

IDEA model fits to daily Canadian COVID-19 data

22-May-2020

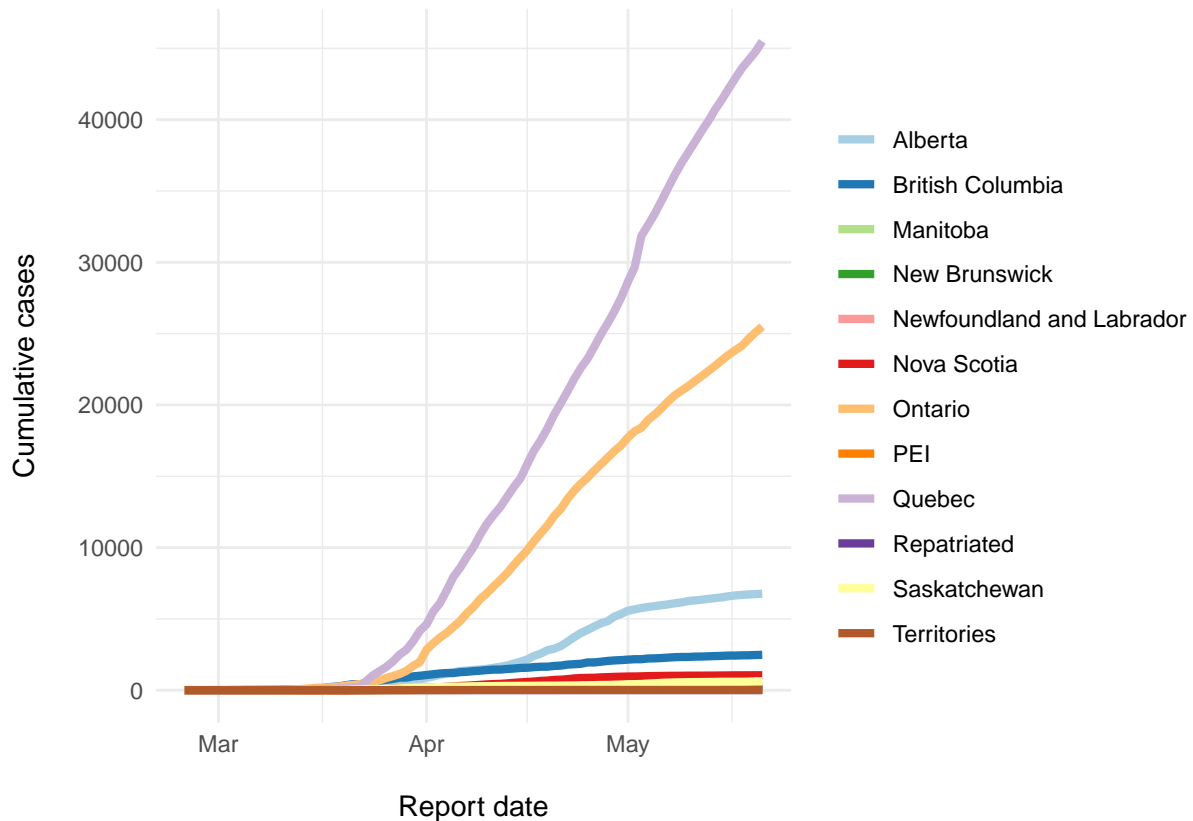


Figure 1: Cumulative cases

Overview

Daily fits to reported case counts are presented for provinces/regions reporting substantial COVID-19 activity using the IDEA model. This report was run on 2020-05-22 06:59:42. Forecasts are based on reported case data up to 2020-05-21. Data are collected by the [COVID-19 Canada Open Data Working Group](#).

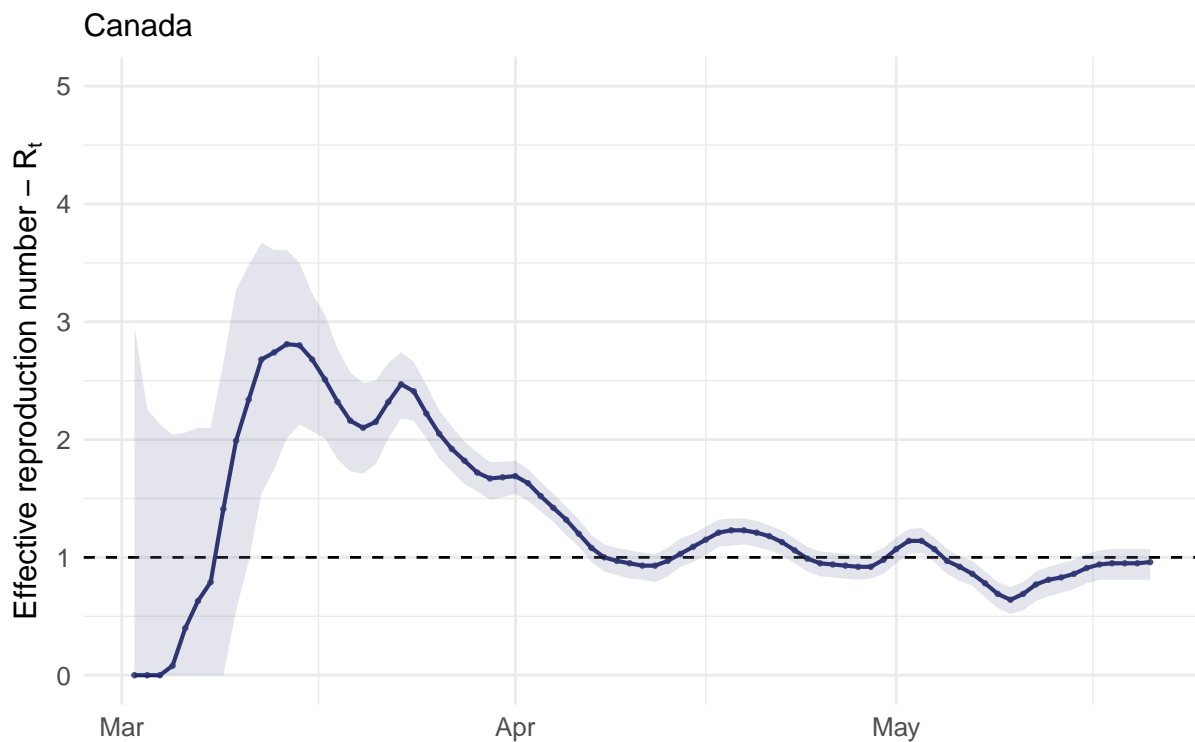
For each province, we show the model fit to incident and cumulative cases. We also include a daily estimate of the discount factor (d). The metric provides a measure of the degree of control that is occurring. A larger value is better - it suggests more control and therefore slowing epidemic growth. The value of d is estimated every day, using all of the case data up to the date of estimation. When estimates of d are stable (no large swings), this suggests that the model estimates are reliable. Large swings in estimates of d over time suggest unstable model estimates and less confidence in the forecasts - this may indicate that a new outbreak wave is coming or a change in case definition or testing criteria (as was seen in Quebec). A decline in d corresponds to worsening control.

The effective reproduction number (R_t) is calculated over time. Our goal is for this value to be less than 1. A value <1 indicates that each old case is making less than one new case on average and the epidemic is under control. Note that we're estimating R_t using the reported case data. Ideally, we'd want to use onset or

transmission dates but since we're using publicly-reported, aggregate data across jurisdictions with different reporting lags, we're not attempting to adjust the data. The method used is described [here](#).

Table 1: Estimated effective reproductive numbers and 95% confidence intervals

Region	R _t	95% confidence interval
Canada	0.96	0.81-1.07
Alberta	0.47	0-1.04
British Columbia	0.93	0-1.96
Manitoba	1.00	0-4.57
New Brunswick	0.20	0-3.98
Newfoundland and Labrador	0.56	0-3.32
Nova Scotia	0.02	0-2.62
Ontario	1.14	0.89-1.34
Quebec	0.88	0.69-1.03
Saskatchewan	1.65	0.02-3.13



Provinces/Territories with at least 50 reported COVID-19 cases

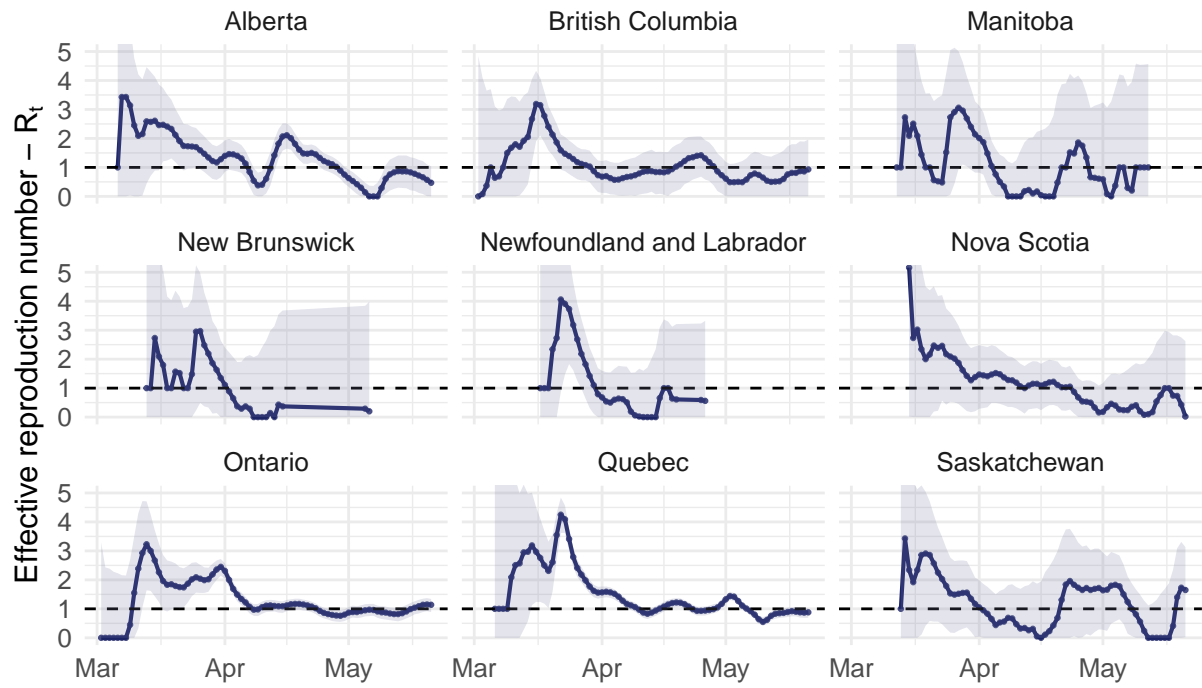


Figure 2: Alternate method for estimating effective reproductive number

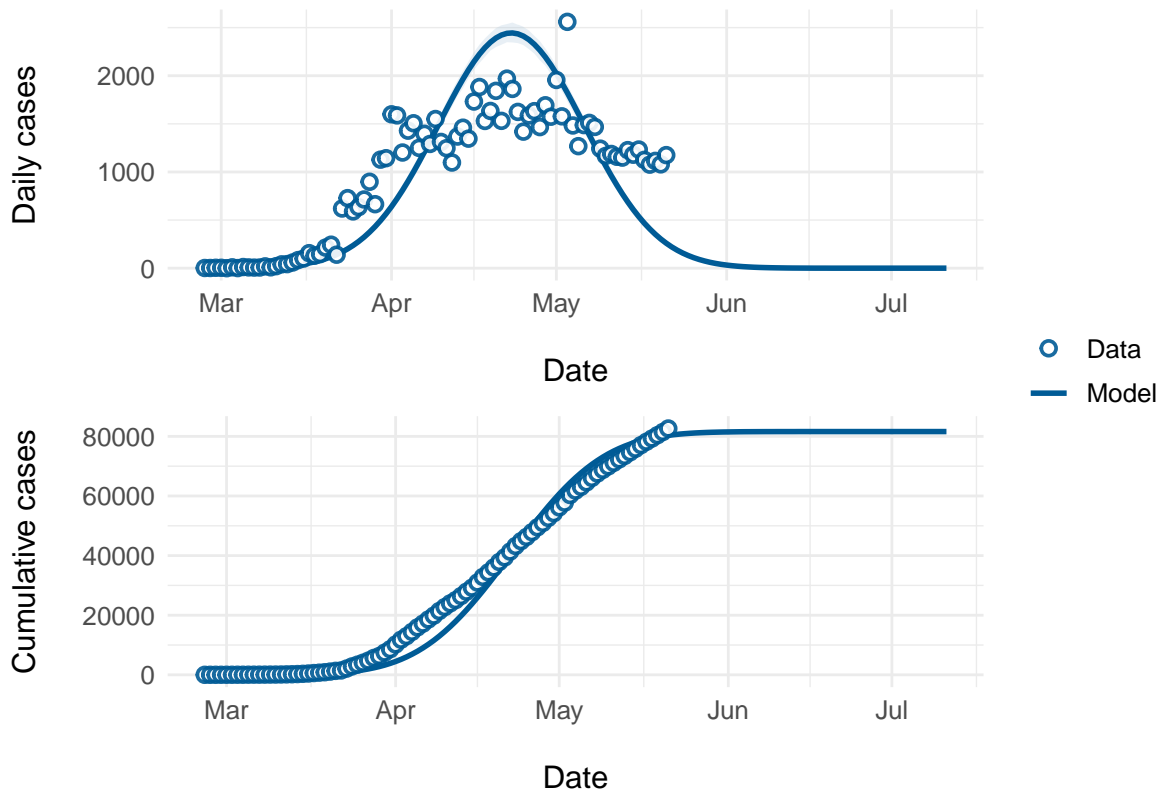


Figure 3: Canada

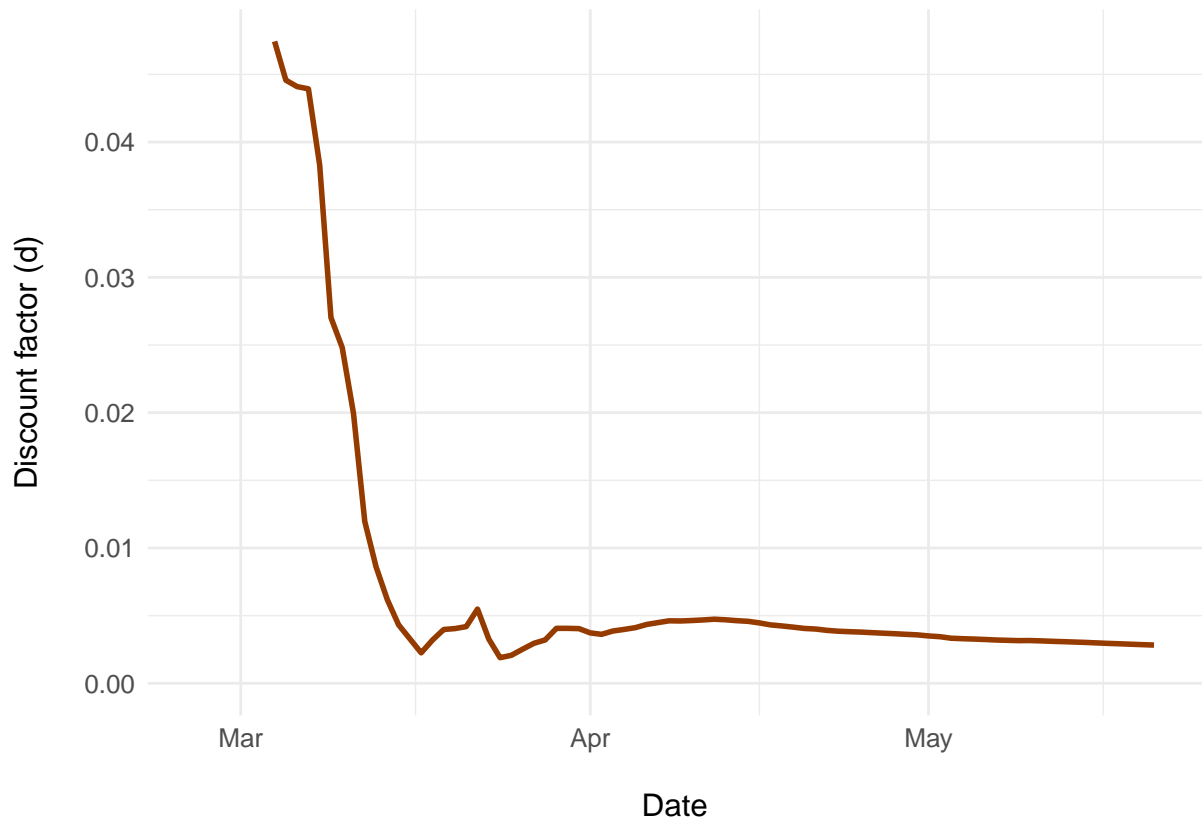


Figure 4: Discount factor - Canada

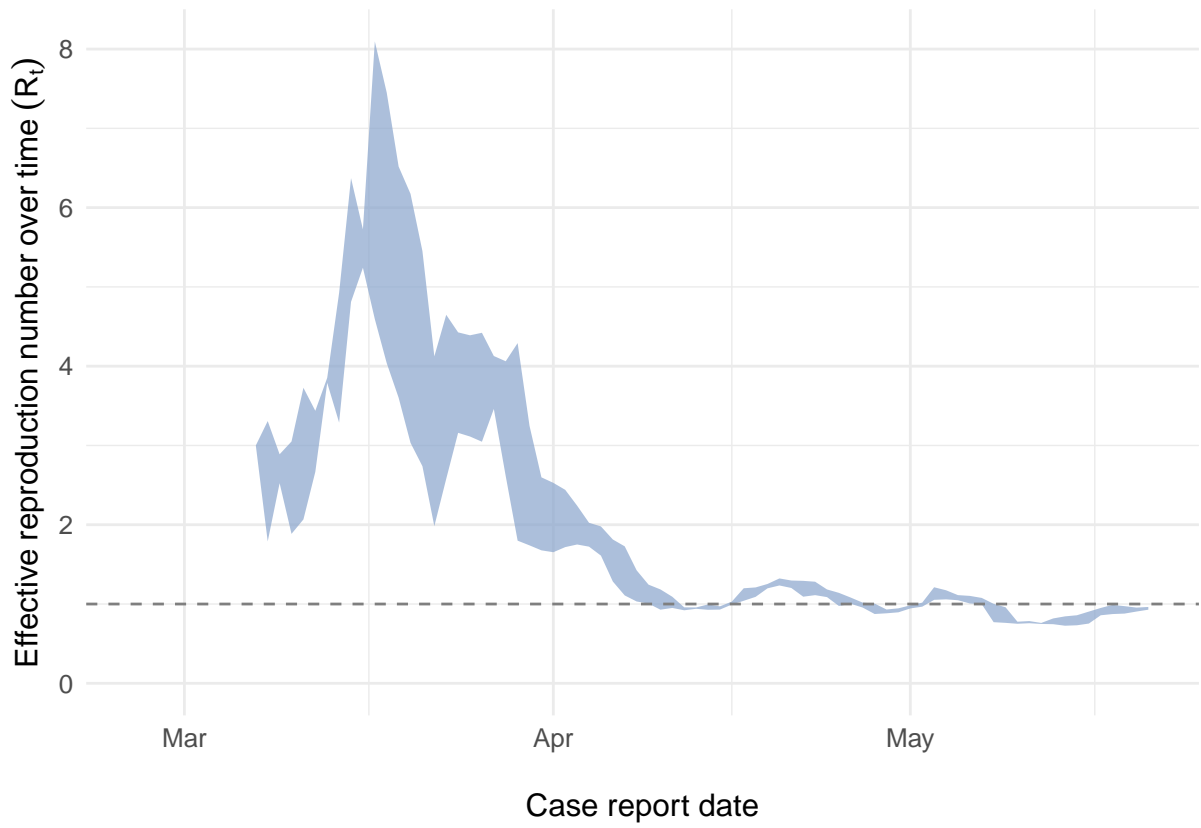


Figure 5: Effective reproductive number - Canada

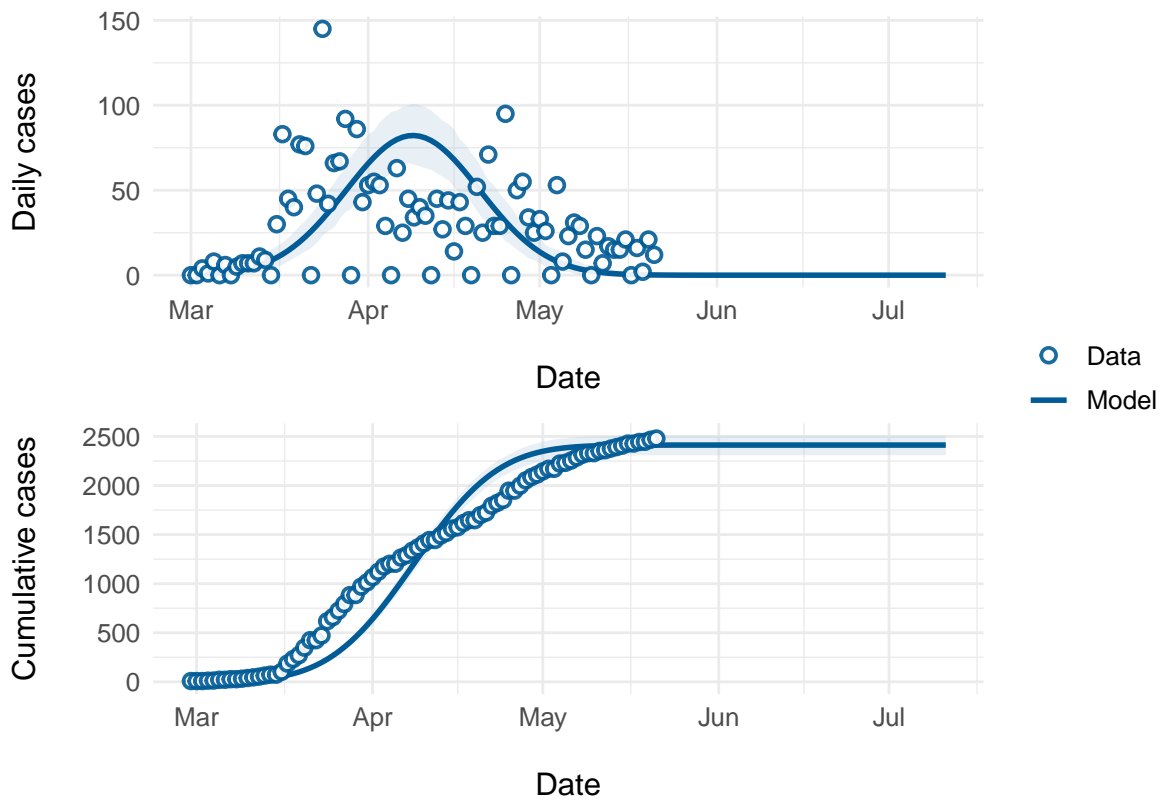


Figure 6: British Columbia

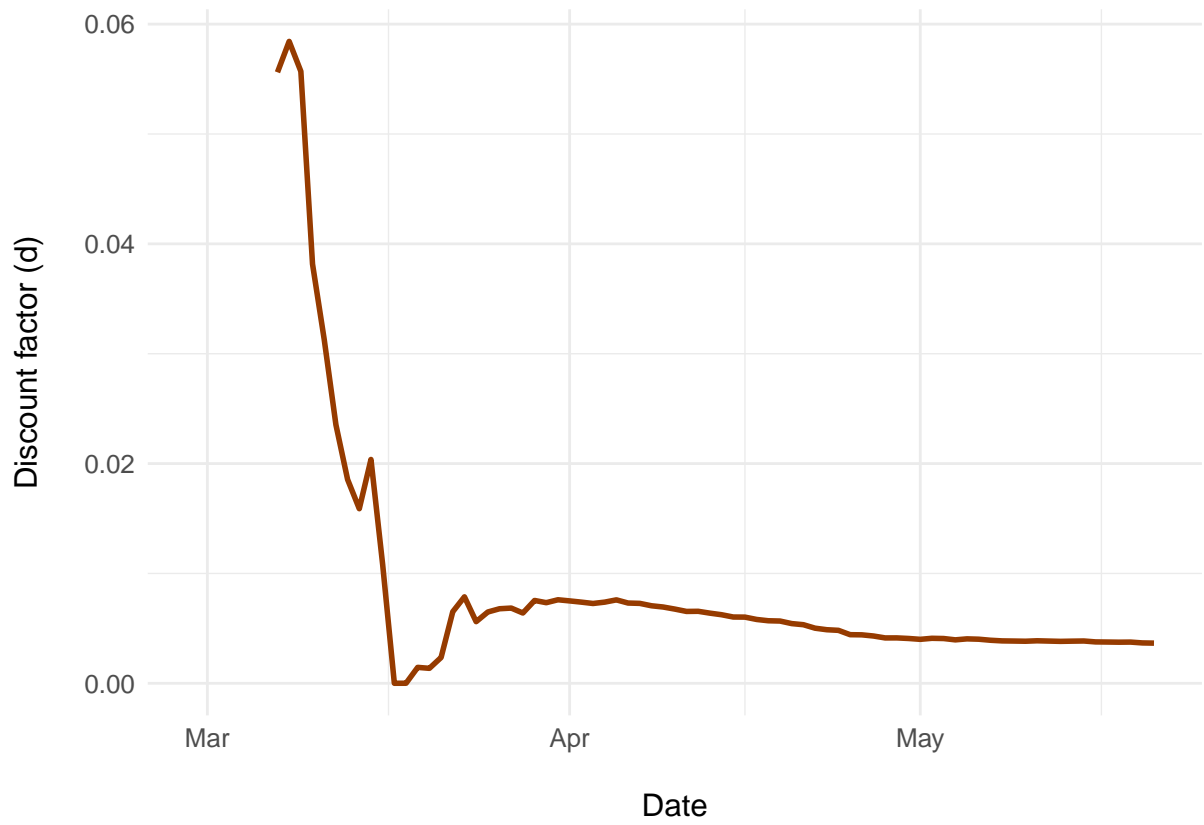


Figure 7: Discount factor - British Columbia

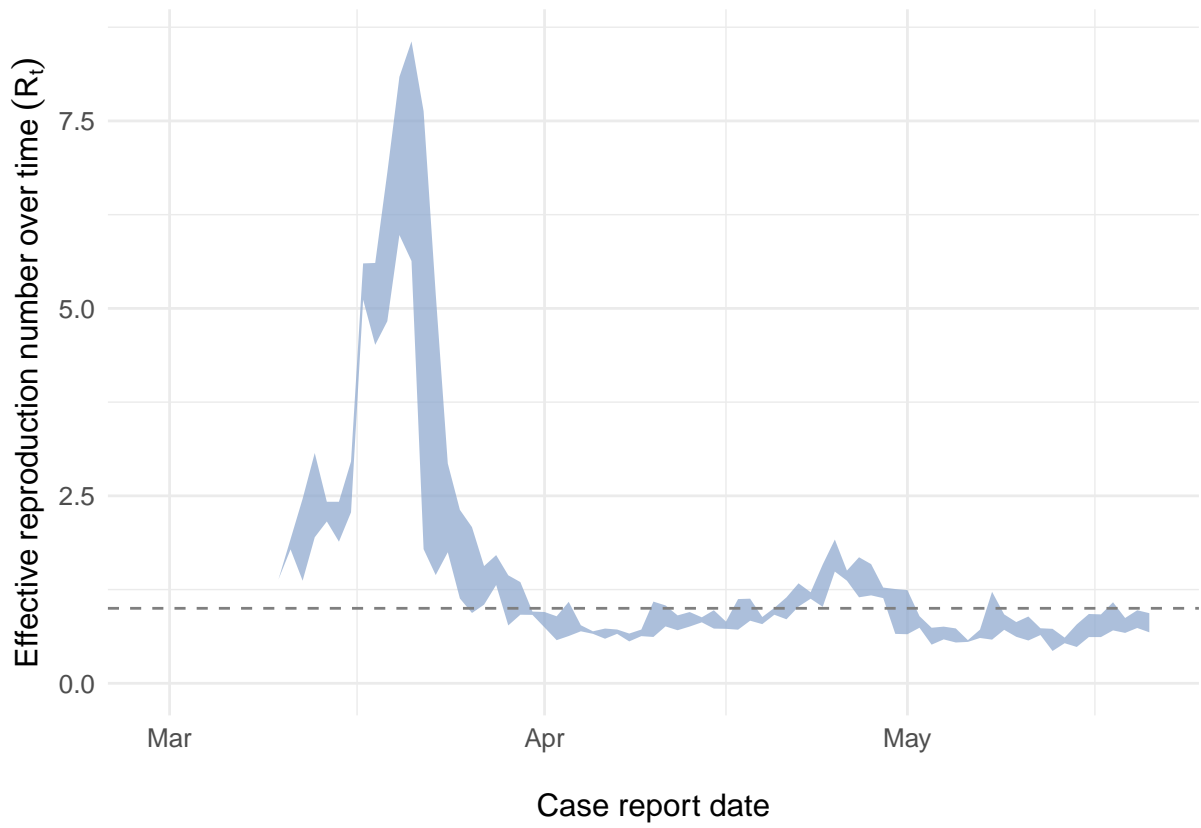


Figure 8: Effective reproductive number - British Columbia

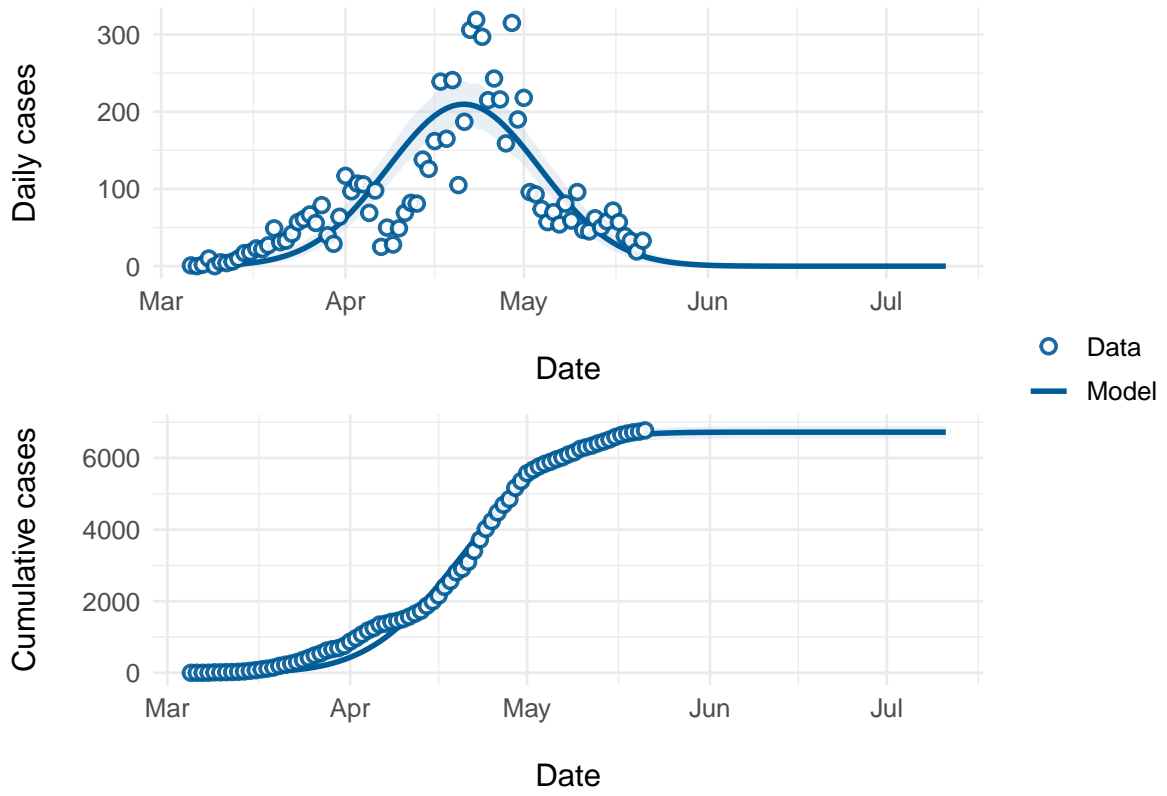


Figure 9: Alberta

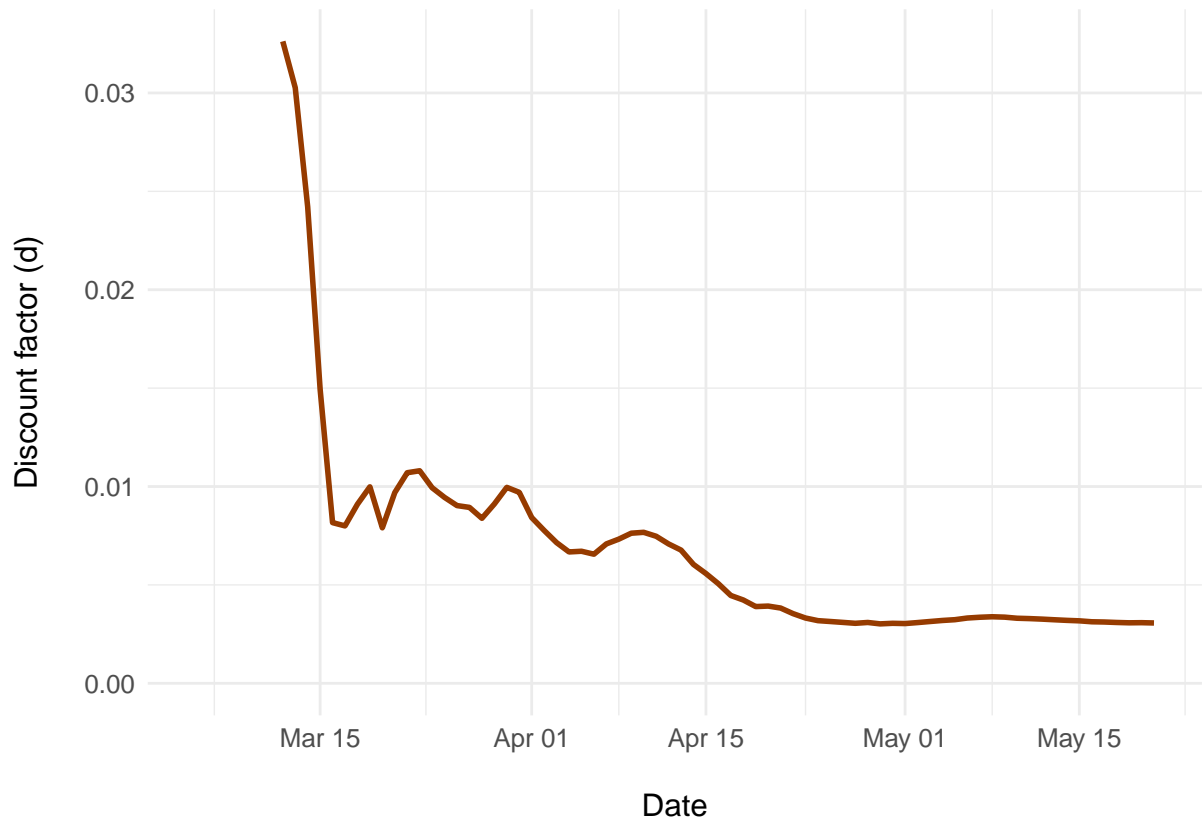


Figure 10: Discount factor - Alberta

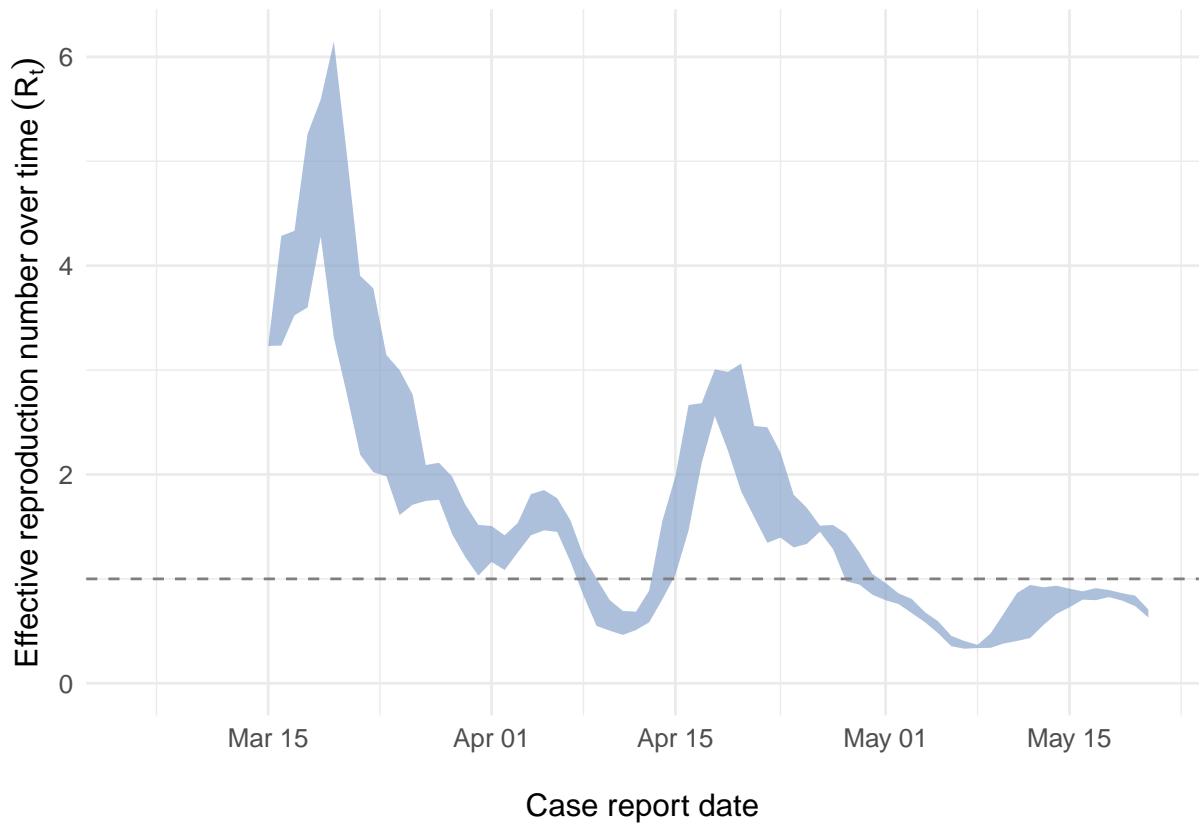


Figure 11: Effective reproductive number - Alberta

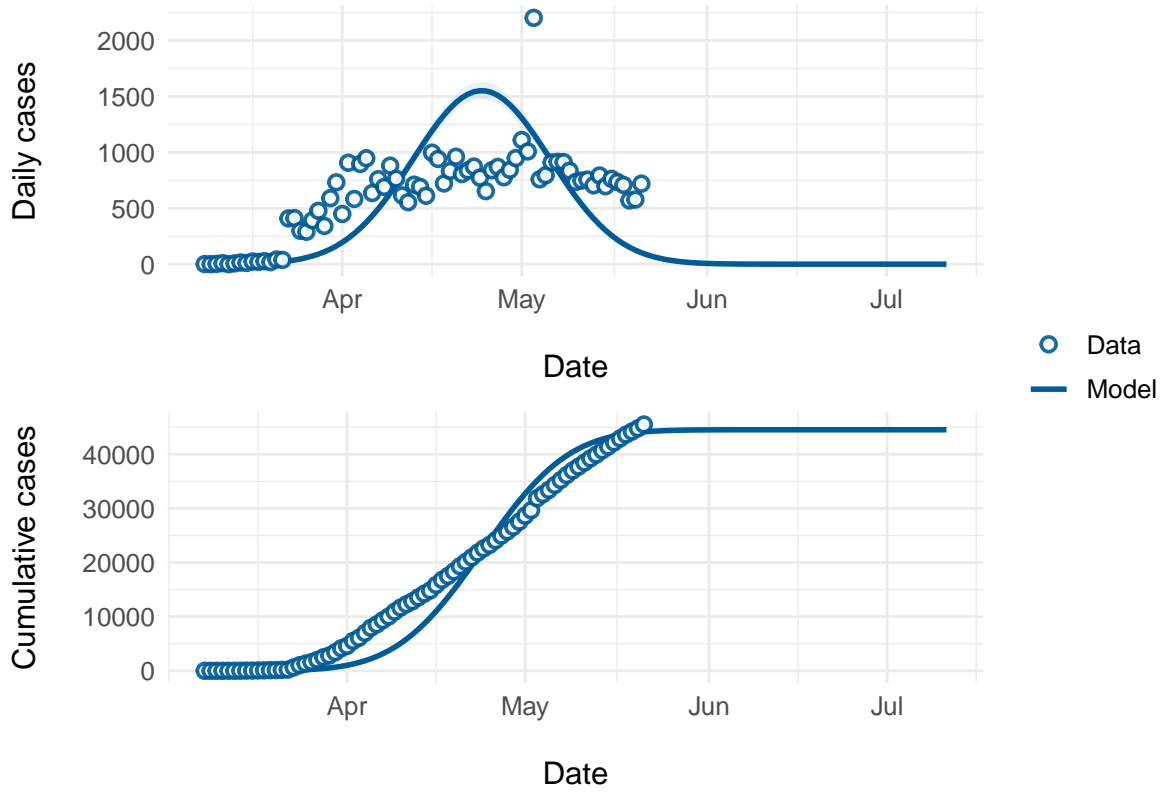


Figure 12: Quebec

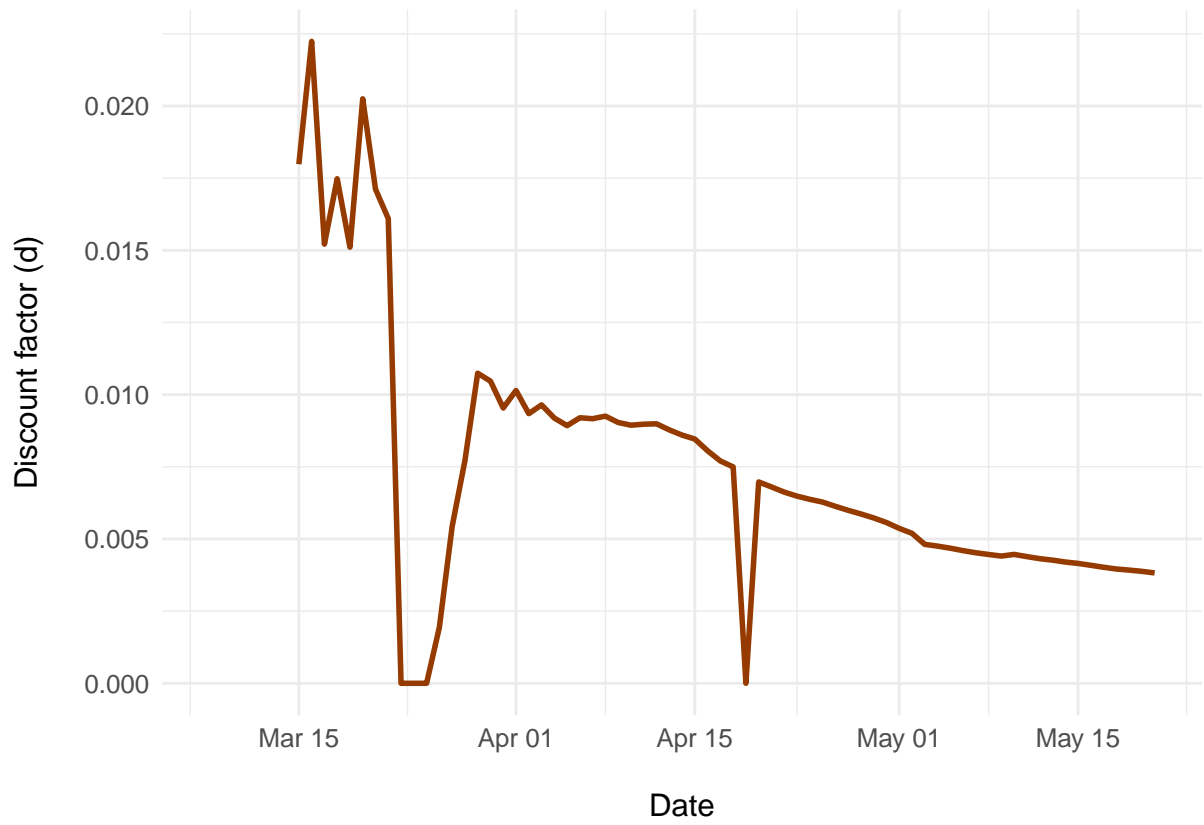


Figure 13: Discount factor - Quebec

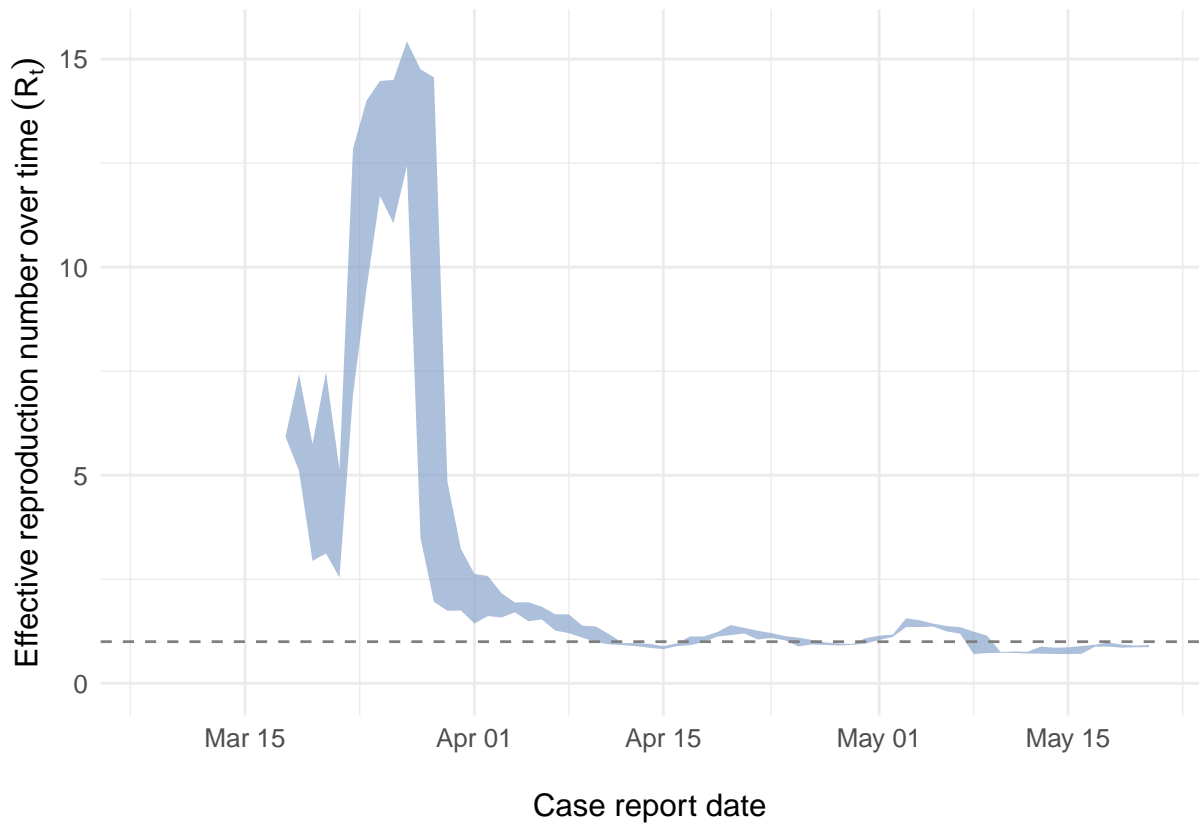


Figure 14: Effective reproductive number - Quebec

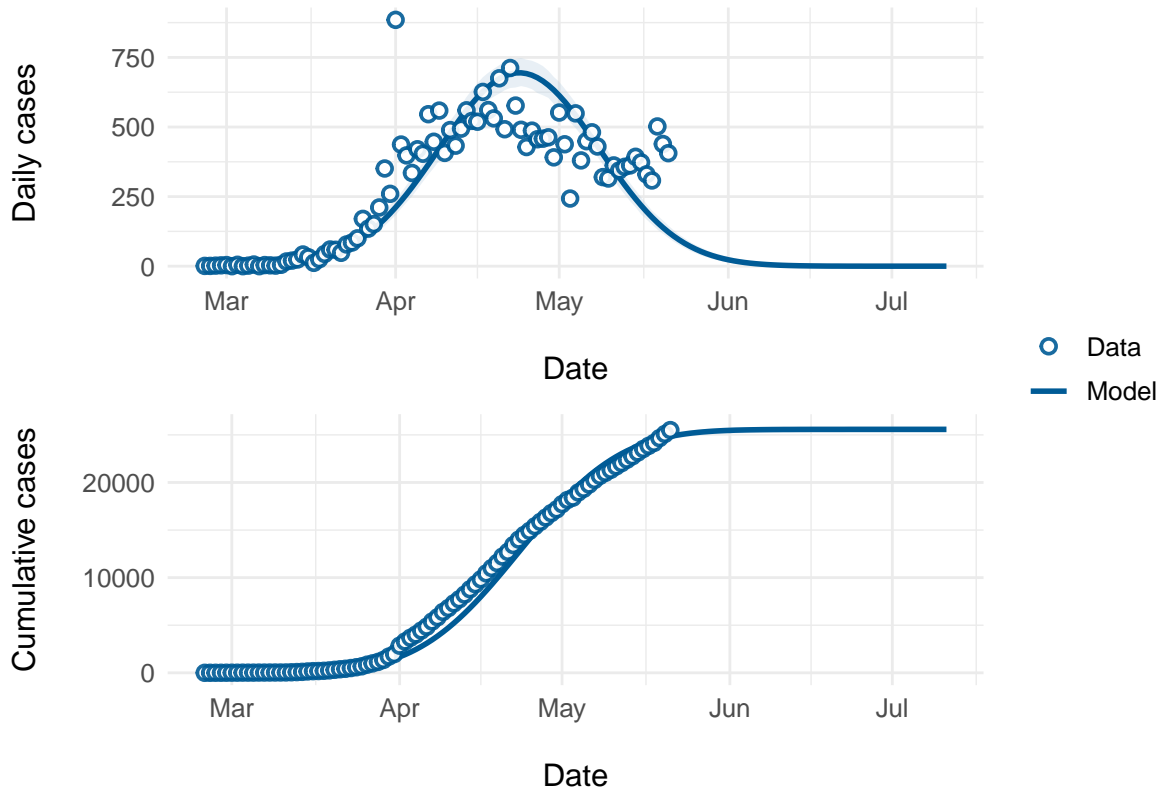


Figure 15: Ontario

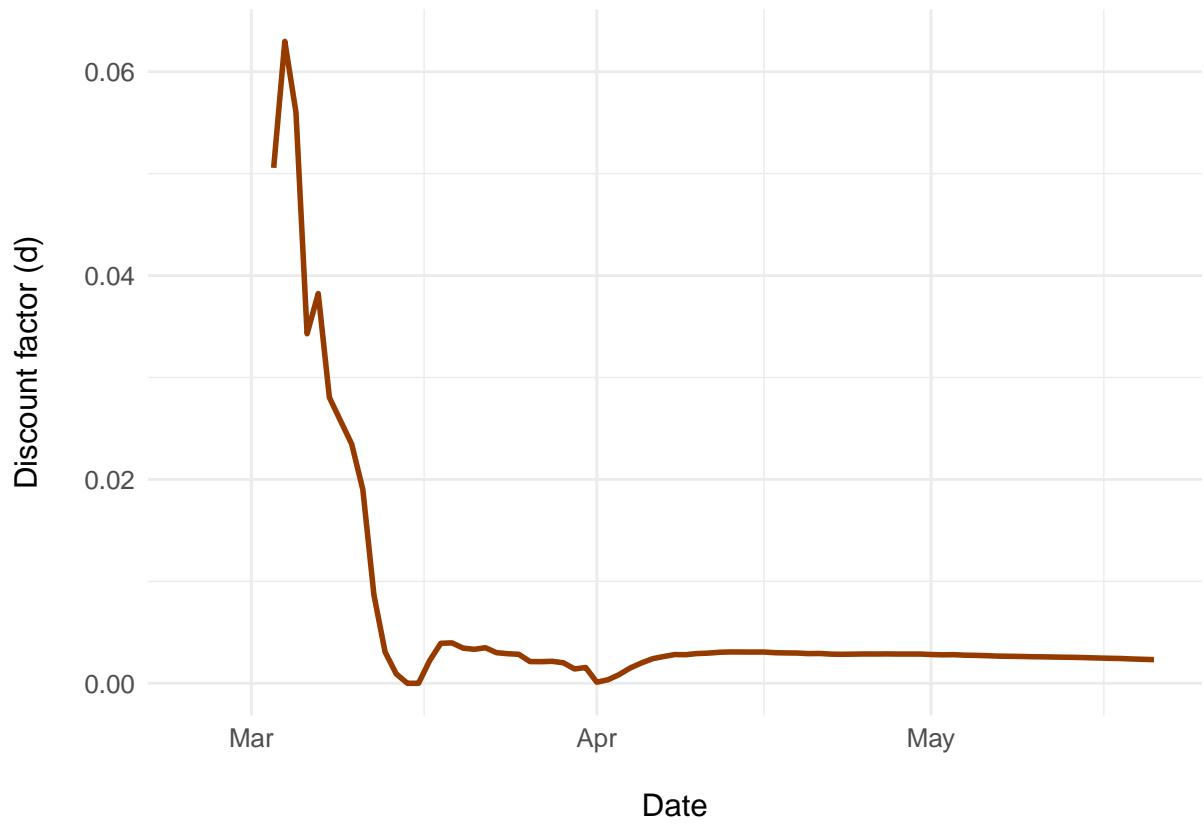


Figure 16: Discount factor - Ontario

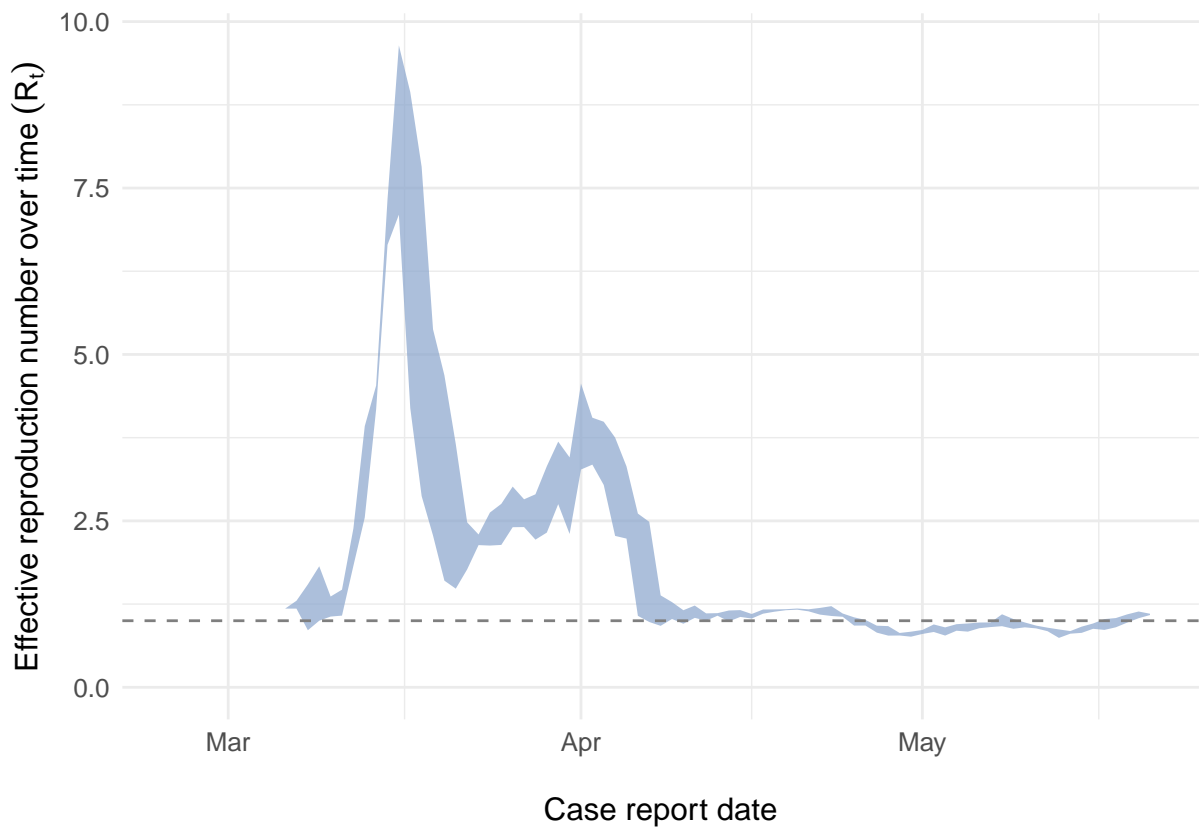


Figure 17: Effective reproductive number - Ontario

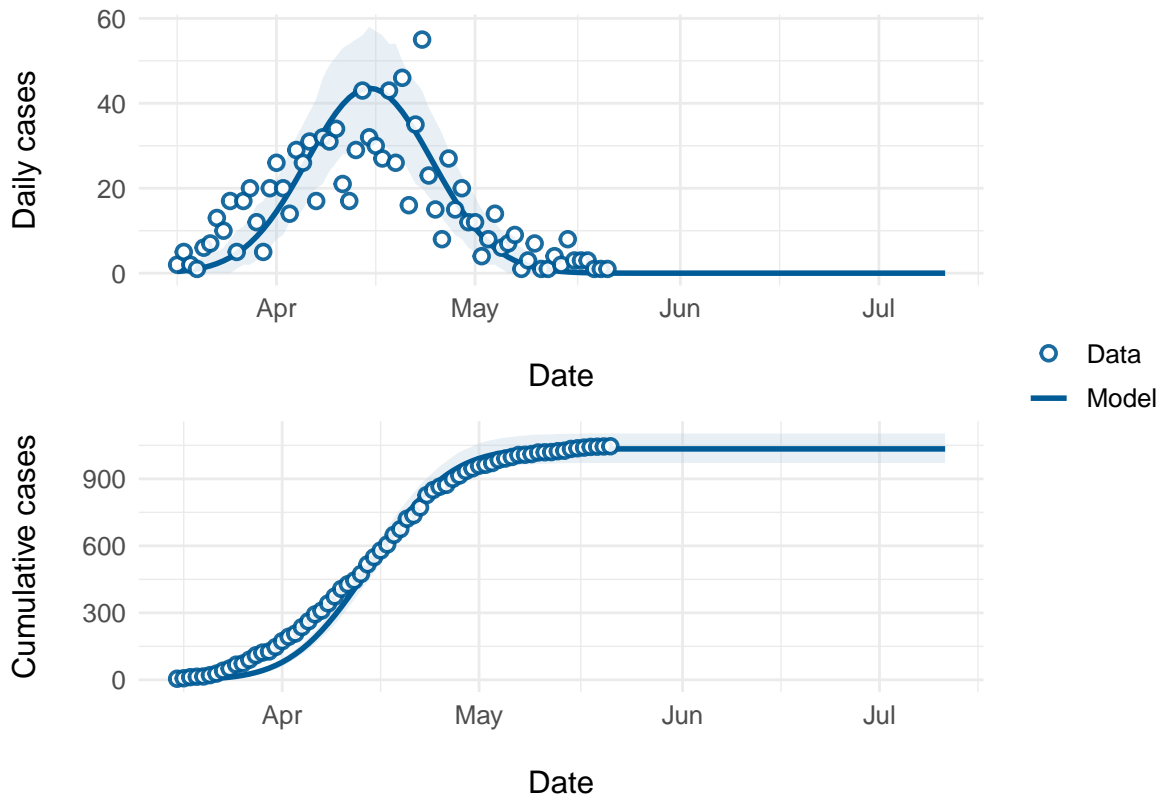


Figure 18: Nova Scotia

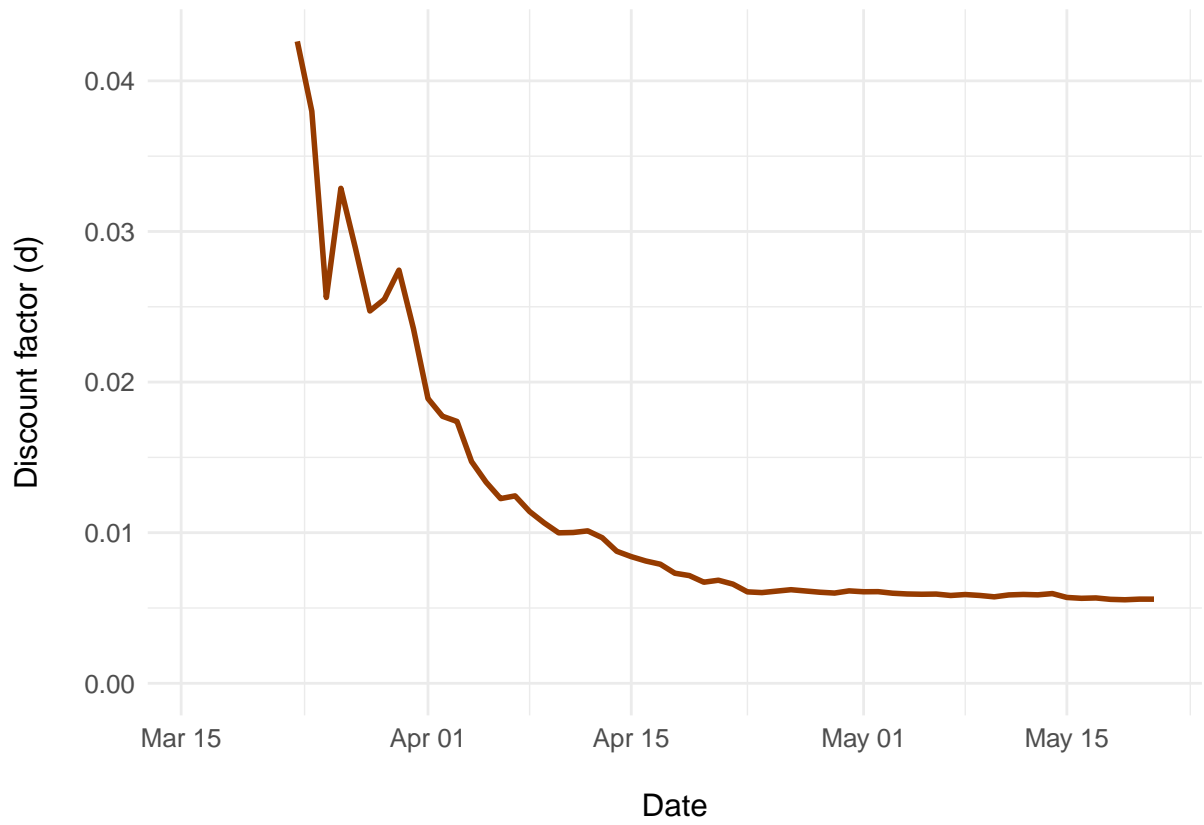


Figure 19: Discount factor - Nova Scotia

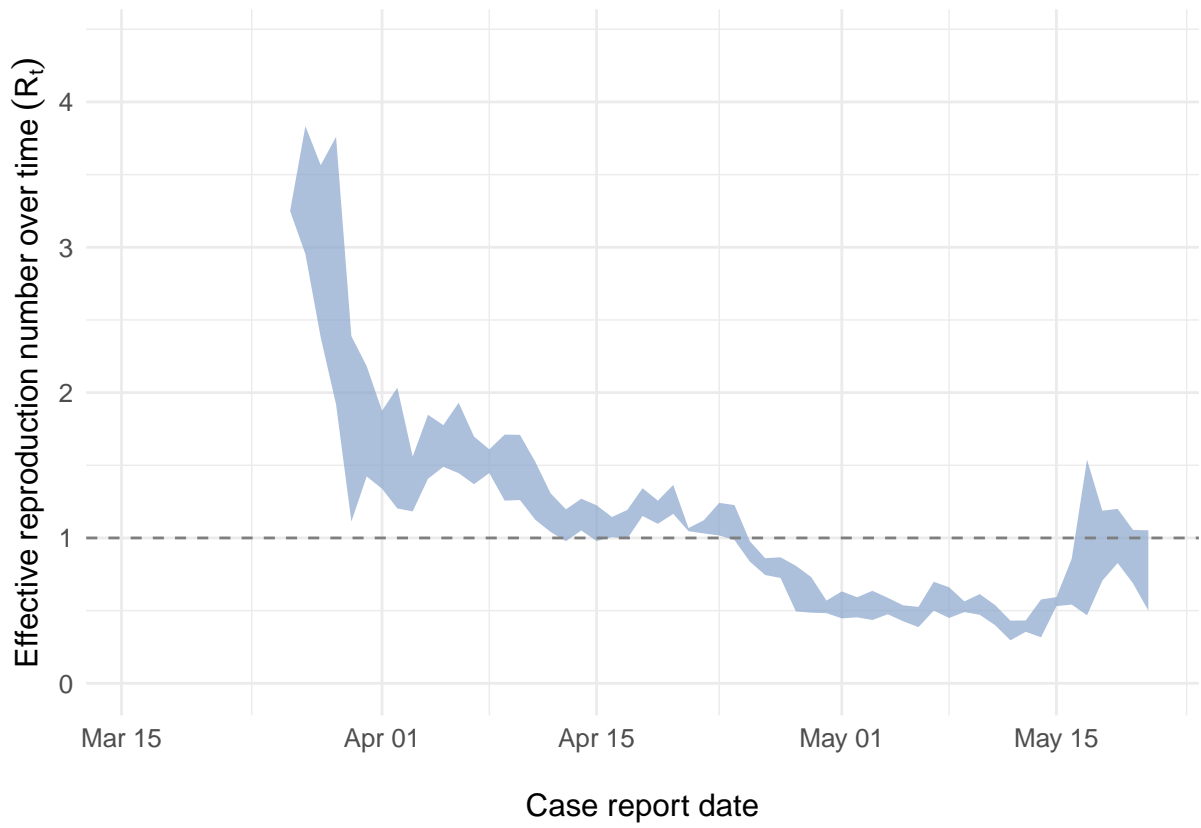


Figure 20: Effective reproductive number - Nova Scotia

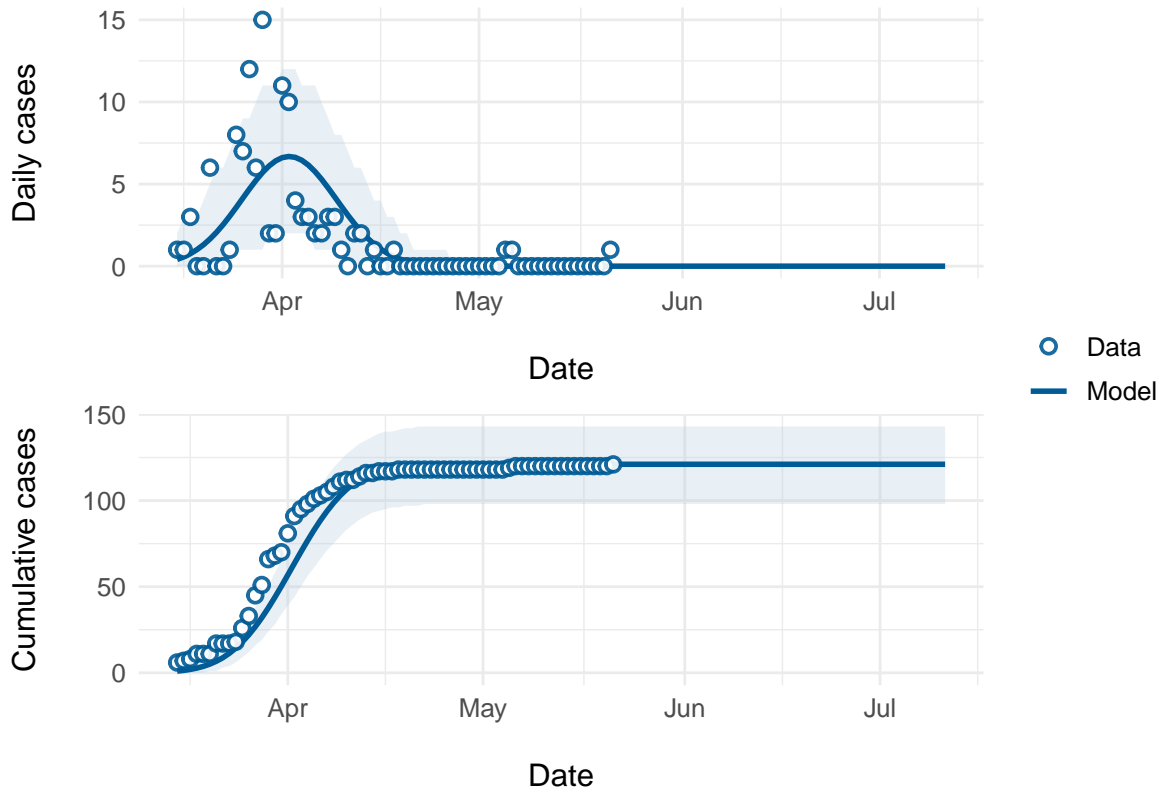


Figure 21: New Brunswick

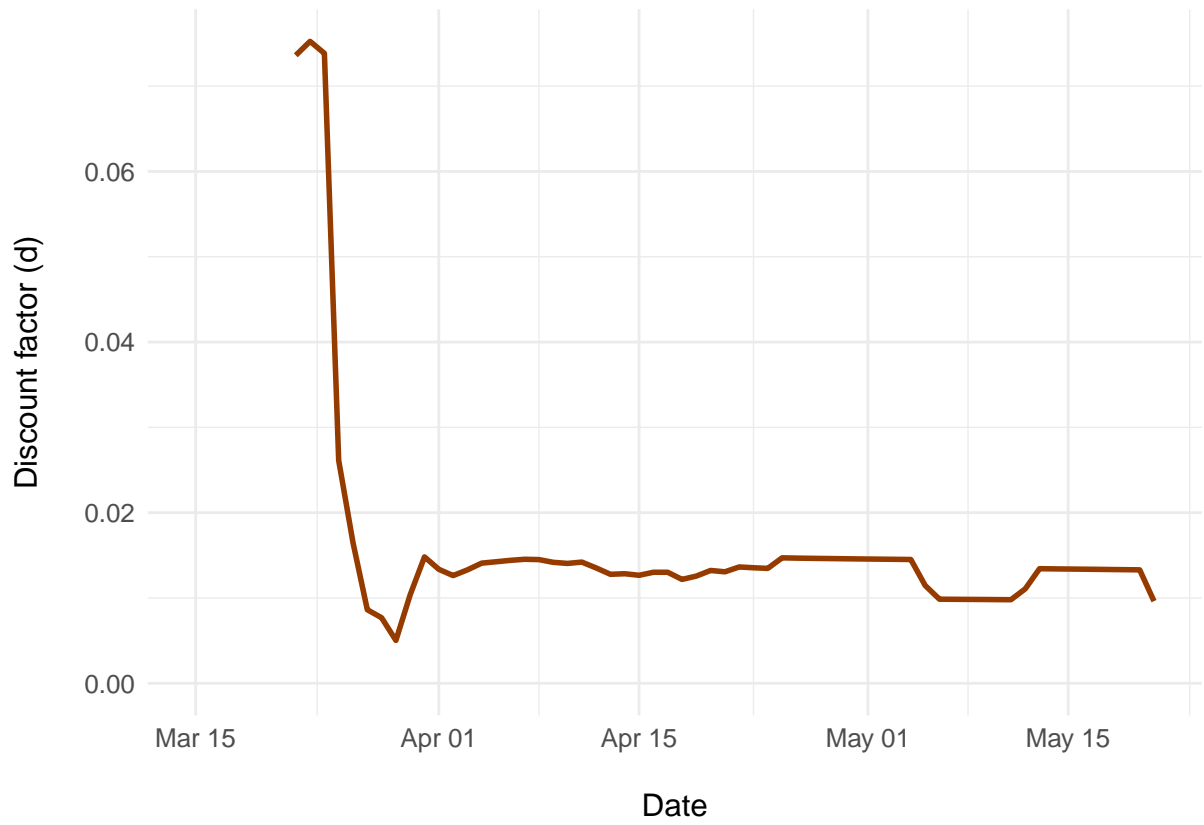


Figure 22: Discount factor - New Brunswick

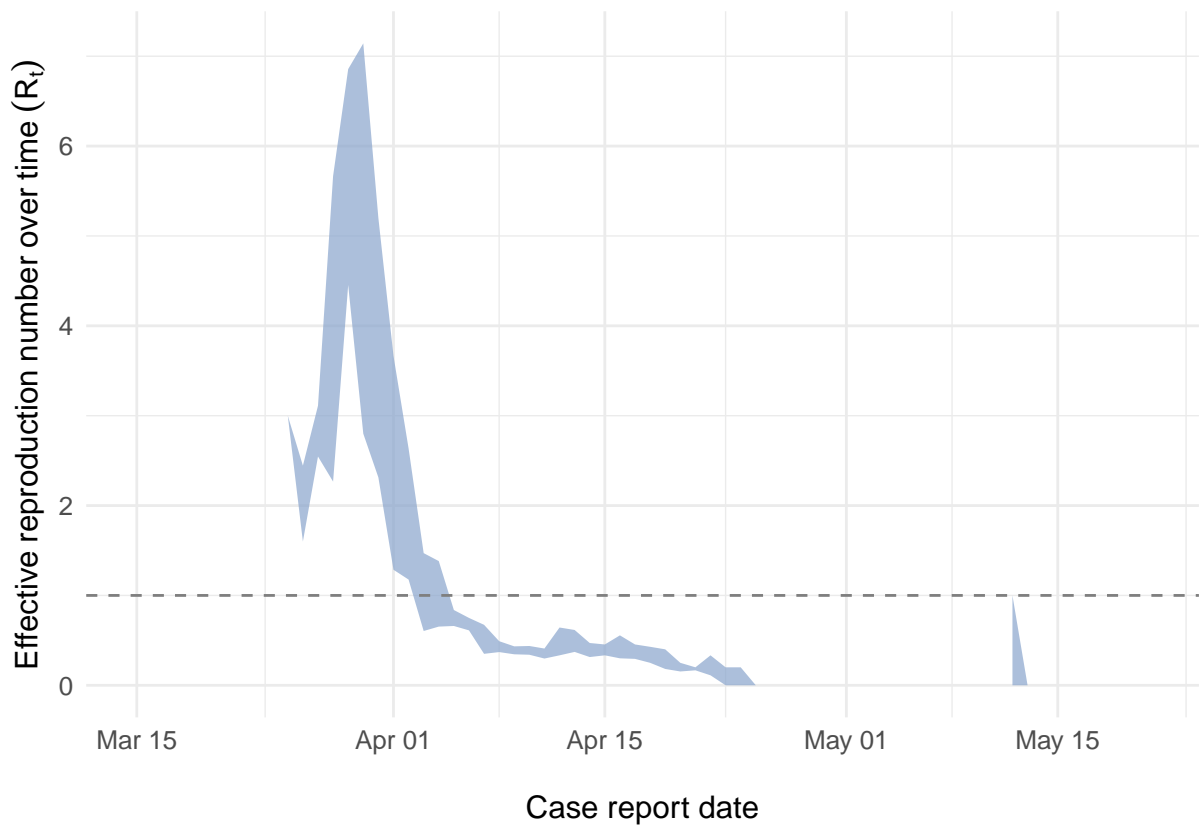


Figure 23: Effective reproductive number - New Brunswick

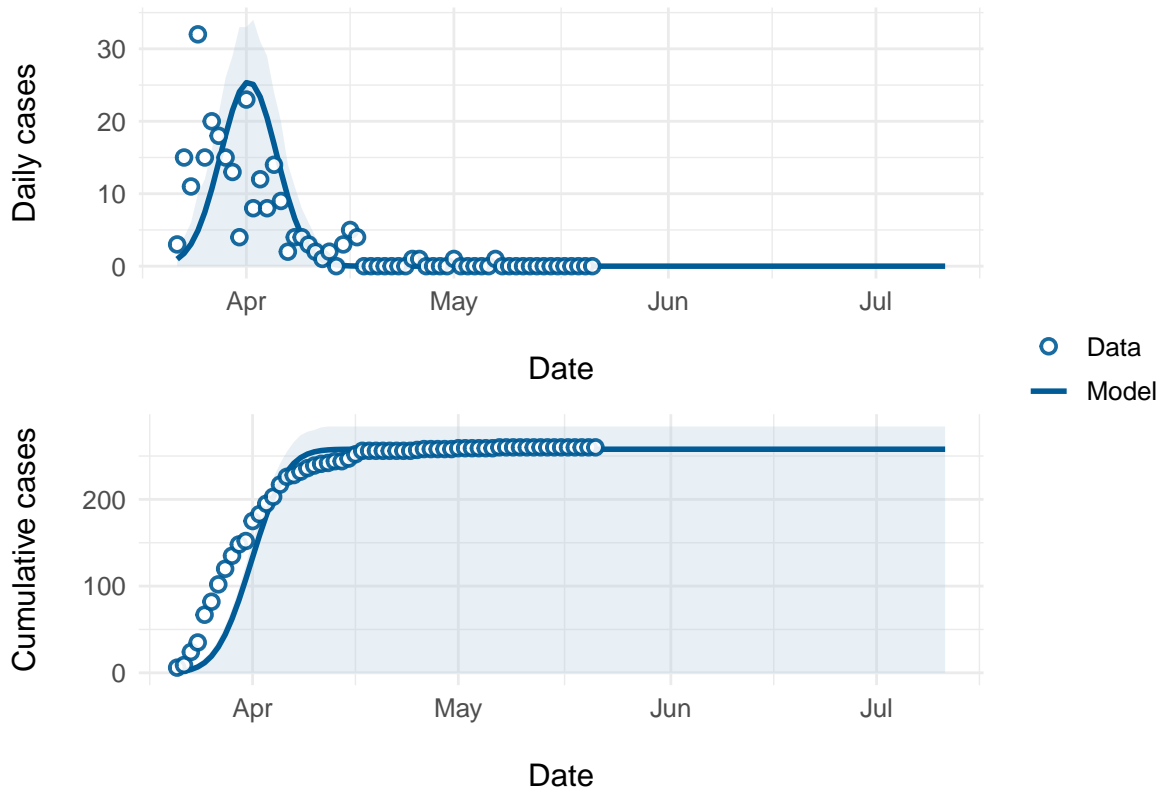


Figure 24: Newfoundland and Labrador

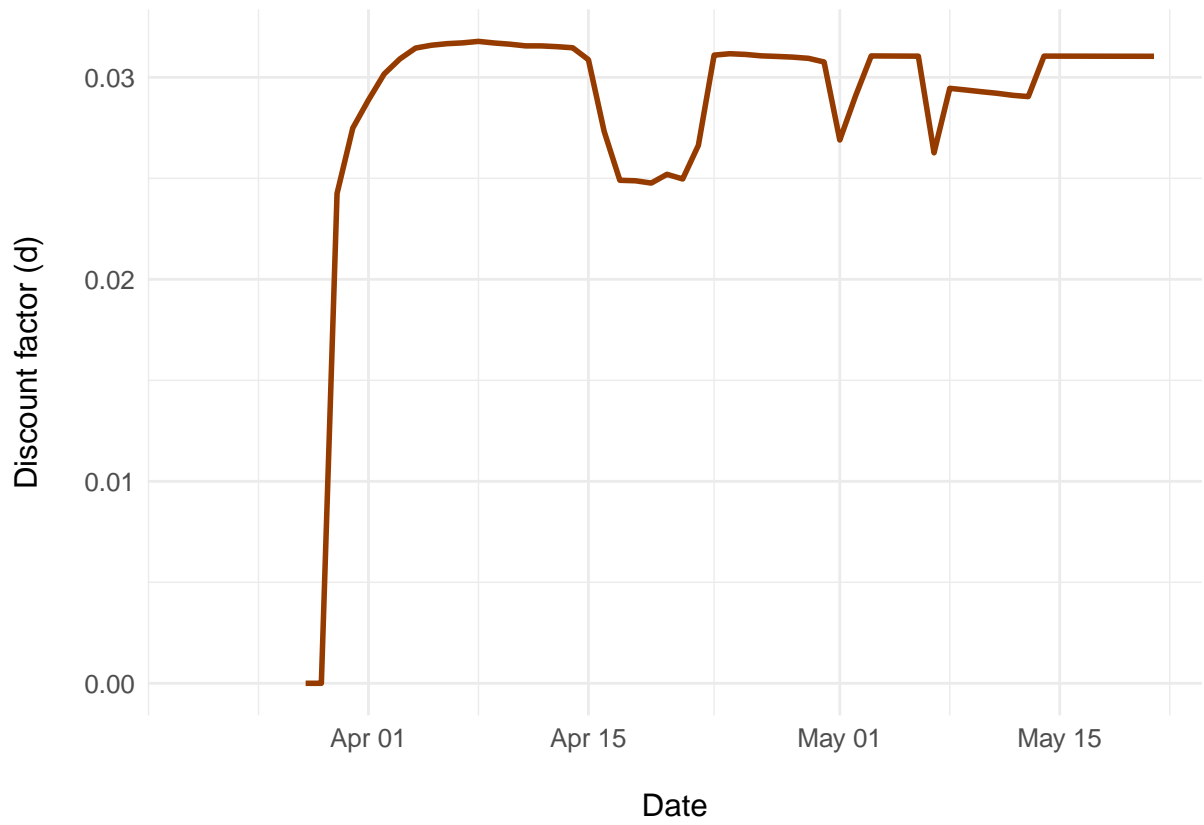


Figure 25: Discount factor - Newfoundland and Labrador

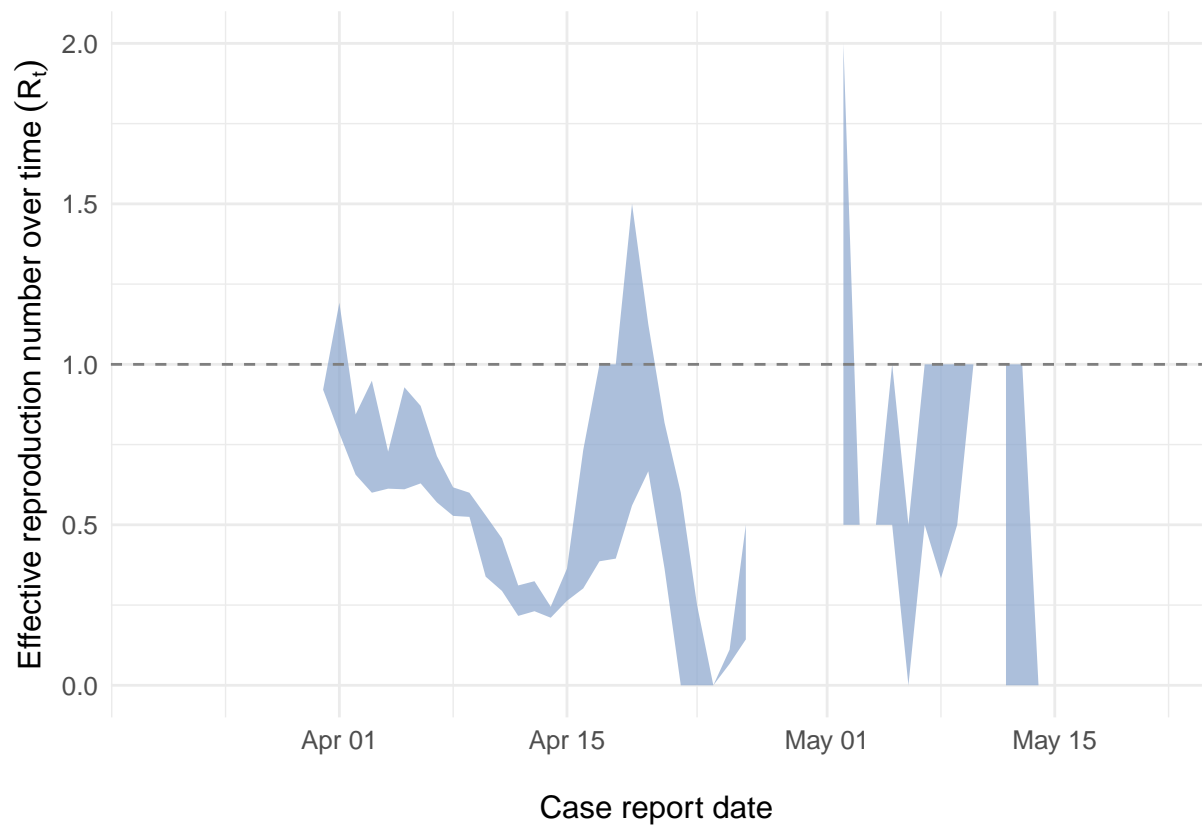


Figure 26: Effective reproductive number - Newfoundland and Labrador

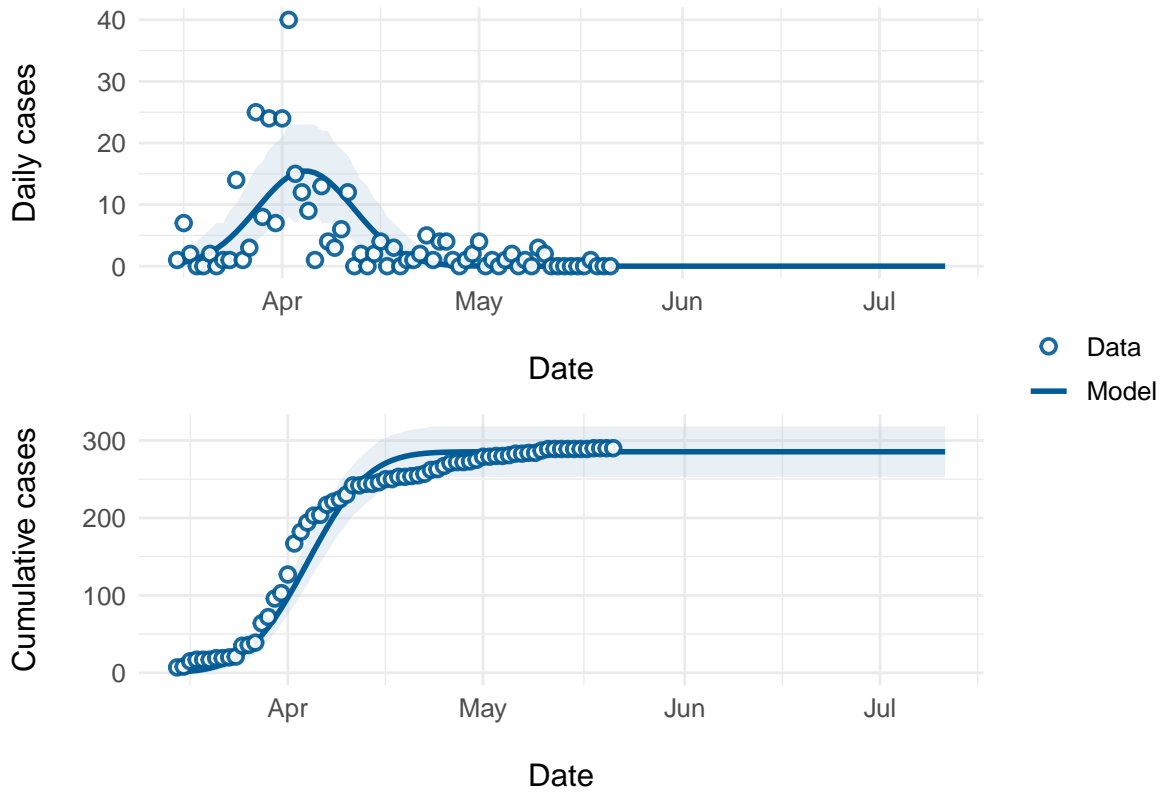


Figure 27: Manitoba

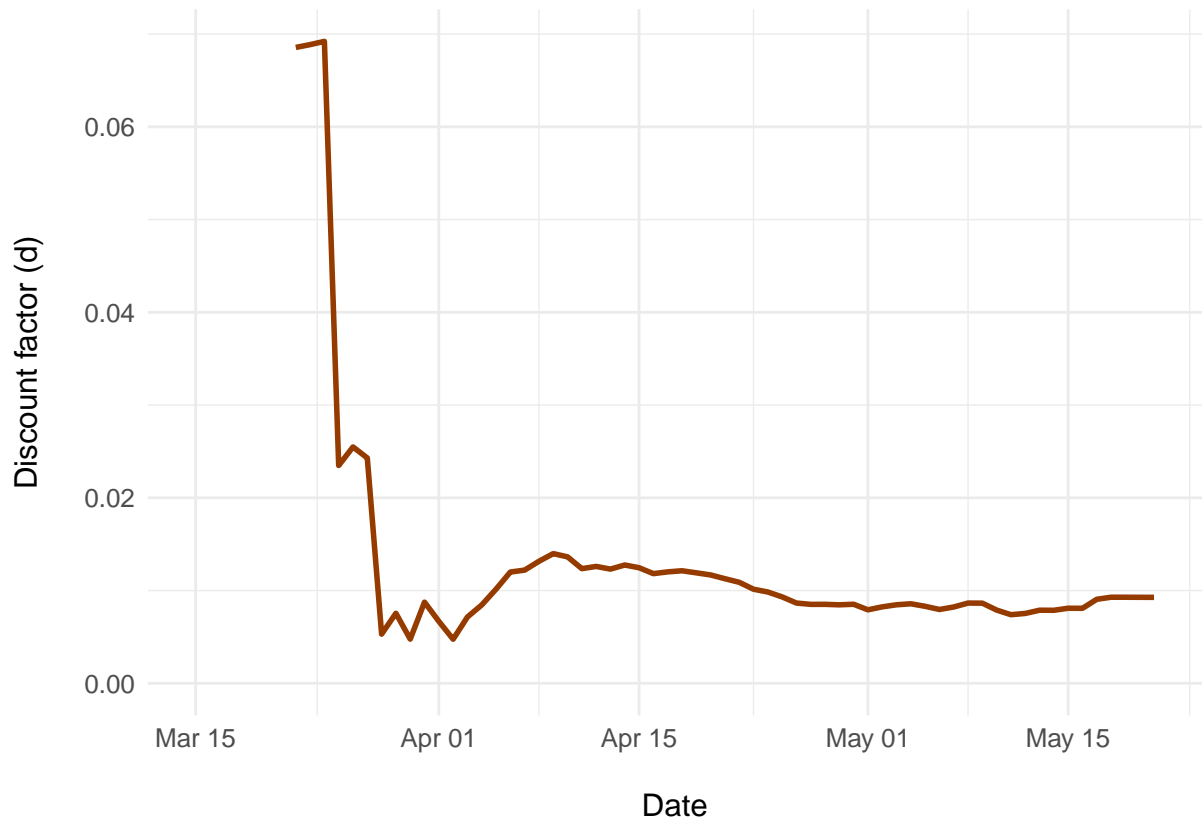


Figure 28: Discount factor - Manitoba

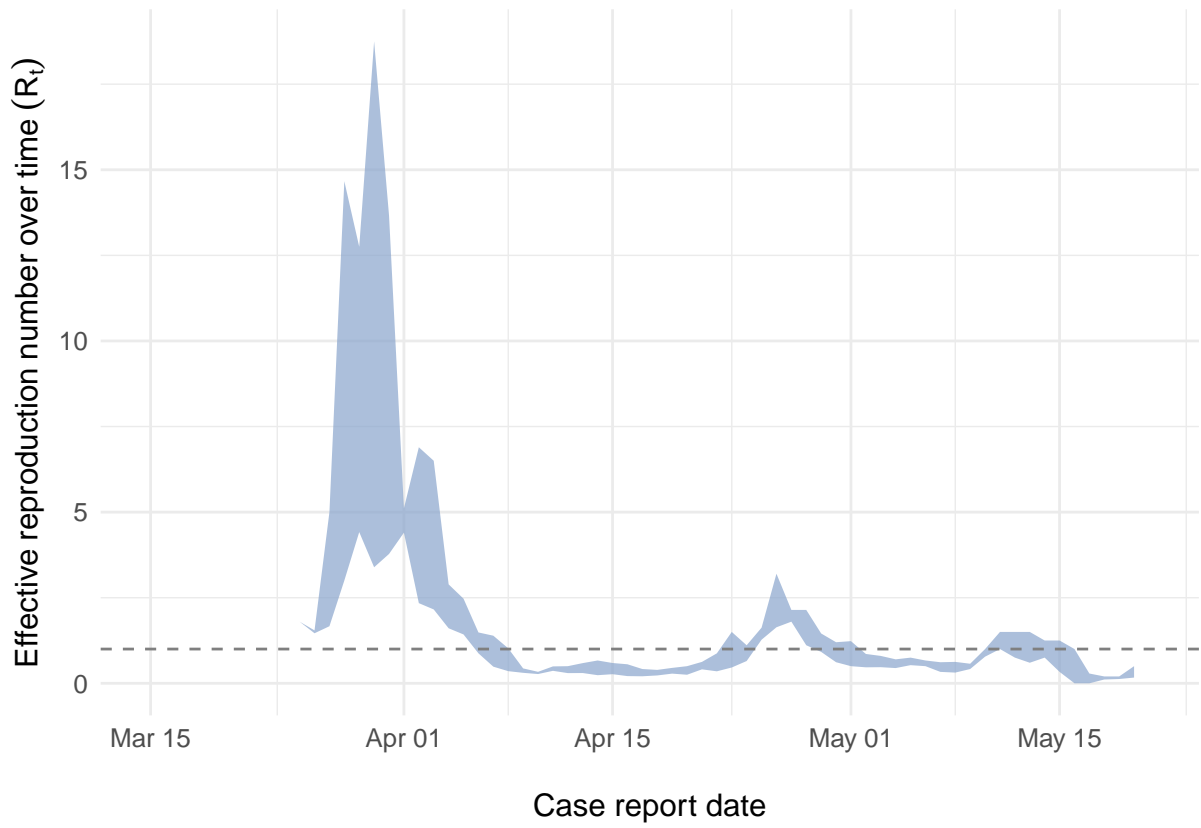


Figure 29: Effective reproductive number - Manitoba

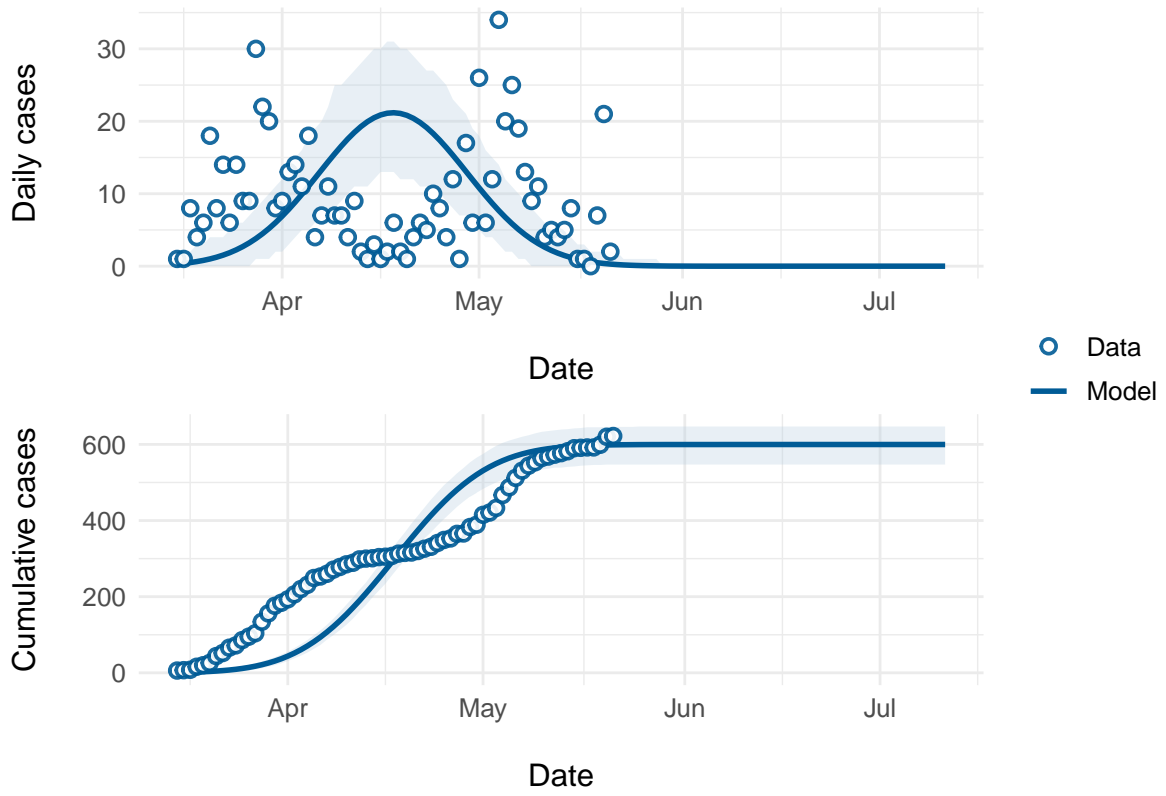


Figure 30: Saskatchewan

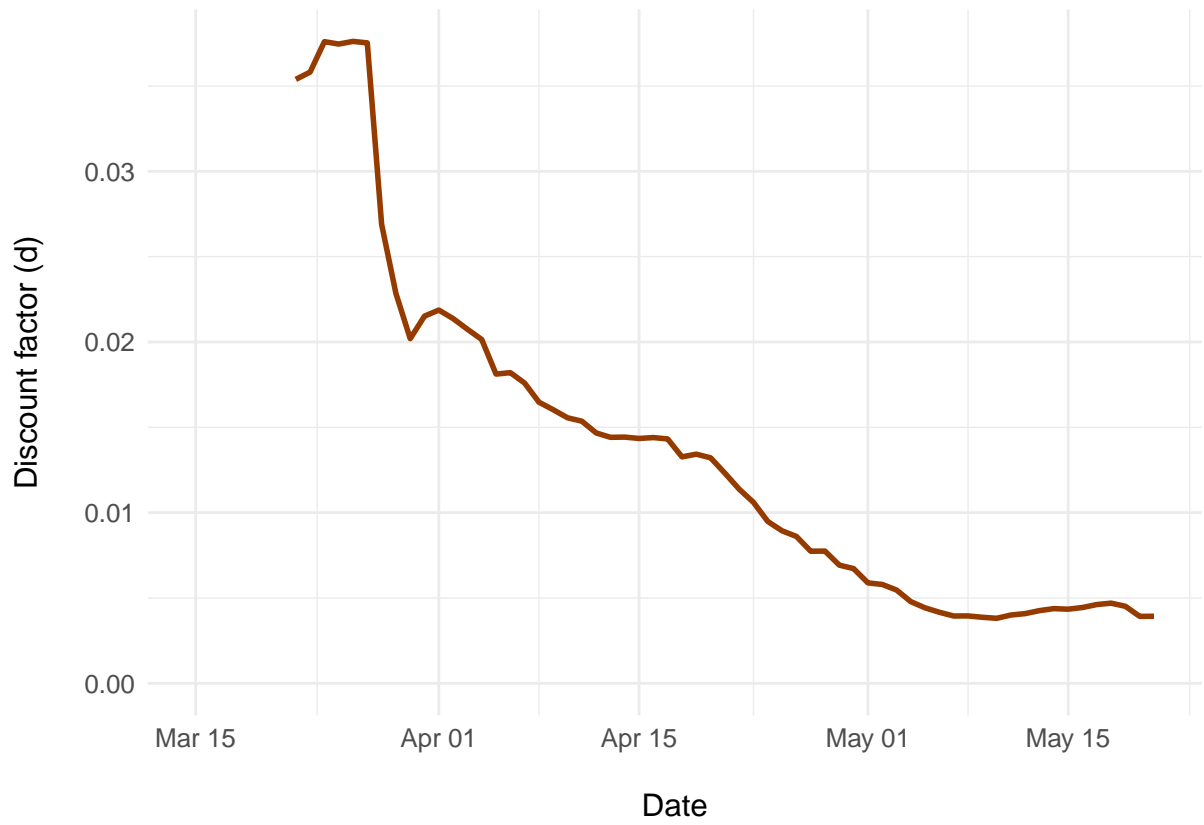


Figure 31: Discount factor - Saskatchewan

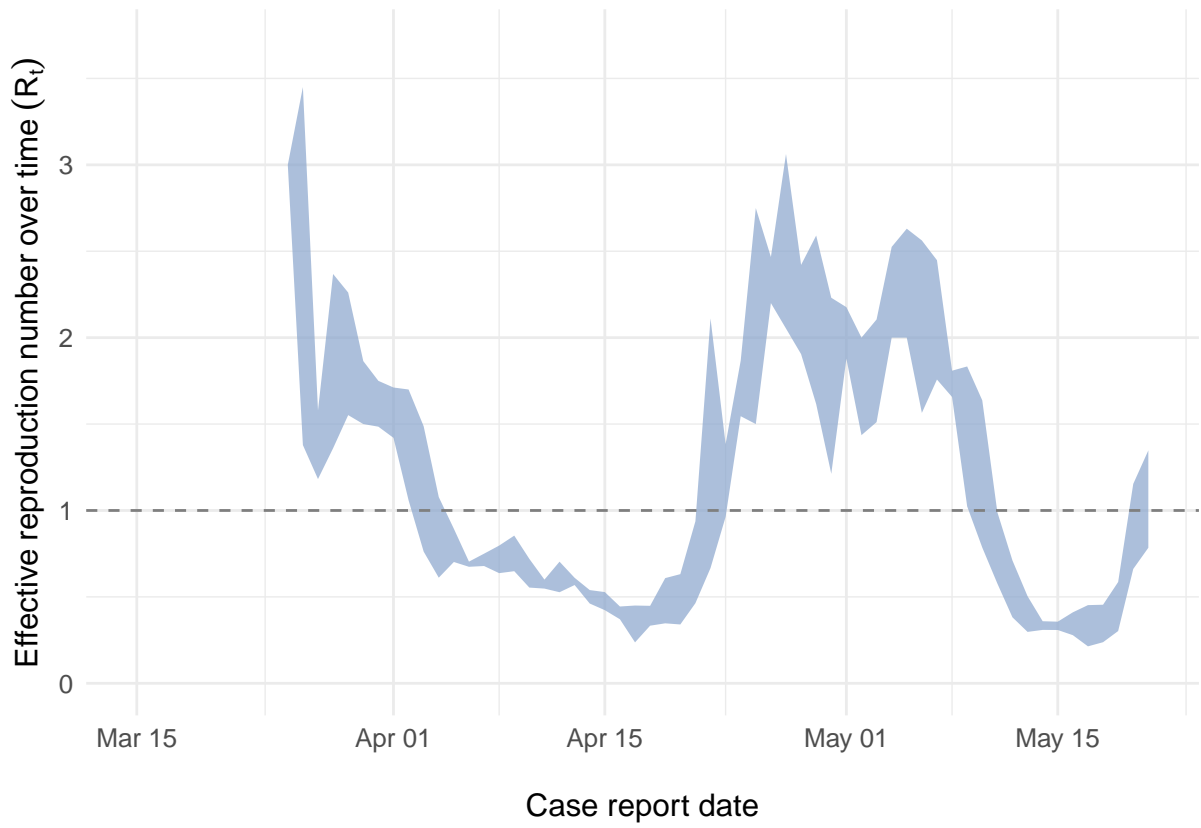


Figure 32: Effective reproductive number - Saskatchewan