

SCIENTIFIC RESEARCH MONITORING ON COVID-19

22 SEPTEMBER 2020

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SCIENTIFIC RESEARCH MONITORING ON COVID-19

(ISSUE 233)

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



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

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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Diagnosis

Detection of SARS-CoV-2
with SHERLOCK One-Pot
Testing

Transmission

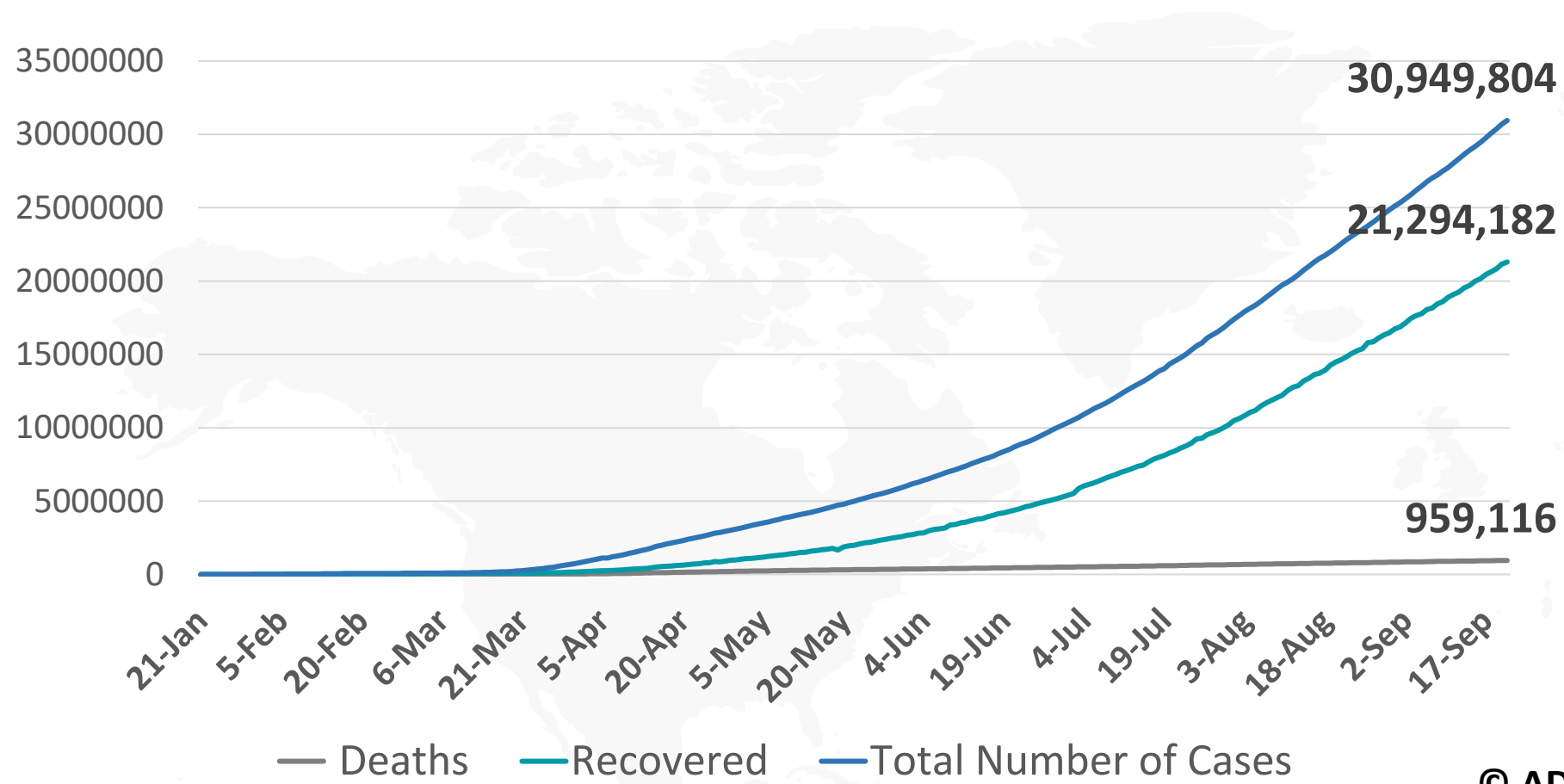
In Vitro Efficacy of a
Povidone-Iodine Nasal
Antiseptic for Rapid
Inactivation of SARS-CoV-2

Clinical Feature

Should We Mandate a
COVID-19 Vaccine for
Children?



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



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

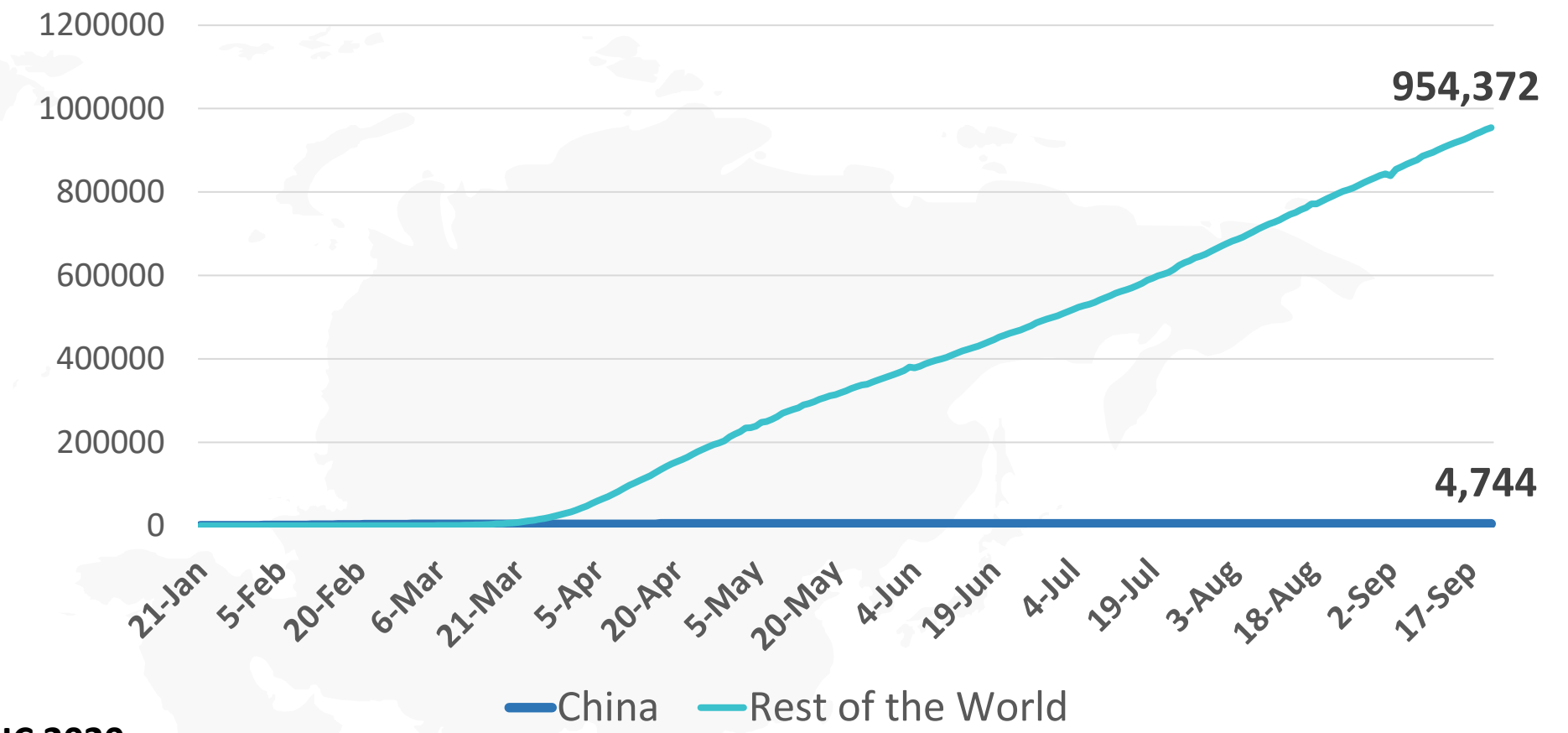


Figure 2: Daily New Infected COVID-19 Cases (China and rest of the world)

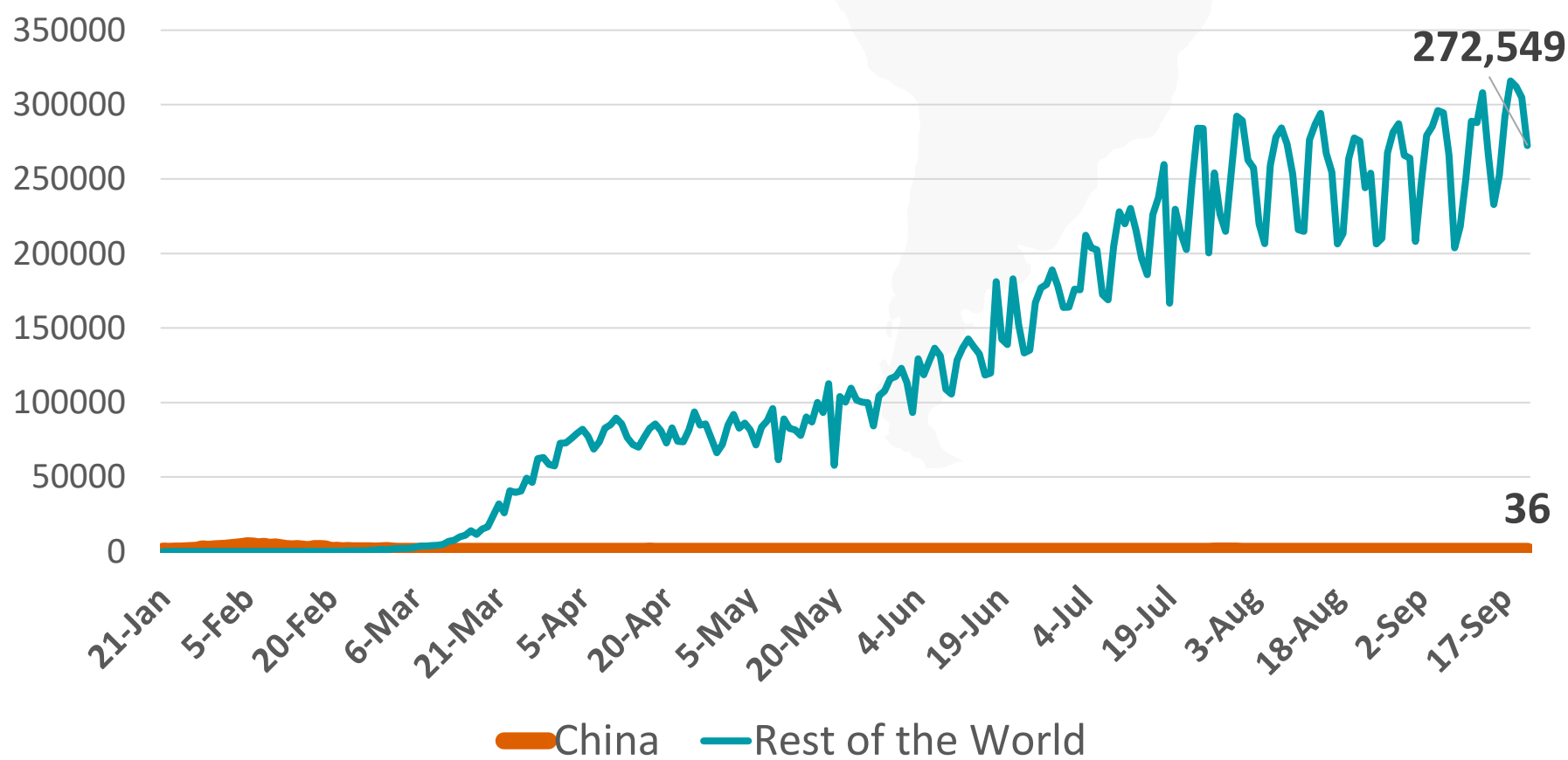


Figure 4: Global Daily New Deaths Due to COVID-19 (china and rest of the world)

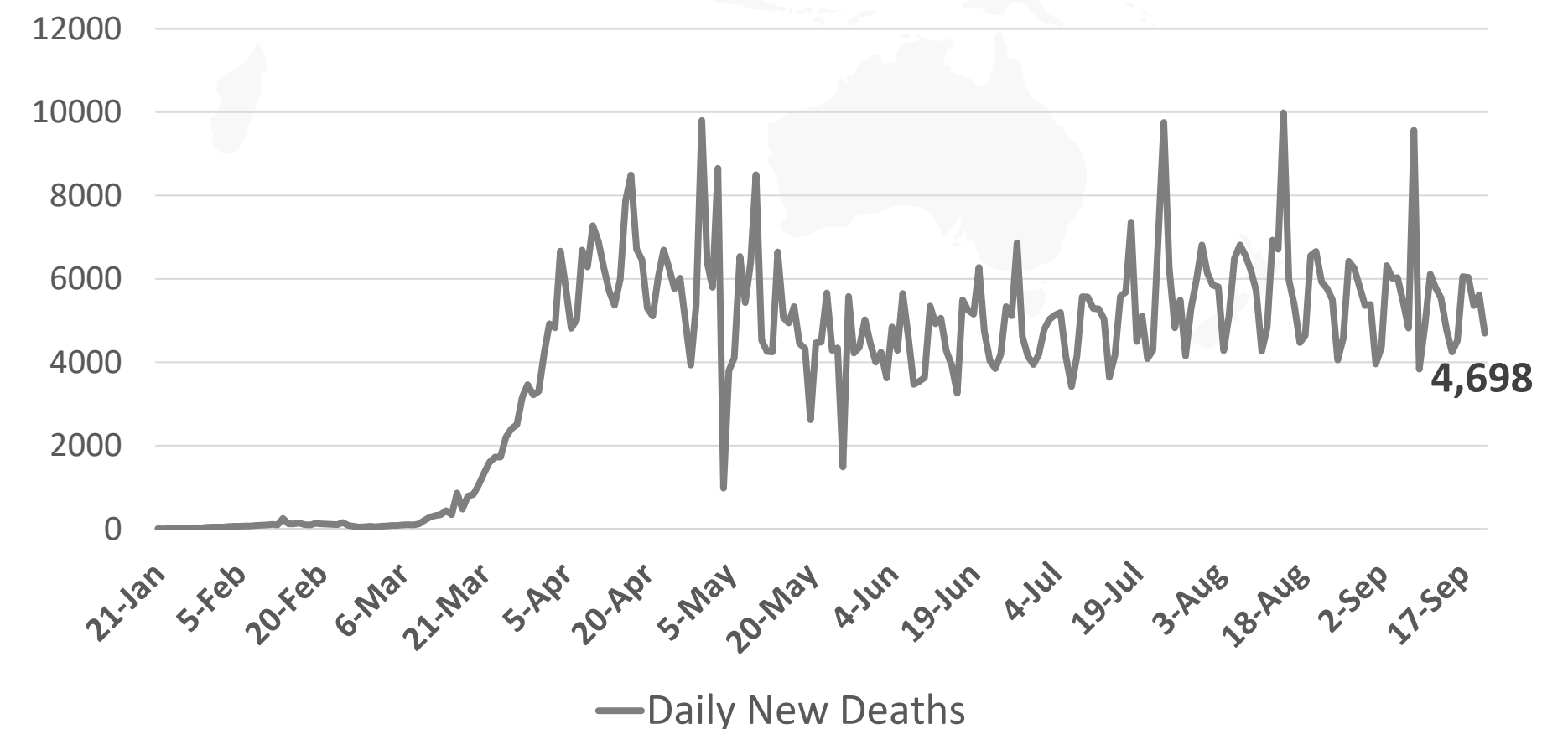
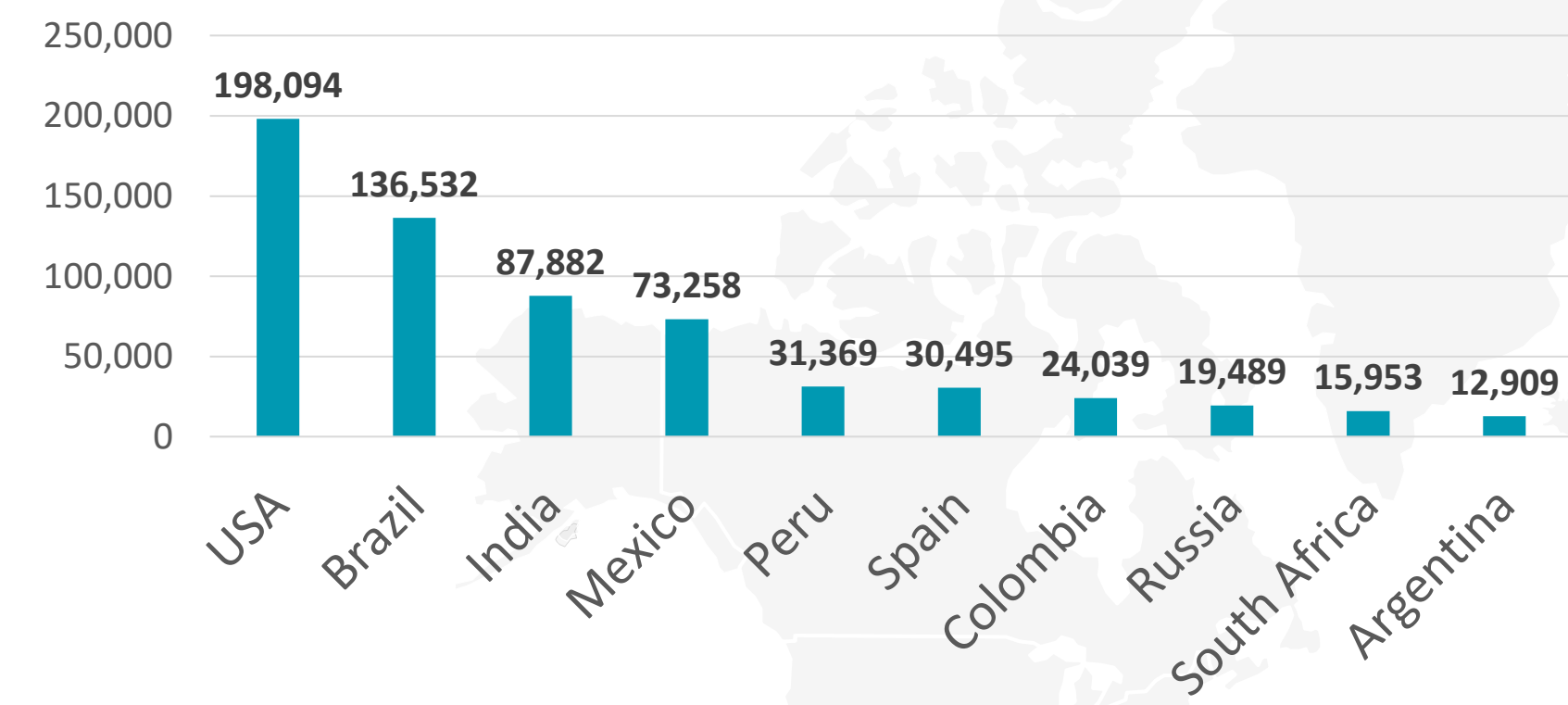
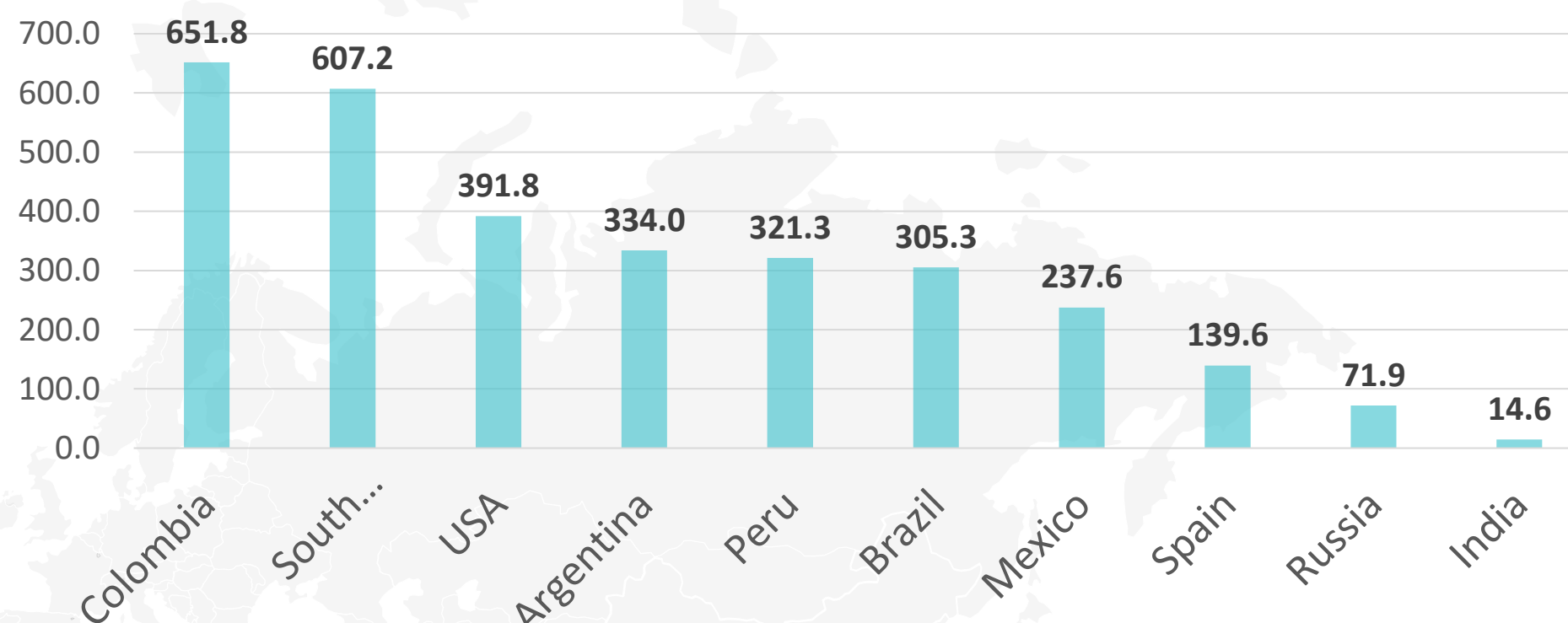


Figure 5: Top 10 Countries in the Total Number of Cases Due to COVID-19

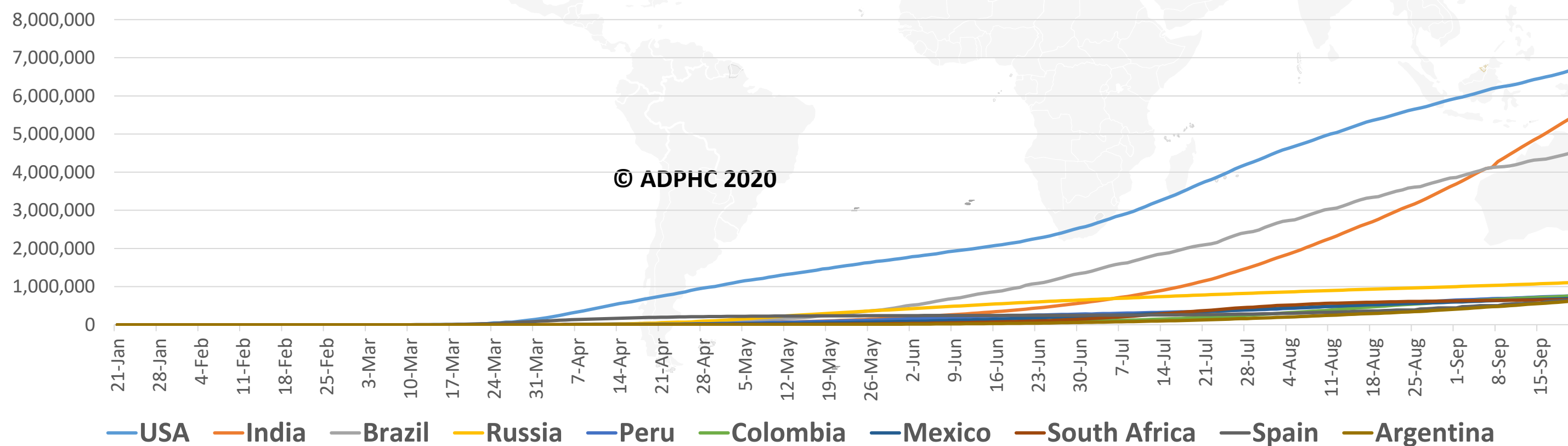
TOTAL DEATHS



DEATHS PER MILLION

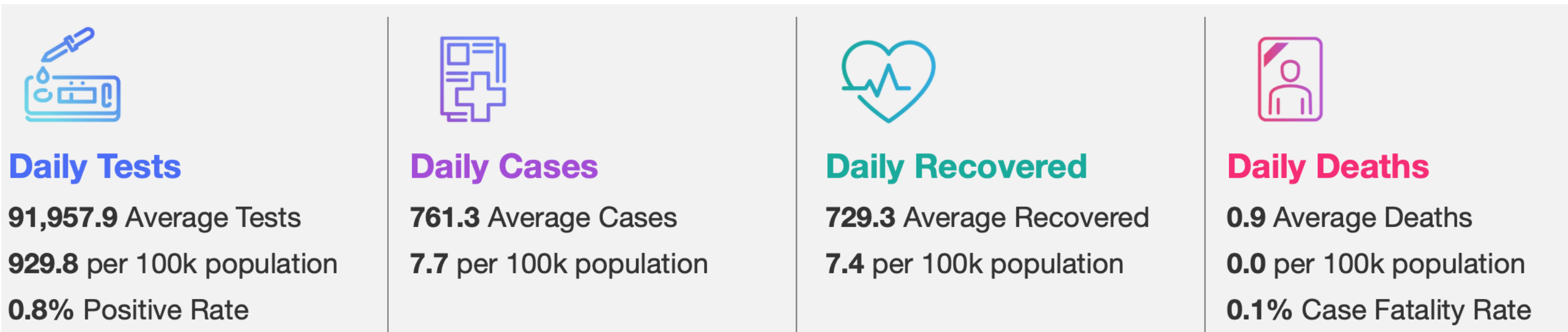


TOTAL INFECTED CASES



USA	6,703,698
India	5,487,580
Brazil	4,528,240
Russia	1,109,595
Peru	762,865
Colombia	758,398
Mexico	694,121
South Africa	661,211
Spain	640,040
Argentina	622,934

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

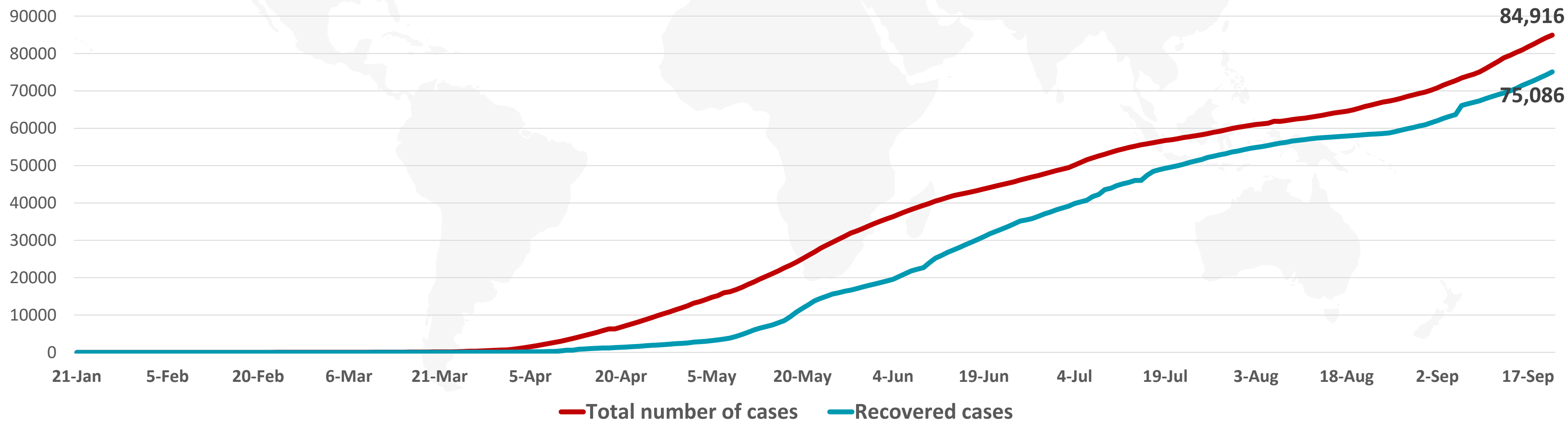
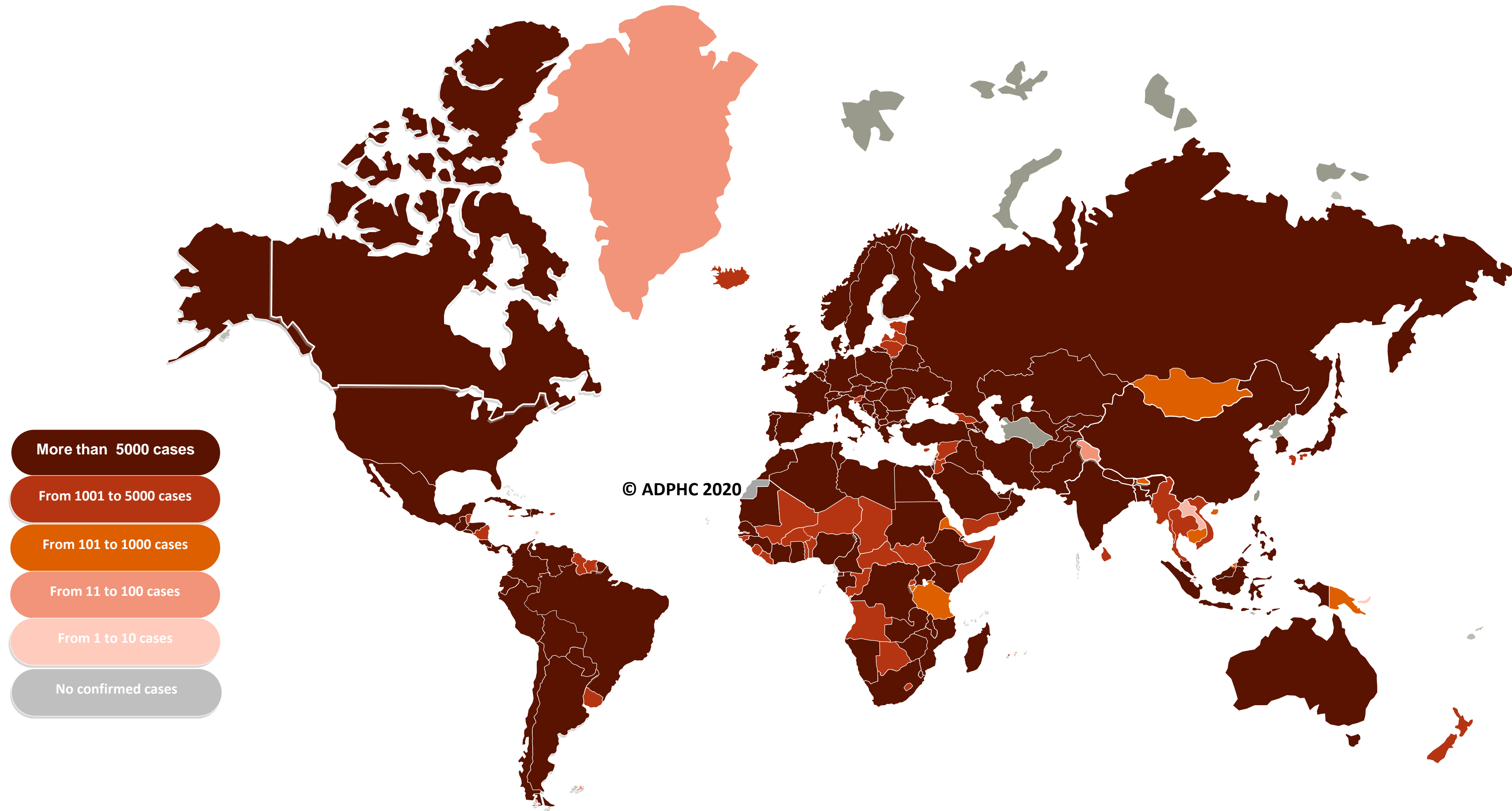


Figure 7A : Global Distribution of COVID-19 Cases



More than 5000 cases

From 1001 to 5000 cases

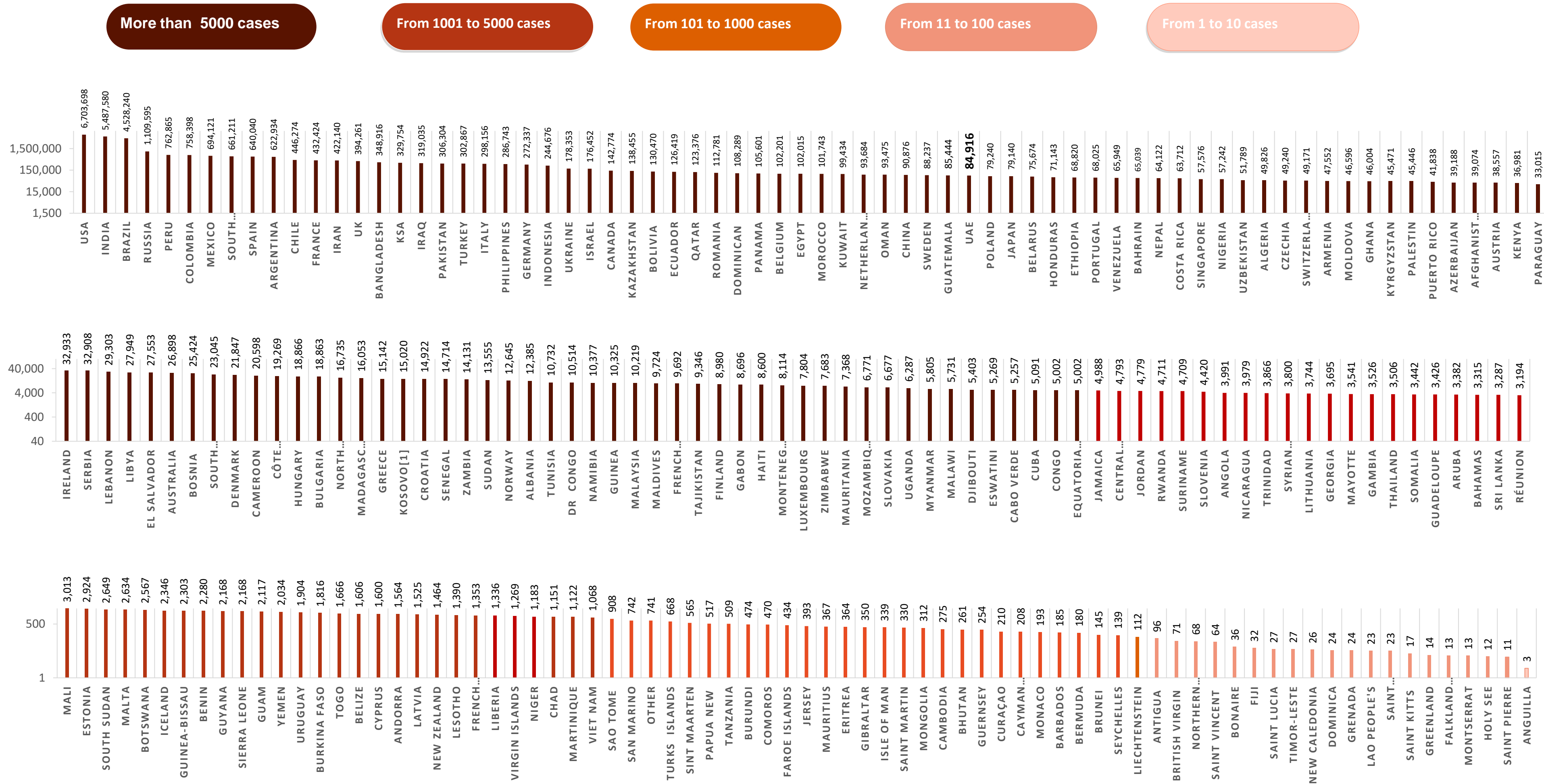
From 101 to 1000 cases

From 11 to 100 cases

From 1 to 10 cases

No confirmed cases

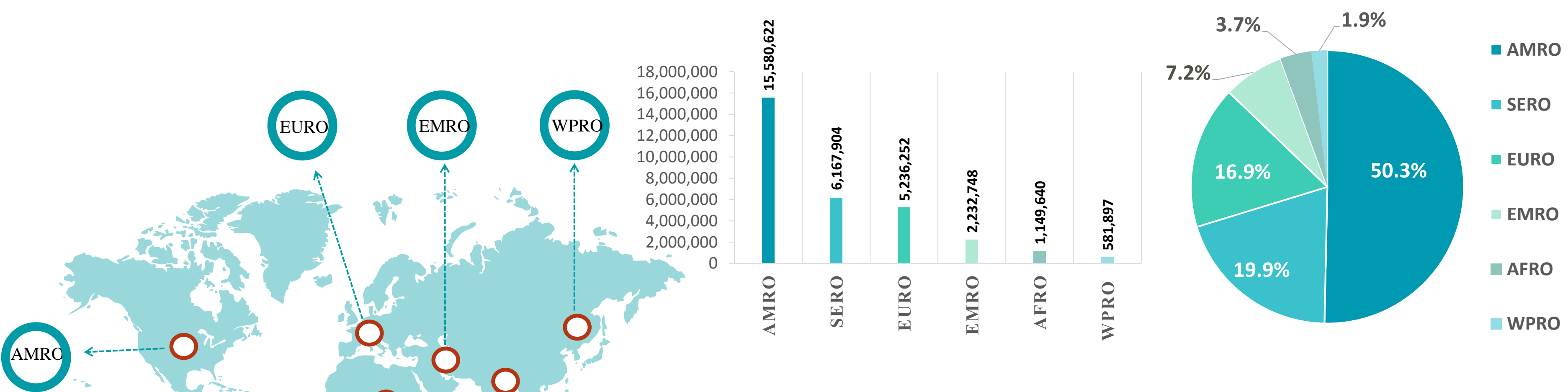
Figure 7B: Bar Chart Illustrates the Global Distribution of COVID19 Cases



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

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

INFECTED



DEATHS

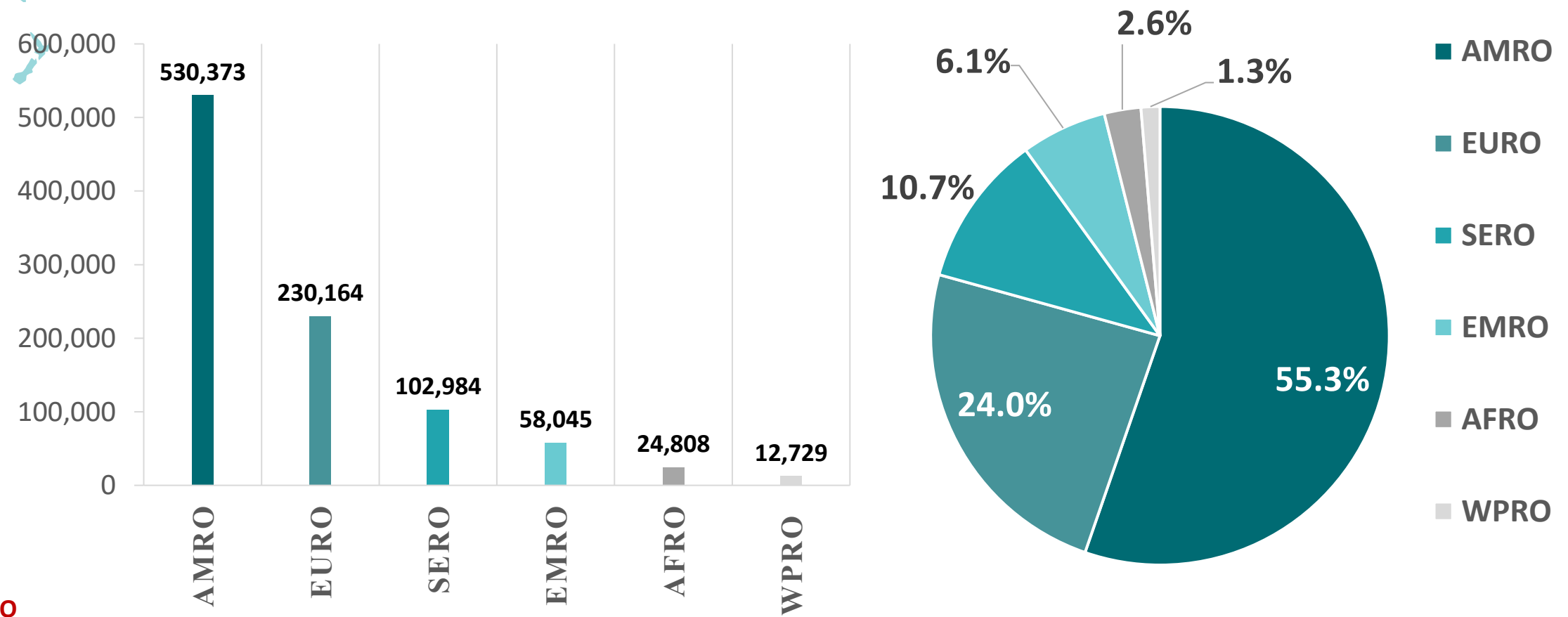
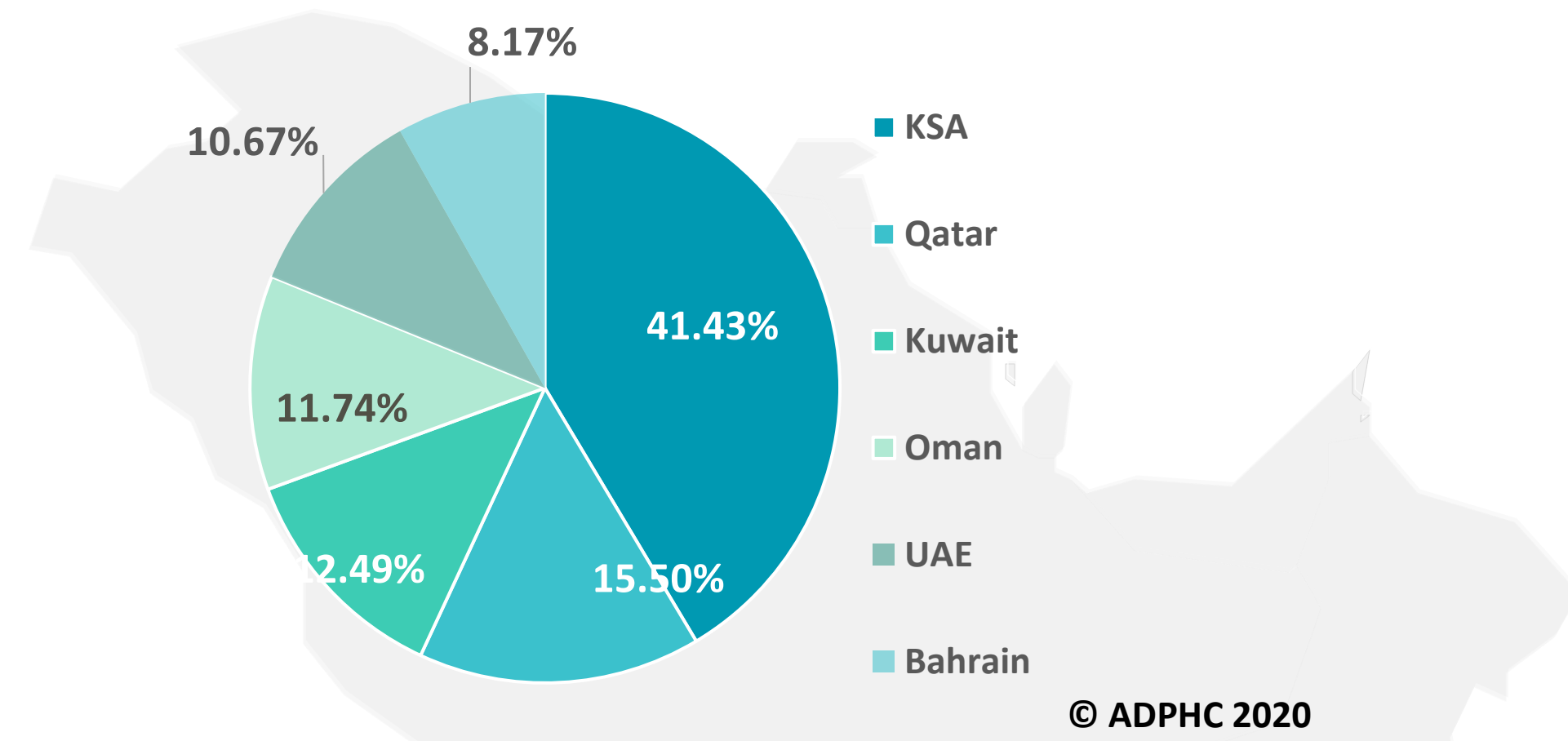
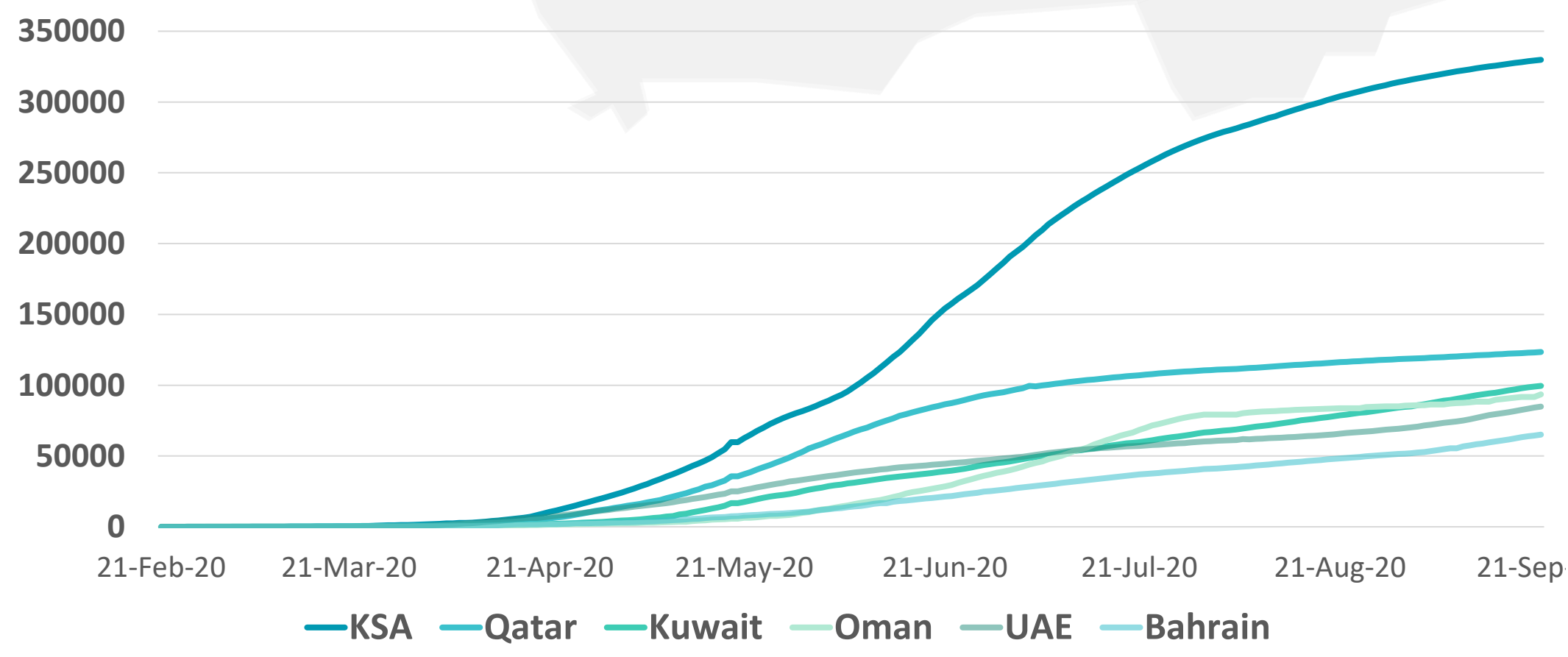
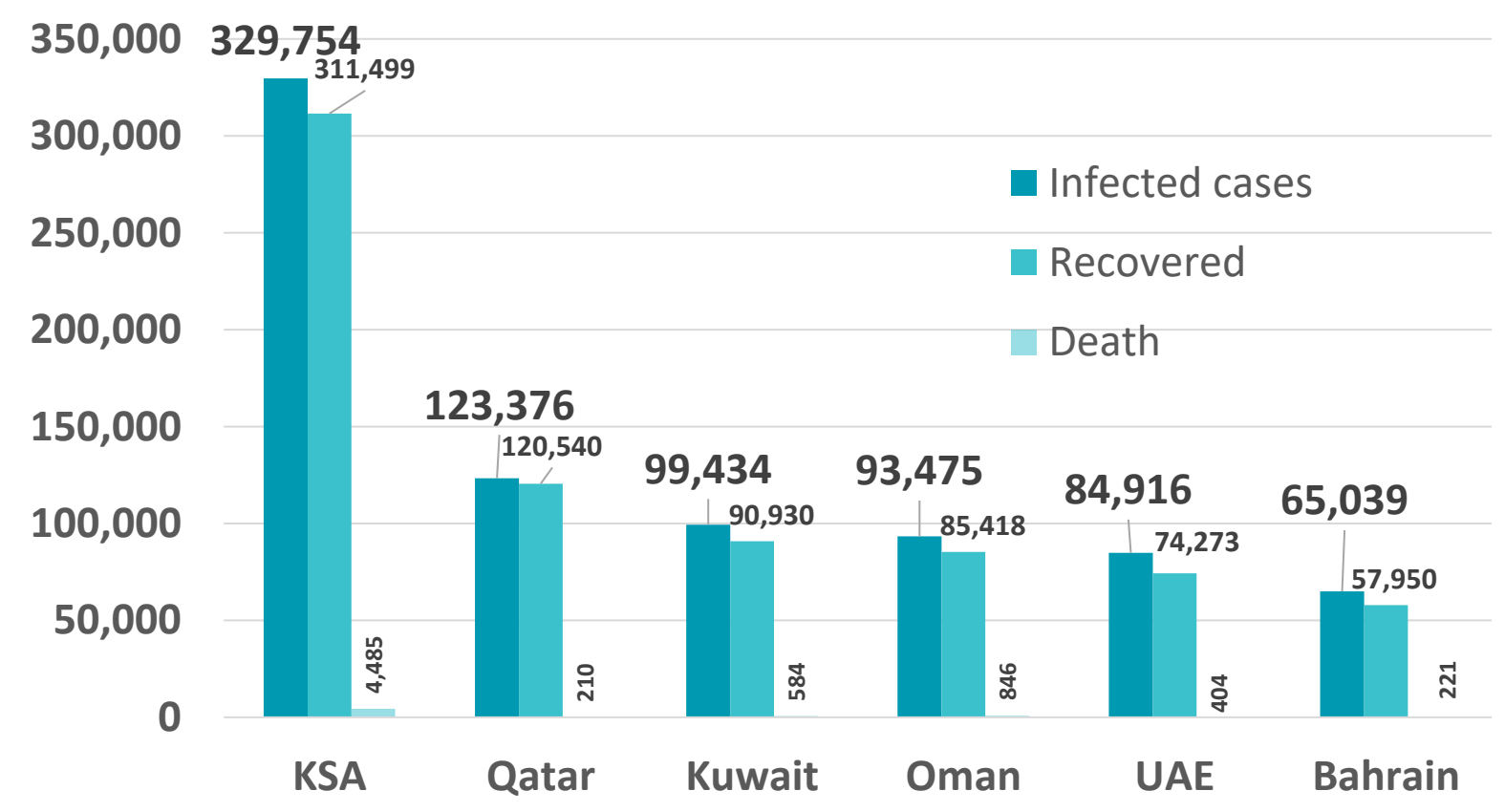


Figure 9: Comparative Analysis of the Distribution of COVID-19 Cases in GCC Countries

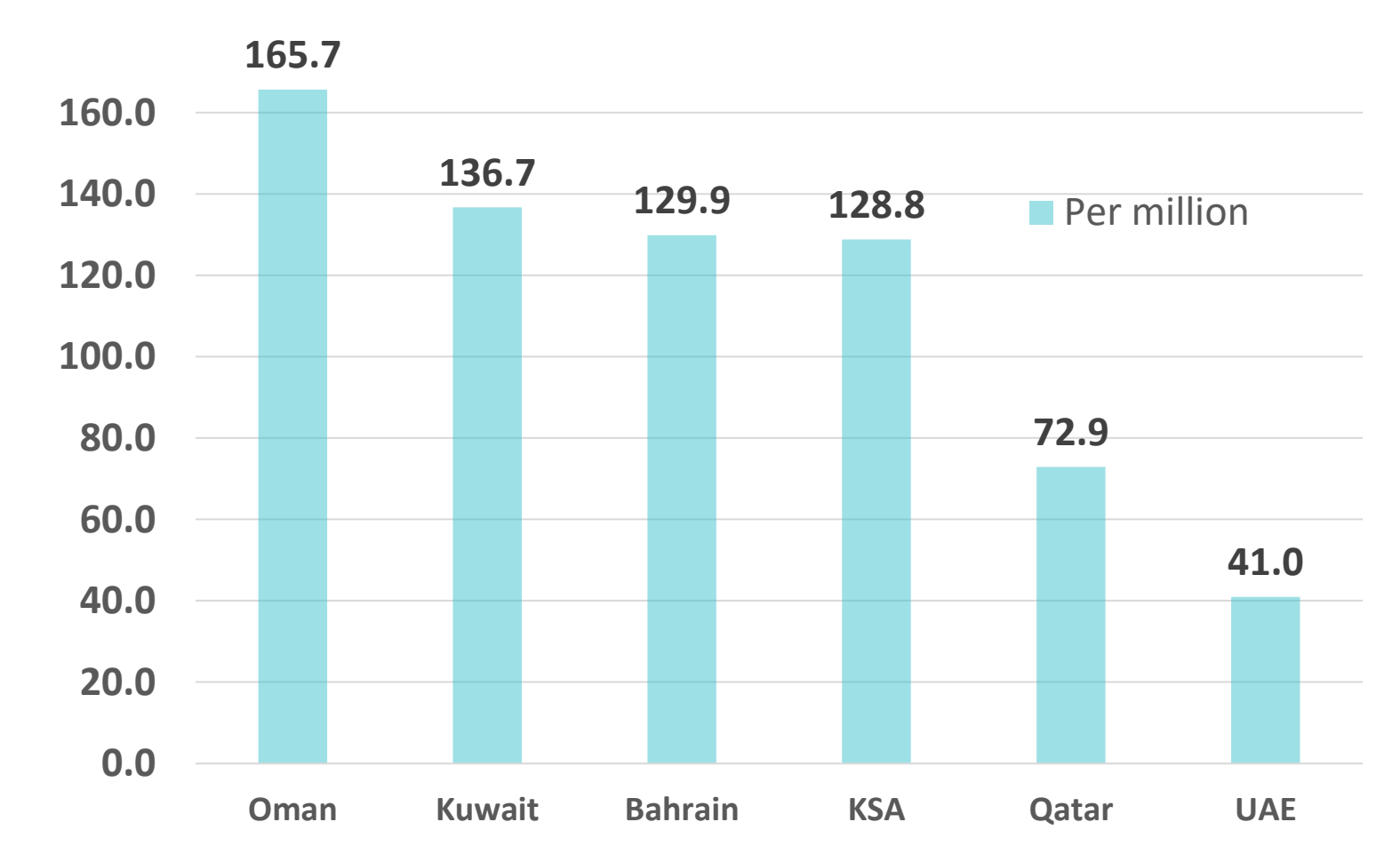
TOTAL NUMBER OF INFECTED CASES



TOTAL NUMBER OF INFECTED, RECOVERED AND DEATHS



DEATHS PER MILLION



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

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

UAE



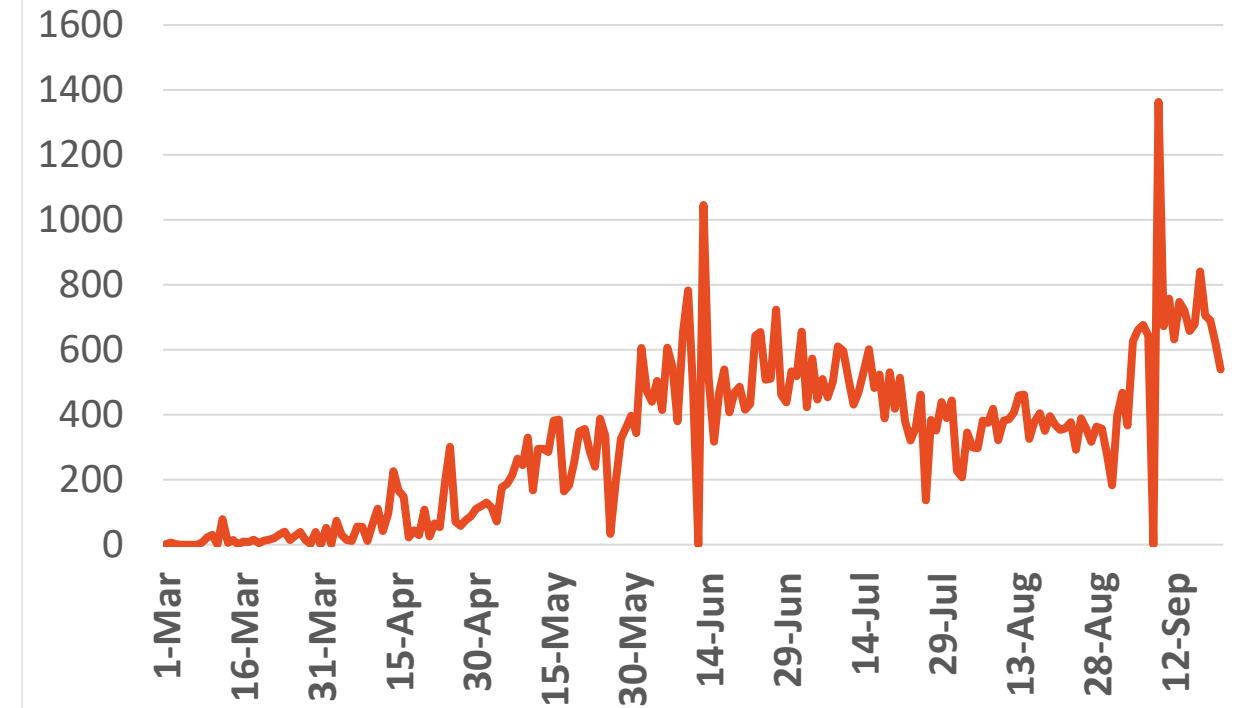
Source : National Emergency Crisis and Disaster Management Authority

KSA



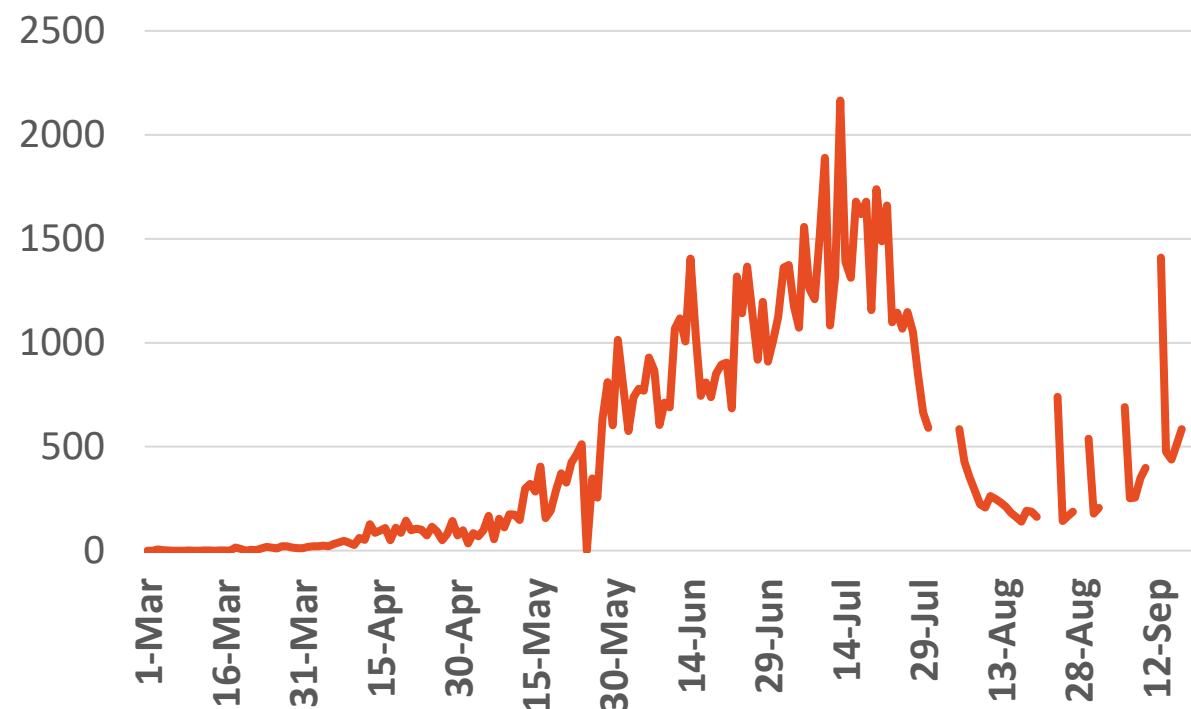
Source : KSA ministry of health

Bahrain



Source :WHO

Oman

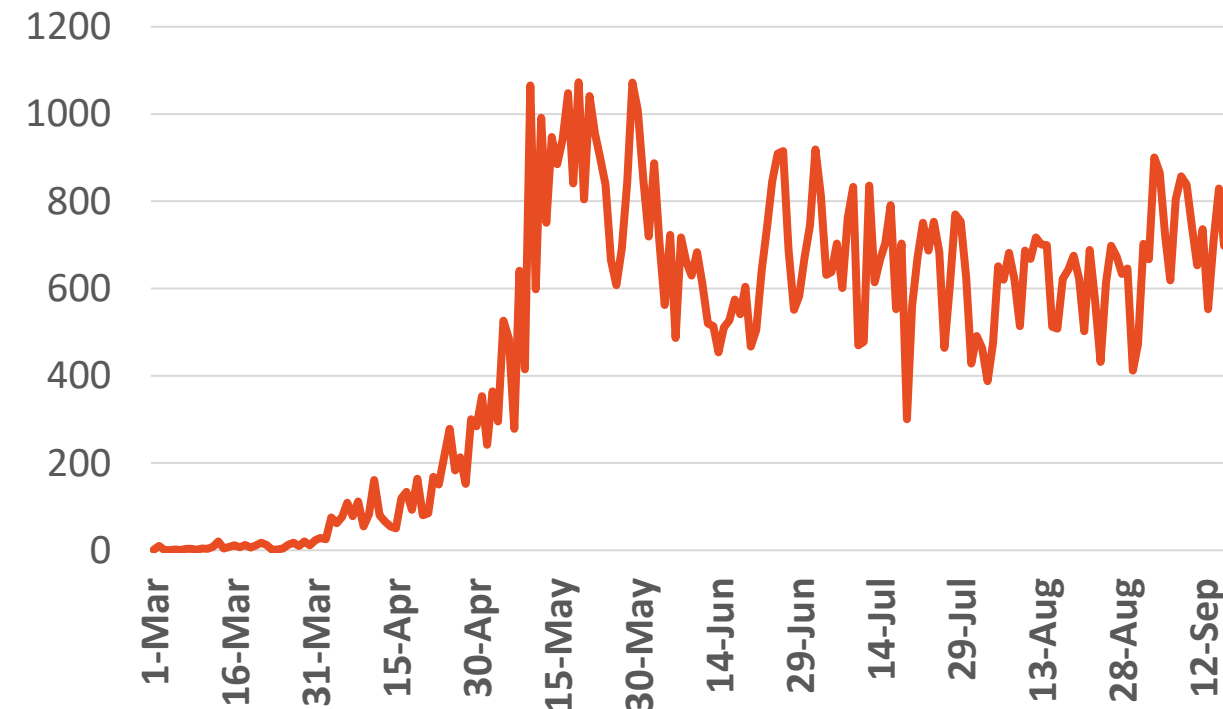


Source :Oman ministry of health

*No announced statistic data from 31 July to 4 August, 21,23,28,30 August, 2, 4, 5,11,12,18 & 19 September
*No announced statistic data on weekends and official holidays.

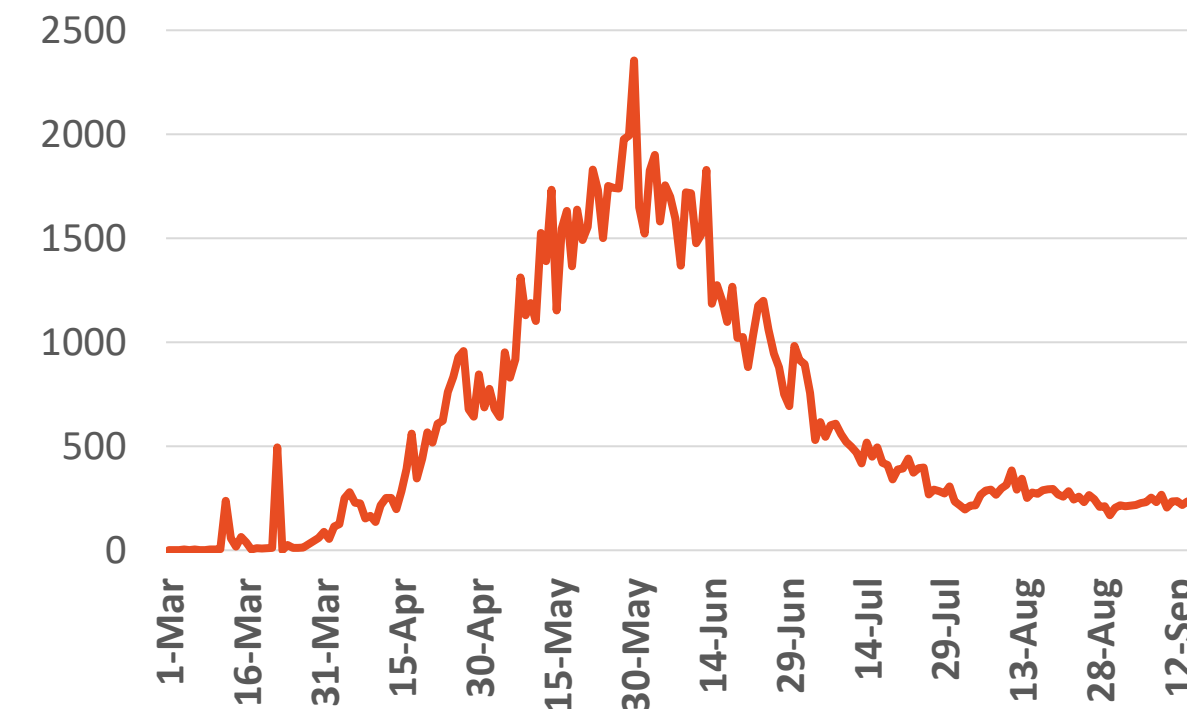
Kuwait

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Source : Kuwait ministry of health

Qatar



Source : Qatar ministry of health



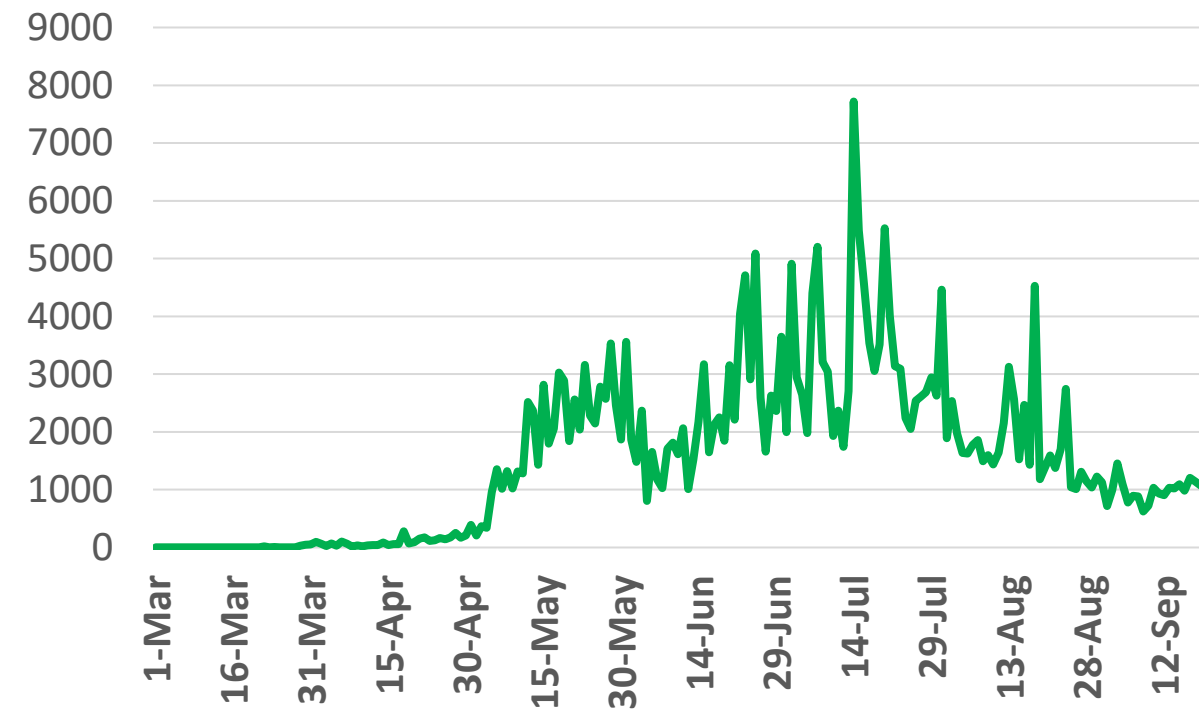
Figure 11: Comparative Analysis of the Distribution of COVID-19 Newly Recovered Cases in GCC Countries

UAE



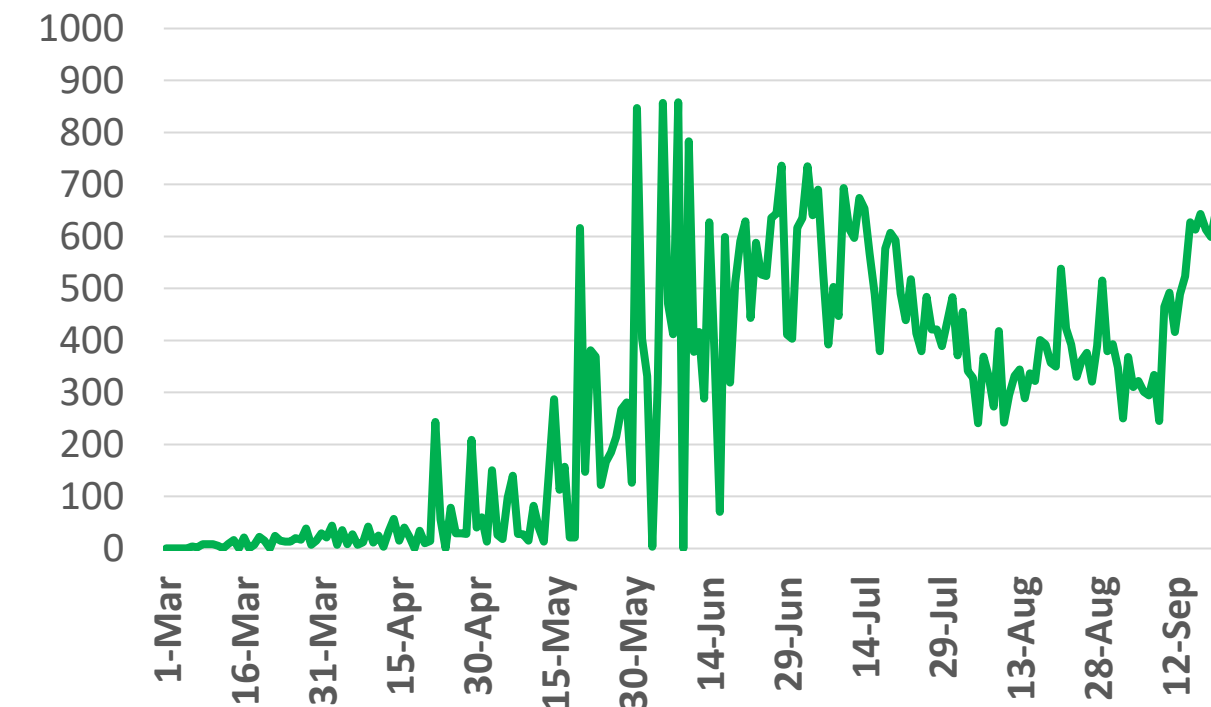
Source : National Emergency Crisis and Disaster Management Authority

KSA



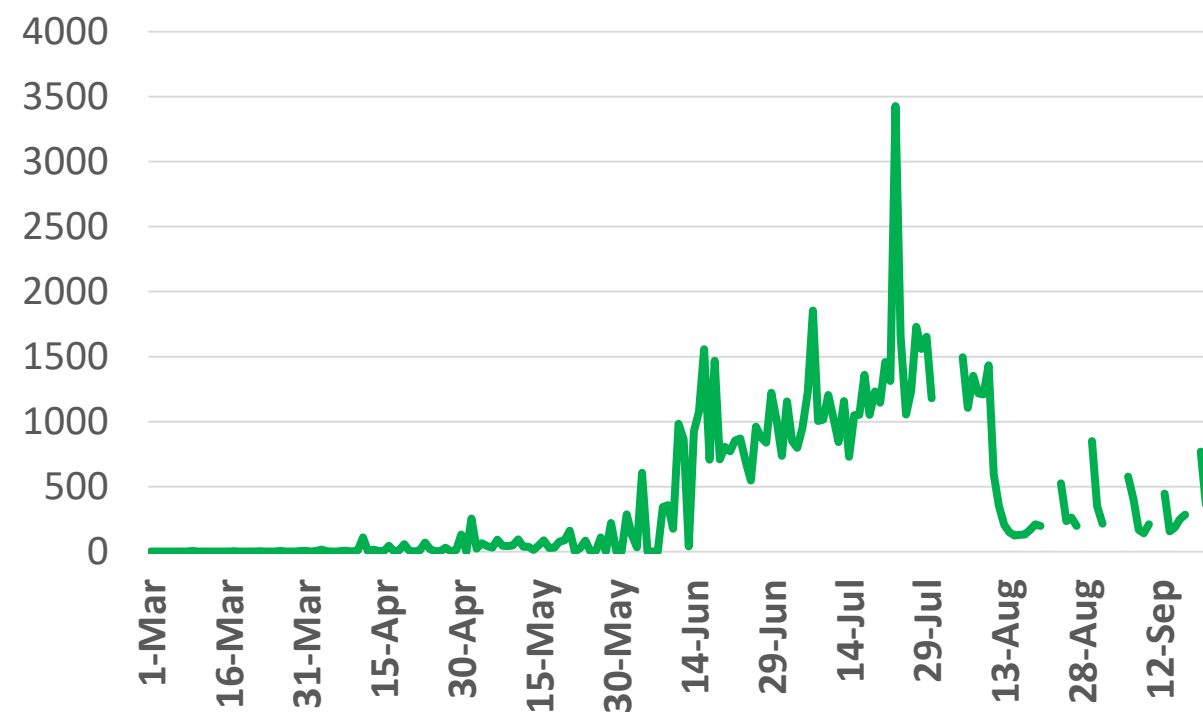
Source : KSA ministry of health

Bahrain



Source : Bahrain ministry of health

Oman



Source : Oman ministry of health

Kuwait

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Source : Kuwait ministry of health

Qatar



Source : Qatar ministry of health

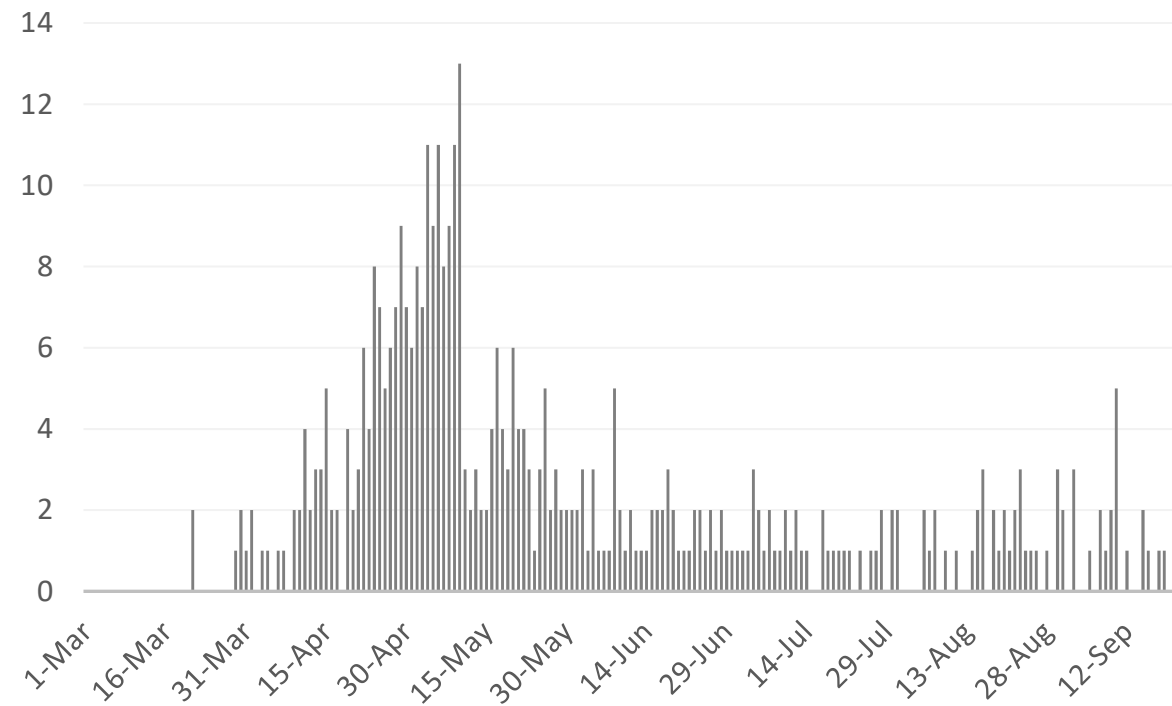
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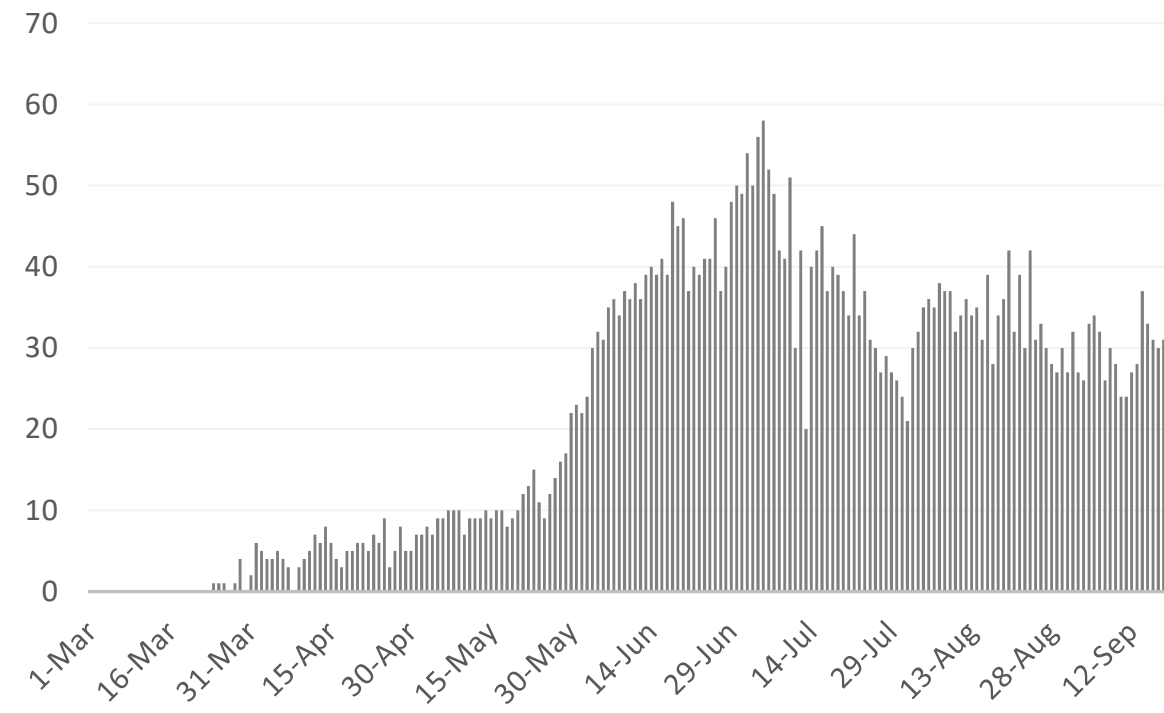
Figure 12: Comparative Analysis of the Distribution of COVID-19 New Death Cases in GCC Countries

UAE



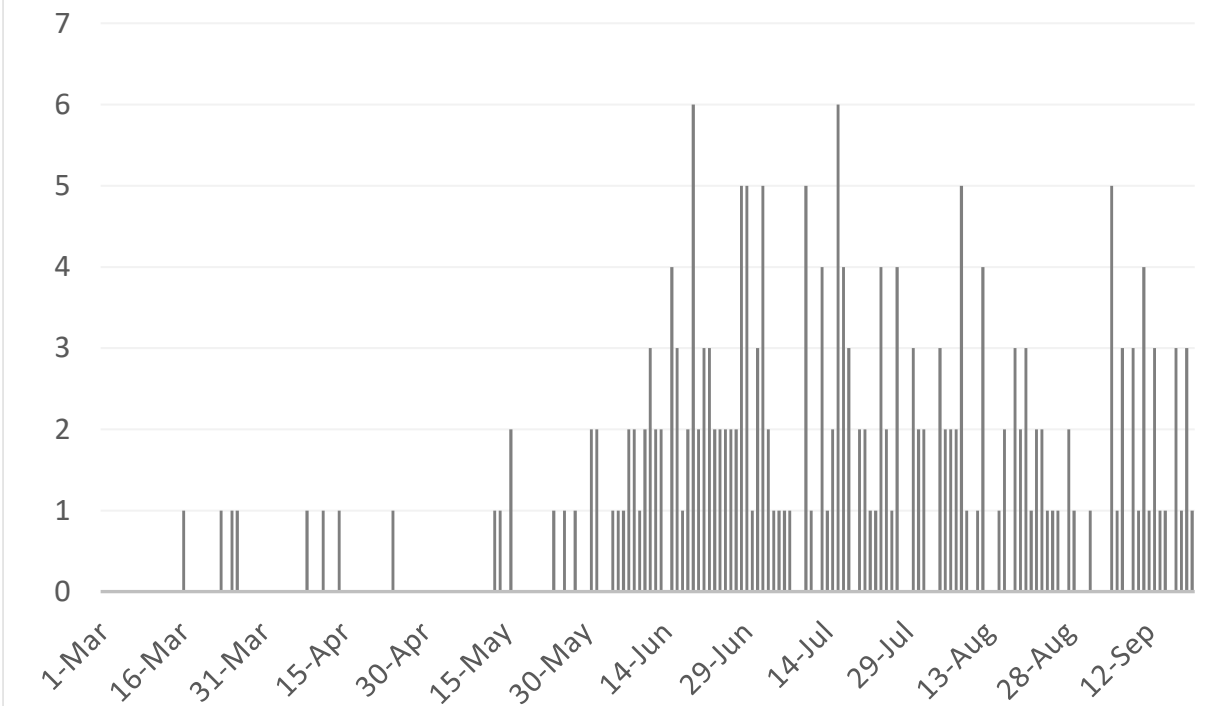
Source : National Emergency Crisis and Disaster Management Authority

KSA



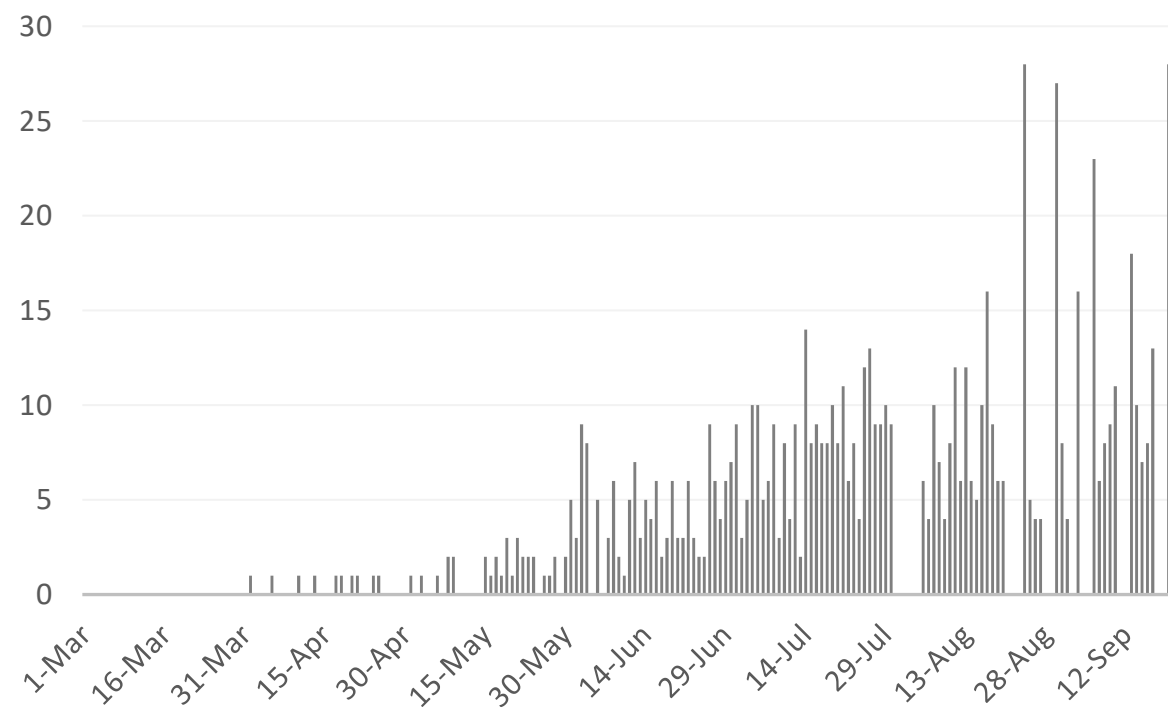
Source : KSA ministry of health

Bahrain



Source :WHO

Oman



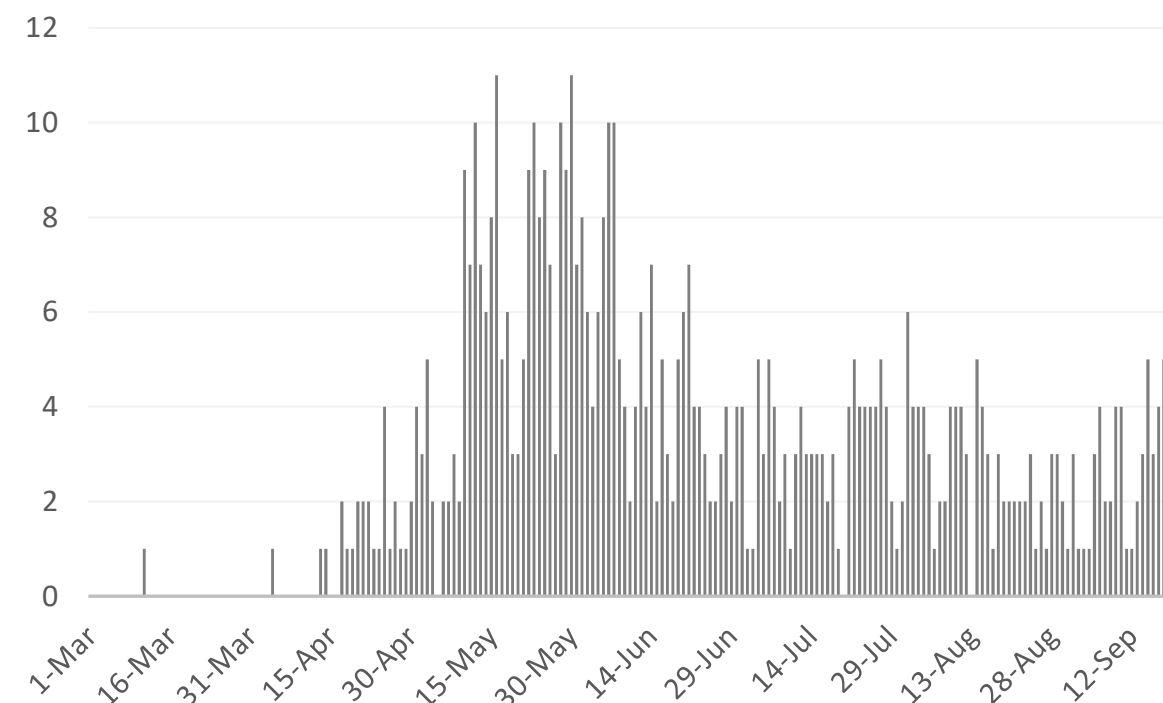
Source :Oman ministry of health

*No announced statistic data from 31 July to 4 August, 21,23,28,30 August, 2, 4, 5,11,12,18 & 19 September

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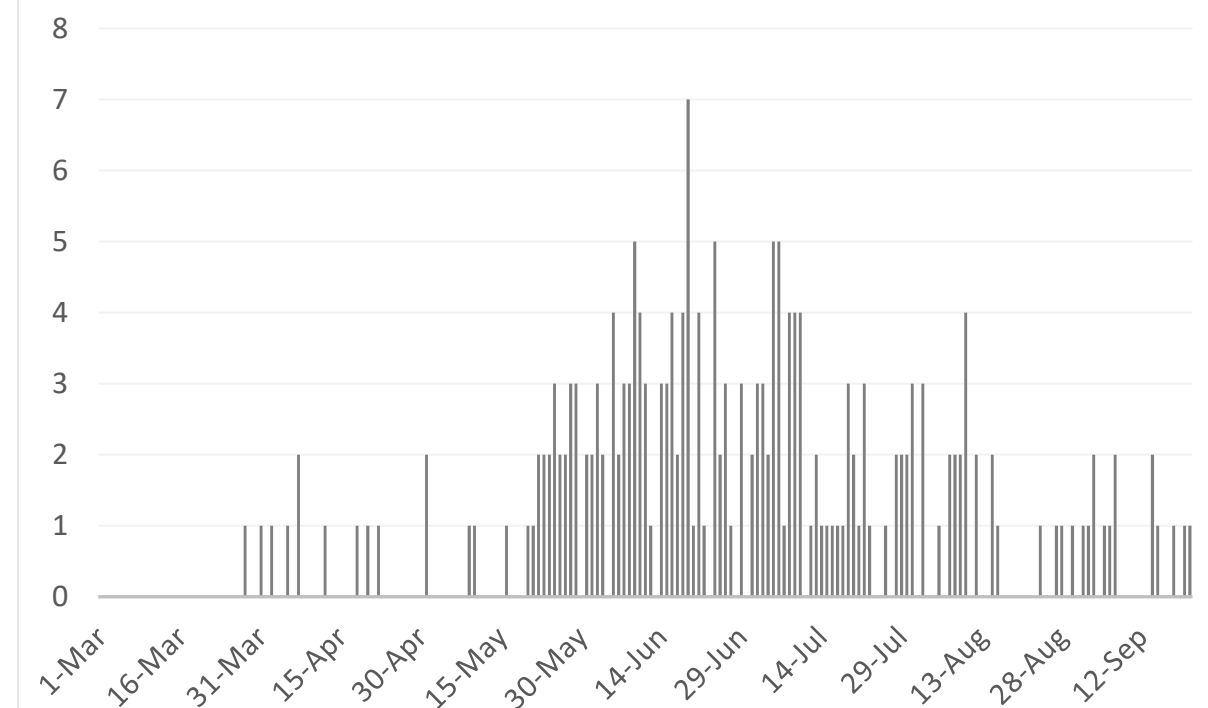
Kuwait

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Source : Kuwait ministry of health

Qatar



Source : Qatar ministry of health





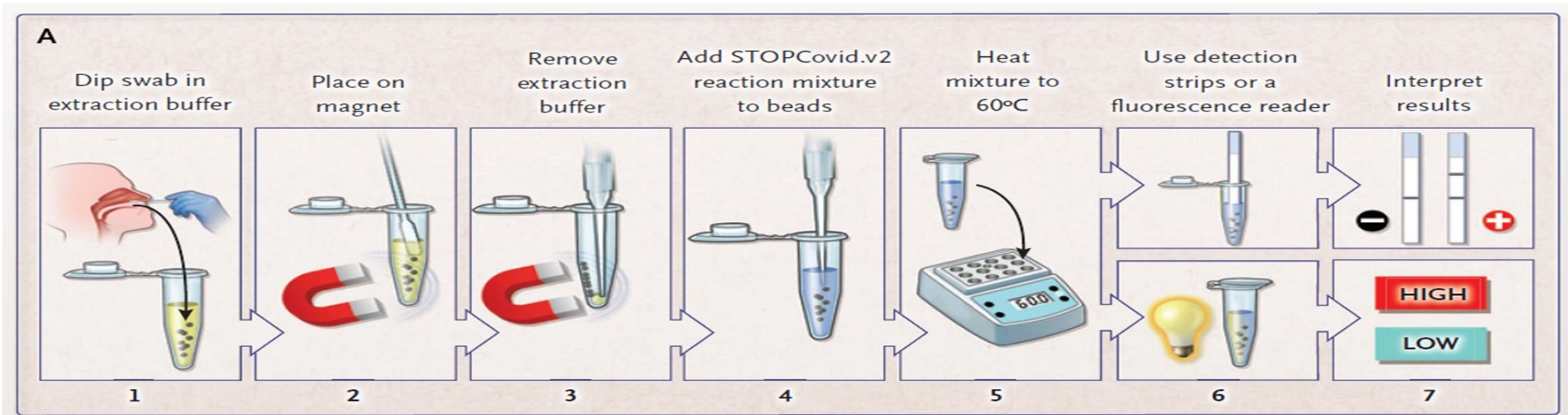
Article 1

Detection of SARS-CoV-2 with SHERLOCK One-Pot Testing

Published

Sept 16, 2020 in [NEJM](#)

- Complex methods of SARS-CoV-2 detection such as SHERLOCK (specific high-sensitivity enzymatic reporter unlocking), typically use a two-step process; target amplification followed by CRISPR-mediated nucleic acid detection to detect the virus. This method depends on an RNA extraction step and multiple liquid-handling steps that increase the risk of cross-contamination of samples.
- This letter to the editor describes a new test for detection of SARS-CoV-2. The sensitivity of this test is similar to that of reverse-transcription–quantitative polymerase-chain-reaction (RT-qPCR) assays. STOP (SHERLOCK testing in one pot) is a streamlined assay that combines simplified extraction of viral RNA with isothermal amplification and CRISPR-mediated detection. This test can be performed at a single temperature in less than an hour and with minimal equipment.
- To simplify RNA extraction and to boost sensitivity, the investigators adapted a magnetic bead purification method. The magnetic beads concentrated SARS-CoV-2 RNA genomes from an entire nasopharyngeal or anterior nasal swab into one STOPCovid reaction mixture. They streamlined the test by combining the lysis and magnetic bead–binding steps and eliminating the ethanol wash and elution steps to reduce the duration of sample extraction to 15 minutes with a minimal hands-on time.





Article 2

In Vitro* Efficacy of a Povidone-Iodine Nasal Antiseptic for Rapid Inactivation of SARS-CoV-2

Published

September 17, 2020 [JAMA](#)

- The laboratory work with SARS-CoV-2 was conducted at the Institute for Antiviral Research at Utah State University, USA. The controlled study used three different concentrations of study solution [Povidone-Iodine (PVP-I) - 0.5%, 1.25%, and 2.5%) and ethanol 70% as a positive control on test media infected with SARS-CoV-2. Test media without virus were added to two tubes of the compounds to serve as toxicity and neutralization controls. The primary outcome was the log reduction value (LRV) after 15 and 30 seconds of a given treatment.
- SARS-CoV-2 was completely inactivated by PVP-I within 15 seconds of contact as measured by LRV of greater than 3 log₁₀ of the 50% cell culture infectious dose of the virus. However, ethanol 70% could not completely inactivate after 15 seconds of contact. The nasal antiseptics tested performed better than the standard positive control routinely used for in vitro assessment of anti-SARS-CoV-2 agents at a contact time of 15 seconds.

Table 1. Virus Titers and Log Reduction Value (LRV) of SARS-CoV-2 When Incubated With Various Concentrations of Povidone Iodine (PVP-I) and Controls for 15 Seconds

Test product	PVP-I concentration after 1:1 dilution, %	Virus titer ^a	LRV ^b
PVP-I nasal antiseptic			
5.0%	2.5	<0.67	3.0
2.5%	1.25	<0.67	3.0
1.0%	0.50	<0.67	3.0
Ethanol 70%	NA	1.5	2.17
Virus control	NA	3.67	NA

Conclusion

- This study demonstrated rapid inactivation of SARS-CoV-2 by PVP-I at concentrations as low as 0.5% for as little as 15 seconds of contact. These findings are consistent with previous study investigated efficacy of an oral solution in the same class of PVP-I antiseptics against SARS-CoV-2.

*In vitro methods used in a laboratory can often include things like studying bacterial, animal, or human cells in culture. Although this can provide a controlled environment for an experiment, it occurs outside of a living organism, and results must be considered carefully.



Continued

- Intranasal PVP-I may play an adjunctive role to reduce viral transmission beyond personal protective equipment (PPE).
- Nasal PVP-I irrigations should additionally be considered for use by health care professionals for prophylaxis. Oral mucosa decontaminated with PVP-I remains sterilized for up to 4 hours. Although this has not yet been proven in the nasal mucosa, health care providers should consider using every 4 hours, or whenever donning or doffing a mask in high-risk settings, up to 4 times daily. At concentrations of 1.25%, iodine absorption is negligible.

Limitations

- **Randomized clinical trials have not yet been conducted to prove that viral transmission is mitigated with intranasal use of PVP-I, although these studies are already underway. Similarly, the safety of intranasal PVP-I use regarding thyroid-stimulating hormone, olfaction, and mucociliary clearance has only specifically been demonstrated at concentrations up to 0.08% for a time period of up to 7 weeks. Safety has been inferred based on in vitro studies, but in vivo tolerability trials proving the safety of PVP-I up to 1.25% for long-term use are currently underway.**





VACCINE

Article 3

Should We Mandate a COVID-19 Vaccine for Children?

Published

September 14, 2020 [THE LANCET](#)

- There are nine standard criteria that can help guide whether a COVID-19 vaccine for children should be mandated. These criteria can be divided into three categories - four criteria related to the vaccine, two related to disease, and three related to implementation. Each criterion would be considered to determine if a vaccine should be mandated for children. During COVID-19 pandemic, it has been proposed that each criterion continue to be evaluated in making vaccine policy; however, five criteria should be prioritized.
- The criterion that should be prioritized as follows:
 - There must be evidence that a COVID-19 vaccine is safe for children with an acceptable level of risk (criterion #1)
 - Burden of COVID-19 disease ought to be substantial in at least a subset of the population (criterion #5)
 - Vaccinating children should reduce the risk of transmission of disease (criterion #6)
 - COVID-19 vaccine must also be effective in protecting a child from the disease (criterion #2)
 - The benefit of a COVID-19 vaccine will largely accrue to high-risk adults than children, it should not be burdensome for a child or child's parent or guardian to comply with the vaccine mandate (criterion #9).

Box. Criteria to Consider When Evaluating Antigens for Inclusion in Mandatory School Immunization Programs

1. *Vaccine related:* Experience to date with the vaccine containing this antigen indicates that it is safe and has an acceptable level of adverse effects.
2. *Vaccine related:* The antigen is effective as measured by immunogenicity and population-based prevention.
3. *Vaccine related:* The vaccine containing this antigen is as cost-effective from a societal perspective as other vaccines used to prevent disease.
4. *Vaccine related:* The vaccine containing this antigen should bear some relationship to increasing safety in the school environment.
5. *Disease related:* The vaccine containing this antigen prevents disease(s) with significant morbidity and/or mortality in at least some subset of the population.^a
6. *Disease related:* Vaccinating the infant, child, or adolescent against this disease reduces the risk of person-to-person transmission.^b
7. *Implementation related:* The vaccine is acceptable to the medical community and the public.
8. *Implementation related:* The administrative burdens of delivery and tracking of vaccine containing this antigen(s) are reasonable.
9. *Implementation related:* The burden of adherence for the vaccine containing this antigen is reasonable for the parent/caregiver.

^a Adapted from Washington State Board of Health, Immunization Advisory Committee.⁵

^b Adapted from Opel et al.⁶



THANK YOU

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