



Scientific Research Monitoring on COVID-19

30 May 2020

For accessing the full series of published scientific reports please visit the following link:
<https://www.doh.gov.ae/ar/covid-19/Healthcare-Professionals/Scientific-Publication>

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.
- Two strain have been identified for SARS-COV2 (L type (more aggressive) and S type .and 3 cluster groups.

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).

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.

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.
- Also more therapies are currently under investigation including immunomodulatory, antimalarial and others.
- Vaccination are under clinical trial stage in many countries around the world.

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) data from china



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

- **Treatment:** article argue that antiviral medications and novel therapies took more attention than what we really need to focus on; which is management of Acute Respiratory Distress Syndrome. Strategies such as tidal volume ventilation , fluid management shall remain the standard of care for all patients with ARDS, including patients with COVID-19.
- **Clinical Feature:** a study in china comparing asymptomatic patient with symptomatic found that asymptomatic are more likely younger , women, have more stable PCR testing, shorter duration of viral shedding, less damage of immune system and faster CT scan recovery.
- **Transmission:** research aim to study the viral shedding after discharge on 60 covid19 patients found 10 patient were positive after 4-24 day post discharge.
- **Transmission:** a study checking breast milk transmission found positive PCR in milk sample. Further studies are needed to determine if breast milk can transmit covid19 to infants.



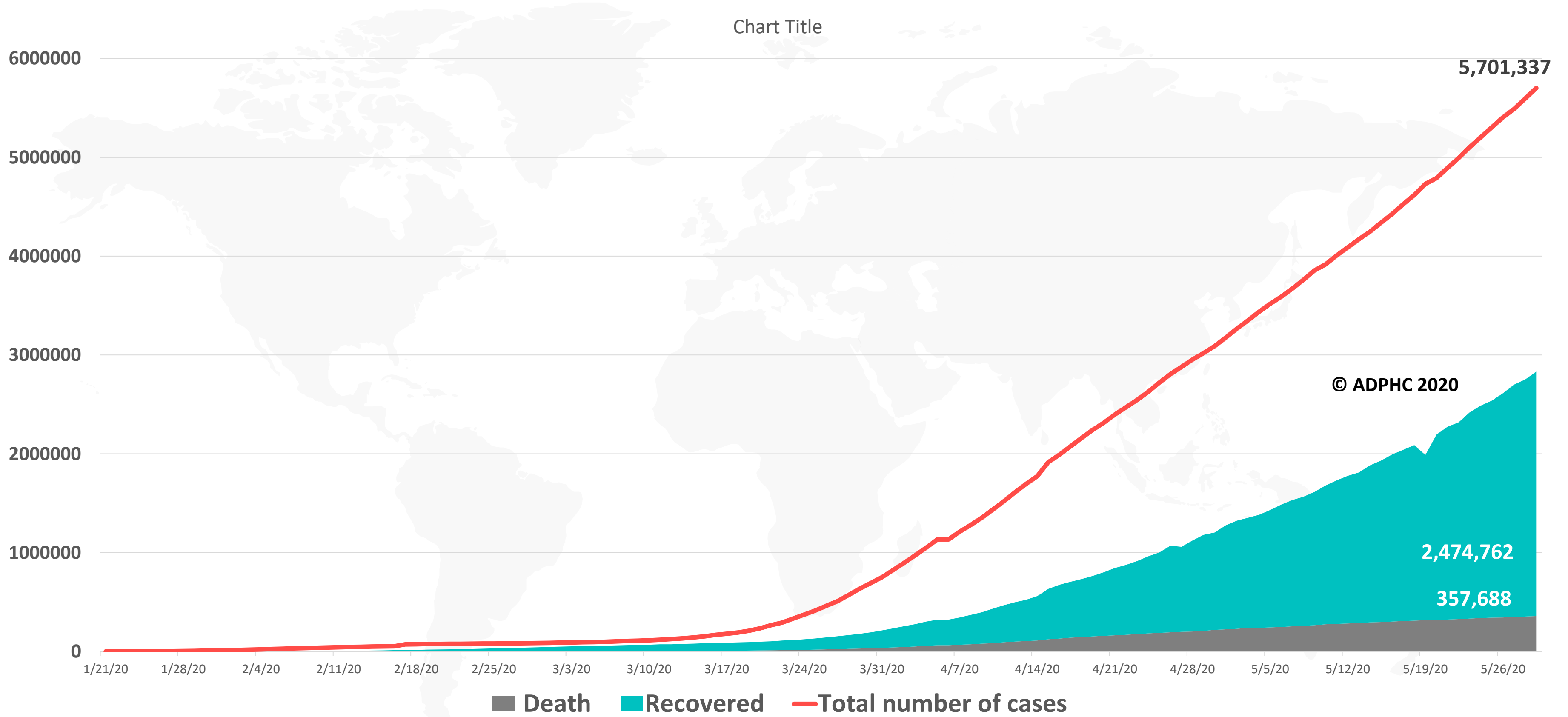
WHO Daily Report 29 May 2020

- WHO has published a [surveillance protocol for SARS-CoV-2 infection among health workers](#). This is a technical tool that countries can use to better understand the characteristics and exposure risks of health workers infected with COVID-19.
- WHO Director-General Dr Tedros, in his regular media briefing, stated the Solidarity Response Fund will continue to receive donations to support WHO's activities related to COVID-19, while the WHO Foundation will help to fund all elements of WHO's work and be fully aligned with the Organization's priorities.
- WHO is using the experience of health professionals, police staff and prisoners in Italy to inform guidance on preparedness, prevention and control of COVID-19 in prisons and other places of detention.
- Community pharmacists are key players in the COVID-19 response and should be aware of what steps to take if they suspect or see signs of COVID-19. The WHO Regional Office for Europe has published technical guidelines on practical ways in which health systems can better respond to COVID-19.

Epidemiology



Figure 1: Total number of infected, recovered , and death cases (January 21st to May 29, 2020)

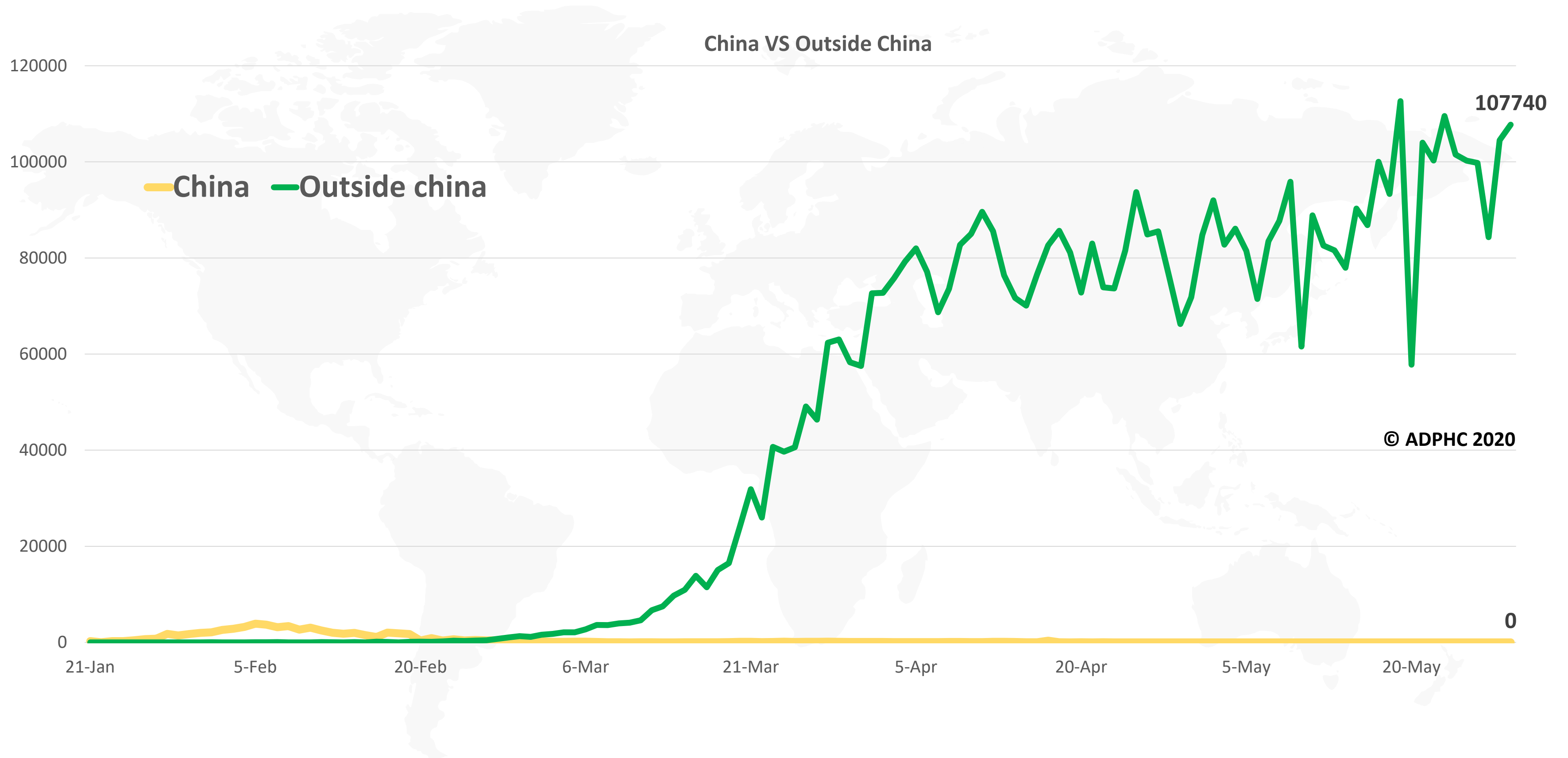


Line graph published by Abu Dhabi Public Health Center 2020.

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



Figure 2: Daily new infected COVID-19 cases reported between (January 21 to May 29, 2020).



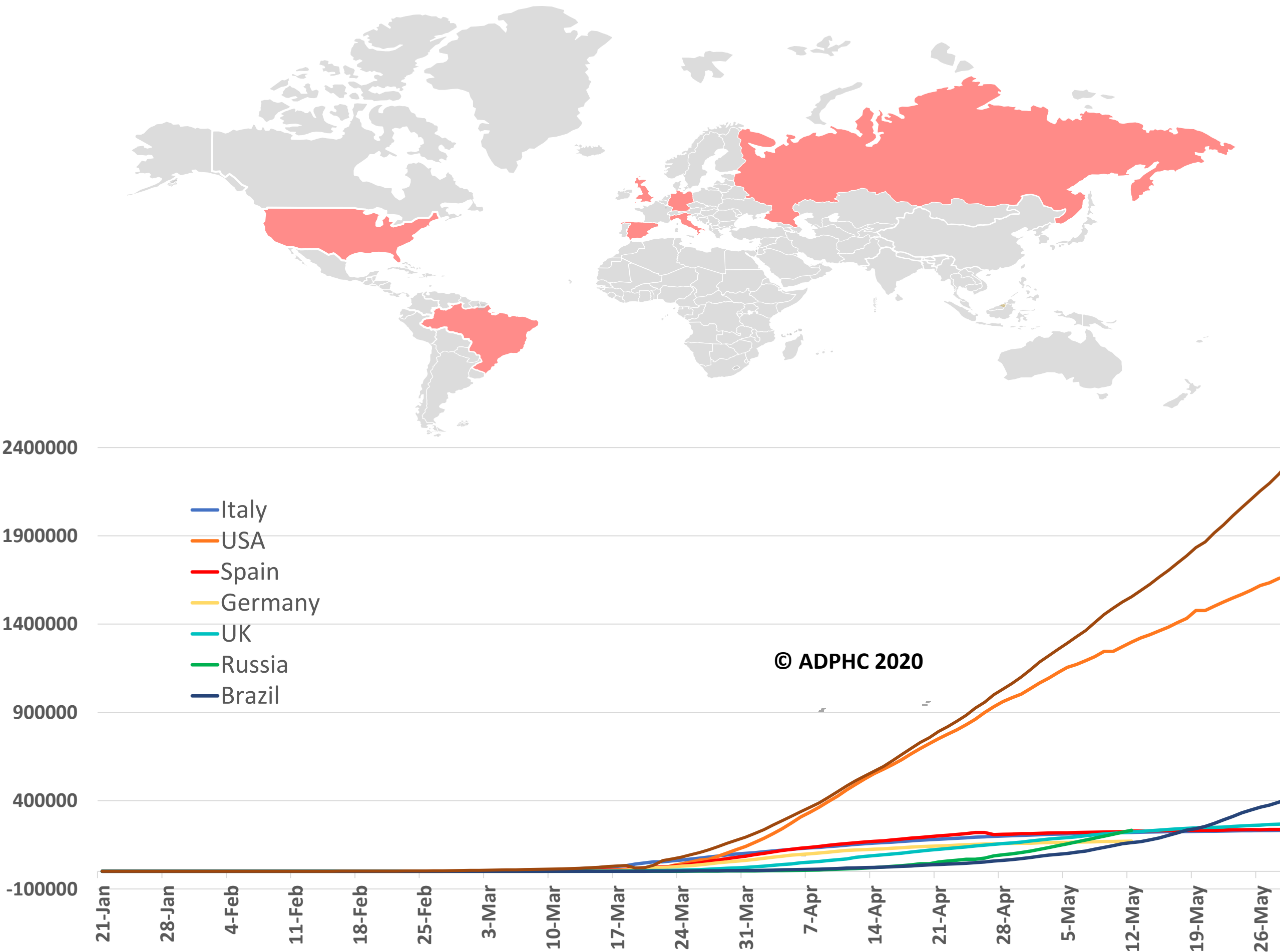
Line graph published by Abu Dhabi Public Health Center 2020.

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

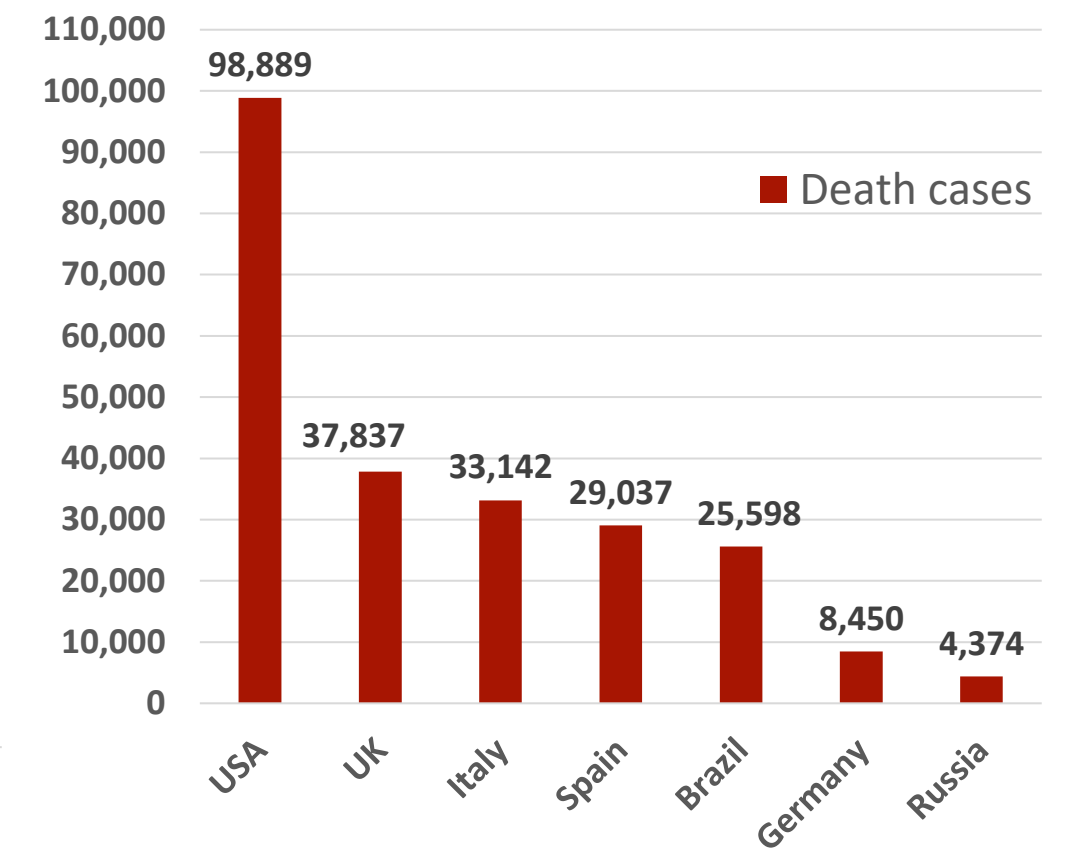
Epidemiology



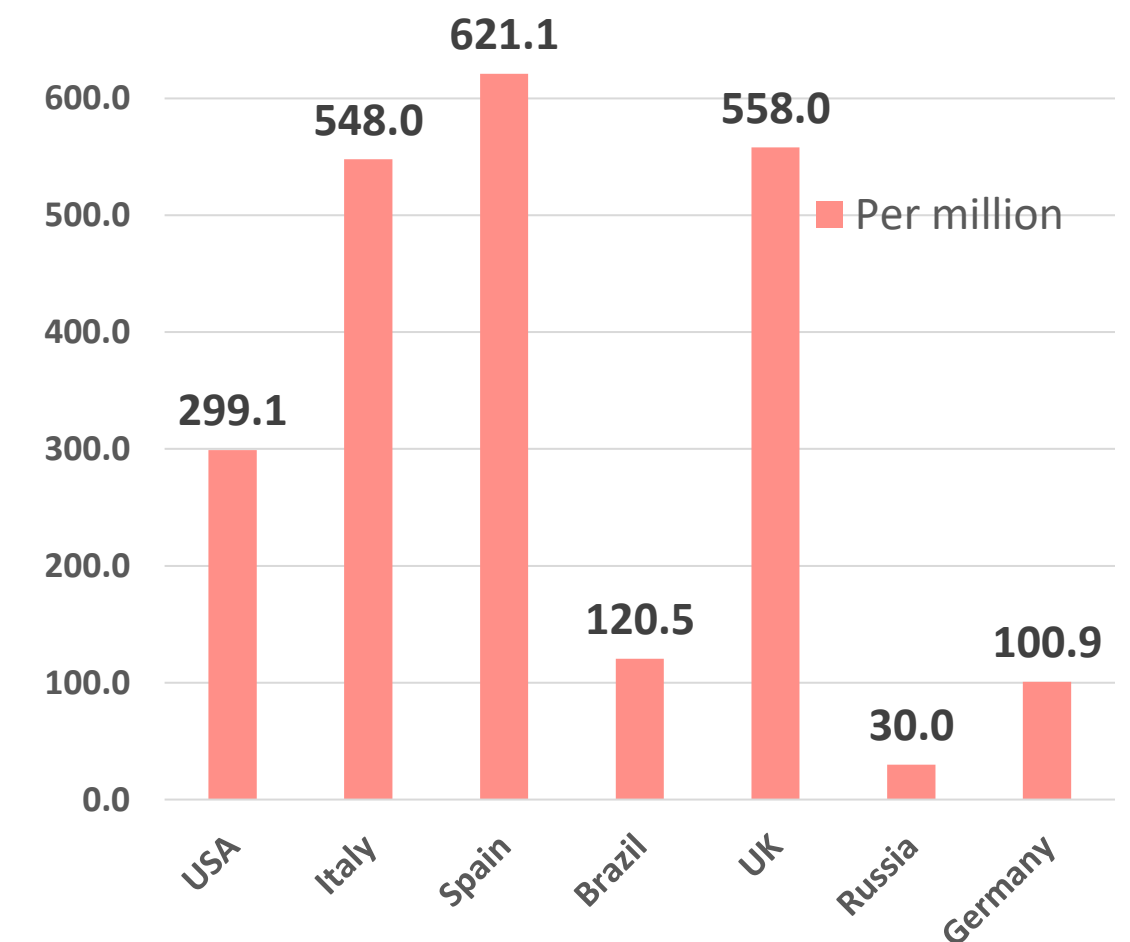
Figure 3 : Top 7 countries in the total number of cases due to COVID-19 (January 21 to May 29, 2020).



TOTAL DEATHS



DEATHS PER MILLION

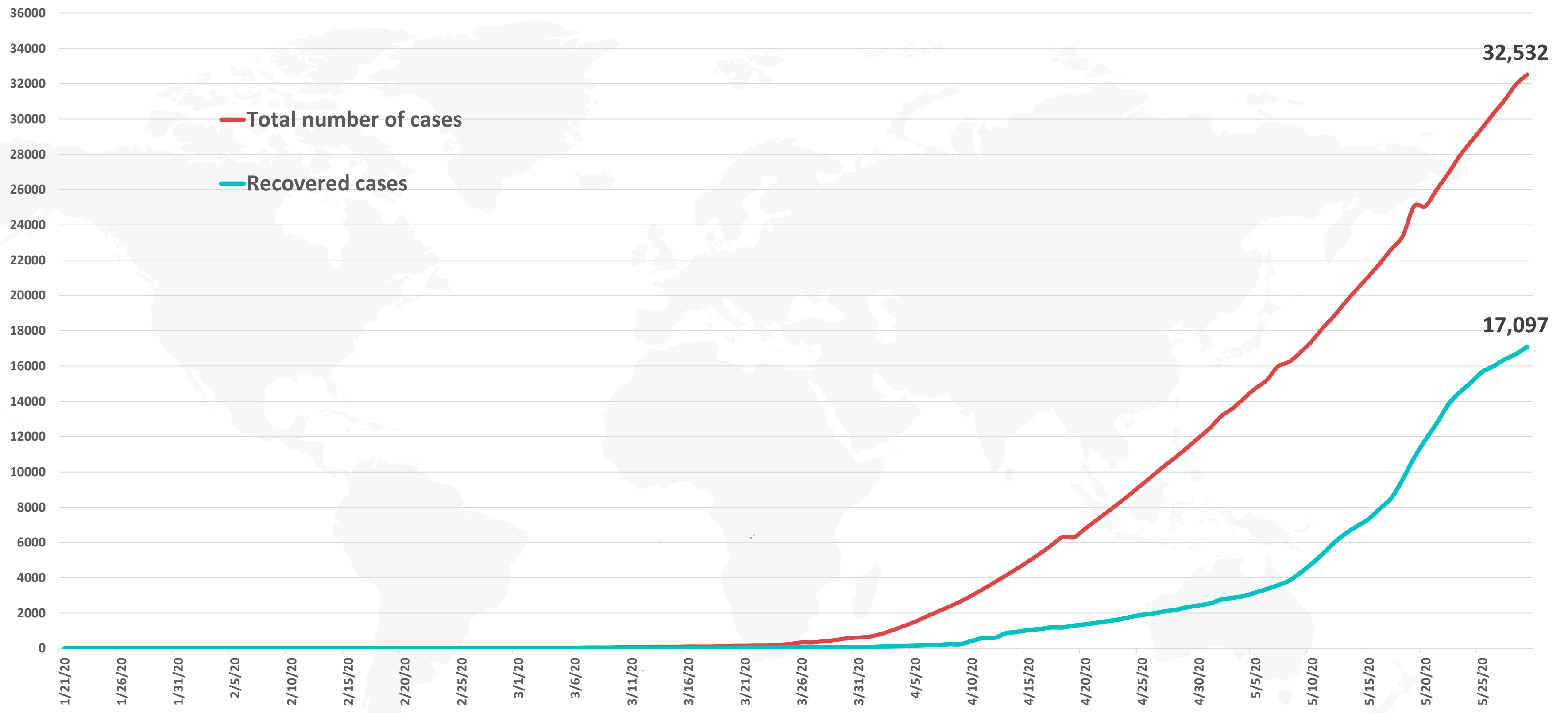


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Data resources: [WHO](https://www.who.int)



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



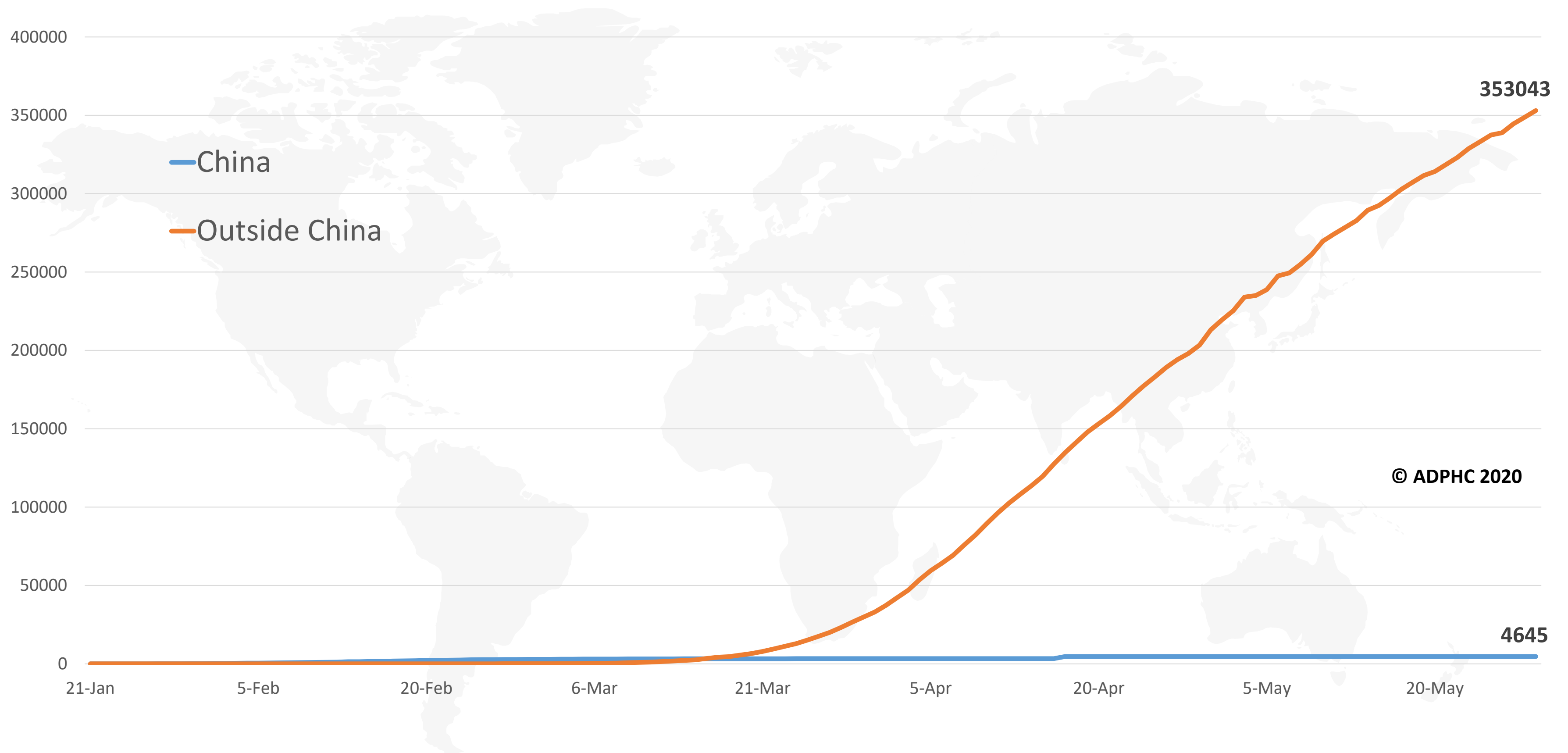
Line graph published by Abu Dhabi Public Health Center 2020.

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 29, 2020).



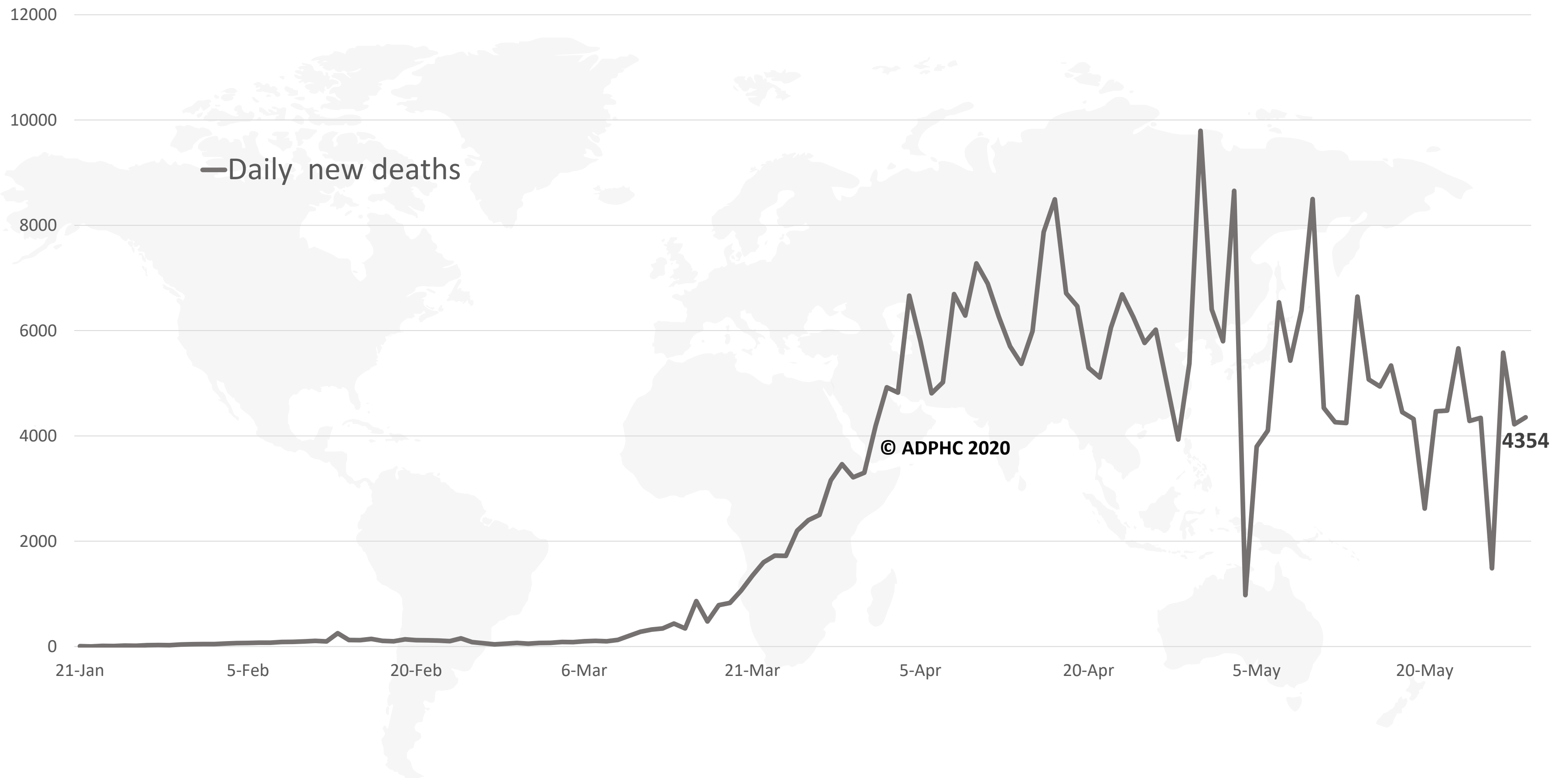
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Line graph published by Abu Dhabi Public Health Center 2020.

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



Figure 6: Global daily new deaths due to COVID-19 (January 22 to May 29, 2020).



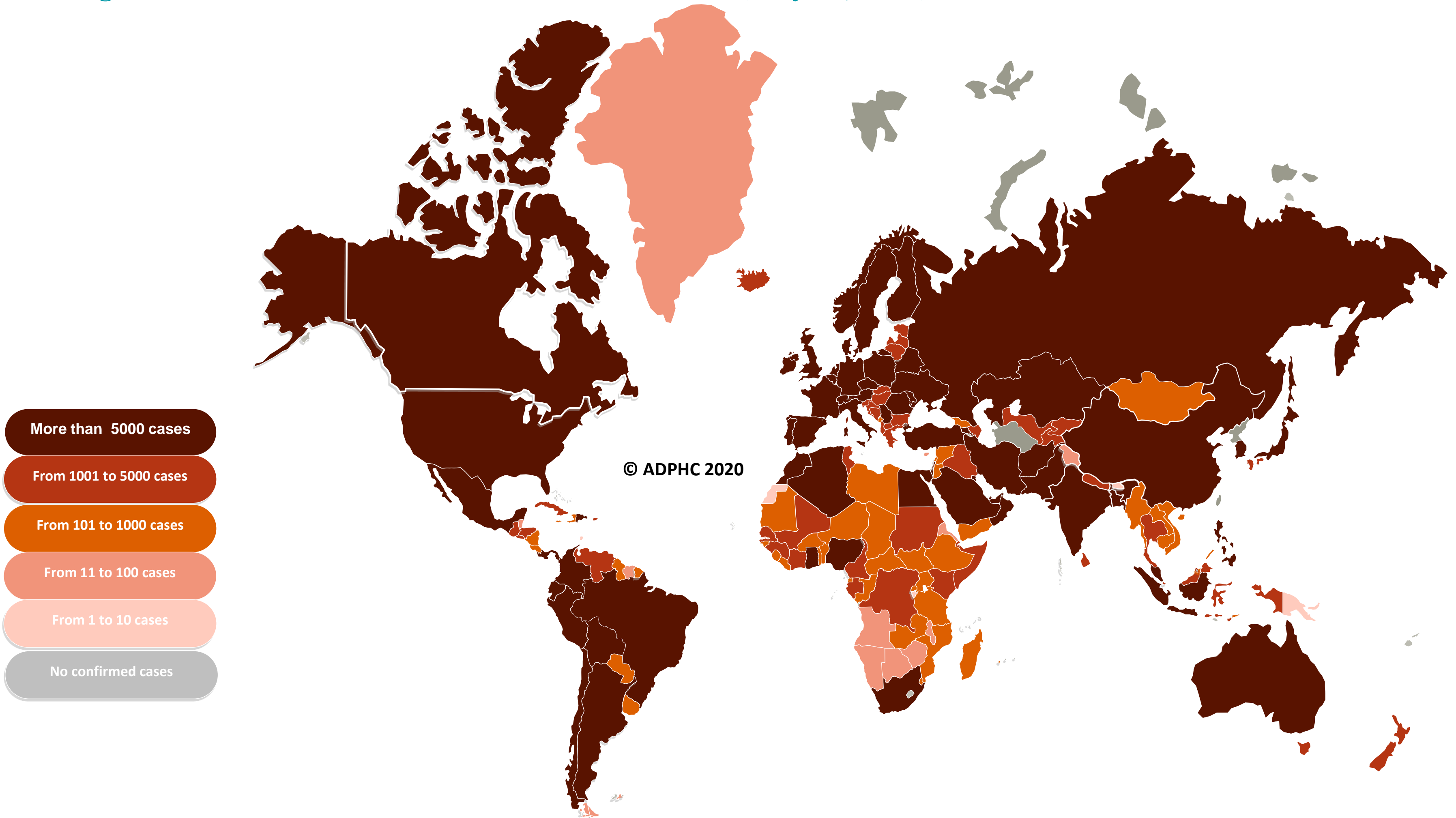
Line graph published by Abu Dhabi Public Health Center 2020.

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

Epidemiology



Figure 7a : Global distribution of COVID-19 cases (May 29, 2020).

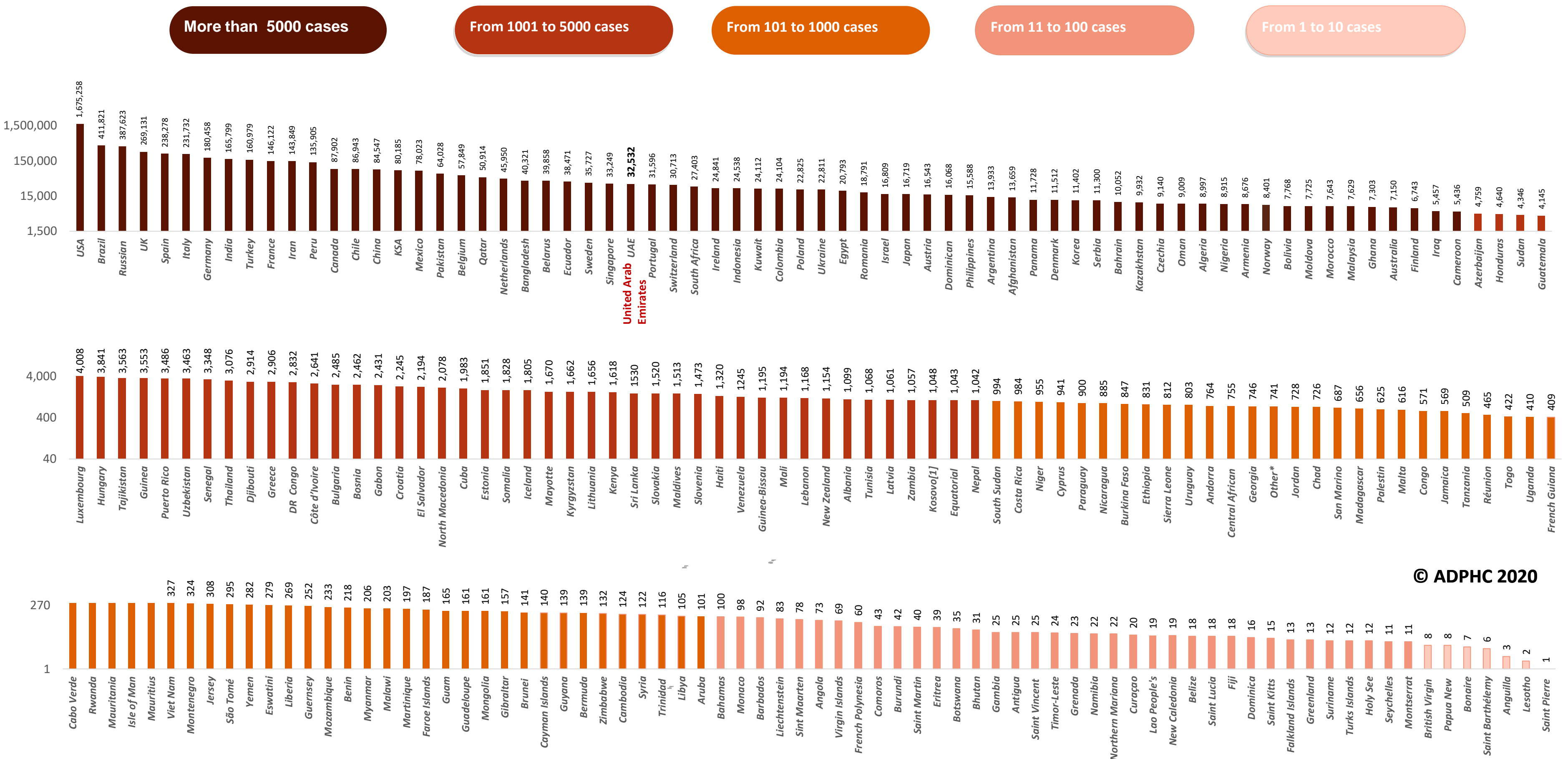


Map chart published by Abu Dhabi Public Health Center 2020.

Epidemiology



Figure 7B: Bar chart illustrate the global distribution of COVID19 cases (May 29, 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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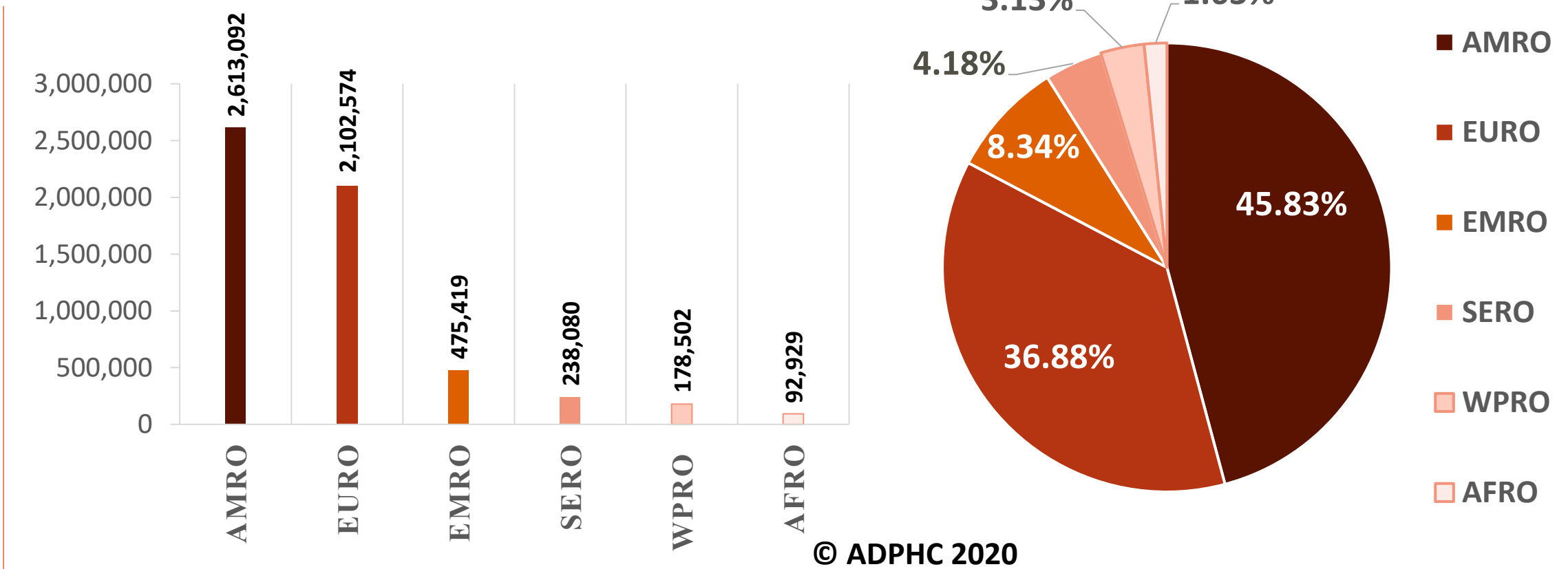
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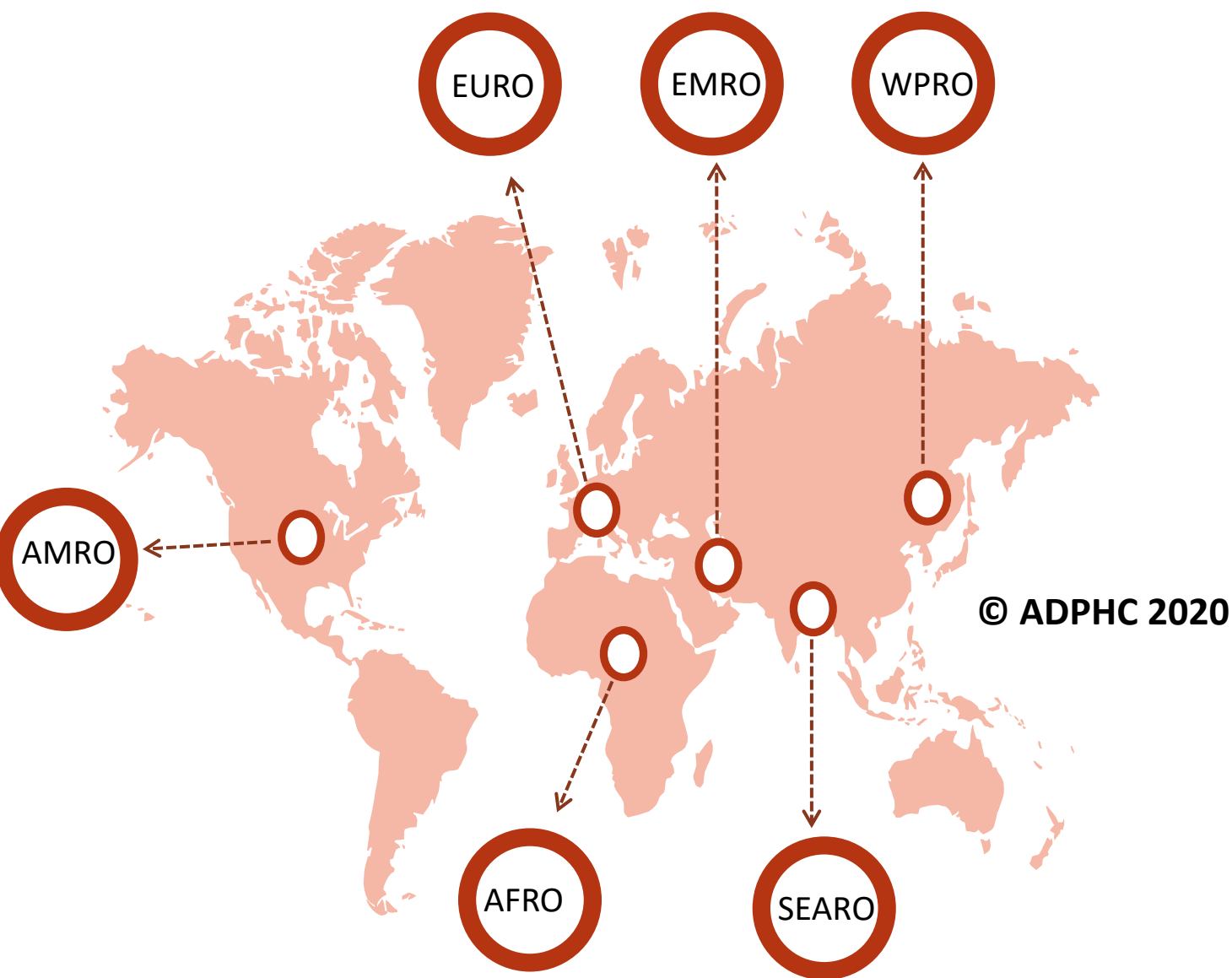
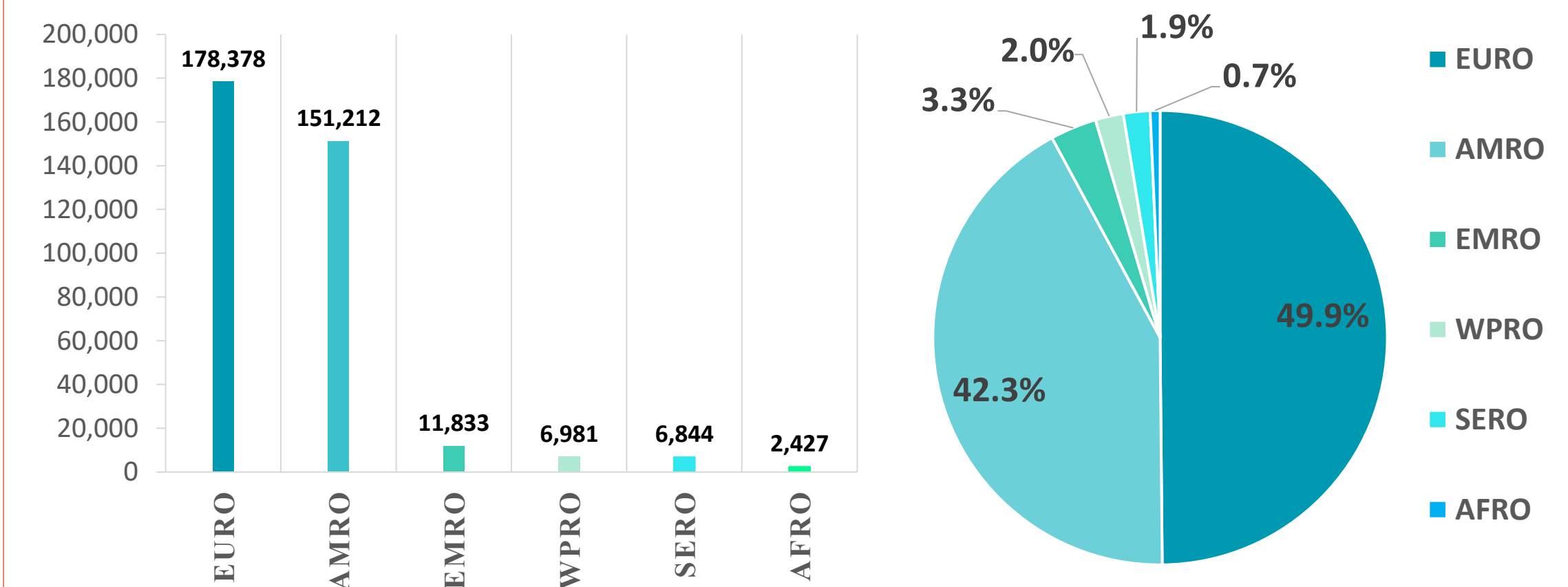


Figure 8: illustrate the Global distribution of COVID19 cases per region (May 29, 2020)

INFECTED



DEATH



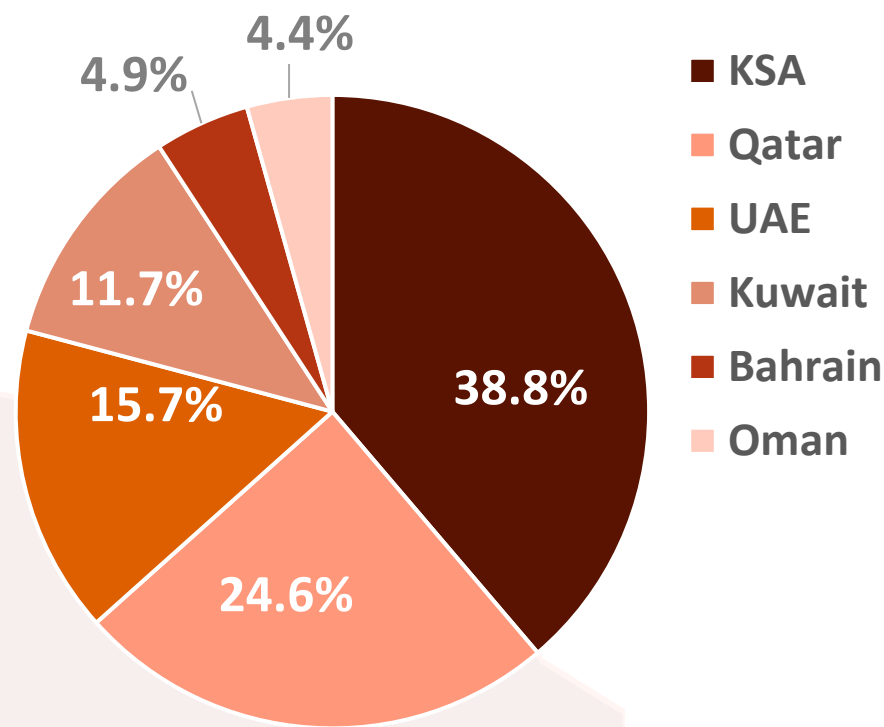
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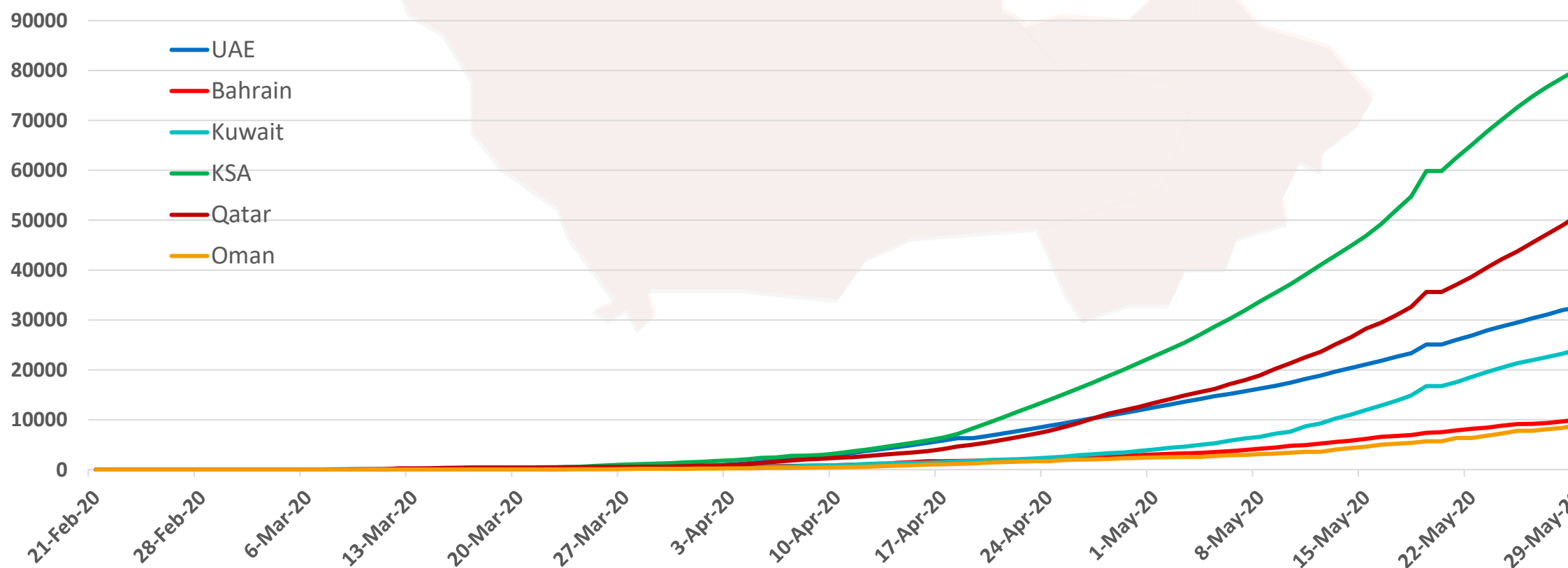


Figure 9: Comparative analysis of the distribution of COVID19 cases in GCC countries (May 29, 2020)

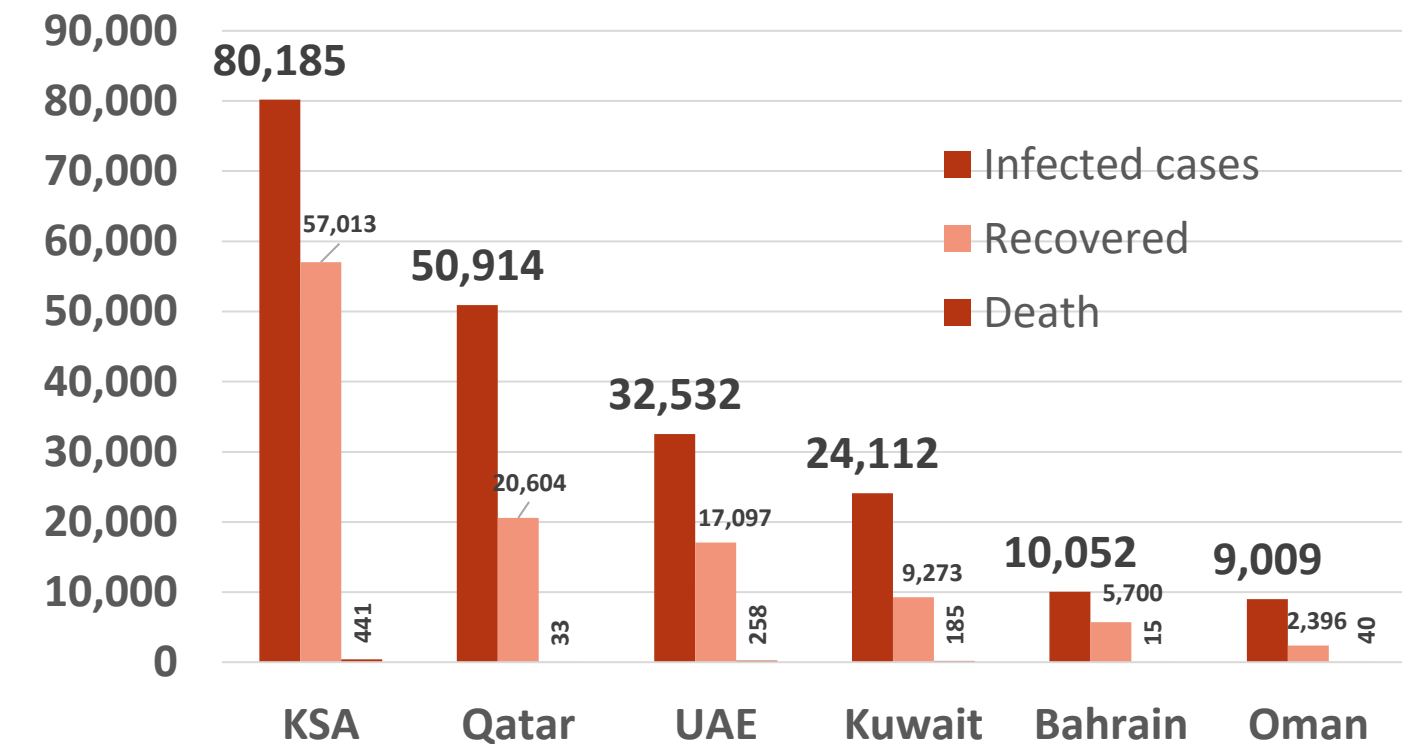
TOTAL NUMBER OF INFECTED CASES



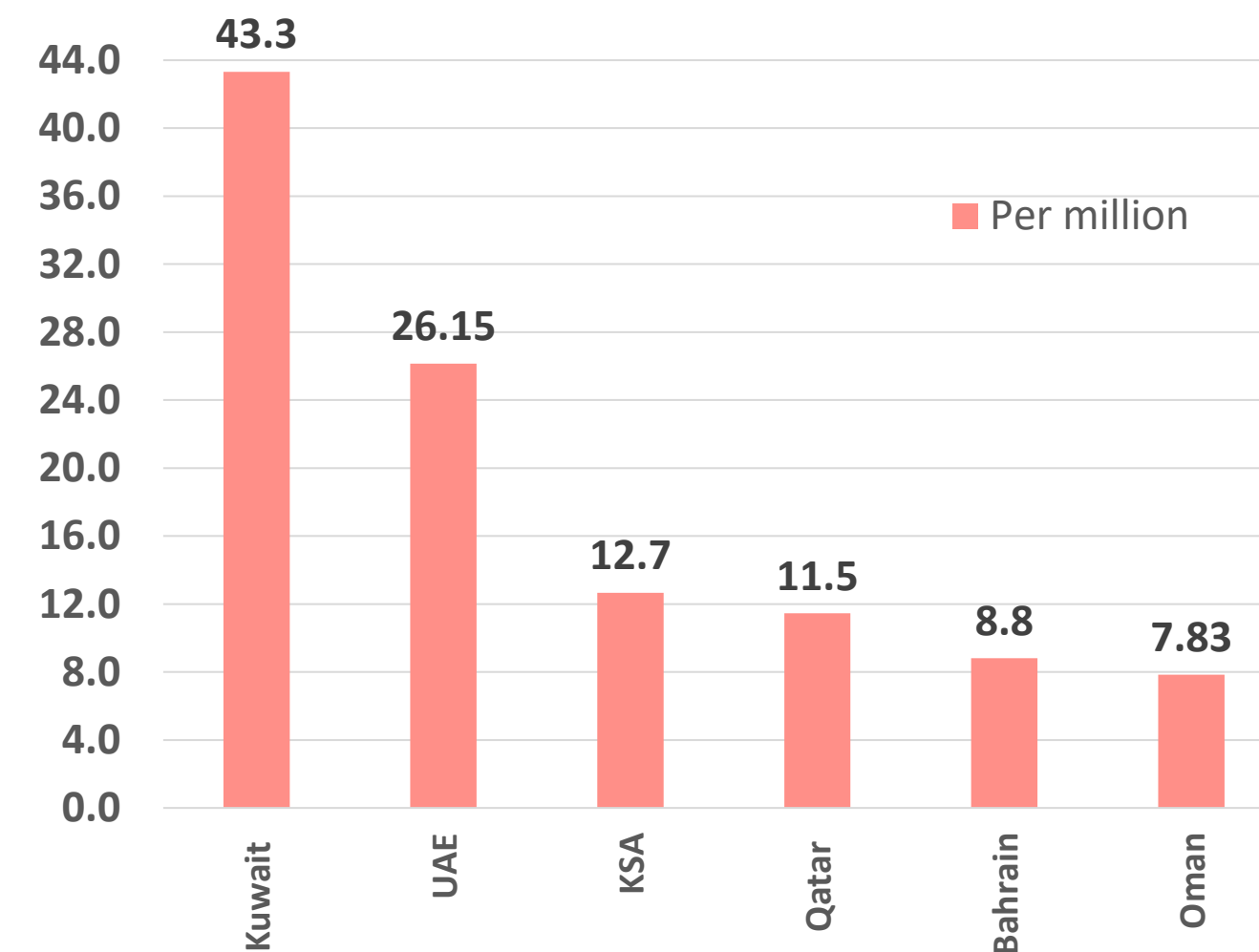
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Total number of infected, recovered and Deaths



Death per million



charts published by Abu Dhabi Public Health Center 2020.

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

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Treatment



Article 1 : Novel viruses, old data, and basic principles: how to save lives and avoid harm amid the unknown

Published: May 20,2020 in [the Lancet](#).

Summary:

Summarized by Expert matter subject

- This article is a ‘Comment’ by three authors from the Department of Medicine & Paediatrics, John Hopkins University School of Medicine, Baltimore, US.
- During Ebola epidemic, all American patients received experimental antiviral medications or convalescent plasma but the efficacy and ethics of these treatments have not been proven.
- During the COVID-19, many unproven and potentially dangerous pharmacological therapies are being trialled including use of hydroxychloroquine while the evidence based care against COVID-19 is being ignored.
- They argue that common interventions like correction of metabolic derangements, precise haemodynamic monitoring and support, lung protective mechanical ventilation, and dialysis etc, which can save countless lives have not received much attention compared with the novel therapeutic strategies during the COVID-19 pandemic.
- There are effective interventions available to manage Acute Respiratory Distress Syndrome (ARDS) which is a known complication of COVID-19 include **small tidal volumes, prone position of the patient, conservative fluid management strategy, conservative use of blood products, early identification of sepsis, default use of lung protective ventilation and intensivists involvement.**

Conclusion:

- In the absence of evidence to the contrary, proven therapies for ARDS (**low tidal volume ventilation, prone positioning, and conservative fluid strategy**) should remain the standard of care for all patients with ARDS, including patients with COVID-19.



Clinical Features

Article 2: Comparison of Clinical Characteristics of Patients with Asymptomatic vs Symptomatic Coronavirus Disease 2019 in Wuhan, China

Published: May 27 2020 [JAMA Network Open](#)

Summarized by Subject Matter Expert

Summary:

- This case series described the clinical characteristics of patients with SARS-CoV-2 (COVID-19) infection confirmed by reverse RT-PCR from 26 transmission cluster series in Wuhan, China, from December 24, 2019, to February 24, 2020.
- **Indicative patients:** defined as those who had confirmed history of exposure to the Hunan seafood market or had close contact with a hospitalized RT-PCR confirmed case for COVID-19, from nasopharyngeal swabs.
- **Clustered cases:** defined as the patients who were exposed to the same indicative patients with COVID-19.
- **All cases were hospitalized in the same hospital and received similar healthcare including** detecting COVID-19 from nasopharyngeal swab every 24 to 48 hours.
- For patients with stable conditions, a second chest CT was conducted 4 to 6 days after the first time, then 6 to 7 days after the second time. Chest CT was also conducted at any time a patient's condition became worse. CD4+T lymphocyte count was tested every 5 to 6 days.

Results (Table presented in the next page)

- 78 patients from 26 cluster cases of exposure to the Hunan seafood market or close contact with other patients with COVID-19 were included, of them:
- 33 (42.3%) patients were asymptomatic
- 45 (57.7%) patients symptomatic
- Compared to symptomatic, asymptomatic COVID-19 patient were more likely to:
 - be **younger** (IQR age, 37 [26-45] years vs 56 [34-63] years, respectively; $P < .001$).
 - be **females** (66.7% vs 31.%; respectively; $P = .002$).
 - **Not to have liver injuries** (3.0% vs 20.0%; respectively; $P = .03$)
 - have **less consumption of CD4+T lymphocytes** (median CD4 lymphocyte count during recovery, 719 per μL vs 474 per μL ; respectively; $P = .009$)
 - have **faster lung recovery** in CT scans (median duration, 9 days vs 15 days; respectively; $P = .001$)
 - have shorter duration of viral shedding from nasopharynx swabs (median duration, 8 days vs 19 days; respectively; $P = .001$)
 - have **more stable results** of SARS-CoV-2 testing (12.1% vs 33.3% with fluctuated results; , respectively).



Discussion

- Less consumption of CD4+T lymphocyte in asymptomatic infections suggests that damage to the immune system in asymptomatic infections was milder compared with symptomatic infections.
- Patients with asymptomatic SARS-CoV-2 infection have a shorter duration of viral shedding from nasopharyngeal swabs and lower risk of a recurring positive test result of SARS-CoV-2 from nasopharyngeal swabs.

Table. Clinical Features and Prognosis of Patients With Coronavirus Disease 2019 From 26 Transmission Cluster Series

Characteristic	Patients, No. (%)		χ^2 or <i>F</i> test	<i>P</i> value
	Asymptomatic (n = 33)	Symptomatic (n = 45)		
Age, median (IQR), y	37 (26-45)	56 (34-63)	10.221	.001
Women	22 (66.7)	14 (31.1)	9.685	.002
Incubation period, median (IQR), d	NA	3 (2-6)	NA	NA
Baseline liver injury ^a	1 (3.0)	9 (20.0)	4.905	.03
Duration of viral shedding, median (IQR), d ^b	8 (3-12)	19 (16-24)	7.022	.001
Duration of lung recovery, median (IQR), d ^c	9 (6-18)	15 (11-18)	6.914	.001
Maximum difference of CD4 lymphocytes during treatment, median (IQR), / μ L ^d	203 (170-304)	328 (145-506)	4.570	.04
CD4 lymphocyte count during recovery, median (IQR), / μ L ^e	719 (538-963)	474 (354-811)	7.203	.009
Fluctuated results of SARS-CoV-2 test ^b	4 (12.1)	15 (33.3)	4.649	.03
Deaths	0	2 (4.4)	1.505	.22

Implications

- Identifying and isolating patients with asymptomatic COVID-19 as early as possible is critical to control the transmission of COVID-19.
- Close contacts of patients with COVID-19 should be closely monitored to avoid secondary transmission.



Transmission

Article 3: Coronavirus Disease 2019 Test Results After Clinical Recovery and Hospital Discharge Among Patients in China.

Published: May 22 2020 [JAMA Network Open](#)

Summarized by subject matter experts

Summary

- The cross-sectional study collected nasopharyngeal and anal swab samples **from 60 patients who had been hospitalized for COVID-19 and discharged** before February 27, 2020, in Loudi, China, to evaluate potential viral persistence.
- The collected swabs were tested for COVID-19 using RT-PCR.

Results

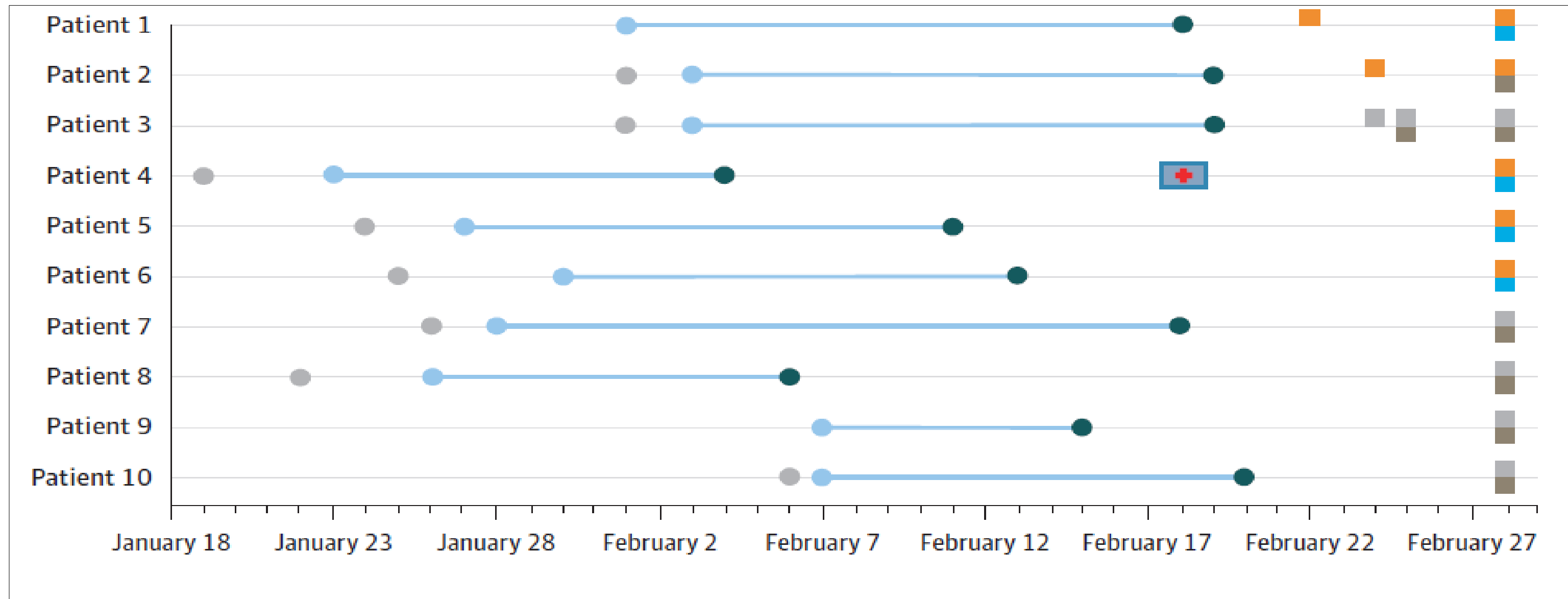
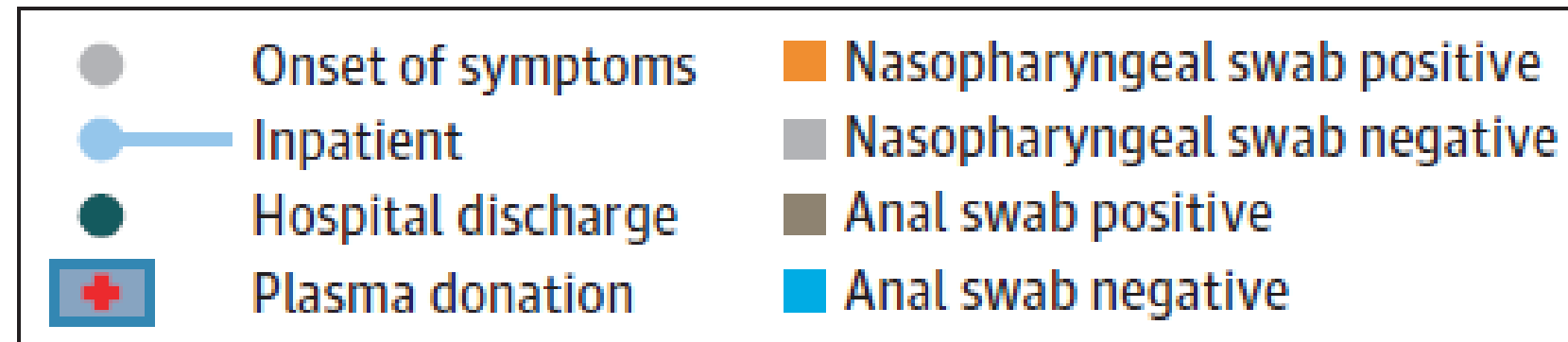
- A total of 10 patients (**16.7%**) had **RT-PCR results positive for SARS-CoV-2** after discharge
- Five (50%) of the 10 RT-PCR positive patients were positive in the tested nasopharyngeal swabs
- Six (60%) of the 10 RT-PCR positive patients were positive in the tested anal swabs
- One (10%) patient had positive results in both nasopharyngeal and anal swab
- None of the patients with RT-PCR results positive for SARS-CoV-2 had clinical symptoms of COVID-19, except for occasional cough in patients 1 and 2, both of whom were older than 70 years with multiple underlying medical conditions.
- Figure shows the timeline of Clinical Course of Discharged Patients With Positive RT-PCR Results for COVID-19



Transmission

Article 3: Cont.,

Summary



Conclusion

- 10 of 60 patients previously diagnosed with and treated for COVID-19 had RT-PCR test results positive for SARS-CoV-2 from **4 to 24 days after index hospital discharge**.
- Since all discharged patients were instructed to quarantine at home, the positive results **indicate to presumed to be persistent viral shedding rather than reinfection**.
- The study is limited with a small number of discharged patients who had test results positive for SARS-CoV-2.



Transmission

Article 4: Detection of SARS-CoV-2 in human breastmilk

Published: May 21, 2020 in [the lancet](#)

Summary

- Milk sample from two lactating mothers infected with SARS-CoV-2 was examined. Milk was collected with pumps into sterile containers (stored at 4°C or -20°C) 5-10 min after feeding the newborn and with disinfecting breast. Viral loads were determined using RT-qPCR for SARS-CoV-2 N and ORF1b-nsp14 genes in both whole and skimmed milk.
- Four milk samples from Mother 1 tested negative following admission and delivery. In contrast, SARS-CoV-2 RNA was detected in milk sample from Mother 2 at days 10 (left and right breast), 12, and 13. Samples taken subsequently were negative. Ct values for SARS-CoV-2 N peaked at 29.8 and 30.4 in whole milk and skimmed milk respectively that correspond to 1.32×10^5 copies per mL and 9.48×10^4 copies per mL.
- Viral RNA in milk sample from Mother 2 coexisted with mild COVID-19 symptoms and a SARS-CoV-2 positive test for newborn 2. Mother 2 had been wearing a surgical mask since the onset of symptoms and followed safety precautions such as proper hand and breast disinfection, strict washing, and sterilisation of milk pumps and tubes during handling or feeding the newborn.
- Whether newborn 2 was infected by breastfeeding or other modes of transmission is still unknown. Future research of milk samples from lactating mothers and possible **virus transmission through breastfeeding are needed to develop recommendations on whether mothers with COVID-19 should breastfeed.**