

ABU DHABI PUBLIC  
HEALTH CENTRE

مركز أبوظبي  
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# Scientific Research Monitoring on COVID-19

14 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

- Virology :** a study on the virus stability showed that at room temperature (22°C), virus infectivity disappeared at day 14, No infectious virus could be detected after 3 hours from printing paper & tissue paper, after 2 days from wood & cloth, while it was undetectable from smooth surfaces like glass and banknotes after 4 days or after 7 days from stainless steel & plastic. Most disinfectant works eliminates in 5 min.
- Public Health response:** a group in the US develop a model to increase the blood donation uptake.
- Public Health Response:** a modeling study in Kuwait showed Early control measures had the effect of delaying and lowering the intensity of the outbreak but were unsuccessful in reducing the effective reproduction number below 1.





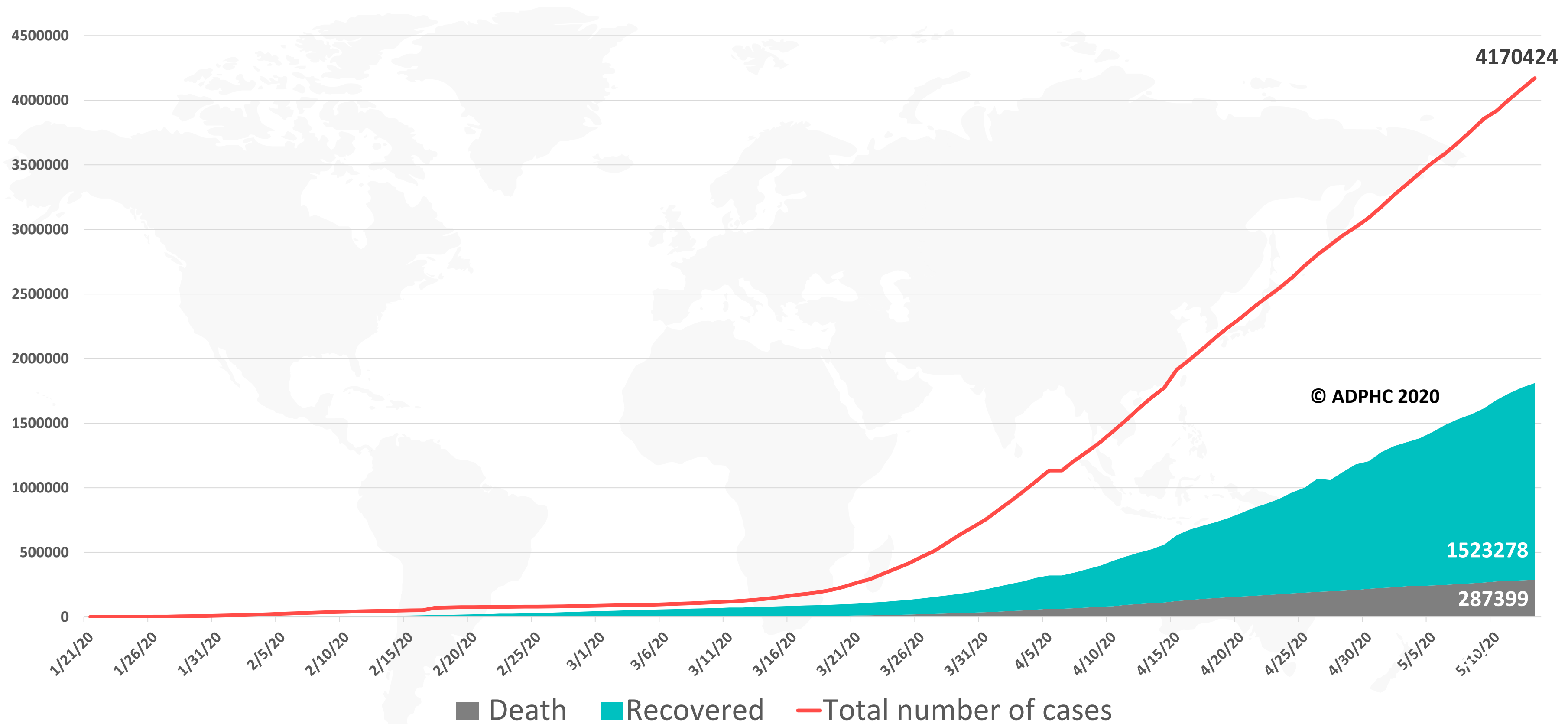
## WHO daily report 13 May 2020

- WHO has published an annex to the guidance on considerations on adjusting public health and social measures (PHSM). The new annex provides a pragmatic decision process to help countries through adapting PHSM based on epidemiological and public health criteria.
- According to the [2020 World Health Statistics](#) published by WHO today, the COVID-19 pandemic is causing significant loss of life, disrupting livelihoods, and threatening the recent advances in health and progress towards global sustainable development goals.
- WHO has joined forces with the United Kingdom to run an awareness campaign named “Stop The Spread” about the risks of inaccurate and false information regarding the COVID-19 pandemic.
- About school reopening:
- EPI-WIN co-hosted a webinar with UNICEF on public health and social measures in schools on 13 May, with more than 890 registrants
  - series of factors should be considered when deciding on whether to open or to close schools, such as the **epidemiology of COVID-19 nationally** and in the local area, **health system** and public health capacity to respond to outbreaks as well as **the school settings** and ability to maintain COVID-19 prevention and **control measures that protect children**.
  - Thus, additional important factors to include in the assessment **are risk of non-return to school**, risk of widening disparity in educational attainment, **access to meals for children who need them**, the **possibility of domestic violence** aggravated by economic uncertainties, and the need to maintain **schools at least partially open for children whose caregivers are ‘key workers’ for the country**.

# Epidemiology



Figure 1: Total number of infected, recovered, and death cases (January 21<sup>st</sup> to May 13, 2020)

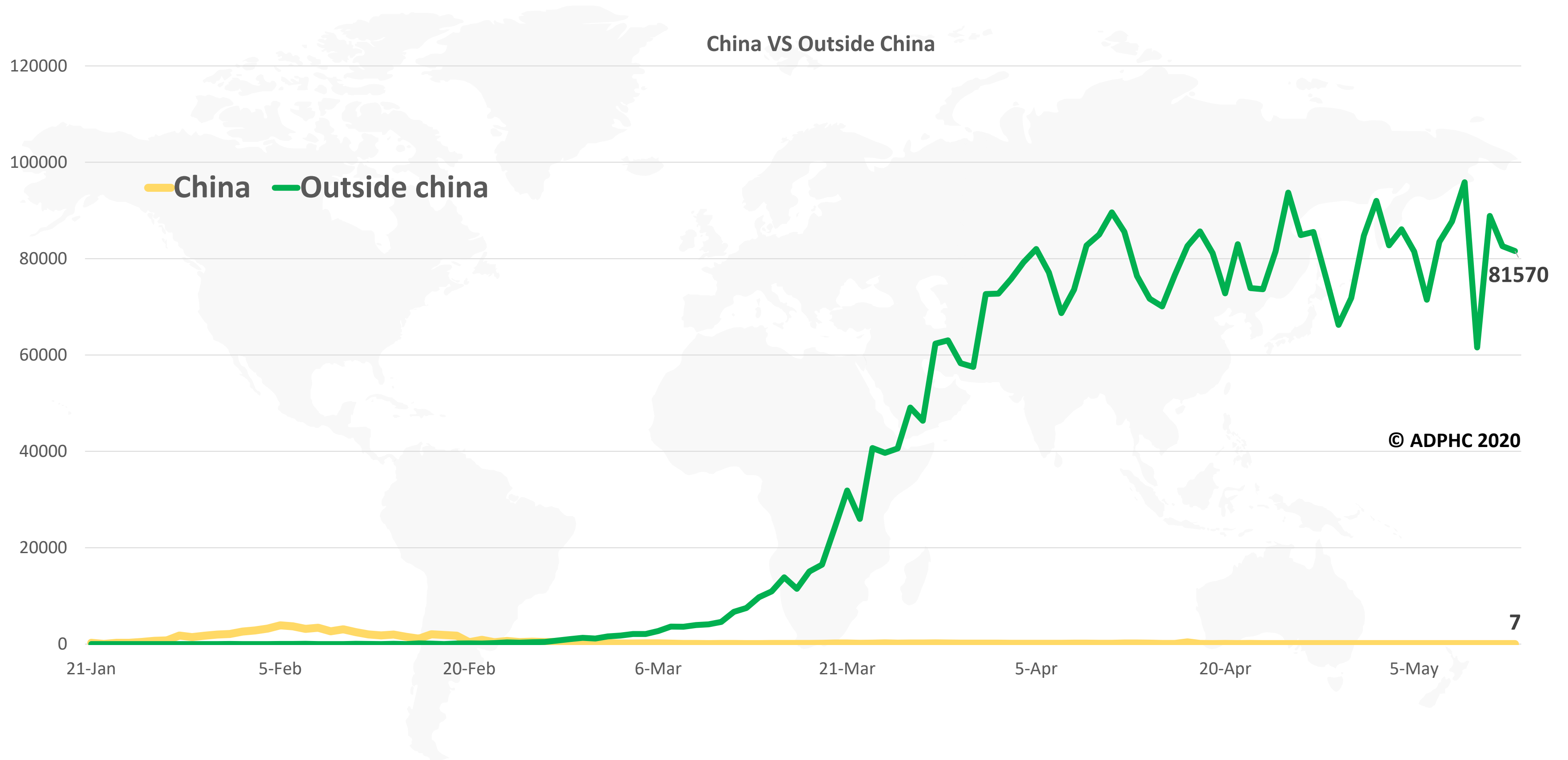


Line graph published by Abu Dhabi Public Health Center 2020.

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



Figure 2: Daily new infected COVID-19 cases reported between (January 21 to May 13, 2020).



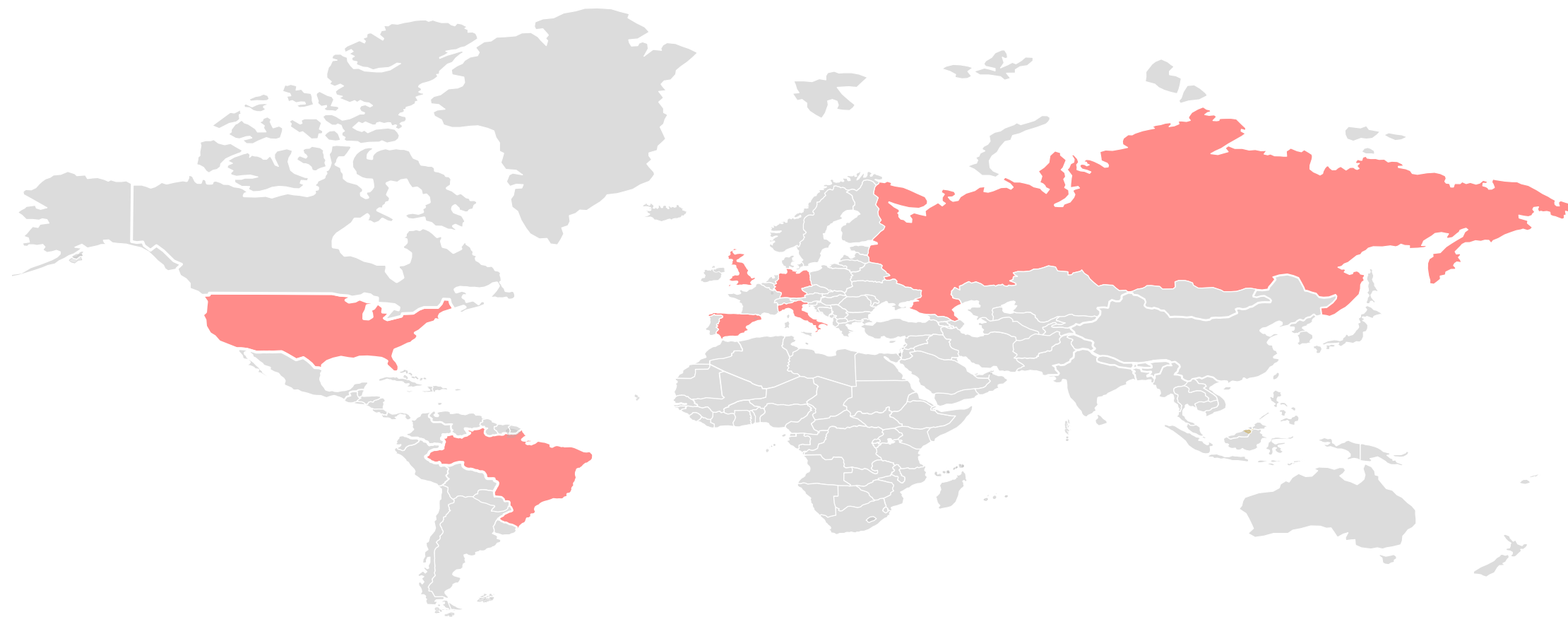
Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#)

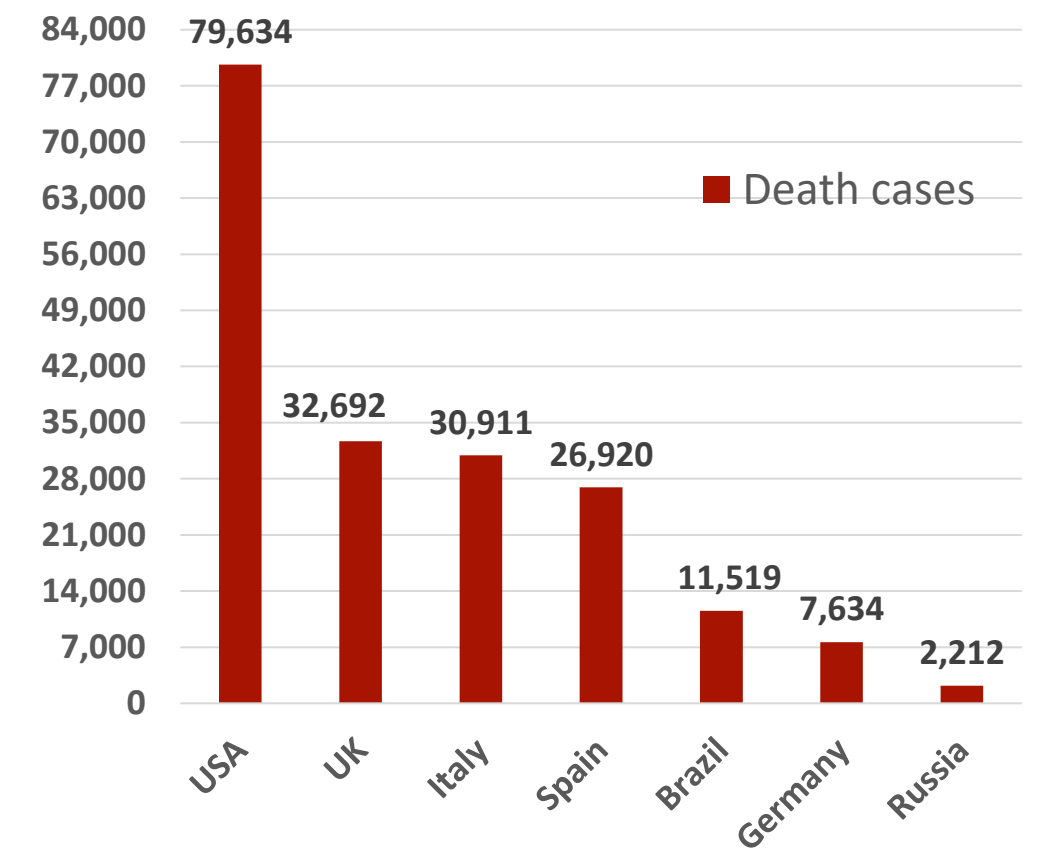
# Epidemiology



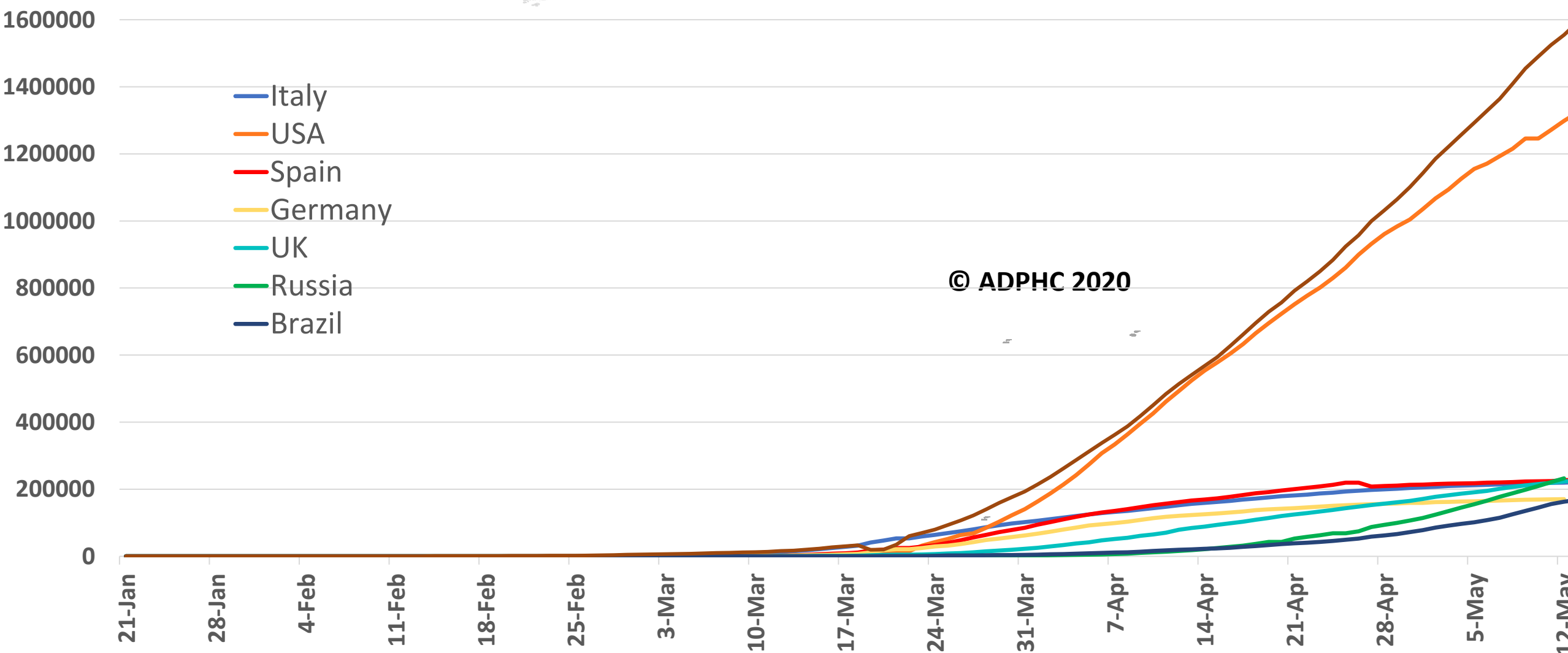
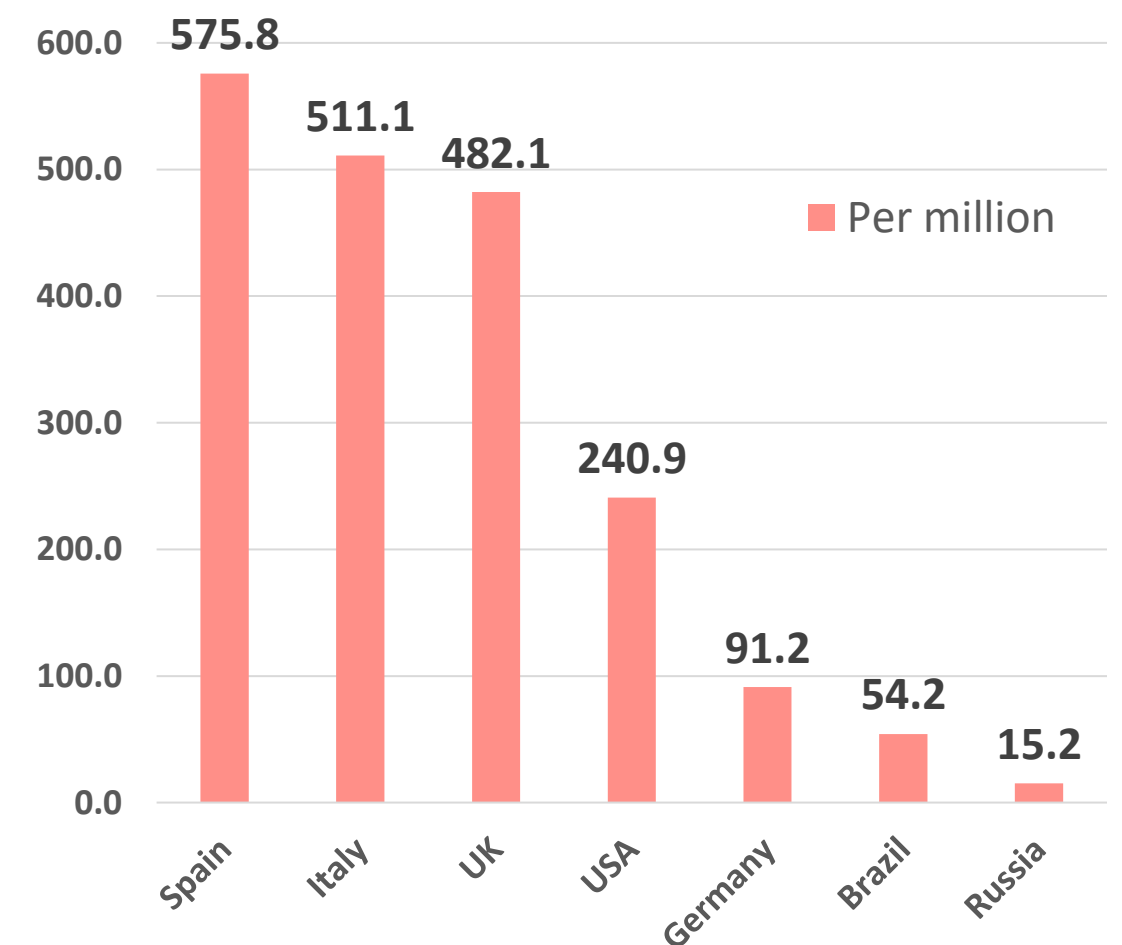
Figure 3 : Top 7 countries in the total number of cases due to COVID-19 (January 21 to May 13, 2020).



## TOTAL DEATHS



## DEATHS PER MILLION



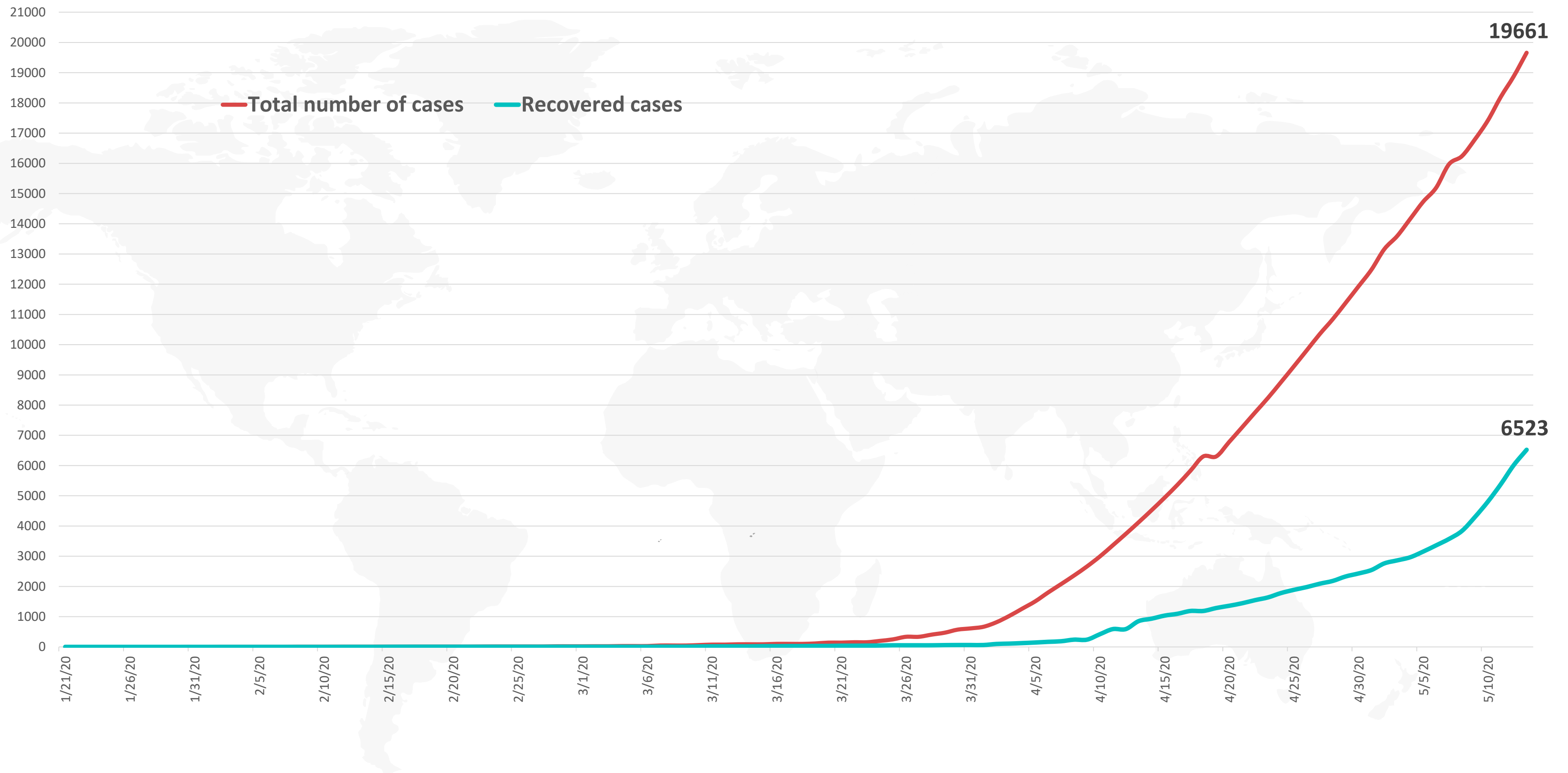
Line graph published by Abu Dhabi Public Health Center 2020.

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





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



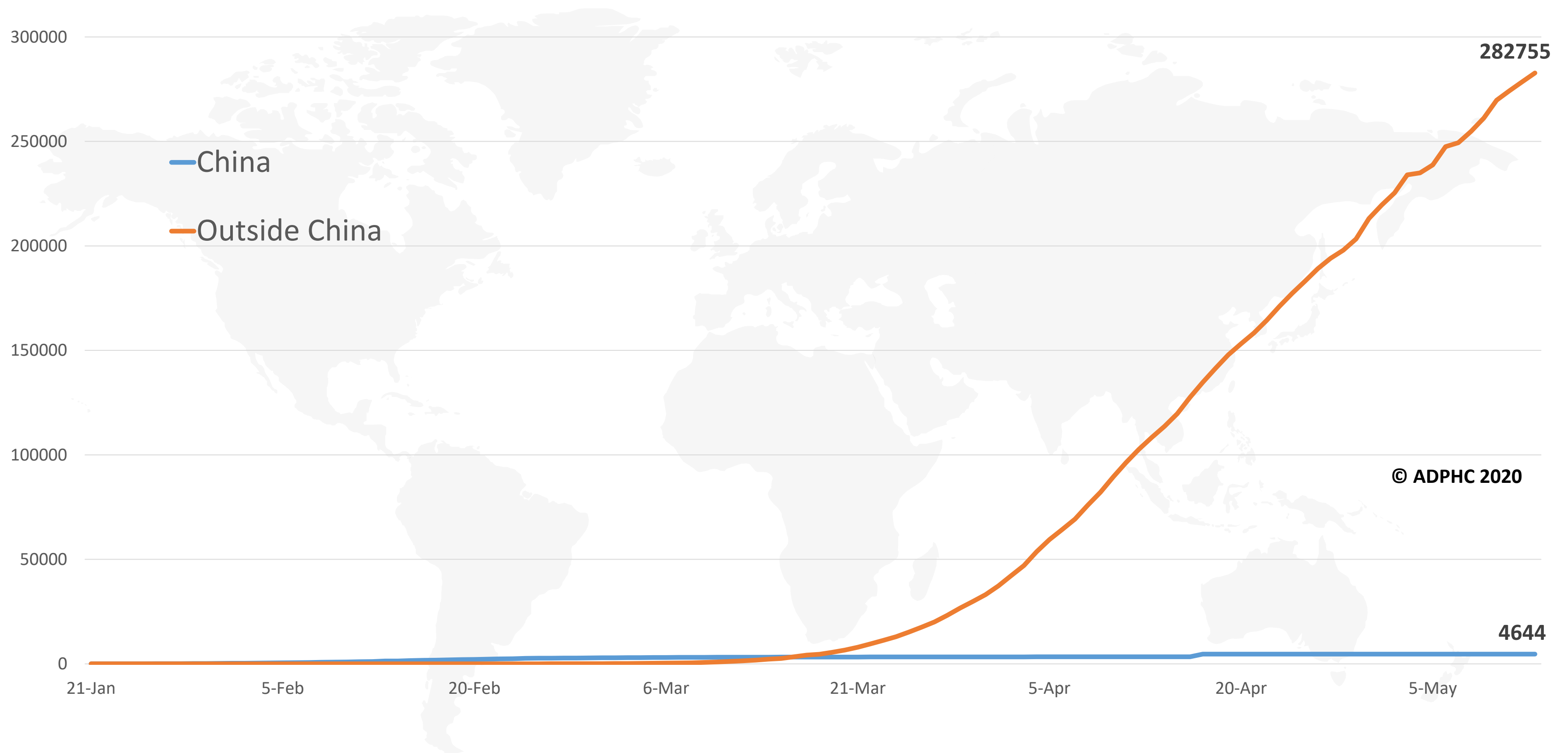
Line graph published by Abu Dhabi Public Health Center 2020.

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 13, 2020).**



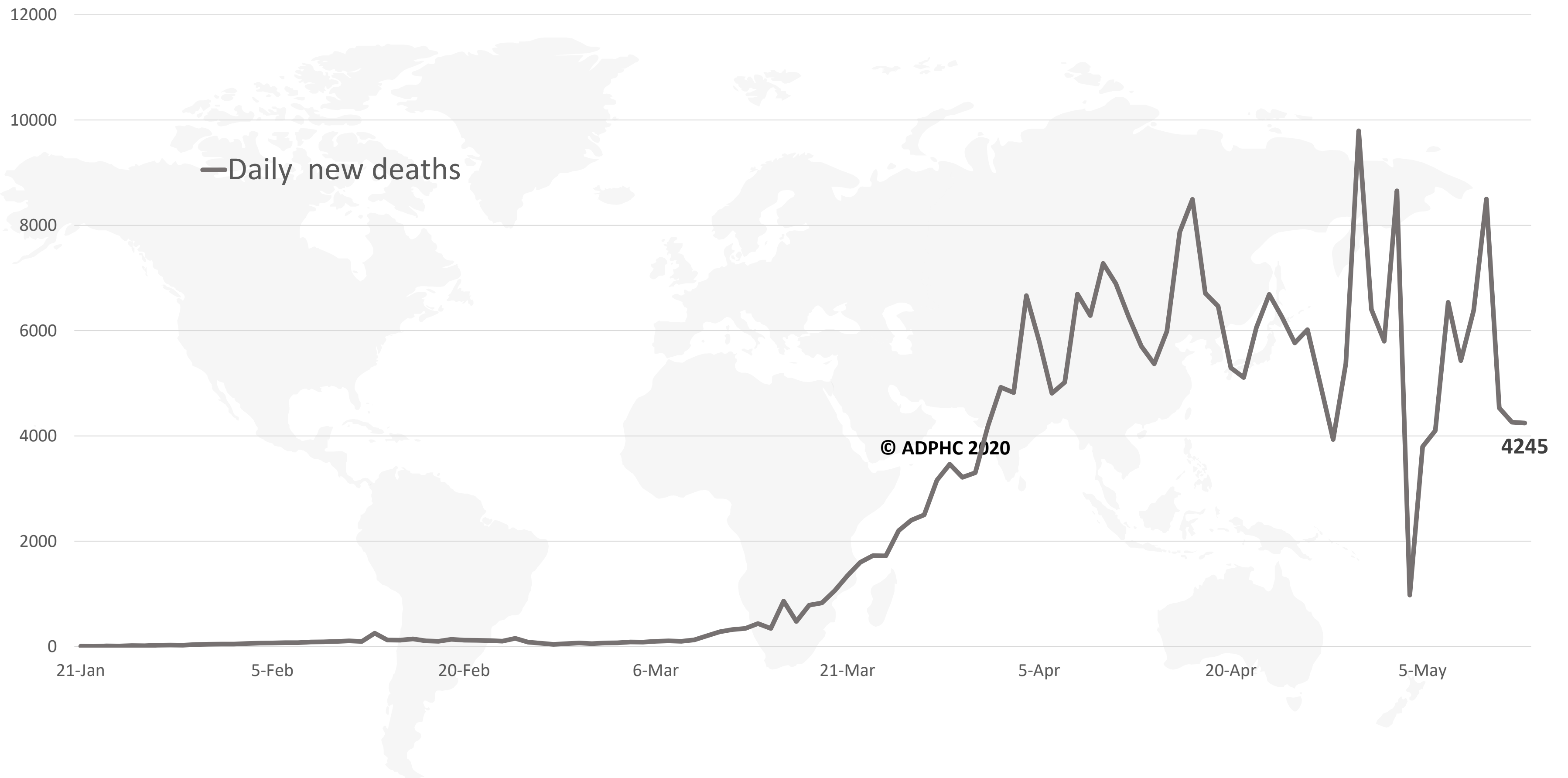
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Line graph published by Abu Dhabi Public Health Center 2020.

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



**Figure 6: Global daily new deaths due to COVID-19 (January 22 to May 13, 2020).**



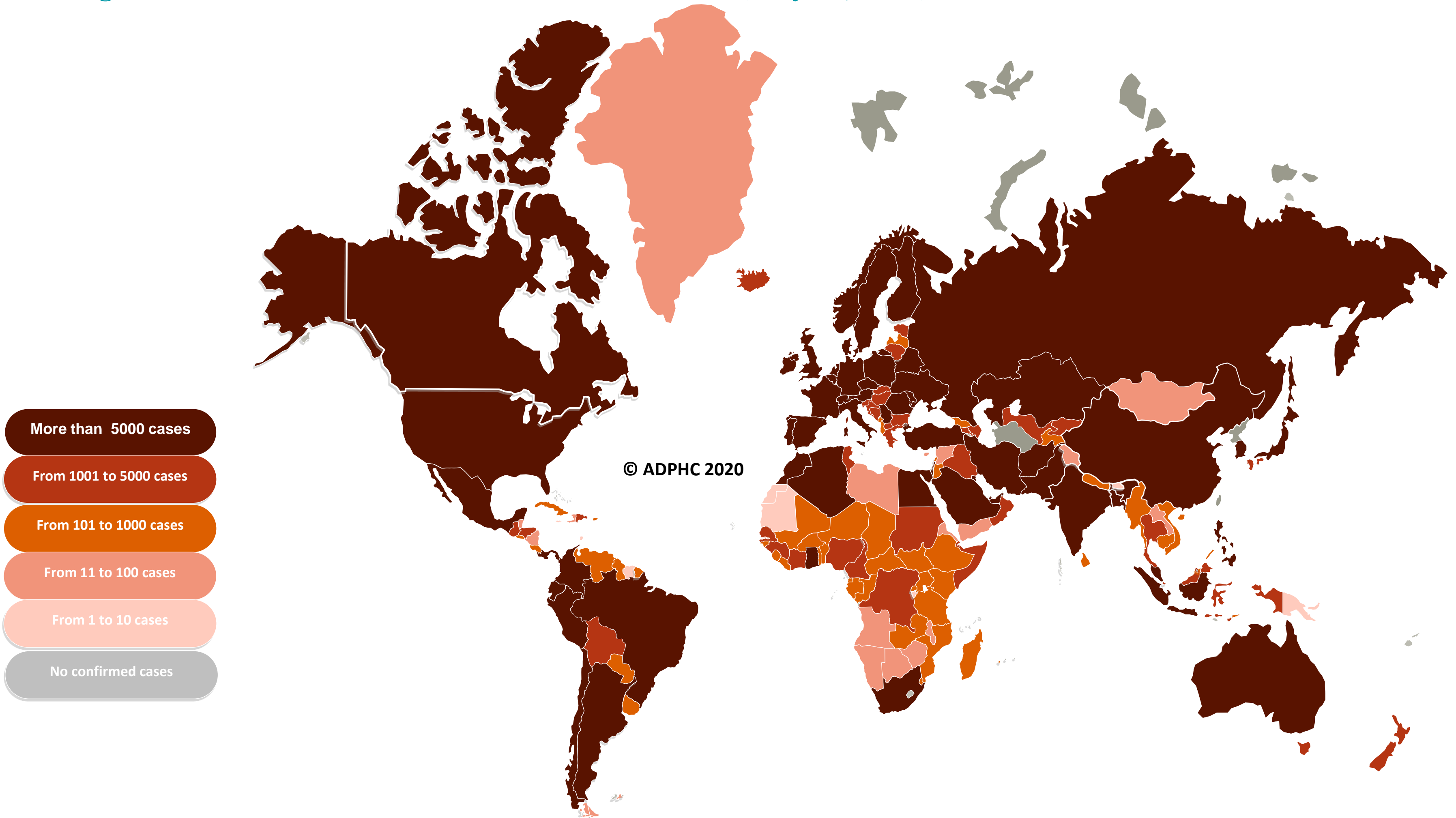
Line graph published by Abu Dhabi Public Health Center 2020.

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

# Epidemiology



Figure 7a : Global distribution of COVID-19 cases (May 13, 2020).

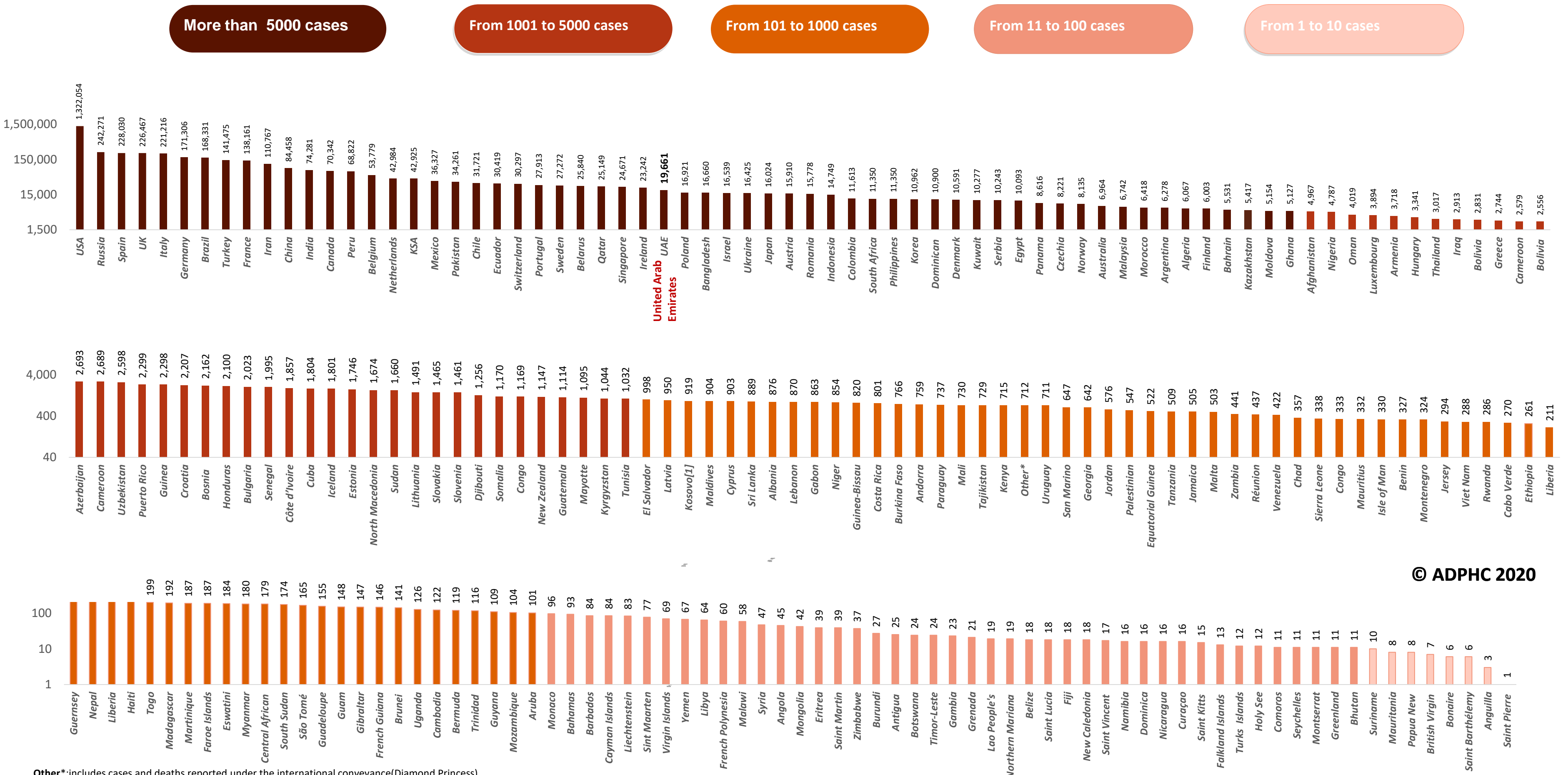


Map chart published by Abu Dhabi Public Health Center 2020.





Figure 7B: Bar chart illustrate the global distribution of COVID19 cases May 13, 2020)



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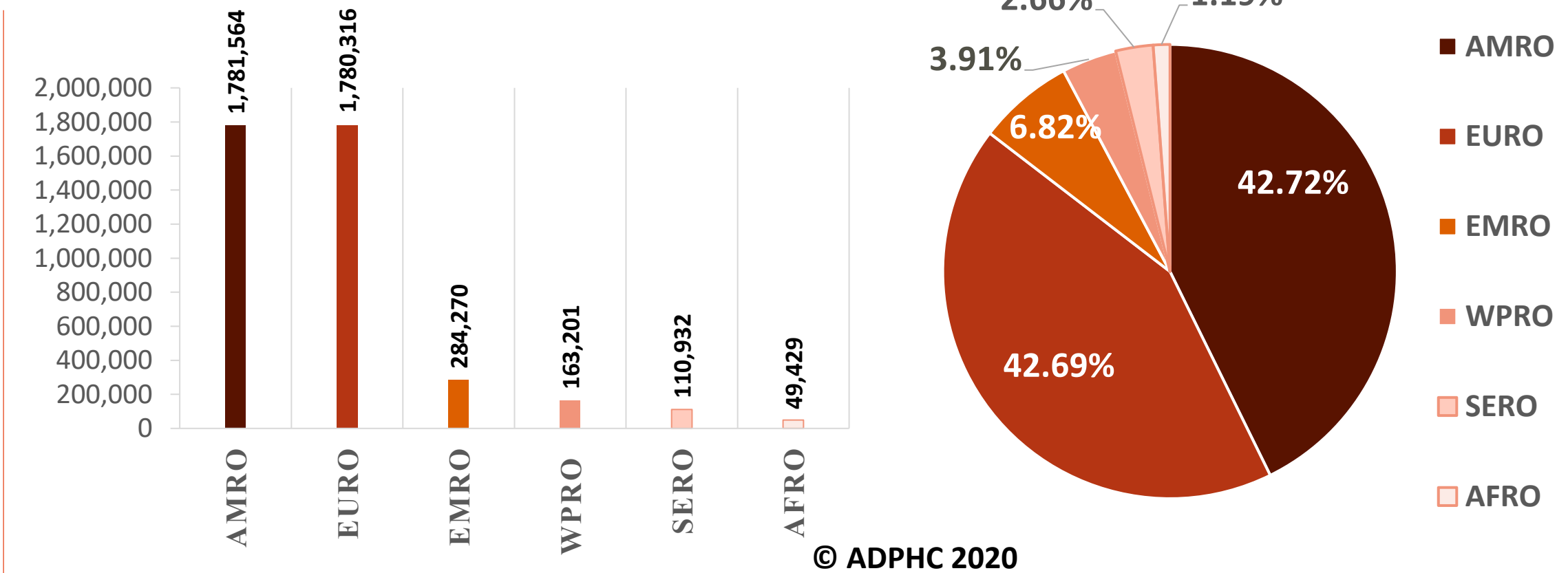
Map chart published by Abu Dhabi Public Health Center 2020.

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

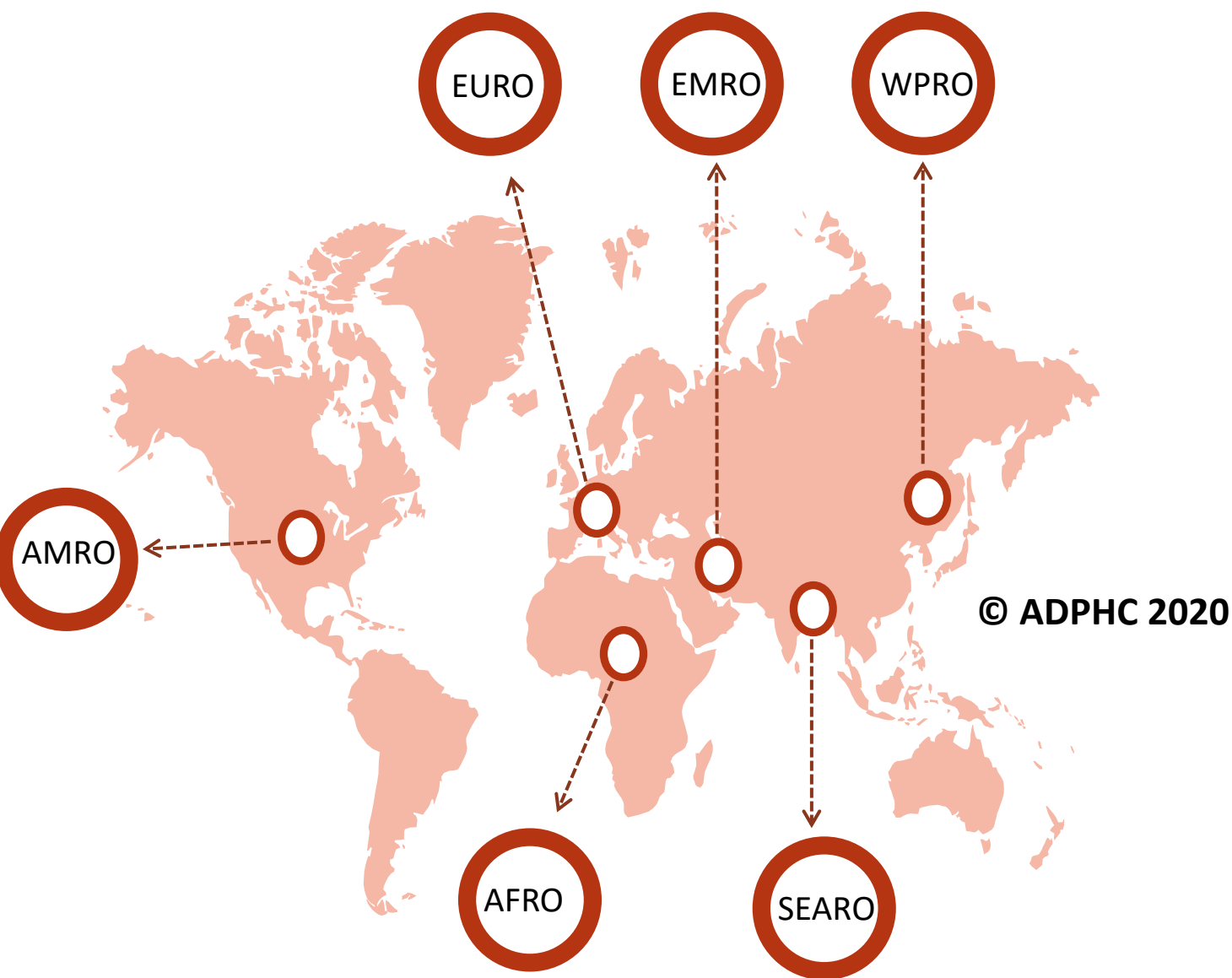
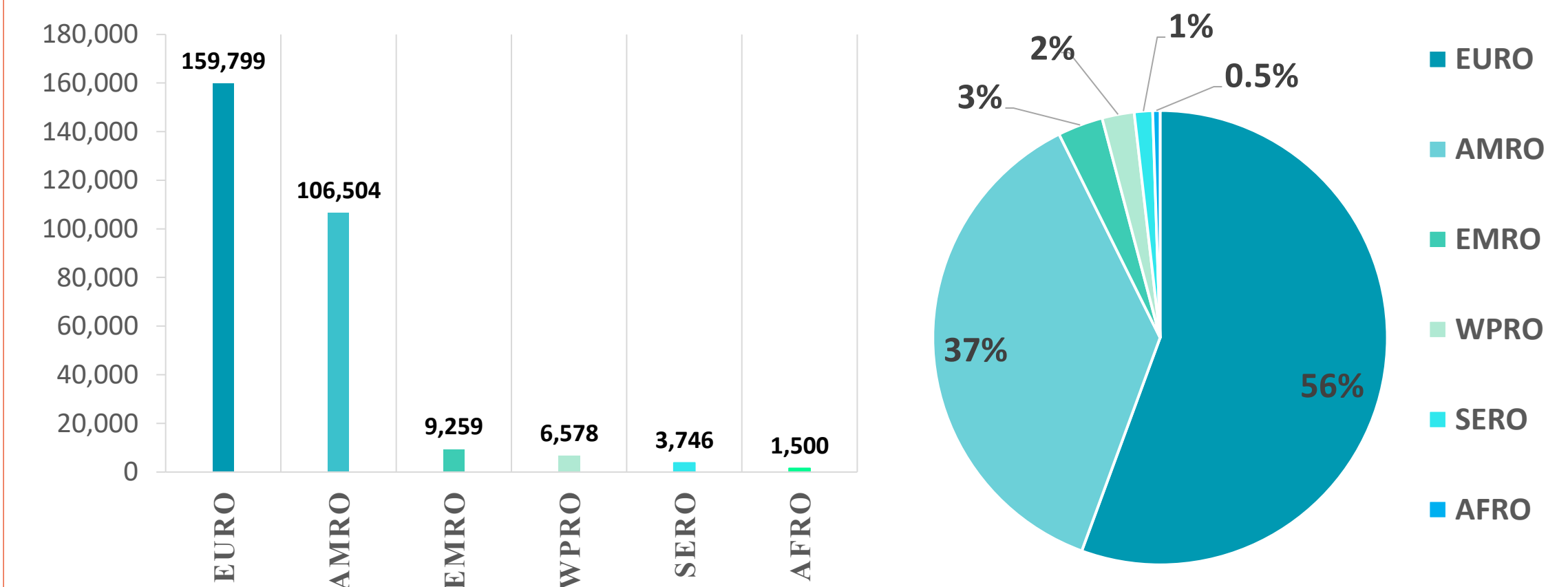


Figure 8: illustrate the Global distribution of COVID19 cases per region (May 13, 2020)

## INFECTED



## DEATH



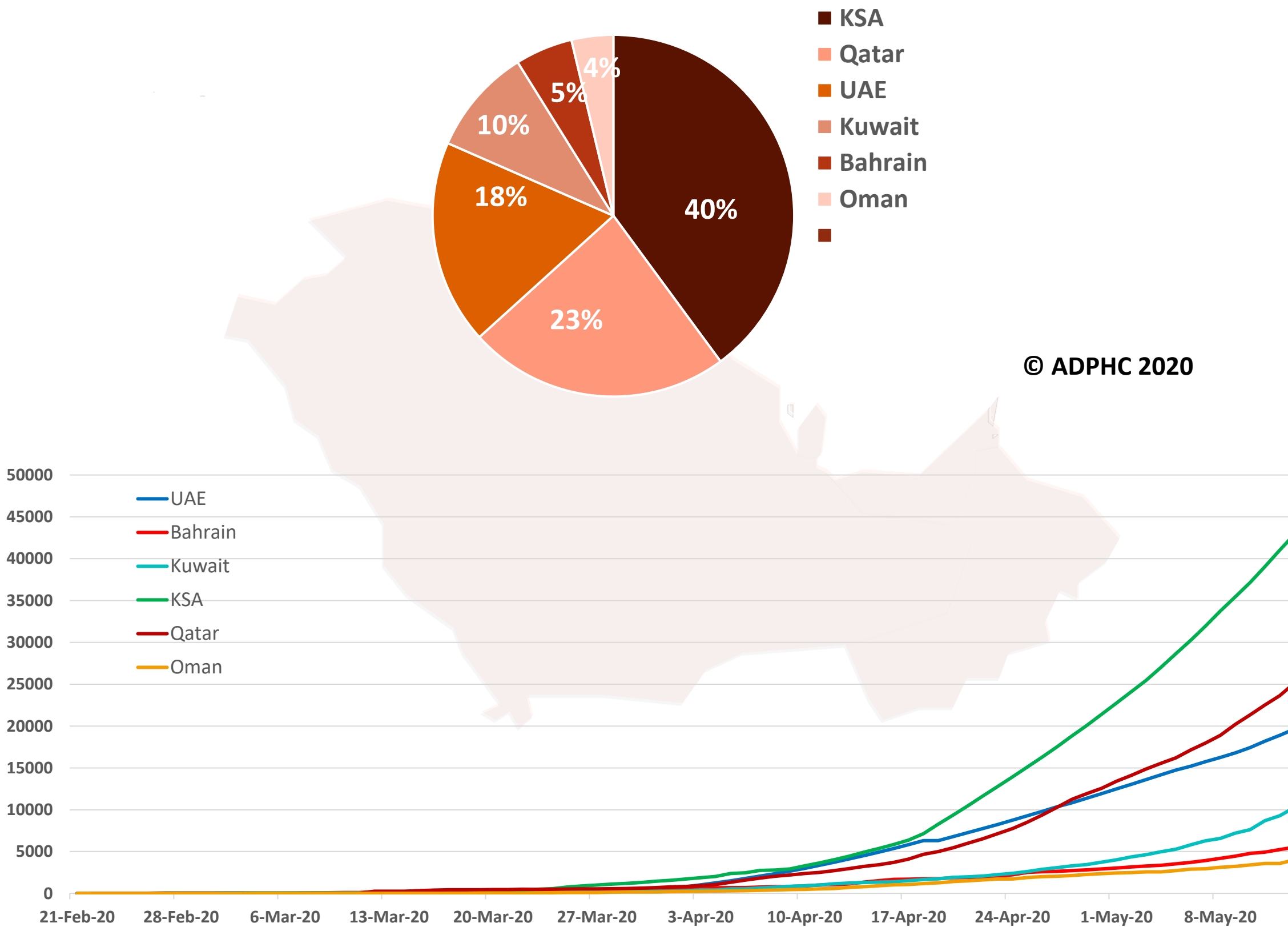
Map chart published by Abu Dhabi Public Health Center 2020.

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

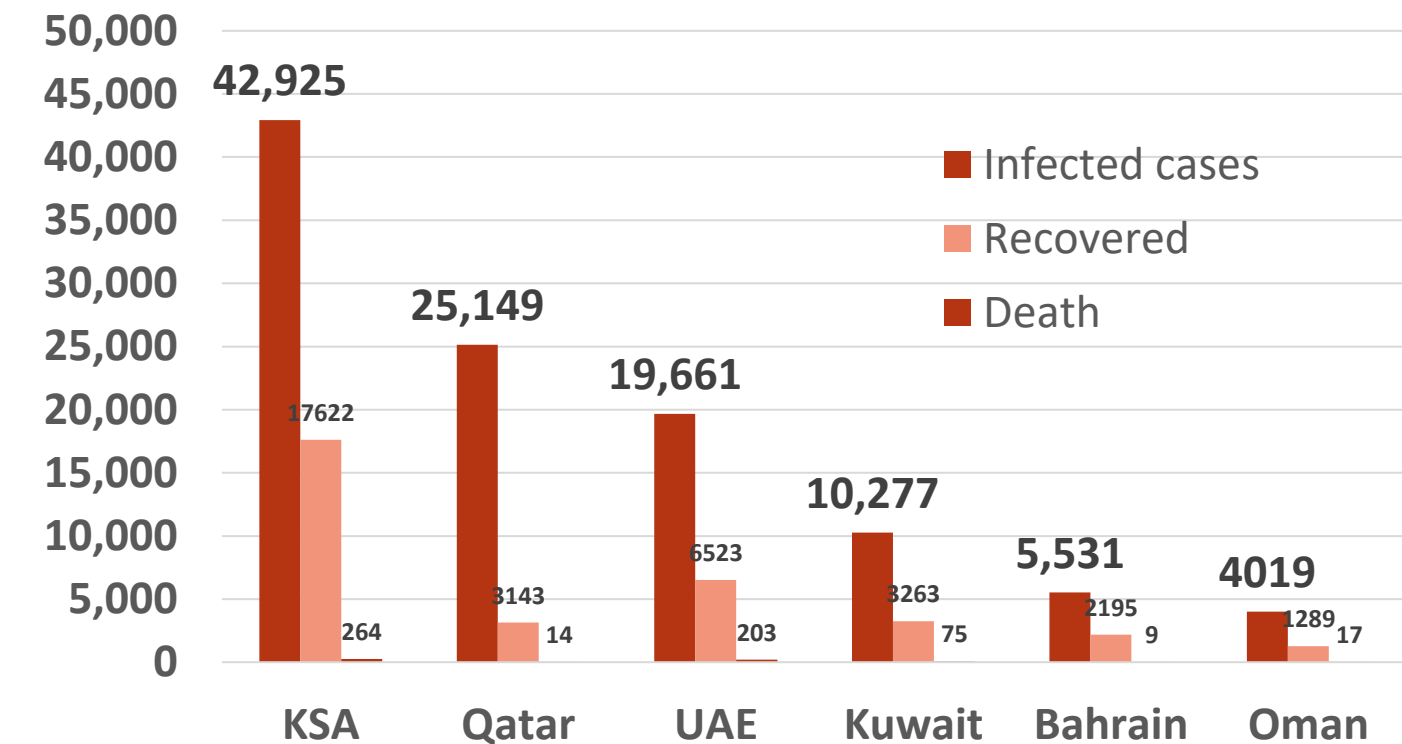


**Figure 9: Comparative analysis of the distribution of COVID19 cases in GCC countries (May 13, 2020)**

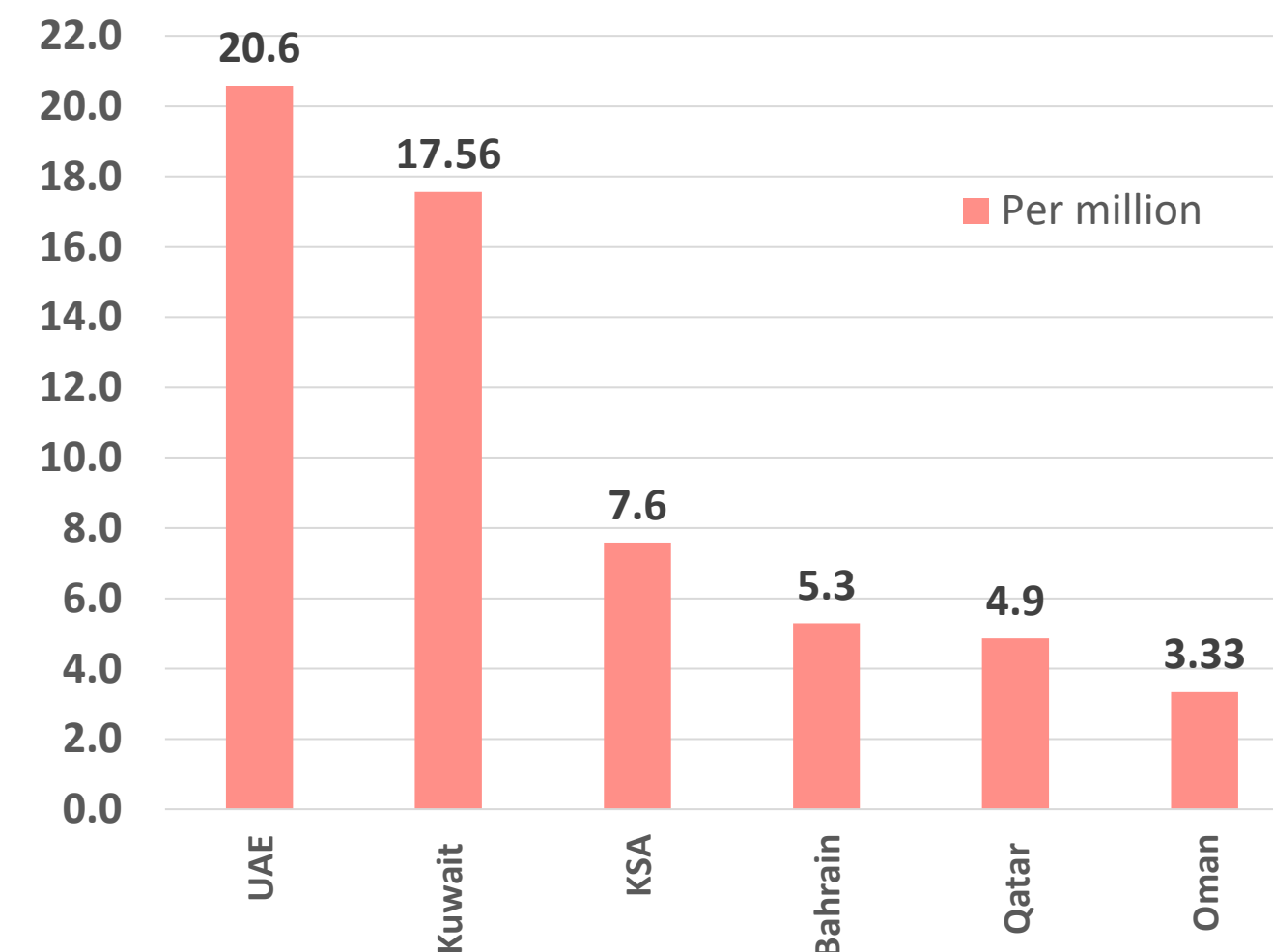
## TOTAL NUMBER OF INFECTED CASES



## Total number of infected, recovered and Deaths



## Death per million



charts published by Abu Dhabi Public Health Center 2020.

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

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# Public Health Response



**Article 1:** Emergency Blood Drives During the Covid-19 Pandemic: A New Model of Collaboration among UCSF Leadership, Medical Students, and a Community Partner

**Published:** May 6, 2020, [the NEJM](#)

## Summary:

- During COVID-19 pandemic, limitations on public gatherings had led to mass cancellation of blood drives that are the primary source of blood products in the hospitals. Suspension of community-based blood drives has put the health care system at risk for a critical blood shortage if a continuous channel of community donations is not reestablished.
- The goal of this blood drive was to (1) develop a replicable blood drive model at University of California San Francisco (UCSF) academic medical center; (2) address the ongoing need for collecting blood products during the pandemic; (3) provide a safe opportunity for individuals to contribute to the public health need; and (4) inspire confidence in donors that safe blood donation is possible in this pandemic.
- A multidisciplinary working group was formed to plan and execute a series of blood drives with new protocols to minimize risk of COVID-19 transmission. The group included UCSF medical students, senior faculty, health system leadership, school of medicine deans, hospital and campus operations, and a major blood provider.
- Five key metrics assessed - a) start-to-execute time to meet urgent need was two weeks instead of typical 8-12 weeks; b) publicity was sufficient to address COVID-19 related concerns, with 100% of appointment slots filled prior to drives; c) 90% of blood drive capacity was utilized that resulted in exceeding Vitalant's (blood provider) collection goal by 20%; d) first-time donors reached 73% of total that was significantly higher than typical range at Vitalant's drives; and e) 155 units were collected that was 120% of the 129 unit goal.





## Article 2: Stability of SARS-CoV-2 in different environmental conditions

Published: [Lancet Microbe](#); April 2, 2020

Article reviewed by Subject Matter Expert

### Summary:

- This study tested the stability of SARS-CoV-2 virus under different environmental conditions such as temperature, pH, and exposure to disinfectants using both virus infectivity and RT-PCRs assays. **The use of infectivity assays makes this study very strong compared to many others that have used only RT-PCR assays to look for presence of viral RNA**, leaving is questionable whether the virus is infectious or not. Test for infectious virus in virus transport media revealed that virus was highly stable at 4°C for up to 14 days, but unstable with increase in temperatures. For example, **at room temperature (22°C), virus infectivity was decreased by 3.3 logs on day 7 with no infectious virus observed at day 14. At 37 °C, infectious virus was reduced by 3.6 logs on day 1 and undetectable by day 2.** Incubation of the virus at 56°C reduced infectious virus by 3 logs in 10 minutes, **while no detectable infectious virus was present by 5 minutes at 70°C.**
- Next, they tested virus stability on surfaces (~ cm<sup>2</sup> pieces) by leaving a drop (~ 5 µL) of virus culture on a surface at room temperature with a **relative humidity of ~ 65%**. The surfaces were then soaked in virus transport media at different times to remove the virus and tested for infectivity. **No infectious virus could be detected after 3 hours from printing paper & tissue paper, after 2 days from wood & cloth, while it was undetectable from smooth surfaces like glass and banknotes after 4 days or after 7 days from stainless steel & plastic.** Detectable levels of infectious virus could still be observed on the outer layer of a mask after day 7. Viruses on smooth surfaces revealed a biphasic kill curve that may explain the longer persistence of the virus on the smoother surfaces. Interestingly, test of “39 representative non-infectious samples by RT-PCR” still showed that viral RNA (non-infectious) could still be detected in these samples.
- They also tested antiviral effects of different disinfectants by the addition of virus culture to their working dilutions, including bleach, hand soap water, 70% ethanol, 7.5% povidone-iodine, 0.05% Chloroxylenol, 0.05% Chlorhexidine, and 0.01% Benzalkonium chloride. **All disinfectants (except one soap water sample amongst three replicates) could deactivate virus within 5 minutes at 22°C.** Finally, they tested the pH stability of the virus and found that it was very stable in a wide range of pH (3-10) at room temperature (22°C).

### Conclusions and Implications:

- Under favorable environmental conditions such as refrigeration temperatures (4°C) , SARS-CoV-2 can be very stable, especially on smooth surfaces, but is very sensitive to temperatures >56 °C and standard disinfection conditions.



## Article 3: Real-time tracking and forecasting of the of COVID-19 outbreak in Kuwait: a mathematical modeling study

Published: May 08 2020

[medRxiv](#)

Article reviewed by Subject Matter Expert

### Summary:

- Since diagnosing the first COVID-19 imported case in Kuwait on **Feb 24 2020**, the country has implemented gradual control measures in attempt to contain the spread of SARS-CoV2 including (**Figure**).
  - *Closure of schools, universities, governmental offices and non-essential businesses.*
  - *Full border lockdown*
  - *Partial curfew and geographic isolation of areas experiencing wide community transmission*
- The study developed a mathematical model of COVID-19 transmission and provided a real-time tracking and forecasting tool for the epidemic outbreak in Kuwait. Also, the study assessed the potential epidemic and healthcare burdens and the effectiveness of early control measures.
- The study modelled the course of the COVID-19 outbreak by developing a generalization of the Susceptible-Exposed-Infective-Recovered (SEIR) epidemiological models that is informed by two local mechanisms; a **delay period during which suspected COVID-19 individuals are tested, identified and hospitalized, and different severity of illness** (ranging from recovered asymptomatic to needing critical care).

### Findings

- The study found that the estimated basic **reproduction number was  $R_0 = 1.43$  (95% CI: 1.33–1.58)**.
- **Early control measures had the effect of delaying and lowering the intensity of the outbreak but were unsuccessful in reducing the effective reproduction number below 1.**
- By the second half of May 2020, **based on 500,000 susceptibles**, the model projected the following (**Table**):
  - The daily numbers of reported cases to peak around 480 (95% CI: 300—680).
  - The peak hospital admission of 8000 patients (95% CI: 5000—12000).
  - The ICUs admission to peak around 350 patients (95% CI: 220—480).

### Conclusion

- The study shown that aggressive control measure can effectively delay and lower the intensity of the outbreak. However, they might not be sufficient to completely halt the transmission of the disease in the presence of certain structural restrictions.

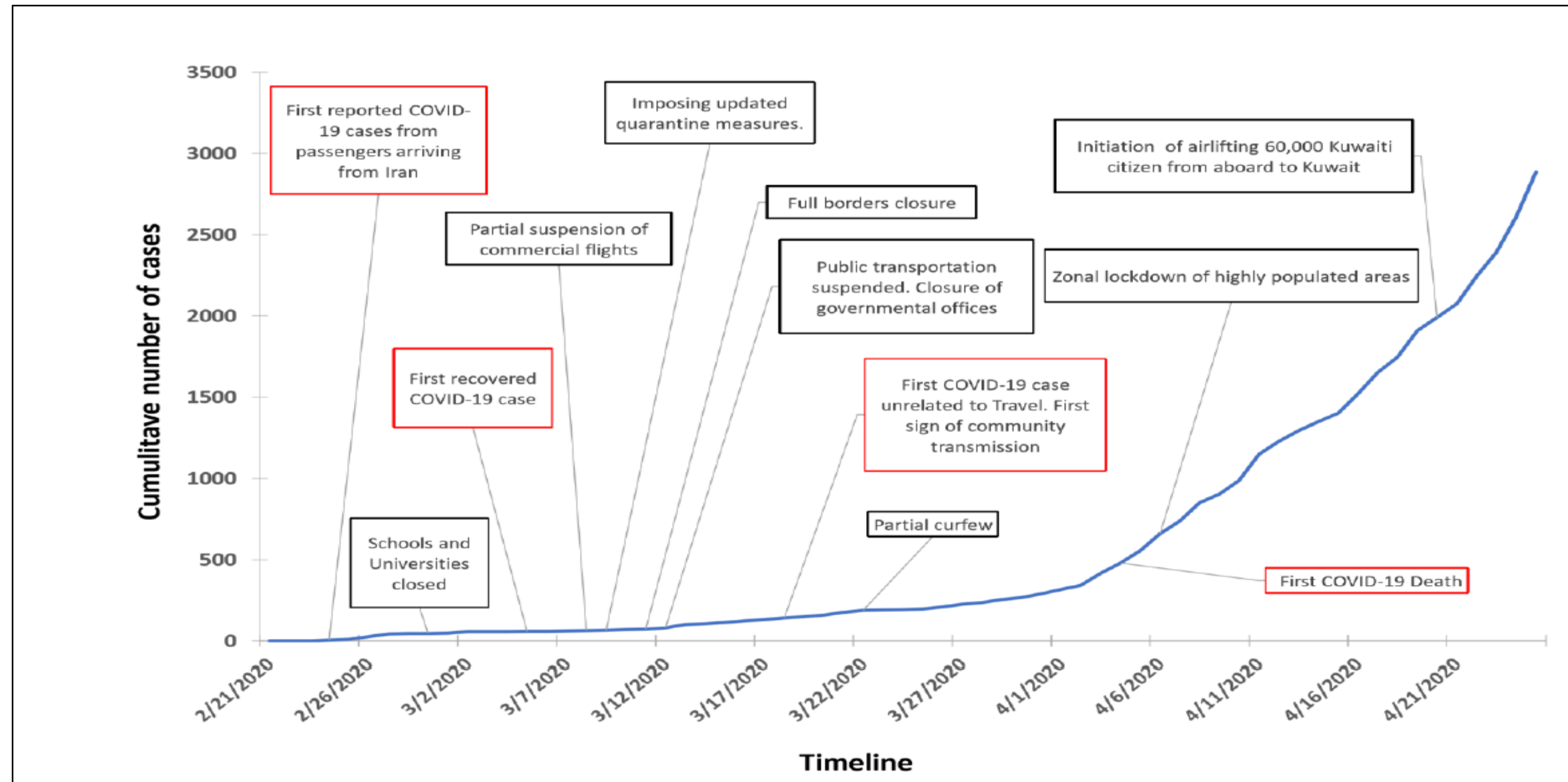


# Public health response



Article 3: Cont.,

Figure1. Cumulative number of reported COVID-19 cases in Kuwait along with a timeline of events



## Expected Burden

### 500,000 Susceptibles

### 1,500,000 Susceptibles

Max reported cases

480 (300–680)

1400 (800–2000)

Max hospital occupancy

8000 (5000–12000)

25000 (15000–35000)

Max ICU occupancy

350 (220–480)

1000 (600–1400)

Max daily mortality

8 (5–12)

24 (15–33)

Peak time-window

15 May – 3 June

1 June – 20 June