

# COVID-19: Never Say Never Again

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# From China With Love

- Dec 2019: People are admitted at hospitals in Wuhan, China with pneumonia.
- Dec 31, 2019: Chinese government confirms patients with pneumonia of unknown source.
- Jan 1, 2020: Wuhan health authorities shut down the Huanan Seafood Wholesale Market as it was believed to be the source of the virus.
- Jan 5, 2020: Chinese authorities confirm the new virus is a novel coronavirus and not SARS or MERS.
- Jan 11, 2020: First death caused by the virus, a 61 year old man believed to contract the virus at the Huanan Seafood Wholesale Market.

# The Doctor Who Loved Me

Dr. Li Wenliang was a ophthalmologist working at Wuhan Central Hospital who warned the world about the existence of a potential new virus similar to SARS.

- Dec 30, 2019: Dr. Li sent a private message in a group chat to fellow doctors alerting them to the potential existence of a new virus and advising them to protect themselves.
- Jan 3, 2020: Dr. Li was accused of "making false comments" by the Public Security Bureau and was then told to sign a letter stating "We solemnly warn you: If you keep being stubborn, with such impertinence, and continue this illegal activity, you will be brought to justice - is that understood?"
- Jan 10, 2020: Dr. Li started to feel unwell
- Jan 12, 2020: Dr Li was hospitalized
- Feb 7, 2020: Dr. Li dies from COVID-19

# China is not Enough

- China: Ground zero for the virus, cases increased to 80,174 on March 1 but since then increased very little. This is attributed to the draconian measures taken by the government.
- South Korea: Number of cases surged quickly and were second only to china. From **first case on Jan 20** to **7134 cases on March 8**.
- Iran: First country to have a pandemic out of south east Asia. Cases rose from **first cases on Feb 19** to **94,640 cases on May 1**. Cases in Iraq, Afghanistan, Bahrain, Kuwait, Oman, Lebanon and the United Arab Emirates are considered to come from Iran, by the private airline Mahan Air who continued to fly even after the government banned all flights.

# China is not Enough

- Western Europe (Spain, Italy, France and Germany):  
These 4 countries were the first ones to have large number of cases out of Asia. From **first cases between Jan 24 and 31** to **over 100,000 each on April 7**.

## Note:

- While cases appeared in many countries afterwards, by April the virus spread throughout most of the world already and travel has been heavily restricted. Many cases were then community transmission cases and not imported from other places.
- Cases have continued to increase in all the mentioned countries, but were community driven as well.

# COVID-19 eh?

## January 2020: Patient Zero and Early Advisories

- Jan 25th: The first Canadian case of the novel coronavirus was reported by Health Canada, in a Toronto man who had recently travelled to Wuhan, China.
- Jan 30th: Canada warns against travelling to China and any travellers coming from China were asked to isolate for two weeks after arriving.
- “If (China) fails to control it, they’ll demonstrate that it cannot be controlled,” said Dr. McGeer, an infectious disease specialist in Toronto. “If these public health measures (Wuhan lock down) are not enough, then none of the rest of us will be able to do it either.”

# COVID-19 eh?

## February 2020: Travel Related Cases and Increased Awareness

- Feb 6th: Dr. David Williams, Ontario's public health chief, said that they would begin testing patients with symptoms who had come from other Chinese cities outside the quarantined area
- Feb 20th: Canada reported its first case related to travel outside mainland China—a traveller from Iran.
- Feb 26th: Canada had 12 confirmed cases.
- By the end of February, Canadian leaders continued to resist calls to shut down borders as some other countries had done.
- For the broader population, public health began to stress the importance of basic hygienic practices (hand washing, not touching one's face, etc.) to stem any spread that may have gone undetected.

# COVID-19 eh?

## March 2020: Local Transmission and More Testing

- March 1st-10th: Canadian cases began to climb as the country began importing cases from places that, at the time, were not known hot spots.
- March 13th: Health Canada advised travellers to avoid all non-essential travel “until further notice,”.
- March 18th: Canada further tightened those measures announcing a ban on all foreign nationals entering Canada and that all returning Canadians would be funneled through airports in Toronto, Calgary, Vancouver or Montreal.
  - Ottawa also reached an agreement with the U.S. to suspend all non-essential travel across the border.



# COVID-19 eh?

- March 24th: Health Canada officially reports that local transmission had become the “primary source” of cases (at which point there were a total of 2,792 confirmed cases).
  - Evidence suggests that local transmission was occurring as early as March 1st.
  - To make matters worse, growing body of scientific findings suggests that the virus could be transmitted by asymptomatic people.

# License to Legislate

- March 15,2020: Federal government announces CERB financial aid program, to replace EI to assist people who lost income due to COVID-19.
- March 16,2020: Canada banned entry of all non-Canadian or non-permanent residents into Canada
- March 22,2020: All provinces and territories in Canada have declared public health emergencies
- March 25,2020: Canada imposes mandatory 14-day self-isolation for any person entering Canada

# License to Legislate

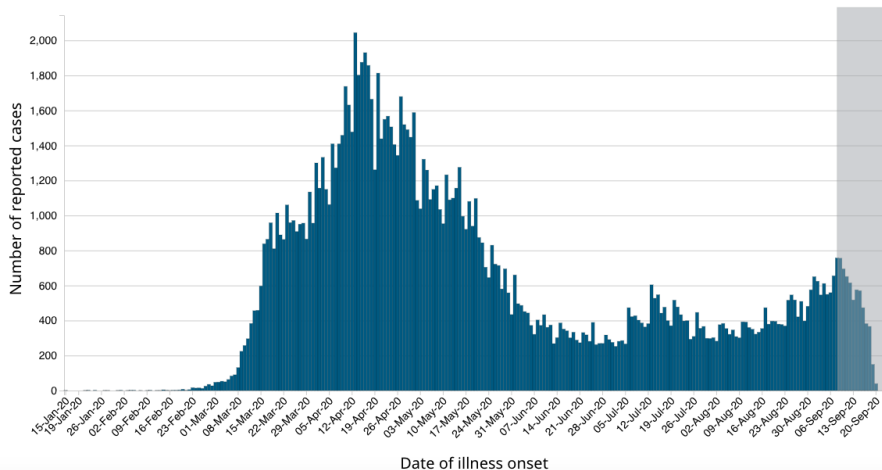
- March 27, 2020: the federal government announced CEWS to help businesses subsidize the wages of their employees.
- March - May, 2020: Provinces shutdown schools across the country.
- April 22, 2020: Federal government announces the CESB financial aid program for students unable to find for work during the summer.
- May, 2020: Provinces begin to reopen in stages, easing restrictions.

## No Time to Infect

- Due to COVID-19 inter-provincial travel was restricted as well. Most provinces only required visitors to quarantine for 14 days for visitors from some or all provinces. This created tensions within communities near provincial borders.
- The most extreme restriction were initiated by the Atlantic provinces, some of which banned entrance for non-residents. The legality of this action is questionable as The Canadian Charter of Rights and Freedoms states every Canadian is free to move and work anywhere within the country.

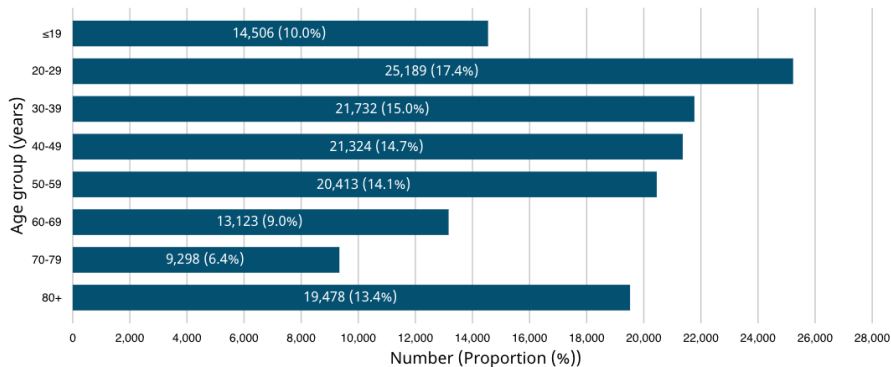
# COVID-19 is forever

Figure: Total Number of COVID-19 Cases (n=140,063) in Canada as of September 22nd, 2020

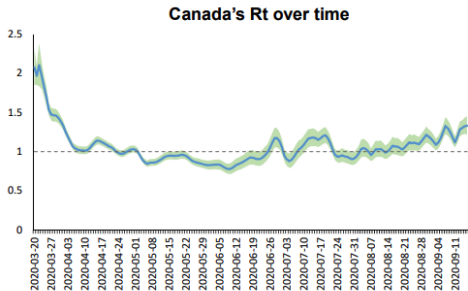


# The Age With the Golden Virus

Figure: Age Distribution of COVID-19 Cases (n=145,063) in Canada as of September 22nd, 2020



## $R_t$ in Canada is trending above 1 nationally and in heavily impacted areas



Data as of September 16, 2020  
Calculations are based on date of case report

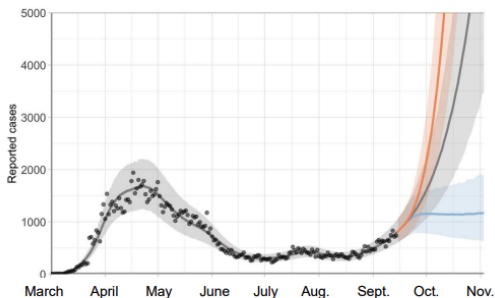
$R_t$ , or the time varying effective reproduction number, represents the average number of people infected by each case

When  $R_t$  is consistently  $>1$ , the epidemic is growing

Since mid-August, Canada's  $R_t$  has been increasing and has remained  $>1$

Cases reported now reflect increasing transmission one to two weeks ago

## Long range forecast - Canada is at a crossroads and individual action to reduce contact rates will decide our path



- If we **maintain** our current rate of contacts – the epidemic is forecast to resurge: **Grey line**
- If we **increase** our current rate of contacts – the epidemic is forecast to resurge faster and stronger: **Orange line**
- If we **decrease** our current rate of contacts – the epidemic is forecast to come under control in most locations: **Blue line**

Methods: Anderson SC, Edwards AM, Yerlanov M, Mulberry N, Stockdale J, Iyaniwura SA, Faicao RC, Otterstatter MC, Irvine MA, Janjua NZ, Coombs D, Colijn C. 2020. Estimating the impact of COVID-19 control measures using a Bayesian model of physical distancing. <https://www.medrxiv.org/content/10.1101/2020.04.17.20070086v1>



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