

ABU DHABI PUBLIC
HEALTH CENTRE

مركز أبوظبي
للصحة العامة



Scientific Research Monitoring on COVID-19

29 March 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.)

ABU DHABI PUBLIC
HEALTH CENTRE

مركز أبوظبي
للصحة العامة



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

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

Scientific Research

- **Treatment** :preliminary uncontrolled case series of 5 critically ill patients with COVID-19 and ARDS, administration of convalescent plasma containing neutralizing antibody was followed by improvement in their clinical status.
- **Clinical feature and transmission:** A study tested the Antibodies in Infants Born to Mothers with COVID-19 Pneumonia.

*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

[Association of Coronavirus Disease 2019 \(COVID-19\) With Myocardial Injury and Mortality](#)

[Neonatal Early-Onset Infection With SARS-CoV-2 in 33 Neonates Born to Mothers With COVID-19 in Wuhan, China](#)

[COVID-19: learning from experience](#)

[Covid-19: risk factors for severe disease and death](#)

[Covid-19: Over 300 Italian doctors and scientists call for more testing](#)



WHO daily report

- No new countries/territories/areas reported cases of COVID-19 in the past 24 hours.
- The WHO Director-General highlighted in his media briefing yesterday that the chronic global shortage of personal protective equipment (PPE) is one of the most urgent threats to our collective ability to save lives.
- To date, WHO has shipped almost 2 million individual items of PPE to 74 countries and is preparing to send a similar amount to a further 60 countries.
- Today, WHO published the first edition of the practical manual to set up and manage a severe acute respiratory infection (SARI) treatment centre and a SARI screening facility in health-care facilities. The document has been developed to meet the operational needs emerging with the COVID-19 pandemic.



The WHO Director-General highlights in his media briefing

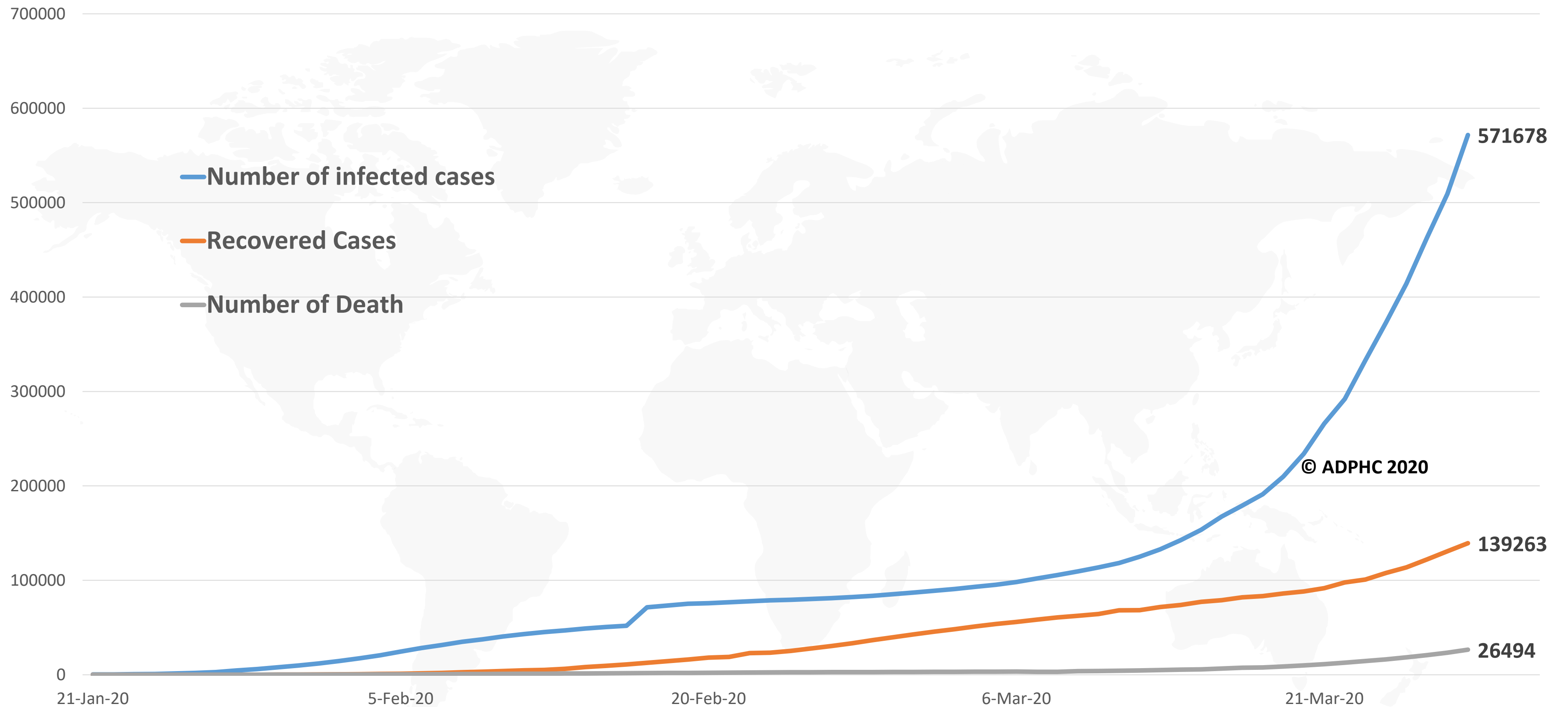
- A briefing was held with around 50 Ministers of Health from around the world at which China, Japan, the Republic of Korea and Singapore shared their experiences and the lessons they have learned.
- **Several common themes emerged about what has worked:**
 - The need for early detection and isolation of confirmed cases;
 - Identification, follow-up and quarantine of contacts;
 - The need to optimize care;
 - And the need to communicate to build trust and engage communities in the fight.
- **Countries also expressed several common challenges:**
 - global shortage of personal protective equipment is now one of the most urgent threats to our collective ability to save lives.
- Also addressed **research and development:**
 - A vaccine is still at least 12 to 18 months away.
 - Regarding therapeutic; Norway and Spain, will shortly be enrolled in the **Solidarity Trial**, which will compare the safety and effectiveness of **four different drugs or drug combinations against COVID-19**.
 - This is a **historic trial** which will **dramatically cut the time needed to generate robust evidence about what drugs work**
 - **More than 45 countries** are contributing to the trial,
 - We also need to ensure that using **unproven drugs does not create a shortage of those medicines to treat diseases for which they have proven effective.**

*We are only at the beginning of this fight.
We need to stay calm, stay united and work together.*

Epidemiology



Figure 1: Total number of infected, recovered, and death cases (January 21st to March 28, 2020)

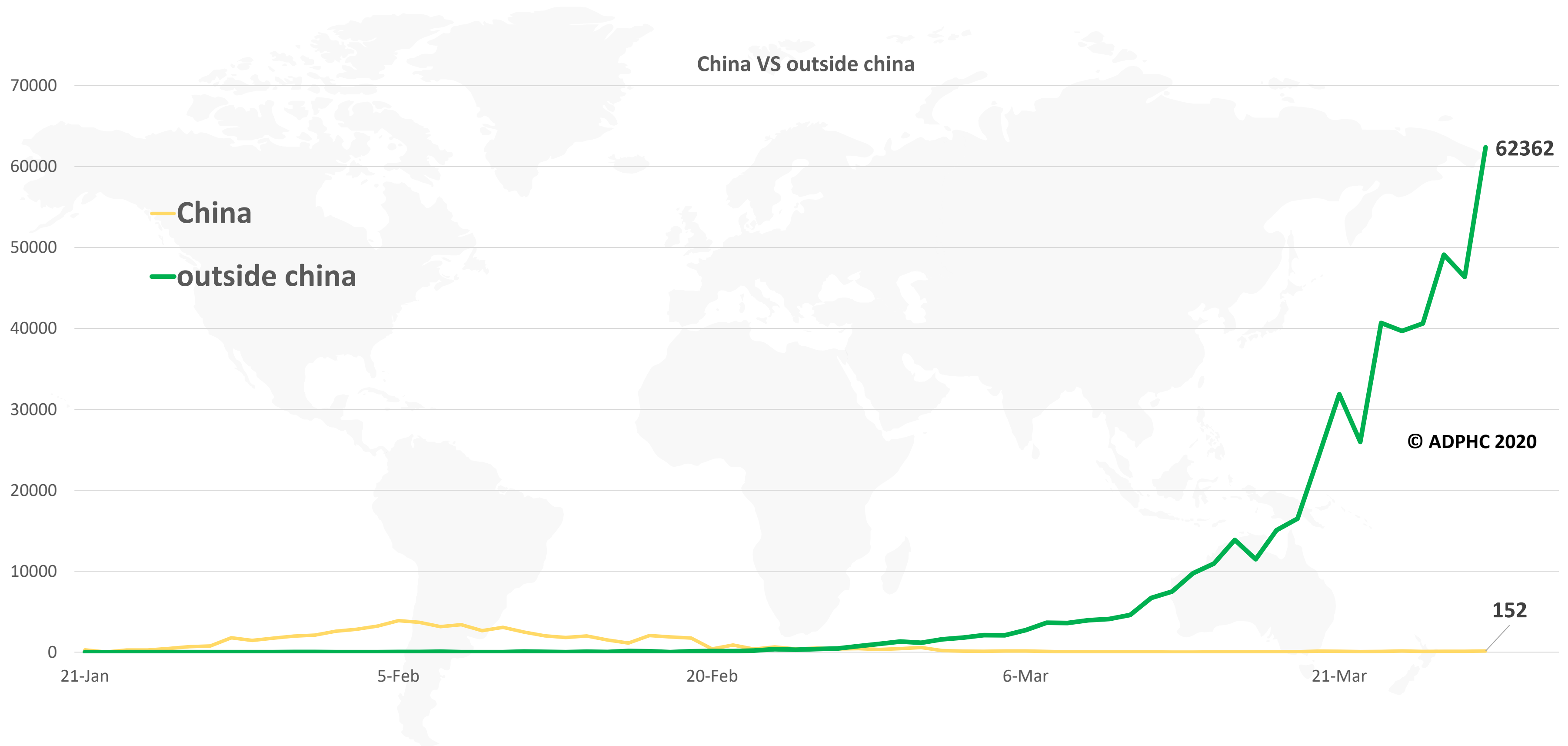


Line graph published by Abu Dhabi Public Health Center 2020.

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



Figure 2a: Daily new infected COVID-19 cases reported between (January 21 to March 28, 2020).



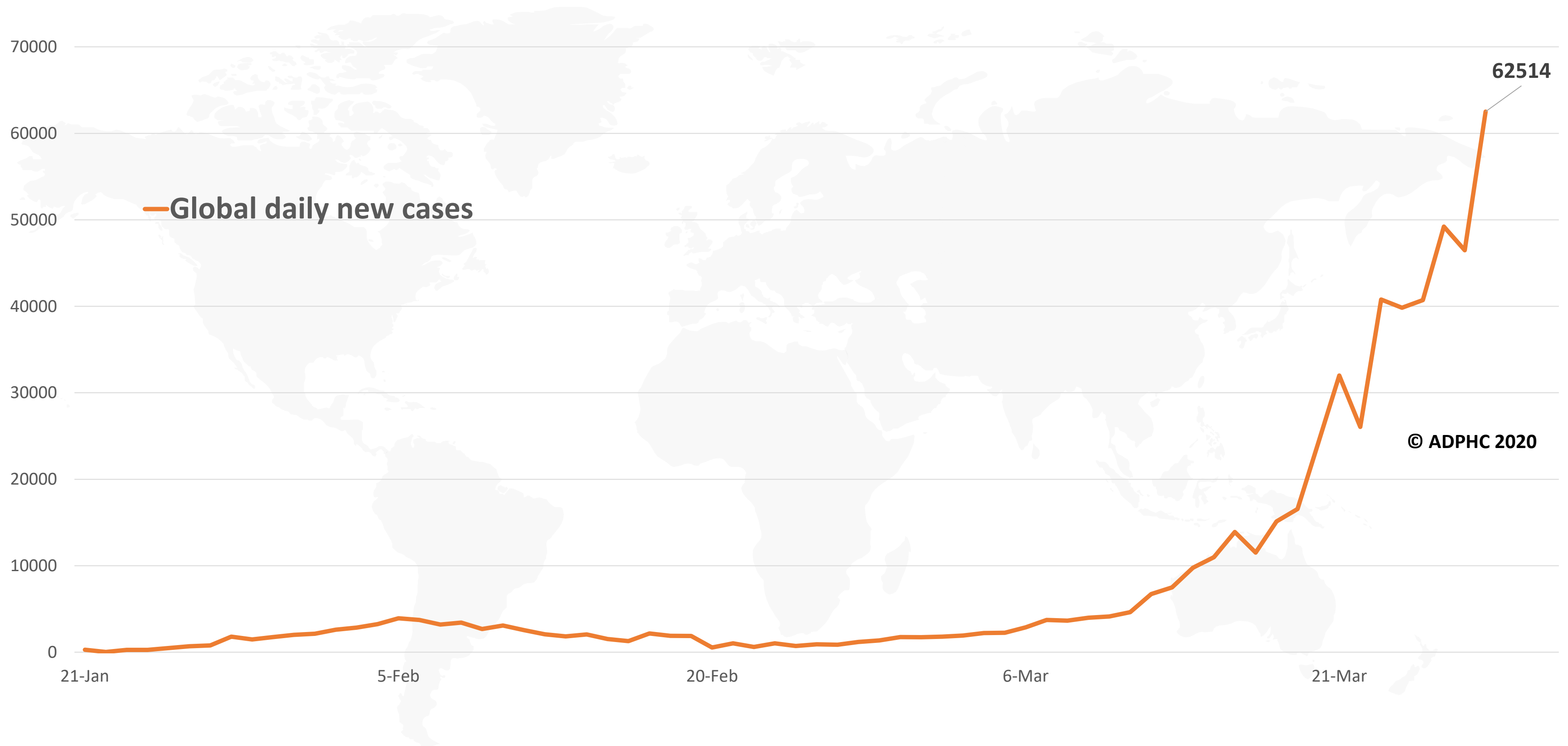
Line graph published by Abu Dhabi Public Health Center 2020.

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

Epidemiology



Figure 2b: Global daily new infected COVID-19 cases reported between (Jan 21 to March 28, 2020).



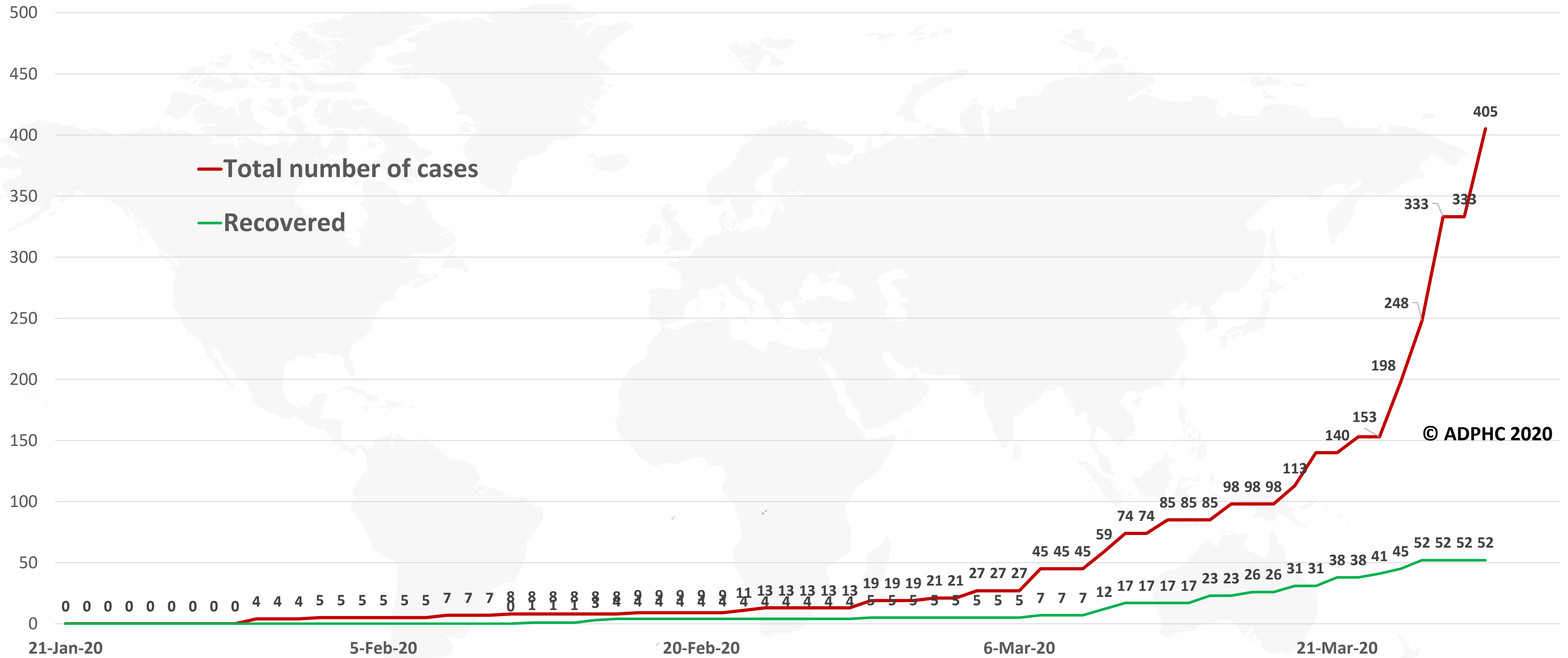
Line graph published by Abu Dhabi Public Health Center 2020.

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

Epidemiology



Figure 3: Total number of COVID-19 infected and recovered cases in UAE over time



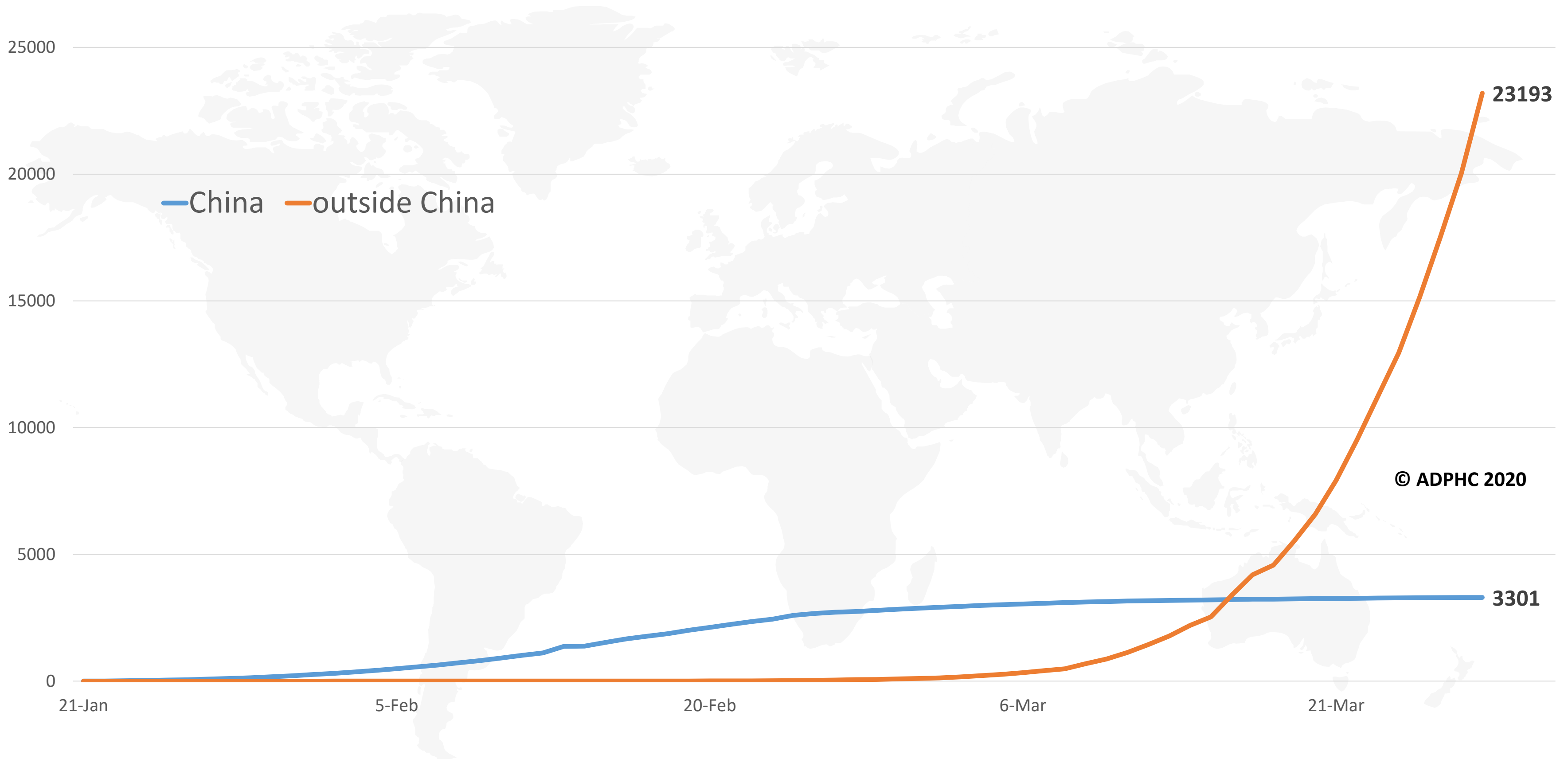
Line graph published by Abu Dhabi Public Health Center 2020.

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

Epidemiology



Figure 4a: Total number of death due to COVID-19 reported by China and the rest of the world (January 21 to March 28, 2020).



Line graph published by Abu Dhabi Public Health Center 2020.

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

Epidemiology



Figure 4b: Total number of global deaths due to COVID-19 (January 21 to March 28, 2020).

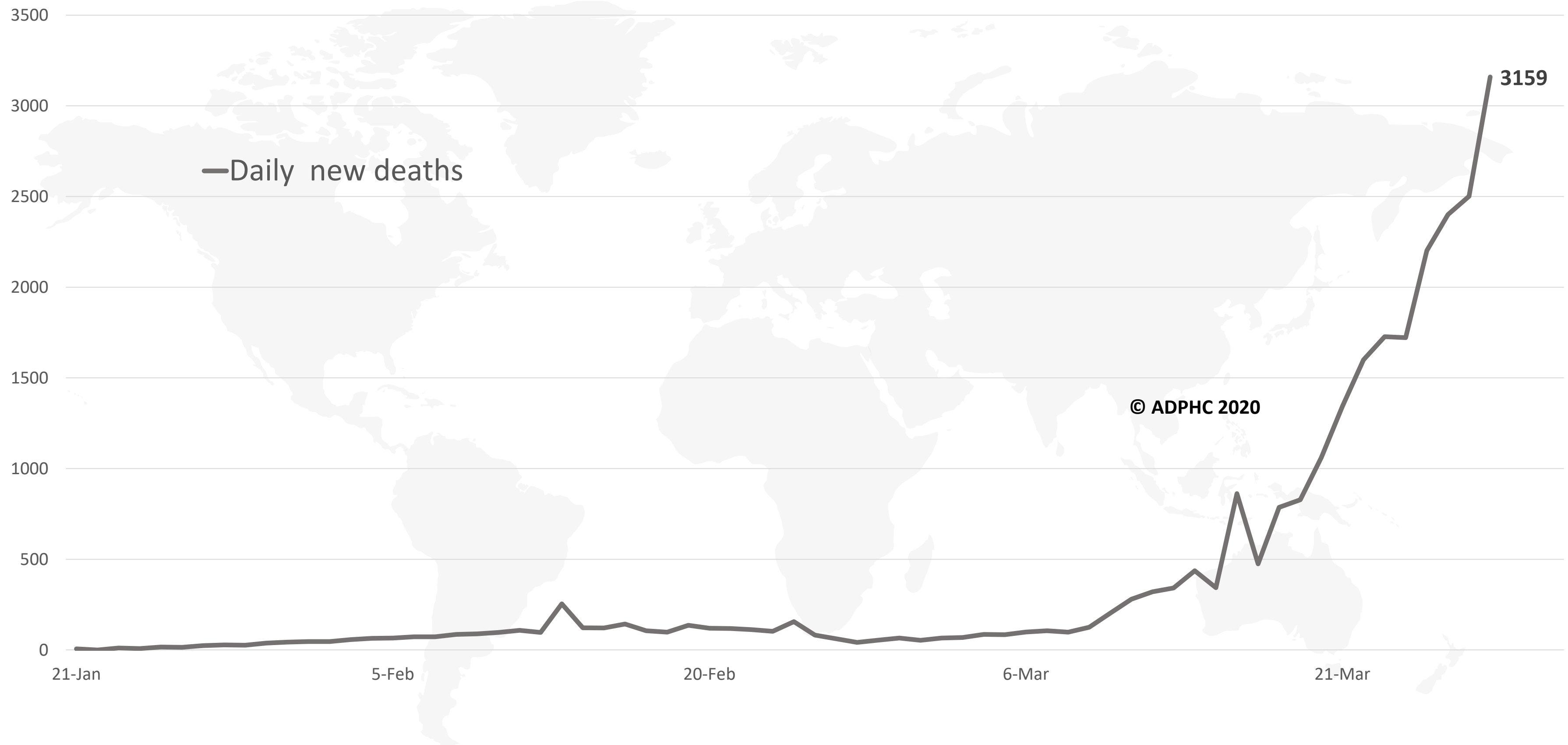


Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#)



Figure 5: Global daily new deaths due to COVID-19 (January 21 to March 28, 2020).



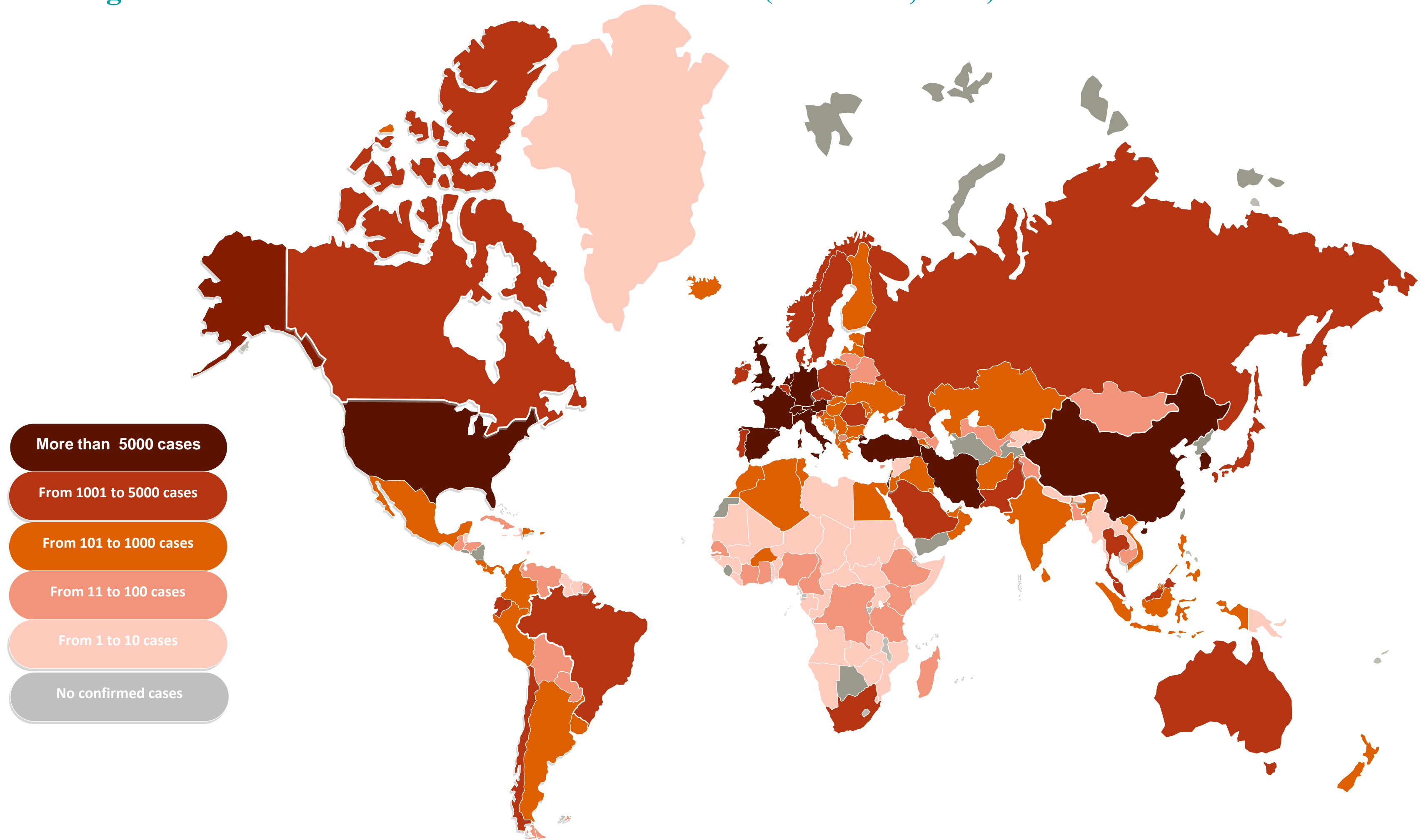
Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#)

Epidemiology



Figure 6A: Global distribution of COVID-19 cases (March 28, 2020).

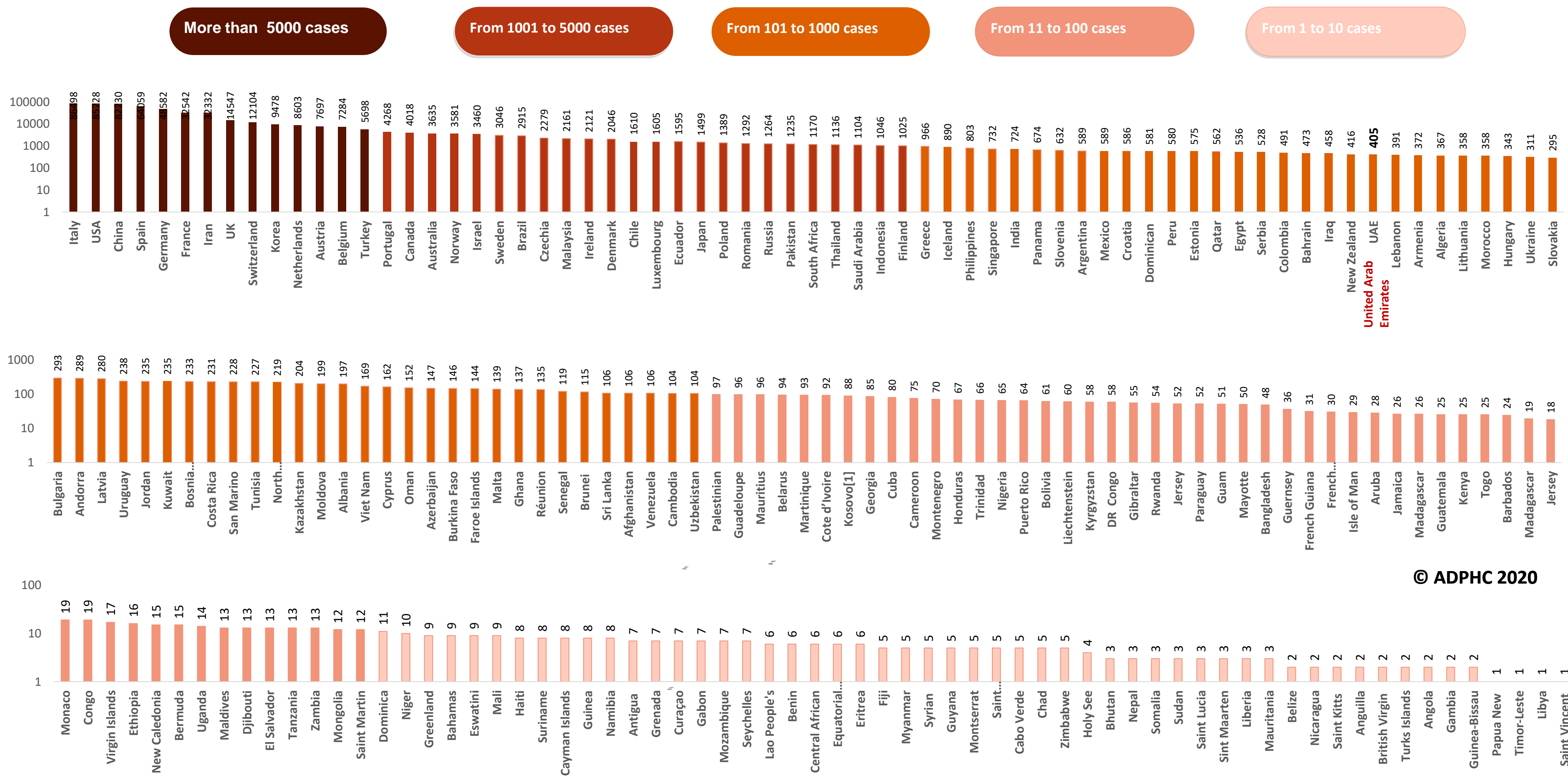


Map chart published by Abu Dhabi Public Health Center 2020.

Epidemiology



Figure 6B: Bar chart illustrate the global distribution of COVID19 cases (March 28, 2020)



© ADPHC 2020

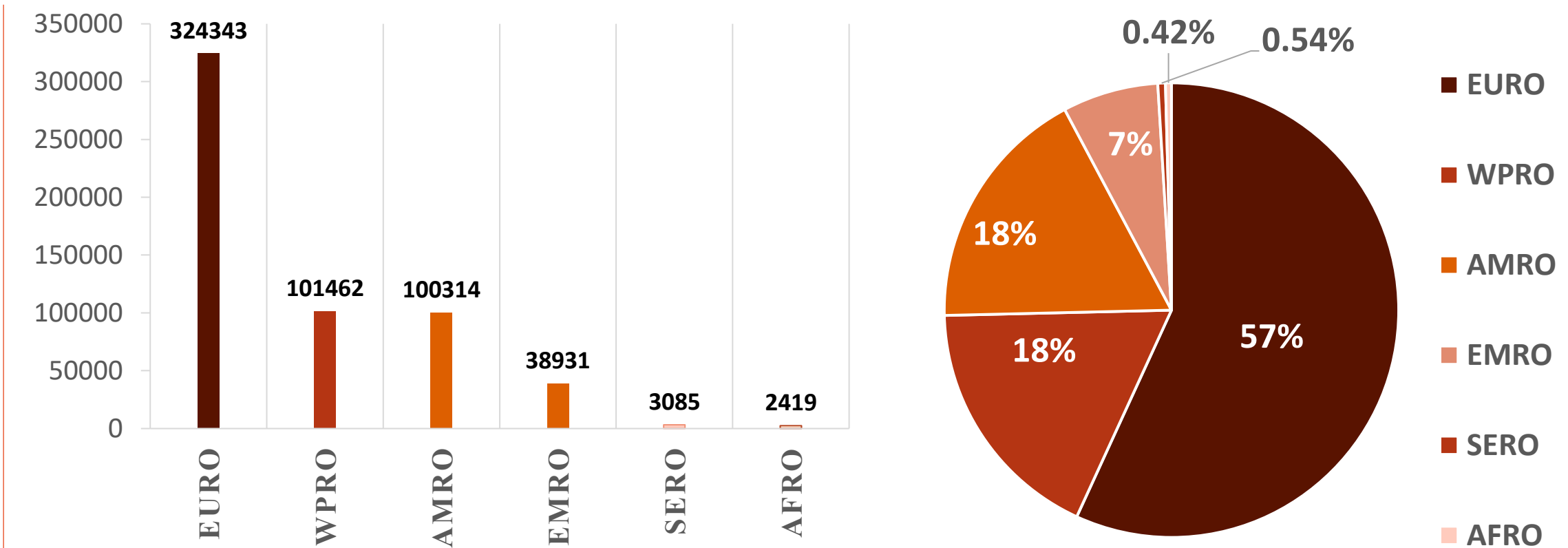
Map chart published by Abu Dhabi Public Health Center 2020.

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

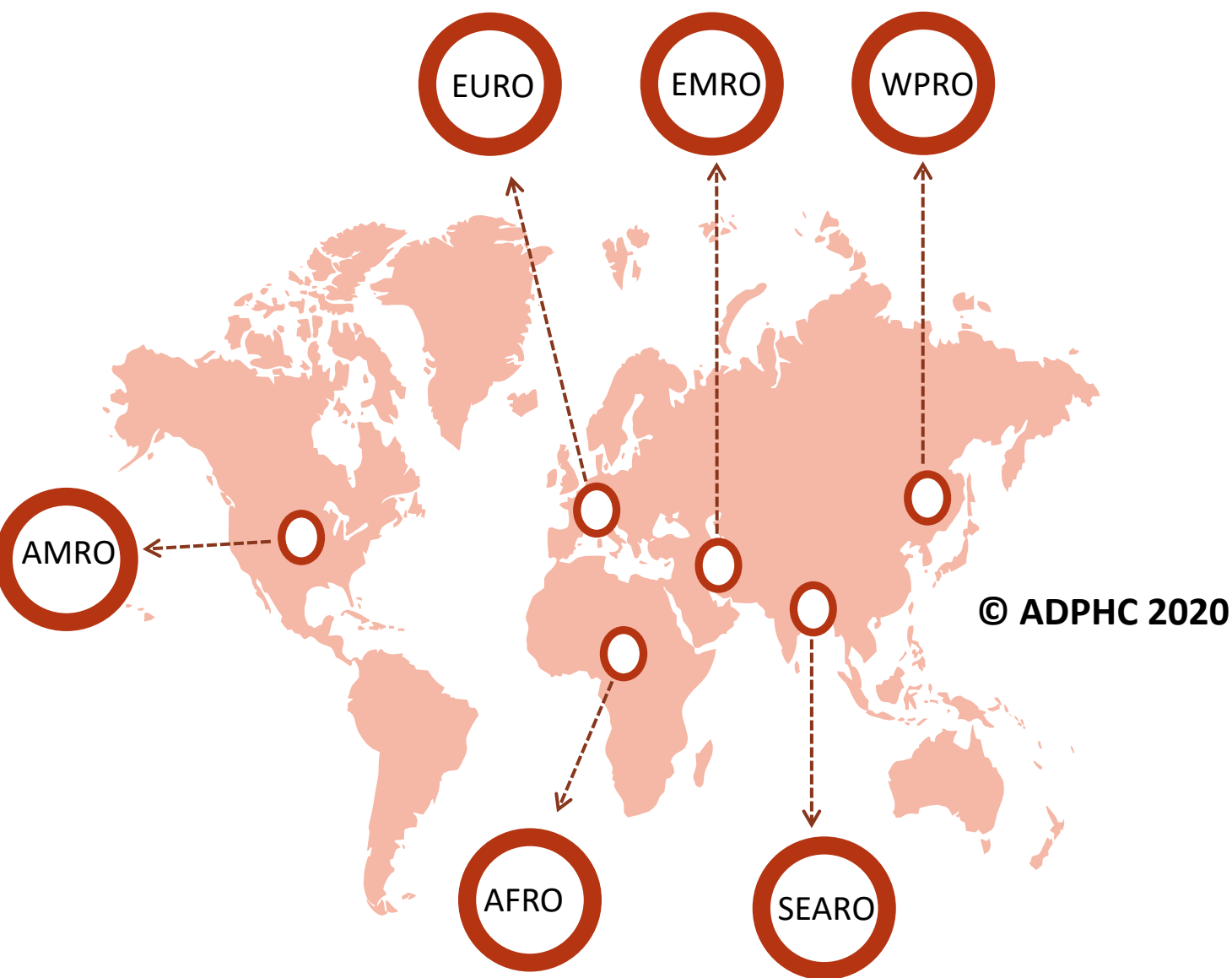
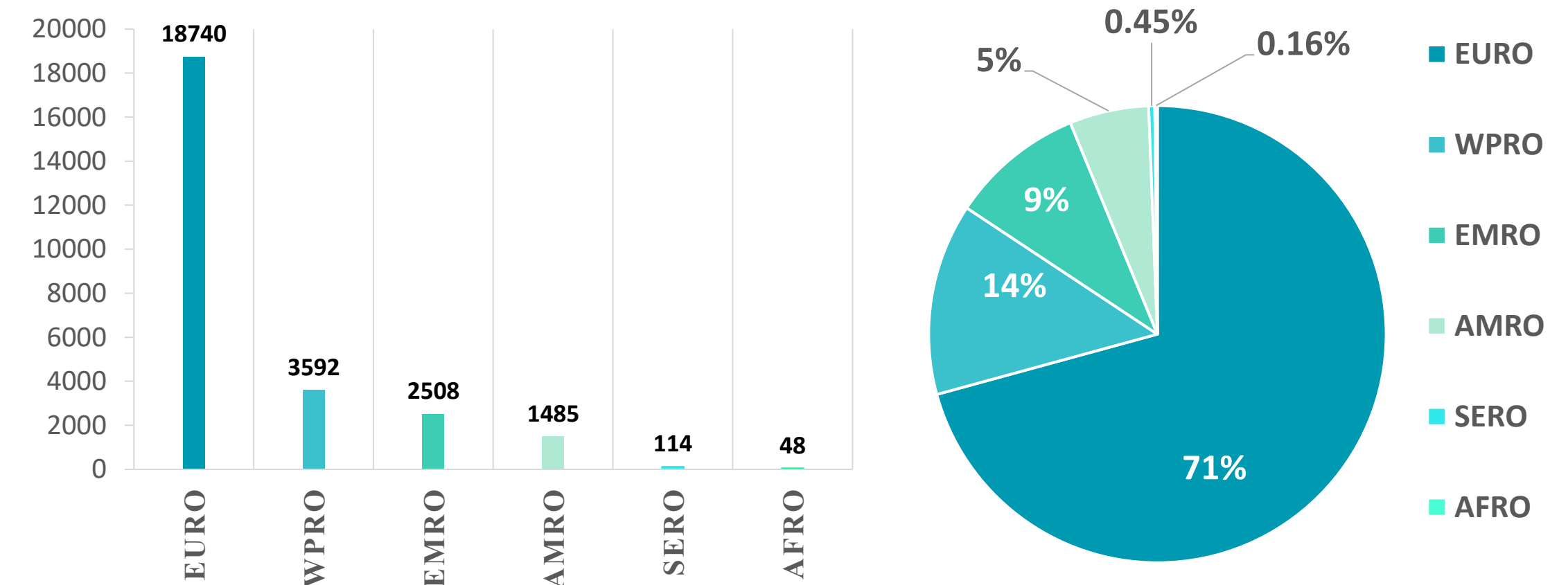


Figure 7: illustrate the Global distribution of COVID19 cases per region (March 28, 2020)

COMPERATIVE ANALYSIS OF INFECTED CASES PER REGION



COMPERATIVE ANYALSIS OF DEATH CASES PER REGION



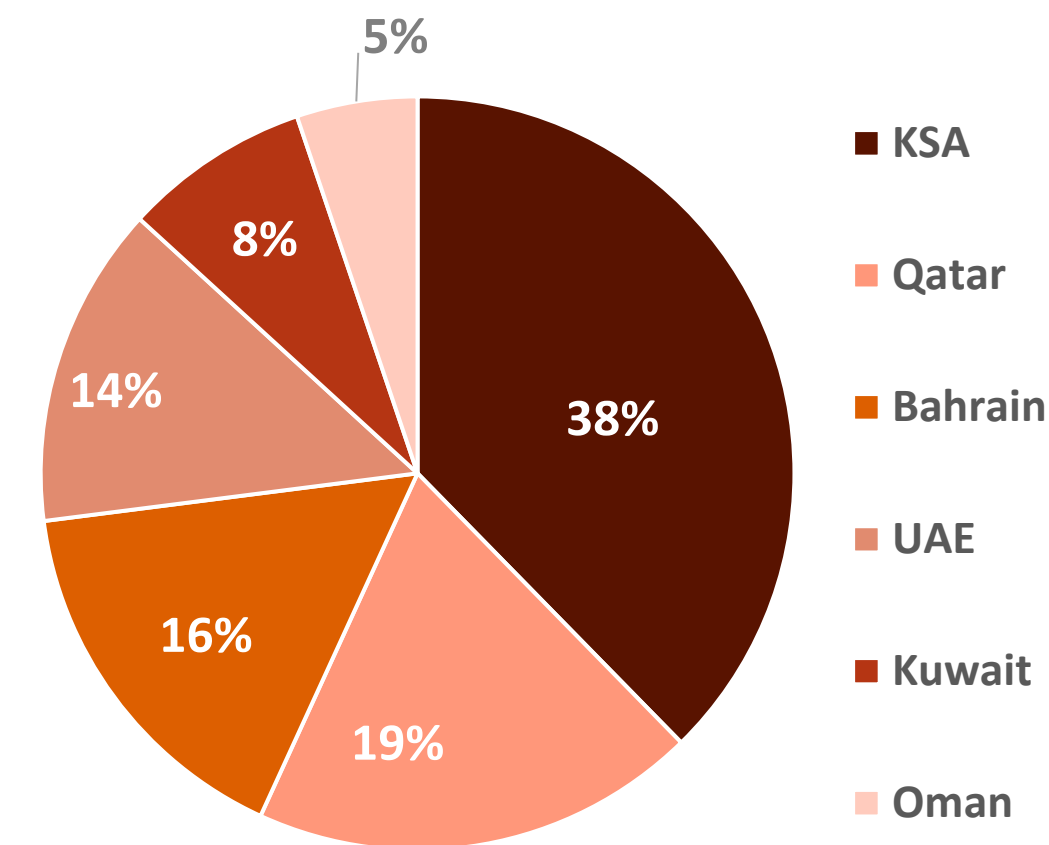
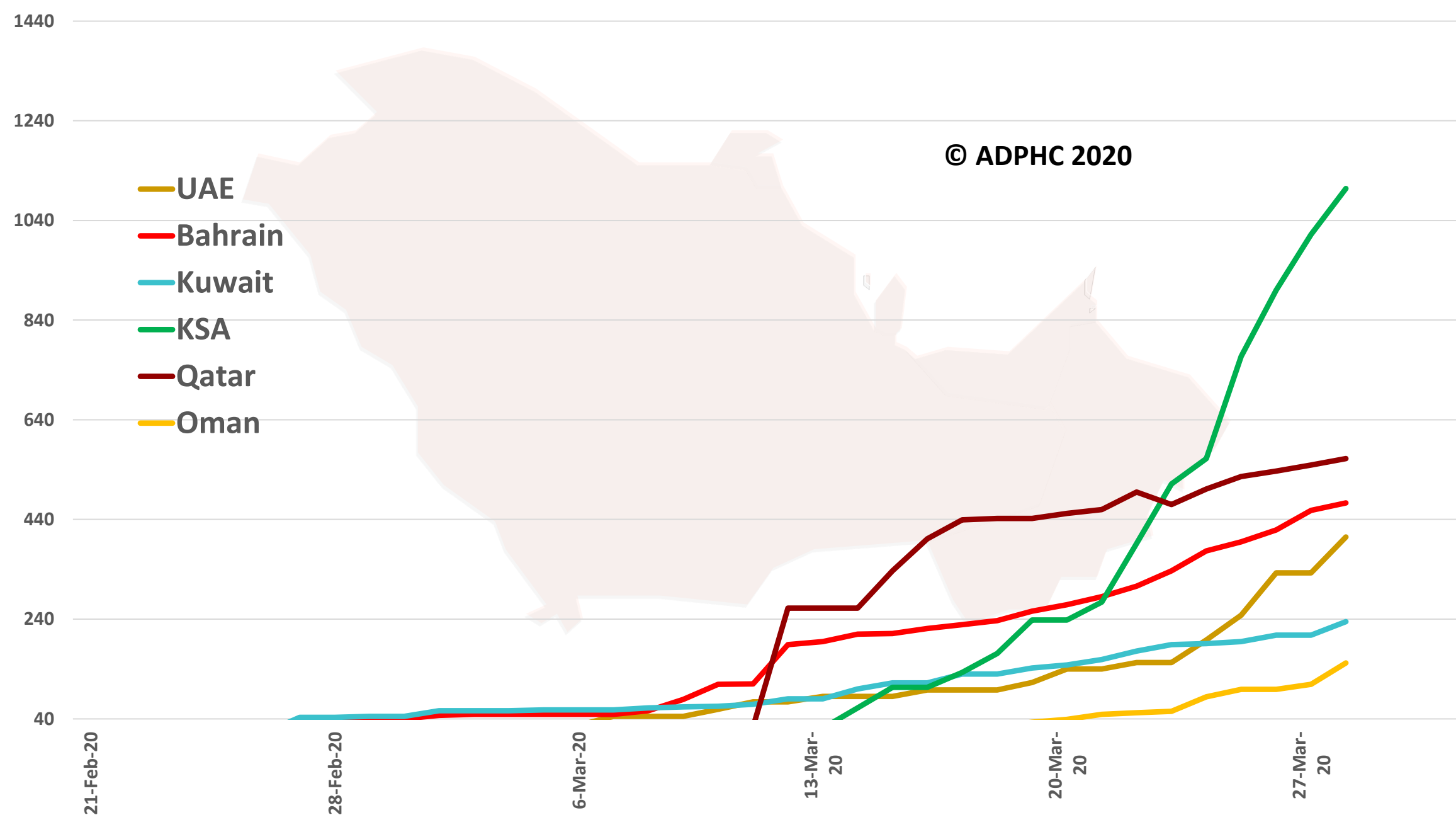
Map chart published by Abu Dhabi Public Health Center 2020.

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

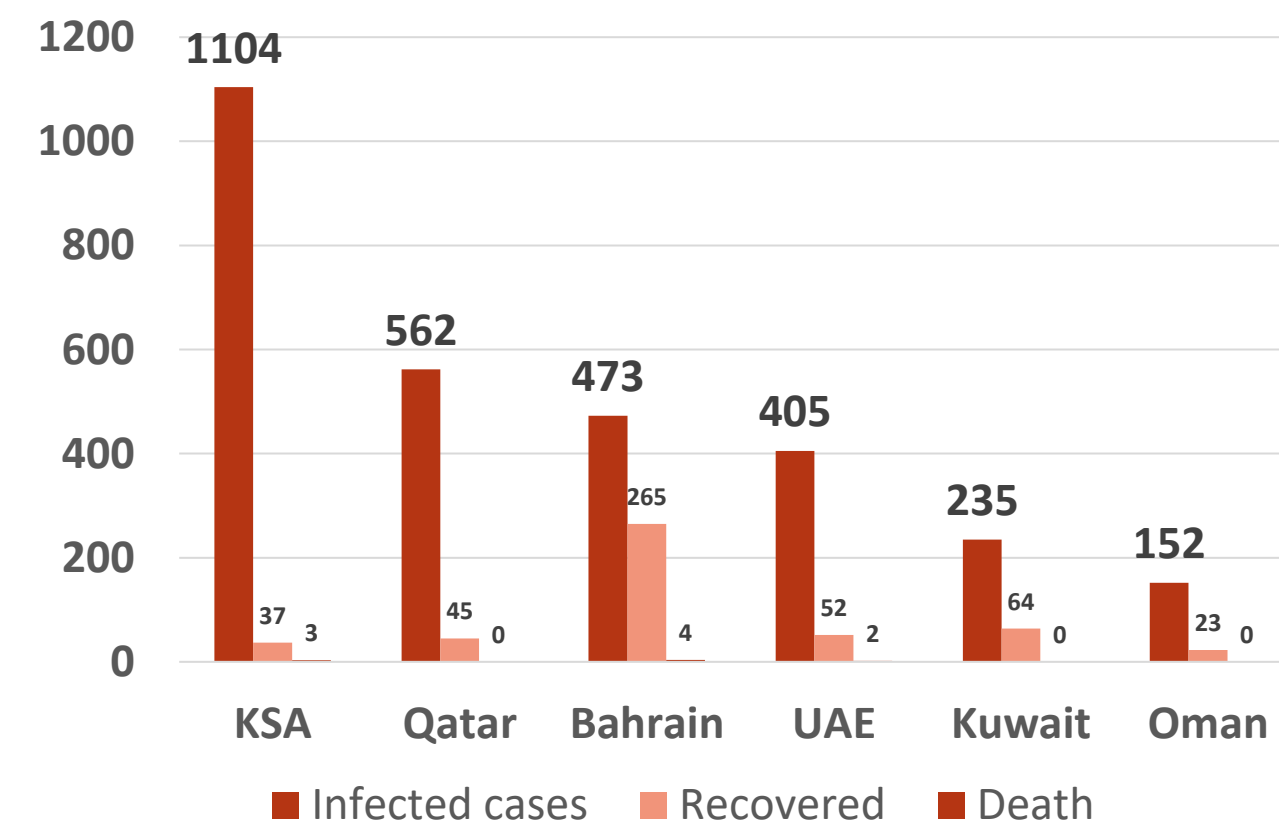


Figure 8: Comparative analysis of the distribution of COVID19 cases in GCC countries (March 28, 2020)

TOTAL NUMBER OF INFECTED CASES



Total number of infected, recovered and death



Map chart published by Abu Dhabi Public Health Center 2020.

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

Public health response



Article 1 : Antibodies in Infants Born to Mothers with COVID-19 Pneumonia.

Published: : March 26, 2020

link: [Click Here](#)

Summary:

- Clinical records and laboratory test results were retrospectively reviewed for 6 pregnant women diagnosed with COVID-19 and admitted (February 16 - March 6, 2020). Blood samples were collected from the mothers during delivery and neonatal blood and throat swab samples were collected during birth. RT-PCR was conducted on neonatal serum and throat swabs. Inflammatory cytokines were tested on neonatal serum. Maternal and neonatal sera samples were used to test for IgG and IgM antibodies.

Findings:

- Neonatal blood and throat swabs were negative RT-PCR test results.
- Antibodies were detected among all 6 infants in their serum. Two infants showed IgG and IgM higher than the normal levels. Their mothers also had elevated levels of IgG and IgM.
- Three infants showed elevated IgG levels ,however, IgM levels were normal.
- All 3 mothers showed elevated IgG levels and 2 of them showed elevated IgM levels. Inflammatory cytokine IL-6 was significantly increased among all infants. None of the infants presented any symptoms.

Table 1. Antibody and IL-6 Levels in Infant Sera Samples

Clinical value	Reference range	Infant ^a					
		1	2	3	4	5	6
IgM, AU/mL	<10	39.6	16.25	3.79	1.9	0.96	0.16
IgG, AU/mL	<10	125.5	113.91	75.49	73.19	51.38	7.25
IL-6, pg/mL	0.1-2.9	15.07	33.65	19.16	18.15	32.75	19.62

^a Infants and mothers correspond by number between tables.

Table 2. Antibody Levels in Mother Sera Samples

Clinical value	Reference range	Mother ^a					
		1	2	3	4	5	6
IgM, AU/mL	<10	83.97	236.6	5.58	33.26	15.61	1.39
IgG, AU/mL	<10	136.72	117.37	120.63	103.46	70.05	8.12

^a Mothers and infants correspond by number between tables.

Public health response



Article 1 : cont., .

Published: : March 26, 2020

link: [Click Here](#)

Summary:

Discussion:

- IgG is passively transferred across the placenta from mother to fetus beginning at the end of the second trimester and reaches high levels at the time of birth.
- However, IgM, which was **detected in 2 infants, is not usually transferred from mother to fetus** because of its **larger macromolecular structure**. In study 6 of mothers with SARS, the placentas of 2 women who were convalescing from SARS-CoV infection in the third trimester of pregnancy had abnormal weights and pathology. **Whether the placentas of women in this study were damaged and abnormal is unknown. Alternatively, IgM could have been produced by the infant if the virus crossed the placenta.**
- Results inconclusive to state that there is vertical transmission .

Table 1. Antibody and IL-6 Levels in Infant Sera Samples

Clinical value	Reference range	Infant ^a					
		1	2	3	4	5	6
IgM, AU/mL	<10	39.6	16.25	3.79	1.9	0.96	0.16
IgG, AU/mL	<10	125.5	113.91	75.49	73.19	51.38	7.25
IL-6, pg/mL	0.1-2.9	15.07	33.65	19.16	18.15	32.75	19.62

^a Infants and mothers correspond by number between tables.

Table 2. Antibody Levels in Mother Sera Samples

Clinical value	Reference range	Mother ^a					
		1	2	3	4	5	6
IgM, AU/mL	<10	83.97	236.6	5.58	33.26	15.61	1.39
IgG, AU/mL	<10	136.72	117.37	120.63	103.46	70.05	8.12

^a Mothers and infants correspond by number between tables.

Treatment :



Article 2: Treatment of 5 Critically Ill Patients With COVID-19 With Convalescent Plasma

Published: March 27, 2020

Link: [Click Here](#)

Summary:

- Preliminary uncontrolled case series of 5 critically ill patients with laboratory-confirmed COVID-
- The study done in Chinese hospital, from January 20, 2020, to March 25, 2020; final date of follow-up was March 25, 2020.

Donors

- The 5 donors of convalescent plasma were between the ages of 18 and 60 years.
- The donors had recovered from SARS-CoV-2 infection and were invited
- The donors had been well (asymptomatic) for at least 10 days, with a serum SARS-CoV-2-specific ELISA antibody titer higher than 1:1000 and a neutralizing antibody titer greater than 40.

Table 1. Clinical Characteristics of SARS-CoV-2-Infected Patients Who Received Convalescent Plasma

	Patient				
	1	2	3	4	5
Sex	Male	Male	Female	Female	Male
Age, y	70s	60s	50s	30s	60s
Weight, kg	55	85	60	41.5	87
Smoking	No	No	No	No	No
Blood type	B	B	B	A	B
Coexisting chronic diseases	None	Hypertension; mitral insufficiency	None	None	None
Disease presentation and course					
Estimated incubation period, d ^a	1	7	3	7	15
Interval between symptom onset and admission, d	2	4	2	2	3
Interval between admission and plasma transfusion, d	22	10	20	19	20
Complications prior to plasma transfusion	Bacterial pneumonia; severe ARDS; MODS	Bacterial pneumonia; fungal pneumonia; severe ARDS; myocardial damage	Severe ARDS	Severe ARDS	Severe ARDS
Most severe disease classification	Critical	Critical	Critical	Critical	Critical
Treatments					
Steroids	Methylprednisolone	Methylprednisolone	Methylprednisolone	Methylprednisolone	Methylprednisolone
Antivirals	Lopinavir/ritonavir; interferon alfa-1b; favipiravir	Lopinavir/ritonavir; arbidol; darunavir	Lopinavir/ritonavir; interferon alfa-1b;	Interferon alfa-1b; favipiravir	Lopinavir/ritonavir; interferon alfa-1b

Abbreviations: ARDS, acute respiratory distress syndrome; MODS, multiple organ dysfunction syndrome; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2. ^a Estimated incubation period defined as interval between estimated exposure to SARS-CoV-2 and symptom onset.

Patients

- As in the table .
- Convalescent plasma was administered between 10 and 22 days after admission.
- In addition, plasma was obtained from the donors and transfused in the recipients on the same day, which helps preserve the natural activity of the plasma.



Treatment :

Article 2: cont., Summary:

Results:

Following plasma transfusion:

- Body temperature normalized **within 3 days** in 4 of 5 patients, oxygen requirement improved.
- Viral loads also **decreased and became negative** within **12 days** and SARS-CoV-2-specific ELISA and neutralizing **antibody titers increased** following the transfusion (range, 40-60 before **and 80-320 on day 7**).
- **ARDS resolved in 4 patients at 12 days** after transfusion, and **3 patients were weaned** from mechanical ventilation **within 2 weeks of treatment**.
- **Of the 5 patients, 3 have been discharged** from the hospital (length of stay: 53, 51, and 55 days), and **2 are in stable condition at 37 days after transfusion**.

Limitations

- Small case series that included no controls.
- It is unclear if these patients would have improved without transfusion of convalescent or they improved with the other antiviral medication.