ABU DHABI PUBLIC HEALTH CENTRE | مركز أبوظبي للصحة العامة

Scientific Research Monitoring on COVID-19

2 April 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

- **Vaccine:** epidemiological study showing correlation between public policy on Bacillus Calmette-Guérin (BCG) vaccination and protection from COVID-19-induced morbidity and mortality.
- **Public health response:** The strategies of early detection, diagnosis, isolation, and treatment when applied are also contributed to decrease the case fatality ratio of the disease.
- **Public health response:** An article that discusses the innovative financing for pandemic response.

Due to abundant COVID19 information resources and given the urgent need to keep up with the updates .Below is a cluster of other academic articles for interested reviewer.
Listed articles may represent information that has been previously shared in the report and/or may target specific technical audience.

Others

In patients of COVID-19, what are the symptoms and clinical features of mild and moderate cases?

Refugee and migrant health in the COVID-19 response

Racism and discrimination in COVID-19 responses

WHO daily report

- Three new countries/territories/areas reported cases of COVID-19 in the past 24 hours: Botswana, Burundi, and Sierra Leone.
- WHO has released a scientific brief on the off-label use of medicines for COVID-19. A number of medicines have been suggested as potential investigational therapies, many of which are now being or will soon be studied in clinical trials, including the SOLIDARITY trial co-sponsored by WHO and participating countries.
- WHO recognizes the importance of addressing the needs of refugees and migrants when preparing for or responding to the COVID-19 pandemic. WHO European Region has released a guidance document to assist healthcare working with refugees and migrants.
- At a press briefing, yesterday, PAHO Director Dr. Carissa Etienne stressed that countries of the Americas must act now to slow the spread of COVID-19. WHO encourages countries to prepare hospitals and health facilities, protect their health personnel, and decide what social distancing measures need to be implemented and for how long, among other actions.

WHO daily report

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WHO daily report

- Public health and social measures to slow or stop the spread of COVID-19 must be implemented with the full engagement of all members of society. WHO has described four levels of COVID-19 transmission with varying public health and social measures depending on the local evolution of the COVID-19 pandemic.
  - These levels are 1. No cases reported. 2. Sporadic cases. 3. Clusters of cases (grouped in place and time), or 4. Community transmission. Countries may wish to specify which measures are to be taken at each level and review the situation regularly.
- Social measures play an essential role in reducing the number of infections and saving lives. While vaccines and specific medications are not yet available for COVID-19.
- Measures for the general public include **introducing flexible work arrangements such** as teleworking, distance learning, reducing and avoiding crowding, **closure of non-essential facilities** and services, shielding and protection **for vulnerable groups**, **local or national movement restrictions** and staying-at home measures, and coordinated reorganization of health care and social services networks to protect hospitals. The measures are used in conjunction **with individual protective measures** against COVID-19 such as frequent hand washing and cough etiquette.
- Countries should balance the possible benefits and negative consequences of each intervention and should limit social or economic harm:
  - Social measures should make the task of contact tracing much easier as the number of contacts rapidly dwindles and eventually the number of cases declines as well.
  - If lifted : then strengthen case-finding, isolation for COVID-19 cases and quarantine of contacts, in order to respond to resurgent or imported cases is essential. **Guidance for lifting measures is being developed**.
- A table summarizing public health and social measures to support control of COVID-19 will be available shortly at www.who.int/epi-win.

Epidemiology

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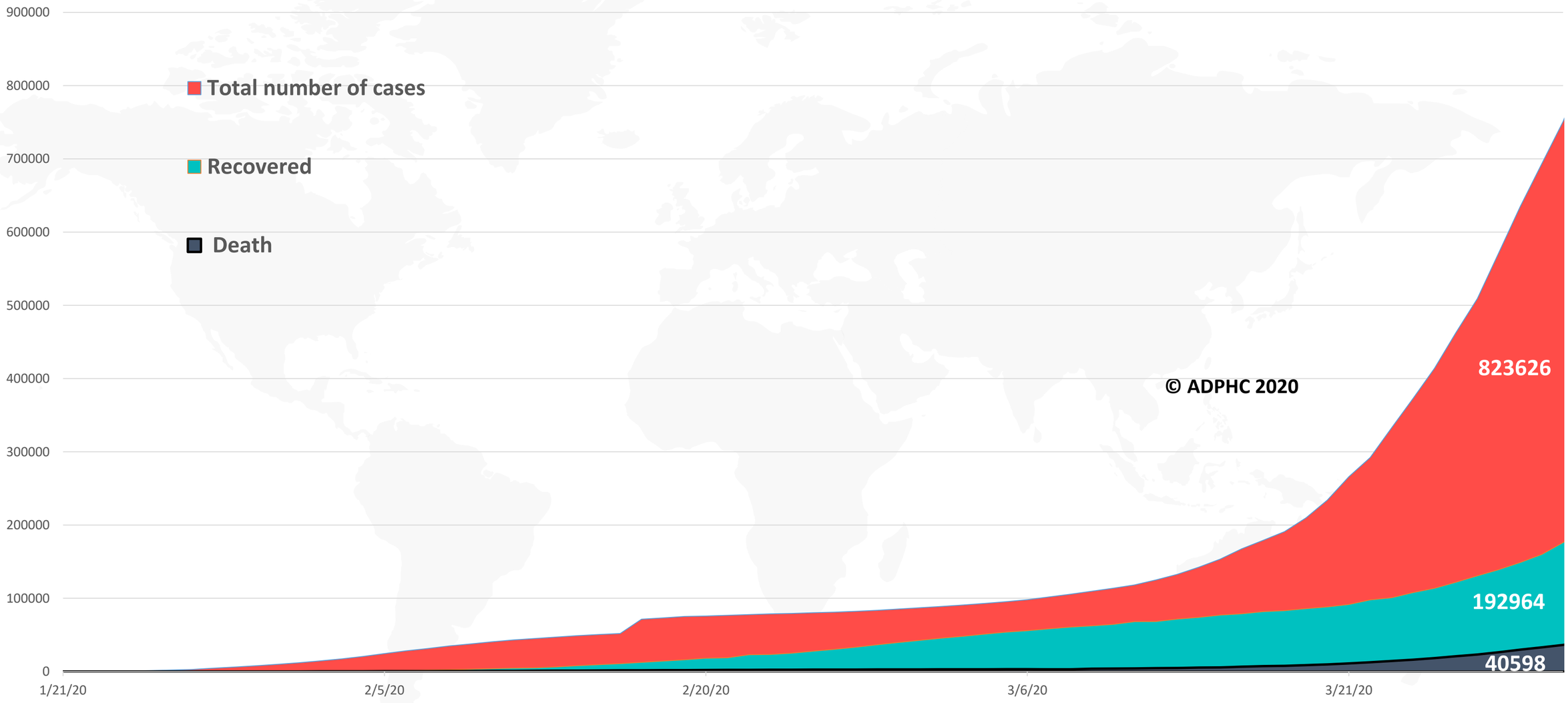
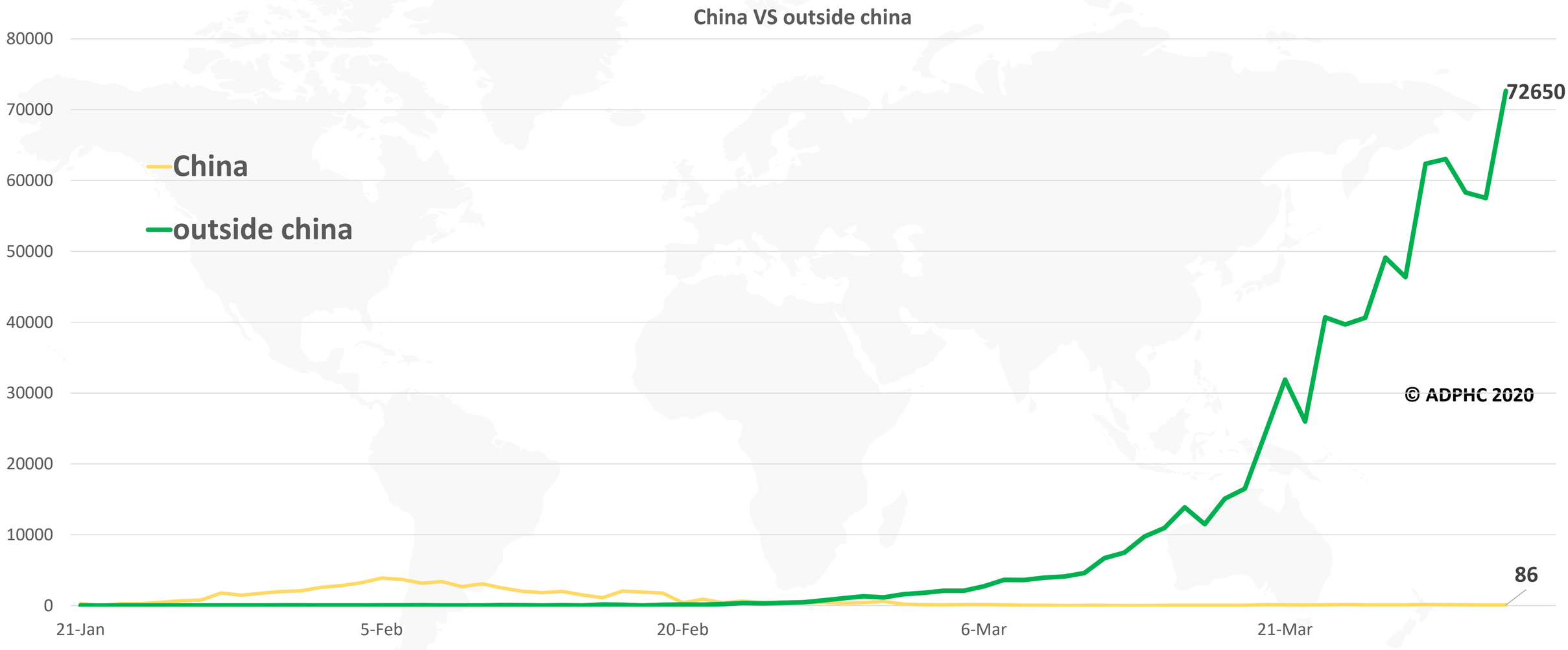
Figure 1: Total number of infected, recovered , and death cases (January 21st to April 1st, 2020)



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

Epidemiology

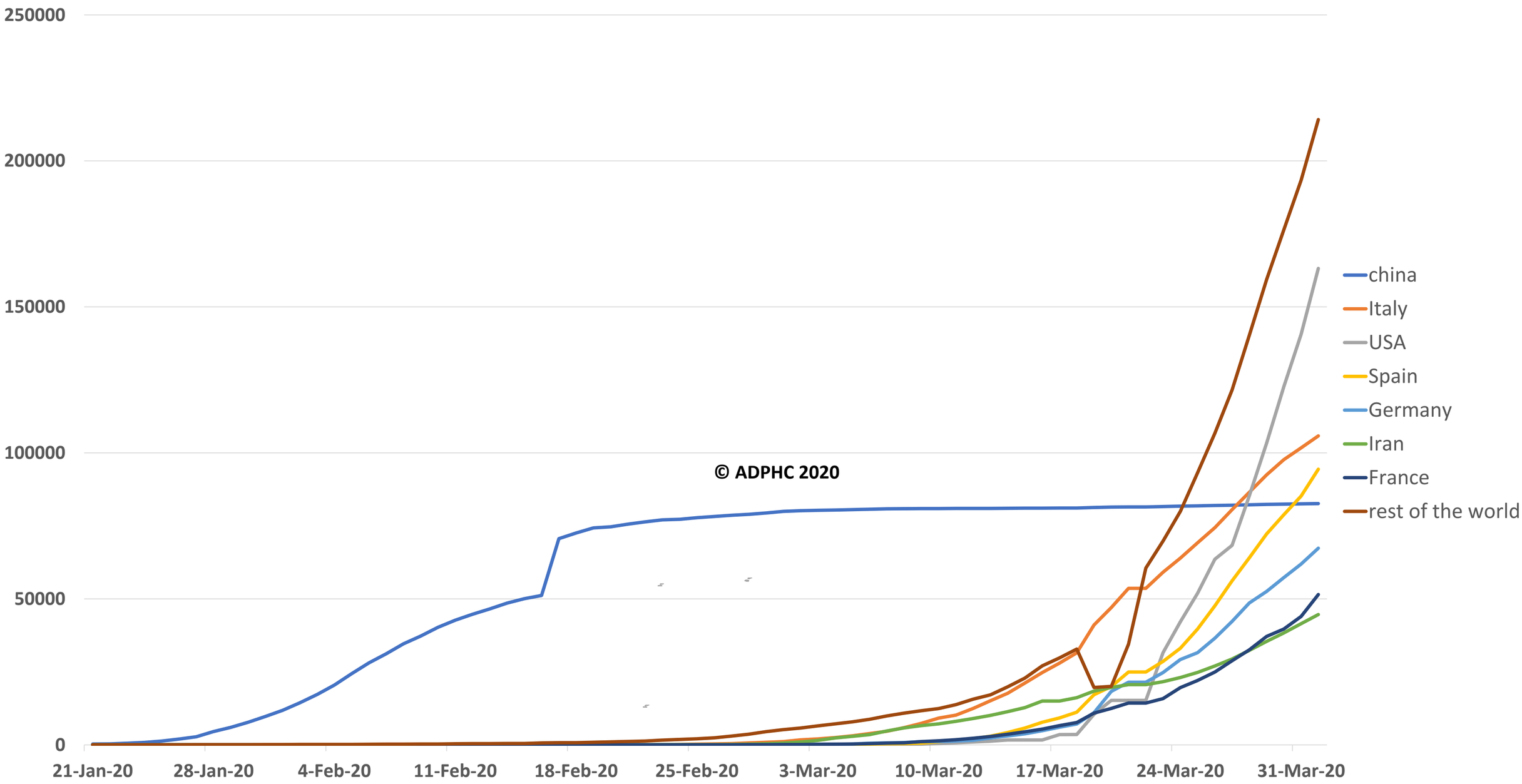
Figure 2: Daily new infected COVID-19 cases reported between (January 21 to April 1st, 2020).



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 April 1st , 2020).

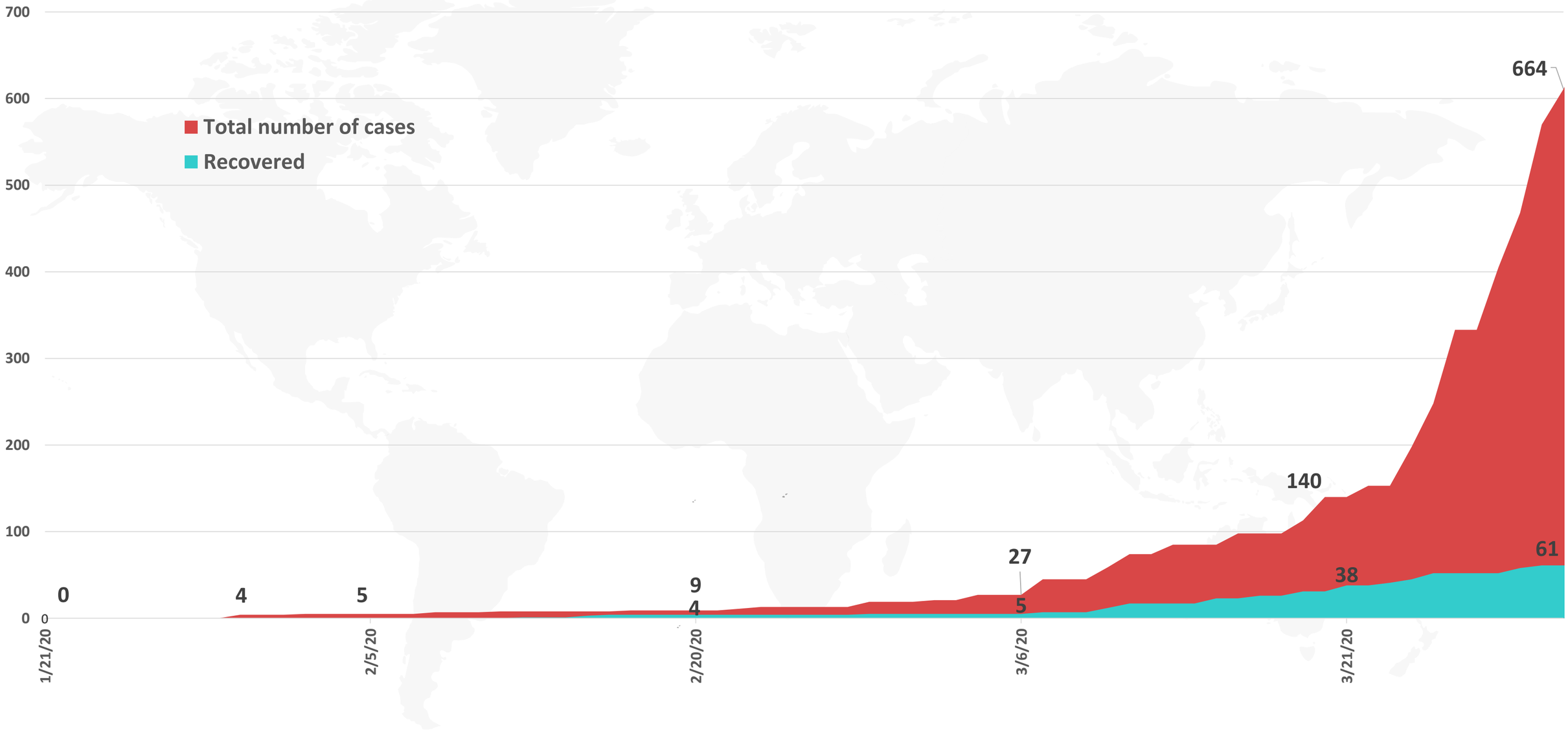


Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: WHO

Epidemiology

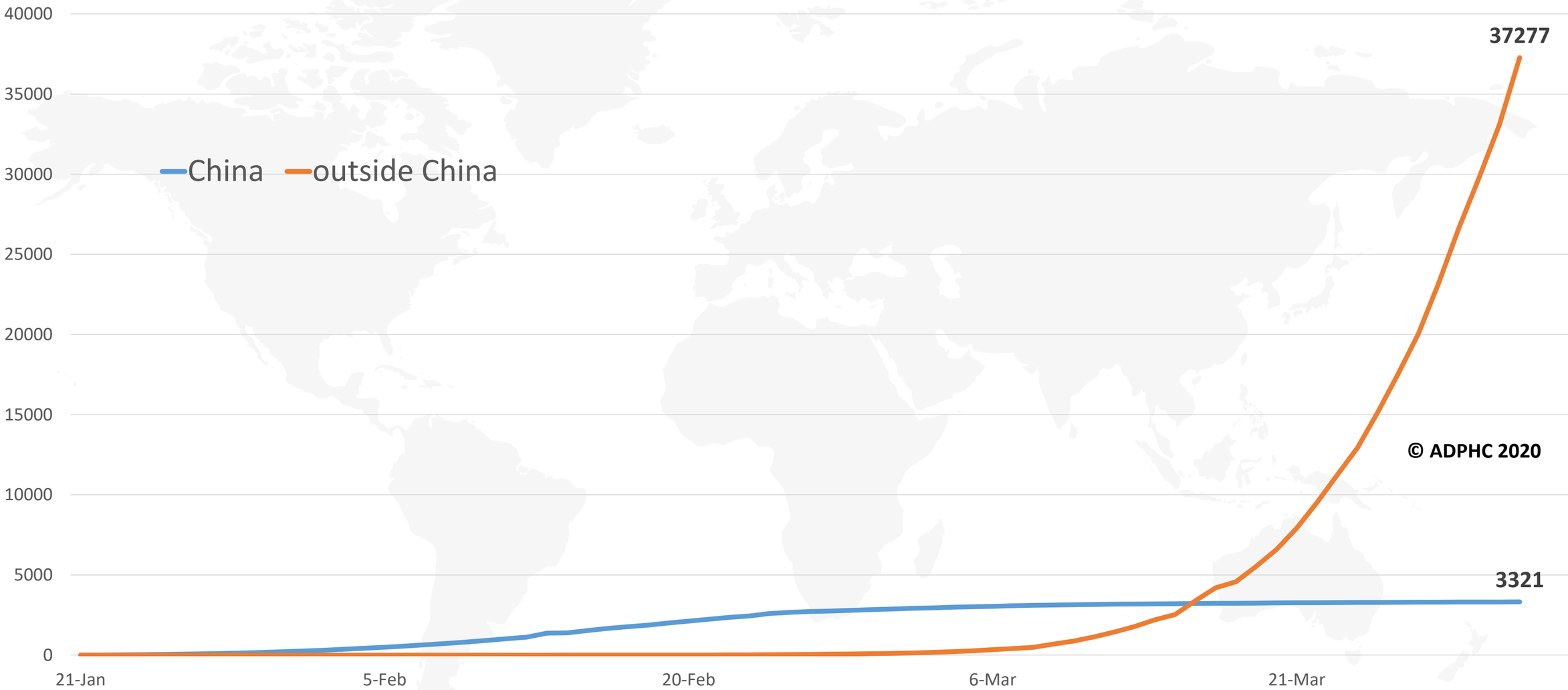
Figure 4: Total number of COVID-19 infected and recovered cases in UAE over time



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

Epidemiology

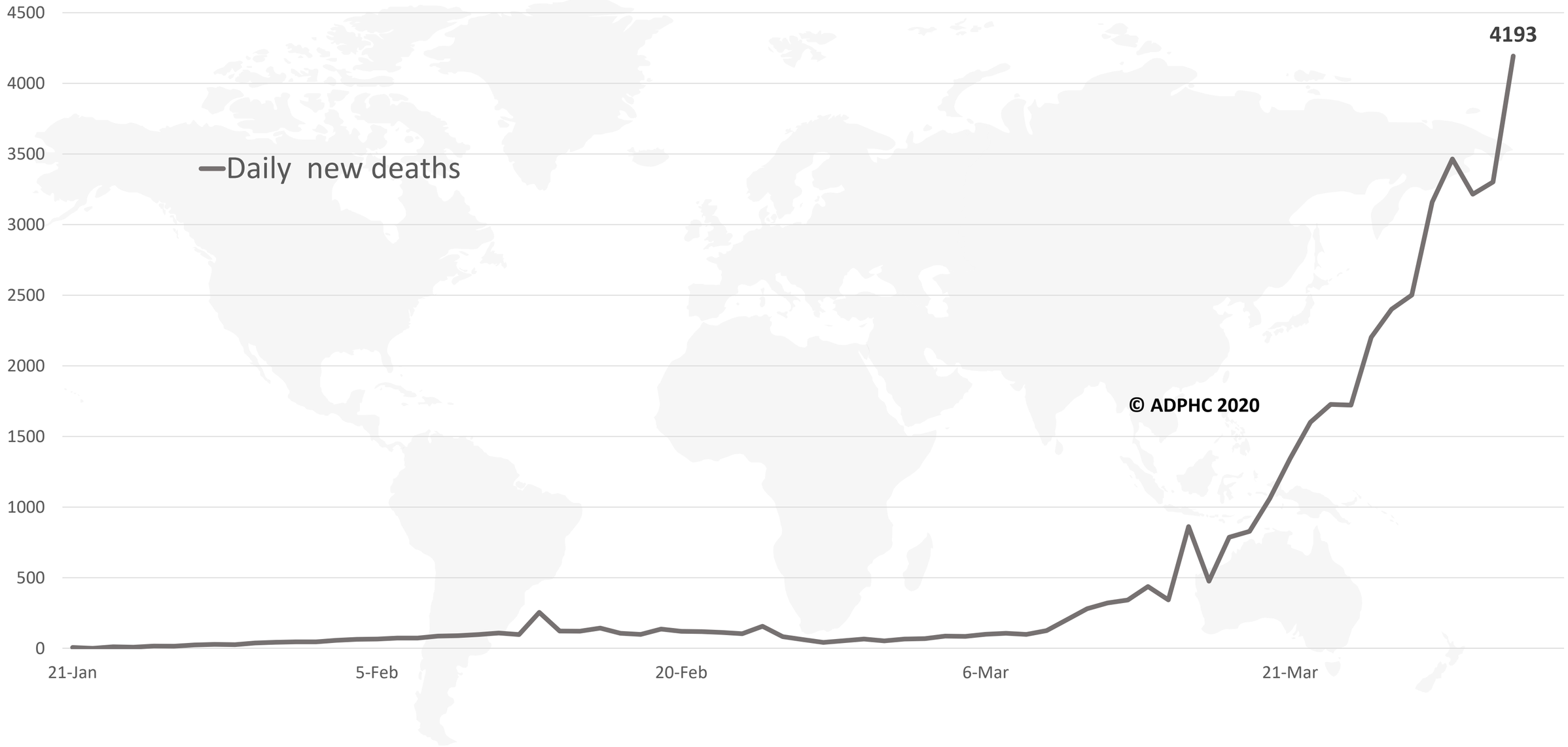
Figure 5: Total number of death due to COVID-19 reported by China and the rest of the world (January 21 to April 1st , 2020).



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

Epidemiology

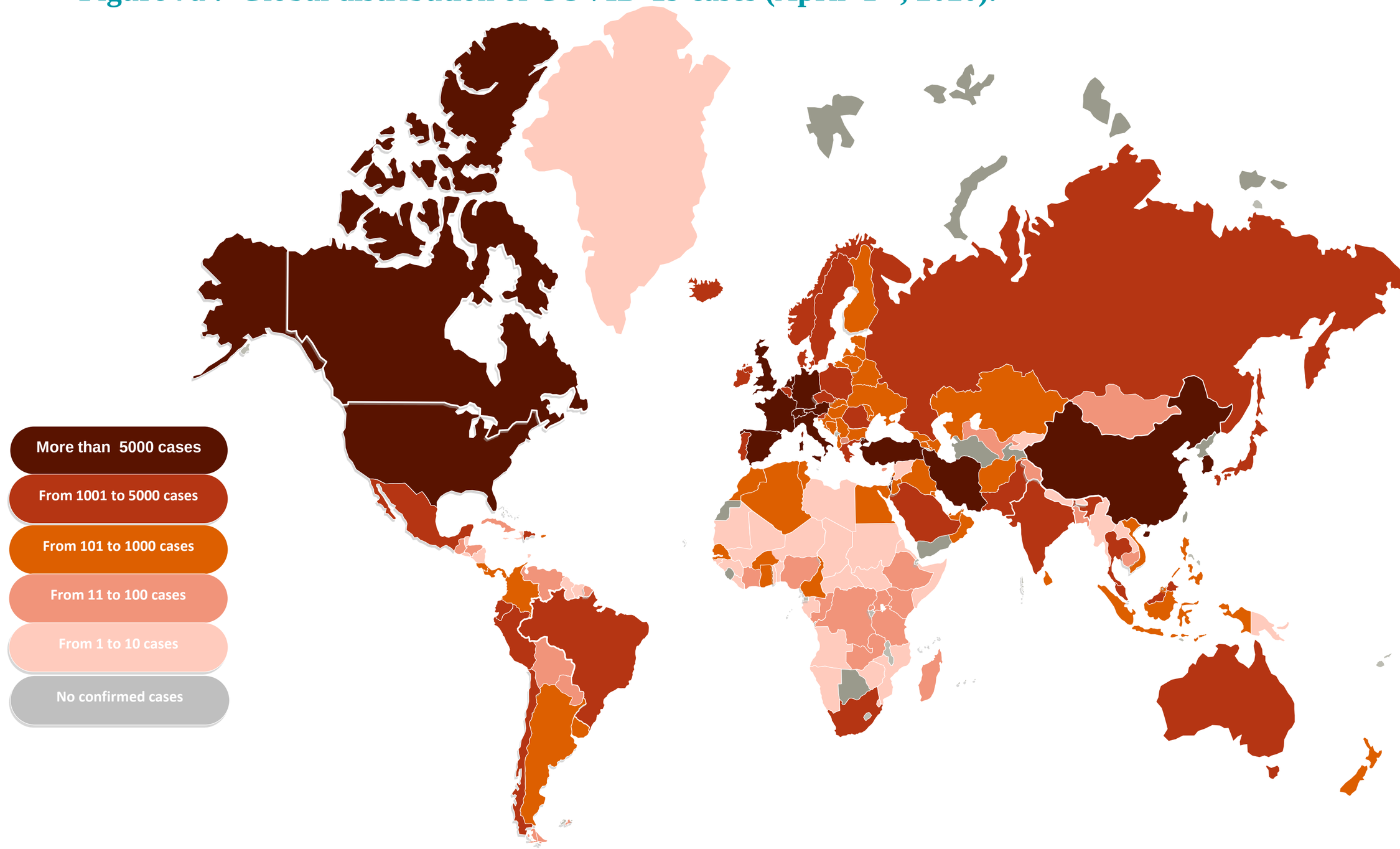
Figure 6: Global daily new deaths due to COVID-19 (January 21 to April 1st , 2020).



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

Epidemiology

Figure 7a : Global distribution of COVID-19 cases (April 1st , 2020).



Map chart published by Abu Dhabi Public Health Center 2020.

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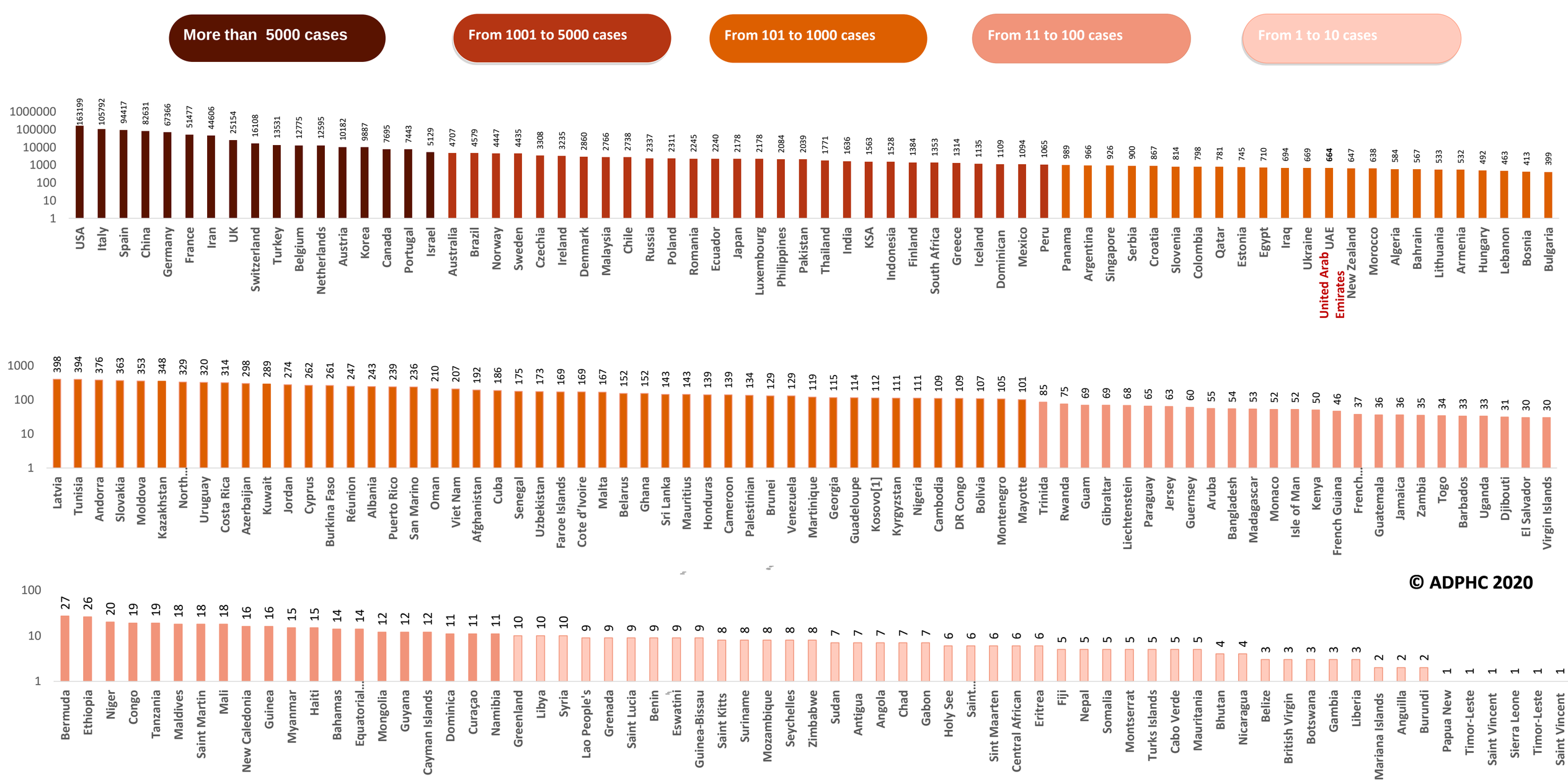
Figure 7B: Bar chart illustrate the global distribution of COVID19 cases 1st April , 2020)



Map chart published by Abu Dhabi Public Health Center 2020.

Data resources: WHO

Vaccine

Article 1: Correlation between universal BCG vaccination policy and reduced morbidity and mortality for COVID-19: an epidemiological study

Published: March 24, 2020 **Link:** Click Here

This article is summarized by subject matter Expert

Summary:

Since its publication as a non-peer reviewed preprint, this provocative study has made quite a stir in the media for its potential significance. It is primarily an epidemiological study showing correlation between public policy on Bacillus Calmette-Guérin (BCG) vaccination and protection from COVID-19-induced morbidity and mortality. BCG is a childhood vaccine against tuberculosis (TB) and one of the oldest vaccines still in use. Other than protection against TB, previous data has shown that it can induce non-specific immunity that can be protective against respiratory infections and sepsis. In this study, the authors investigated potential correlations between BCG vaccine and protection against COVID-19 in countries with medium to high income levels. Their analysis revealed that BCG vaccine not only reduced mortality rates, but also slowed the spread of infection in these countries as follows:

1. Countries with universal BCG vaccination **(n = 55)** had lower mortality than those that never had such a policy **(n = 5; p = 8.64e-04).** This may explain the higher mortality observed in Italy, Spain and US versus Japan or China, for example.
2. Countries that initiated BCG vaccination earlier (e.g. Brazil in 1920 or Japan in 1947) had lower mortality rates (0.0573 & 0.28 per million, respectively) than those that started it later (e.g., Iran in 1984 with a mortality rate of 19.7 per million inhabitants). This also might explain why there has been less spread of infection in Japan despite less stringent social isolation policies.
3. Countries that started BCG vaccination earlier (more older people protected) but then dropped it since it was not necessary had lower mortality (e.g., Denmark with 2.3 deaths/million) than ones that that started it later and then dropped it (e.g., Spain with 29.5 deaths/million).
4. Countries with universal BCG vaccination had less infections than those that never had such a policy (59 ± 23 vs 265 ± 135; p = 0.0064). For e.g., Japan verses Italy, Spain, or the US.

Article 1 continued: Correlation between universal BCG vaccination policy and reduced morbidity and mortality for COVID-19: an epidemiological study

Published: March 24, 2020 **Link:** Click Here

This article is summarized by subject matter Expert

Summary:

Reflection from the reviewer:

Implications: The study is preliminary since the data used for the analysis is based on only the last 3 months while the number of countries in the two groups analyzed were skewed (n = 55 vs 5). However, due to its significant results, each country should review its national policy on BCG vaccination and effect of COVID-19 in the population. For e.g., this study suggests that countries such as UAE, India, and Pakistan that have universal BCG vaccination policy in place, the spread of SARS-CoV-2 and mortality rate from COVID-19 should be much less than what is being predicted, based on current models. Additionally, it raises important questions that should be looked at by policy makers of each country such as the effect of vaccine strain and schedule on disease severity. The UAE, for instance, could try correlating the nationalities of the individuals with severe COVID-19 disease or people who have died with their BCG vaccine status to predict which nationality/group will be more susceptible to COVID-19 in the country.

Note that there are currently multiple Clinical trials to assess the effect of BCG vaccine in enhancing the immune system of high risk individuals (elderlies and health care worker) to fight against covid19 initiated in Germany, Australia , and other countries.

Epidemiology

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Article 2: Likelihood of survival of coronavirus disease 2019

Published: **March 30, 2020** **Link:** **Click Here**

Summary:

- A case fatality ratio of an infectious disease estimates the proportion of the individuals diagnosed with a disease who will die from that particular disease. During the epidemic, measuring case fatality ratio for COVID-19 is very challenging. However, this ratio is a very important part of the data that will help to guide the response from government and public health authorities across the globe.
- It has been argued that crude case fatality ratios obtained by simply dividing the number of deaths by the number of cases can be misleading as there can be a period of 2-3 weeks between a person developing symptoms and that case being detected and reported.
- Estimates of case fatality ratios might differ from country to country because there are differences in prevention, control, and mitigation policies implemented, and furthermore the case **fatality ratio is substantially affected by preparedness and availability of health care.**
- In China, the average duration **from symptom onset to death to be 17.8 days** and from symptom **onset to hospital discharge to be 24.7 days** that gives an estimate of the overall case fatality ratio of **1.38%** that becomes higher as age increases

	SARS	COVID-19 (95% CrI)	Influenza (95% CI)
Overall	14–15%	1·38% (1·23–1·53)	0·0024% (0·0004–0·0051)
Age, years			
0–4	0·0%	0·0026% (0·0003–0·038)	0·0013% (0·0004–0·0036)
5–9			0·0004% (0·0001–0·0012)
10–14		0·0148% (0·003–0·076)	
15–17	0·5%		
18–19			0·0018% (0·001–0·0042)
20–24		0·06% (0·032–0·132)	
25–29	1·6%		
30–34		0·146% (0·103–0·256)	
35–39	10·0%		
40–44		0·30% (0·22–0·42)	
45–49	13·0%		
50–54		1·3% (1·0–1·6)	0·009% (0·0056–0·0214)
55–59	25·3%		
60–64		4·0% (3·4–4·6)	
65–69	52·5%		0·0487% (0·0341–0·0789)
70–74		8·6% (7·5–10·0)	
75–79	69·6%		
≥80		13·4% (11·2–15·9)	

Figure: **Comparison of case fatality ratios for SARS,[1,8] COVID-19,[7] and seasonal influenza[9]**
SARS=severe acute respiratory syndrome. COVID-19=coronavirus disease 2019. CrI=credible interval.

- Although the fatality rate is **low among younger people**, it is very clear that any suggestion of COVID-19 being just **like influenza is not true - even for those 20-29 years old, once infected with SARS-CoV-2, the mortality rate is 33 times higher as compared to that from seasonal influenza.**
- In China, the strategies of early detection, diagnosis, isolation, and treatment that were applied are likely to be not only useful to control the outbreak, but also contribute to decrease the case fatality ratio of the disease.

Public Health response

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Article: Will financial innovation transform pandemic response?
Published: March 30, 2020 **Link: Click Here**

- The Pandemic Emergency Financing Facility (PEF) pandemic bond was facilitated by the World Bank to **pre-pool** money for **rapid response ahead** of a disease outbreak. When health crises occur, many countries promise financial **support but do not pay.** The world's first pandemic bond issued **in July, 2017, raising $425 million** from **private investors for Ebola.**
- PEF bond, is based on large private investors put money in advance for 3 years. If there is a qualifying pandemic during this period, some of the money is spent for pandemic response. Otherwise, the investors get **their money back with minimum 10% interest**.

There are three crucial components of the bond need to be understood:

a) The PEF bond have **binding agreement between the World Bank and its investors**. **Regardless of the severity** of an **epidemic**, the release of fund based on predetermined disbursement criteria (which include **confirmed deaths, cross-border spread, and disease growth rate)** if not met, the Bank has no authority to release investors' money. (This criteria was not written for the interest of responders or the sick instead its driven by financial industry priorities.)

b) The contract also specifies that a third-party (also called a calculation agent) judges if disbursement criteria are met. (These agents using modelling system which is not released publically.)

c) The next version of the PEF is in development at the World Bank. Other pre-financed models like African Risk Capacity (ARC) mutual sovereign drought insurance pool use **similar parametric modelling mechanisms to trigger release of funds**.

- New parametric-based instruments are being developed. Famine Action Mechanism (FAM) is a new organization collaborate **with Amazon, Microsoft, Google**, and the insurance companies. It **will use artificial intelligence to identify upcoming food crises and trigger the release of the Bank's designated funds to prevent famine** through early response. If the PEF and ARC **raise concerns about triggering aid** through **black boxed technical schemes**, concerns **will inevitably multiply** as profit-driven private technology giants become involved.

The author calls that these that the bonds' triggers should be publicly negotiated and have open access.