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HEALTH CENTRE

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Scientific Research Monitoring on COVID-19

22 May 2020

Summary on COVID19



SARS-COV2 virus

- The virus have been sequenced and found to be similar to MERS-CoV and SARS-CoV. Research revealed that the virus originated in a bat reservoir.
- New designation for the disease and the virus: COVID-19 and SARS-COV2.
- SARS-COV2 stay viable in aerosol for hours and in surface up to 3 days.
- Two strain have been identified for SARS-COV2 (L type (more aggressive) and S type .

Transmission

- Transmission from human to human has been confirmed. Incubation period ranges from 5 days and can reach up to 14 days.
- Suggested human-to-human transmission occurs through droplets, contact and fomites, similar to Severe Acute Respiratory Syndrome (SARS).
- Isolation is the best measure to control transmission.

Clinical features and outcome

- Non-specific and the disease presentation can range from no symptoms (asymptomatic) to severe pneumonia and death.
- Highest risk for severe disease and death include people aged over 60 years and those with underlying conditions
- Pregnant women infected with SARS-COV2 may experience symptoms similar to those of non-pregnant adults. No evidence suggests transmission from mother to newborn if infected late in pregnancy. No evidence of transmission through breast milk.

Therapies and vaccination

- Efforts currently in developing therapies for this virus focus on previously known medications and vaccination for MERS-CoV and SARS-CoV. In addition to other type of medication.
- WHO forum held 11-12 Feb 2020 to mobilize research on COVID19 vaccinations and therapies.

Summary on COVID19 (Cont.)

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COVID19 in figure

- 80% of laboratory confirmed patients have had mild to moderate disease
- 13.8% have severe disease.
- 6.1% are critical
- Children account for 2.4% of all reported cases.(less than 19 years)



Todays' Highlights

All articles presented in this report represents the authors' views and not necessarily represents Abu Dhabi Public Health Center views or directions.

Scientific Research

- **Mental Health:** review study on SARAS ,MERS and COVID19 neuropsychiatric consequences Coronavirus infection found first, that most people do not suffer from a psychiatric disorder following coronavirus infection, and second, that so far there is little to suggest that common neuropsychiatric complications beyond short-term delirium are a feature.
- **Public Health Response: article emphasize that** Social determinants of health should be included as part of pandemic research priorities, public health goals, and policy implementation.
- **Public Health Response:** article give explanation in different modelling studies and their uses and limitation.



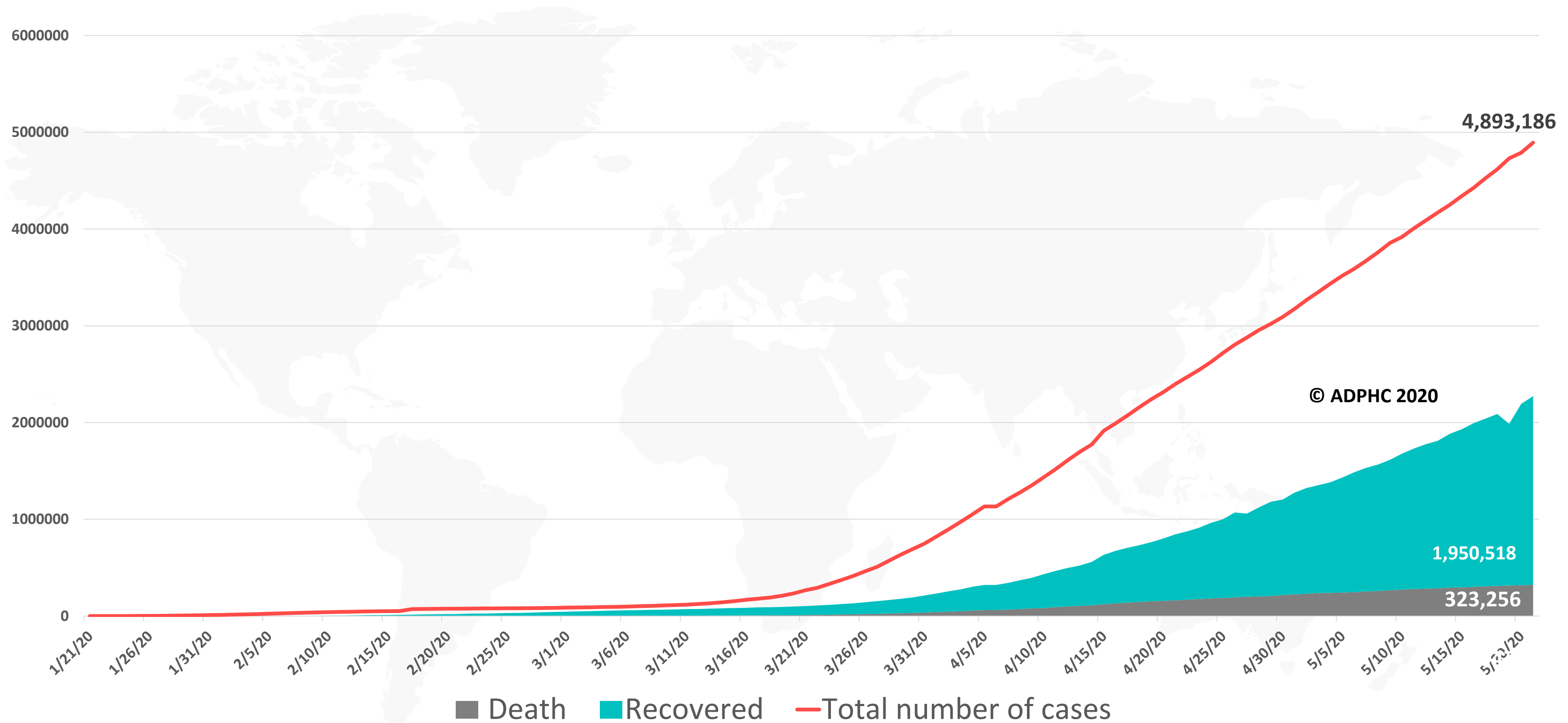
WHO daily report 20 May 2020

- The WHO World Health Assembly has ended with a global commitment to the COVID-19 response.
- Delegates adopted a [landmark resolution to bring the world together to fight the COVID-19 pandemic](#).
- Draft resolution proposed by Albania, Australia, **Bahrain**, Bangladesh, Belarus, Bhutan, Bolivia (Plurinational State of), Brazil, Canada, Chile, China, Colombia, Costa Rica, Djibouti, Dominican Republic, Ecuador, El Salvador, Fiji, Guatemala, Guyana, Iceland, India, Indonesia, Iraq, Japan, Jordan, Kazakhstan, Maldives, Marshall Islands, Mexico, Micronesia (Federated States of), Monaco, Montenegro, Morocco, New Zealand, North Macedonia, Norway, Panama, Paraguay, Peru, **Qatar**, Republic of Korea, Republic of Moldova, Russian Federation, San Marino, **Saudi Arabia**, Singapore, Sri Lanka, Thailand, the African Group and its Member States, the European Union and its Member States, Tunisia, Turkey, Ukraine and United Kingdom of Great Britain and Northern Ireland
- WHO has been supporting Somalia since the beginning of this outbreak to enhance its infection control measures, testing capacities, and case management. In particular, training has been provided for the healthcare workers of the De-Martino hospital and 13 other isolation centers across the country, which have also received medical supplies and budget support for salaries. However, so far, only 26% of WHO's urgent appeal of US\$ 21.95 million for emergency response to COVID-19 in Somalia has been funded.

Epidemiology



Figure 1: Total number of infected, recovered, and death cases (January 21st to May 21, 2020)

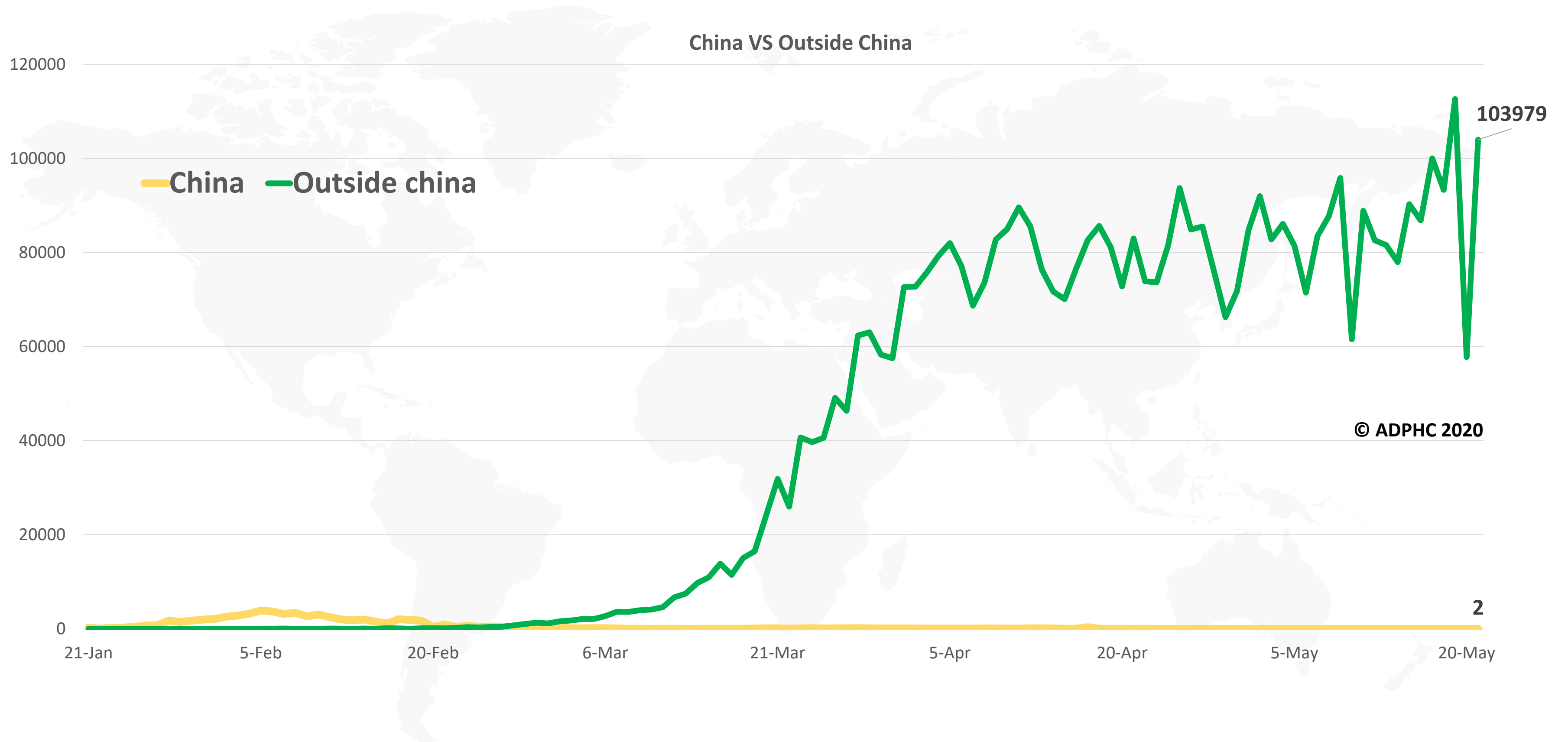


Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#), [John Hopkins University](#)



Figure 2: Daily new infected COVID-19 cases reported between (January 21 to May 21, 2020).



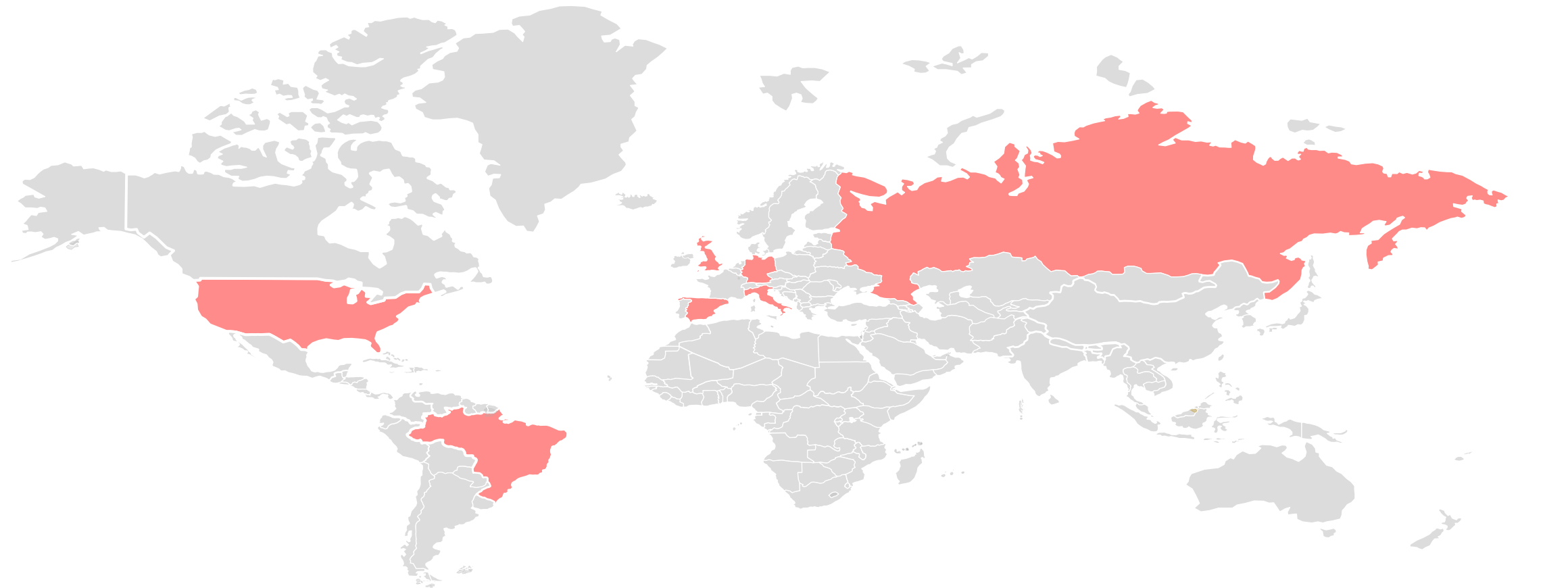
Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](https://www.who.int/)

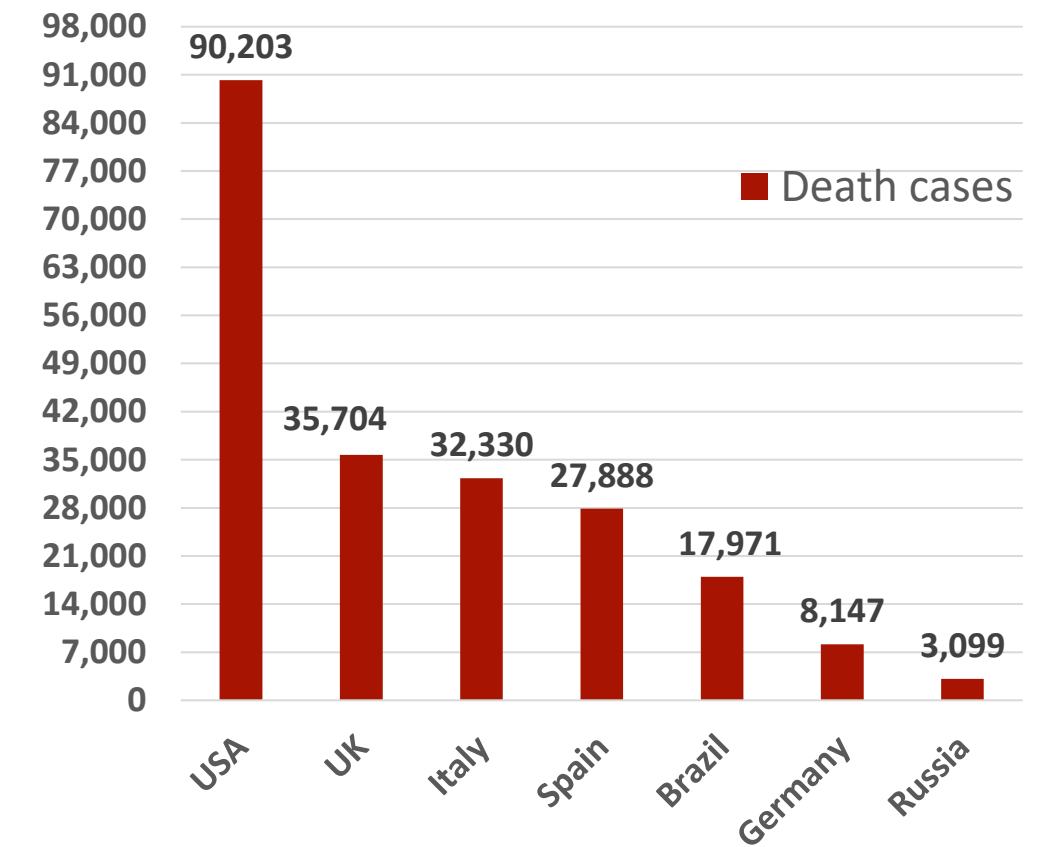
Epidemiology



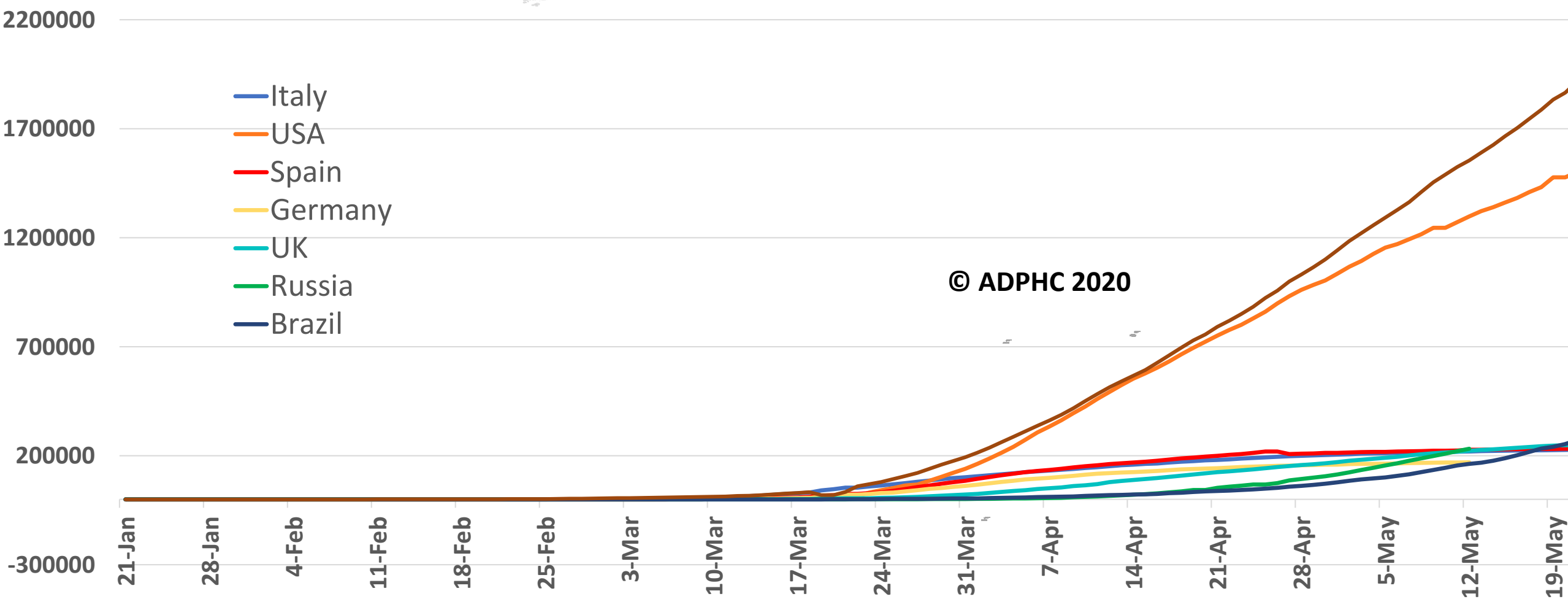
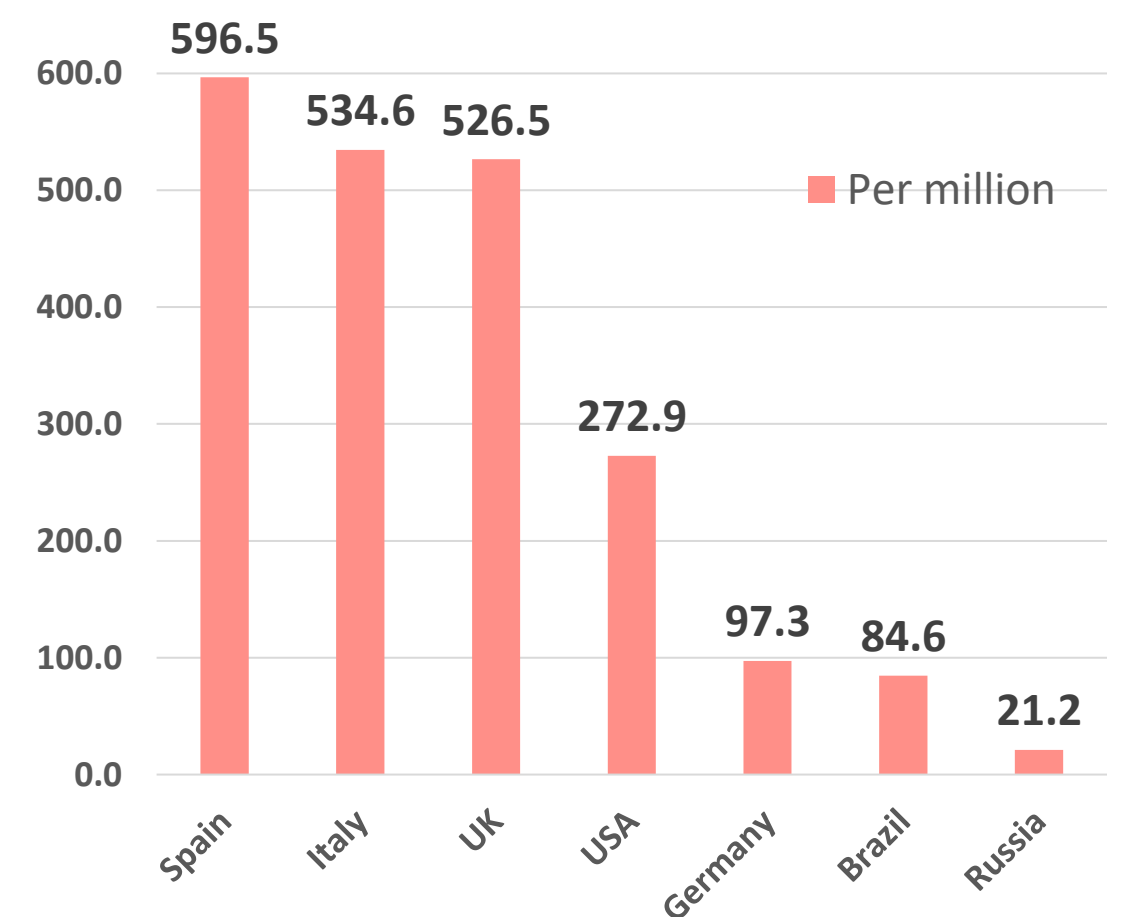
Figure 3 : Top 7 countries in the total number of cases due to COVID-19 (January 21 to May 21, 2020).



TOTAL DEATHS



DEATHS PER MILLION

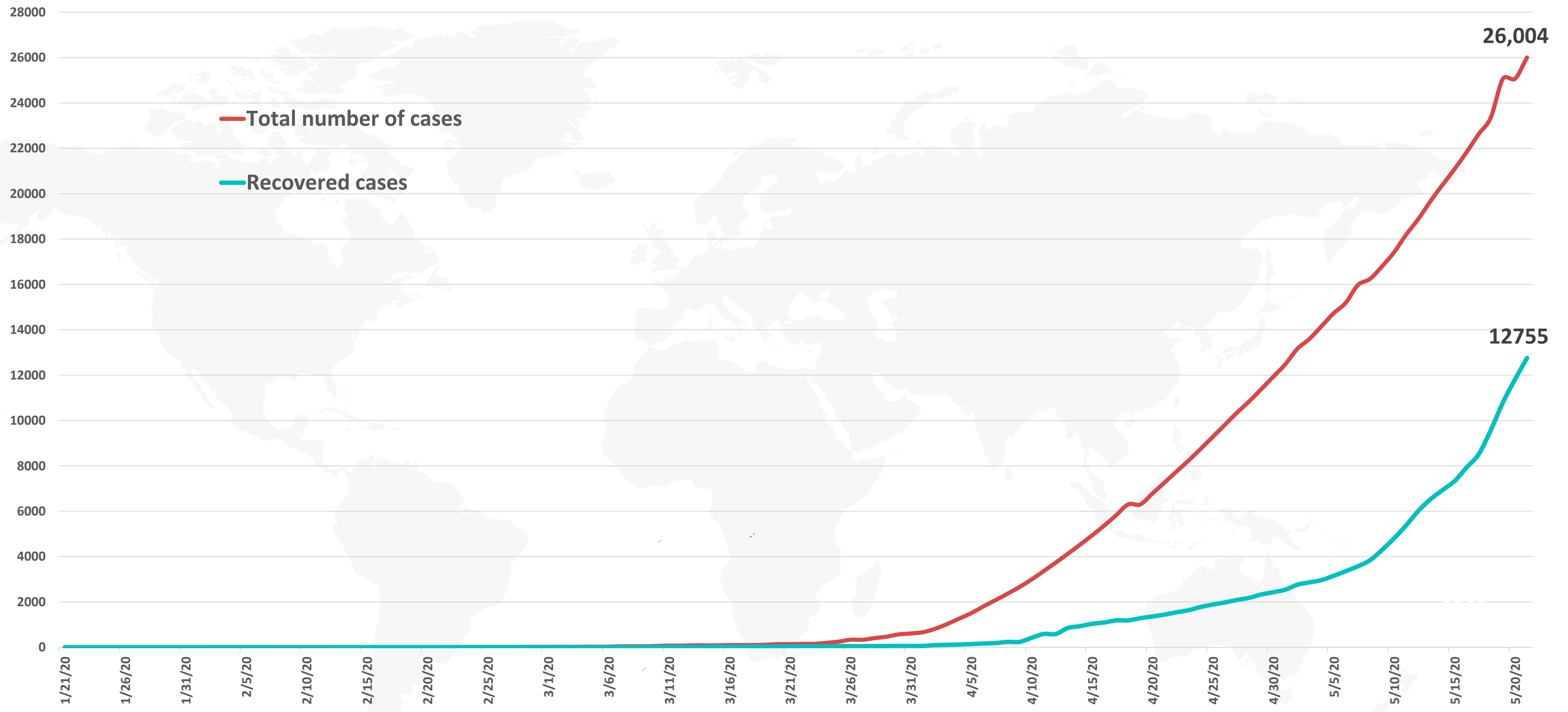


Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](https://www.who.int)



Figure 4: Total number of COVID-19 infected and recovered cases in UAE over time



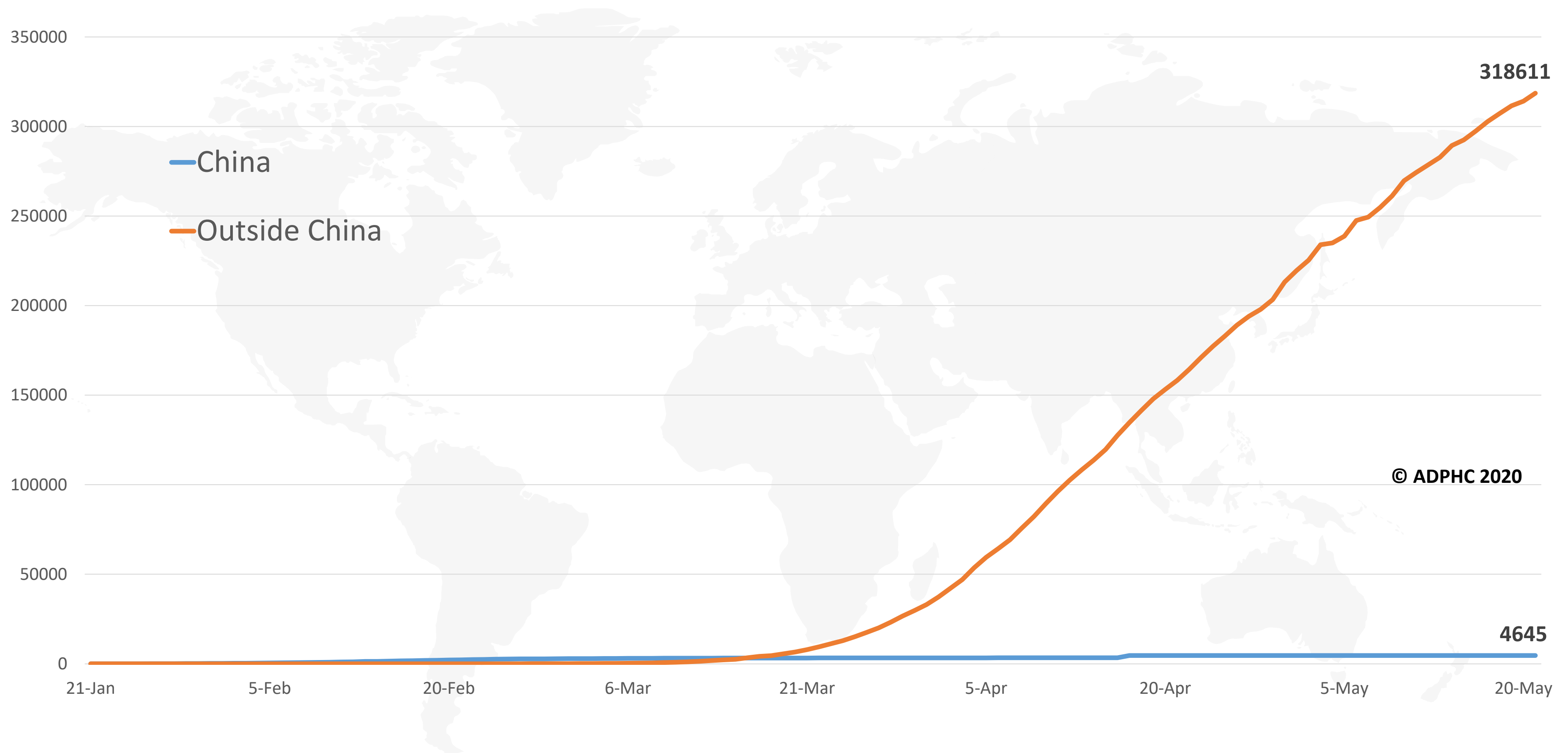
Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#), [John Hopkins University](#)

Epidemiology



Figure 5: Total number of death due to COVID-19 reported by China and the rest of the world (January 22 to May 21, 2020).



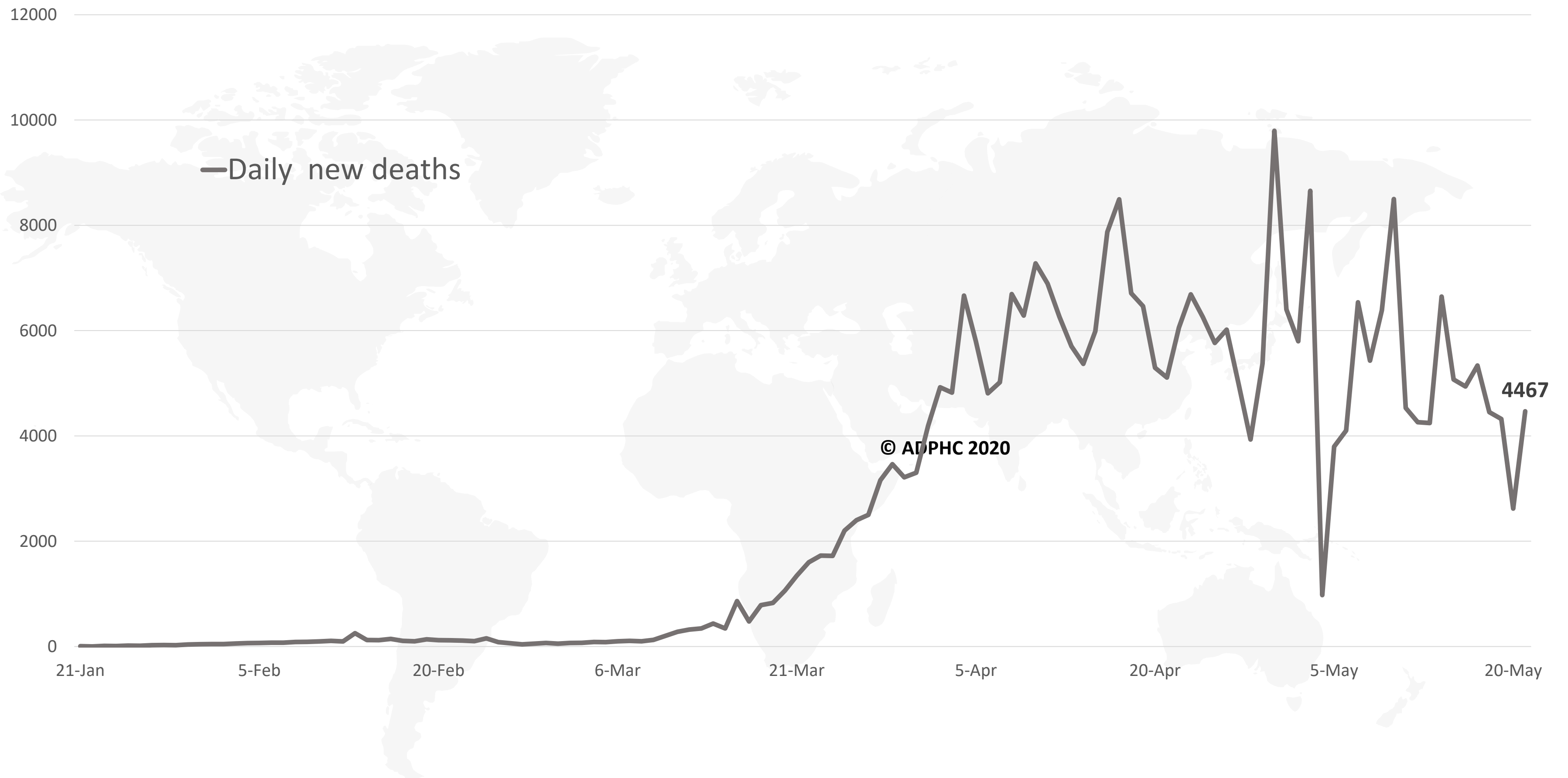
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Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](https://www.who.int/)



Figure 6: Global daily new deaths due to COVID-19 (January 22 to May 21, 2020).



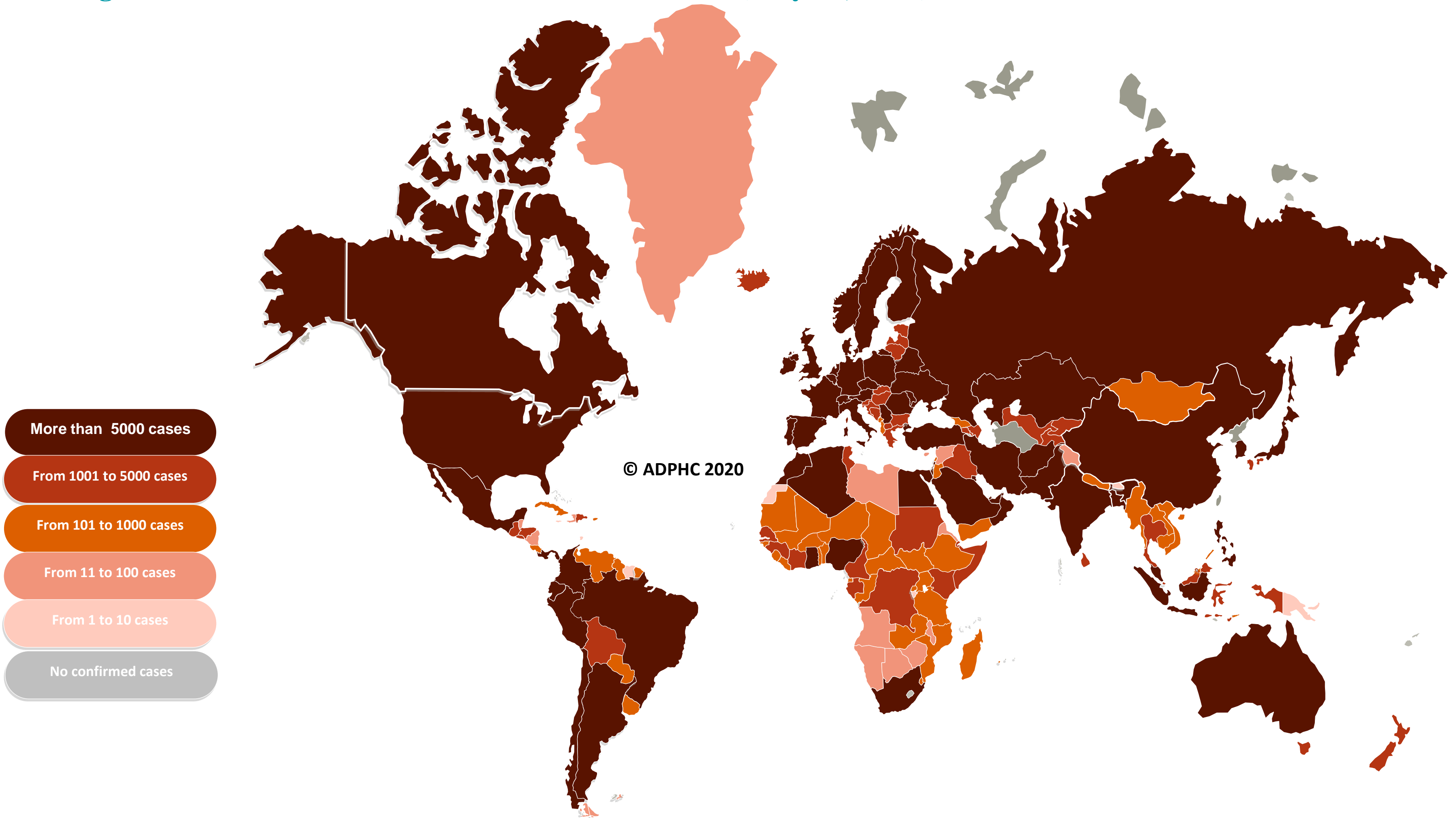
Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](https://www.who.int/)

Epidemiology



Figure 7a : Global distribution of COVID-19 cases (May 21, 2020).

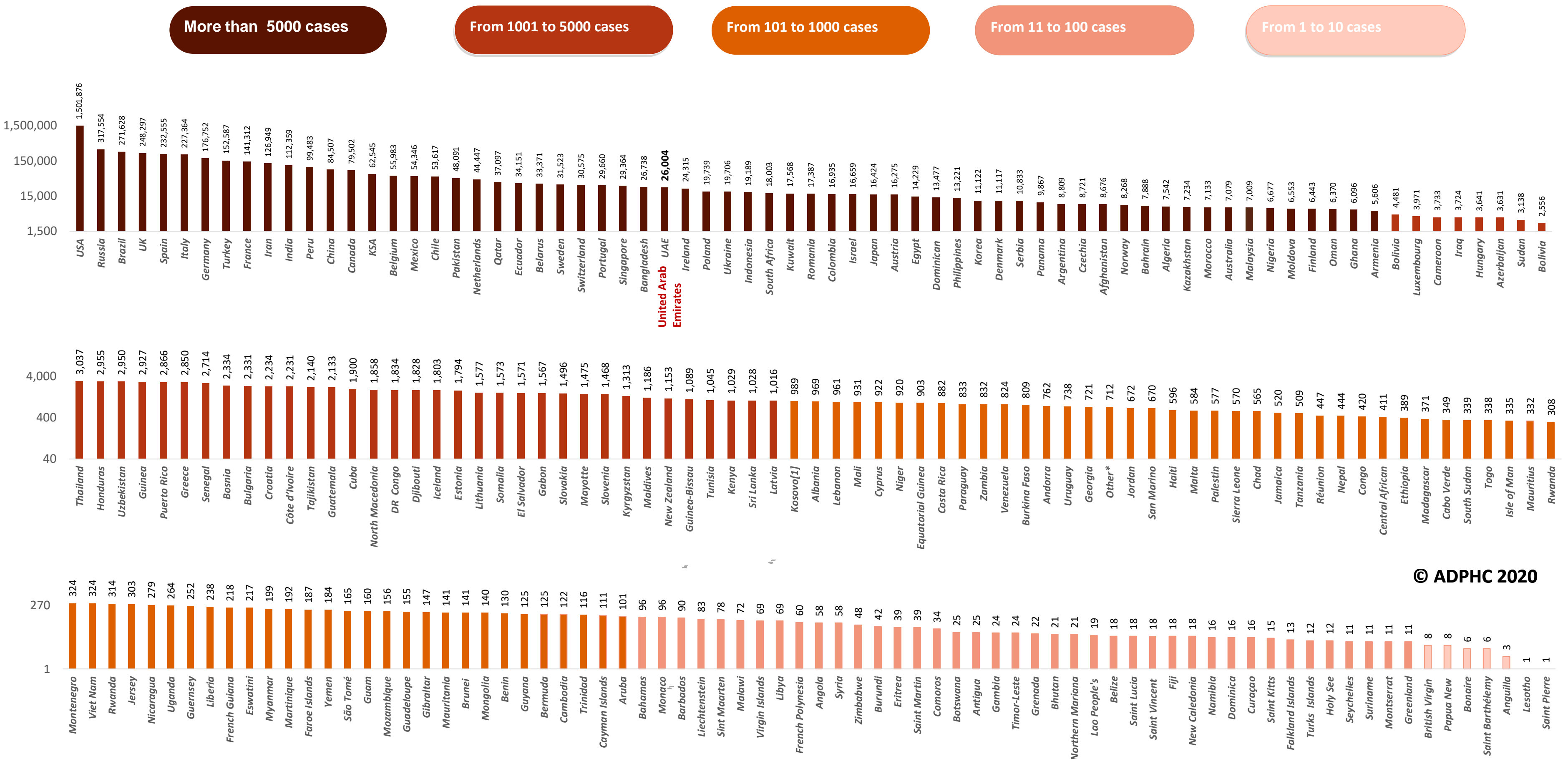


Map chart published by Abu Dhabi Public Health Center 2020.

Epidemiology



Figure 7B: Bar chart illustrate the global distribution of COVID19 cases May 21, 2020)



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

Map chart published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](https://www.who.int/)

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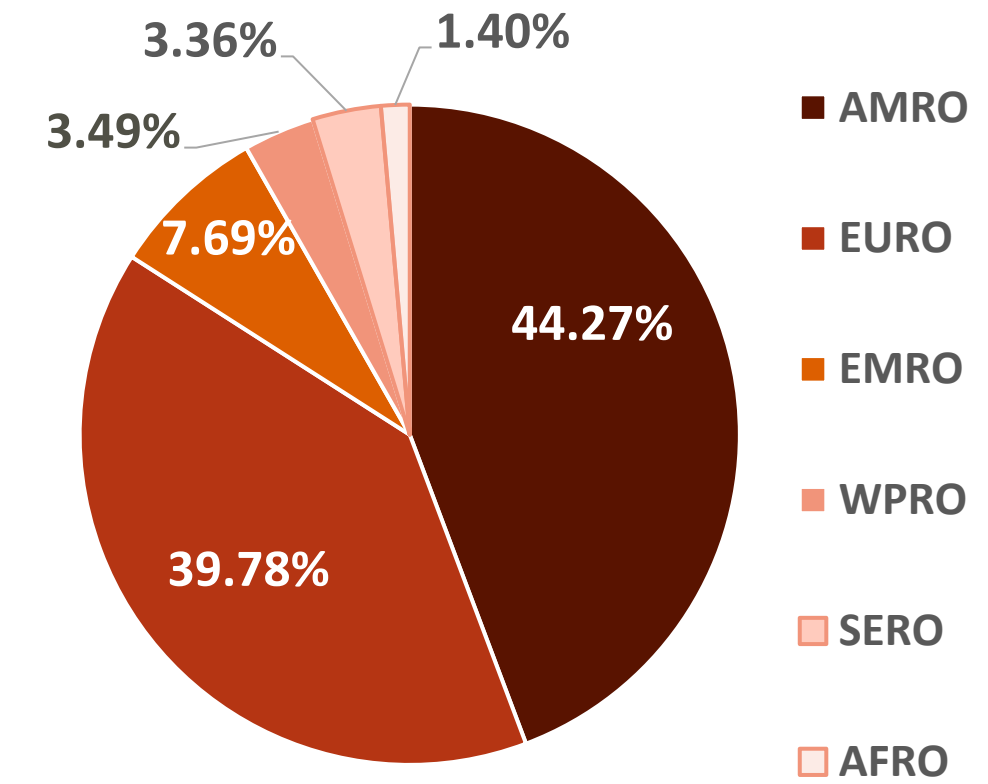
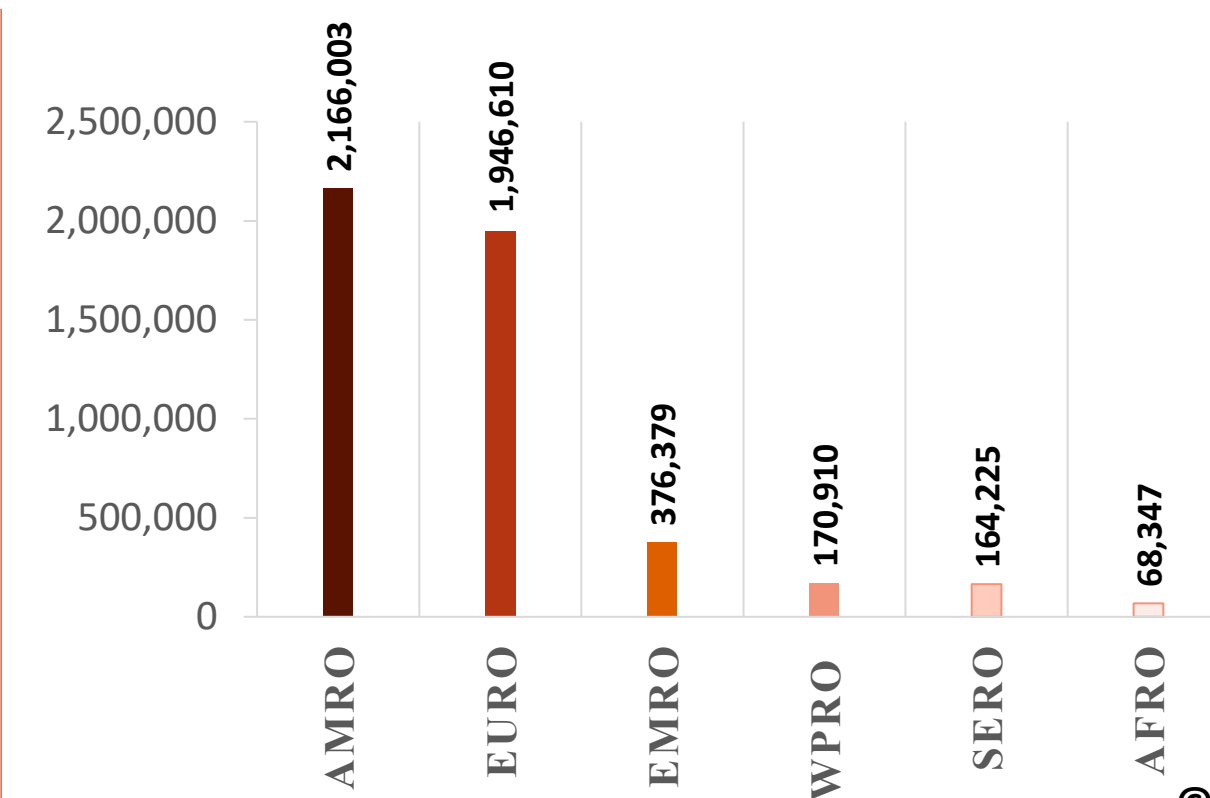
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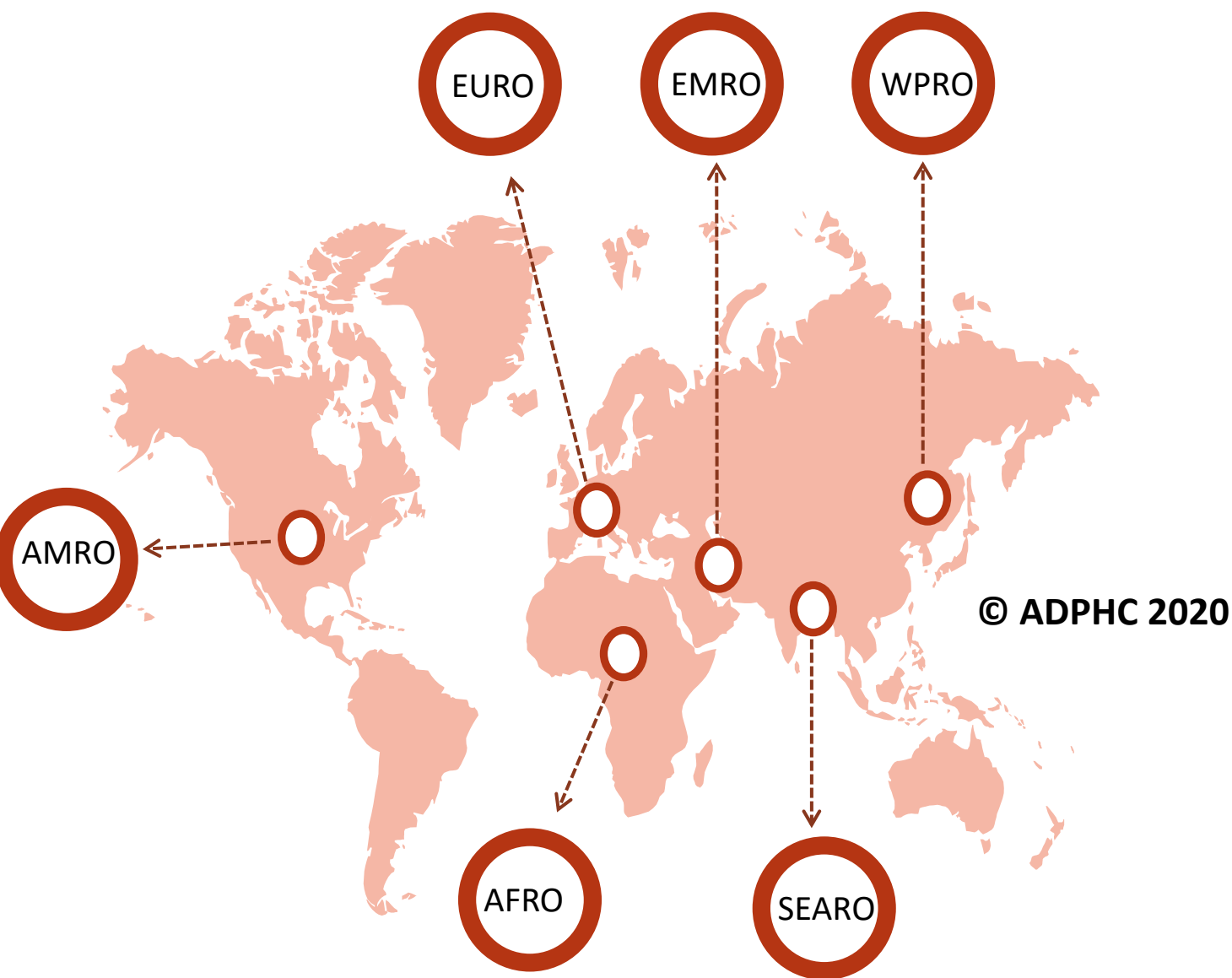
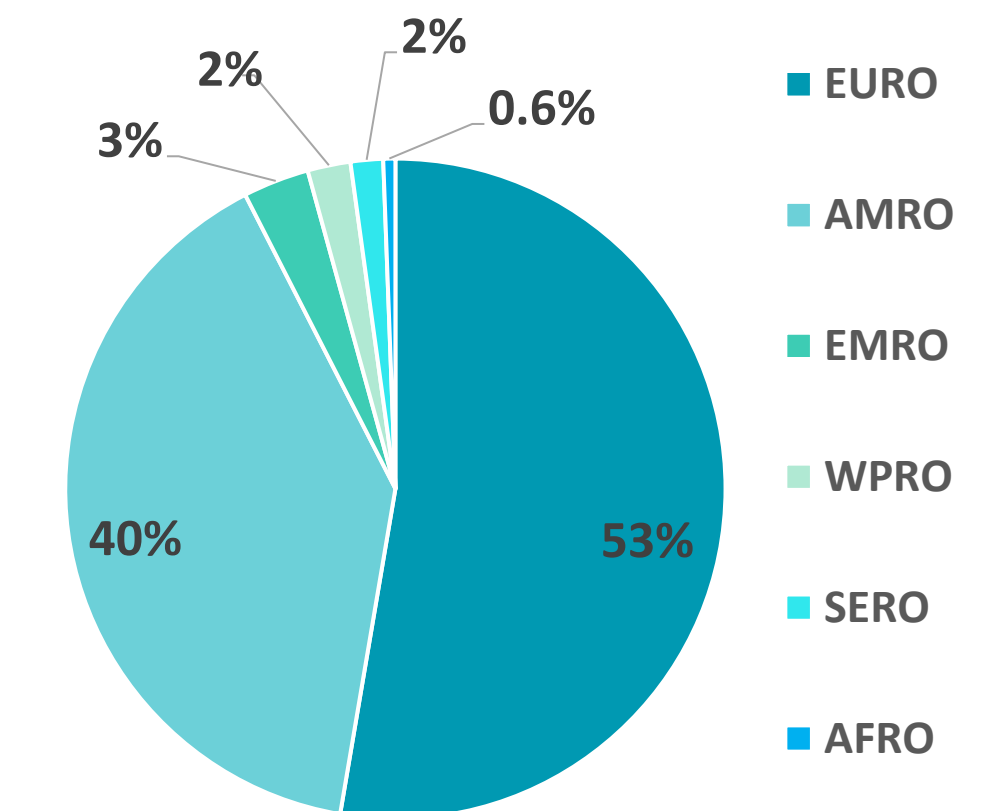
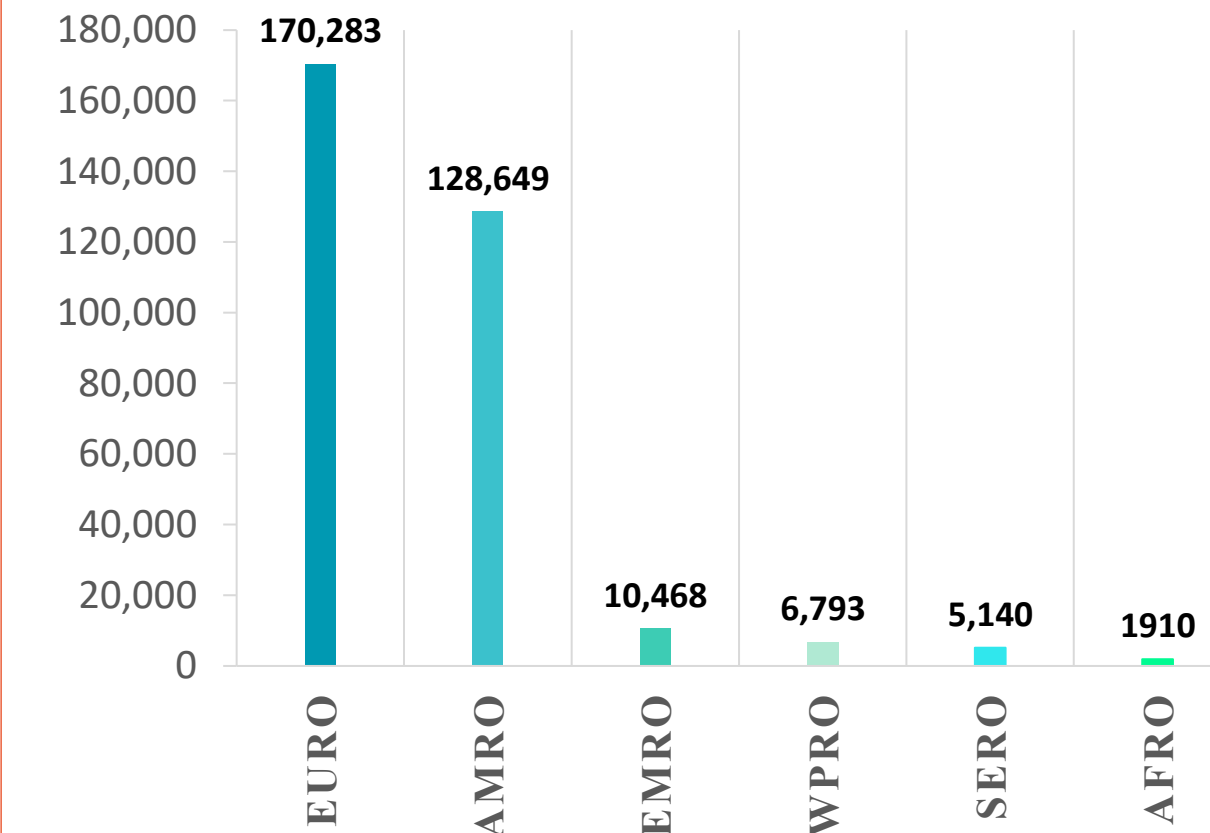
Figure 8: illustrate the Global distribution of COVID19 cases per region (May 21, 2020)

INFECTED



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DEATH



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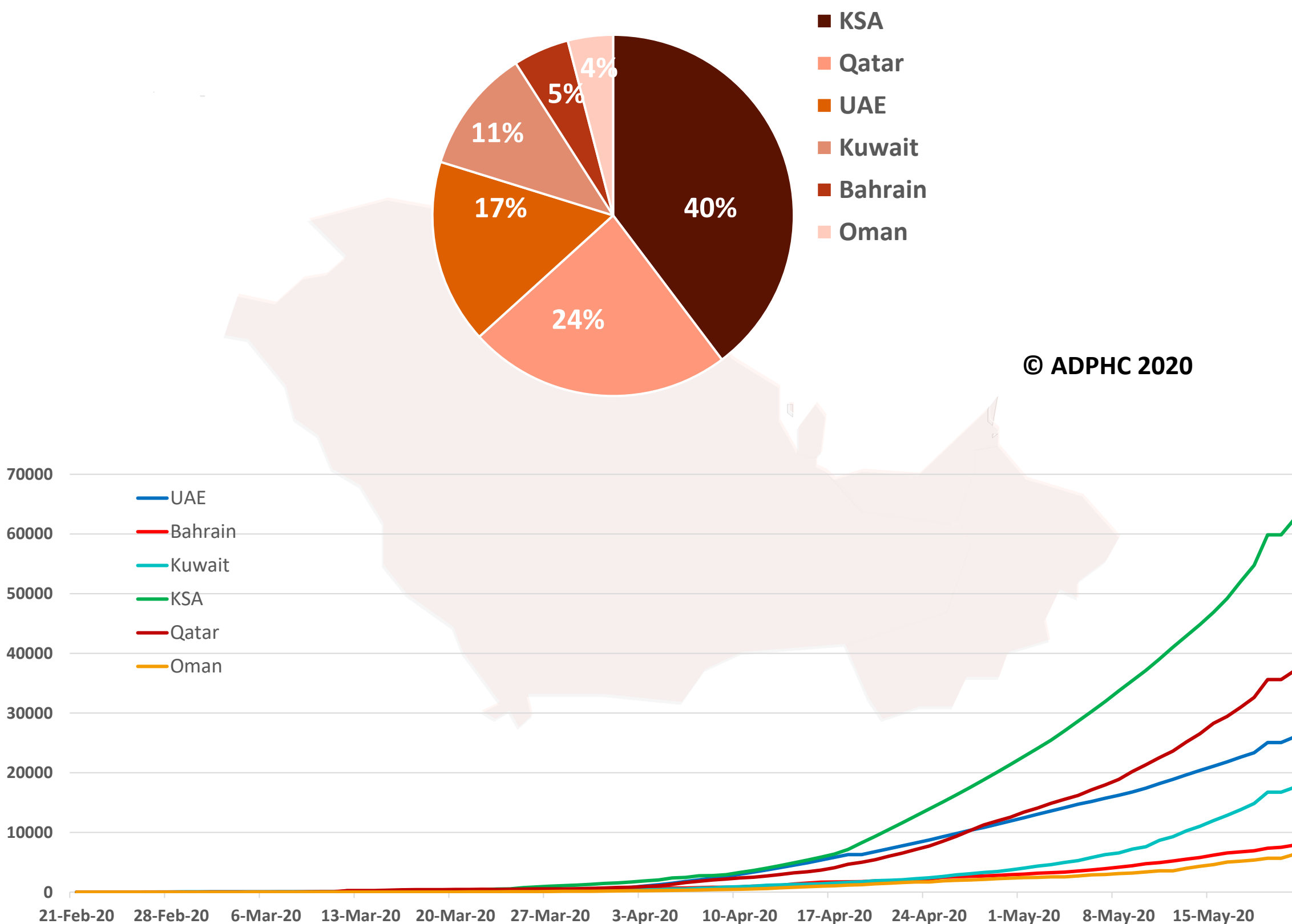
Map chart published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](http://www.who.int)



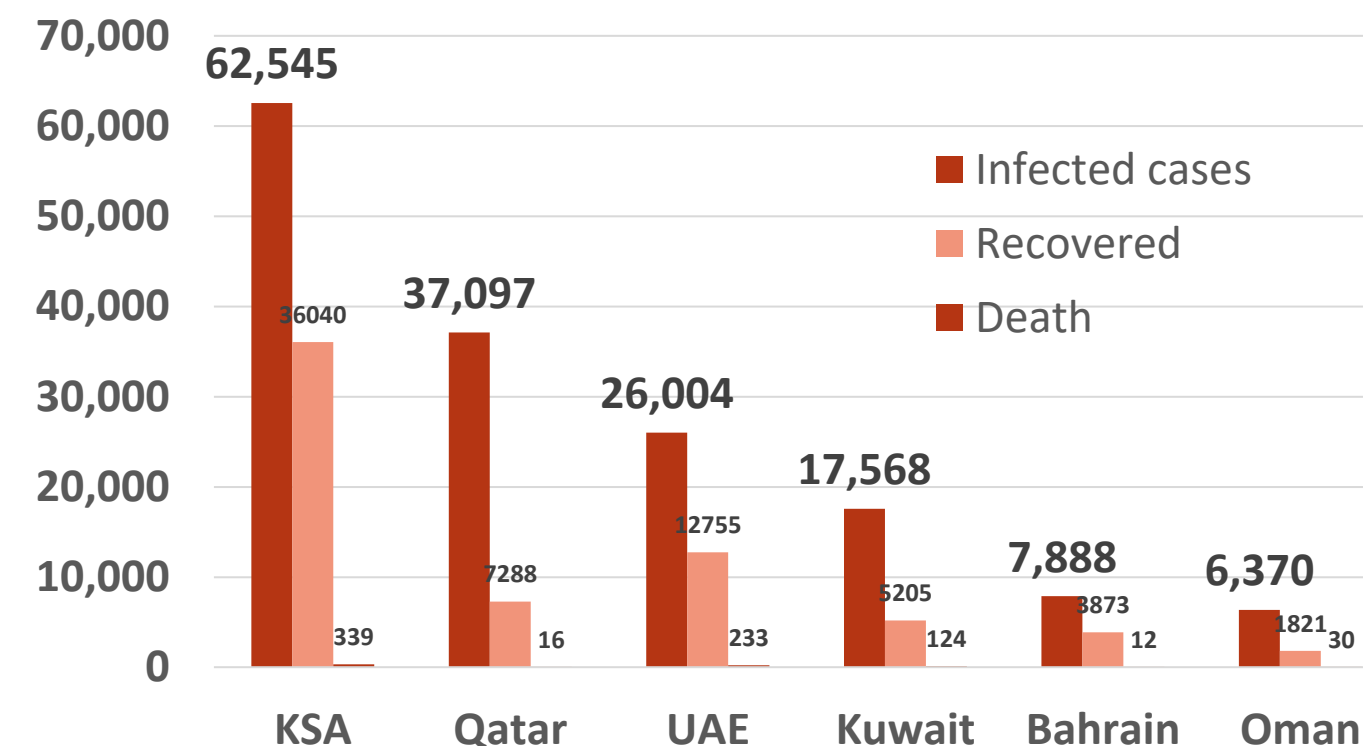
Figure 9: Comparative analysis of the distribution of COVID19 cases in GCC countries (May 21, 2020)

TOTAL NUMBER OF INFECTED CASES

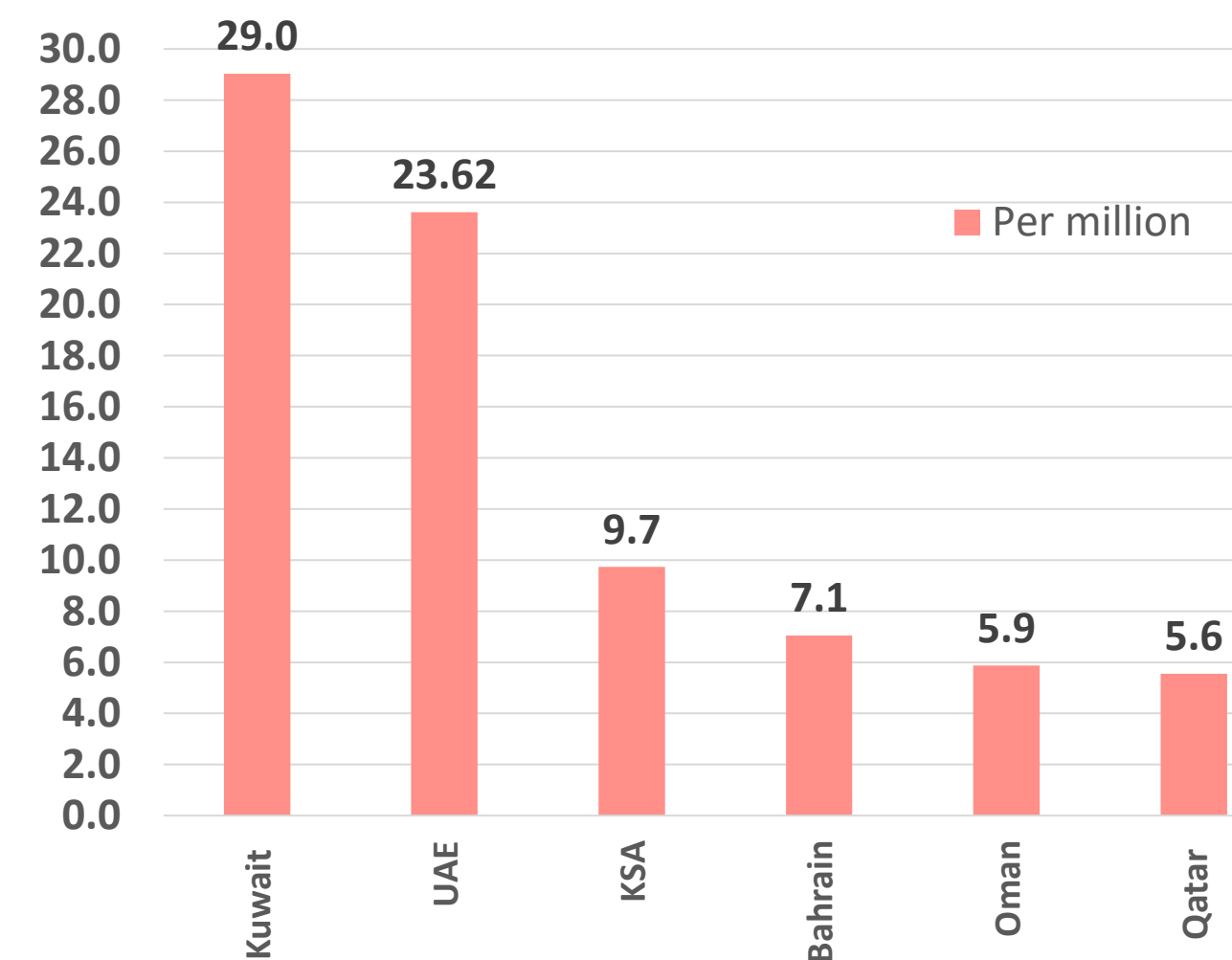


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Total number of infected, recovered and Deaths



Death per million



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Data resources: [WHO](http://www.who.int)

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Mental Health

Article 1 : Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic

Published: May 18, 2020, in [the Lancet](#)

Summarized by subject matter expert

Summary:

- Before the COVID-19 pandemic, coronaviruses caused two noteworthy outbreaks: severe acute respiratory syndrome (SARS), starting in 2002, and Middle East respiratory syndrome (MERS), starting in 2012. This study aimed to assess the psychiatric and neuropsychiatric presentations of SARS, MERS, and COVID-19.
- Methodology included systematic review and meta-analysis using different databases from their inception until April 10, 2020. Outcomes were psychiatric signs or symptoms; symptom severity; diagnoses based on ICD-10, DSM-IV, or the Chinese Classification of Mental Disorders, or psychometric scales; quality of life; and employment.
- Out of 1963 studies and 87 preprints, 72 (65 peer-reviewed studies and seven preprints) met the inclusion criteria. The number of coronavirus cases of the **included studies was 3559**, and the mean age of participants in studies ranged from **12 to 68 years**.
- Findings:
 - The systematic review revealed that **during the acute illness, common symptoms among patients admitted to hospital for SARS or MERS included confusion, depressed mood, anxiety, impaired memory, and insomnia.**
 - **Steroid-induced mania and psychosis were reported in patients with SARS in the acute stage in one study.**
 - **In the post-illness stage, depressed mood, insomnia, anxiety, irritability, memory impairment, fatigue was reported.** The meta-analysis indicated that in the post-illness stage **the point prevalence of post-traumatic stress disorder was 32.2%** , for **depression was 14.9%**, **anxiety disorders 14.8%**. **446 of 580 patients from six studies had returned to work.**



Mental Health

Article 1: Cont., Summary:

Summarized by subject matter expert

There was evidence for delirium (confusion, altered consciousness and agitation) among intensive care unit patients in one study.

At discharge, **15 of 45 patients** with COVID-19 who were assessed had a dysexecutive syndrome (group of symptoms resulting from **brain damage, that fall into cognitive, behavioral and emotional categories**) in one study. At the time of writing, there were two reports of **hypoxic encephalopathy** and one report of **encephalitis**. 68 (94%) of the 72 studies were of either low or medium quality. **For COVID-19, the conclusions must be cautious because data on acute effects of the illness are limited and no data exists on the post-illness phase.**

Conclusion:

Although there are many ways in which mental health might be adversely affected by a pandemic, this review suggests, **first, that most people do not suffer from a psychiatric disorder following coronavirus infection, and second, that so far there is little to suggest that common neuropsychiatric complications beyond short-term delirium are a feature.** Clinicians must be aware of the possibility of depression, anxiety, fatigue, post-traumatic stress disorder, and rarer neuropsychiatric syndromes in the aftermath. **The quality of studies to date has been variable, and ongoing surveillance is essential.**



Article 2: COVID-19 and the impact of social determinants of health

Published: May 18, 2020 , in [the lancet](#)

Summary:

- **Social determinants** of health such as **poverty, physical environment, and ethnicity** can have a substantial impact on COVID-19 outcomes. Homeless people are at higher risk of viral transmission due to crowded living spaces. **Current or former smokers** were more likely to have severe symptoms as well as an increased risk of intensive care unit admission, mechanical ventilation, or mortality than non-smokers. In the United States, infection rate is three times higher in predominantly black counties than that of white counties.
- The impact of social determinants of health on COVID-19 morbidity is not sufficiently valued. Pandemic disproportionately affect the underprivileged population. Mitigating social determinants such as improved housing, reduced overcrowding, and improved nutrition reduce the effect of infectious diseases before development of effective medications.
- Future studies are required to measure the effect of **COVID-19 on individuals with adverse social determinants and innovative approaches for management are required. Social determinants of health should be included as part of pandemic research priorities, public health goals, and policy implementation.** While the relationships between these variables needs additional explanation, measures that affect adverse determinants including reducing smoke exposure, regular income support to low-income households, and access to testing and shelter among the homeless have the potential to reduce future pandemic morbidity and mortality.



Article 3: Wrong but Useful — What Covid-19 Epidemiologic Models Can and Cannot Tell Us (1/3)

Published: 15 May 2020 in [NEJM](#)

Summary:

Summarized by subject matter expert

This article discusses the usefulness of infectious disease models in general, and specifically in Covid-19 context.

Three types of models

1. Forecasting Models:

- Statistical in nature
- Assess a pattern in a sequence of numbers and guessing the next number
- Provide quantitative projections **that policymakers may need in the short term to allocate resources or plan interventions**
- Example include Covid-19 model from Institute for Health Metrics and Evaluation (IHME)
 - approximate the shape of the epidemic curve from outbreaks in China and Italy and applying it elsewhere. This model does not account for how transmission occurs, **they are generally not well suited for long-term predictions about epidemiologic dynamics** (such as when the peak will occur and whether resurgence will happen) or **for inference about intervention efficacy**. Several forecasting models therefore limit their projections to one week or a few weeks ahead.

2. Mechanistic Models

- Used to explore possible long-term epidemiologic outcomes
- Mimic the way SARS-CoV-2 spreads **and can be used to forecast or simulate future transmission scenarios under various assumptions such as transmission, disease, and immunity**
- Mechanistic approaches include important nonlinear feedback - the more people become infected, the faster disease spreads
- Examples include Susceptible–Exposed–Infectious–Recovered frameworks or SIR models
 - S = the number of susceptible individuals
 - I = the number of infected individuals
 - R = the number of recovered individuals
- **Help to forecast the “Exit Strategies”**



Article 3 : Cont., (2/3)

Summarized by subject matter expert

3. Hybrid Models

- These types of models include both forecasting and mechanistic approaches.

Limitations of Using Models:

I. We remain uncertain about the extent of protective immunity. If SARS-CoV-2 infection produces strong, long-lasting immunity, then the risk of recurrent, annual outbreaks is lower. **If there is waning, only partially protective, or no immunity, then epidemics may recur frequently or seasonally.**

II. The extent of transmission and immunity among people with no or minimal symptoms (including children) plays an important role in predictions: if there is very little asymptomatic infection, we are probably still far from the epidemic peak. If there is a lot of asymptomatic transmission, there are many unobserved cases, but we may be further along the epidemic curve than we thought - assuming some protective immunity.

III. It remains extremely challenging to measure and model contact rates between susceptible and infectious people, not only under physical distancing policies but also in various reopening scenarios.

In conclusion:

- **The most obvious source of uncertainty, affecting all models, is that we don't know how many people are, or have been, infected.**
- **The epidemiological models are constrained by what we know and what we assume, but used appropriately and with an understanding of the limitations, they can and should help guide us through this pandemic.**

Public Health Response:



Article: Cont., (3/3)

Summarized by subject matter expert

Referenced Covid-19 Pandemic Models.

Model	Source
IHME COVID-19 Predictions	https://covid19.healthdata.org
Los Alamos National Laboratory COVID-19 Confirmed and Forecasted Case Data	https://covid-19.bsvgateway.org
University of Geneva and Swiss Data Science Center, COVID-19 Epidemic Forecasting	https://renkulab.shinyapps.io/COVID-19-Epidemic-Forecasting
Ferguson et al., Imperial College Covid-19 Response Team, Report 9	www.imperial.ac.uk/media/imperial-college/medicine/mrc-gida/2020-03-16-COVID19-Report-9.pdf
Kissler et al., Projecting the transmission dynamics of Covid-19 through the postpandemic period	https://doi.org/10.1126/science.abb5793
Aleta et al., Modeling the impact of social distancing, testing, contact tracing and household quarantine on second-wave scenarios of the COVID-19 epidemic	https://cosnet.bifi.es/wp-content/uploads/2020/05/main.pdf
Hellewell et al., Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts	https://doi.org/10.1016/S2214-109X(20)30074-7