



SCIENTIFIC RESEARCH MONITORING ON COVID-19

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SCIENTIFIC RESEARCH MONITORING ON COVID-19

(Issue 417)

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

Updated



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 PHR@adphc.gov.ae



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).

Vaccine

Efficacy of the ChAdOx1
nCoV-19 Covid-19
Vaccine against the
B.1.351 Variant

Immunology

Neutralizing Antibodies
Against SARS-CoV-2
Variants After Infection
and Vaccination

Immunology

Sustained neutralising
antibodies in the Wuhan
population suggest
durable protection
against SARS-CoV-2

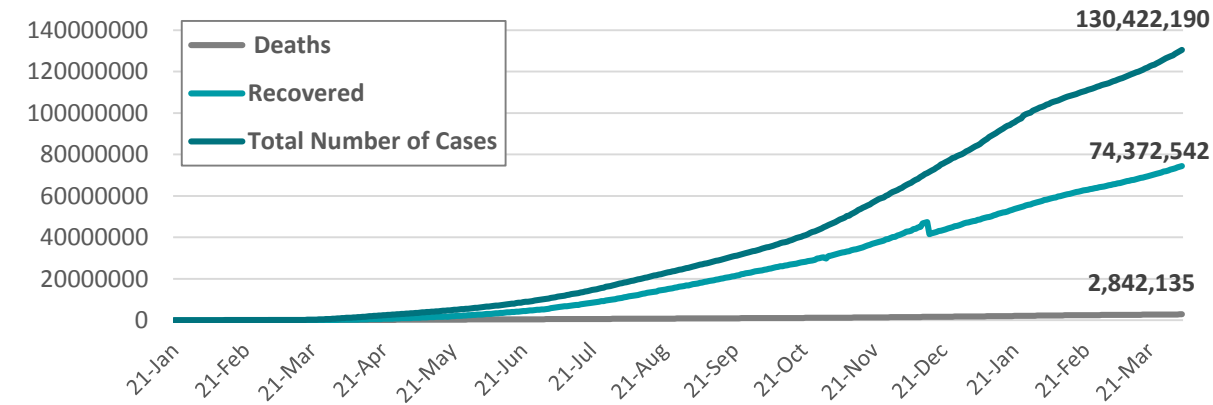
Immunology

Seroprevalence of SARS-
CoV-2 Antibodies in the
US Adult Asymptomatic
Population as of
September 30, 2020





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



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

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

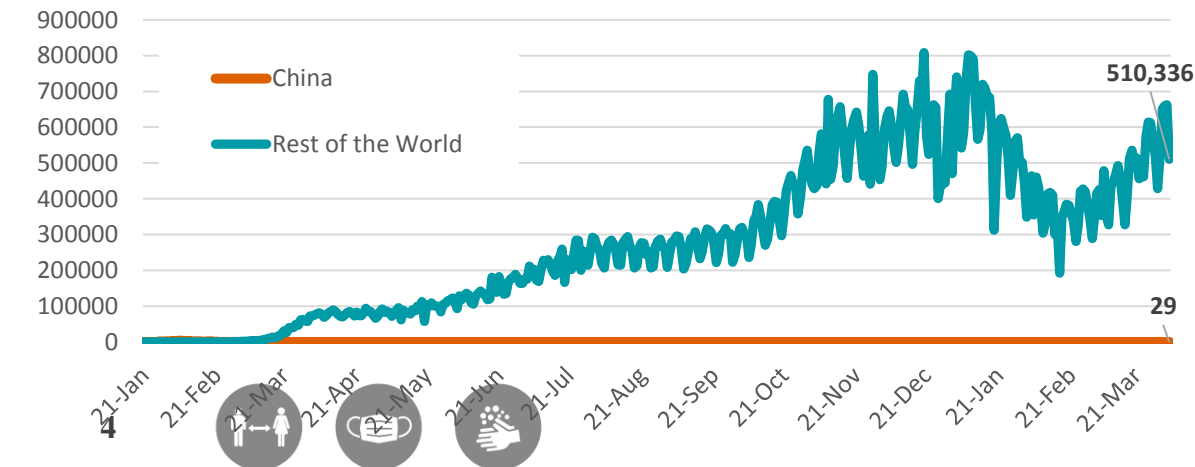


Figure 3: Total Number of Death Due to COVID-19 (china and result of the world)

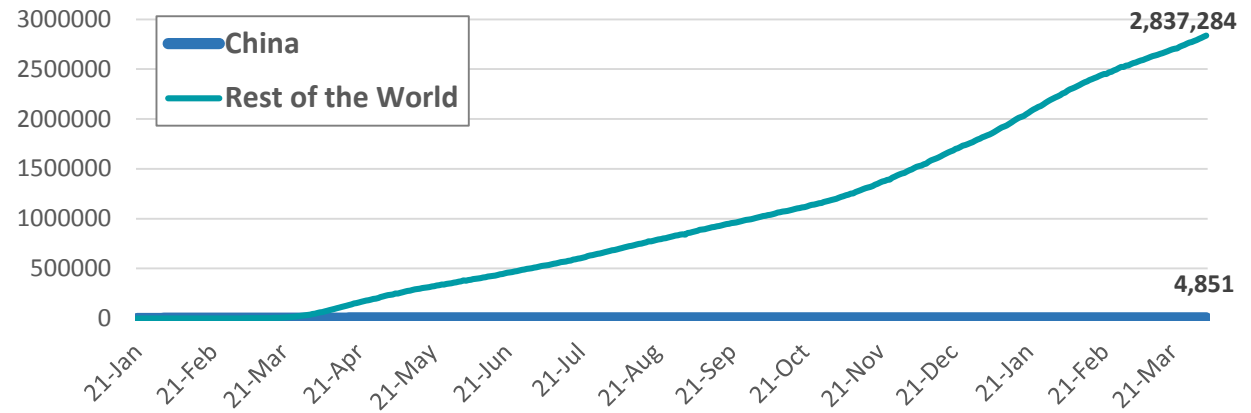


Figure 4: Global Daily New Deaths Due to COVID-19

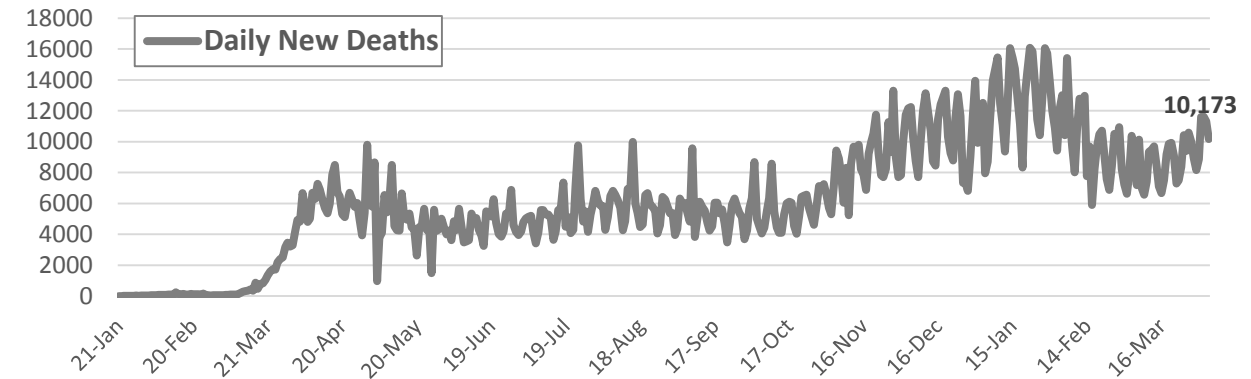
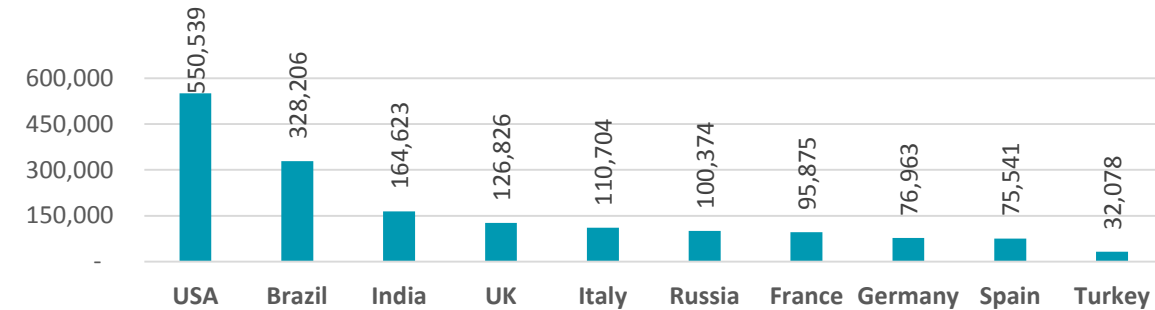


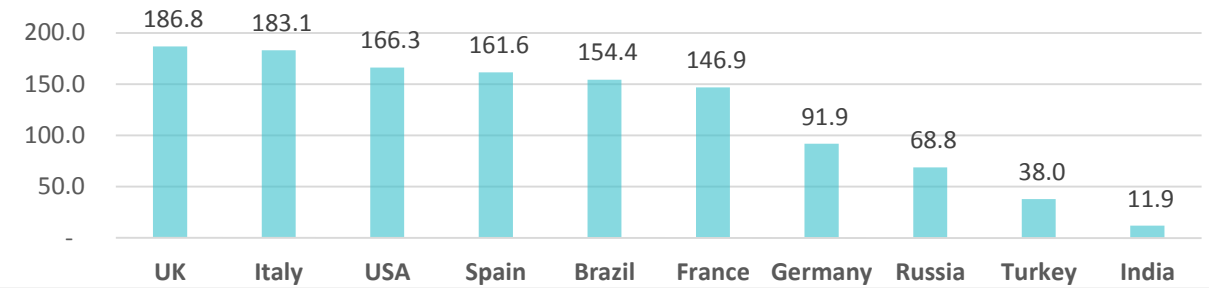


Figure 5: Top 10 Countries in the Total Number of Cases Due to COVID-19

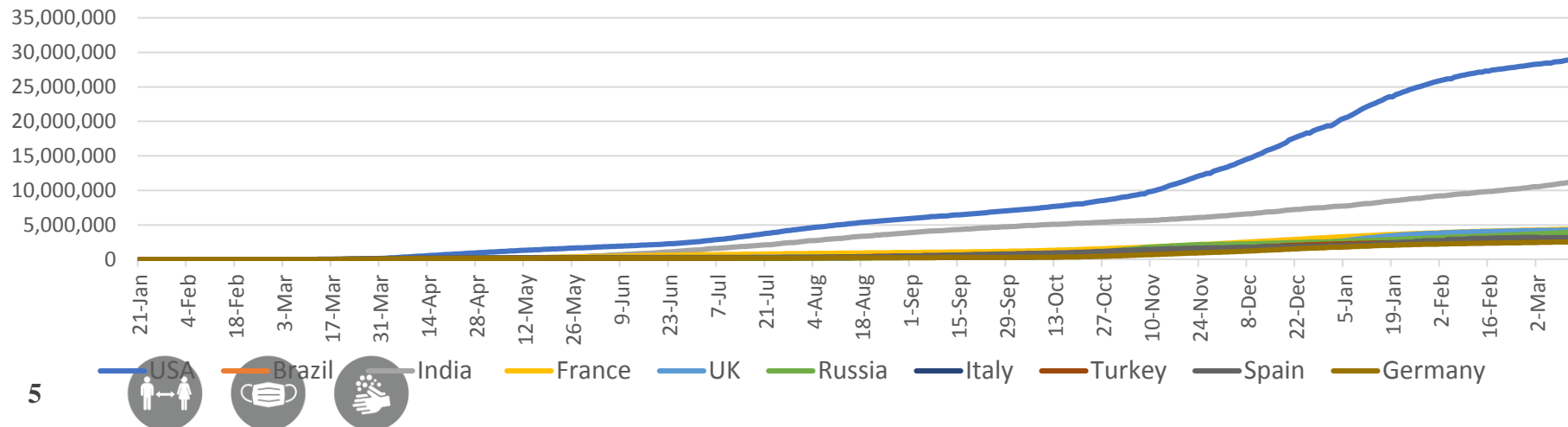
TOTAL DEATHS



DEATHS PER MILLION



TOTAL INFECTED CASES



USA	30,304,462
Brazil	12,910,082
India	12,485,509
France	4,665,709
Russia	4,580,894
UK	4,357,095
Italy	3,650,247
Turkey	3,445,052
Spain	3,291,394
Germany	2,885,386



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

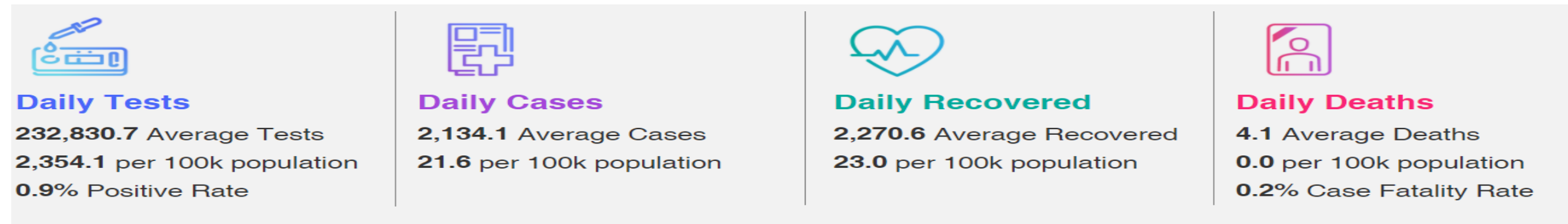


Figure 6A: TOTAL Number Of Infected And Recovered Cases Due To Covid-19 Reported By The UAE

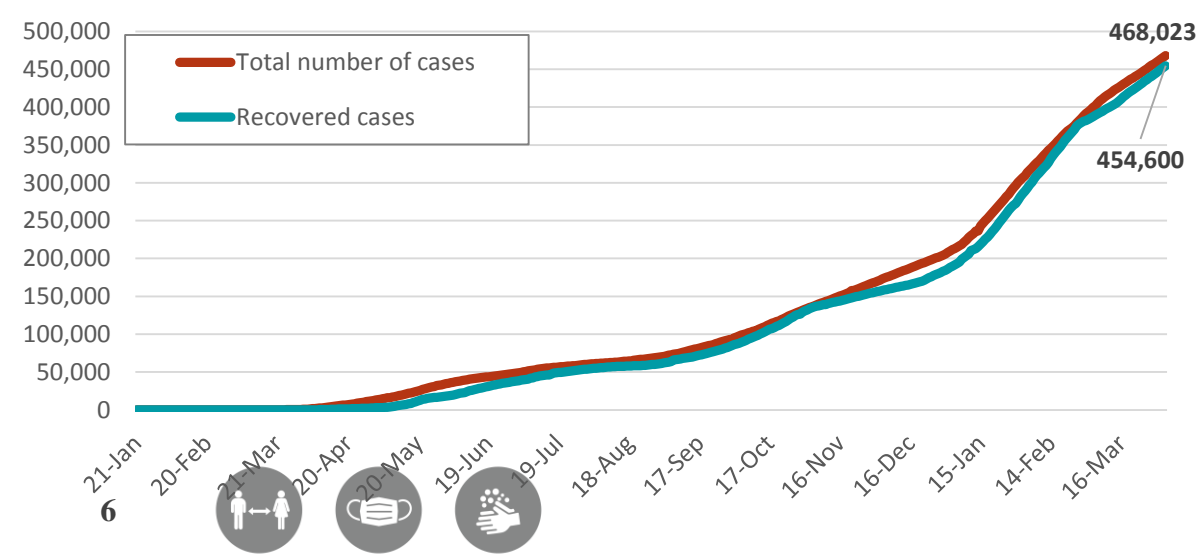


Figure 6 B: TOTAL NUMBER and Percentage of UAE population Vaccinated

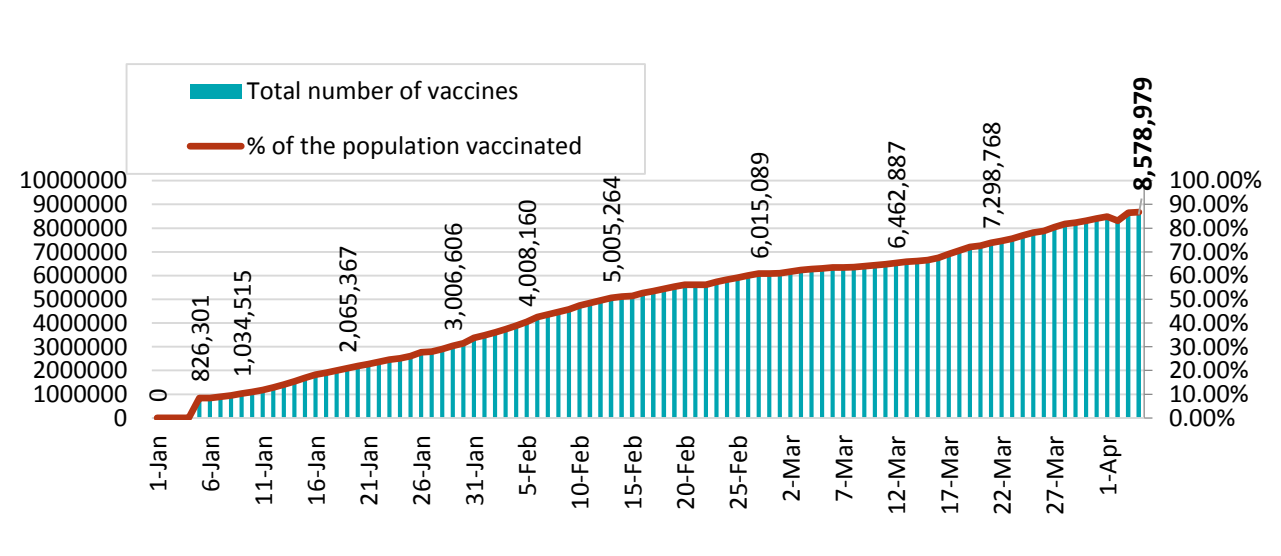




Figure 7A : Global Distribution of COVID-19 Cases

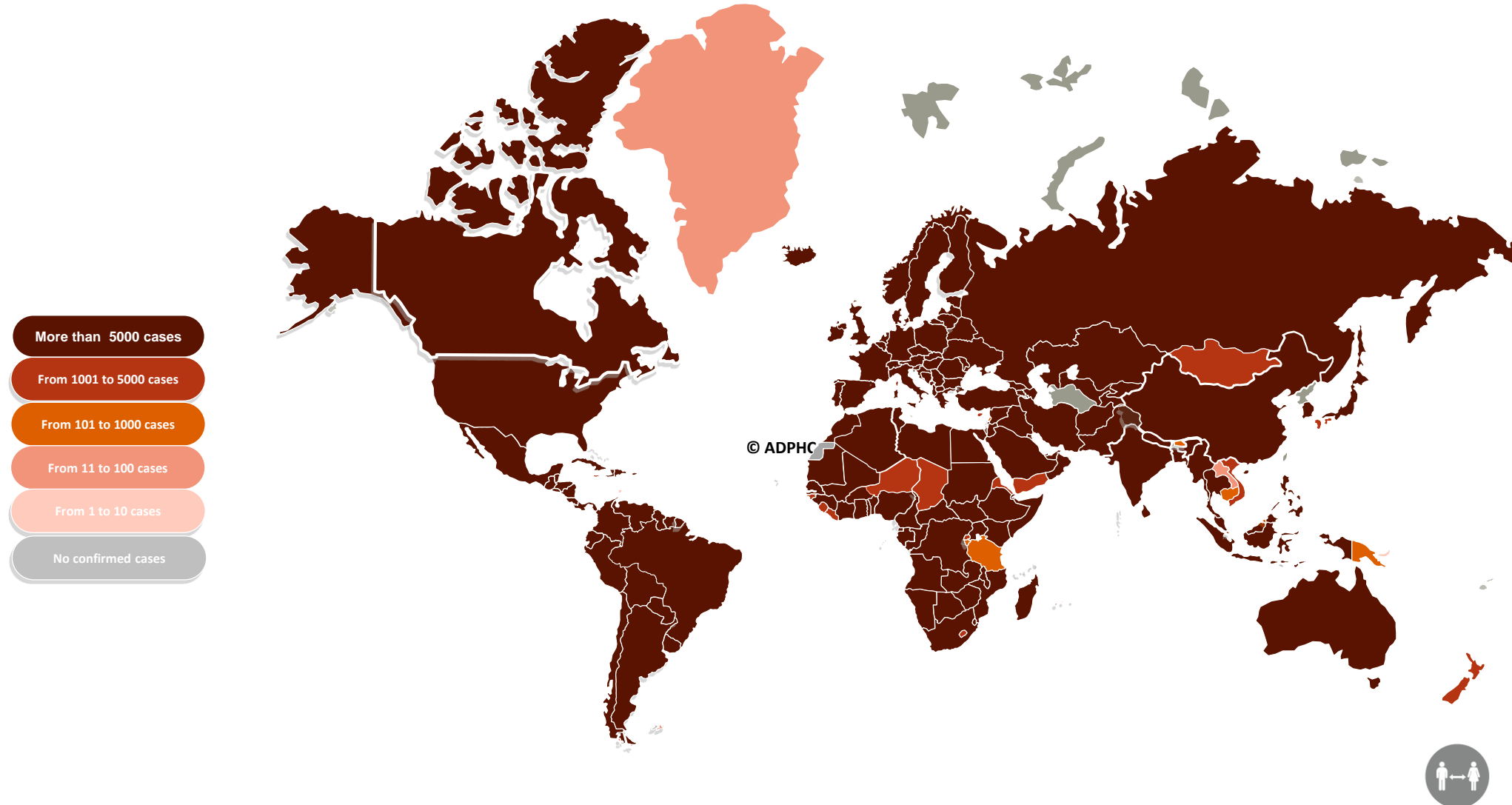
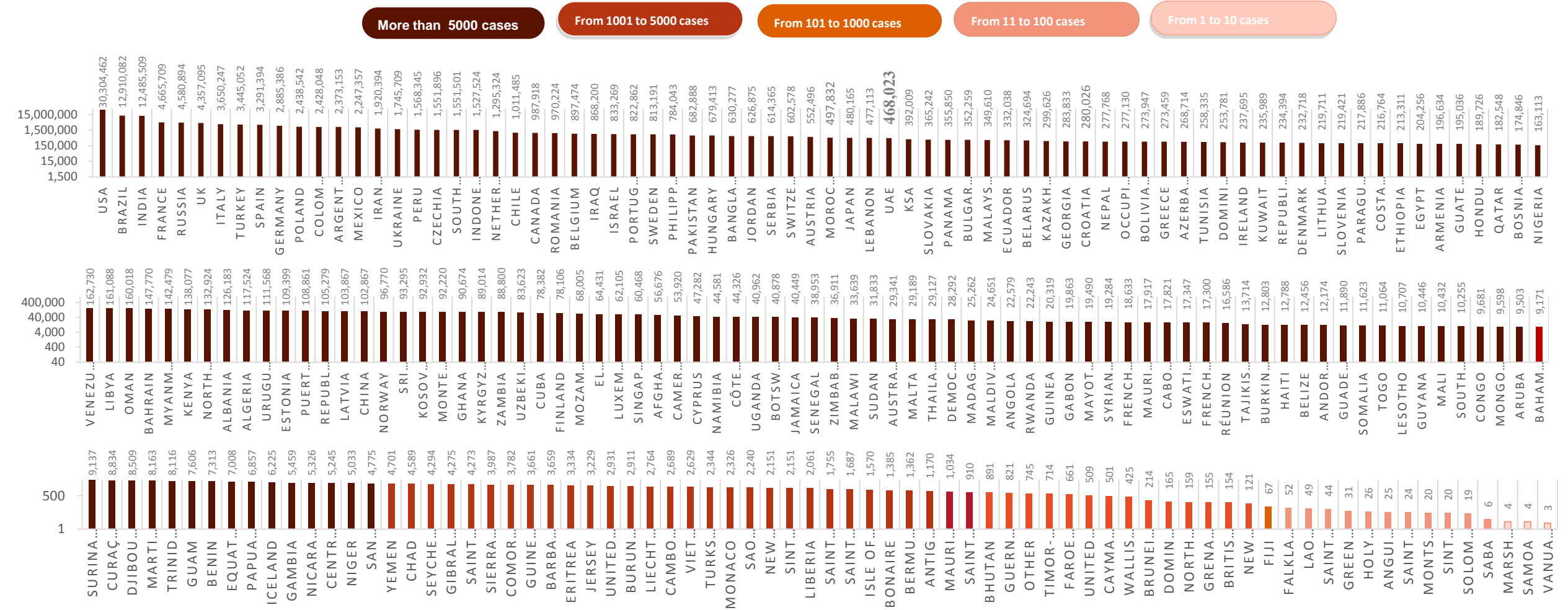




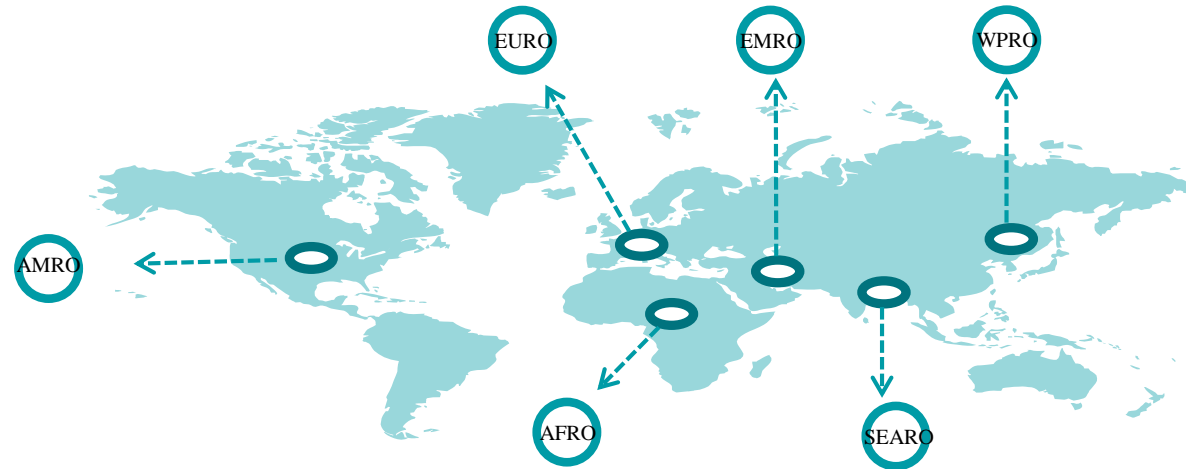
Figure 7B: Bar Chart Illustrates the Global Distribution of COVID19 Cases



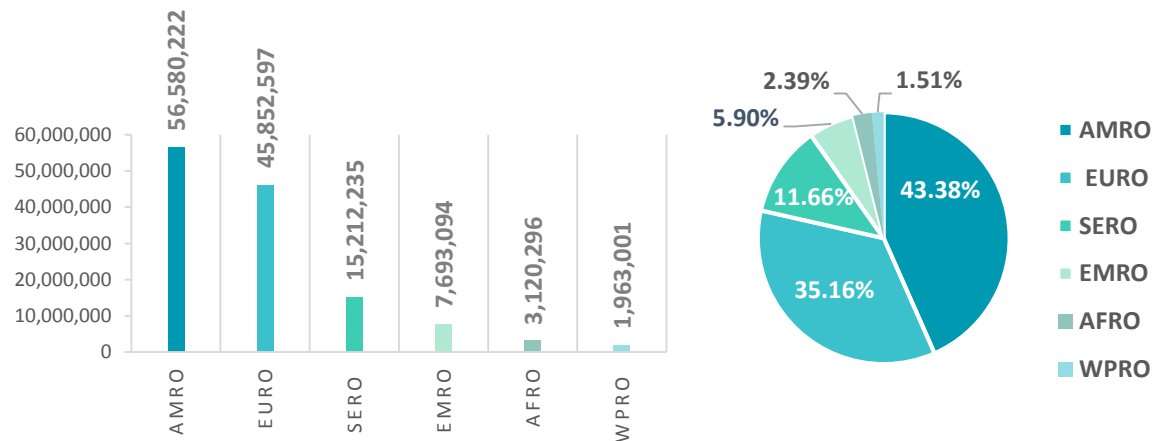
Other*: includes cases and deaths reported under the international conveyance(Diamond Princess)



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



INFECTED



DEATHS

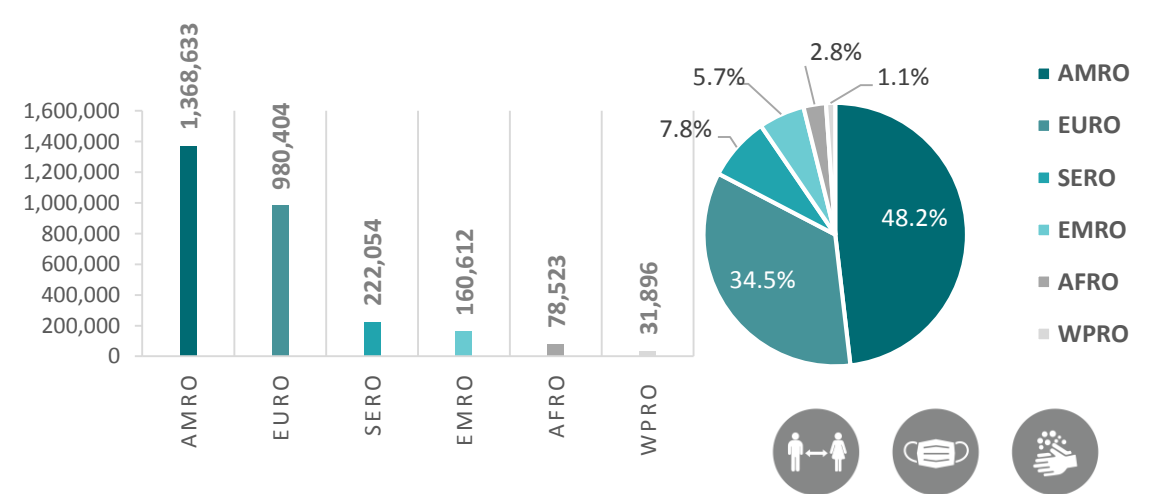
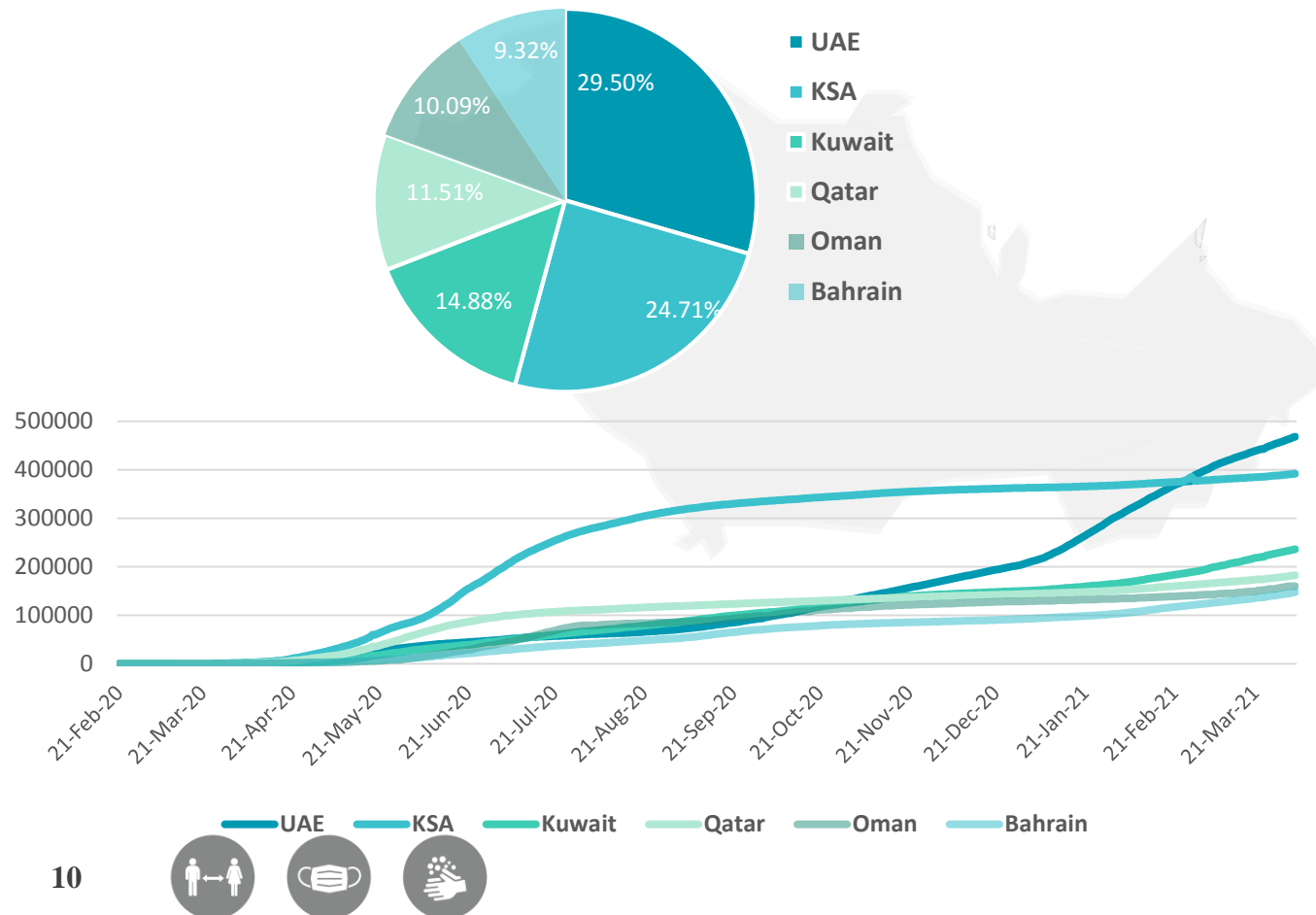
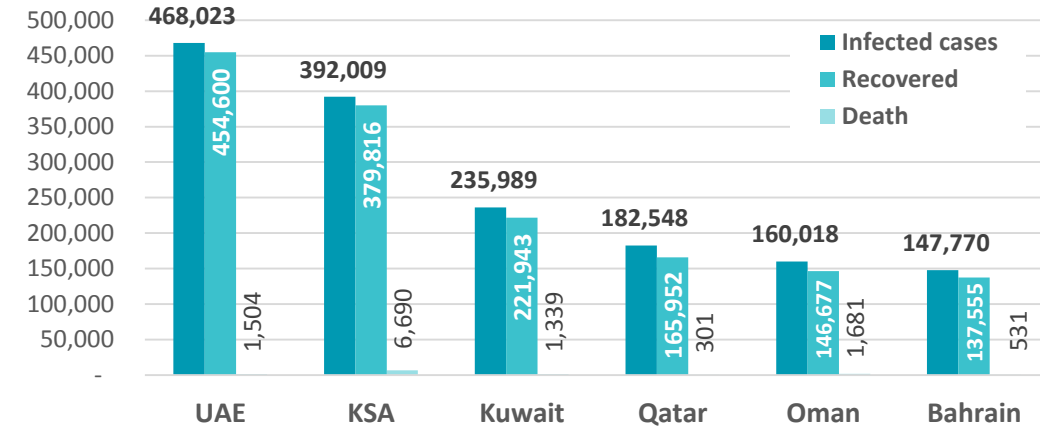


Figure 7: Comparative Analysis of the Distribution of COVID-19 Cases in GCC Countries

TOTAL NUMBER OF INFECTED CASES



TOTAL NUMBER OF INFECTED, RECOVERED AND DEATHS



DEATHS PER MILLION

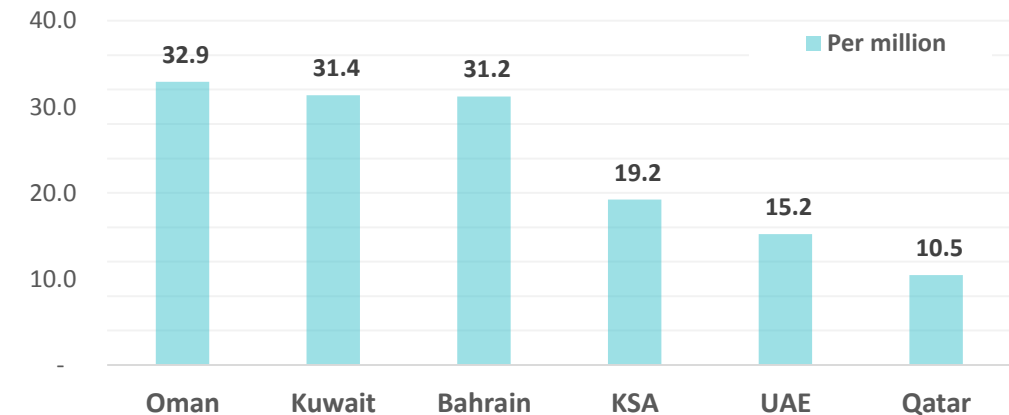




Figure 10: Comparative Analysis of the Distribution of COVID-19 New Cases in GCC Countries

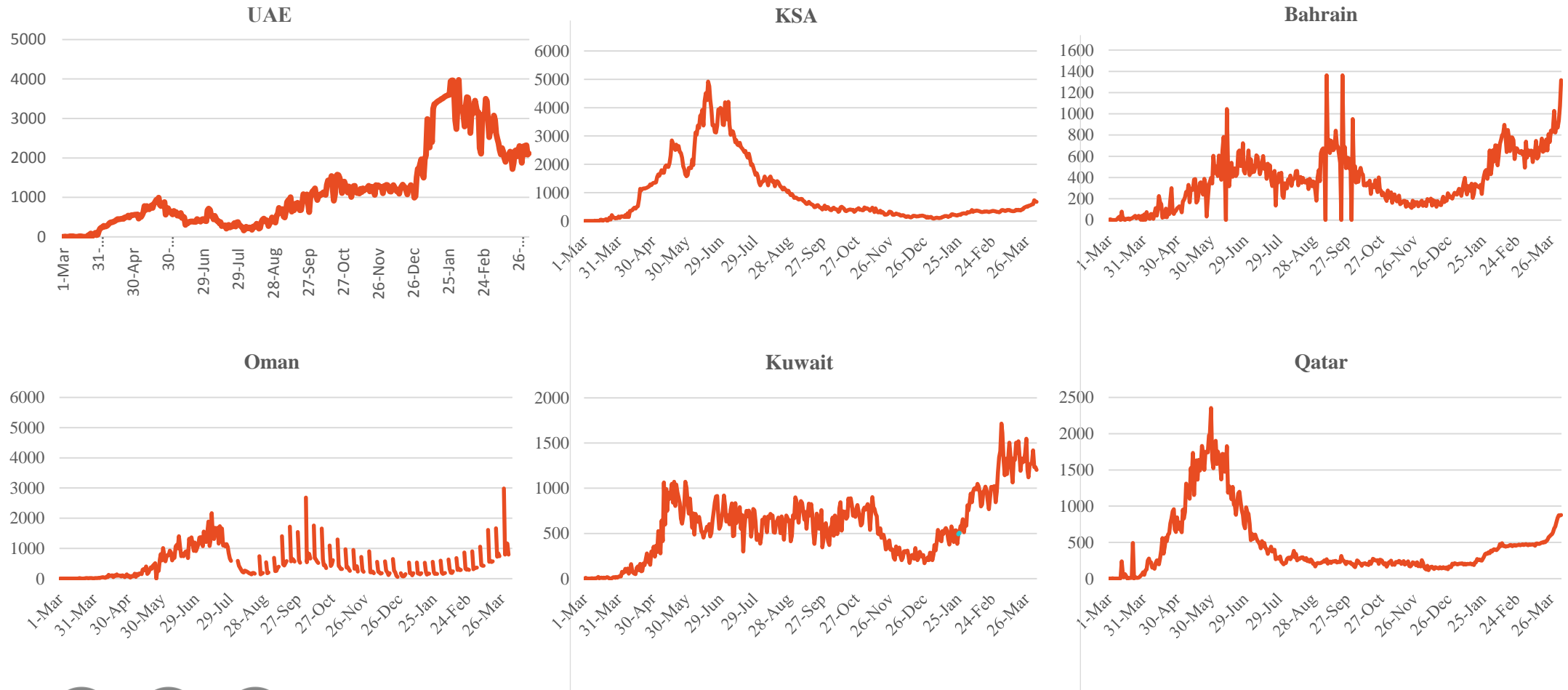




Figure 11: Comparative Analysis of the Distribution of COVID-19 Recovered Cases in GCC Countries

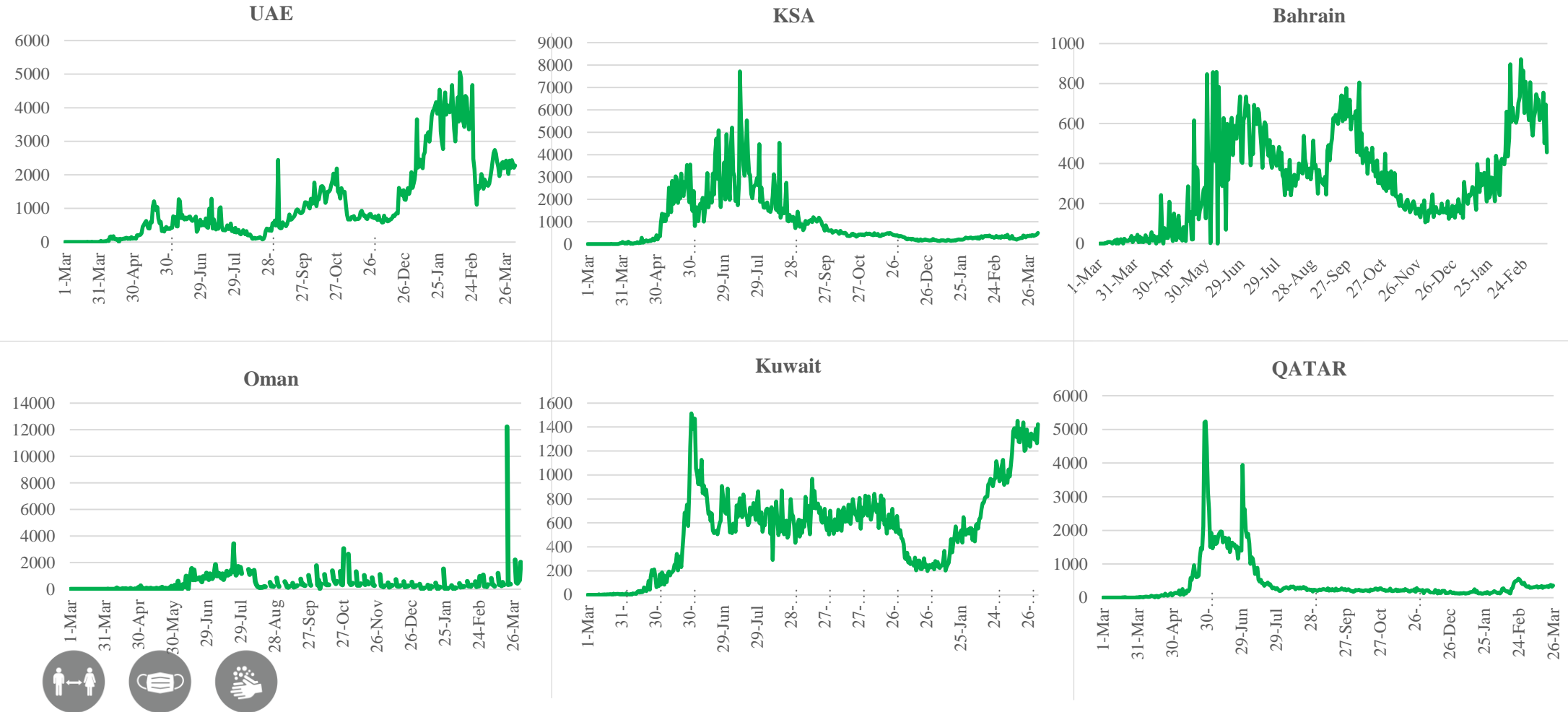
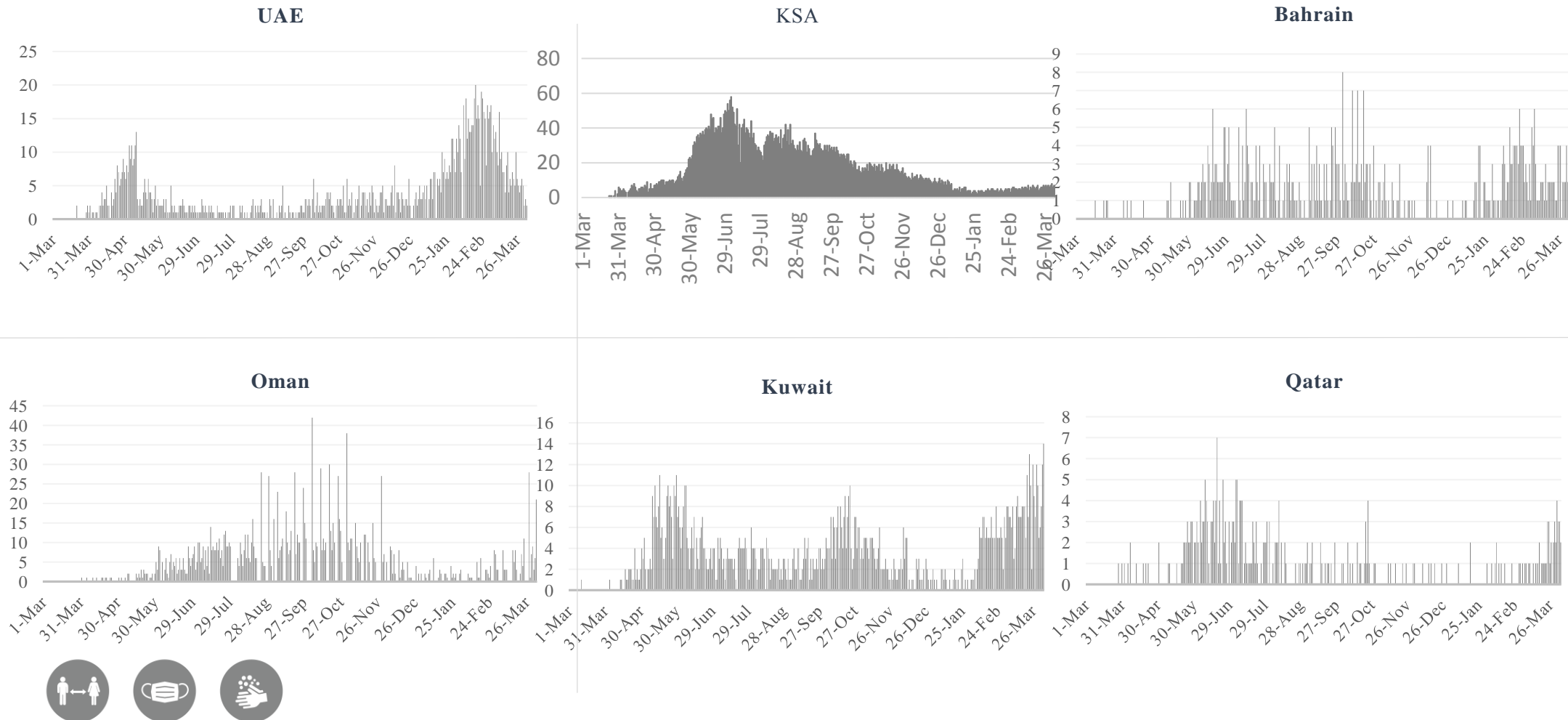




Figure 12: Comparative Analysis of the Distribution of COVID-19 New Death Cases in GCC Countries



Article 1: Efficacy of the ChAdOx1 nCoV-19 Covid-19 Vaccine against the B.1.351 Variant

Published

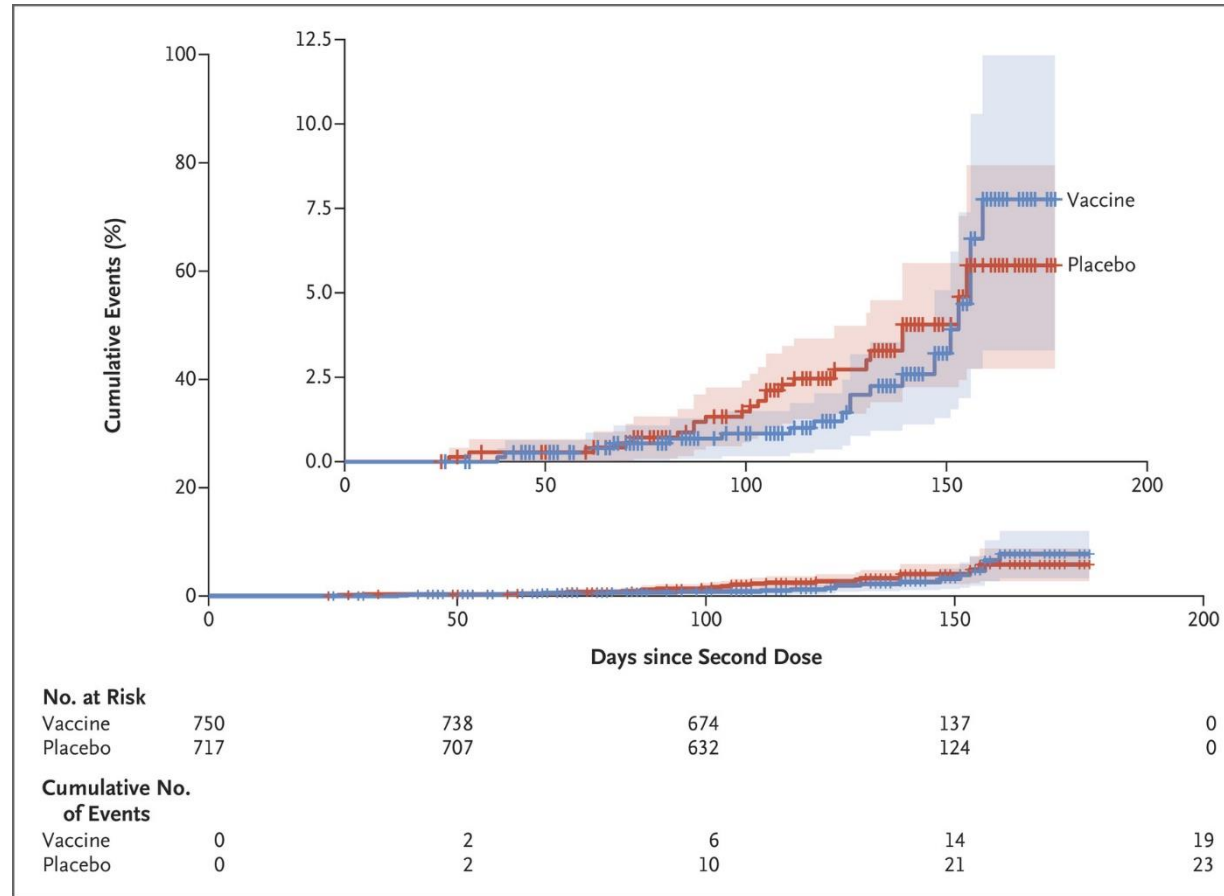
March 16, 2021 in [THE NEJM](#)

- This article investigated the efficacy of AstraZeneca vaccine against COVID-19 South African variant (B.1.351).
- This is a multisite, double-blind, randomized, placebo-controlled trial conducted in South Africa.
- Adults participants between 18 and less than 65 years of age, with no or well-controlled chronic medical conditions, were eligible.
- Two standard doses of the AstraZeneca vaccine were administered 21 to 35 days apart.
- 750 assigned to the vaccine and 717 to placebo were eligible for primary end point analysis of ‘efficacy’ which was confirmed symptomatic COVID-19 with onset more than 14 days after the second injection.
- The median duration of follow-up from 14 days after the second dose of vaccine or placebo was 121 days (as of January 15, 2021).

- Mild-to-moderate COVID-19 developed in 23 of 717 placebo recipients (3.2%) and in 19 of 750 vaccine recipients (2.5%), for an **efficacy of 21.9%**.
- 39 out of 42 cases (92.9%) were caused by the South African variant; and **vaccine efficacy against this variant was 10.4%**.
- There were no cases of severe disease or hospitalization in either group.
- However, mild-to-moderate illness with onset >14 days after one dose until October 31, 2020 (a proxy for non-South African variant) developed in 15 cases (12 placebo), and **vaccine efficacy was 75.4%**.
- The trial was not powered to test the vaccine efficacy against South African variant, hence, the trial findings are inconclusive with respect to whether the AstraZeneca vaccine may protect against severe COVID-19 caused by infection with the South African variant.



Continued



Kaplan–Meyer Plot of AstraZeneca (ChAdOx1 nCoV-19) Vaccine Efficacy against Symptomatic COVID-19 Illness of Mild or Moderate Severity after Two Doses, as Compared with Placebo.



Article 2: Neutralizing Antibodies Against SARS-CoV-2 Variants After Infection and Vaccination

Published

March 19, 2021 in [JAMA](#)

- This study published in JAMA compared the neutralizing-antibody response to 4 variants in infected and vaccinated individuals to determine how mutations within the spike protein are associated with virus neutralization to understand concerns about the breadth of neutralizing-antibody responses that emerged due to the different SARS-COV2 variants.
- Serum samples were obtained from 3 groups of individuals - hospitalized adults with SARS-CoV-2 infection (PCR confirmed) , infected convalescent individuals (PCR or antigen test confirmed) and de-identified serum samples were drawn 14 days after the second dose (100-µg cohort) from individuals in the mRNA-1273 phase 1 clinical trial.
- Four variants chosen to represent the original SARS-CoV-2 strain and emerging variants with mutations in the spike protein were examined.
- The first variant, nCoV/USA_WA1/2020 (A.1 lineage), closely resembled the original Wuhan strain, the second variant, EHC-083E (B.1 lineage), was the predominant circulating strain at the time of the study, the third variant, B.1.1.7, was originally identified in the UK and of concern because of increased transmissibility and the fourth variant, N501Y SARS-CoV-2 virus, containing a mutation in the critical receptor binding domain of the spike that is present across multiple emerging variants, including the B.1.1.7 variant in this study, was generated from an infectious clone.
- Live-virus focus reduction neutralization tests (FRNTs) were performed. This study found neutralizing activity of infection- and vaccine-elicited antibodies against 4 SARS-CoV-2 variants, including B.1, B.1.1.7, and N501Y. **Because neutralization studies measure the ability of antibodies to block virus infection, these results suggest that infection- and vaccine-induced immunity may be retained against the B.1.1.7 variant.**
- The study concluded that as additional variants emerge, neutralizing-antibody responses after infection and vaccination should be monitored. Limitations of the study include the small sample size, possible selection bias, lack of clinical outcomes, and how neutralization titers correlate with protection



Article 3:

Sustained neutralising antibodies in the Wuhan population suggest durable protection against SARS-CoV-2

Published

March 20, 2021 in [THE LANCET](#)

- This article published in the Lancet discusses the sustained levels of neutralising antibodies noted in the Wuhan population thereby suggesting longer protection against SARS-COV2.
- This is a cross-sectional, longitudinal sero-survey of 9500 Wuhan residents from 3600 households, estimated the penetration of the virus into the community. The study was initiated shortly after lockdown in Wuhan ceased in April, 2020, with follow-up over two time points (**June and October–December**, 2020). They also examined the development and durability of SARS-CoV-2 neutralising antibodies, the assumed to be correlated with protection from COVID-19.
- In this population sample, 532 (5.6%) of 9542 participants were positive for pan-immunoglobulins against SARS-CoV-2 at baseline, giving an adjusted sero prevalence of **6.92%** which was higher than the previous estimation of **3.2–3.8%**. More than **80%** of those surveyed who were seropositive were asymptomatic. A quick extrapolation of these estimates based on the population, suggests that approximately **622, 800 individuals in Wuhan would have been infected as of April, 2020, far exceeding the cumulative number of confirmed cases in Wuhan which was only 50 333 as of April 17, 2020.**
- The apparent disparity between low case numbers and high seroconversion rate seems to suggest that most seroconverted individuals produced antibodies to SARS-CoV-2 after asymptomatic infection. Neutralising antibodies were detected in **39.8% of the seropositive subgroup** and this **proportion was sustained over the 9-month study period**, indicating that putative protection was durable when it occurred. Moreover, **titres of neutralising antibodies were lower in individuals who had asymptomatic infections**, compared with those with symptomatic infection and confirmed cases and this might be simply explained by different levels of exposure to SARS-CoV-2 antigens.
- The authors concluded that efficient global management of COVID-19 will probably succeed or fail on the basis of the immunity induced by **natural infection** and, especially, vaccination. Given the relative paucity of neutralising antibodies through natural infection, this study reinforces the need for effective COVID-19 vaccines in the population-level control of the disease.
- Findings from this study also **suggest that herd immunity will likely not develop after natural transmission in settings where infection control mechanisms are successfully introduced, underscoring the importance of effective vaccination strategies to control the spread of COVID-19.**



Article 4:

Seroprevalence of SARS-CoV-2 Antibodies in the US Adult Asymptomatic Population as of September 30, 2020

Published

March 16, 2021 in [JAMA](#)

- This cross-sectional study published in JAMA assesses the seroprevalence of SARS-CoV-2 in a nationwide, in the USA through viral serologic testing as this may provide a more accurate estimate of disease prevalence.
- A convenience sample of 61,910 self-reported well life insurance applicants was evaluated for the presence of antibody to nucleocapsid protein with an immunoassay intended for qualitative detection of antibodies to SARS-CoV-2 in human serum and plasma at the Clinical Reference Laboratory in Lenexa, Kansas. This test has a reported sensitivity and specificity of 99.5% and 99.8%, respectfully.
- To estimate the total burden of SARS-CoV-2 infections in the United States, the 2019 estimated US Census population was multiplied by the proportion of the US population between the ages of **16 and 80 years (75.5%)**, the selected adult portion of the total population. Then, the state-specific proportion of positive test results was applied from the sample.
- A total of 61,910 participants were tested for antibodies to SARS-CoV-2. Out of this, 4094 were seropositive participants, 2215 (54%) were male. The median age of male participants was 39 years and for female was also 39 years.
- Among the 57,816 seronegative participants, 56% were male with a median age of 42 years and for the 27,173 seronegative female participants the median age was 41 years. The differences in age and sex were both significant.
- The seroprevalance rate was slightly higher for **female than male** participants (6.9% compared with 6.4%) and was associated with age; **those older than 70 years had the lowest seroprevalence rate (2.8%)**, and those younger than 30 years **(9.8%) had the highest seroprevalence rate**.
- On the basis of this sample, it was estimated that 15.9 million asymptomatic or undiagnosed SARS-CoV-2 infections had occurred in the United States as of September 30, 2020. These estimates implied more than twice the number of infections than cases reported to the CDC, suggesting a more widespread pandemic. Findings from this study validate the need for ongoing population-wide surveillance.
- Based on the findings of this study, the overall number of SARS-CoV-2 infections in the US may be substantially higher than estimates based on public health case reporting.



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