Scientific Research Monitoring on nCov

Date:15 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). Suggested R0 is 2-3.

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 of the resolved case in US showed resolve of the symptoms 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 30 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. Clarification in regards to the WHO new naming: the name of the virus is SARS-COV2 and the name of the disease is COVID19
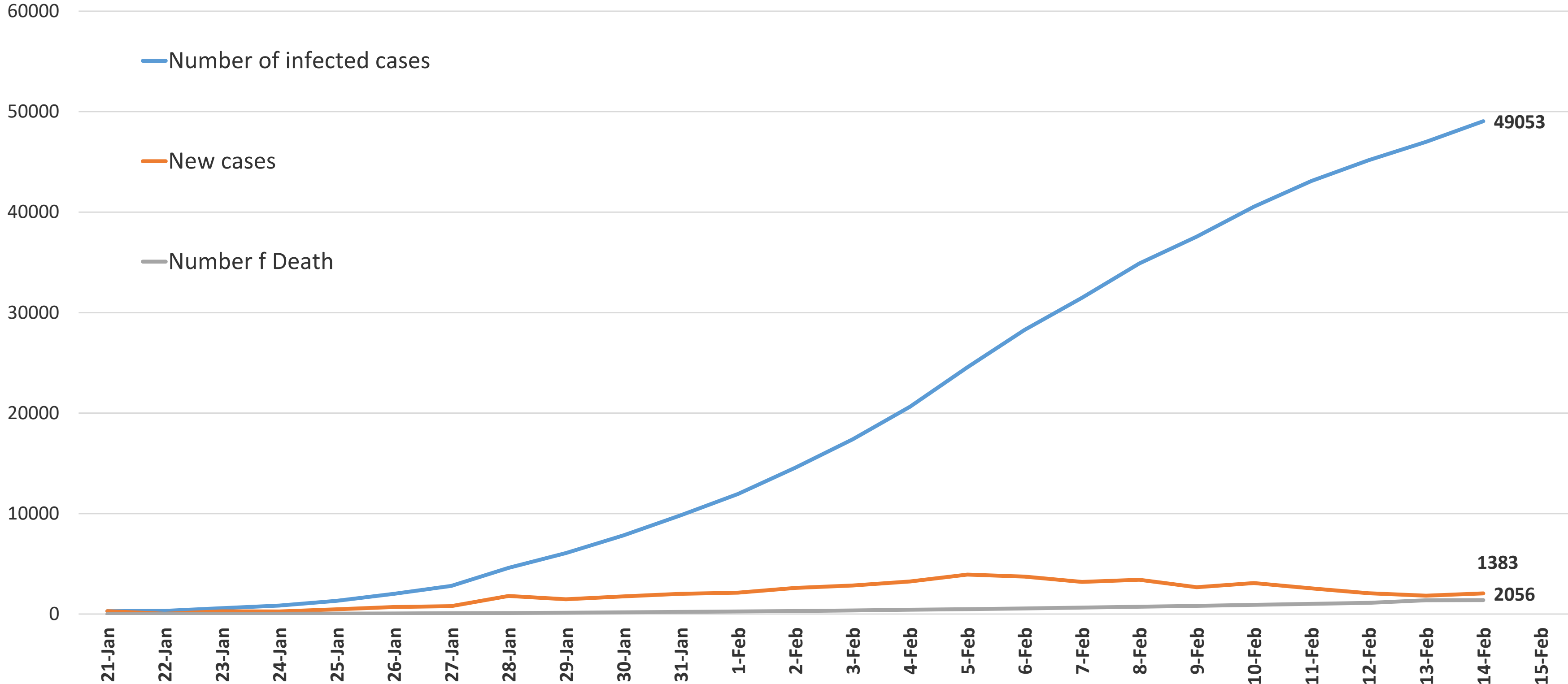
NEW UPDATES FROM TODAY'S REPORT:

- Epidemiology section: WHO raise the concern that Healthcare provider in China is affected by the epidemic.

- Public health response section : thermal imaging for airport screening might not be effective.

EPIDEMIOLOGY:

Figure 1 : Total Number of infected , new and death cases (21st of January to 14th of February 2020)
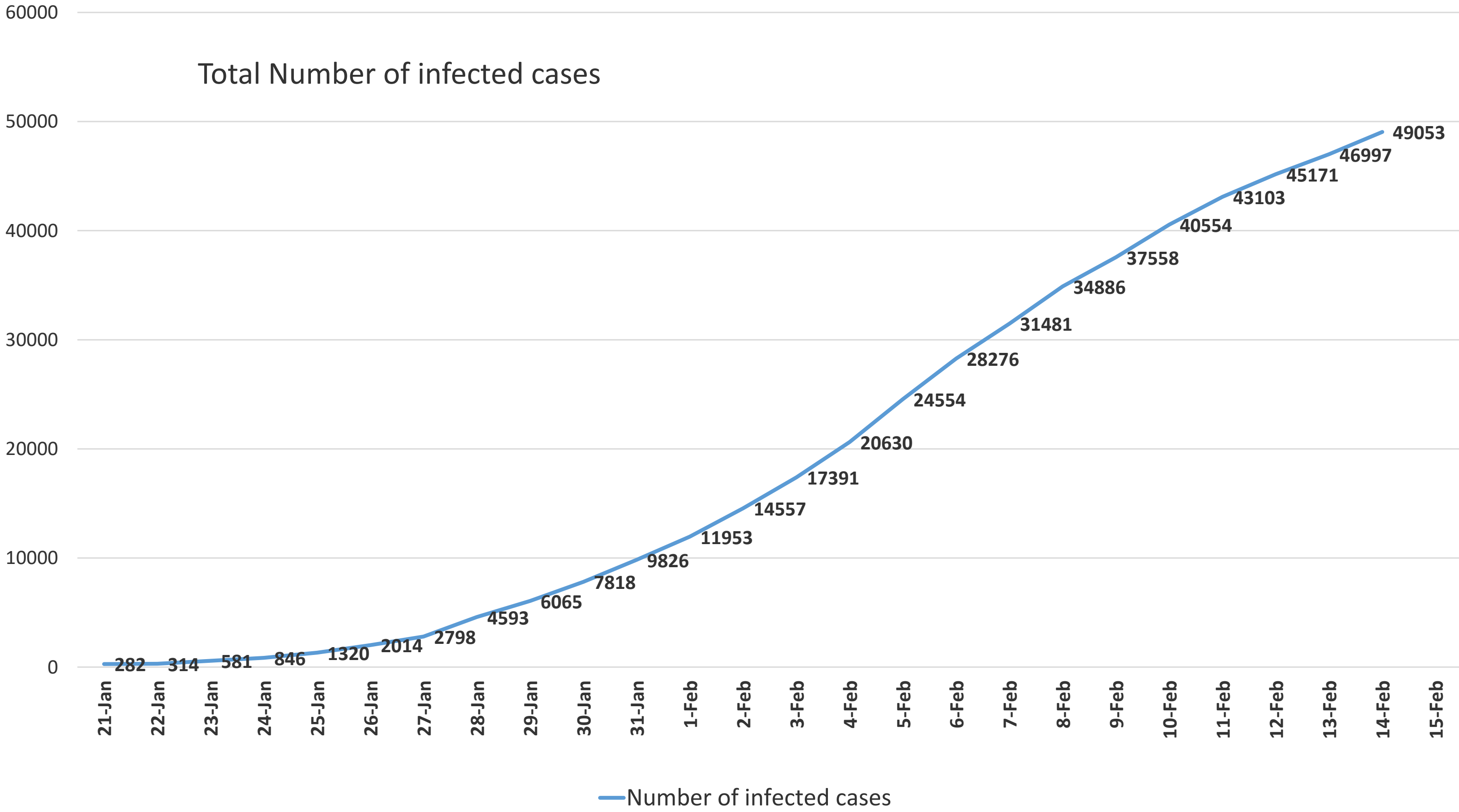

Line graph Published by Abu Dhabi Public Health Center 2020.

Data resource : WHO

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Figure 2: Number of infected cases (laboratory confirmed cases): 21 January to February 14th

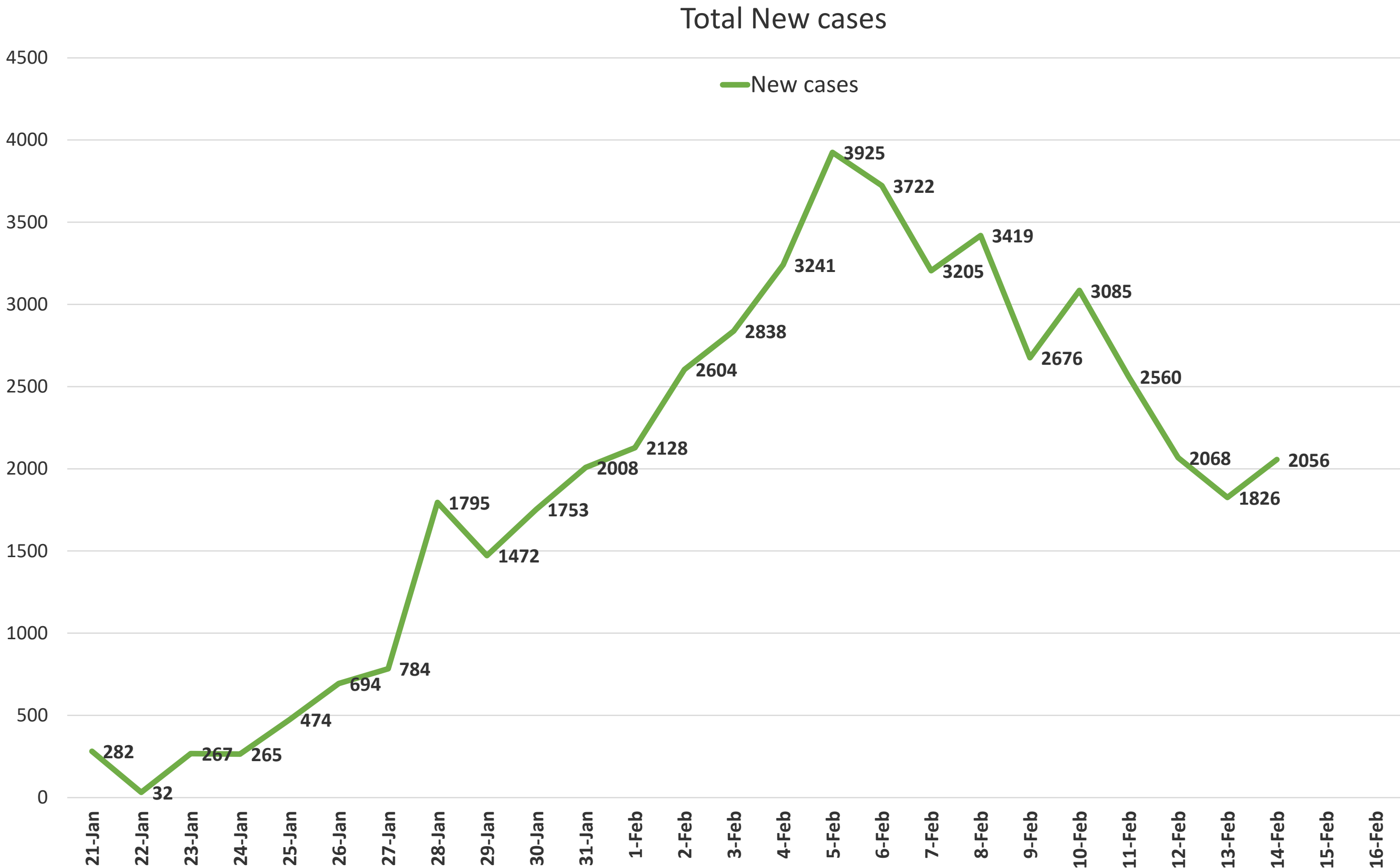
Total Number of infected cases

Number of infected cases

Line graph Published by Abu Dhabi Public Health Center 2020.

Data resource : WHO

EPIDEMIOLOGY:

Figure 3: Number of new cases :(21st January to February 14ᵗʰ)

Total New cases

Line graph Published by Abu Dhabi Public Health Center 2020.
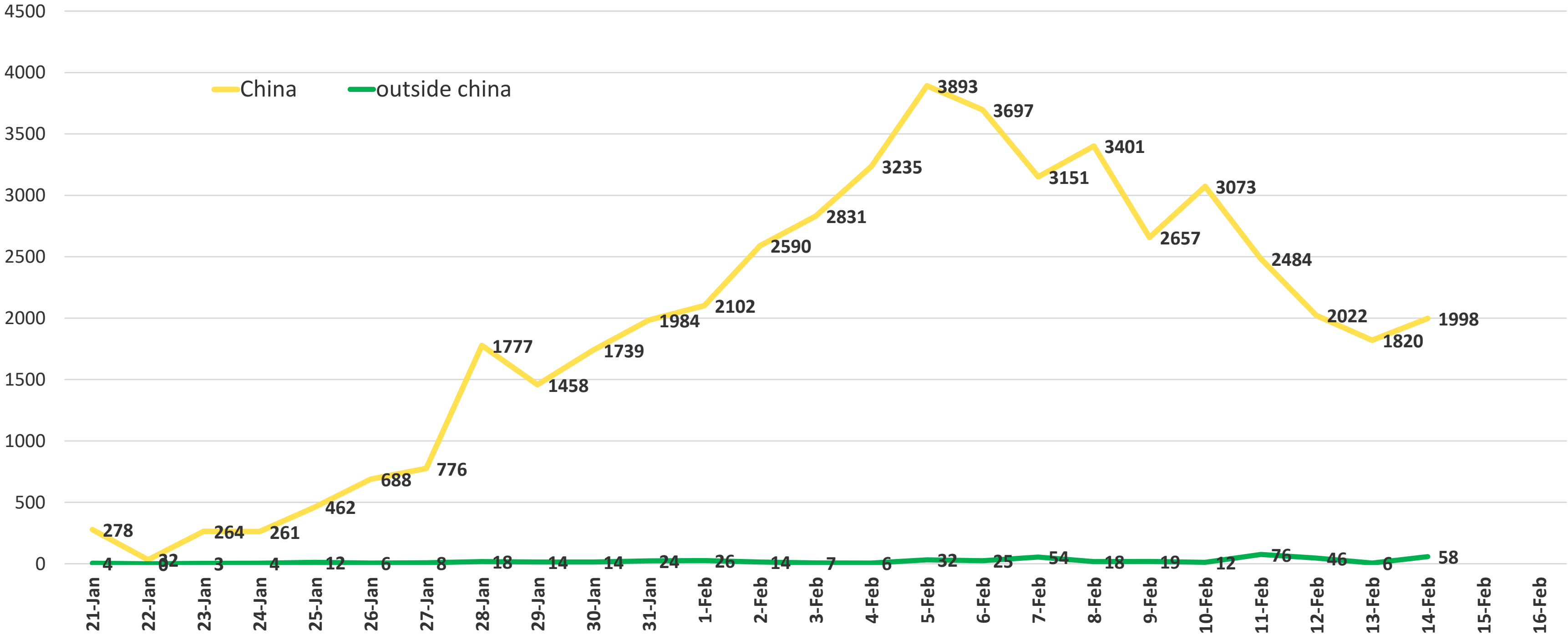
Data resource : WHO

EPIDEMIOLOGY:

**Figure 4: Number of new cases in china versus outside china : 21 January to 14th
February 2020.**

China VS outside china

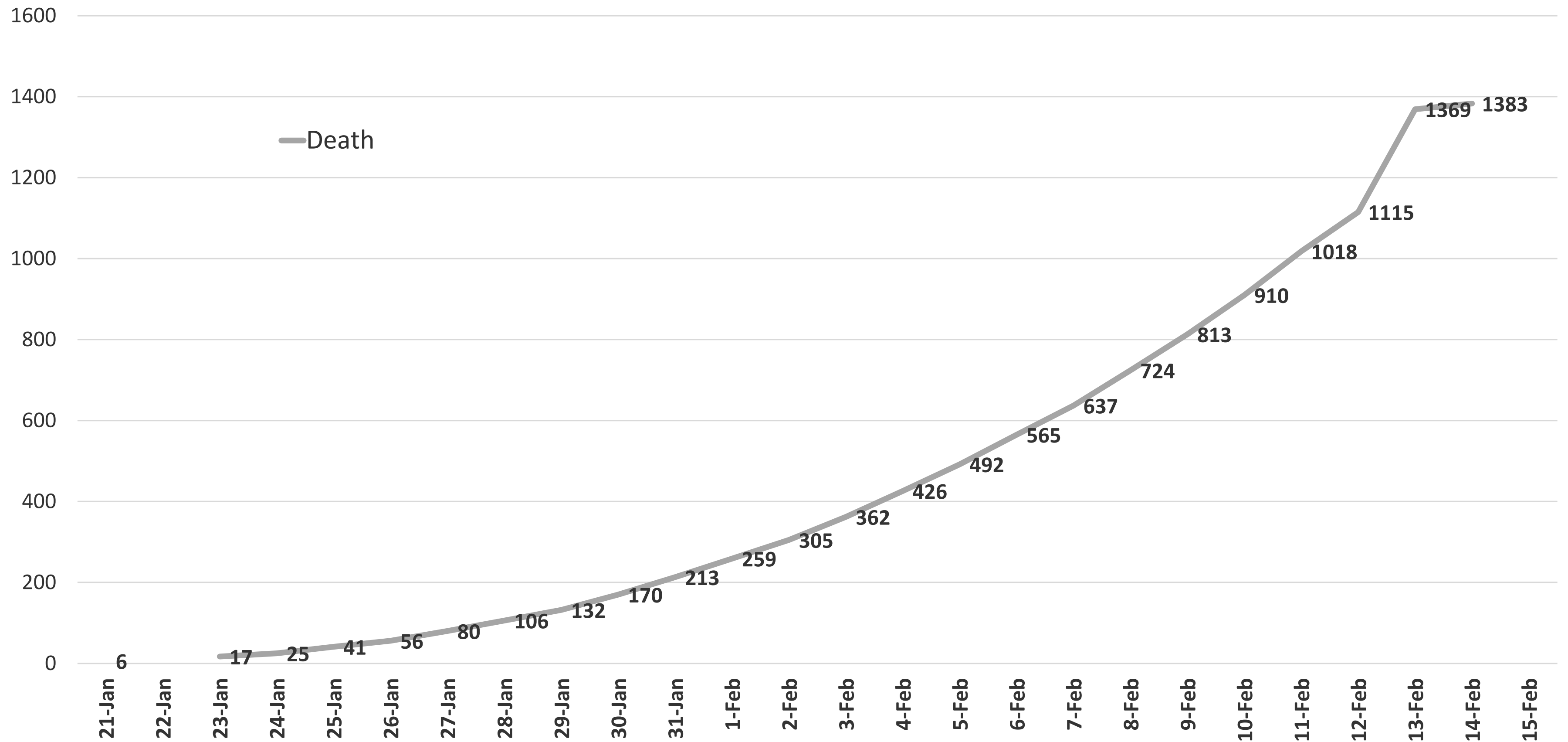Line graph Published by Abu Dhabi Public Health Center 2020.

Data resource : WHO

Figure 5: Number of total death: 21 January to February 14th

Line graph Published by Abu Dhabi Public Health Center 2020.

Data resource : WHO

The number of cases outside china per country: 14/2/2020
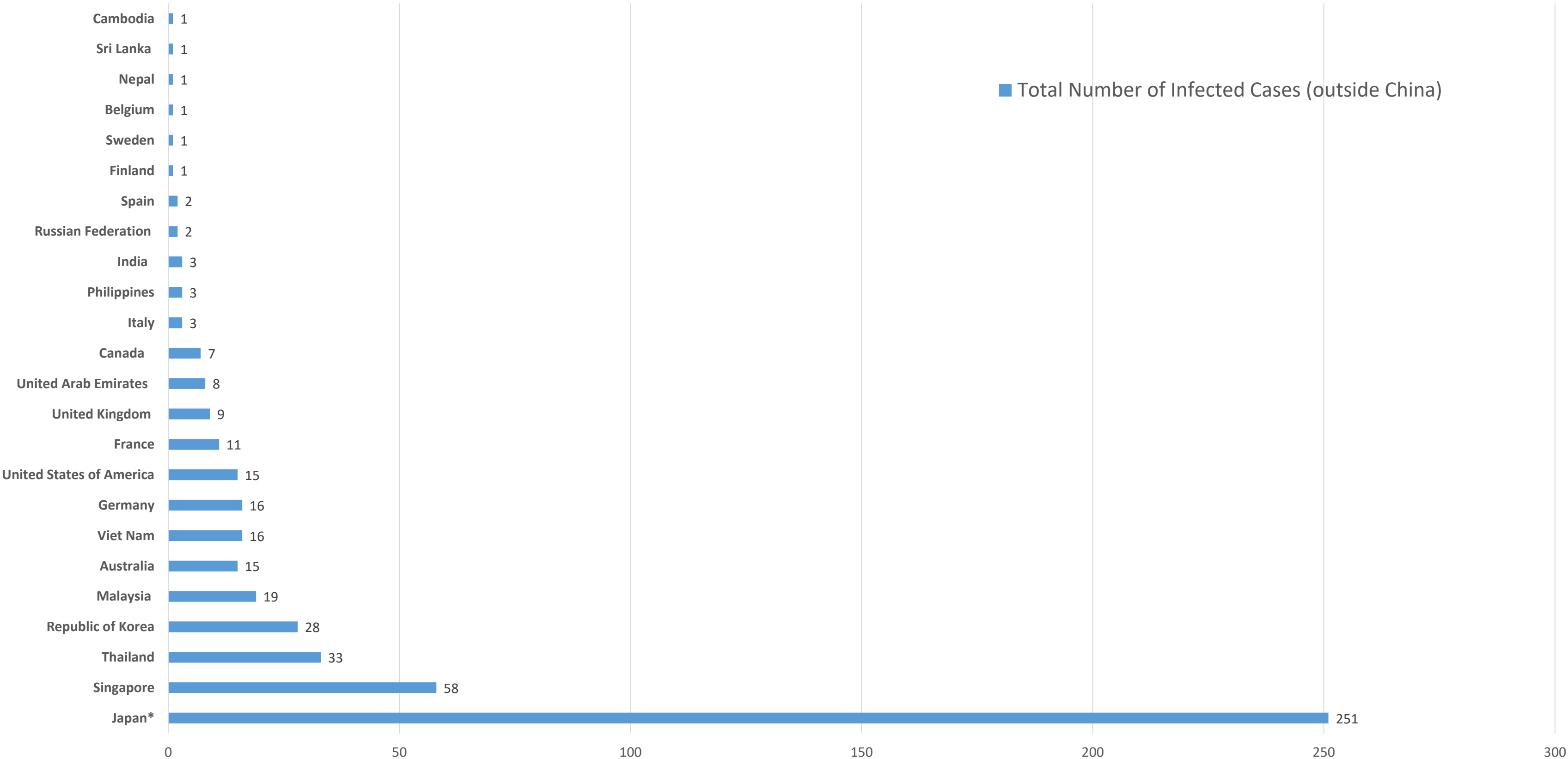
■ Total Number of Infected Cases (outside China)

Country	Value
Cambodia	1
Sri Lanka	1
Nepal	1
Belgium	1
Sweden	1
Finland	1
Spain	2
Russian Federation	2
India	3
Philippines	3
Italy	3
Canada	7
United Arab Emirates	8
United Kingdom	9
France	11
United States of America	15
Germany	16
Viet Nam	16
Australia	15
Malaysia	19
Republic of Korea	28
Thailand	33
Singapore	58
Japan*	251

Bar chart Published by Abu Dhabi Public Health Center 2020.

Data resource : WHO

EPIDEMIOLOGY:

WHO report 14/2/2020 important points:

- No New countries reported cases of COVID-19 in the past 24 hours.

- The second death has been reported outside of China, in Japan. This individual did not have known travel history to China.

- In China, health care workers account for 1716 confirmed cases of COVID-19 including six deaths. (since this is only happening in china , maybe infection control measures are not strongly implemented)

Bar chart Published by Abu Dhabi Public Health Center 2020.

Data resource : WHO

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	49 053	8000	2494
Death cases	1383	800	858
Mortality rate	11% , 14% , 15 Per WHO 4% (still not confirmed	10%	>35 %

*Data until 14th of February 2020.

TIMELINE

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

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

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

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

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

2 February - 5th case reported in the UAE.

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

13th February- WHO Explain the Sudden Jump in china infected cases

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

31 DEC 2020 - First cases reported in china.

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

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

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

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

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

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

PUBLIC HEALTH RESPONSE

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 mean the 14 % of patient who went through this screening might be missed)

- The percent who are asymptomatic (17% of those whom got infected with COVID19 according to previous articles may have no symptoms with typical screening procedures)

- Incubation period of 5.2 (+ or – 4.1days)

- Time of symptoms onset to evaluation of disease.

- Note 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/

CLINICAL FEATURES AND TRANSMISSION:

No Updates!

Title: Persistence of coronaviruses on inanimate surfaces and its inactivation with biocidal agents.

Published on 6th Feb 2020.

https://www.journalofhospitalinfection.com/article/S0195-6701(20)30046-3/fulltext

- The analysis of 22 studies reveals that human coronaviruses can persist on inanimate surfaces l**ike metal, glass or plastic** for up to **9 days**, but it can be e**fficiently inactivated by surface disinfection** procedures.
  – the virus stay in a room temperature for 9 day
  – in temperature 30C or more it stays shorter .

- **Disinfection that works:**
  – 1) 62-71% ethanol,
  – 2) 0.5% hydrogen peroxide
  – 3) 0.1% sodium hypochlorite **within 1 minute**

- **Disinfection** which **less likely to work:**
– 0.05-0.2% benzalkonium chloride
– 0.02% chlorhexidine digluconate

Note : The article is a summary of previously studied Human coronavirus included SARS, MERS, this does not include nCoV
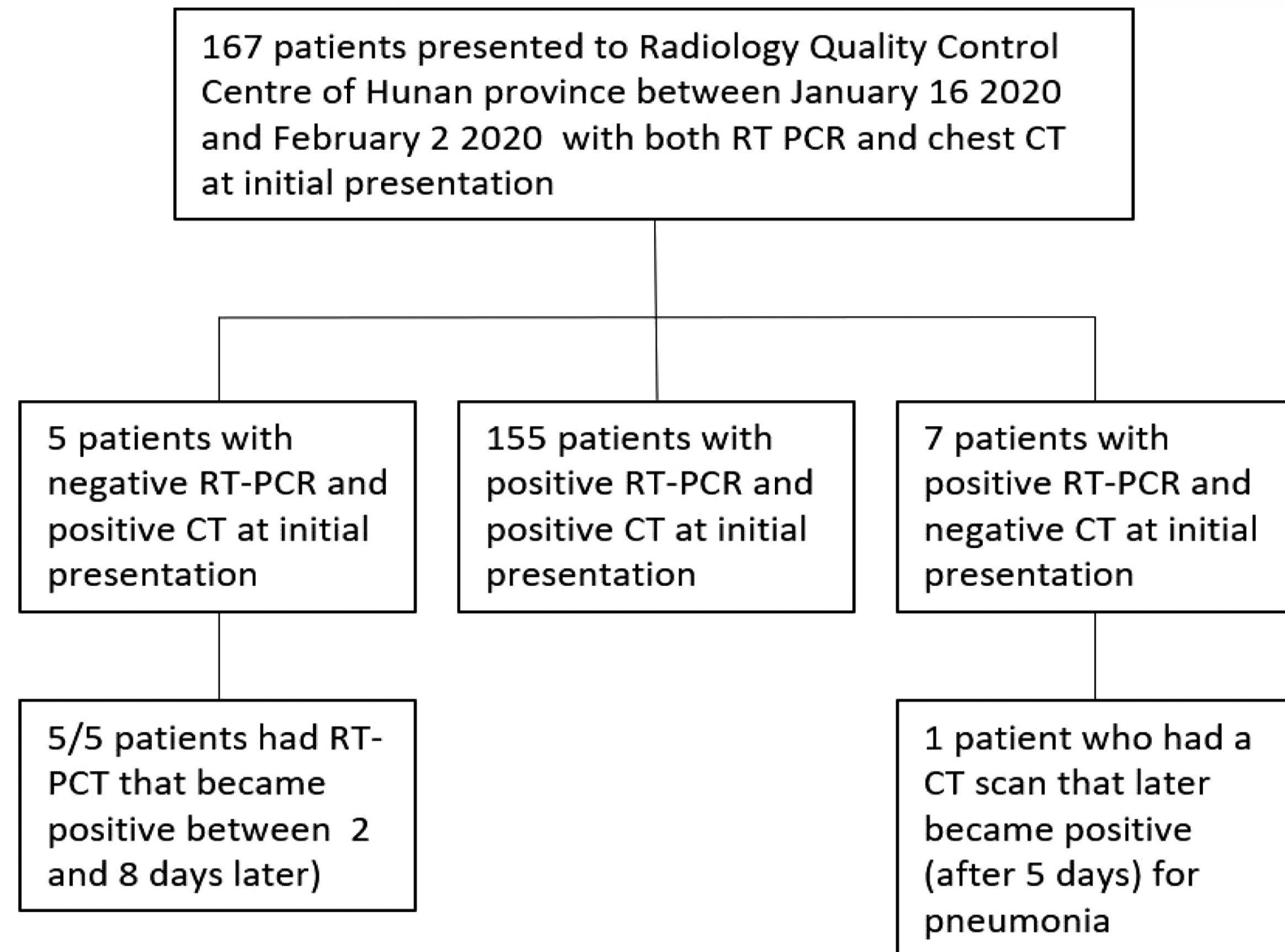
DIAGNOSIS:
No Updates!

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

Published on 12th Feb 2020.

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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

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- Two radiologist with 10 year experience were interpreting the CT.
- 5 patient initially **test positive** in **CT** and **negative for RT-PCR** and after consecutive testing RT-PCR become positive
- 7 patient were test **negative** for **CT** and **positive for RT-PCR**.
- The **Five cases** whom were **negative** in **RT-PCR** and **positive** for **CT** at initial were discuss in this article presentation.
  - 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**.
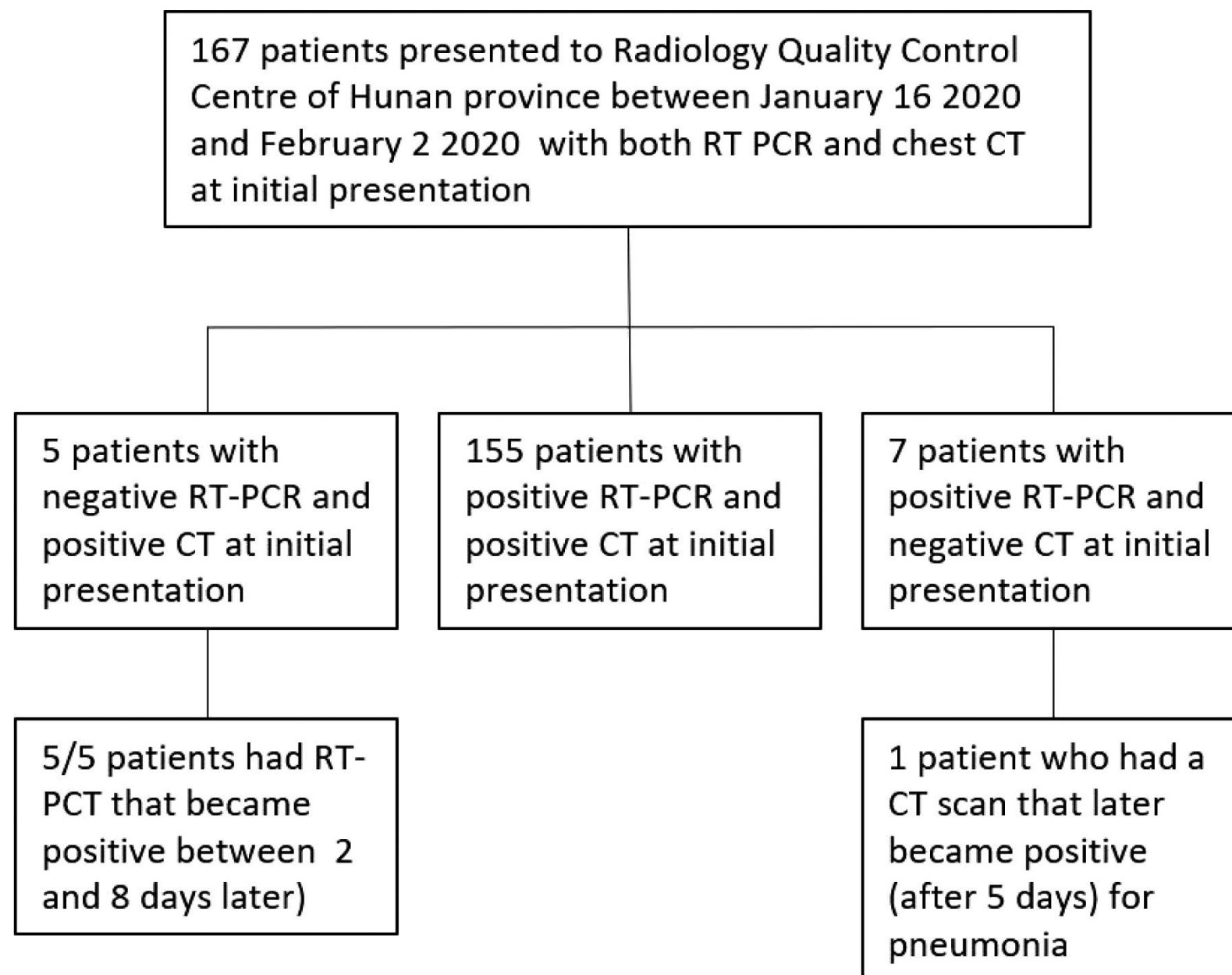
Conclusion from the study:

A combination of repeated swab tests and CT scanning may be helpful when for individuals with **high clinical suspicion of nCoV infection** but **negative RT-PCR screening**

DIAGNOSIS:

Flowchart:

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
  - 5/5 patients had RT-PCT that became positive between 2 and 8 days later)
- 155 patients with positive RT-PCR and positive CT at initial presentation
- 7 patients with positive RT-PCR and negative CT at initial presentation
  - 1 patient who had a CT scan that later became positive (after 5 days) for pneumonia

Our appraisal on 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 that authorities and health care provider 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 of 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.

Access to the article : https://pubs.rsna.org/doi/10.1148/radiol.2020200343

TREATMENT:
No Updates!

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:

No Updates!

Latest article on 27 of Jan 2020

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

List of suggested vaccines:

https://www.who.int/blueprint/priority-diseases/key-action/list-of-candidate-vaccines-developed-against-ncov.pdf?ua=1