

# SCIENTIFIC RESEARCH MONITORING ON COVID-19

**3 NOVEMBER 2020**

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# SCIENTIFIC RESEARCH MONITORING ON COVID-19

## (ISSUE 545)



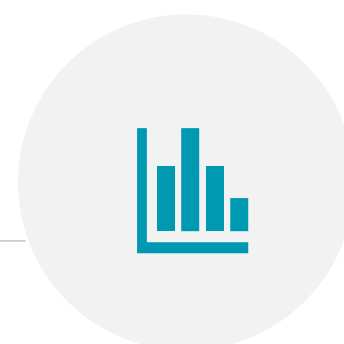
Abu Dhabi Public Health Center (ADPHC) is gathering the latest scientific research updates and trends on coronavirus disease (COVID-19) in a daily report. The report provides summaries on breakthrough or updated research on COVID-19 to allow health care professionals and public health professionals get easy and fast access to information.

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### Research

Update



### Statistics

[Slide 4](#)



### 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](mailto: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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## Immunology

**Herd Immunity and  
Implications for SARS-CoV-2  
Control**

## Immunology

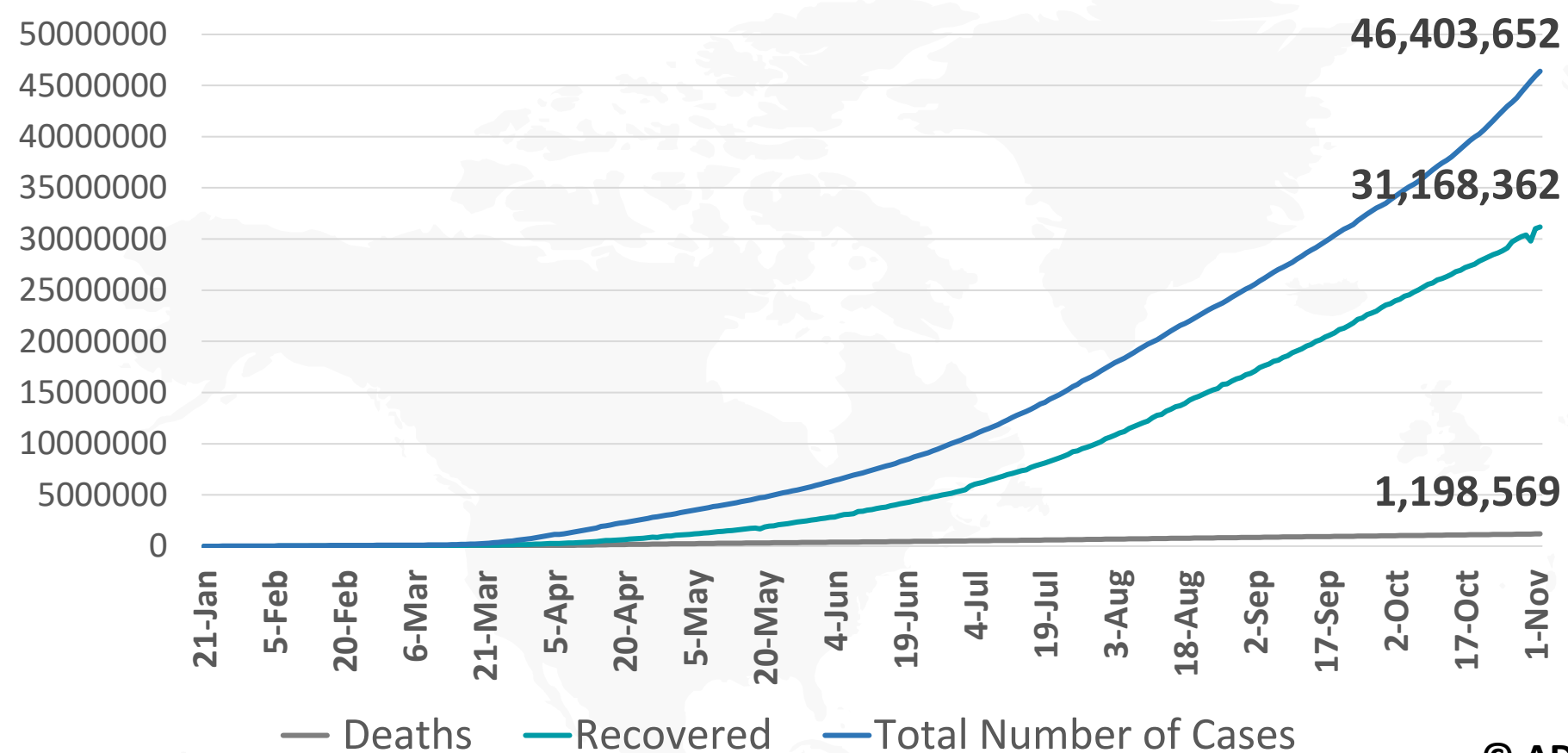
**Herd Immunity Confusion**

## Public Health Response

**Slovakia to Test All Adults for  
SARS-CoV-2**



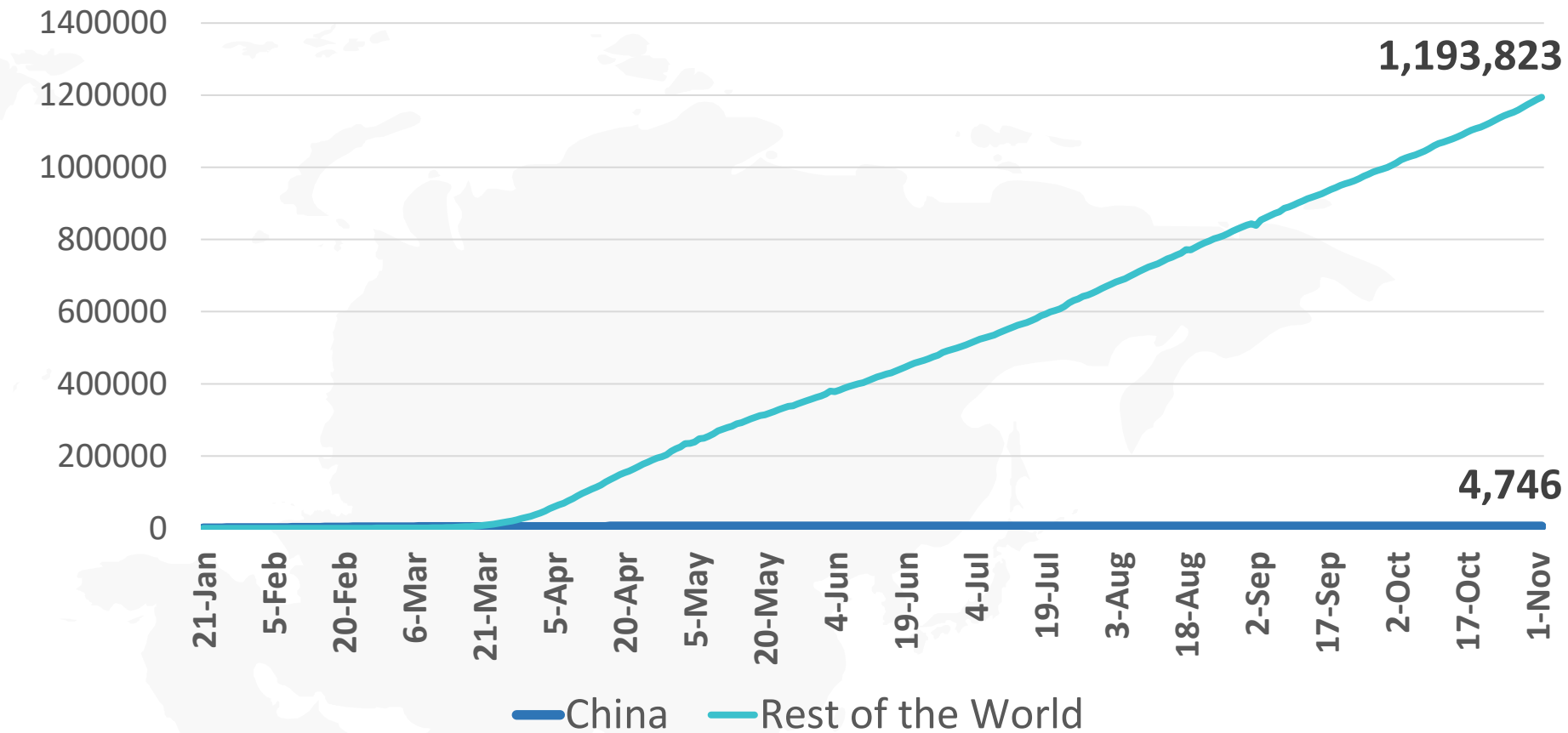
**Figure 1: Total Number of Infected, Recovered, and Death Cases**



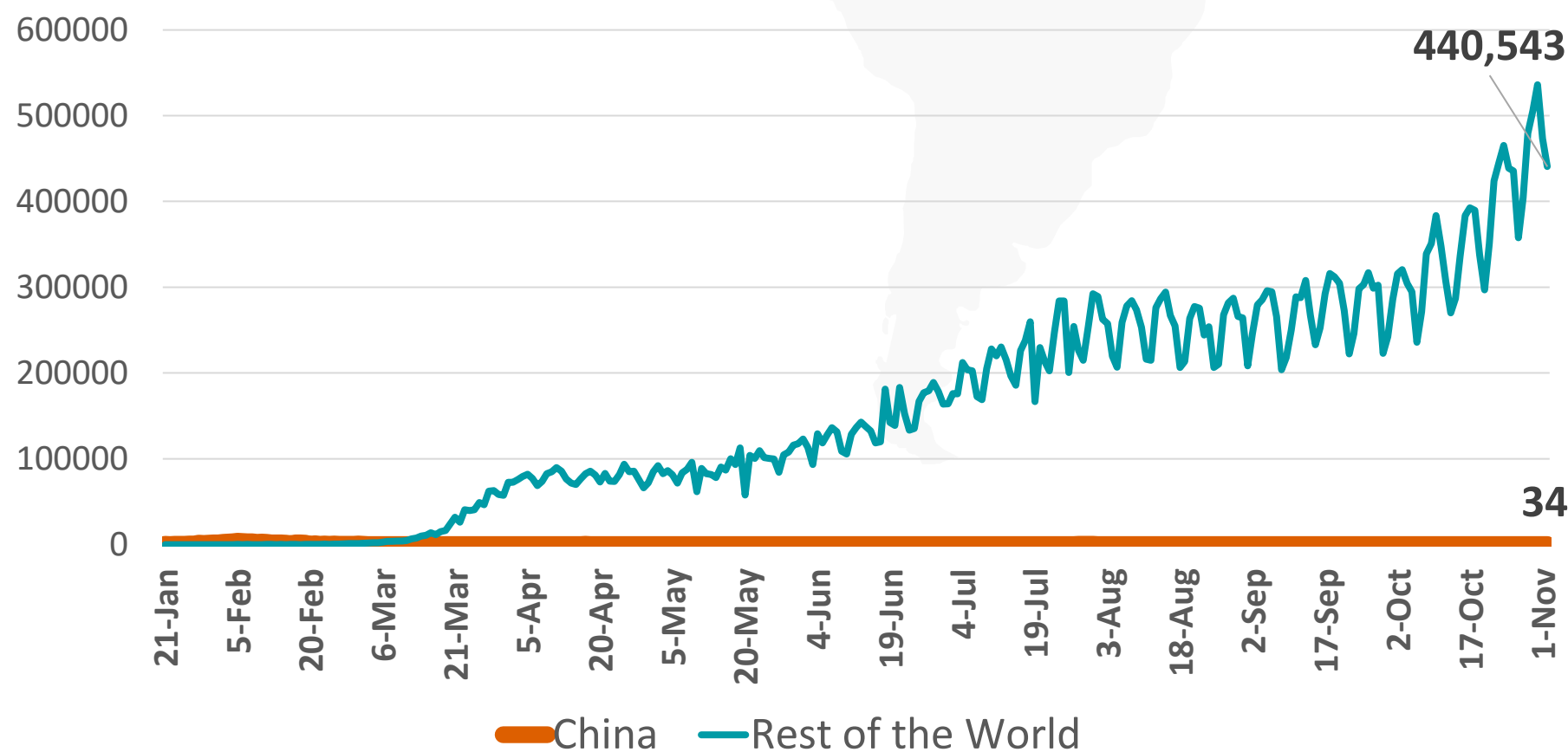
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Note: the number of recovered cases in 31<sup>st</sup> October recorrected from 30 million to 29 million in Johns Hopkins website

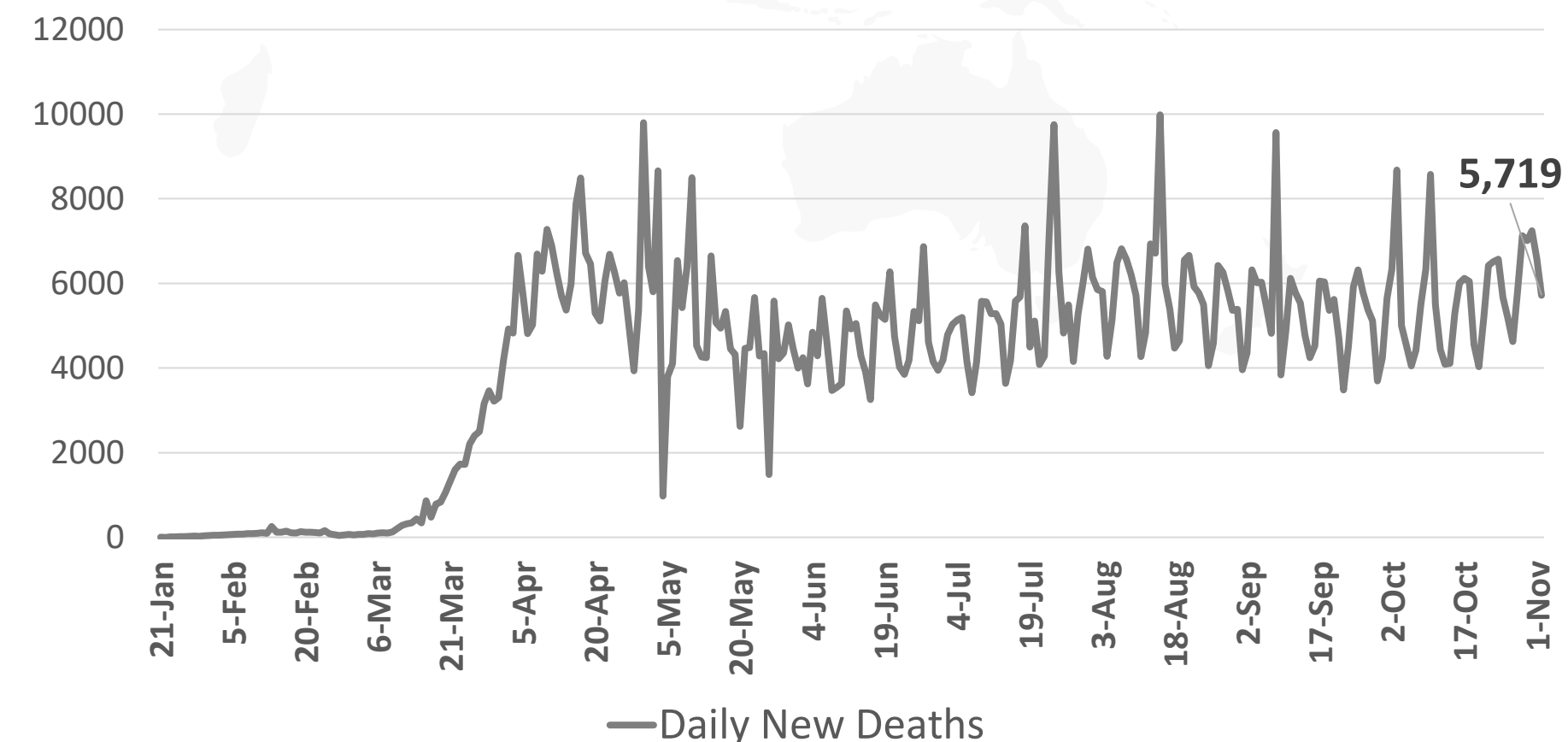
**Figure 3: Total Number of Death Due to COVID-19 (china and result of the world)**



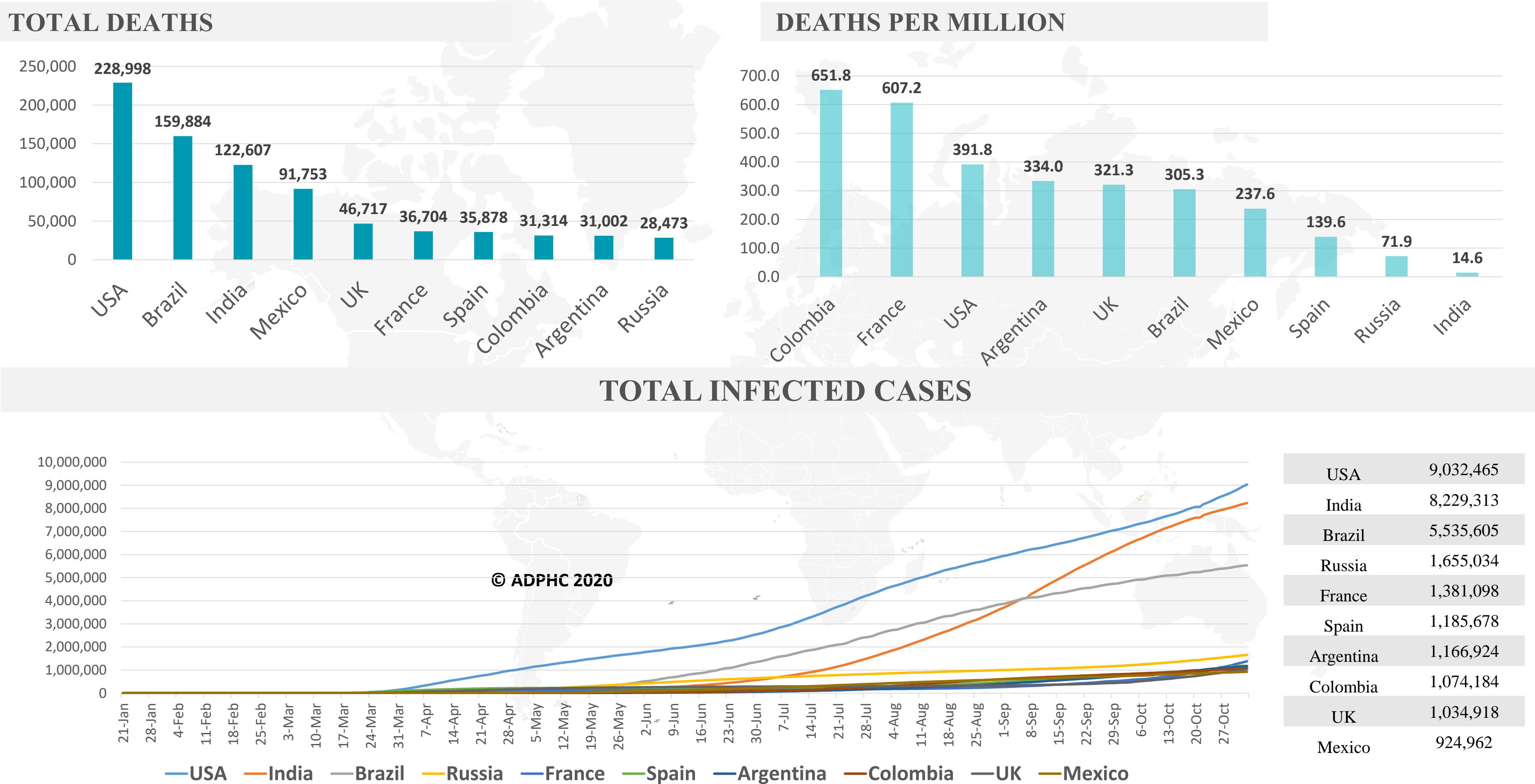
**Figure 2: Daily New Infected COVID-19 Cases (China and rest of the world)**



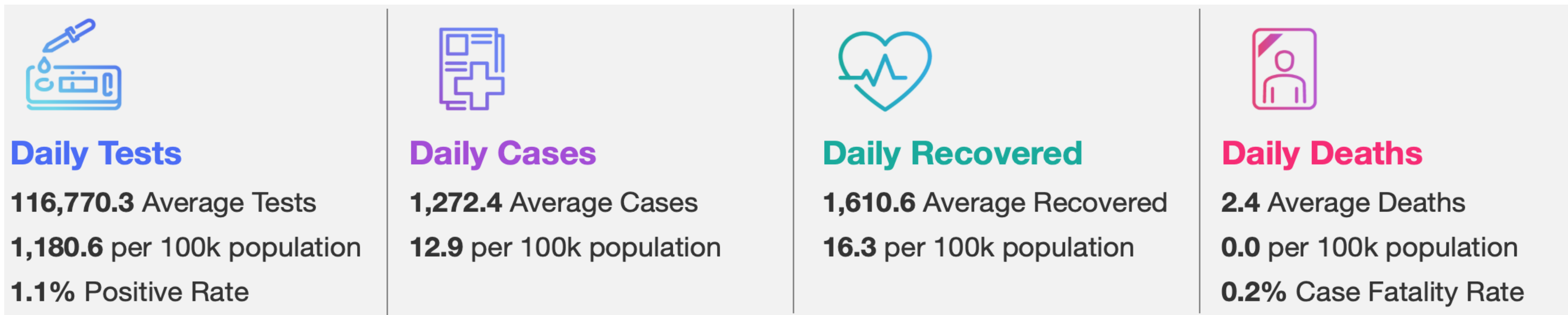
**Figure 4: Global Daily New Deaths Due to COVID-19 (china and rest of the world)**



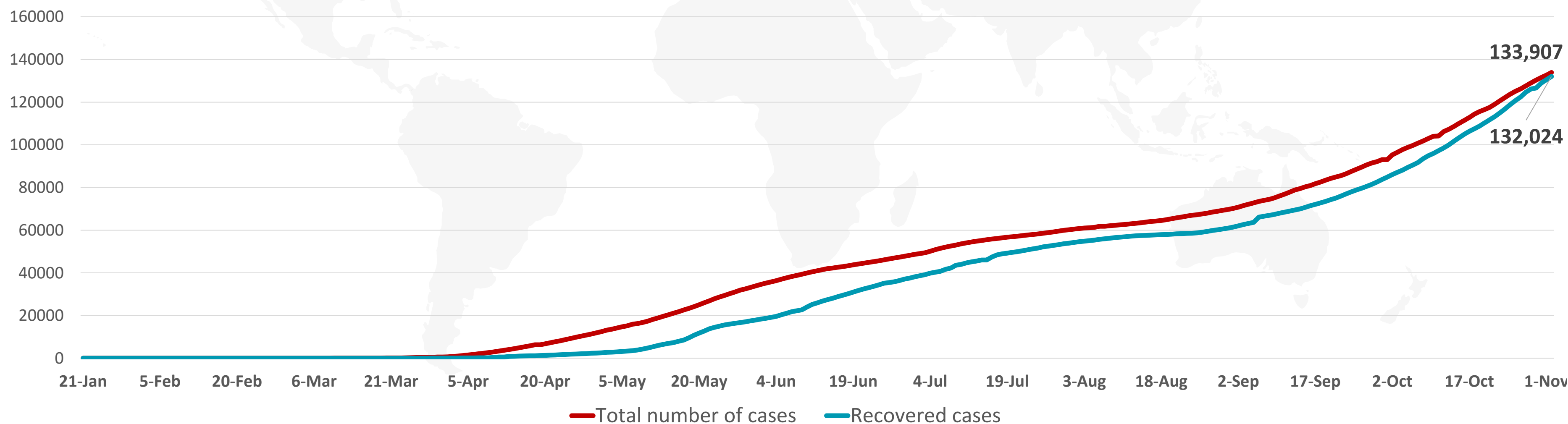
## Figure 5: Top 10 Countries in the Total Number of Cases Due to COVID-19



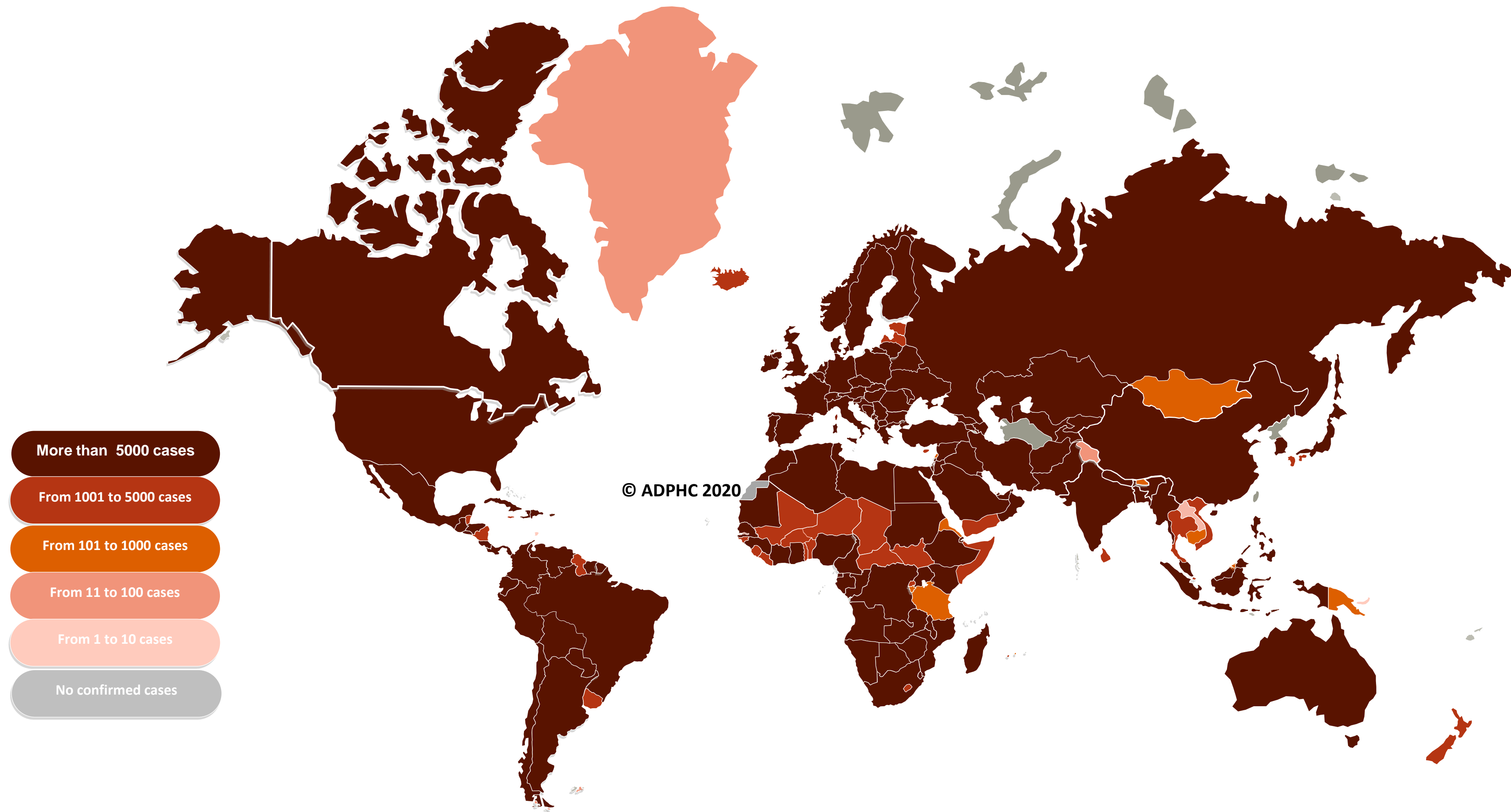
**Figure 6: COVID-19 Status in the UAE** (Federal Competitiveness and Statistics Authority Dashboard)



## TOTAL NUMBER OF INFECTED AND RECOVERED CASES DUE TO COVID-19 REPORTED BY THE UAE



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



More than 5000 cases

From 1001 to 5000 cases

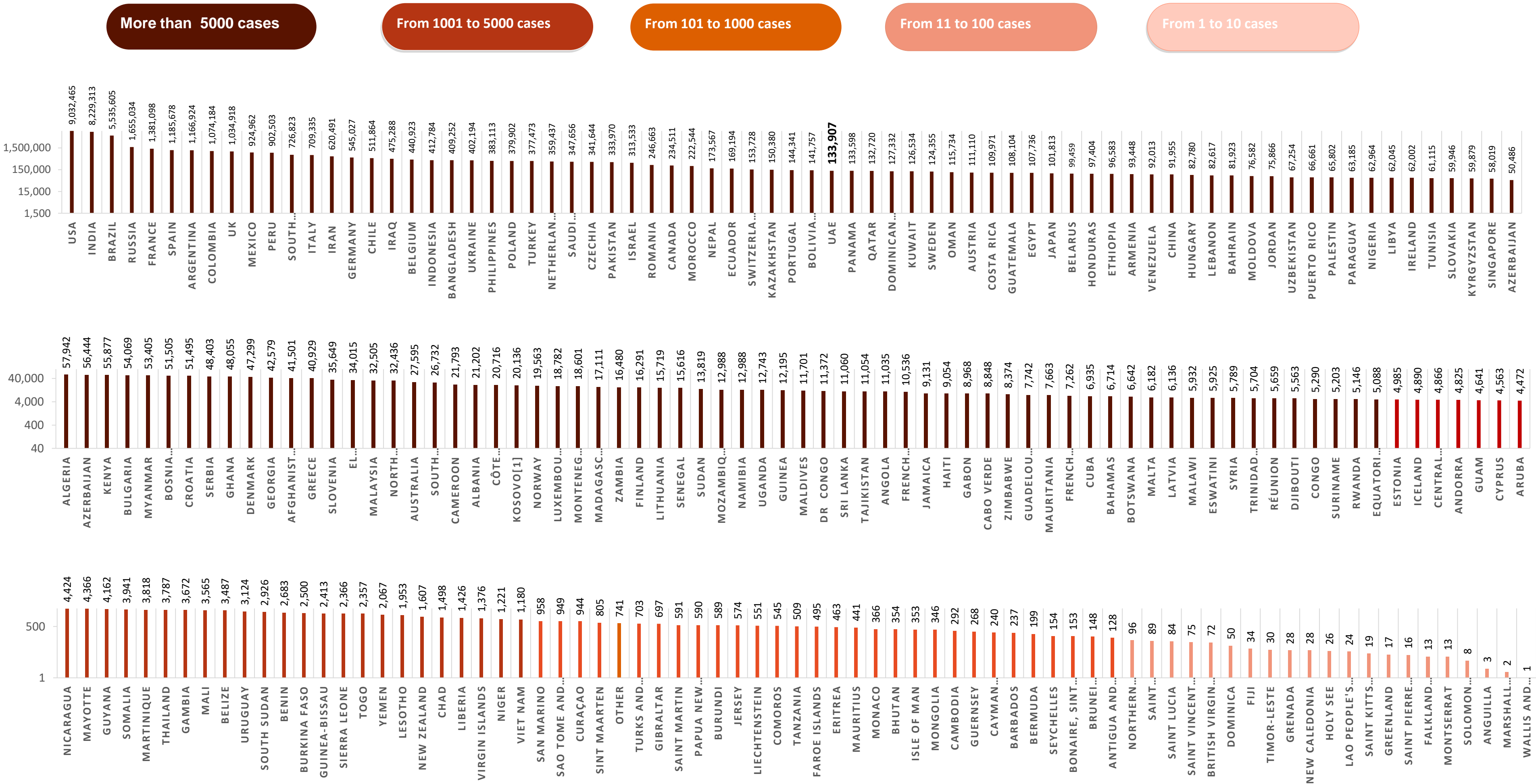
From 101 to 1000 cases

From 11 to 100 cases

From 1 to 10 cases

No confirmed cases

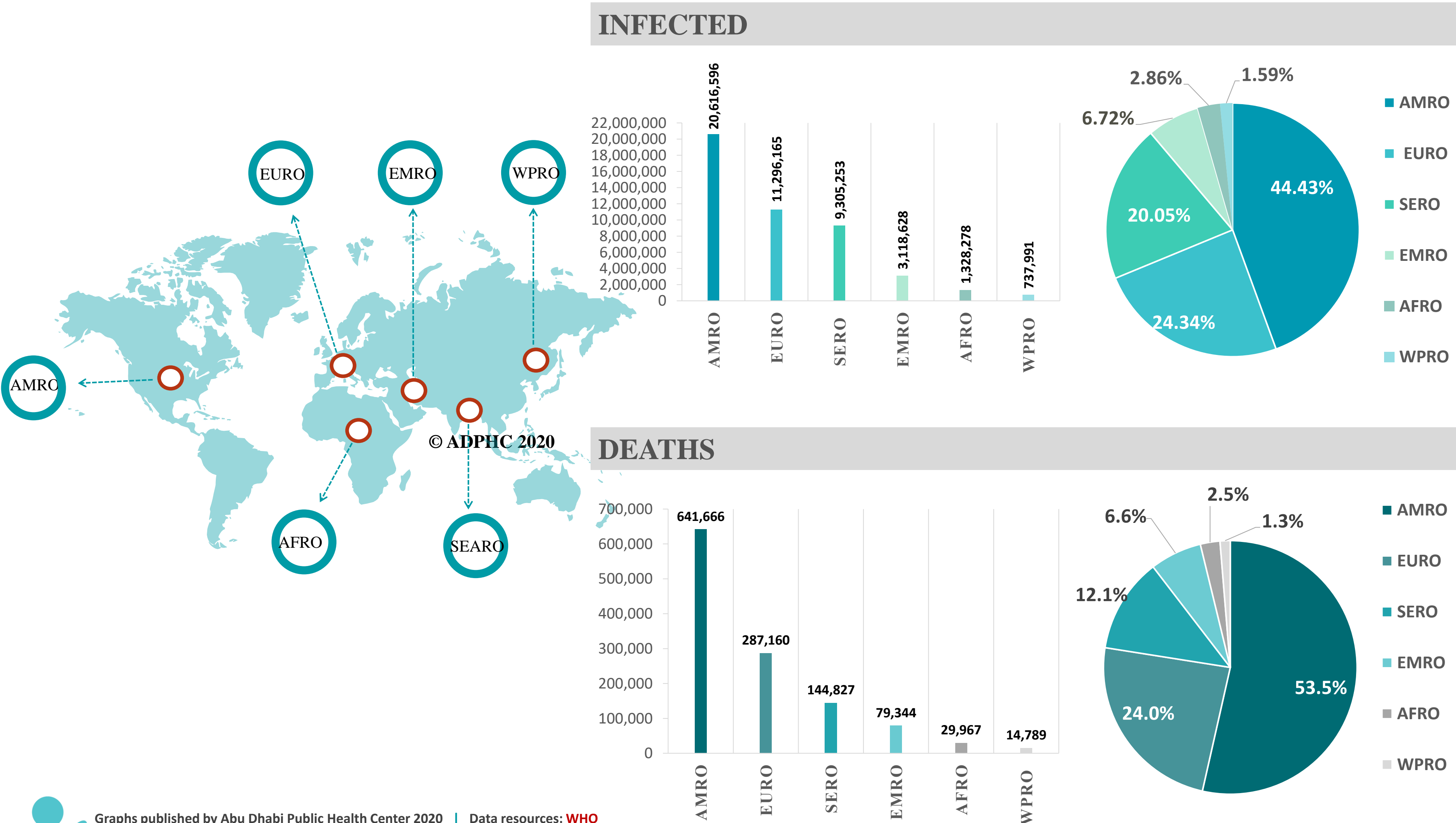
## Figure 7B: Bar Chart Illustrates the Global Distribution of COVID19 Cases



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



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



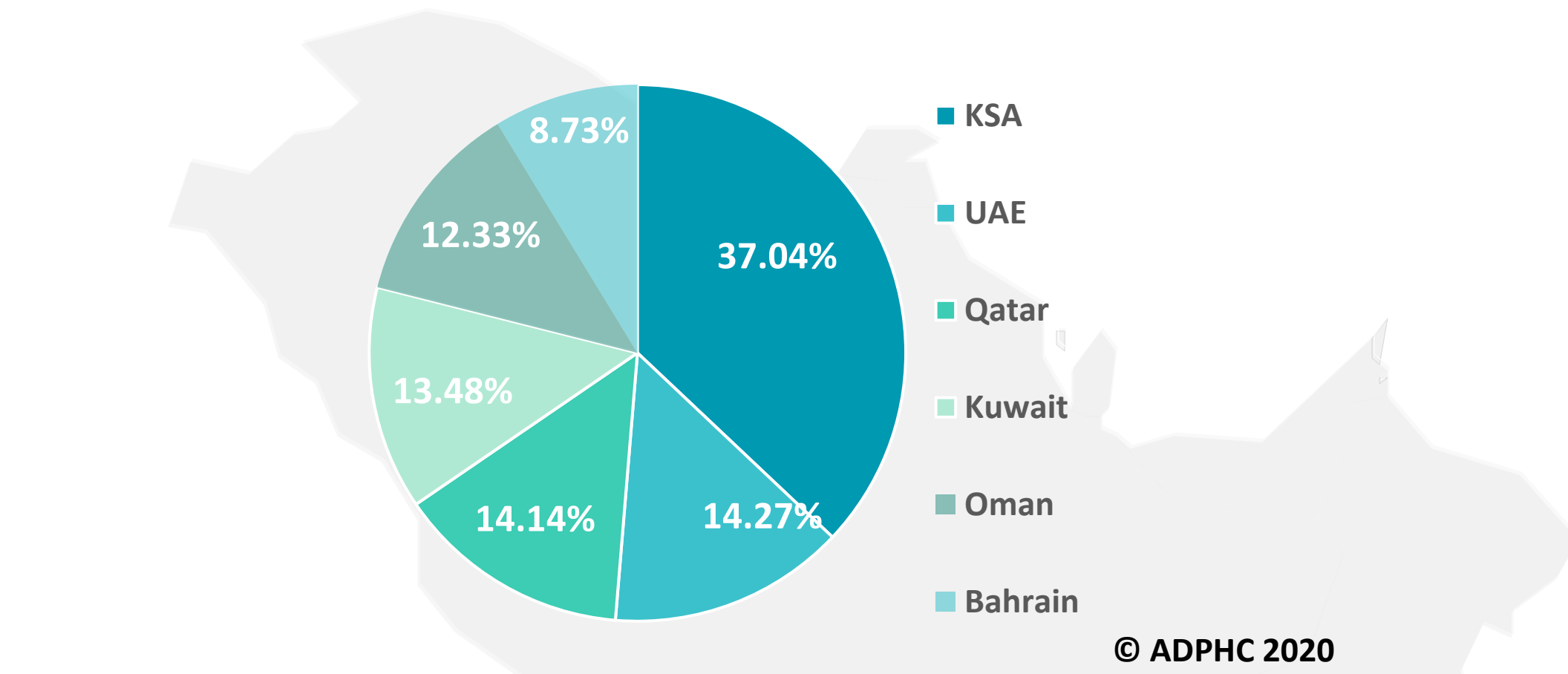
Graphs published by Abu Dhabi Public Health Center 2020 | Data resources: [WHO](#)

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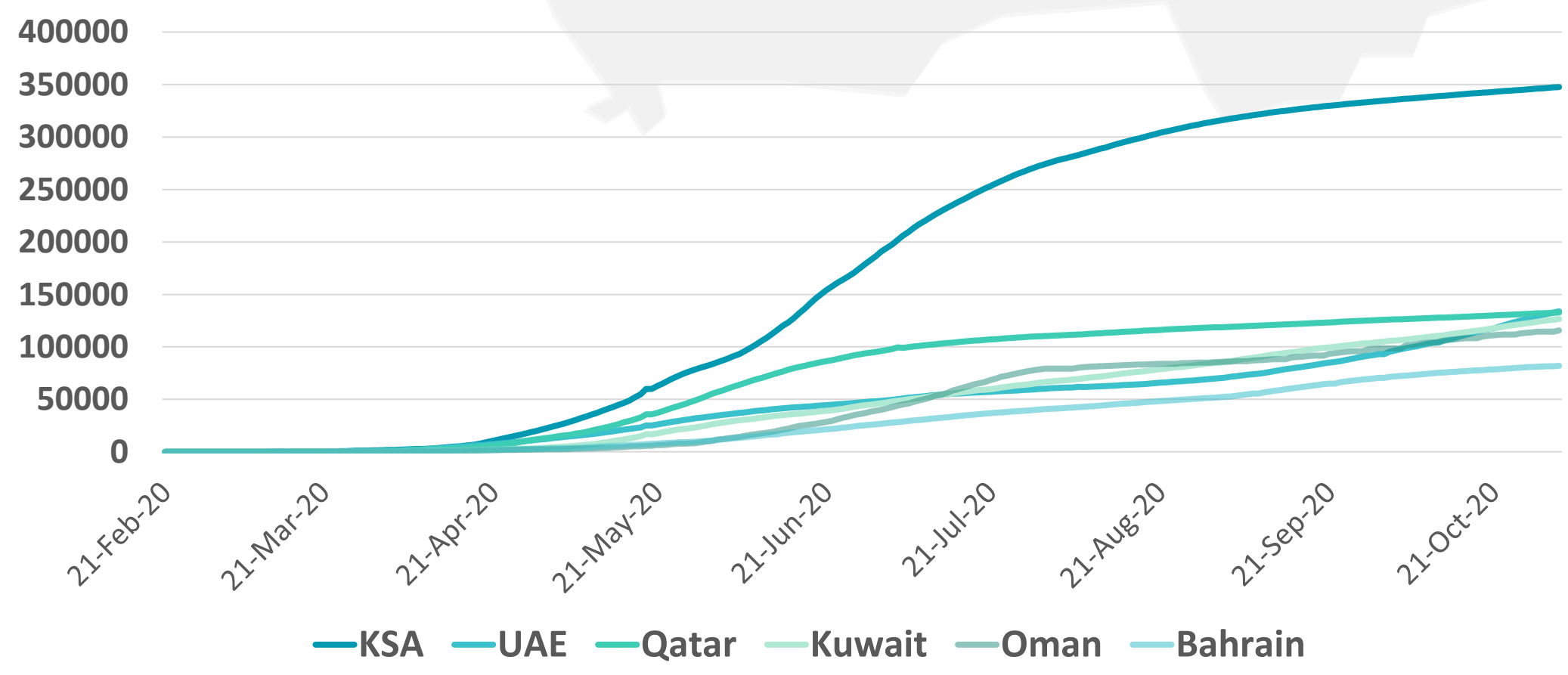
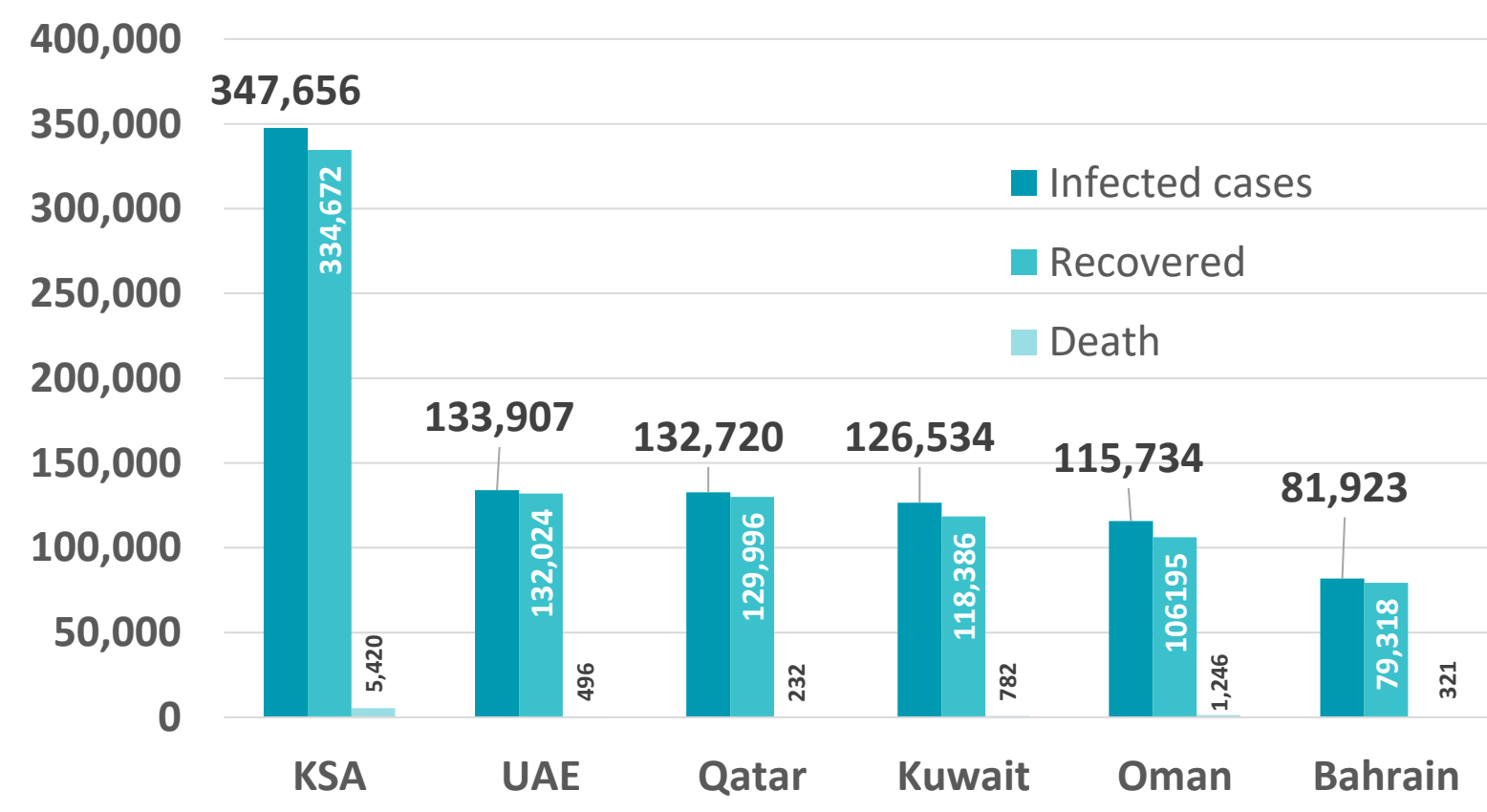
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## Figure 9: Comparative Analysis of the Distribution of COVID-19 Cases in GCC Countries

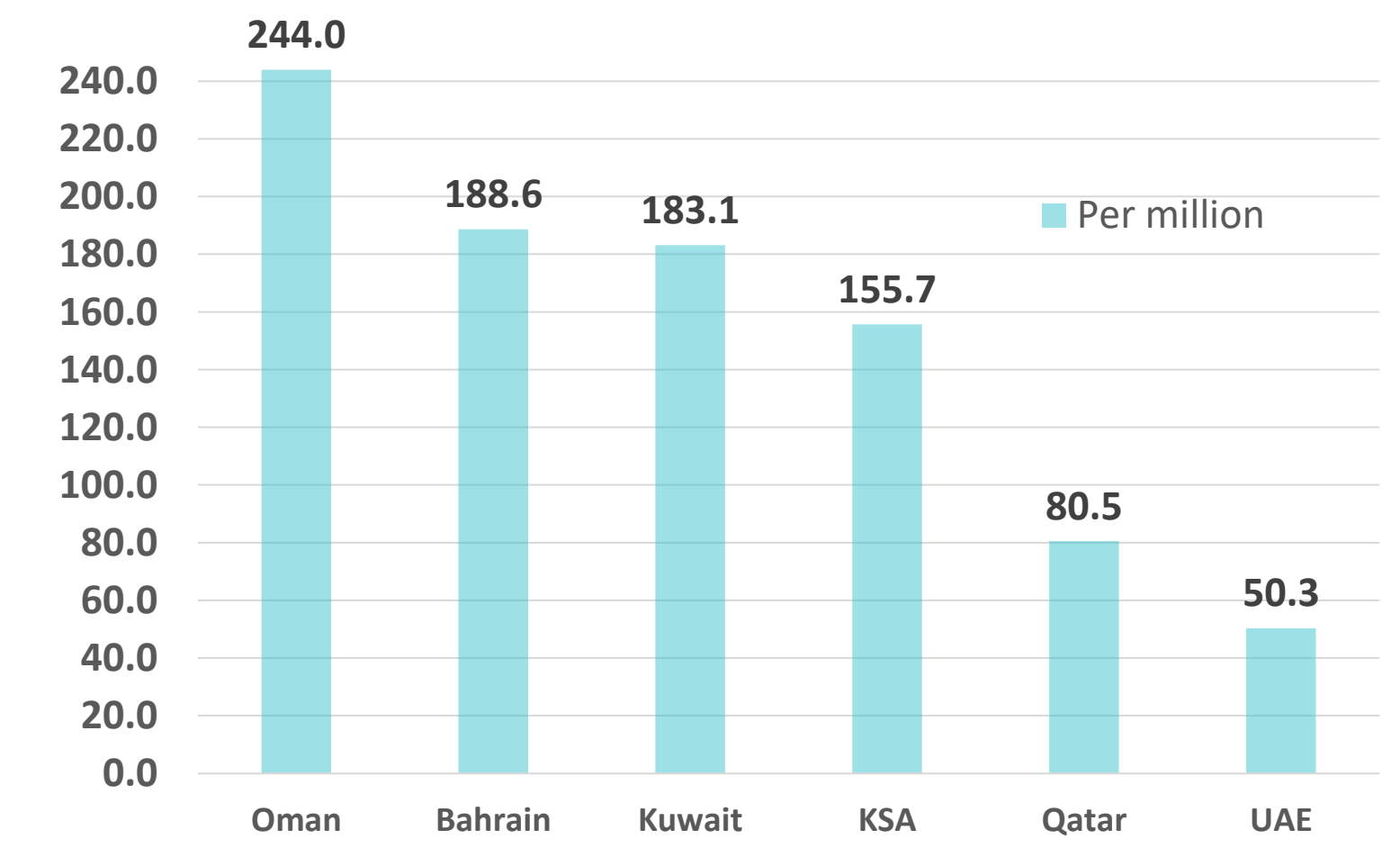
### TOTAL NUMBER OF INFECTED CASES



### 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



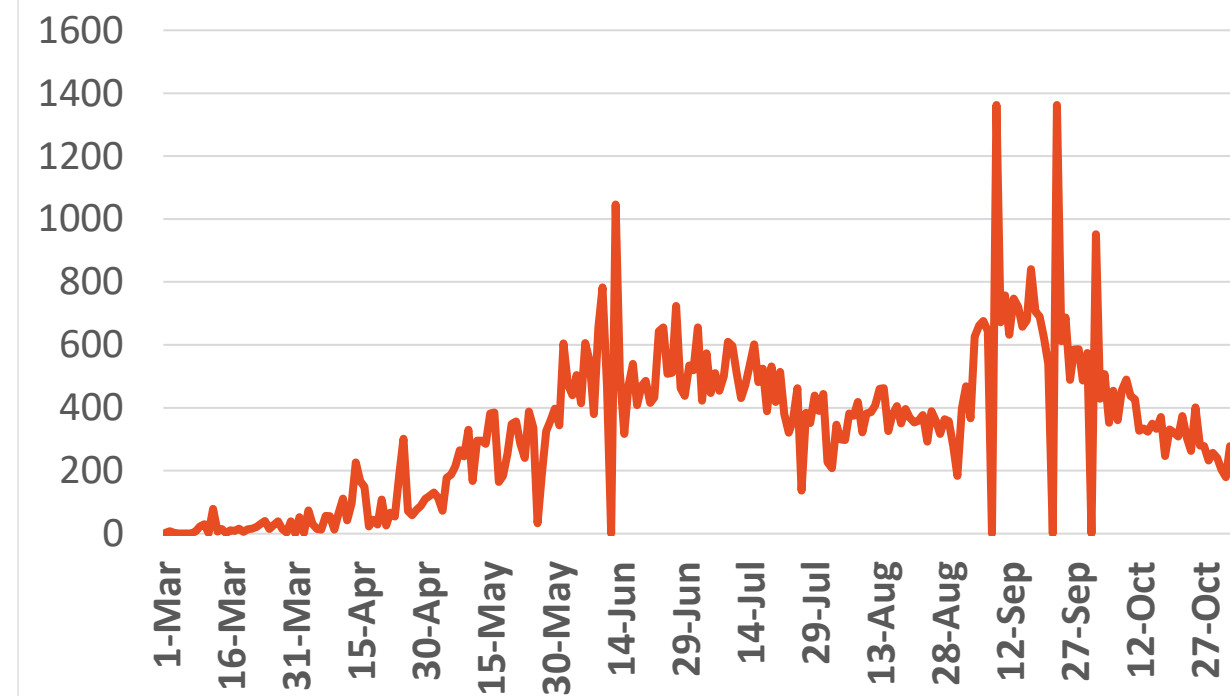
Source : National Emergency Crisis and Disaster Management Authority

### KSA



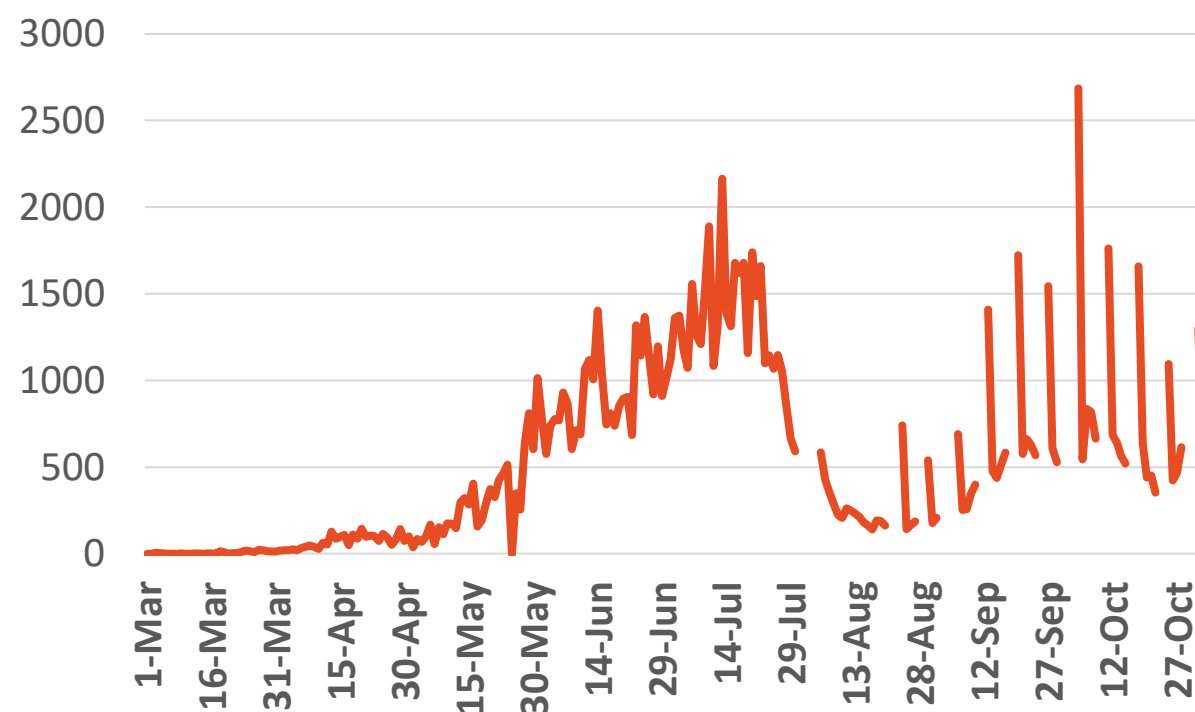
Source : KSA ministry of health

### Bahrain



Source :WHO

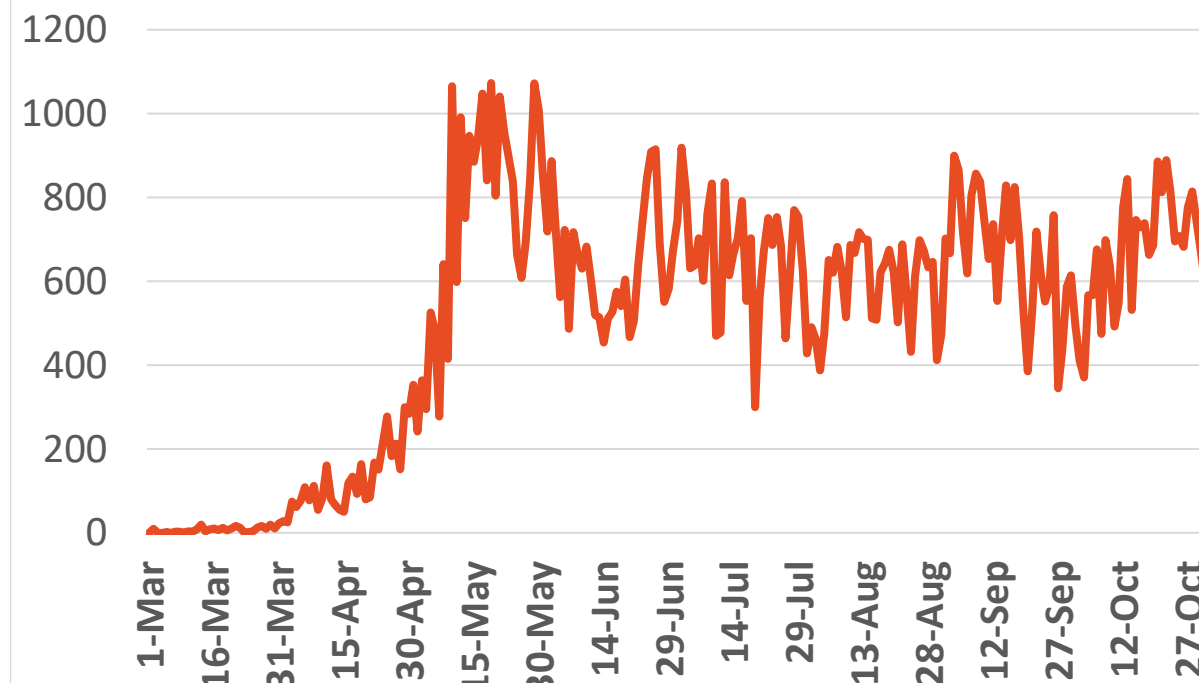
### Oman



Source :Oman ministry of health

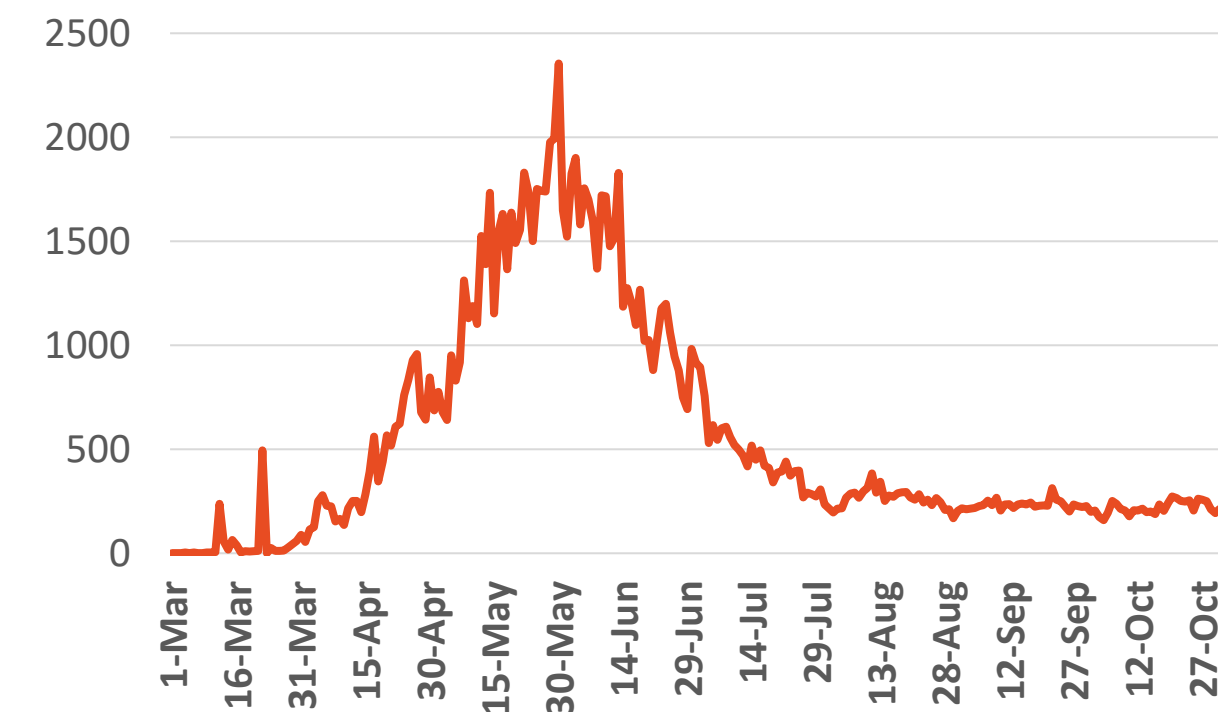
### Kuwait

© ADPHC 2020



Source : Kuwait ministry of health

### Qatar



Source : Qatar ministry of health

\*No announced statistic data from 31 July to 4 August, 21,23,28,30 August 2, 4, 5,11,12,18,19,25, 26,30 September,1,2,9,10,16,17,23 & 24 October  
\*No announced statistic data on weekends and official holidays.



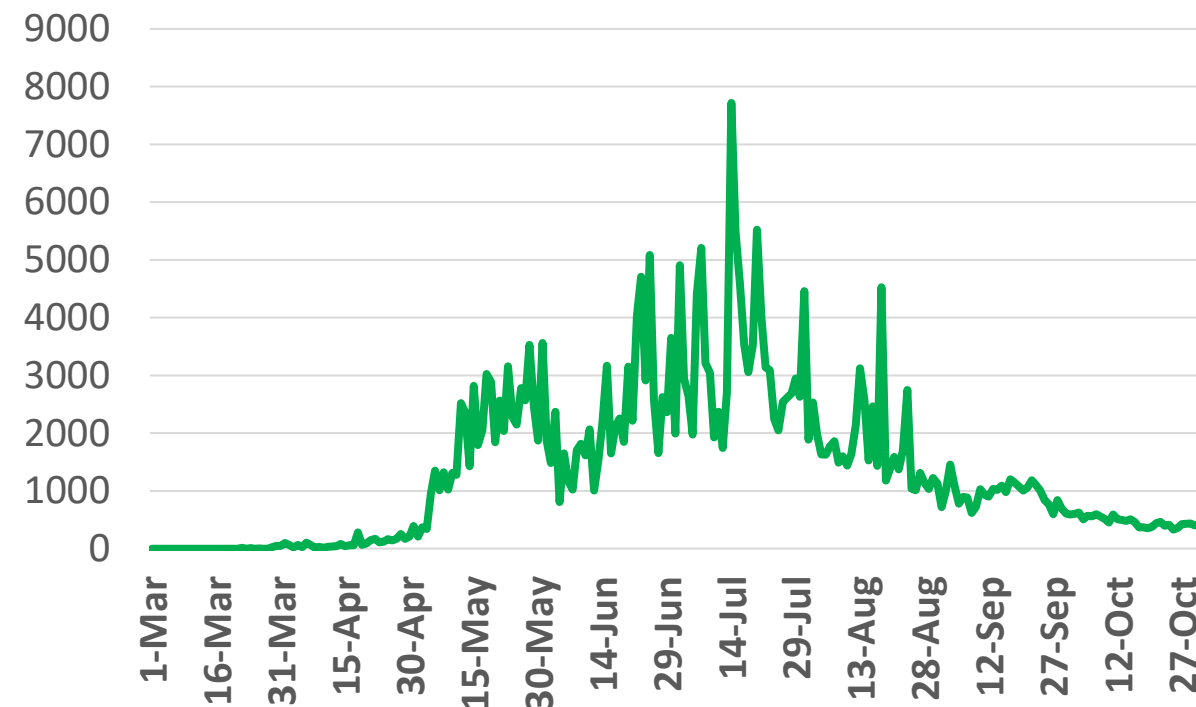
**Figure 11: Comparative Analysis of the Distribution of COVID-19 Newly Recovered Cases in GCC Countries**

## UAE



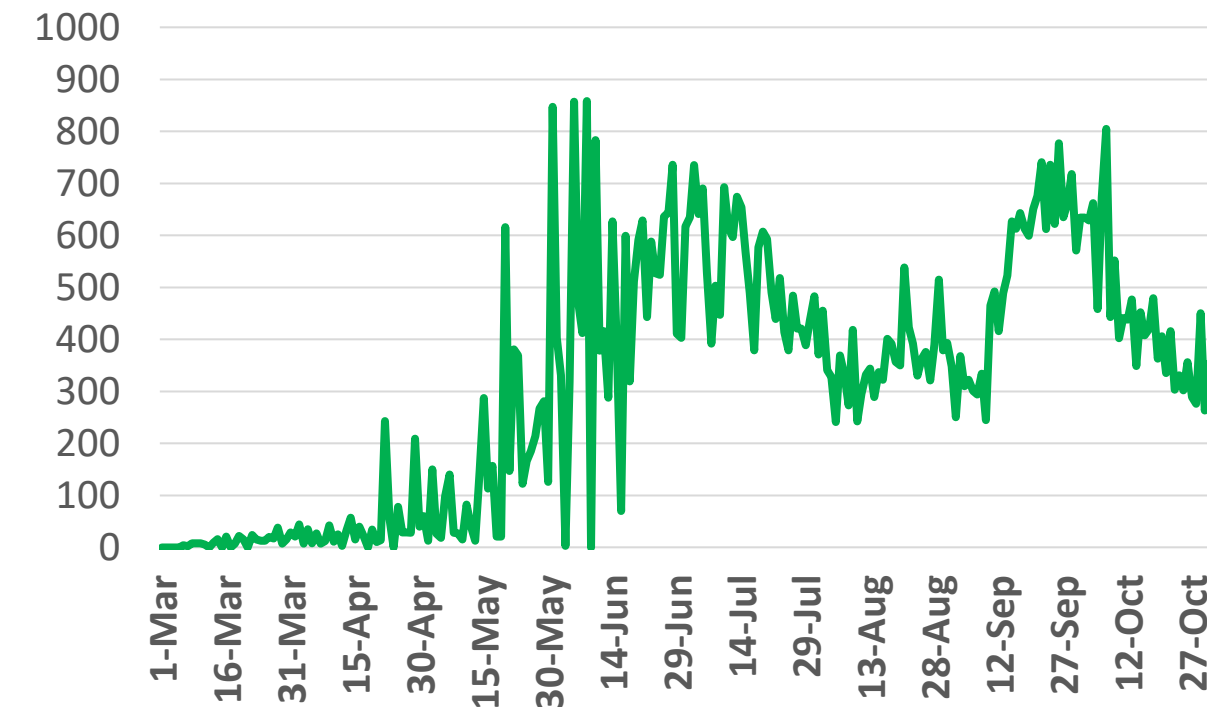
Source : National Emergency Crisis and Disaster Management Authority

## KSA



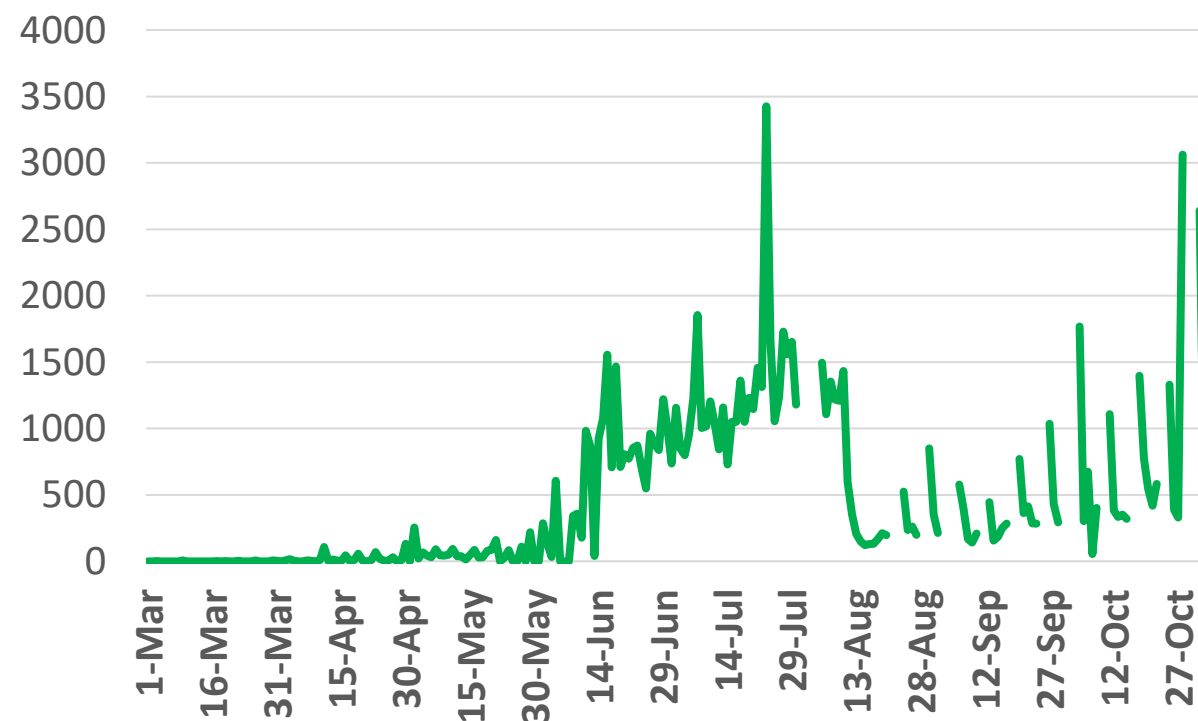
Source : KSA ministry of health

## Bahrain



Source : Bahrain ministry of health

## Oman



Source : Oman ministry of health

## KUWAIT © ADPHC 2020



Source : Kuwait ministry of health

## Qatar



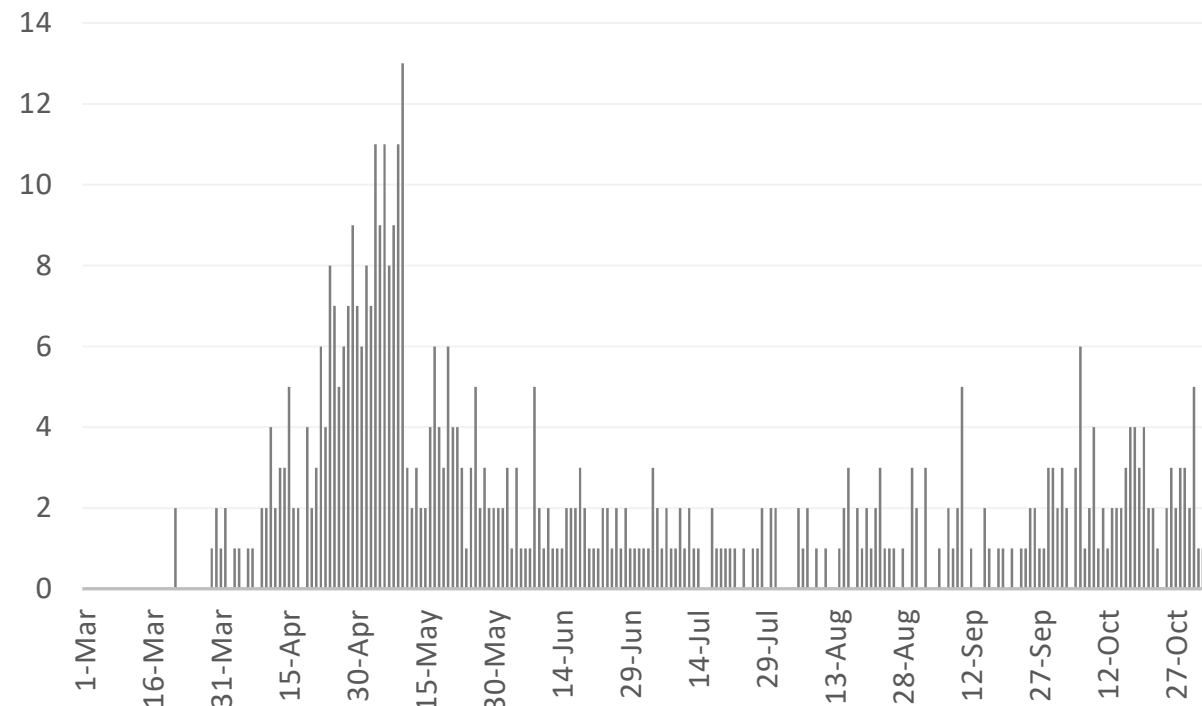
Source : Qatar ministry of health

\*No announced statistic data from 31 July to 4 August, 21,23,28,30 August 2,4, 5,11,12,18,19,25,26,30 September,1,2,9,10,16 &17,23 &24 October  
\*No announced statistic data on weekends and official holidays.



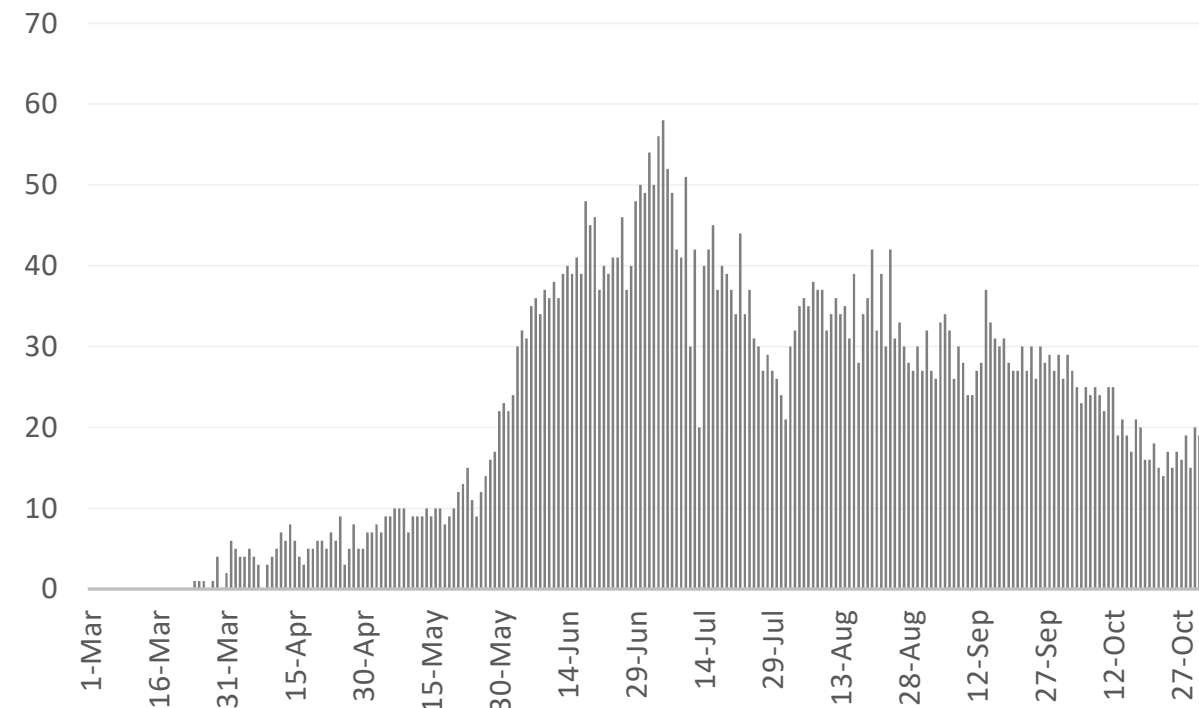
## Figure 12: Comparative Analysis of the Distribution of COVID-19 New Death Cases in GCC Countries

### UAE



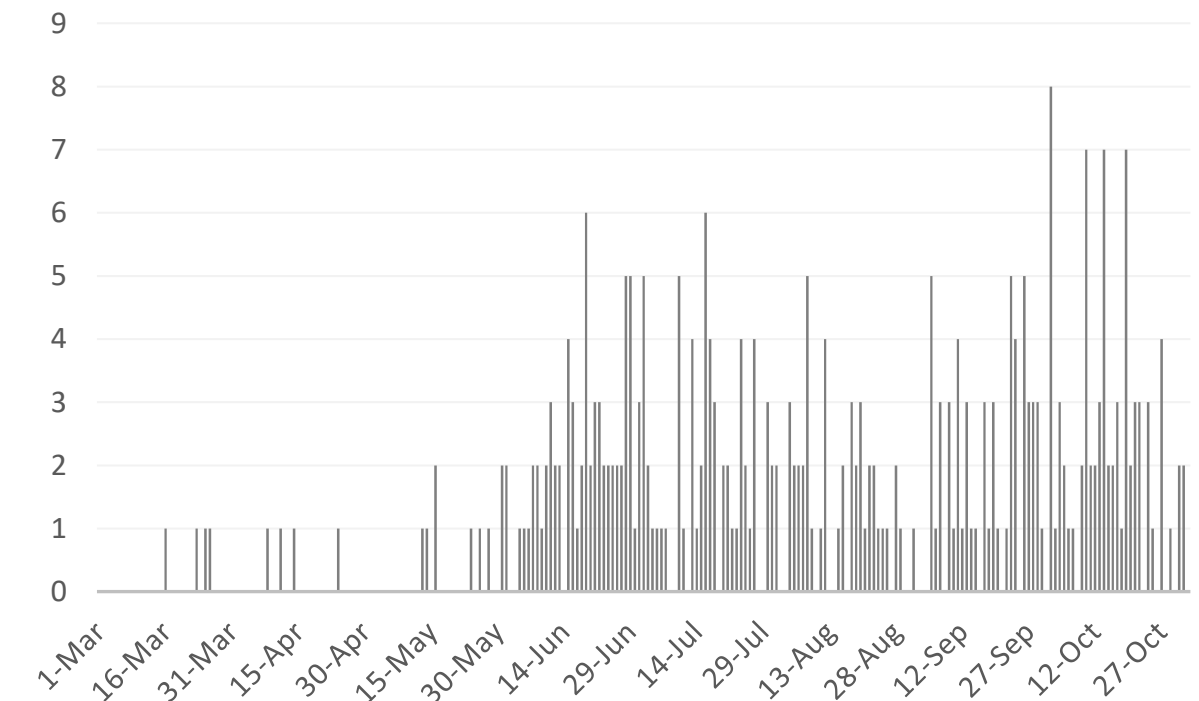
Source : National Emergency Crisis and Disaster Management Authority

### KSA



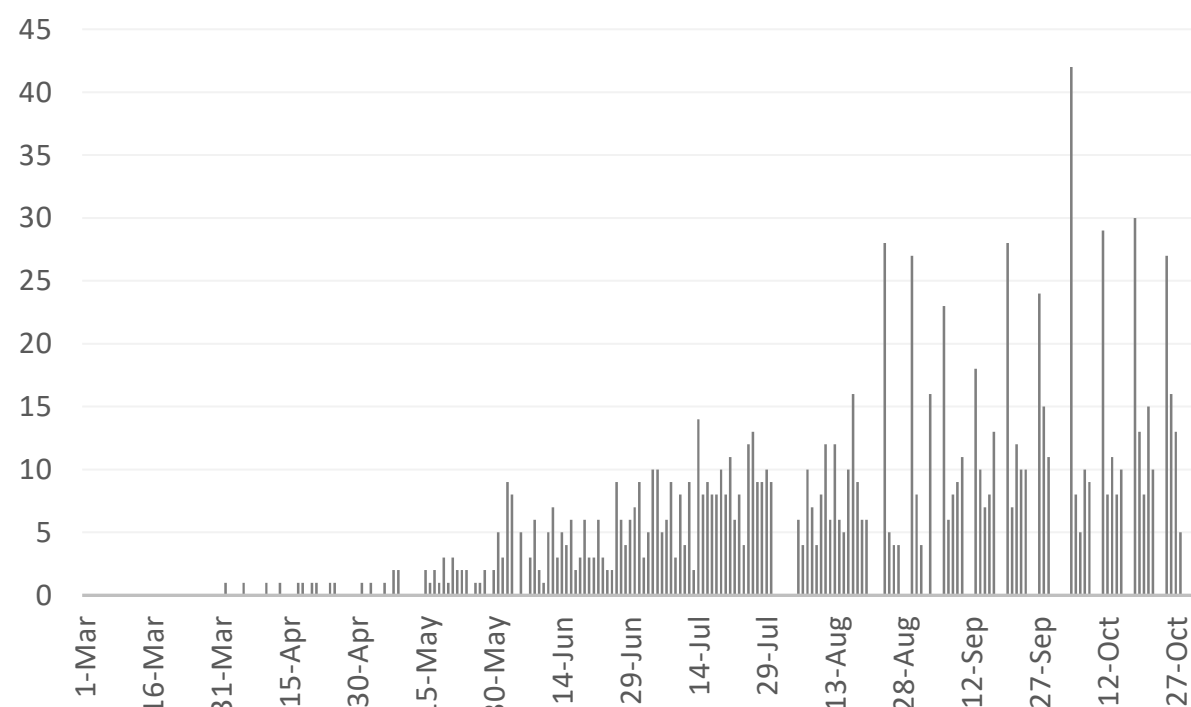
Source : KSA ministry of health

### Bahrain



Source :WHO

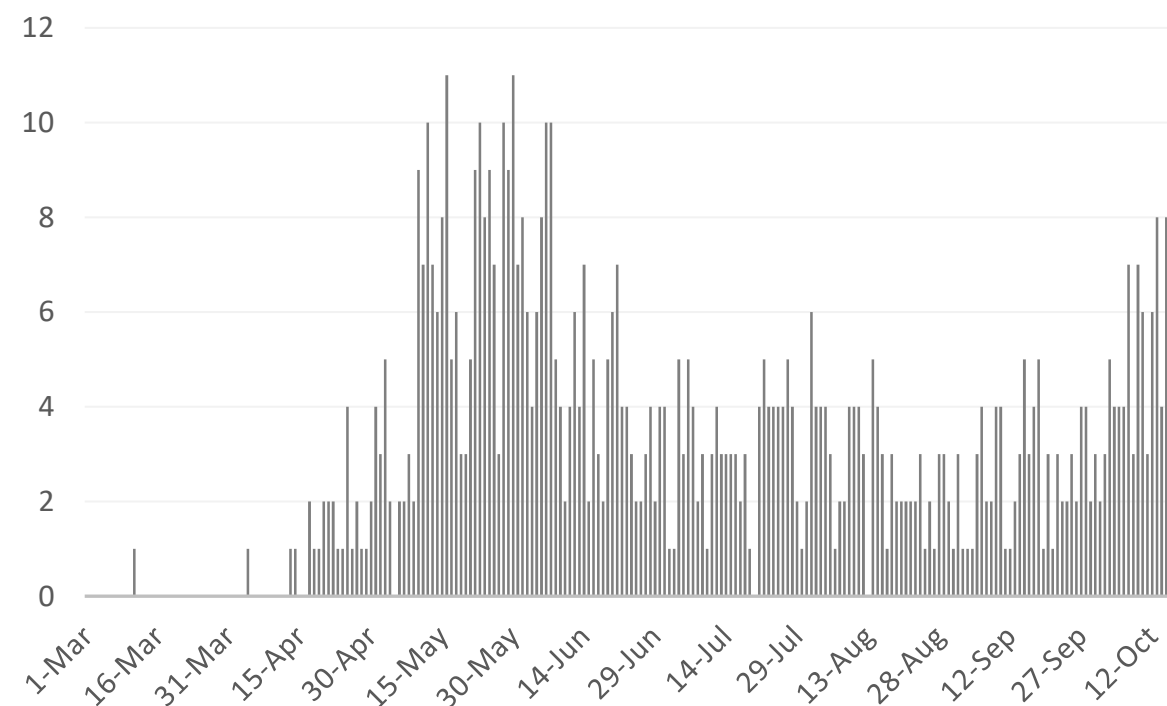
### Oman



Source :Oman ministry of health

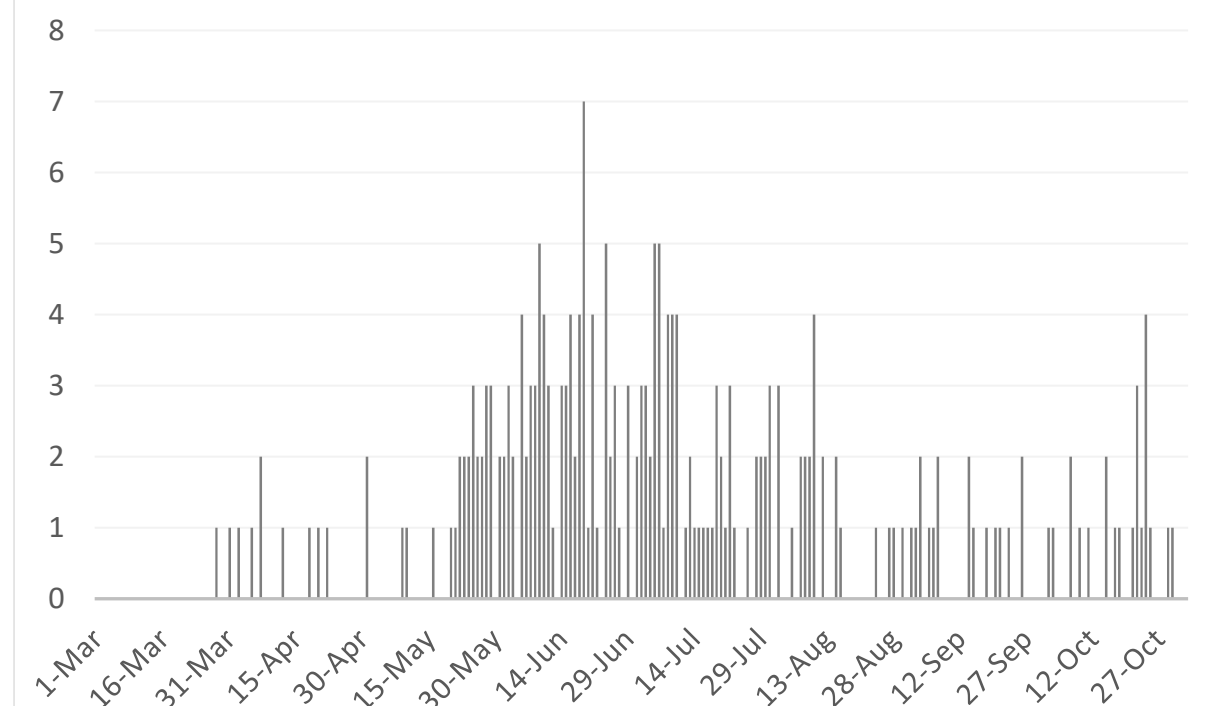
### Kuwait

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Source : Kuwait ministry of health

### Qatar



Source : Qatar ministry of health

\*No announced statistic data from 31 July to 4 August, 21,23,28,30 August 2,4, 5,11,12,18,19,25,26,30 September,1,2,9,10,16 &17,23 &24 October  
\*No announced statistic data on weekends and official holidays.



## Article 1

# Herd Immunity and Implications for SARS-CoV-2 Control

Published

October 19, 2020 [JAMA](#)

**Individual immunity** gained through natural infection or through vaccination

Sufficiently **large proportion of immune individuals** exist in a population

**Protection of susceptible individuals** against an infection

## Herd Immunity

- Herd immunity is also known as *indirect protection, community immunity or community protection*
- Successful examples of vaccine-induced herd immunity:
  - Eradication of smallpox
  - Sustained reductions in disease incidence in adults and those who are not vaccinated following routine childhood immunization with conjugated Haemophilus influenzae type B and pneumococcal vaccines are of the effects

## Herd Immunity Threshold

- It is the proportion of individuals in a population who, having acquired immunity, can no longer participate in the chain of transmission.
- The herd immunity threshold depends on the basic reproduction number ( $R_0$ ; the average number of persons infected by an infected person in a fully susceptible population) and is calculated as  $1 - 1/R_0$
- SARS-CoV-2  $R_0$  estimated range is 2 to 3.
- **Assuming no population immunity and that all individuals are equally susceptible and equally infectious, the herd immunity threshold for SARS-CoV-2 would be expected to range between 50% and 67% in the absence of any interventions.**



## Continued

### Duration of Protection

- With seasonal coronaviruses, durable immunity has not been observed or has been short-lived. With an effective vaccine and vaccine program, herd immunity can be sustained even if periodic vaccination is required to do so.

### Role of Heterogeneity

- Individuals who have higher numbers of interactions get infected earlier in outbreaks. This may contribute to the slowing of community spread of infection before reaching the nominal herd immunity threshold.
- Effect of heterogeneity in social mixing on herd immunity against SARS-CoV-2 is uncertain.

### T-Cell Cross-Reactivity

- Cross-reactivity with other coronaviruses may confer relative protection of the population from coronavirus disease 2019 (COVID-19). It is less clear that T-cell cross-reactivity could provide sterilizing immunity (i.e. that the host could not carry nor transmit infection) as opposed to reducing the severity of illness.

### Infection-Based Herd Immunity as Policy

- An infection-based herd immunity approach (i.e. letting the low-risk groups become infected while “sequestering” the susceptible groups), has been proposed to slow the spread of SARS-CoV-2.
- However, such a strategy is fraught with risks e.g. even with modest infection fatality ratios a new pathogen will result in substantial mortality because most, if not all, of the population, would not have immunity to the pathogen.
- Sequestering the high-risk population is impractical.
- Moreover, so far, there is no example of a large-scale successful intentional infection-based herd immunity strategy.

***“Vaccines must not only be effective, but vaccination programs must be efficient and broadly adopted.”***



## Article 2

# Herd Immunity Confusion

Published

October 22, 2020 [THE LANCET](#)

- Herd immunity is a real phenomenon that occurs whether the immunity generated is naturally acquired or vaccine-induced.
- The severe acute respiratory syndrome coronavirus 2 epidemic is ongoing, and it remains the case that although most people remain susceptible to infection, control of transmission has to be through non-pharmaceutical interventions.
- Hopefully, at some point, we will have a vaccine against SARS-CoV-2, and we will use this to seek ways of generating herd immunity.

*Ideally, this immunity will be vaccine-induced rather than through transmission of the disease.*

- Isolation and quarantine, physical distancing, and contact tracing will be required until the transmission is reduced by immunity.

*The author of this correspondence does not endorse the strategy that is being suggested by some, which is to simply protect everyone who is at risk of infection, by allowing the epidemic to spread in those at low risk.*

- Technical terms such as herd immunity should be explained by scientists to agree upon cohesive and coherent strategies
- The scientific and medical communities have a duty to inform and support the public, especially during times that threaten lives with an unknown disease.







## Article 3

# Slovakia to Test All Adults for SARS-CoV-2

Published

October 31, 2020, [THE LANCET](#)

- In Slovakia, during the COVID-19 pandemic, thousands of testing sites are to be set up for mass testing across the country. Individuals >10 years will be asked to attend a testing site and take an antigen test. This testing is voluntary; however, anyone not participating must self isolate for 10 days in their homes. Individuals >65 years have been urged not to participate, although the government has mentioned that testing will be conducted for older people at care homes.
- According to World Health Organization (WHO), antigen tests are not suitable for mass testing unless used alongside PCR tests. The test has a sensitivity (96.5%) and a specificity (99.6%) compared with PCR tests. However, previous research has suggested that some sensitivities and specificities are much lower than those reported.
- Experts have mentioned the increased risk of infection at testing sites and concerned about massive logistical challenges. The aim and process of the testing could create misunderstanding, frustration, fear, and opposition due to lack of proper communication to the public. Furthermore, there was a risk of many false positive and false negative results that could allow infected people to transmit the disease while keeping others unnecessarily in quarantine.
- Although many experts agree on the potential benefits of mass testing, the Prime Minister mentioned that the government's scientific advisory team had told him to impose an immediate three-week lockdown. The expert added that the Prime Minister's decision highlighted what he sees as a detrimental role politics is playing in response to the outbreak. **According to the experts' opinion, politicians should let scientists, epidemiologists, and others decide what needs to be done.**



# THANK YOU

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