



# Scientific Research Monitoring on COVID-19

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# SUMMERY IN COVID19 OUTBREAK



1. 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.
2. Transmission from human to human has been confirmed. Incubation period ranges from 3–7 days and can reach up to 14 days.
3. Suggested human-to-human transmission occurs through droplets, contact and fomites, similar to Severe Acute Respiratory Syndrome (SARS).
4. Efforts currently in developing therapies for this virus focus on previously known medications and vaccination for MERS-CoV and SARS-CoV.
5. Most studies mention multiple antiviral medications are involved but treatment outcomes are yet to be published. **Trial on animals have shown multiple drug candidates to be effective. Trials in humans are ongoing.**
7. WHO forum held 11-12 Feb 2020 to mobilize research on COVID19 vaccinations and therapies.
8. WHO issued a response budget for three month starting from February 2020.

# SUMMARY IN COVID19 OUTBREAK



9. 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.

10. 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.

11. Transmission of SARS occurs most often when a patient develops severe symptoms, which make it easier to contain an outbreak. But with COVID-19/ SARS-CoV2, a patient can present with mild symptoms and still have the potential to spread the disease.

12. Children have mild symptoms compared with adults. **Further studies of this population is needed.**

13. 80% of infected patients have mild symptoms and 1.2% may present without symptoms.

15. People with mild disease, recovery time is about two weeks, while people with severe or critical disease recover within 3 to 6 weeks.



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 section:** A **6-month-old infant** with positive COVID-19 infection remains asymptomatic, apart from a single transient temperature of 38.5°C **with continuous positive nasopharyngeal swabs to day 16** of admission.
- **Diagnosis section:** Deep machine learning and AI might be a potential screening tool for COVID19 using Lung CT imaging.
- **Public health response:** Mitigate the effects of home confinement on children during the COVID-19 outbreak.
- **Public health response:** Hospital Emergency Management Plan During the COVID-19 Epidemic

*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

- Article title : **Priorities for the US Health Community Responding to COVID-19.** [link](#)
- Article title: **Clinical Characteristics of Seven Cases Infected with SARS-CoV-2 in the Perioperative Period of Lung Resection: A Retrospective Study from a Single Thoracic Department in Wuhan, China.** [Link](#)
- Article title: **Risk of COVID-19 for cancer patients .** [Link](#)
- Article title: **The species Severe acute respiratory syndrome-related coronavirus: classifying 2019-nCoV and naming it SARS-CoV-2 .** [Link](#)
- Article Title : **Analyzing the Epidemiological Outbreak of COVID-19: A Visual Exploratory Data Analysis (EDA) Approach.** [Link](#)
- Article title: **Fecal specimen diagnosis 2019 Novel Coronavirus–Infected Pneumonia.** [Link](#)



4<sup>th</sup> March 2020

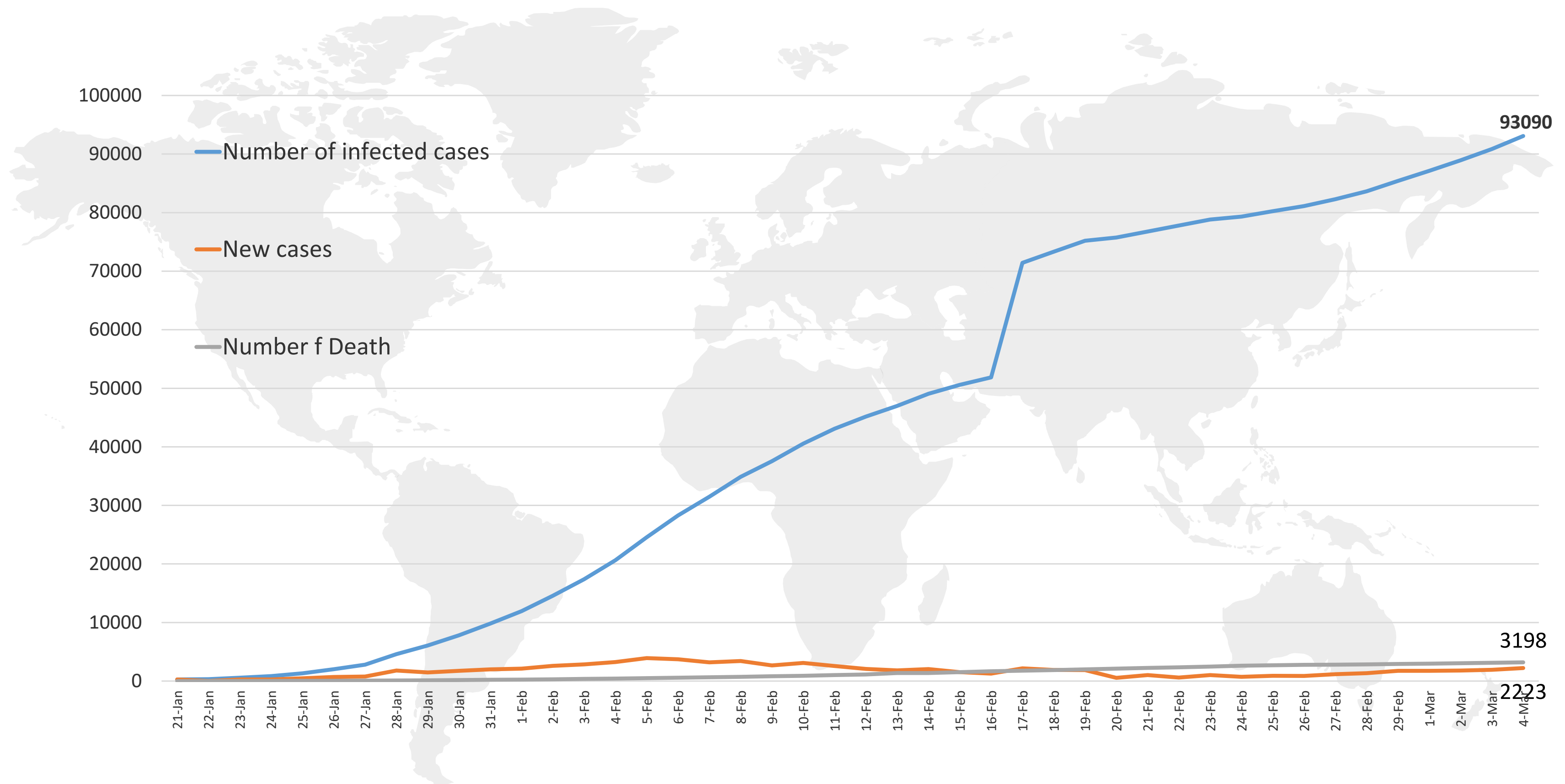
## WHO DG weekly brief ( important highlights) :

- Almost 90% of those cases outside china are from just three countries and the 75 countries with cases, 47 have 10 cases or less.
- 119 countries have not detected any cases.
- Some countries have signs of community transmission. (*community transmission means the spread with the source of the spread of the infection is unknown*).
- WHO and Iran :
  - WHO now has a team on the ground **in Iran to deliver supplies** and support the **government in the response**.
  - I would especially like to thank Crown Prince **Sheikh Mohammed bin Zayed Al Nahyan of the United Arab Emirates for his support for the mission**.
- **WHO has raised its assessment to very high at the global level.**
- WHO is advising countries on actions they can take for each of the “**three Cs**” scenarios – **first case, first cluster, and first evidence** of community transmission.
- Recommendation for countries to It calls
  - **to educate their populations**
  - **to expand surveillance**
  - **to find, isolate and care for every case,**
  - **to trace every contact,**
  - **to take an all-of-government and all-of-society approach** – this is not a job for the health ministry alone.
- WHO actions: ( provide PPEs, work to boost supply production , lab test to all countries in need ,

# Epidemiology



Figure 1: Total number of infected, new, and death cases (January 21<sup>st</sup> to March 4<sup>th</sup>, 2020)

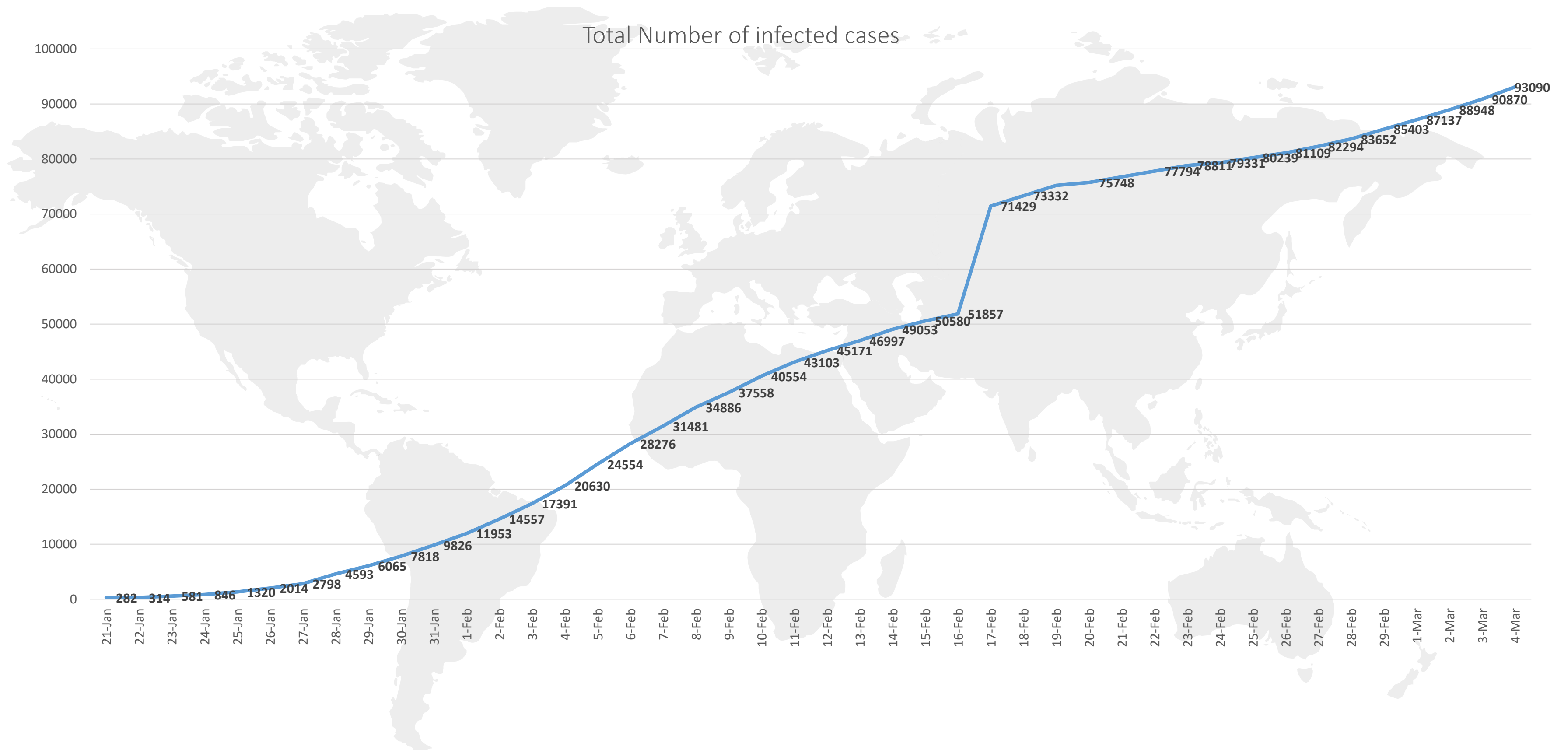


Line graph published by Abu Dhabi Public Health Center 2020.

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



Figure 2: Number of infected cases (January 21<sup>st</sup> to March 4<sup>th</sup>, 2020)



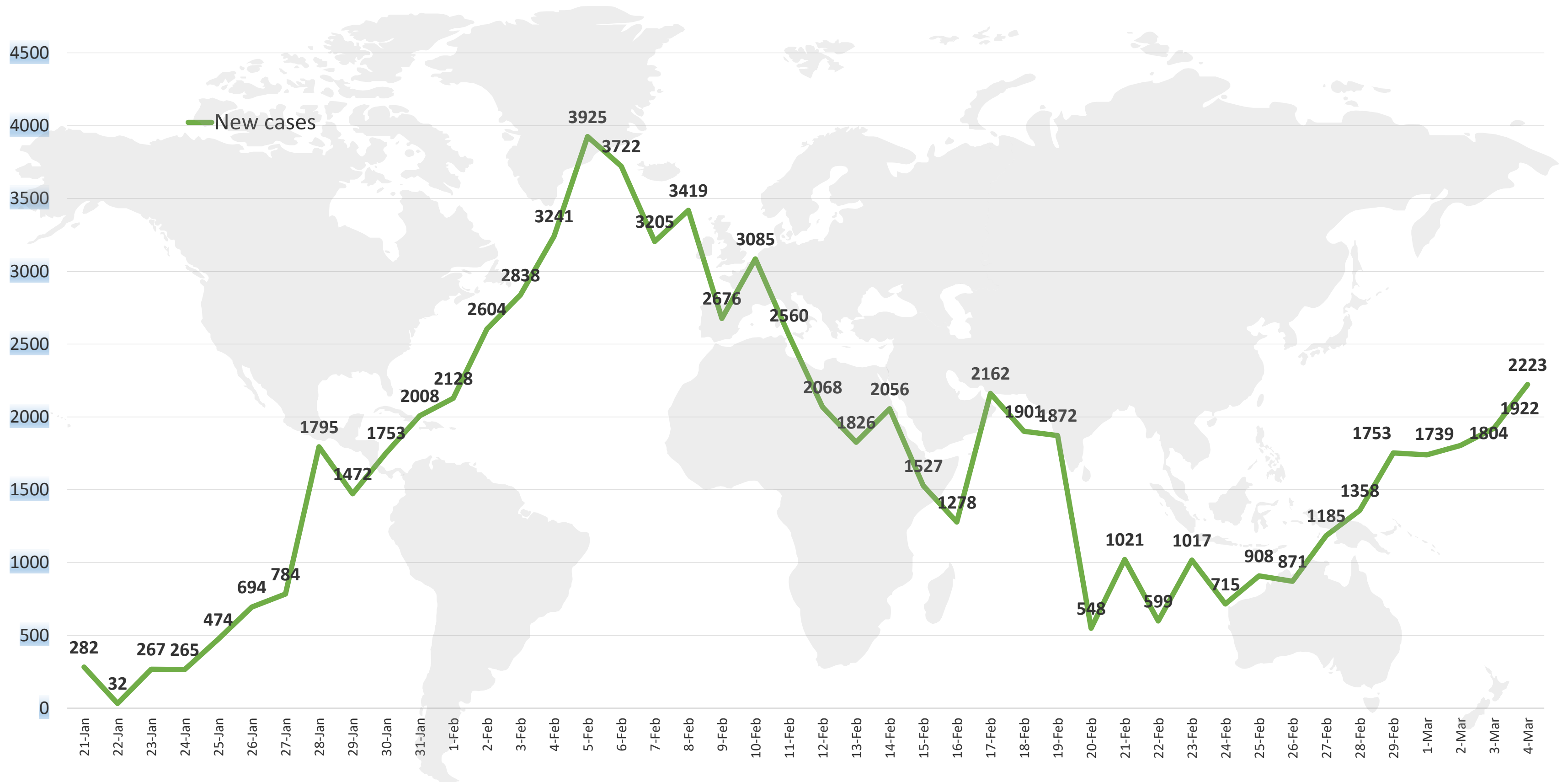
Line graph published by Abu Dhabi Public Health Center 2020.

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

# Epidemiology



Figure 3: Number of new cases (January 21<sup>st</sup> to March 4<sup>th</sup>, 2020)



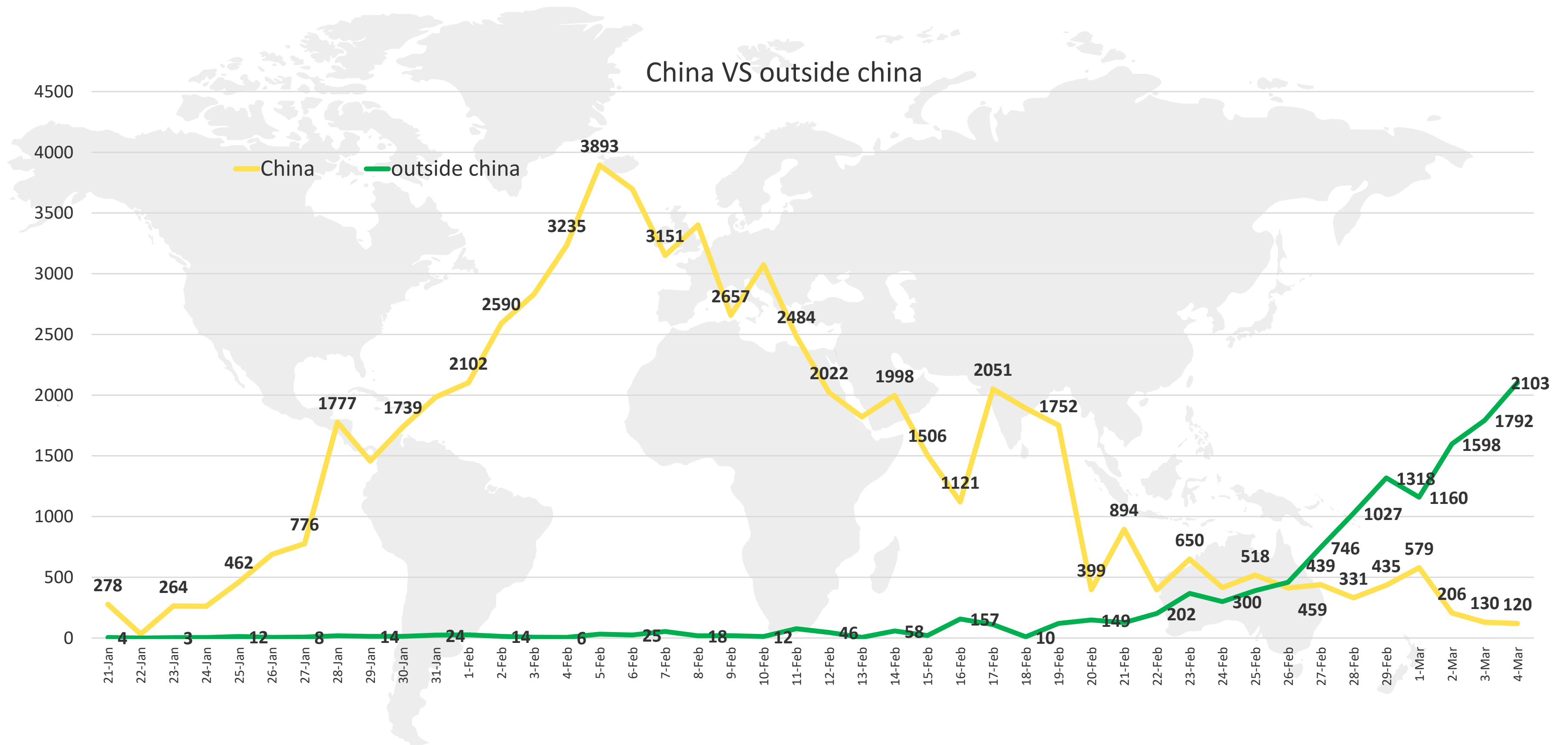
Line graph published by Abu Dhabi Public Health Center 2020.

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





Figure 4: Number of new cases in China versus outside China (January 21<sup>st</sup> to March 4<sup>th</sup>, 2020)

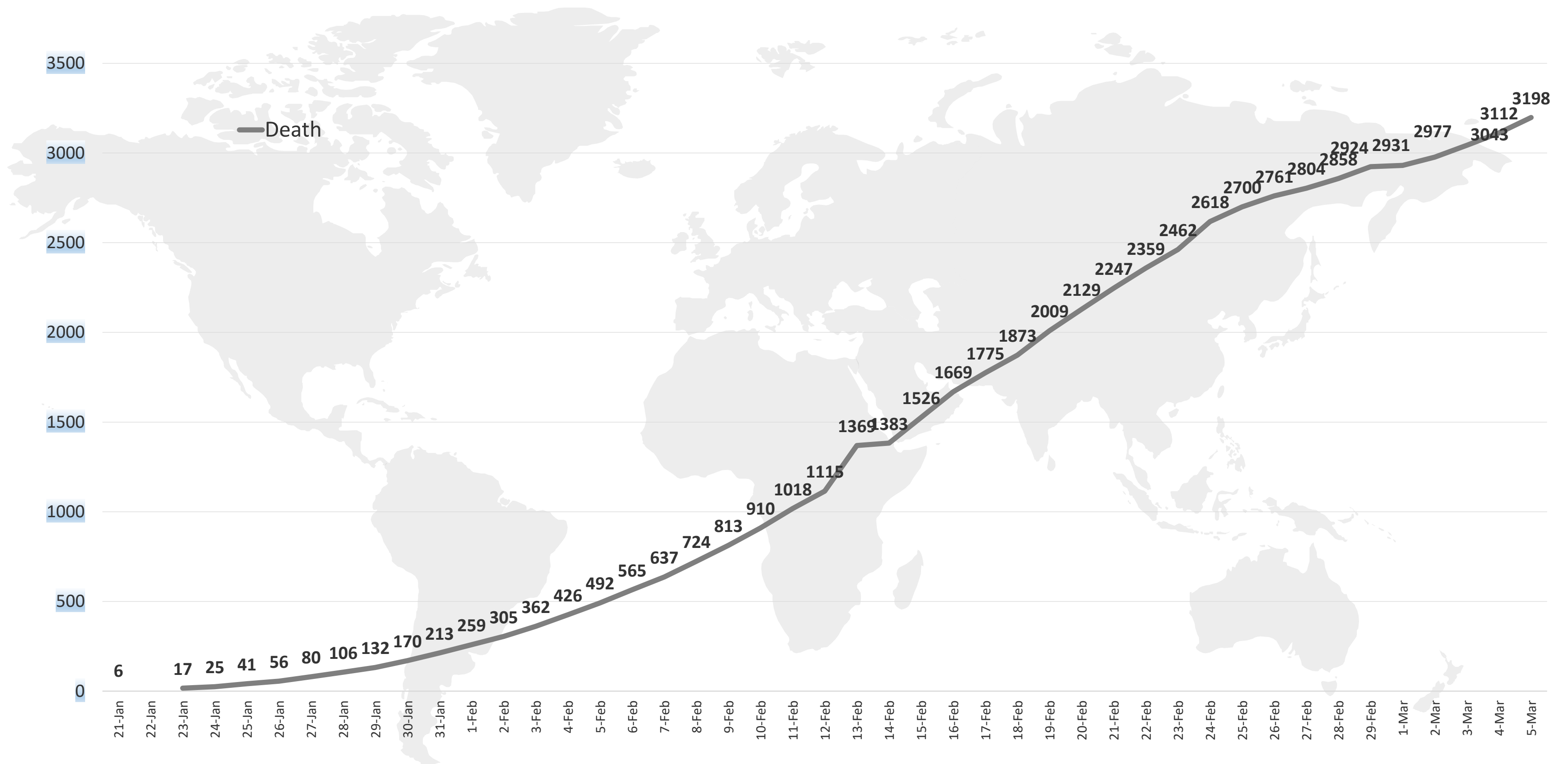


Line graph published by Abu Dhabi Public Health Center 2020.

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



Figure 5: Number of total deaths (January 21<sup>st</sup> to March 4<sup>th</sup>, 2020)

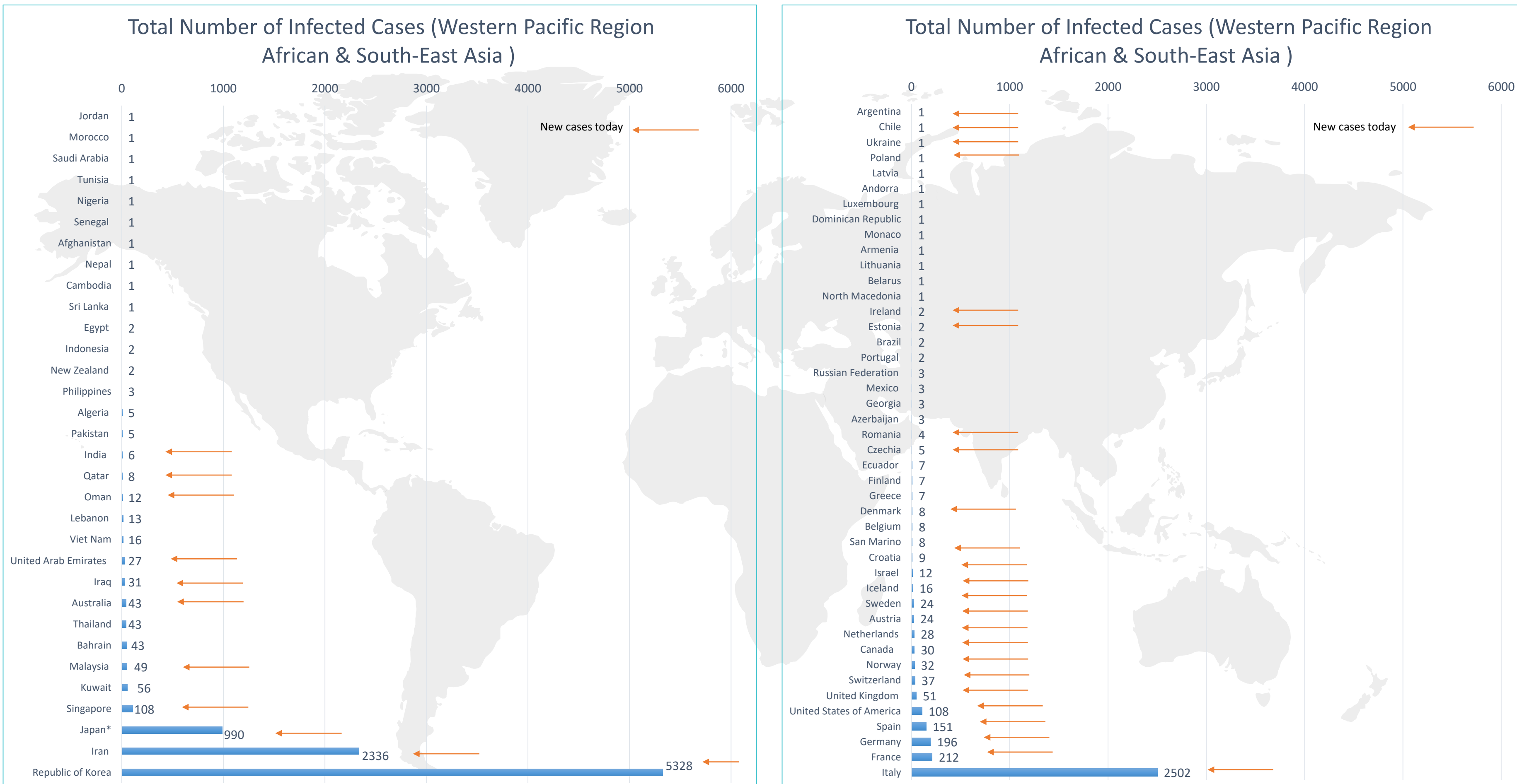


Line graph published by Abu Dhabi Public Health Center 2020.

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



**Figure 6: Total number of cases outside China per country (January 21<sup>st</sup> to March 4<sup>th</sup>, 2020)**

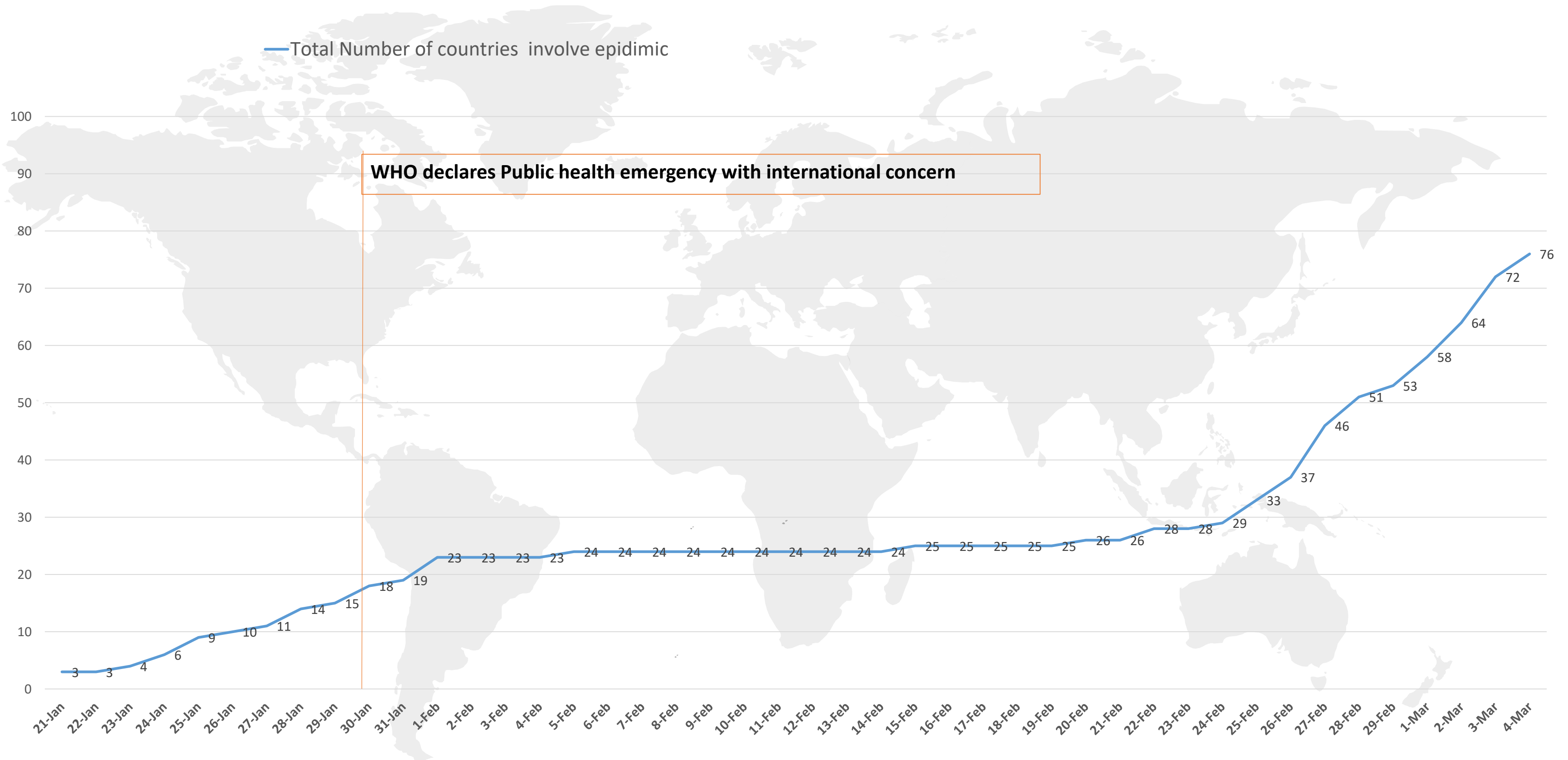


Line graph published by Abu Dhabi Public Health Center 2020.

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



Figure 7: Total number of countries reporting cases of COVID-19 outside China over time



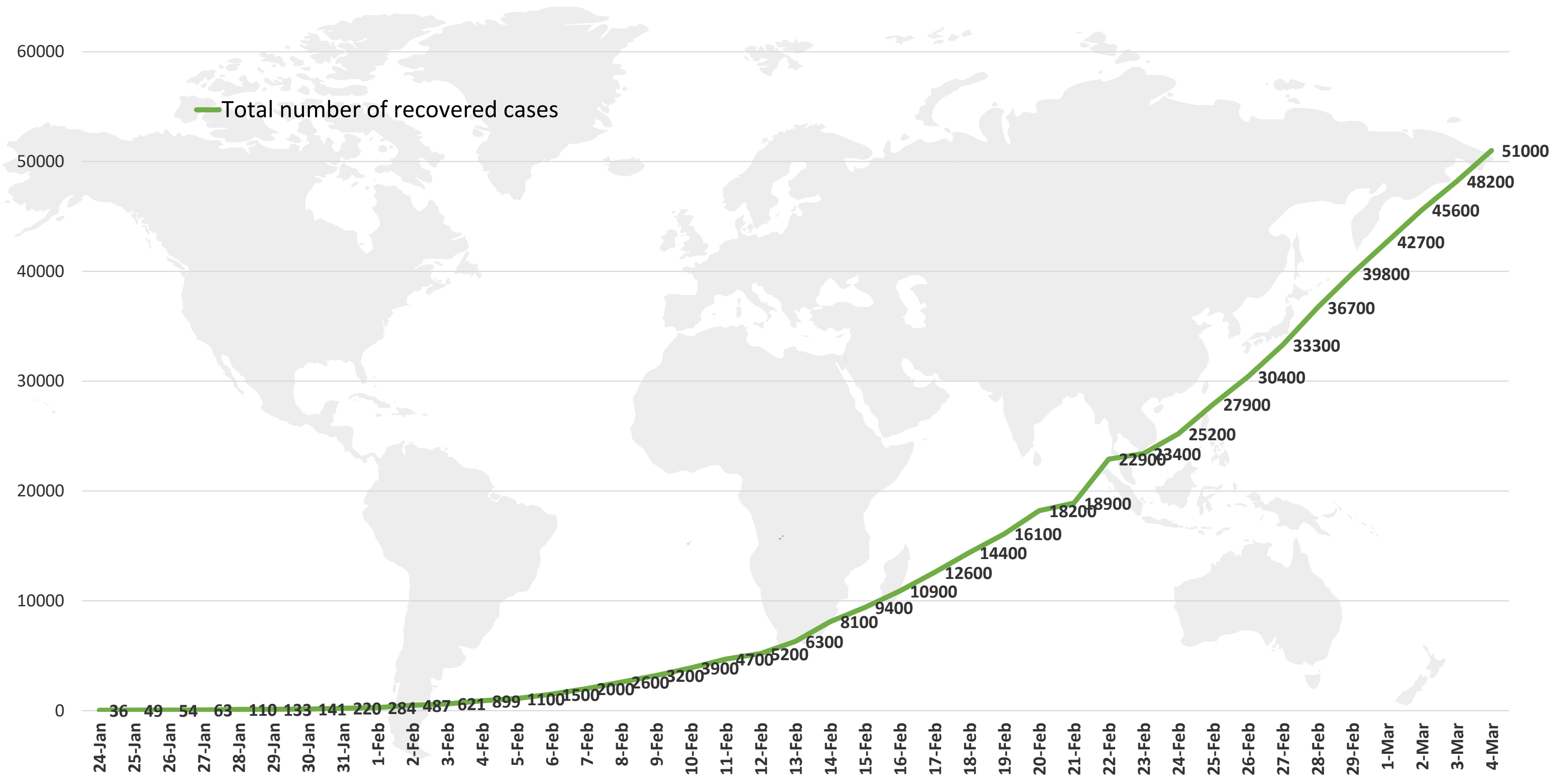
Line graph published by Abu Dhabi Public Health Center 2020.

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

# Epidemiology



Figure 8: Total recovered cases of COVID-19. (January 21<sup>st</sup> to March 4<sup>th</sup>, 2020)



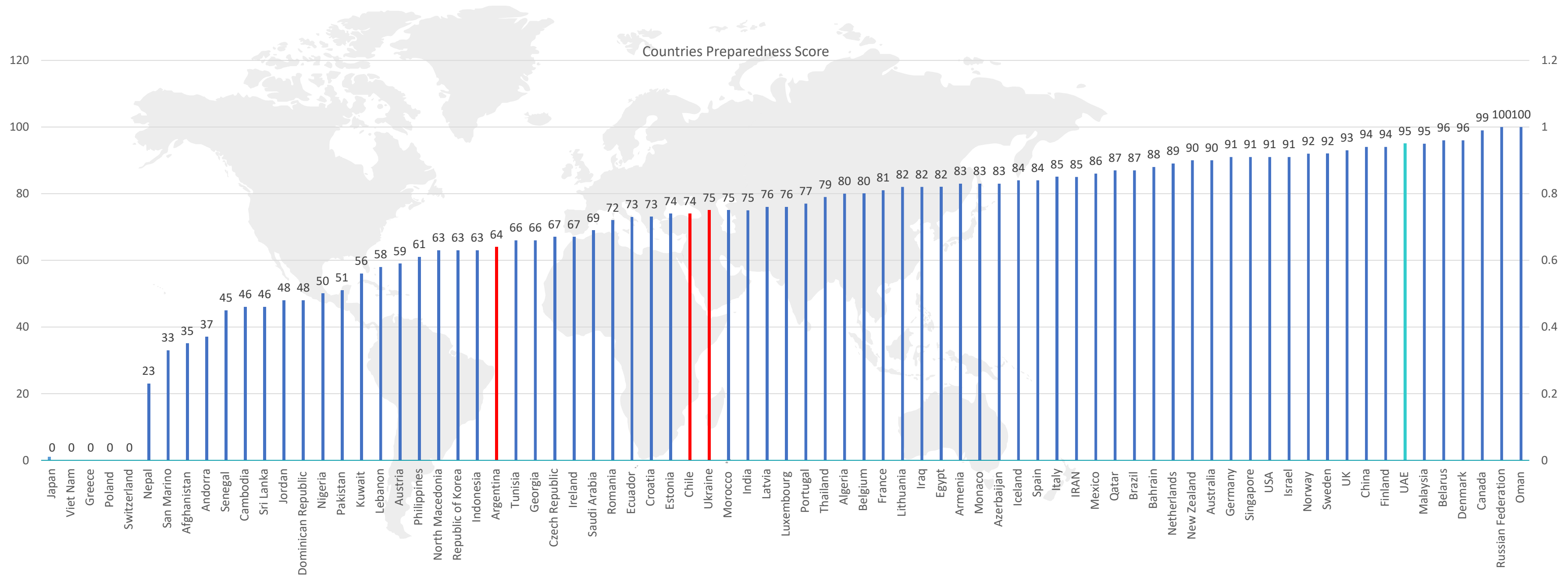
Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [John Hopkins University](https://www.jhu.edu/)



## Figure 9 : Capacities of countries reporting COVID19 cases

Figure 9A: Countries' preparedness score in responding to Public health risks and acute events. Published in 2018



Line graph published by Abu Dhabi Public Health Center 2020.

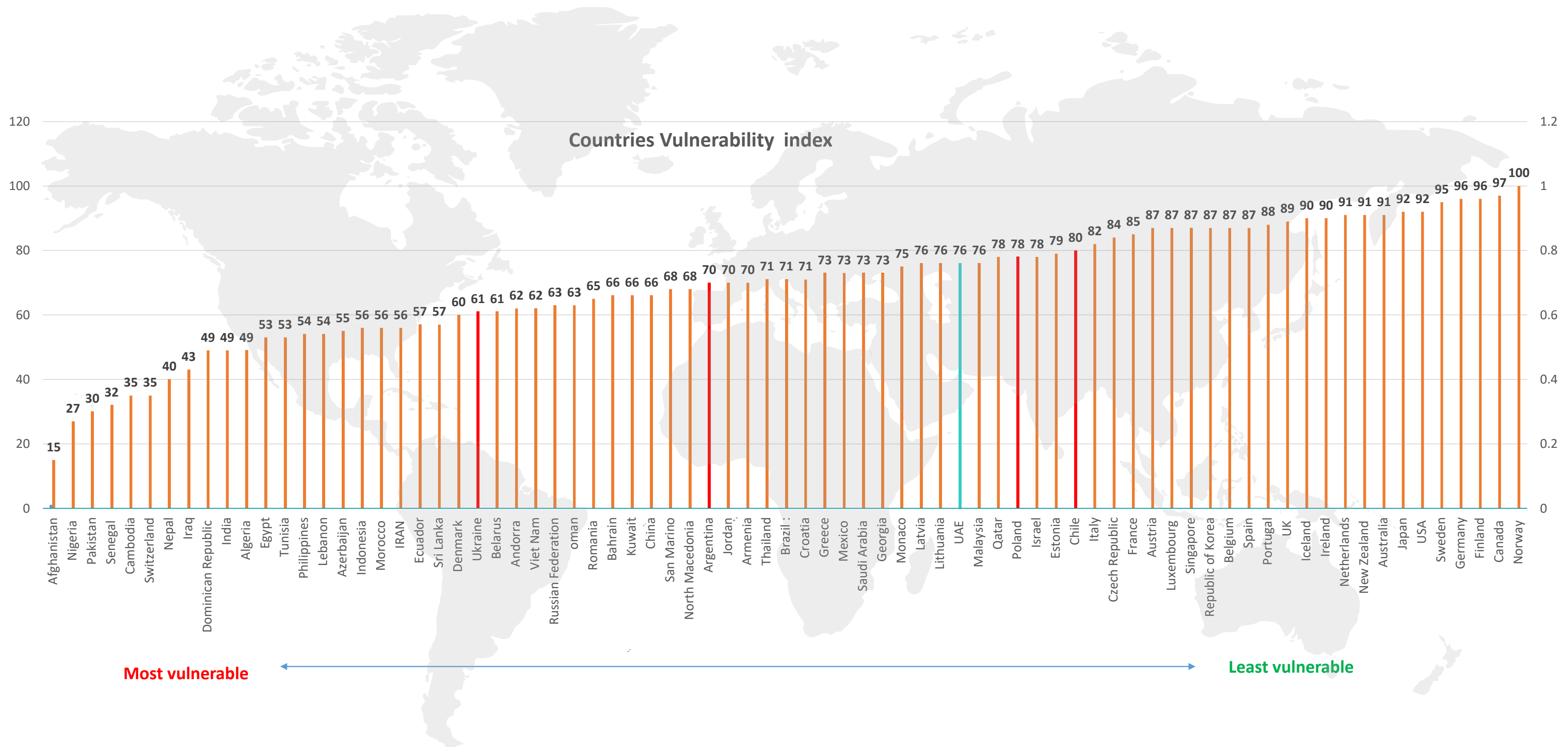
Data resources : [SPAR score](#), [IDVI score](#)

# Epidemiology



Figure 10 : Capacities of countries reporting COVID19 cases

Figure 9B: Countries' vulnerability index to spread infectious disease. Published in 2016



Line graph published by Abu Dhabi Public Health Center 2020.

Data resources : [SPAR score](#) , [IDVI score](#)



# Public health response

## Article : Mitigate the effects of home confinement on children during the COVID-19 outbreak

Published: 3 March 2020

### Summary:

The emergency home school plan has been rigorously implemented in china and in the other some countries in the world.

The risk for prolonged school closure and home confinement during a disease outbreak might have a negative effects on children's physical and mental health.

### Some recommendation to mitigate this risks are:

- Government should **Raise the awareness** of potential **physical and mental health impacts** of home confinement during this unusual period.
- Government should provide guidelines and principles in **effective online learning** and ensure that the contents of the courses **meet the educational requirements**.
- The government might **mobilize existing resources**, perhaps involving **Non-Governmental Organization to create a platform for online education courses** about healthy lifestyle and psychosocial support programs available for schools .
- Create a social safety net from parent's communities and social workers and psychologists.
- Schools have a critical role to emphasis interaction with teachers and obtain psychological counselling for student in need.

Link: [here](#)





# Public health response

## Article : Hospital Emergency Management Plan During the COVID-19 Epidemic

Published: March 2, 2020

- From January 13 2020 to February 1, 2020, the study reviewed The daily Emergency Department (ED) visits and The personal protection equipment (PPE) supplies records.

### • Findings:

1. Increased fever presentation between January 20 and 25.
2. On January 25, ratio of patients with fever was at its peak at 40%.
3. Protective clothing, N95 respirators and goggles were available to less than 15% of ED personnel.

To adopt a series of measures to protect spread of infection among healthcare personnel the following is recommended:

#### First:

- Online clinic: to facilitate triage and provide free online consultation.
- Case prioritization based on health status:
- High risk patients: refer to Fever Clinic via green channel.
- Low risk patients: provide treatment instructions for self-isolation at home.

#### Second:

- Establish interim triage to divide into low, high suspected cases.
- Separate ED space into high, low risk regions.
- Assign an independent Fever Clinic, Fever Observation and CT examination for high risk cases.
- Active transfer of confirmed cases to quarantine ward.

#### Third:

- Ensure presence of PPE and medical devices in the ED. And standardized personal protection measures. .
- Ensure enough manpower to cover ED and vital areas.
- Postpone non-urgent procedures.

[Link: here](#)

# Diagnosis



## Article : Deep Learning System to Screen Coronavirus Disease 2019 Pneumonia

Published: February 2020

### Summery:

- The article explores the potential of AI technology for early screening of COVID-19 patients using CT imaging.
- **618 CT samples were collected:** 219 from 110 patients with COVID-19, 224 CT samples from 224 patients with Influenza-A viral pneumonia, and 175 CT samples from healthy people (with at least two days gap between CT datasets).
- 528 CT samples training and validation sets and 90 CT samples were for testing.
- Deep learning technologies, such as convolutional neural network (CNN) was used to classify the images.
- The **deep learning models were 86.7% accurate for the three groups:** COVID-19, Influenza-A viral pneumonia and healthy cases.
- AI can be a useful supplementary diagnostic method for frontline clinical doctors it can assist physicians to make a quick clinical decision more accurately and start quarantine/treatment plan promptly.
- **The study limitations:** A small dataset hence, less opportunity for machine training, validation and testing to improve the accuracy.

[Link : here](#)

# Clinical Feature and Transmission



## Article : A Well Infant Coronavirus Disease 2019 (Covid-19) With High Viral Load

Published: February 28, 2020

### Summery:

6-month-old baby boy with coronavirus-19 traced after positive COVID19 in his mother and later in his father.

- **3<sup>rd</sup> Feb 2020** The mother of the child admitted to the Singapore General Hospital (SGH) isolation for COVID19.
- The mother's **occupation involved close contact with tourists from china.**
- **Presenting history:**

The child was asymptomatic on admission; and developed only one day fever in the second day of admission.

### Clinical findings

#### 4<sup>th</sup> Feb 2020 (1<sup>st</sup> day of admission):

- Chest x-ray: not performed in view of normal signs, Nasopharyngeal swab: **positive with low cycle threshold** suggesting **high viral load** AND Stool and urine samples: Negative.
- Daily nasopharyngeal swab: positive for SARS-COV-2 but became negative on day 17 of admission.
- Infant become neutropenic in 11<sup>th</sup> Feb 2020) on **day 8 and had a Positive stool sample for SARS-COV-2 on day 9.**
- on the 6<sup>th</sup> of February 2020 mother joined her child with no symptoms \_Breastmilk samples tested for COVID19 and it was negative on **day 11** of illness.

### Observations:

- A 6-month-old infant with positive COVID-19 infection remains asymptomatic, apart from a single transient temperature of 38.5°C with positive nasopharyngeal swabs to day 16 of admission.
- This adds considerable challenge as these carriers: Make it difficult to identify true incidence of COVID-19.

[Link : here](#)