Ontario School Forecast Scenarios

How Scarsin can help Ontario, NOW!

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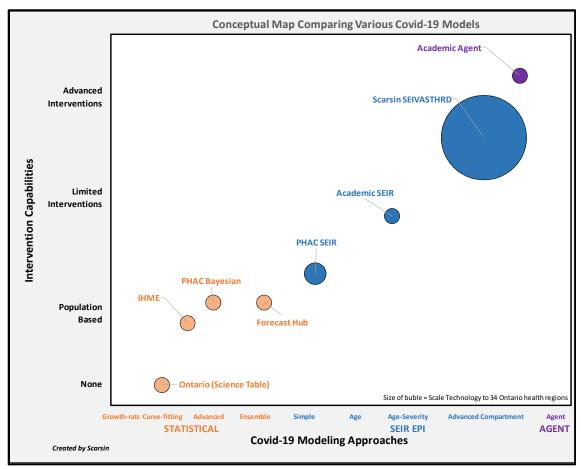pminshull@scarsin.com   www.scarsin-covid.com   **November 18, 2020**

- **The kind of "modeling" used is very important in terms of intervention decision making**
  - It determines how much information decision makers have in setting policy and measuring results
  - It also influences how far they can plan ahead which is the difference between reactive and proactive decisions

- **Scarsin's SEIVASTHRD SEIR model is capable of advanced intervention planning**
  - We have taken the current debate about school closing in Ontario and produced a series of scenarios to provide "best available scientific knowledge"* in alignment to the provinces states goes and to do that in a transparent manner
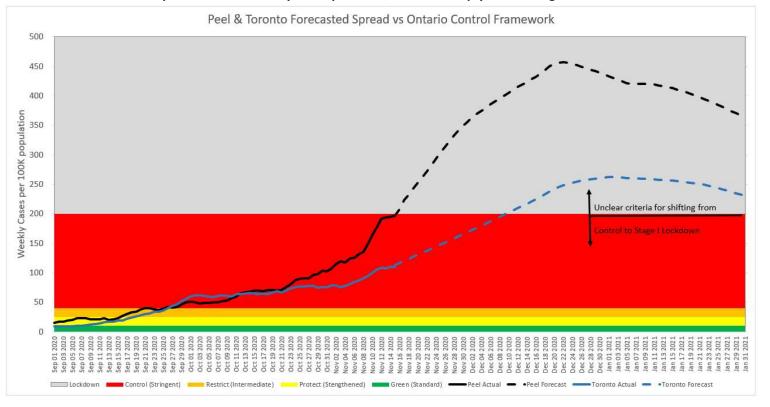
Conceptual Map Comparing Various Covid-19 Models

Intervention Capabilities (y-axis): Advanced Interventions, Limited Interventions, Population Based, None

Bubbles: Academic Agent, Scarsin SEIVASTHRD, Academic SEIR, PHAC SEIR, PHAC Bayesian, IHME, Forecast Hub, Ontario (Science Table)

Size of buble = Scale Technology to 34 Ontario health regions

Covid-19 Modeling Approaches (x-axis): Growth-rate, Curve-fitting, Advanced — **STATISTICAL**; Ensemble; Simple, Age, Age-Severity, Advanced Compartment — **SEIR EPI**; Agent — **AGENT**

Created by Scarsin

* One of the 4 key principles of keeping Ontario Safe and Open, Slide 6 https://covid19-sciencetable.ca/wp-content/uploads/2020/11/Update-on-COVID-19-Projections.pdf

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- The Scarsin forecasts for the next 30 days as outlined in our video posted on Nov 16 is around 3,000 cases in mid Dec
- Peel and Toronto make up ~65% of Ontario's cases so we have restricted our school intervention scenarios to just these two regions
- The graph below layers on the Ontario colour framework although it is unclear exactly what will trigger a shutdown
- The current Peel forecast peaks at ~450 weekly cases per 100k, which is deeply concerning!

Peel & Toronto Forecasted Spread vs Ontario Control Framework

Premier Doug Ford to announce new measures for Toronto, Peel, York on Nov 20 (below)

Scarsin to remodel after the announcement

https://www.cbc.ca/news/canada/toronto/covid-19-coronavirus-ontario-november-18-update-1.5806310

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Decision Support

Scenario one: Dec 4 - Jan 4 (2 weeks early)
Scenario two: Dec 18 - Jan 18 (2 weeks later)
Scenario three: Dec 4 – Jan 18 (2 weeks early + 2 weeks later)

Intervention: Adjust the Holiday Closure for Schools
Impact: ↓ Close Schools
↓ Workplace (Teachers/Staff + Parents at home)

SEIVASTHRD

Susceptible

Exposed

Imported

Vaccinated

Asymptomatic

Symptomatic

Tested

Hospitalized

Recovered

Deceased

Normal Contact Behaviour

Transmission Patterns

Vaccines

Covid-19 Dynamics

Testing

Infection Location Behaviour

Home	Congregate Setting	University / College
Schools	Workplace	Community
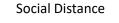
Travel

Contact Quantity
- Open / Close
- +2 Intervention

- Mask
- Social Distance

3 Regions of Travel

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Example – Modify School Closing 2 weeks earlier
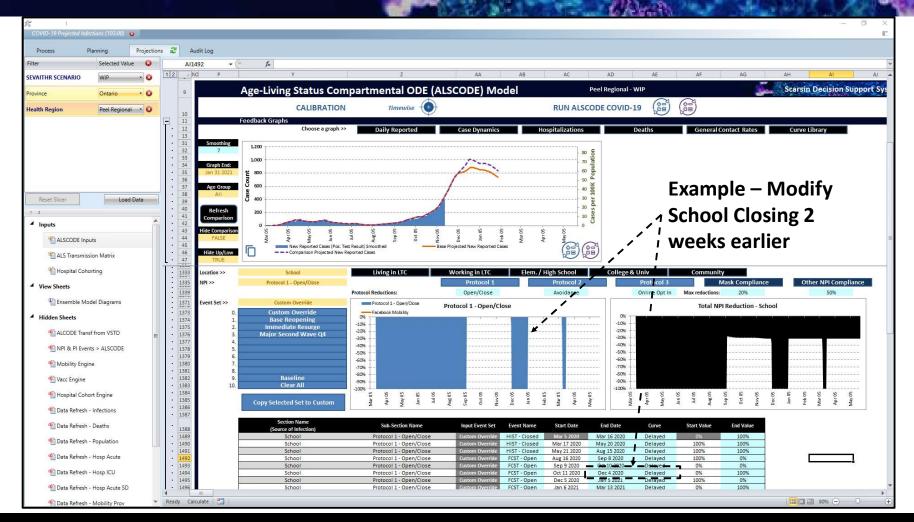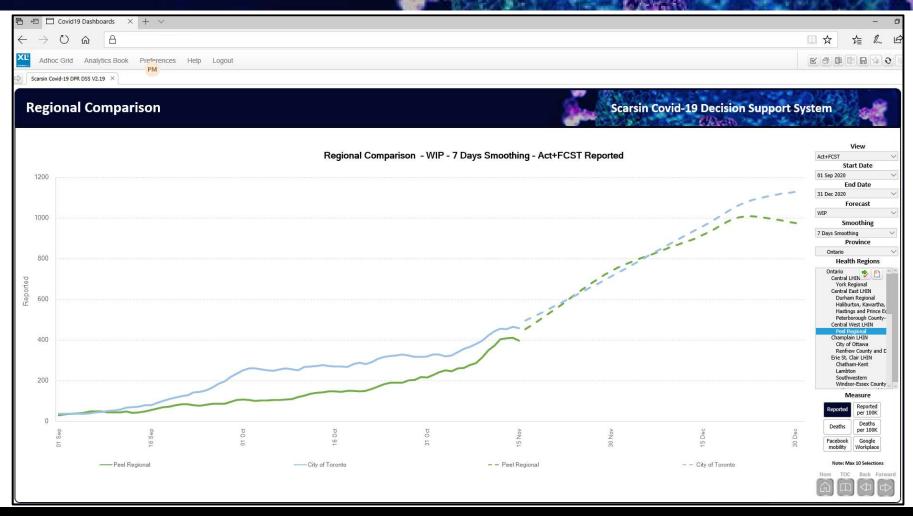
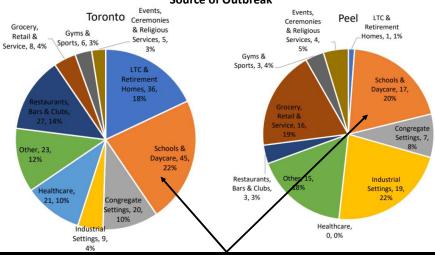# Scarsin Dashboard – No Closings

Positivity Rate By Age Group

- Positivity Rate among the first 4 age groups (0 to 17 yrs old) have had the largest growth relative to other age groups from Oct to Nov

- Toronto and Peel are the 1st and the 2nd largest school boards in Canada with 255k-42k and 155k-15k students and staff respectively

- All imposed restrictions have had very limited impact on positivity rate growth among students

- Schools and Daycares constitute 22% and 20% of outbreaks in Toronto and Peel

- Given the high proportion of asymptomatic cases among students/children, the continuous positivity rate growth is very concerning
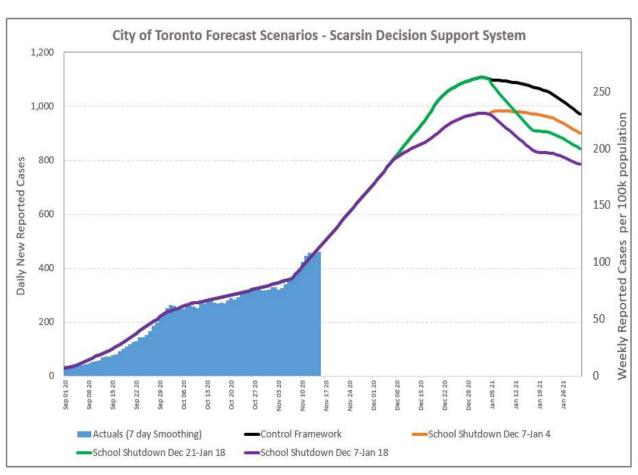
Positivity Rate

	October					November	Nov (44)/Oct (39) Growth
Week No	39	40	41	42	43	44	
Age Group							
75+	1.3	1.4	1.8	2.3	2.8	3.4	162%
65-74	1.2	1.3	1.7	1.9	2.2	2.6	117%
55-64	1.4	1.6	2.3	2.4	2.4	3	114%
45-54	1.9	1.9	2.7	2.8	3	3.8	100%
35-44	1.5	1.7	2.4	2.7	2.9	3.7	147%
25-34	2.5	2.2	2.9	3.2	3.4	4	60%
18-24	3.6	2.6	3.5	3.9	4.3	4.6	28%
14-17	1.9	2.1	2.9	4.1	4.1	5.4	184%
9-13	0.8	1.2	1.8	2.8	3.7	4.8	500%
4-8	0.4	1	1.5	2.7	2.7	3.7	825%
0-3	0.7	1.3	2.2	2.5	2.2	3	329%
Total	1.6	1.8	2.4	2.8	3	3.7	131%
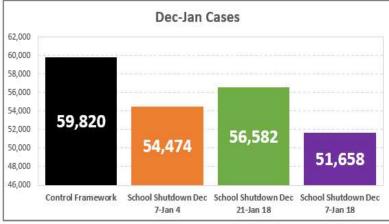
Source of Outbreak
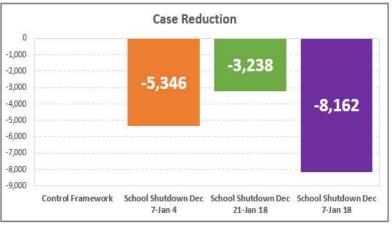
Toronto

- Grocery, Retail & Service, 8, 4%
- Gyms & Sports, 6, 3%
- Events, Ceremonies & Religious Services, 5, 3%
- LTC & Retirement Homes, 36, 18%
- Schools & Daycare, 45, 22%
- Congregate Settings, 20, 10%
- Industrial Settings, 9, 4%
- Healthcare, 21, 10%
- Other, 23, 12%
- Restaurants, Bars & Clubs, 27, 14%

Peel

- Events, Ceremonies & Religious Services, 4, 5%
- LTC & Retirement Homes, 1, 1%
- Gyms & Sports, 3, 4%
- Schools & Daycare, 17, 20%
- Congregate Settings, 7, 8%
- Industrial Settings, 19, 22%
- Healthcare, 0, 0%
- Other, 15, 18%
- Restaurants, Bars & Clubs, 3, 3%
- Grocery, Retail & Service, 16, 19%
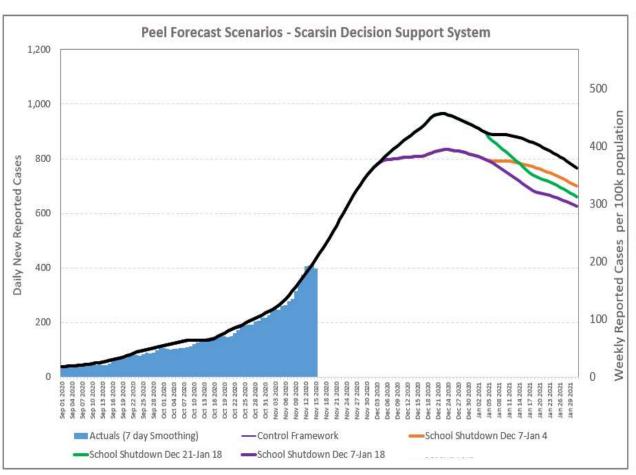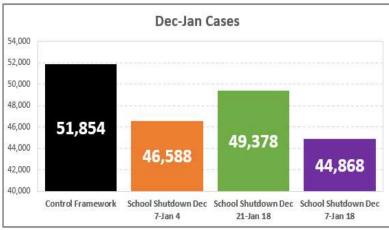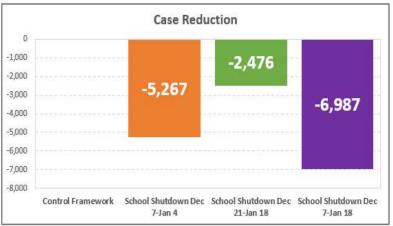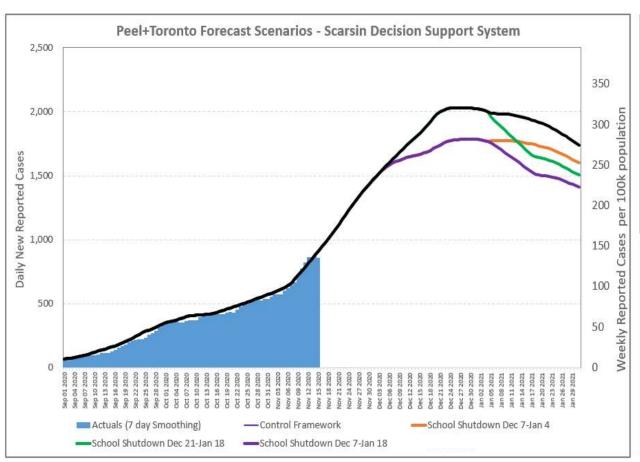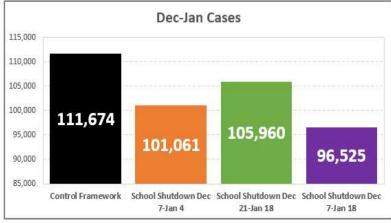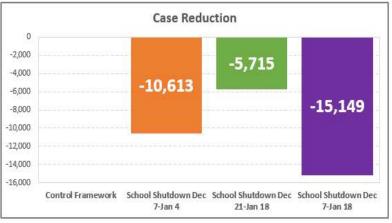
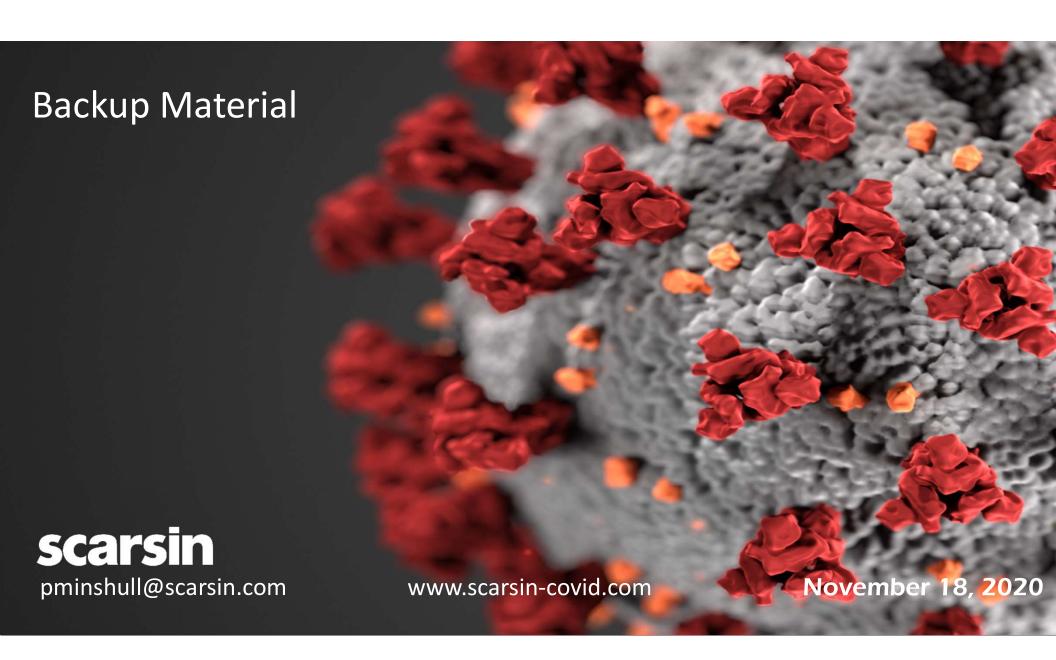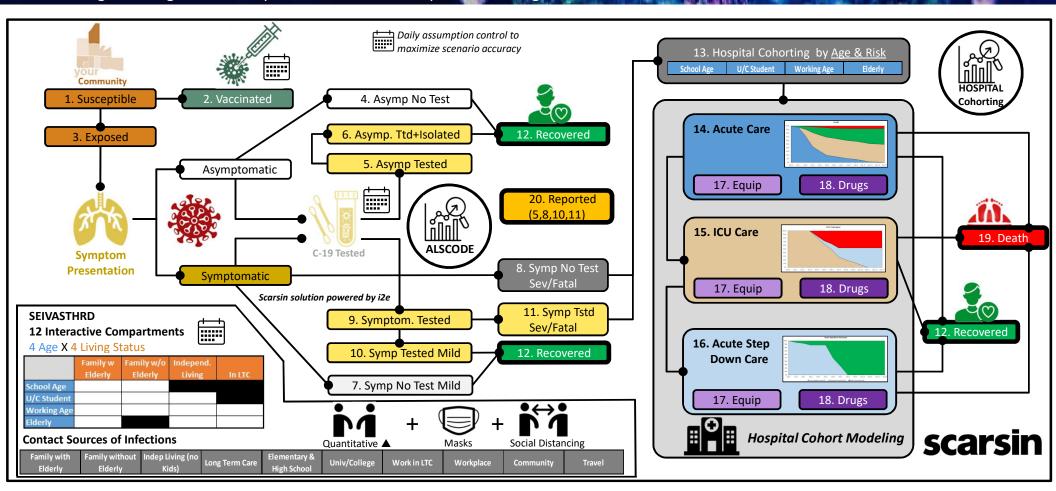## Scarsin Model – Peel+Toronto Scenarios

- **Ontario cases to date on November 18 is 98,162**

- **Toronto & Peel base forecasts for Dec and January will add a staggering 111,674 case (based on currently announced Control measures)**

- **Closing schools can provide a deceleration of the spread and is a relevant consideration given the positivity rates and growth in school age children**

- **The general peaking behavior in our base forecast is due to general citizen behavior changes in the absence of government action when the rates of infection reach critical levels**

- **Allowing Peel to reach such a high spread increases the risk of a long sustained Lockdown to regain control**

- **This analysis demonstrates the agility of the Scarsin system to evaluate detailed interventions at a health region level**

- **We remain open to help the province with its decision making, but to do that they have to meet with us**

- **https://www.cbc.ca/news/business/covid-pandemic-ontario-ottawa-forecasting-model-1.5804374**

Backup Material

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www.scarsin-covid.com

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