



Scientific Research Monitoring on COVID-19

4 June 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



Today's 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

- **Pathology:** autopsy on COVID19 patient found the respiratory tract is the leading cause of death.
- **Treatment:** review on Extracorporeal Membrane Oxygenation
- **Public Health response:** article described different methods of air disinfection when considering aerosol precaution.
- **Treatment:** The first randomized trial of chemoprophylaxis of COVID19 found that after **high-risk or moderate-risk exposure** to COVID-19, HCQ **did not prevent illness** compatible with COVID-19 or confirmed infection when used as **post-exposure** prophylaxis within 4 days after exposure.



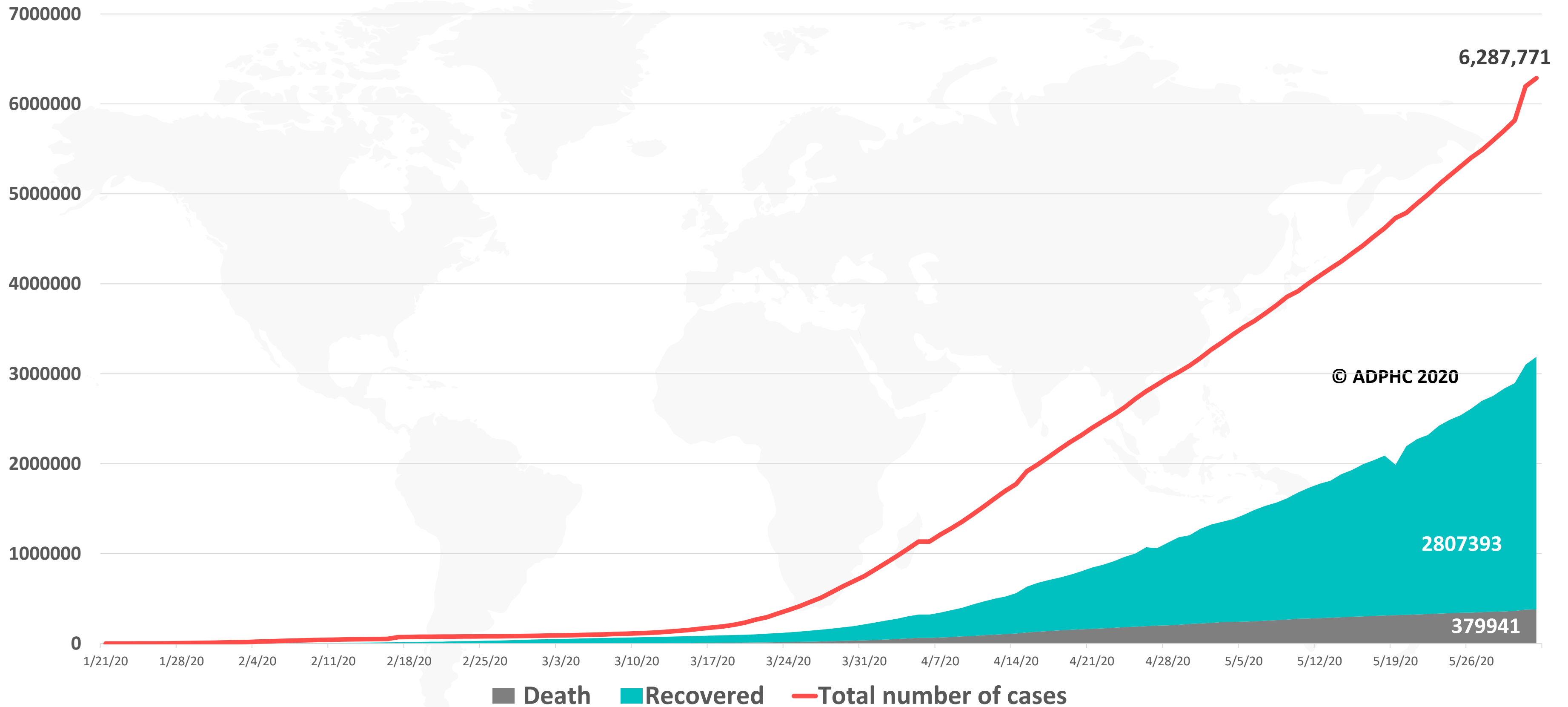
WHO Daily Report 3 June 2020

- Basic psychosocial support skills are at the core of any mental health and psychosocial support intervention. To assist all those involved in the COVID-19 response, WHO has published guidance on basic psychosocial skills.
- At the Yemen High-level Pledging Conference, Dr Mike Ryan, Executive Director, WHO Health Emergencies Program emphasized that COVID-19 was placing a major burden on the health system, already on the verge of collapse , and that despite the considerable efforts of WHO and partners in Yemen, ‘we need a massive scale-up of our COVID and non-COVID health operations to assist some of the most vulnerable populations in the world’.
- A record number of countries have contributed data revealing disturbing rates of antimicrobial resistance. [WHO is concerned that the trend will further be fueled by the inappropriate use of antibiotics during the COVID-19 pandemic.](#)
- On 29 May 2020, WHO and the International Labour Organization (ILO) hosted a webinar on returning to work in the context of COVID-19.
 - The ILO’s recently-released guidance note on safe and healthy return to work aims to assist governments, as well as employers’ and workers’ organizations, in developing national policy [guidance for a phased and safe return to work](#), and provide guidelines for workplace-level risk assessments and implementation of preventive and protective measures—which are summarized in the ILO’s ten action points tool.
 - WHO has developed a [manifesto for a healthy and green recovery from COVID-19](#), with six prescriptions including protecting nature, investing in essential services, ensuring a quick healthy energy transition, promoting healthy and sustainable food systems, building healthy, liveable cities, and ending taxpayer subsidies for polluting activities.

Epidemiology



Figure 1: Total number of infected, recovered, and death cases (January 21st to Jun 3, 2020)

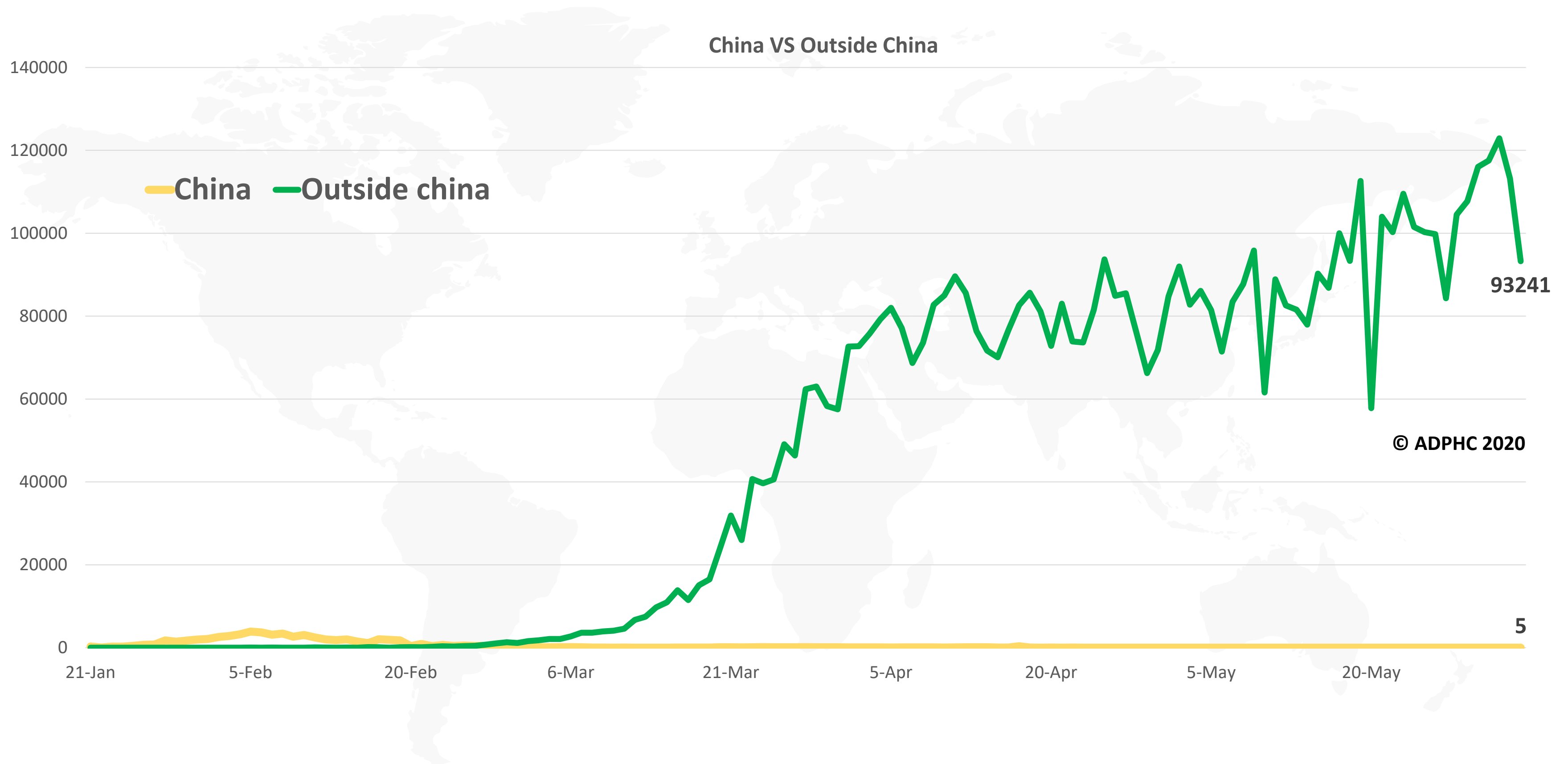


Line graph published by Abu Dhabi Public Health Center 2020.

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



Figure 2: Daily new infected COVID-19 cases reported between (January 21 to Jun 3, 2020).



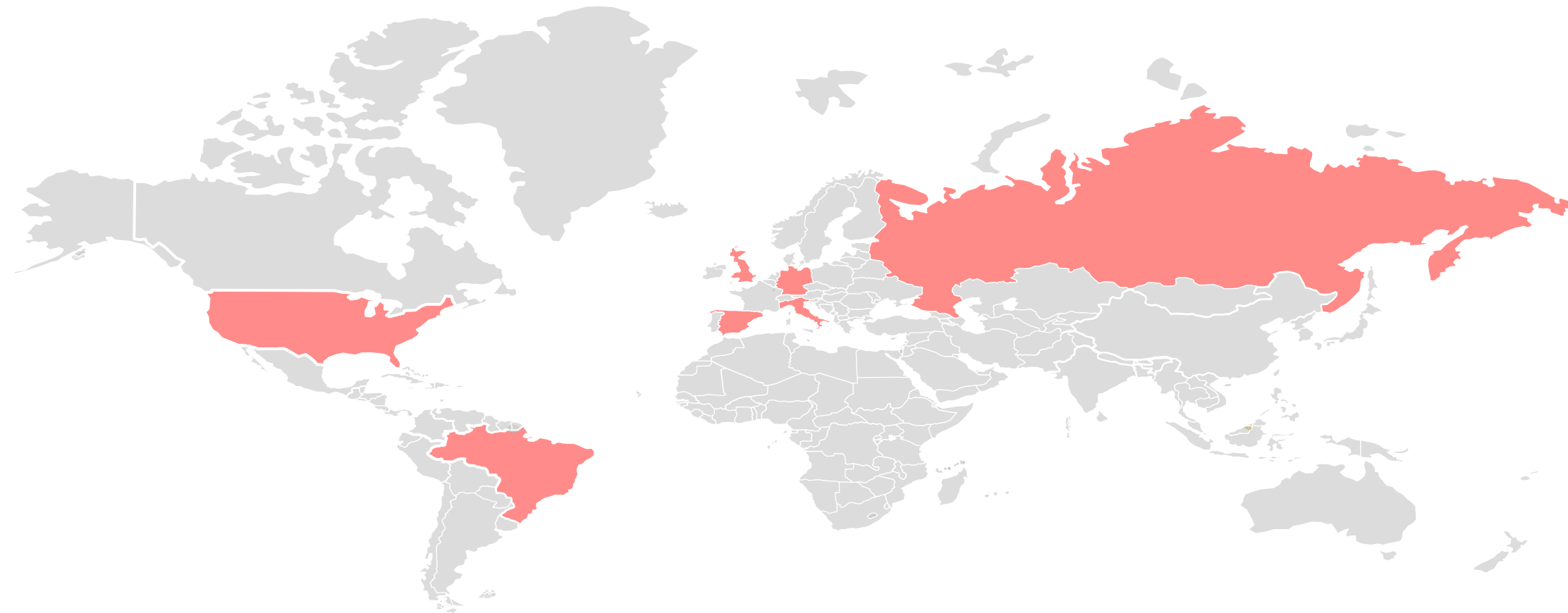
Line graph published by Abu Dhabi Public Health Center 2020.

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

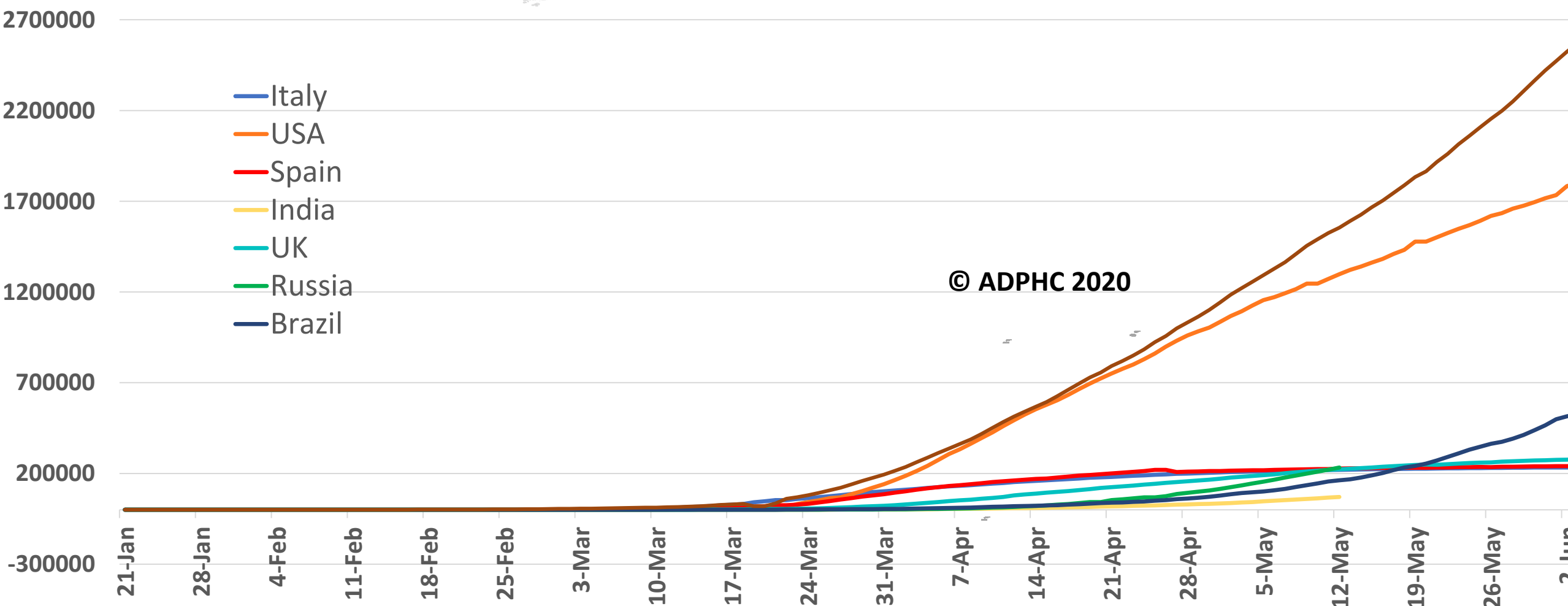
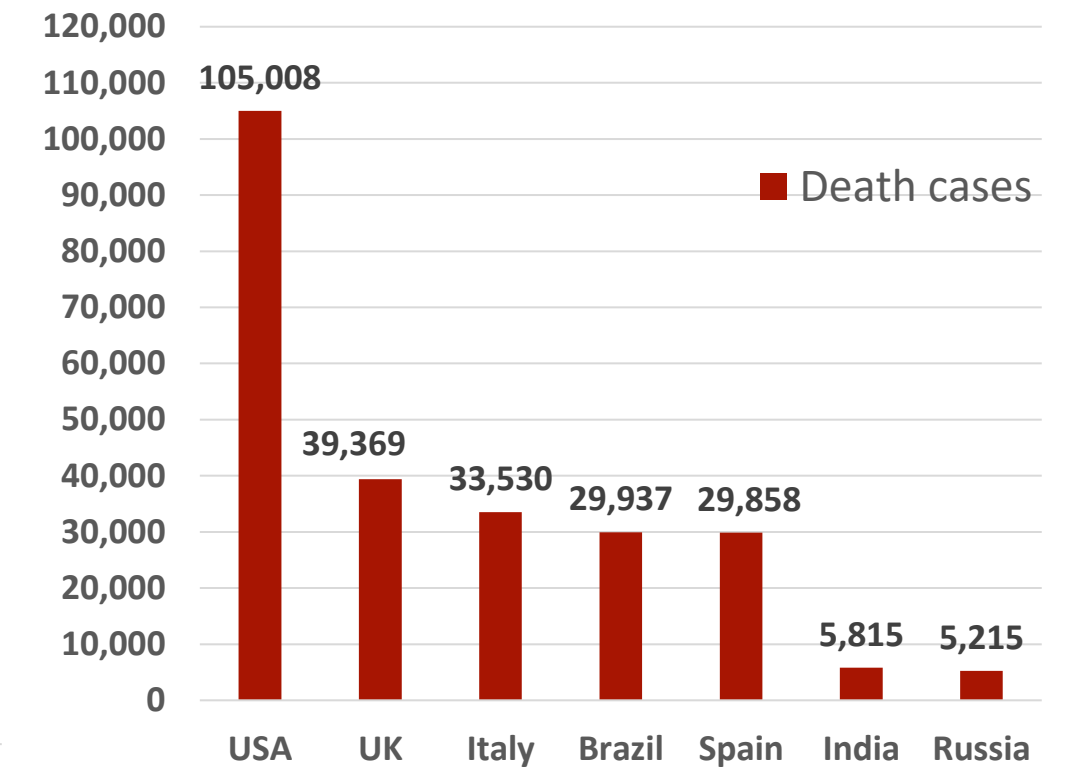
Epidemiology



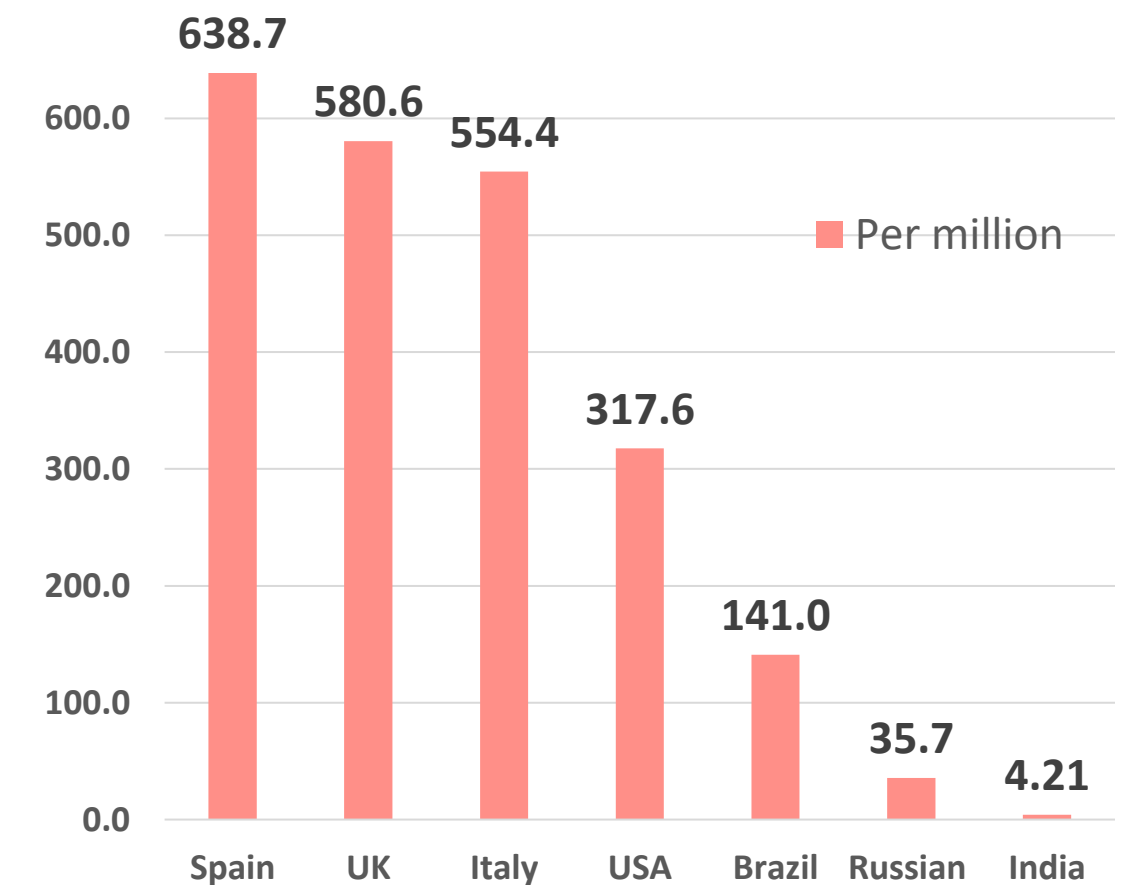
Figure 3 : Top 7 countries in the total number of cases due to COVID-19 (January 21 to Jun 3, 2020).



TOTAL DEATHS



DEATHS PER MILLION

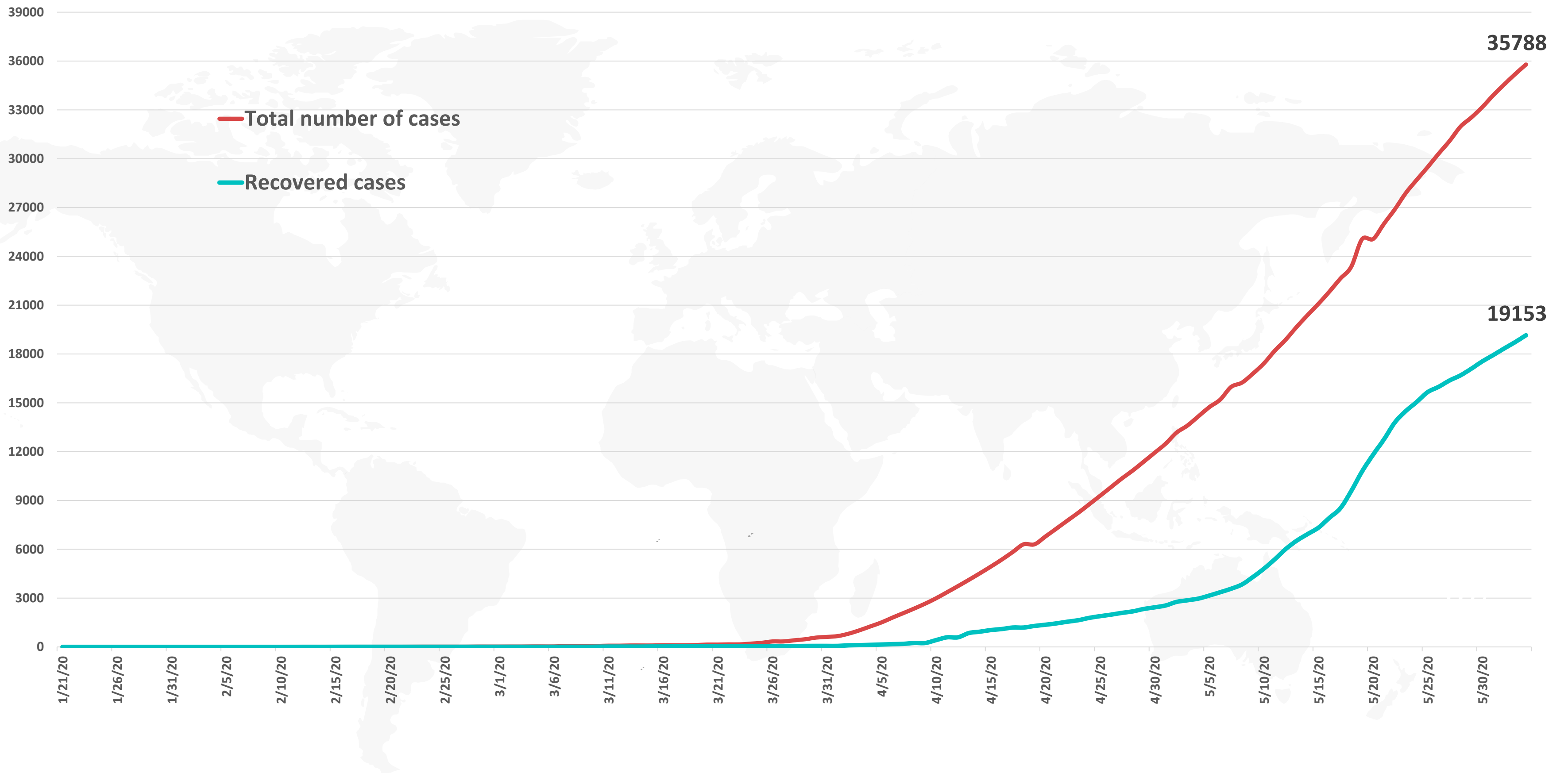


Line graph published by Abu Dhabi Public Health Center 2020.

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



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



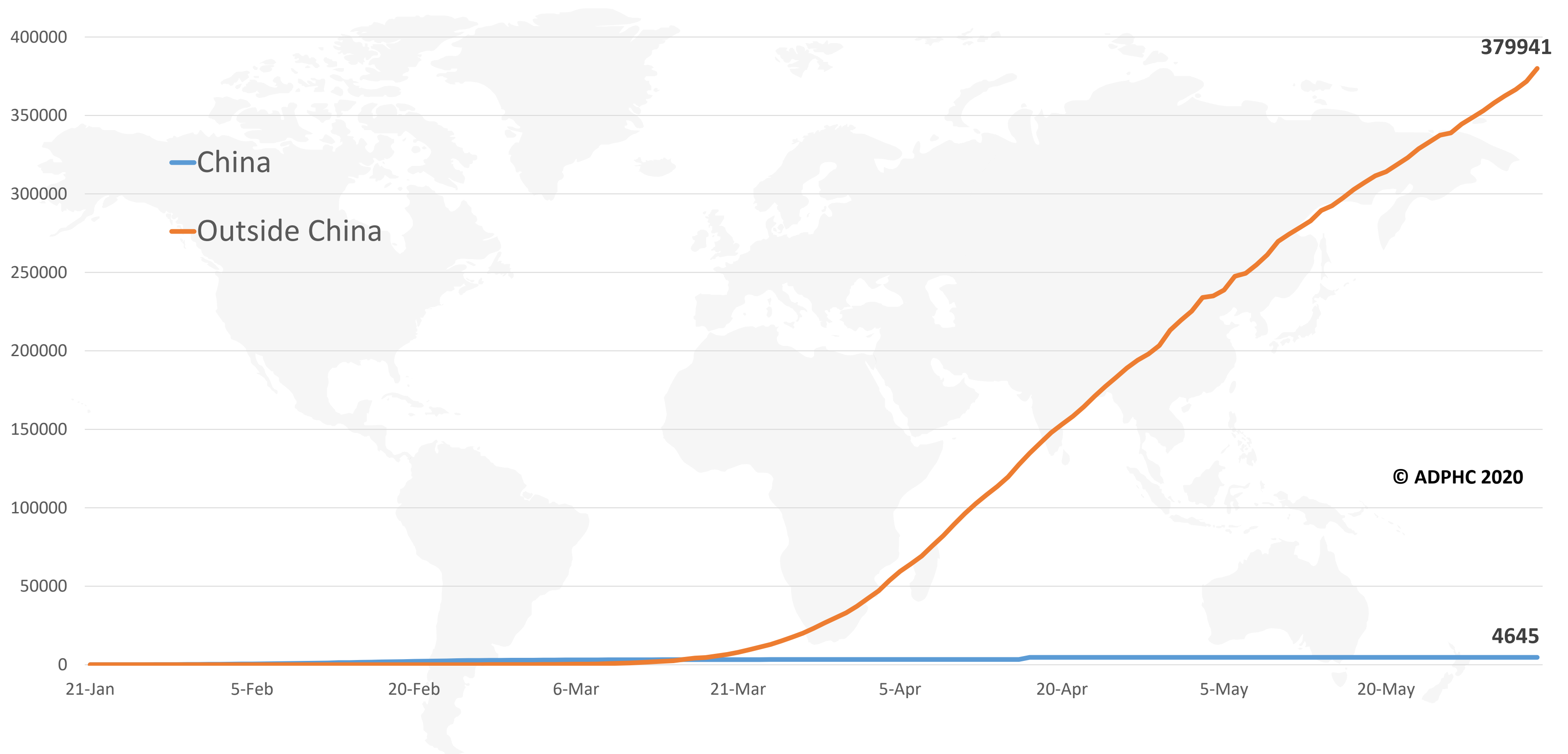
Line graph published by Abu Dhabi Public Health Center 2020.

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 Jun 3, 2020).



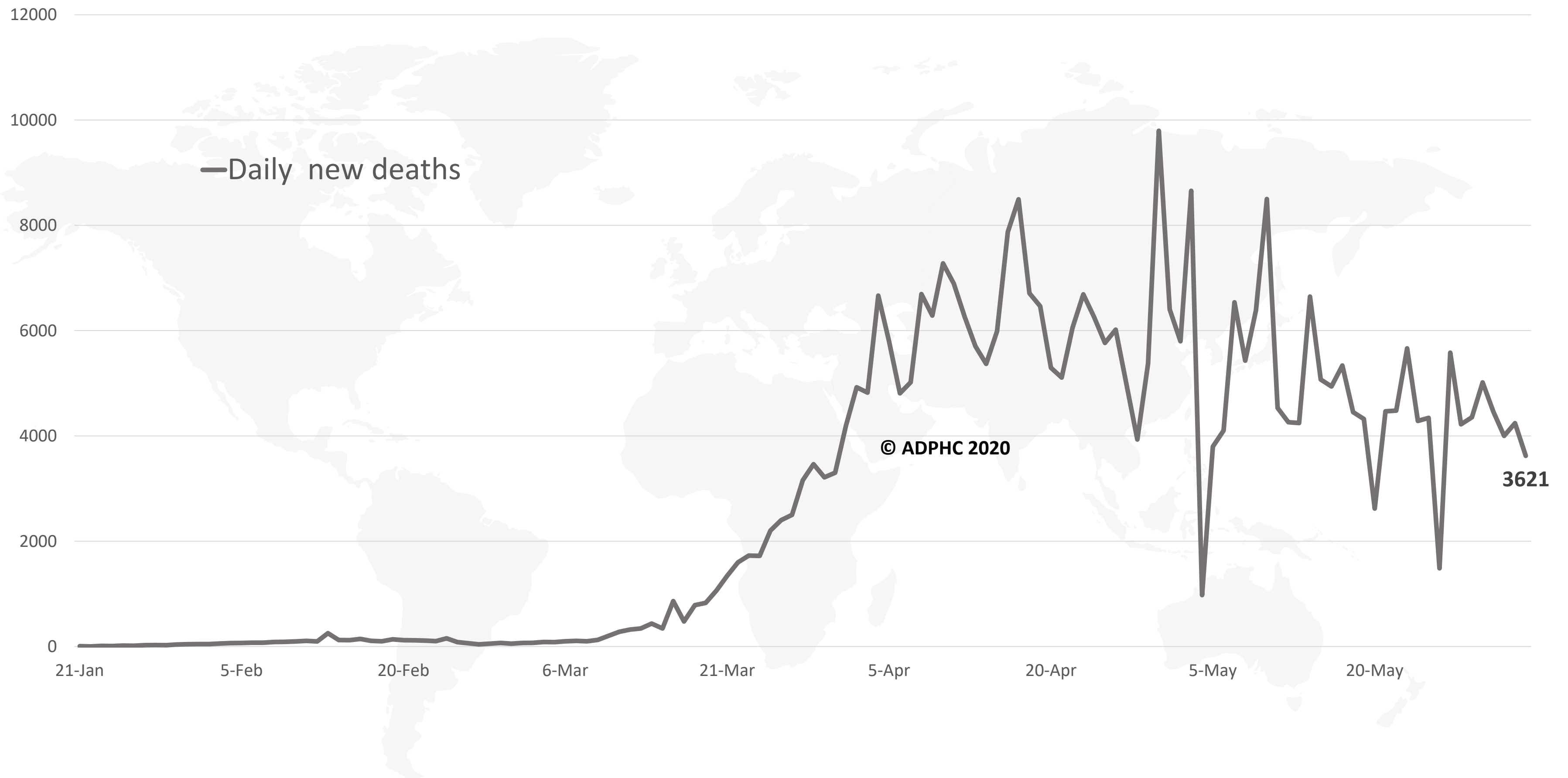
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Data resources: [WHO](https://www.who.int/)



Figure 6: Global daily new deaths due to COVID-19 (January 22 to Jun 3, 2020).



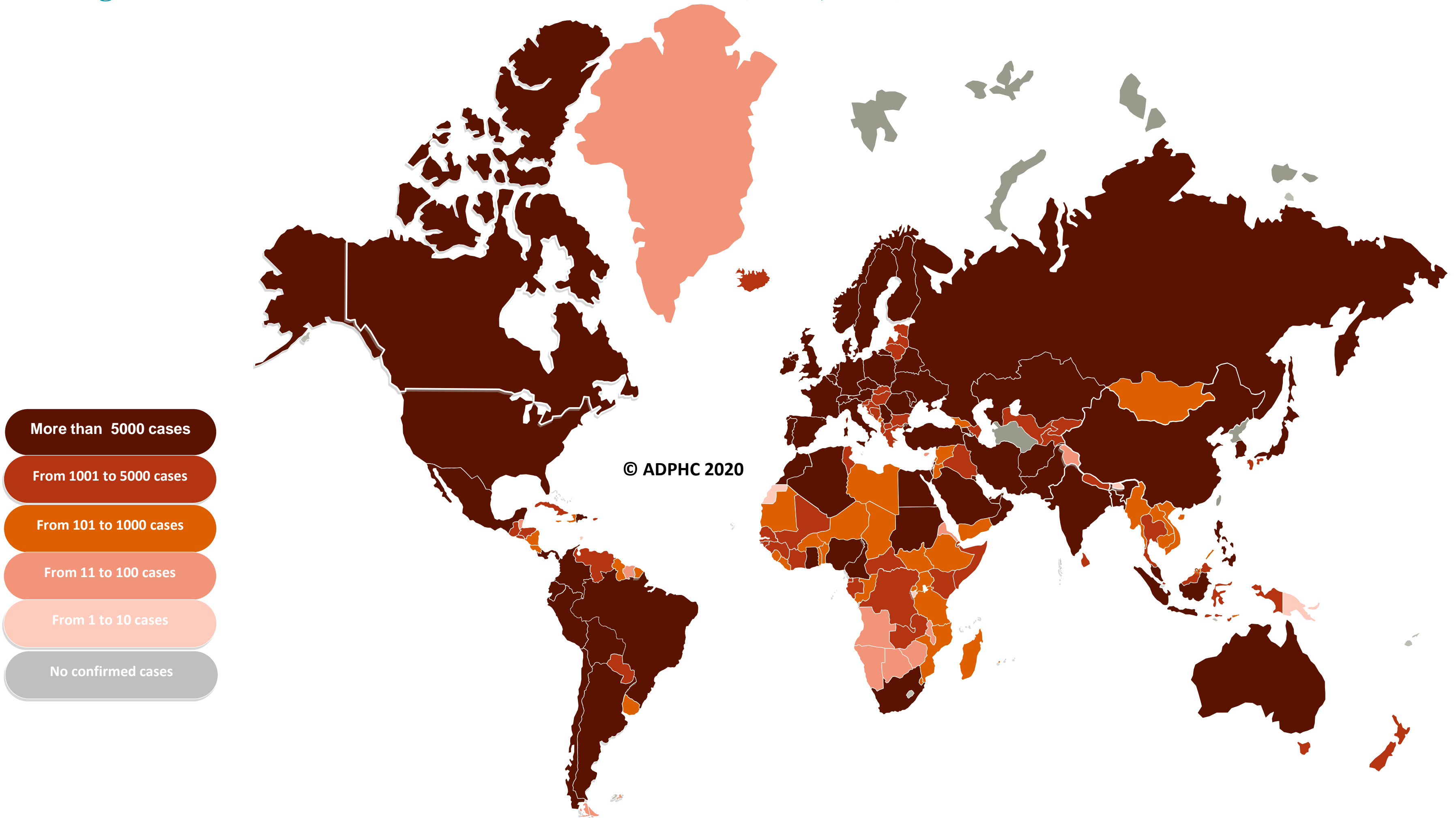
Line graph published by Abu Dhabi Public Health Center 2020.

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

Epidemiology



Figure 7a : Global distribution of COVID-19 cases (Jun 3, 2020).

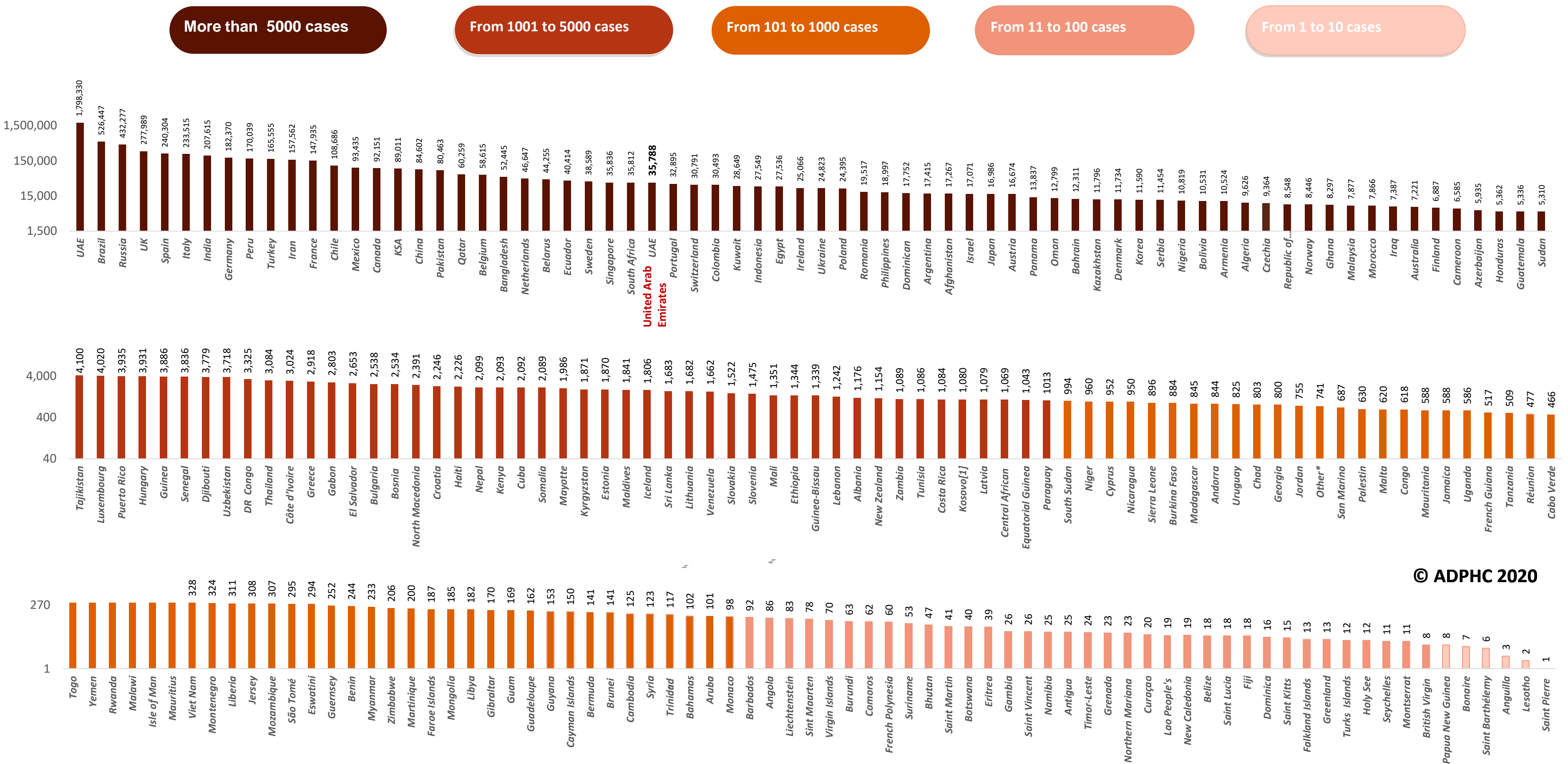


Map chart published by Abu Dhabi Public Health Center 2020.

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Figure 7B: Bar chart illustrate the global distribution of COVID19 cases Jun 3, 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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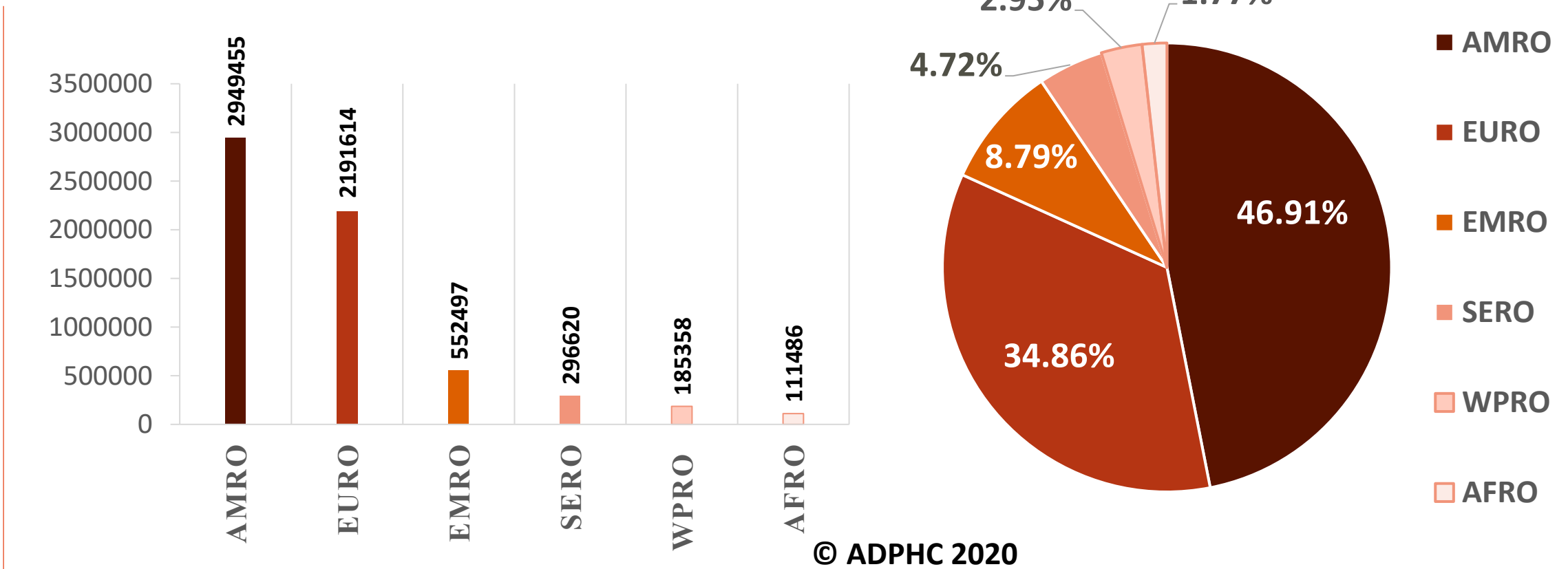
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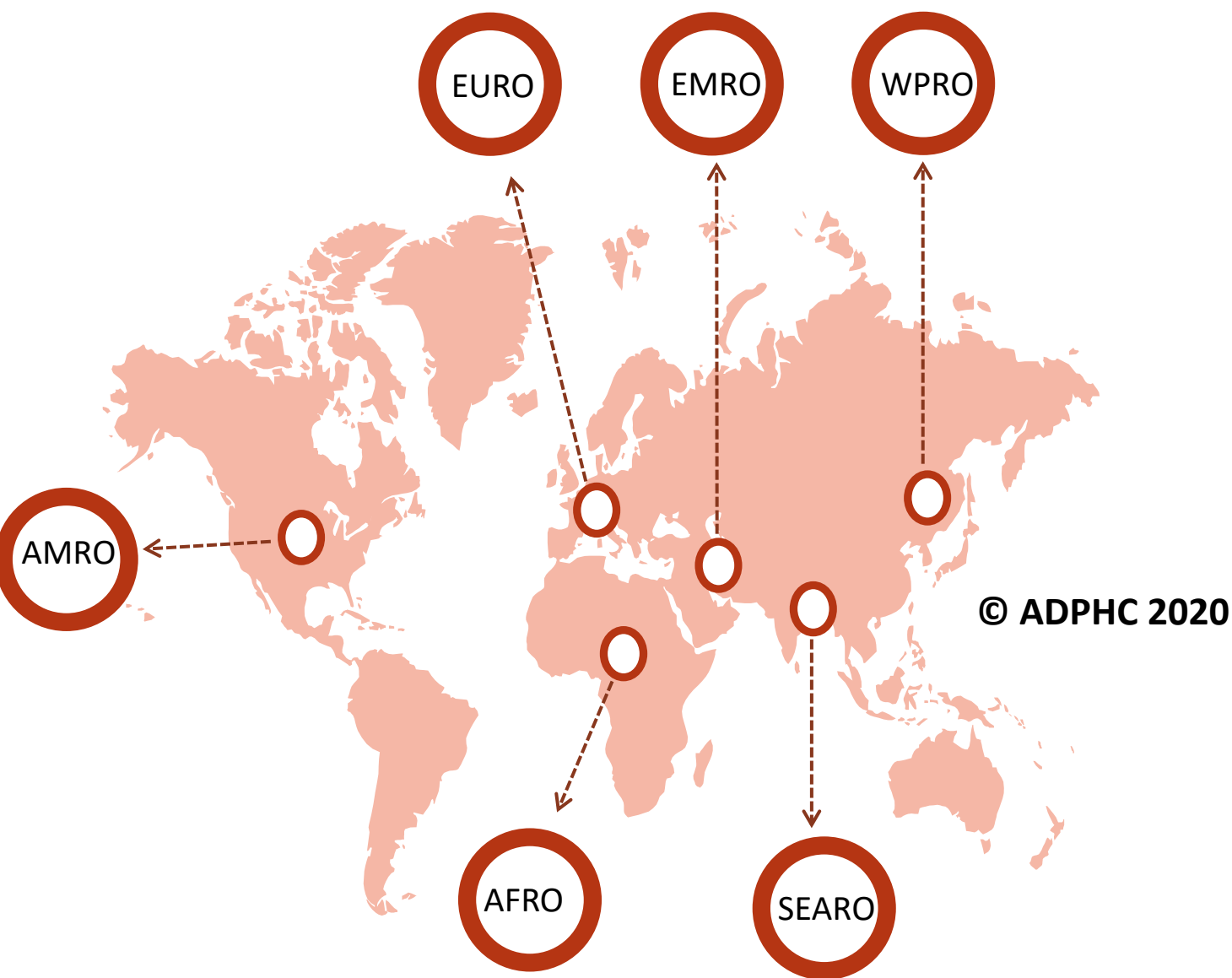
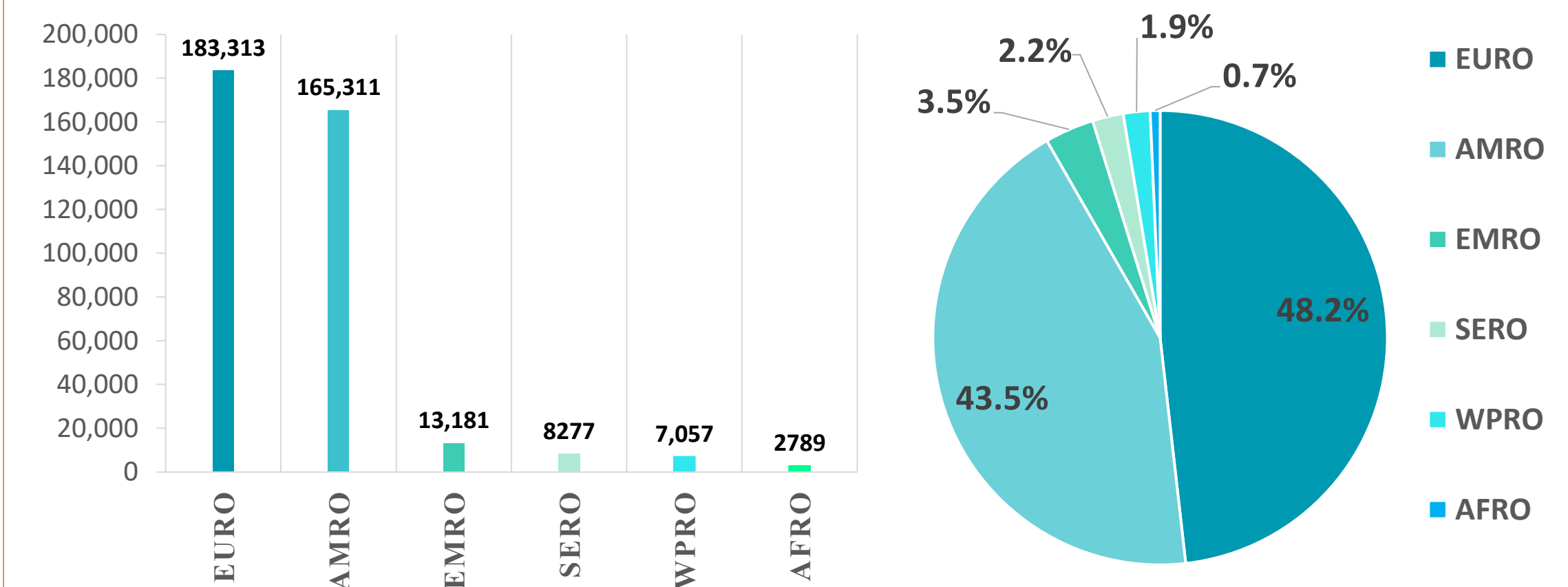


Figure 8: illustrate the Global distribution of COVID19 cases per region (Jun 3, 2020)

INFECTED



DEATH



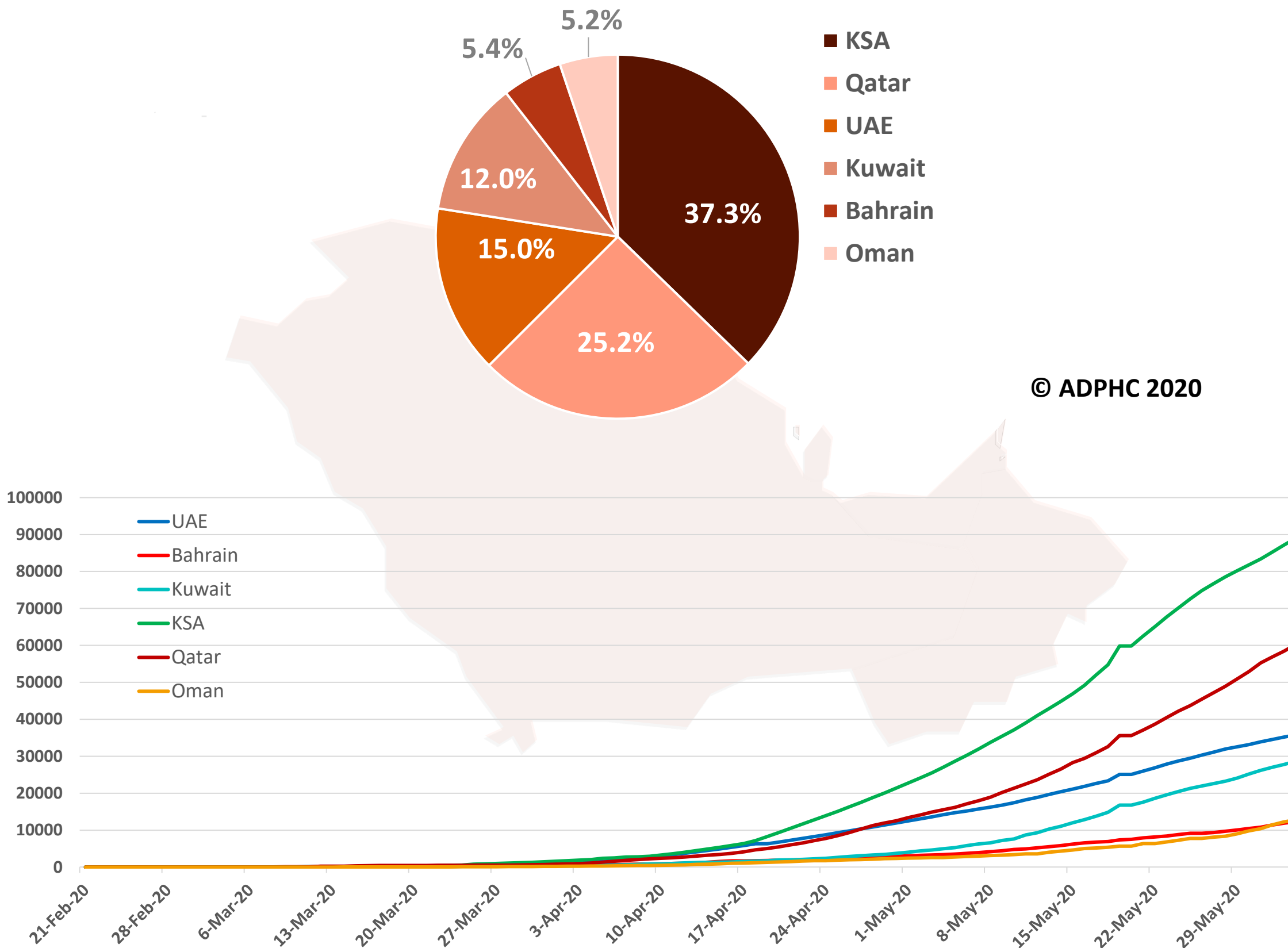
Map chart published by Abu Dhabi Public Health Center 2020.

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

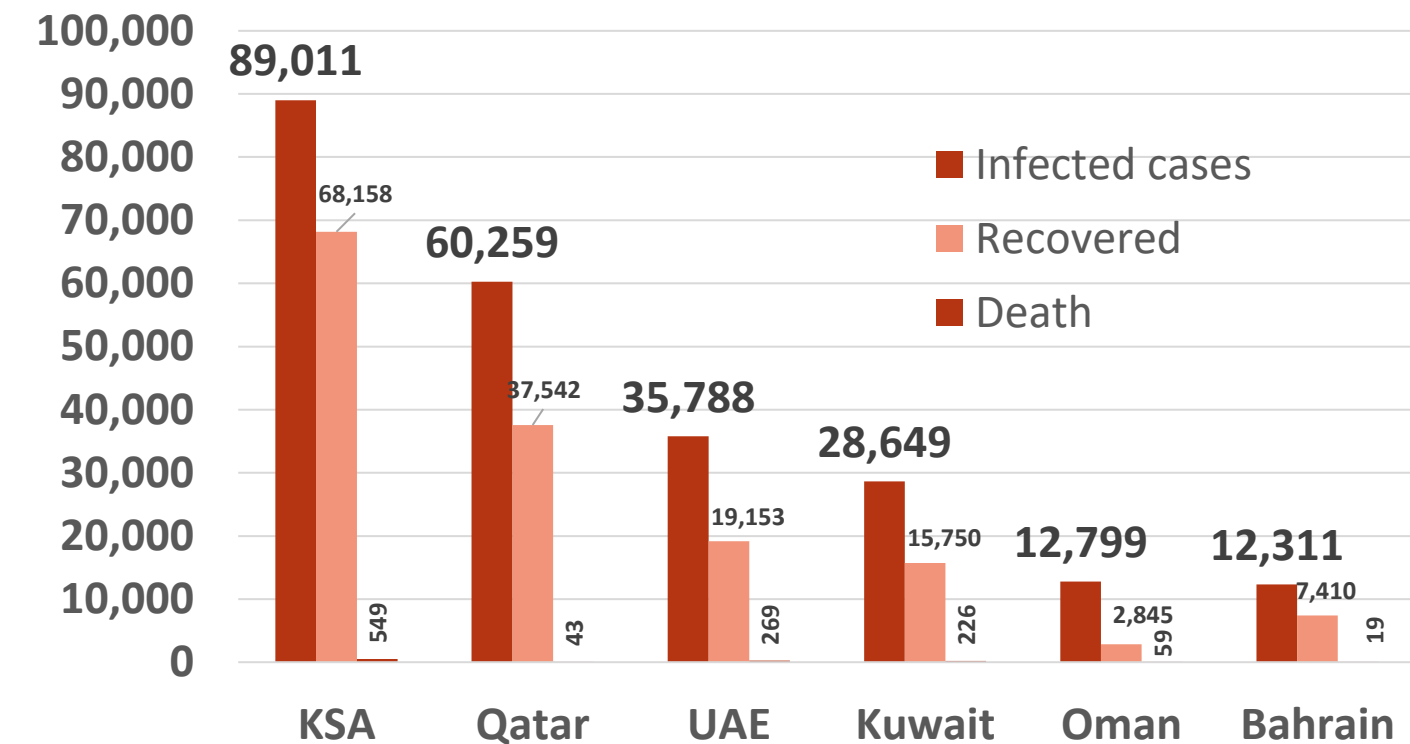


Figure 9: Comparative analysis of the distribution of COVID19 cases in GCC countries (Jun 3, 2020)

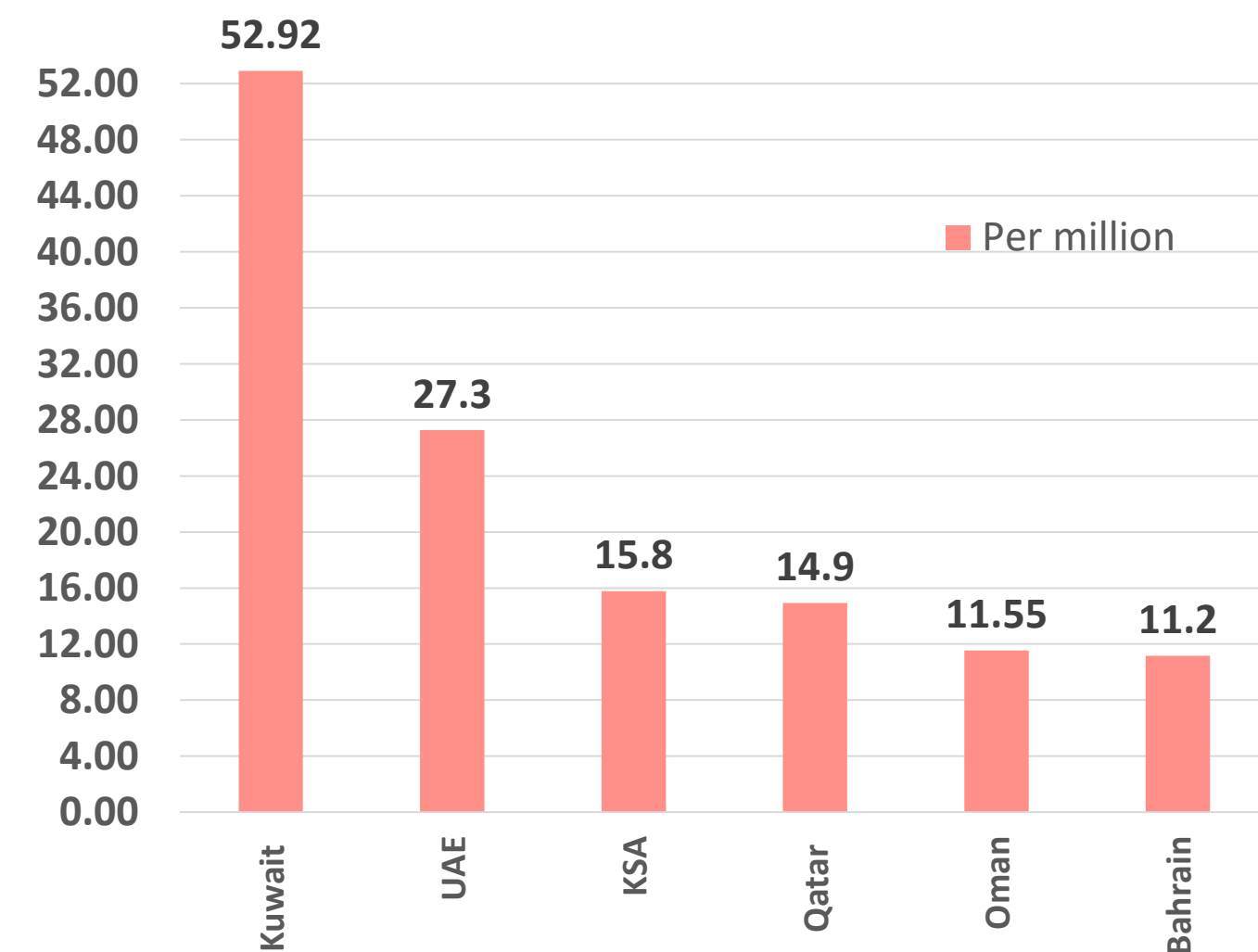
TOTAL NUMBER OF INFECTED CASES



Total number of infected, recovered and Deaths



Death per million



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

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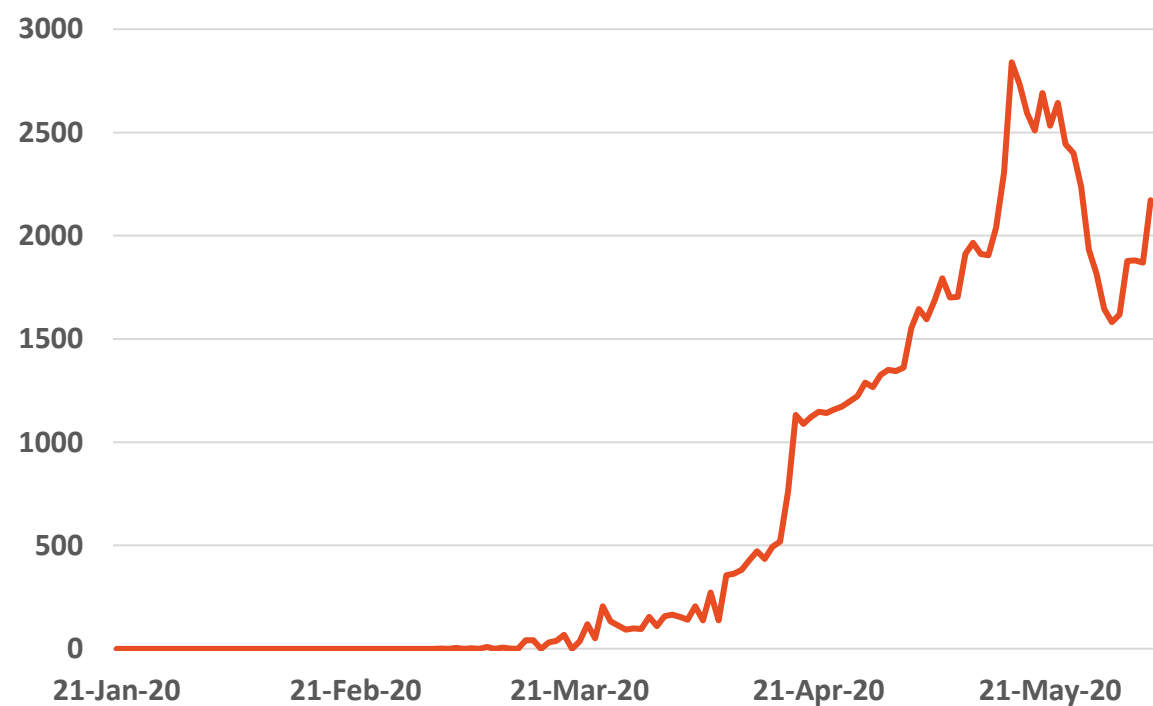
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Epidemiology



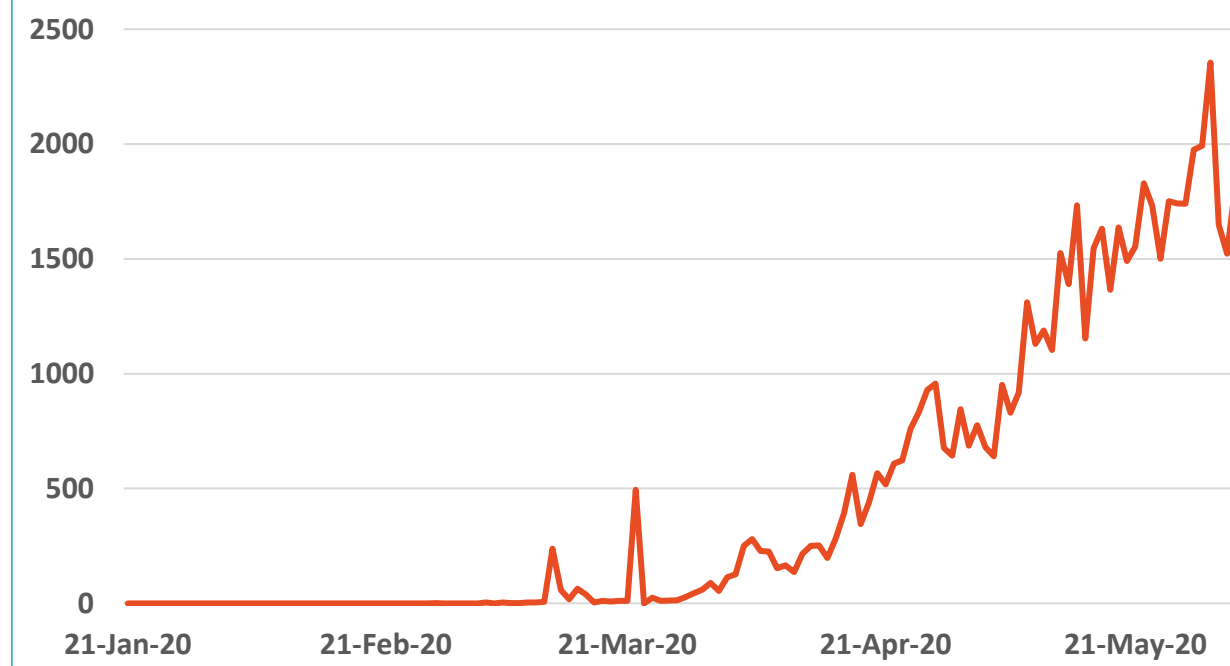
Figure 10: Comparative analysis of the distribution of COVID19 new cases in GCC countries (June 3, 2020)

KSA



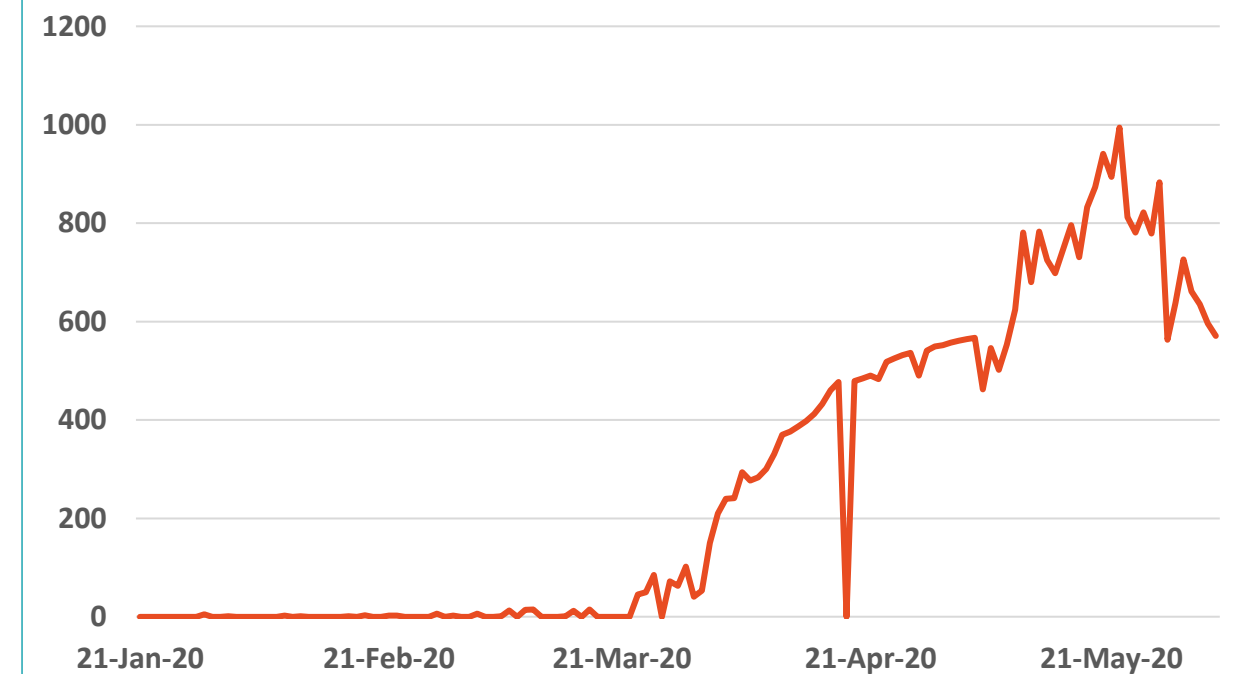
Source : KSA ministry of health

Qatar



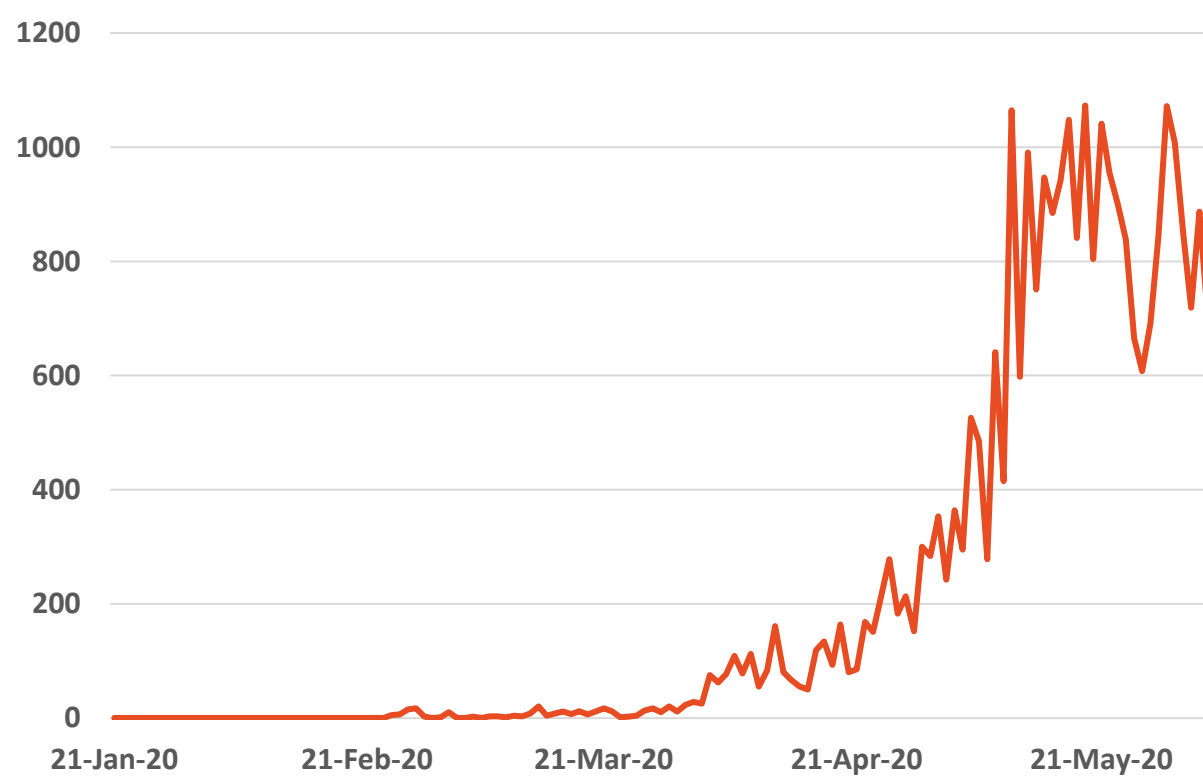
Source : Qatar ministry of health

UAE



Source : UAE ministry of health

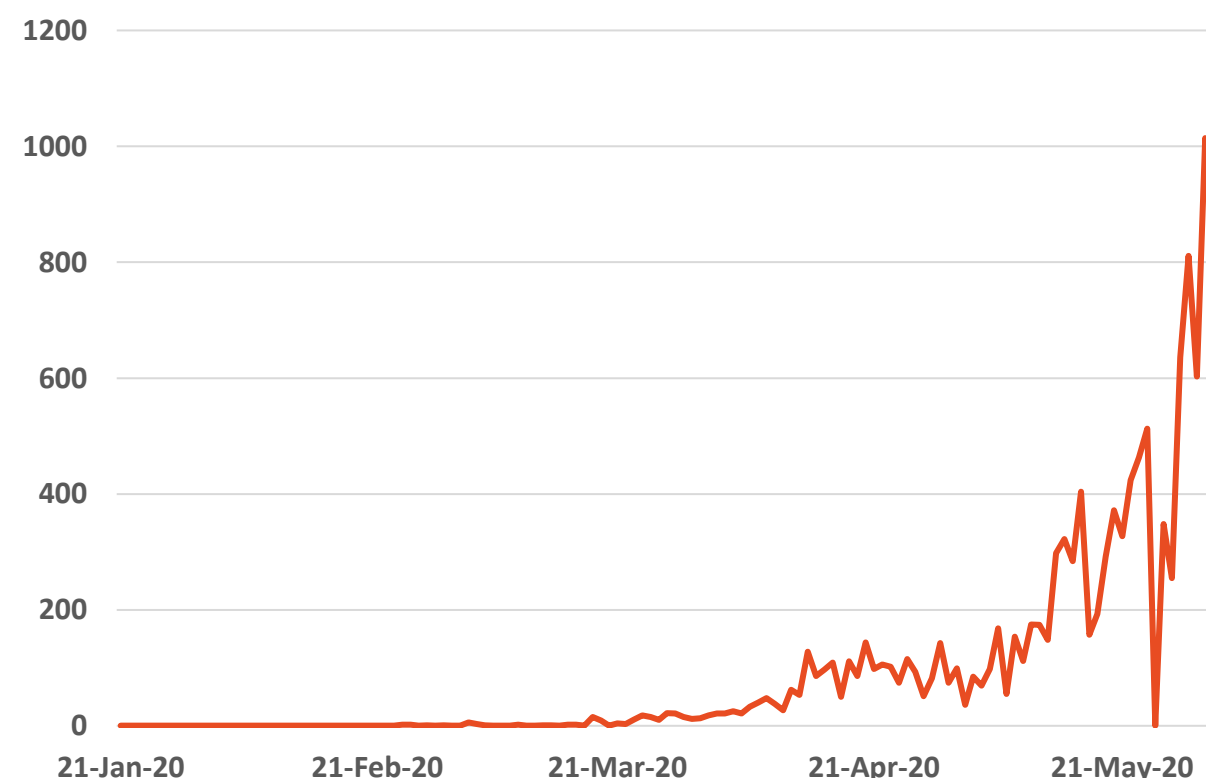
Kuwait



Source : Kuwait ministry of health

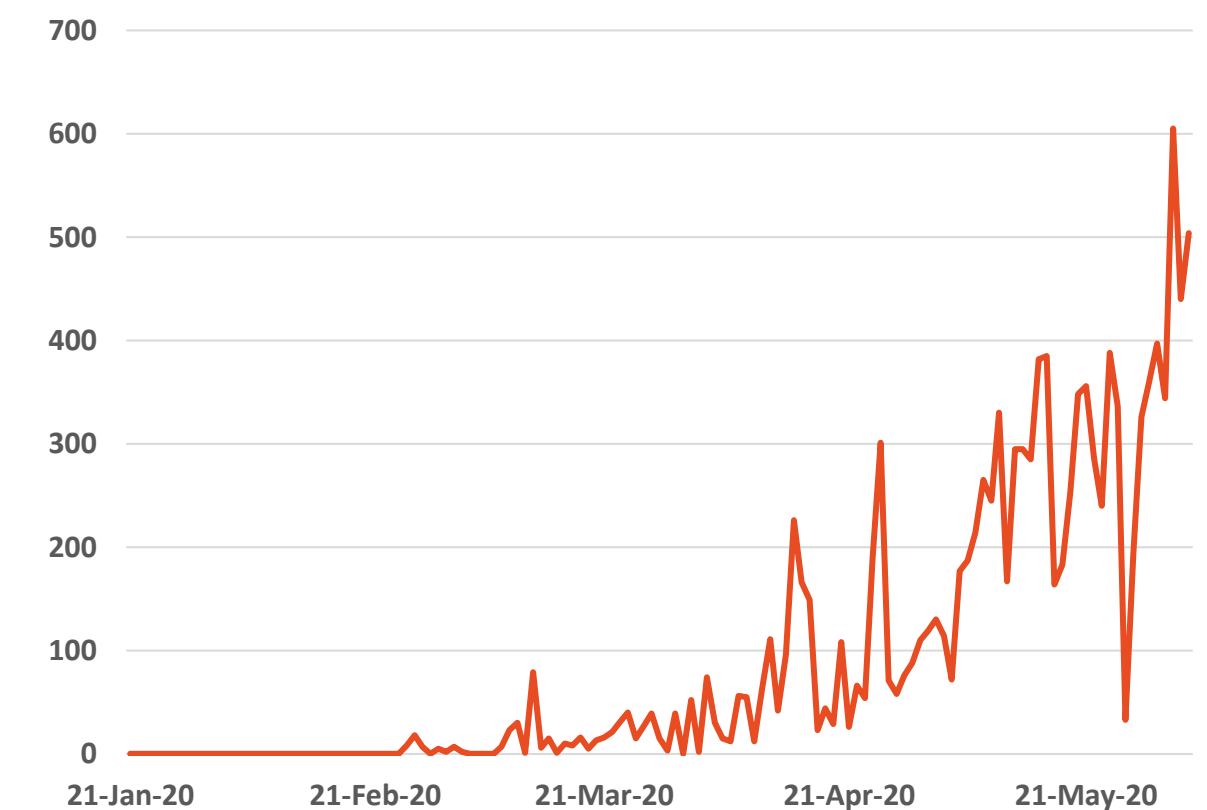
Oman

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Source : Oman ministry of health

Bahrain



Source : WHO

Epidemiology



Figure 11 : Comparative analysis of the distribution of COVID19 newly recovered cases in GCC countries (June 3, 2020)

KSA



Source : KSA ministry of health

Qatar



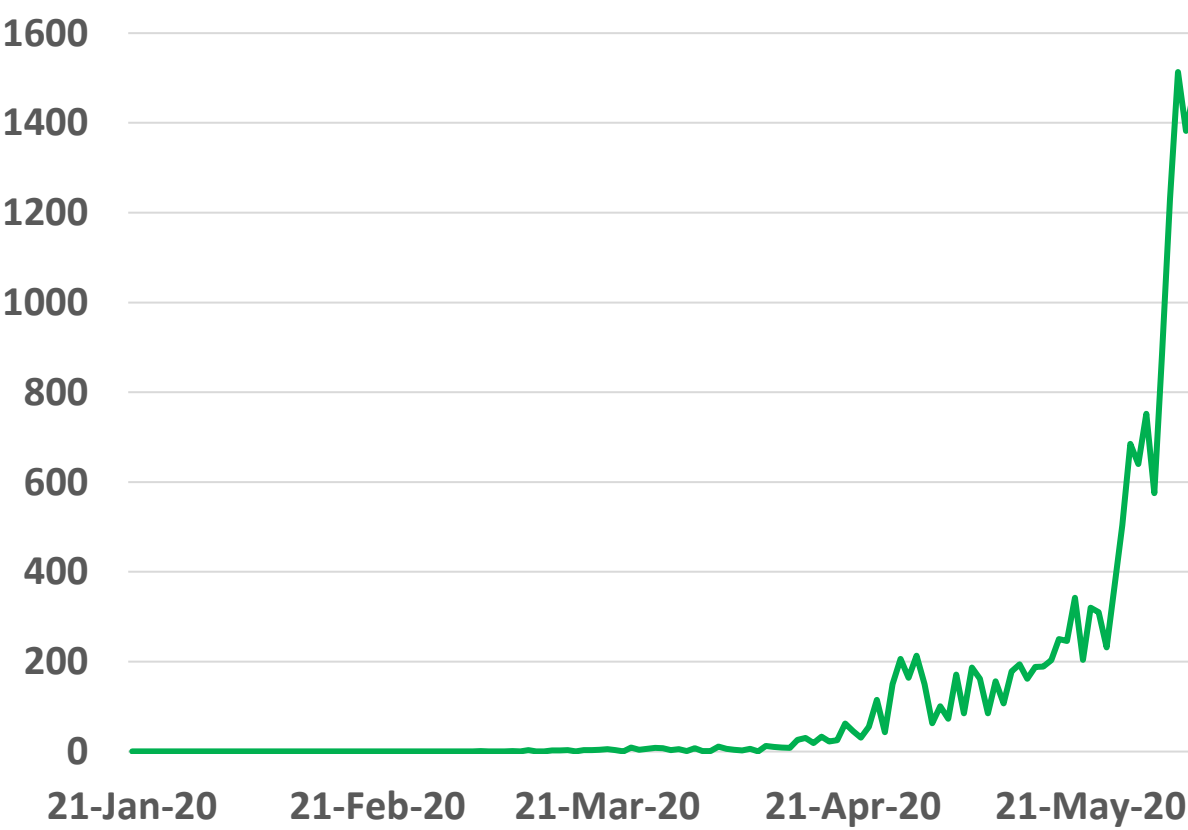
Source : Qatar ministry of health

UAE



Source : UAE ministry of health

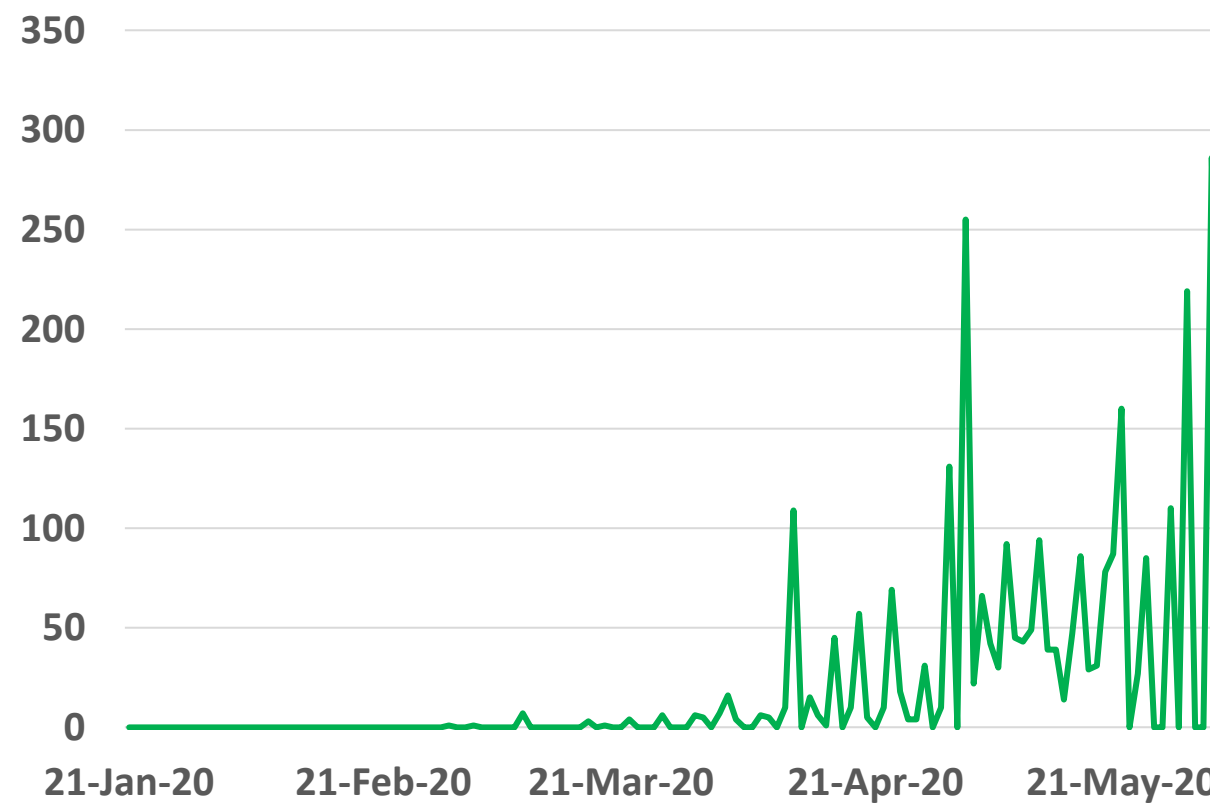
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Source : Kuwait ministry of health

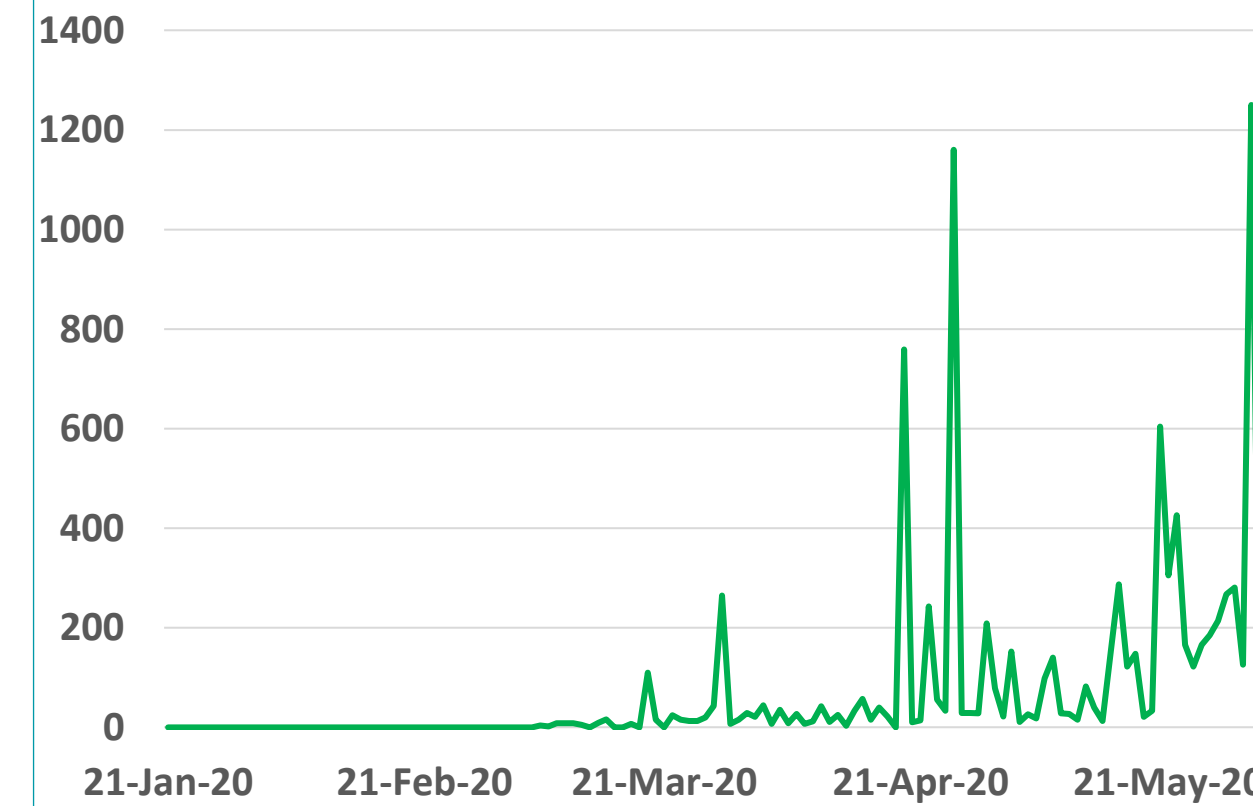
Oman

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Source : Oman ministry of health

Bahrain



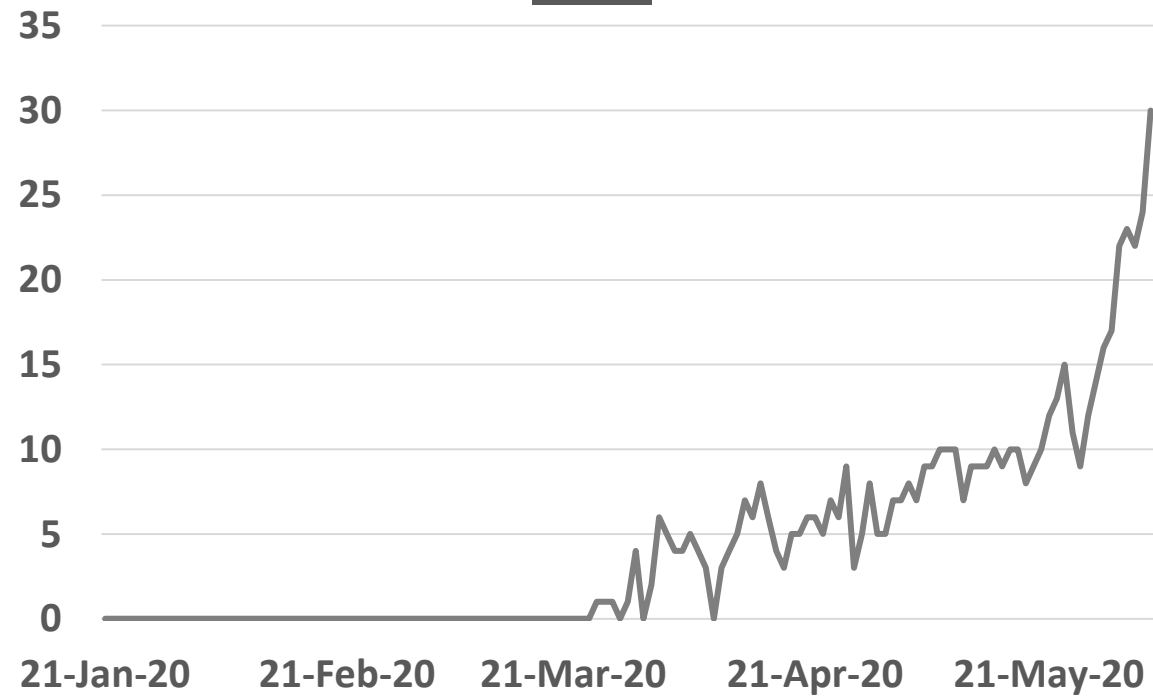
Source : WHO

Epidemiology



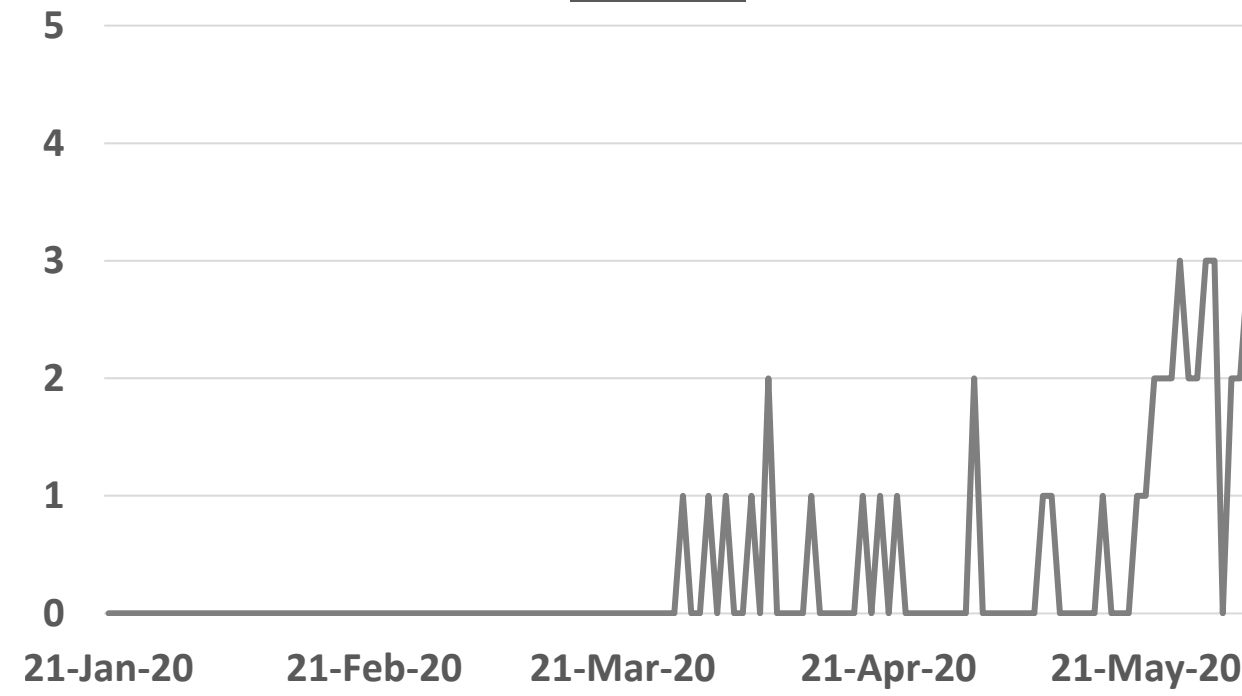
Figure 12: Comparative analysis of the distribution of COVID19 newly death cases in GCC countries (June 3, 2020)

KSA



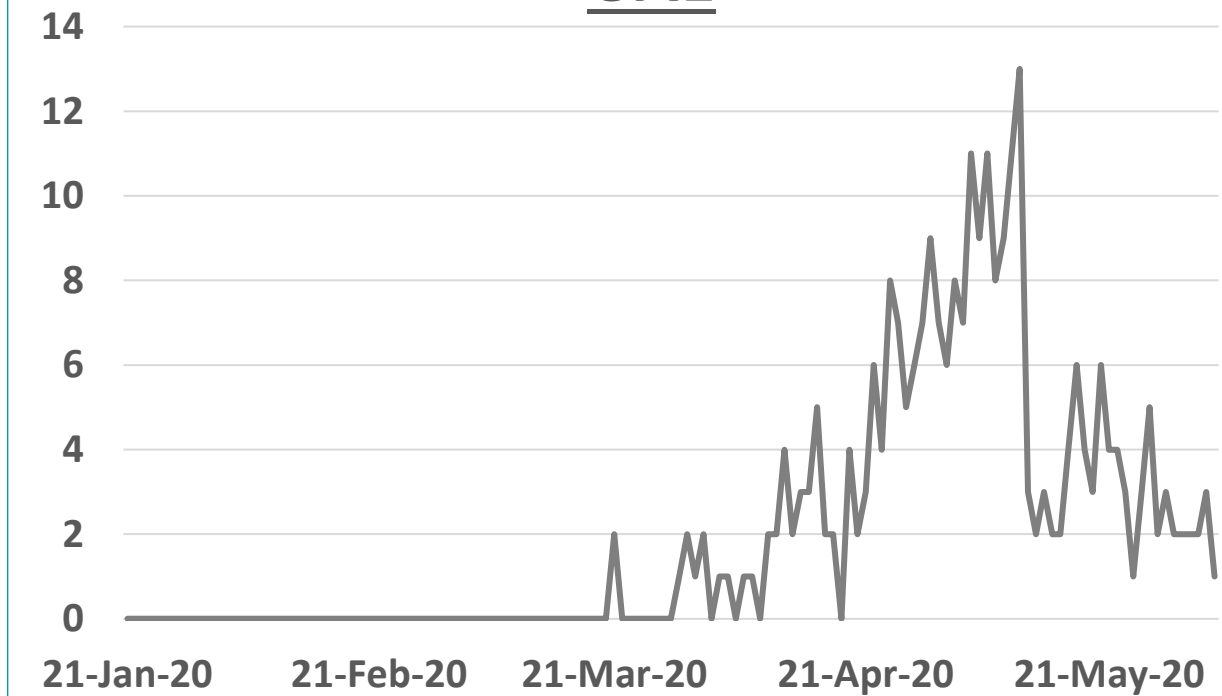
Source : KSA ministry of health

Qatar



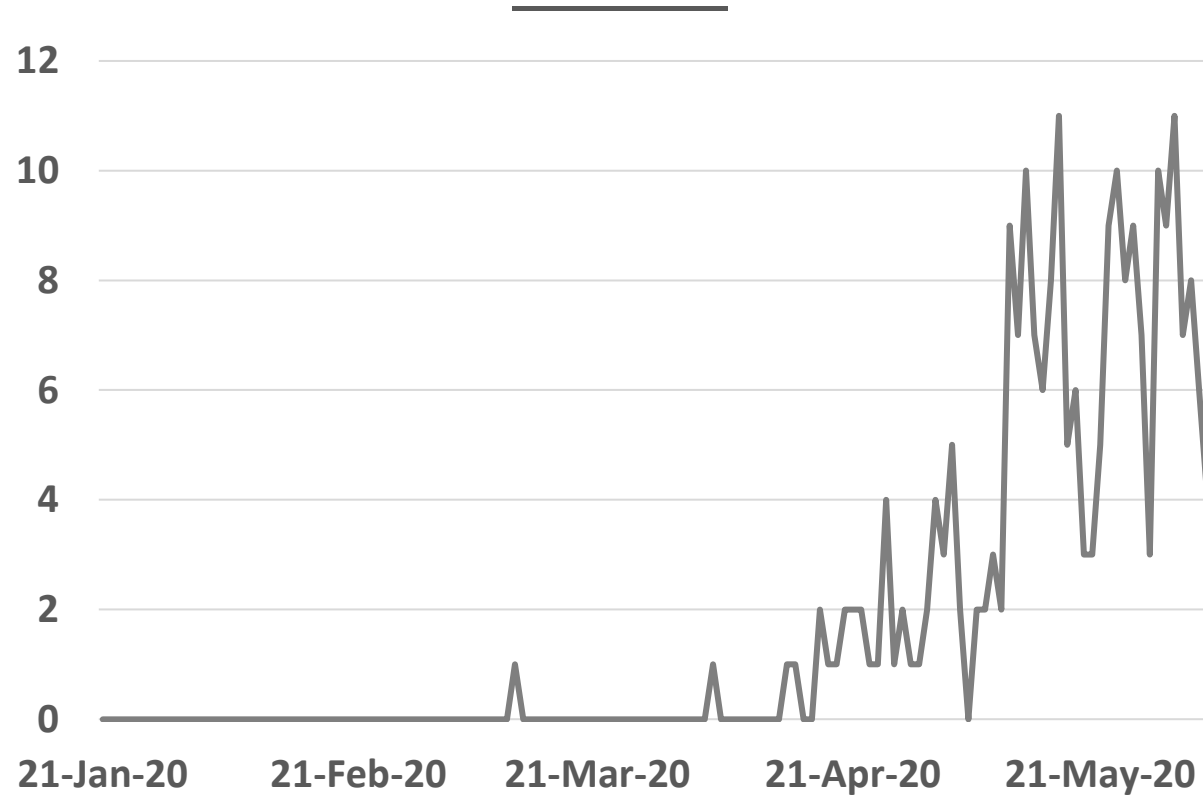
Source : Qatar ministry of health

UAE



Source : UAE ministry of health

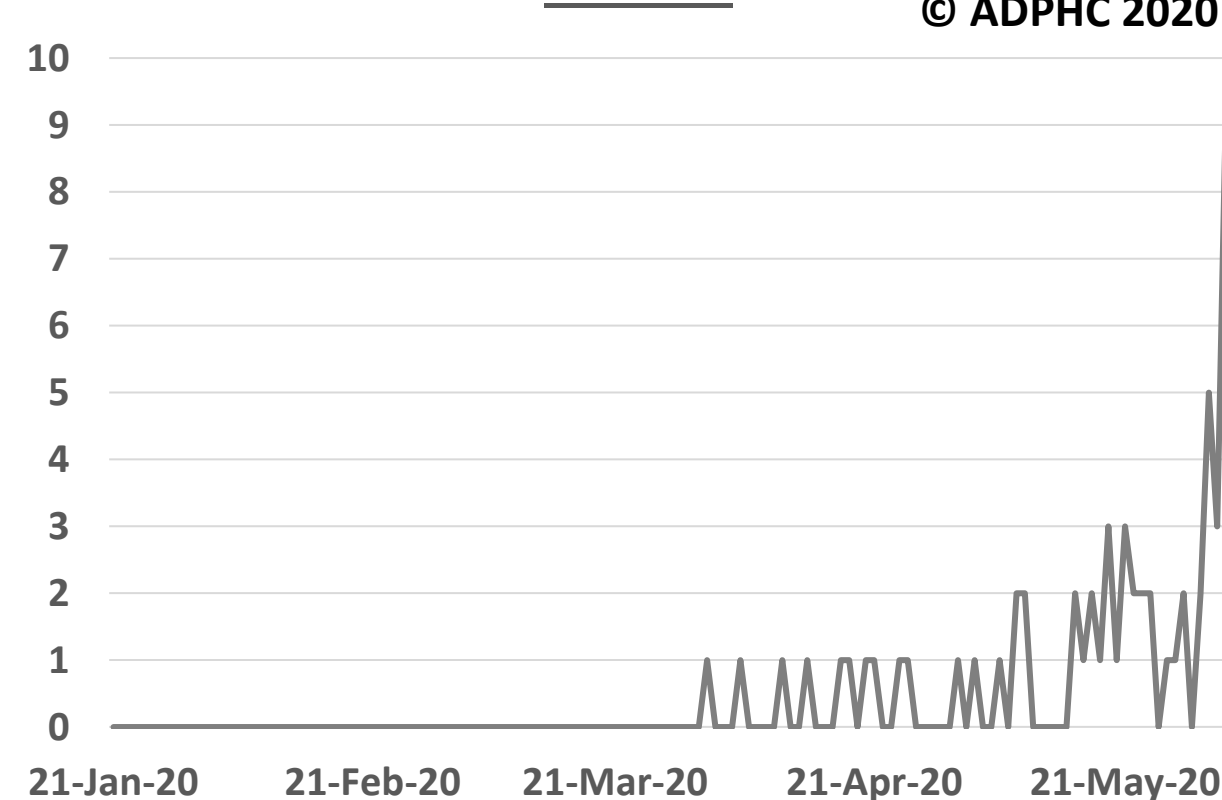
Kuwait



Source : Kuwait ministry of health

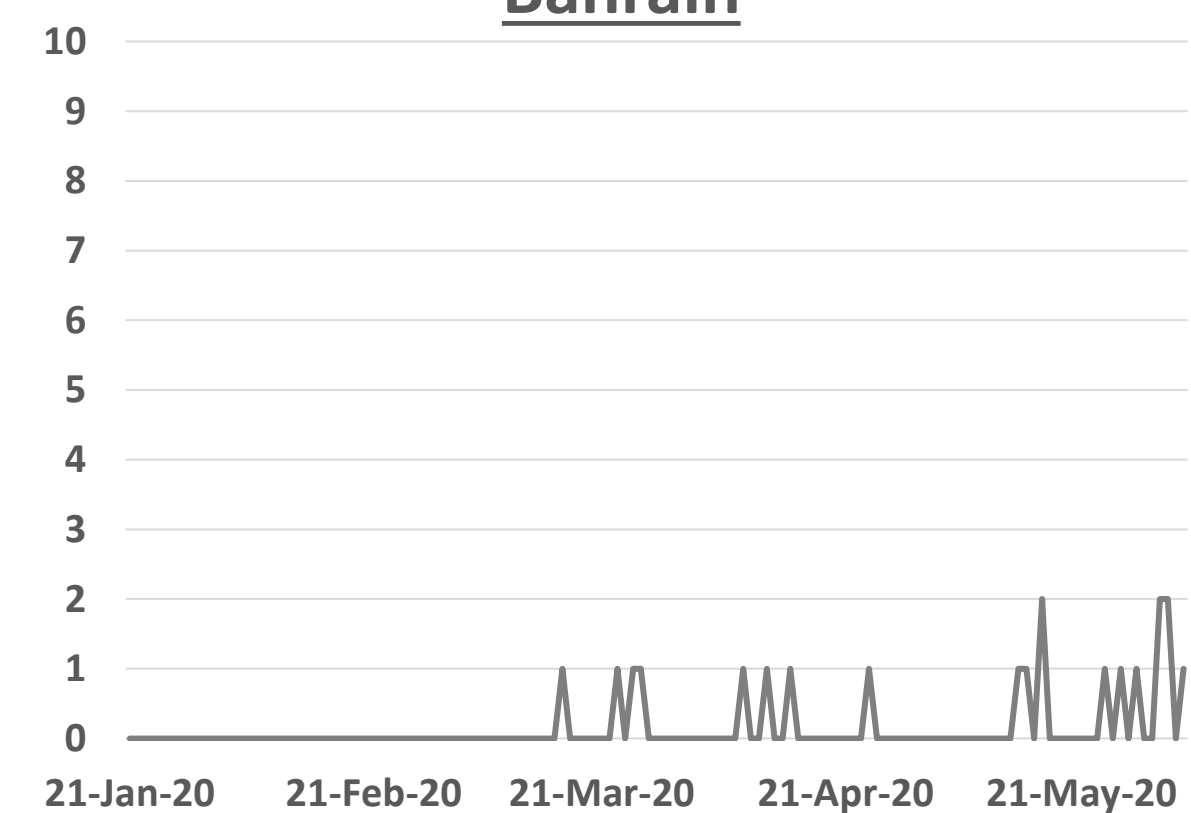
Oman

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Source :Oman ministry of health

Bahrain



Source : WHO



Clinical Features

Article 1: Postmortem Examination of Patients with COVID-19

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

Summary:

This paper reported postmortem examinations in a case series of patients with COVID-19.

- Serial postmortem examinations were conducted (between April 4 and 19, 2020) among patients (n=10) with COVID-19 who died at the University Medical Center Augsburg in Germany. Specimens from lung, heart, liver, spleen, kidney, brain, pleural effusion, and cerebrospinal fluid (CSF) were examined. Postmortem nasopharyngeal, tracheal, bronchial swabs, pleural effusion, and CSF were assessed for SARS-CoV-2 by RT-PCR.
- Acute and disseminated diffuse alveolar damage (with hyaline membrane formation, intra-alveolar edema, and thickened alveolar septa with perivascular lymphocyte-plasmocytic infiltration) and **SARS-CoV-2 persistence in the respiratory tract were the predominant histopathologic findings** and comprised the **leading cause of death among patients with and without (n=6) invasive ventilation.**
- **Liver histology indicated minimal periportal lympho plasma cellular infiltration** and signs of **fibrosis.** Whether myoepicardial alterations represented systemic inflammation or **early myocarditis was unclear; criteria for true myocarditis were not met. Involvement of central nervous system could not be detected.**
- **The pulmonary histopathologic findings of COVID-19 were similar to those observed in diseases caused by other betacoronavirus infections including Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS).**



Clinical Features

Article2: Extracorporeal Membrane Oxygenation Published: May 28, 2020 in [the JAMA](#)

Summary:

ECMO uses a pump to replace the function of the heart while an oxygenator performs the work of the lungs. ECMO provides short-term support, giving the heart and lungs time to recover.

Why Is ECMO Used?

- Cardiogenic shock
- Respiratory failure
- Postoperative heart failure
- Extracorporeal cardiopulmonary resuscitation (CPR)
- Awaiting heart or lung transplant.

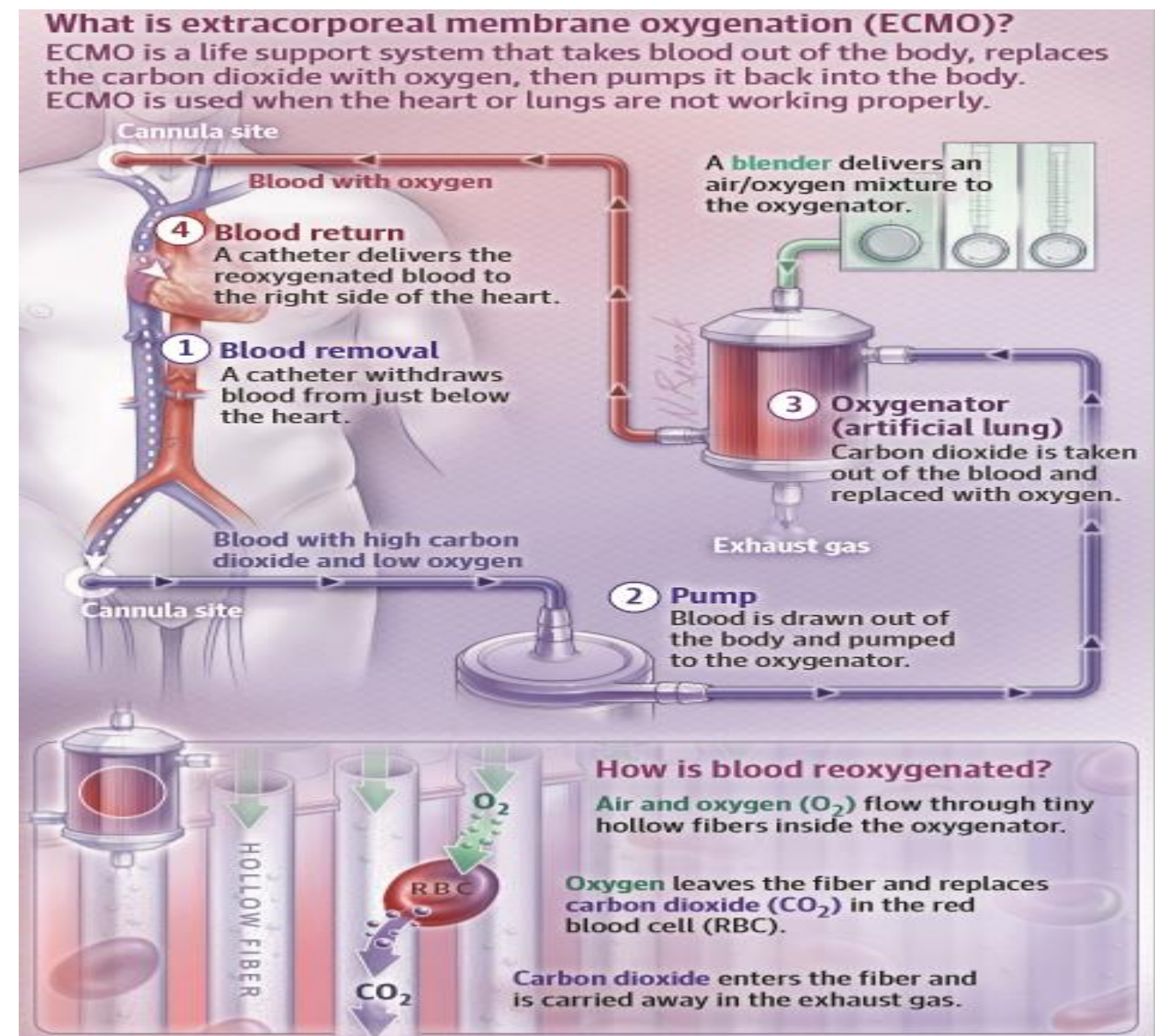
How Does ECMO Work? [Figure](#)

Complications of ECMO

ECMO is temporary and there may be serious risks.

- Bleeding: Blood thinners are used to prevent clots from forming in the tubing that carries the blood. Bleeding is the most common complication of ECMO and can be life-threatening if it occurs in the brain, lungs, or gastrointestinal tract. Patients receiving ECMO commonly require blood transfusions.
- Stroke: Clots. This rarely happens, but it can be disabling or fatal.
- Leg injury: When cannulas are placed in vessels in the leg, blood flow to the lower portion of the leg may be compromised. This may require surgery or amputation.

Figure: HOW the ECMO works



Why Don't All Patients Improve With ECMO?

Some patients may not improve if their disease is not reversible or does not respond to treatment. Certain diseases may lead to progressive organ dysfunction, such as liver failure or severe neurologic injury. These conditions have a poor prognosis and may warrant discussion about discontinuing ECMO support.



Clinical Features

Article 3: Airborne Spread of SARS-CoV-2 and a Potential Role for Air Disinfection

Published: June 1, 2020 in [the JAMA](#)

Summary:

- This article discusses different examples supporting airborne and aerosol transmission in COVID-19.
- The article also describes the different practical methods of air disinfection in table 1.
- The article concluded:
- Air disinfection shall be considered in hospitals. Priority areas for air disinfection might be waiting rooms, emergency departments, intensive care units, bronchoscopy and endoscopy rooms, and other sites where aerosol is generated.
- Management of the current crisis and preparation for future respiratory viral pathogens should include consideration of the use of upper-room GUV to help mitigate airborne transmission.

natural ventilation	mechanical ventilation	Portable room air cleaners	upper-room germicidal UV (GUV) fixtures
ventilation with 6 to 12 room air changes per hour	ventilation with 6 to 12 room air changes per hour. (ventilation systems designed for such high-flow rates—but at high operating costs when intake air must be heated or cooled and dehumidified.)	room volume dependent, their specified clean air delivery rates generally add too few equivalent air changes per hour to provide adequate protection against airborne infection.	with an effective rate of air mixing (see the figure) it reduces airborne tuberculosis transmission by 80%, equivalent to adding 24 room air changes per hour
Suitable for limited resource settings. Not suitable when air pollution or global warming issues exist.			Suitable in limited resource settings when considering cases of outdoor air pollution.

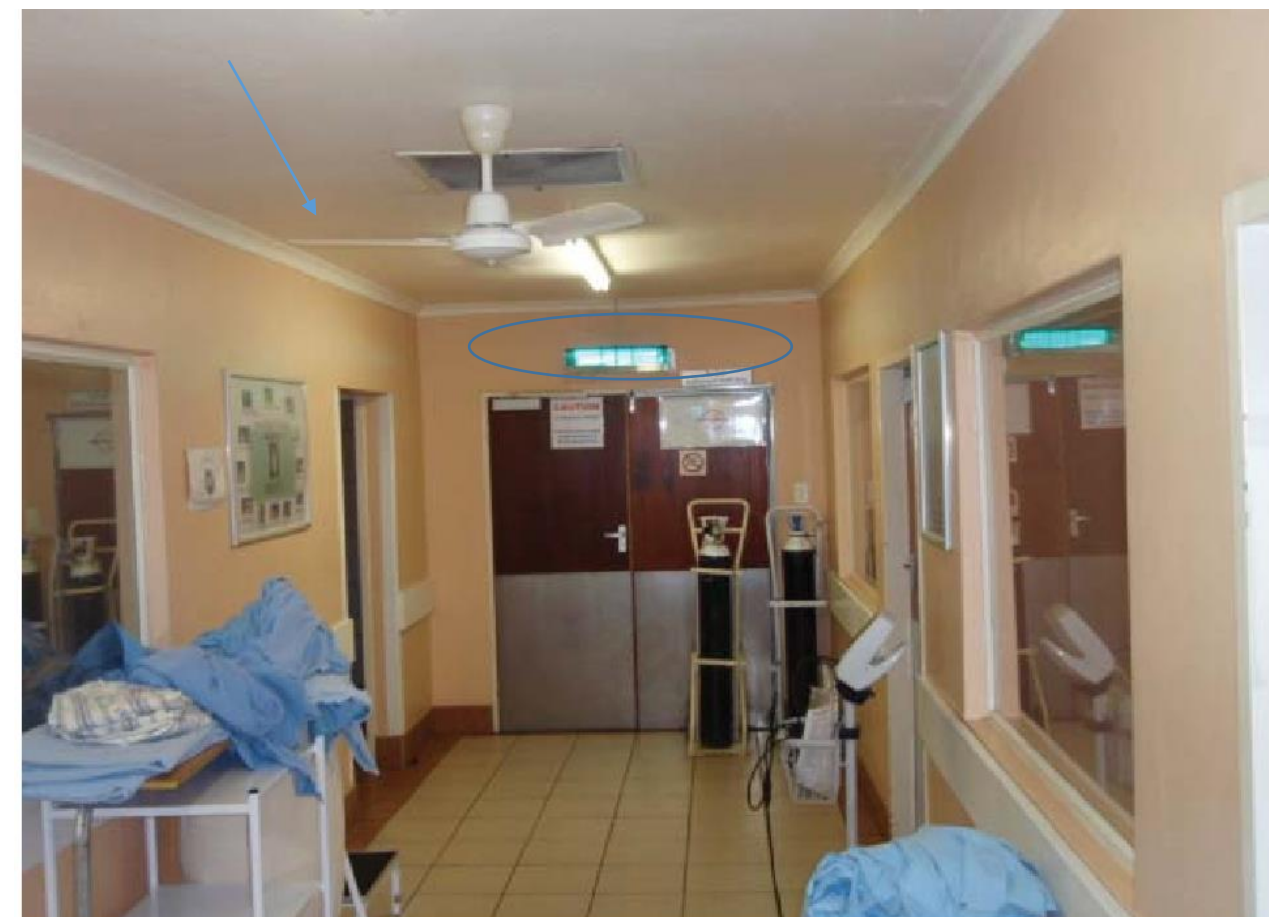


Figure 1: An upper-room germicidal UV fixture on the far wall, disinfecting the corridor between isolation rooms. Also shown in the foreground, a low-velocity ceiling fan assures good air mixing between the upper irradiated and lower occupied room.

Direct whole-room GUV is also used for room surface disinfection in unoccupied rooms (eg, between infectious patients), and GUV devices are being used to decontaminate respirators used for COVID-19 patient care. GUV technology is effective against viruses that have been tested, including influenza and SARS-CoV-1



Clinical Features

Article 4 :A Randomized Trial of Hydroxychloroquine as Postexposure Prophylaxis for Covid-19

Published: June 3, 2020 in [the NEJM](#)

Summary

a randomized, double-blind, placebo-controlled trial across the United States and parts of Canada testing hydroxychloroquine as postexposure prophylaxis. 821 adults were enrolled. Those who had household or occupational exposure to someone with confirmed Covid-19 at a **distance of less than 6 ft for more than 10 minutes while wearing neither a face mask nor an eye shield** (high-risk exposure) or while wearing a face mask **but no eye shield (moderate-risk exposure)**. Within 4 days after exposure, participants were randomly assigned to receive either placebo or hydroxychloroquine (800 mg once, followed by 600 mg in 6 to 8 hours, then 600 mg **daily for 4 additional days**). The **primary outcome** was the incidence of either laboratory-confirmed Covid-19 or illness compatible with Covid-19 within 14 days.

Results

Overall, **87.6%** of the participants (719 of 821) reported a **high-risk exposure** to a confirmed Covid-19 contact. The incidence of new illness compatible with Covid-19 **did not differ significantly between participants receiving hydroxychloroquine (49 of 414 [11.8%]) and those receiving placebo (58 of 407 [14.3%])**; Side effects were more common with hydroxychloroquine than with placebo (40.1% vs. 16.8%), but no serious adverse reactions were reported.

Conclusions

After **high-risk or moderate-risk exposure** to Covid-19, hydroxychloroquine did not prevent illness compatible with Covid-19 or confirmed infection when used as postexposure prophylaxis within 4 days after exposure.