# COVID-19

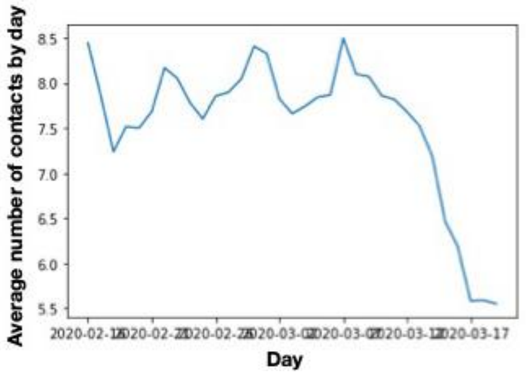
## How is MagicBox involved in the response?

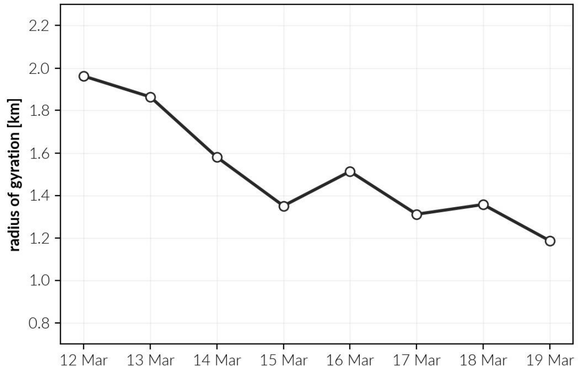
unicef

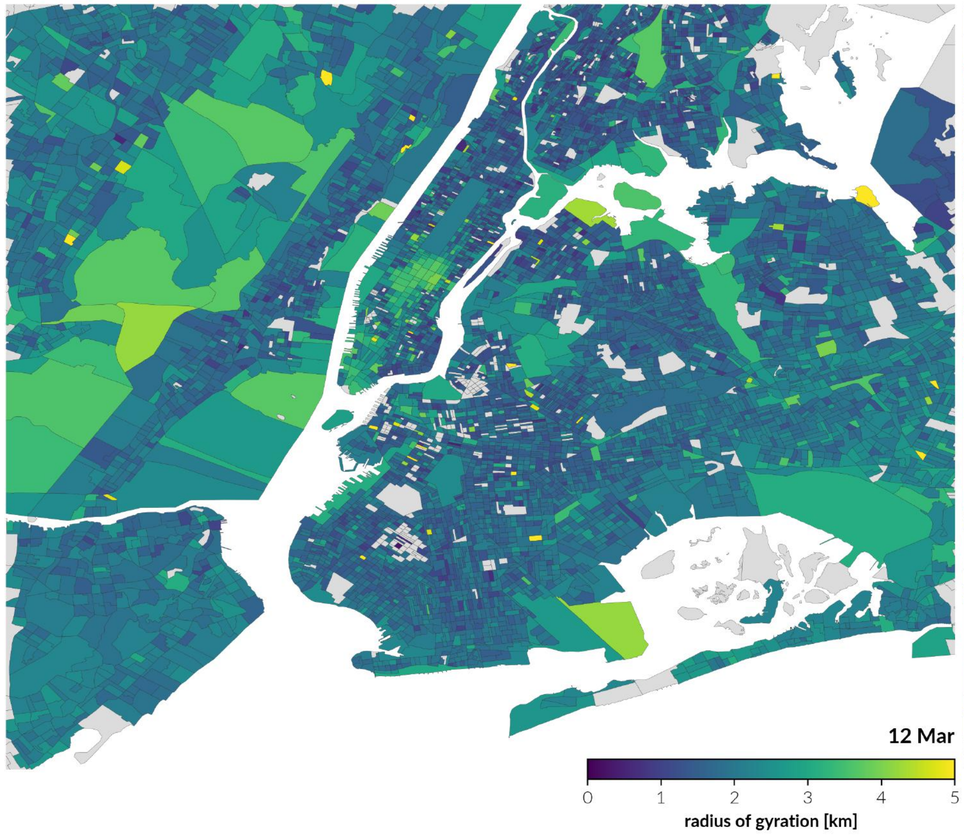
# NYC social distancing

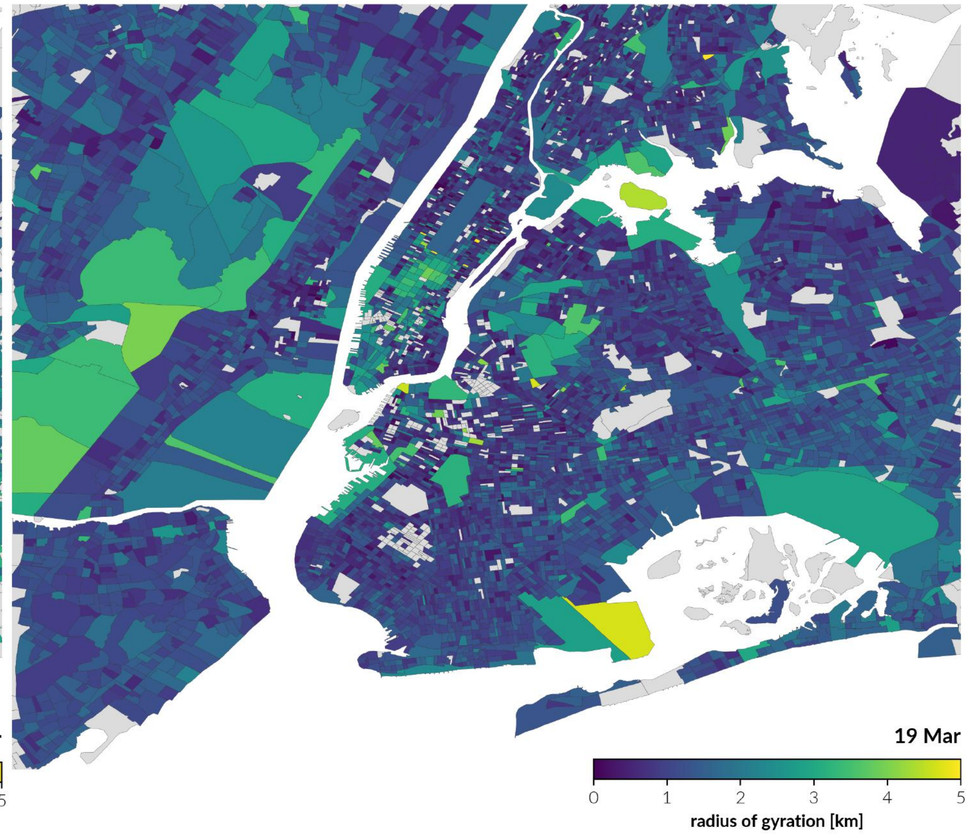
Mobility being reduced in NYC in the last days significantly.
Average Radius of movement almost halfed.
Average number of contacts from 8 to 5.5 (Wuhan lowered it from 10 to 2)

***Radius of Gyration by UNICEF MB***
***Average number of contacts by MIT Media Lab Human Dynamics – UC3M***



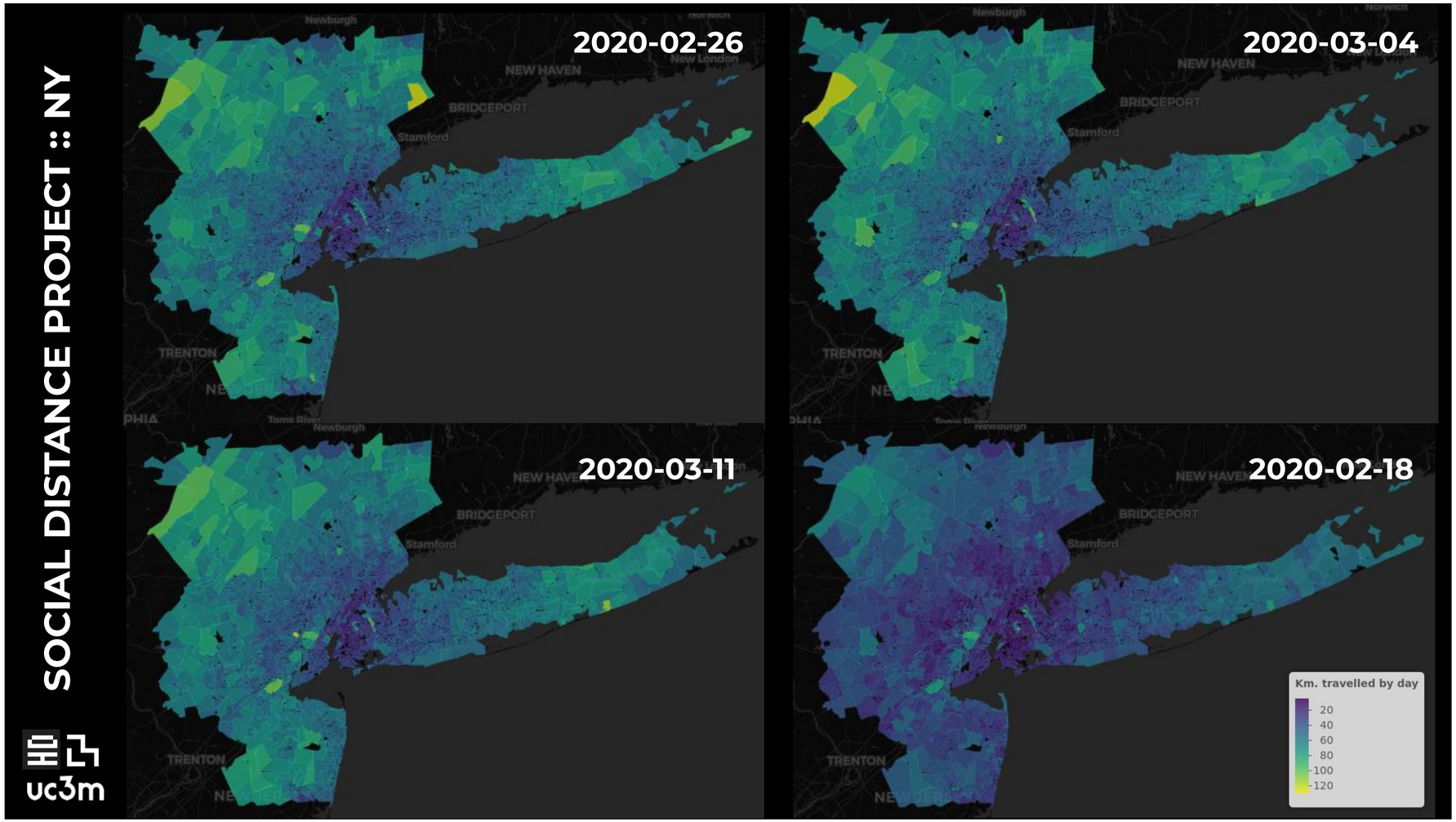



# Larger NYC

Evident drop of movements




*Data from: Cuebiq*
*Analysis by: Esteban Moro, MIT & UC3M*

# Predicting spread: Global flight traffic



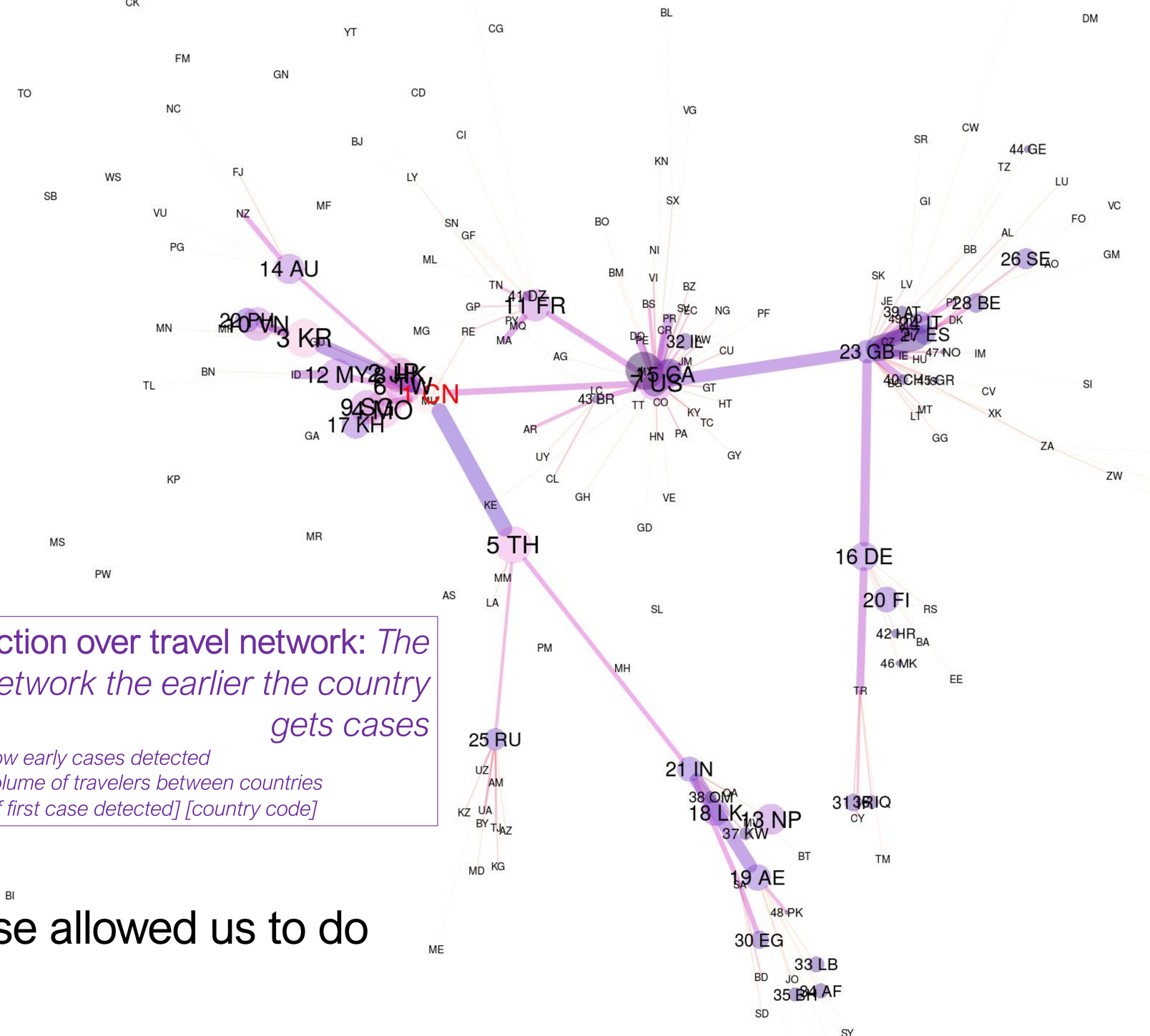
**Thanks to Amadeus*, through MagicBox, UNICEF has access to global flight data, at airport level, including origin-final destination as well as intermediary legs.**

**Data is on a weekly resolution, updated every monthly, with about 20 days of delay after the month ends.**

***Amadeus: major IT provider for global travel***

# Global spread

Globally the **disease moves through the flight network**. Countries “closer” to China and affected countries from a travel network perspective show introduction of cases earlier.




Order of CoViD introduction over travel network: *The more central in the network the earlier the country gets cases*

*Size of node: how early cases detected*
*Size of edge: volume of travelers between countries*
*Label: [Order of first case detected] [country code]*

This network analysis of the disease allowed us to do risk mapping and forecasting…

# Egypt Announces first Coronavirus infection



Egypt's Health Ministry announced, Friday first Coronavirus infection for a 'foreigner' inside the country. Photo via Facebook

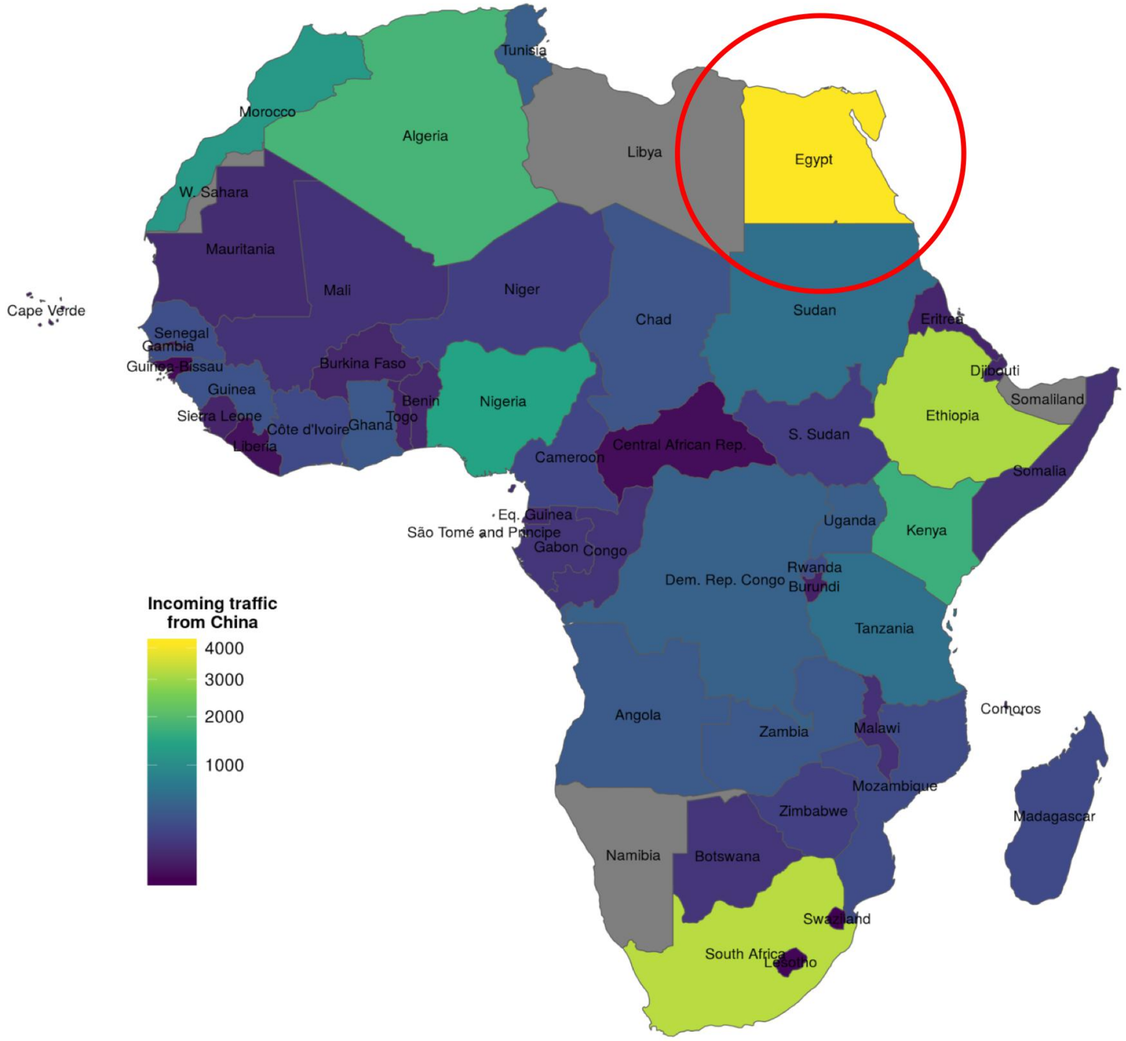
Egypt announces first Coronavirus infection

By: Egypt Today staff Fri, Feb. 14, 2020

***CAIRO – 14 February 2020: Egypt's Health Ministry announced, Friday first Coronavirus infection for a 'Chinese' national in Egypt.***
***https://www.egypttoday.com/Article/1/81641/Egypt-announces-first-Coronavirus-infection***

**MagicBox January models with flight data from Amadeus showed Egypt as the most common destination of passengers from China, putting it in the top list of countries at risk in Africa.**

**Forecast by January 20th shows Egypt as top Risk country in Africa**



But our efforts have since shifted towards <u>understanding the secondary impacts of the response</u>

- what effect will the closing of schools have on our societies?

- what effect will closed factories have?

- what about panic?

1. Doing proof-of-concepts to quantify these
2. Scaling up our data science capacity

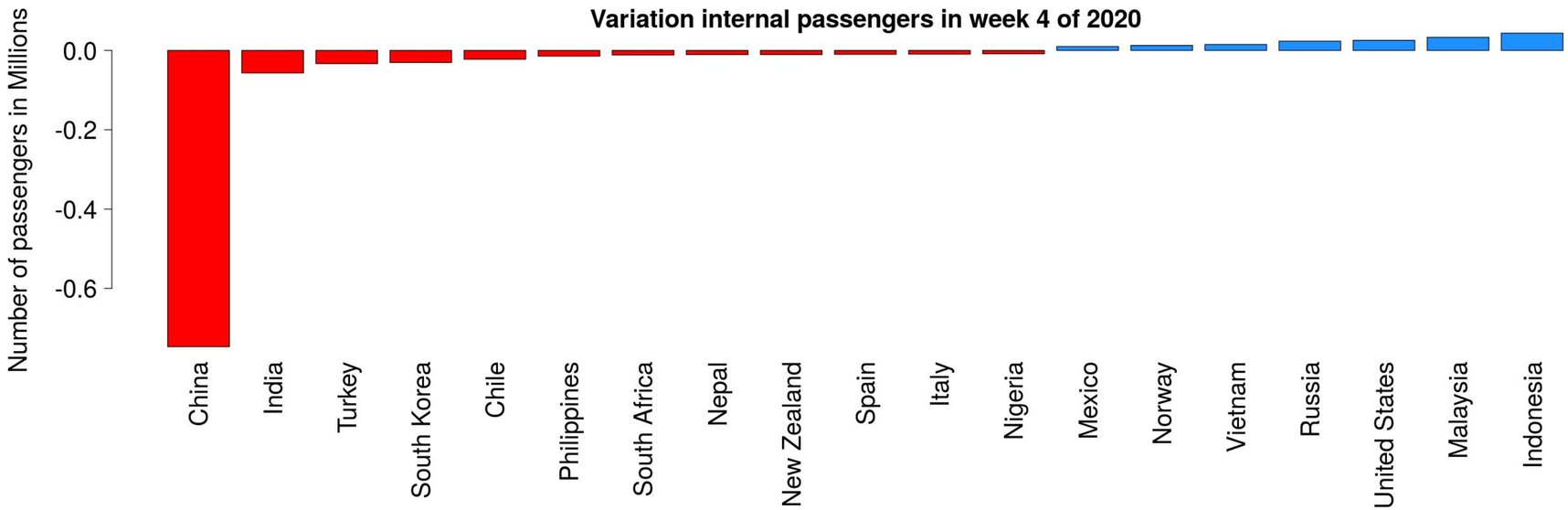
# Proof-of-concepts








# Flight changes: Domestic travels

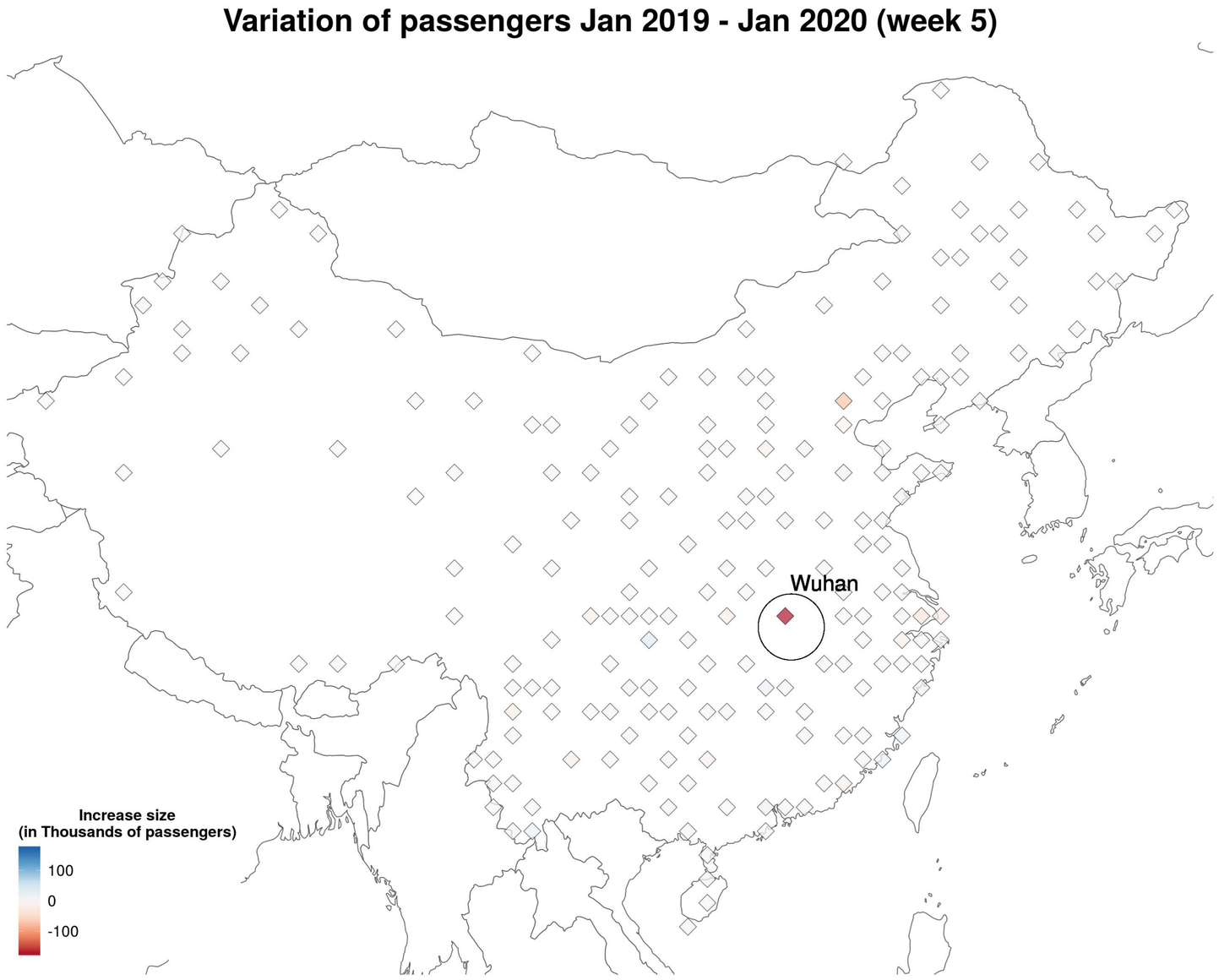



**In week 4 China already shows a sharp decrease of passengers flying within country.**

**Over 700,000 less than expected in week 4.**

**More than 1.3 Million less than expected in week 5**

*Data from Amadeus*
*New data: approx 26th March*



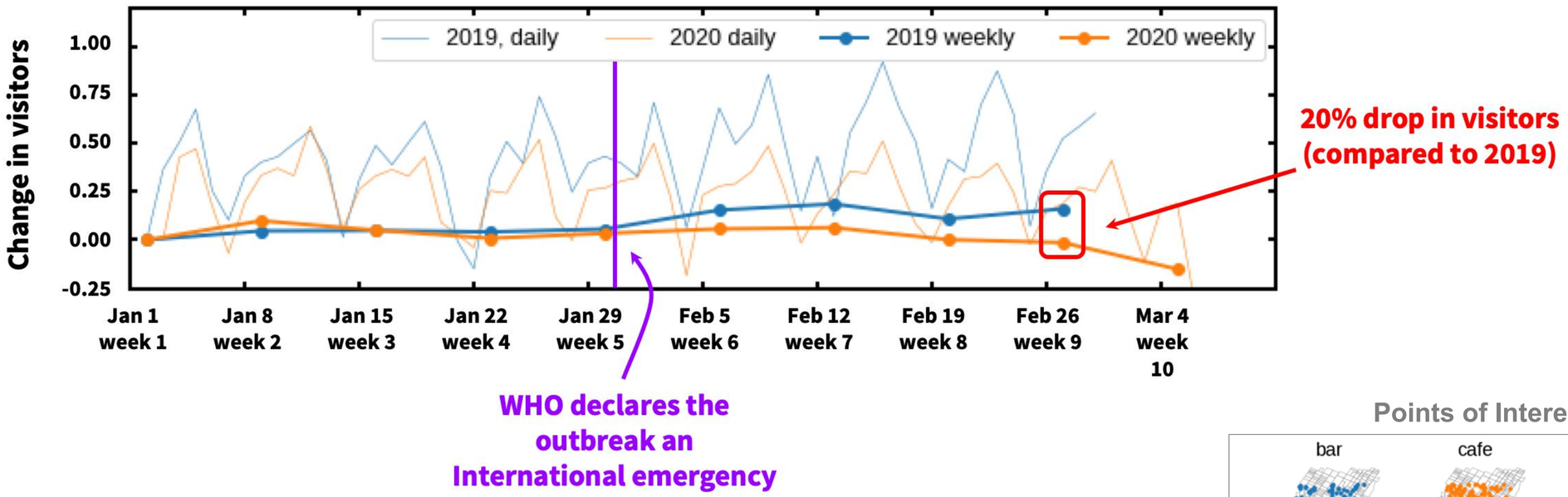

**The decrease of movement in China during week 5 can be pinned down to Wuhan lockdown (23 Jan 2020).**

**More than 150,000 travelers less, compared to the same week of 2019 (despite the overall great increase of domestic travelers over 2019).**

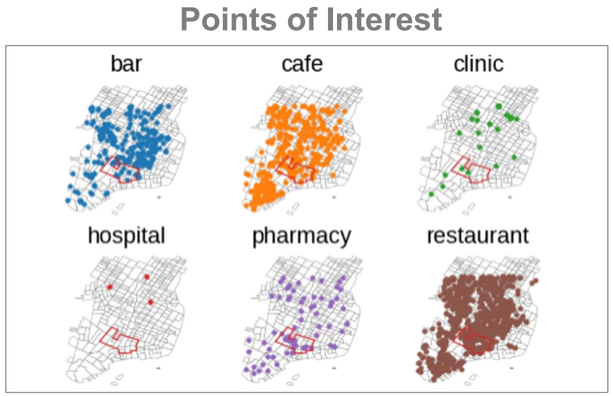
*Data from Amadeus*
*New data: approx 26th March*

# Phone data: Urban movements

## Manhattan visits to Points of Interest dropping since WHO announcement



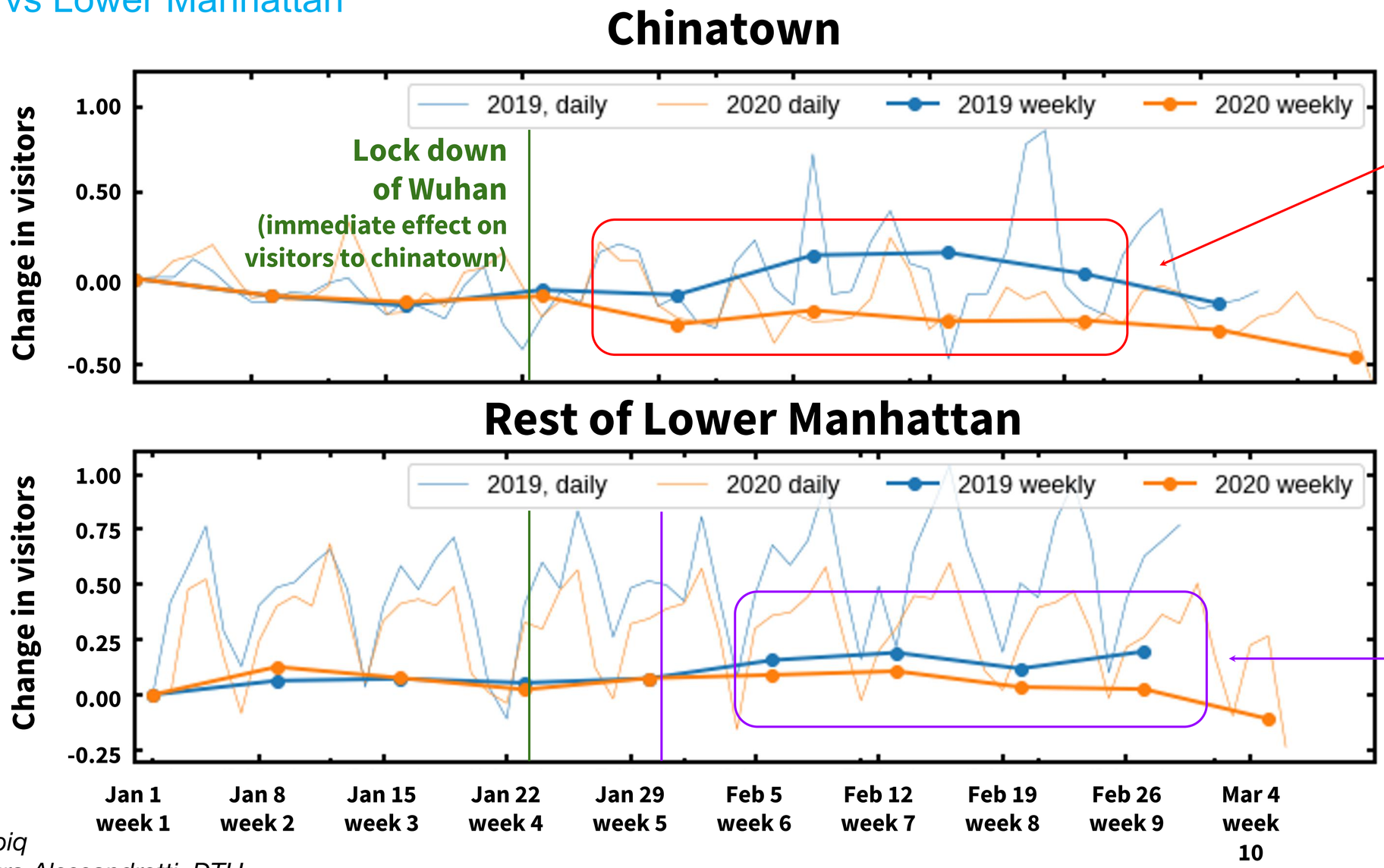

Through a partnership with **Cuebiq** (a private company) we have access to data about **visitation patterns** of Points of Interest in lower Manhattan. New data expected to cover cities in more than 8 countries




*Data from: Cuebiq*
*Analysis by: Laura Alessandretti, DTU*

# Starting earlier in Chinatown

Chinatown vs Lower Manhattan




Fewer visitors for Chinese new year

Change in visitors first after WHO declares the outbreak an International emergency

*Data from: Cuebiq*
*Analysis by: Laura Alessandretti, DTU*

# Prices of PPE in the US have been rising

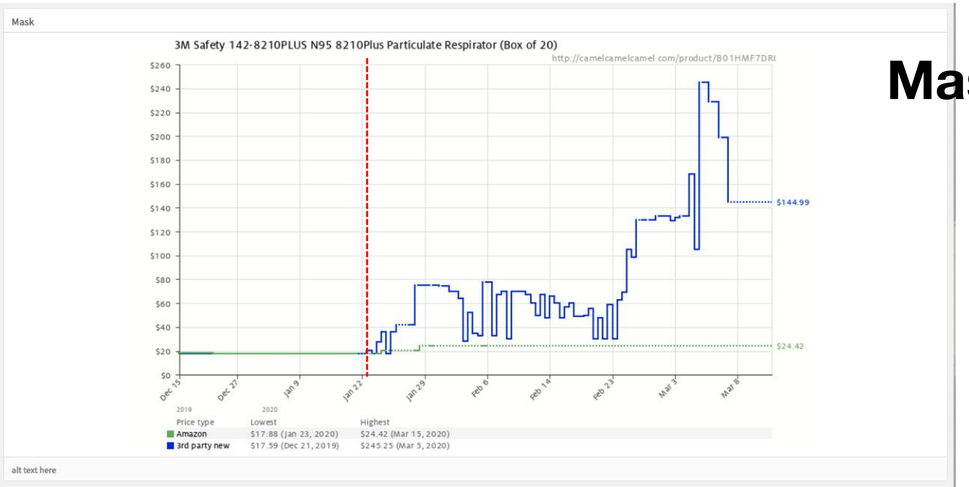
Out of stock since early in the epidemic. Huge rise from 3rd party sellers. Small drop in prices recently from the high panic peak.

**Jan 21st First case detected in US**

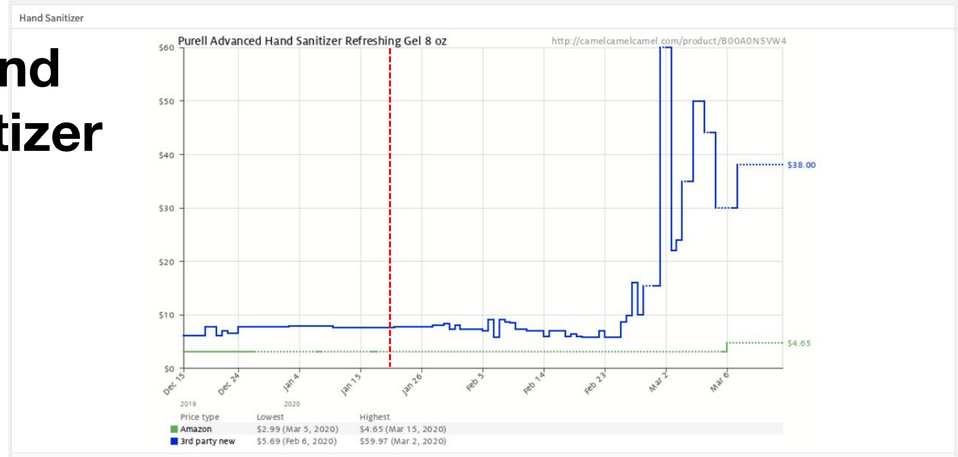
**Gloves**



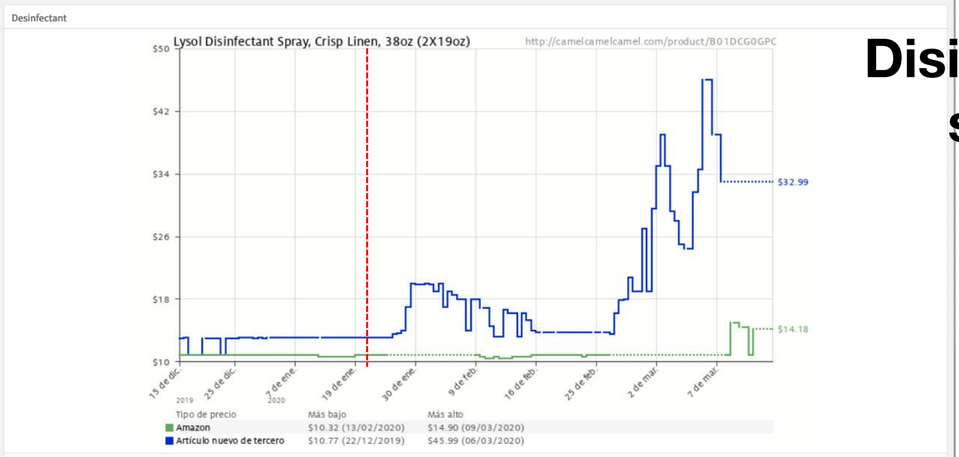

**Masks**




**Hand sanitizer**




**Disinfectant spray**




*Data: Amazon prices from Camelcamelcamel.com*
*New data: Waiting for partnership agreement*

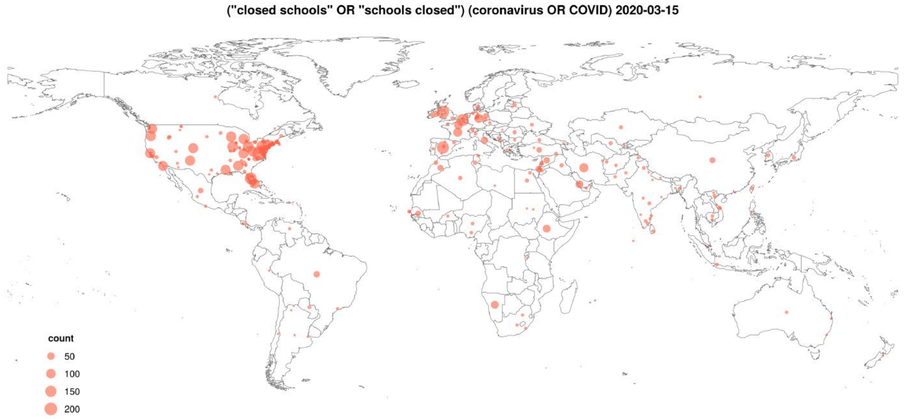
*Analysis by: Esteban Moro, MIT & UC3M*

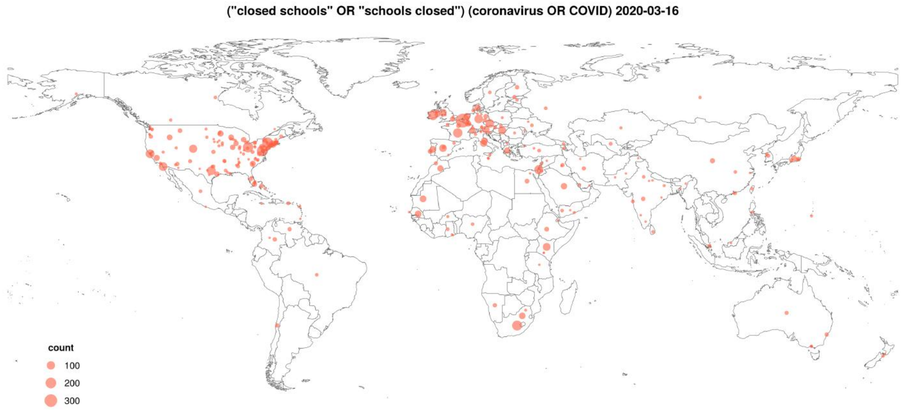
# School closures

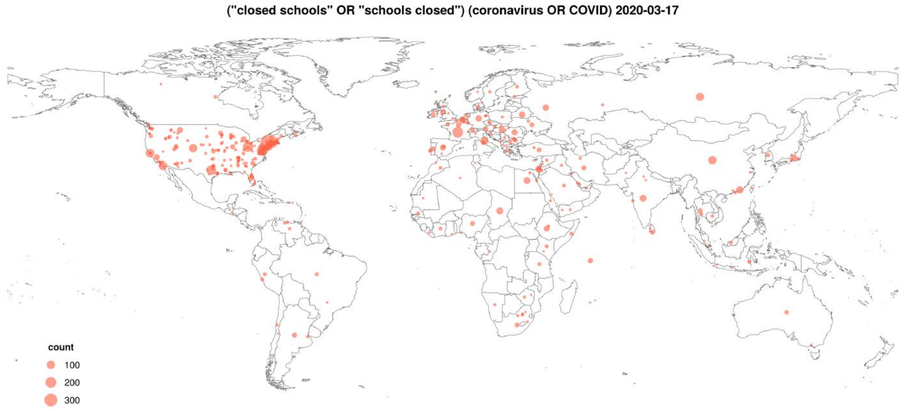
Exploring news monitoring to map school closures

**MARCH 2020**

| MON | TUE | WED | THU | FRI | SAT | SUN |
|---|---|---|---|---|---|---|
| | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | 31 | | | | | |



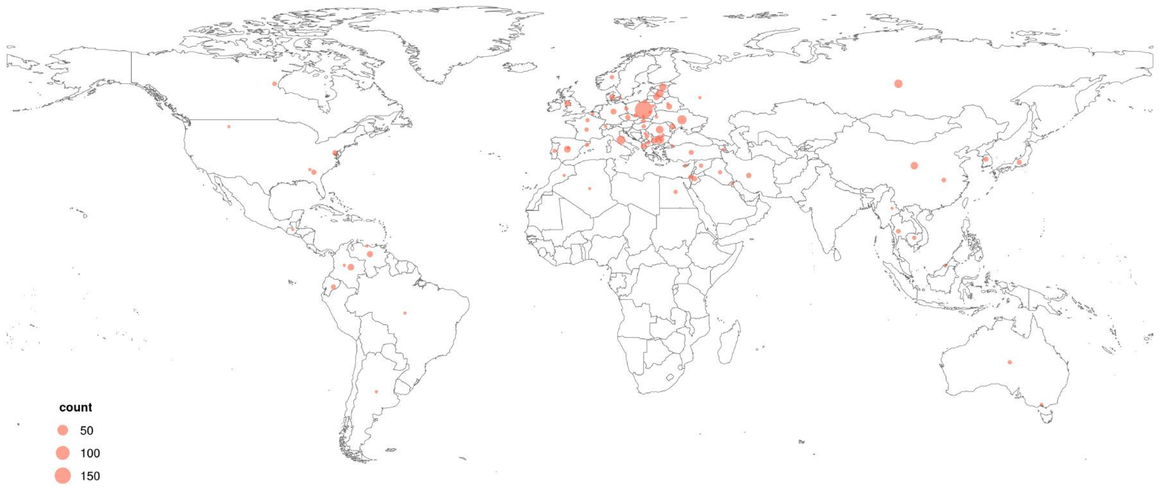




**Data from GDELT.**
**Next update: Daily**

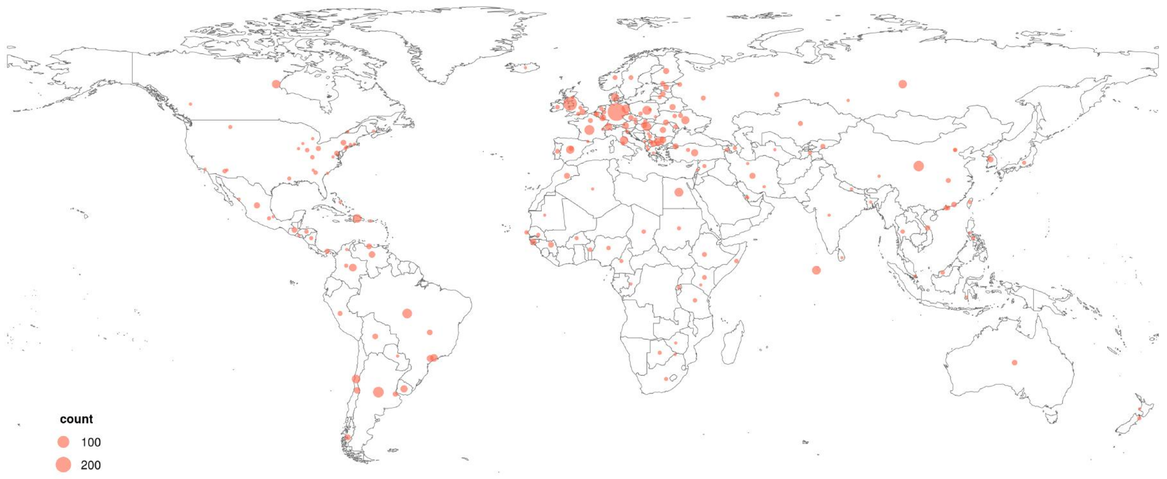
# Border closures

Exploring similar techniques for news related to closing borders

("closed borders" OR "borders closed") (coronavirus OR COVID) 2020-03-15



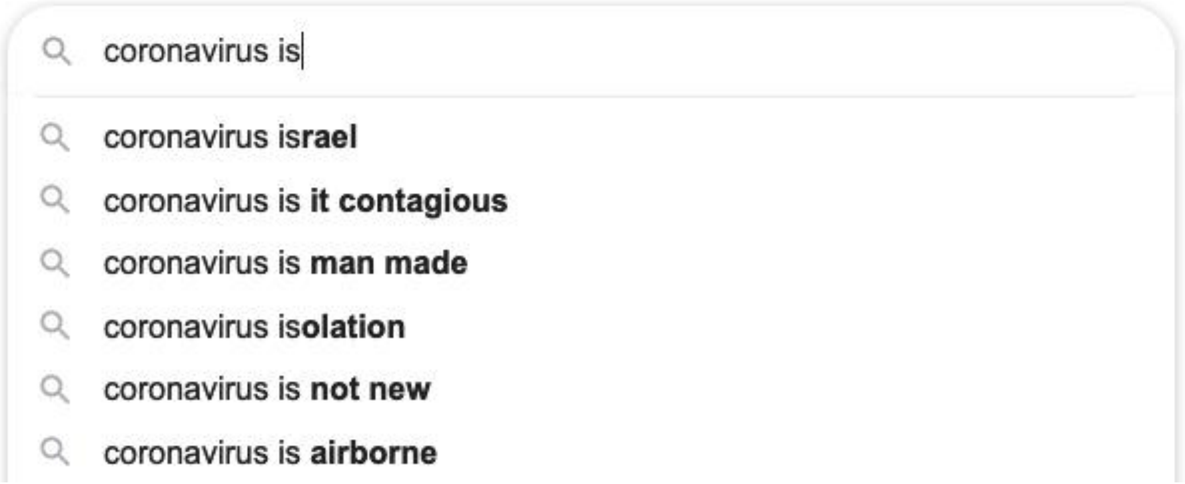

("closed borders" OR "borders closed") (coronavirus OR COVID) 2020-03-18



# Search patterns

## Background

When people search on Google for a term the search engine offers a list of suggestion to autocomplete the query

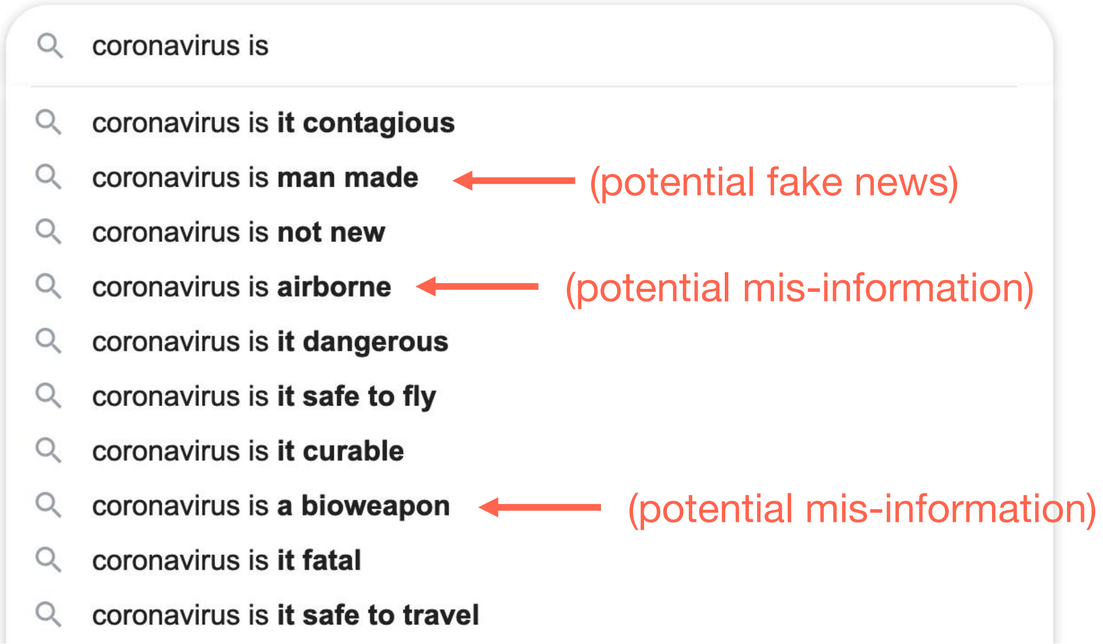


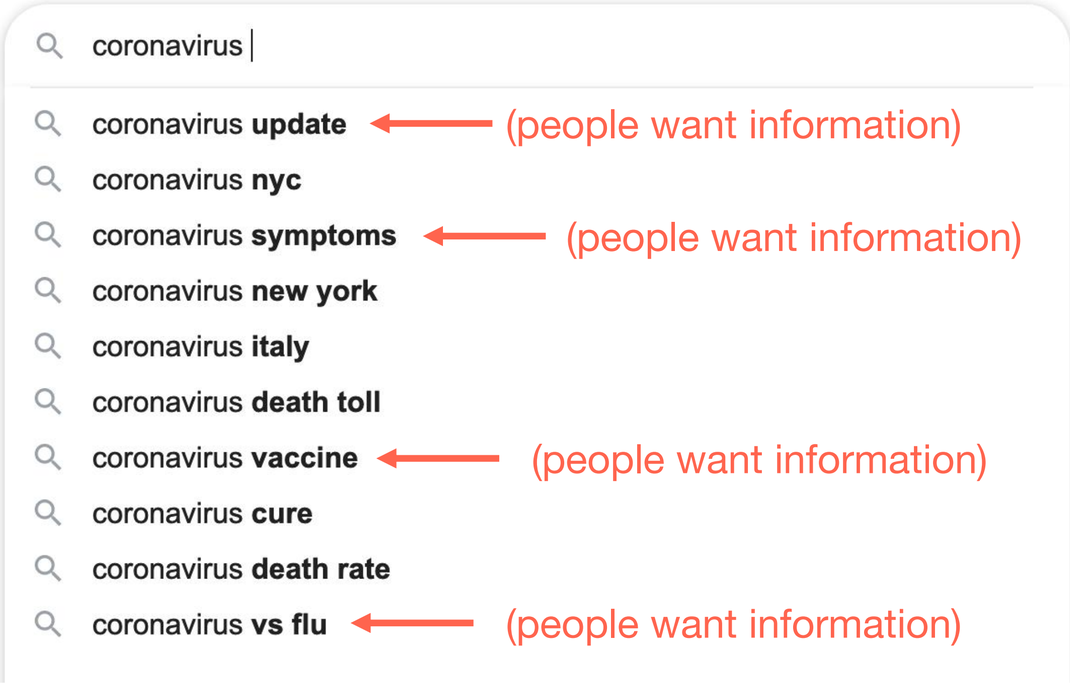

The suggestions are a prediction, based on what people are looking for and what other people have already searched for

Data from Google

Next update: No partnerships establishsed. No update possible yet

# USA (New York)


coronavirus is
coronavirus is **it contagious**
coronavirus is **man made**
(potential fake news)
coronavirus is **not new**
coronavirus is **airborne**
(potential mis-information)
coronavirus is **it dangerous**
coronavirus is **it safe to fly**
coronavirus is **it curable**
coronavirus is **a bioweapon**
(potential mis-information)
coronavirus is **it fatal**
coronavirus is **it safe to travel**


coronavirus
coronavirus **update**
(people want information)
coronavirus **nyc**
coronavirus **symptoms**
(people want information)
coronavirus **new york**
coronavirus **italy**
coronavirus **death toll**
coronavirus **vaccine**
(people want information)
coronavirus **cure**
coronavirus **death rate**
coronavirus **vs flu**
(people want information)

# Hong Kong

## coronavirus*



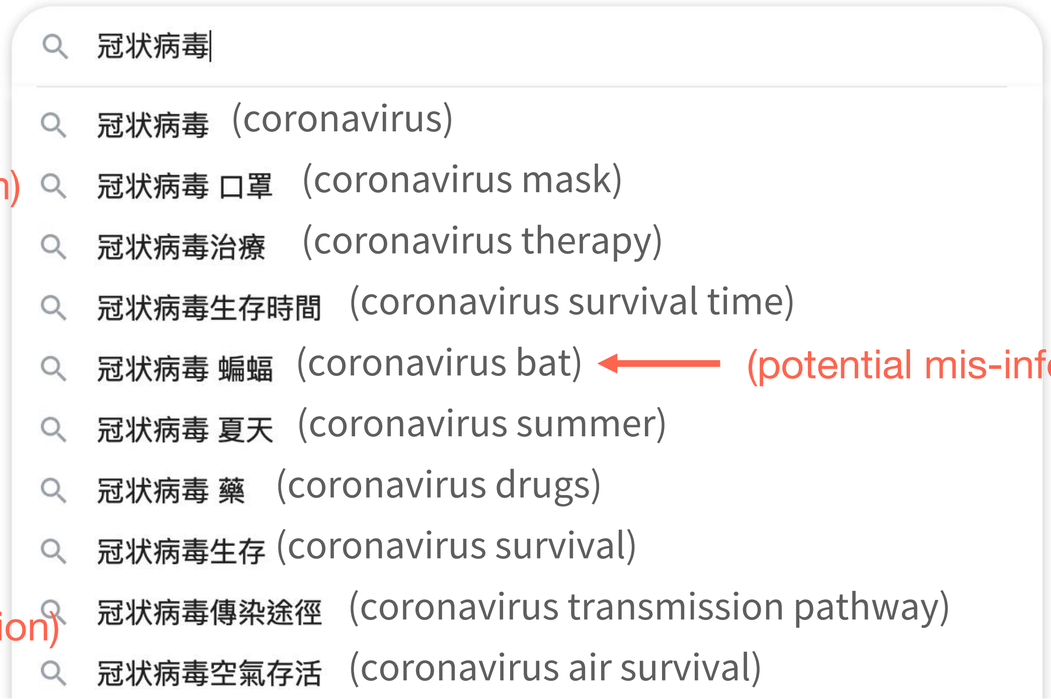

(potential mis-information)

(people want information)

* ”coronavirus_”

space

## coronavirus*

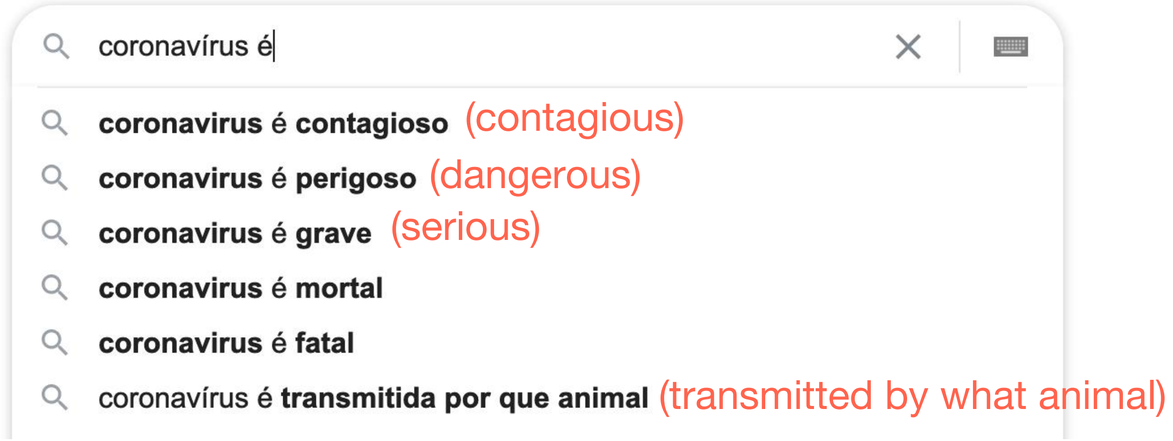



(potential mis-information)

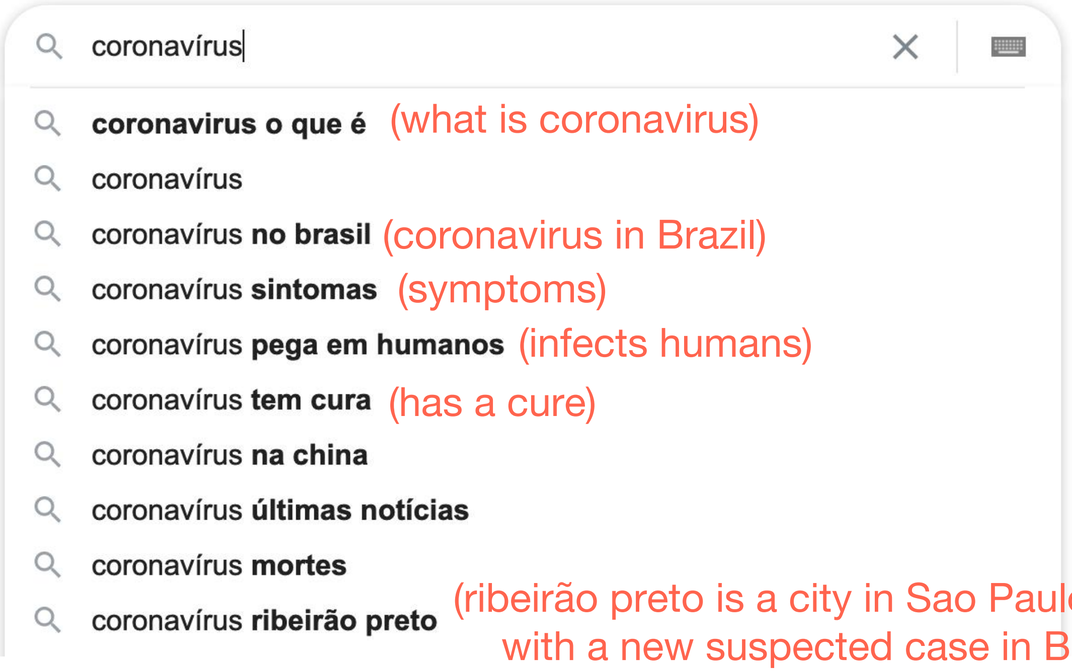
* ”coronavirus”

# Brazil

## coronavirus is



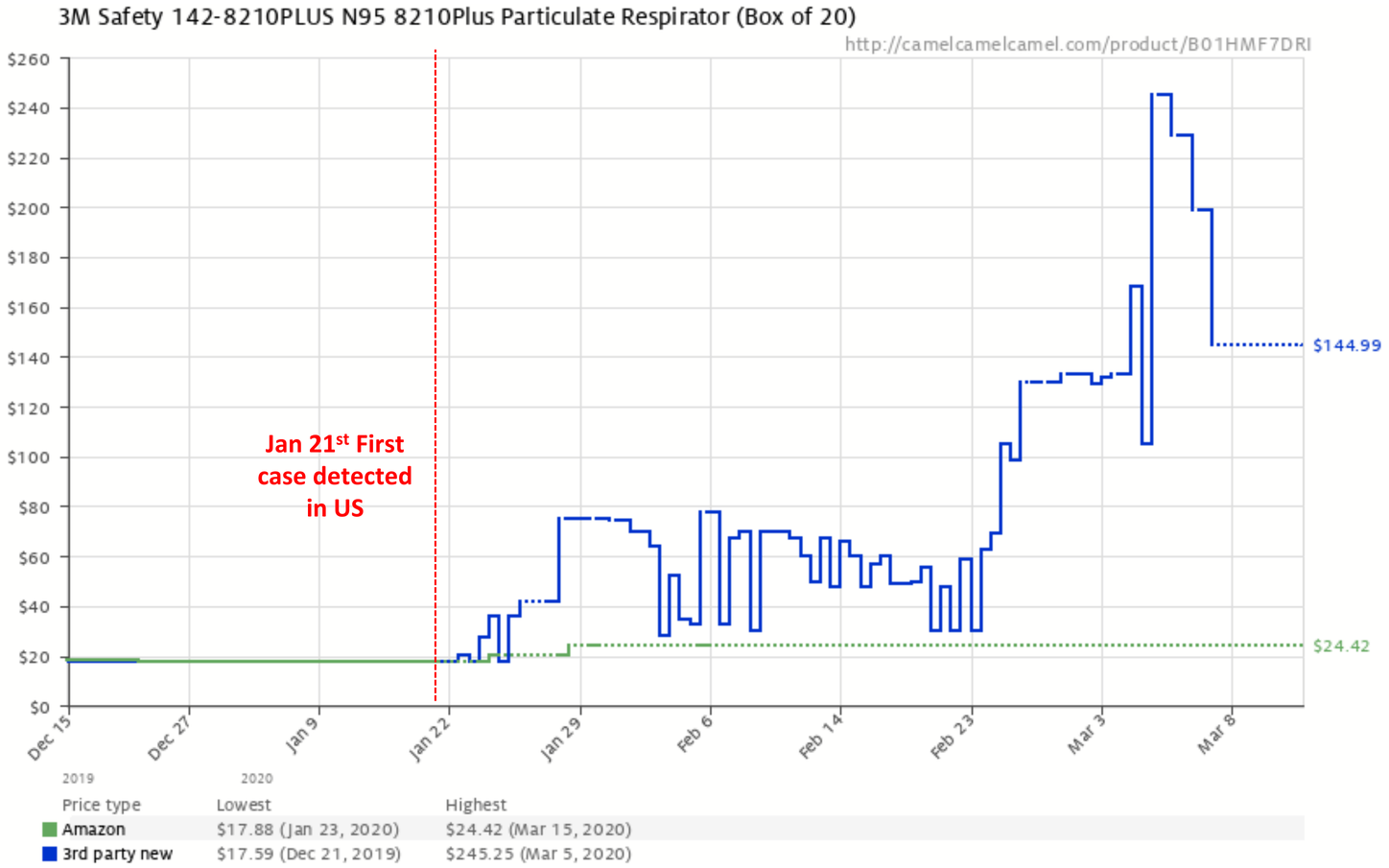

## coronavirus



# Prices on PPE

Even though masks are not recommended by WHO, they have been going **out of stock** in the US since late Jan.

**Big spike in 3rd party sellers' cost** in the last week




Data from camelcamelcamel.com
Analysis by MIT
Next update: No partnership established wit Amazon or similar data provider. Manual updates from MIT group in
http://moribus.media.mit.edu/impact_demand/

# We can compare historically

For example, hand sanitizer in the US had not seen a peak this high since 2015

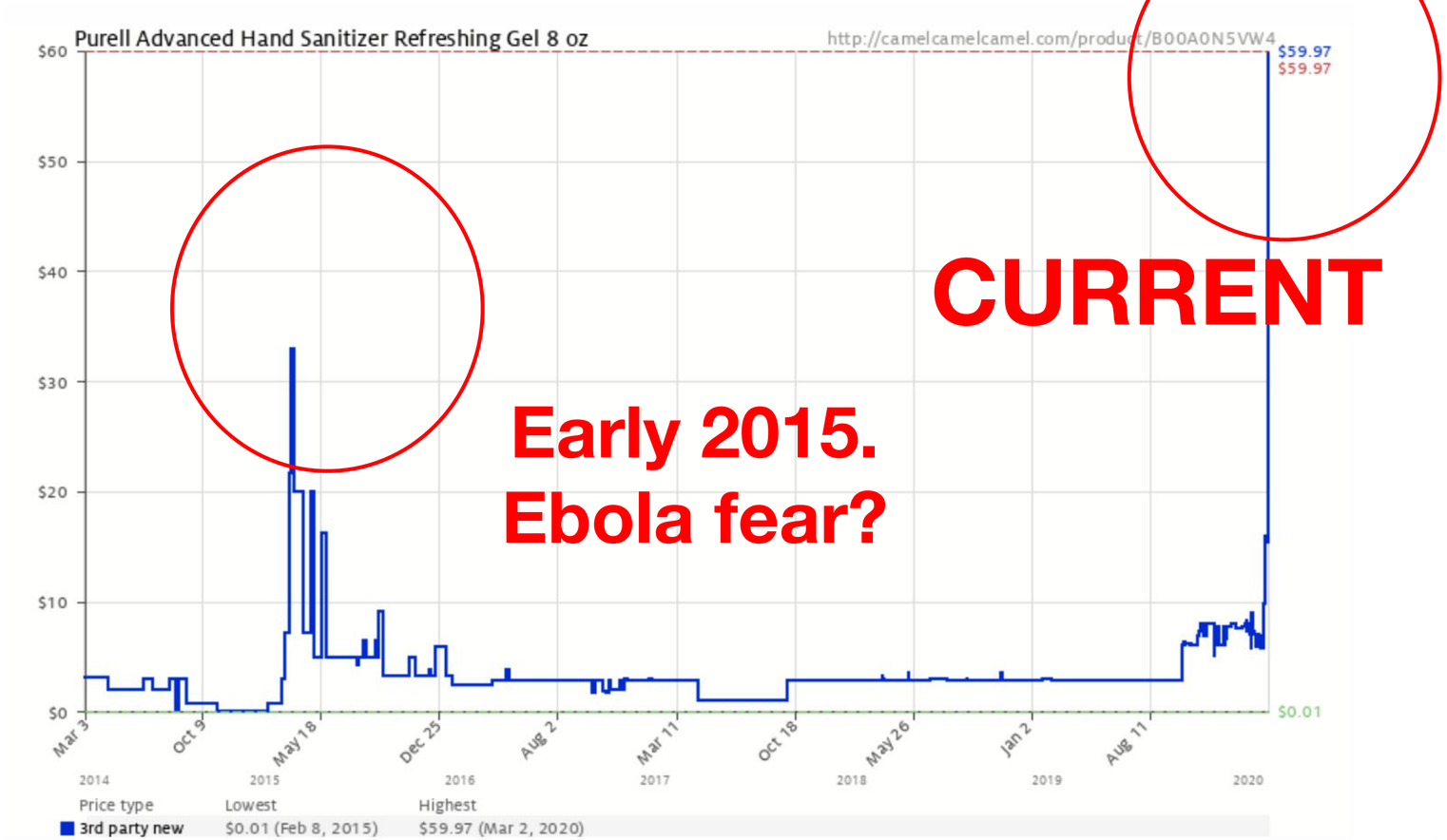


PURELL Surgical Scrub Waterless Liquid 1200ml, 1907-02 (1 Per Pack)

$249.99

prime FREE Delivery Thu, Mar 5

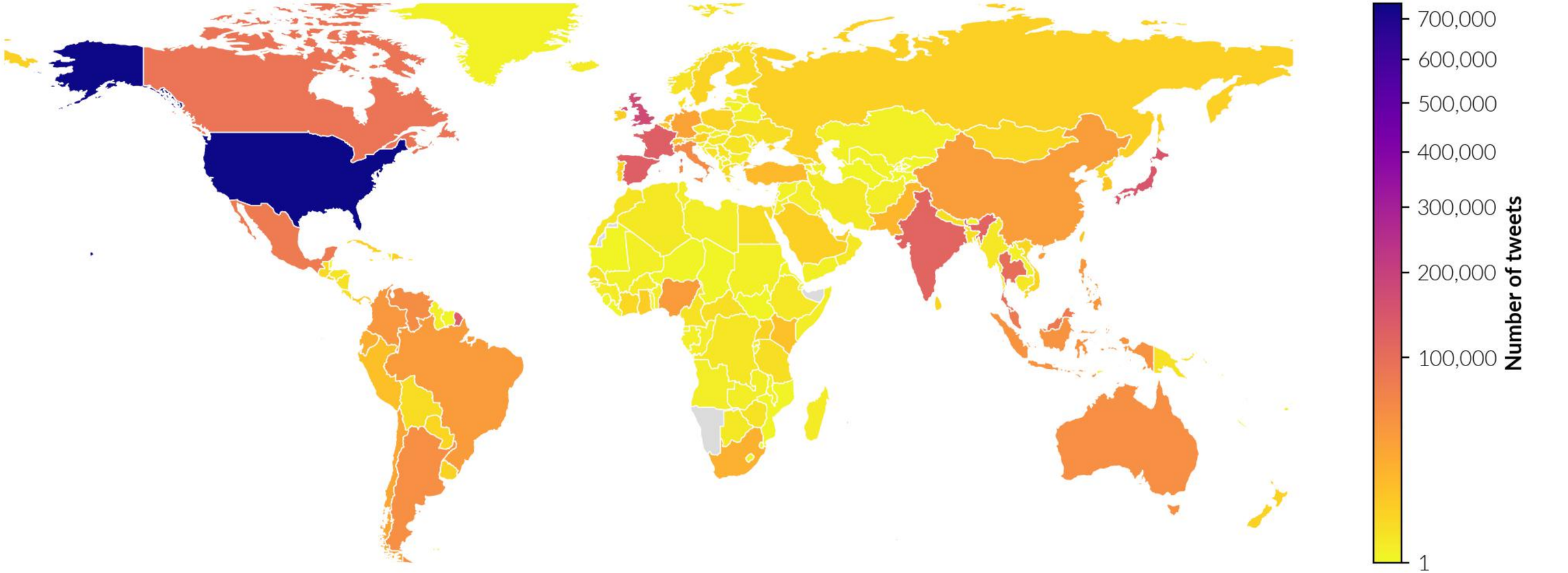
Only 3 left in stock - order soon.




*Data from: Camelcamelcamel.com*
*Analysis by: Esteban Moro, MIT & UC3M*

# Monitoring COVID social media chat

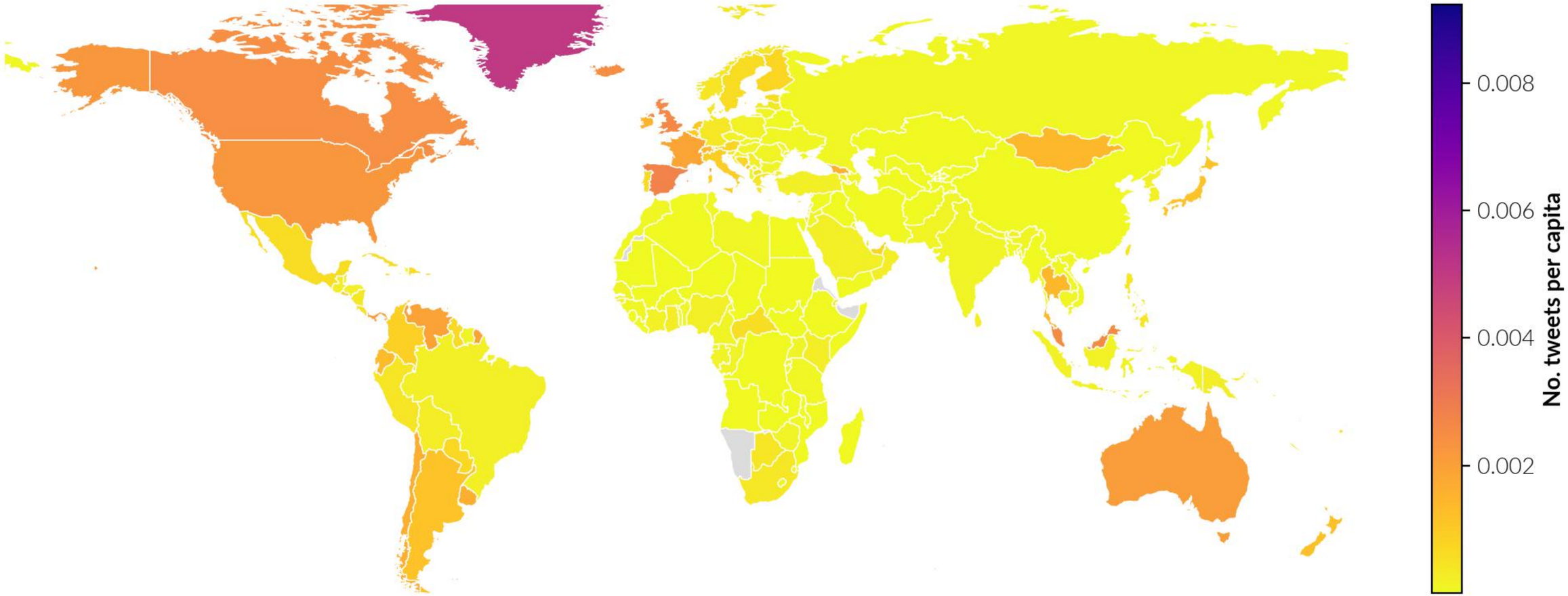
Where do we have tweets from (2020-02-10 to 2020-02-17)



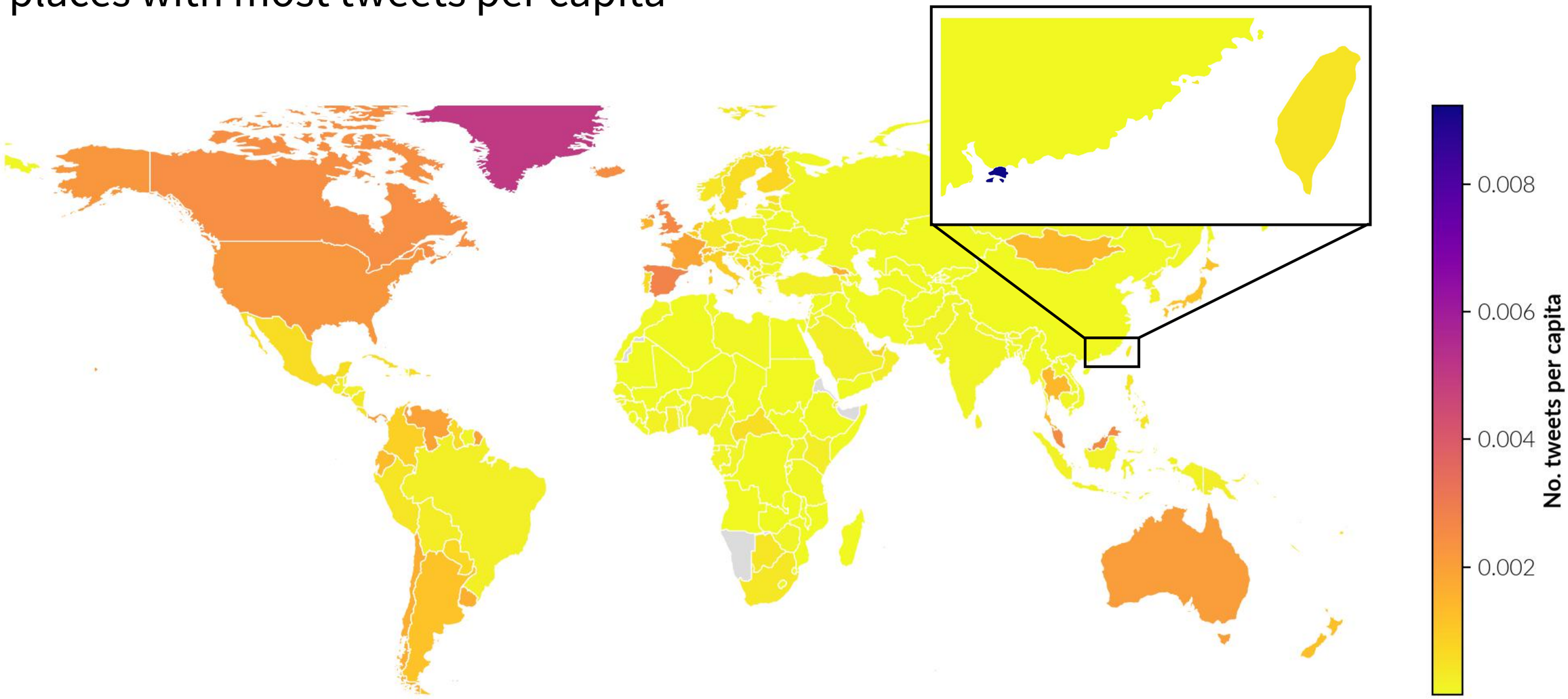

Data from Twitter

Next update: on hold until UNGP is able to extend agreement limitations on Volume

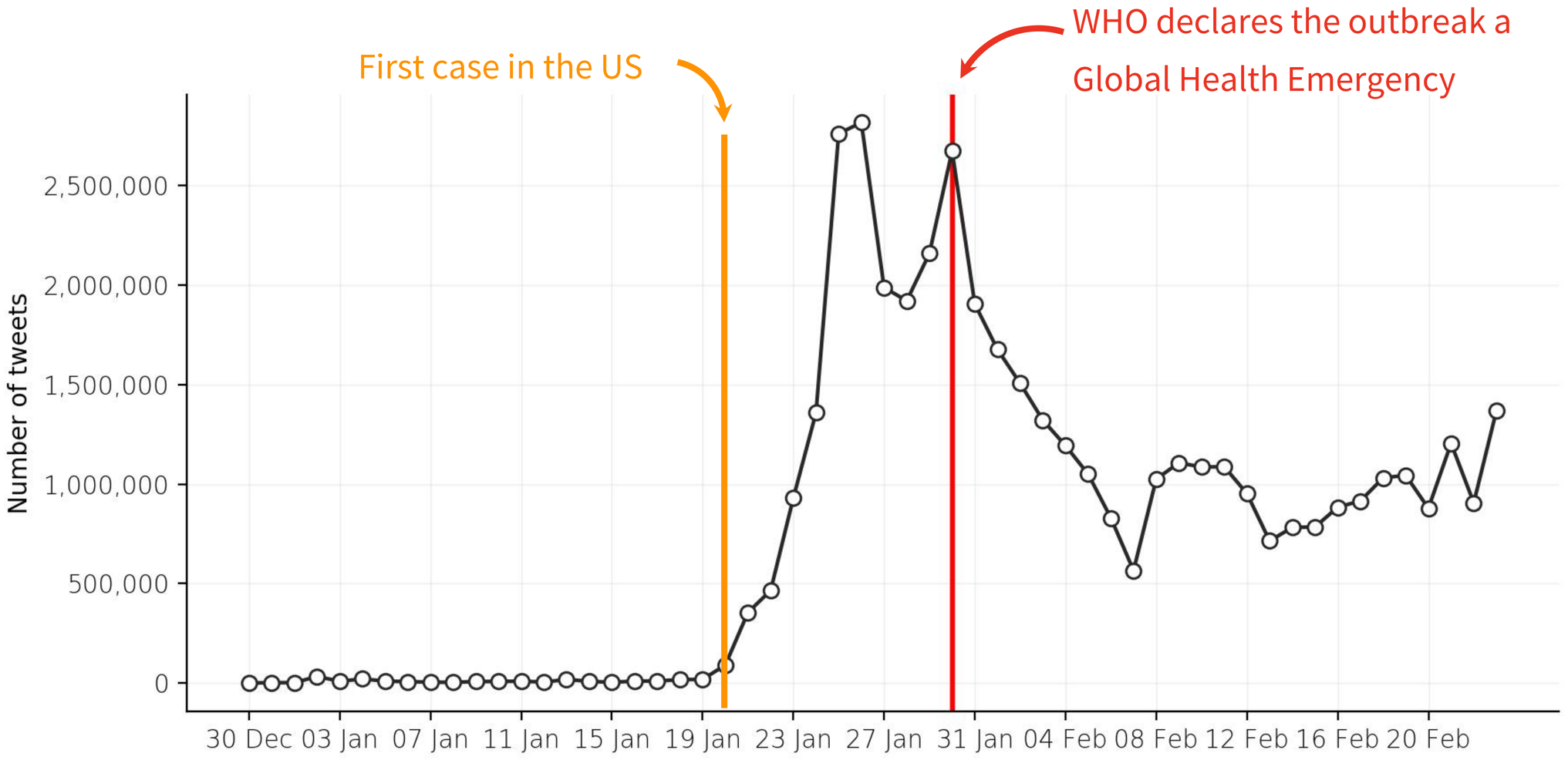
If we compare to number of tweets per capita the picture is a bit different



If we zoom in, we see that Hong Kong is among the places with most tweets per capita



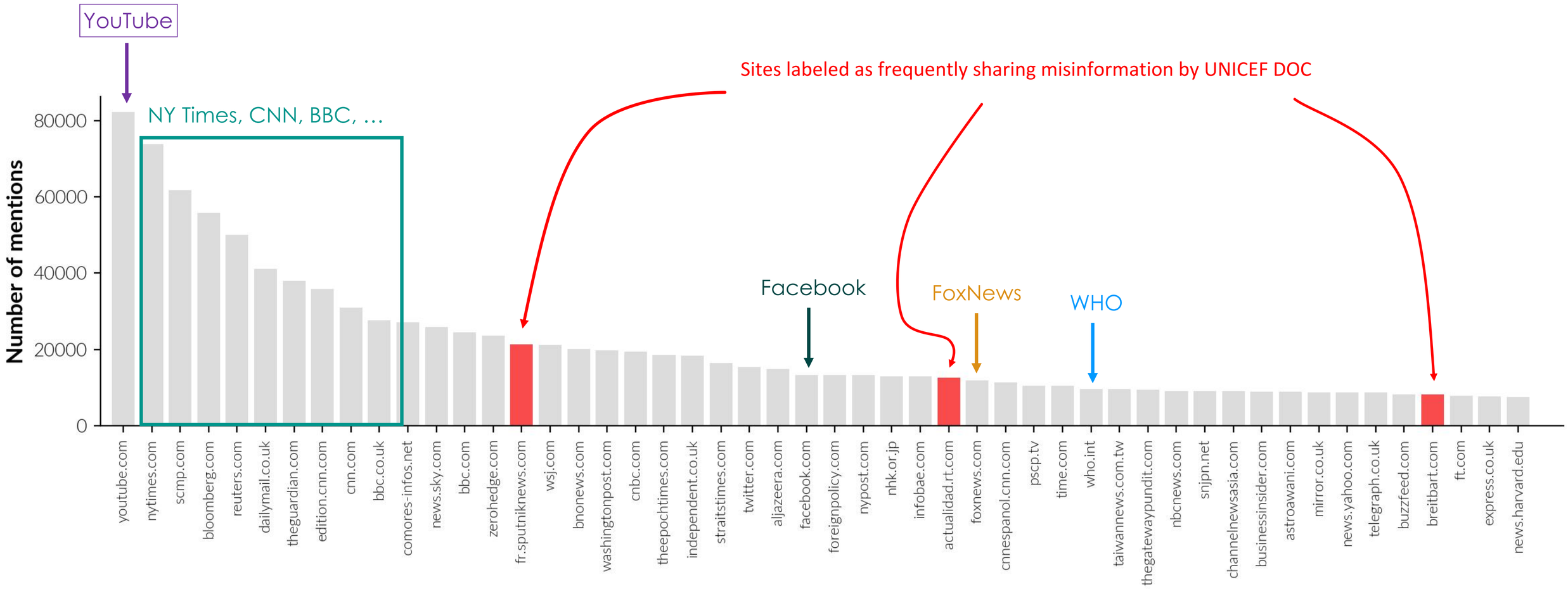
# How much do people tweet about the coronavirus?




Data from Twitter

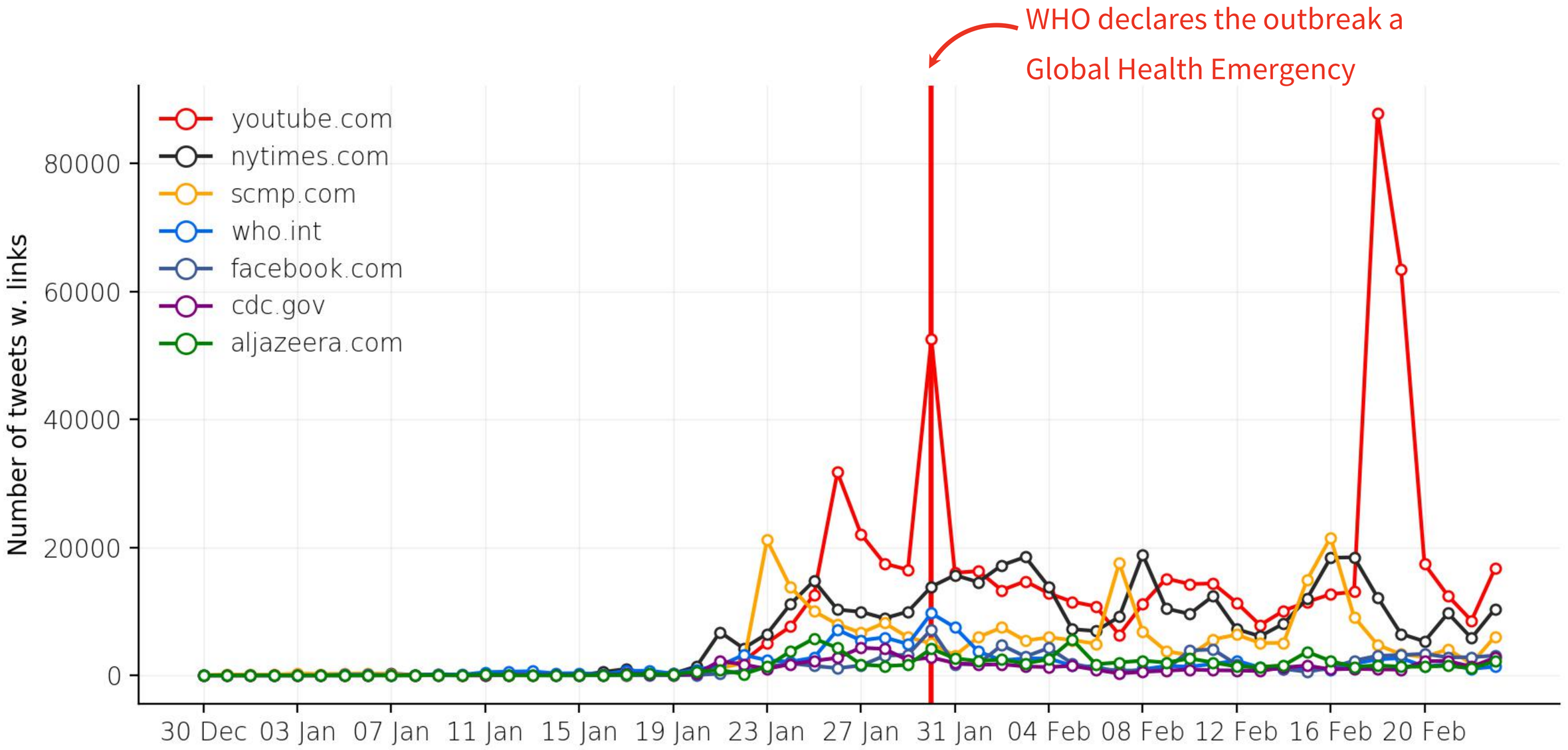
Next update: on hold until UNGP is able to extend agreement limitations on Volume

# Which websites are the most popular




Data from 2020-02-10 to 2020-02-17. **Youtube main source of CoVID related links shared**

# Websites compete for attention

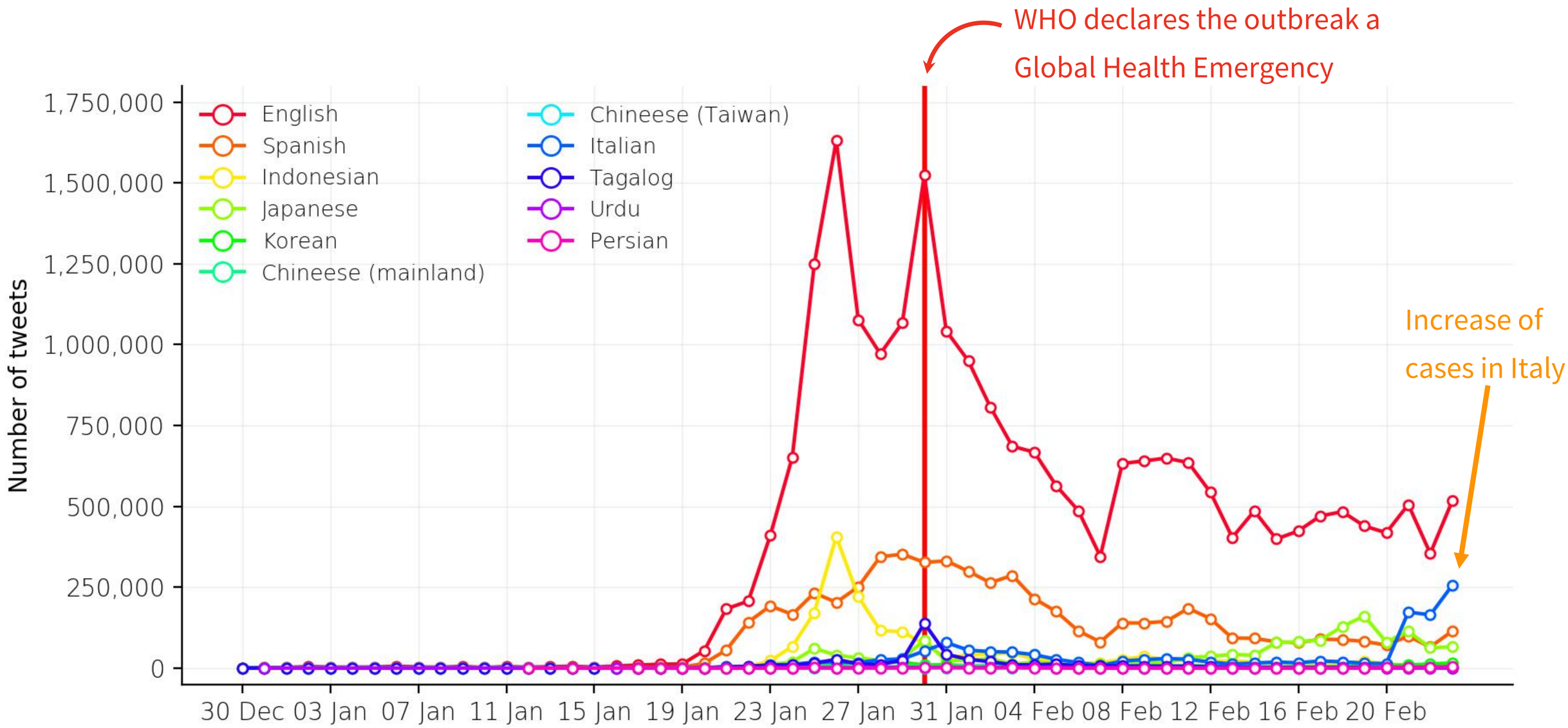


# Websites compete for attention

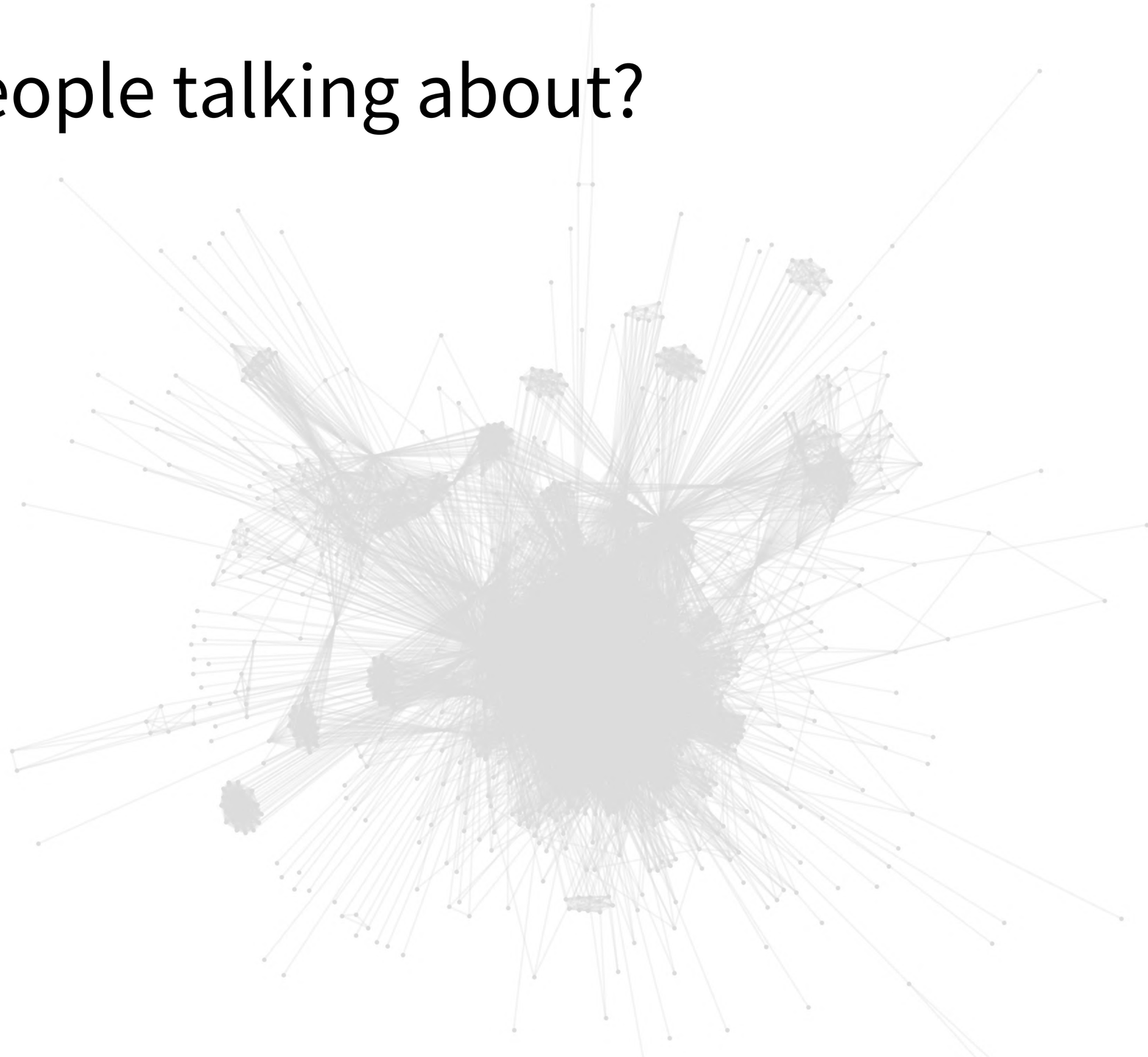


# What languages do people tweet in?

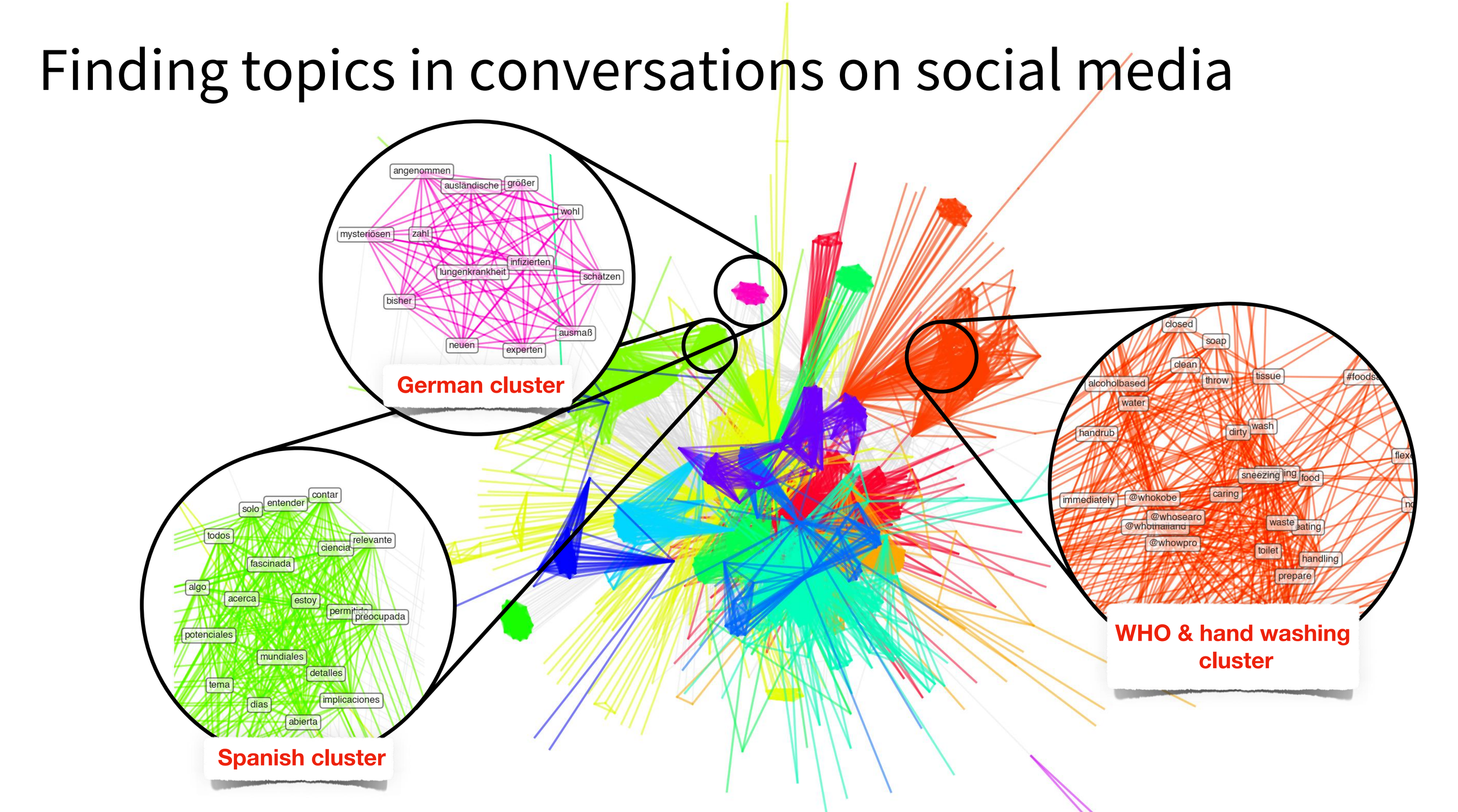
*Caveat: keywords are in english



# What are people talking about?



# Finding topics in conversations on social media



# What do we need

- 3-4 more researchers / data scientists on staff
- 1 Sysadmin/Data engineer to manage data/platform
- A dedicated focal point in PFP for data for emergencies
- A briefing to relevant senior management
- Partnerships with Mobile Network Operators / other corporates, where they provide their data to us (see deck on MNO asks)