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Scientific Research Monitoring on COVID-19

15 March 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.
- Human coronavirus remains on inanimate surfaces such as metal or glass for up to 9 days, but can be efficiently inactivated by disinfection, suggesting that effects on SARS-CoV2 could be similar.
- 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

- **Clinical feature and transmission:** Older age, elevated d-dimer levels, and high SOFA score could help clinicians to identify at an early stage those patients with COVID-19 who have poor prognosis. . Viral shedding can be prolonged up to 37 days.

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

Involving Antimicrobial Stewardship Programs in COVID-19 Response Efforts:

All Hands on Deck

Evaluation of the Effectiveness of Surveillance and Containment Measures for the

First 100 Patients with COVID-19 in Singapore — January 2–February 29, 2020\

From Containment to Mitigation of COVID-19 in the US

Supporting the Health Care Workforce During the COVID-19 Global Epidemic

WHO daily report

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14th March 2020

- 13 new countries/territories/areas have reported cases of COVID-19 in the past 24 hours.
- The Director-General said yesterday that Europe has now become the epicenter of the pandemic, with more reported cases and deaths than the rest of the world combined, apart from China. Many countries are now acting on the eight pillars of WHO's Strategic Preparedness and Response Plan.
- WHO published guidance on 'Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected' on 13 March. The document provides clinicians with updated interim guidance on timely, effective, and safe supportive management of patients with suspected and confirmed COVID-19.

Epidemiology

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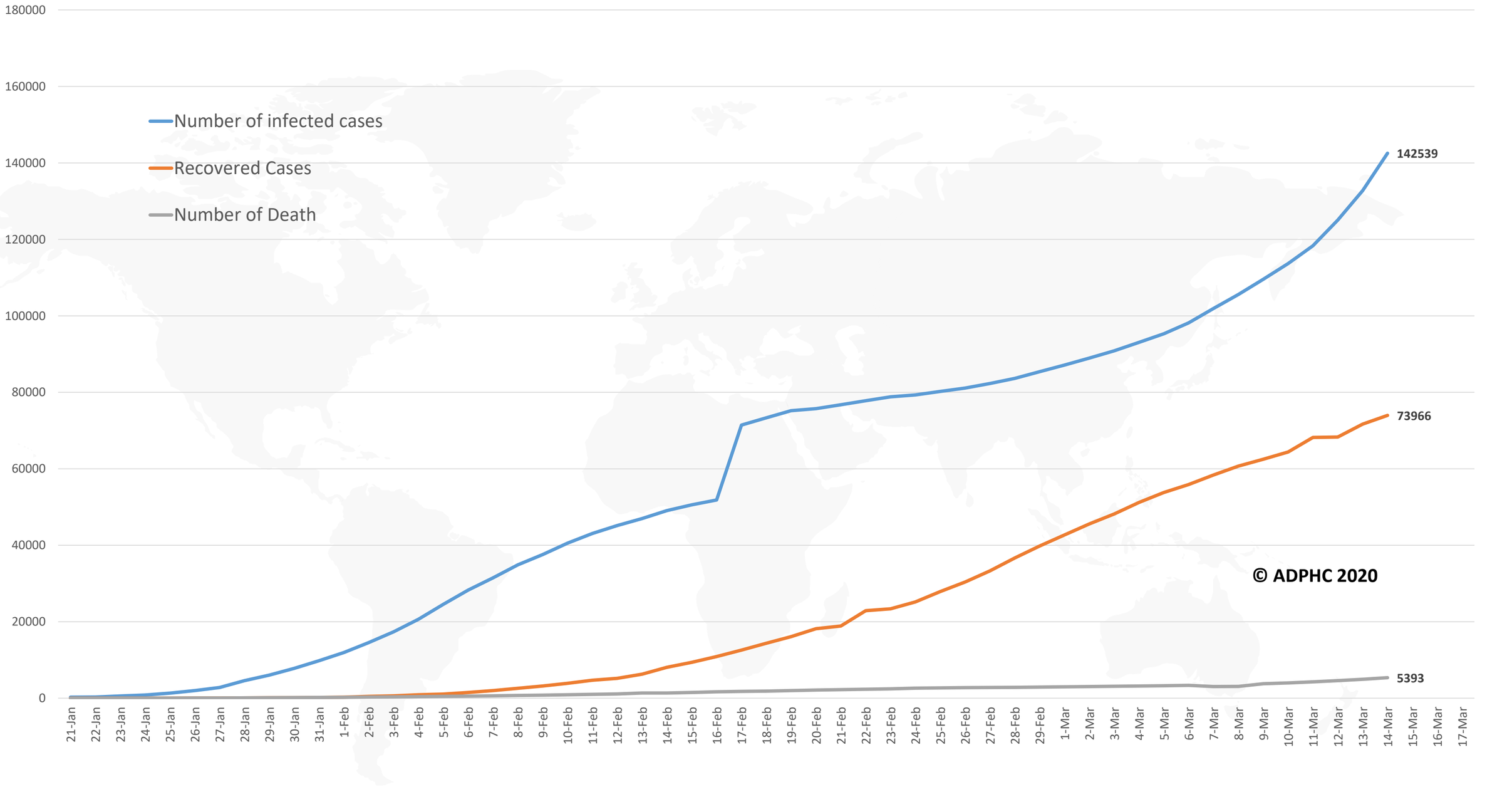
Figure 1: Total number of infected, recovered , and death cases (January 21st to March 14th, 2020)



Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: WHO

Epidemiology

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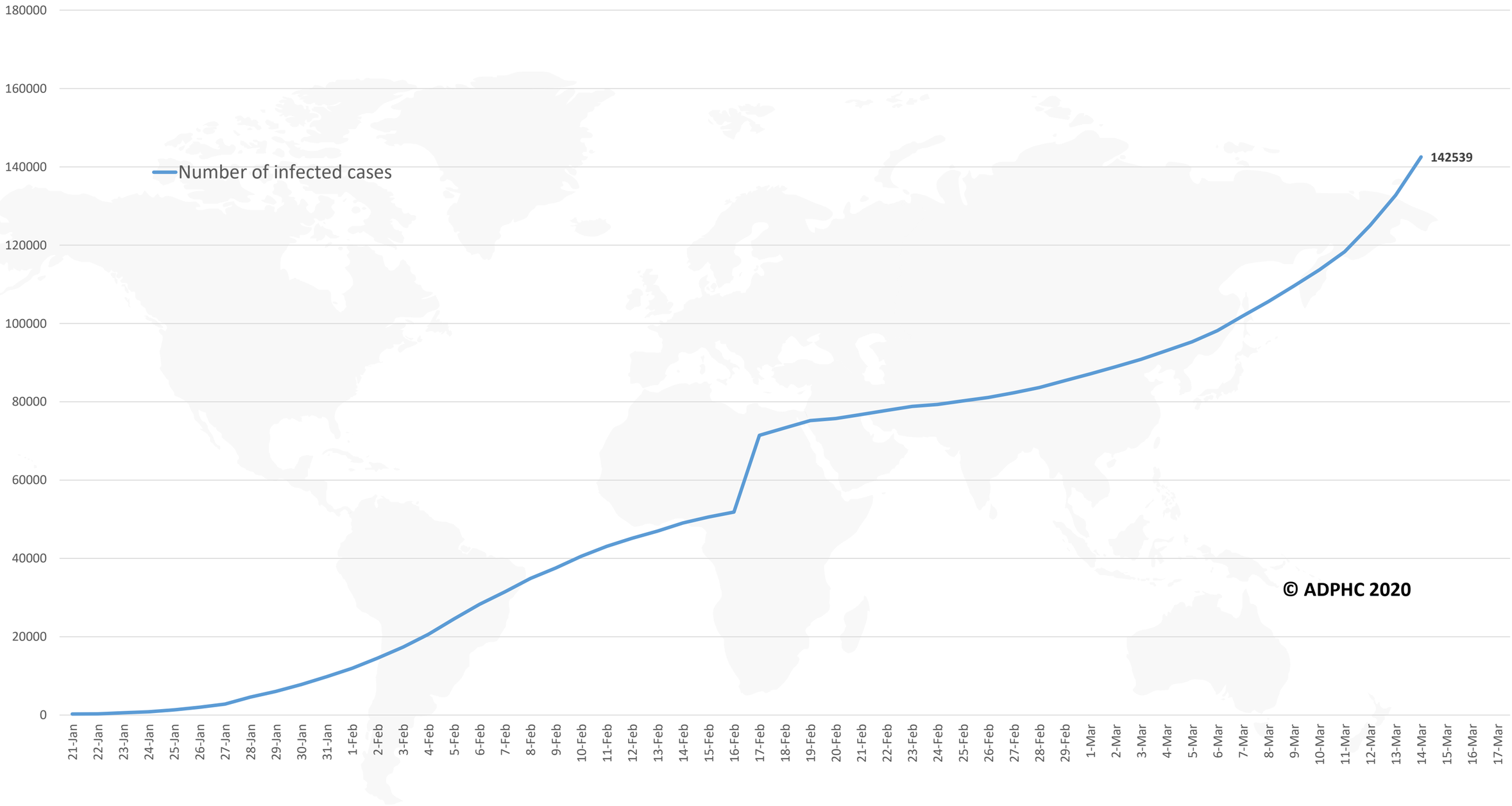
Figure 2: Number of infected COVID-19 cases worldwide (January 21 to March 14, 2020).

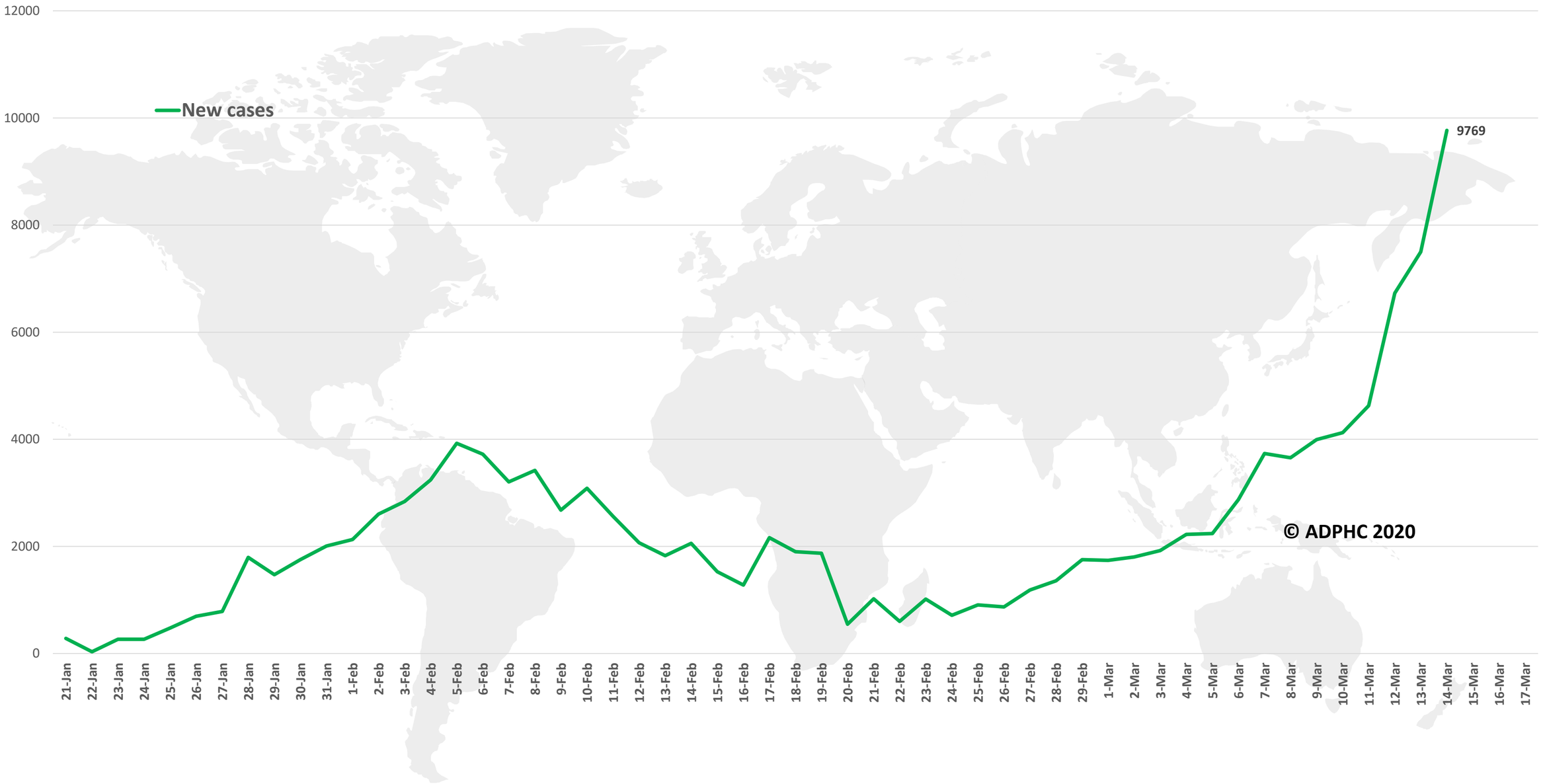


Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: WHO

Epidemiology

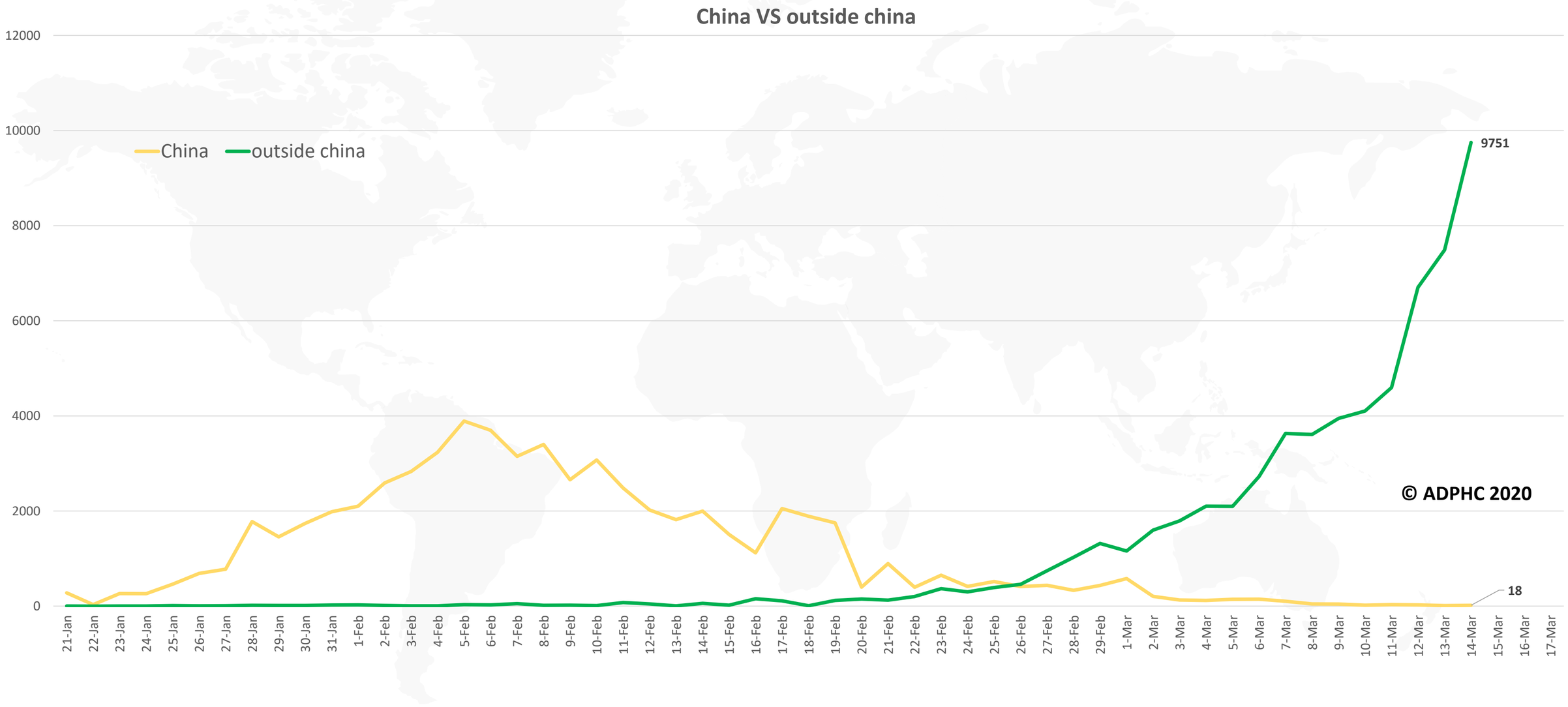
Figure 3: Daily new infected COVID-19 cases worldwide (January 21 to March 14, 2020).



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

Epidemiology

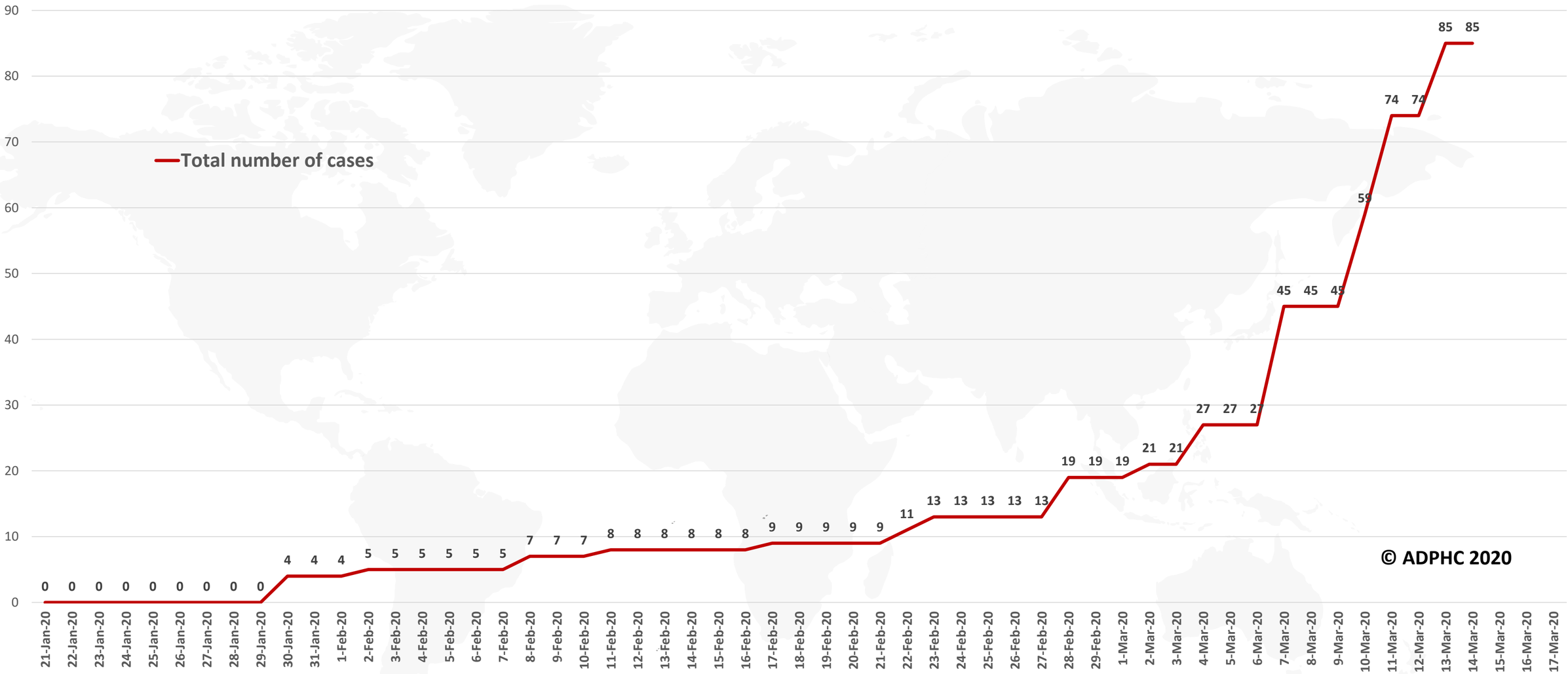
Figure 4: Daily new infected COVID-19 cases reported by China and the rest of the world (January 21 to March 14, 2020).



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

Epidemiology

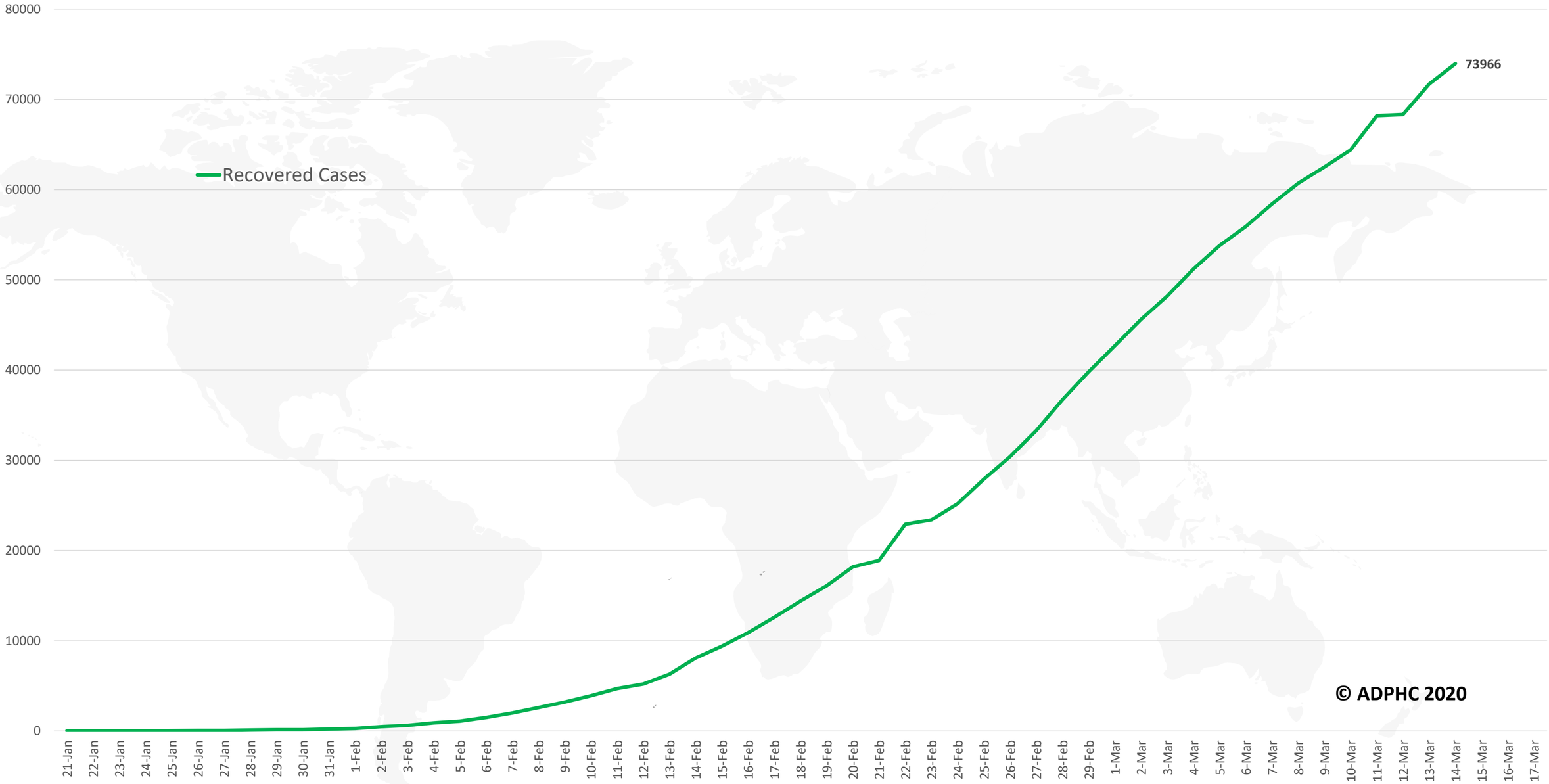
Figure 5: Total number of COVID-19 cases in UAE over time



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

Epidemiology

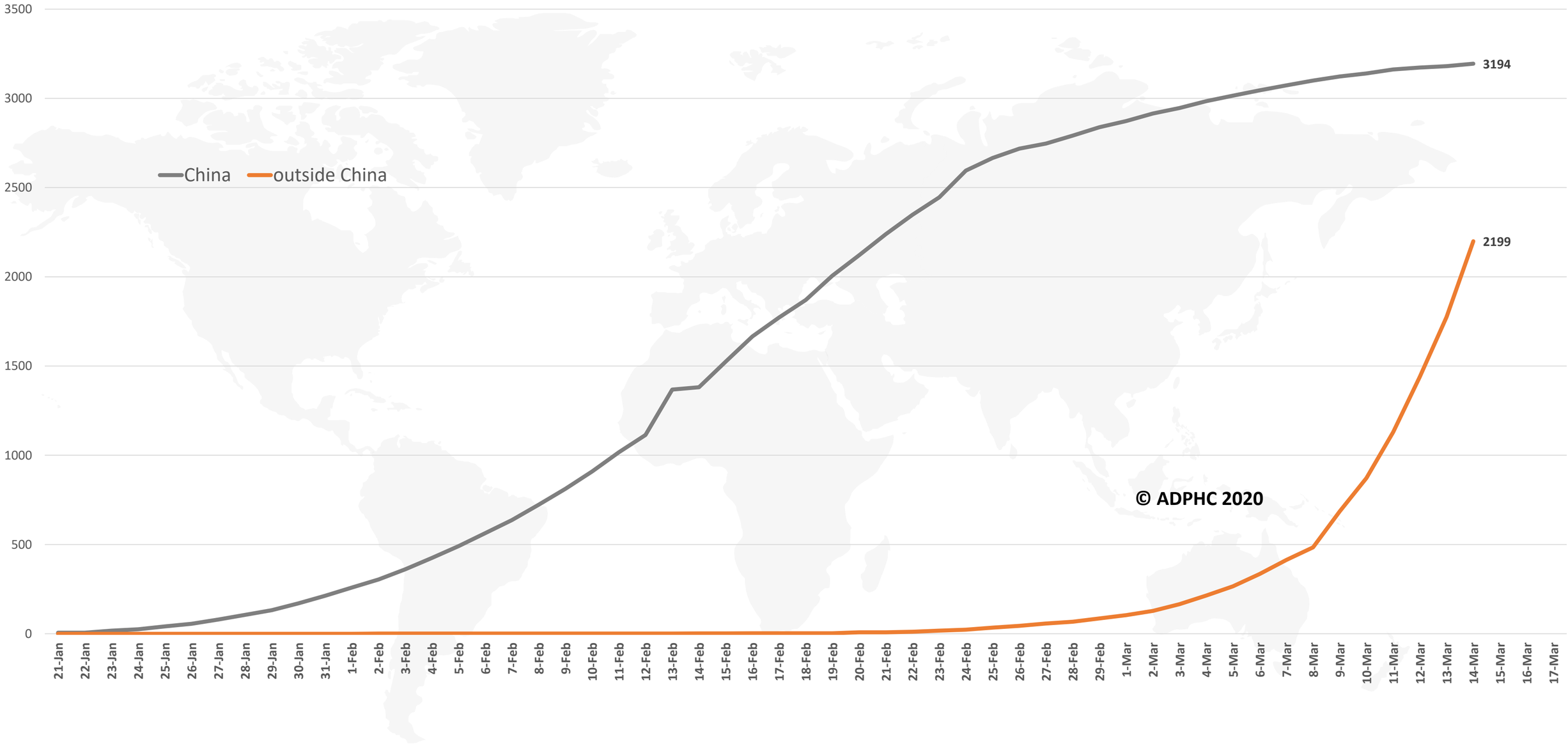
Figure 6: Number of recovered COVID-19 cases worldwide (January 21 to March 14, 2020).



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

Epidemiology

Figure 7: Daily number of death due to COVID-19 reported by China and the rest of the world (January 21 to March 14, 2020).

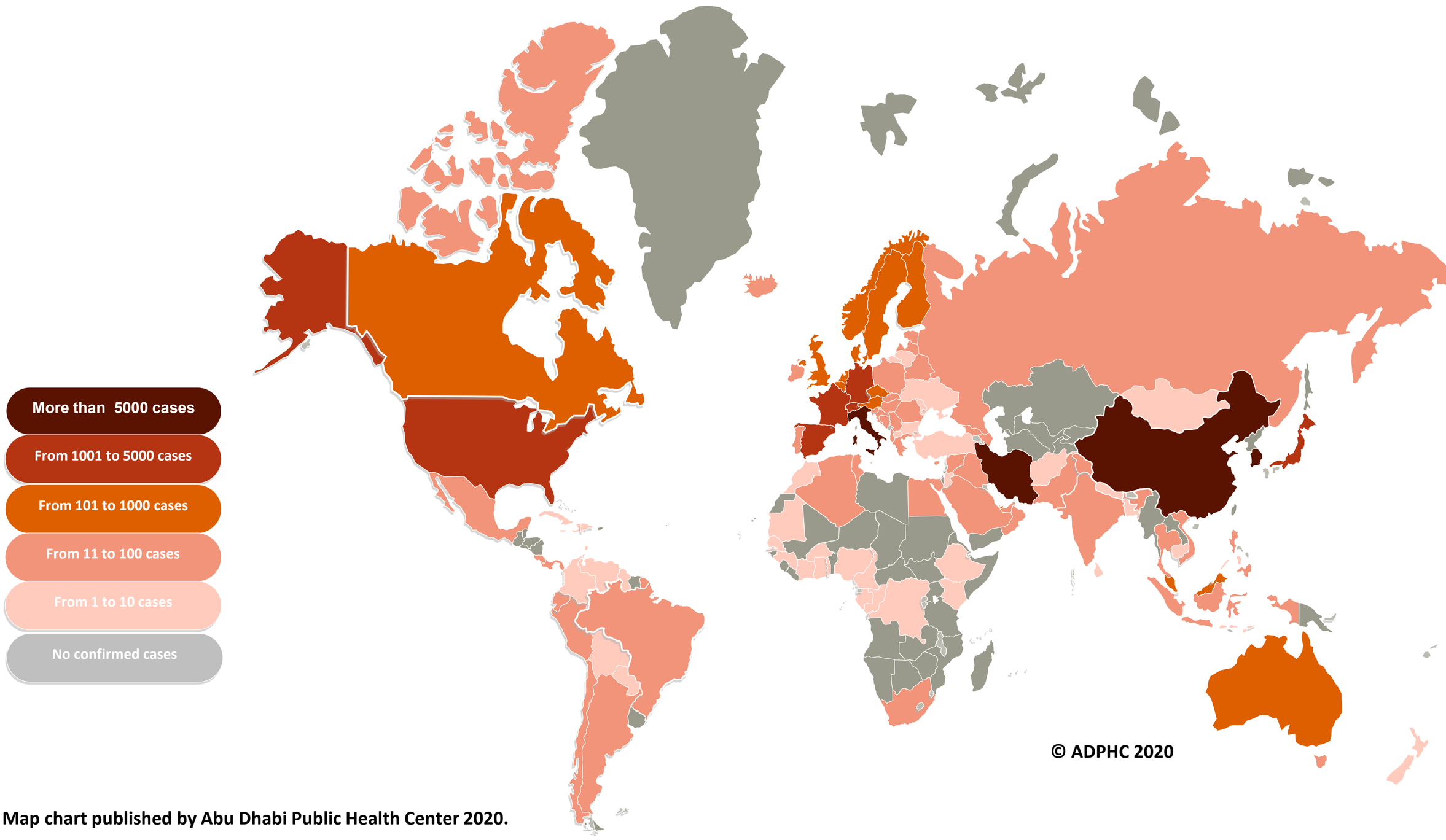


Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: WHO

Epidemiology

Figure 8A: Global distribution of COVID-19 cases (January 21 to March 14, 2020).



Map chart published by Abu Dhabi Public Health Center 2020.

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Figure 8B: Bar chart illustrate the global distribution of COVID19 cases (January 21st to March 14th, 2020)

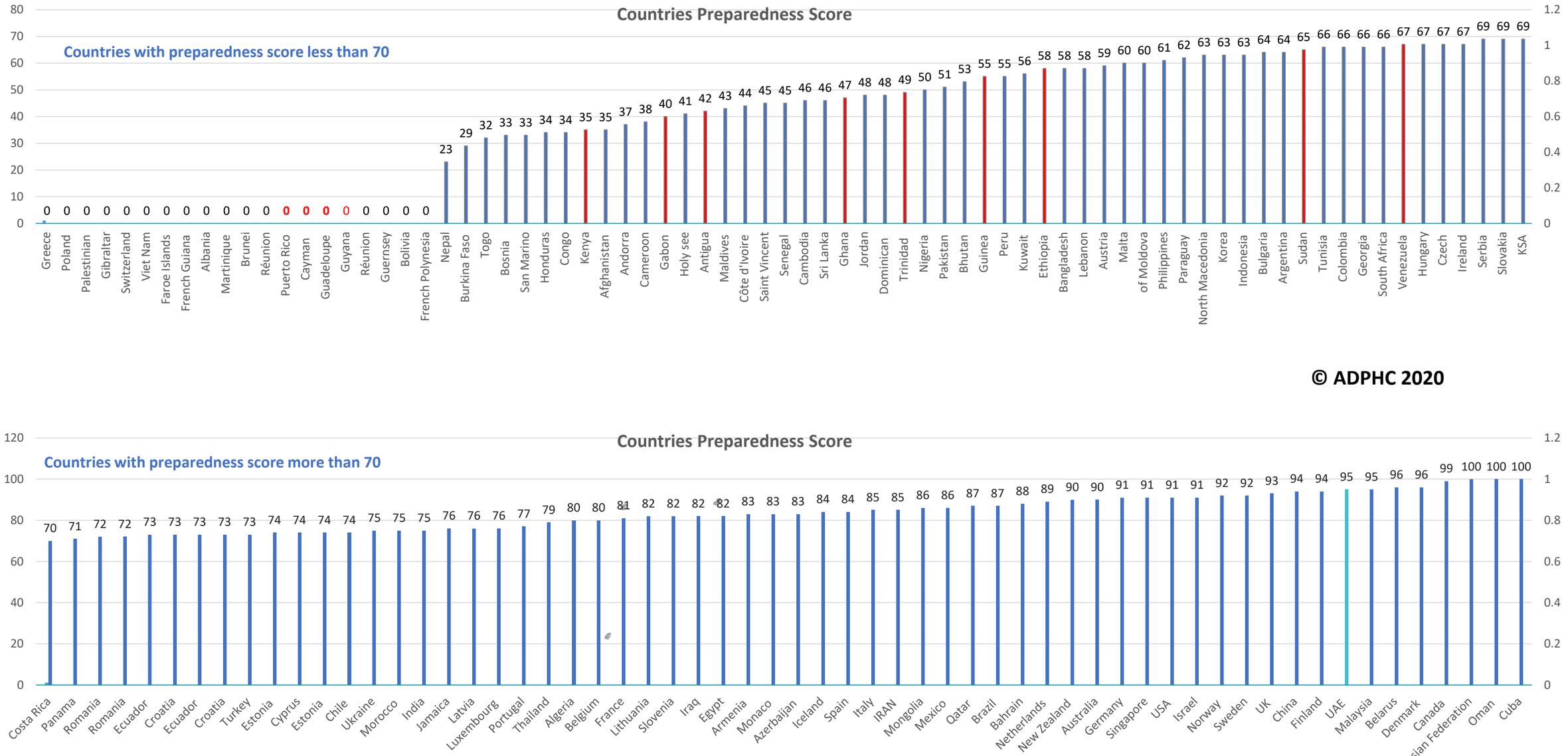
More than 5000 cases | From 1001 to 5000 cases | From 101 to 1000 cases | From 11 to 100 cases | From 1 to 10 cases

Map chart published by Abu Dhabi Public Health Center 2020.

Epidemiology

Figure 9 : Countries capacities to report COVID-19 cases

Figure 9A: Countries' preparedness score in responding to Public health risks and acute events. *



Line graph published by Abu Dhabi Public Health Center 2020.

Data resources : SPAR score , IDVI score

*** Published in 2018**

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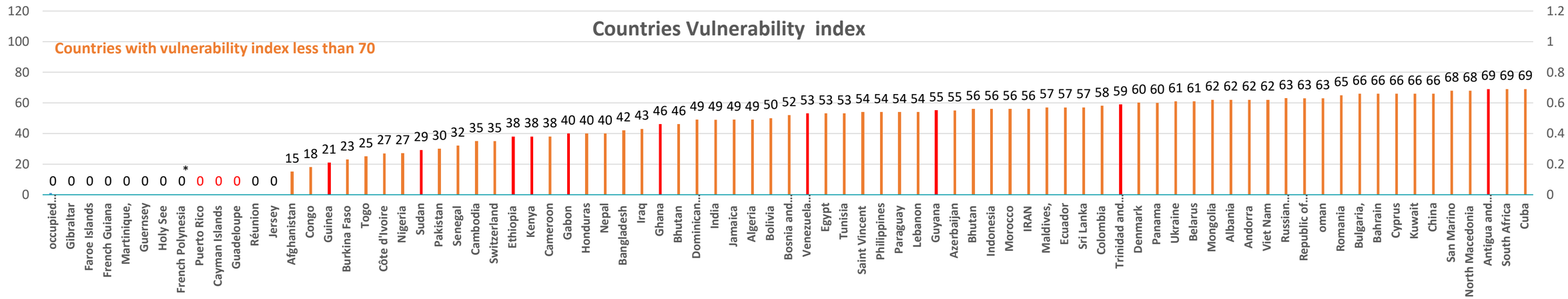
Figure 9: Countries capacities to report COVID-19 cases

Figure 9B: Countries' vulnerability index to spread infectious disease. **



* No available data on those countries.

Line graph published by Abu Dhabi Public Health Center 2020.

Data resources : SPAR score , IDVI score

*** *Published in 2016**

Clinical feature and transmission

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Article 1: Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study **(1/3)**

Published: 11 March 2020
Link: click here

Summery:
This is a retrospective cohort study of adult inpatients in two hospitals in Wuhan, China. Compared between survivors and non survivors. (survivors means discharged) between 29 dec 2019 to 31 Jan 2020.

Findings:

- Older age, elevated d-dimer levels, and high SOFA score could help clinicians to identify at an early stage those patients with COVID-19 who have poor prognosis.
- **Prolonged viral shedding provides the rationale for a strategy of isolation of infected patients and optimal antiviral interventions in the future**.
- Viral shedding was found to be **between 8 and 37 days.** The median duration of viral shedding was 20·0 days (IQR 17·0–24·0) in survivors but continued until death in fatal cases.

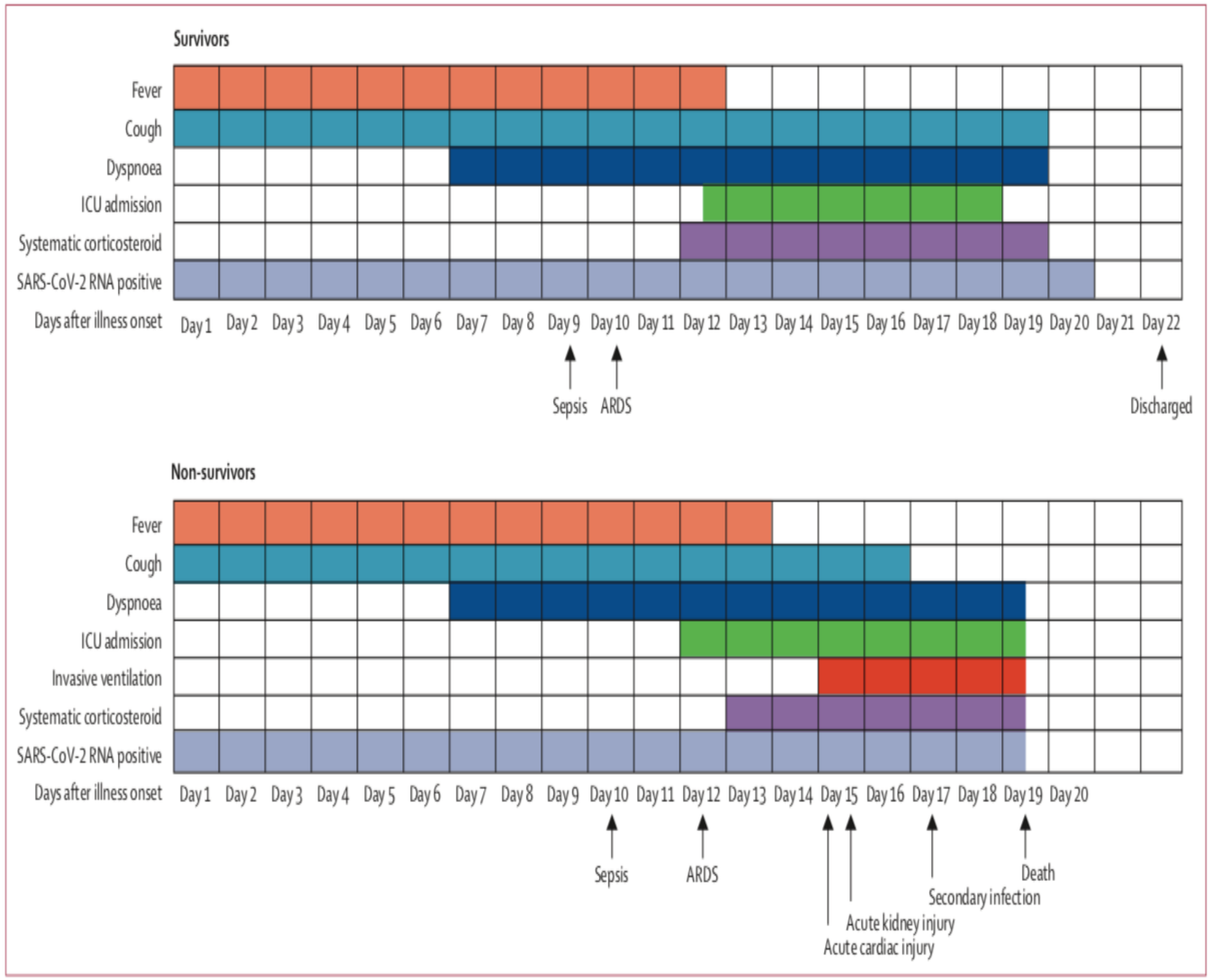

Figure 1: **Clinical courses of major symptoms and outcomes and duration of viral shedding from illness onset in patients hospitalised with COVID-19**
Figure shows median duration of symptoms and onset of complications and outcomes. ICU=intensive care unit. SARS-CoV-2=severe acute respiratory syndrome coronavirus 2. ARDS=acute respiratory distress syndrome. COVID-19=coronavirus disease 2019.

Clinical feature and transmission

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Article : (2/3)

- The study found that the detectable SARS-CoV-2 RNA **persisted for a median of 20 days in survivors** and that it was sustained until death in non-survivors.
- This has important implications for both patient isolation decision making and guidance around the length of antiviral treatment.
- **In severe influenza virus infection, prolonged viral shedding was associated with fatal outcome and delayed antiviral treatment** was an **independent risk factor for prolonged virus detection**. Similarly**, effective antiviral treatment** might **improve outcomes** in COVID-19, although we **did not observe shortening of viral shedding duration after lopinavir/ritonavir treatment** in the current study.

	Total (n=191)	Non-survivor (n=54)	Survivor (n=137)	p value
Treatments*				
Antibiotics	181 (95%)	53 (98%)	128 (93%)	0·15
Antiviral treatment	41 (21%)	12 (22%)	29 (21%)	0·87
Corticosteroids	57 (30%)	26 (48%)	31 (23%)	0·0005
Intravenous immunoglobin	46 (24%)	36 (67%)	10 (7%)	<0·0001
High-flow nasal cannula oxygen therapy	41 (21%)	33 (61%)	8 (6%)	<0·0001
Non-invasive mechanical ventilation	26 (14%)	24 (44%)	2 (1%)	<0·0001
Invasive mechanical ventilation	32 (17%)	31 (57%)	1 (1%)	<0·0001
ECMO	3 (2%)	3 (6%)	0	0·0054
Renal replacement therapy	10 (5%)	10 (19%)	0	<0·0001

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Article : (3/3)

Outcomes				
Sepsis	112 (59%)	54 (100%)	58 (42%)	<0·0001
Respiratory failure	103 (54%)	53 (98%)	50 (36%)	<0·0001
ARDS	59 (31%)	50 (93%)	9 (7%)	<0·0001
Heart failure	44 (23%)	28 (52%)	16 (12%)	<0·0001
Septic shock	38 (20%)	38 (70%)	0	<0·0001
Coagulopathy	37 (19%)	27 (50%)	10 (7%)	<0·0001
Acute cardiac injury	33 (17%)	32 (59%)	1 (1%)	<0·0001
Acute kidney injury	28 (15%)	27 (50%)	1 (1%)	<0·0001
Secondary infection	28 (15%)	27 (50%)	1 (1%)	<0·0001
Hypoproteinaemia	22 (12%)	20 (37%)	2 (1%)	<0·0001
Acidosis	17 (9%)	16 (30%)	1 (1%)	<0·0001
ICU admission	50 (26%)	39 (72%)	11 (8%)	<0·0001
ICU length of stay, days	8·0 (4·0–12·0)	8·0 (4·0–12·0)	7·0 (2·0–9·0)	0·41
Hospital length of stay, days	11·0 (7·0–14·0)	7·5 (5·0–11·0)	12·0 (9·0–15·0)	<0·0001
Time from illness onset to fever, days	1·0 (1·0–1·0)	1·0 (1·0–1·0)	1·0 (1·0–1·0)	0·16
Time from illness onset to cough, days	1·0 (1·0–3·0)	1·0 (1·0–1·0)	1·0 (1·0–4·0)	0·30
Time from illness onset to dyspnoea, days	7·0 (4·0–9·0)	7·0 (4·0–10·0)	7·0 (4·0–9·0)	0·51
Time from illness onset to sepsis, days	9·0 (7·0–13·0)	10·0 (7·0–14·0)	9·0 (7·0–12·0)	0·22
Time from illness onset to ARDS, days	12·0 (8·0–15·0)	12·0 (8·0–15·0)	10·0 (8·0–13·0)	0·65
Time from illness onset to ICU admission, days	12·0 (8·0–15·0)	12·0 (8·0–15·0)	11·5 (8·0–14·0)	0·88
Time from illness onset to corticosteroids treatment, days	12·0 (10·0–16·0)	13·0 (10·0–17·0)	12·0 (10·0–15·0)	0·55
Time from illness onset to death or discharge, days	21·0 (17·0–25·0)	18·5 (15·0–22·0)	22·0 (18·0–25·0)	0·0003
Duration of viral shedding after COVID-19 onset, days	20·0 (16·0–23·0)	18·5 (15·0–22·0)†	20·0 (17·0–24·0)	0·024

Clinical feature and transmission

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Article 2 : Early dynamics of transmission and control of COVID-19: a mathematical modelling study

Published: **11March 2020**

Link: **Click Here**

Summery:

- This article explained the estimation of how transmission in Wuhan varied between December 2019, and February 2020. This estimation was used to assess the potential for sustained human-to-human transmission to occur in locations outside Wuhan if cases were introduced.
- Reproduction number (R_t) is defined as the mean number of secondary cases generated by a typical infectious individual on each day in a full susceptible population.
- R_t varied during January 2020, with median values ranging from 1.6 to 2.6 between Jan 1, 2020, and the introduction of travel restrictions on Jan 23, 2020.
- A decline in R_t in late January, from 2.35 on January 16, one week before the restrictions, to 1.05 on January 31.
- As more cases arrive in international locations with similar transmission potential to Wuhan before these restrictions' measures, it is likely that many chains of transmission will fail to establish initially but might lead to new outbreaks eventually.

Clinical feature and transmission

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Article 3 : SARS-CoV-2 Infection among Travelers Returning from Wuhan, China

Published: 11March 2020

Link: Click Here

Summery:

- This article reported the follow-up of 94 persons who boarded an evacuation flight from Wuhan, China to Singapore on January 30, 2020.
- Understanding the implications of transmission of SARS-CoV-2 infection from persons with asymptomatic or very mild symptomatic cases of Covid-19 is vital for the formulation of containment strategies.