.1.7 variant compared with a non-B.1.1.7 variant in vitro, but the vaccine showed efficacy against the B.1.1.7 variant of SARS-CoV-2.

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