ABU DHABI PUBLIC HEALTH CENTRE | مركز أبوظبي للصحة العامة

Scientific Research Monitoring on COVID-19

20 May 2020

Summary on COVID19

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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

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

Scientific Research

MOHAP review of multiple articles related to the following:

- German study discussing transmission dynamic of the first cluster of cases.
- A study from Australia offered a comprehensive framework for using SARS-CoV-2 genomics in public health responses.
- Review of latest treatments for covid19 Treatment.
- Article suggest different type of model in tracking and assessing intervention of pandemic.
- a study from US and Canada describe the clinical characteristic of children with COVID19 who have been admitted to the ICU.
- A guide for UK GP during the COVID19 pandemic.
- Article about Dubai addressing the new normal post COVID19 in the business market.
- A study Estimating the burden of SARS-CoV-2 in France

WHO daily report

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WHO daily report 18 May 2020

- In his opening remarks at the World Health Assembly, WHO Director-General Dr Tedros declared: '**We have come together as the nations of the world to confront the defining health crisis of our time**.' In concluding he asserted that the COVID-19 pandemic reminds us that we need a healthier, safer and fairer world with a stronger WHO to support this goal.
- Countries around the world have put in place a range of public health and social measures to suppress or stop community spread of COVID-19. WHO has published a document to provide an overview of public health and social measures, and to propose strategies to limit any possible harm resulting from these interventions.
- A new WHO report on the health behaviors of 11–15-year-olds in Europe reveals **more adolescents have been reporting mental health concerns.** The results were based on data between 2014 and 2018 and provide a baseline against which future studies **can measure the impact of COVID-19 on young people's lives**. The study:
  - shows that adolescent mental well-being declined in many countries between 2014 and 2018
  - One in four adolescents report feeling nervous, feeling irritable or having difficulties getting to sleep at least once per week.
  - Clearly, technology can have positive benefits, but it can also amplify vulnerabilities and introduce new threats, such as cyberbullying, which disproportionately affects girls. Over 1 in 10 adolescents report having been cyberbullied at least once in the past two months.
  - The report shows substantial variation in mental well-being across countries. This indicates that cultural, policy and economic factors may play a role in fostering good mental well-being.
- The WHO Regional Office for the Western Pacific has released a timeline outlining some of the key moments and actions to respond to COVID-19 in the Region.

Epidemiology

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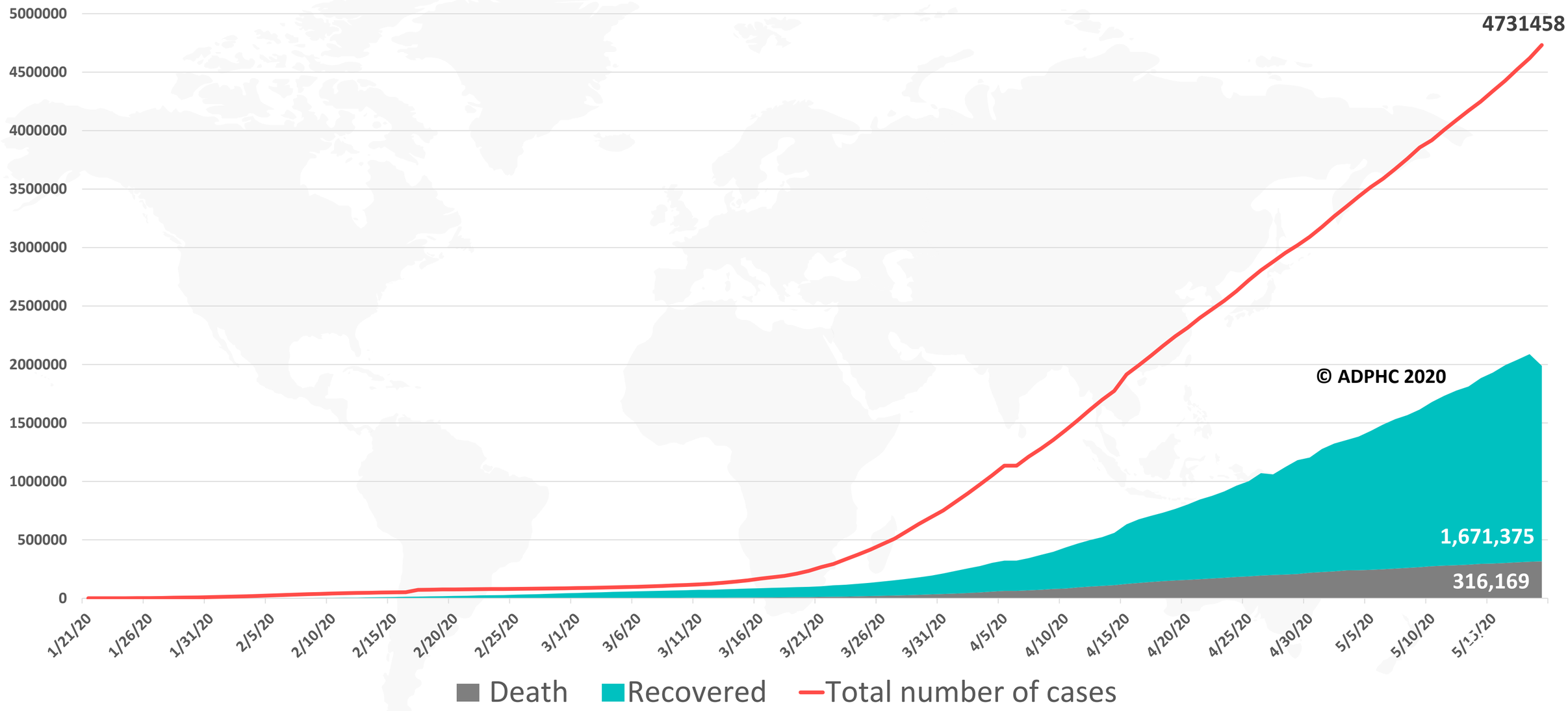
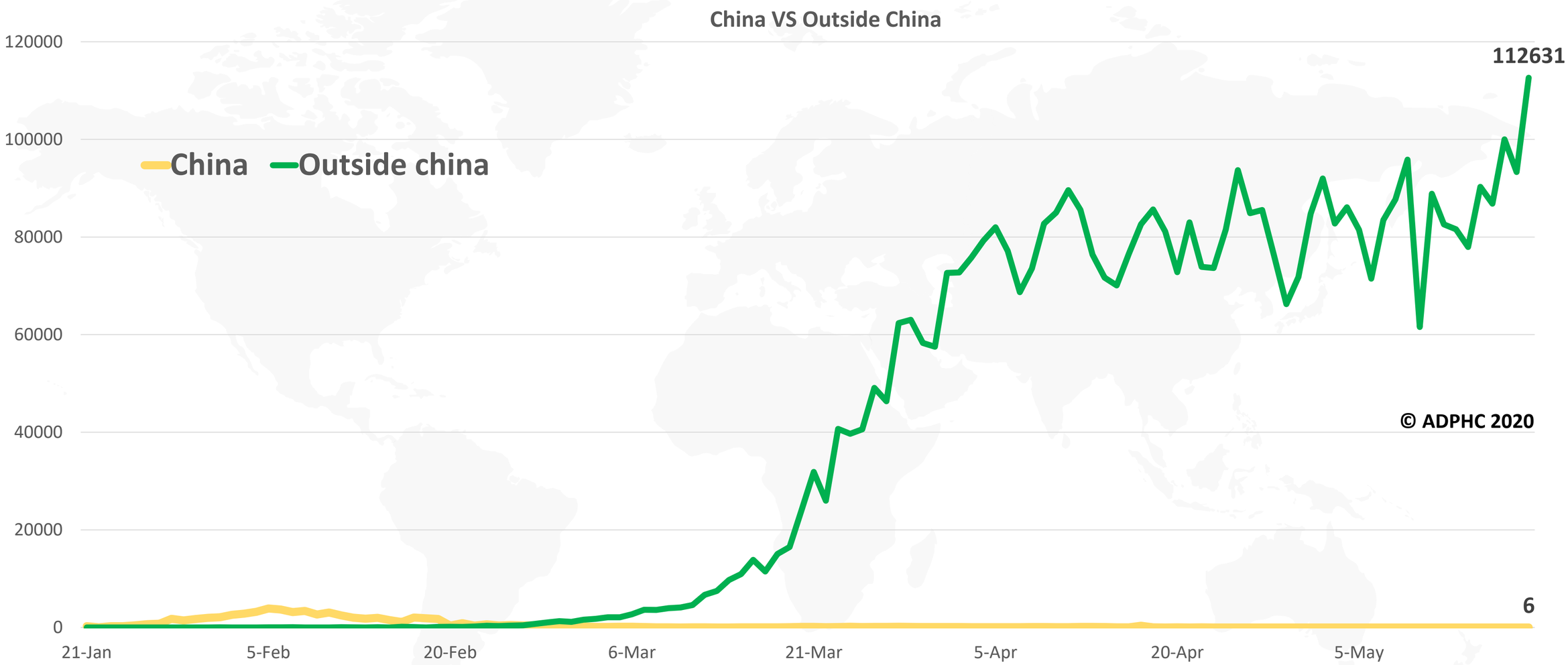
Figure 1: Total number of infected, recovered , and death cases (January 21st to May 19, 2020)



Line graph published by Abu Dhabi Public Health Center 2020.
Data resources: WHO, : John Hopkins University

Epidemiology

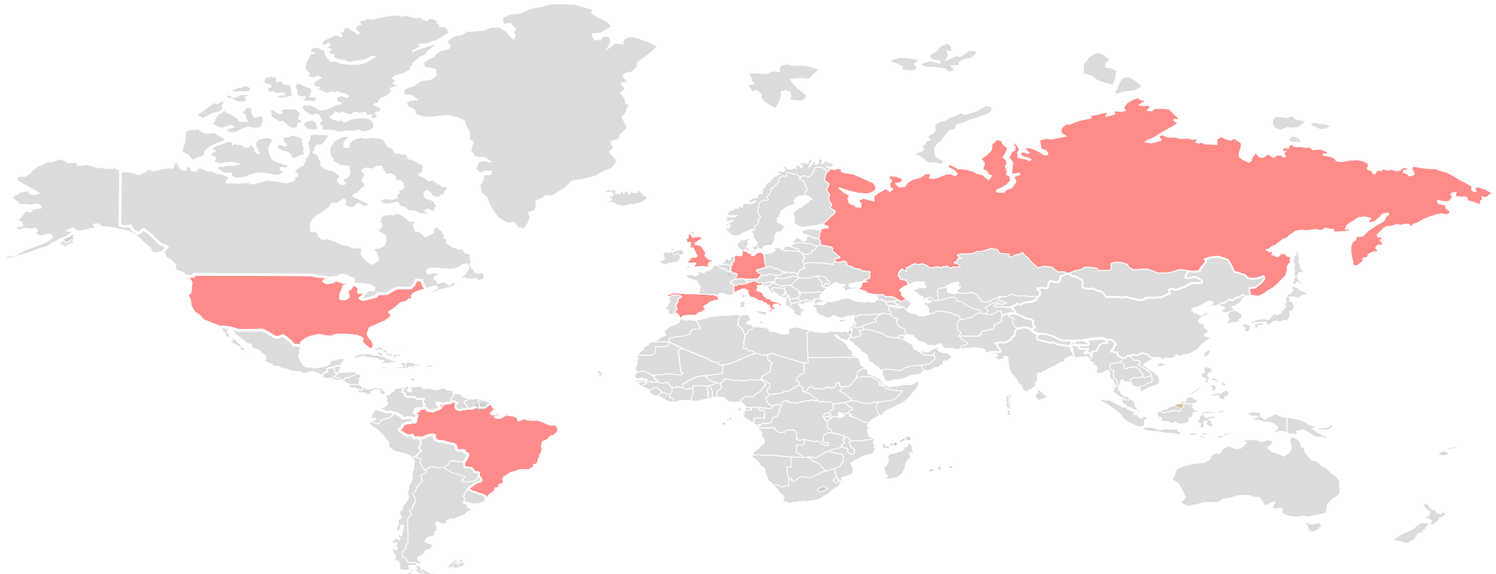
Figure 2: Daily new infected COVID-19 cases reported between (January 21 to May 19, 2020).

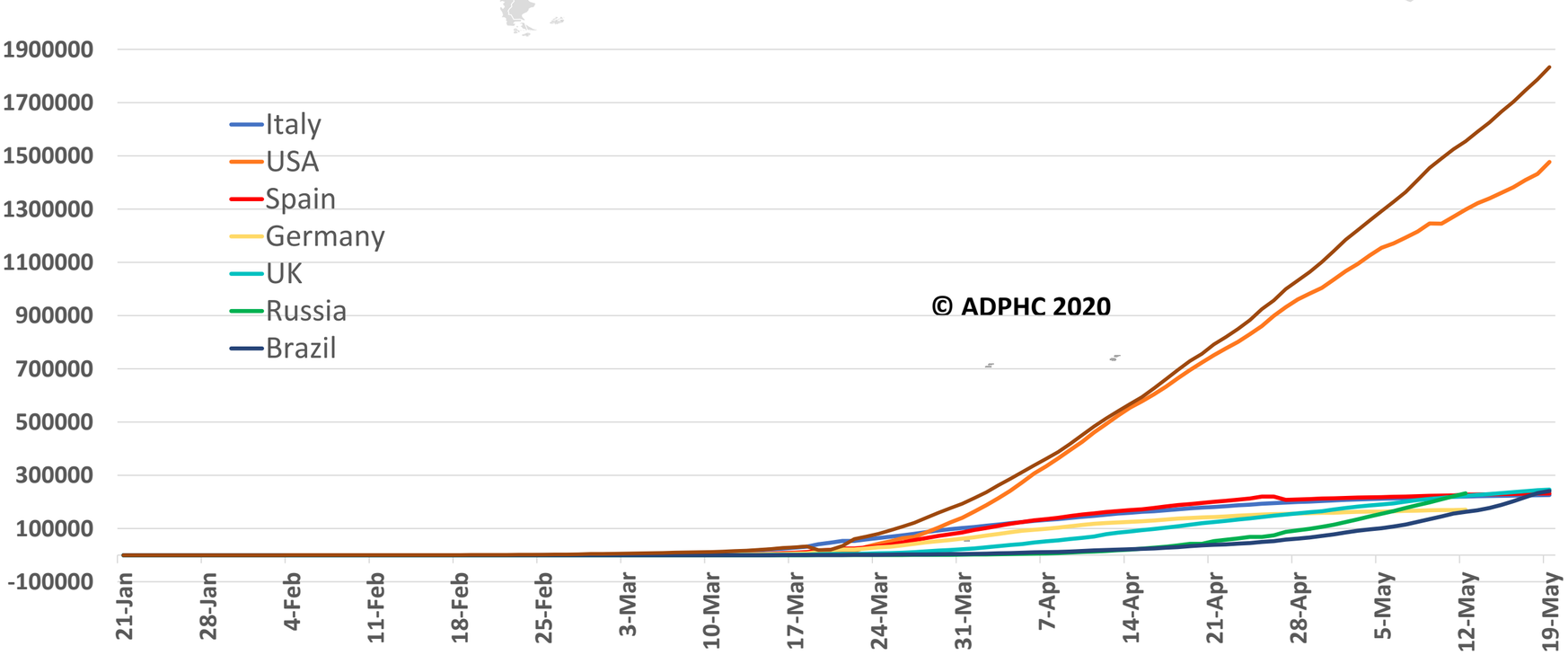


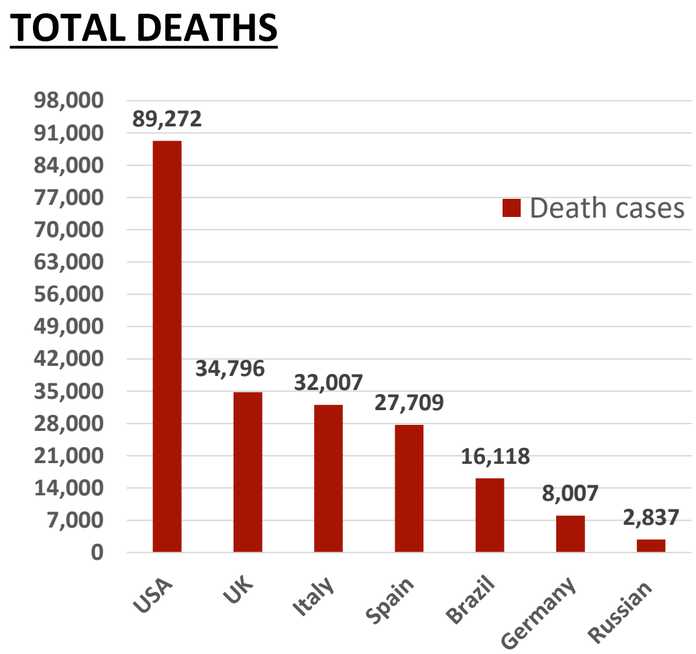
Line graph published by Abu Dhabi Public Health Center 2020.
Data resources: WHO

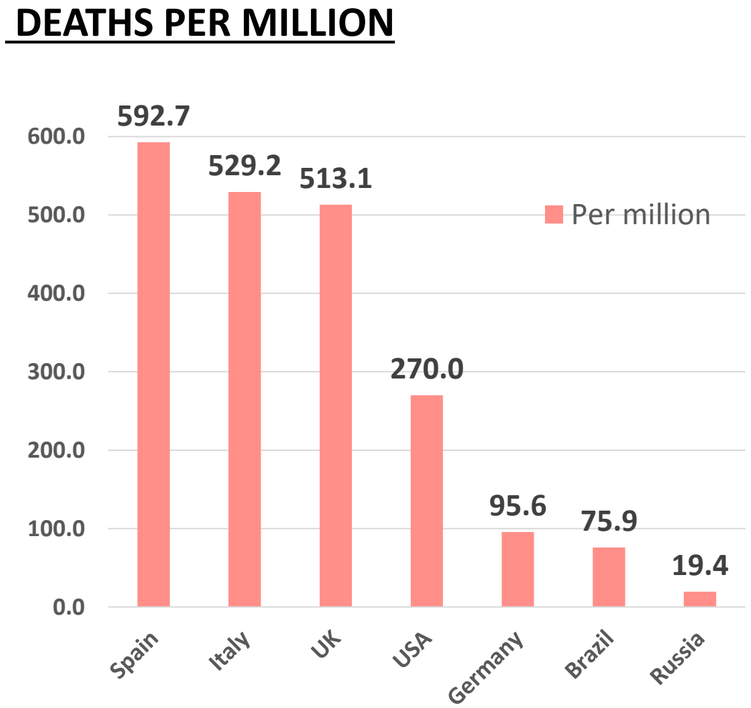
Epidemiology

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









Line graph published by Abu Dhabi Public Health Center 2020.
Data resources: WHO

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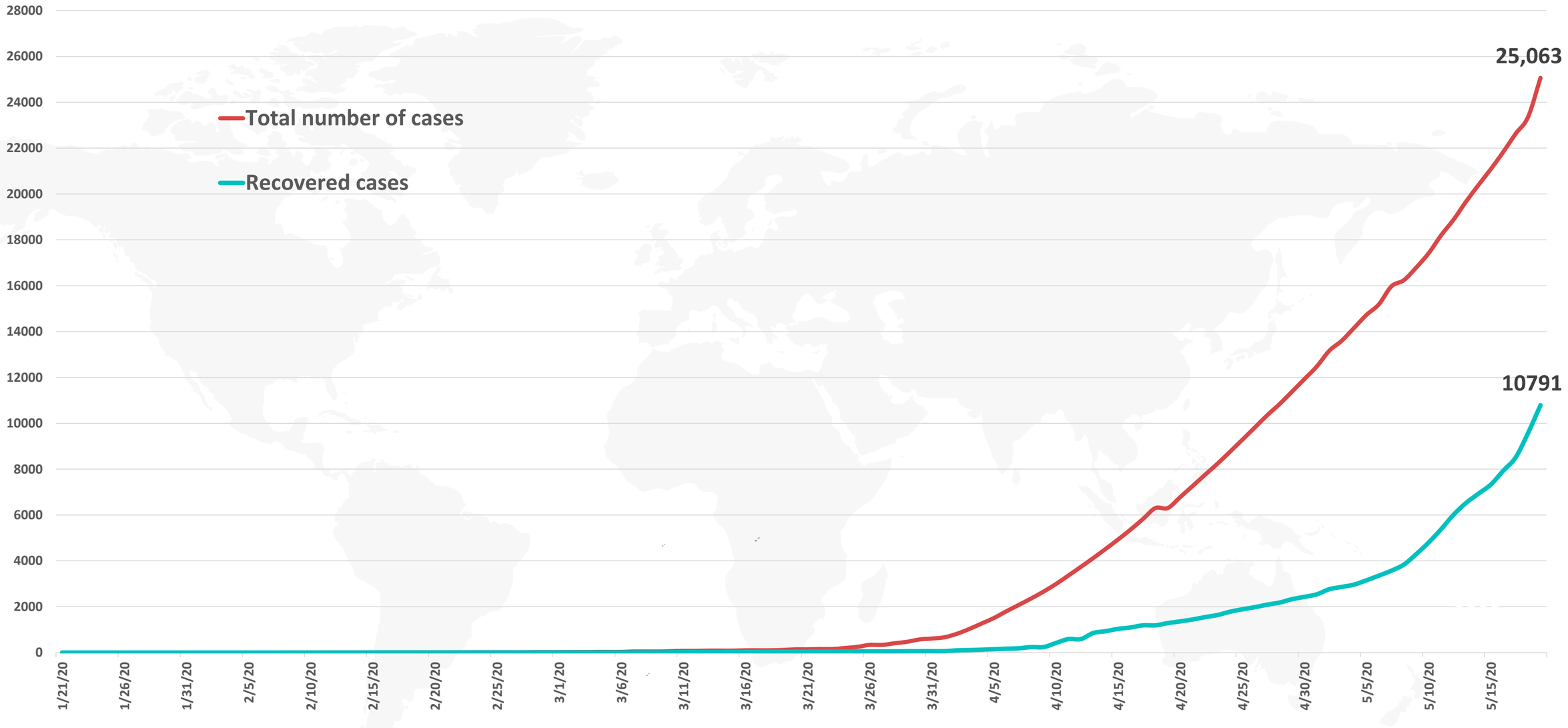
Figure 4: Total number of COVID-19 infected and recovered cases in UAE over time

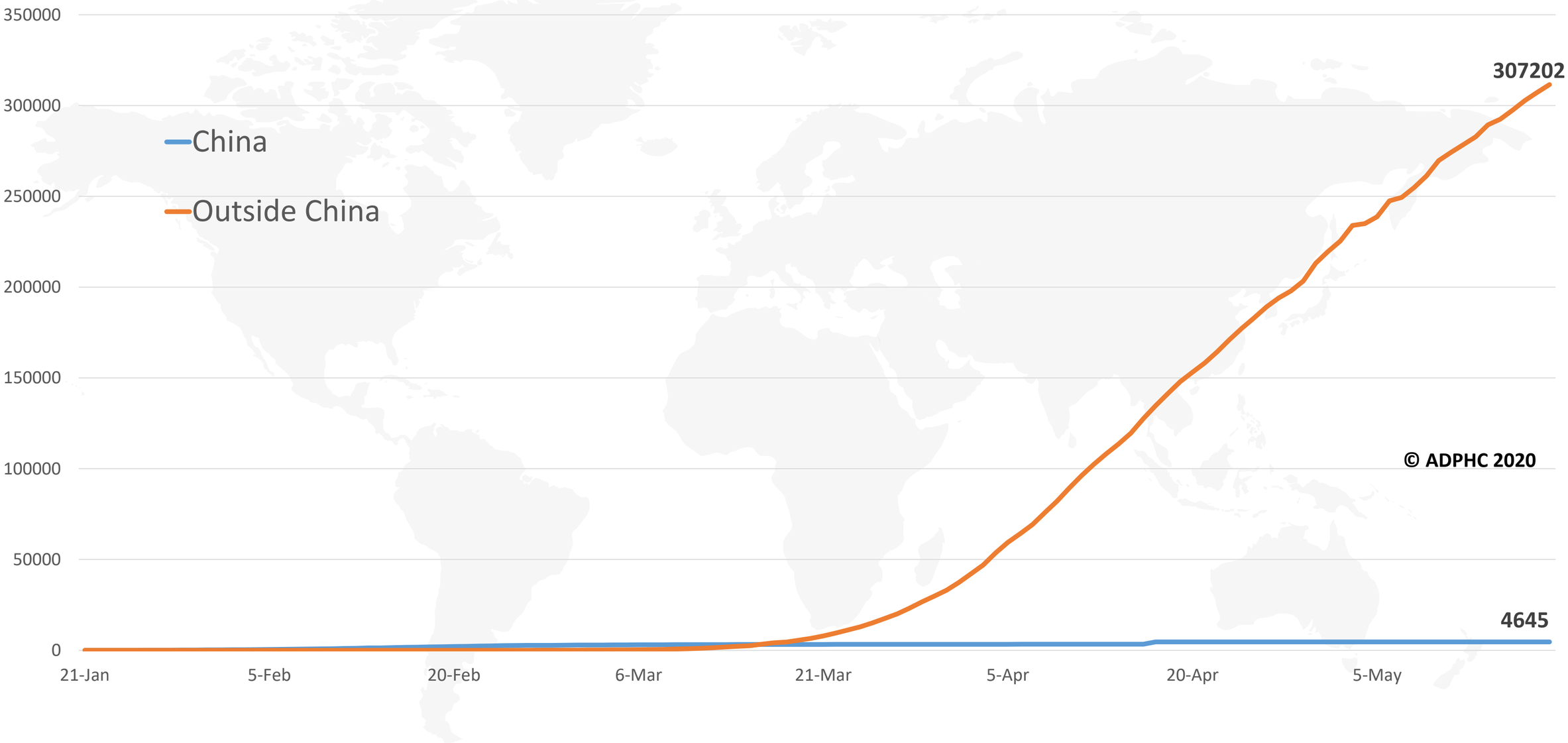


Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: WHO, : John Hopkins University

Epidemiology

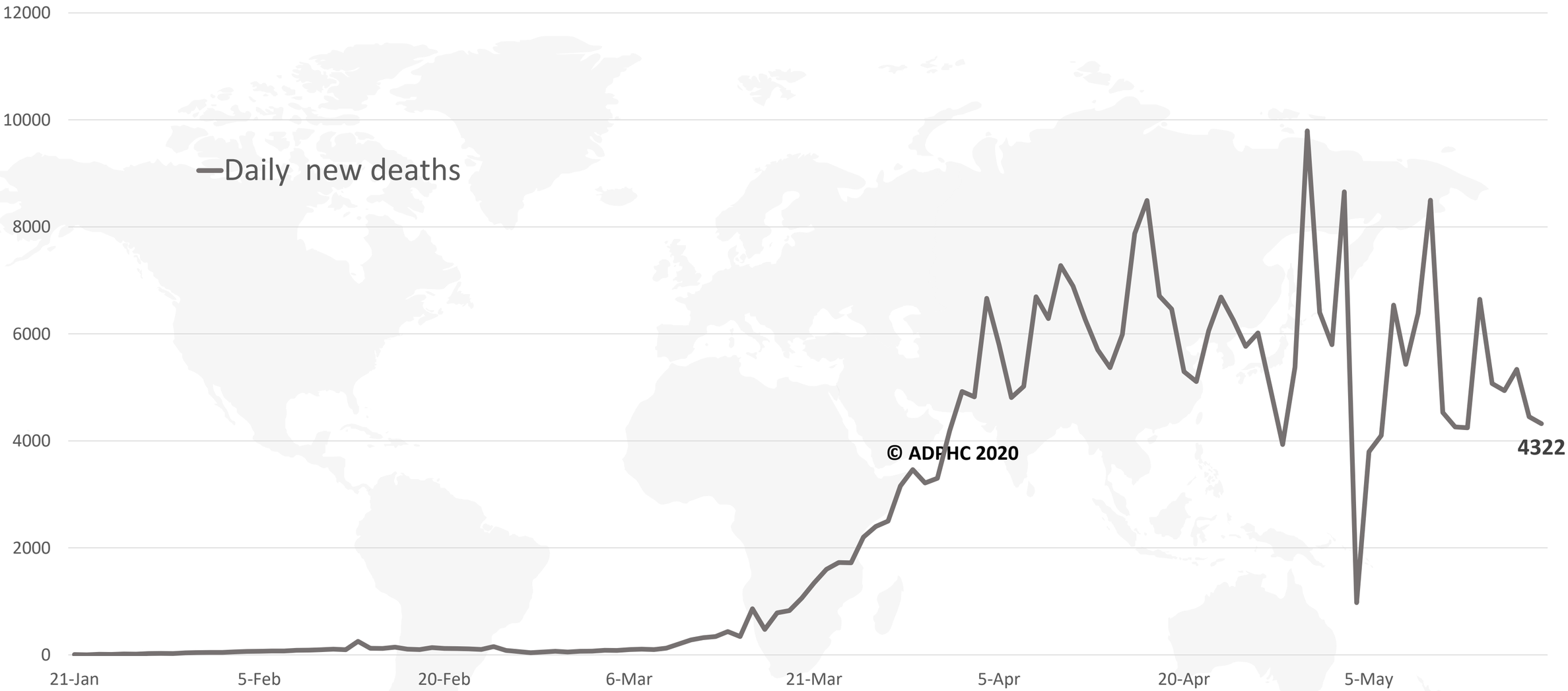
Figure 5: Total number of death due to COVID-19 reported by China and the rest of the world (January 22 to May 17, 2020).



Line graph published by Abu Dhabi Public Health Center 2020.
Data resources: WHO

Epidemiology

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



Line graph published by Abu Dhabi Public Health Center 2020.
Data resources: WHO

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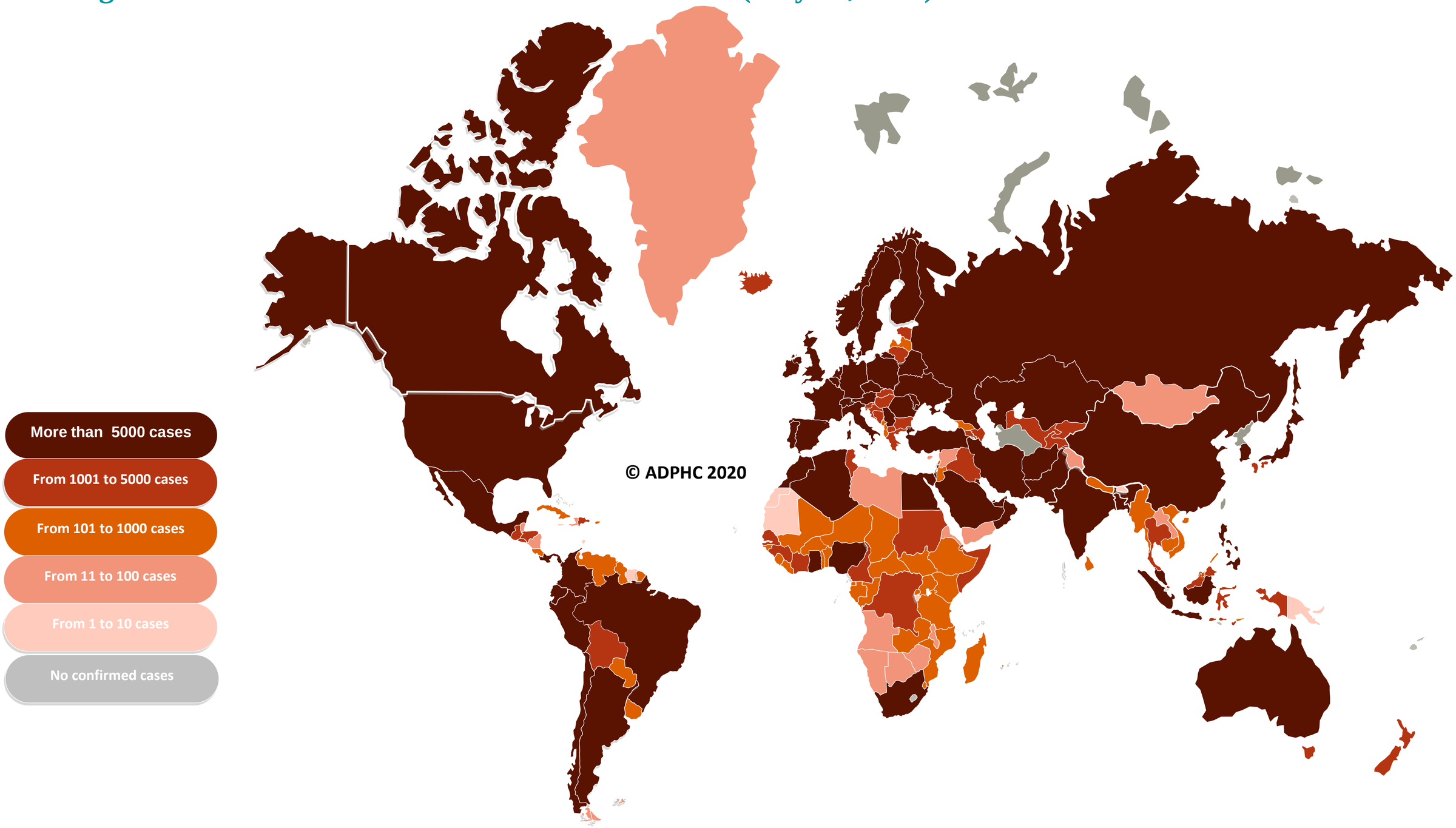
Figure 7a : Global distribution of COVID-19 cases (May 19, 2020).



Map chart published by Abu Dhabi Public Health Center 2020.

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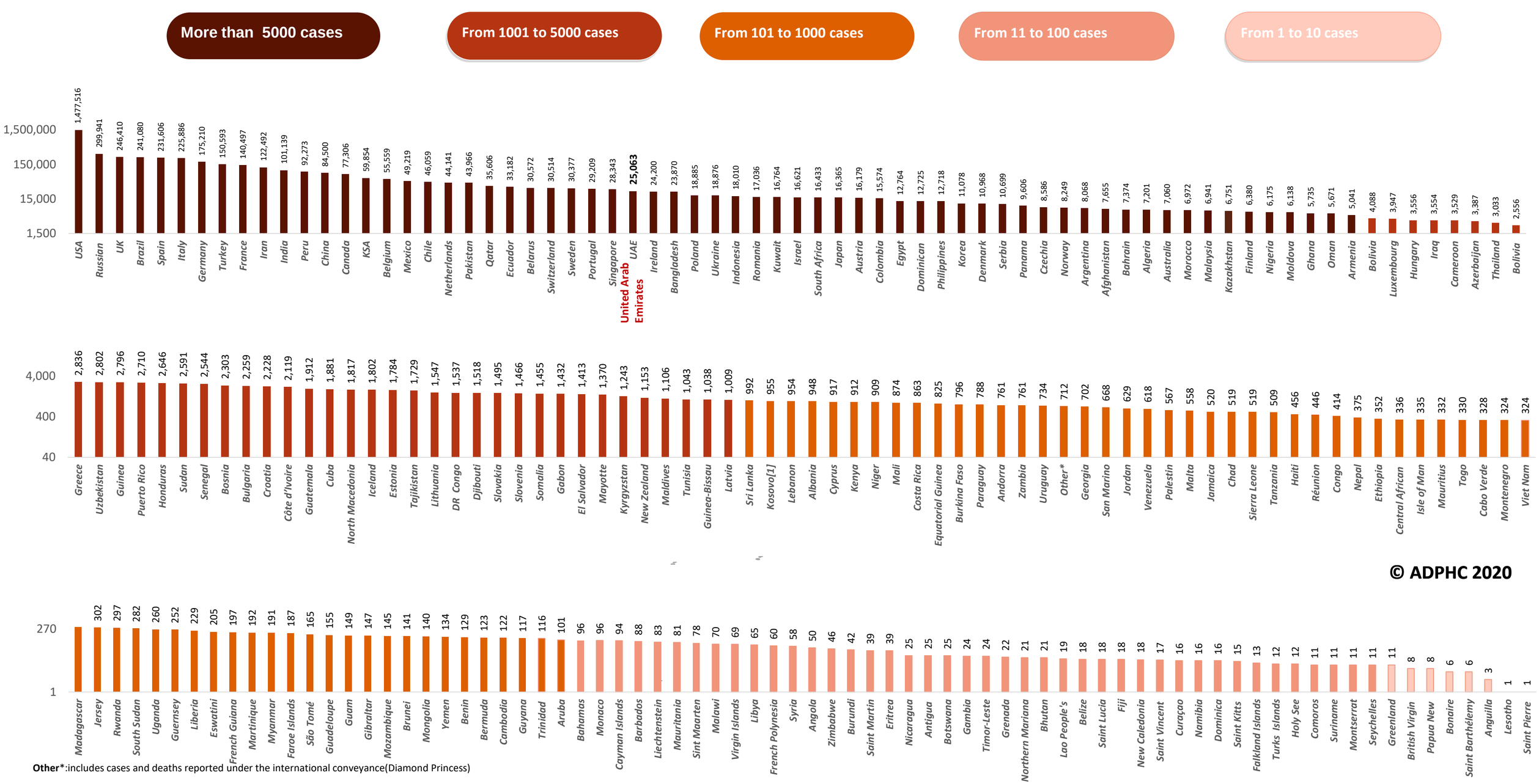
Figure 7B: Bar chart illustrate the global distribution of COVID19 cases May 19, 2020)



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

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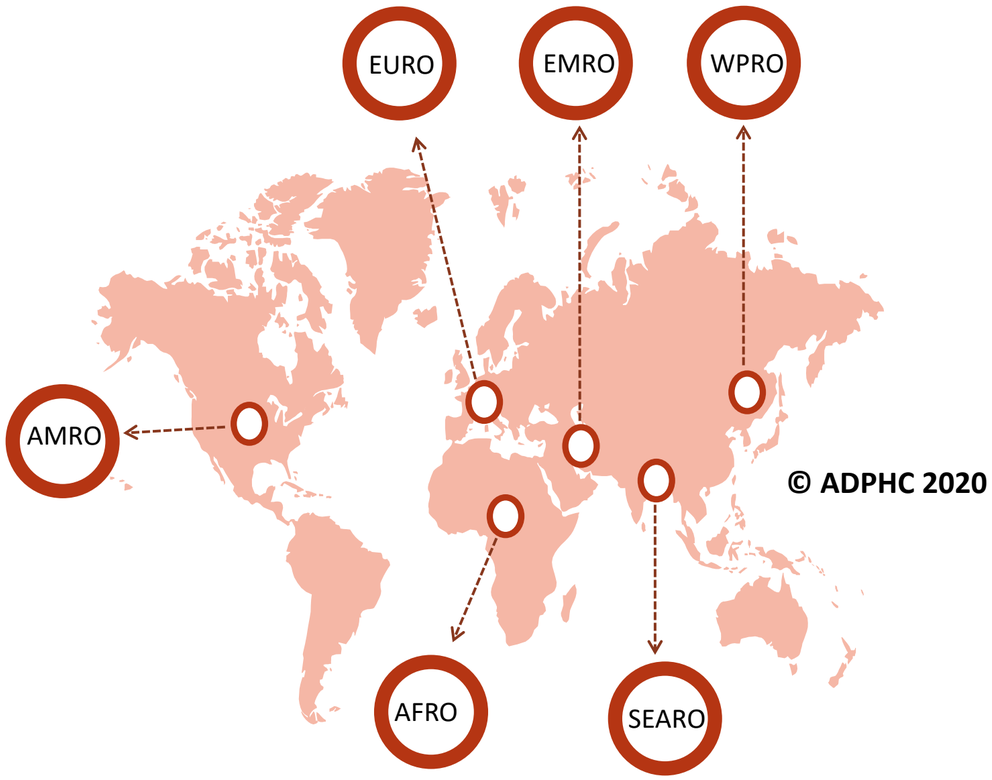
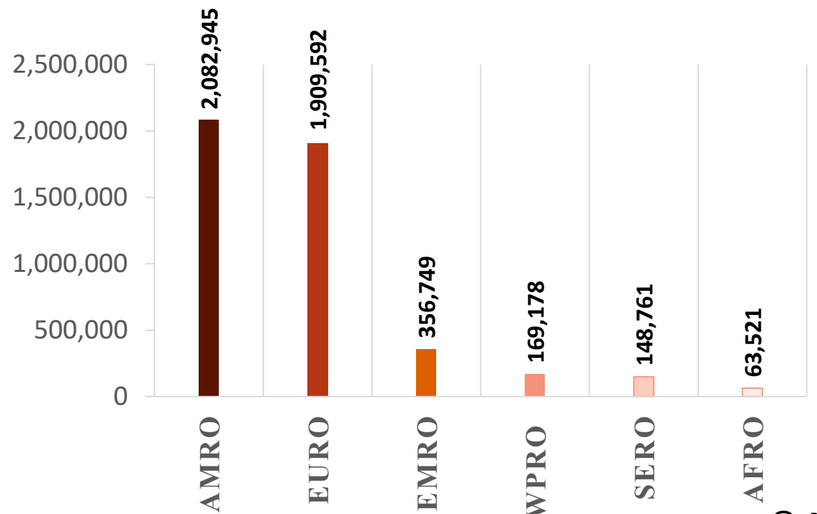
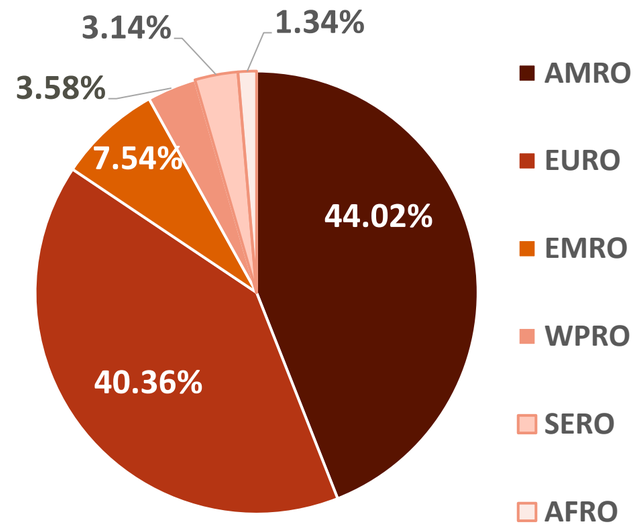
Figure 8: illustrate the Global distribution of COVID19 cases per region (May 19, 2020)



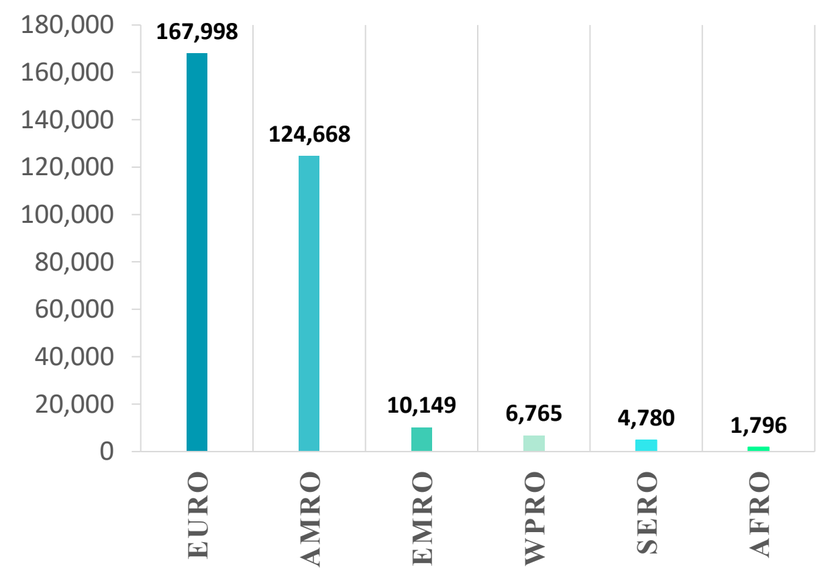
Map chart published by Abu Dhabi Public Health Center 2020.
Data resources: WHO

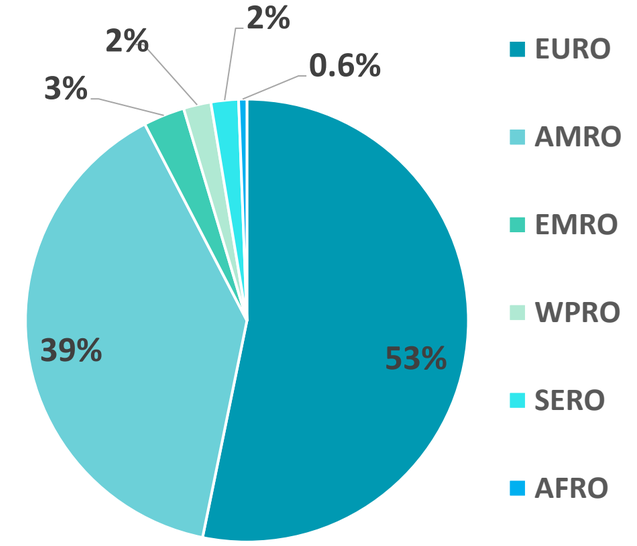
INFECTED





DEATH

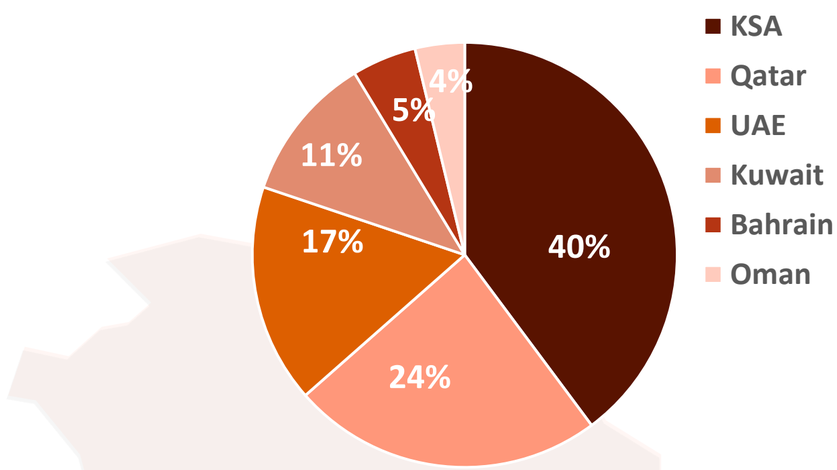


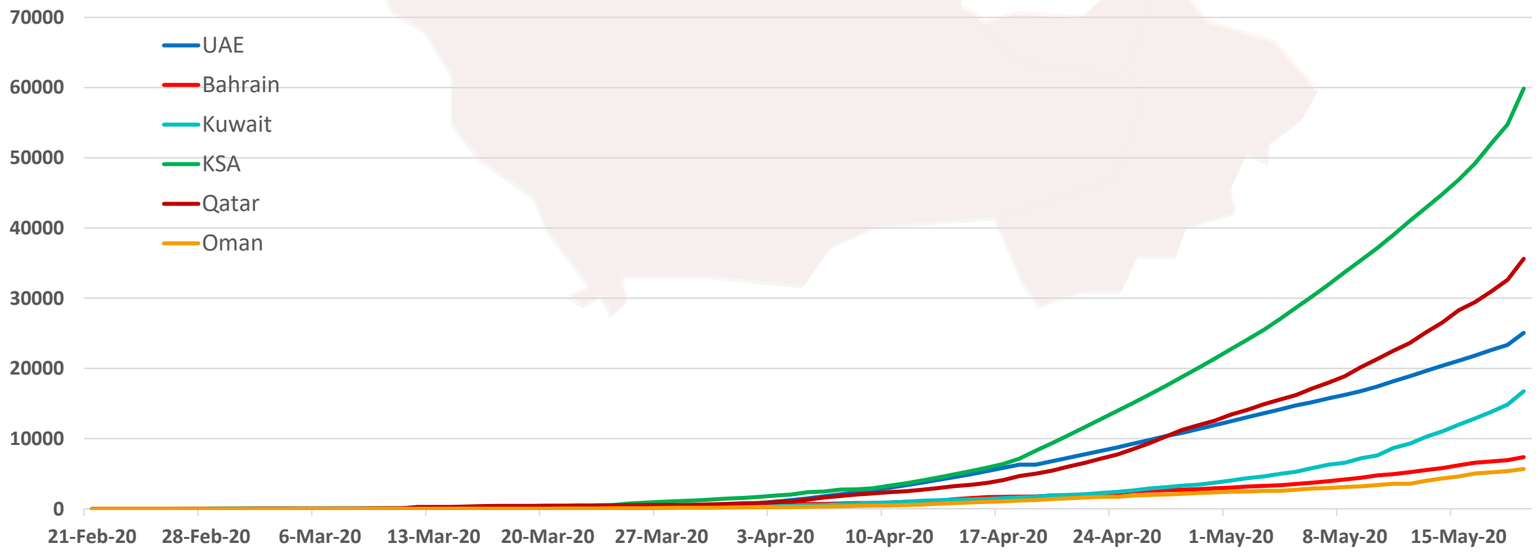


Epidemiology

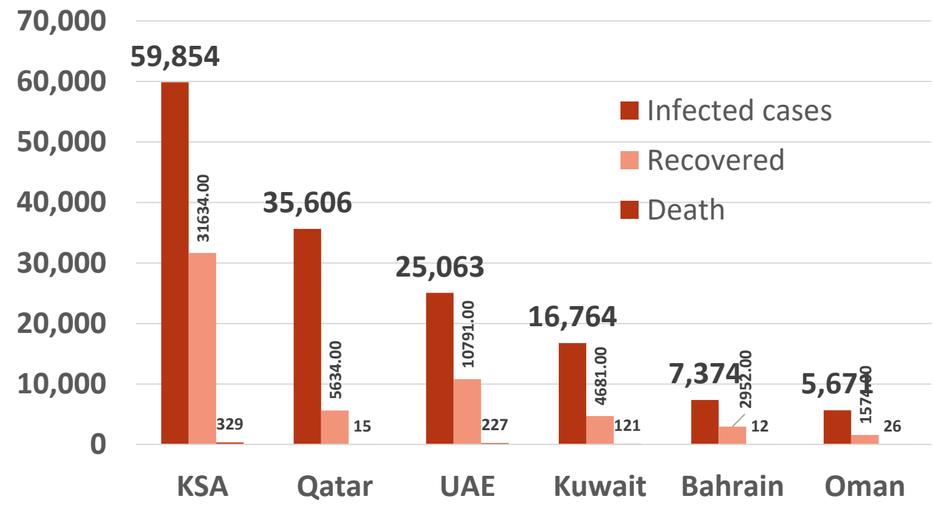
Figure 9: Comparative analysis of the distribution of COVID19 cases in GCC countries (May 19, 2020)

TOTAL NUMBER OF INFECTED CASES

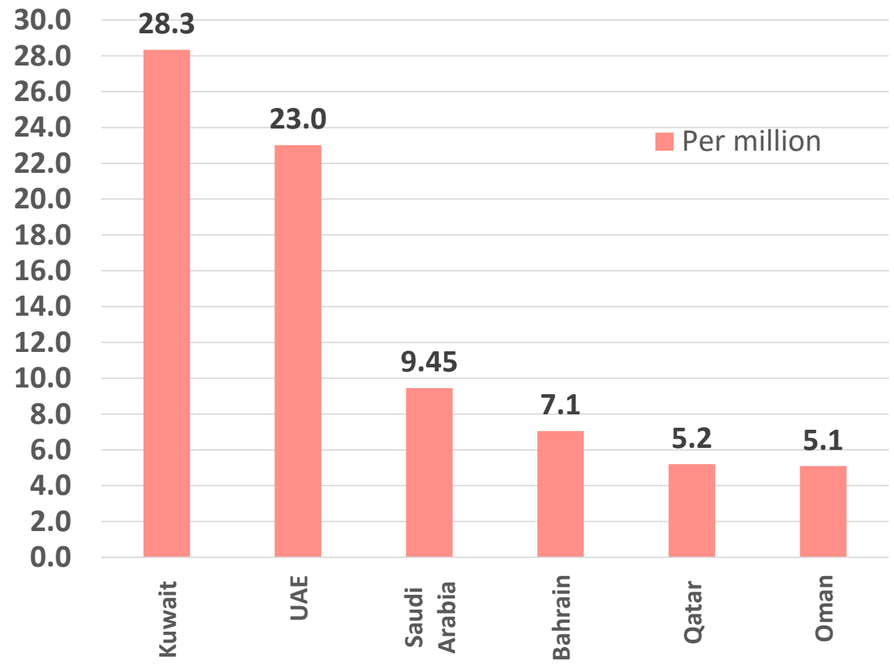




Total number of infected, recovered and Deaths



Death per million



charts published by Abu Dhabi Public Health Center 2020.

Data resources: WHO

Transmission

Article 1: Investigation of a COVID-19 outbreak in Germany resulting from a single travel-associated primary case: a case series

Published: May 15, 2020, in the Lancet

Summary:

This study assessed the key epidemiological parameters such as transmission events, incubation period, and secondary attack rates in Bavaria, Germany. Case interviews were conducted in two stages. **In the first stage**, patients with confirmed SARS-CoV-2 infection or their household members were interviewed to determine date of symptom onset, contact events during the incubation period, links between cases, and contact classification. **In a second stage**, in-depth interviews with ten patients with COVID-19 were done by teams of two professionals (one physician and one epidemiologist) using semi-structured questionnaires**. Secondary attack** rates were also calculated as **number of cases divided by number of contacts or case–contact pairs,** using Fisher's exact test for the 95% CIs.

The findings of the study specified 16 subsequent cases, often with **mild and non-specific symptoms**, emerged **in 4 transmission generations**. Signature mutations in the viral genome occurred upon foundation of generation 2, and in one case pertaining to generation 4. The median incubation period **was 4 days** (IQR 2·3–4·3) and the **median serial interval was 4 days (3·0–5·0).** Transmission events were likely to have **occurred pre-symptomatically for 1 case (possibly five more),** at the day of symptom **onset for 4 cases** (possibly 5 more), and the remainder after the day of symptom onset or unknown. **One or two cases** resulted from contact with a case during **the prodromal phase**. Secondary attack rates **were 75·0% (95% CI 19·0–99·0; three of four people) among members of a household cluster in common isolation**, **10·0% (1·2–32·0; two of 20) among household contacts only together until isolation of the patient**, and **5·1% (2·6–8·9; 11 of 217) among non-household, high-risk contacts**. No further cases associated with the outbreak were detected as of May 2, 2020, suggested that applied containment measures have worked.

Article 2: Tracking the COVID-19 pandemic in Australia using Genomics
Published: May 16, 2020 in MedRxiv

Summary:

The study used cases of SARS-CoV-2 infection that were detected either through contact tracing or active case findings to apply throughput genome sequencing of SARS-CoV-2 to 75% of cases in Australia. The putative impact of social restrictions was assessed through Phylodynamic analysis. Around 1,333 COVID-19 cases were reported in Victoria in the late of March. Of these, 903 samples were included in genomic analyses. The samples sequenced were representative of the global diversity of SARS-CoV-2. Overall, **76 distinct genomic clusters** were identified; these included large clusters associated with healthcare facilities, social venues, and cruise ships. Phylodynamic modelling showed a significant reduction in the effective viral reproductive number (Re) from 1.63 to 0.48 after travel restrictions implementations and physical distancing at the population-level. **The study offered a comprehensive framework for using SARS-CoV-2 genomics in public health responses.** The genomics application to rapidly identifying SARS-CoV-2 transmission chains will become critically imperative as social restrictions ease globally.

Treatment and Epidemiology

وزارة الصحة ووقاية المجتمع
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Article 3: Commentary on COVID-19
Published: May 11, 2020 in Springer

Summary:
This commentary addressed the latest treatment modalities available across the globe in tackling COVID-19. Some of the potential therapeutic drugs being used are as follows: remdesivir, lopinavir-ritonavir, hydroxychloroquine/chloroquine, IL-6 monoclonal antibodies (toculizumab, sarilumab; Kevzara, Actemra), interferon, arbidol, favipiravir, angiotensin-converting enzyme 2 (ACE2) receptor blocker, colchicine, traditional Chinese herbal medicinal products (phytochemicals most likely possessing anti-inflammatory/anti-oxidative stress effects, anti-viral effects and or other effects), and acupuncture, among others

Article 4: Inferring change points in the spread of COVID-19 reveals the effectiveness of interventions
Published: May 15, 2020 in Science ,AAAS
Summary:
This study discussed an established class of models for epidemic outbreaks: "The Susceptible-Infected-Recovered (SIR)" model that mainly specifies the rates that population compartments change over time, such as, when susceptible people become infectious, and when infectious people recover. This simple model can be formulated in terms of coupled ordinary differential equations (in mean field), which enable analytical treatment or fast evaluation (ideally suited for Bayesian inference). This family of models has played a dominant role in the analyses of the coronavirus (SARS-CoV-2) pandemic, from inference through scenario forecasting to control strategies. By combining an established epidemiological model with Bayesian inference, the study analysed the time dependence of the effective growth rate of new infections. The Bayesian approach discussed in the study allows detection and quantification of the effect of governmental interventions, combined with potential subsequent interventions, forecasting future case number scenarios.

Clinical Feature and transmission

Article 5:Characteristics and Outcomes of Children with Coronavirus Disease 2019 (COVID-19) Infection Admitted to US and Canadian Paediatric Intensive Care Units.
Published: May 11, 2020 in the JAMA

Summary:
This cross-sectional study provides an early description and characterization of COVID-19 infection in North American PICUs, focusing on the mode of presentation, therapeutic interventions, the presence of comorbidities, severity of disease, clinical course, and early outcome. The study recruited 48 children with COVID-19 admitted to paediatric intensive care units (PICUs). Forty patients (**83%) had significant pre-existing** comorbidities; 18 **(38%)** required **invasive ventilation**; and 35 **(73%)** presented with respiratory symptoms.
Eleven patients (23%) had failure of 2 or more organ systems. Extracorporeal membrane oxygenation was needed for 1 patient (2%). **Targeted therapies were utilized in 28 patients (61%),** with **hydroxychloroquine** being the most commonly used agent either alone (**11 patients**) or in combination (10 patients). At the end of the follow-up period, **2 patients (4%) had died** and **15 (31%) were still hospitalized**, with **3 still needed ventilatory support** and 1 received extracorporeal membrane oxygenation. The median (range) PICU and **hospital lengths** of stay for those who had been **discharged were 5 (3-9) days and 7 (4-13) days**, respectively. The study confirms that severe illness in children is significant but far less frequent in adults. Prehospital comorbidities appear to be an important factor in children. These preliminary observations provide an important platform for larger and more extensive studies of children with COVID-19 infection

Article 6: Coronavirus disease 2019 (covid-19): a guide for UK GPs
Published: March 6, 2020, in BMJ

Summary:

- Individuals with continuous cough, temperature ≥37.8ºC, flu like illness, pneumonia, or breathlessness may be considered to have the Virus.
- Such individuals should be self-isolate for 7 days from the onset of symptoms, and asymptomatic household members should stay at home for 14 days
- Remote consultations should be used when possible. Triage all patients online or by phone to examine the requirement for face-to-face appointments.
- Personal protective equipment (PPE) should be worn when seeing patients suspected to have covid-19, and separate the consultation in time or place from other patients in the surgery. Subject to local risk assessment, PPE may also be indicated for routine medical work, regardless of the patient's status, in settings where there is sustained transmission of covid-19
- GP surgeries should develop protocols for managing patients with possible infection, including triaging remotely, isolation procedures, postponing non-urgent services, seeking specialist advice, PPE provision, decontamination, and collaborating with community services.

Link to the infographic:
https://www.bmj.com/content/368/bmj.m800/infographic

Article 7 :Talent management in Covid-19 crisis: how Dubai manages and sustains its global talent pool
Published: May 11. 2020 in Nature publishing group.

Summary:

The introduction of innovative measures, for instance the Virtual Labour Market, will most likely remain in place post Covid-19. The blend of a lower degree of central control and a higher level of flexibility may be the revitalisation of global talent management in Dubai's labour market. Working more independently and remotely will become a new norm to be addressed in labour market structures post Covid-19. Taking it all together, the new level of flexibility introduced into Dubai's employment market is likely to result in (1) increased flexibility of work, space and time, (2) stronger competition for jobs and talent, (3) increased investment in talent retention, and (4) active support to support people to find jobs.

Article 8:Estimating the burden of SARS-CoV-2 in France
Published: May 13, 2020 in Science, AAAS

Summary:

This study demonstrated the massive impact the French lockdown had on SARS-CoV-2 transmission. This approach for modelling was applied to death and hospital data which allowed to estimate underlying probabilities of infection, death, and hospitalization that is essential for the interpretation of COVID-19 surveillance data. **Around 3.6% of infected individuals were hospitalized and 0.7% die, ranging from 0.001% in those <20 years of age (ya) to 10.1% in those >80ya.** Across all ages, men are more likely to be hospitalized, enter intensive care, and die than women. The lockdown reduced the reproductive number from 2.90 to 0.67 (77% reduction). The forecasts guided in informing the lockdown exit strategies.