



# Scientific Research Monitoring on COVID-19

16 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.
- 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.)



## 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

- **Public health response:** the first report of the consequences of the COVID-19 outbreak on critical care capacity outside China. ( experience from Italy)
- **Clinical feature and transmission:** another study of children with COVID19, some received antiviral treatment.
- **Treatment:** an overview of the potential drugs to be used for the treatment of COVID19 in children.

*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

[Limiting spread of COVID-19 from cruise ships - lessons to be learnt from Japan](#)

[Pathogenic T cells and inflammatory monocytes incite inflammatory storm in severe COVID-19 patients](#)

[Interrupting transmission of COVID-19: lessons from containment efforts in Singapore](#)

[Emergence of a Novel Coronavirus Disease \(COVID-19\) and the Importance of Diagnostic Testing: Why](#)

[Partnership between Clinical Laboratories, Public Health Agencies, and Industry Is Essential to Control the Outbreak](#)

[Dysregulation of immune response in patients with COVID-19 in Wuhan, China](#)

[Protecting Health Care Workers during the COVID-19 Coronavirus Outbreak –Lessons from Taiwan's SARS response](#)



15th March 2020

- Nine new countries/territories/areas (African Region [7], European Region [1] and Region of Americas [1]) in have reported cases of COVID-19 in the past 24 hours.
- A WHO high-level technical mission concluded a visit to Iraq to support the Iraqi Ministry of Health in their COVID-19 prevention and containment measures.
  - Iraq reported its first case of COVID 19 – an Iranian student in Iraq on 22 February 2020 – followed by 4 cases for members of one family with a travel history to Islamic Republic of Iran. Case reporting escalated to include almost all Iraqi governorates. The total number of cases reported as of 12 March stands at 83 confirmed cases, 24 recovered, and 8 deaths.
  - The WHO is working to provide sufficient supplies of laboratory test kits and personal protective equipment.
  - In addition, WHO is working around the clock to establish **3 negative-pressure rooms in Baghdad, Erbil and Basra to accommodate patients who might require more sophisticated medical treatment.**

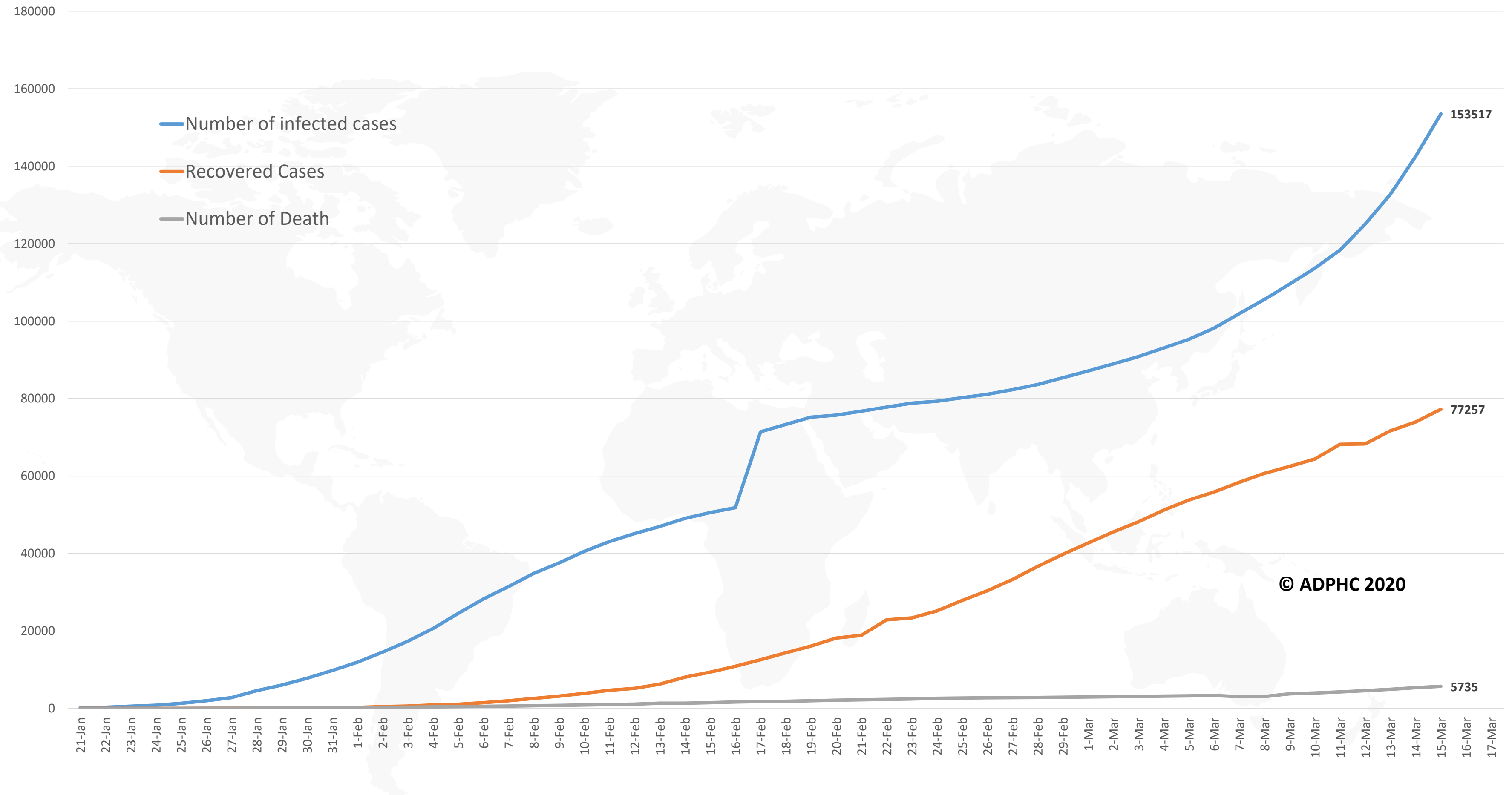
# Epidemiology

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**Figure 1: Total number of infected, recovered , and death cases (January 21<sup>st</sup> to March 15<sup>th</sup>, 2020)**



Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#)

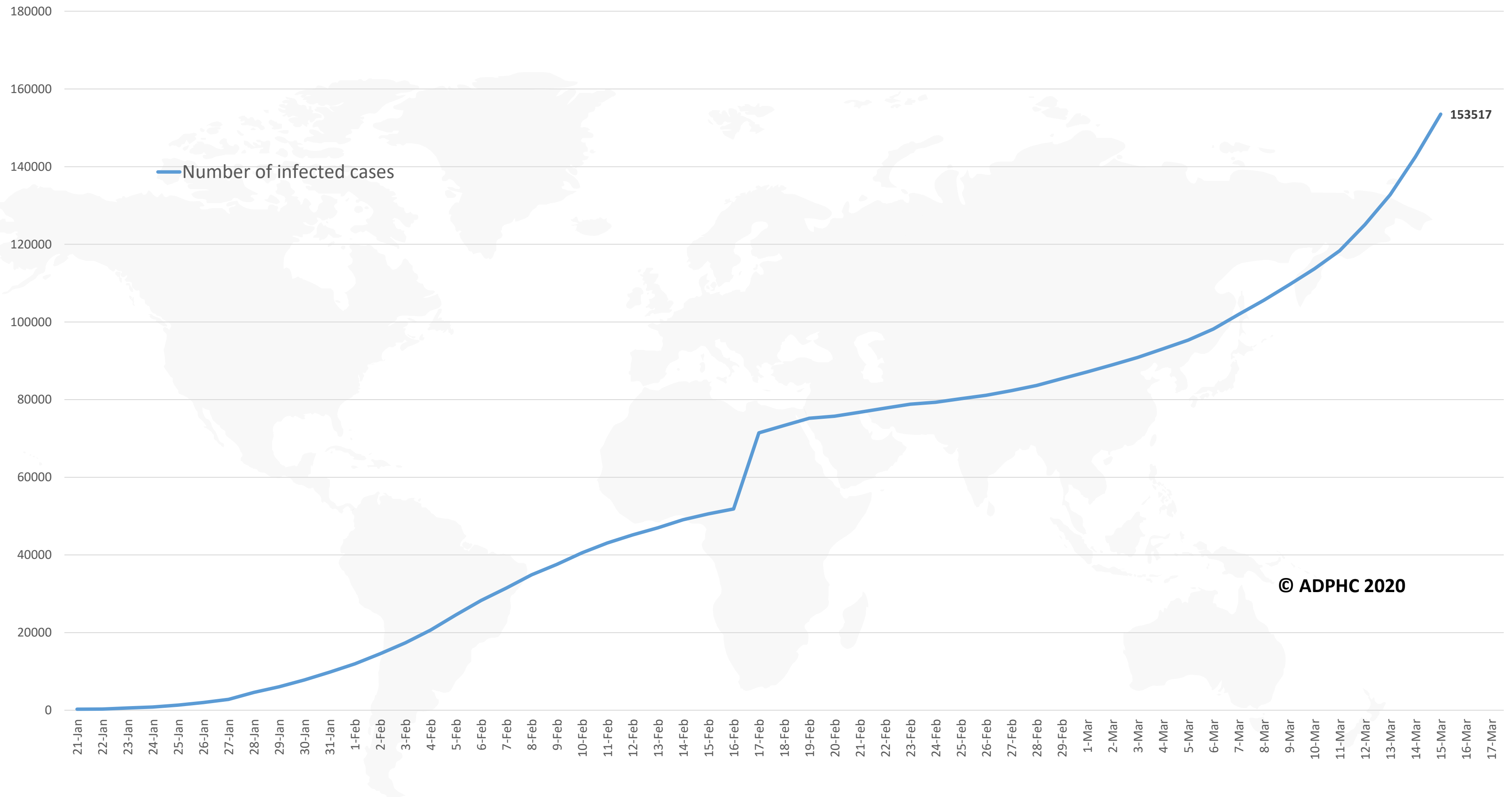
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**Figure 2: Number of infected COVID-19 cases worldwide (January 21 to March 15, 2020).**

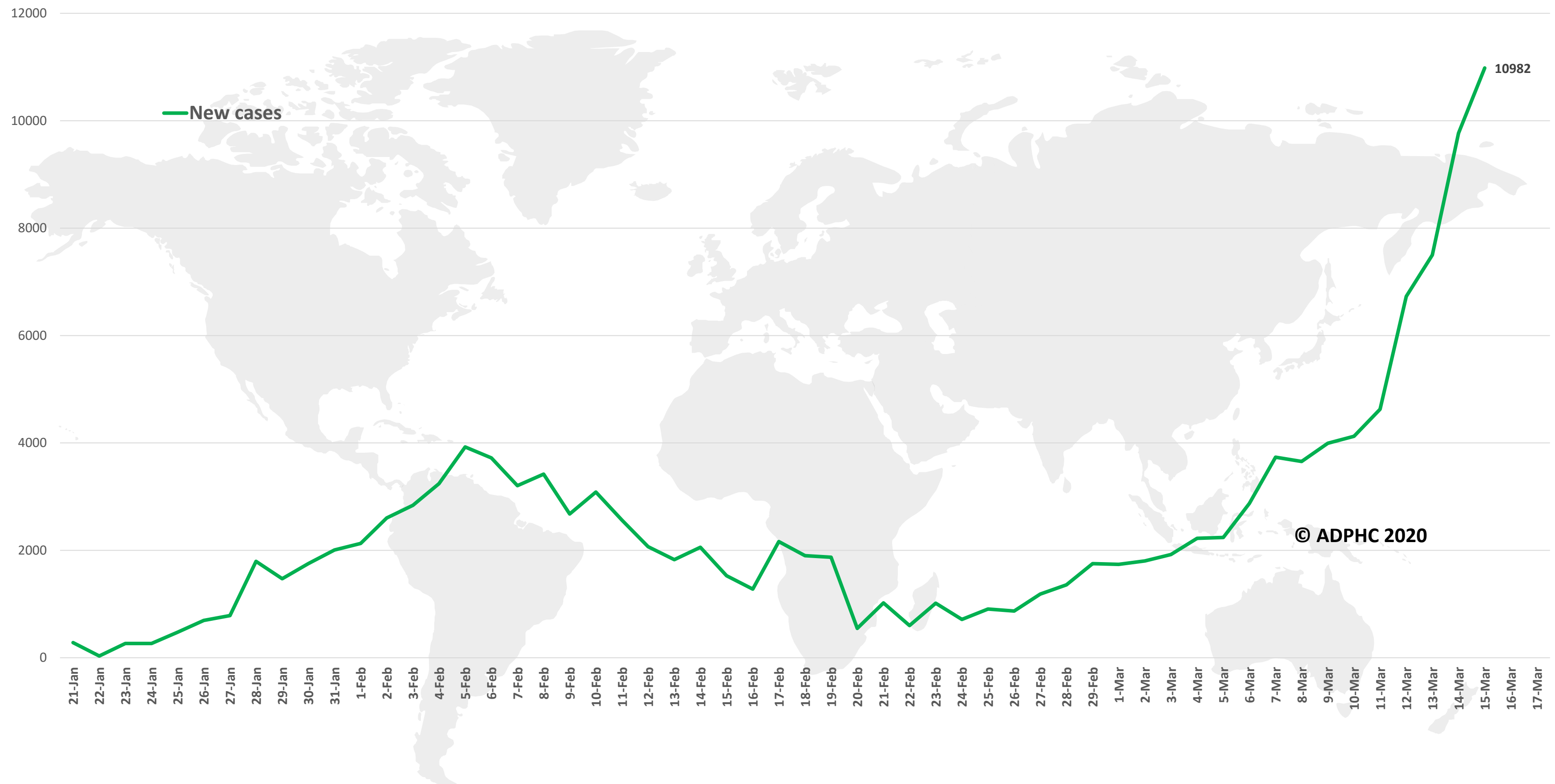


Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#)



**Figure 3: Daily new infected COVID-19 cases worldwide (January 21 to March 15, 2020).**

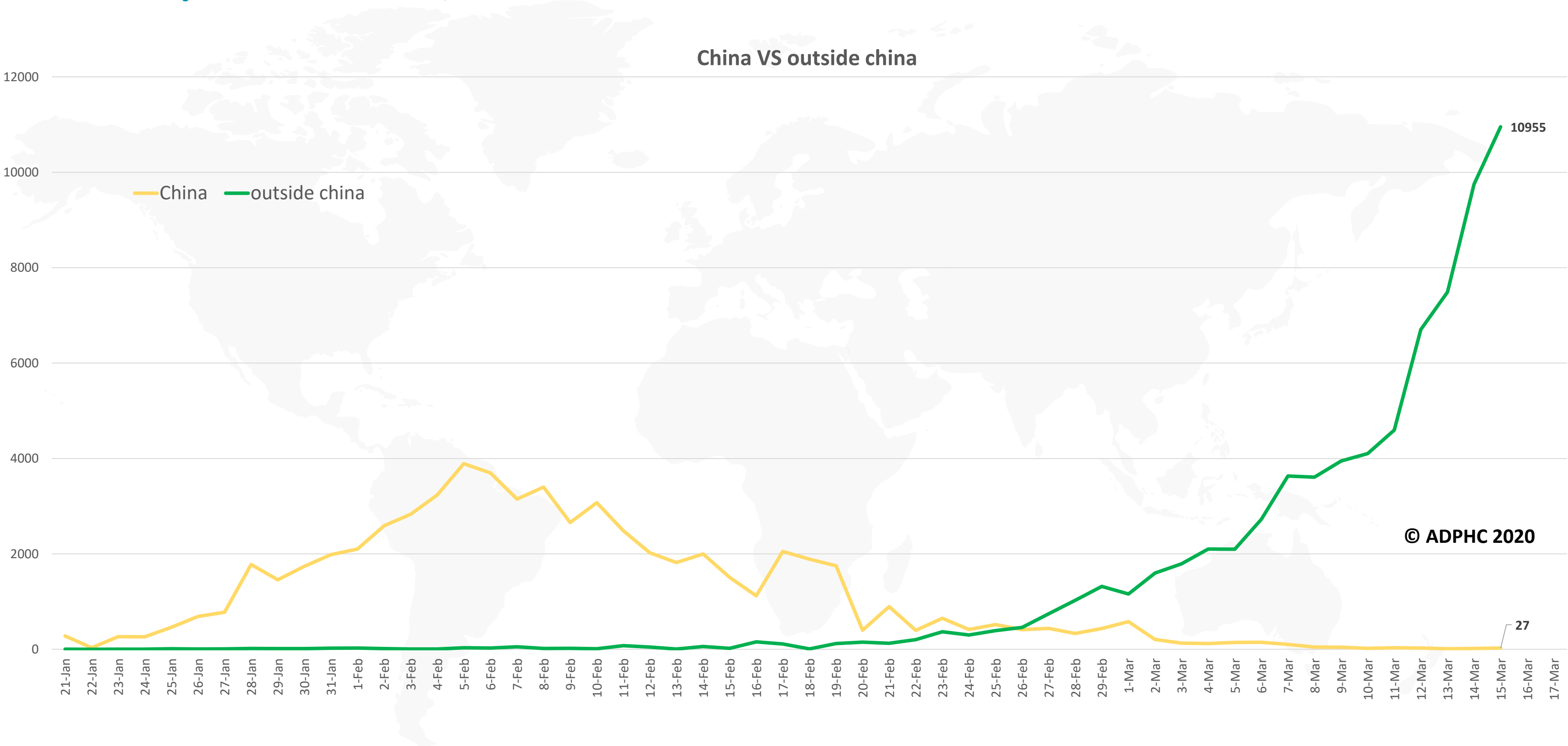


Line graph published by Abu Dhabi Public Health Center 2020.

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



**Figure 4: Daily new infected COVID-19 cases reported by China and the rest of the world (January 21 to March 15, 2020).**

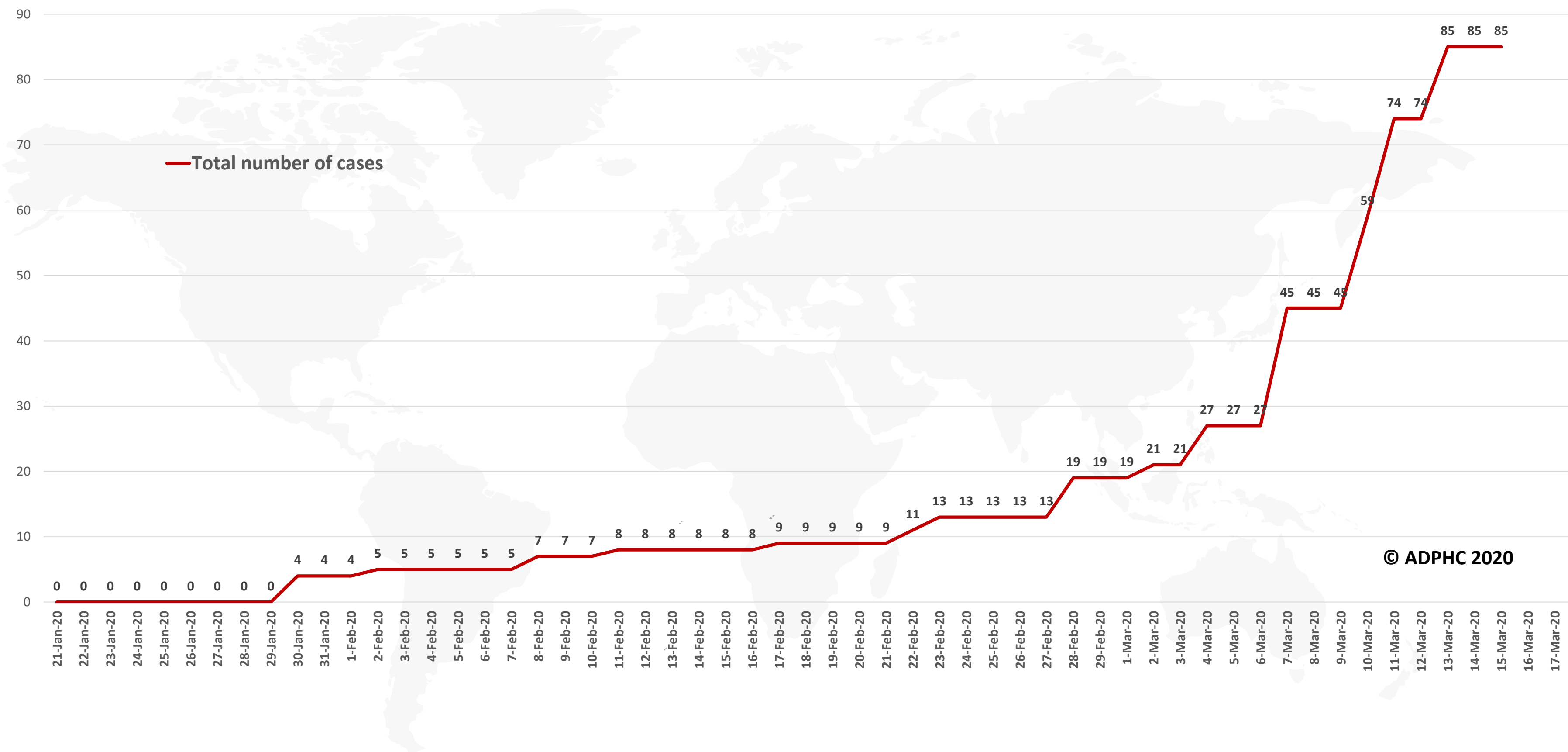


Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#)



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](#)

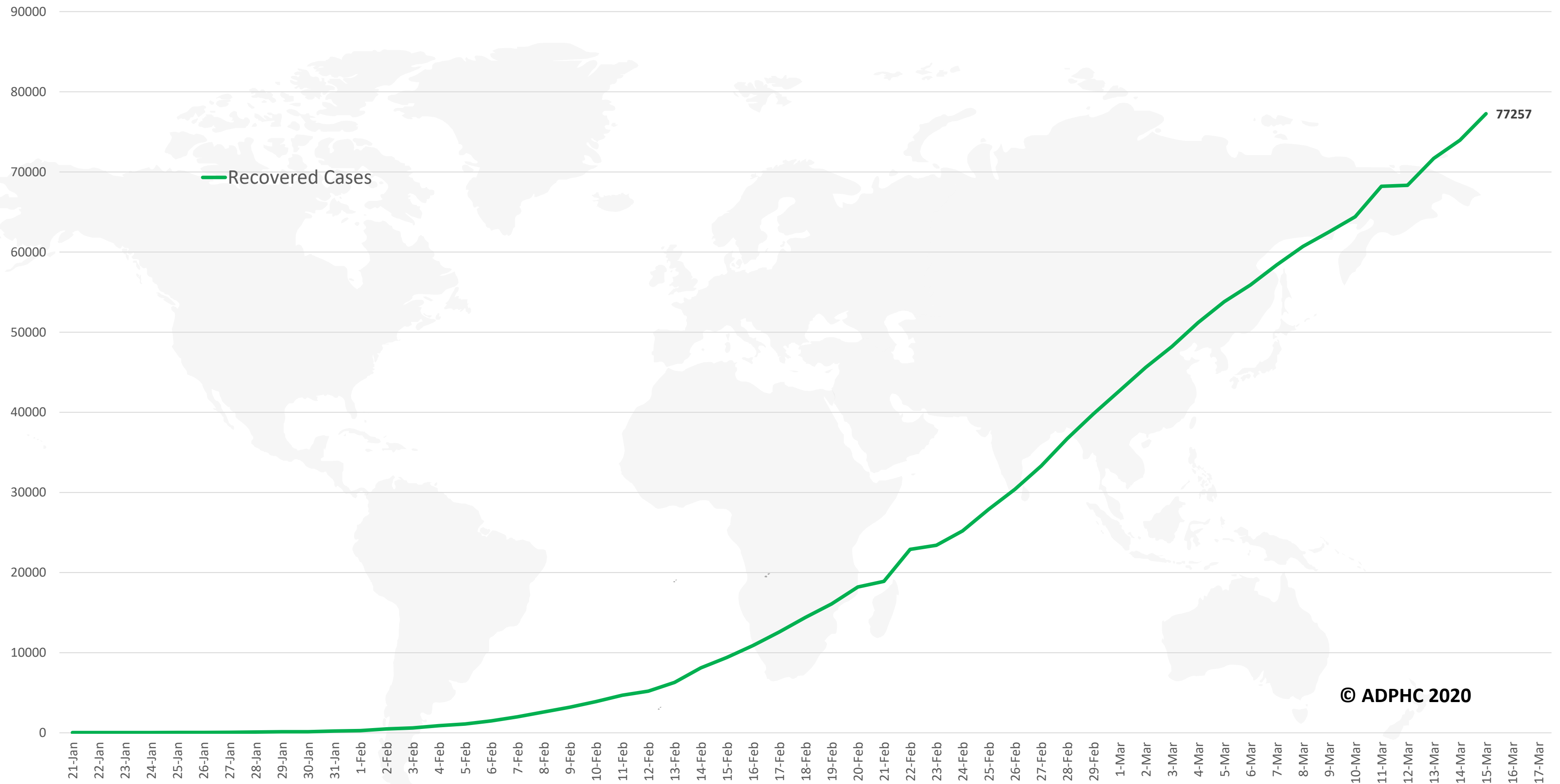
# Epidemiology

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**Figure 6: Number of recovered COVID-19 cases worldwide (January 21 to March 15, 2020).**

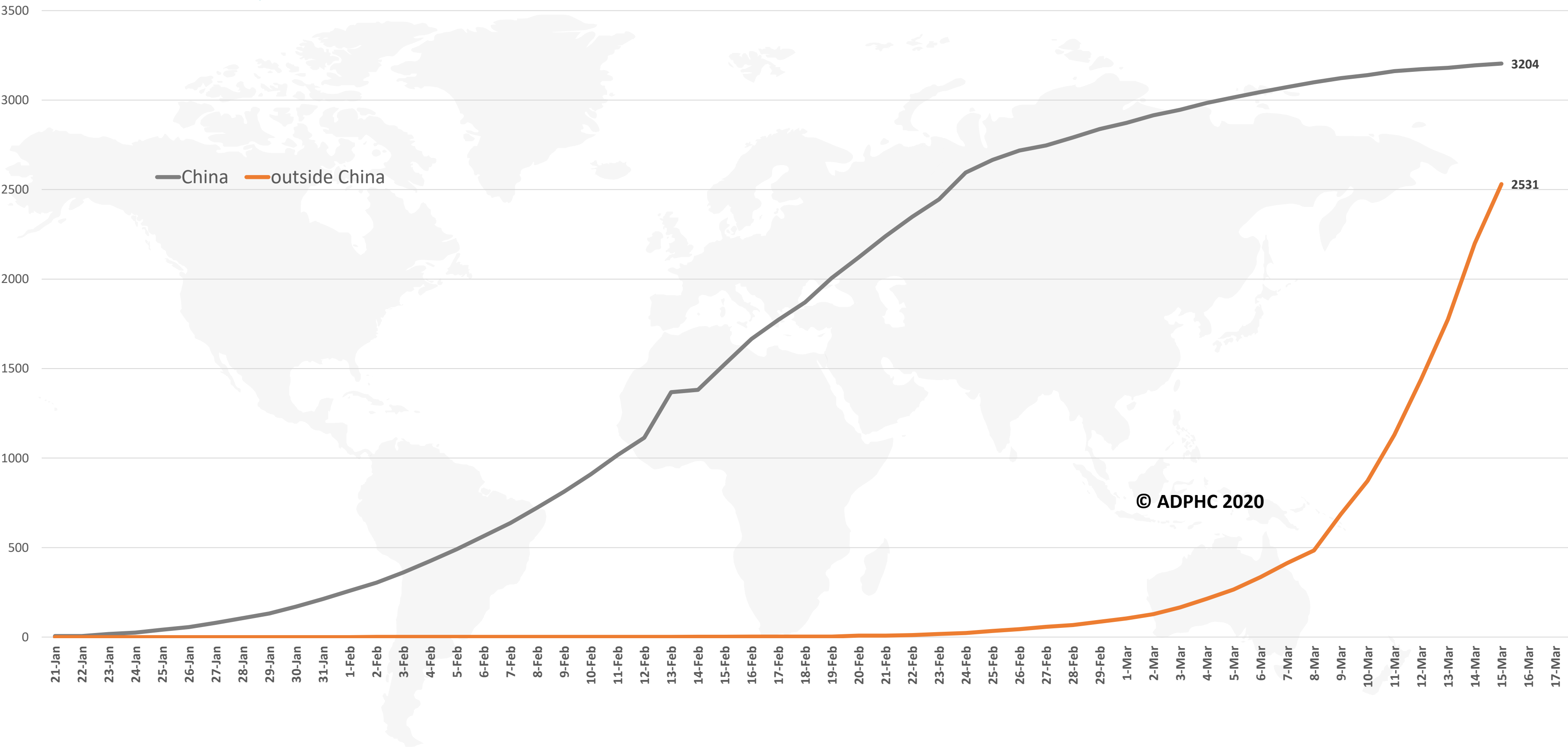


Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [John Hopkins University](#)



**Figure 7: Daily number of death due to COVID-19 reported by China and the rest of the world (January 21 to March 15, 2020).**

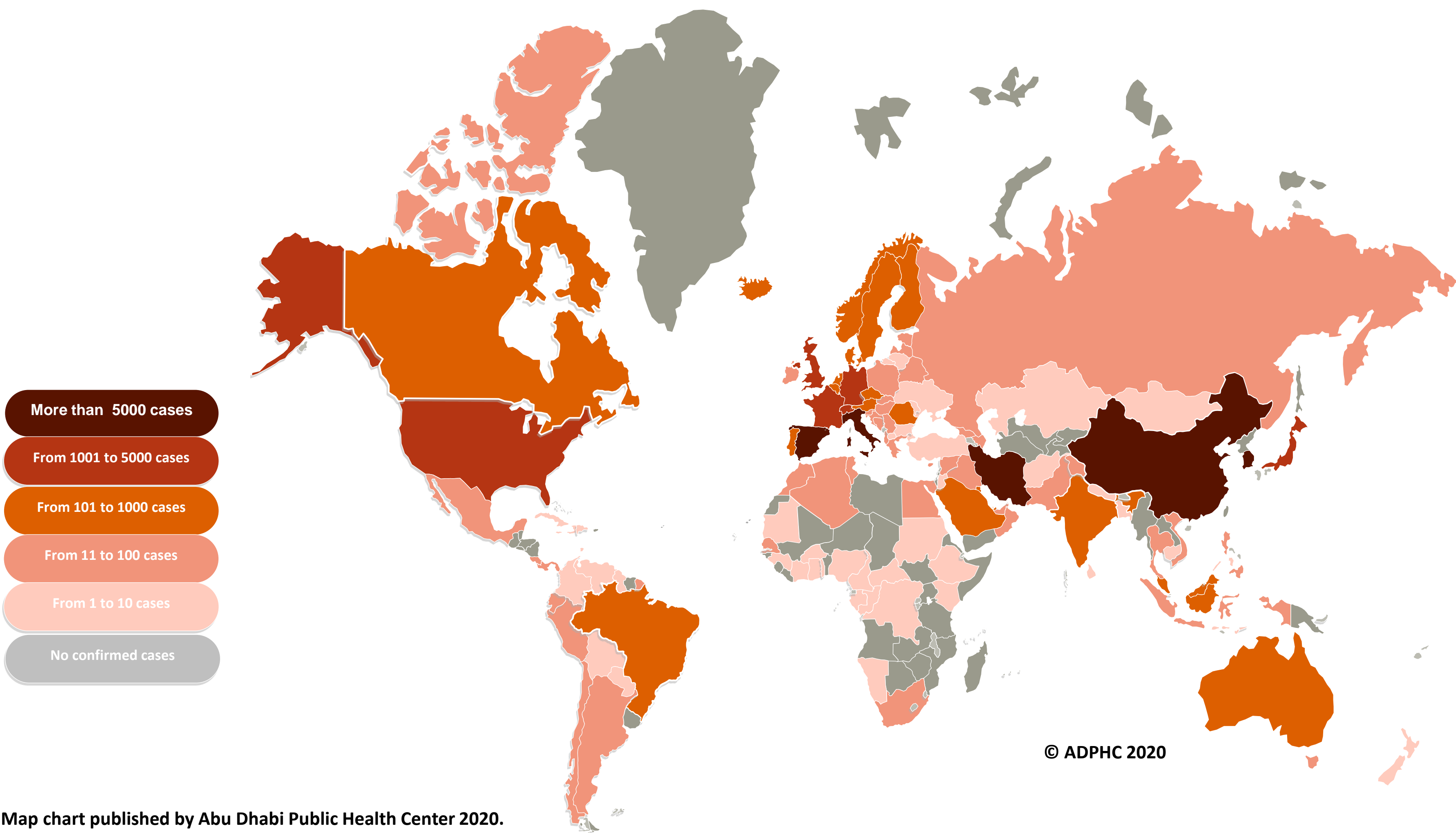


Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#)



Figure 8A: Global distribution of COVID-19 cases (January 21 to March 15, 2020).



Map chart published by Abu Dhabi Public Health Center 2020.

# Epidemiology



Figure 8B: Bar chart illustrate the global distribution of COVID19 cases (January 21<sup>st</sup> to March 15<sup>th</sup>, 2020)



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Map chart published by Abu Dhabi Public Health Center 2020.

# Clinical feature and transmission



## **Article 1: Critical Care Utilization for the COVID-19 Outbreak in Lombardy, Italy Early Experience and Forecast During an Emergency Response (1/2)**

**Published: 13 March 2020**

**Link: [Click Here](#)**

### **Summery:**

After the sudden outbreak of 36 cases of COVID19 in Lombardy city on 20 Feb 2020. Emergency task force was formed by the Government and local health authorities to lead the response to the outbreak. This Viewpoint provides a **summary** of the response of the COVID-19 Lombardy ICU network and a **forecast of estimated ICU demand over the coming weeks (projected to March 20, 2020).**

**Two top priorities were identified:**

#### **1- Increasing ICU capacity:**

- **Out of the total 720 ICU beds (482 ICU beds were allocated for patients with COVID-19 in 18 days) .**
- 15 hospitals were chosen to be the responder hub (because they either had expertise in infectious disease or were part of the Venous-Venous ECMO Respiratory Failure Network (RESPIRA)).
- As of March 8, critically ill patients (initially COVID-19–negative patients) have been transferred to receptive ICUs outside the region via a national coordinating emergency office.
- **In the first two weeks it was noted that the proportion of ICU admissions represents 12% of the total positive cases, and 16% of all hospitalized patients. This rate is higher than what was reported from China, where only 5% of patients who tested positive for COVID-19 required ICU admission.** (possible explanation , either different admission criteria or difference race and demographics)

**2- Implementing measure containment:** The government put several towns on quarantine where initial cluster were found. later the government enforced self isolation and quarantine for public.

# Clinical feature and transmission

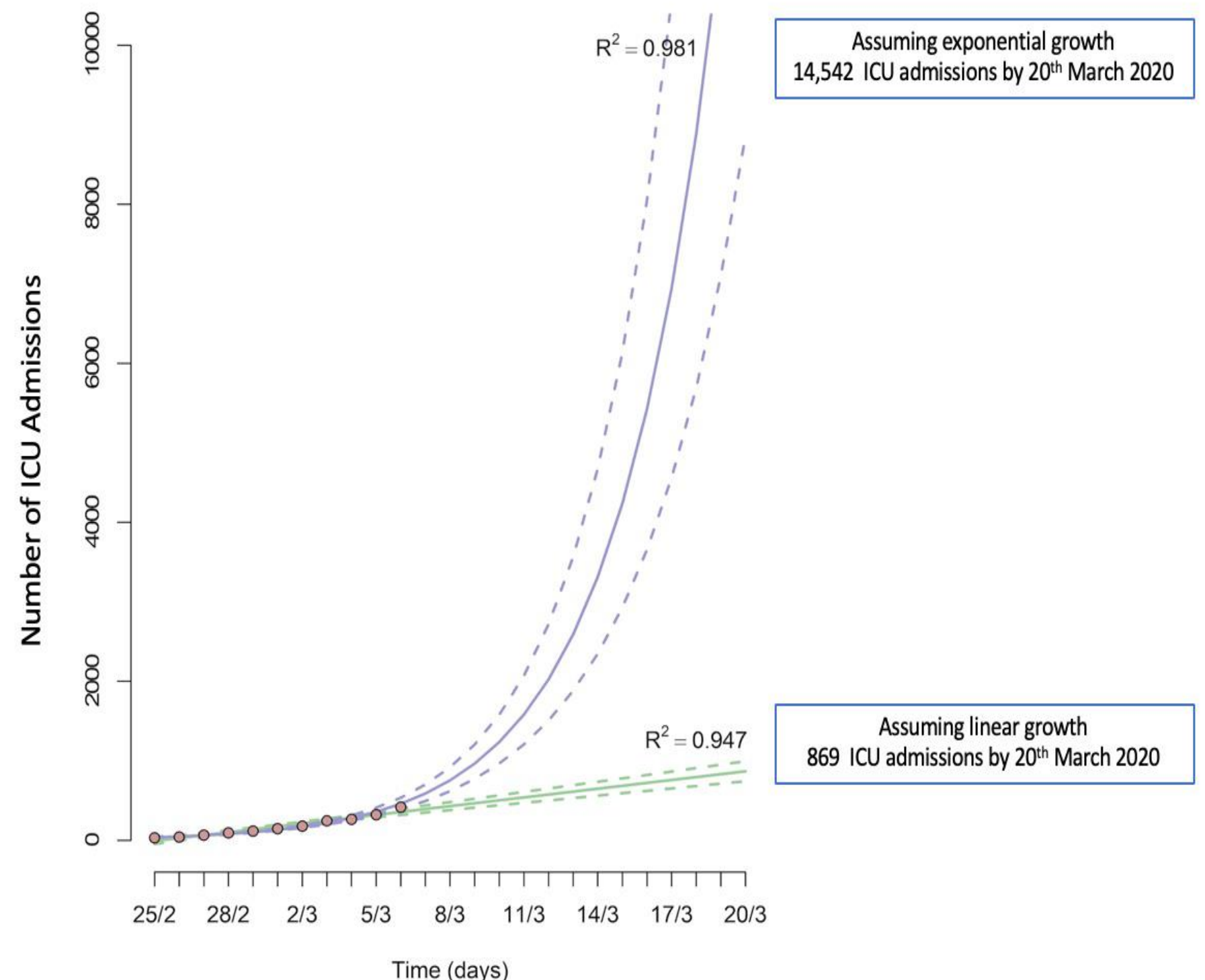


## Article : Critical Care Utilization for the COVID-19 Outbreak in Lombardy, Italy (2/2)

- Based on data to March 7, when 556 COVID-19–positive ICU patients had been admitted to hospitals over the previous 15 days, linear and exponential models were created to estimate further ICU demand ( Figure 1)

### Lessons to learn:

- Increase laboratory capacity to test immediately.
- Converting to a COVID19 facility should be more quickly.
- In practice, the health care system cannot sustain an uncontrolled outbreak, and **stronger containment measures are now the only realistic option** to avoid the **total collapse of the ICU system**. For this reason, over the last 2 weeks, clinicians have continuously advised authorities to augment the containment measures.
- This experience would suggest that only an **ICU network** can provide the **initial immediate surge** response to allow every patient in need for an ICU bed to receive one. Health care systems **not organized in collaborative emergency networks** should **work toward one now**.



**Figure 1:** The predicted number of ICU admissions on March 20, 2020, was estimated to be **869** (95%CI: 744-995) with **the linear model** and was estimated to be **14 542** (95%CI: 8856-23 879) the **exponential model**.

## **Article: Supporting the Health Care Workforce During the COVID-19 Global Epidemic**

**Published: March 12, 2020**

### **Summery:**

The pressure on global workforce is from the burden of illnesses stressing health system capacity and the adverse effects on health care workers (risk of infection).

*In China, an estimated 3000 health care workers have been infected and at least 22 have died.*

- A focus on worker protection through specific training and encouragement of adherence guidelines. Telling **caregivers to focus on their safety and being clear and specific about how to do so** can promote calm during an epidemic.
- **Health care workers must self-monitor**, report signs of illness, and not engage in patient care while exhibiting infectious symptoms.
- **Health care workforce and families must be prioritized** when testing, vaccination, and treatments become available. Many have conditions that elevate risk for severe infection or death if they become infected with COVID-19, so organizations will need to decide if such workers should be redeployed to eliminate the risk.
- **Telemedicine, patient advice lines, and augmented telephone triage systems maybe alternatives.**
- **Protocols for routine arrival home after duty may or may not help** hence, supportive conversations, clear guidance when recommendations exist, attempts to minimize misinformation, and efforts to reduce anxiety.
- Ensuring workers get adequate rest, are **supported both as health care professionals and as individuals** will help maintain individual and team performance over the long run.

**Link:** <https://jamanetwork.com/journals/jama/fullarticle/2763136>



# Clinical feature and transmission

**Article** :Detection of COVID-19 in Children in Early January 2020 in Wuhan, China

**Published:** March 12, 2020

**Link:** [Click Here](#)

## Summery:

- This paper reported clinical characteristics of the children diagnosed with COVID-19.
- A retrospective study was conducted involving hospitalized children in Wuhan, China.
- A total of 366 children aged  $\leq 16$  years were enrolled in this study from January 7 to January 15, 2020. The study was conducted at three branches of Tongji Hospital in central Wuhan.
- The most frequently detected pathogens were influenza A virus (23 patients (6.2%)) and influenza B virus (20 patients (5.4%)). The virus that causes COVID-19, was detected among 6 (1.6%) patients.

**Table 1.** Summary of the Clinical Characteristics of Six Children with Covid-19.\*

Characteristic	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	Patient 6
Age (yr)	3	7	3	1	3	4
Sex	Female	Female	Female	Male	Female	Male
CT findings	Patchy ground-glass opacities in both lungs	NA	Patchy shadows in both lungs	Patchy shadows in both lungs	Patchy shadows in both lungs	Normal
Treatments						
Ribavirin	Yes	No	No	No	No	Yes
Oseltamivir	Yes	Yes	Yes	Yes	Yes	Yes
Glucocorticoids	Yes	No	Yes	Yes	Yes	No
Supplemental oxygen	Yes	No	No	No	No	No
Intravenous immune globulin	Yes	No	No	No	No	No
Clinical course						
ICU admission	Yes	No	No	No	No	No
Duration of fever (days)	11	3	7	6	4	6
Duration of hospitalization (days)	13	7	7	5	10	8
City of residence	Wuhan	Wuhan	Huangshi	Wuhan	Wuhan	Wuhan

\* Covid-19 denotes coronavirus disease 2019, CT computed tomography, ICU intensive care unit, and NA not available.

It is worth mentioning (Patient 3) who resided outside Wuhan; this patient had illness onset **on January 2, 2020**. they did not identify the source of infection for this patient! Their **findings indicate that SARS-CoV-2 infections in children were occurring early in the epidemic.**

# Treatment



**Article:** Pharmaceutical care recommendations for antiviral treatments in children with coronavirus disease 2019

**Published:** March 12, 2020

**Link:** [Click Here](#)

## Summery:

- This article explained the pharmaceutical care of five antiviral treatments which could be potentially used in COVID19 - Interferon- $\alpha$  (IFN- $\alpha$ ), Lopinavir/Ritonavir (LPVr), Ribavirin, Chloroquine Diphosphate (CD), and Arbidol among children with COVID-19.
- Note that Up to now, no antiviral therapeutic regimens with exact efficacy are recommended to be used in children with coronavirus disease 2019 (COVID-19).

IFN- $\alpha$  is the only antiviral drug which is clearly recommended to be used in children with COVID-19.

Drugs	Age available	Dosage regimen of COVID-19 in children	Precaution/contraindication
IFN- $\alpha$	Nebulization: using with caution in neonates and infants younger than 2 months	Nebulization: 200,000–400,000 IU/kg or 2–4 $\mu$ g/kg in 2 mL sterile water, twice daily for 5–7 days Spray: 1–2 sprays on each nostril and 8–10 sprays on the oropharynx, once every 1–2 h, 8–10 sprays/day for 5–7 days	Contraindication: CrCl < 50 mL/min; histories of mental illness, severe or unstable heart disease, or aplastic anemia
LPVr	China: OS $\geq$ 6 months, T $\geq$ 2 years USA: OS $\geq$ 14 days, T $\geq$ 6 months	Body weight (kg) 7–15: 12 mg/3 mg/kg/time, twice daily for 1–2 weeks 15–40: 10 mg/2.5 mg/kg/time, twice daily for 1–2 weeks > 40: 400 mg/100 mg/time, twice daily for 1–2 weeks	Contraindication: patients with severe hepatic insufficiency Not be recommended: children with jaundice
Ribavirin	China: oral dosage forms $\geq$ 6 years USA and Europe: oral dosage forms $\geq$ 3 years	Intravenous infusion at a dose of 10 mg/kg every time (maximum 500 mg every time), 2–3 times daily	Not be recommended: CrCl < 50 mL/min Should be discontinued: SCr > 2 mg/dL Warning: hemolytic anemia
CD	Using with caution	No recommendation	Acute poisoning is usually fatal with a dose of 50 mg/kg
Arbidol	$\geq$ 2 years for influenza in Russia	No recommendation	Using with caution in patients with liver dysfunction

IFN- $\alpha$  interferon- $\alpha$ , LPVr lopinavir/ritonavir, CD chloroquine diphosphate, COVID-19 coronavirus disease 2019, CrCl creatinine clearance, SCr serum creatinine, OS oral solutions, T tablets