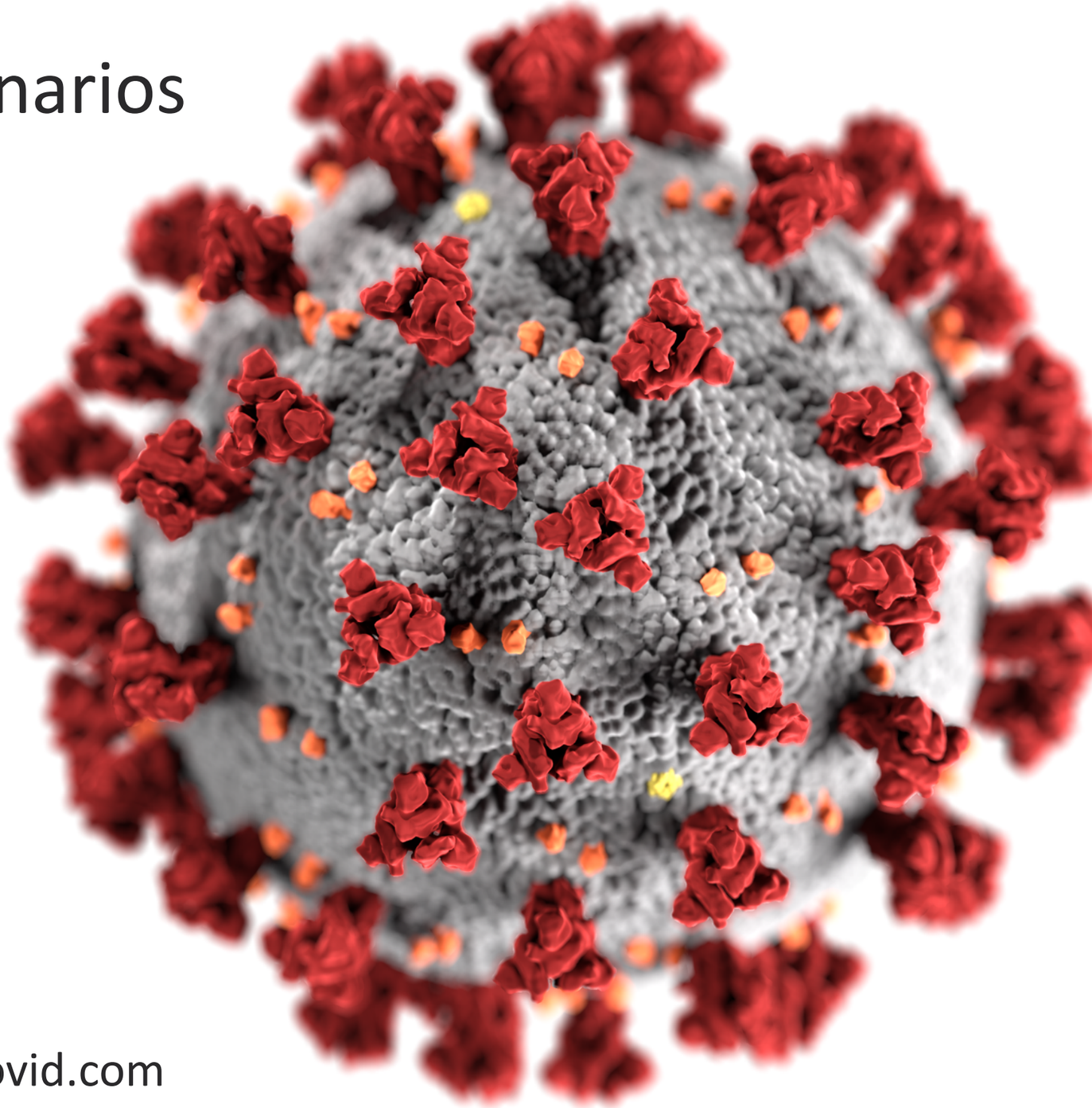
Ontario School Forecast Scenarios

How Scarsin can help Ontario, NOW!

November 18, 2020



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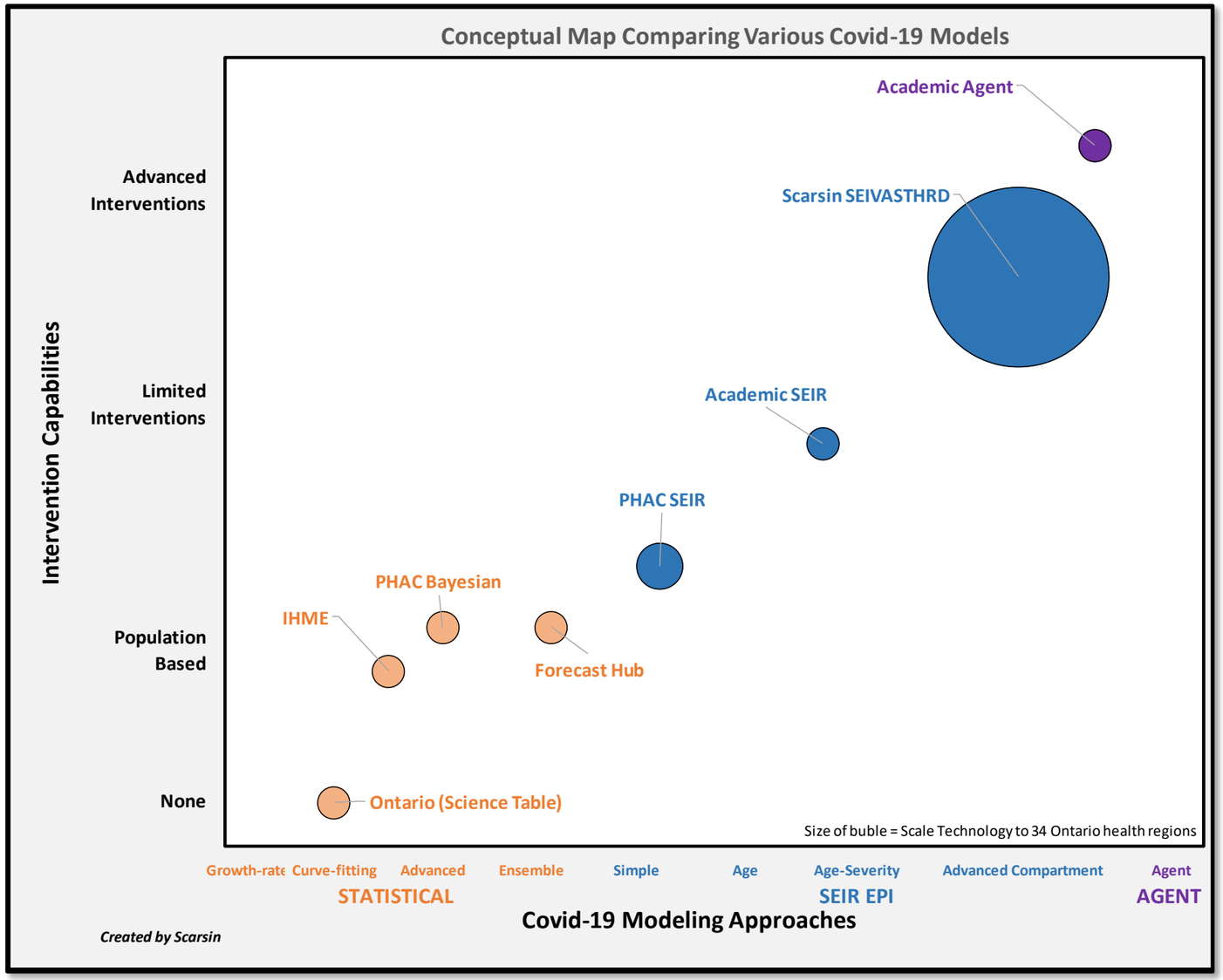
School Scenarios

- **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

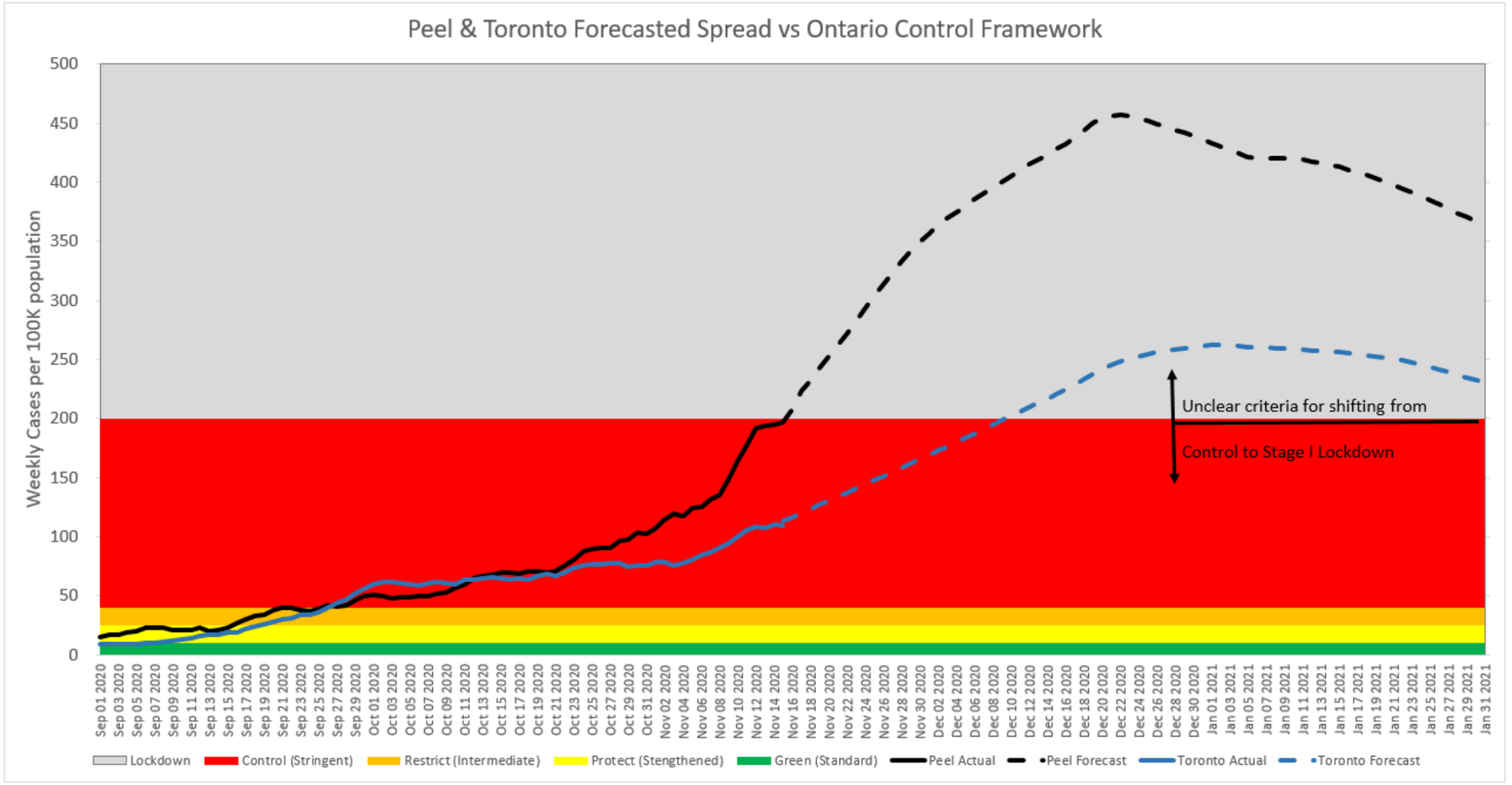
- **Scarsin's SEIVASTHRD SEIR model is capable of advanced intervention planning**
  - We have taken the current debate about school closing in Ontario and produced a series of scenarios to provide "best available scientific knowledge"* in alignment to the provinces states goes and to do that in a transparent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



* 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

School Scenarios – Peel & Toronto Only

- **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!**



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

Three School Closure Scenarios

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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)

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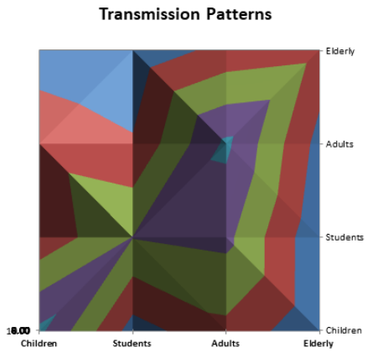
Decision Support

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

Normal Contact Behaviour



Vaccines

Covid-19 Dynamics

Testing

Infection Location Behaviour

Home	Congregate Setting	University / College
Schools	Workplace	Community

Contact Quantity
- Open / Close
- +2 Intervention

- Mask
- Social Distance

Travel

3 Regions of Travel

SEIVASTHRD

Susceptible
Exposed
Imported
Vaccinated
Asymptomatic
Symptomatic
Tested
Hospitalized
Recovered
Deceased

Scarsin Covid-19 Model

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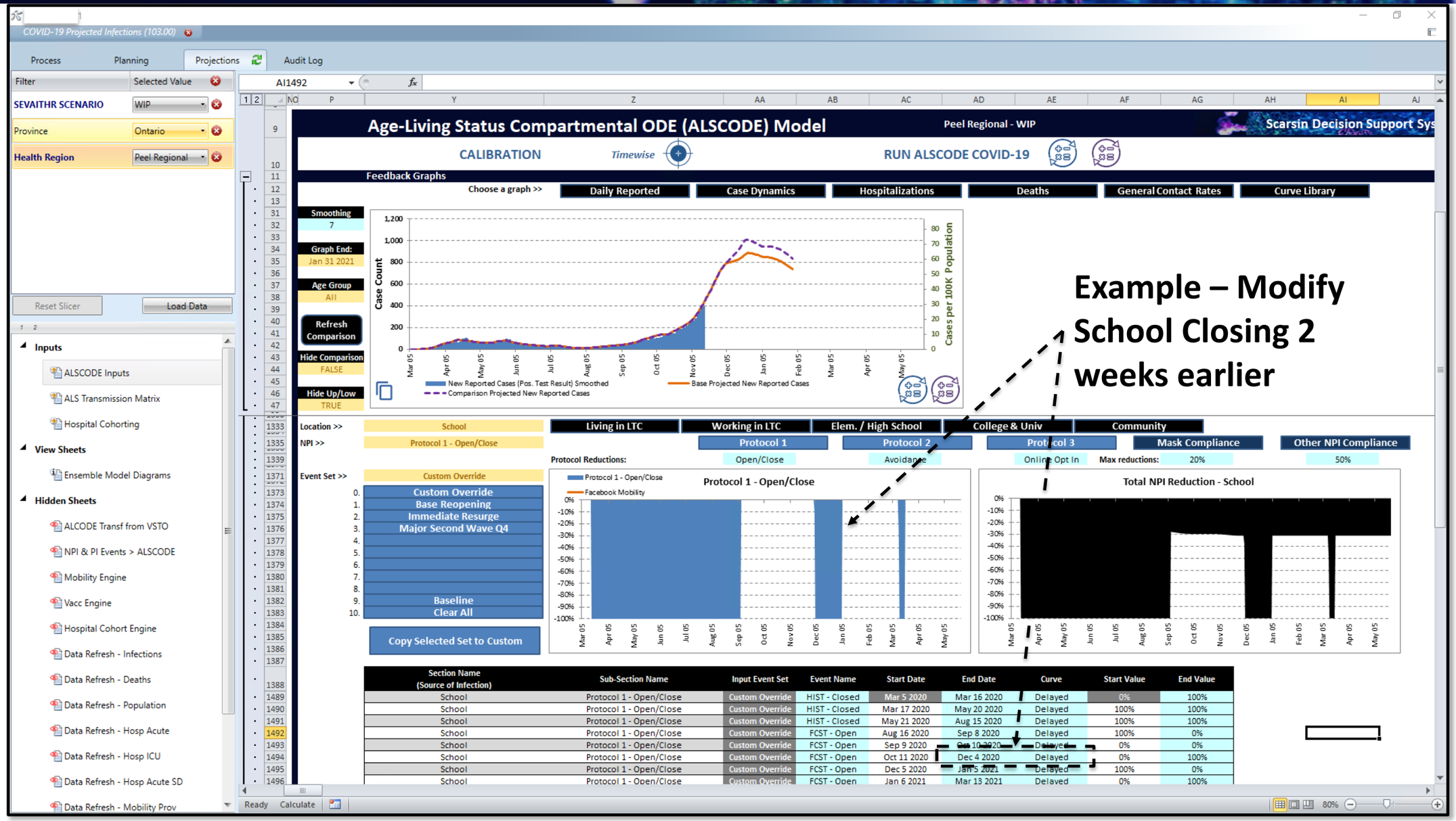

Scarsin Dashboard – No Closings

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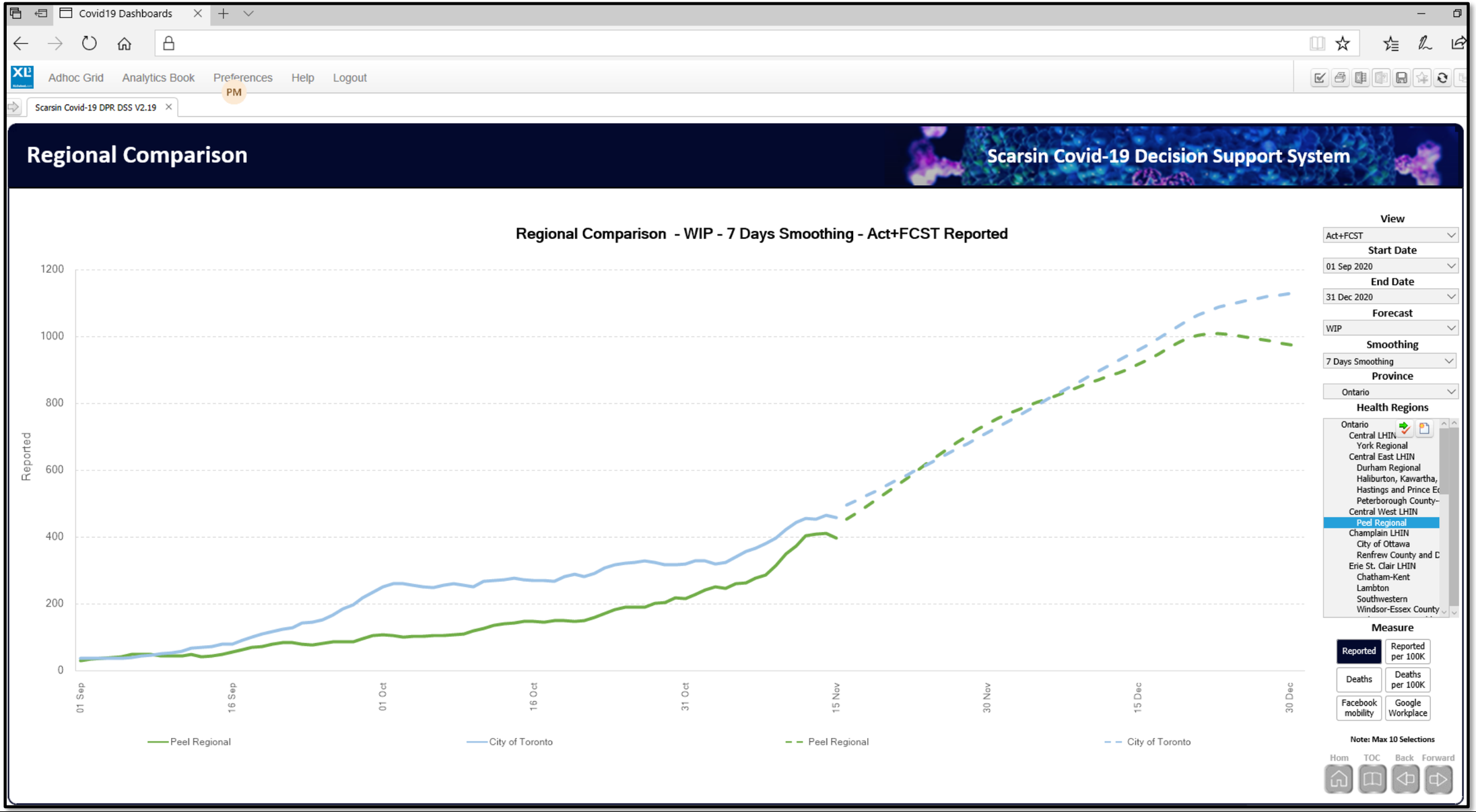


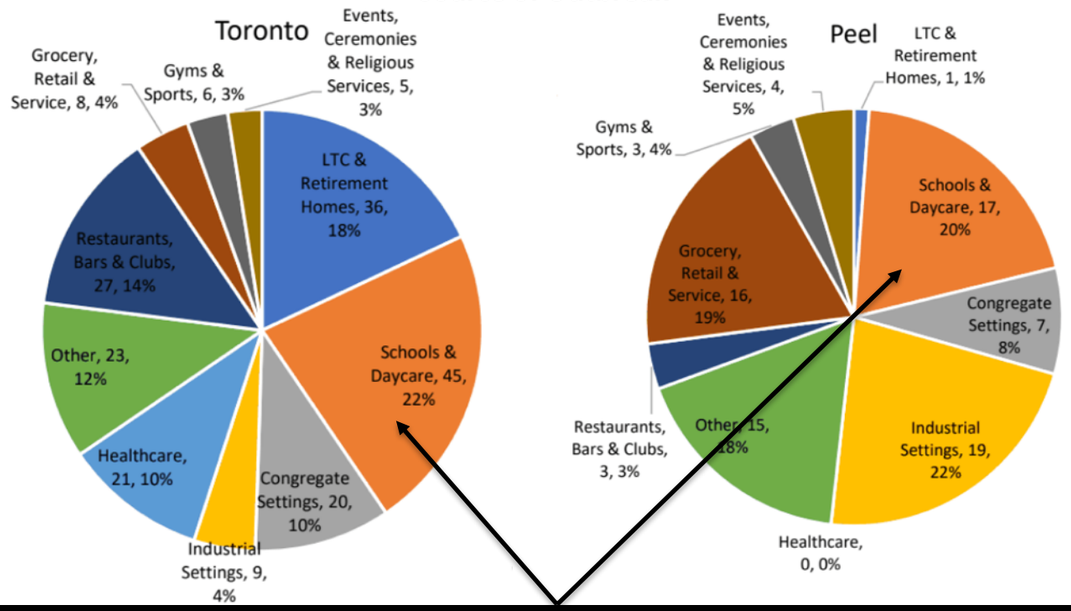
Positivity Rate By Age Group

- 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

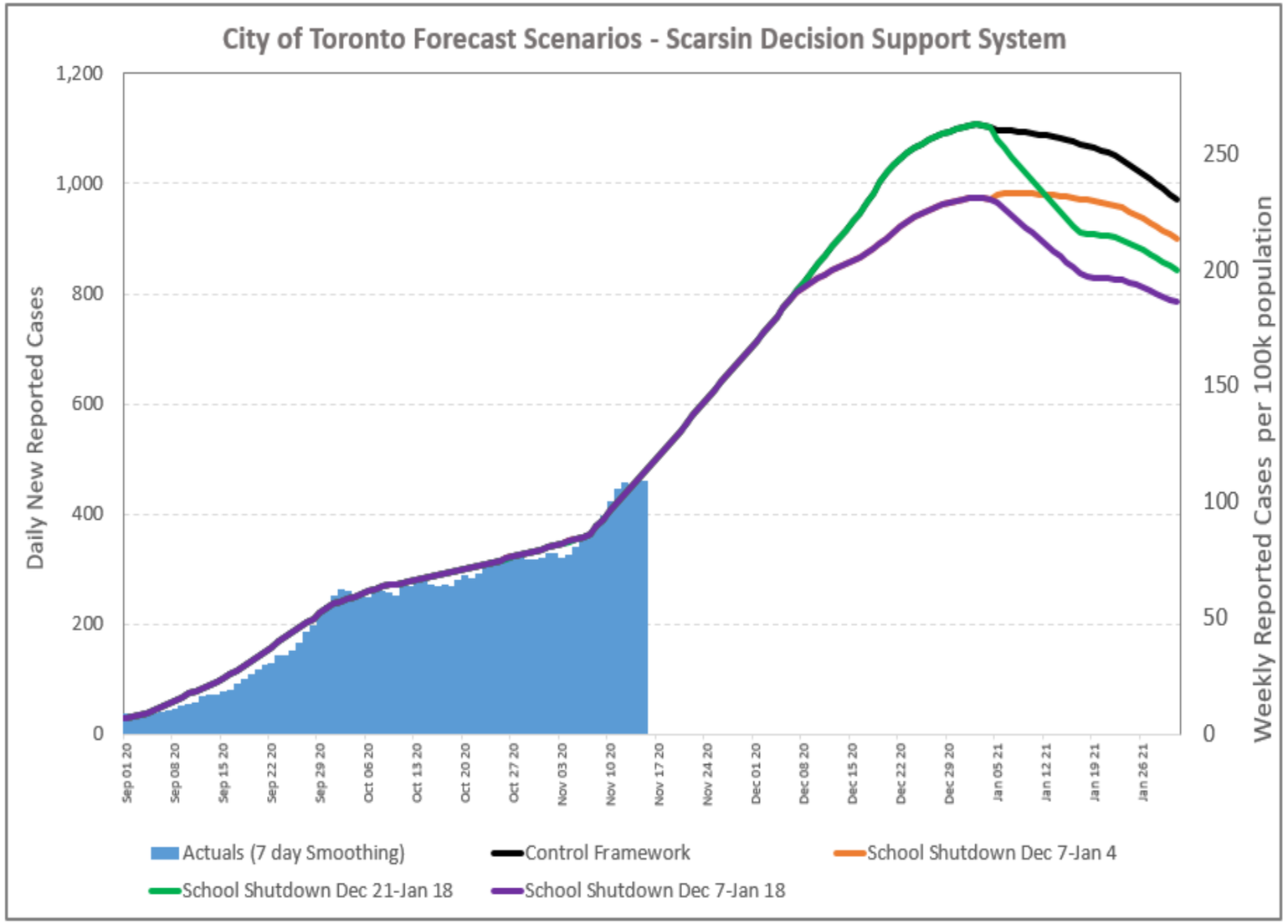
Positivity Rate

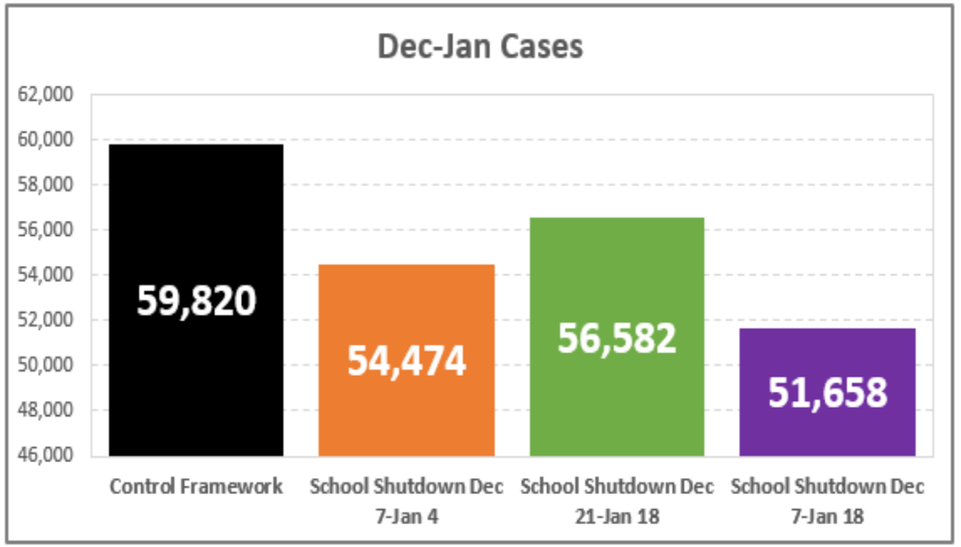
	October					November	Nov (44)/Oct (39) Growth
Week No	39	40	41	42	43	44	
Age Group							
75+	1.3	1.4	1.8	2.3	2.8	3.4	162%
65-74	1.2	1.3	1.7	1.9	2.2	2.6	117%
55-64	1.4	1.6	2.3	2.4	2.4	3	114%
45-54	1.9	1.9	2.7	2.8	3	3.8	100%
35-44	1.5	1.7	2.4	2.7	2.9	3.7	147%
25-34	2.5	2.2	2.9	3.2	3.4	4	60%
18-24	3.6	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%

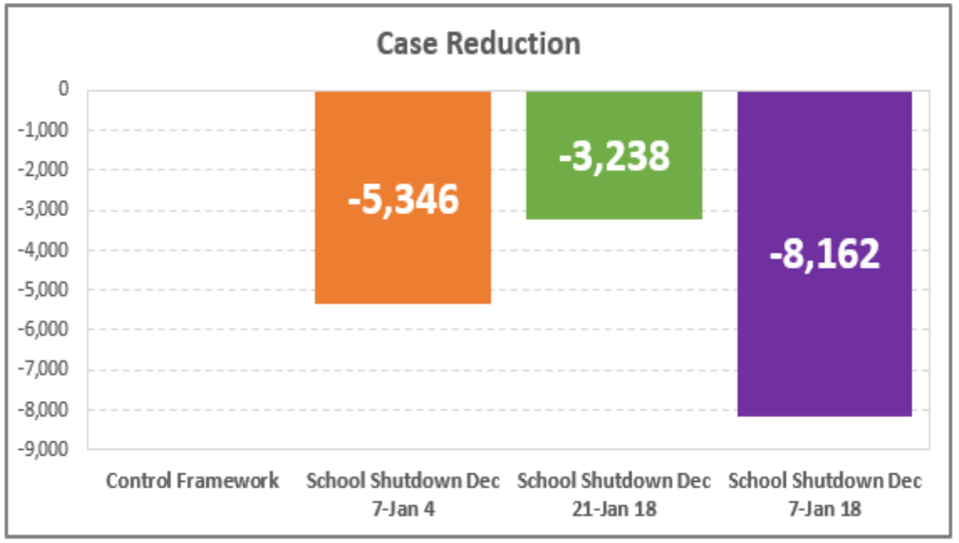
Source of Outbreak



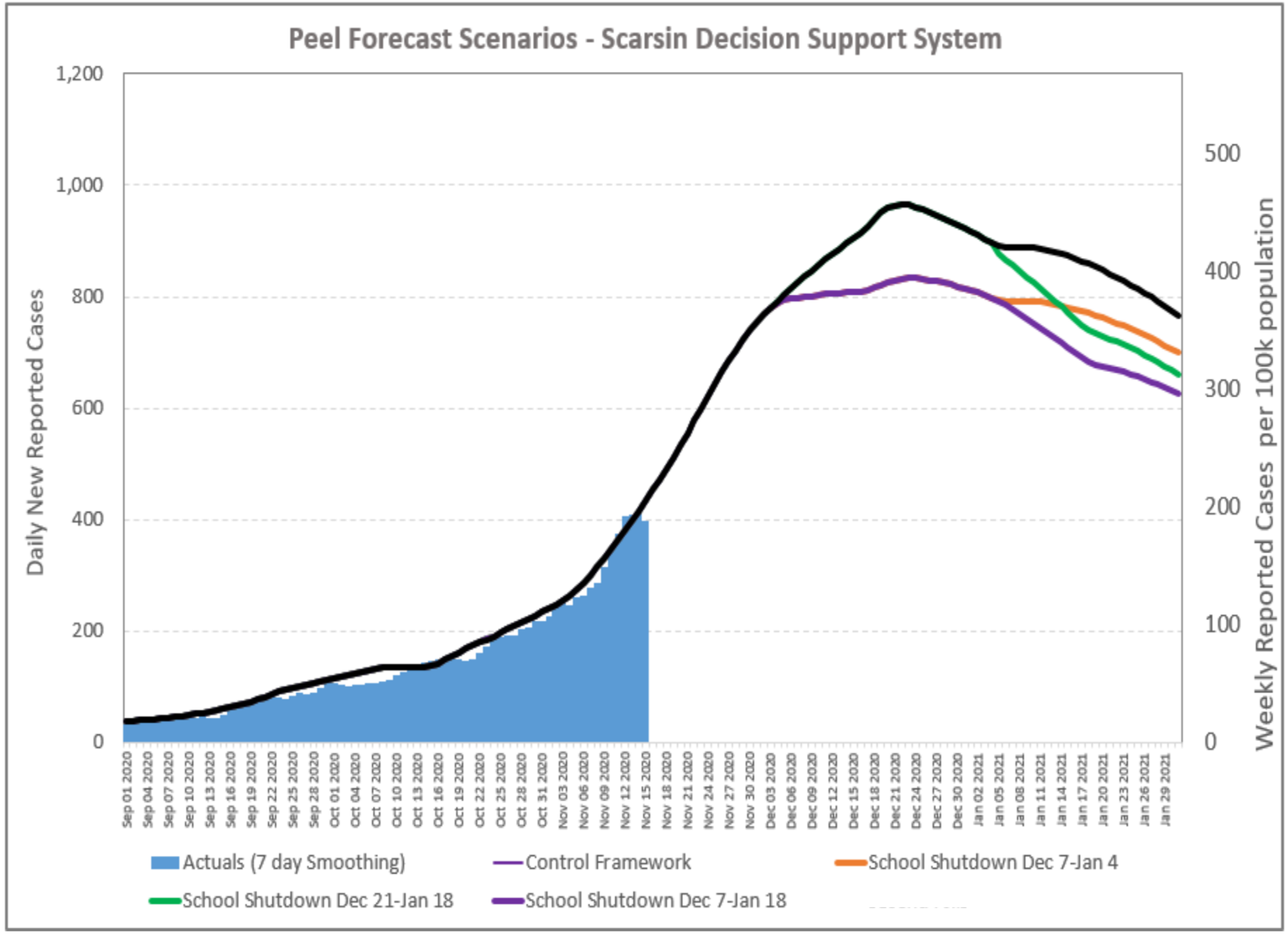
Scarsin Model – Toronto Scenarios

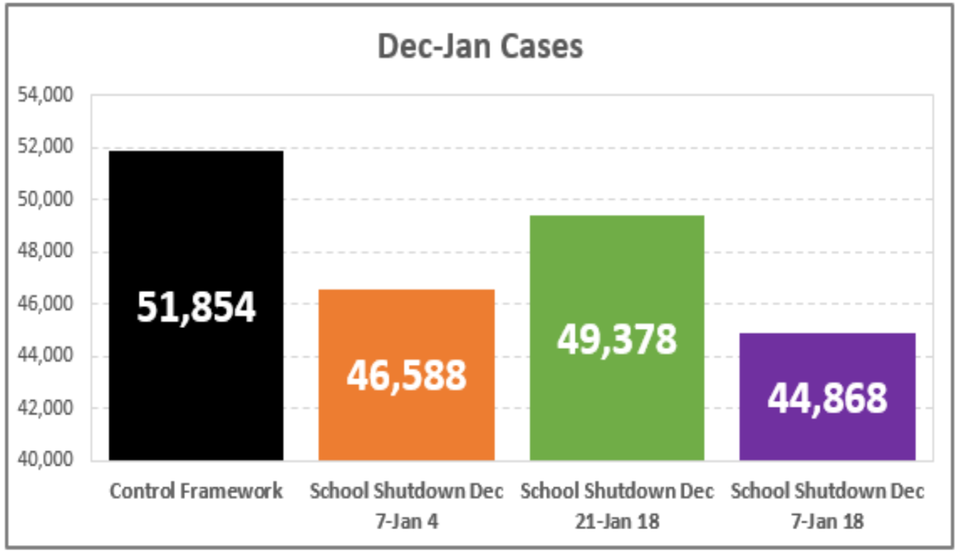


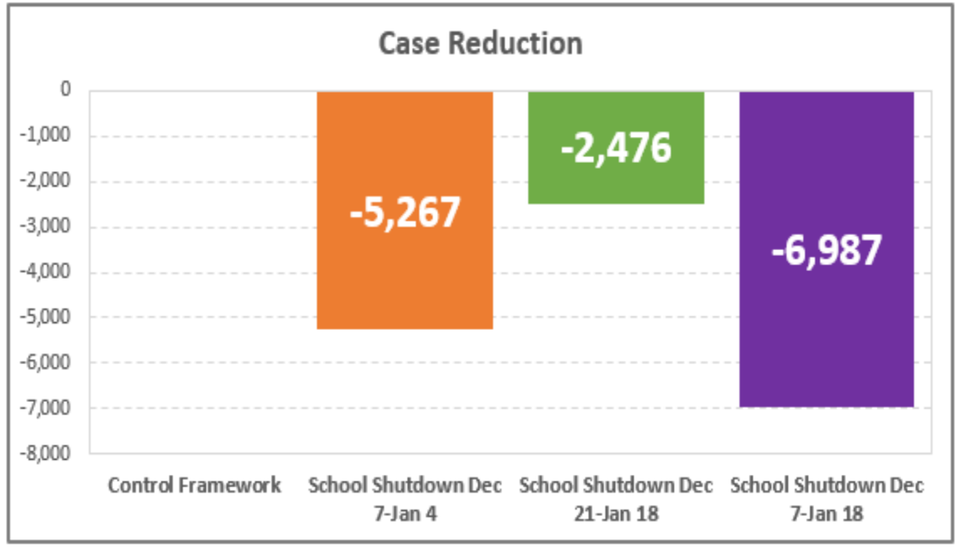




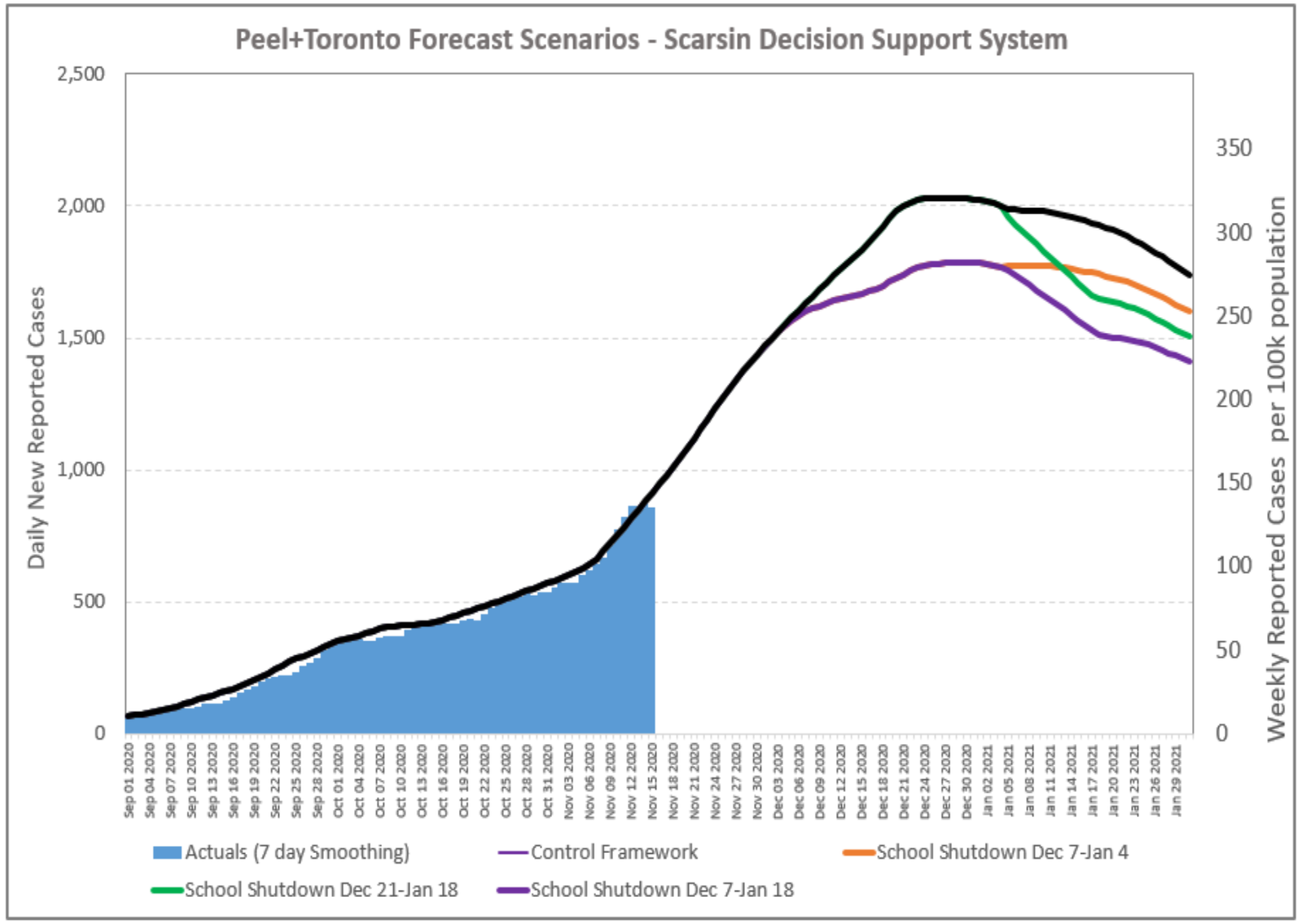
Scarsin Model – Peel Scenarios

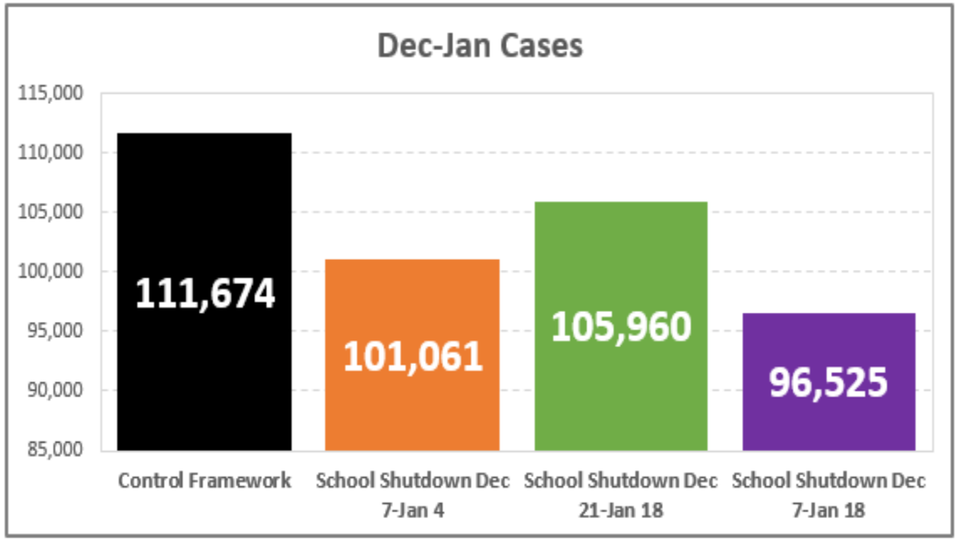


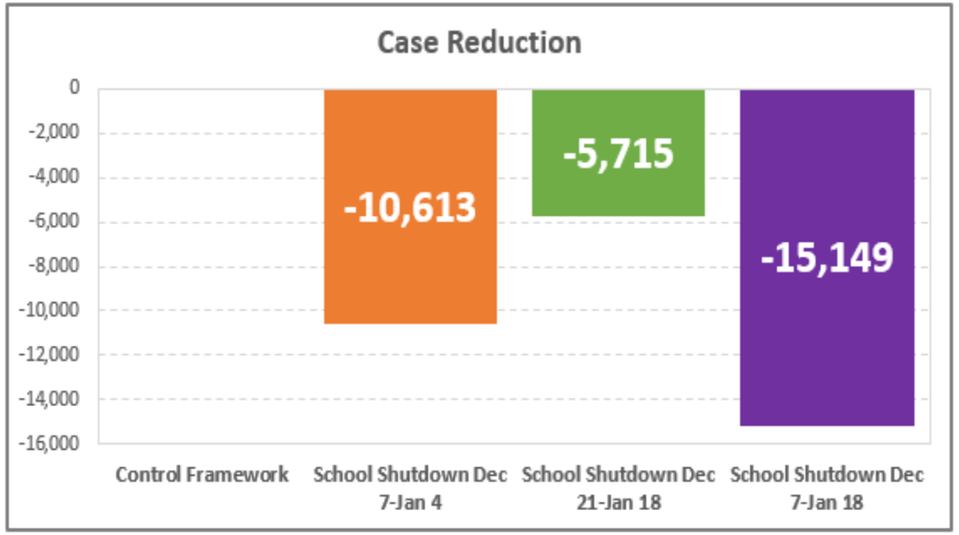




Scarsin Model – Peel+Toronto Scenarios







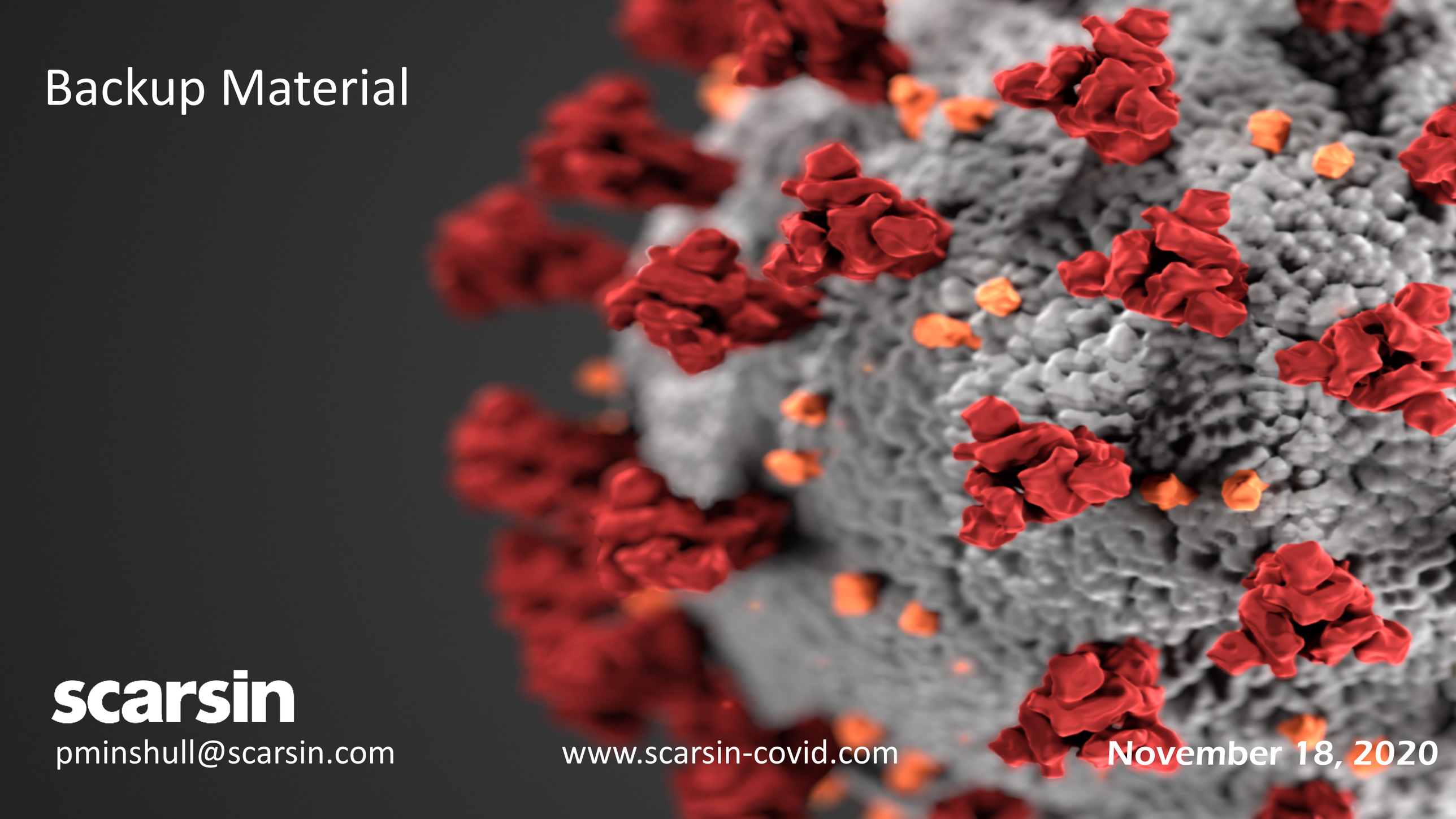
Scarsin Model – Peel+Toronto Scenarios

- **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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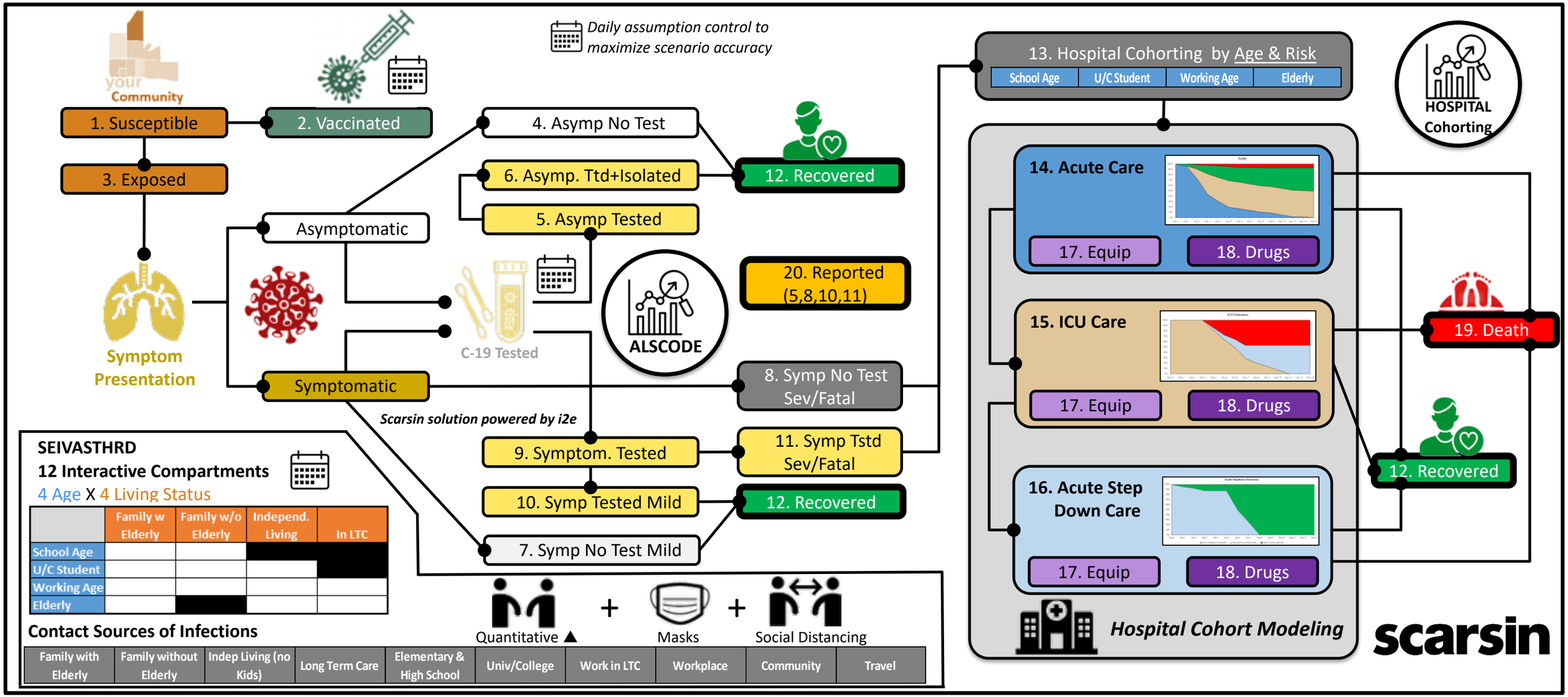
November 18, 2020

Flexible and Pragmatic models

Robust Age – Living Status Compartmental ODE > Hospital Cohorting Model



SCARSIN IS READY

i2e Technology Overview

User Friendly Data Integration

Google facebook Statistics Canada

ETL

Database Power

Microsoft SQL Server

Secure Reporting

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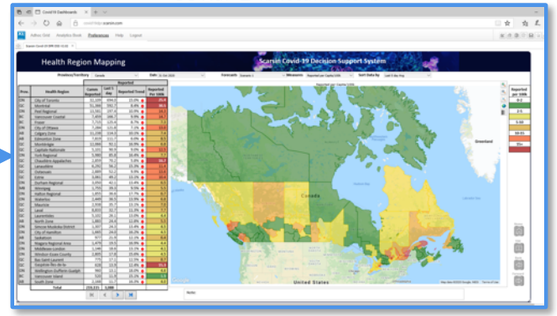
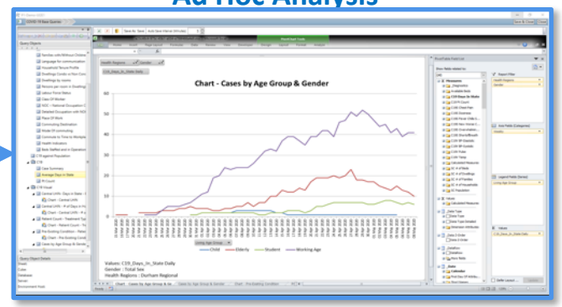
Decision Support

Web Dashboard



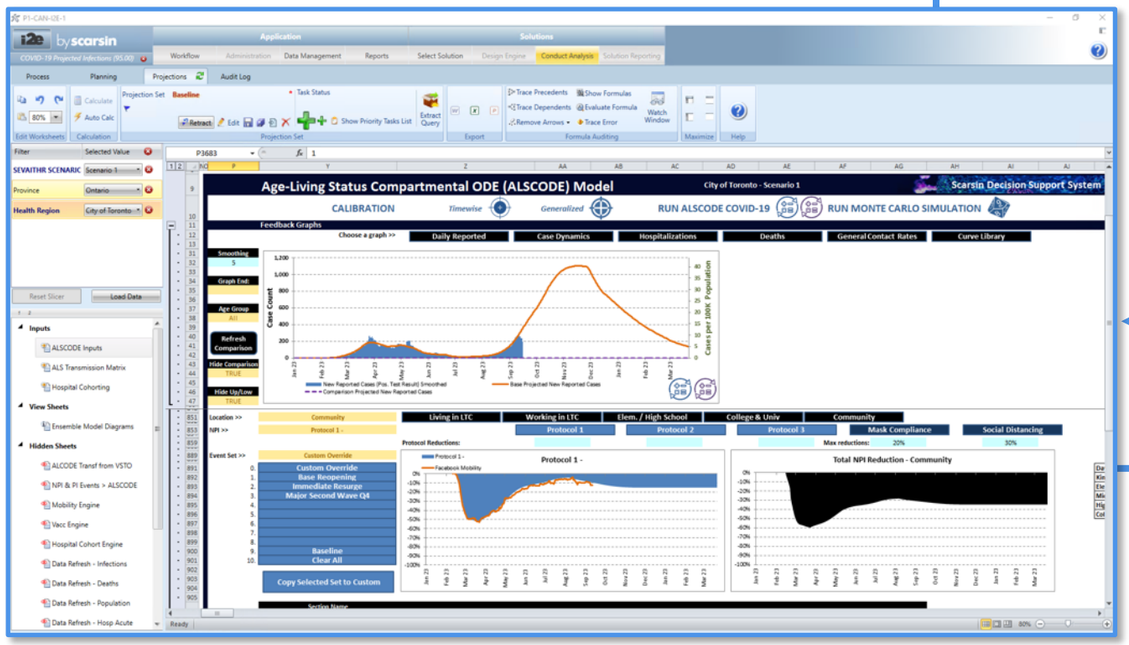
Ad Hoc Analysis



Machine Learning Feature Sets

↑ Accuracy of ML/AI algorithms leveraging Covid-19 Dynamics

Statistical & SEIVASTHRD Models



Microsoft Machine Learning Server (Python & R)

Near Real Time (<1 min)

Microsoft Gold Partner

DELL