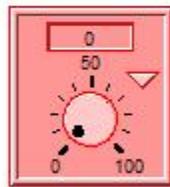
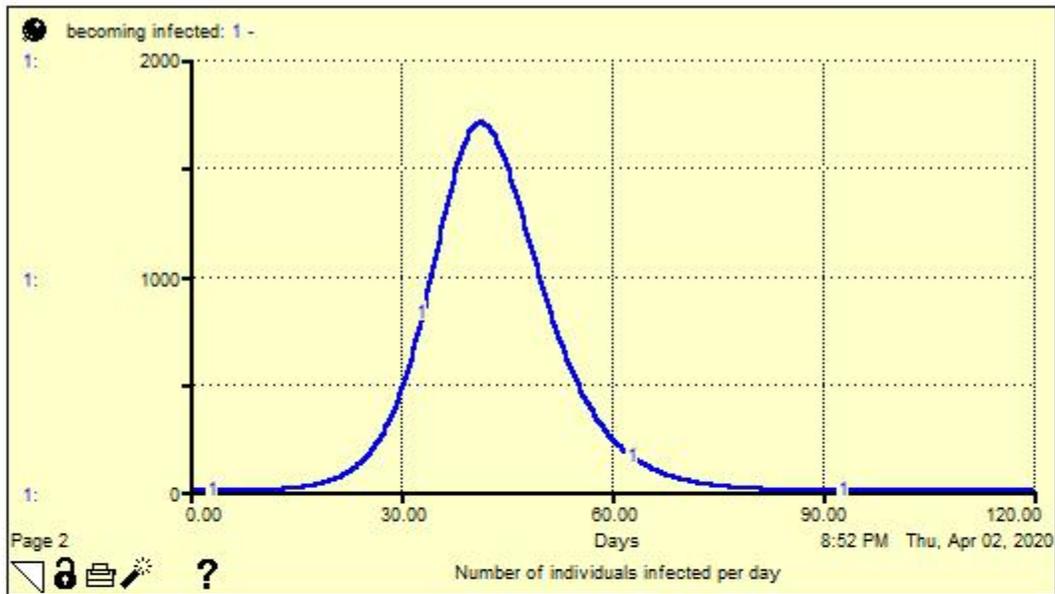
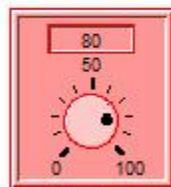


I had some time tonight to run a few simulation experiments within the model that I created. I have adjusted my model to reflect better information available at the World Health Organization.

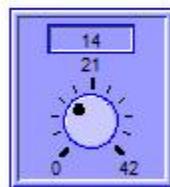
In the first scenario, I assume the population of the city of Timmins (43,000) would be completely available to be infected, beginning with one infectious person roaming freely in the community having 1.4 contacts per day, and then I look at the resulting infection behavior. In this base case, I am reflecting the best public health practice that is in place within the Porcupine Health Unit (PHU) catchment area. So, I have assumed that an individual who becomes infected will first show symptoms within 4 days (on average), and will have an illness duration of a further 10 days (on average). So at some time between 4 days and 14 days of the course of the illness, the individual is capable of infecting others. On average, each infected person will interact with 1.4 people per day. In each of those interactions, there is a 30% chance that the virus will be passed on. However, with adequate testing, every infected individual would be isolated from the uninfected population for 14 days (on average), after the infection is detected. The settings for the simulation are shown within the knob values, in the figure below.



% vaccinated



% effectiveness of vaccine



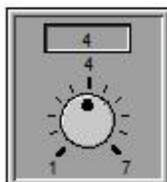
days sick individuals stay home



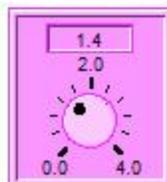
How does this simulation work?



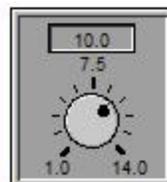
total population



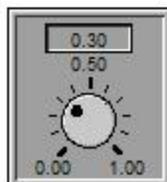
illness duration without symptoms



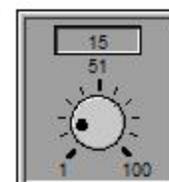
R_0 contacts per infected per day



illness duration with symptoms



probability of transfer



Mortality Per 100

Under these settings, the model finds that there would be 26 COVID-19 cases on April 7th. One to two of these cases would require ICU care.

Looking forward, on April 14th there would be 136 cases with 8-9 requiring ICU care.

The highest demand for ICU resources will occur on May 1st, with 23 cases requiring ICU care of a total of 1553 cases in isolation.

The rate of case doubling is somewhere between every 3.5 to 4 days.

Under these conditions, the model finds that by June 18th, 34.8K of the 43K population of Timmins would be infected (and possibly resolved), if there was no physical distancing or isolation in place.

I still have insufficient data to apply statistical confidence to the estimates above.

There are a couple of glaring deficiencies that I see in the available data:

1) **Insufficient testing is taking place** (as compared to places like Singapore or South Korea) and so infected individuals are not being isolated from the population as soon as possible. I could carry out a power of sampling to determine the needed sampling rate number if you wish. Even without test kits, doctors in Italy have noted that the sense of smell and taste disappear days before infectious symptoms are presented (see this [link](#) for discussion). Individuals (especially those not in isolation and working essential services within the city) might remove themselves from within the susceptible population sooner if they were to self-identify these symptoms, without burdening the health care resources of the city.

2) With the current physical isolation being practiced locally, the susceptible population size is likely much smaller than 43K people (or even the 83.5K of the PHU catchment). Therefore, the worst case scenario (above) may be much smaller in terms of ICU resources demanded. I have **no estimate of what percentage of isolation is actually in place within the city.**

3) There seems to be **inconsistent delay in reporting the number of new cases** in our area. I would suggest that the same time be employed each day. Weekends seem to have the most variable reporting. I would also suggest that the PHU and city of Timmins coordinate by using the same time stamped page for reporting the daily totals. A table showing the data (new cases, infected, resolved, hospitalized, dead) by date might also be very useful, especially as the course of the disease advances.

Hope this information will be of some use to you.

George Hughes