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للصحة العامة
ABU DHABI PUBLIC
HEALTH CENTRE

SCIENTIFIC RESEARCH MONITORING ON COVID-19

5 SEPTEMBER 2020

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SCIENTIFIC RESEARCH MONITORING ON COVID-19 (ISSUE 216)

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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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Note : All articles presented in this report represent the authors' views and not necessarily represents Abu Dhabi Public Health Center views or directions. Due the nature of daily posting , some minor language errors are expected.
For further inquiries you may communicate with us as PHP@adphc.gov.ae

RESEARCH UPDATES

The views and opinions expressed in this report are those of the authors and do not reflect the official policy or position of the Abu Dhabi Public Health Center (ADPHC).

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Vaccine

Phase 1–2 Trial of a SARS-CoV-2 Recombinant Spike Protein Nanoparticle Vaccine

Vaccine

Safety and immunogenicity of an rAd26 and rAd5 vector-based heterologous prime-boost COVID-19 vaccine in two formulations: two open, non-randomised phase 1/2 studies from Russia

EPIDEMIOLOGY

FROM 21 JAN TO 4 SEPT 2020

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

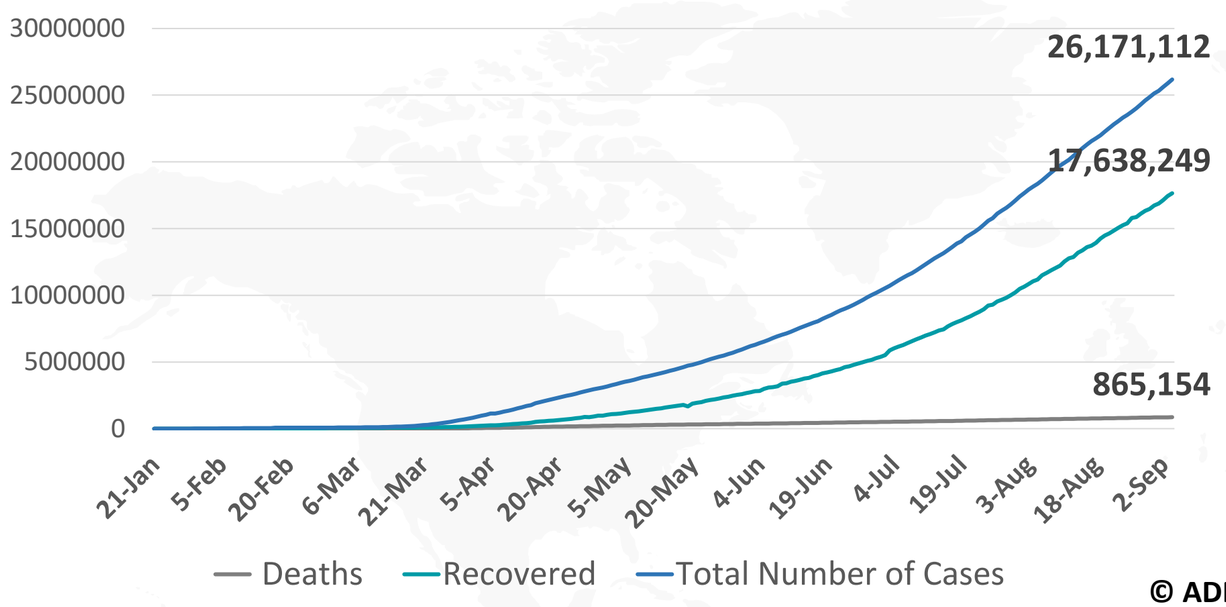


Figure 2: Daily New Infected COVID-19 Cases (China and rest of the world)

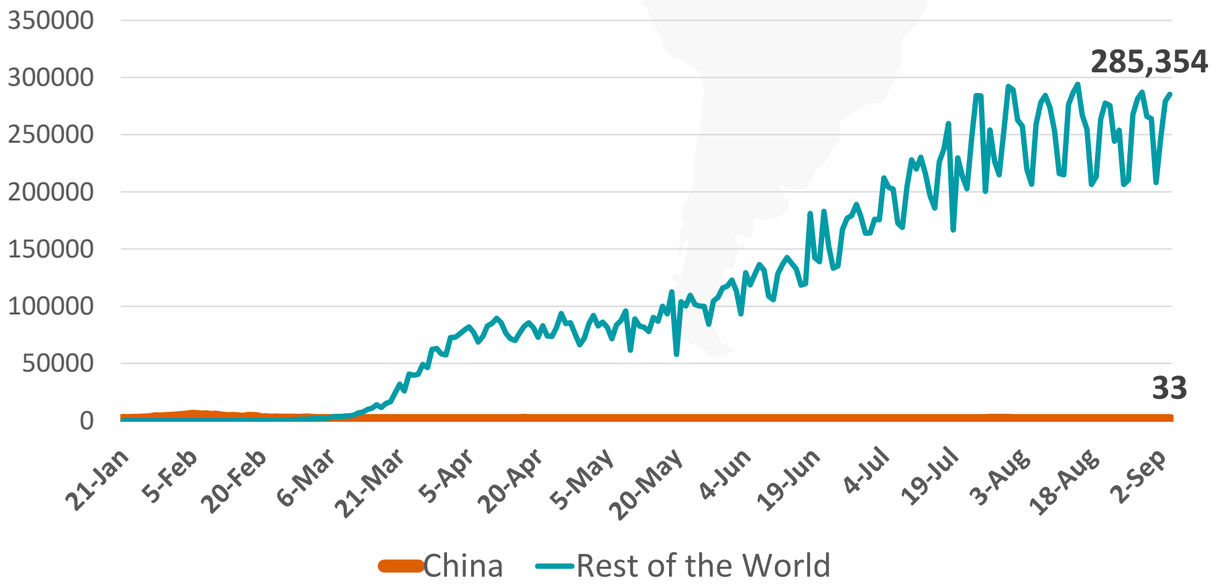


Figure 3: Total Number of Death Due to COVID-19 (china and result of the world)

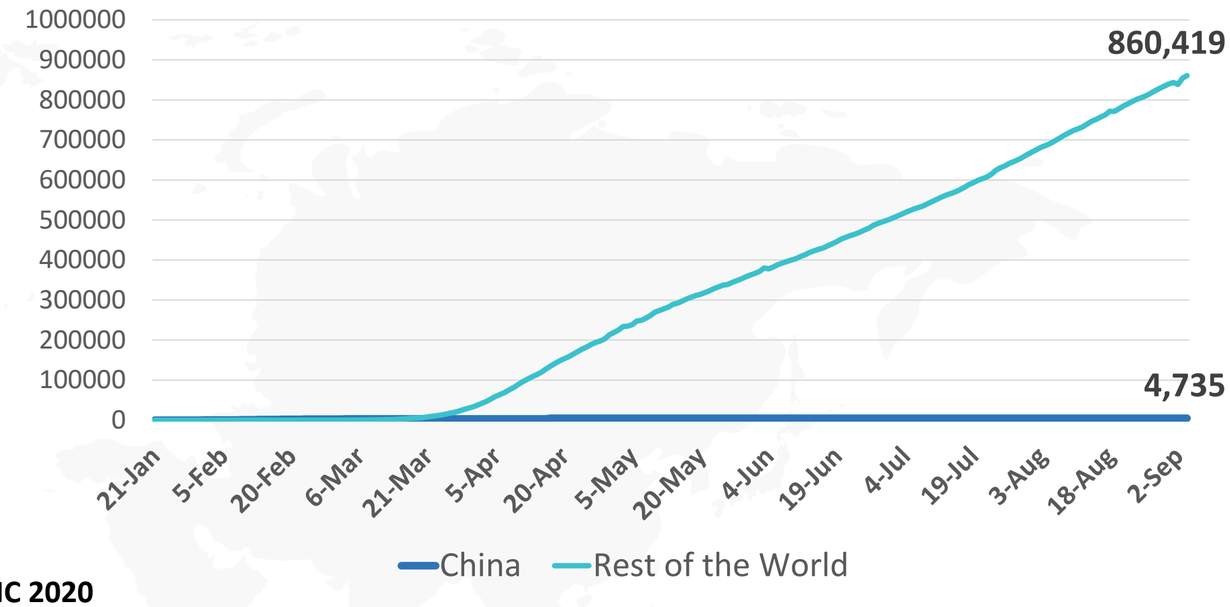
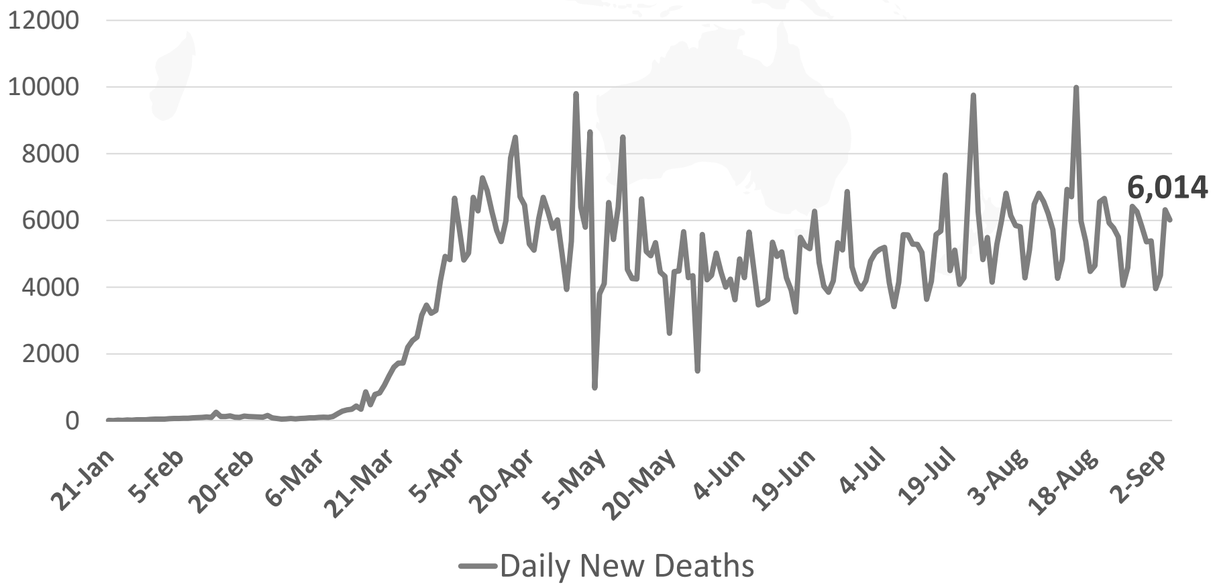


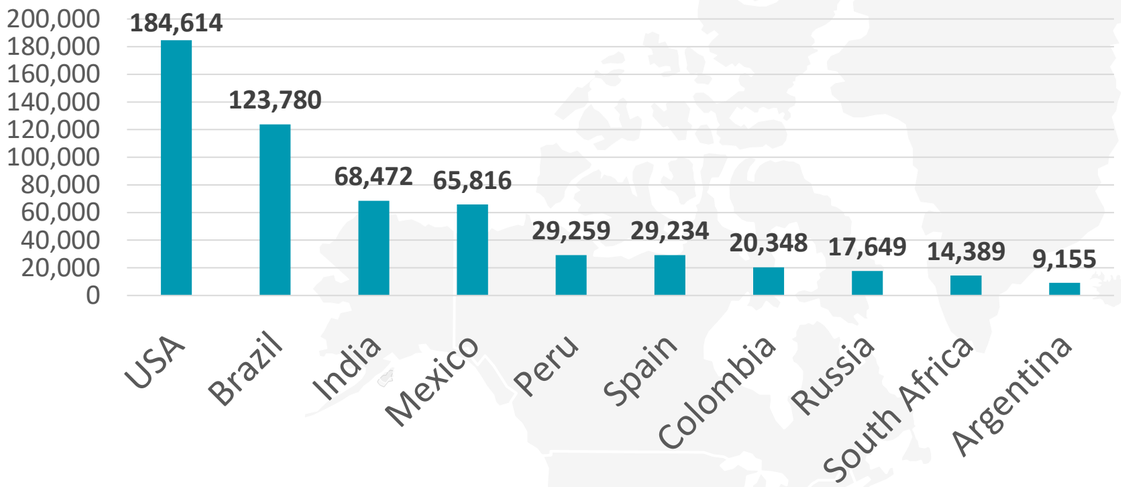
Figure 4: Global Daily New Deaths Due to COVID-19 (china and rest of the world)



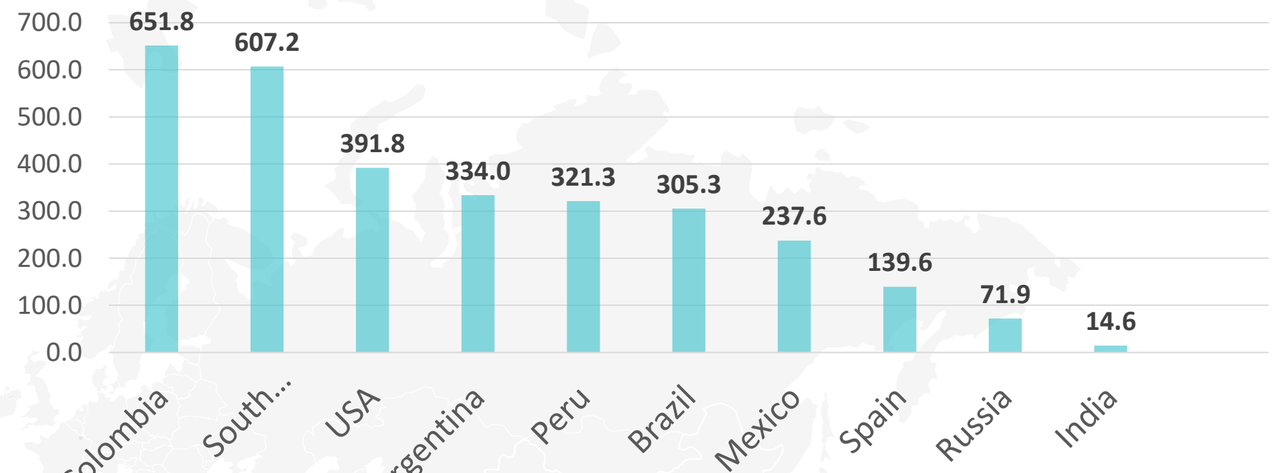
Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: John Hopkins, WHO

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

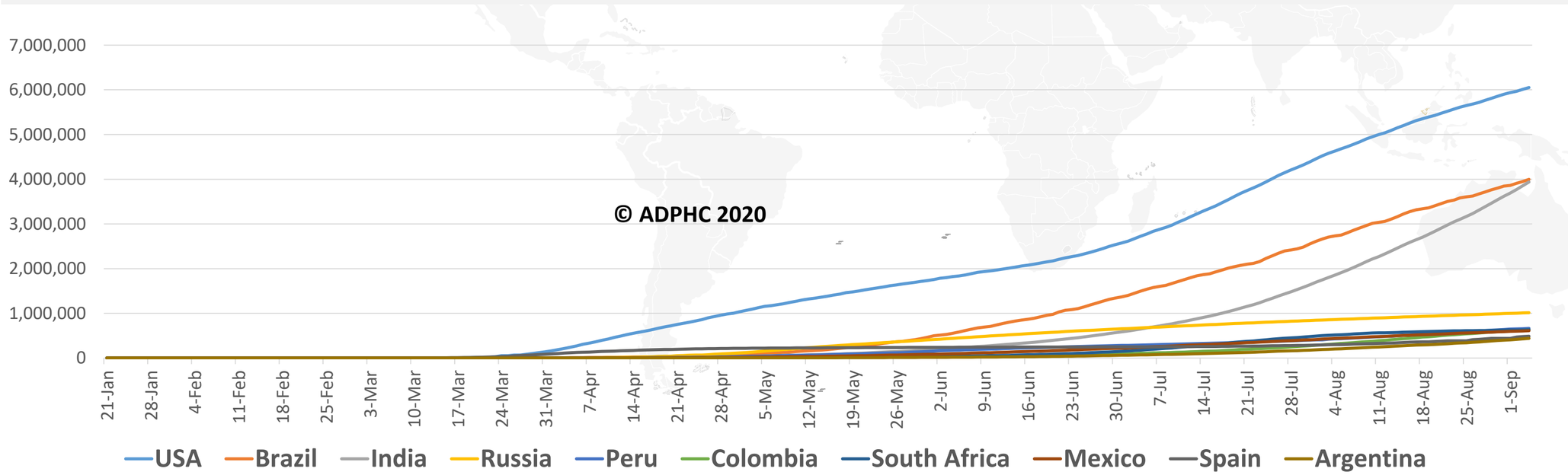
TOTAL DEATHS



DEATHS PER MILLION



TOTAL INFECTED CASES



USA	6,050,444
Brazil	3,997,865
India	3,936,747
Russia	1,015,105
Peru	663,437
Colombia	633,339
South Africa	633,015
Mexico	610,957
Spain	488,513
Argentina	439,172

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

EPIDEMIOLOGY

FROM 21 JAN TO 4 SEPT 2020

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

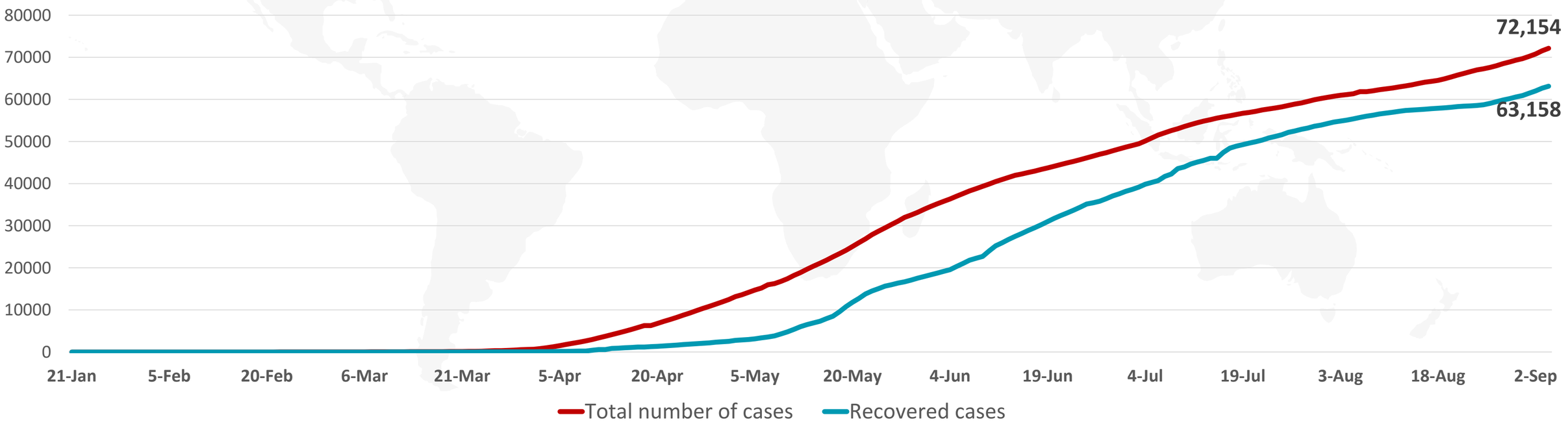
Daily Tests
81,524.6 Average Tests
824.3 per 100k population
0.7% Positive Rate

Daily Cases
552.1 Average Cases
5.6 per 100k population

Daily Recovered
471.0 Average Recovered
4.8 per 100k population

Daily Deaths
1.1 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

EPIDEMIOLOGY

Date: 4 SEPT 2020

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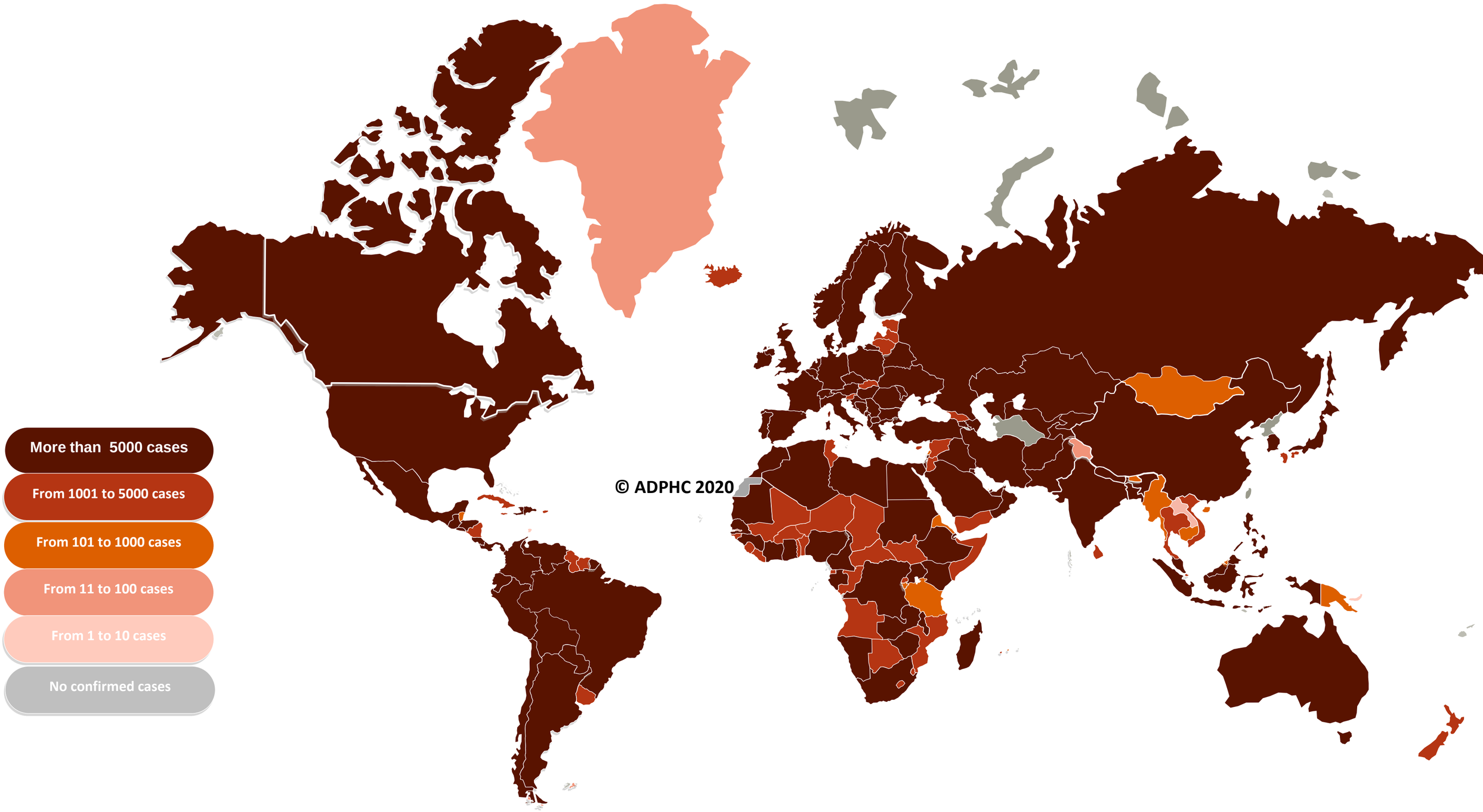
Figure 7A : Global Distribution of COVID-19 Cases



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

EPIDEMIOLOGY

Date: 4 SEPT 2020

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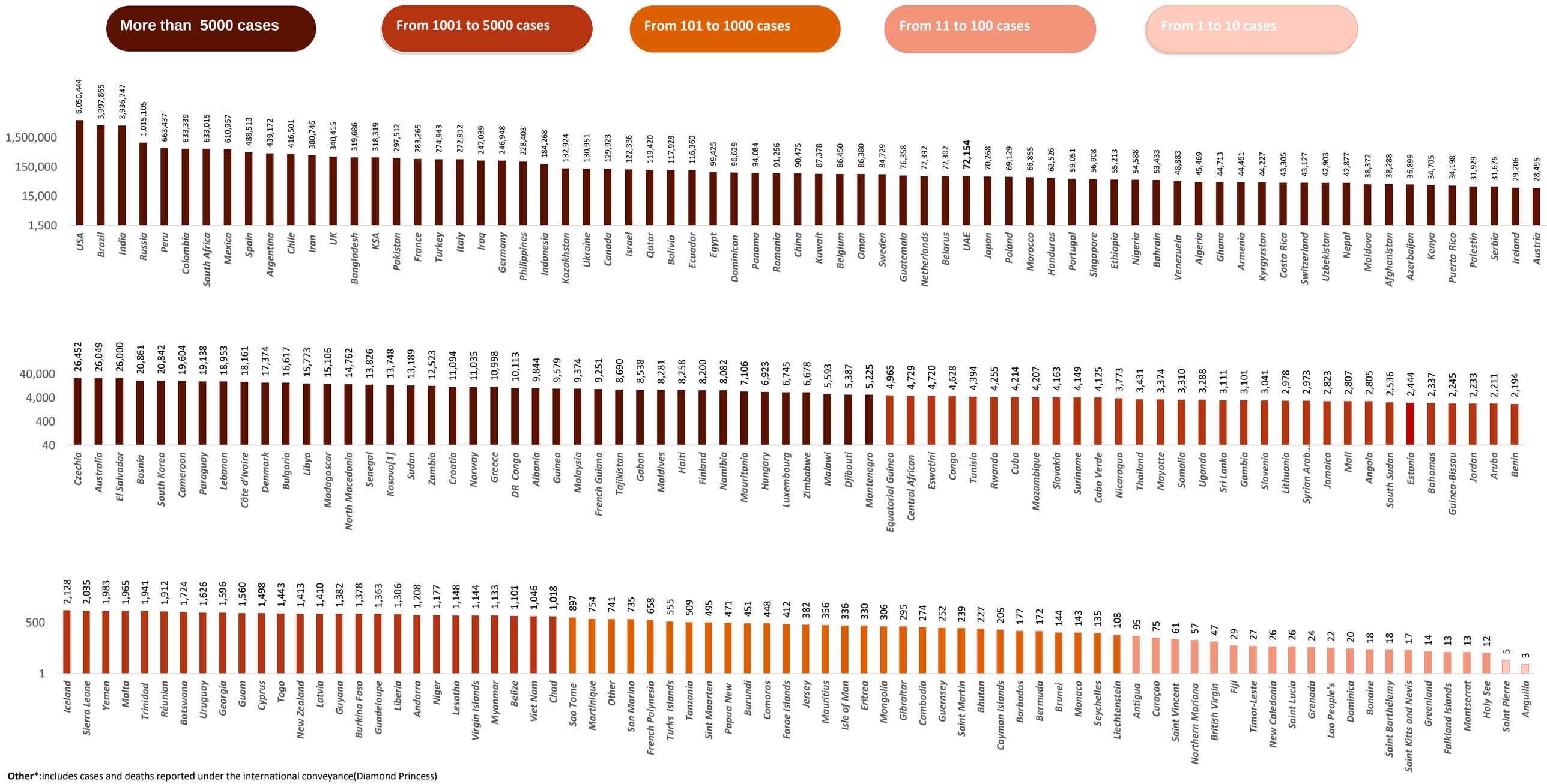
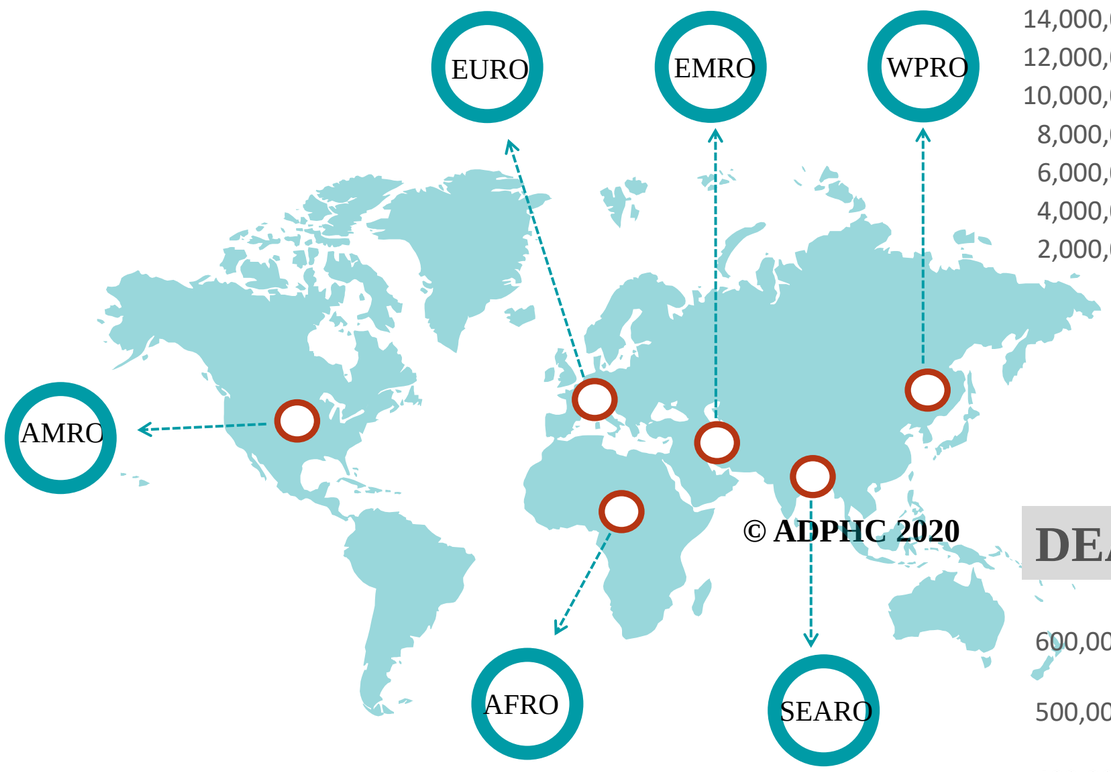
Figure 7B: Bar Chart Illustrates the Global Distribution of COVID19 Cases



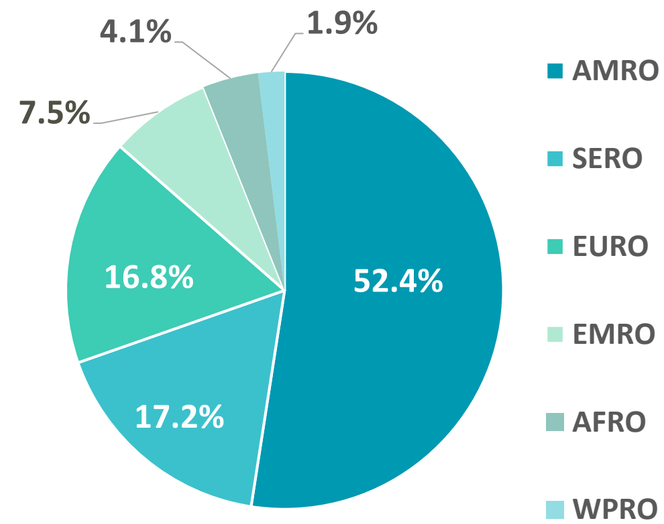
Other*:includes cases and deaths reported under the international conveyance(Diamond Princess)

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

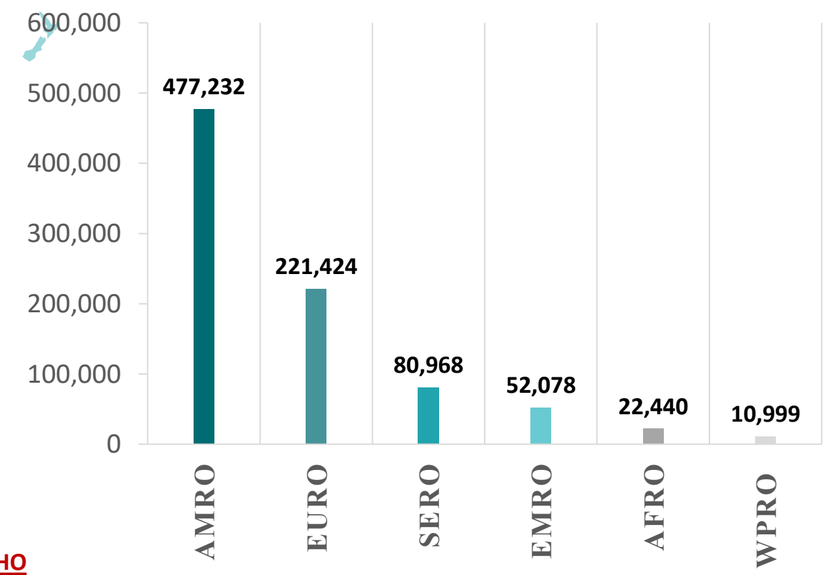
Figure 8: Global Distribution of COVID-19 Cases per Region

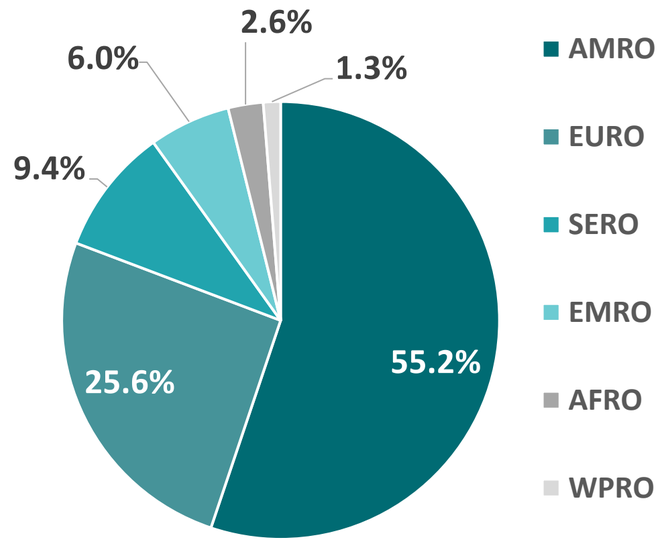


INFECTED



DEATHS





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

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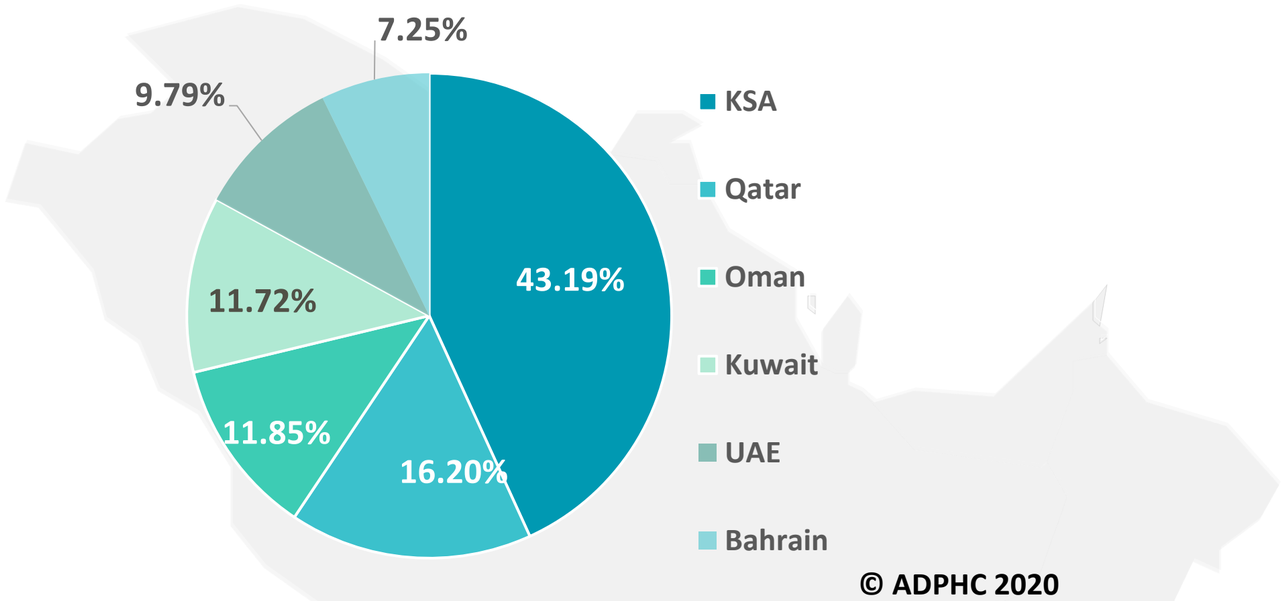
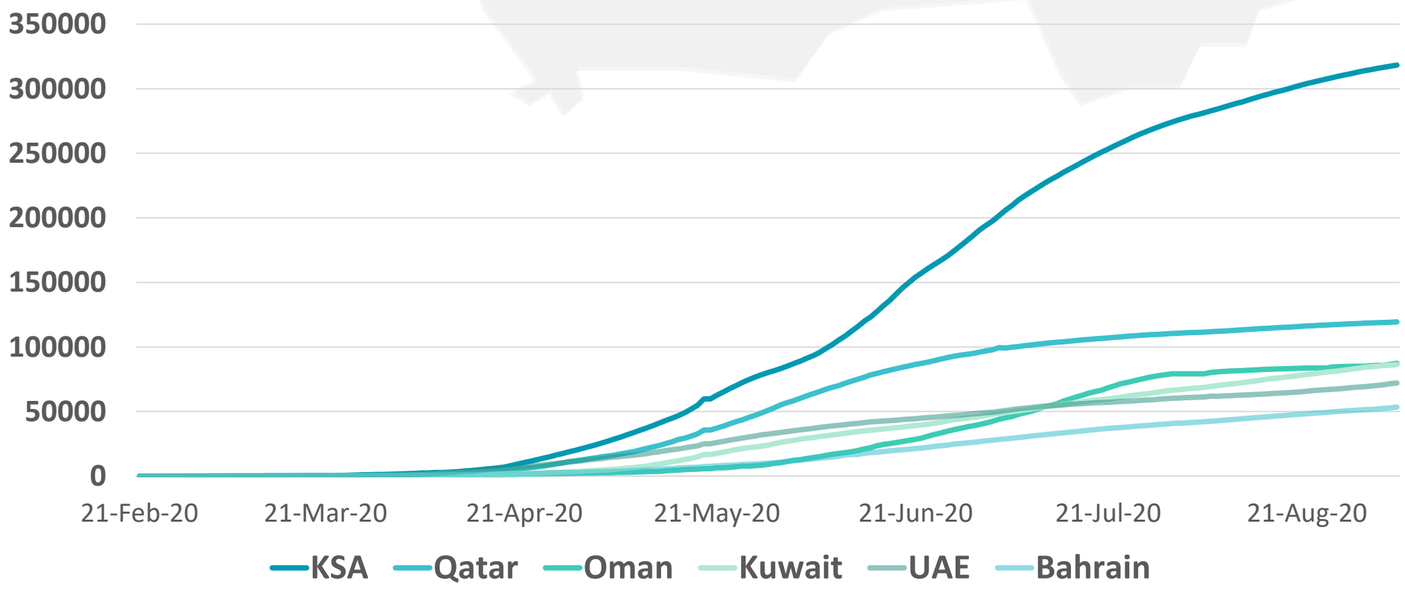
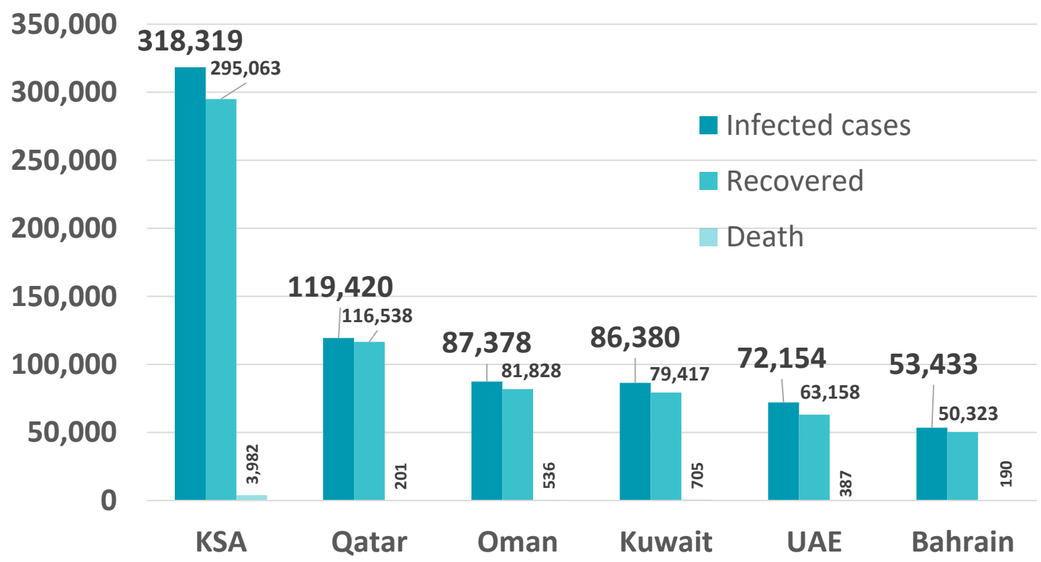
Figure 9: Comparative Analysis of the Distribution of COVID-19 Cases in GCC Countries

TOTAL NUMBER OF INFECTED CASES

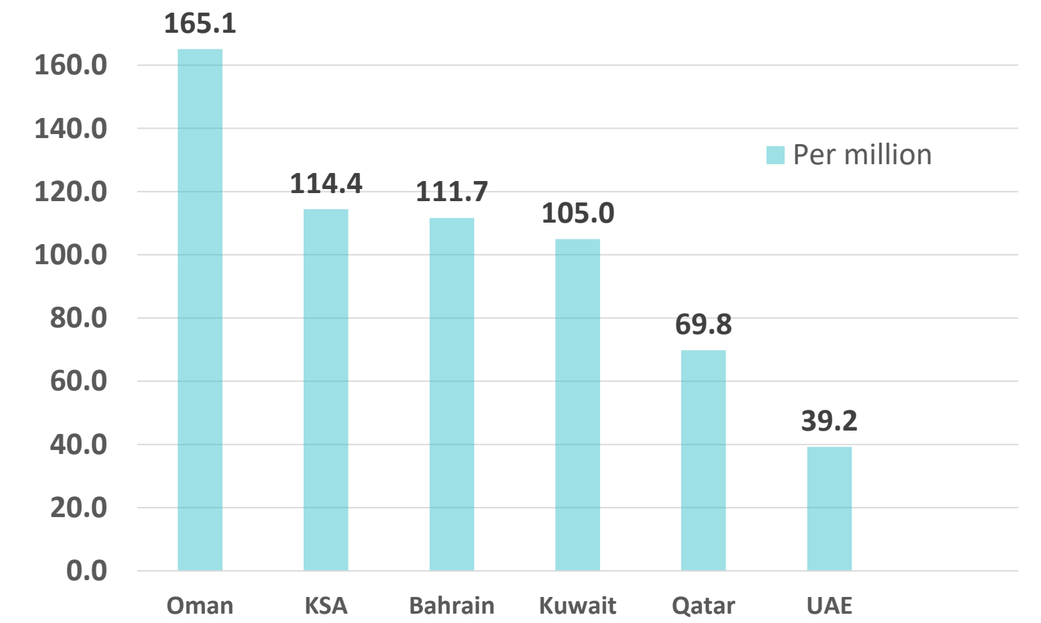




TOTAL NUMBER OF INFECTED, RECOVERED AND DEATHS



DEATHS PER MILLION



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

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

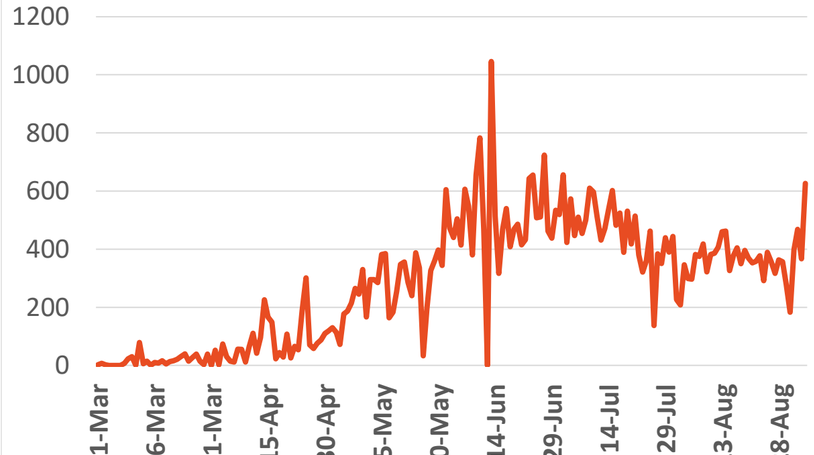
UAE

Source : National Emergency Crisis and Disaster Management Authority

KSA

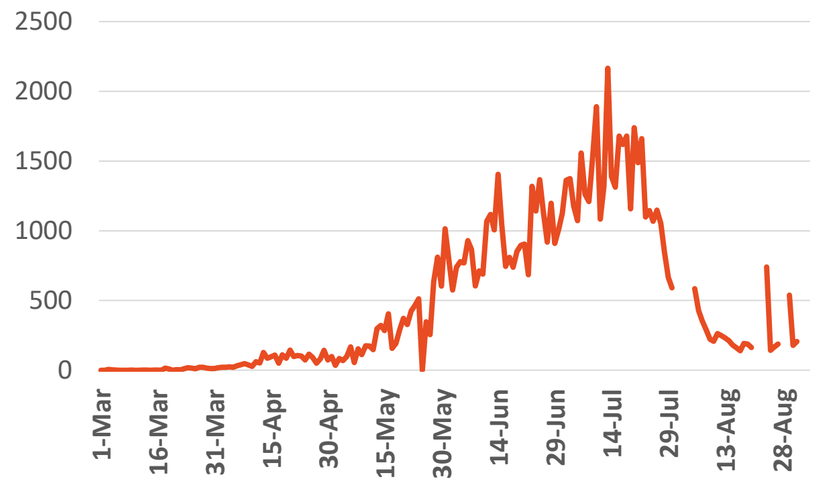
Source : KSA ministry of health

Bahrain



Source :WHO

Oman

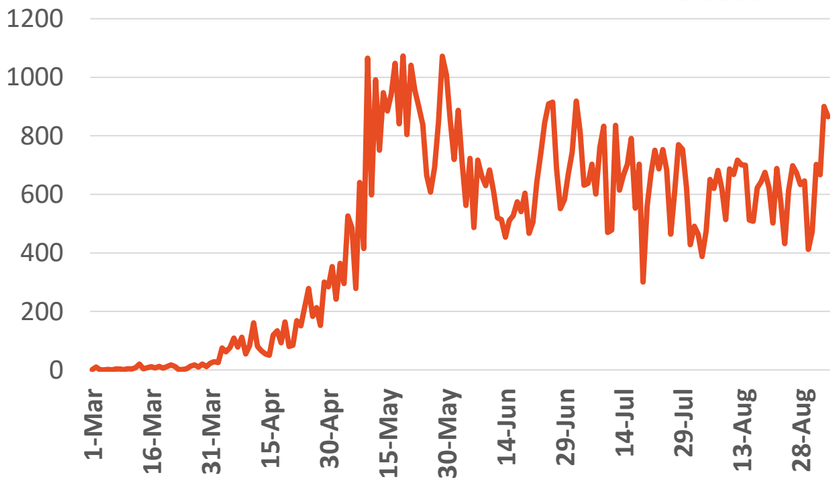


Source :Oman ministry of health

*No announced statistic data from 31 July to 4 August, 21 to 23 August & from 28 to 30 August, 2, 4& 5 September

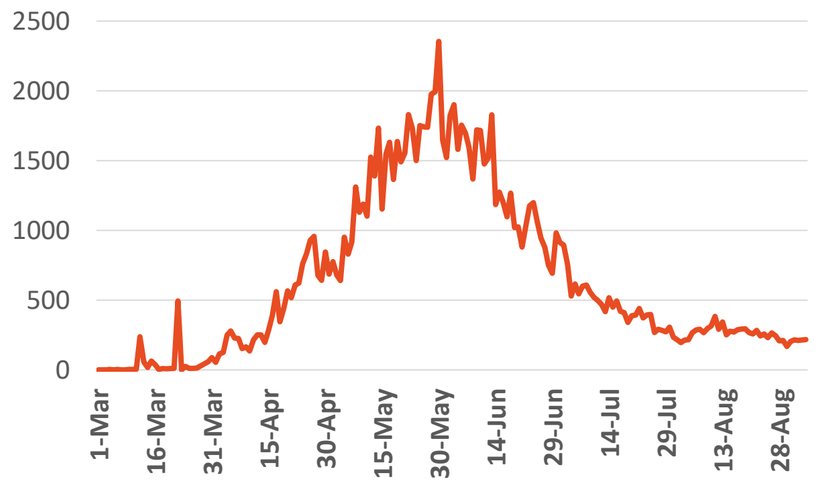
*No announced statistic data on weekends and official holidays.

Kuwait



Source : Kuwait ministry of health

Qatar



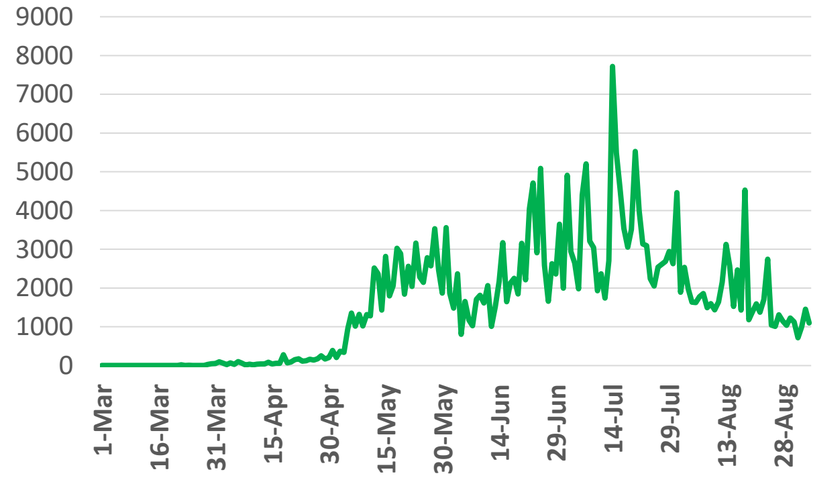
Source : Qatar ministry of health

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

UAE

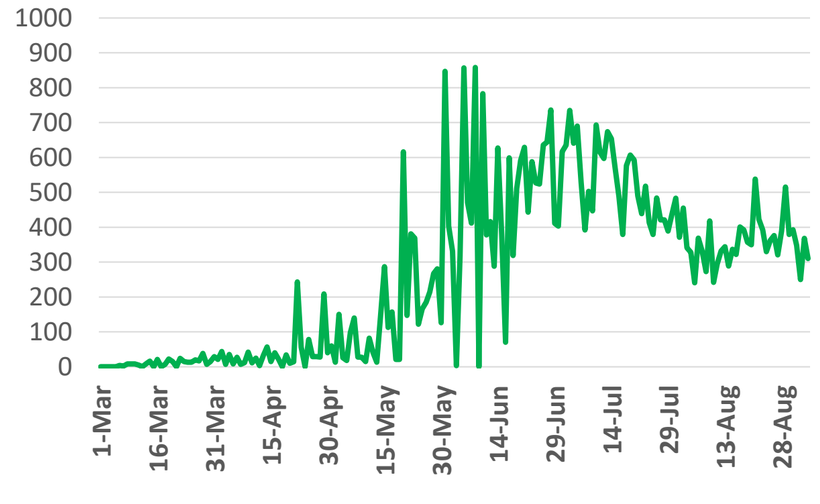
Source : National Emergency Crisis and Disaster Management Authority

KSA



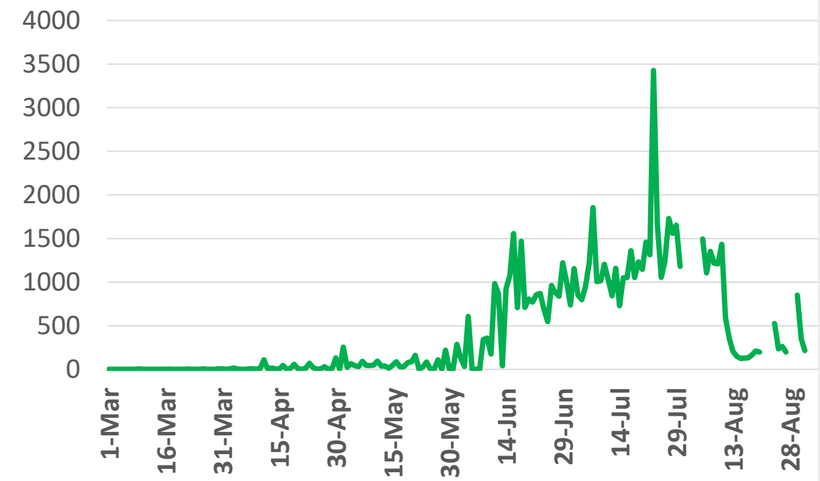
Source : KSA ministry of health

Bahrain



Source : GCCStat

Oman



Source :Oman ministry of health

*No announced statistic data from 31 July to 4 August, 21 to 23 August & from 28 to 30 August

*No announced statistic data on weekends and official holidays.

Kuwait

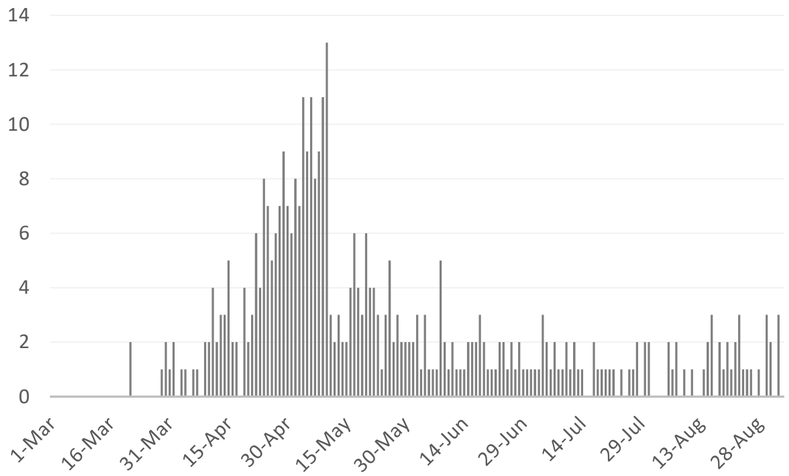
Source : Kuwait ministry of health

Qatar

Source : Qatar ministry of health

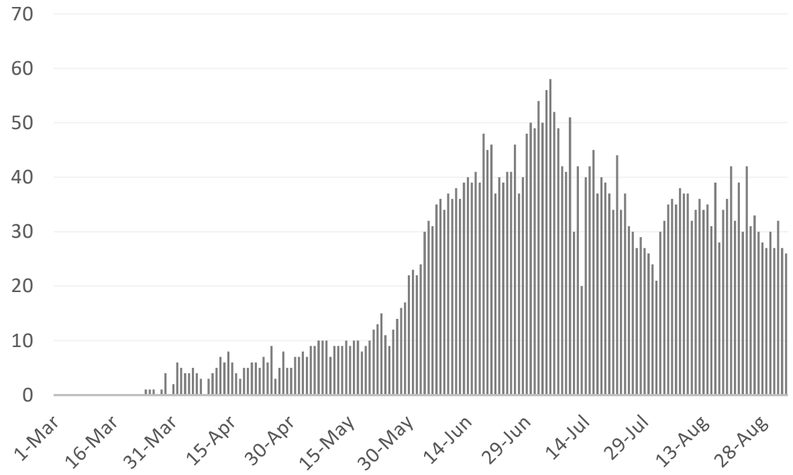
Figure 12: Comparative Analysis of the Distribution of COVID-19 New Death Cases in GCC Countries

UAE



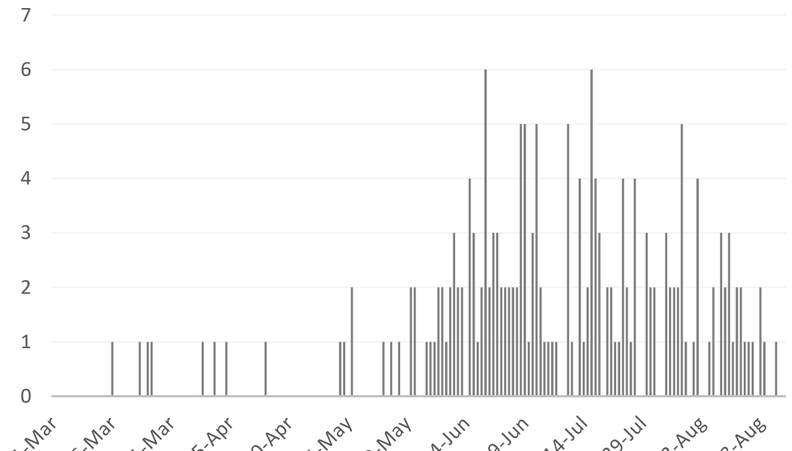
Source : National Emergency Crisis and Disaster Management Authority

KSA



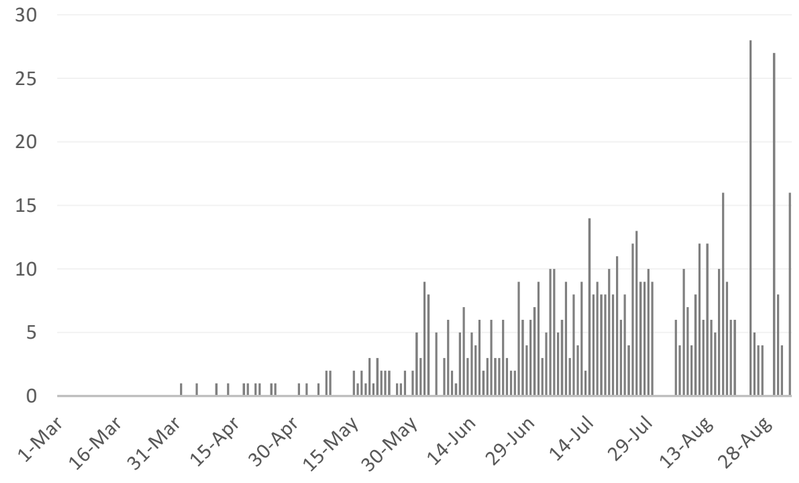
Source : KSA ministry of health

Bahrain



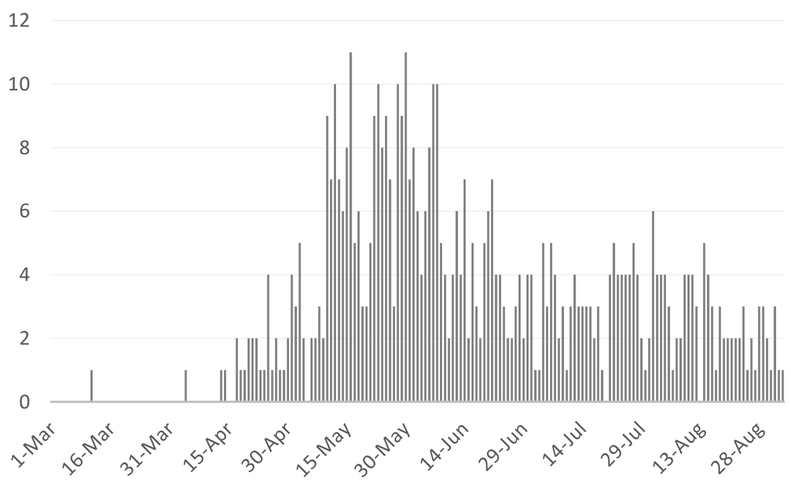
Source :WHO

Oman



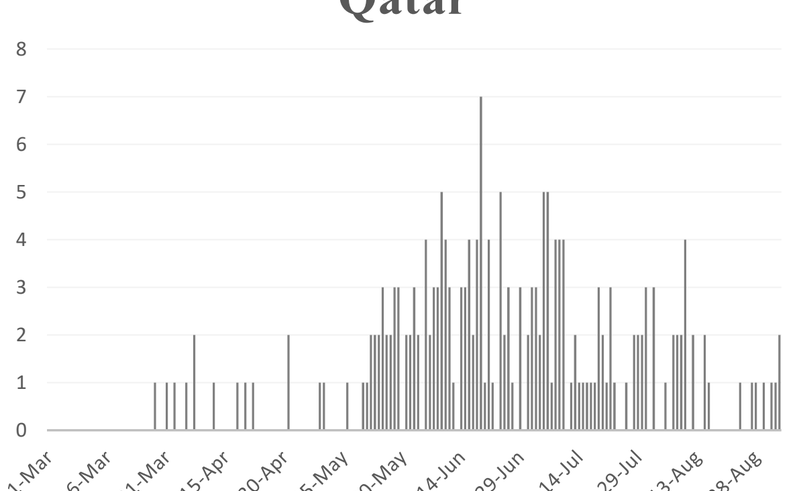
Source :Oman ministry of health

Kuwait



Source : Kuwait ministry of health

Qatar



Source : Qatar ministry of health

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*No announced statistic data on weekends and official holidays.

Article 1

Published

Phase 1–2 Trial of a SARS-CoV-2 Recombinant Spike Protein Nanoparticle Vaccine

September 2, 2020 NEJM

- The article present the results of phase 1-2 randomized, placebo-controlled trial for a candidate vaccine called NVX-CoV2373. The vaccine is a product of an American vaccine development company based in the US.
- Participants: 131 healthy adults 18 to 59 years of age,
- Aim : asses the safety and immunogenicity of the rSARS-CoV-2 vaccine (in 5-µg and 25-µg doses, with or without Matrix-M1 adjuvant. With a dose at 0 day and booster in day 21.
- Trial was conducted in Australia and initiated on May 26, 2020 .
- As a safety measure, 6 participants were initially randomly assigned in a 1:1 ratio to the 5-µg and 25-µg rSARS-CoV-2 plus Matrix-M1 groups (groups C and D), vaccinated in an open-label manner, and observed for reactogenicity for 48 hours.
- Thereafter, the remaining 125 participants were randomly assigned, in a 1:1:1:1:1 ratio and in a blinded manner to one of five vaccine groups 23 received placebo (group A), 25 received 25-µg doses of rSARS-CoV-2 (group B), 29 received 5-µg doses of rSARS-CoV-2 plus Matrix-M1, including three sentinels who have not been blinded (group C), 28 received 25-µg doses of rSARS-CoV-2 plus Matrix-M1, including three sentinels those who have not been blinded (group D), and 26 received a single 25-µg dose of rSARS-CoV-2 plus Matrix-M1 followed by a single dose of placebo (group E)

Table 1. Demographic Characteristics of the Participants in the NVX-CoV2373 Trial at Enrollment.*

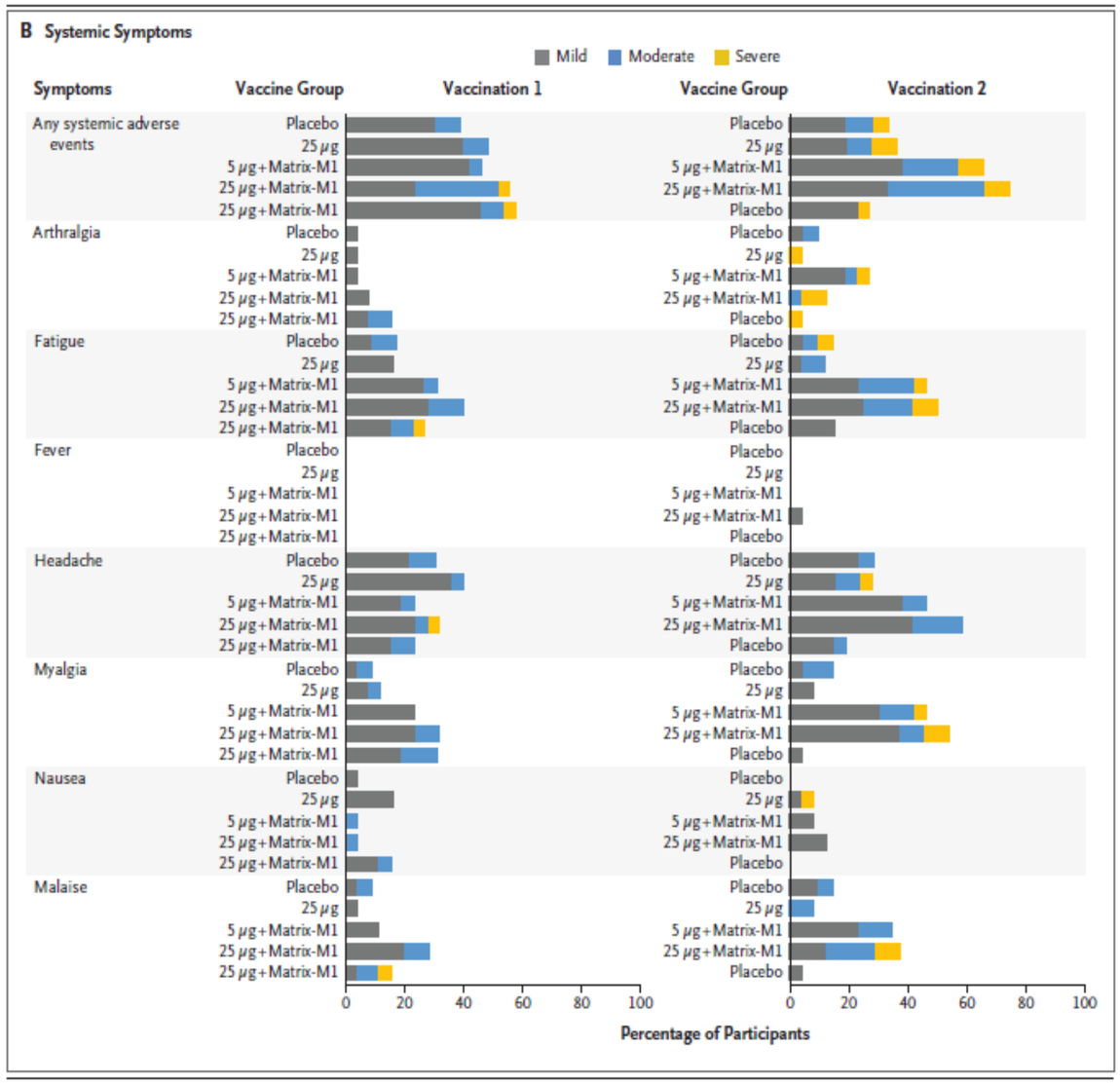
Variable	Group A	Group B	Group C	Group C (Sentinel)	Group D	Group D (Sentinel)	Group E	Total
rSARS-CoV-2 dose 1, dose 2 — µg	0, 0	25, 25	5, 5	5, 5	25, 25	25, 25	25, 0	—
Matrix-M1 dose 1, dose 2 — µg	0, 0	0, 0	50, 50	50, 50	50, 50	50, 50	50, 0	—
No. of participants	23	25	26	3	25	3	26	131
Sex — no. (%)								
Male	11 (47.8)	12 (48.0)	13 (50.0)	2 (66.7)	17 (68.0)	2 (66.7)	9 (34.6)	66 (50.4)
Female	12 (52.2)	13 (52.0)	13 (50.0)	1 (33.3)	8 (32.0)	1 (33.3)	17 (65.4)	65 (49.6)
Age — yr	30.3±10.92	27.2±9.38	29.5±7.99	23.7±7.37	35.6±12.50	25.0±4.58	33.0±8.91	30.8±10.20
Race or ethnic group — no. (%)†								
American Indian or Alaska Native	1 (4.3)	1 (4.0)	2 (7.7)	0	1 (4.0)	0	2 (7.7)	7 (5.3)
Asian	2 (8.7)	0	6 (23.1)	1 (33.3)	3 (12.0)	1 (33.3)	4 (15.4)	17 (13.0)
Black or African American	0	0	0	0	1 (4.0)	0	1 (3.8)	2 (1.5)
Multiracial	1 (4.3)	0	0	0	0	0	0	1 (0.8)
Native Hawaiian or other Pacific Islander	0	0	0	0	0	0	1 (3.8)	1 (0.8)
Not reported	0	0	0	0	0	0	0	0
White	19 (82.6)	24 (96.0)	18 (69.2)	2 (66.7)	20 (80.0)	2 (66.7)	18 (69.2)	103 (78.6)
Hispanic or Latino	2 (8.7)	3 (12.0)	6 (23.1)	0	3 (12.0)	0	5 (19.2)	19 (14.5)
Body-mass index‡	24.94±3.418	25.59±4.217	24.10±3.872	21.43±2.401	26.18±3.454	25.67±2.294	25.52±3.342	25.19±3.672

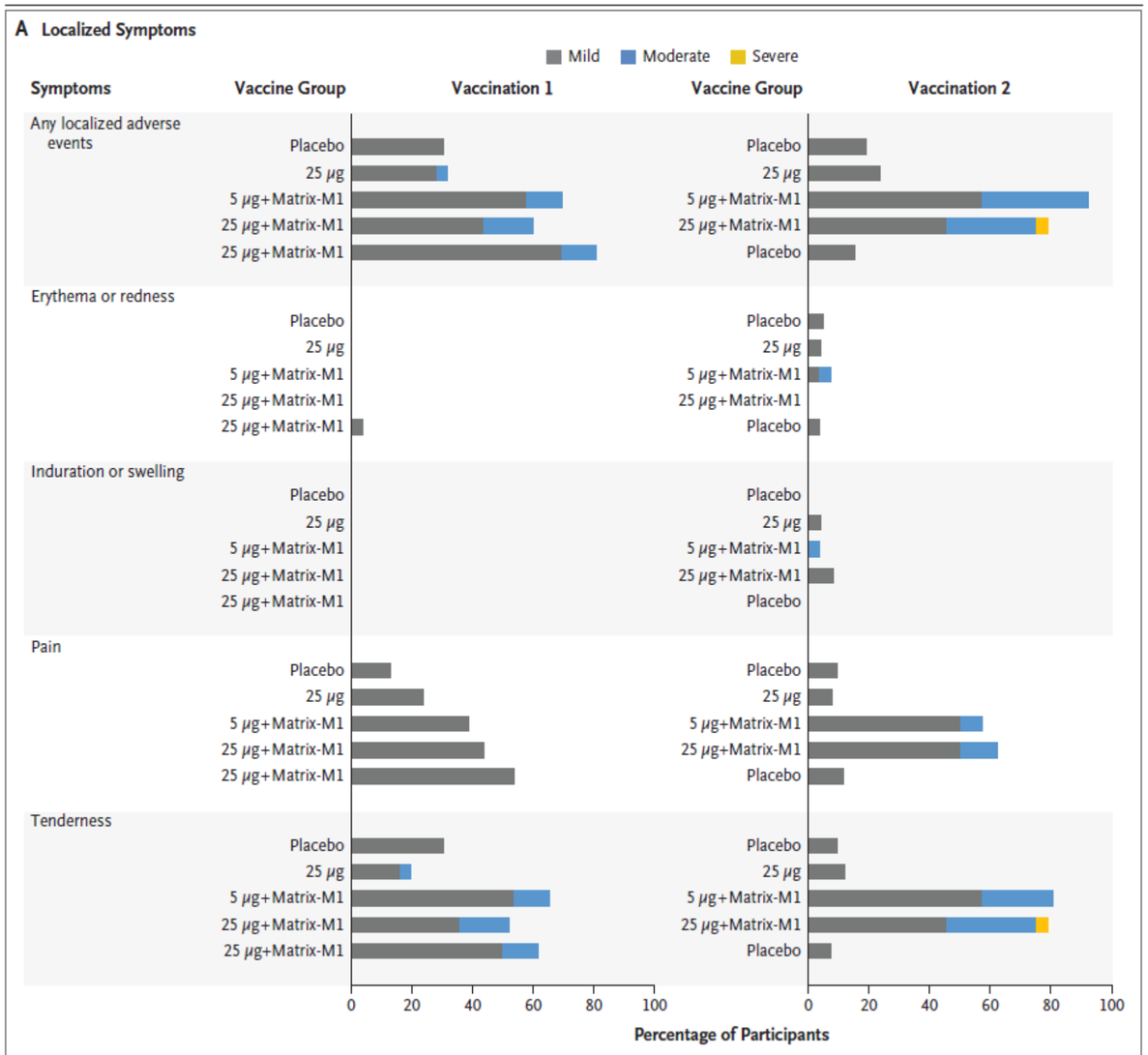
VACCINE

Continued

Results

- Safety : No serious adverse events were noted. Reactogenicity was absent or mild in the majority of participants, more common with adjuvant, and of short duration (mean, ≤2 days).





VACCINE

Continued

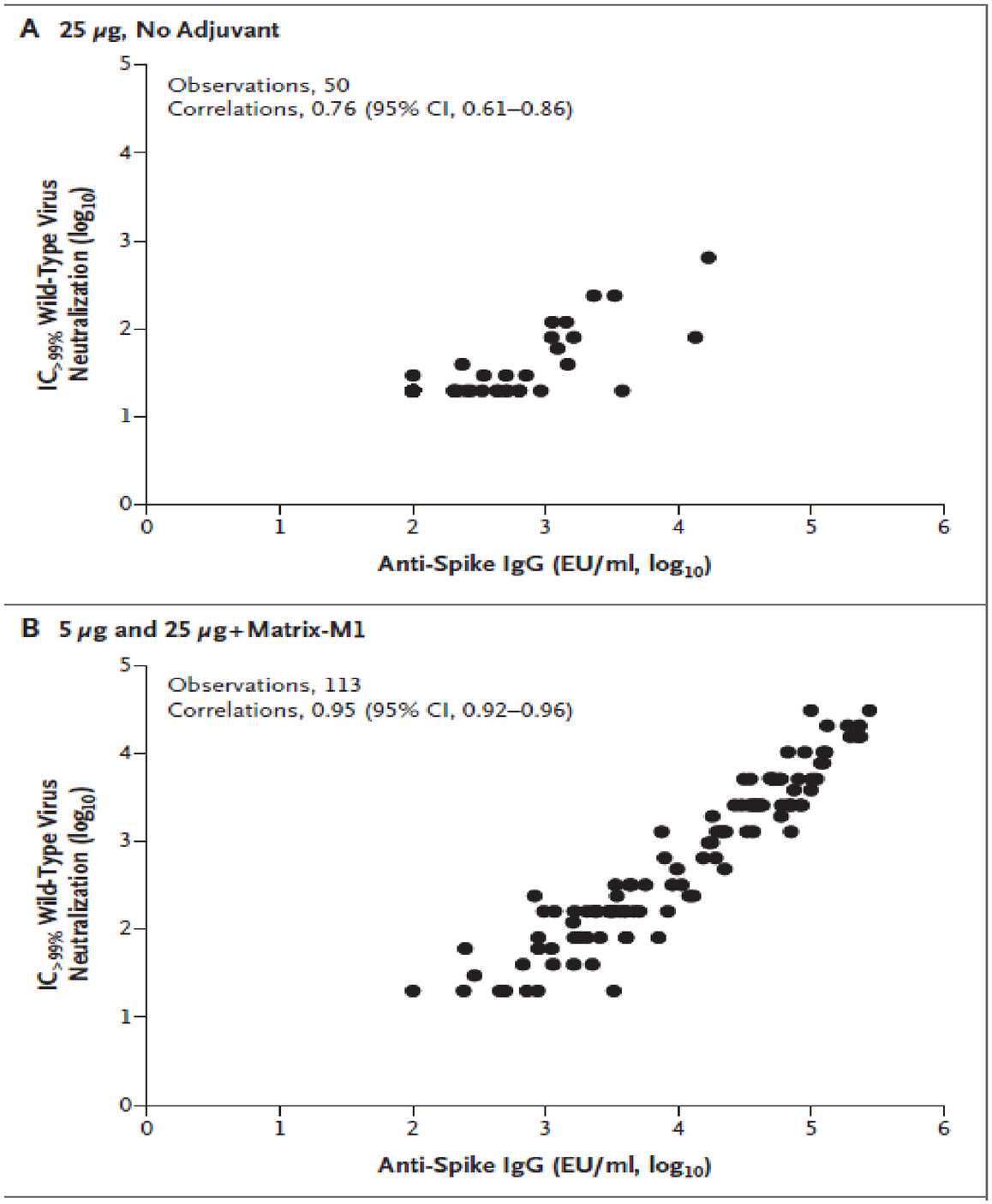
Immunogenicity:

By day 21, responses had occurred for all adjuvanted regimens

Conclusion

- The primary safety and immunogenicity analyses indicate that in healthy adult participants **18 to 59 years of age, two-dose regimens of 5 µg and 25 µg of rSARS-CoV-2 plus the Matrix-M1 adjuvant had acceptable safety findings and induced high immune responses,** with levels of neutralizing antibodies that closely correlated with anti-spike IgG.
- Neutralizing antibody responses after the second vaccination with rSARS-CoV-2 plus Matrix-M1 exceeded values seen in symptomatic Covid-19 outpatients and were of the magnitude seen in convalescent serum from hospitalized patients with Covid-19. see figure.

- The value of the second dose on day 21 for the two-dose rSARSCoV- 2 plus Matrix-M1 regimen is clearly demonstrated and warrants the use of this vaccination schedule.



VACCINE

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Article 2

Published

Safety and immunogenicity of an rAd26 and rAd5 vector-based heterologous prime-boost COVID-19 vaccine in two formulations: two open, non-randomised phase 1/2 studies from Russia

September 4, 2020 THE LANCET

This is a phase ½ trial non randomized trial on the Russian vaccine. The vaccine was designed with two recombinant adenovirus vectors and was developed as two formulations (frozen [Gam-COVID-Vac] and lyophilized (freeze –dry) [Gam-COVID-Vac-Lyo]).
aimed to assess safety and immunogenicity of both vaccine formulations and to compare the humoral immune response with that recorded in people who have recovered from COVID-19.

Study design as in the figure.

During phase 1 of both studies, participants received one dose intramuscularly of either rAd26-S or rAd5-S and were assessed for safety over 28 days.
Phase 2 of both studies began no earlier than 5 days after phase 1 vaccination.
Volunteers were in hospital for 28 days
from the start of vaccination

Results

Safety

In volunteers who received both vaccine components (rAd26-S and rAd5-S), most adverse events occurred after the second dose. As in table next page.

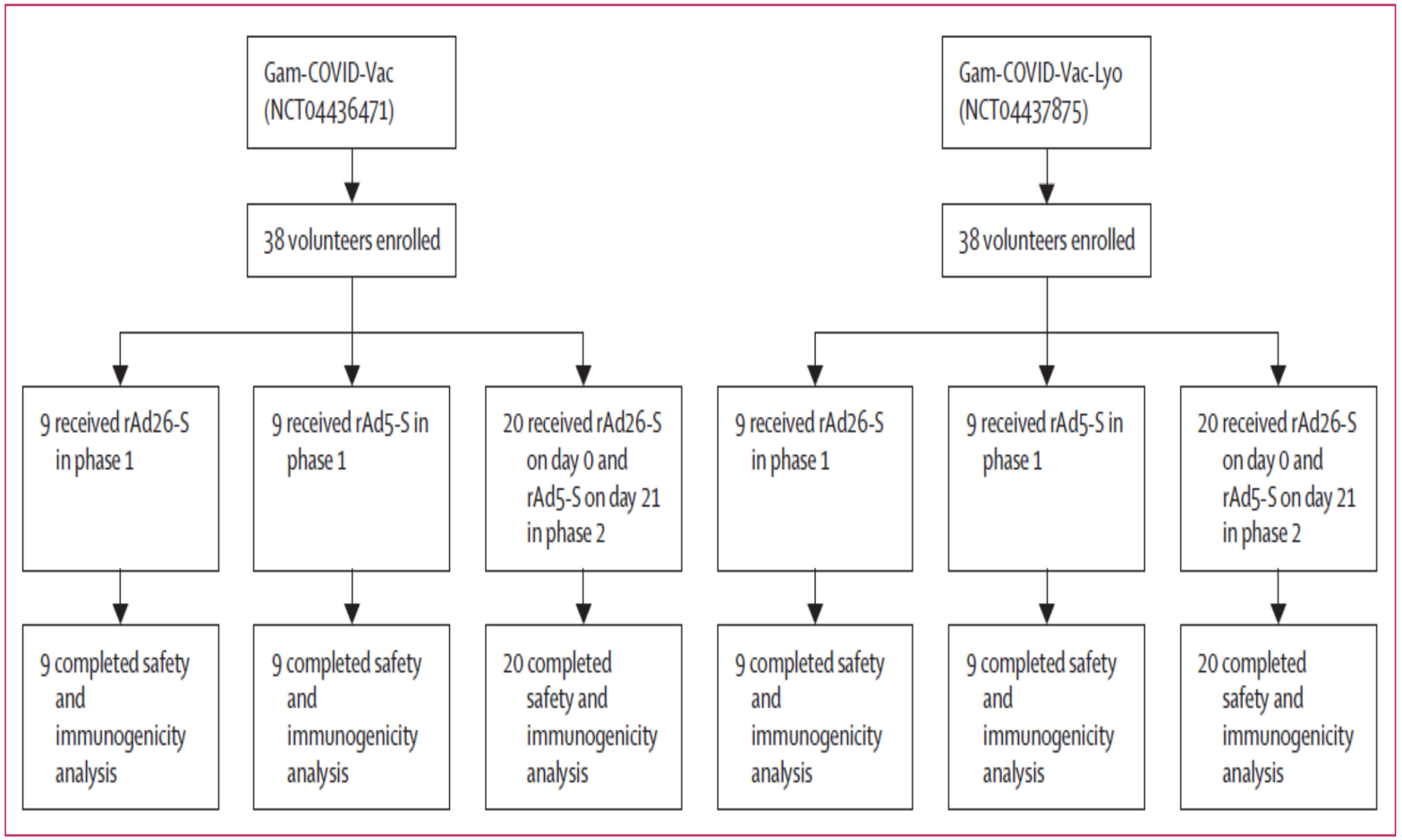

Figure 1: Trial profile

VACCINE

Continued

Immunogenicity outcome:

- During phase 1 of both studies (administration of either rAd26-S or rAd5-S alone), SARS-CoV-2 RBD-specific IgGs were detected on day 14 in 88·9% of participants after administration of rAd26-S and in 84·2% of participants after administration of rAd5-Sd vaccination (beginning from day 21, SARS-CoV-2 RBD-specific IgGs were detected in 100% of vaccinated participants
- During phase 2, SARS-CoV-2 RBD-specific IgGs were detected in 85·0% of participants on day 14 (after priming with rAd26-S) and in 100% of participants
- from day 21 (geometric mean titre [GMT] 1629 with the frozen formulation [Gam-COVID-Vac] and 951 with the lyophilized

	Gam-COVID-Vac			Gam-COVID-Vac-Lyo		
	rAd26-S (n=9)	rAd5-S (n=9)	rAd26-S plus rAd5-S (n=20)	rAd26-S (n=9)	rAd5-S (n=9)	rAd26-S plus rAd5-S (n=20)
Systemic reactions						
Hyperthermia						
Mild (37·0–38·4°C; grade 1)	8 (89%)	2 (22%)	19 (95%)	1 (11%)	1 (11%)	6 (30%)
Moderate (38·5–38·9°C; grade 2)	0	1 (11%)	1 (5%)	0	0	1 (5%)
Headache						
Mild (grade 1)	6 (67%)	3 (33%)	9 (45%)	3 (33%)	4 (44%)	5 (25%)
Moderate (grade 2)	0	0	2 (10%)	0	0	0
Asthenia						
Mild (grade 1)	3 (33%)	3 (33%)	11 (55%)	0	0	4 (20%)
Muscle and joint pain						
Mild (grade 1)	3 (33%)	2 (22%)	4 (20%)	1 (11%)	2 (22%)	4 (20%)
Moderate (grade 2)	0	0	1 (5%)	0	0	2 (10%)
Heartbeat (subjective palpitation)						
Mild (grade 1)	3 (33%)	1 (11%)	0	0	0	0
Diarrhoea						

Conclusion

These findings of two open, phase 1/2 non-randomized studies of a heterologous prime-boost COVID-19 vaccine based on recombinant adenoviral vectors rAd26-S and rAd5-S show that the vaccine is safe, well tolerated, and induces strong humoral and cellular immune responses in 100% of healthy participants. All reported adverse events were mostly mild. The most common systemic and local reactions were pain at the injection site, hyperthermia (body temperature 37–38°C).

THANK YOU

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