Truckee Meadows COVID Risk Meter

Presentation to the Washoe County Board of County Commissioners

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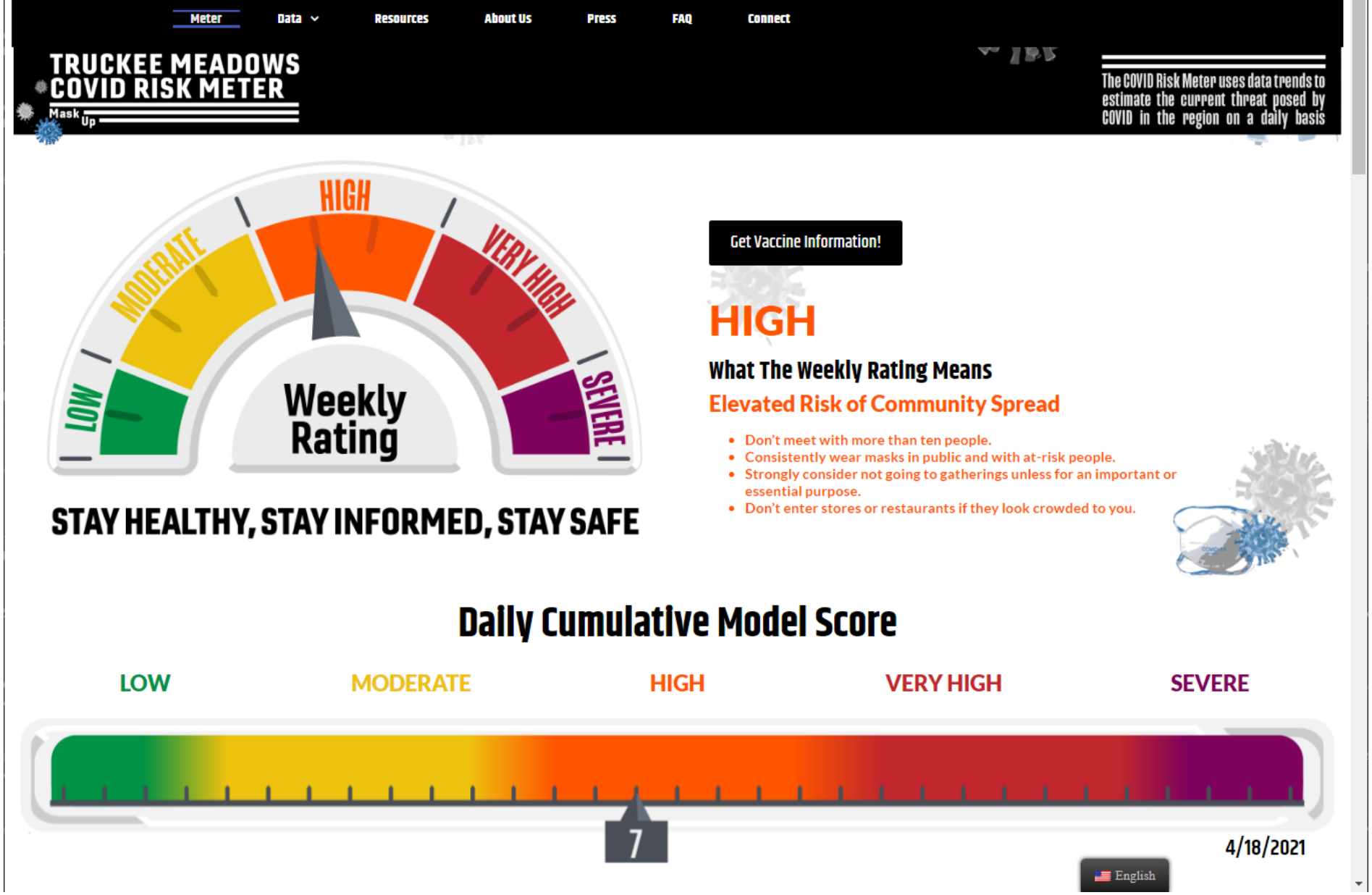
Collaborative Approach to Data Synthesis and Messaging

- The COVID Risk Meter team was made up of many people with a broad spectrum of experience within public health, the medical field and the public sector.

  - Medical doctors
  - Health professionals
  - Hospital administrators
  - Emergency responders
  - WC Health District
  - WC School District
  - Elected officials
  - Communications staff
  - Data scientists
  - Graduate students

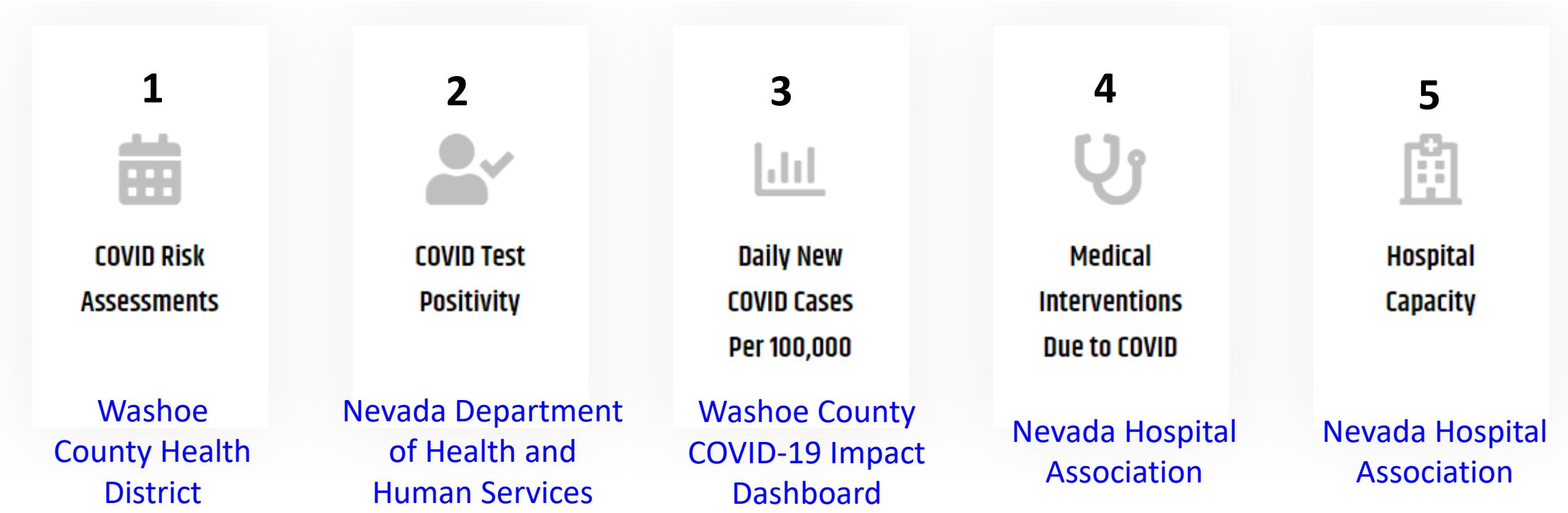
Goal: To simplify communication about COVID-19 risk in our community based on a synthesis of accurate, daily data



https://covidriskmeter.org/

Truckee Meadows COVID Threat Meter

- Data Indicators



- Each data indicator can contribute a potential score of 0 to 3
- Highest possible model score = 15

Table 1. Scoring and Cutoff Criteria for the Meter

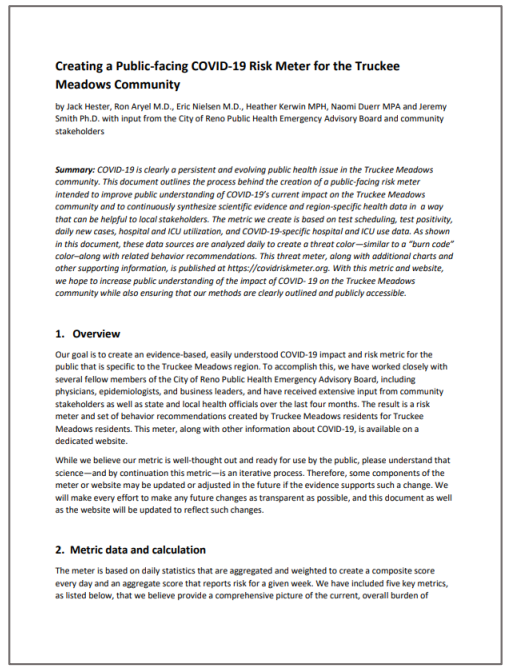
	Indicator 1	Indicator 2	Indicator 3	Indicator 4	Indicator 5
Score	**Risk Assessment**	**Test Positivity**	**Cases Per 100,000**	**Medical Interventions**	**Hospital Capacity**
	Measures slope over preceding 14 days	7-day average of test positivity	7-day average of new daily cases, normalized by population.	Measures the percent change in the average over preceding 7 days versus preceding 14 days for both COVID hospitalizations and COVID ICU	7-day average of hospital bed and ICU bed use
0	<= 25	<3%	<1	>5% Decline	<70%
1	> 25 to <= 265	>3% to 7%	1 to 9	5% change (+/-) Stable	>70 to 80%
2	> 265 to <= 400	>7% to 12%	10 to 25	>5% to 20% Increase	>80% to 90%
3	> 400	>12%	>25	>20% Increase	>90%

a. *The cutoffs for % test positivity are chosen to be consistent with the State of Nevada guidelines for counties*

b. *The cutoffs for daily cases per 100,000 are based on recommendations from the Harvard Global Health Institute and the Edmond J. Safara Center for Ethics*

c. *Indicators 4 and 5 utilize two half-weighted data variables, overall hospital numbers as well as ICU-specific numbers, and can generate decimal model scores*

Methodology



Creating a Public-facing COVID-19 Risk Meter for the Truckee Meadows Community

by Jack Hester, Ron Aryel M.D., Eric Nielsen M.D., Heather Kerwin MPH, Naomi Duerr MPA and Jeremy Smith Ph.D. with input from the City of Reno Public Health Emergency Advisory Board and community stakeholders

Summary: *COVID-19 is clearly a persistent and evolving public health issue in the Truckee Meadows community. This document outlines the process behind the creation of a public-facing risk meter intended to improve public understanding of COVID-19's current impact on the Truckee Meadows community and to continuously synthesize scientific evidence and region-specific health data in a way that can be helpful to local stakeholders. The metric we create is based on test scheduling, test positivity, daily new cases, hospital and ICU utilization, and COVID-19-specific hospital and ICU use data. As shown in this document, these data sources are analyzed daily to create a threat color—similar to a "burn code" color—along with related behavior recommendations. This threat meter, along with additional charts and other supporting information, is published at https://covidriskmeter.org. With this metric and website, we hope to increase public understanding of the impact of COVID- 19 on the Truckee Meadows community while also ensuring that our methods are clearly outlined and publicly accessible.*

1. Overview

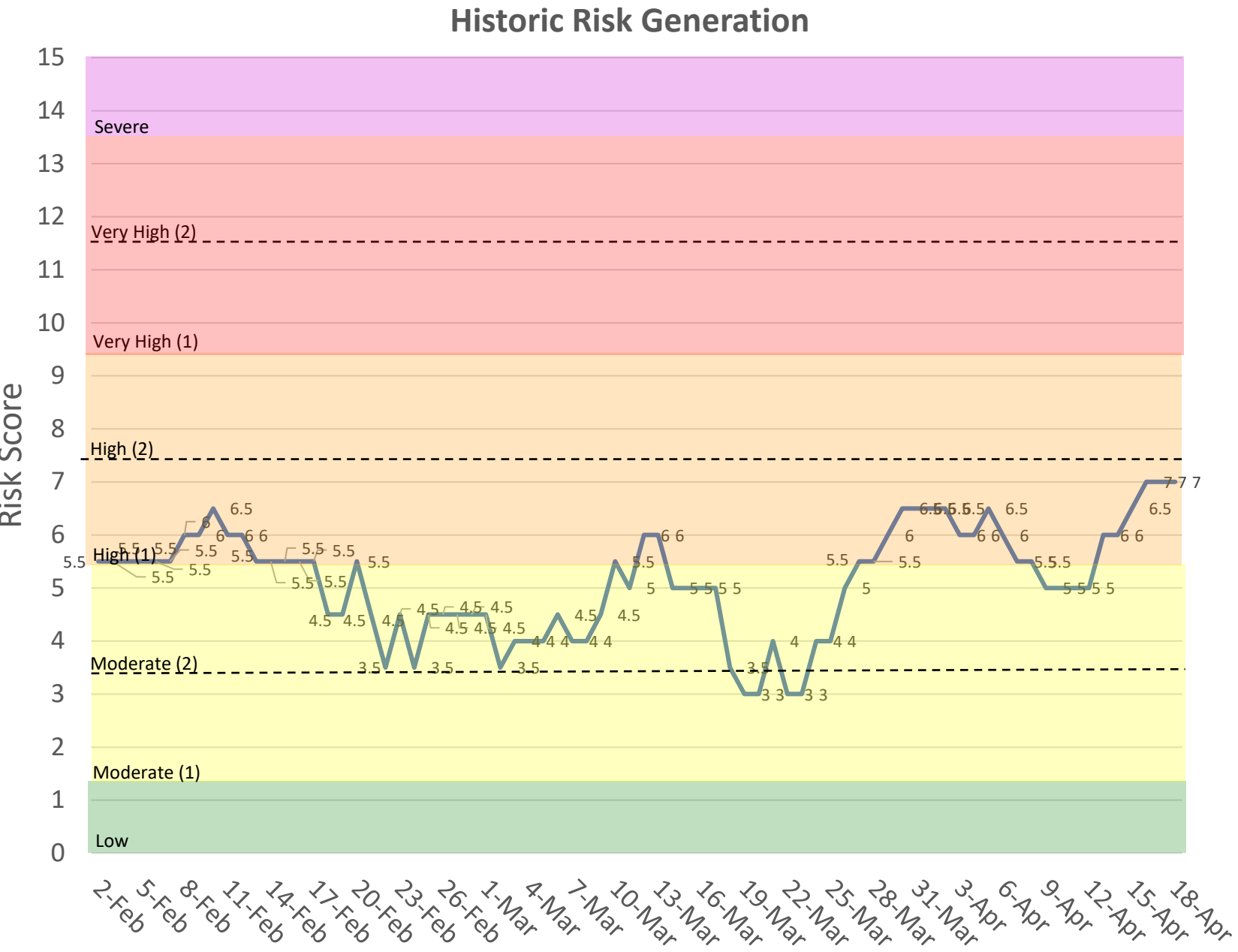
Our goal is to create an evidence-based, easily understood COVID-19 impact and risk metric for the public that is specific to the Truckee Meadows region. To accomplish this, we have worked closely with several fellow members of the City of Reno Public Health Emergency Advisory Board, including physicians, epidemiologists, and business leaders, and have received extensive input from community stakeholders as well as state and local health officials over the last four months. The result is a risk meter and set of behavior recommendations created by Truckee Meadows residents for Truckee Meadows residents. This meter, along with other information about COVID-19, is available on a dedicated website.

While we believe our metric is well-thought out and ready for use by the public, please understand that science—and by continuation this metric—is an iterative process. Therefore, some components of the meter or website may be updated or adjusted in the future if the evidence supports such a change. We will make every effort to make any future changes as transparent as possible, and this document as well as the website will be updated to reflect such changes.

2. Metric data and calculation

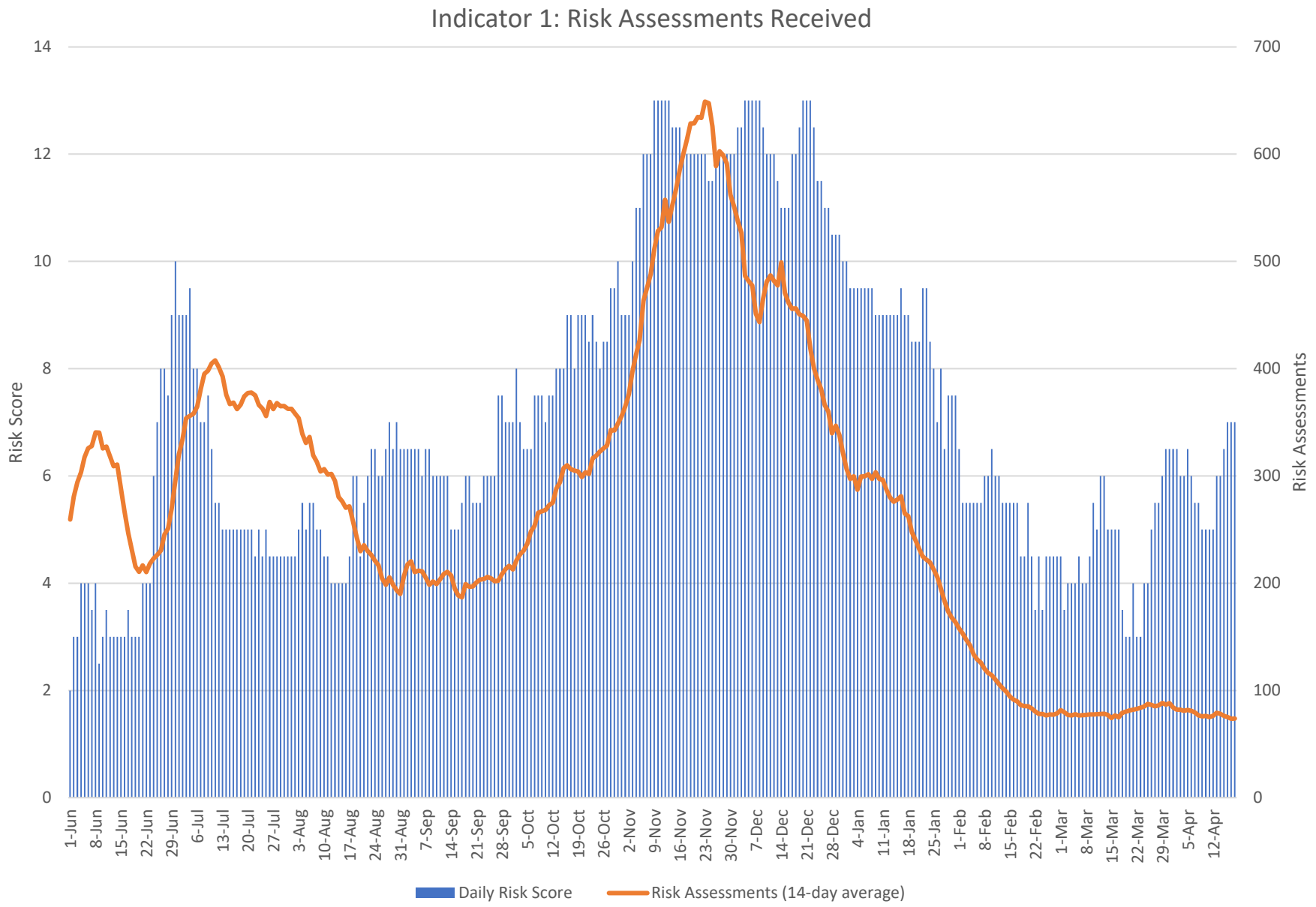
The meter is based on daily statistics that are aggregated and weighted to create a composite score every day and an aggregate score that reports risk for a given week. We have included five key metrics, as listed below, that we believe provide a comprehensive picture of the current, overall burden of

https://tmrpa.org/files/data/COVID/COVID_RiskMeter_Methodology_11192020.pdf

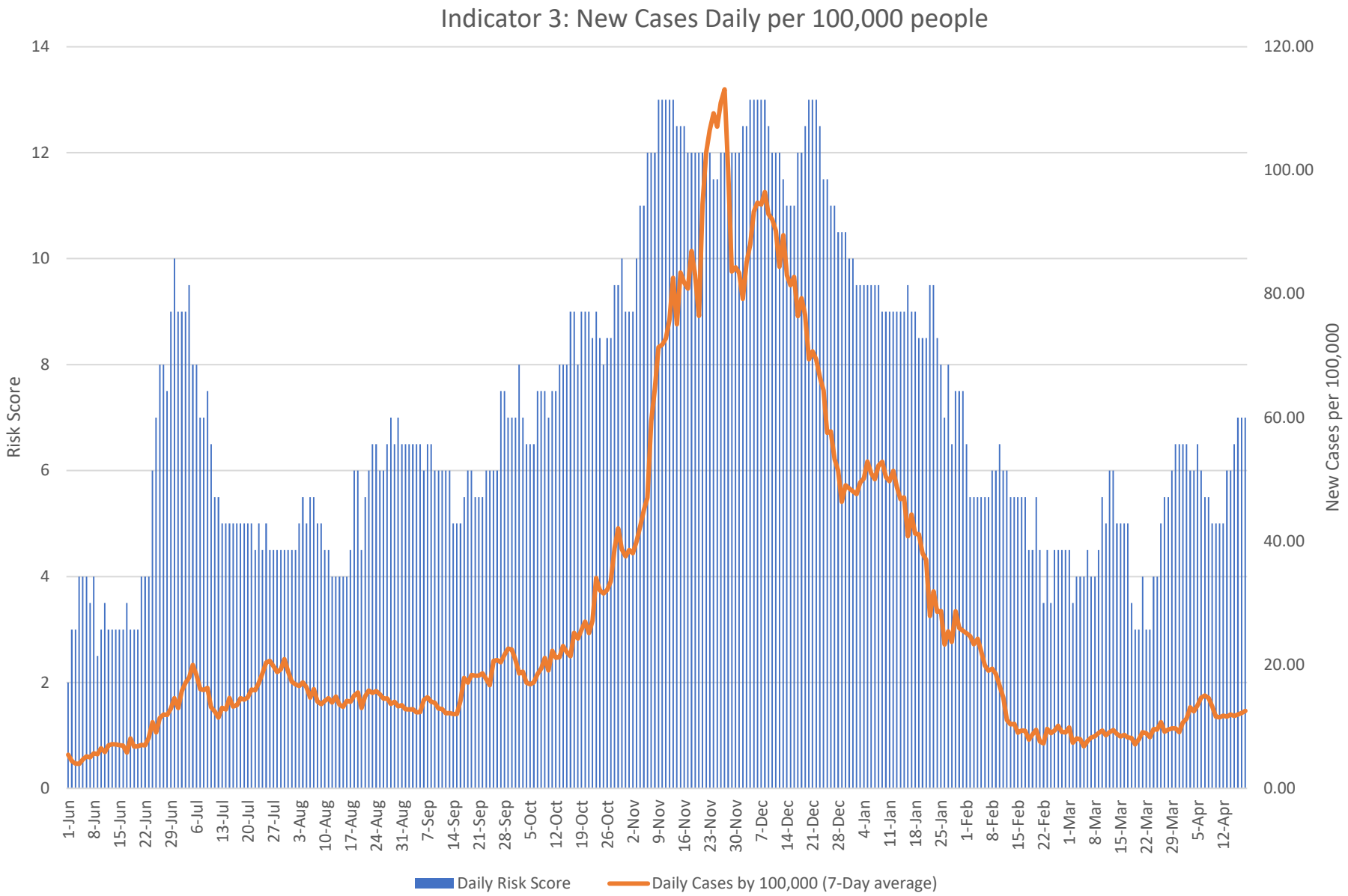


Color	Rating	Model Breaks
Purple	Severe	> 13
Red 2	Very High	> 11 & <= 13
Red 1	Very High	> 9 & <= 11
Orange 2	High	> 7 & <= 9
Orange 1	High	> 5 & <= 7
Yellow 2	Moderate	> 3 & <= 5
Yellow 1	Moderate	> 1 & <= 3
Green	Low	<= 1

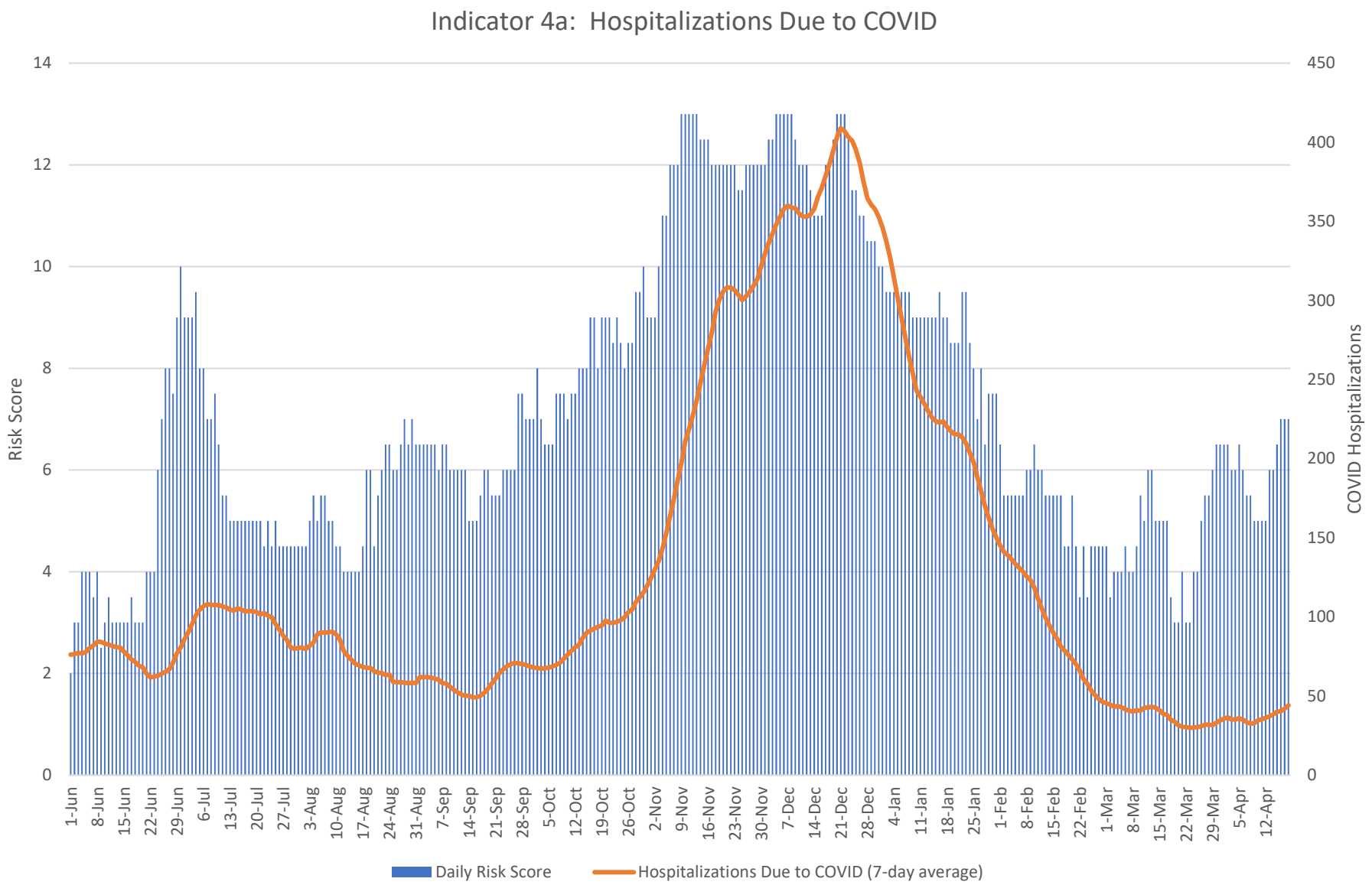
Risk Meter Model Performance



Risk Meter Model Performance

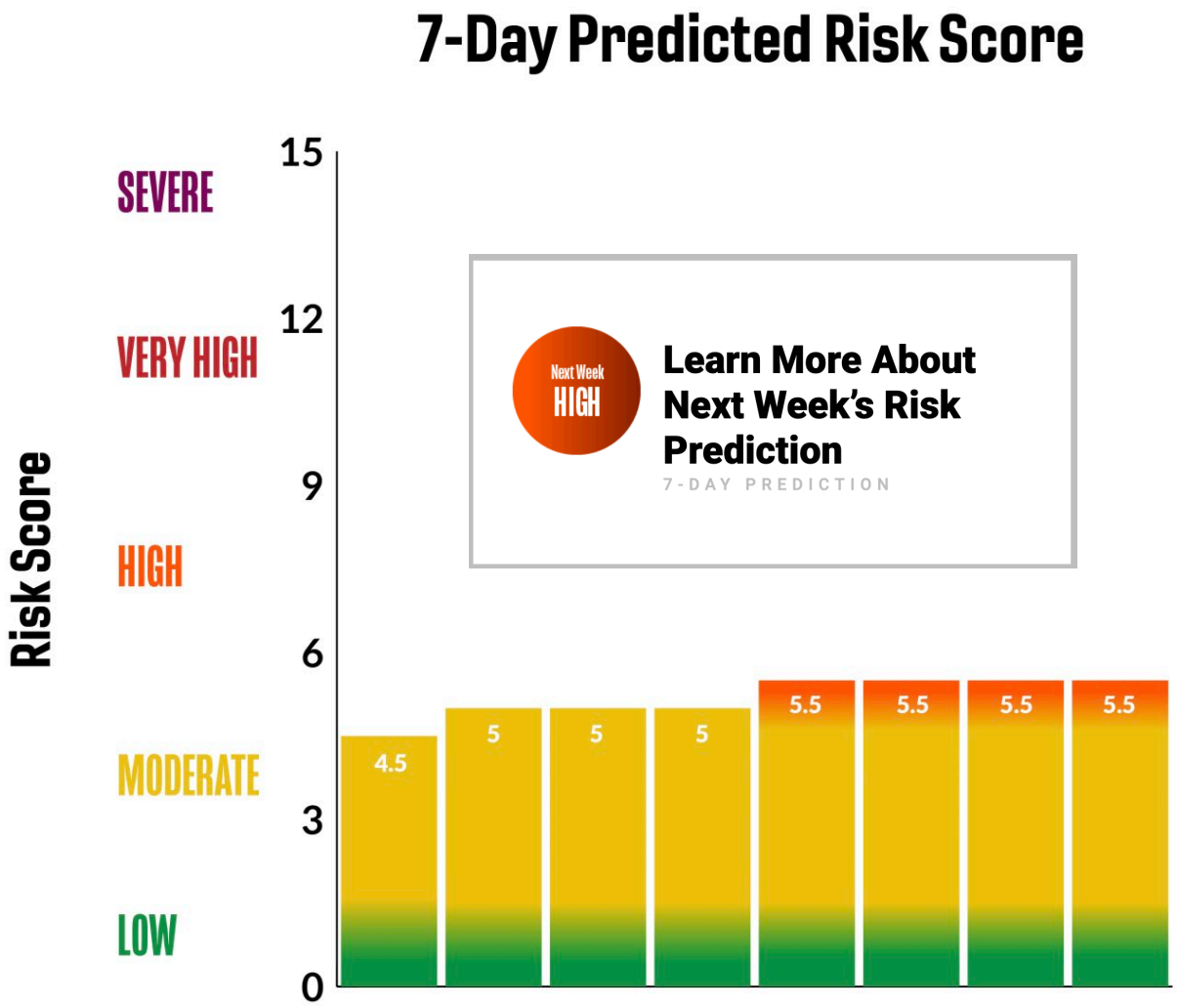


Risk Meter Model Performance



Risk meter prediction

Goal: Forecast the risk upto 7 days in the future



https://covidriskmeter.org/risk-prediction/

Data: indicator variables

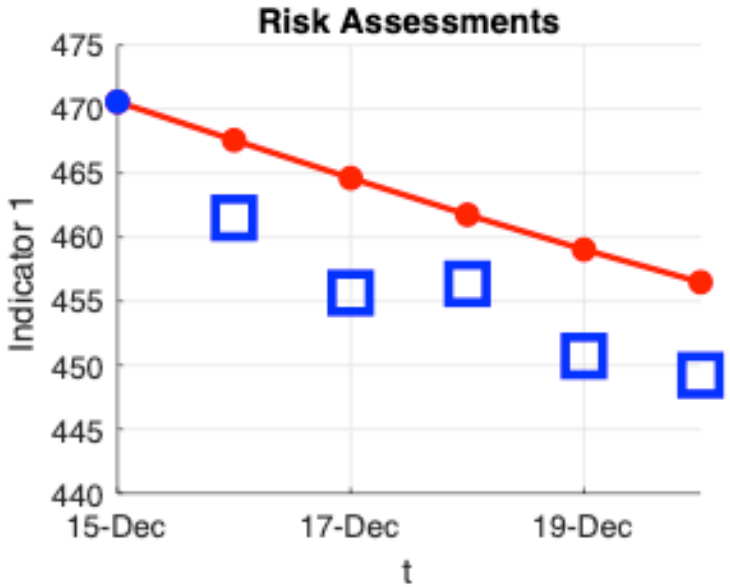
$$\boldsymbol{X} = \begin{matrix} \circ \\ \bullet \\ \bullet \end{matrix}$$

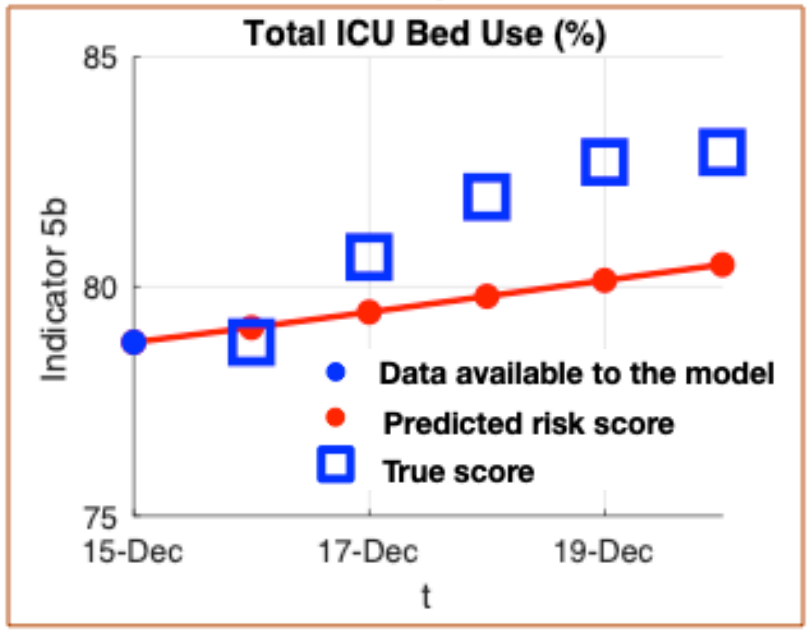
Basis function:

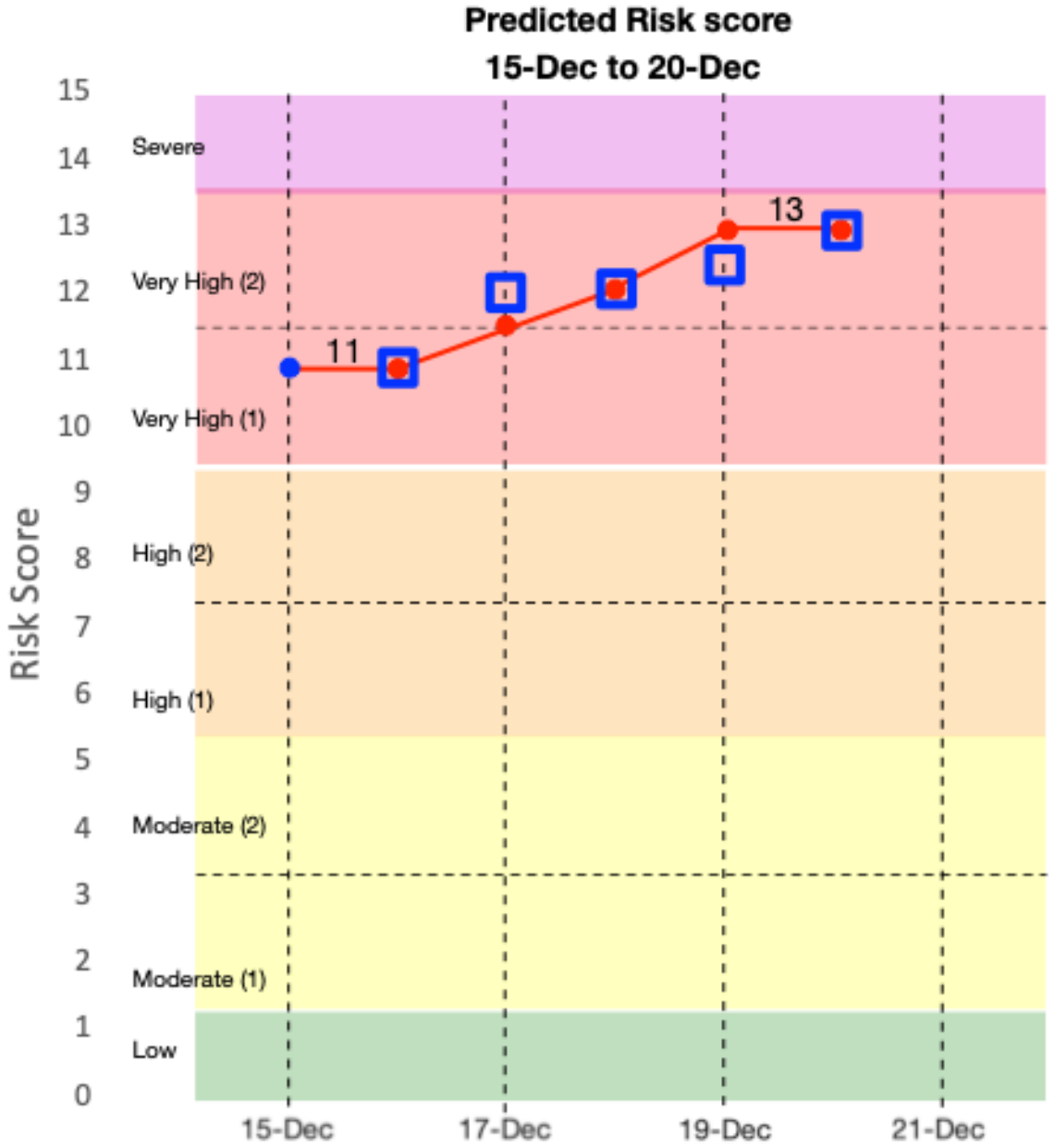
time t

Predictive model: $\dot{\boldsymbol{X}} = \boldsymbol{\Theta}(\boldsymbol{X})\Xi$

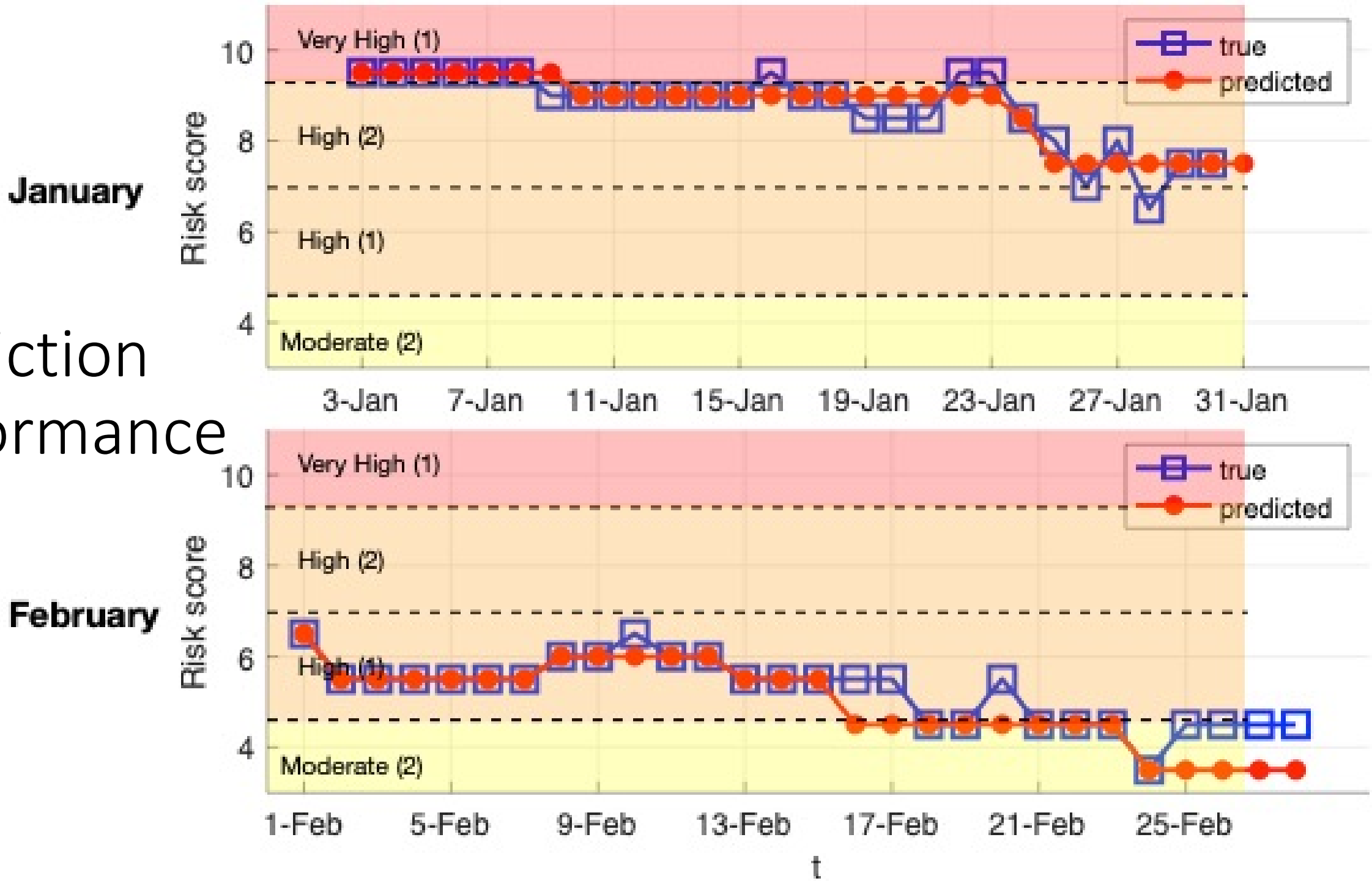
Why the surge during 15 -20 December?







Prediction Performance



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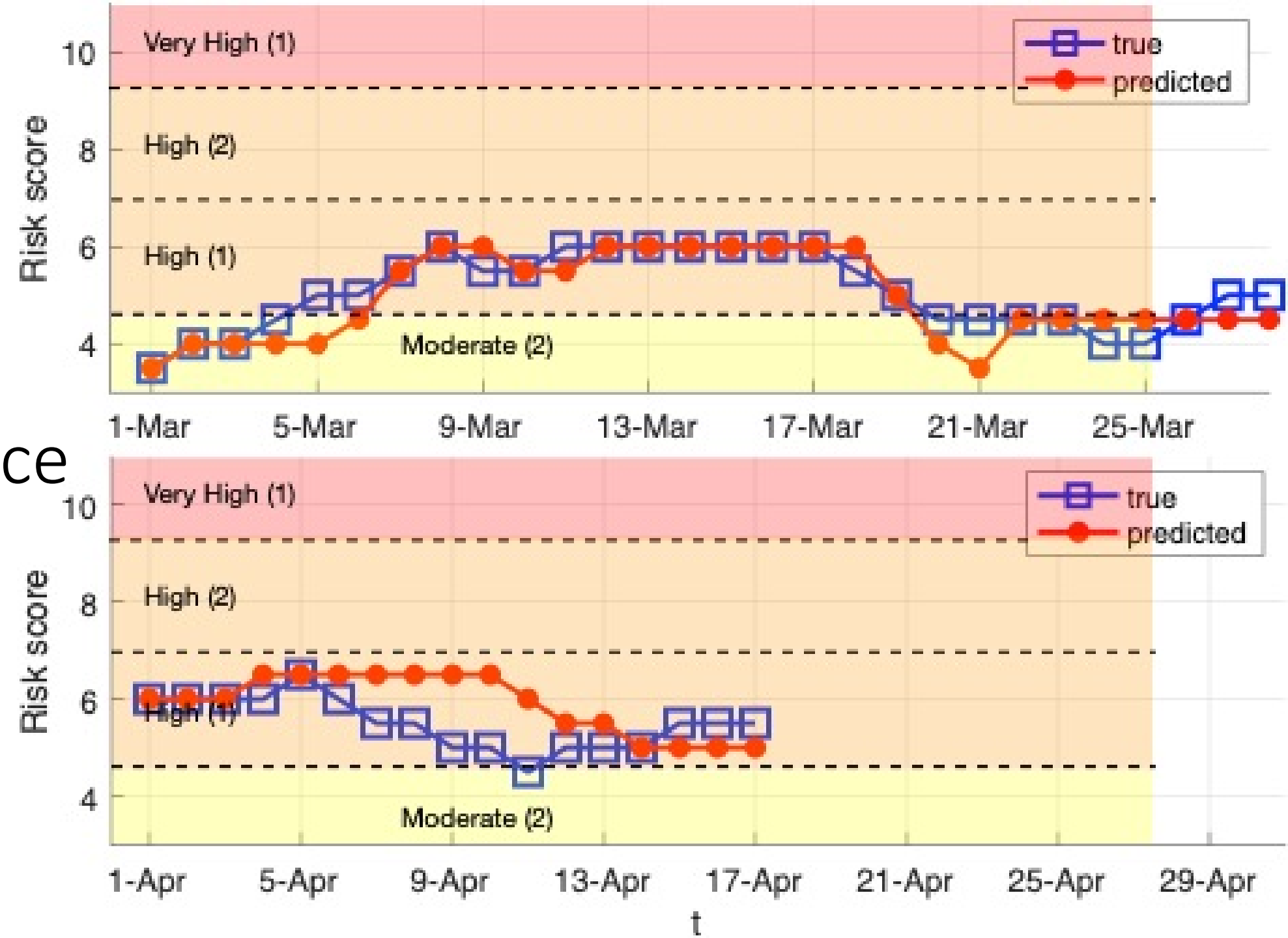

Where are we heading?