

ABU DHABI PUBLIC
HEALTH CENTRE

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Scientific Research Monitoring on COVID-19

13 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)



Today's Highlights

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

Scientific Research

- Multiple review articles on COVID19 provided by Ministry of Health and Prevention on the following topics:
- History of Coronaviruses.
- Convalescent Plasma
- Model to prevent transmission of covid19 into hematopoietic stem cell receiver.
- Some useful links to different COVID19 information.



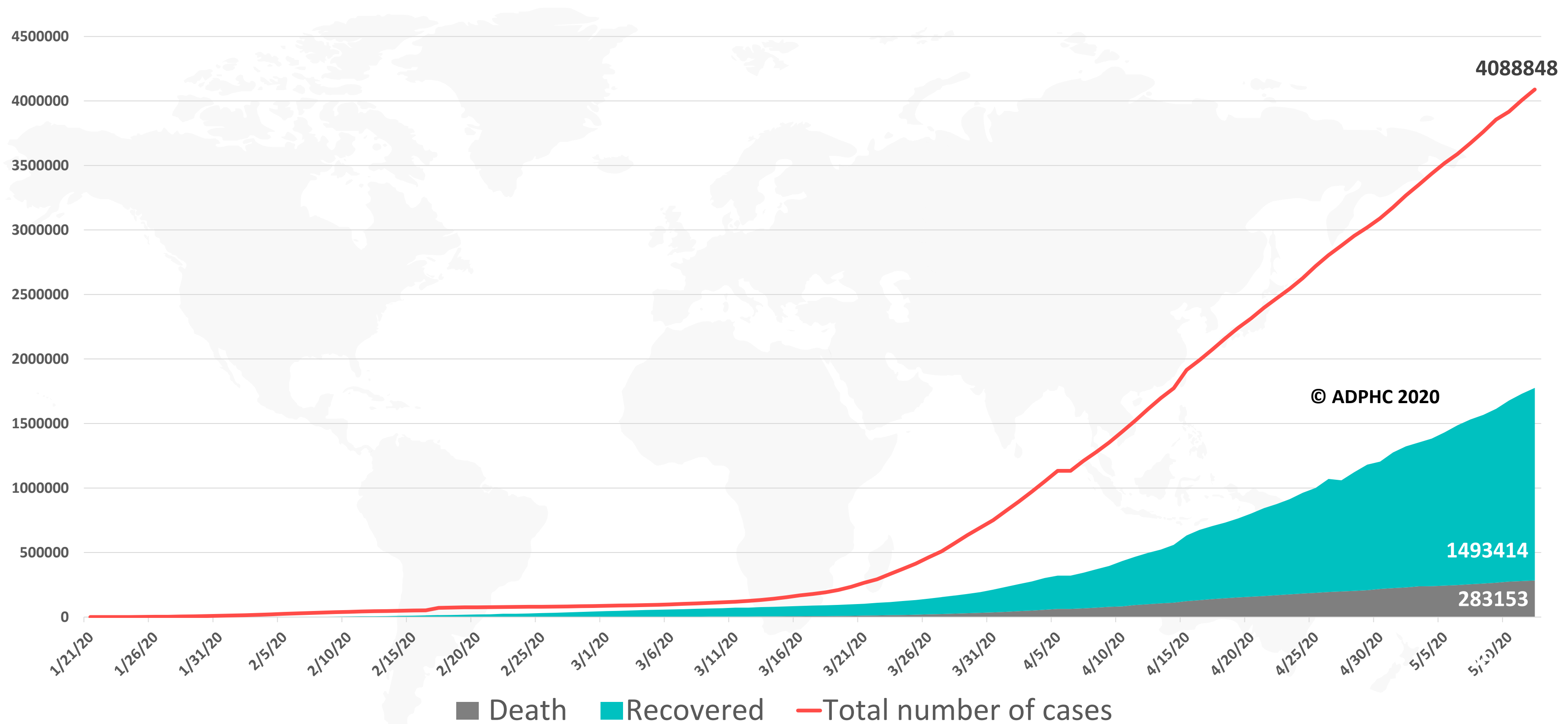
WHO daily report 12 May 2020

- WHO has issued a Statement on Tobacco use and COVID-19. Tobacco smoking is a known risk factor for many respiratory infections and increases the severity of respiratory diseases. A review of studies by public health experts convened by WHO found **that smokers are more likely to develop severe disease with COVID-19, compared to non-smokers. WHO urges researchers, scientists and the media to be cautious about amplifying unproven claims that tobacco or nicotine could reduce the risk of COVID-19.**
- The Director-General Dr. Tedros in his media briefing, urged a slow, steady, lifting of public health and social measures (so called lockdowns), which is key to stimulating economies, while also keeping a vigilant eye on the virus so that control measures can be quickly implemented if an upswing in cases is identified.
- WHO Operations and Support Logistics (OSL), in collaboration with a technical network of universities, architects, biomedical engineers and other health experts, is working to support the establishment of COVID-19 treatment centers, self-quarantine and community facilities at the request of countries seeking technical guidance in setting up such facilities.

Epidemiology



Figure 1: Total number of infected, recovered, and death cases (January 21st to May 12, 2020)

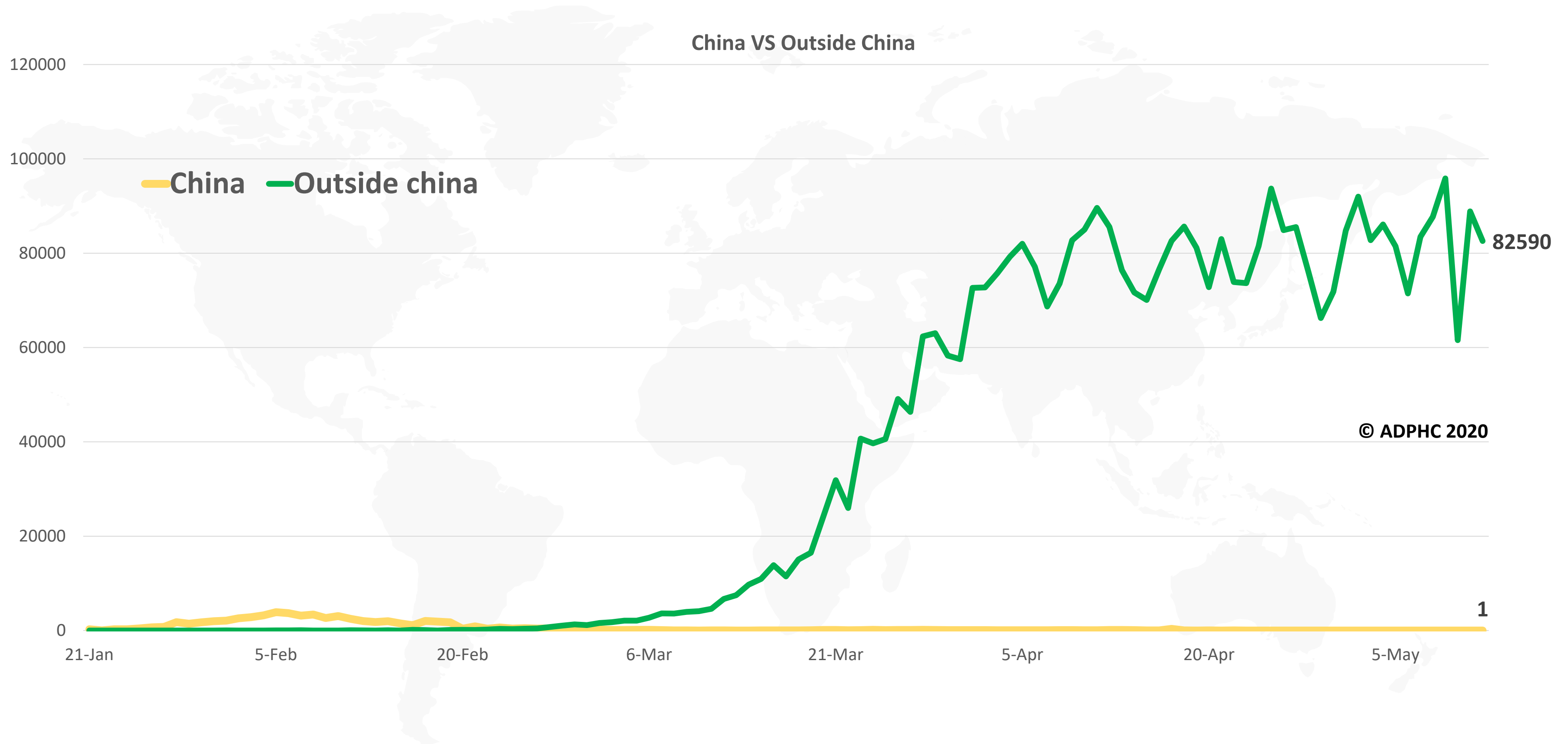


Line graph published by Abu Dhabi Public Health Center 2020.

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



Figure 2: Daily new infected COVID-19 cases reported between (January 21 to May 12, 2020).



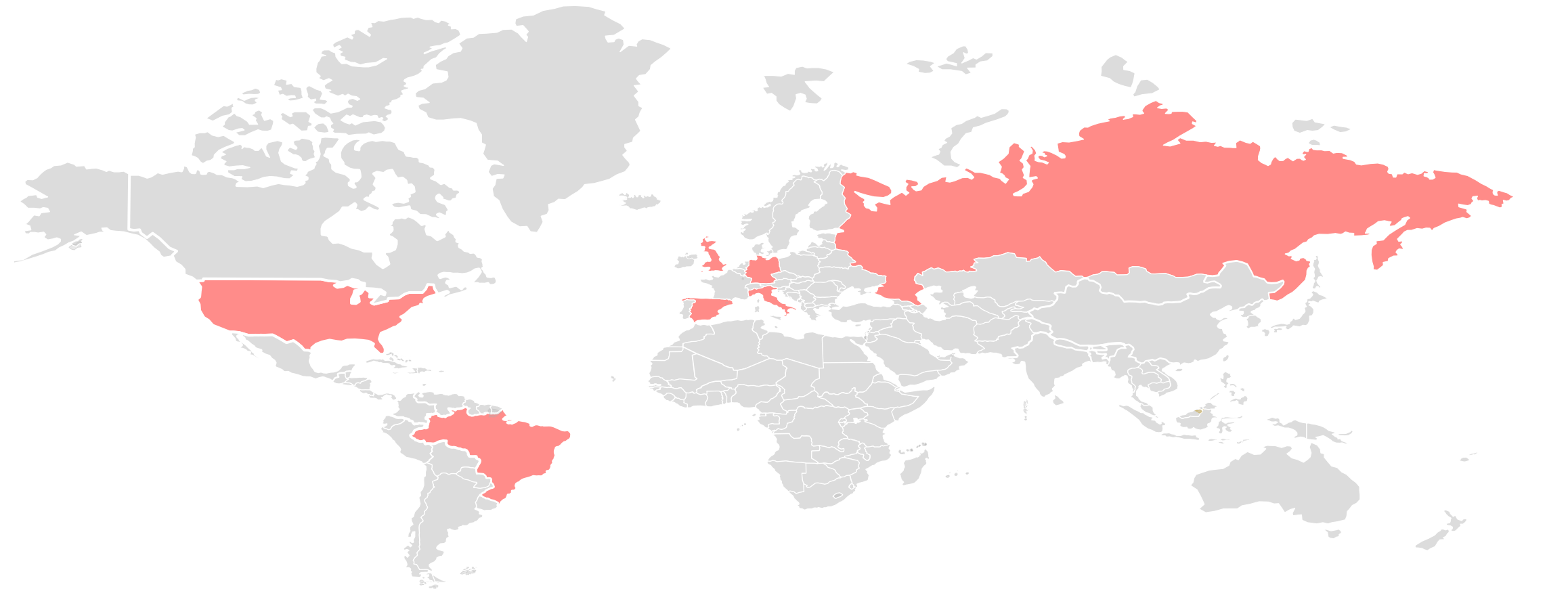
Line graph published by Abu Dhabi Public Health Center 2020.

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

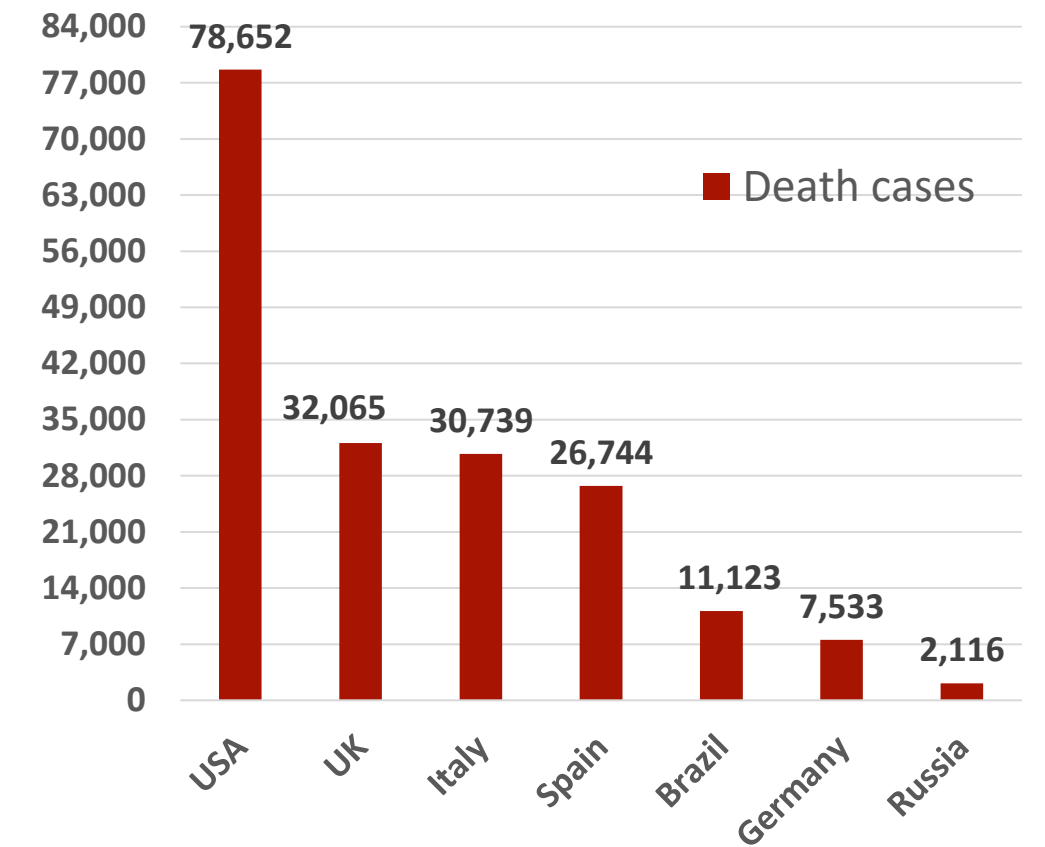
Epidemiology



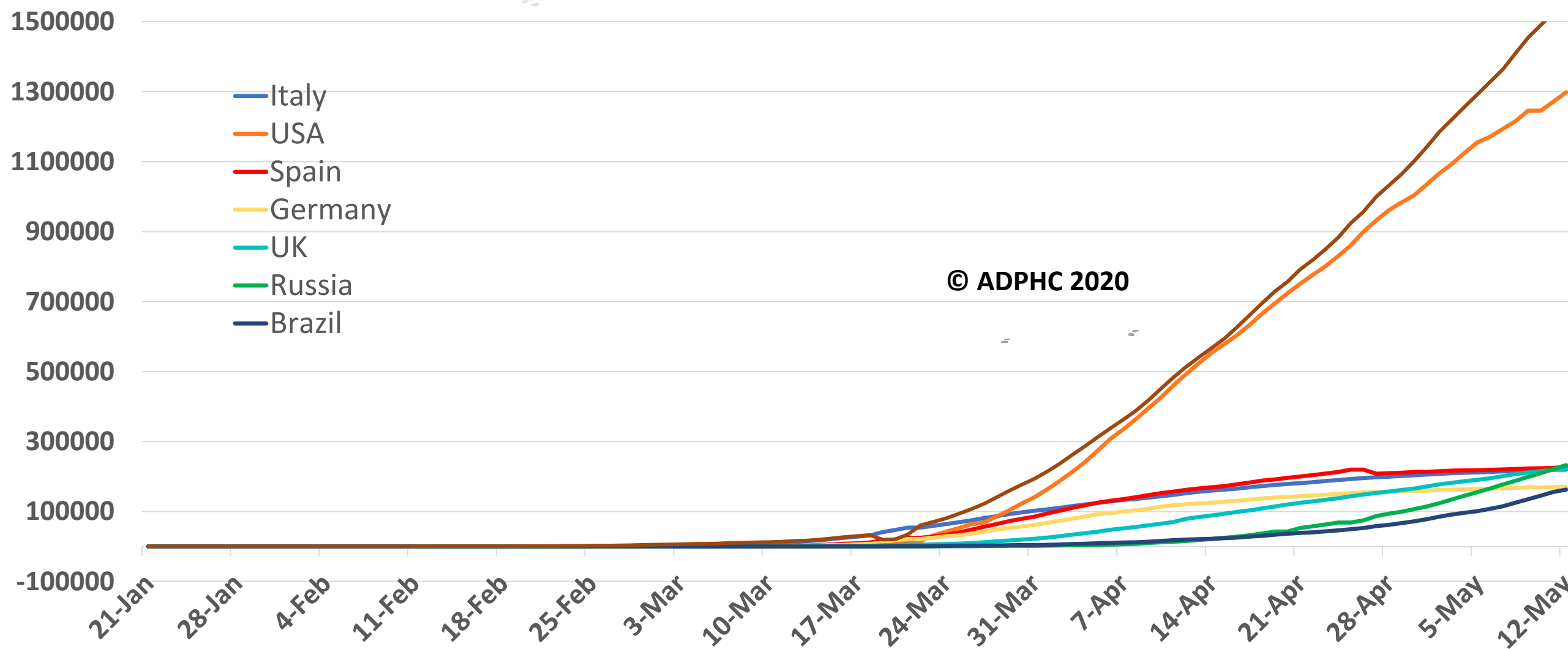
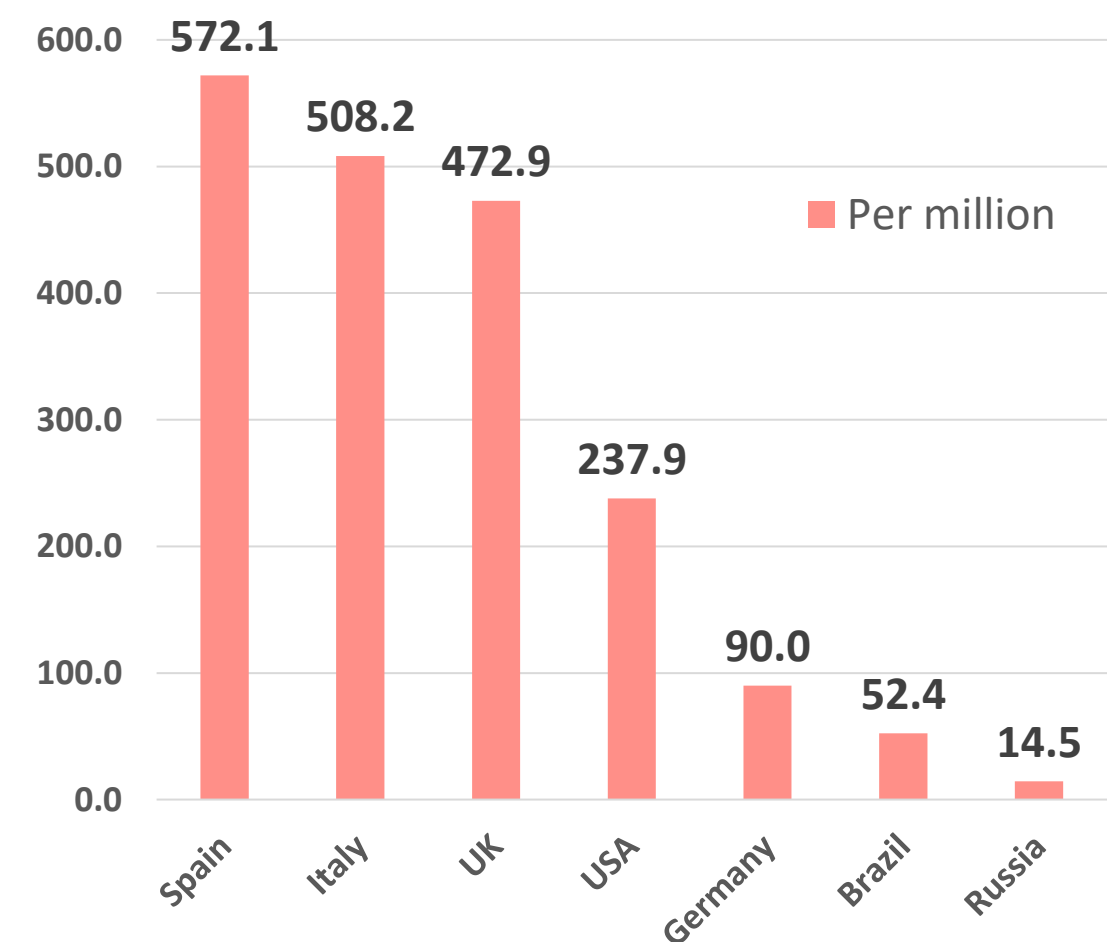
Figure 3 : Top 7 countries in the total number of cases due to COVID-19 (January 21 to May 12, 2020).



TOTAL DEATHS



DEATHS PER MILLION

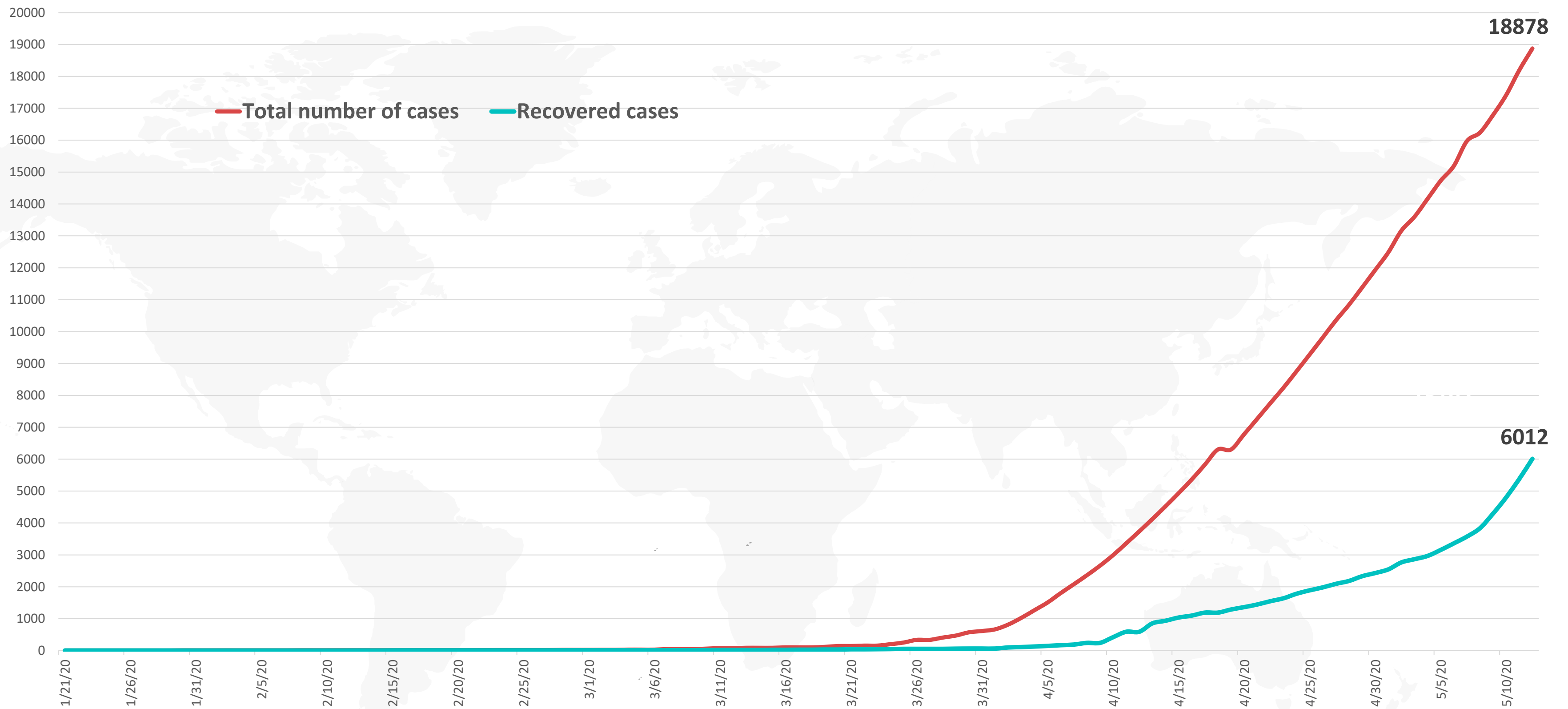


Line graph published by Abu Dhabi Public Health Center 2020.

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



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



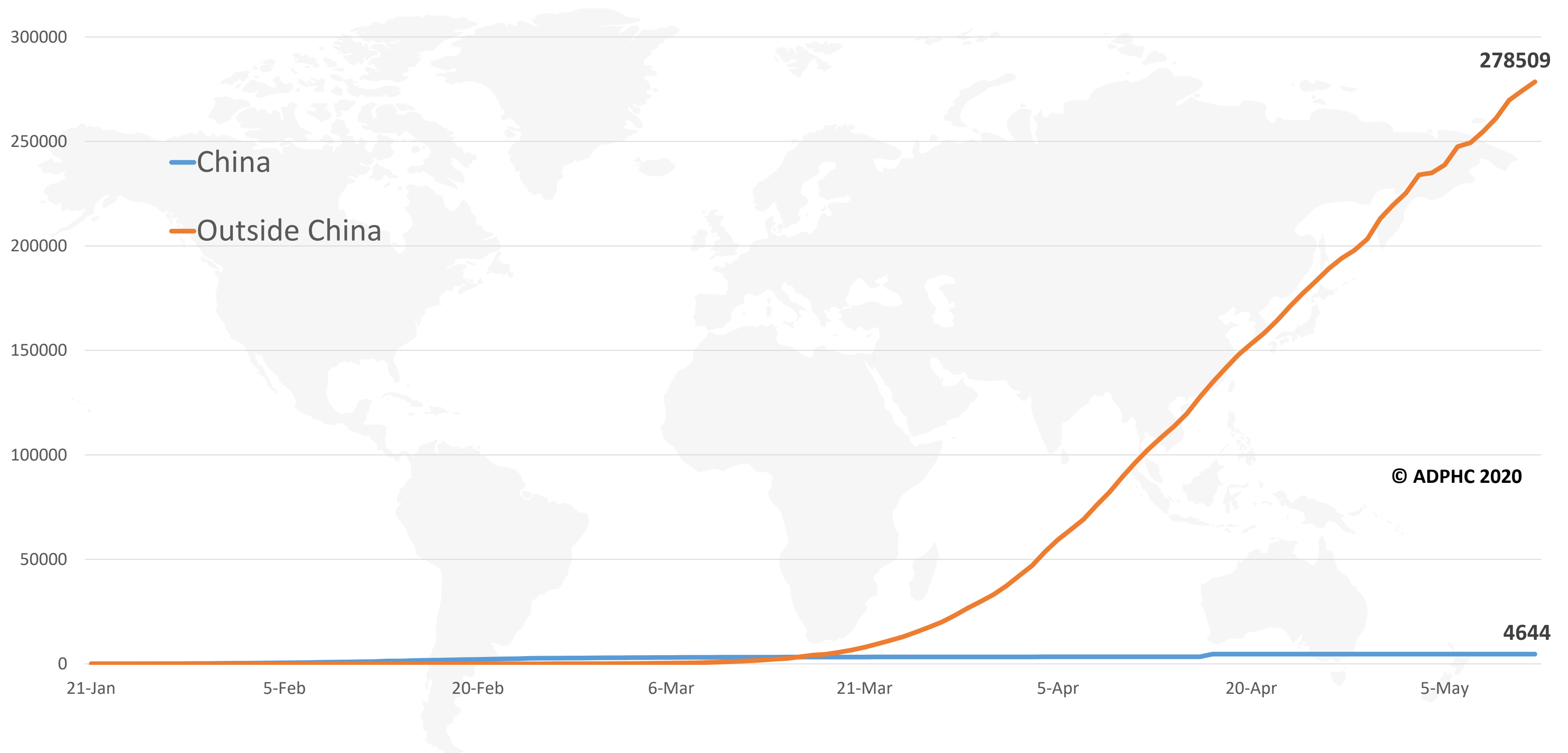
Line graph published by Abu Dhabi Public Health Center 2020.

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 12, 2020).



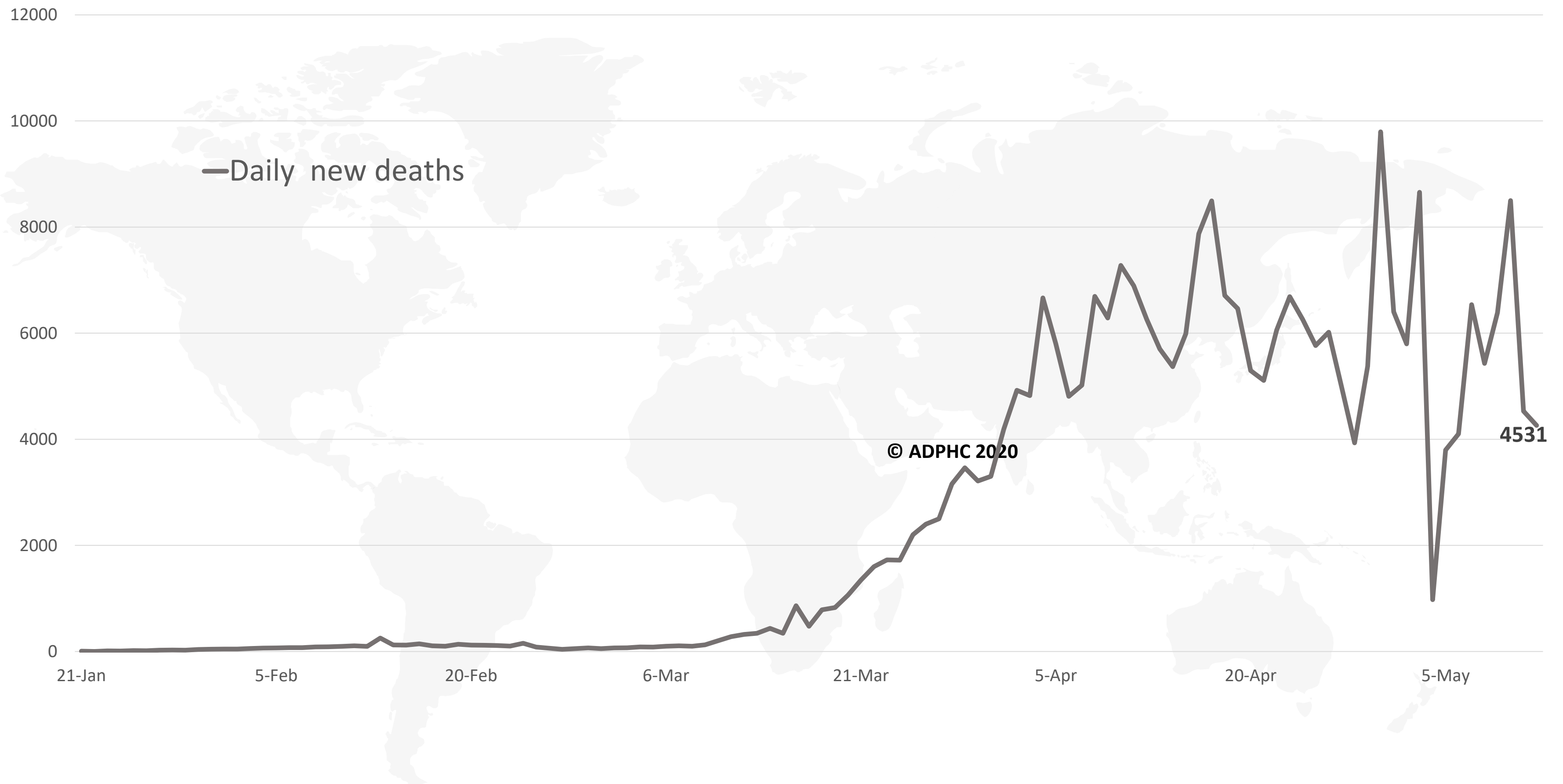
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Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#)



Figure 6: Global daily new deaths due to COVID-19 (January 22 to May 12, 2020).



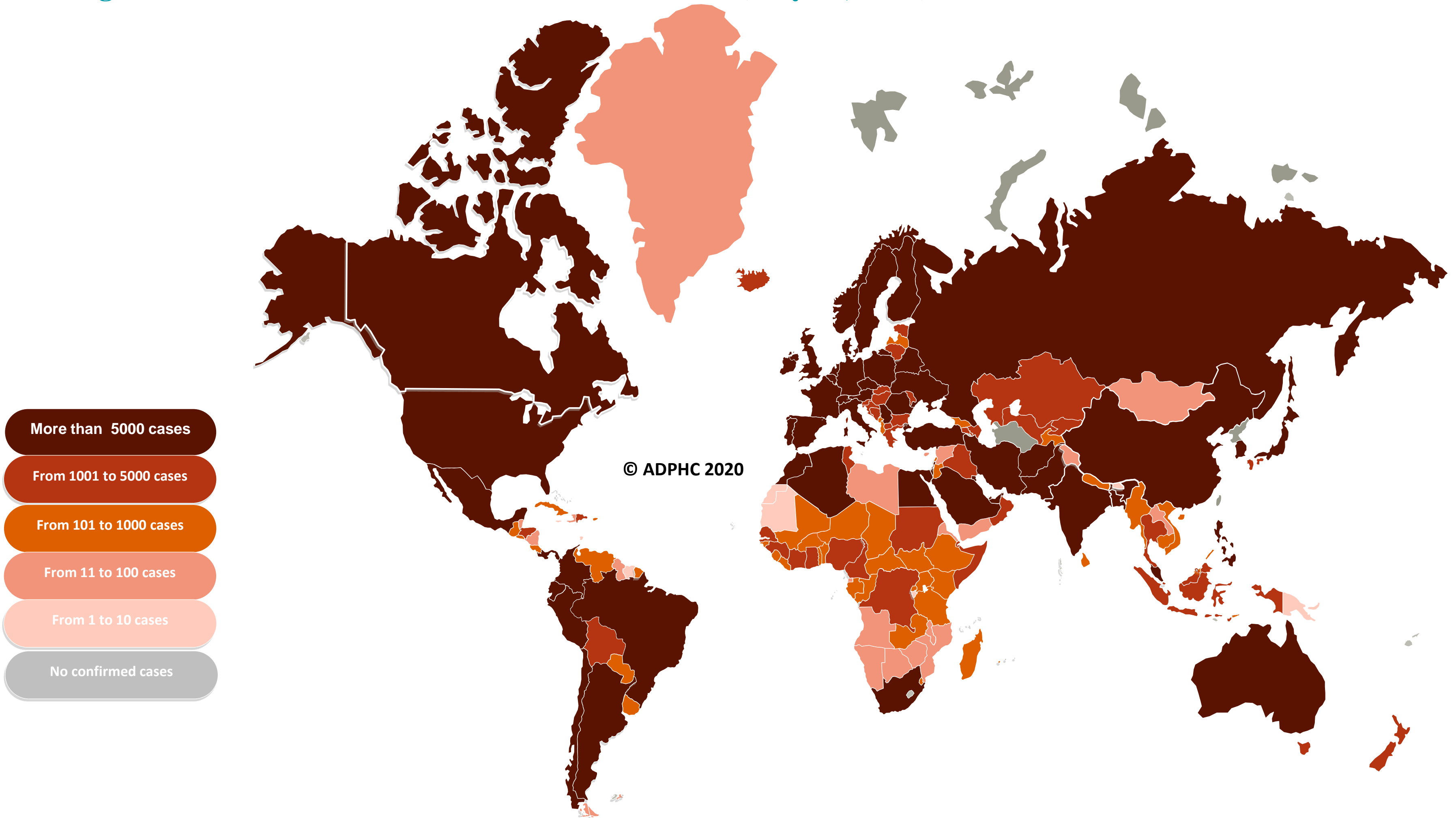
Line graph published by Abu Dhabi Public Health Center 2020.

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

Epidemiology



Figure 7a : Global distribution of COVID-19 cases (May 10, 2020).

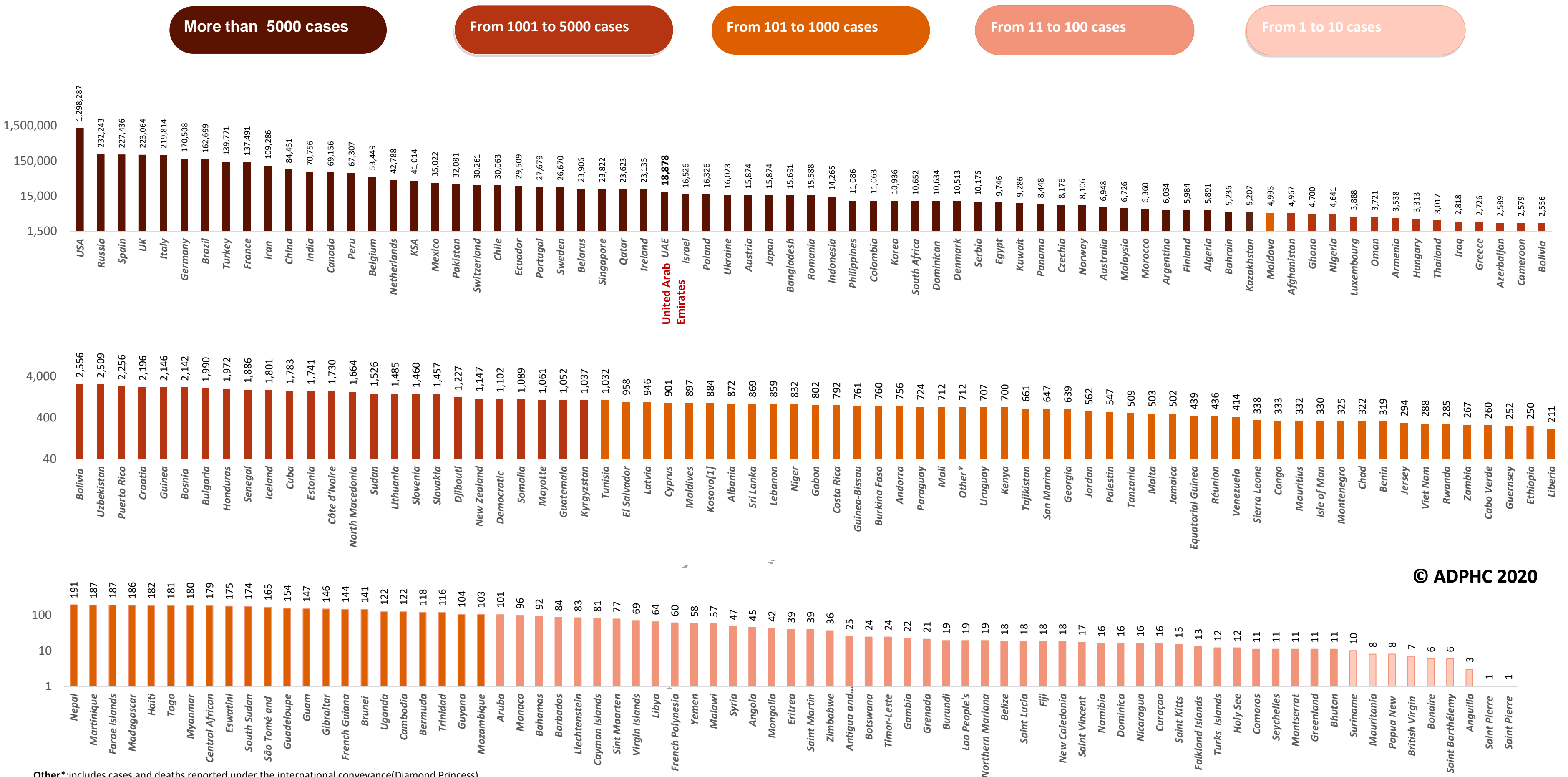


Map chart published by Abu Dhabi Public Health Center 2020.

Epidemiology



Figure 7B: Bar chart illustrate the global distribution of COVID19 cases May 12, 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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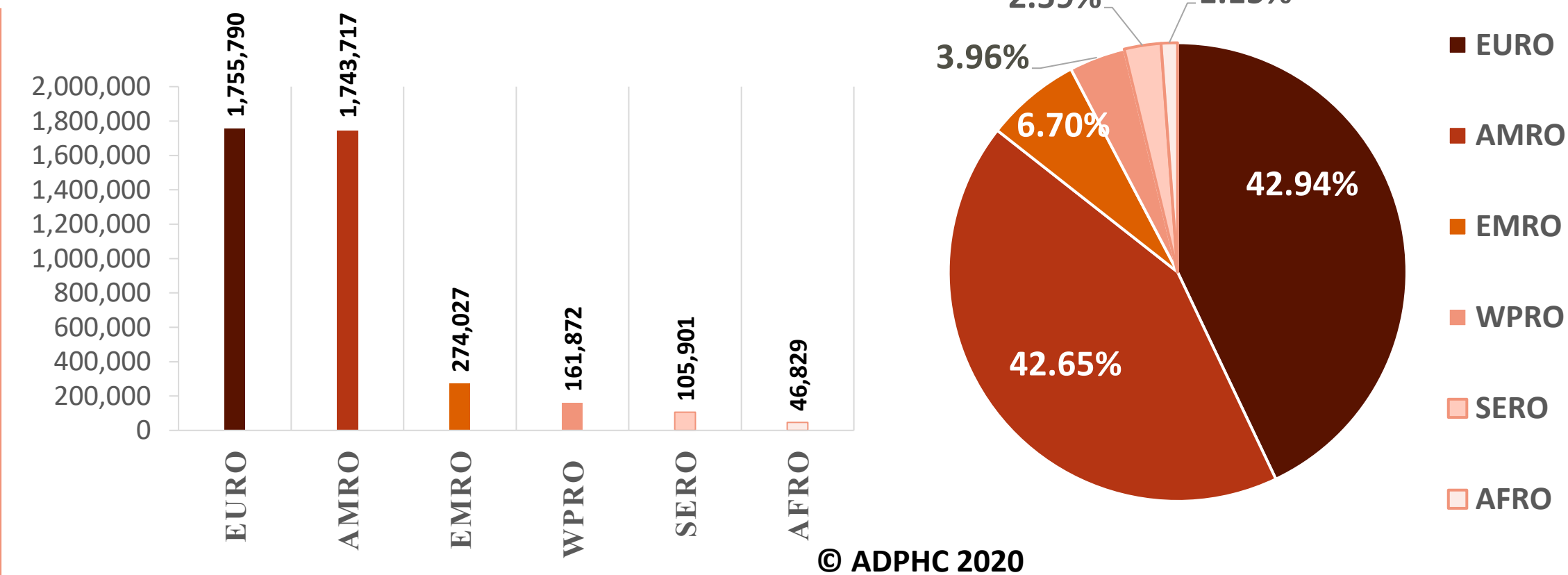
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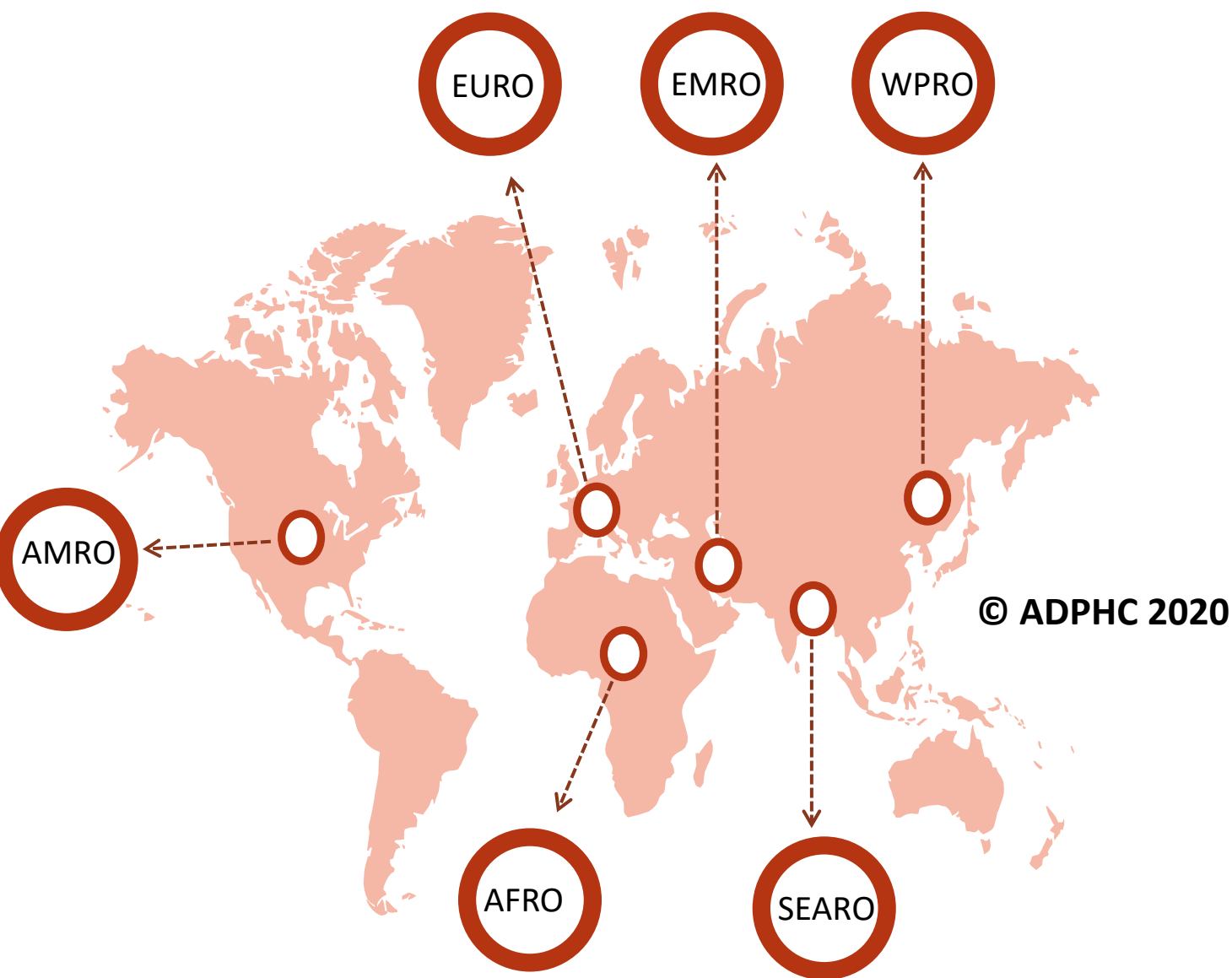
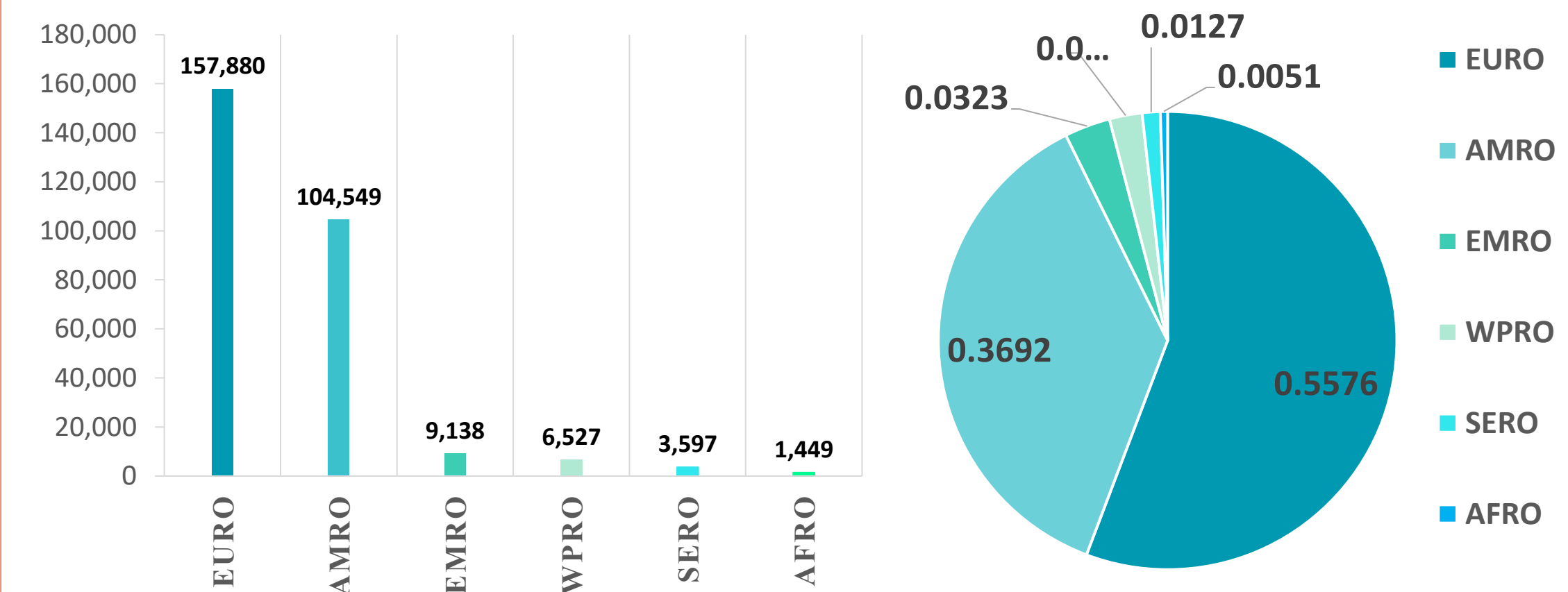


Figure 8: illustrate the Global distribution of COVID19 cases per region (May 12, 2020)

INFECTED



DEATH



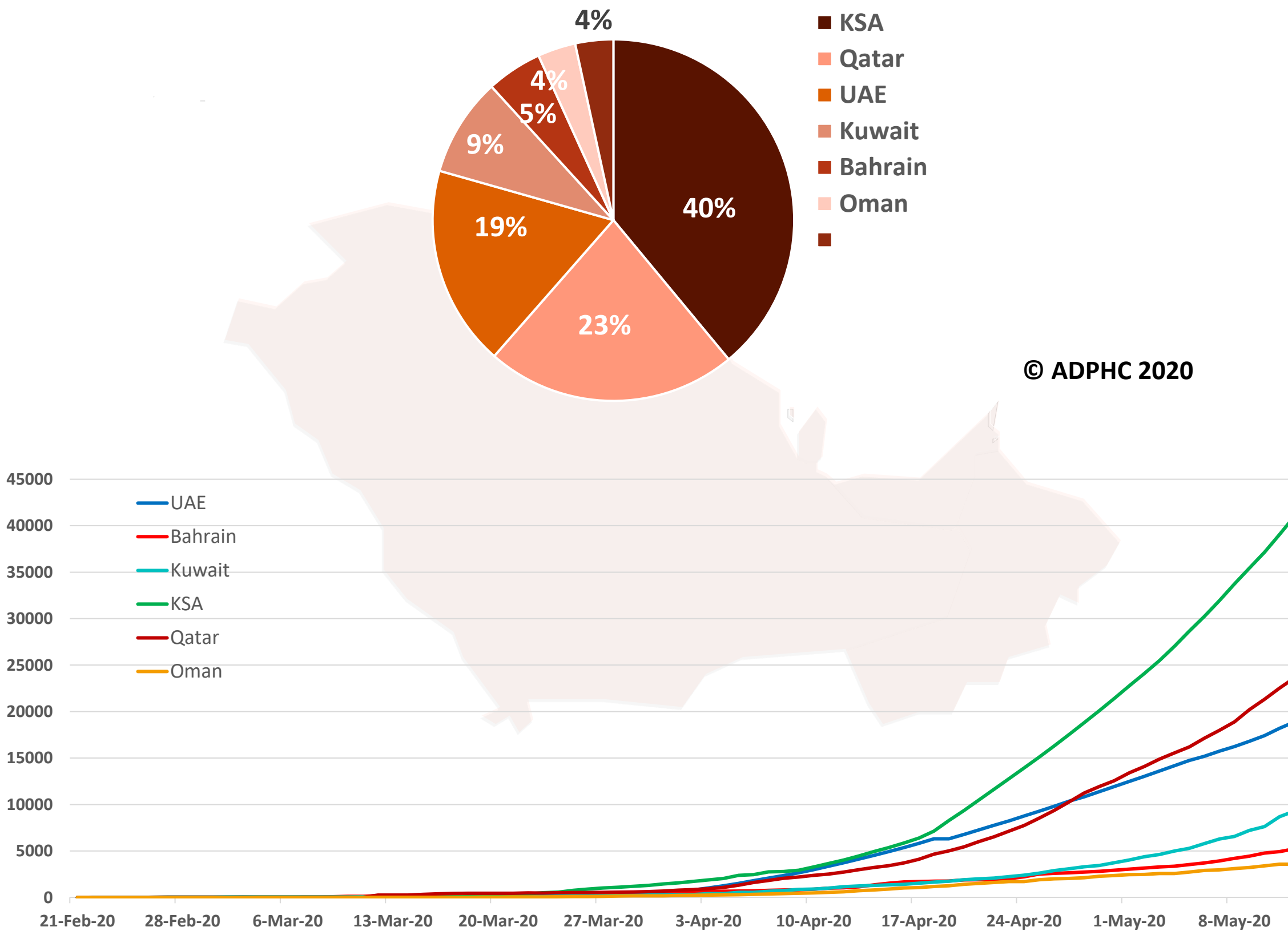
Map chart published by Abu Dhabi Public Health Center 2020.

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



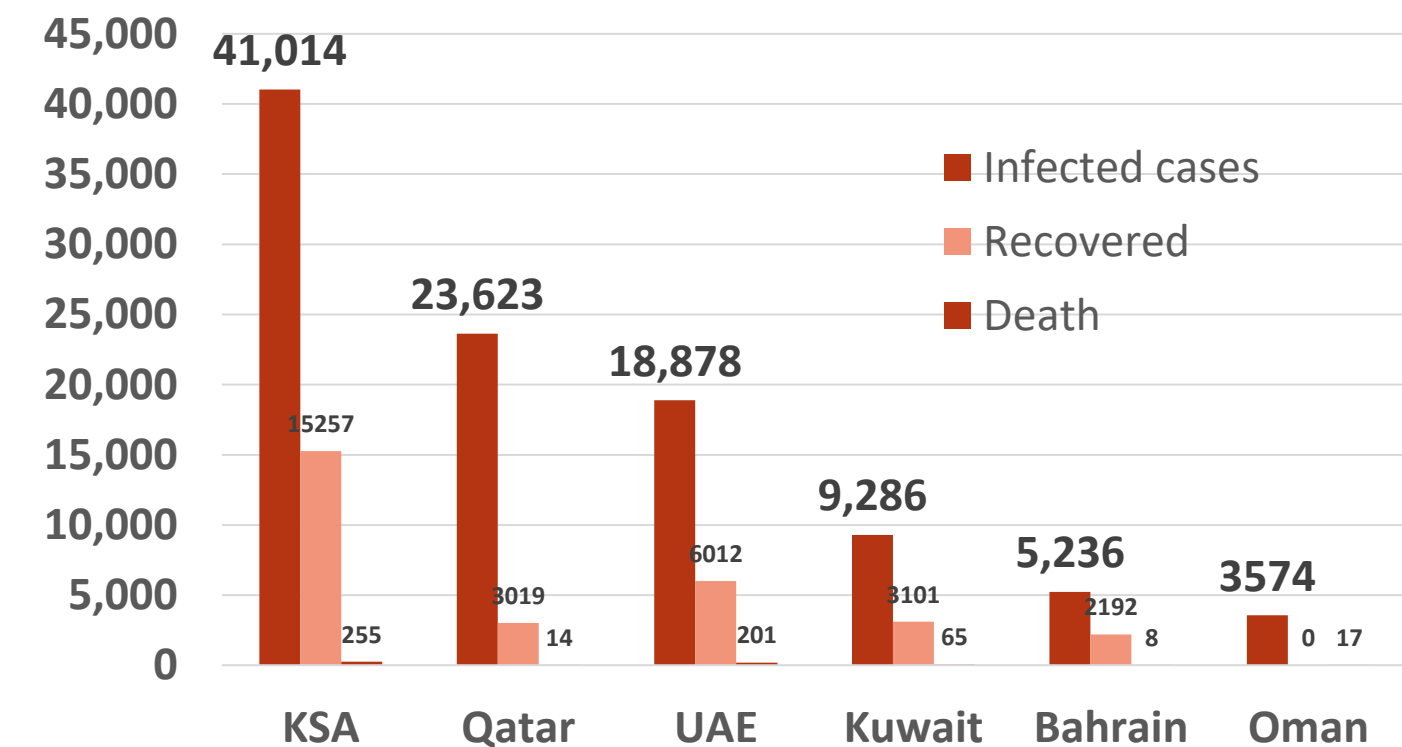
Figure 9: Comparative analysis of the distribution of COVID19 cases in GCC countries (May 12, 2020)

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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History



This work is done by Ministry of Health and Prevention, Statistics and Research Department.

Article 1: COVID-19: the First Documented Coronavirus Pandemic in History

Published: May 5th, 2020 in Biomedical Journal

Summary:

This review paper addressed the potential origin, basic properties, and evolution of the novel human coronavirus. The factors reviewed in the paper are critical for studies of antiviral designs, pathogenicity, and development of vaccine against the virus.

Findings:

Nomenclature - COVID-19 and SARS-COV-2

- The findings from the whole-genome sequencing showed that the causative agent is a **novel coronavirus**. Therefore, the virus was reported to be a seventh member of the coronavirus family to infect humans.
- The World Health Organization (WHO) temporarily termed the **new virus 2019 novel coronavirus (2019-nCoV)** in January 2020 and then officially named this infectious disease **coronavirus disease 2019 (COVID-19)** on 12 February 2020.
- International Committee on Taxonomy of Viruses (ICTV) officially designated the virus as **SARS-CoV-2** based on its taxonomy, phylogeny, and established practice.
- Later, WHO finally characterized COVID-19 as a **pandemic**.

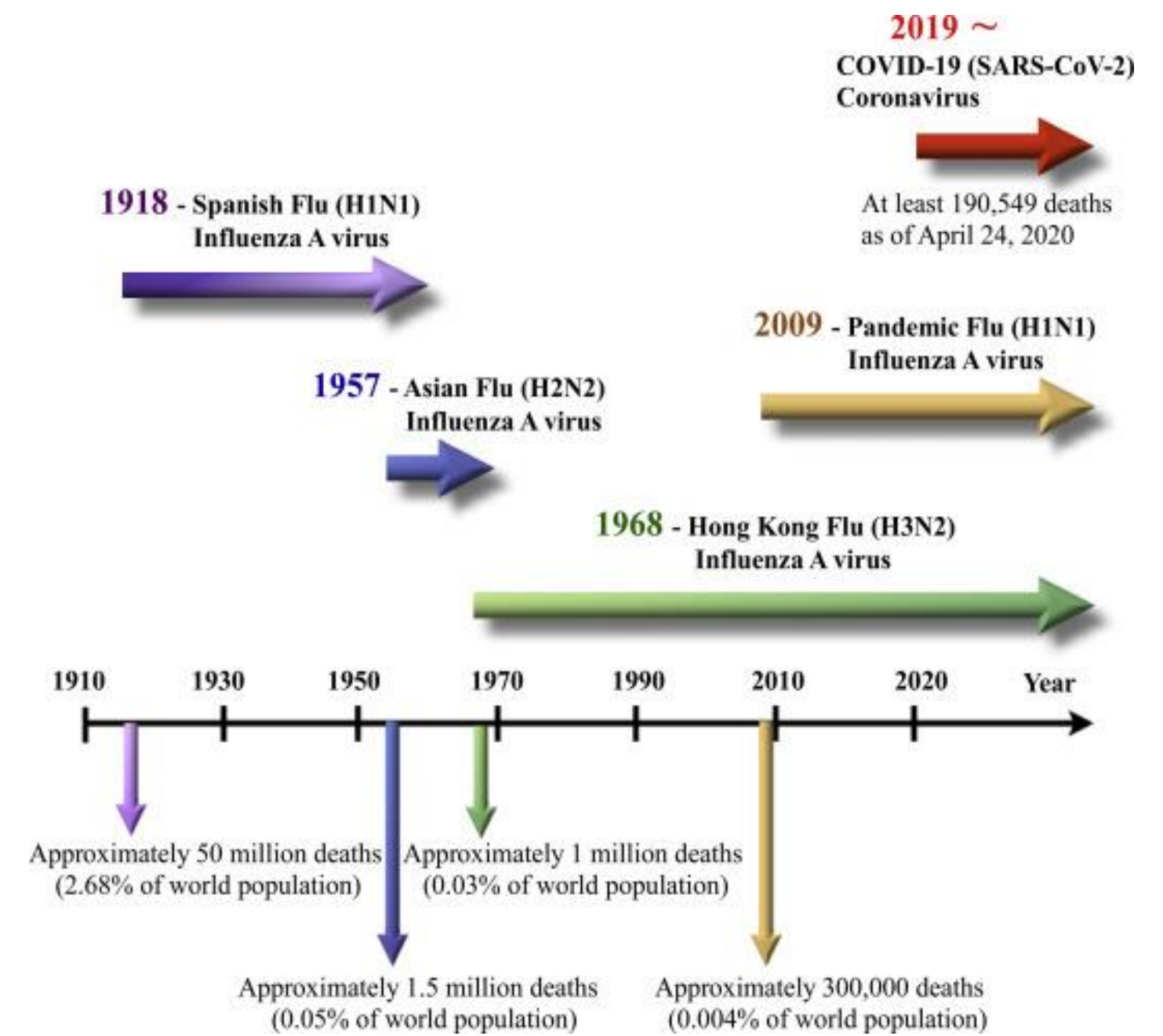


Fig. 1. A timeline of five pandemics since 1918 and the globally circulating viruses afterward.

History



This work is done by Ministry of Health and Prevention, Statistics and Research Department.

Article 1: Cont.,

Findings:

Virology

Since the virus keeps evolving and mutating during the pandemic, studies on viral pathogenicity, prophylactic vaccines and treatments should closely consider the genetic characteristics of the virus.

Evolution of SARS-COV-2 during the past few months

RNA virus replication often generates the mutations because of the low proofreading ability of their RdRP. The mutation rate varies in the RNA viruses. These variations in the genome generated by viral RdRP can turn out to be beneficial for an emerging virus to adapt to new hosts. During replication of the coronavirus, this mutation rate can be controlled partially by viral exoribonuclease nsp14.

Based on the GISAID databases, the nCoV-19 (SARS-CoV-2) sequences collected in the late December from Wuhan China, were different from the viral sequences collected in early April 2020 from North America. Due to continuously changing viral sequences, the construction of a phylogenetic network is critical to investigate the adaptation of the virus in different human environments and populations.

Genotypes can be correlated to the geographic locations demonstrating that the SARS-CoV-2 can be impacted by the replicating environments for example, immunological and genetic restrictions in different populations of human. Further investigating these geographic pattern may help in providing useful information on the development of vaccine in different population.



Treatment

This work is done by Ministry of Health and Prevention, Statistics and Research Department.

Article 2: Convalescent plasma in Covid-19: Possible mechanisms of action

Published: May 4th, 2020 in Autoimmun Rev.

Summary:

This review paper proposed the constructive mechanisms of administering Convalescent plasma (CP) to patients with COVID-19 and provides a summary of evidence of this strategy in the current pandemic. Convalescent plasma (CP) emerges as the first option for hospitalized COVID-19 patient's management.

Findings:

The findings suggests that **Convalescent plasma** is a potentially **effective and safe** strategy for the **treatment** of emerging and re-emerging pathogens, particularly in those scenarios without proved antiviral agents or vaccines. IVIg (Intravenous immunoglobulin) and Convalescent plasma shared similar mechanisms of action.

Transference of neutralizing antibodies helps in controlling the COVID-19 infection as well as modulates inflammatory response. Other plasma components may increase the anti-inflammatory and antiviral properties of Convalescent plasma. According to the COVID-19 physiopathology, severe patients should be privileged over critical ones to reduce mortality and improve outcomes.



Treatment

This work is done by Ministry of Health and Prevention, Statistics and Research Department.

Article 2: Cont.,

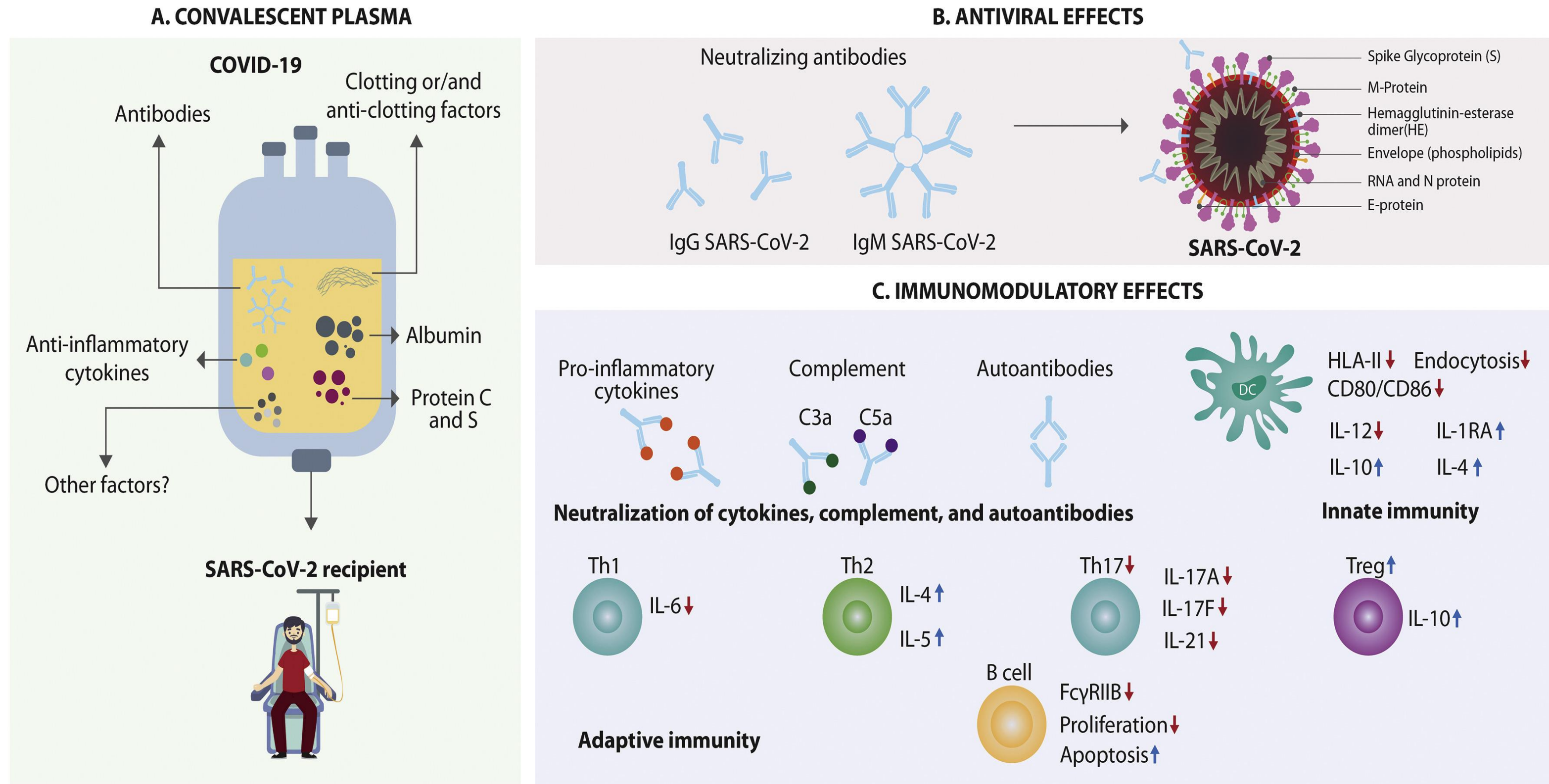


Fig. 1. Schematic representation of convalescent plasma components and its mechanisms of action.

A. Main convalescent plasma components.

B. Antiviral effects of NABs. IgG and IgM are the main isotypes, although IgA may be also important, particularly in mucosal viral infections. Other non-NABs may exert a protective effect. The humoral immune response is mainly directed towards spike (S) protein.

C. Anti-inflammatory effects of CP include network of autoantibodies and control of an overactive immune system (*i.e.*, cytokine storm, Th1/Th17 ratio, complement activation and regulation of a hypercoagulable state).

Transmission



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This work is done by Ministry of Health and Prevention, Statistics and Research Department.

Article 3: Addressing the Impact of the Coronavirus Disease (COVID-19) Pandemic on Hematopoietic Cell Transplantation: Learning Networks as a Means for Sharing Best Practices

Published: April 24th, 2020 in Biol Blood Marrow Transplant.

Summary:

This perspective paper reviews the current COVID-19 epidemiology, potential therapies and diagnosis; care considerations unique to Hematopoietic Cell Transplantation recipients; and the concept of a learning network to assimilate emerging guidelines as well as best practices and to optimize the outcomes of the patients through facilitating shared experience and learning across transplantation centres.

- The study reported a care model with 4 interdependent focus areas and vital components to ensure the model functions efficiently.
- Immunocompromised patient populations were at higher risk for severe infection from SARS-CoV-2.
- Such patients likely have different COVID-19 features, such as and concomitant duration of shedding, viral incubation period, duration and onset of clinical signs and symptoms, risk factors for progression to severe disease, viral detection and associated laboratory features, risk for secondary infections, and response to supportive care or future antiviral therapies. This type of data on immune response and viral dynamics is crucial in examining the risk of SARS-CoV-2 transmission from potential HCT donors to recipients and the influence on transplantation outcomes

Transmission

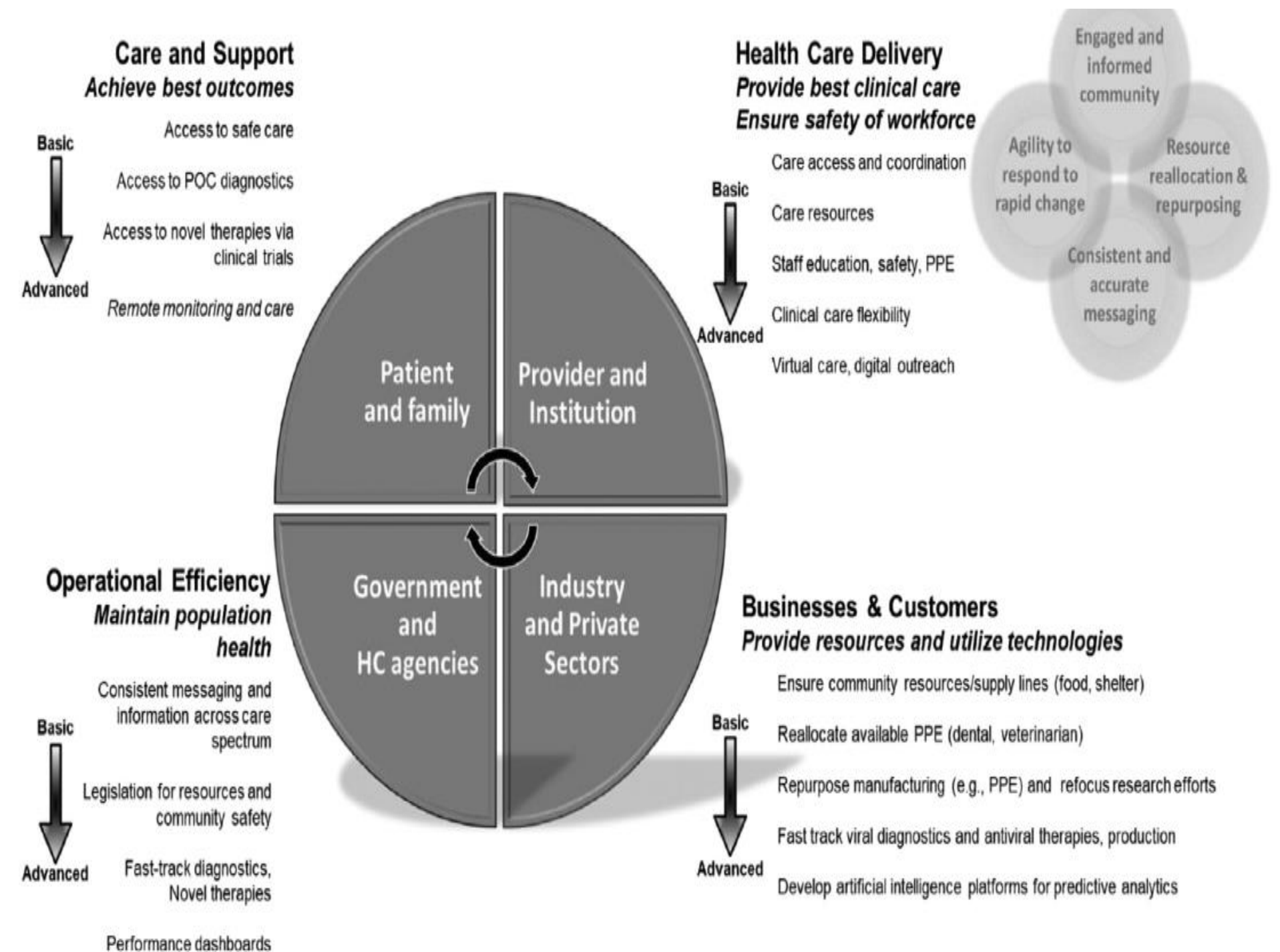


This work is done by Ministry of Health and Prevention, Statistics and Research Department.

Article 3: Cont.,

Findings:

Furthermore, the paper recommended that collaborative learning health networks can achieve marked improvement in the quality of care. Learning health networks are multicentre collaborations that comprise of researchers, healthcare providers, patients, and families aimed at improving outcomes and driving healthcare innovations. Engagement of individuals and institutions by sharing data, best practices, and new knowledge efficiently in real time across the learning health network helps to solve complex problems that impacts patient care.





Some useful links to different COVID19 information:

SMS Message Library -by WHO

The below message library, provided by WHO, is intended to be locally adapted and delivered to the general public in countries around the world via SMS or voice message. The complete message library can be viewed in the following link

[Here](#)

Surveillance strategies for COVID-19 human infection-by WHO

The below mentioned document provides an overview of surveillance strategies that should be considered as part of comprehensive national surveillance for COVID-19. This document emphasises on the need to adapt and reinforce existing national systems where appropriate and to scale-up surveillance capacities as needed.

Link [Here](#)

Contact tracing in the context of COVID-19-by WHO

The below mentioned document provides guidance on how to establish contact tracing capacity for the control of COVID-19. Contact tracing if applied systematically can help to break the chains of transmission of an infectious disease and is thus an important public health tool for controlling the outbreaks of infectious disease.

Click [Here](#)

Fact Sheet for Healthcare Providers

This Fact Sheet informs you of the significant known and potential risks and benefits of the emergency use of the Quick SARS-CoV-2 rRT-PCR Kit. The Quick SARS-CoV-2 rRT-PCR Kit is authorized for use on respiratory specimens collected from individuals suspected of COVID-19 by their healthcare provider.

Link [Here](#)