

ABU DHABI PUBLIC
HEALTH CENTRE

مركز أبوظبي
للصحة العامة



Scientific Research Monitoring on nCov

Date:17 February 2020

Reported by: *(Public Health Research Section)*



WHAT WE KNOW SO FAR:

1. Virus have been sequenced, found to have similarity to MERS-CoV and SARS-CoV. Research found the Virus to be originating from Bats reservoir.
2. Transmission from human to human is confirmed. Incubation period ranged from 3-7days and can reach up to 14 days. Transmission during incubation period not yet confirmed (still need further studies).
3. Suggested human-to-human transmission occurred through droplets, contact and fomites, similar to Acute Respiratory Syndrome (SARS).
4. Efforts currently in developing therapies for this virus focuses on a previously known medications and vaccination for MERS-Cov and SARS-Cov.
5. Most of the studies mention multiple antiviral medications involved in the treatment but linking the use of these medications to outcome is not yet published. Only the study in US showed experience recovery after 1 day of treatment with Remdesivir.



WHAT WE KNOW SO FAR:

6. WHO had conducted a forum 11-12 Feb 2020 to mobilize research on 2019- nCoV vaccination and therapies.
7. The WHO issued the budget to act on the response till the end of April 2020.
8. Human coronavirus stay on inanimate surfaces like metal or glass for up to 9 days, but can be efficiently inactivated by disinfection which suggests that the nCoV might be the same.
9. Pregnant women infected with COVID19 may have similar symptoms with non-pregnant adults. No evidence suggest transmission of the virus from mother to newborn if infected in late pregnancy. Evidence shows that there is no transmission of the virus through breast milk.
10. WHO new naming of disease and the virus(COVID19, SARS-COV2)
11. **Isolation** is the best measure to control transmission of the virus. The epidemic is expected to peak in early March 2020.
12. **Transmission of SARS** mostly occur when the patient develop sever symptoms which make it easier to contain the outbreak, unlike **COVID-19** where the patient can present with mild symptoms and still have the potential to spread the disease.



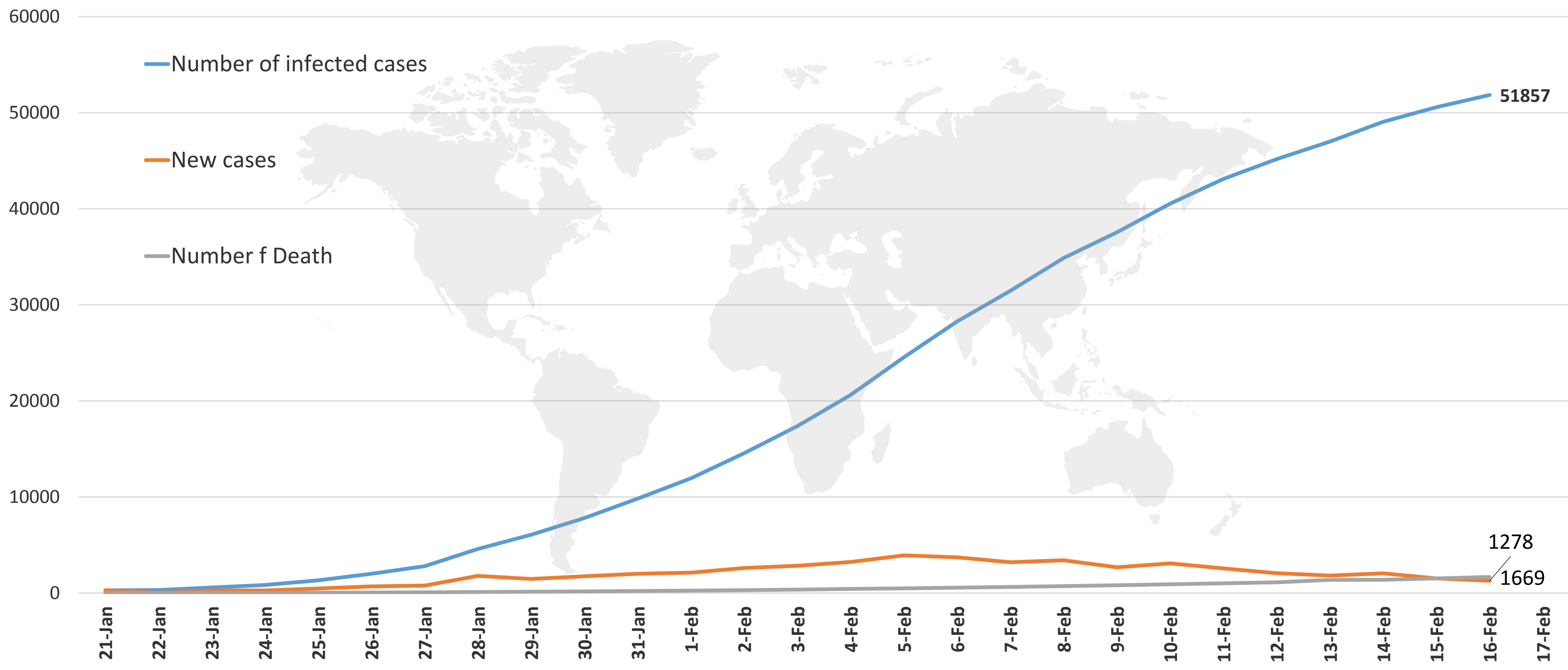
NEW UPDATES FROM TODAY'S REPORT:

- **Epidemiology section: WHO is developing a protocol to enhance epidemiological research and understand the characteristic of COVID19 Disease. Countries are asked to report cases to WHO and use its protocol.**
- **Epidemiology section: third case of death outside china in France.**



EPIDEMIOLOGY:

Figure 1 : Total Number of infected , new and death cases (21st January to February 16th)



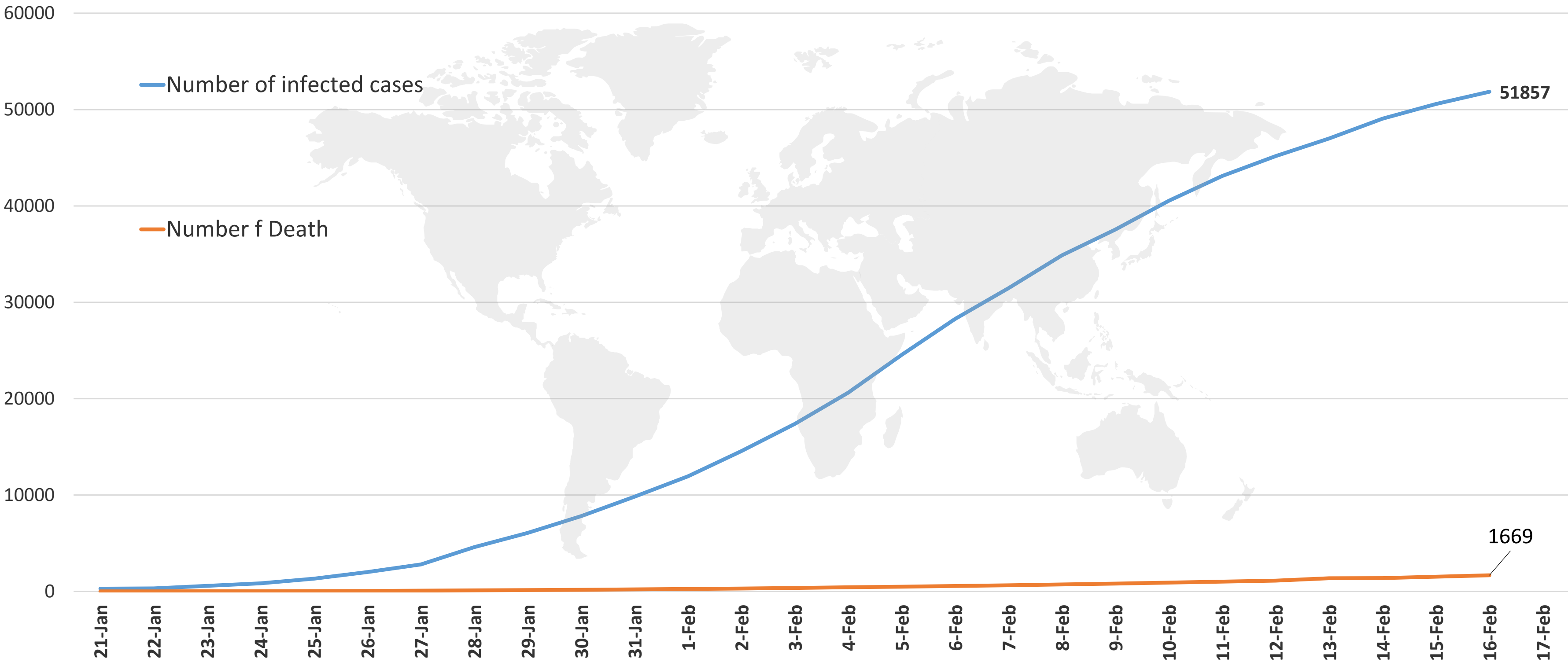
Line graph Published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 2: Number of infected cases versus Number of death; (21st January to February 16th)



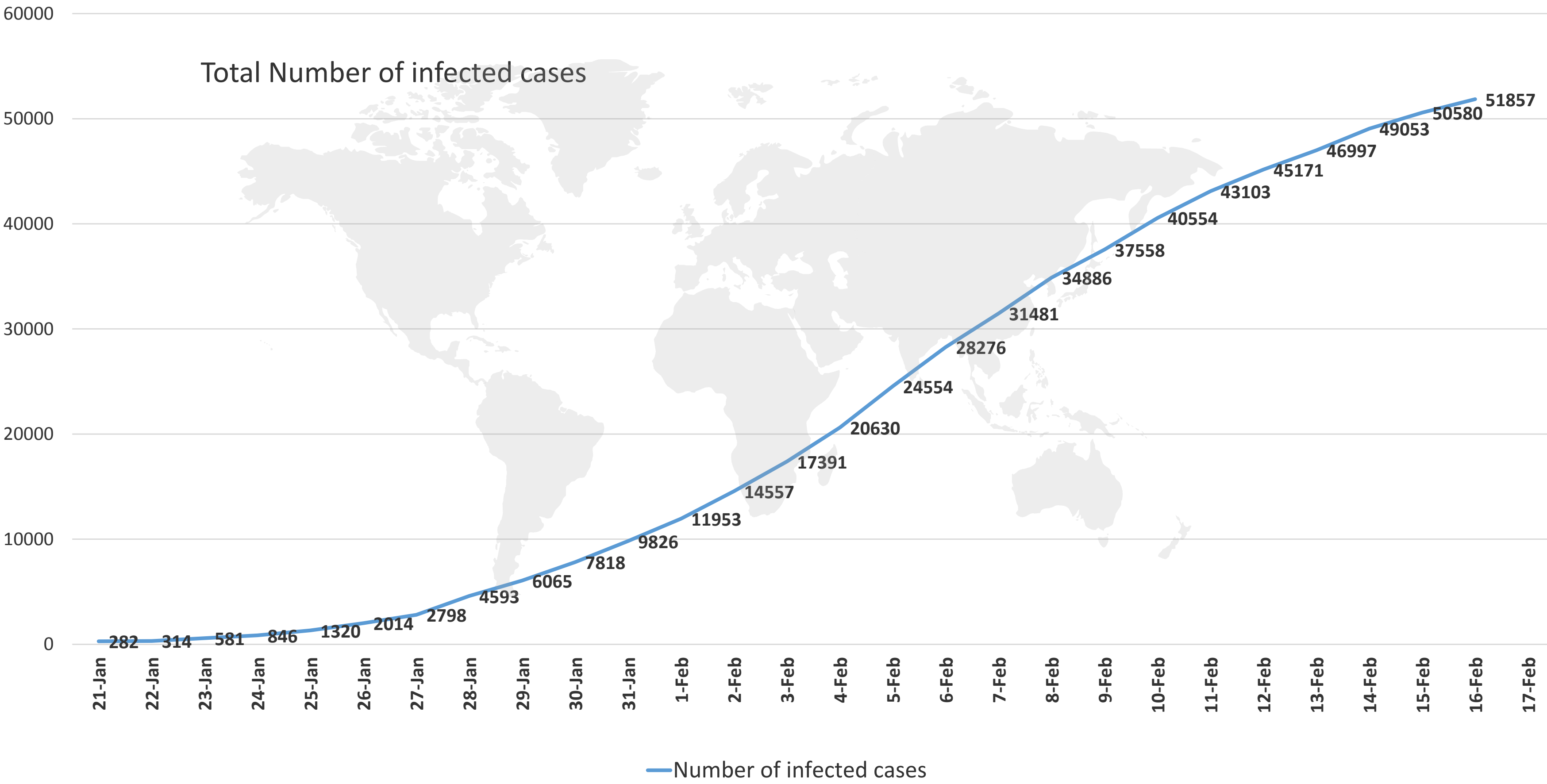
Line graph Published by Abu Dhabi Public Health Center 2020.

Data resource : [WHO](#)



EPIDEMIOLOGY:

Figure 2: Number of infected cases (laboratory confirmed cases): 21st January to February 16th



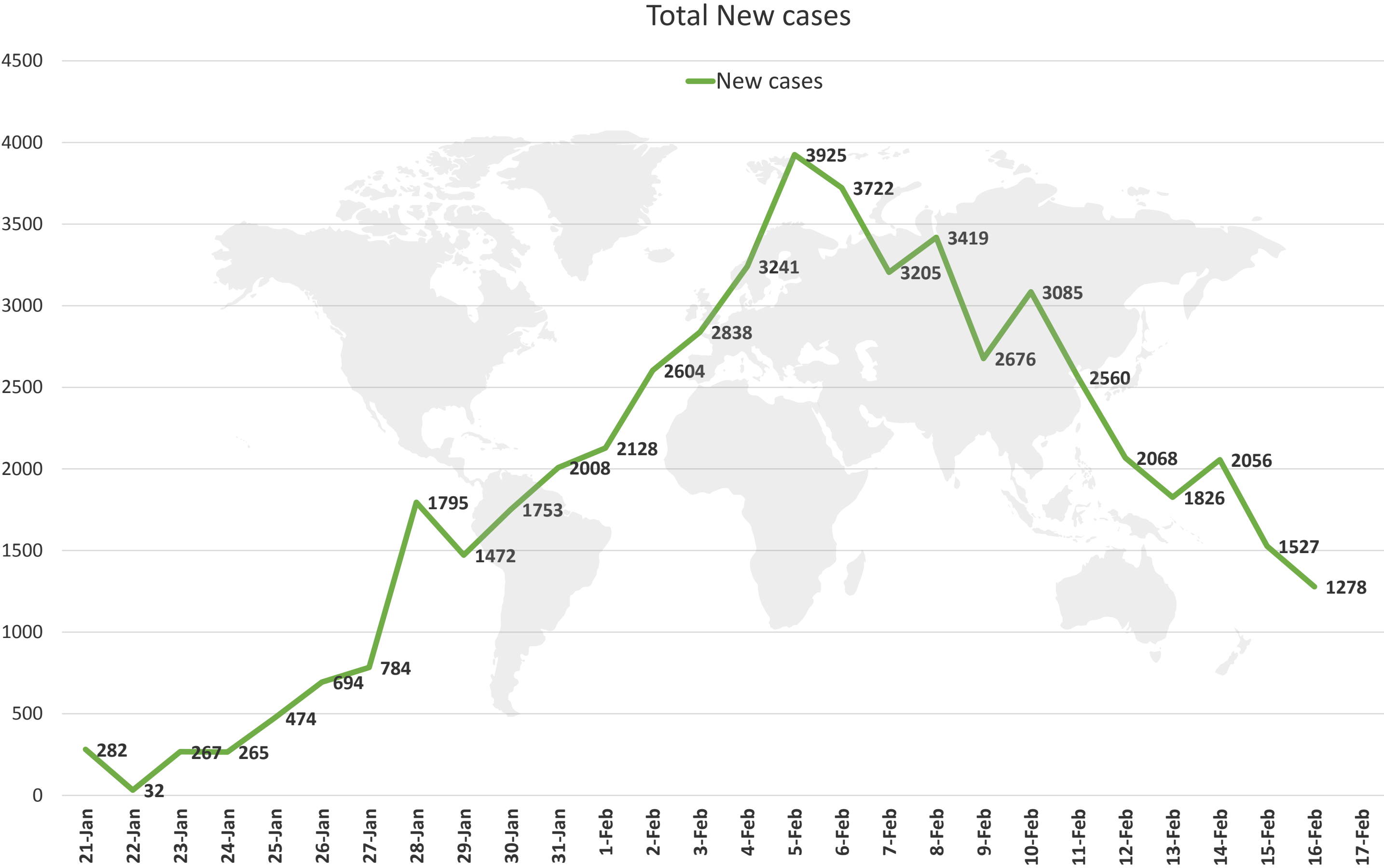
Line graph Published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 3: Number of new cases (21st January to February 16th)



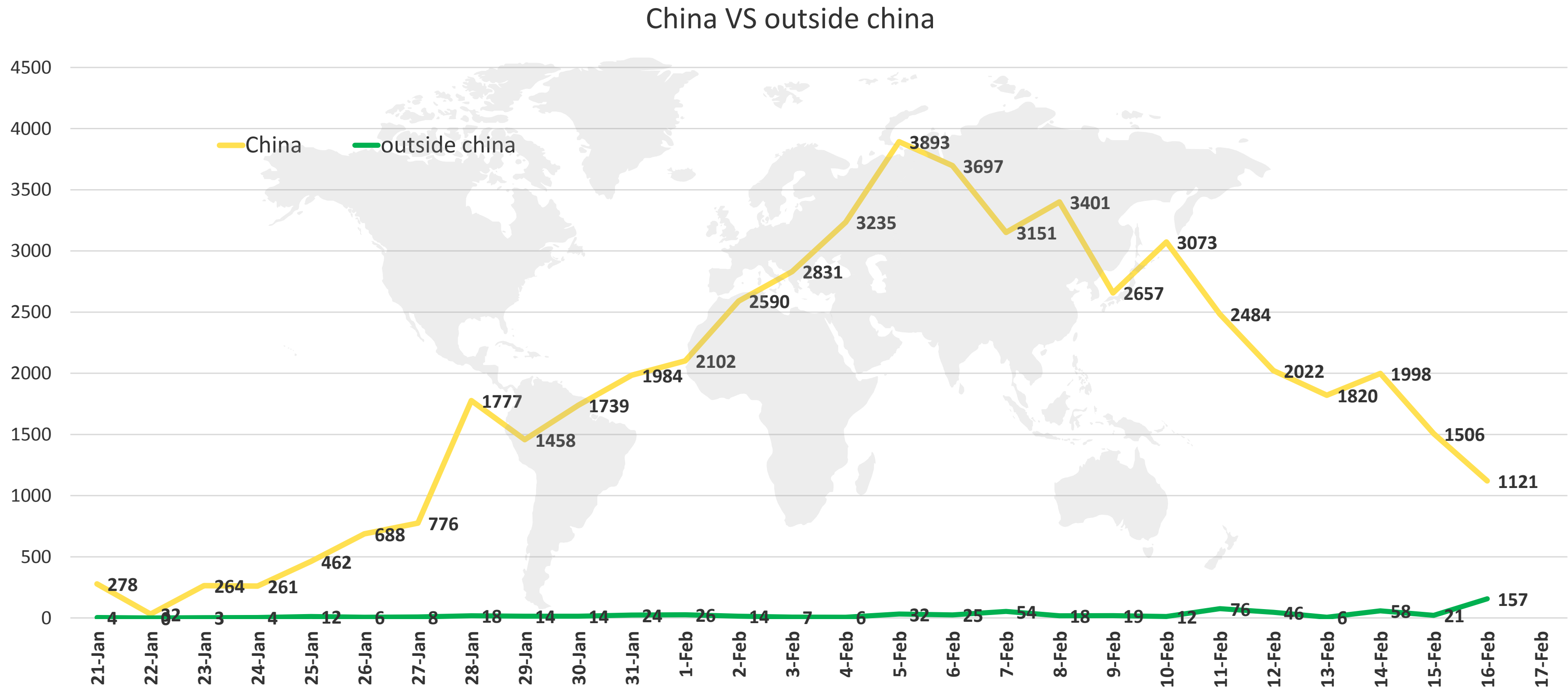
Line graph Published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 4: Number of new cases in china versus outside china : (21st January to February 16th).



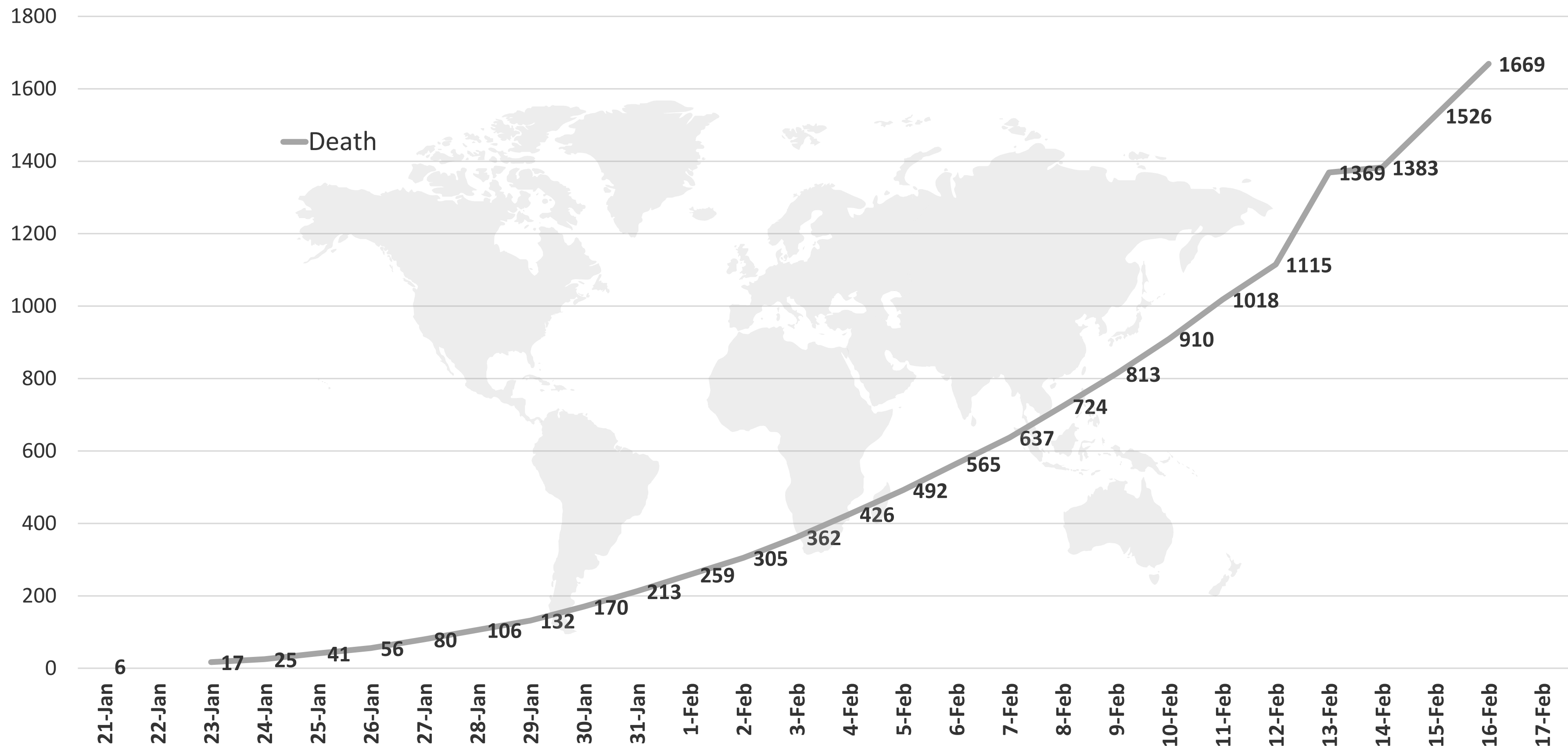
Line graph Published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 5: Number of total death: (21st January to February 16th)



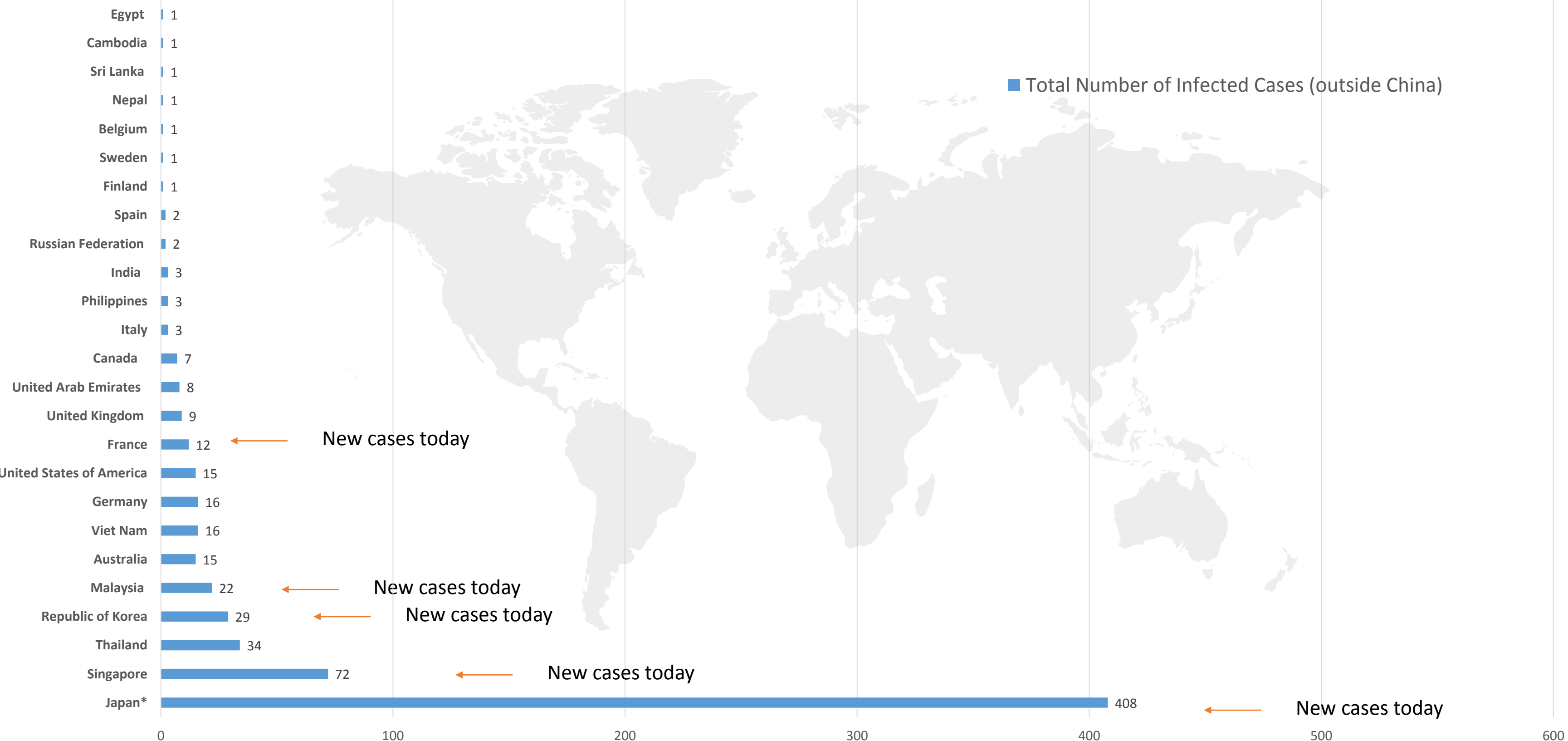
Line graph Published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 6: The total number of cases outside china per country: (21st January to February 16th)



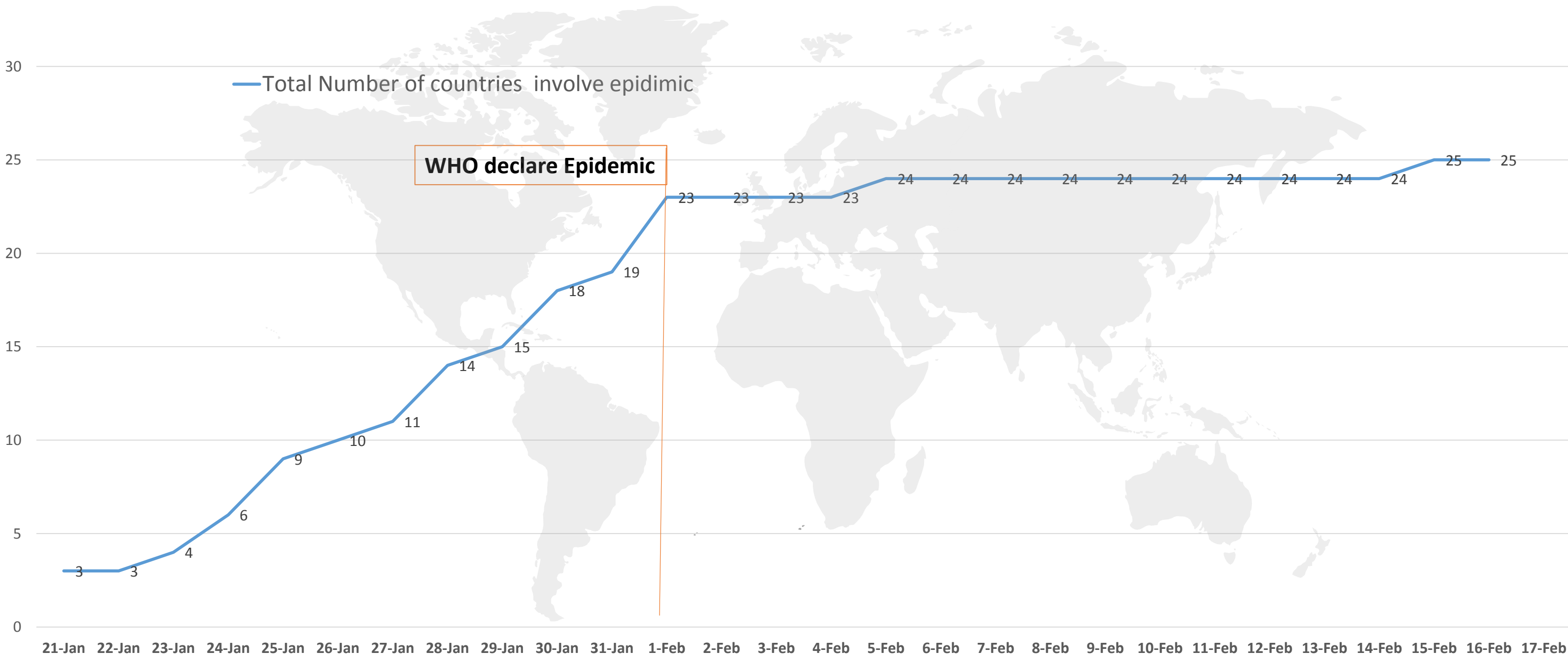
Bar chart Published by Abu Dhabi Public Health Center 2020.

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



EPIDEMIOLOGY:

Figure 7: The total number of countries reporting Cases of COVID-19 outside China over time



* Include the number of cases of International conveyance.



EPIDEMIOLOGY:

WHO report 16/2/2020 important points:

- **No new countries reported cases of COVID-19 in the past 24 hours.**
- **A third death of a COVID-19 patient has been reported outside of China. This individual was a tourist from China visiting France.**
- **Studies to assess the epidemiology and clinical characteristics of COVID-19 cases in different settings are therefore critical to furthering our understanding of this virus and associated disease. Several early investigation master protocols or master forms are available for countries to use.**



EPIDEMIOLOGY:

Figure 6: Comparison between three viruses.

Virus	SARS COV2	SARS-COV	MERS-COV
Date of epidemic	2019	2002	2012
Countries	25	37	27
Infected cases	51857	8000	2494
Death cases	1669	800	858
Mortality rate	11% , 14% , 15 Per WHO 2-4% (still not confirmed)	10%	>35 %

*Data until 16th of February 2020.

TIMELINE



31 DEC 2020
- First cases reported in china.

10 January 2020- Chinese health officials posted the full 2019-nCoV genome sequence.

11/12 January 2020 - China announced the confirmation of a novel coronavirus as the causative agent of 41 pneumonia cases.

20 January - Chinese authorities confirmed evidence of human to human transmission

24 January 2020 - Travel bans began to be instituted by the Chinese government, resulting in restricted travel in and out of Hubei Province, including the city of Wuhan

27 & 28th January- WHO Issue a meeting to discuss the potential candidate for therapeutic intervention and clinical trial to treat corona.

29th January – 1st reported cases in the UAE. (4 cases)

30 January - The WHO declared a Public Health Emergency. WHO set consultation for vaccine prioritization trial.

2 February - 5th case reported in the UAE.

3 February – UAE have issued a travel restriction to flight to and from china except to Beijing. To be effective on 5th of February 2020

5 February – WHO estimated the action plan in response to nCoV to cost 675.5 million USD budget from Feb to April 2020

7th of February- a total of 72 countries implemented travel restriction.

8th February – Two new additional cases reported by UAE added to the total of 5 cases

9th February – WHO issued online training course on two aspects (detection and identification of cases & management of patients in ICU setting)

16^h February- the 9th case of COVID19 reported in the UAE

11^h February- WHO is sending advance team for an international mission to investigate the virus and public health response in china



KEY FINDINGS IN SCIENTIFIC RESEARCH :

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>

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>

PUBLIC HEALTH RESPONSE:

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List of 72 countries listed a travel restriction last updated 7th of February 2020.

Country	Date of the announcement of travel restriction
Antigua And Barbuda	31-Jan-20
Armenia	1-Feb-20
Australia	1-Feb-20
Austria	1-Feb-20
Azerbaijan	1-Feb-20
Bahamas	30-Jan-20
Bangladesh	2-Feb-20
Canada	30-Jan-20
Cook Island	4-Feb-20
Czech Republic	30-Jan-20
Egypt	26-Jan-20
El Salvador	31-Jan-20
Fiji	3-Feb-20
Finland	1-Feb-20
France	4-Feb-20
Germany	3-Feb-20
Greece	30-Jan-20
Guatemala	31-Jan-20
Hong Kong	27-Jan-20
India	8-Feb-20
Indonesia	3-Feb-20
Iraq	1-Feb-20
Israel	31-Jan-20
Italy	30-Jan-20
Jamaica	31-Jan-20
Japan	1-Feb-20
Jordan	2-Feb-20
Kazakhstan	29-Jan-20
Kenya	31-Jan-20
Kiribati	1-Feb-20
Kosovo (Rep.)	7-Feb-20
Kuwait	31-Jan-20
Macao (Sar China)	4-Feb-20
Malaysia	27-Jan-20
Maldives	3-Feb-20
Marshall Isl.	31-Jan-20
Mauritius	3-Feb-20
Mongolia	31-Jan-20
Morocco	2-Feb-20
Myanmar	1-Feb-20
Netherlands	2-Feb-20
New Zealand	3-Feb-20
Niue	7-Feb-20

North Korea	4-Feb-20
Oman	3-Feb-20
Cyprus	29-Jan-20
Pakistan	23-Jan-20
Palau	1-Feb-20
Paraguay	31-Jan-20
Philippines	31-Jan-20
Poland	4-Feb-20
Qatar	3-Feb-20
Russia	1-Feb-20
Rwanda	31-Jan-20
Samoa	26-Jan-20
Saudi Arabia	6-Feb-20
Seychelles	28-Jan-20
Singapore	1-Feb-20
Solomon Isl.	1-Feb-20
South Korea	4-Feb-20
Spain	29-Jan-20
Sri Lanka	28-Jan-20
Taiwan	6-Feb-20
Tonga	3-Feb-20
Trinidad And Tobago	30-Jan-20
Turkey	31-Jan-20
Tanzania	29-Jan-20
U.A.E.	3-Feb-20
U.K.	29-Jan-20
U.S.	31-Jan-20
Vanuatu	28-Jan-20
Vietnam	1-Feb-20

data obtained from media company, accuracy of information should be considered



PUBLIC HEALTH RESPONSE

Article: 1

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

Published on
12th of Feb 2020



[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)

- 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.
- **Tourism sector:**
 - The loss of The Chinese tourists will cost more than 73 billion dollar.
- **The automotive industry:** (*wuhan city is china's steel and vehicle market*).
 - The production loss of over 1.7 million units is expected if the outbreak situation continues until mid-March.

***Note the article is still yet under pear-review. However the article under WHO research database**



CLINICAL FEATURES AND TRANSMISSION:

Article 2

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

**Published on
11th Feb 2020.**



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

- The authors develop a new model for the **risk of transmission of SARS-COV2.**
- They found that the risk **has fallen from 2 or 3 persons** to below one. (they attributed the reduction to the **introduction of rapid technology to detect the disease faster** –in 24th of Jan - and also because of strict self-isolation)
- The author used the data during the period of **23 to 29 of Jan 2020** to develop the model .
- The author findings suggest that **the best measure to control the disease is persistent and strict self-isolation.**
- The article refers to another article which estimates that the outbreak to be **significantly decreased within 77 [95% CI 75-80] days from its beginning.** (*this means early march2020. prediction used data of Jan 2020*)
- Every one-day reduction in the duration of the period from illness/symptom onset to **isolation** would **reduce the peak population** size by **72-84%** and the cumulative infected cases and deaths both by **68-80%.**



DIAGNOSIS:

167 patients presented to Radiology Quality Control Centre of Hunan province between January 16 2020 and February 2 2020 with both RT PCR and chest CT at initial presentation

5 patients with negative RT-PCR and positive CT at initial presentation

155 patients with positive RT-PCR and positive CT at initial presentation

7 patients with positive RT-PCR and negative CT at initial presentation

5/5 patients had RT-PCT that became positive between 2 and 8 days later)

1 patient who had a CT scan that later became positive (after 5 days) for pneumonia

Article 3 :

Title: 2019-nCoV Pneumonia: Relationship to Negative RT-PCR Testing.
Number of patient 167 patient.

Published on 12th Feb 2020.

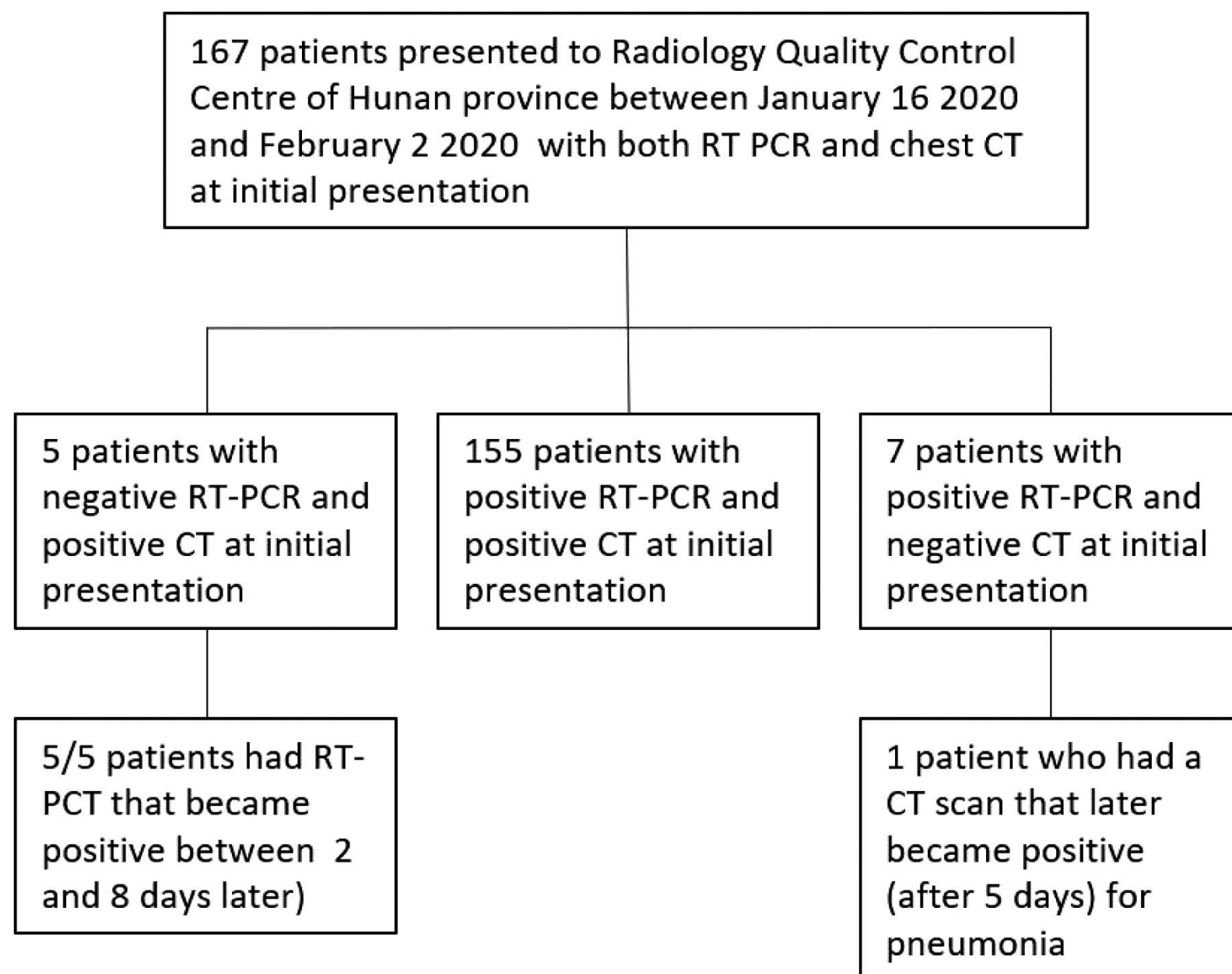
- Two radiologist with 10 year experience were interpreting the CT.
- 5 patients initially **test positive** by **CT** and **negative for RT-PCR** but after consecutive testing with RT-PCR it become positive!
- 7 patients were tested **negative** for **CT** but **positive for RT-PCR**.
- The **Five cases** whom were **negative** in **RT-PCR** and **positive** for **CT** at initial were discussed in this article. .
 - All of these cases were having either h/o visiting Wahun or have contact with positive cases.
 - All have 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 with **high clinical suspicion of nCoV infection** but **negative RT-PCR screening**



DIAGNOSIS:



Our appraisal of the article:

Based on these findings:

- The study does not recommend all patients to be screened using CT only NOR does it recommend using combination **of CT and RT PCR** in all cases..
- The aim of the study is that authorities and health care providers **shall not depend only on one time RT-PCR** in detecting cases (especially with highly suspected patients).
- Note that **CT still can miss positive cases** (as the study show negative results in 7 patients (see the graph).
- In addition : CT scan is highly dependent on the radiologist skill and its sensitivity can be lower when preformed by less experienced radiologist (in the study the radiologists who confirmed the cases **had 10 years experience**).
- Therefore, repeated swab for patient with high risk (for up to 8 days and isolation) might be a good option.



PUBLIC HEALTH RESPONSE

Article :4

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



Published on
6th of Feb 2020

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

The article estimate the effectiveness of thermal image scan in airports by developing an equation./ model

The equation/model was developed based on the following information on COVID19 from previous articles (*the model will be updated as information on the disease are evolving*):

- The duration of the travel
- sensitivity of entry and exit screening using thermal image scan is 86% sensitive (this means that 14 % of patients who went through this screening might be missed)
- The percent who are asymptomatic (17% of those who got infected with COVID19 according to previous articles can have no symptoms with typical screening procedures)
- Incubation period of 5.2 (+ or – 4.1days)
- Time of symptoms onset to evaluation of disease.
- **Note that this equation does not include screening using PCR swab for all passengers.**

The study conclude the following:

- Under generally conservative assumptions on sensitivity, we find that **46 of 100 infected travelers will enter undetected.**
- We find 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.**

For accessing the equation please use the following link: https://cmmid-lshtm.shinyapps.io/traveller_screening/



PUBLIC HEALTH RESPONSE

Article : 5

Title: COVID-19: what next for public health?

Published on
13th of Feb 2020



[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)

The article recommends nine measure to control the outbreak:

1. close **monitoring** in **epidemiology** and of the **effectiveness** of public health strategies and their social acceptance.
2. Provide **strategies** to the general populations and **vulnerable populations** most at risk **with actionable information** for **self-protection**, including **identification of symptoms**, and **clear guidance for treatment** seeking.
3. Intensive source control is needed in the epicenter of China i.e. **isolation of patients** and persons testing positive for COVID-19, **contact tracing** and health monitoring, **strict health facility infection prevention and control**, and use of other active public health control interventions with continued active surveillance and containment activities at all other sites where outbreaks are occurring in China.
4. continued containment activities are needed around sites **outside China** where there are infected people and transmission among contacts, with intensive study to provide information on **transmissibility, means of transmission, and natural history of infection**, with regular reporting to WHO and sharing of data.
5. intensified active surveillance is needed for possible infections in all countries using the **WHO-recommended surveillance case definition**.
6. preparation for **resilience of health systems** in all countries is needed, as is done at the time of seasonal influenza, anticipating severe infections and course of disease in older people and other populations identified to be at risk of severe disease.
7. if widespread community transmission is established, there should then be **consideration of a transition to include mitigation activities**, especially if contact tracing **becomes ineffective or overwhelming** and an **inefficient use of resources**. Examples of mitigation activities include **cancelling public gatherings, school closure, remote working, home isolation, observation of the health of symptomatic** individuals supported by telephone or online health consultation, and **provision of essential life support such as oxygen supplies, mechanical ventilators and extracorporeal membrane oxygenation (ECMO)** equipment.
8. **serological tests need to be developed that can estimate current and previous infections** in general populations.
9. Continued **research** is important to understand the **source of the outbreak** by study of animals and animal handlers in markets to provide evidence necessary for prevention of future coronavirus outbreaks.



TREATMENT:

Latest article on 27 of Jan 2020

Current trial: (Source WHO in 20 Jan 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 – that 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 candidate for therapeutic treatment is released on 24th of Jan 2020** .
<https://www.who.int/blueprint/priority-diseases/key-action/overview-ncov-therapeutics.pdf?ua=1>

- **Update draft design for therapeutic trial published in 27 of January 2020**

- **Promote the use of information on MERS –COV and SARS-Cov to develop vaccine**

<https://apps.who.int/iris/bitstream/handle/10665/330695/WHO-HEO-RDBlueprintnCoV-2020.5-eng.pdf?sequence=1&isAllowed=y&ua=1>



VACCINATION:

Latest article on 27 of Jan 2020

Updated draft design for therapeutic trial published in **27 of January 2020.**

Promote the use of information on MERS –COV and SARS-Cov to develop 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?ua=1>