



Scientific Research Monitoring on COVID-19

20 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.



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:

- 13.** Children have mild symptoms compared with adults. **Further studies of this population is needed.**
- 14.** **80% of infected patients have mild symptoms and 1.2% may present without symptoms.**



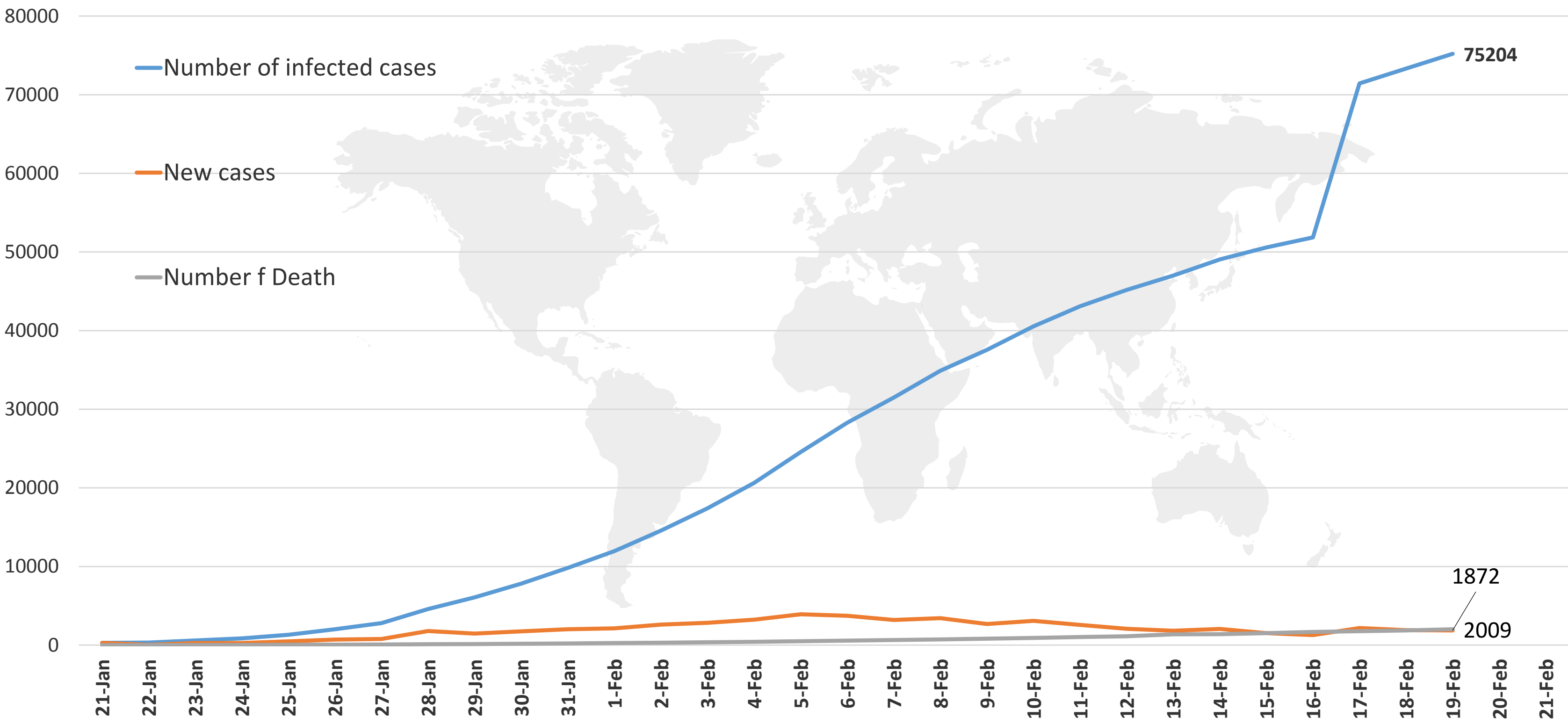
NEW UPDATES FROM TODAY'S REPORT:

- **Epidemiology section:** WHO presenting preliminary epidemiological parameter such as incubation period , fatality ratio ,...etc.
- **Clinical feature and transmissibility:** New study reporting the characteristic of more than **72000** cases in china. Fatality rate in 2.3 % , 80% have mild symptoms, cases with infection but without symptoms are 1.2% .
- **Treatment section:** Clarification on drug **Favipiravir** , WHO have released synopsis on therapeutic/ vaccination trials design..



EPIDEMIOLOGY:

Figure 1: Total number of infected, new, and death cases (January 21st to February 19th, 2020)



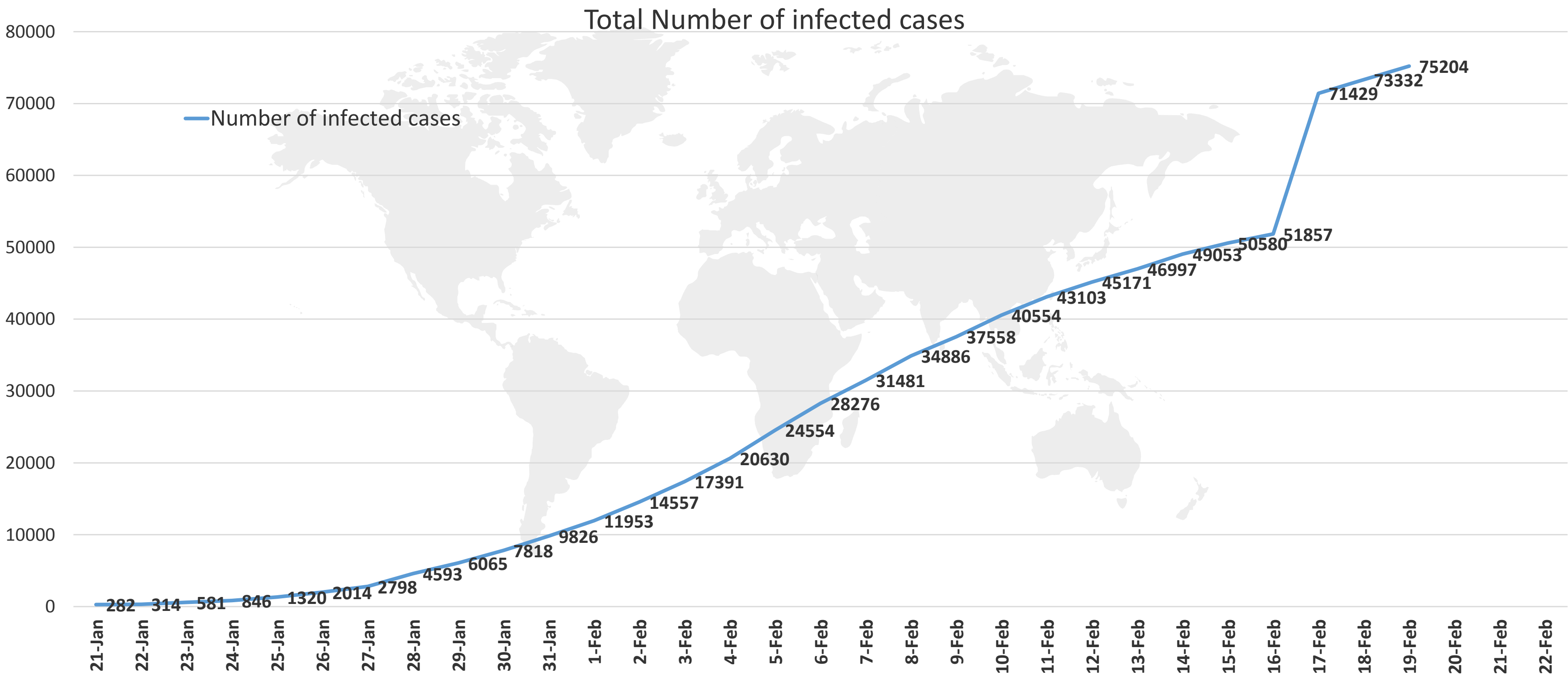
Line graph published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 2: Number of infected cases (January 21st to February 19th , 2020)



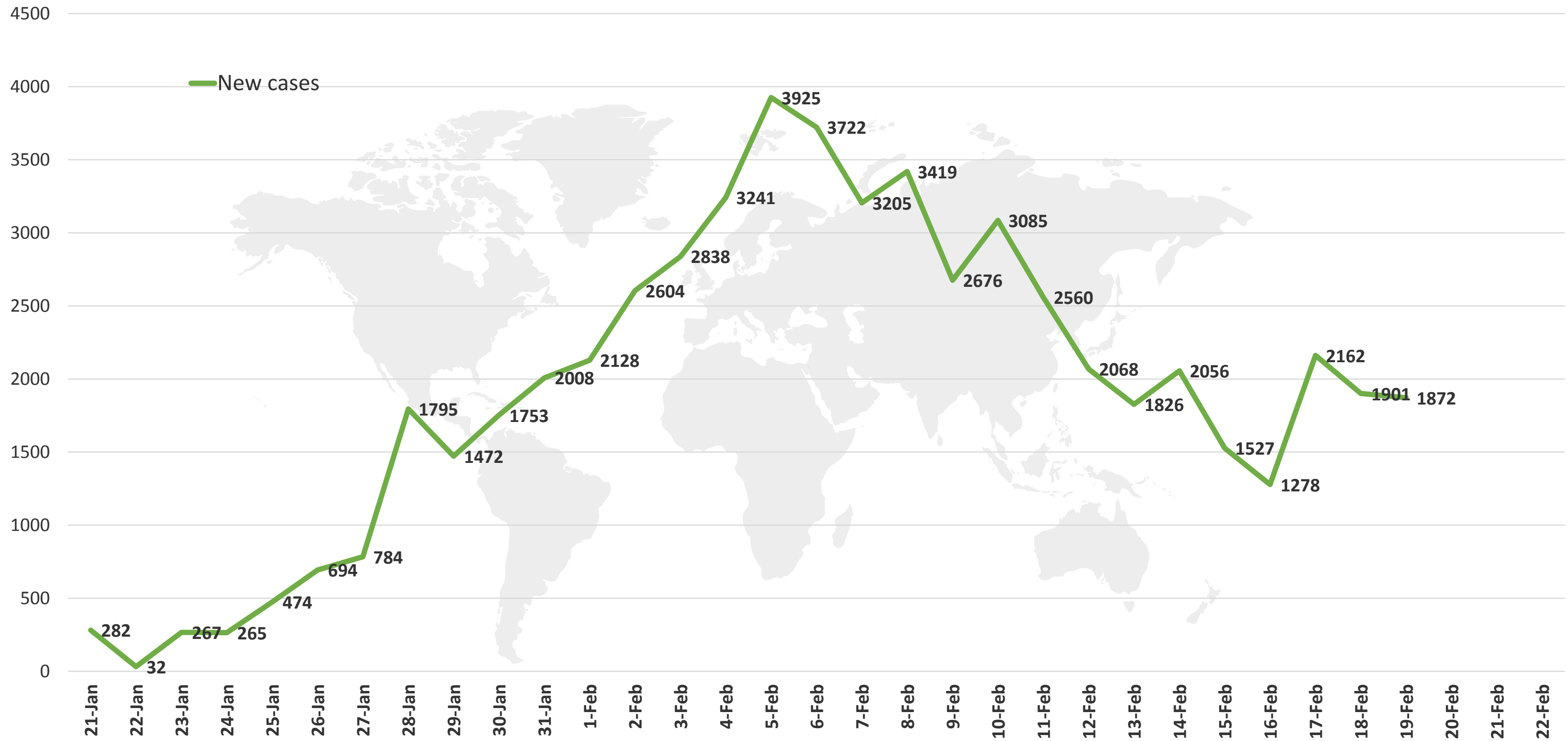
Line graph published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 3: Number of new cases (January 21st to February 19th , 2020)



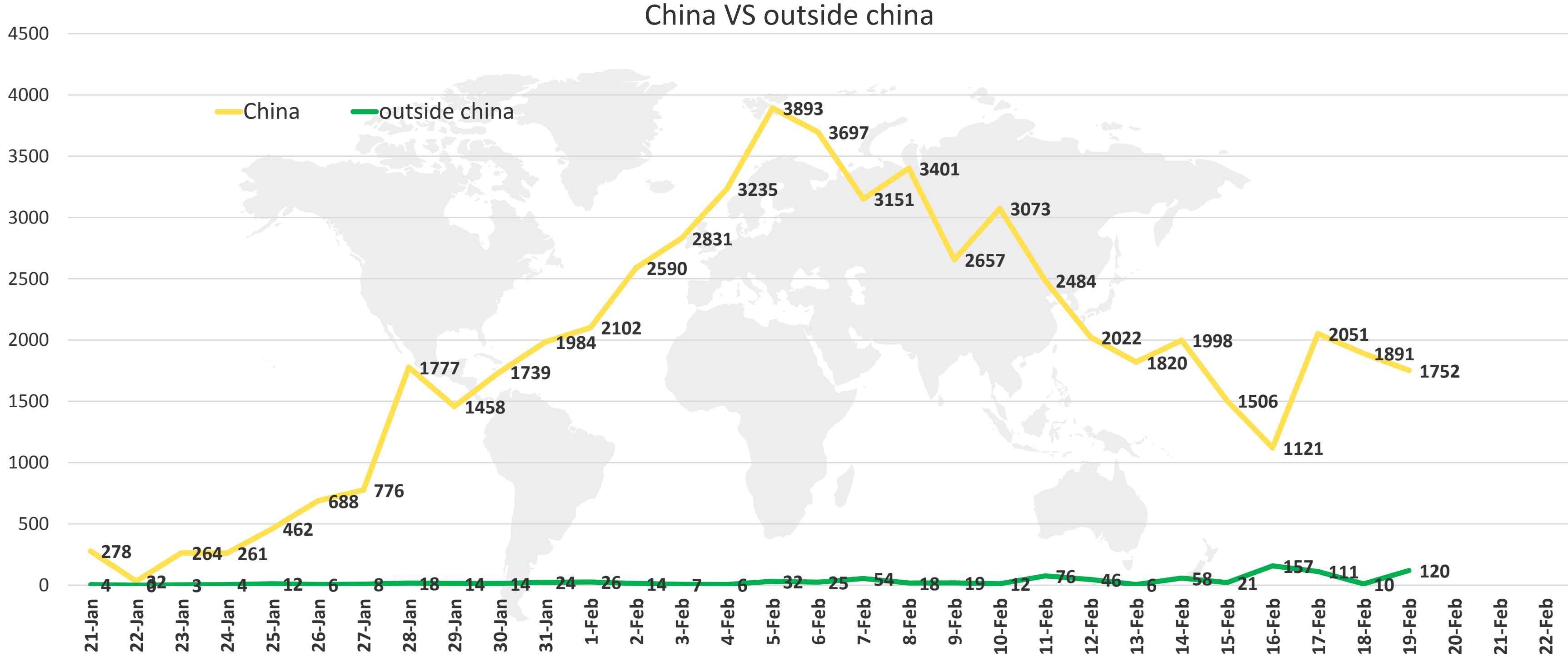
Line graph published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 4: Number of new cases in China versus outside China (January 21st to February 19th , 2020)



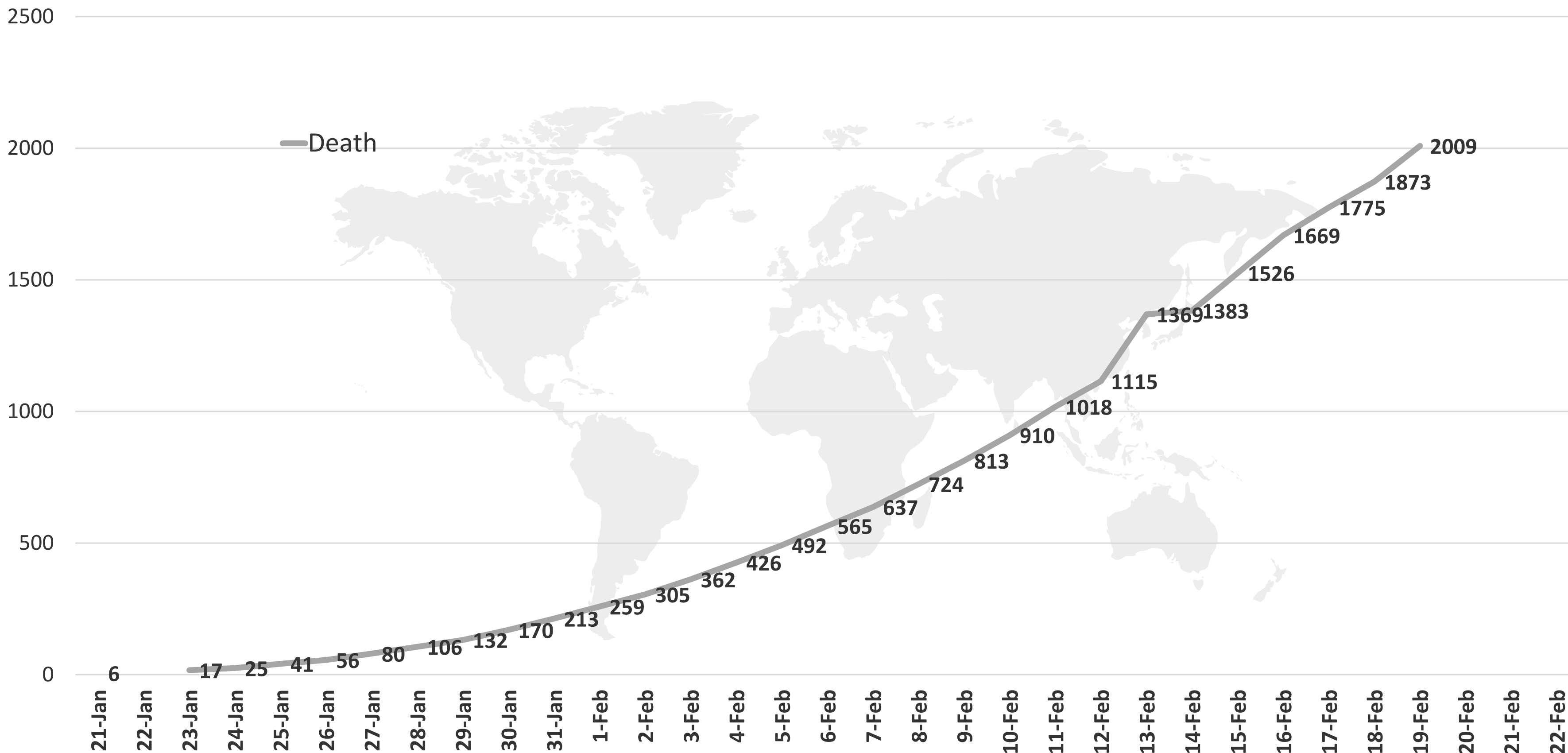
Line graph published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 5: Number of total deaths (January 21st to February 19th , 2020)



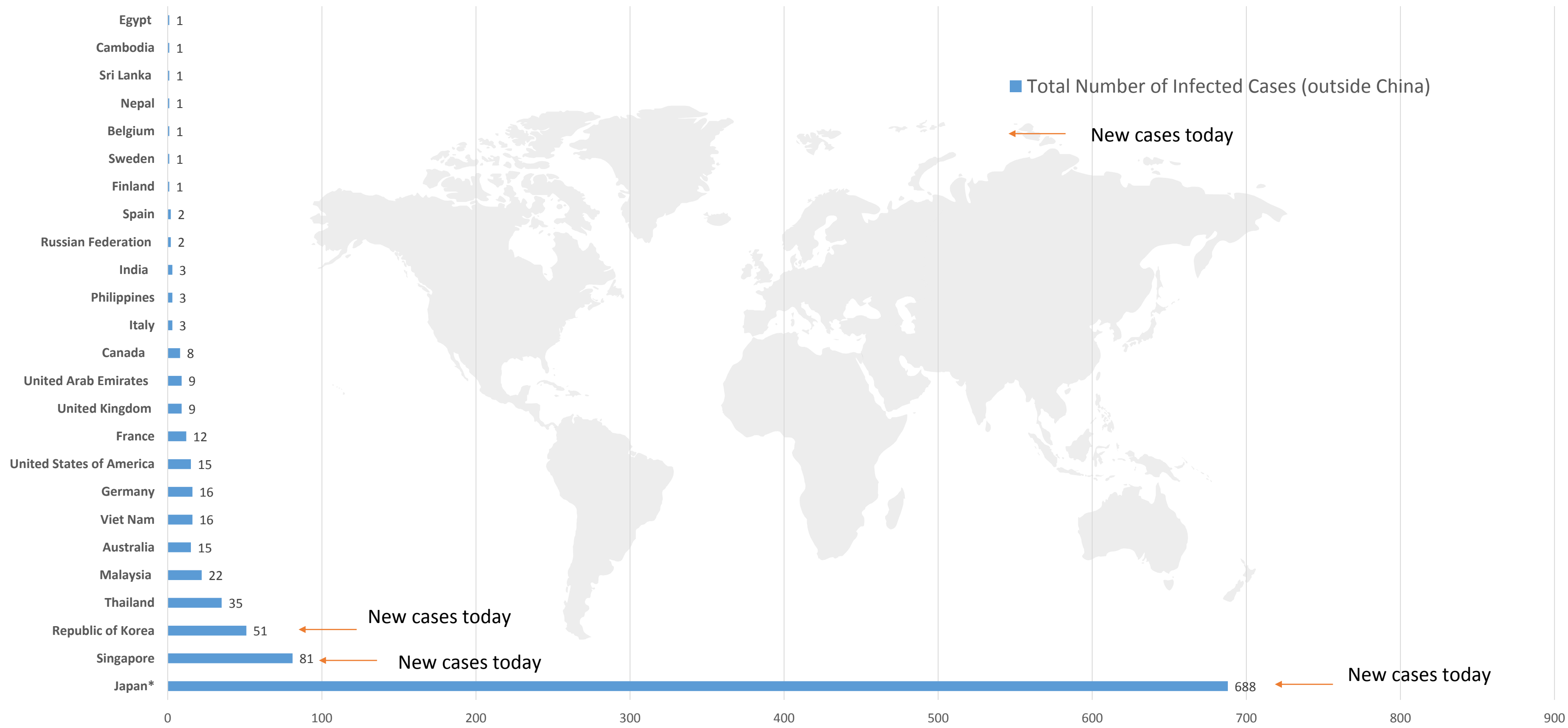
Line graph published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 6: Total number of cases outside China per country (January 21st to February 19th, 2020)



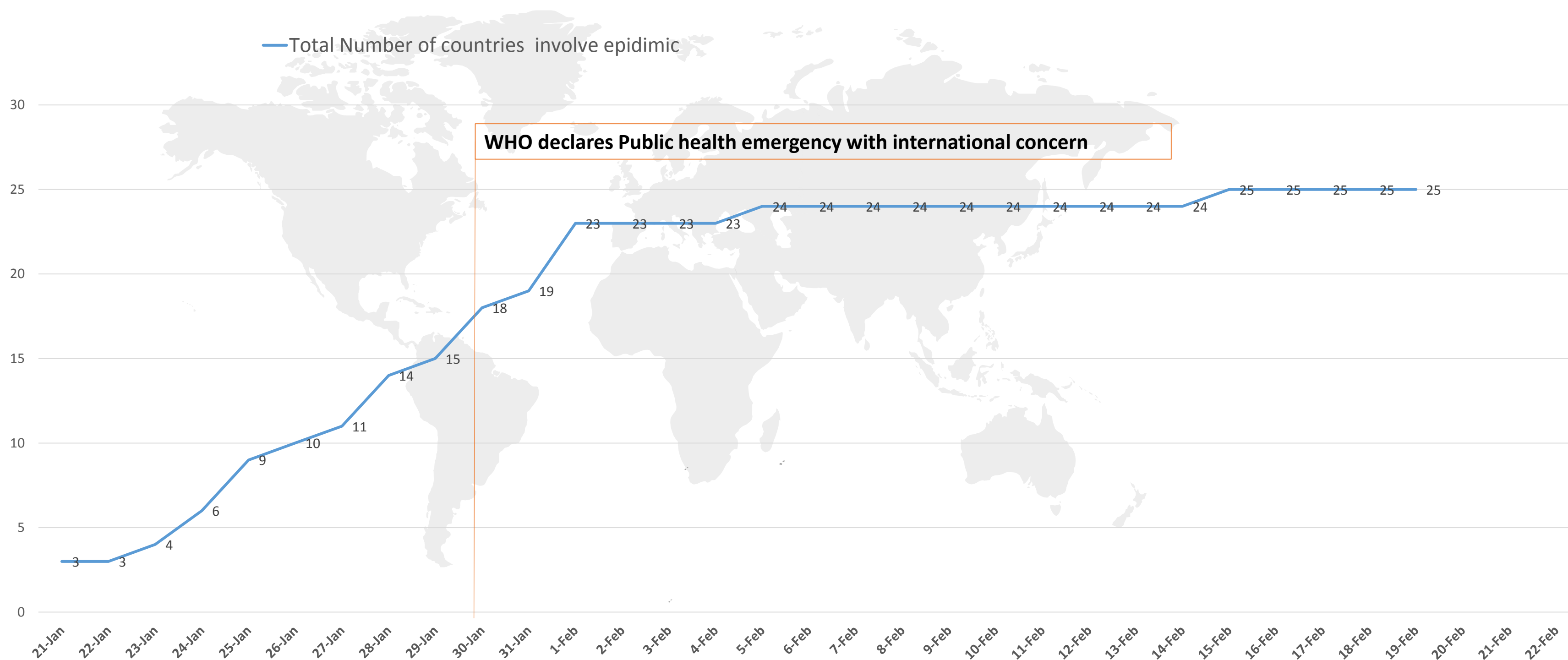
Bar chart published by Abu Dhabi Public Health Center 2020.

Data resource : [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 resource : [WHO](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports)

EPIDEMIOLOGY:

WHO report 19/2/2020 important points



- No new countries reported cases of COVID-19 in the past 24 hours.
- WHO is working with an international network of statisticians and mathematical modelers to estimate key epidemiologic parameters of COVID-19. (**preliminary data***) :
 - Infection Fatality Ratio 0.3% to 1%
 - Fatality ratio: 2.3%
 - median incubation period are 5-6 days (ranging from 0-14 days) and estimates for the serial interval 4,8 range from 4.4 to 7.5 days.
- Modeling has also been used to **estimate the impact of the 23 January, 2020 Wuhan travel ban on reducing transmission both inside and outside of China**. According to these models, **travel restrictions alone** are projected to have **only a modest effect** on the progression of the outbreak; they would need to be **combined with other public health interventions**, such as **early case isolation**, other forms of **mobility restrictions**, **social distancing** and **population-level behavioral changes** to be effective

**as we don't know the outcomes of those patients who is still admitted yet (whether they eventually die or recover) .*



EPIDEMIOLOGY:

Figure 6: Comparison of three viruses

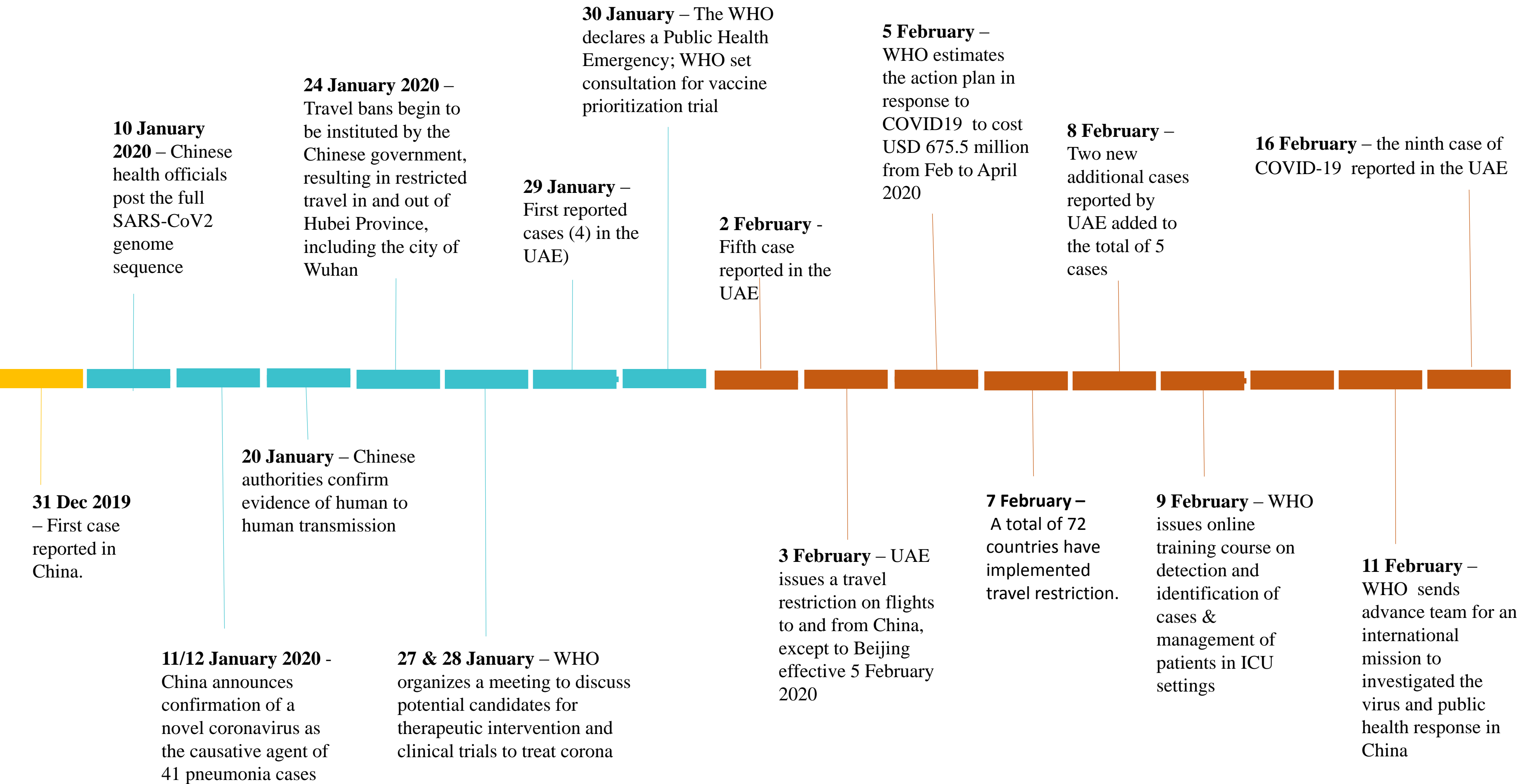
Virus	SARS COV2	SARS-COV	MERS-COV
Date of epidemic	2019	2002	2012
Countries	25	37	27
Infected cases	75204	8000	2494
Death cases	2009	800	858
Mortality	2.3%* ³	10%	> 35 %

- Data until February 19, 2020
- *Fatality rate (preliminary).

TIMELINE

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PUBLIC HEALTH RESPONSE **NO UPDATE**

Article 1: Title: Economic Impacts of Wuhan 2019-nCoV on China and the World.

Published: 12 February 2020

Summery finding: without urgent global actions to curtail the Wuhan 2019-nCoV within the shortest possible time, China is expected to lose up to \$62 billion in the first quarter of the year, while the world is likely to lose over \$280 billion within the same period.

Link: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(20\)30374-3/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30374-3/fulltext)

Article 2: Title: An updated estimation of the risk of transmission of the novel coronavirus (2019-nCov).

Published: 11th February 2020.

Summery finding: The author findings suggest that **the best measure to control the disease is persistent and strict self-isolation.**

Link: <http://www.sciencedirect.com/science/article/pii/S246804272030004X>

Article 3 : Title: : 2019-nCoV Pneumonia: Relationship to Negative RT-PCR Testing.

Published: 12th February 2020.

Summery finding: one nasal swap might not be enough to detect cases (Swab missed 5 cases out 176, and became positive after repetitive swab between 2-8 days later)

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

** Note the article is still under peer-review. However, the article is indexed by the WHO research database*



PUBLIC HEALTH RESPONSE

NO UPDATE

Article 4 : Title: Effectiveness of airport screening at detecting travelers infected with novel coronavirus (2019-nCoV)

Published: 6 Feb 2020.

Summery finding: Under generally conservative assumptions on sensitivity, it was found that **46 out of 100 infected travelers will enter undetected.** As well it was found that exit or entry screening at **airports** for initial symptoms, via **thermal scanners or similar**, is **unlikely to prevent passage of infected travelers into new countries or regions where they may seed local transmission**

Link: <https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.5.2000080#r11>

**** Note the article is still under peer-review. However, the article is indexed by the WHO research database***



CLINICAL FEATURES AND TRANSMISSION *NEW UPDATE*

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Clinical features: (1/4)

Title: The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) - China, 2020

Published 17 February 2020.

Link: <http://magictour.free.fr/study17.pdf>

Summery : All COVID-19 cases (# 72,314) reported through February 11, 2020 were extracted from China's Infectious Disease Information System. Study includes the following summary of patient by age group and patient characteristics, fatality rate / mortality rate, viral spread, health care worker analysis .

- **61.8% confirmed cases, 22.4% suspected cases, 14.6% clinically diagnosed cases and 1.2 % without symptoms.**
- **80% mild cases and 13.8% sever cases.**
- **2.3% fatality rate .**
- A total of 1,716 health workers have become infected and 5 have died (0.3%)
- **Author conclusion:** the epidemic spread so quickly in 30 days to all china. China need to **prepare** well for **possible rebound** as people are coming from holiday.



CLINICAL FEATURES AND TRANSMISSION *NEW UPDATE*

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Clinical features: (2/4)

Title: The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) - China, 2020 . Continue..

TABLE 1. Patients, deaths, and case fatality rates, as well as observed time and mortality for n=44,672 confirmed COVID-19 cases in Mainland China as of February 11, 2020.

Baseline Characteristics	Confirmed Cases, N (%)	Deaths, N (%)	Case Fatality Rate, %	Observed Time, PD	Mortality, per 10 PD
Overall	44,672	1,023	2.3	661,609	0.015
Age, years					
0-9	416 (0.9)	-	-	4,383	-
10-19	549 (1.2)	1 (0.1)	0.2	6,625	0.002
20-29	3,619 (8.1)	7 (0.7)	0.2	53,953	0.001
30-39	7,600 (17.0)	18 (1.8)	0.2	114,550	0.002
40-49	8,571 (19.2)	38 (3.7)	0.4	128,448	0.003
50-59	10,008 (22.4)	130 (12.7)	1.3	151,059	0.009
60-69	8,583 (19.2)	309 (30.2)	3.6	128,088	0.024
70-79	3,918 (8.8)	312 (30.5)	8.0	55,832	0.056
≥80	1,408 (3.2)	208 (20.3)	14.8	18,671	0.111
Sex					
Male	22,981 (51.4)	653 (63.8)	2.8	342,063	0.019
Female	21,691 (48.6)	370 (36.2)	1.7	319,546	0.012
Occupation					
Service industry	3,449 (7.7)	23 (2.2)	0.7	54,484	0.004
Farmer/laborer	9,811 (22.0)	139 (13.6)	1.4	137,992	0.010
Health worker	1,716 (3.8)	5 (0.5)	0.3	28,069	0.002
Retiree	9,193 (20.6)	472 (46.1)	5.1	137,118	0.034
Other/none	20,503 (45.9)	384 (37.5)	1.9	303,946	0.013

Link: <http://magictour.free.fr/study17.pdf>

Highest fatality rate with age above 80 years (14.8%



CLINICAL FEATURES AND TRANSMISSION *NEW UPDATE*



Clinical features: (3/4)

Title: The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) - China, 2020 . Continue..

TABLE 1. (continued)

Baseline Characteristics	Confirmed Cases, N (%)	Deaths, N (%)	Case Fatality Rate, %	Observed Time, PD	Mortality, per 10 PD
Province					
Hubei	33,367 (74.7)	979 (95.7)	2.9	496,523	0.020
Other	11,305 (25.3)	44 (4.3)	0.4	165,086	0.003
Wuhan-related exposure*					
Yes	31,974 (85.8)	853 (92.8)	2.7	486,612	0.018
No	5,295 (14.2)	66 (7.2)	1.2	71,201	0.009
Missing	7,403	104	2.8	103,796	0.010
Comorbid condition†					
Hypertension	2,683 (12.8)	161 (39.7)	6.0	42,603	0.038
Diabetes	1,102 (5.3)	80 (19.7)	7.3	17,940	0.045
Cardiovascular disease	873 (4.2)	92 (22.7)	10.5	13,533	0.068
Chronic respiratory disease	511 (2.4)	32 (7.9)	6.3	8,083	0.040
Cancer (any)	107 (0.5)	6 (1.5)	5.6	1,690	0.036
None	15,536 (74.0)	133 (32.8)	0.9	242,948	0.005
Missing	23,690 (53.0)	617 (60.3)	2.6	331,843	0.019
Case severity‡					
Mild	36,160 (80.9)	-	-	-	-
Severe	6,168 (13.8)	-	-	-	-
Critical	2,087 (4.7)	1,023 (100)	49.0	31,456	0.325
Missing	257 (0.6)	-	-	-	-
Period (by date of onset)					
Before Dec 31, 2019	104 (0.2)	15 (1.5)	14.4	5,142	0.029
Jan 1–10, 2020	653 (1.5)	102 (10.0)	15.6	21,687	0.047
Jan 11–20, 2020	5,417 (12.1)	310 (30.3)	5.7	130,972	0.024
Jan 21–31, 2020	26,468 (59.2)	494 (48.3)	1.9	416,009	0.012
After Feb 1, 2020	12,030 (26.9)	102 (10.0)	0.8	87,799	0.012

Patient with comorbidities have a higher fatality rate compare people who don't have comorbidities (10.5%)

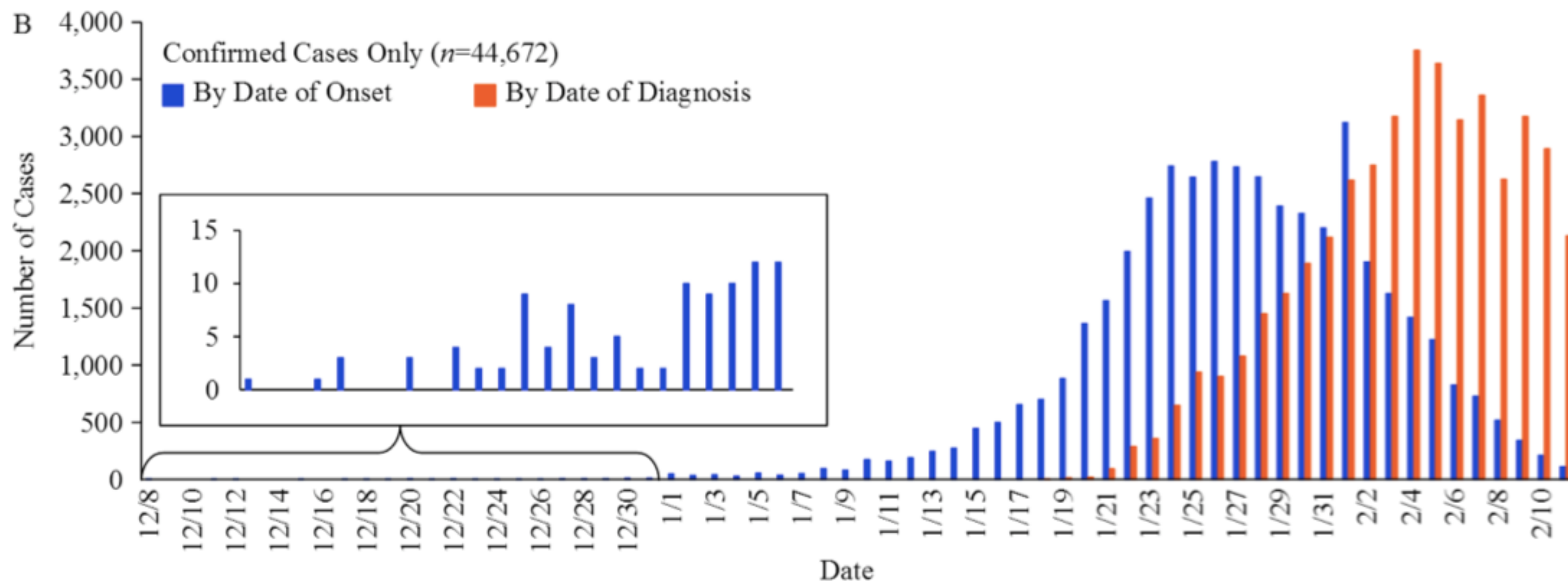


CLINICAL FEATURES AND TRANSMISSION *NEW UPDATE*



Clinical features: (4/4)

Title: The Epidemiological Characteristics of an Outbreak of 2019 Novel Coronavirus Diseases (COVID-19) - China, 2020 .



Although for confirmed cases onset of illness peaked around January 23-27, diagnosis of infection by nucleic acid testing of throat swabs did not peak until February 4



CLINICAL FEATURES AND TRANSMISSION *NO UPDATE*

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Articles in special population:

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.

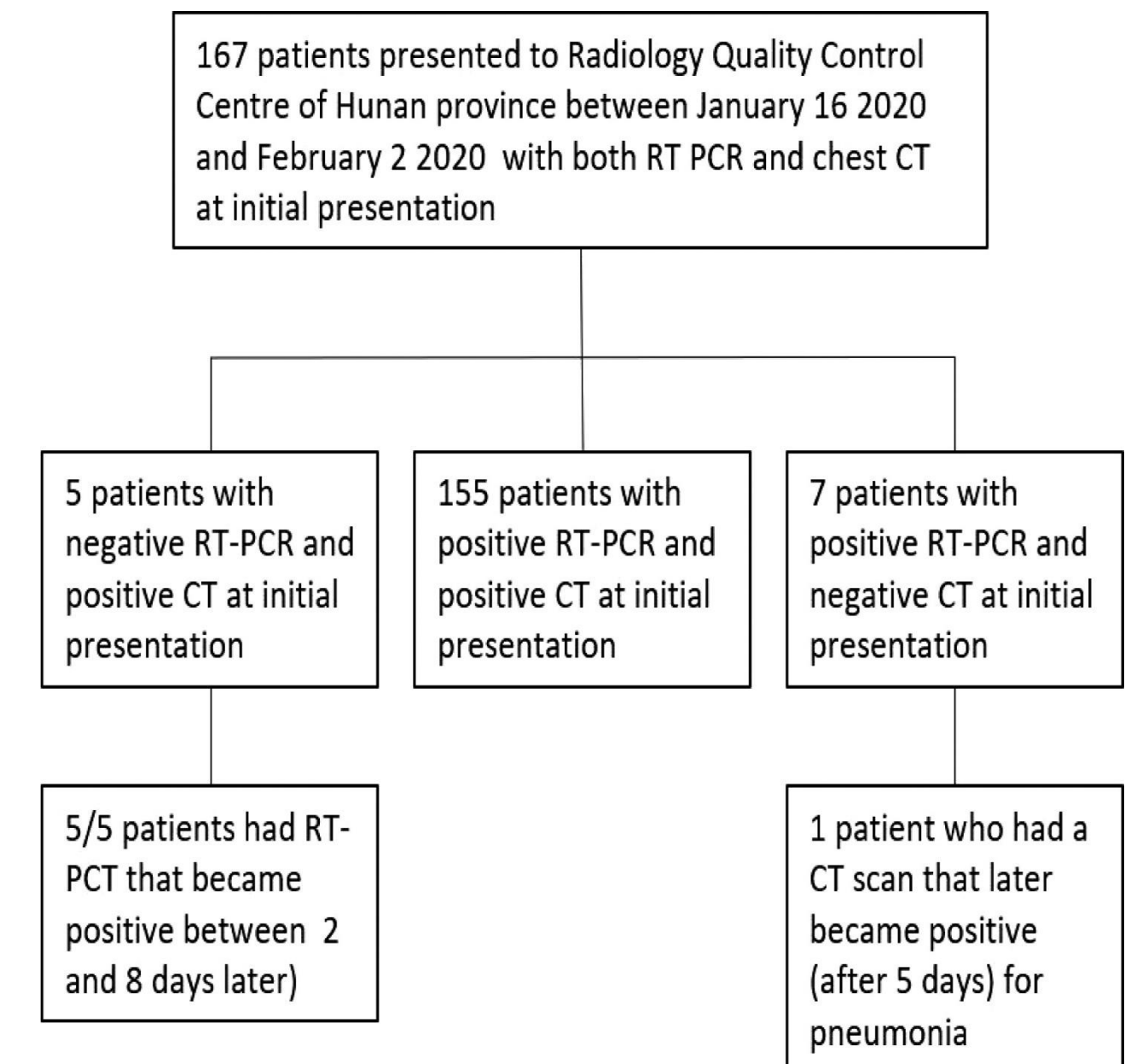
link : <http://www.365heart.com/show/143317.shtml>

* *Articles were translated from Chinese language.*



DIAGNOSIS: *NO UPDATE*

- **Article 1: Title: 2019-nCoV Pneumonia: Relationship to negative RT-PCR testing.**
- **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: *NEW UPDATE*

Clarification on Favipiravir :

- **BRIEF-Corrected-(Zhejiang Hisun Pharma) gets approval for clinical trial to test flu drug Favipiravir for pneumonia caused by new coronavirus.**
(the approval included registrational approval and clinical trial approval) no mentioning of treatment approval)
 - <https://www.reuters.com/article/brief-corrected-zhejiang-hisun-pharma-ge/brief-corrected-zhejiang-hisun-pharma-gets-approval-for-clinical-trial-to-test-flu-drug-favipiravir-for-pneumonia-caused-by-new-coronavirus-idUSL4N2AH0C8>
- **Favipiravir among the WHO therapeutic candidate for COVID19. the drug was**
 - https://www.who.int/blueprint/priority-diseases/key-action/Table_of_therapeutics_Appendix_17022020.pdf?ua=1
- **According to china registry of clinic trial:**
 - **The trial on efficacy of Favipiravir in COVID19 was registered on 6/2/2020. for further information on the trial .**
 - <http://www.chictr.org.cn/showprojen.aspx?proj=49042>



TREATMENT:

NEW 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: *NEW 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>