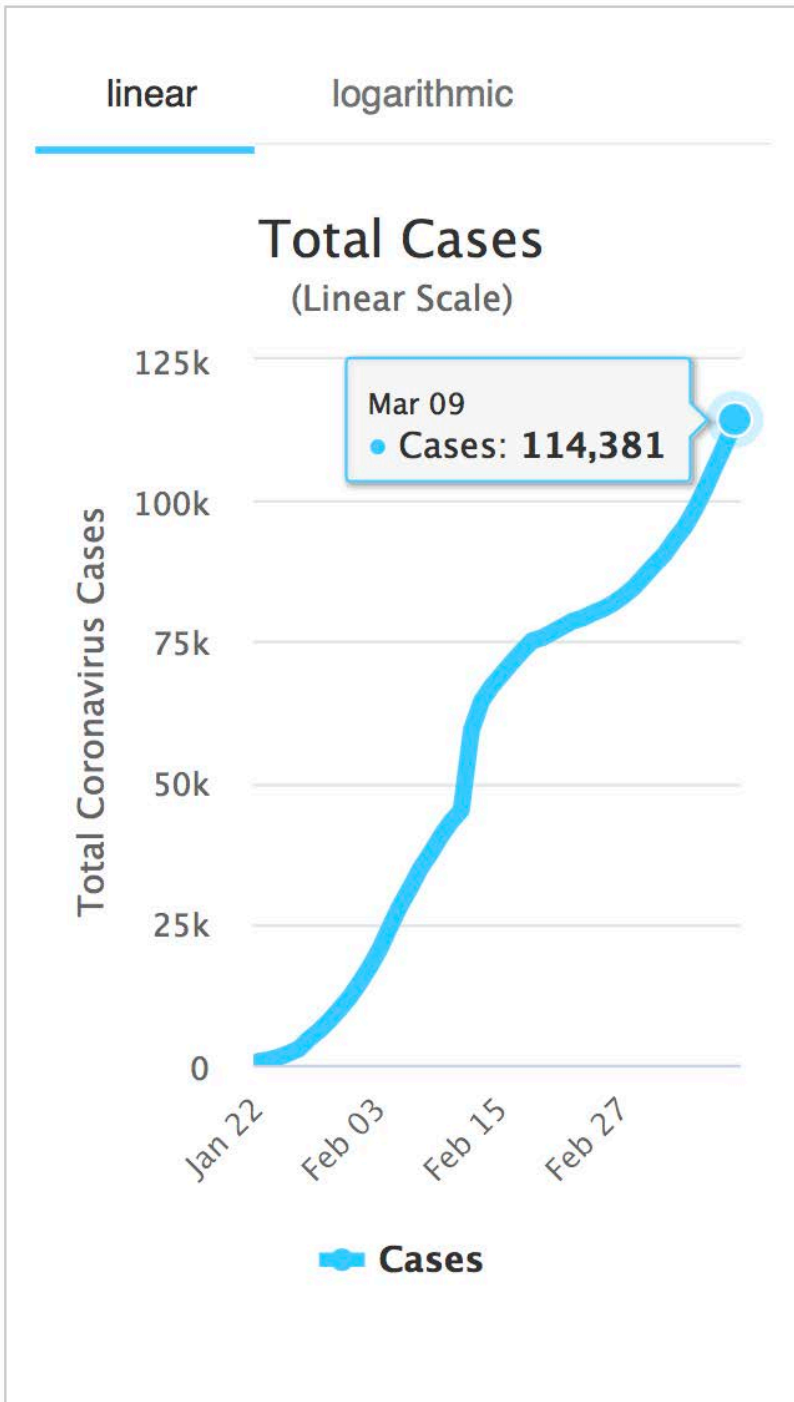


**COVID-19**

**ONE MONTH ON**

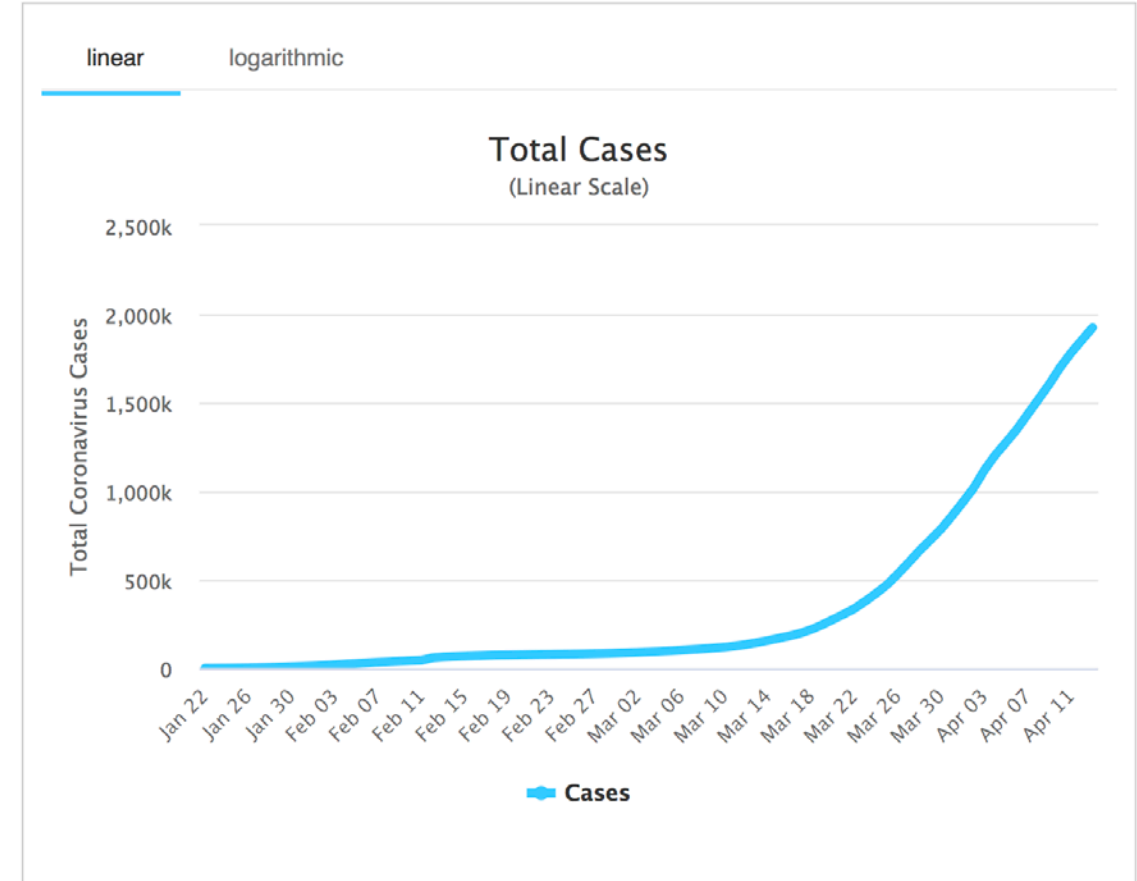
WORLD WIDE COVID-19

# WORLDWIDE CASES



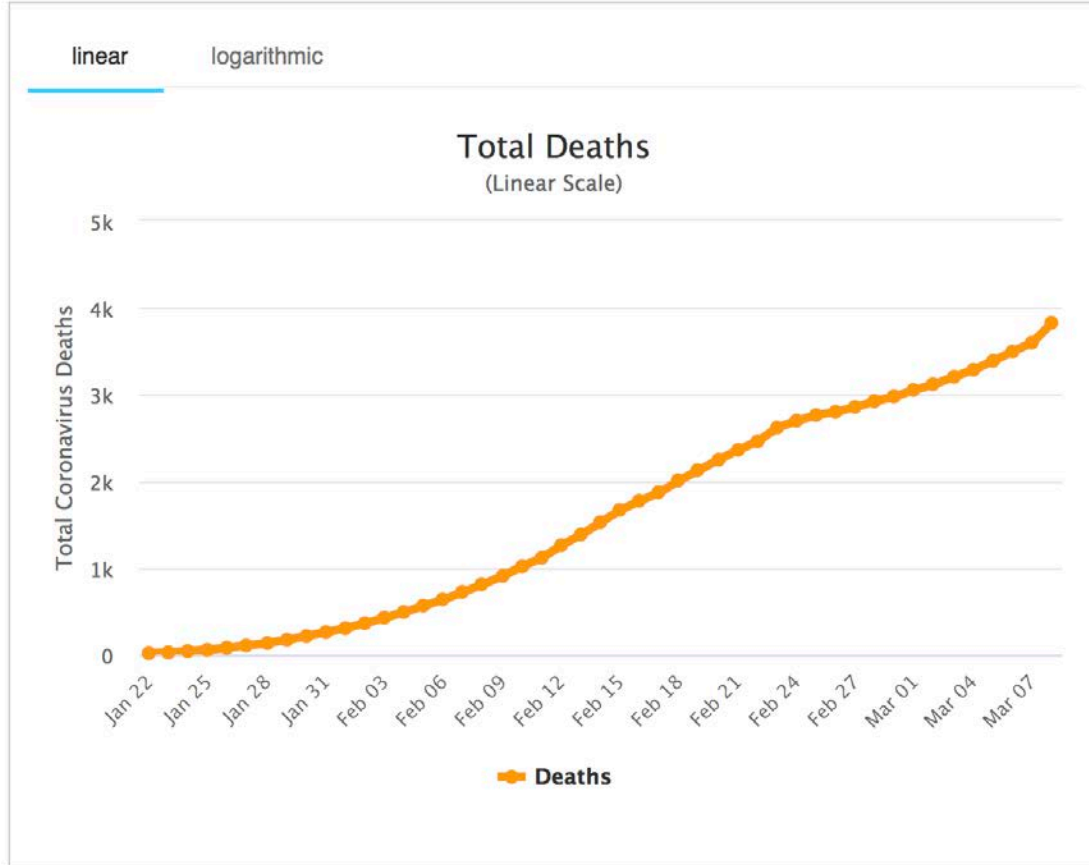
## Total Cases (worldwide)

"Total Cases" = total cumulative count (1,924,679). This figure includes deaths and recovered or discharged patients (cases with an outcome).

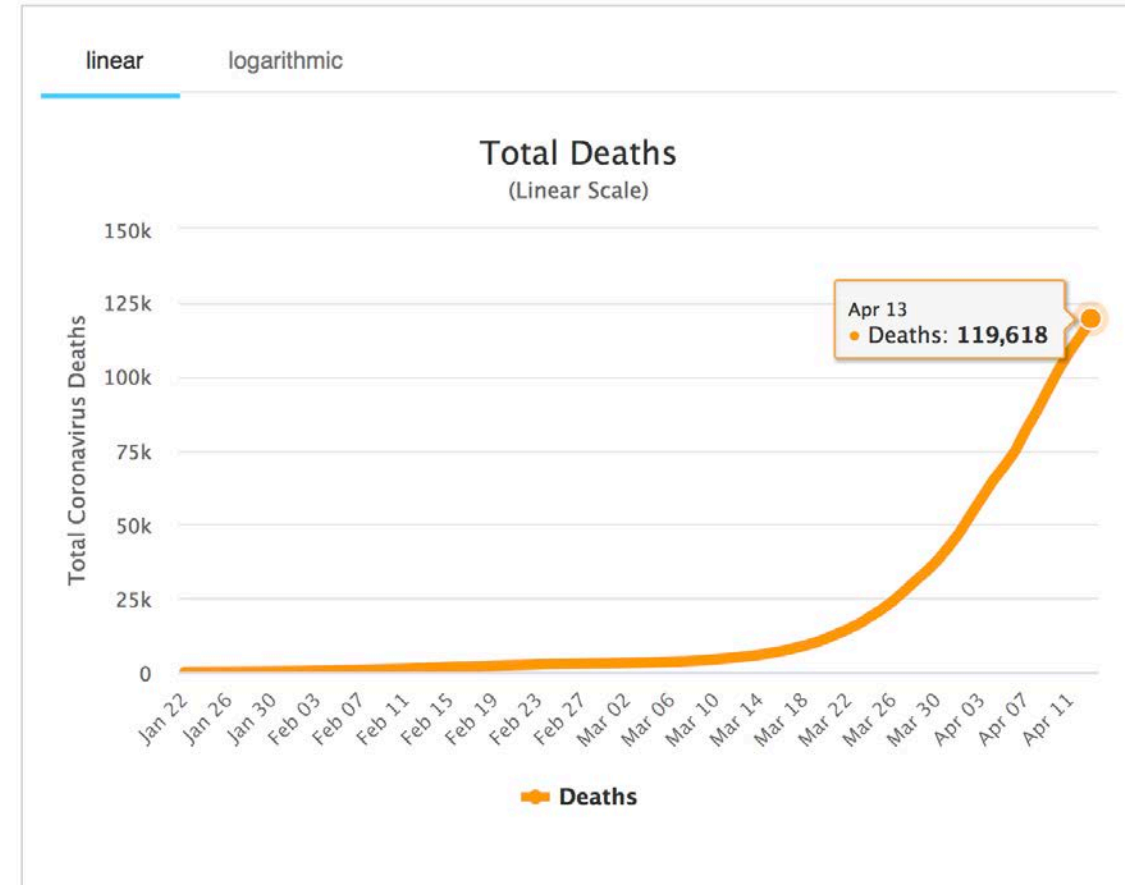


# WORLDWIDE DEATHS

## Total Deaths

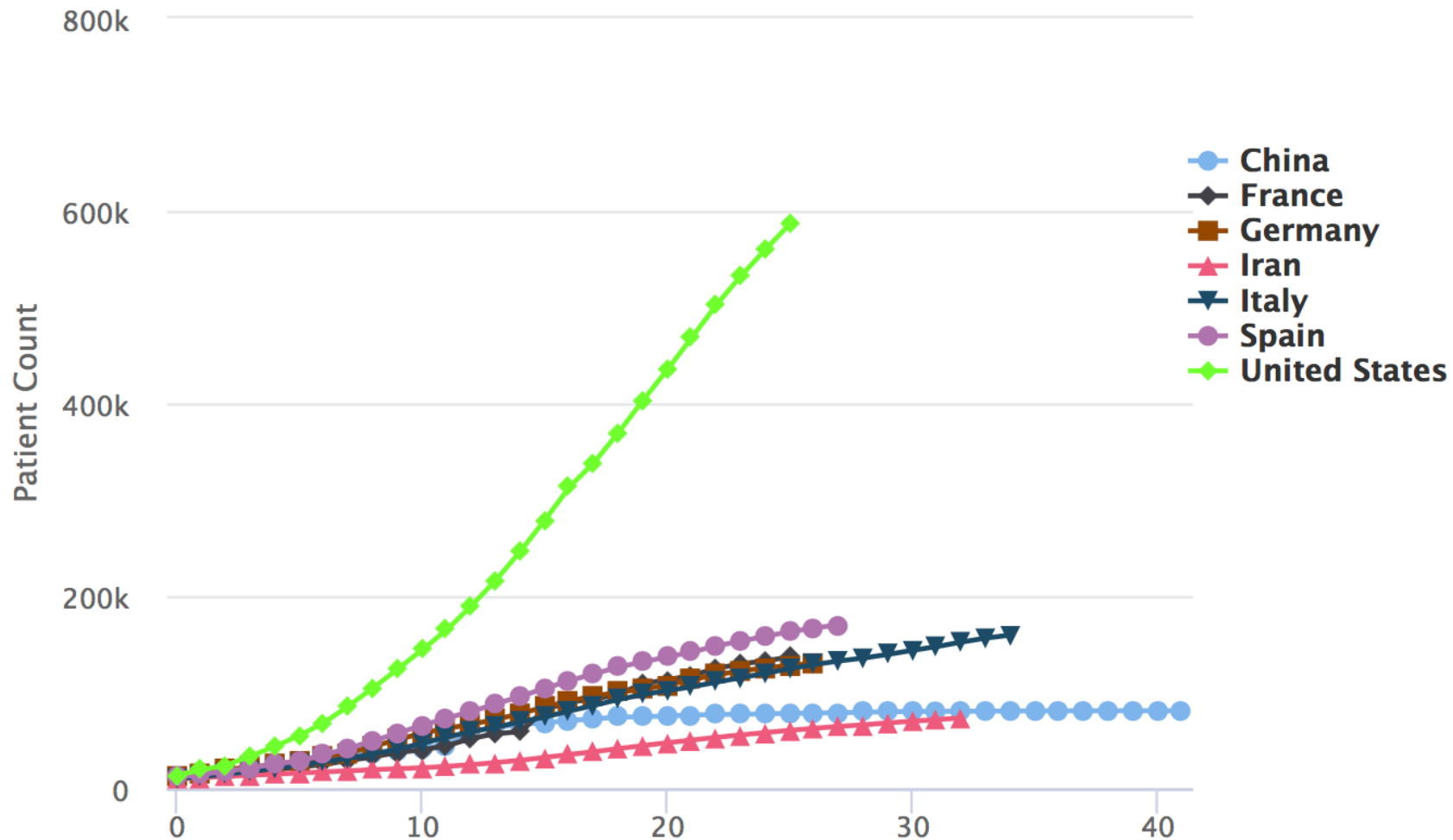


## Total Deaths



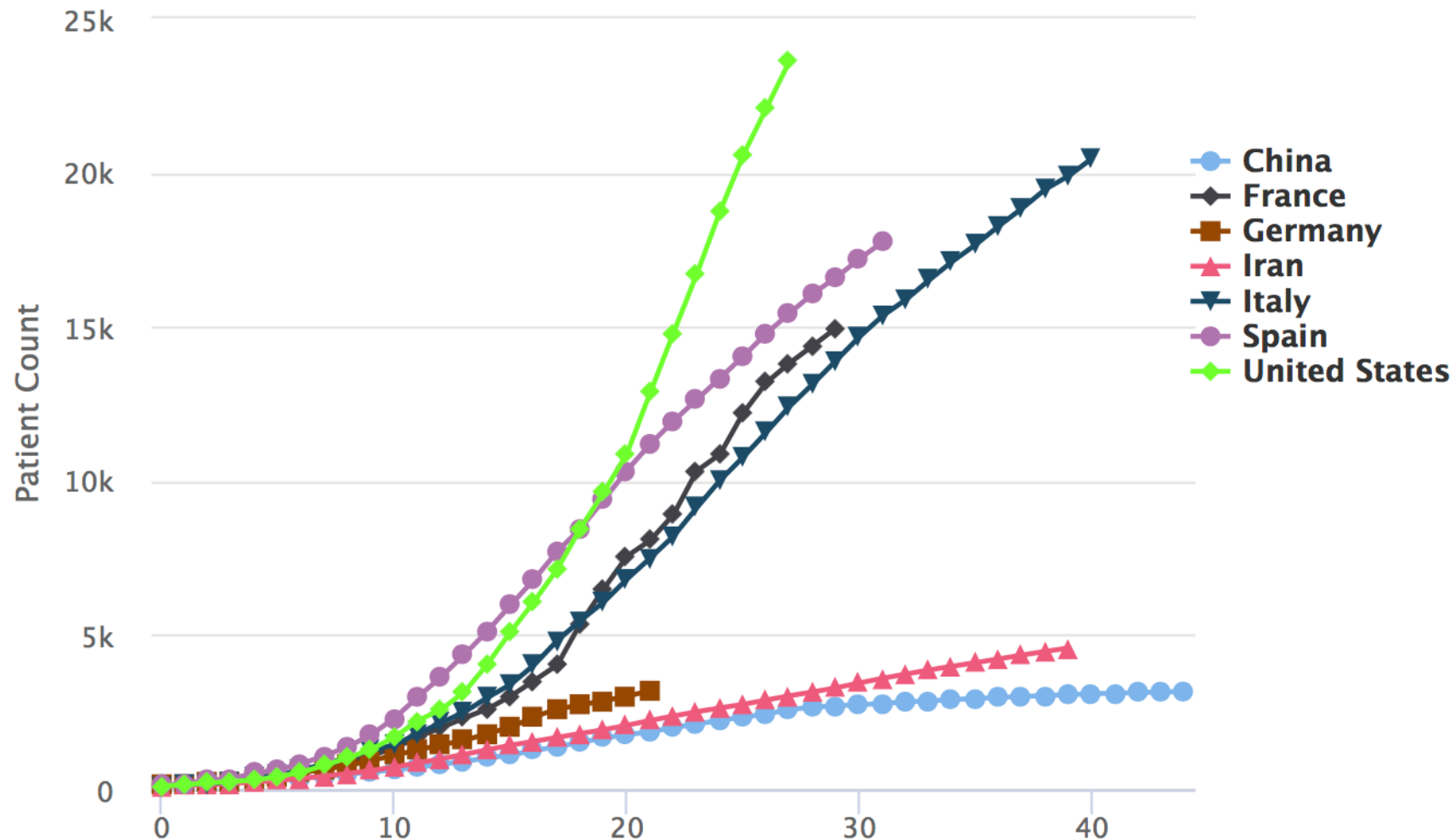
# Cumulative number of cases (by number of days since 10,000 cases)

Cumulative number of cases, by number of days since 10,000 cases



# Cumulative number of deaths (by number of days since 100 deaths)

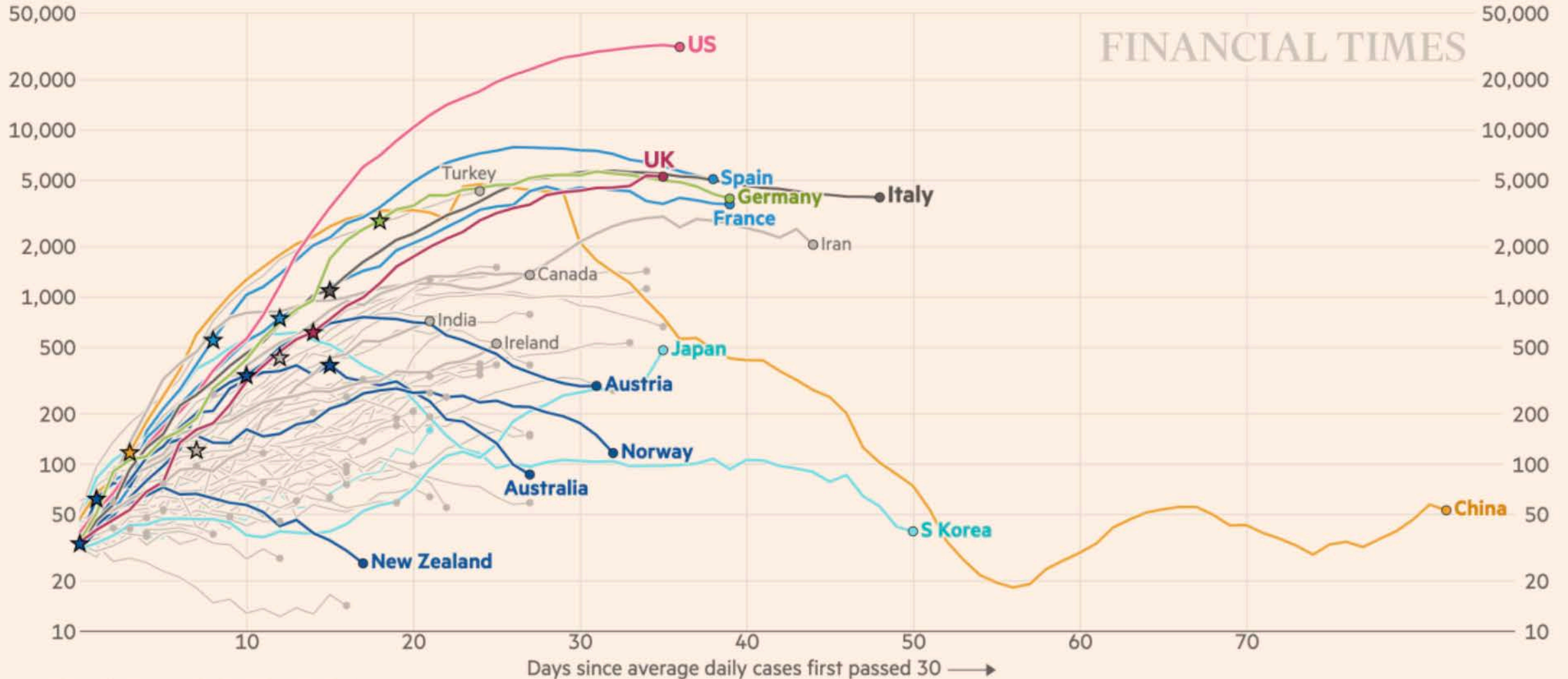
Cumulative number of deaths, by number of days since 100 deaths



## Italy and Spain have turned the corner, with numbers of new cases now in decline, following in China's footsteps

Daily confirmed cases (7-day rolling average), by number of days since 30 daily cases first recorded

Stars represent national lockdowns ★



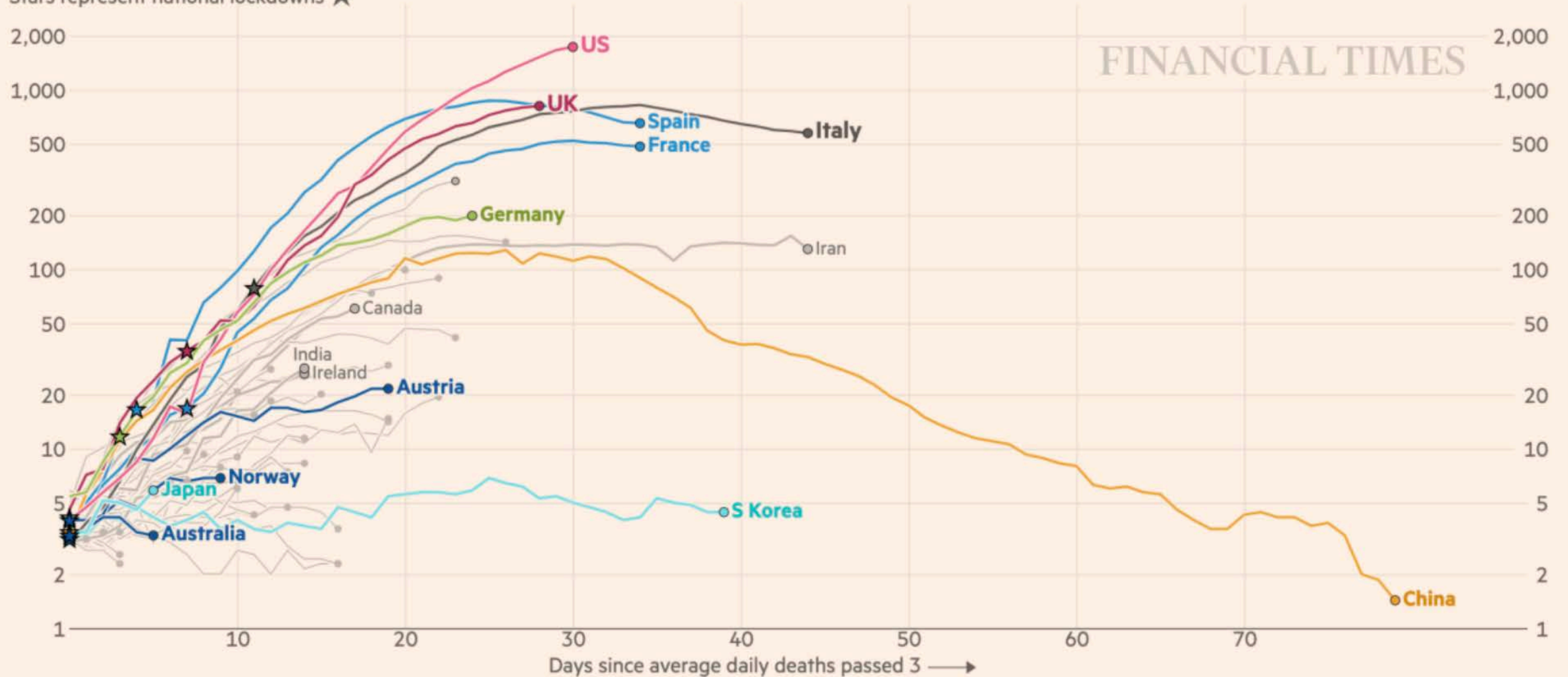
FT graphic: John Burn-Murdoch / @jburnmurdoch

Source: FT analysis of European Centre for Disease Prevention and Control; FT research. Data updated April 12, 19:00 GMT

© FT

# Italy and Spain's daily death tolls are plateauing, but in the UK and US every day generally brings more new deaths than the last

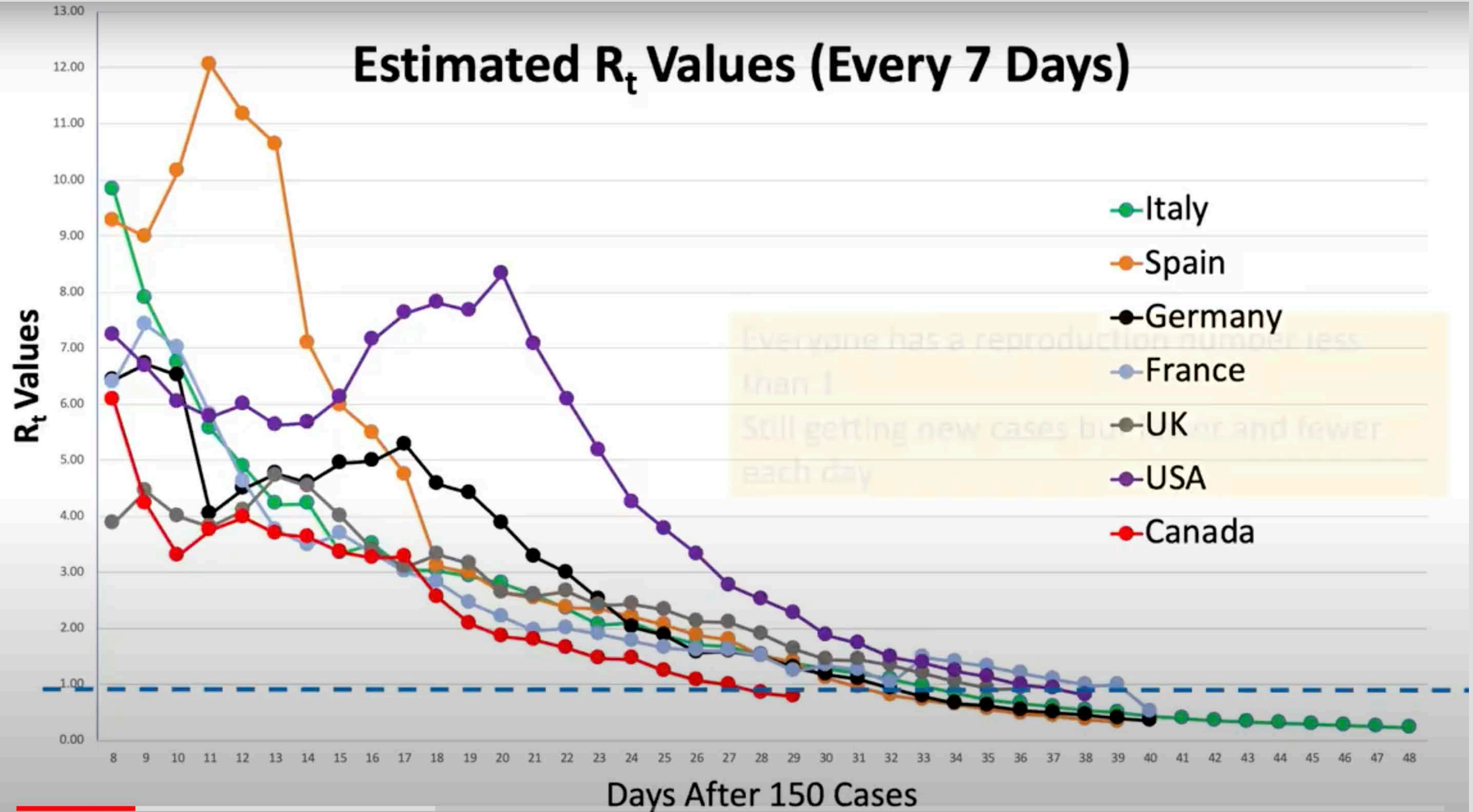
Daily deaths with coronavirus (7-day rolling average), by number of days since 3 daily deaths first recorded  
Stars represent national lockdowns ★



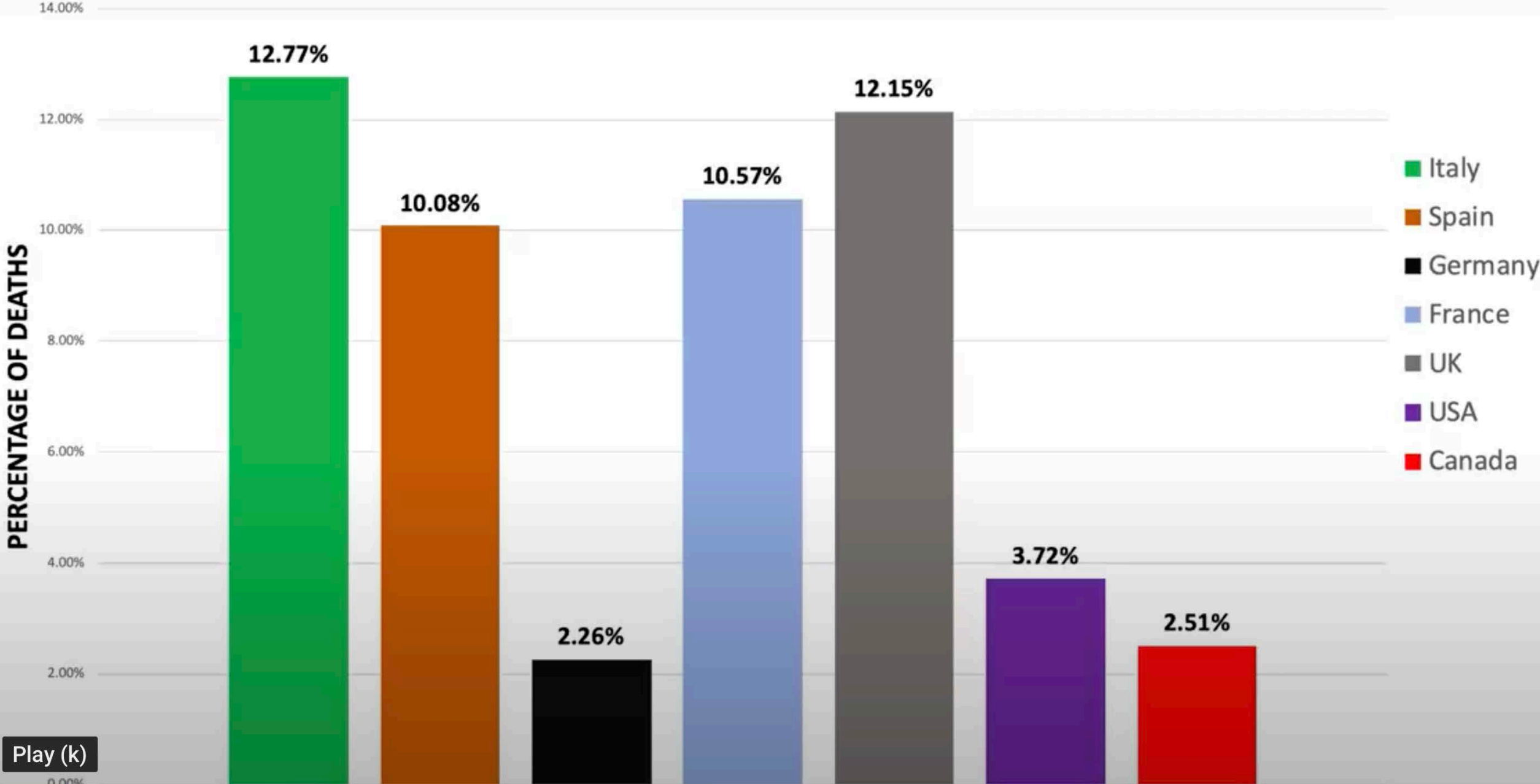
FT graphic: John Burn-Murdoch / @jburnmurdoch  
Source: FT analysis of European Centre for Disease Prevention and Control; FT research. Data updated April 12, 19:00 GMT  
© FT



# Estimated $R_t$ Values (Every 7 Days)



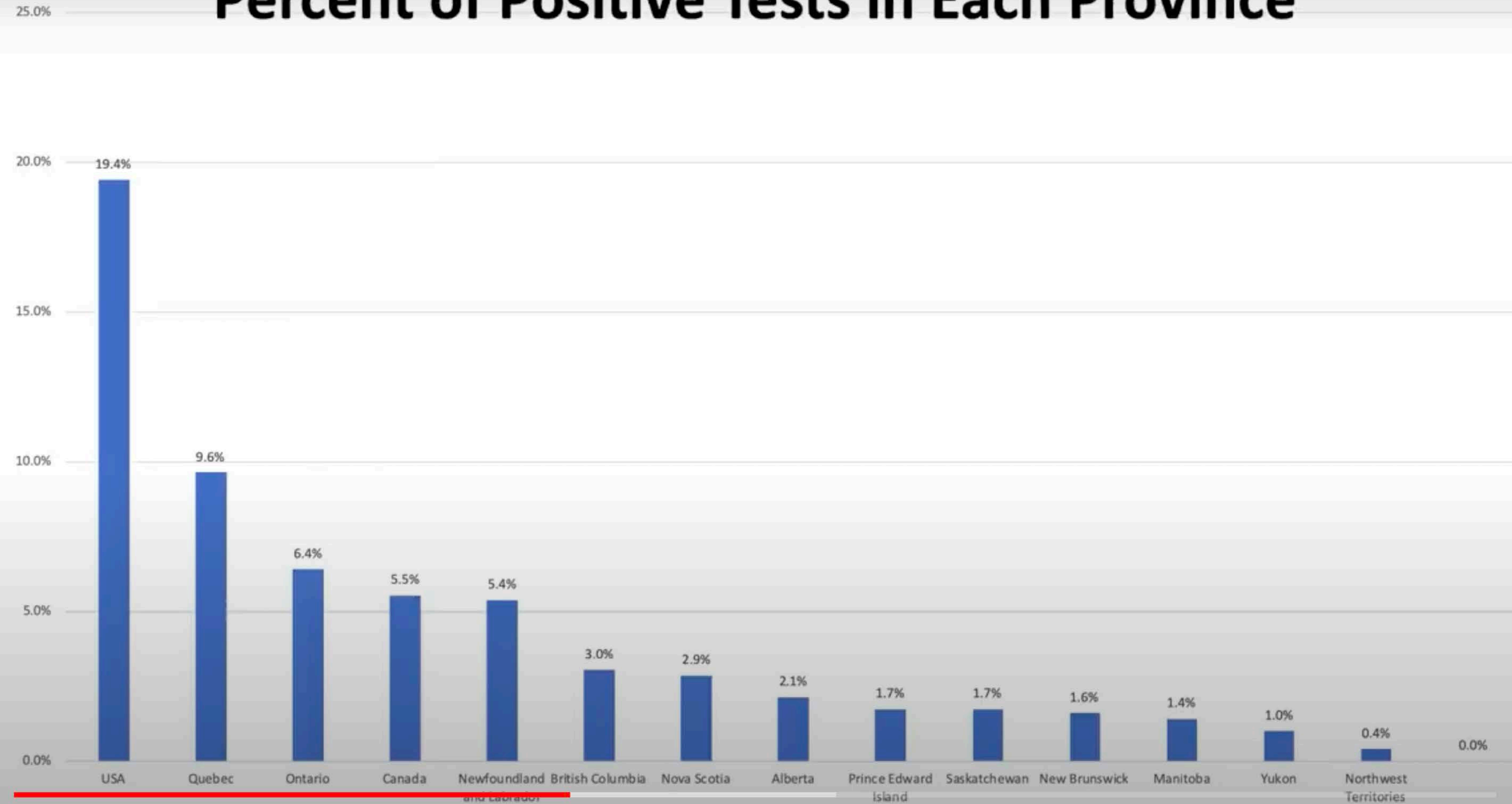
# Percentage of Deaths



Play (k)

0.00%

# Percent of Positive Tests in Each Province



## This is Also Really Important to Understand

- Date of the onset of symptoms (Day 0)
- Date of confirmed diagnosis (7-10 days)
- Date of death (21 days)

Symptoms

Diagnosis

Death

## PLEASE UNDERSTAND THIS

- The only way to understand what is going on is
  - The number of deaths due to COVID-19
  - The number of confirmed cases if you are literally testing everyone
- Since nobody is testing everyone the only way to know what is going on is to look at the number of deaths

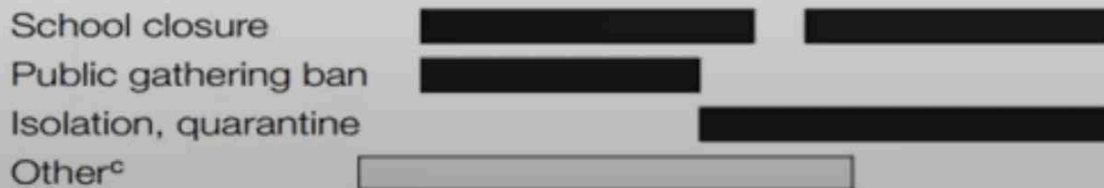
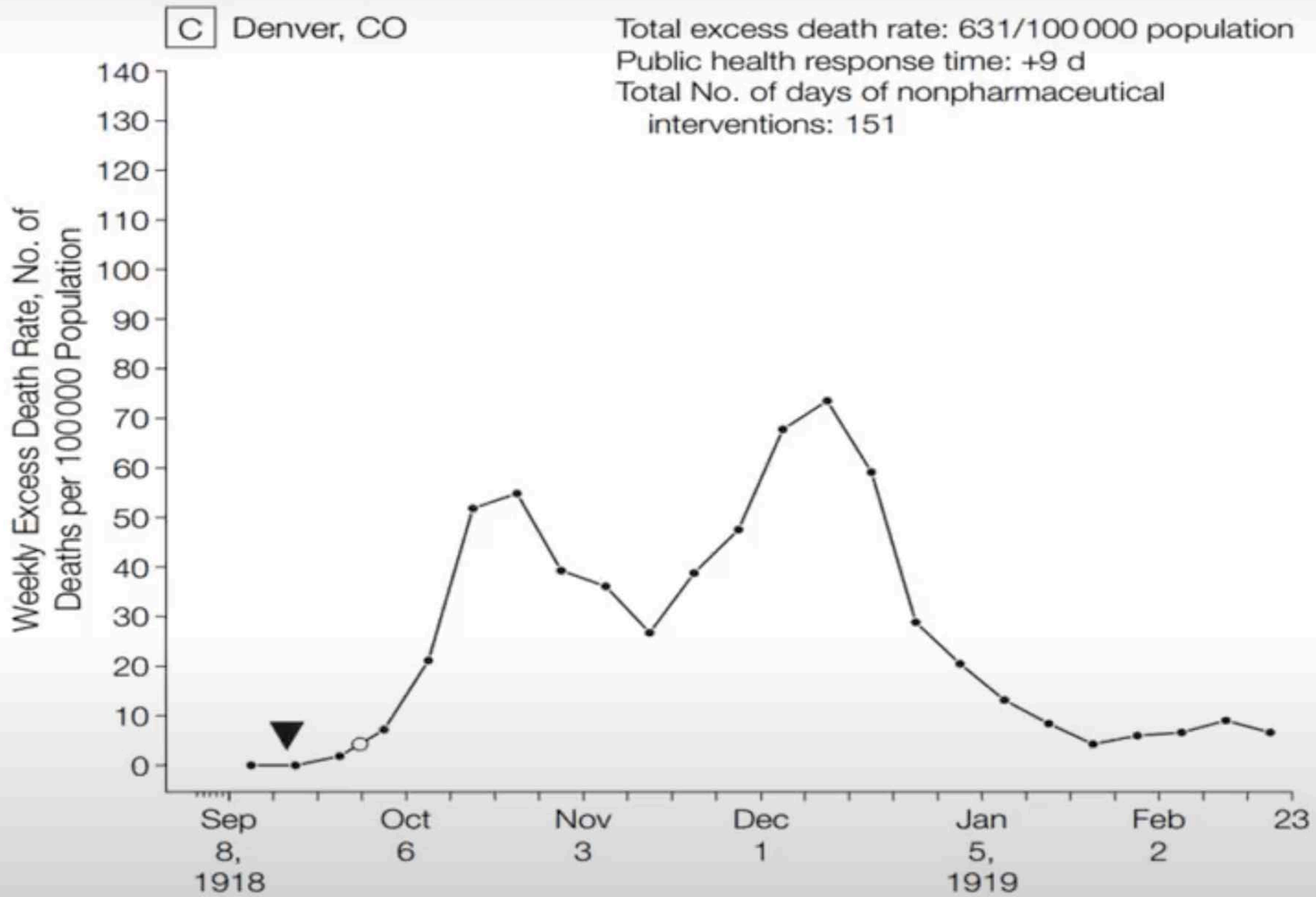
# Daily New Deaths in China

## Daily Deaths

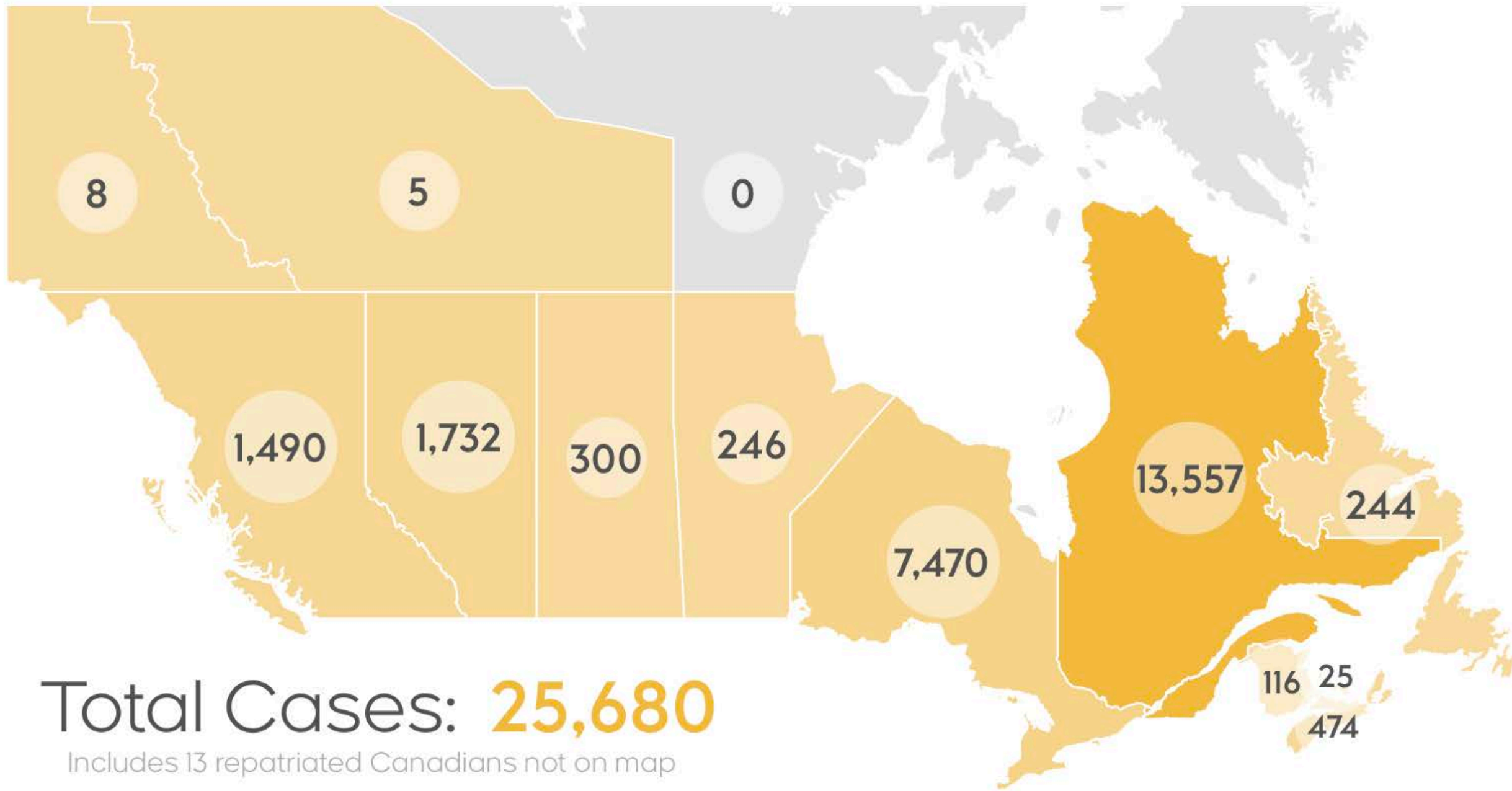
Deaths per Day  
Data as of 0:00 GMT+0



# Chart 20: Excess Death in Denver during the 1918

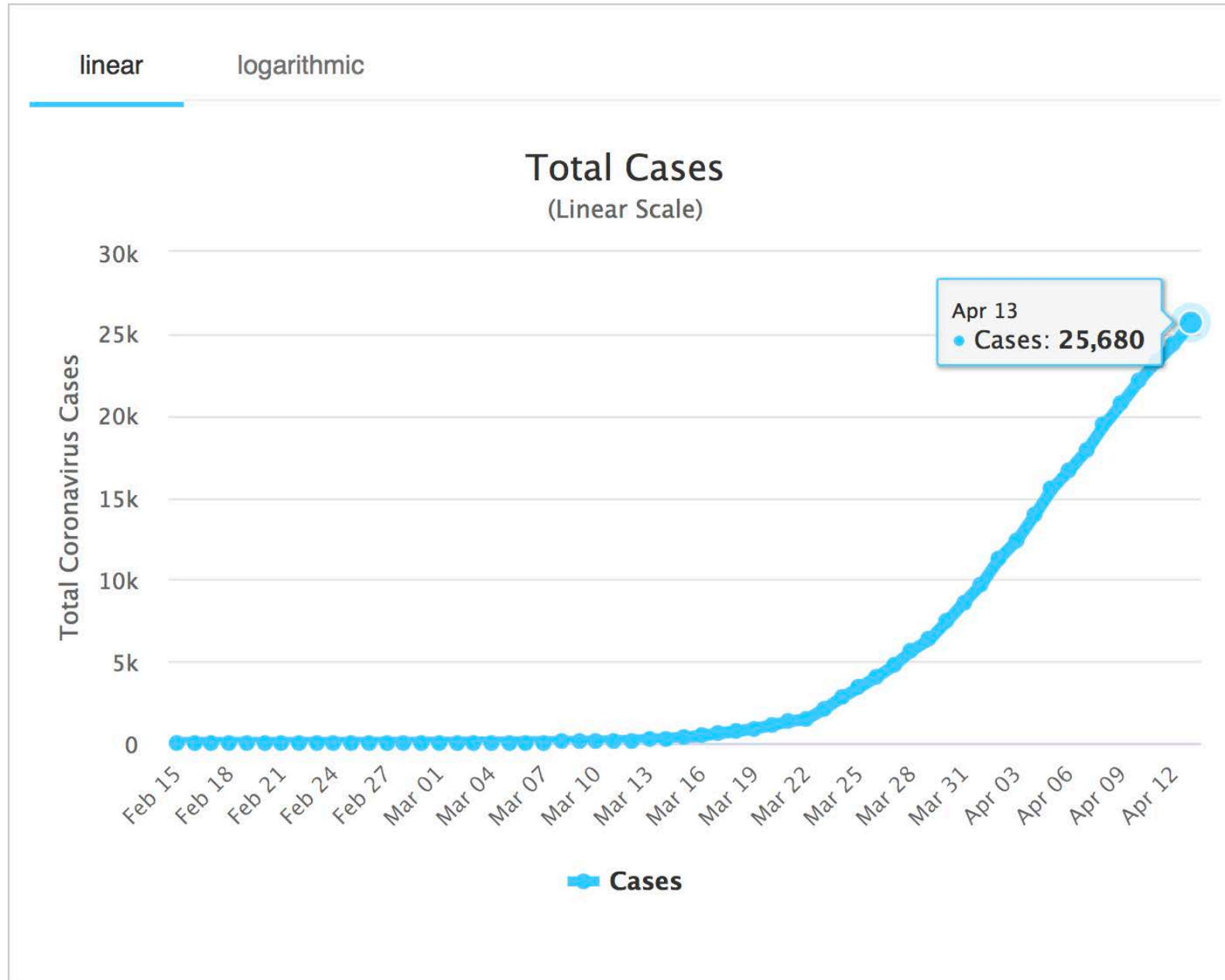


CANADA AND B.C. AND V.I.

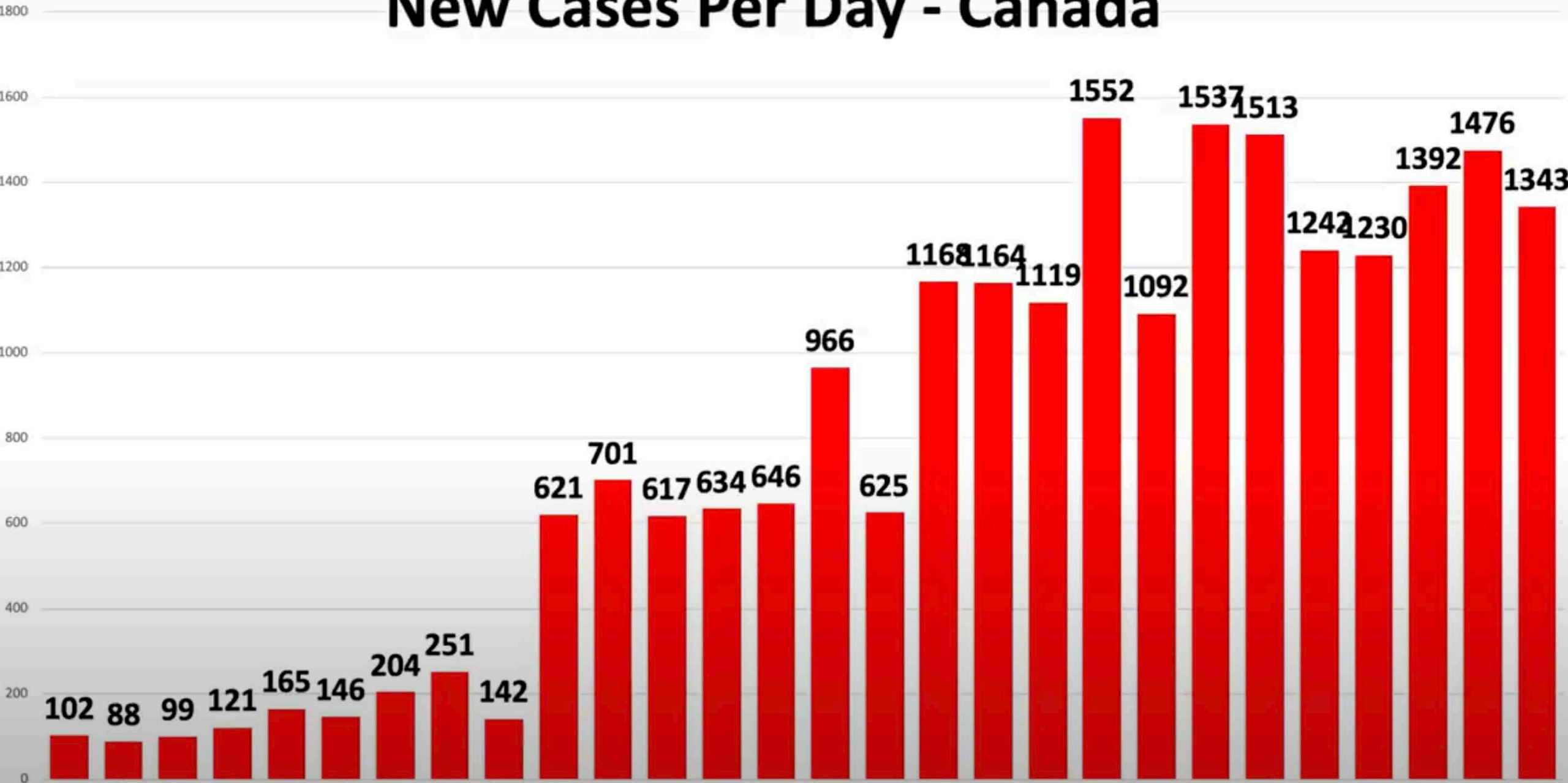




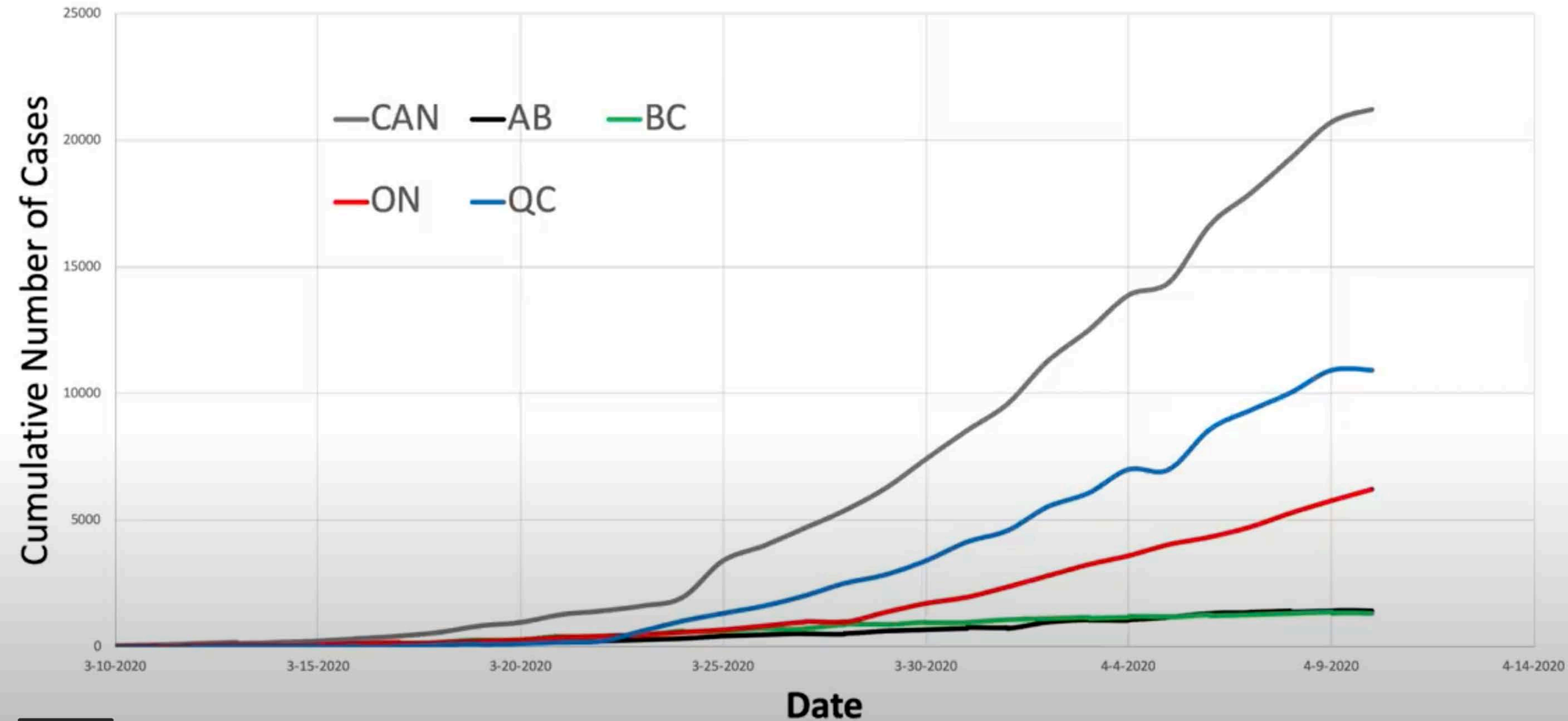
# Total Coronavirus Cases in Canada



# New Cases Per Day - Canada

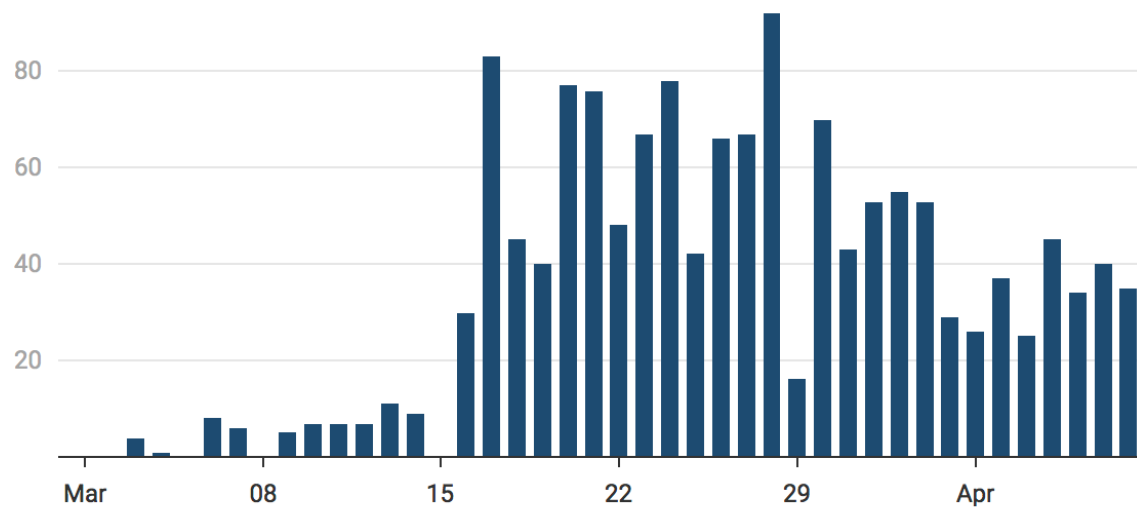


# Provincial Cases of COVID-19



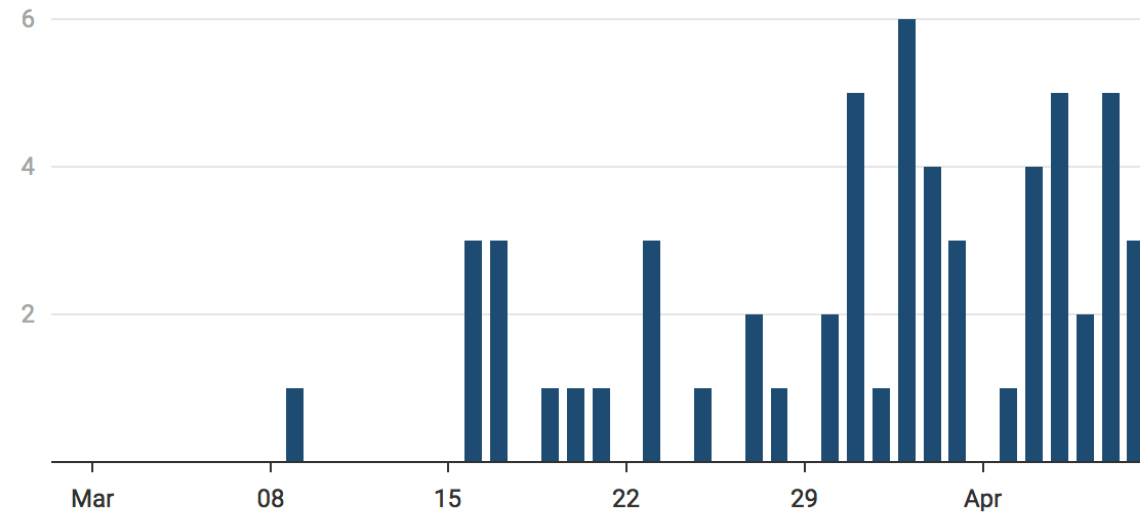
## COVID-19 in British Columbia, March 1 to present

Daily Confirmed Cases



## COVID-19 in British Columbia, March 1 to present

Daily Deaths



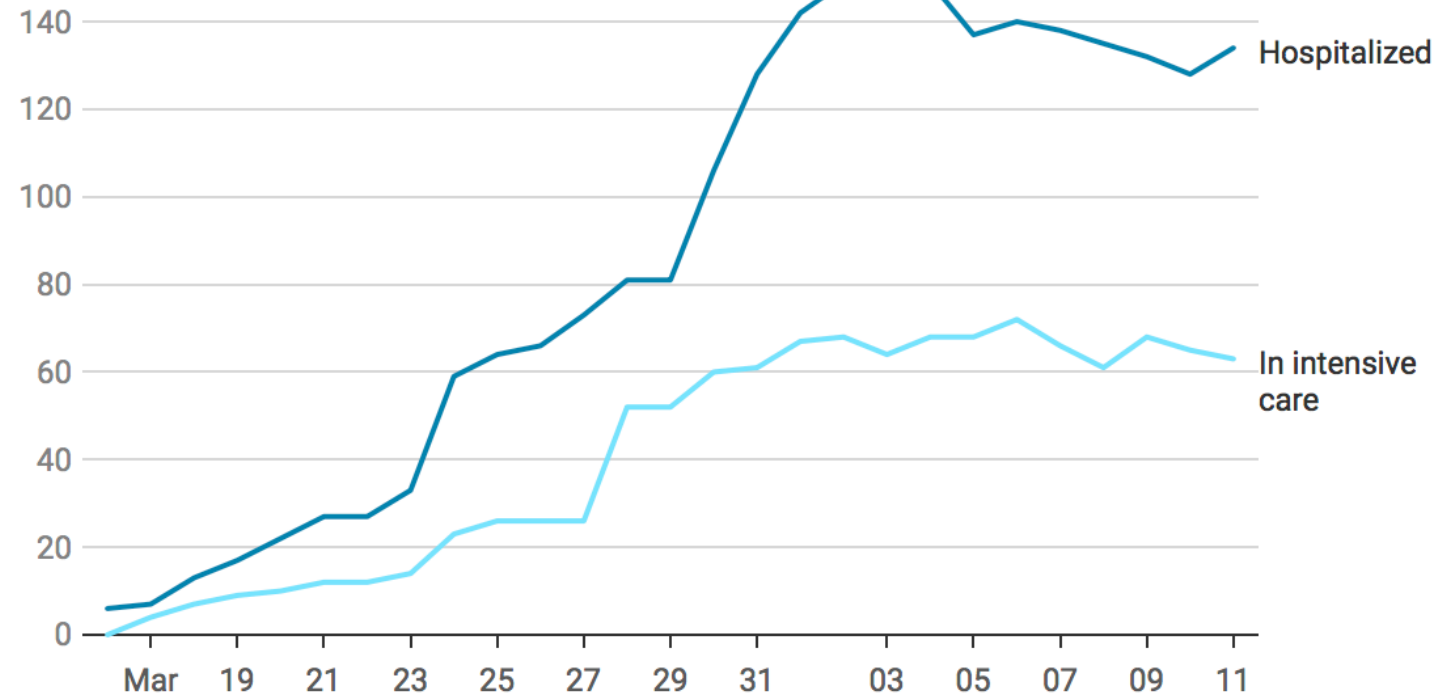
Of the province's total number of cases, 650 are in the Vancouver Coastal Health region, 591 are in the Fraser Health Region, 87 are on Vancouver Island, 136 are in the Interior Health region and 26 are in the Northern Health region.

Health Minister Adrian Dix and provincial health officer Dr. Bonnie Henry's afternoon update covered two days' worth of COVID-19 case numbers as there was no update given Sunday. From Saturday to Sunday, 25 people tested positive, while over the past 24 hours, 20 people tested positive.

That brings the province's total number of cases up to 1,490.

There are 87 confirmed cases of COVID-19 across Island Health – an increase of three cases since Saturday's update. Twelve are being cared for in hospital, with two of those in critical care.

### COVID-19 hospitalizations in B.C.

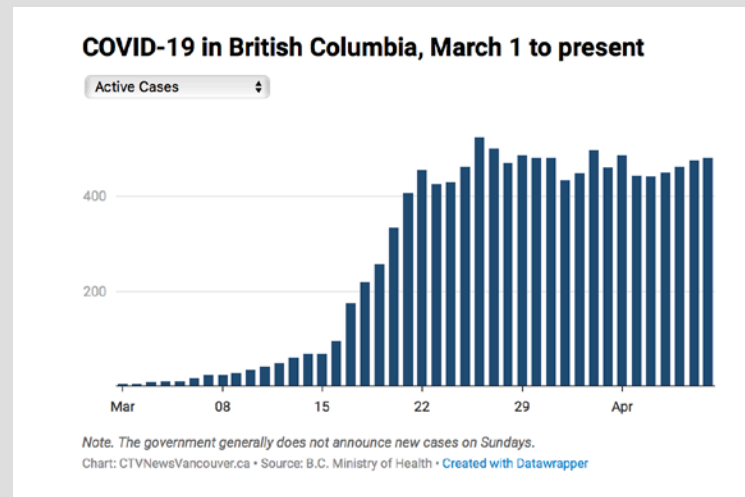
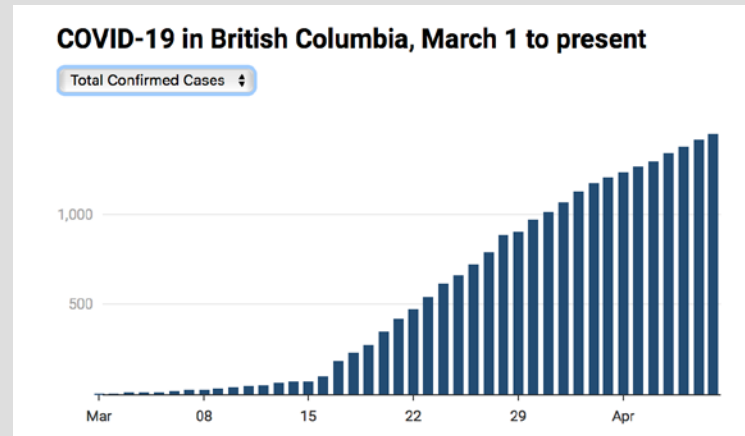


# COVID PREVALENCE ON VANCOUVER ISLAND

- New York
  - Around 10,000 deaths to date – and there may be another 10,000 before the outbreak is controlled.
  - Assuming a 1% death rate (20,000 deaths) then approximately 2 million patients were infected and the population of NY state is 20 million so 10% of people will have had COVID
- Vancouver Island
  - 2 deaths so far – assume 5 deaths during this outbreak
  - Assuming a 1% mortality rate, VI would have had 500 COVID patients.
  - Assuming a population of 850,000, this is a 0.06% of people will have had COVID

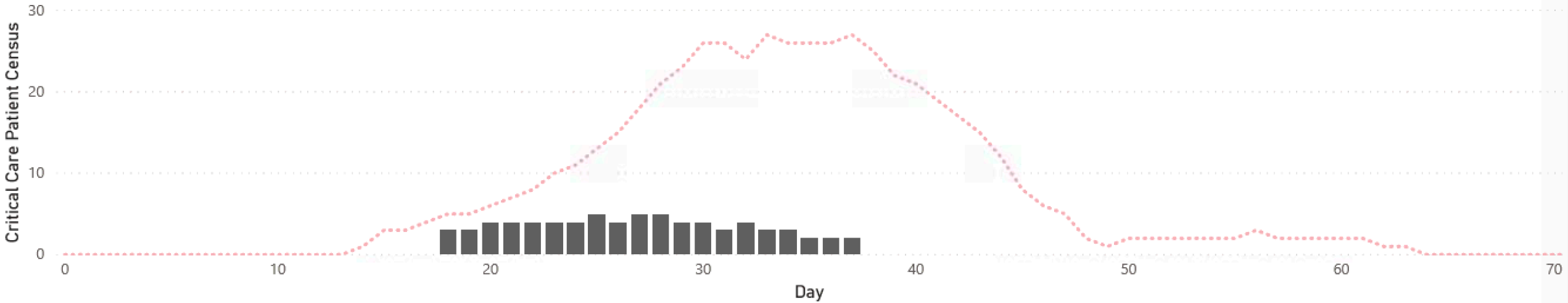
# BRITISH COLUMBIA AND VANCOUVER ISLAND

- Everything points to decreased disease transmission in BC
  - Decreased daily confirmed cases
  - Decreased hospitalizations
  - Decreased ICU admissions
  - Decreased death rate
  - Stable number of active cases
- Everything points to low prevalence on VI
  - Only 2 deaths, reduced ICU numbers, low rate of hospitalization
  - Low positive rate in testing
  - 87 confirmed positive tests on VI would indicate testing has picked up around half to a third of all positive cases.



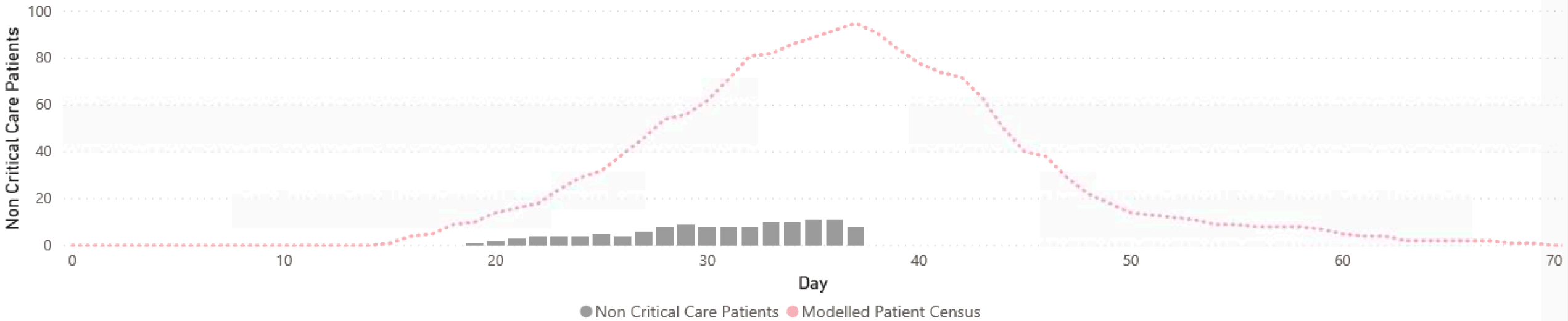
# Provincial COVID19 Monitoring Solution (PCMS)

## Number of COVID19 Patients Hospitalized with Critical Care



**DRAFT**

## Number of COVID19 Patients Hospitalized Non Critical Care



Health Authority Catchment Area

Epidemic Type

Last Data Entry  
4/13/2020 1:21:12 PM

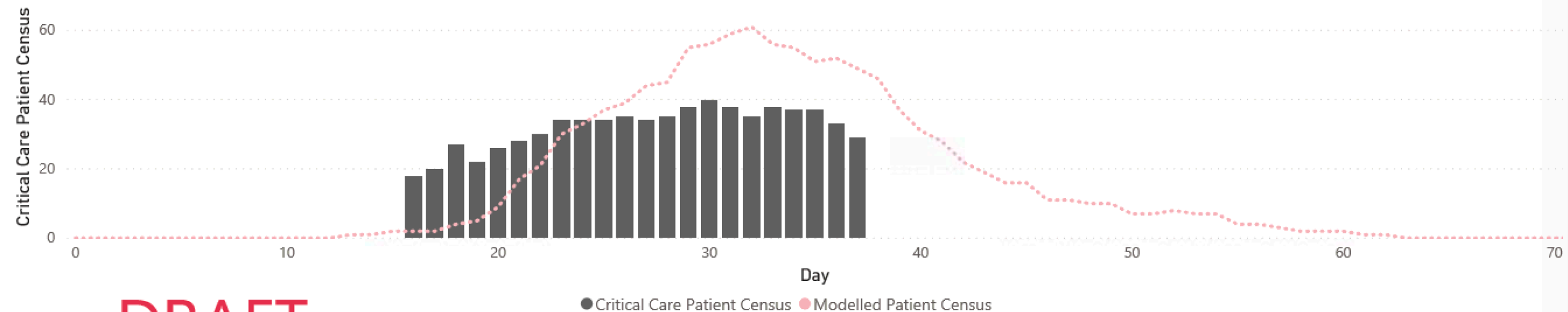
FHA	IHA	NHA	VCH	VIHA	Total
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Hubei	N. Italy
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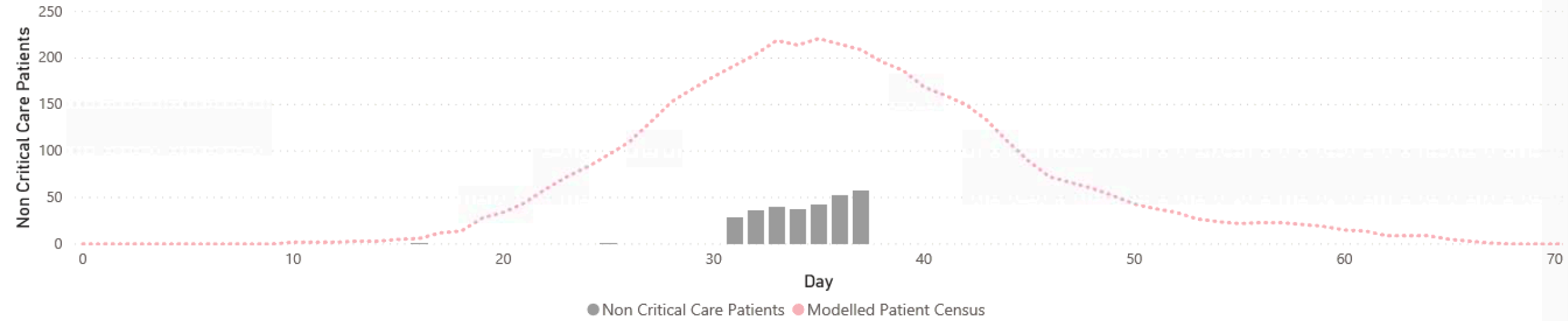
# Provincial COVID19 Monitoring Solution (PCMS)

## Number of COVID19 Patients Hospitalized with Critical Care



# DRAFT

## Number of COVID19 Patients Hospitalized Non Critical Care



Health Authority Catchment Area

- FHA
- IHA
- NHA
- VCH
- VIHA
- Total

Epidemic Type

- Hubei
- N. Italy

THREAT TO HCWS

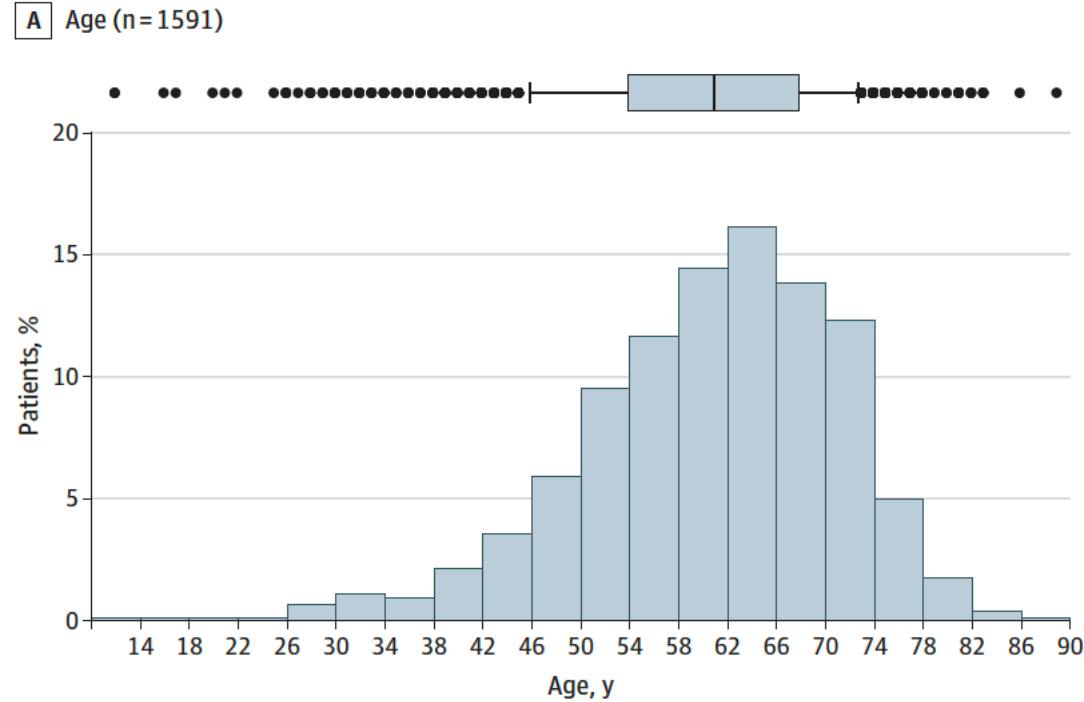
# COVID-19 AND HCWS

- As of 8 April, 22073 HCWs from 52 countries had been reported to WHO as having COVID.
- A publication from China CDC on 44 672 confirmed cases as of 17 February 2020 indicated 1688 (3.8%) infections were among HCWs, including five deaths.
- In Italy, a situation report from 10 April 2020 reported 15 314 infections among HCW, representing 11% of all infections
- While many infections are indicated as mild, severe outcomes, including deaths, among HCWs have also been reported
- Results suggest HCWs are being infected both in the workplace and in the community, most often through infected
- In healthcare settings, factors associated with HCW infection have included:
  - late recognition or suspicion of COVID-19 in patients
  - working in a higher-risk department – ER. Longer duty hours
  - sub-optimal adherence to IPC measures such as hand hygiene practices, and lack of or improper use of PPE
  - Inadequate or insufficient IPC training for respiratory pathogens, including the COVID-19 virus
  - long exposure in areas in healthcare facilities where large numbers of COVID- 19 patients were being cared for.

# COVID-19 AND PHYSICIAN DEATHS

- Review: 198 physician deaths from COVID-19.
- Age: The average age of the physicians that died was 63.4 years (range 28 to 90 years) and the median age was 66 years of age.
- Sex: Ninety percent of the deceased physicians were male (175/194).
- Specialty
  - General practitioners and emergency room doctors (78/192)
  - Respiriologists (5/192)
  - internal medicine specialists (11/192)
  - Anesthesiologists (6/192)
  - 4% were ENT (8/192) and 4% were ophthalmologists (7/192).
  - The countries with the most reported physician deaths were Italy (79/198), Iran (43/198), China (16/198), Philippines (14/198), United States (9/192) and Indonesia (7/192).
- Lack of PPE was cited as a factor in many deaths.

# AGE AND ICU - ITALY



**Table 2. Patient Disposition From COVID-Only Intensive Care Units (ICUs), Total and Stratified by History of Hypertension**

	Patients by age, y, No. (%)								
	All (N = 1591)	0-20 (n = 4)	21-40 (n = 56)	41-50 (n = 143)	51-60 (n = 427)	61-70 (n = 598)	71-80 (n = 341)	81-90 (n = 21)	91-100 (n = 1)
<b>Overall</b>									
Outcome, No. with data	1581	2	56	142	423	596	340	21	1
Died in ICU	405 (26)	0	4 (7)	16 (11)	63 (15)	174 (29)	136 (40)	11 (52)	1 (100)
Discharged from ICU	256 (16)	0	20 (36)	35 (25)	90 (21)	69 (12)	40 (12)	2 (10)	0
Still in ICU as of 3/25/2020 <sup>a</sup>	920 (58)	2 (100)	32 (57)	91 (64)	270 (64)	353 (59)	164 (48)	8 (38)	0

# PRE-SYMPTOMATIC TRANSMISSION

- **Symptomatic transmission WHO**

- Data from published epidemiology and virologic studies provide evidence that COVID -19 is primarily transmitted from symptomatic people to others who are in close contact through respiratory droplets, by direct contact with infected persons, or by contact with contaminated objects and surfaces.
- Shedding of the COVID-19 virus is highest in upper respiratory tract (nose and throat) early in the course of the disease. Preliminary data suggests that people may be more contagious around the time of symptom onset as compared to later on in the disease.

- **Pre-symptomatic transmission WHO**

- The incubation period for COVID-19, which is the time between exposure to the virus (becoming infected) and symptom onset, is on average 5-6 days, however can be up to 14 days. During this period, also known as the “pre- symptomatic” period, some infected persons can be contagious. Therefore, transmission from a pre -symptomatic case can occur before symptom onset.
- Data suggesting that some people can test positive for COVID-19 from 1-3 days before they develop symptoms.

# ASYMPTOMATIC TRANSMISSION

- **Pre-symptomatic transmission**
  - Investigation of all 243 cases of COVID-19 reported in Singapore during January 23–March 16 identified seven clusters of cases in which pre-symptomatic transmission is the most likely explanation for the occurrence of secondary cases.
- **Asymptomatic transmission WHO**
  - There are few reports of laboratory-confirmed cases who are truly asymptomatic, and to date, there has been no documented asymptomatic transmission. This does not exclude the possibility that it may occur.
  - Asymptomatic cases have been reported as part of contact tracing efforts in some countries.
- **Asymptomatic transmission – other reports**
  - The [CDC also evaluated](#) coronavirus patients on the Diamond Princess cruise ship, which was quarantined in Japan in February. Of the 3,711 people onboard, 712 tested positive, but almost 50 percent of them had no symptoms at the time.
  - Recent BMJ letter reported that 80% of swab test positive patients entering China had no symptoms.
  - Difficult to know in the many reports how much is pre-symptomatic vs asymptomatic.
  - Some investigators think that the majority of infections are totally asymptomatic.

# COVID-19 AND AEROSOLS

- The standard care of COVID-19 patients is in Droplet and Contact Precautions.
- Droplets are large particles that may contain virus and fall to the ground.
- It is known that virus can survive for hours to days on surfaces but the viral load degrades exponentially over this time.
- Aerosols are small particles (< 5 or < 2 microns) and are produced when air passes over water. Some are just very small droplets that are suspended in air and others can start as small droplets and the water evaporates before the droplet hits the floor releasing the virus which can float around in the air for some time.
- Some procedures are labelled Aerosol Generating Medical Procedures (AGMPs) which can produce aerosols and HCWs must have a N95 mask because it is thought that the virus could be inspired from the air and infect the HCW.
- There are many investigators and clinicians who think COVID-19 can be spread by aerosols from coughing, sneezing, and just talking.
- Virus particles can be found in the air of patient rooms and on surfaces such as in air ducts indicating that the virus can travel in aerosols



# COVID-19 AND AEROSOLS

- The problem is that there is no clear information about;
  - Are the aerosolized virus particles alive and infective.
  - Is the concentration enough to transmit the disease.
  - Which AGMPs really cause a significant amount of aerosols.
  - Does aerosol transmission occur without a AGMP and is COVID transmitted normally by aerosols?
- Some organizations state that aerosol transmission does not occur in COVID-19 while others say it does.

# COVID-19 AND AEROSOLS

**Aerosols, Droplets, and Airborne Spread:  
Everything you could possibly want to know**



- **At this point, I think the only safe conclusion is that airborne transmission is possible. However, that doesn't make it likely.**
- Because of their larger size, large droplets contain as much as 99.9% of viral particles exhaled. Although aerosols may carry small amounts of virus, they become very diffuse the further you are from the patient and are effectively managed by modern ventilation systems.
- I don't think we should be making black and white statements. We need to consider the potential for aerosol spread, and how that might impact our PPE practices, while simultaneously recognizing that droplets and close contact with patients represent a far greater risk.

In the World Health Organization's [Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care WHO Guidelines, 2014](#), the WHO also supported the precautionary principle for new infectious diseases, calling for airborne and contact precautions.

*“When a new infectious disease is identified, the modes of transmission are not well understood. The epidemiological and microbiological studies needed to determine the modes of transmission and identify possible IPC measures may be protracted. **Due to the lack of information on modes of spread, Airborne and Contact Precautions, as well as eye protection, should be added to the routine Standard Precautions whenever possible, to reduce the risk of transmission of a newly emerging agent** (Annex B describes Standard and other precautions). These precautions should be implemented until further studies reveal the mode of transmission.”*

# AGMPS

- Any suspected or confirmed COVID-19 patient who undergoes a AGMP will require Aerosol PPE.
- HFNO – Optiflow
  - Probably safe and not an aerosol generating procedure but the Provincial Working Group has made recommendations to the BCCDC that;
    - Optiflow can be used in a private room (preferably –ve pressure but not essential) if all HCWs enter the room with Aerosol PPE
- Intubation/Extubation
  - High risk procedure with SARS. Now ALL patients should be intubated with aerosol precautions based on BCCDC recommendations for elective and emergency surgery.
- BiPAP/CPAP
  - BiPAP not recommended for COVID patients – does not prevent intubation and may worsen lung injury.
  - Non-COVID patients?

# CODE BLUE RESPONSE

- Difficult to find consensus
- BCCDC has firm guidelines for suspected or proven COVID.
  - No CPR, bag mask ventilation, or intubation unless all HCWs have Aerosol precautions
- What to do about the non-COVID patient. BCCDC has no Policy.
  - IH guideline says all responders must have Droplet and Contact Precautions.
  - In some IH hospitals, not all ward nurses have been fit tested so mandating Aerosol precautions in a patient with an extremely low risk of being COVID would delay the start of CPR – would have to wait until the code team arrived. So IH has not mandated Aerosol precautions in non-COVID patients.
  - However, responders can make a clinical judgement to switch out the surgical mask/faceshield to a N95 and a full face visor (convert Droplet to Aerosol).

## SENSITIVITY OF SWABS

- Swab sensitivity:
  - Sensitivity varies from between 70 and 95% so 5-30% of negative swabs can be false negative.
  - False negative results may occur more frequently in patients with mild disease and pre-symptomatic patients.
  - Tracheal aspirates have a higher sensitivity than nasal pharyngeal swabs.
  - If the patient has a high pre-test probability of having COVID-19, a single negative swab should not rule the disease out. Especially important in hospitalized patients to ensure proper IC measures are maintained in case it is a false negative.