Covid-19 Modelling Results, as at 10 April 2020

1. Total Confirmed Cases

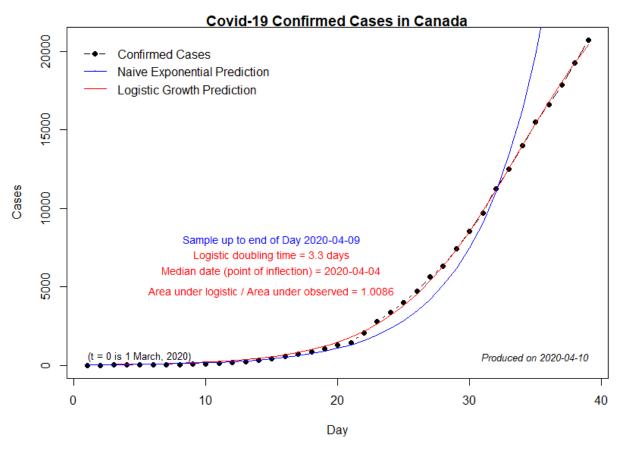
My R code for Covid-19 modelling is at

https://raw.githubusercontent.com/DaveGiles1949/r-code/master/Canadian Covid-19 Cases.R

The code will automatically download the latest data from my github account.

The chart below shows results based on data from 2 March to 9 April inclusive.

The Logistic model produces an "S-shaped" growth curve. One *disadvantage* is that this S-shape is symmetric about its point of inflection.

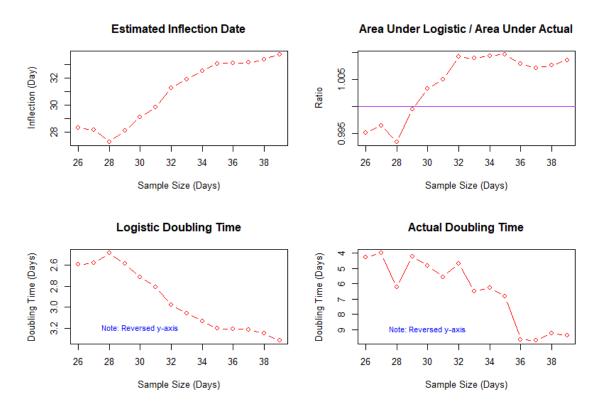


It's also interesting to see how the results change over time as more data become available.

This is summarized in the next set of charts, which are based on successive samples, each starting on 2 March, ending after 26, 27,, 39 days. The last sample is the full sample used to get the chart above.

The second chart indicates the on-going "good fit" of the Logistic model to the observed data. A ratio value greater than 1.0 indicates that the model is over-predicting the actual data over the full sample range. A value of 1.0 would be "ideal", in a loose overall sense.

Both the observed and estimated "doubling times" for new cases have improved substantially. (Note the reverse axis on the last two charts, and the fact that a longer doubling time is better than a short one.)



The following plot shows the projections for total confirmed cases of Covid-19 based on the latest version of the Logistic model. The projections go to 7 days beyond the end of the latest sample.

Projected Cases, Up to 1 Week Ahead

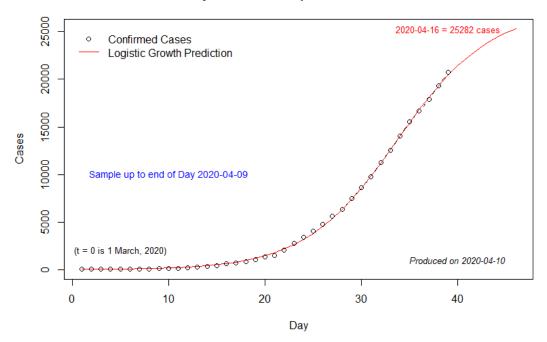


Table 1: Projected Covid-19 Cases in Canada
(Projections are in Blue; Actual Values are in Brackets]

Sample end: 08 April											
09 Apr	10 Apr	11 Apr	12 Apr	13 Apr	14 Apr	15 Apr					
20162 [20765]	21096	21916	22627	23236	23753	24188					
Sample end: 09 April											
10 Apr	11 Apr	12 Apr	13 Apr	14 Apr	15 Apr	16 Apr					
21445 []	22339	23122	23798	24377	24868	25282					
Sample end: 10 April											
11 Apr	12 Apr	13 Apr	14 Apr	15 Apr	16 Apr	17 Apr					
Sample end: 11 April											
12 Apr	13 Apr	14 Apr	15 Apr	16 Apr	17 Apr	18 Apr					

2. Total Number of Deaths

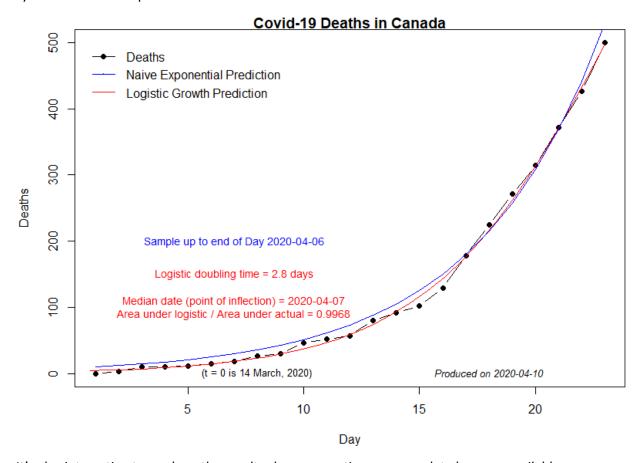
My R code for Covid-19 modelling is at

https://raw.githubusercontent.com/DaveGiles1949/r-code/master/Canadian_Covid-19_Deaths.R

The code will automatically download the latest data from my github account.

The chart below shows results based on data from 15 March to 9 April inclusive.

The Logistic model produces an "S-shaped" growth curve. One *disadvantage* is that this S-shape is symmetric about its point of inflection.

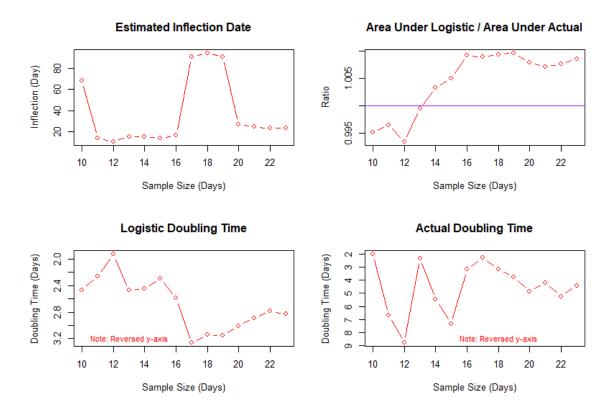


It's also interesting to see how the results change over time as more data become available.

This is summarized in the next set of charts, which are based on successive samples, each starting on 15 March, ending after 10, 11,, 23 days. The last sample is the full sample used to get the chart above.

The second chart indicates the on-going "good fit" of the Logistic model to the observed data. A ratio value greater than 1.0 indicates that the model is over-predicting the actual data over the full sample range. A value of 1.0 would be "ideal", in a loose overall sense.

Both the observed and estimated "doubling times" for new cases have improved substantially. (Note the reverse axis on the last two charts, and the fact that a longer doubling time is better than a short one.)



The following plot shows the projections for total confirmed cases of Covid-19 based on the latest version of the Logistic model. The projections go to 7 days beyond the end of the latest sample.

Projected Deaths, Up to 1 Week Ahead

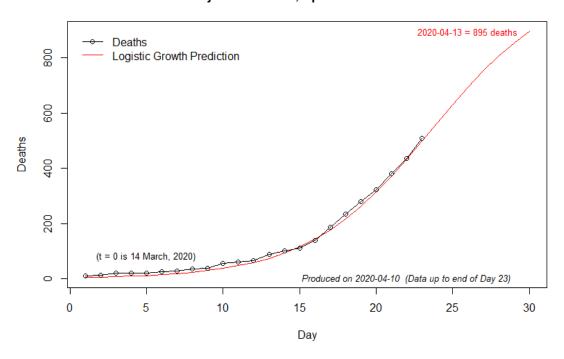


Table 2: Projected Covid-19 Deaths in Canada (Projections are in Red; Actual Values are in Brackets]

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Sample end: 08 April										
09 Apr	10 Apr	11 Apr	12 Apr	13 Apr	14 Apr	15 Apr				
<mark>492</mark> [509]	555	616	674	727	775	816				
Sample end: 09 April										
10 Apr	11 Apr	12 Apr	13 Apr	14 Apr	15 Apr	16 Apr				
564 []	630	693	752	806	853	895				
Sample end: 10 April										
11 Apr	12 Apr	13 Apr	14 Apr	15 Apr	16 Apr	17 Apr				
Sample end: 11 April										
12 Apr	13 Apr	14 Apr	15 Apr	16 Apr	17 Apr	18 Apr				