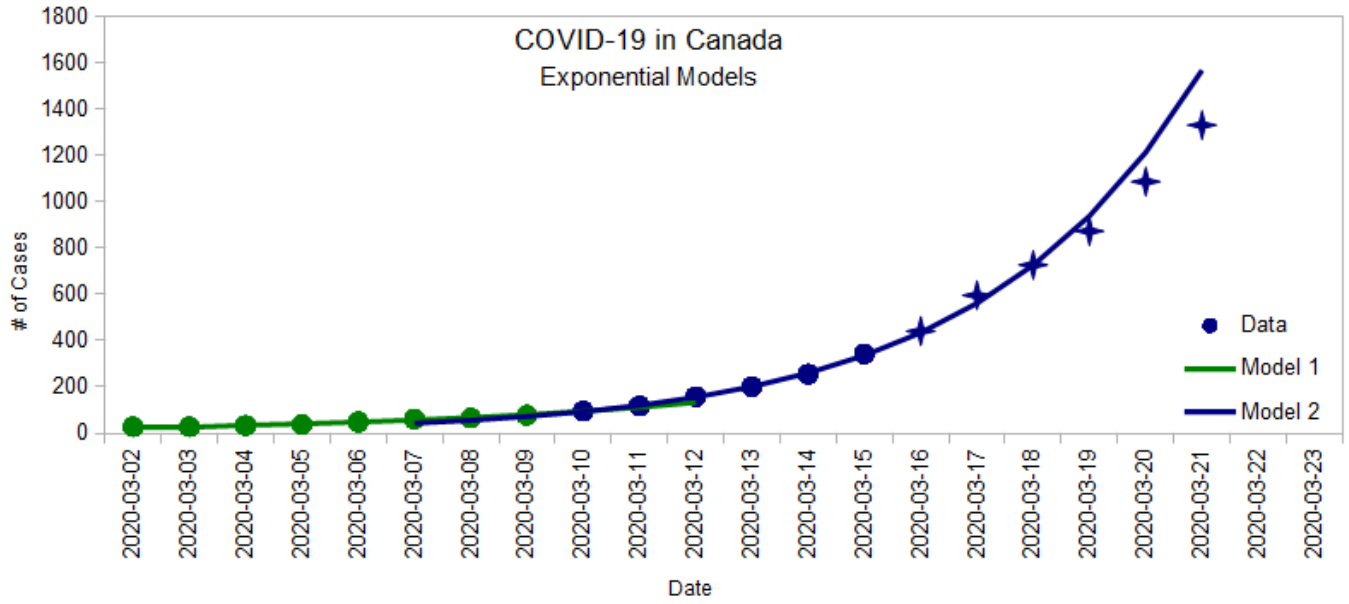
COVID-19 Spread

I'm not an epidemiologist, doctor, or any kind of expert on the subject so take this with a grain of salt.

One of the key messages from today's PM announcement is that things will get worse before they get better. I wanted to have a sense of the rate at which COVID-19 is spreading in Canada, so I made a graph, and did some math.

First, I got the data from https://www.covid-19canada.com, plotted them on a graph, and tried to use a basic exponential model to extract some key information.



Date	Count
2020-03-02	27
2020-03-03	27
2020-03-04	33
2020-03-05	37
2020-03-06	48
2020-03-07	60
2020-03-08	64
2020-03-09	77
2020-03-10	95
2020-03-11	117
2020-03-12	157
2020-03-13	201
2020-03-14	254
2020-03-15	342

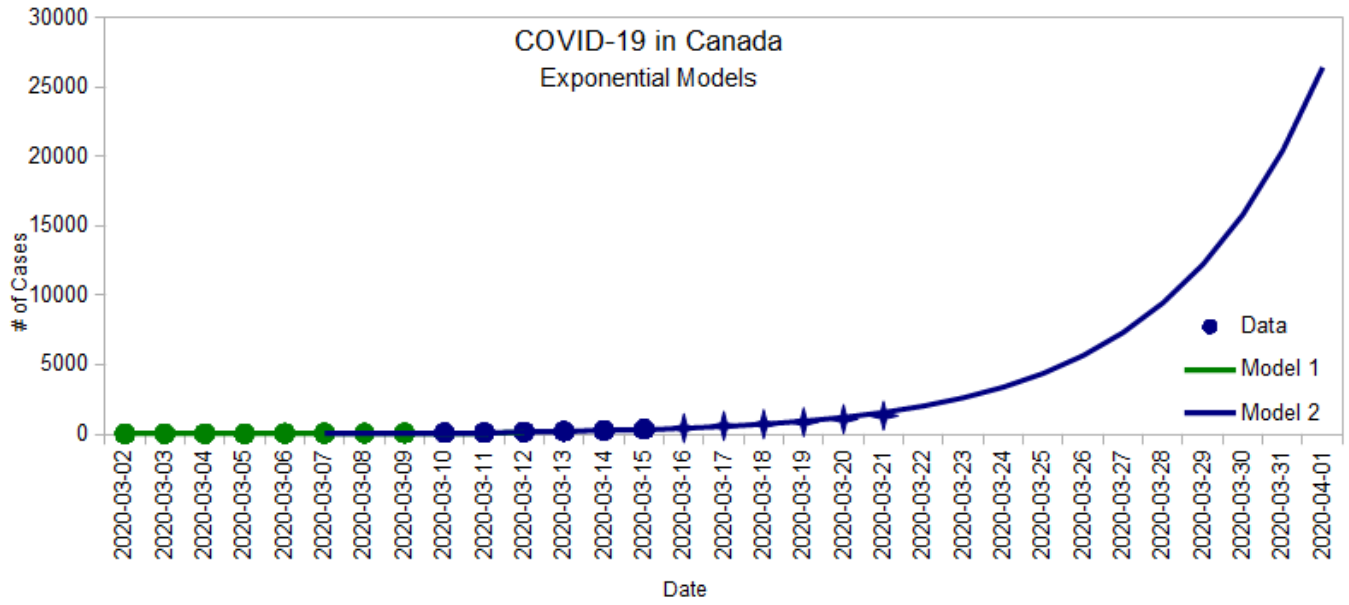
There seems two different patterns in this two-week period:

- Between March 2 and March 10 (ish) (green line), the number of cases was doubling every 4.1 days
- Between March 10 (ish) and now (blue line), the number of cases is doubling every 2.7 days

The formulae for the exponential curves are:

- $24.5 \times 2^{(\frac{t}{4.1})}$ for the green line (where *t* is the number of days since March 2)
- $93.1 \times 2^{(\frac{t}{2.7})}$ for the blue line (where *t* is the number of days since March 10)

If the blue pattern continues until the end of the week, we should have close to 1600 cases by the end of Saturday:



In reality, the spread of the infection follows a curve like the Logistic Function. The beginning looks like an exponential, but the end flattens out.