



Scientific Research Monitoring on COVID-19

25 February 2020

Reported by: *(Public Health Research Section)*

WHAT WE KNOW SO FAR



1. The virus have been sequenced and found to be similar to MERS-CoV and SARS-CoV. Research revealed the virus originated in a bat reservoir.
2. New designation for the disease and the virus: **COVID-19** and **SARS-COV2** .
3. Transmission from human to human has been confirmed. Incubation period ranges from 3–7 days and can reach up to 14 days. Transmission during the incubation period not yet confirmed (further studies are required).
4. Suggested human-to-human transmission occurs through droplets, contact and fomites, similar to Severe Acute Respiratory Syndrome (SARS).
5. Efforts currently in developing therapies for this virus focus on previously known medications and vaccination for MERS-CoV and SARS-CoV.
6. Most studies mention multiple antiviral medications are involved but treatment outcomes have yet to be published. One study in the US reported recovery after 1 day of treatment with Remdesivir. **Trial on animals have shown multiple drug candidates to be effective. Trials in human are ongoing.**



WHAT WE KNOW SO FAR

6. WHO forum held 11-12 Feb 2020 to mobilize research on COVID19 vaccinations and therapies.
7. WHO issued a response budget for three month starting from February 2020.
8. 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.
9. 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.
10. Isolation is the best measure to control transmission. The epidemic is expected to peak in early March 2020.
11. Transmission of SARS occurs most often when a patient develops sever 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.



WHAT WE KNOW SO FAR:

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.



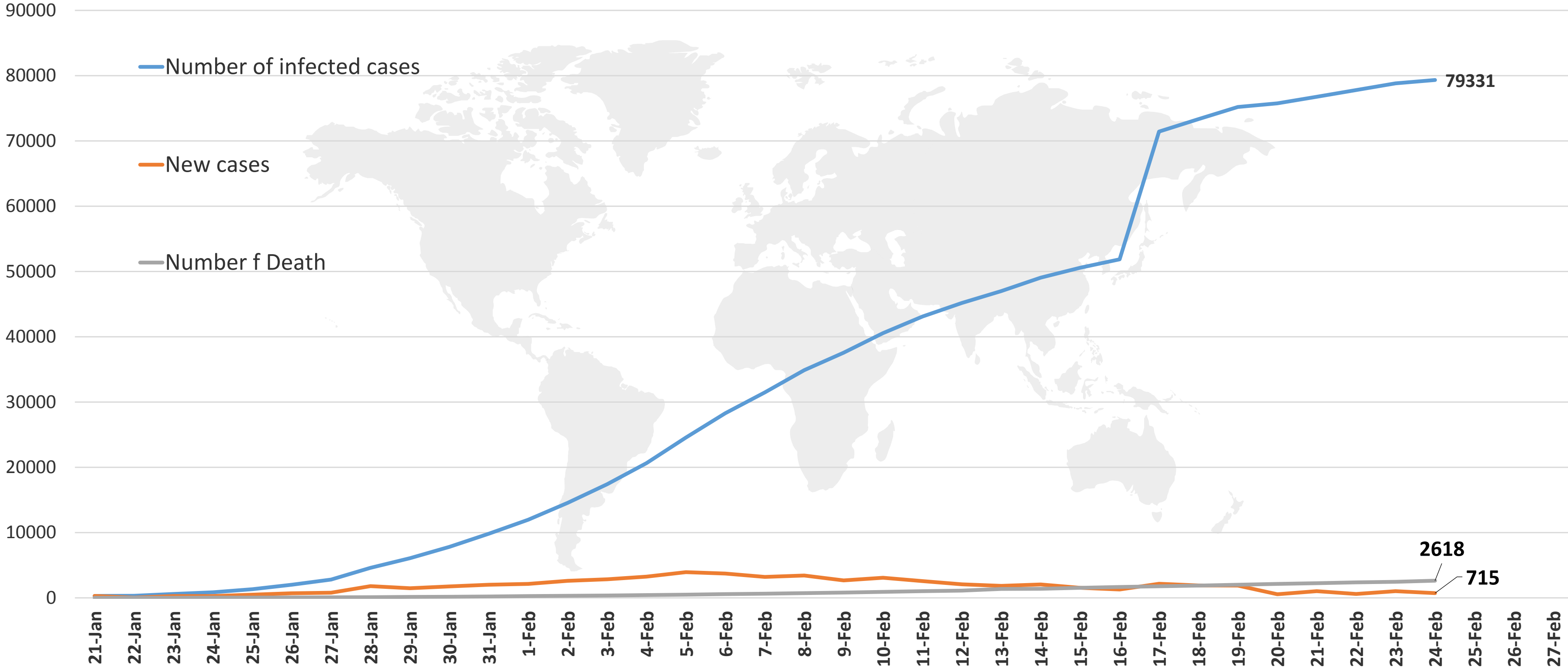
NEW UPDATES FROM TODAY'S REPORT:

- **Epidemiology section :**
 - new cases reported in Kuwait.
 - Stigmatization could potentially contribute to more severe health problems, ongoing transmission, and difficulties controlling infectious diseases during an epidemic.
- **Clinical feature section:** additional findings indicate that a person with 2019-nCoV might be infectious during the incubation period.



EPIDEMIOLOGY:

Figure 1: Total number of infected, new, and death cases (January 24st to February 24th, 2020)



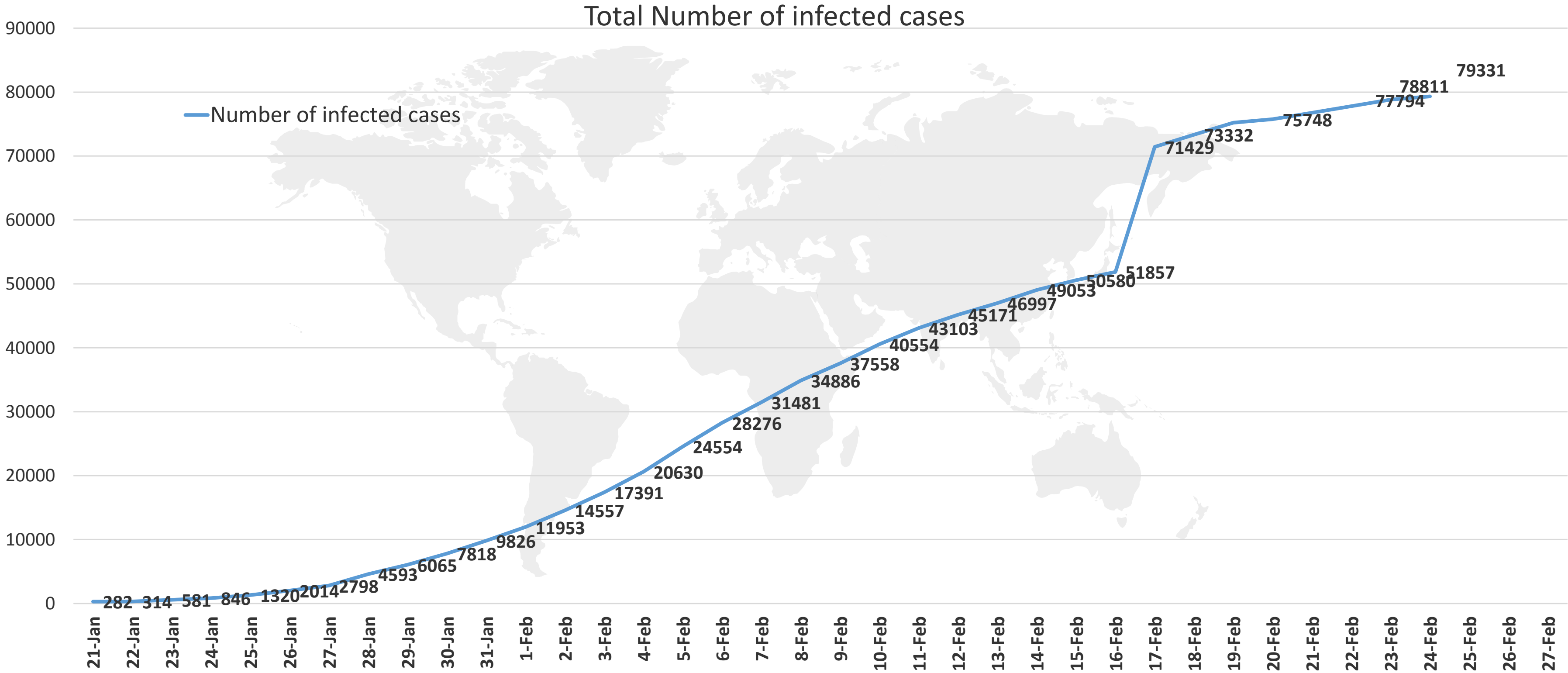
Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#)



EPIDEMIOLOGY:

Figure 2: Number of infected cases (January 22st to February 24th, 2020)



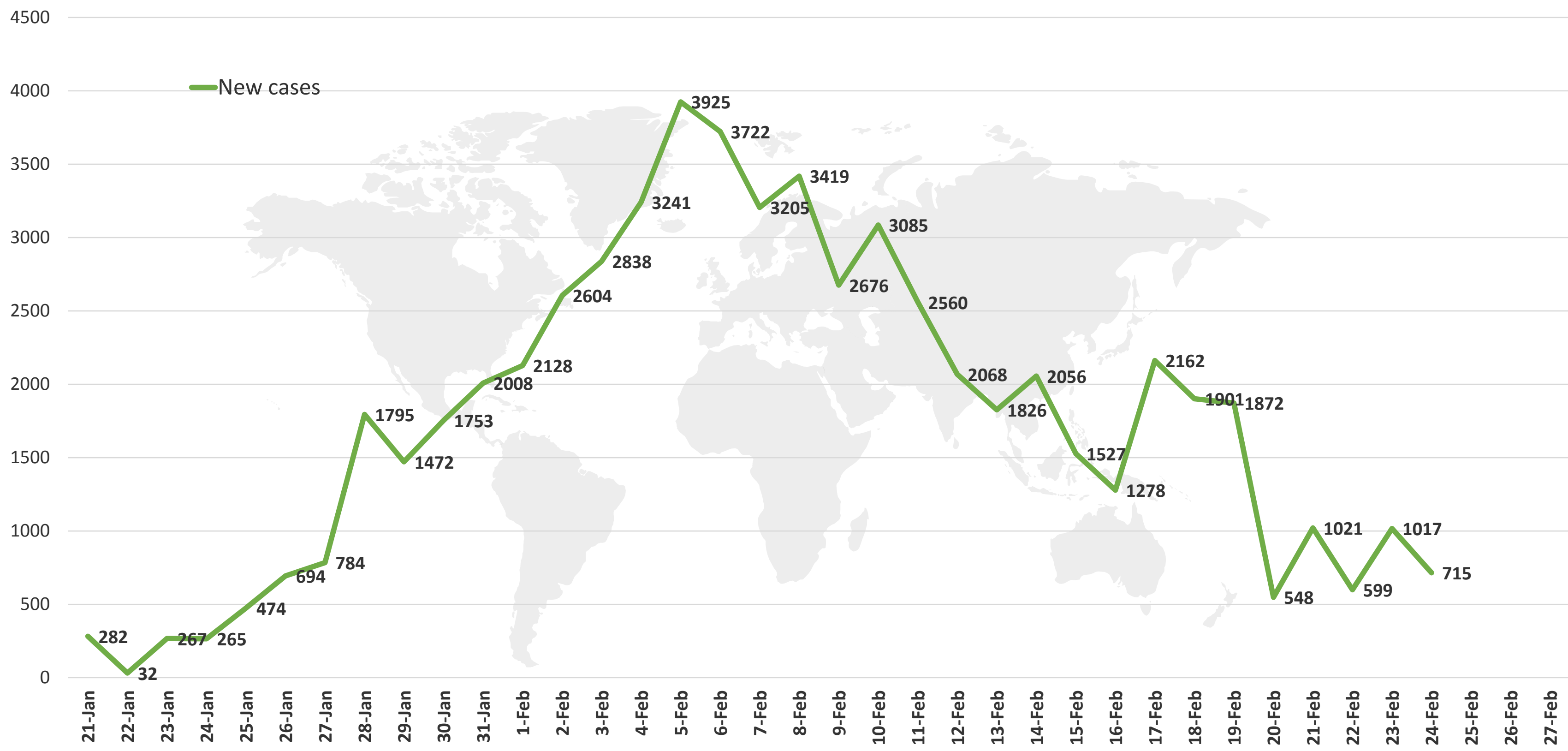
Line graph published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 3: Number of new cases (January 21st to February 24th , 2020)



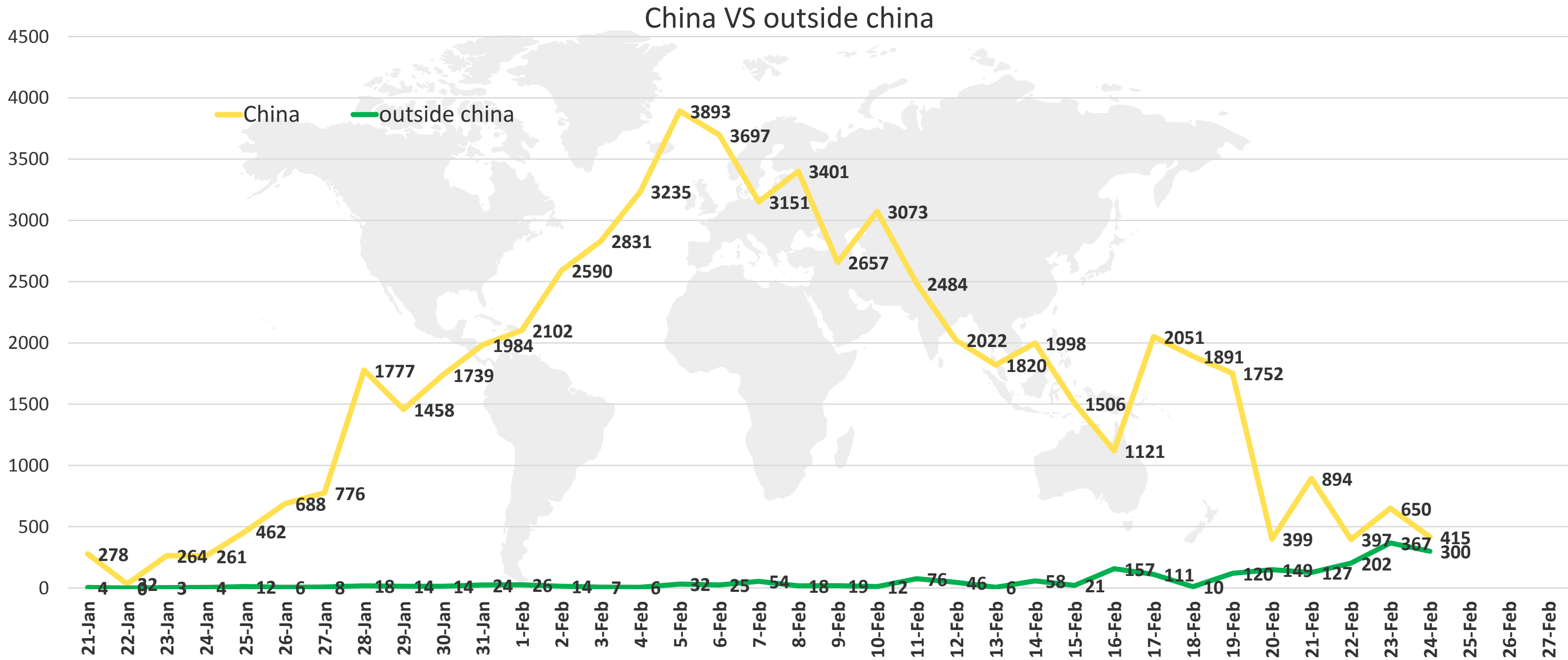
Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#)



EPIDEMIOLOGY:

Figure 4: Number of new cases in China versus outside China (January 22st to February 24th , 2020)



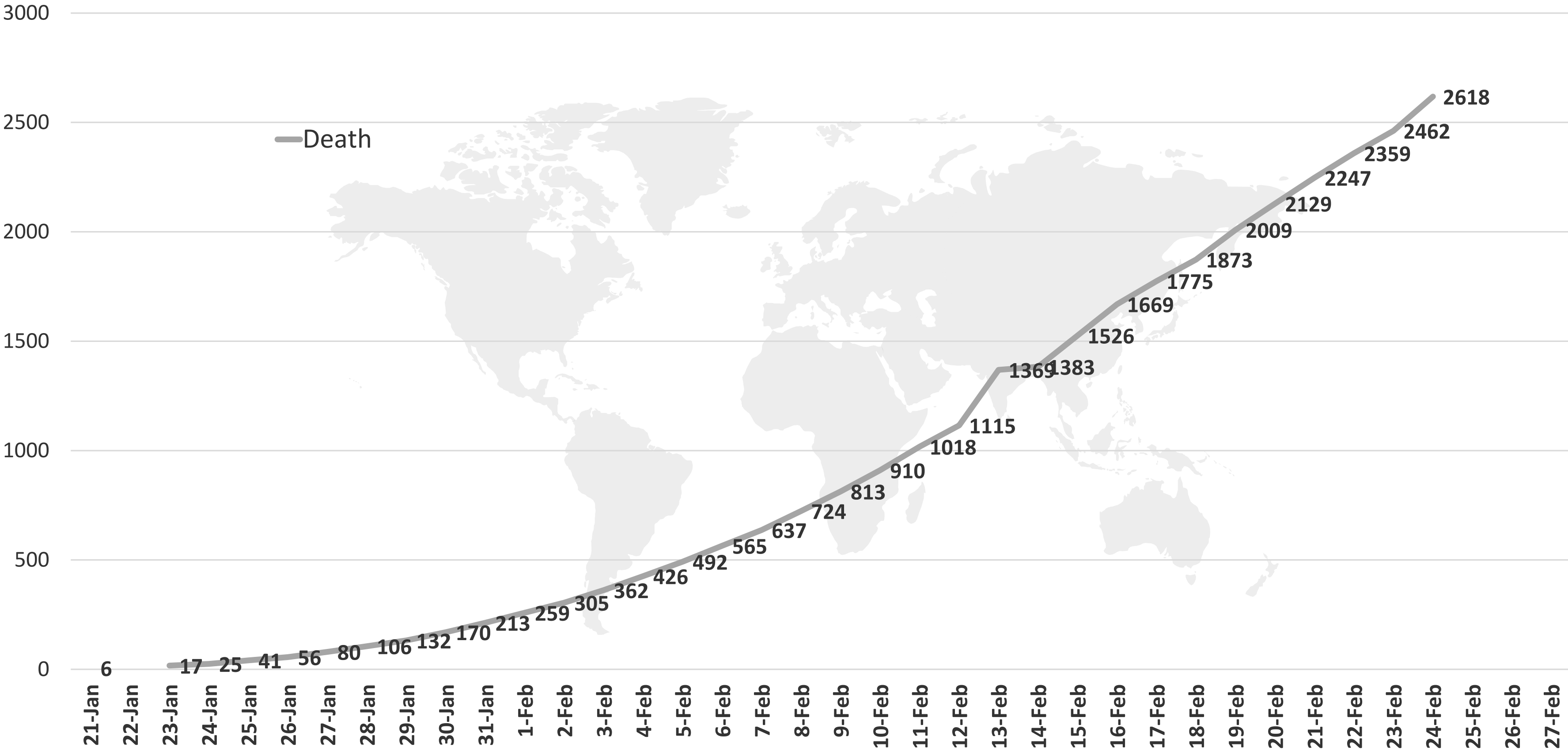
Line graph published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 5: Number of total deaths (January 21st to February 24, 2020)



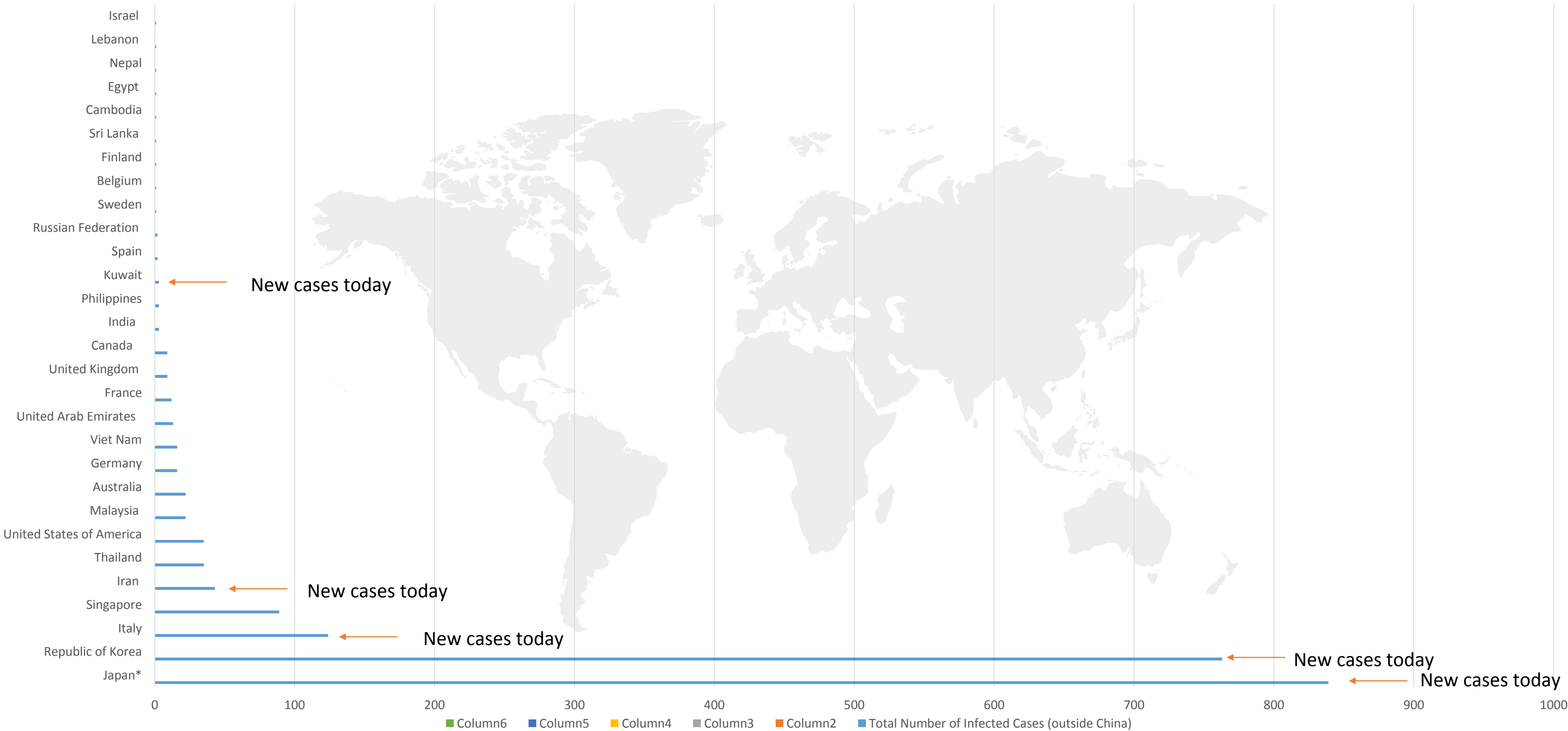
Line graph published by Abu Dhabi Public Health Center 2020.

Data resources: [WHO](#)



EPIDEMIOLOGY:

Figure 6: Total number of cases outside China per country (January 21st to February 24th, 2020)



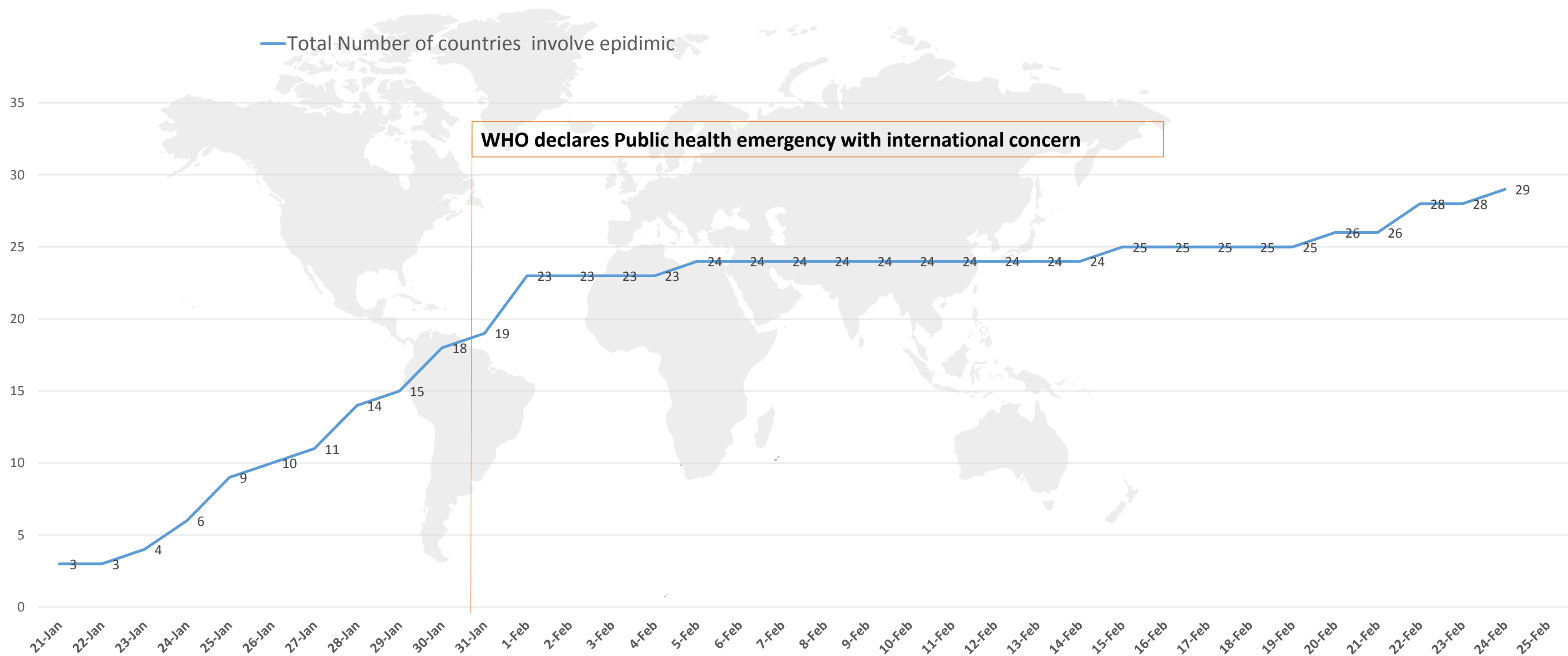
Line graph published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

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](#)



EPIDEMIOLOGY:

Figure 9 : Capacities of countries reporting COVID19 cases

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

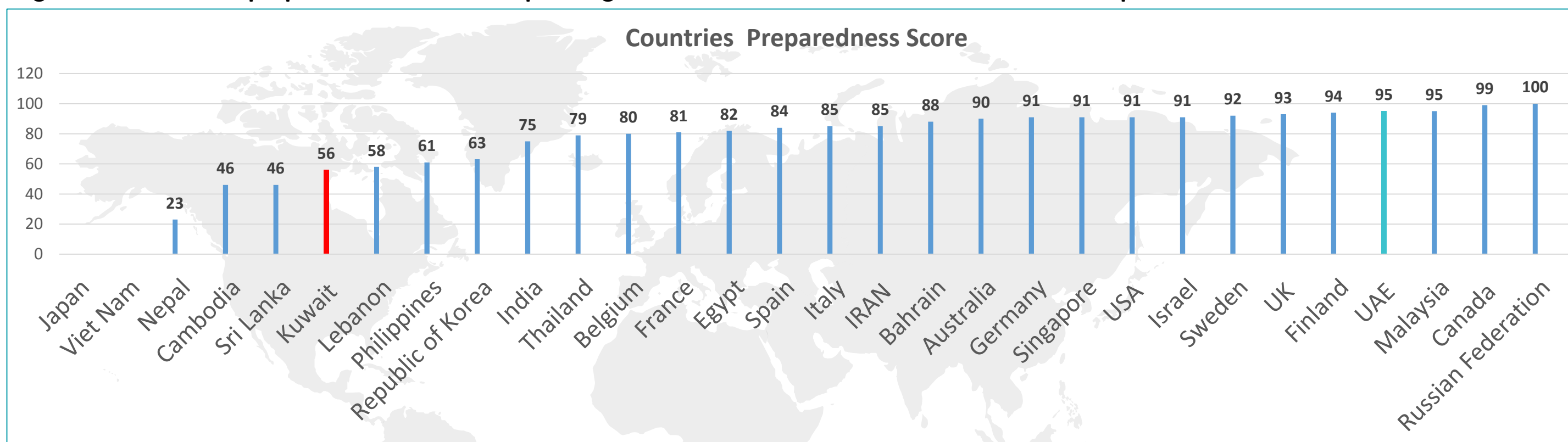
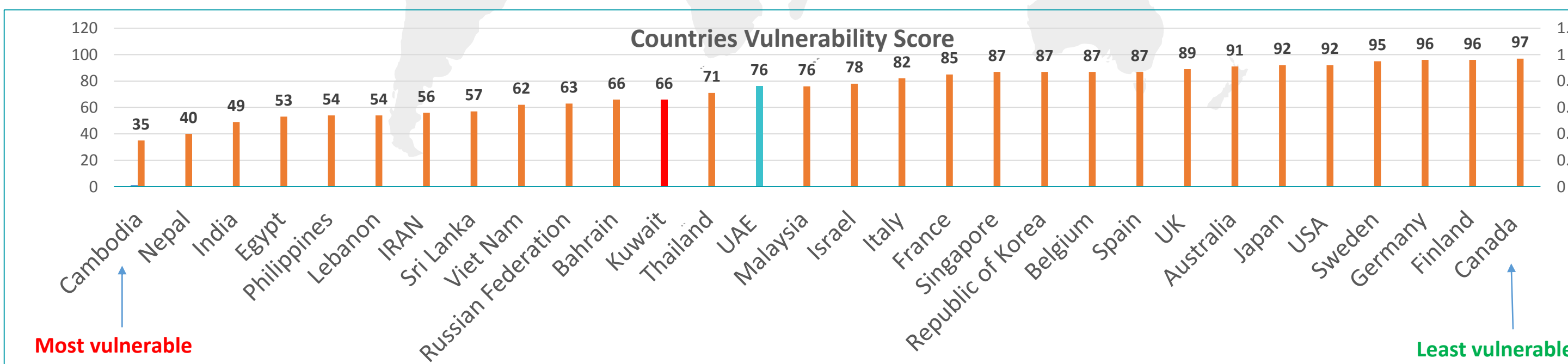


Figure 9B: Countries' vulnerability score to spread infectious disease. Last updated in 2016



Line graph published by Abu Dhabi Public Health Center 2020.

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

EPIDEMIOLOGY:

WHO report 24 /2/2020 important points

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- One new Member State (Kuwait) reported cases of COVID-19 in the past 24 hours.
- Since the emergence of COVID-19 we have seen instances of public stigmatization among specific populations, and the rise of harmful stereotypes. Stigmatization could potentially contribute to more severe health problems, ongoing transmission, and difficulties controlling infectious diseases during an epidemic.
- Stigma can:
 - Drive people to hide the illness to avoid discrimination
 - Prevent people from seeking health care immediately
 - Discourage them from adopting healthy behaviors



EPIDEMIOLOGY:

Figure 6: Comparison of three viruses

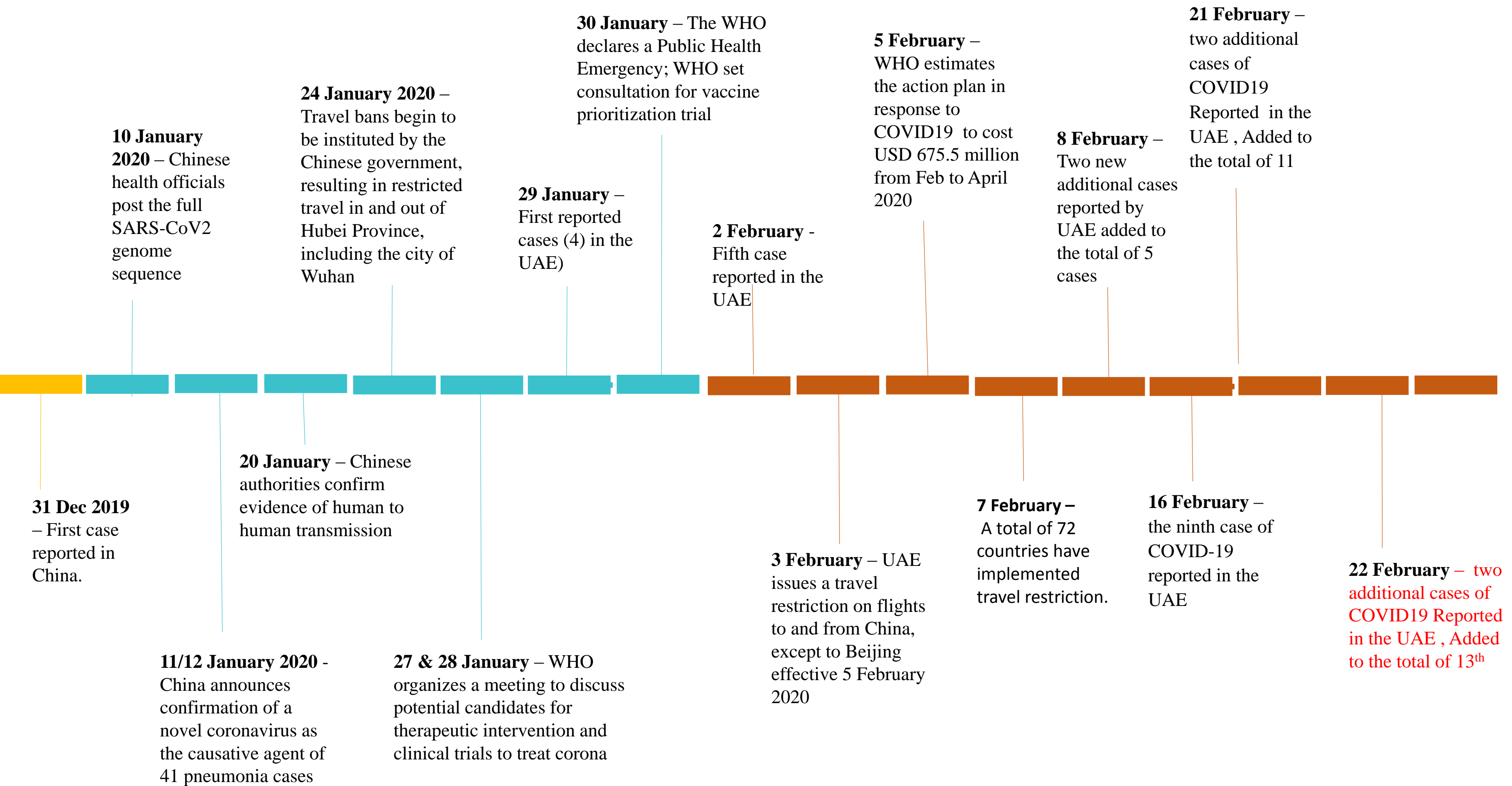
Virus	SARS COV2	SARS-COV	MERS-COV
Date of epidemic	2019	2002	2012
Countries	25	37	27
Infected cases	79331	8000	2494
Death cases	2618	800	858
Mortality	2.3%* ³	10%	> 35 %

- Data until February 24, 2020
- *Fatality rate (preliminary).

TIMELINE

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CLINICAL FEATURES AND TRANSMISSION

NEW UPDATE (1/2)

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Article 1: A familial cluster of infection associated with the 2019 novel coronavirus indicating potential person-to-person transmission during the incubation period.

- **Published:** 18 February 2020
- **Summery finding: (1/2)**
- Case 1 was 88 years old man with moving difficulties and was only exposed to his asymptomatic family members who developed symptoms later. The epidemiological evidence has shown a potential transmission of the 2019-nCoV during the incubation period.
- Case 2 and case 3 were living in Wuhan, and they visited case 1 and case 4 in Shanghai on Jan 15. (they were completely without symptoms)
- **Around 11 AM** on Jan 20, case 1 showed symptoms
Case 2 did not present any symptoms **until 10PM** on January 20.
Case 1&2 admitted in 21 Jan
- Case 3 and case 4 had symptoms on January 23 .Swabs were positive for cases 1&2 on Jan 22, 2020, and cases 3&4 on Jan 24, 2020.

<https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiaa077/5739751>



CLINICAL FEATURES AND TRANSMISSION

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NEW UPDATE (2/2)

- Discussion and comparison:
 - Both SARS-CoV and MERS-CoV does not infect during incubation period and infect lower airway more than cells of the upper airways .
 - In COVID19, culture showed that it can be found in human respiratory epithelial cells in **about 96 hours**.
 - These results support that **2019-nCoV is more** infectious as it is easily discharged through the respiratory tract

Recommendation:

1. **Exposure history** should be the most important reference determining source of infection, and isolation and protection measures.
2. Close contacts should also be those who are exposed during patient incubation.
3. The research and development of **high sensitivity** rapid diagnostic reagent of 2019-nCoV should be accelerated, so as to facilitate the screening of infected persons among **clinical and close contacts**.
4. Health education should be further strengthened and **protective equipment** should be properly used in order to **reduce the exposure** of 2019- nCoV.
5. If possible, the **isolation and medical observation of close** contacts should be centralized under the premise of the **safely transport**. It is important to establish a **community supervision** mechanism when **home isolation** and observation are needed.

<https://academic.oup.com/jid/advance-article/doi/10.1093/infdis/jiaa077/5739751>



CLINICAL FEATURES AND TRANSMISSION *NO UPDATE*

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Articles in special population: (children)

Article 1: Title: First case of severe childhood novel coronavirus pneumonia in China

Published: after 7 February 2020*

Summery finding: 13-month-old male presenting with diarrhea and progressed to respiratory symptoms, shock and kidney failure. No positive contact. Two negative PCRs; third was positive. Treatment failed with Tamiflu but improved with continuous blood purification (dialysis). Sever symptoms may be attributable to a congenital abnormality in the kidney which was not diagnosed. Previously.

Link: <http://rs.yiigle.com/yufabiao/1180144.htm>

Article 2: Title: A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster

Published: 24 January 2020.

Summery finding: 10-year-old male with positive contact. Without symptoms. Lung imaging found to be positive and PCR was positive.

Link: <https://www.cdc.gov/coronavirus/2019-ncov/downloads/Chan-study-of-a-family-cluster-Lancet-1-20-2020.pdf>

Article 3 : Title: Facing a major outbreak of new coronavirus infections in 2019: reflections from pediatricians

Published: 6 February 2020. *

Summery finding: reported 38 confirmed cases of children. Cough was the main manifestation, some children showed weakness, myalgia, nausea, vomiting, or diarrhea. Among them, 1.5-month-old infant only had frequent vomiting.

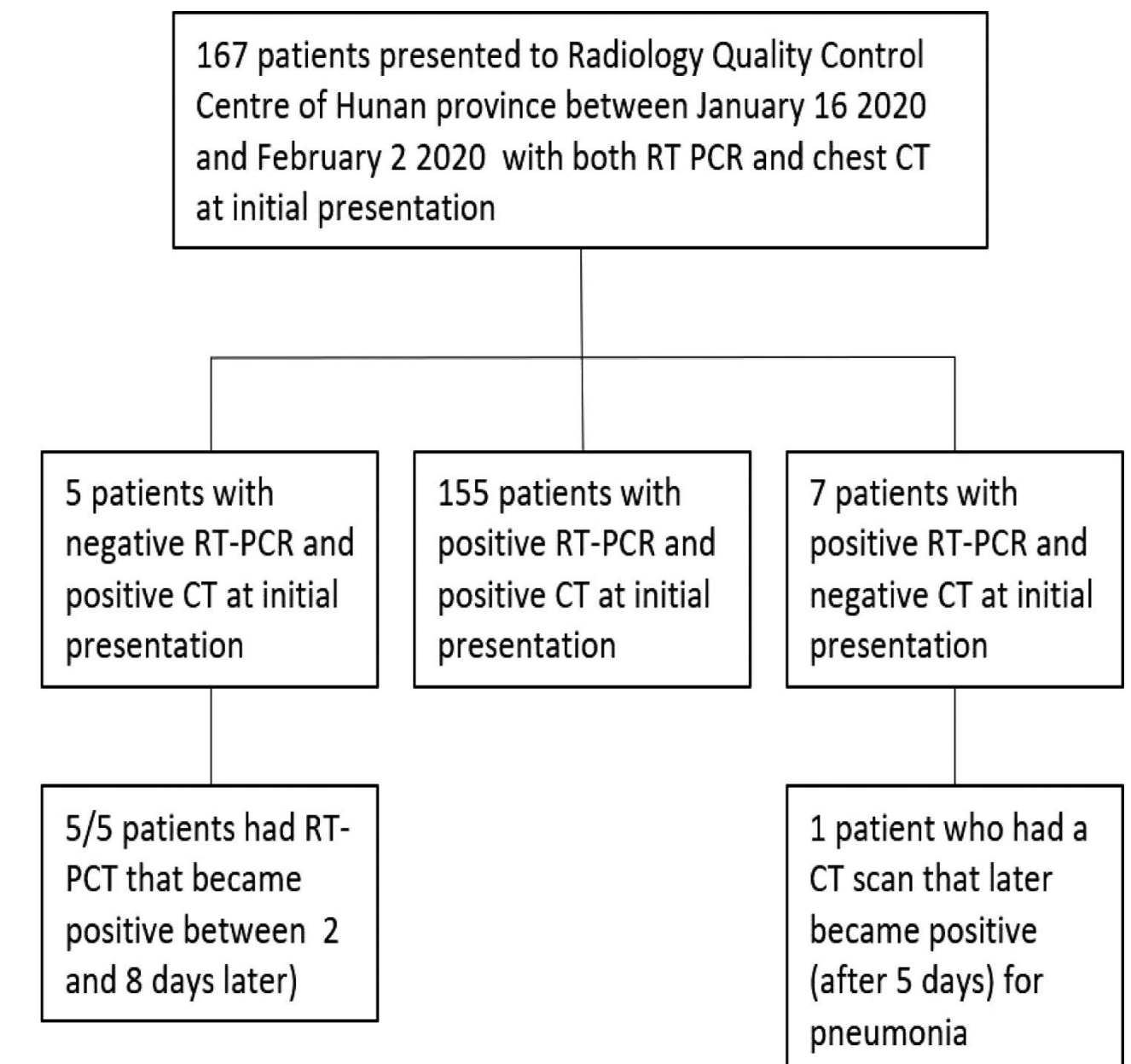
link : <http://www.365heart.com/show/143317.shtml>

** Articles were translated from Chinese language.*



DIAGNOSIS: *NO UPDATE*

- **Article 1: Published: 12 February 2020***
- **Summery finding:** Two radiologists with 10 years of experience interpreted the CT scans.
 - 5 patients initially **tested positive** by **CT** and **negative** by **RT-PCR** but after consecutive testing with RT-PCR became positive.
 - 7 patients tested **negative** by **CT** but **positive** by **RT-PCR**.
 - The **five cases** who were **negative** by **RT-PCR** and **positive** by **CT** at initial are discussed.
 - All cases were had either h/o visiting Wahun or contact with positive cases.
 - All had symptom (some had mild symptoms).
 - After isolation for presumed 2019-nCoV pneumonia, all patients were eventually confirmed with 2019-nCoV infection by **repeated swab tests**.
 - **Conclusion from the study:**
A combination of repeated swab tests and CT scanning may be helpful for individuals at **high clinical suspicion of nCoV infection** but who test **negative in RT-PCR screening**



Link : <https://pubs.rsna.org/doi/10.1148/radiol.2020200343>



TREATMENT:

NO UPDATE

Title: Therapeutic options for the 2019 novel coronavirus (2019-nCoV)

Published 10 Feb 2020 , updated 19 Feb 2020

Links: <https://www.nature.com/articles/d41573-020-00016-0>

1-Ribavirin is approved for treating Hepatitis C Virus and respiratory syncytial virus (RSV), but its side effects such as anaemia may be severe at high doses.

2-Remdesivir an **approved HIV medication**. has been tested in a clinical trial for Ebola. Clinical trial on COVID19 2019 ([NCT04252664](#) and [NCT04257656](#)), with **estimated completion dates in April 2020**. Also **galidesivir** may have potential against 2019-nCoV.

3-Favipiravir approved for influenza treatment. Patients with 2019-nCoV are being recruited in randomized trials to evaluate the efficacy of favipiravir plus interferon- α ([ChiCTR2000029600](#))

4-Pegylated interferon alfa-2a and -2b, approved for the treatment of **HBV and HCV**, could be used for the treatment of COVID19 , **multiple adverse effects** associated with these drugs. Their evaluation should be closely monitored and dose reduction or discontinuation of therapy may be required.

5- Chloroquine (Antimalarial drug) , is being evaluated in an open-label trial , further information : ([ChiCTR2000029609](#)).

There are more than 50 drugs being testing for the treatment COVID19.



TREATMENT:

NO UPDATE

Latest article on February 18, 2020

The WHO developed COVID19 therapeutic trial synopsis (for Multicenter clinical trial studies on investigational therapeutic agent for COVID19). ***NEW***

[https://www.who.int/blueprint/priority-diseases/key-action/COVID-19 Treatment Trial Design Master Protocol synopsis Final 18022020.pdf?ua=1](https://www.who.int/blueprint/priority-diseases/key-action/COVID-19_Treatment_Trial_Design_Master_Protocol_synopsis_Final_18022020.pdf?ua=1)

Current trial: (Source: WHO, January 20, 2020)

- SAG members noted that a **randomized controlled trial was initiated in Wuhan** to assess the effect of **lopinavir/ritonavir with IFN-β1b**, and that trial material from the MIRACLE trial — which aimed to assess the same treatment for **MERS-CoV in Saudi Arabia** — was shared to support the initiation of the trial.

<https://apps.who.int/iris/bitstream/handle/10665/330692/WHO-HEO-RDBlueprintnCoV-2020.2-eng.pdf?sequence=1&isAllowed=y&ua=1>

- **Potential candidates for therapeutic treatment released 24 January 2020**

<https://www.who.int/blueprint/priority-diseases/key-action/overview-ncov-therapeutics.pdf?ua=1>



VACCINATION: *NO UPDATE*

Latest article on February 18, 2020

- The WHO released **COVID-19 Phase IIb/III Vaccine Trial Synopsis**. *NEW*
- <https://www.who.int/blueprint/priority-diseases/key-action/COVID-19-vaccine-trial-synopsis.pdf?ua=1>
- Updated draft design for therapeutic trial published in **27 January 2020. Promote the use of information on MERS-COV and SARS-Cov to develop a vaccine**
- <https://apps.who.int/iris/bitstream/handle/10665/330695/WHO-HEO-RDBlueprintnCoV-2020.5-eng.pdf?sequence=1&isAllowed=y&ua=1>
- **List of suggested vaccines:**
- <https://www.who.int/blueprint/priority-diseases/key-action/list-of-candidate-vaccines-developed-against-ncov.pdf>