



# SCIENTIFIC RESEARCH MONITORING ON COVID-19

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# SCIENTIFIC RESEARCH MONITORING ON COVID-19

(Issue 432)

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  
Titles



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.

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Protection of BNT162b2  
Vaccine Booster against  
Covid-19 in Israel

Waning Immune Humoral  
Response to BNT162b2  
Covid-19 Vaccine over 6  
Months

Effectiveness of mRNA  
BNT162b2 COVID-19  
vaccine up to 6 months in a  
large integrated health  
system in the USA: a  
retrospective cohort study

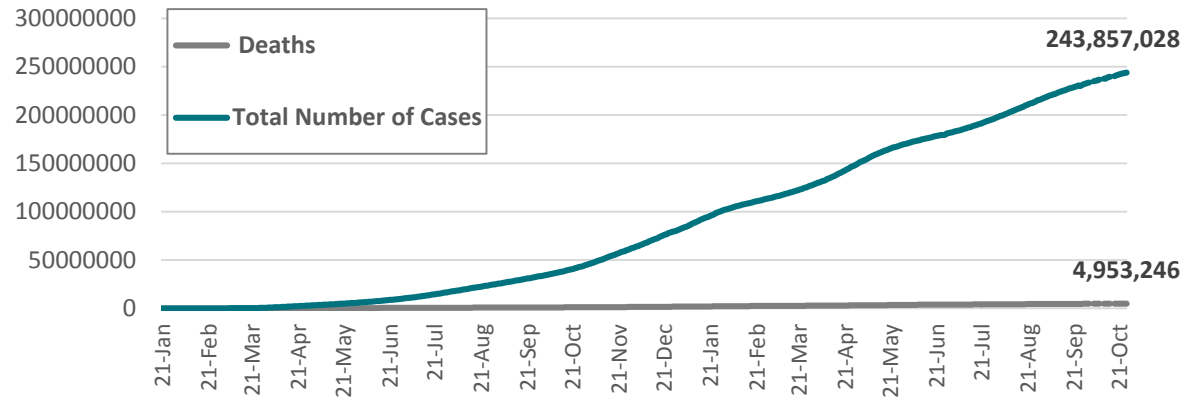
Waning of BNT162b2  
Vaccine Protection against  
SARS-CoV-2 Infection in  
Qatar

How does Pfizer-BioNTech  
BNT162b2 and Oxford-  
AstraZeneca ChAdOx1-S  
vaccines effect confirmed  
covid-19 symptoms

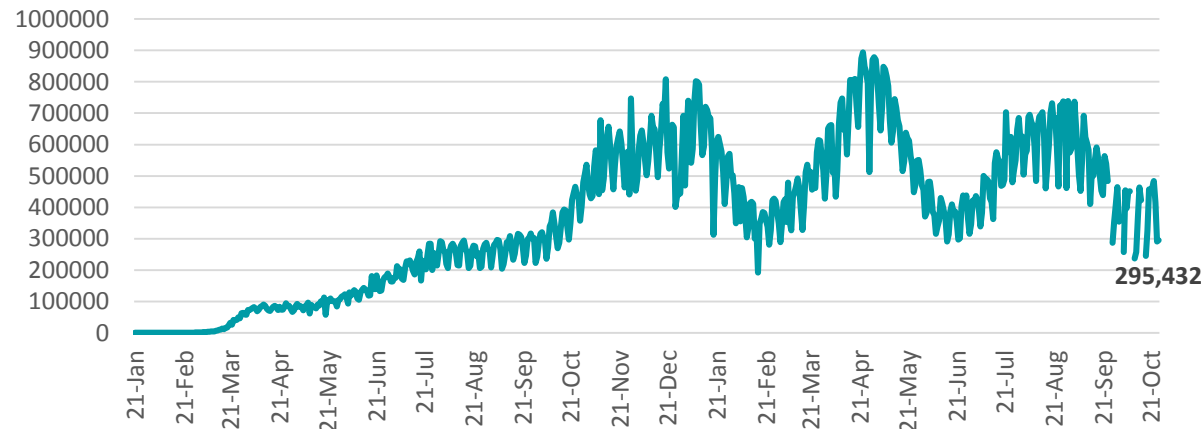
COVID- 19 Booster dose  
benchmark



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

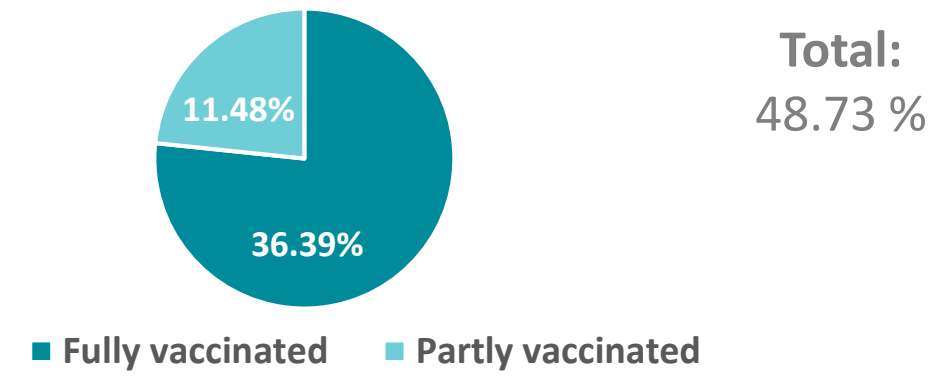


**Figure 2: Daily New Infected COVID-19 Cases**

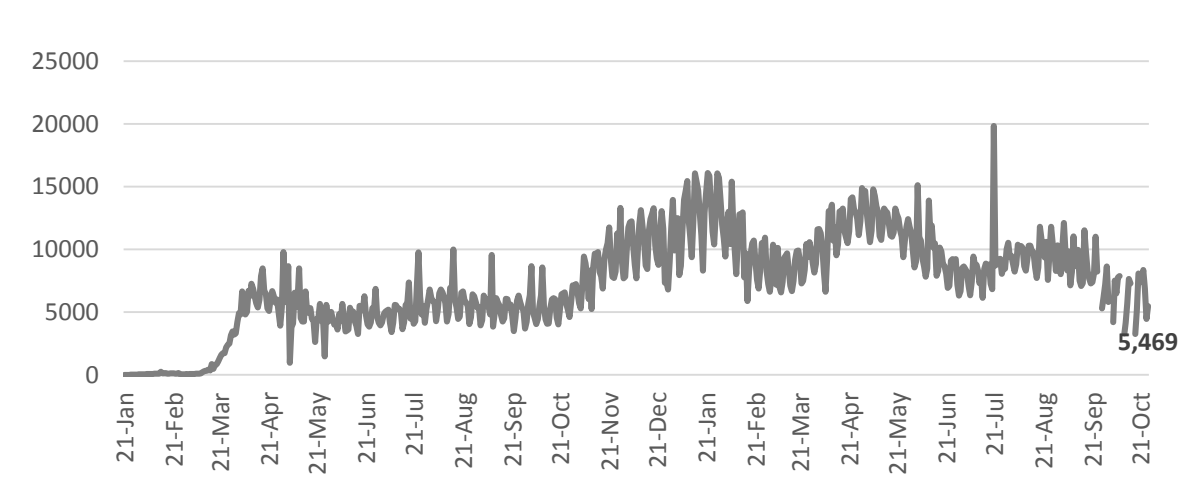


4

**Figure 3: % of people vaccinated fully & partly against COVID-19**

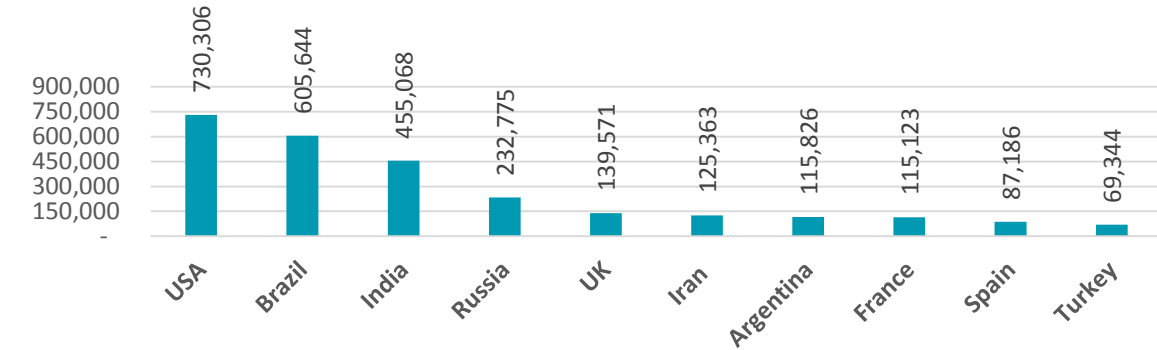


**Figure 4: Global Daily New Deaths Due to COVID-19**

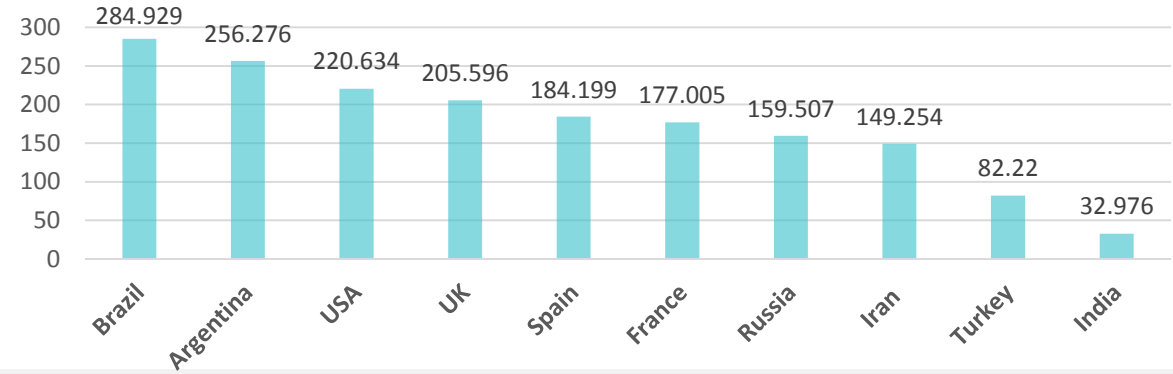


**Figure 5: Top 10 Countries in the Total Number of Cases Due to COVID-19**

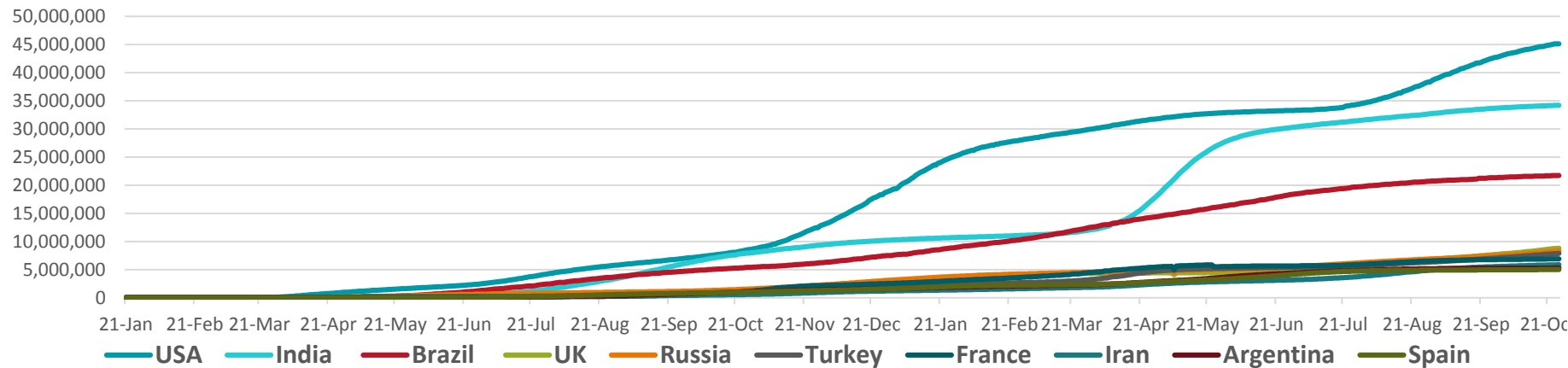
## TOTAL DEATHS



## DEATHS PER MILLION



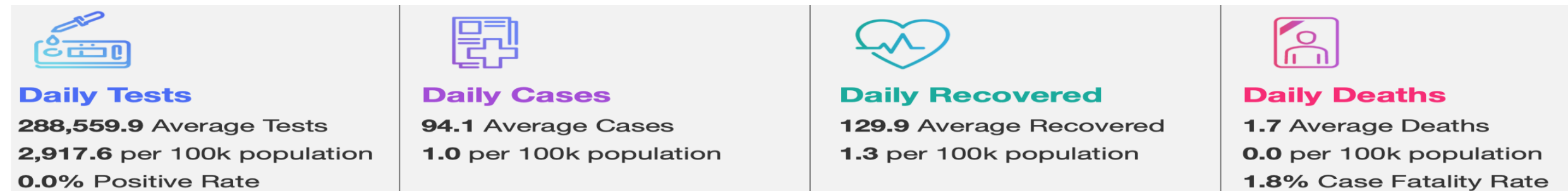
## TOTAL INFECTED CASES



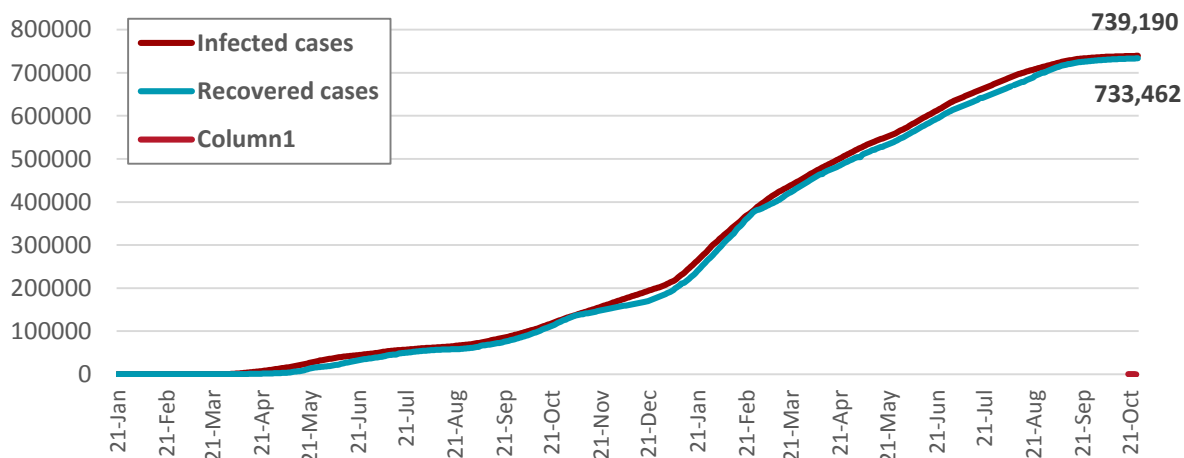
USA	45,107,253
India	34,202,202
Brazil	21,729,763
UK	8,809,778
Russia	8,316,019
Turkey	7,879,468
France	6,905,201
Iran	5,868,360
Argentina	5,280,358
Spain	5,002,218



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



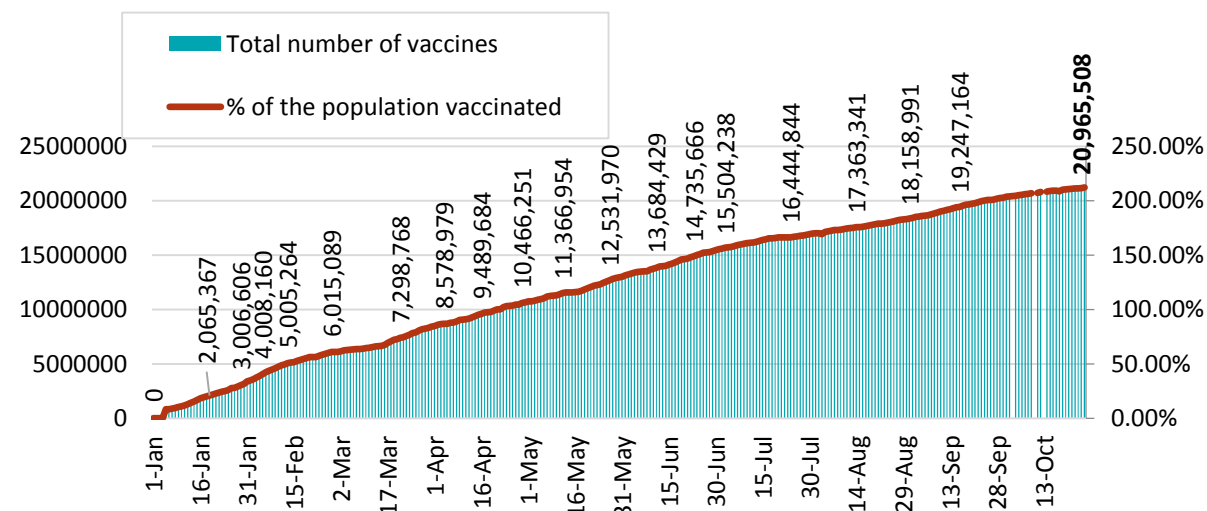
**Figure 6A: TOTAL Number Of Infected And Recovered Cases Due To Covid-19 Reported By The UAE**



6



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



6



Figure 7A : **Global Distribution of COVID-19 Cases**

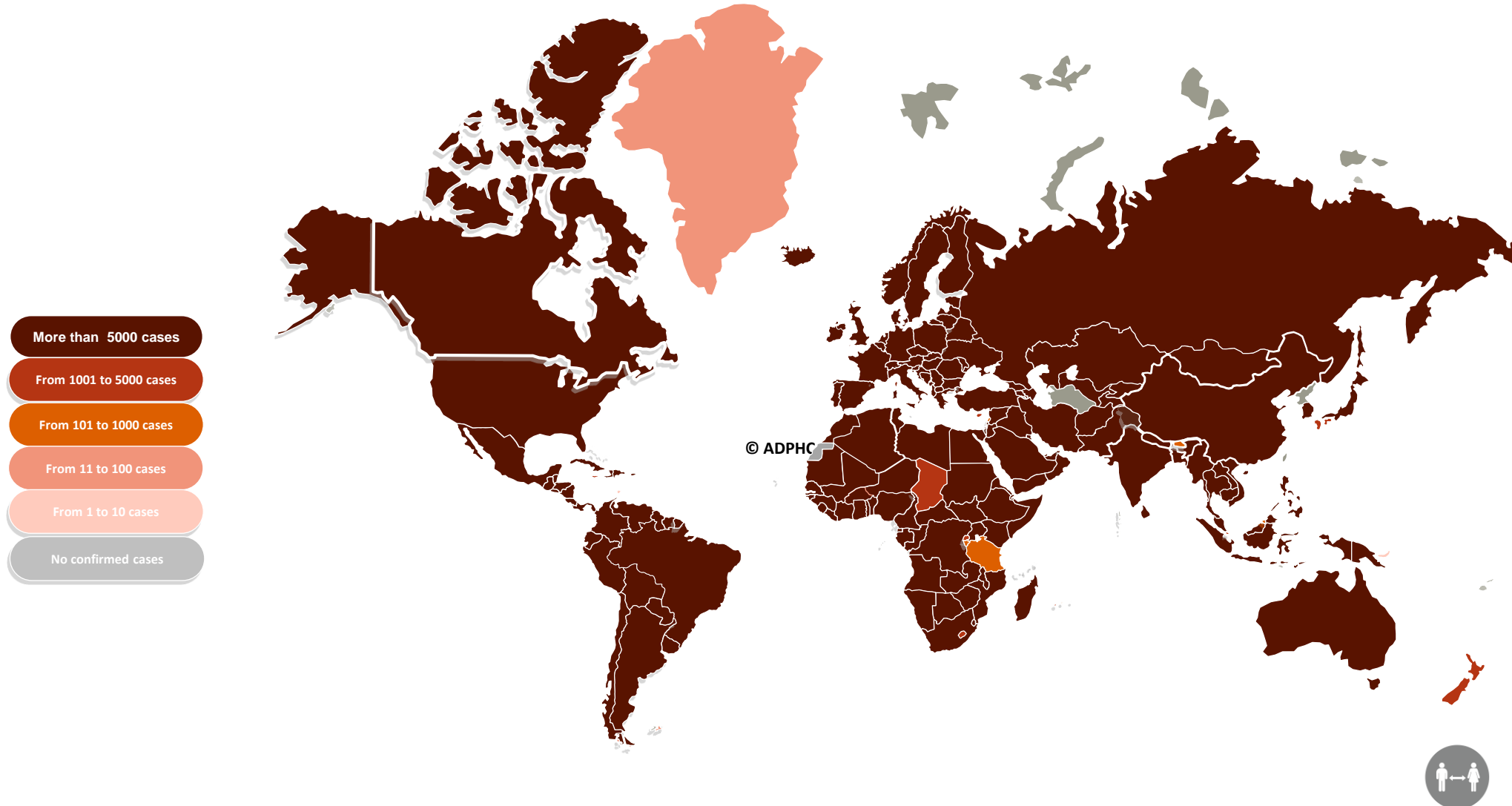
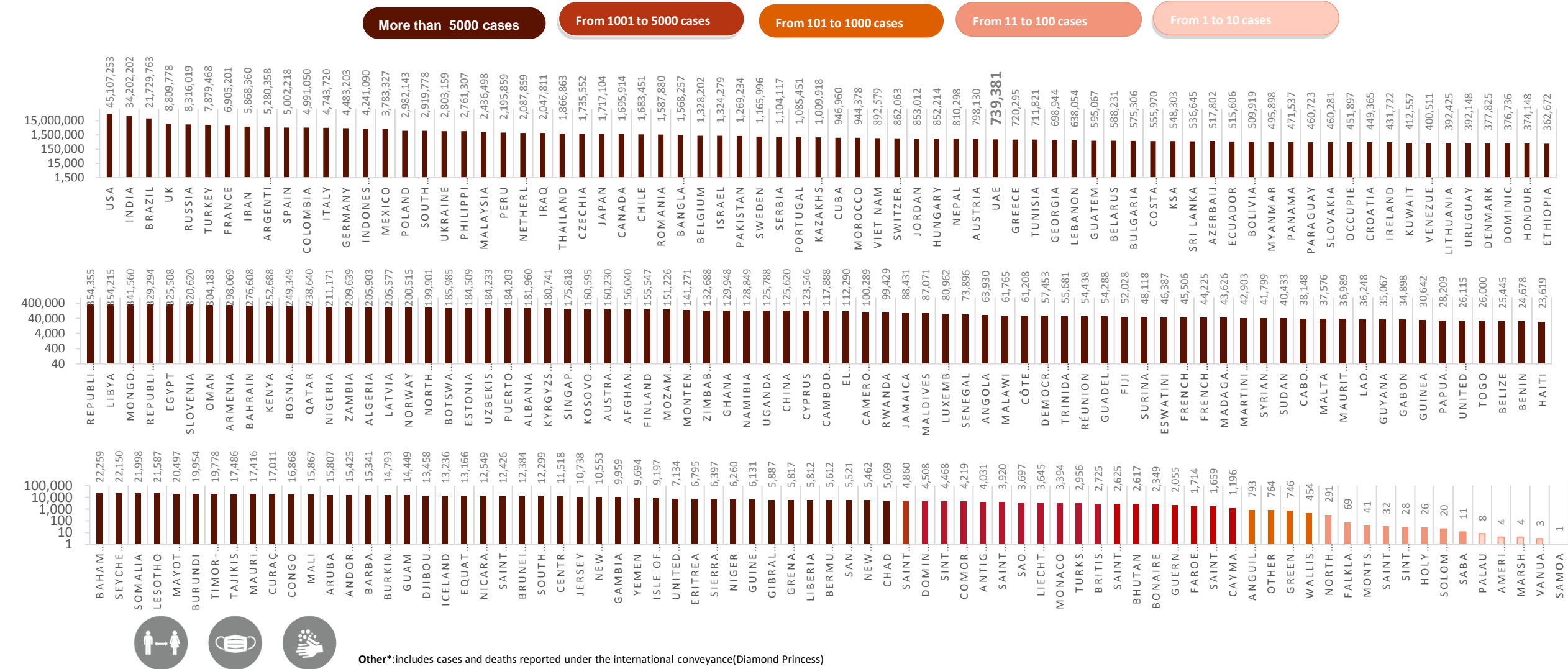




Figure 7B: Bar Chart Illustrates the Global Distribution of COVID19 Cases

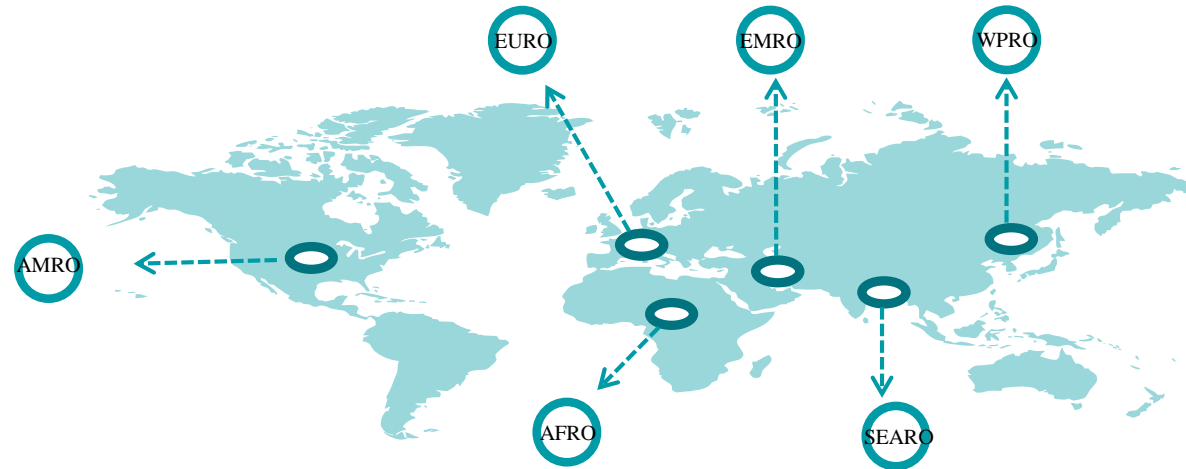


Other\*: includes cases and deaths reported under the international conveyance(Diamond Princess)

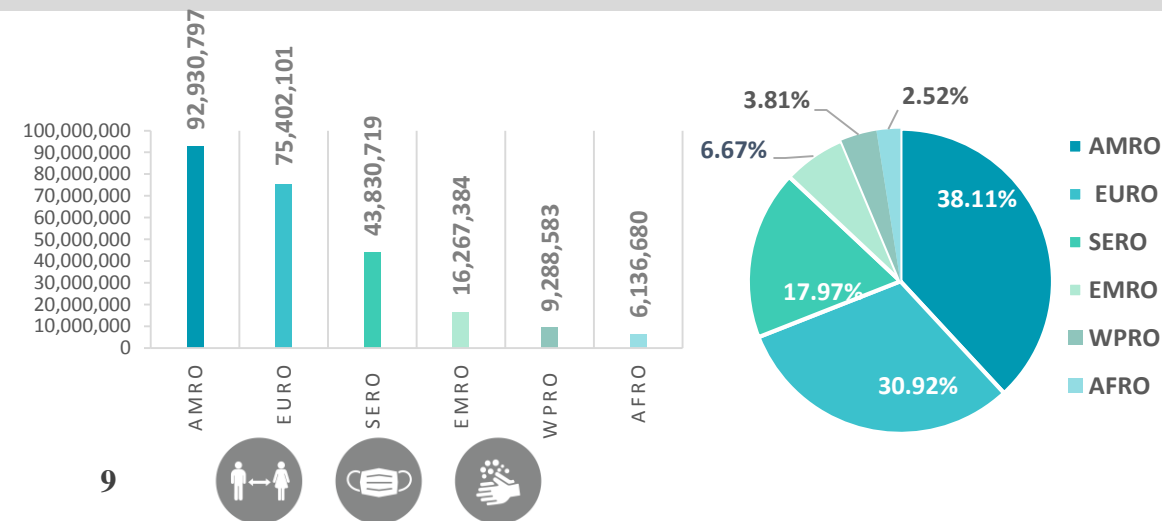




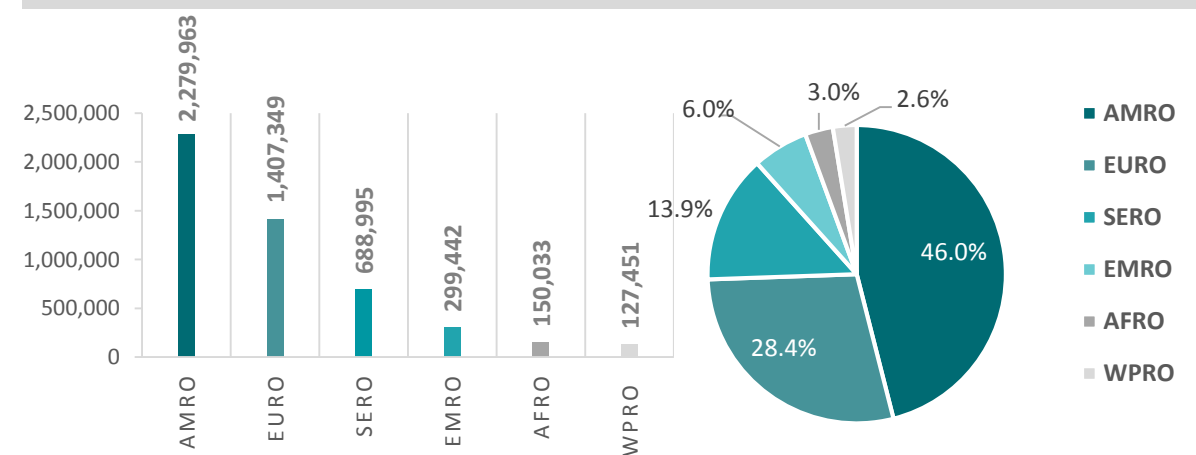
**Figure 6: Global Distribution of COVID-19 Cases per Region**



## INFECTED



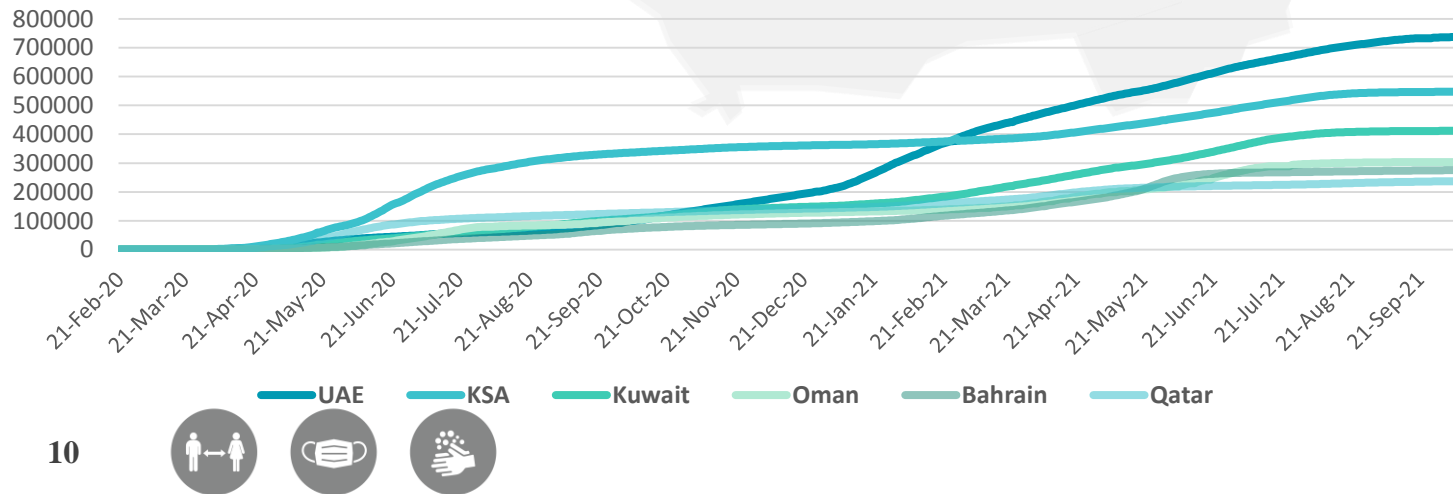
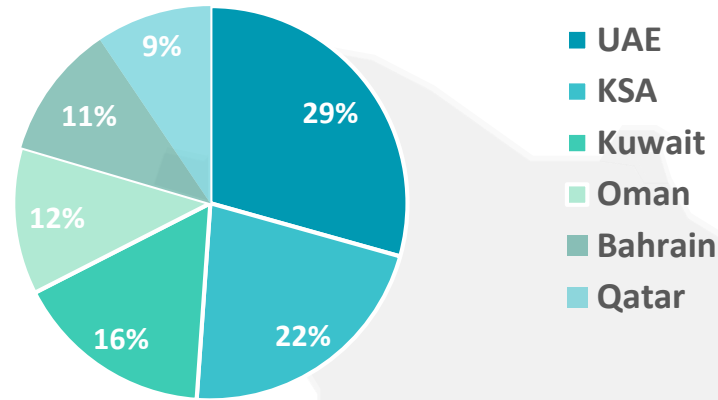
## DEATHS



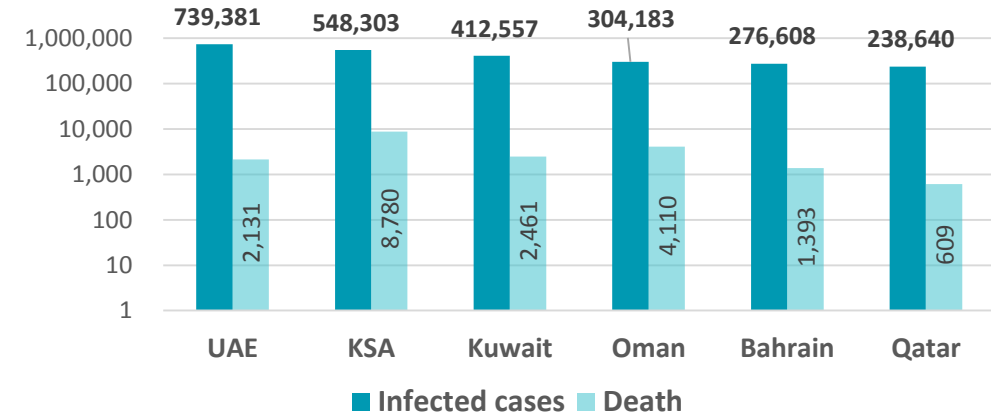


**Figure 7: Comparative Analysis of the Distribution of COVID-19 Cases in GCC Countries**

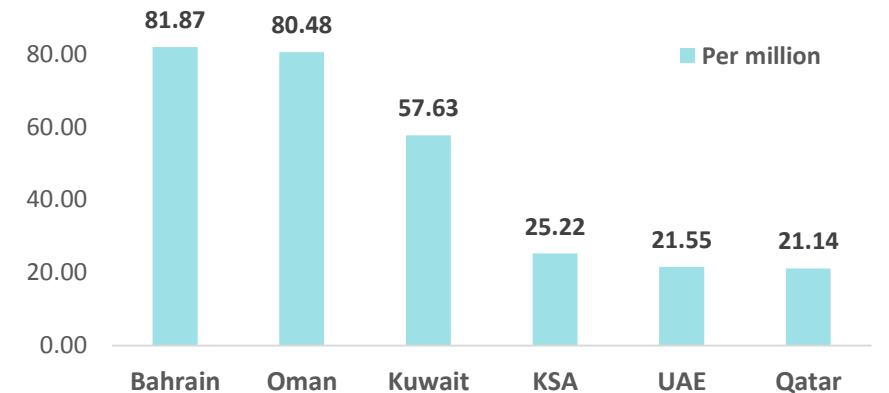
## TOTAL NUMBER OF INFECTED CASES



## TOTAL NUMBER OF INFECTED, RECOVERED AND DEATHS

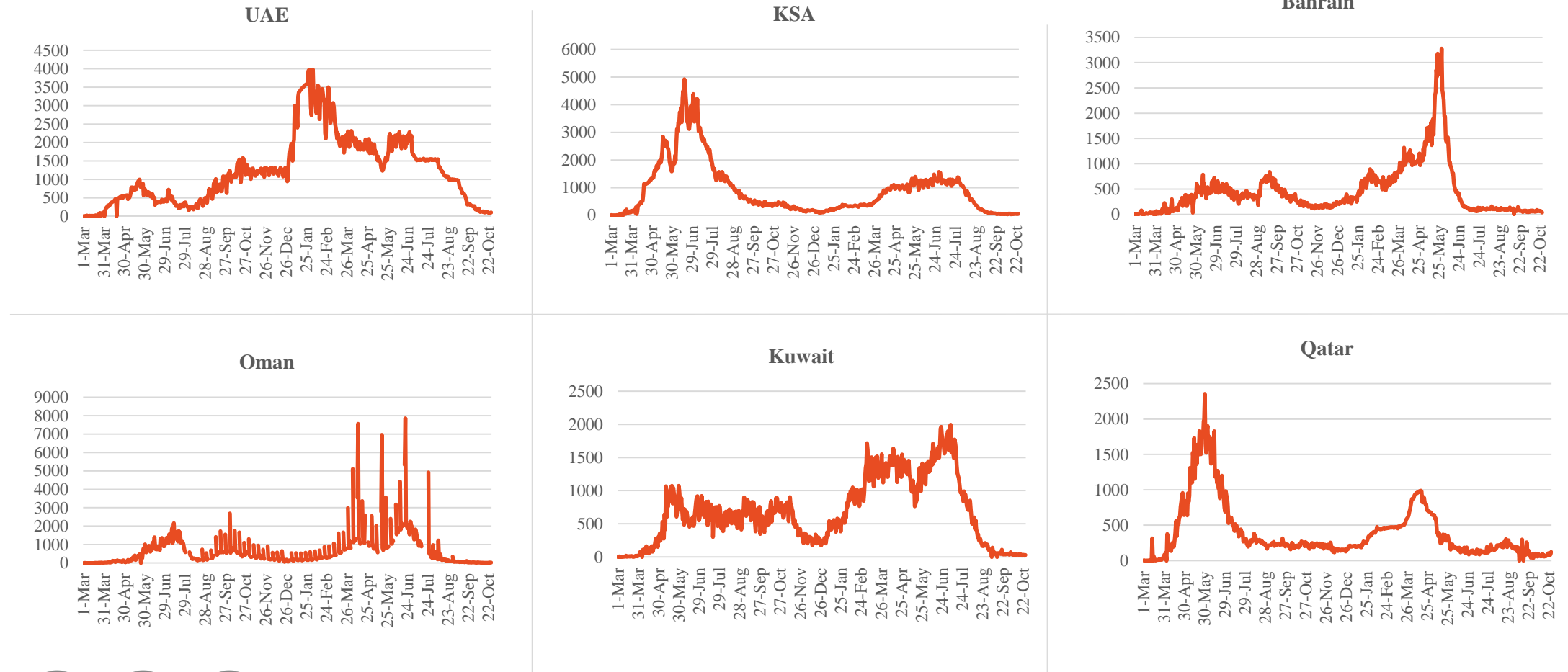


## DEATHS PER MILLION



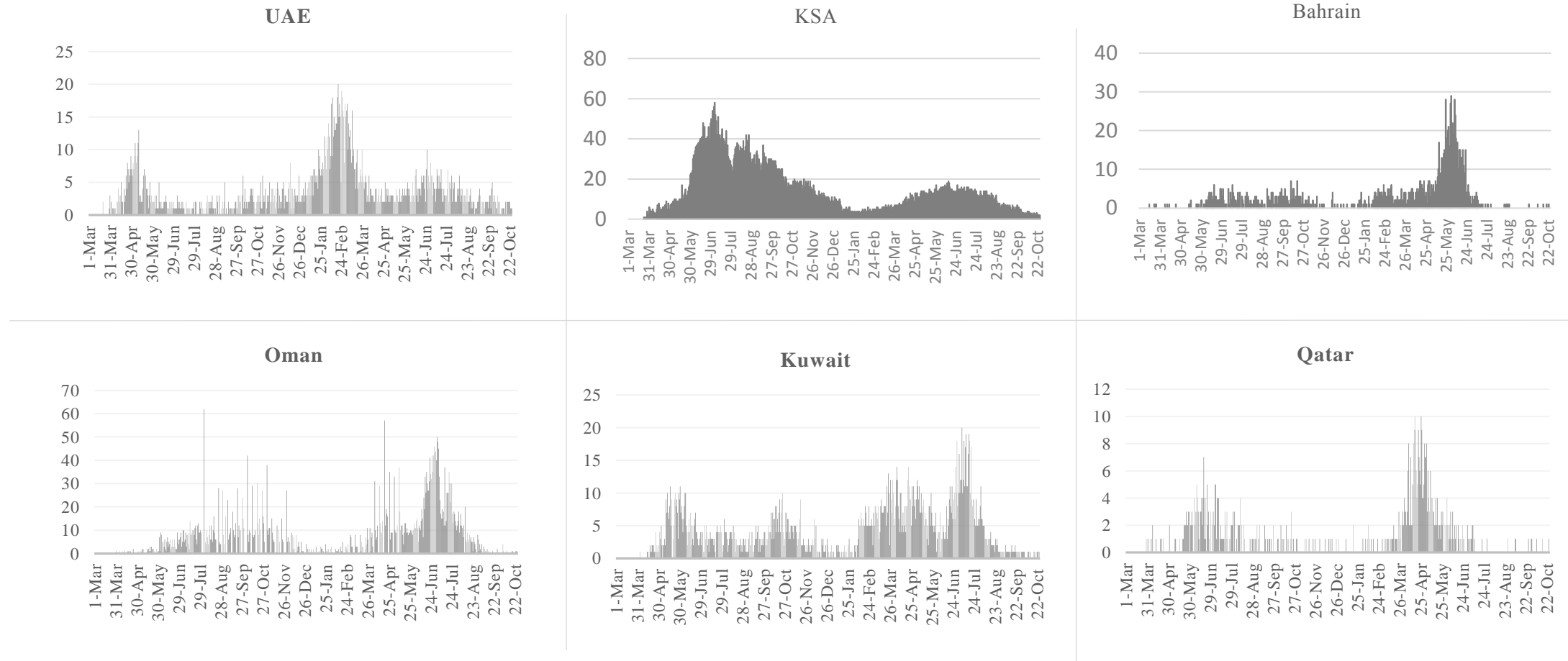


**Figure 10: Comparative Analysis of the Distribution of COVID-19 New Cases in GCC Countries**





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



## Article 1

# Protection of BNT162b2 Vaccine Booster against Covid-19 in Israel

Published

October 07, 2021 in [NEJM](#)

### Background

This study published in the NEJM aimed to assess the effect of the booster dose on the rate of confirmed coronavirus 2019 disease (Covid-19) and the rate of severe illness following approval (30 July 2021) of the administration of a third (booster) dose of the BNT162b2 messenger RNA vaccine (Pfizer–BioNTech) in Israel for individuals who were of 60 years of age or older and who had received a second dose of vaccine at least 5 months earlier.

### Methodology

Data was extracted for the period from July 30 through August 31, 2021, from the Israeli Ministry of Health database regarding 1,137,804 persons who were 60 years of age or older and had been fully vaccinated (i.e., had received two doses of BNT162b2) at least 5 months earlier.

In the primary analysis, comparisons were made between the rate of confirmed Covid-19 and the rate of severe illness between those who had received a booster injection at least 12 days earlier (booster group) and those who had not received a booster injection (non-booster group).

In the secondary analysis, the rate of infection 4 to 6 days after the booster dose as compared with the rate at least 12 days after the booster was evaluated. In all the analyses, Poisson regression was used after adjusting for possible confounding factors.

### Results

- At least 12 days after the booster dose, the rate of confirmed infection was lower in the booster group than in the non-booster group by a factor of 11.3 (95% confidence interval [CI], 10.4 to 12.3) the rate of severe illness was lower by a factor of 19.5 (95% CI, 12.9 to 29.5).
- In a secondary analysis, the rate of confirmed infection at least 12 days after vaccination was lower than the rate after 4 to 6 days by a factor of 5.4 (95% CI, 4.8 to 6.1).

### Conclusion

In this study involving participants who were 60 years of age or older and had received two doses of the BNT162b2 vaccine at least 5 months earlier, rates of confirmed Covid-19 and severe illness were substantially lower among those who received a booster (third) dose of the BNT162b2 vaccine.

Since then, Israel has extended the booster program to the entire population. The results of such a policy are important for policymakers in countries that are exploring strategies to mitigate the pandemic. These findings give clear indications of the effectiveness of a booster dose even against the currently dominant delta variant. Future studies will help determine the long-term effectiveness of the booster dose against current and emerging variants.



## Article 2

# Waning Immune Humoral Response to BNT162b2 Covid-19 Vaccine over 6 Months

Published

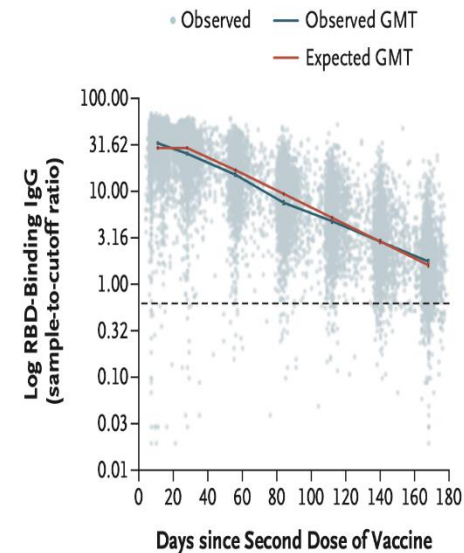
October 06, 2021 in [NEJM](#)

- Levin and Fellows prospectively assessed the anti-spike IgG and SARS-CoV-2 neutralizing antibodies in around 3800 immunized healthcare workers over 6 months period.
- The investigators reported that the concentration of the IgG antibodies decreased at a consistent rate while the neutralizing antibody level decreased rapidly in the first 3 months when compared to the following 3 months.
- In the Spearman's rank correlation, the IgG antibody levels were highly correlated with neutralizing antibody titers (between 0.68 and 0.75), however, the regression relationship between the IgG and neutralizing antibody levels was depended on the time since receipt of the second vaccine dose.
- After 6 months of the vaccine second dose, the neutralizing antibody titers were substantially lower among: men than among women, elderly > 65 years of age, and among participants with immunosuppression.

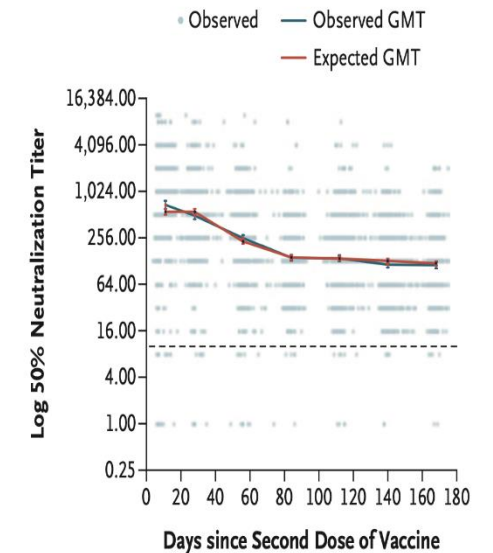
- The investigators concluded that, humoral immunity after second dose of Pfizer–BioNTech vaccine substantially decreased over time especially in men, elderly, and immunocompromised individuals.

## Distribution of Antibodies 6 Months after Receipt of Second Dose of the BNT162b2 Vaccine.

A IgG in Overall Population



B Neutralizing Antibody in Overall Population

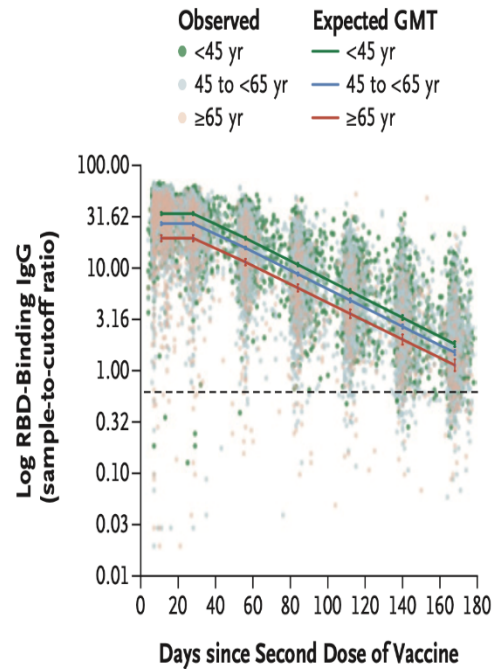




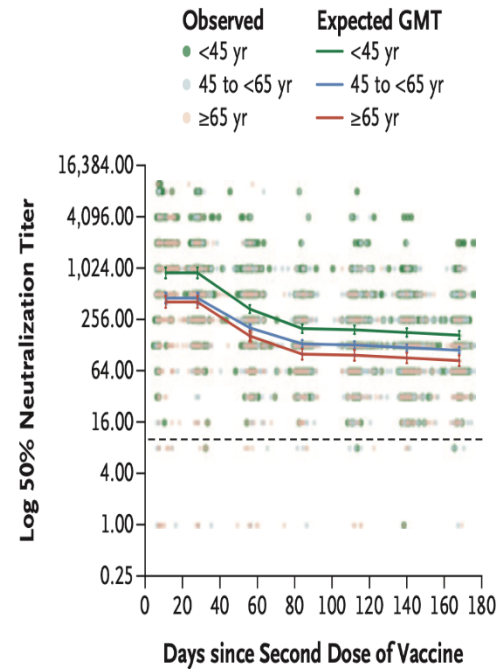
## Continued

- Distribution of Antibodies 6 Months after Receipt of Second Dose of the BNT162b2 Vaccine.

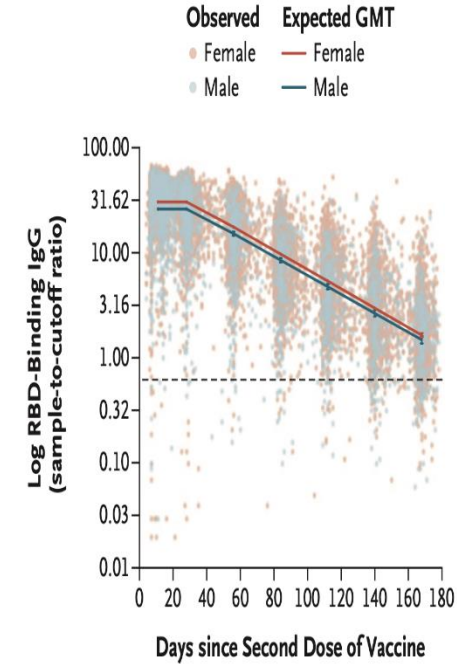
C IgG According to Age Group



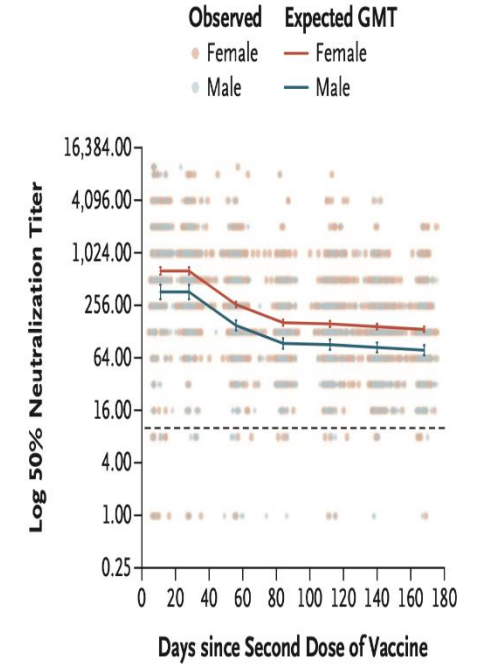
D Neutralizing Antibody According to Age Group



E IgG According to Sex



F Neutralizing Antibody According to Sex





## Effectiveness of mRNA BNT162b2 COVID-19 vaccine up to 6 months in a large integrated health system in the USA: a retrospective cohort study

### Article 3

#### Published

October 04, 2021 in [Lancet](#)

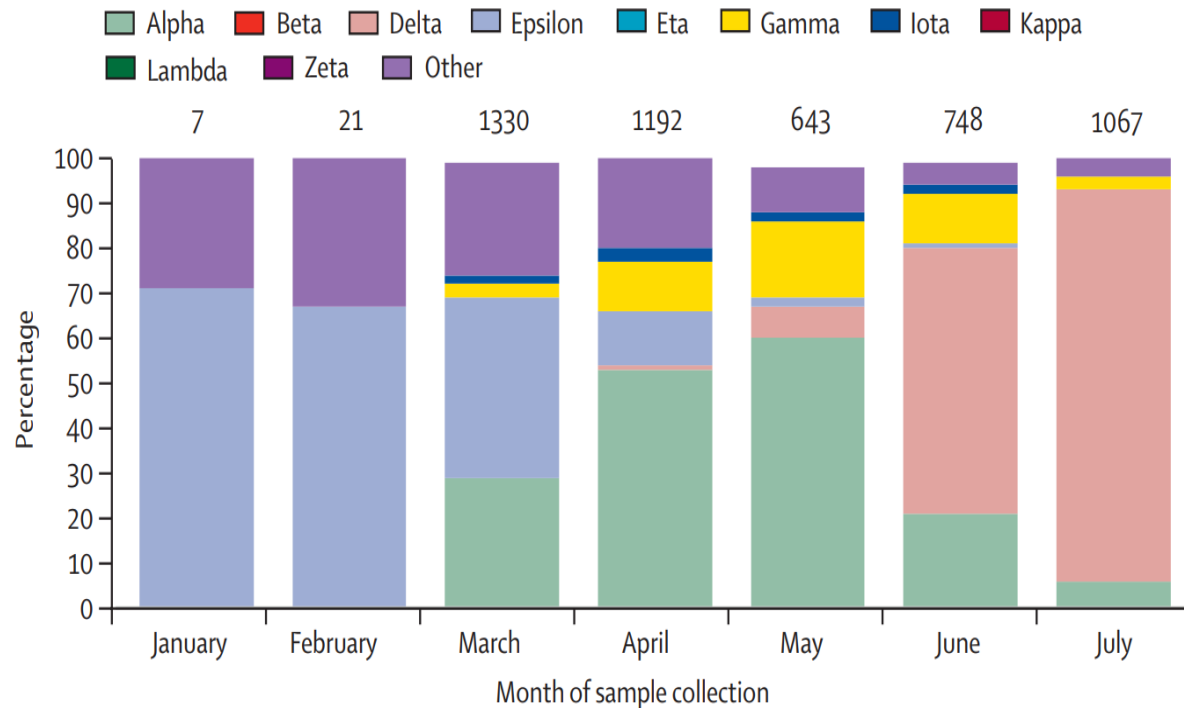
- Vaccine efficacy studies have not investigated the effect of the delta (B.1.617.2) variant and potential waning immunity in observed reductions in efficacy against SARS-CoV-2 infections.
- In a retrospective industry sponsored study, Tartof and fellows assessed the efficacy of the Pfizer–BioNTech Vaccine on around 3.4 million subjects in a large US healthcare center ( $\geq 12$  years of age). Over the the 6-month study, 184,081 SARS-CoV-2 infections and 12,130 COVID-19 hospitalizations occurred
- Over the period of 6 months, fully vaccinated subjects, had 73% (95% CI 72–74) efficacy against infections by SARS-CoV-2, and 90% (89–92) against hospital admission. The efficacy against infections declined from 88% (95% CI 86–89) following full vaccination to 47% (43–51) 5 months later.
- Among whom had variants sequenced: the vaccine efficacy against infections caused by delta variants were (93% [95% CI 85–97]) then declined to 53% [39–65] 4 months later. However, the efficacy against hospital admissions (for all ages) secondary to delta variants remained high overall (93% [95% CI 84–96]) up to 6 months
- The vaccine efficacy against non-delta variants, was 97% (95% CI 95–99) and declined to 67% (45–80) around 5 months later. Additionally, the efficacy of the vaccine against hospitalization in the non-delta variants also declined from 97% (95% CI 95–99) to 53% (45–80) at 5 months point (not significant comparison).
- The authors concluded that the efficacy of the vaccines could last up to 6 months, however, the reduction in vaccine effectiveness over time could be due to waning immunity and not due to the delta variant.





## Continued

• Figure 1: Distribution of variants from January to July, 2021 (n=5008)

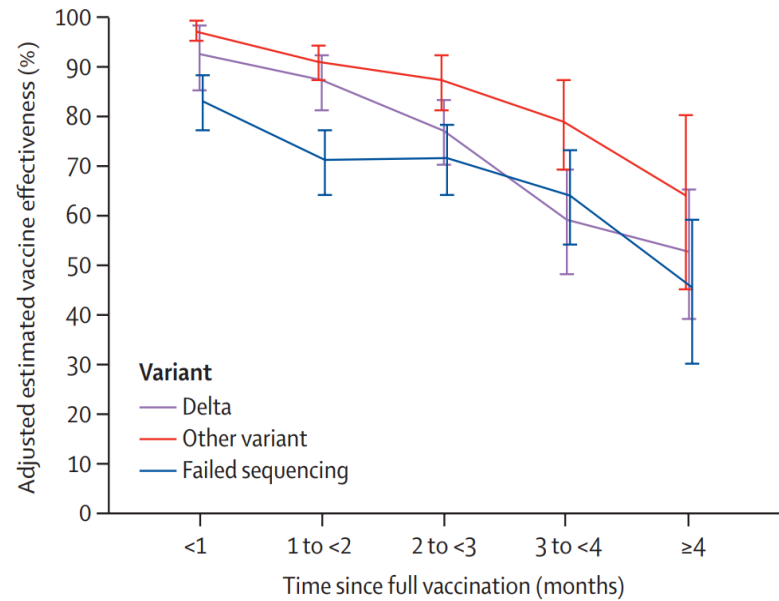


	January	February	March	April	May	June	July
Alpha	0	0	383 (28.8%)	632 (53.0%)	389 (60.5%)	158 (21.1%)	60 (5.6%)
Beta	0	0	2 (0.2%)	5 (0.4%)	2 (0.3%)	1 (0.1%)	1 (0.1%)
Delta	0	0	0	7 (0.6%)	47 (7.3%)	445 (59.5%)	923 (86.5%)
Epsilon	5 (71.4%)	14 (66.7%)	532 (40.0%)	139 (11.7%)	11 (1.7%)	4 (0.5%)	0
Eta	0	0	2 (0.2%)	2 (0.2%)	1 (0.2%)	1 (0.1%)	0
Gamma	0	0	40 (3.0%)	131 (11.0%)	107 (16.6%)	82 (11.0%)	33 (3.1%)
Iota	0	0	25 (1.9%)	33 (2.8%)	16 (2.5%)	17 (2.3%)	1 (0.1%)
Kappa	0	0	1 (0.1%)	1 (0.1%)	0	0	0
Lambda	0	0	1 (0.1%)	4 (0.3%)	3 (0.5%)	0	1 (0.1%)
Zeta	0	0	6 (0.5%)	0	0	0	0
Other	2 (28.6%)	7 (33.3%)	338 (25.4%)	238 (20.0%)	67 (10.4%)	40 (5.3%)	48 (4.5%)
All	7 (100%)	21 (100%)	1330 (100%)	1192 (100%)	643 (100%)	748 (100%)	1067 (100%)
Failed sequence	9/16 (56.3%)	13/34 (38.2%)	993/2323 (42.7%)	882/2074 (42.5%)	648/1291 (50.2%)	720/1468 (49.0%)	638/1705 (37.4%)

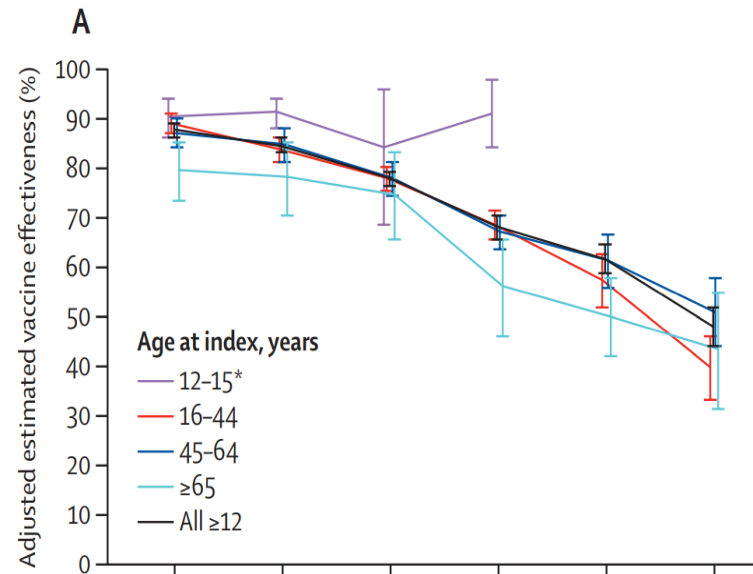


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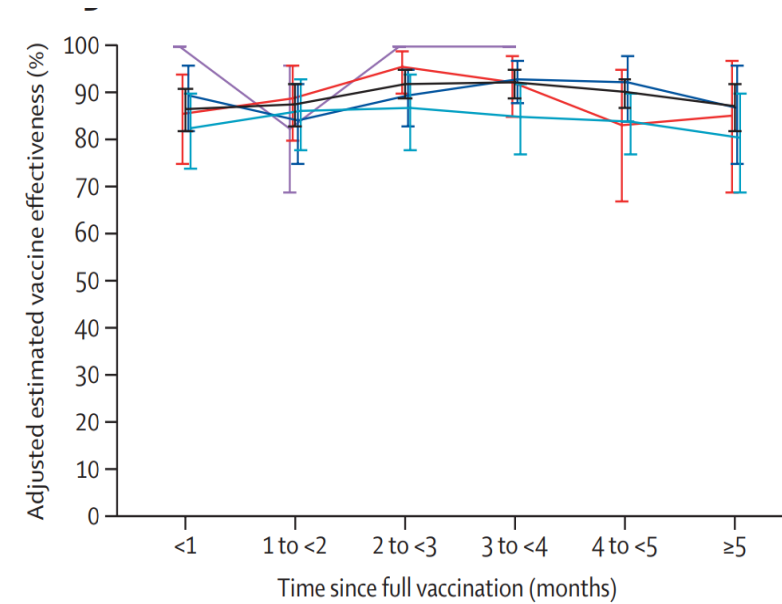
- Figure 2: Adjusted estimated vaccine effectiveness against SARS-CoV-2 infection by variant



- Figure 3: Adjusted estimated vaccine effectiveness against SARS-CoV-2 infection by age groups



- Figure 4: Adjusted estimated vaccine effectiveness against SARS-CoV-2 hospital admissions



## Waning of BNT162b2 Vaccine Protection against SARS-CoV-2 Infection in Qatar

### Article 4

Published

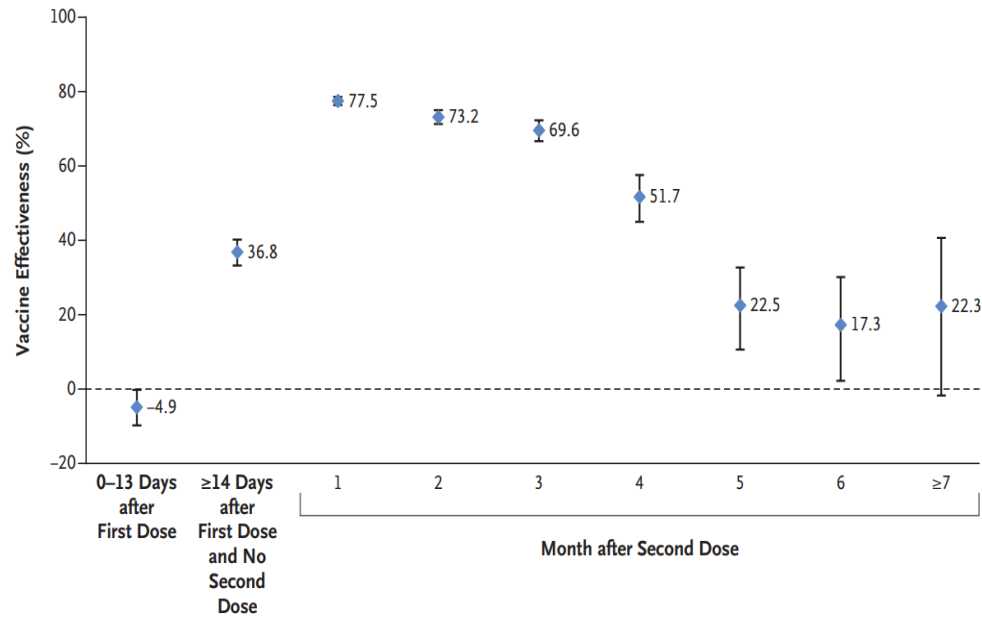
October 06, 2021 in [NEJM](#)

- In a case-control trial, Chemaitelly and fellows, studied the efficacy of Pfizer–BioNTech vaccine over time in around 1 million subjects in Qatar. The efficacy of the vaccine reached the peak of 77.5% efficacy (95% CI, 76.4 to 78.6) in the first month after the second dose.
- The vaccine efficacy waned gradually in the following 4 months with accelerating decline after the fourth month to reach approximately 20% in months 5 through 7 after the second dose. Further, although efficacy against symptomatic infection was higher than efficacy against asymptomatic infection, however, both declined to similar extent. Additionally, efficacy against SARS-CoV2 variants declined in the same way.
- More importantly, the vaccine efficacy against severe, critical, or fatal disease reached peak after 2 months of the second dose at 96% or higher and persisted at approximately this level for 6 months follow up
- The authors concluded that the efficacy of the Pfizer–BioNTech vaccine against infection waned rapidly following its peak after the second dose, but protection against hospitalization and death persisted at same level for 6 months.

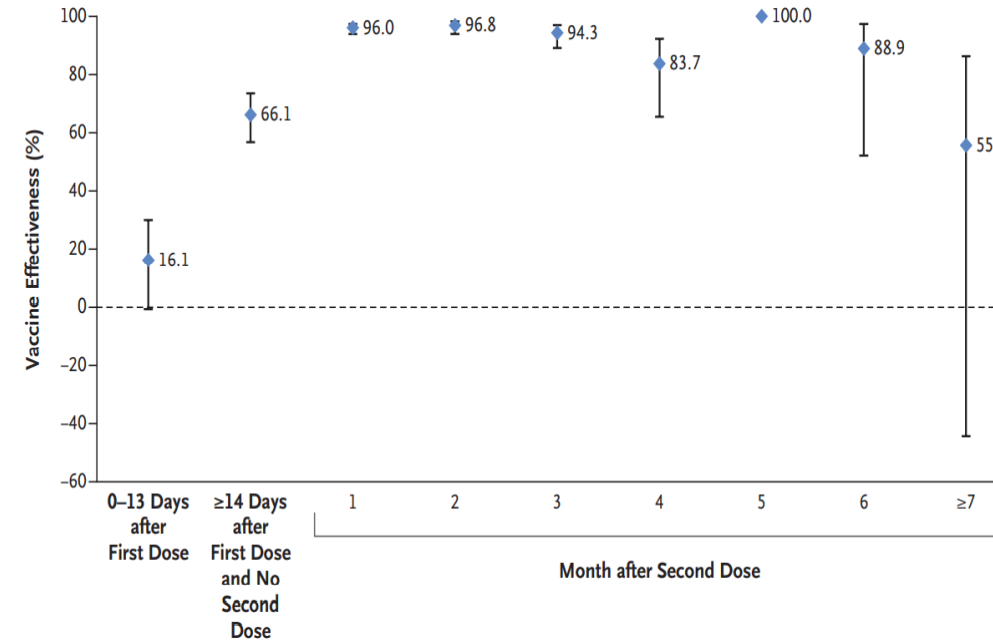


## Continued

**A Effectiveness against Any SARS-CoV-2 Infection**



**B Effectiveness against Any Severe, Critical, or Fatal Case of Covid-19**



## How does Pfizer-BioNTech BNT162b2 and Oxford-AstraZeneca ChAdOx1-S vaccines effect confirmed covid-19 symptoms

### Article 5

### Published

May 13, 2021 in [NCBI](#)

- This article estimates the real-world effectiveness of the Pfizer-BioNTech BNT162b2 and Oxford-AstraZeneca ChAdOx1-S vaccines against confirmed covid-19 symptoms (including the UK variant of concern B.1.1.7), admissions to hospital, and deaths.
- BNT162b2 vaccine effectiveness reached 61% (51% to 69%) from 28 to 34 days after vaccination, then plateaued. On top of the protection against symptomatic disease, a further 43% (33% to 52%) reduced risk of emergency hospital admission and 51% (37% to 62%) reduced risk of death was observed.
- ChAdOx1-S, vaccine effectiveness was seen from 14 to 20 days after vaccination, reaching an effectiveness of 60% (41% to 73%) from 28 to 34 days, increasing to 73% (27% to 90%) from day 35 onwards. Participants who had received one dose of ChAdOx1-S had a further 37% (3% to 59%) reduced risk of emergency hospital admission.
- Both vaccines showed similar effects. Protection was maintained for the duration of follow-up (>6 weeks). A second dose of BNT162b2 was associated with further protection against symptomatic disease. A clear effect of the vaccines against the B.1.1.7 variant was found.



# COVID-19 BOOSTER VACCINE BENCHMARK



Singapore	UK	Israel	Australia	France	Norway	UAE	Italy	S. Korea	Spain	New Zealand	China	Saudi Arabia
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From October 2021	From September 2021	From July 2021	From October 2021	From September 2021	From October 2021	From August 2021	From September 2021	From October 2021	From October 2021	-	-	From Sep 2021
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healthcare workers, front-line workers and those aged 30 and above	elderly, health and social workers and younger people at risk	those who received the second dose at least 5 months earlier	immunocompromised people	Vulnerable groups and Elderly	Elderly '65 and older'	After 6 months of the 2 <sup>nd</sup> Sinopharm dose	Vulnerable groups	High risk groups	Anyone aged 18 and more	-	-	Over the age of 18 who got the second dose at least 6 months ago
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DATE STARTED

APPLICABLE CATEGORY



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HEALTH CENTRE



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