

# IDEA model fits to daily Canadian COVID-19 data

15-May-2020

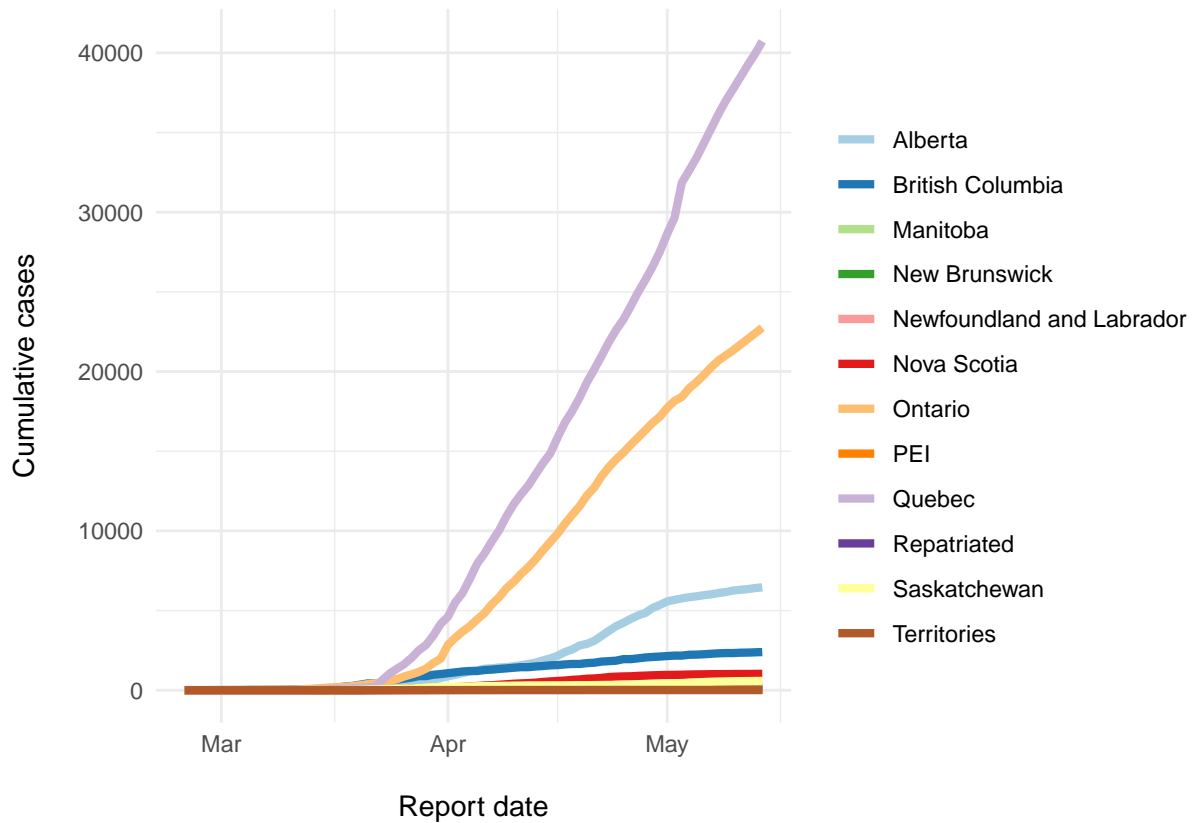


Figure 1: Cumulative cases

## 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 2020-05-15 07:38:50. Forecasts are based on reported case data up to 2020-05-14. Data are collected by the [COVID-19 Canada Open Data Working Group](#).

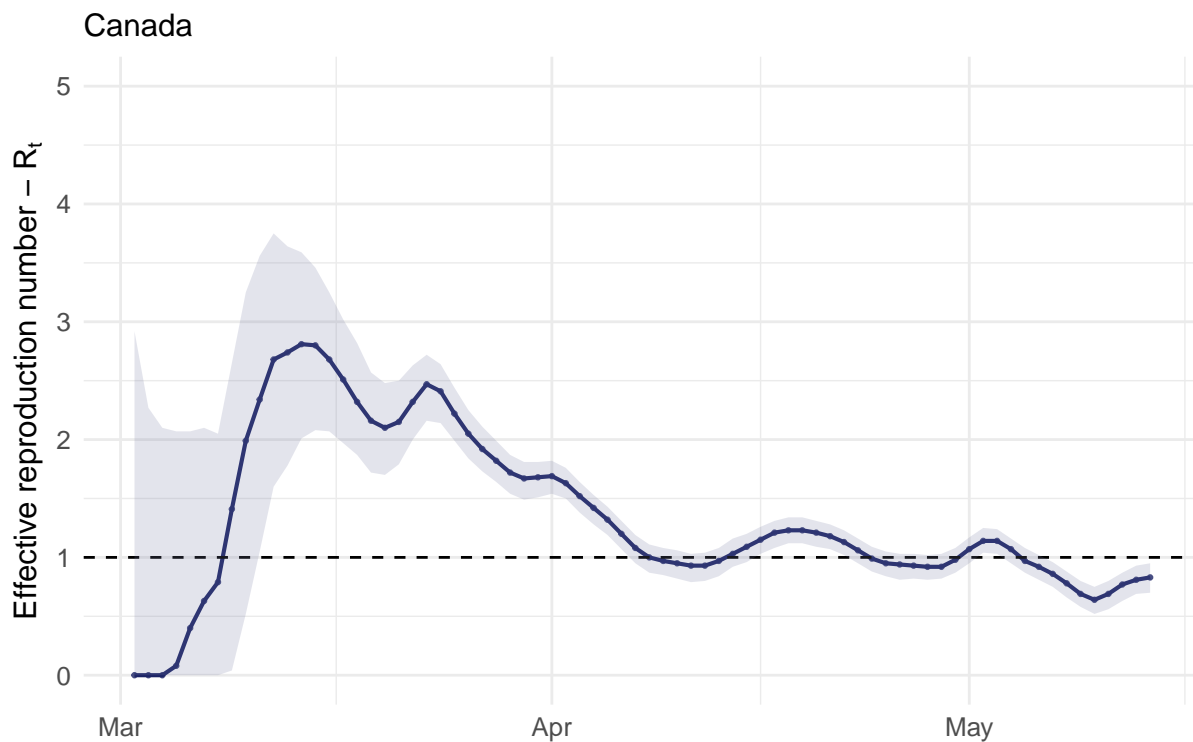
For each province, we show the model fit to incident and cumulative cases. We also include a daily estimate of the discount factor ( $d$ ). The metric provides a measure of the degree of control that is occurring. A larger value is better - it suggests more control and therefore slowing epidemic growth. 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	0.83	0.7-0.95
Alberta	0.82	0.23-1.36
British Columbia	0.52	0-1.5
Manitoba	1.00	0-4.59
New Brunswick	0.20	0-3.95
Newfoundland and Labrador	0.00	0-3.12
Nova Scotia	0.00	0-2.31
Ontario	0.83	0.57-1.04
Quebec	0.86	0.7-1.01
Saskatchewan	0.00	0-1.33



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

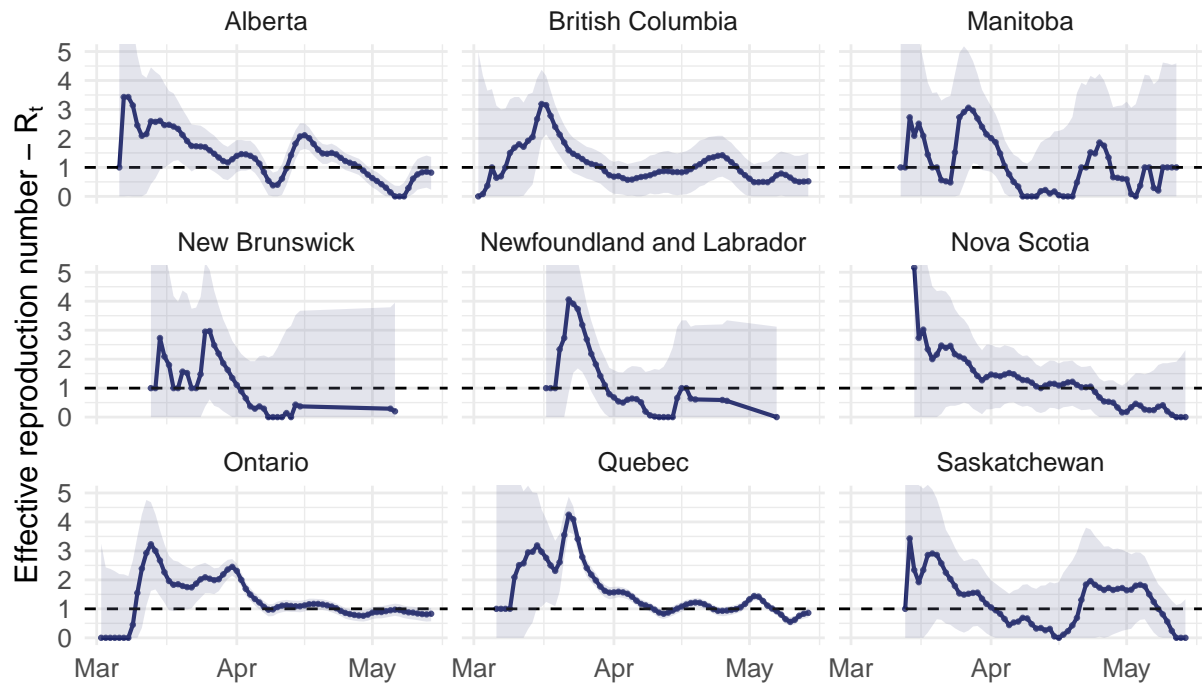


Figure 2: Alternate method for estimating effective reproductive number

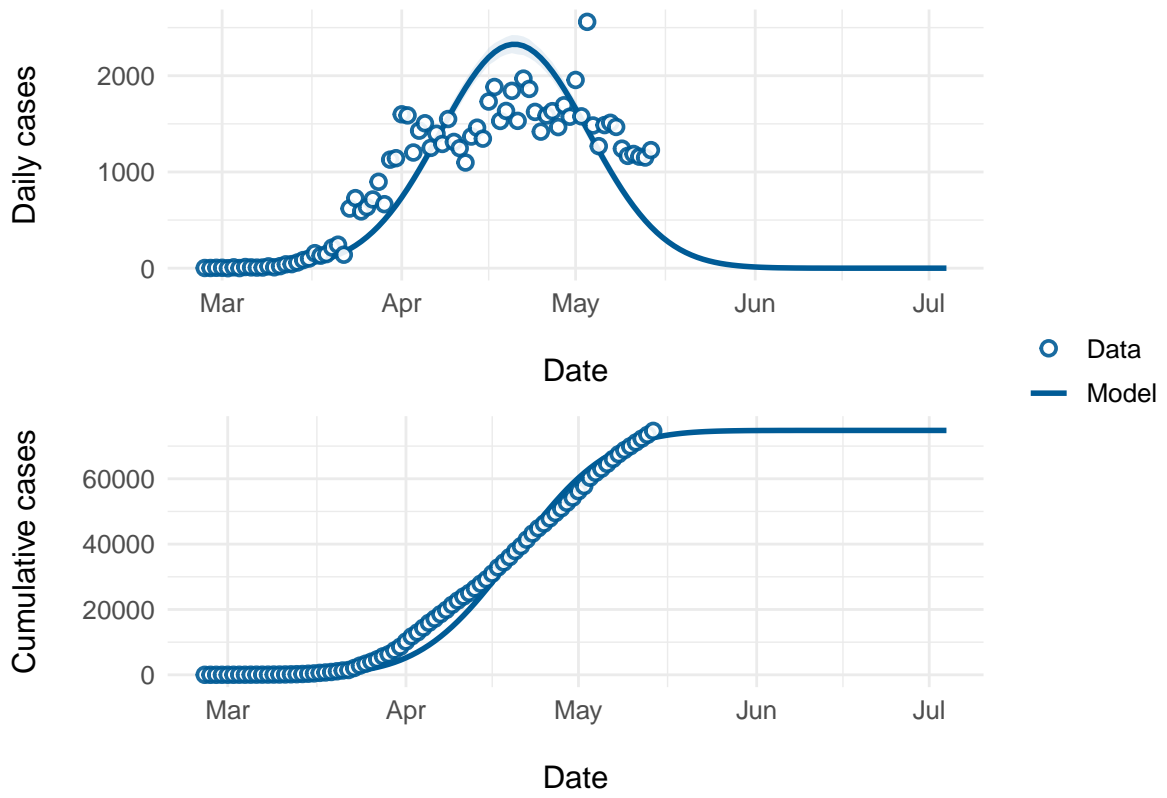


Figure 3: Canada

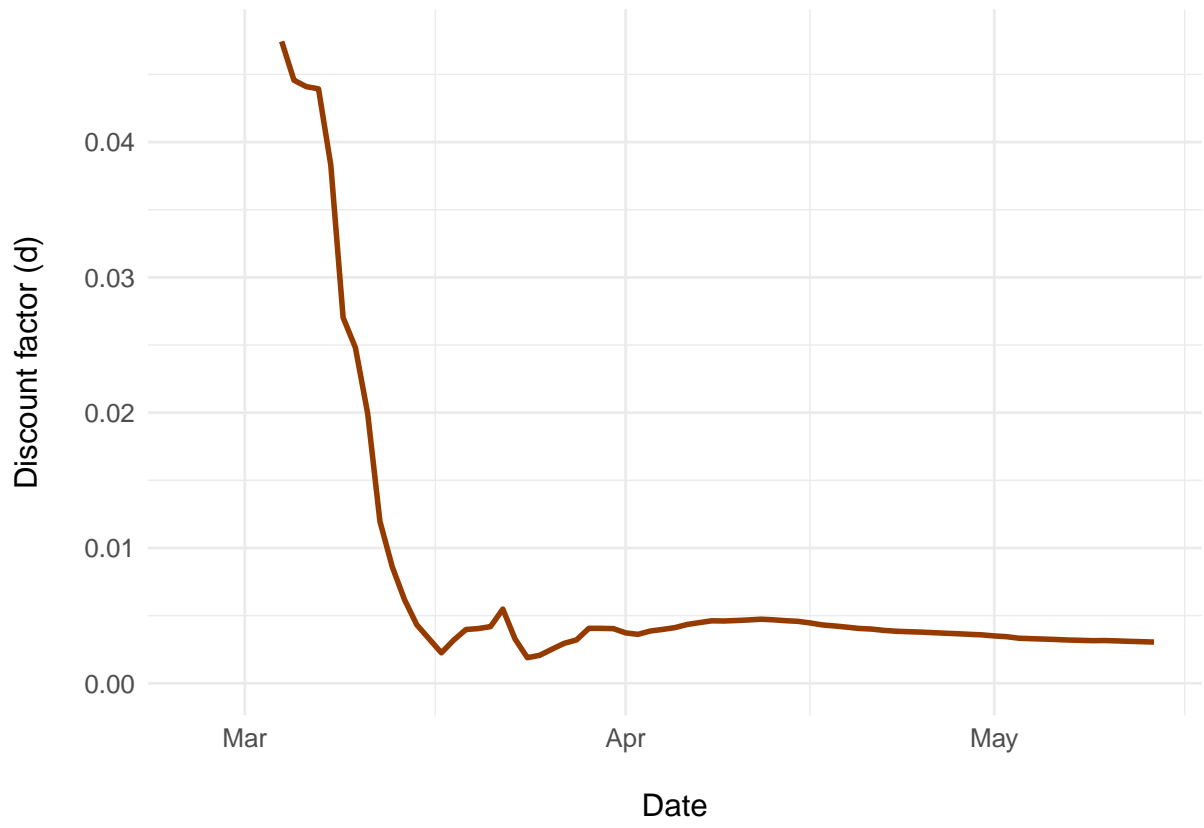


Figure 4: Discount factor - Canada

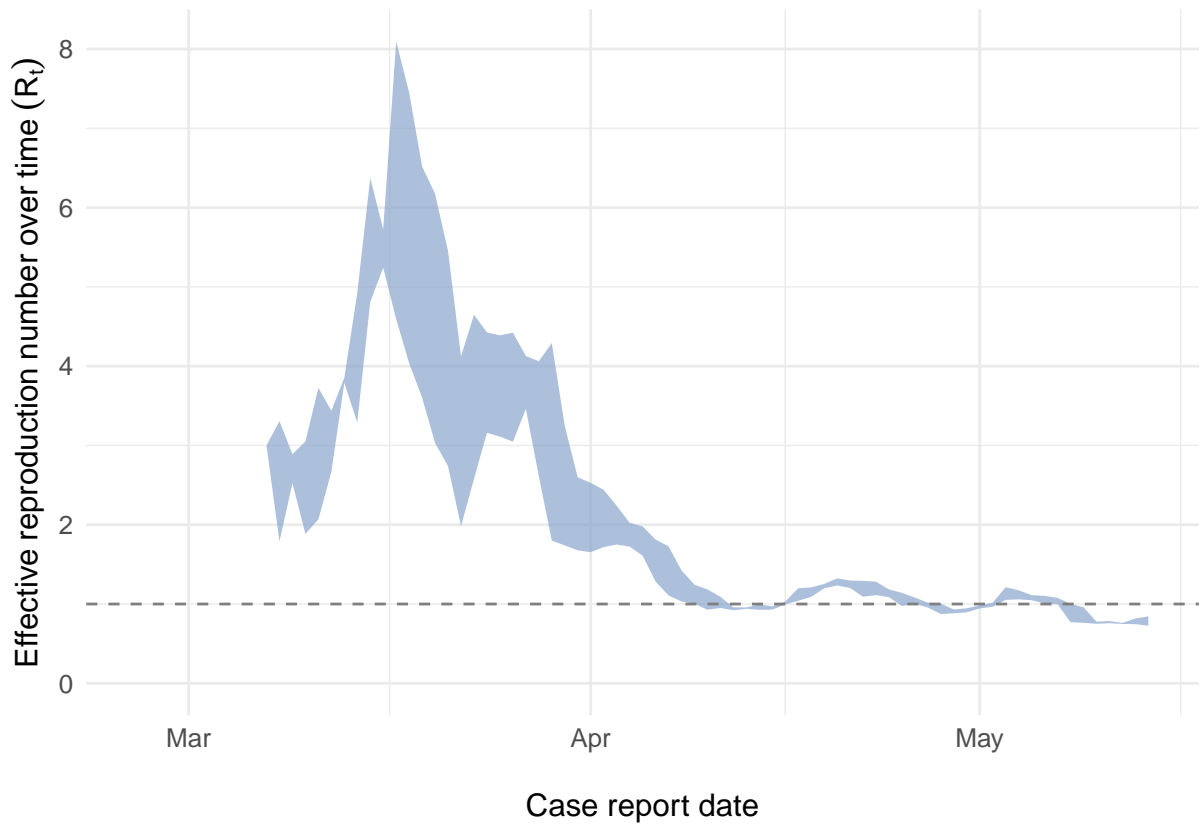


Figure 5: Effective reproductive number - Canada

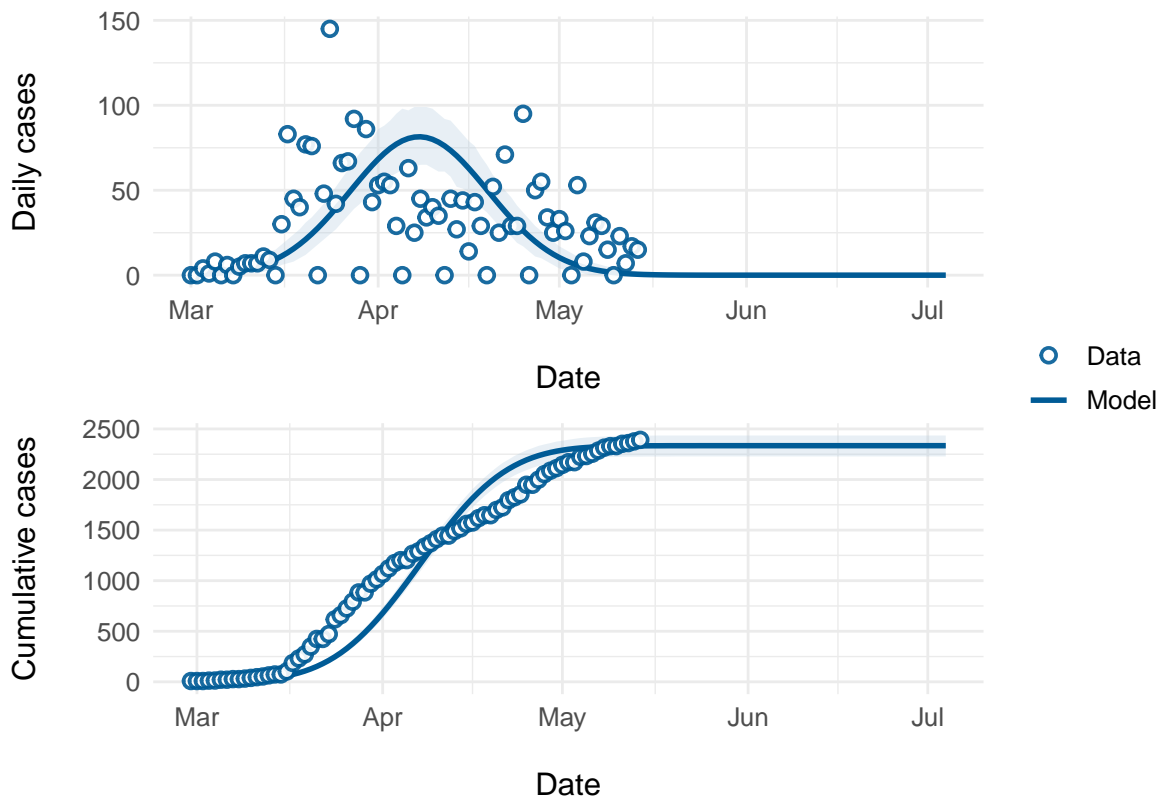


Figure 6: British Columbia

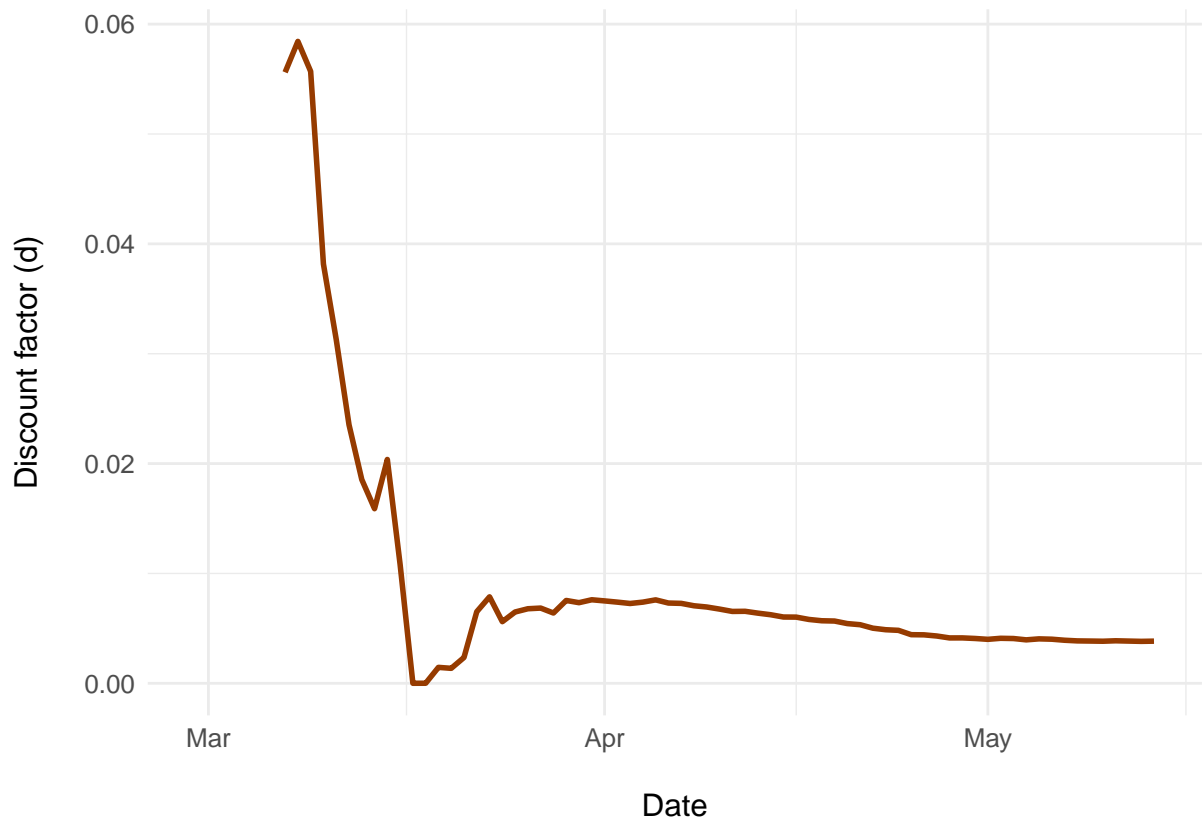


Figure 7: Discount factor - British Columbia



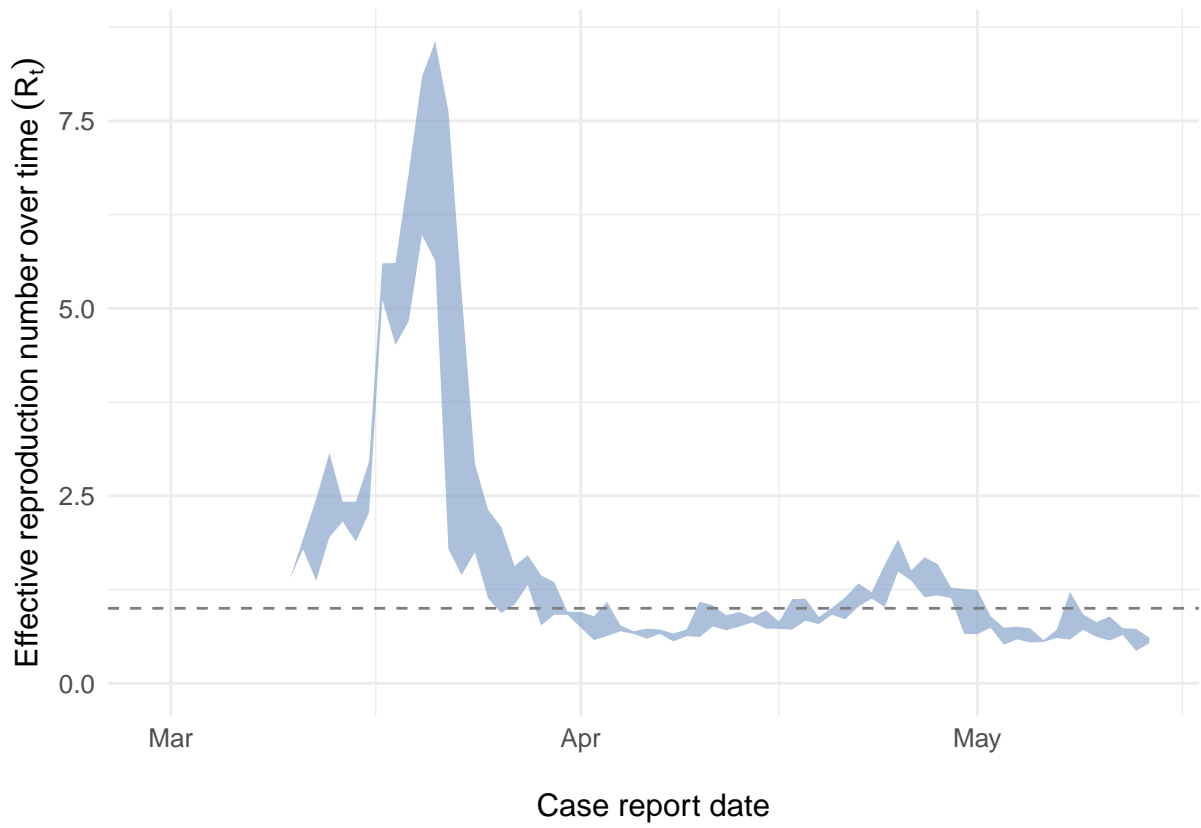


Figure 8: Effective reproductive number - British Columbia

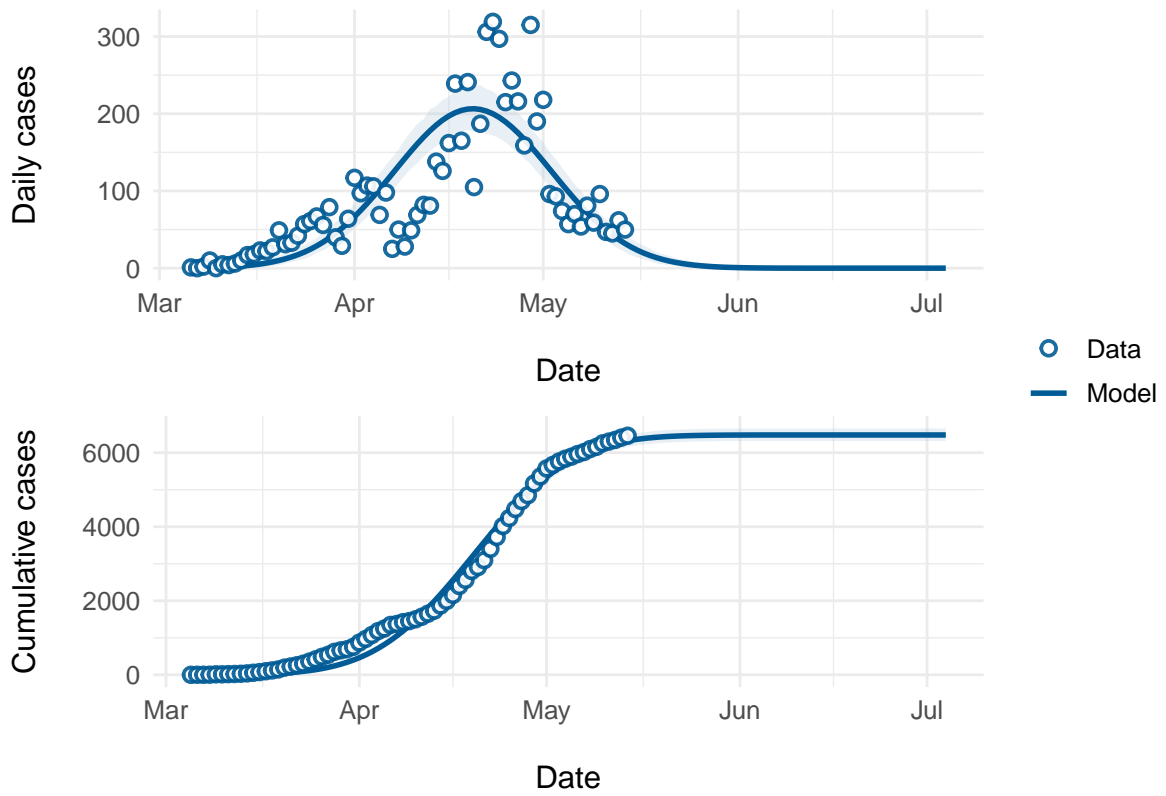


Figure 9: Alberta

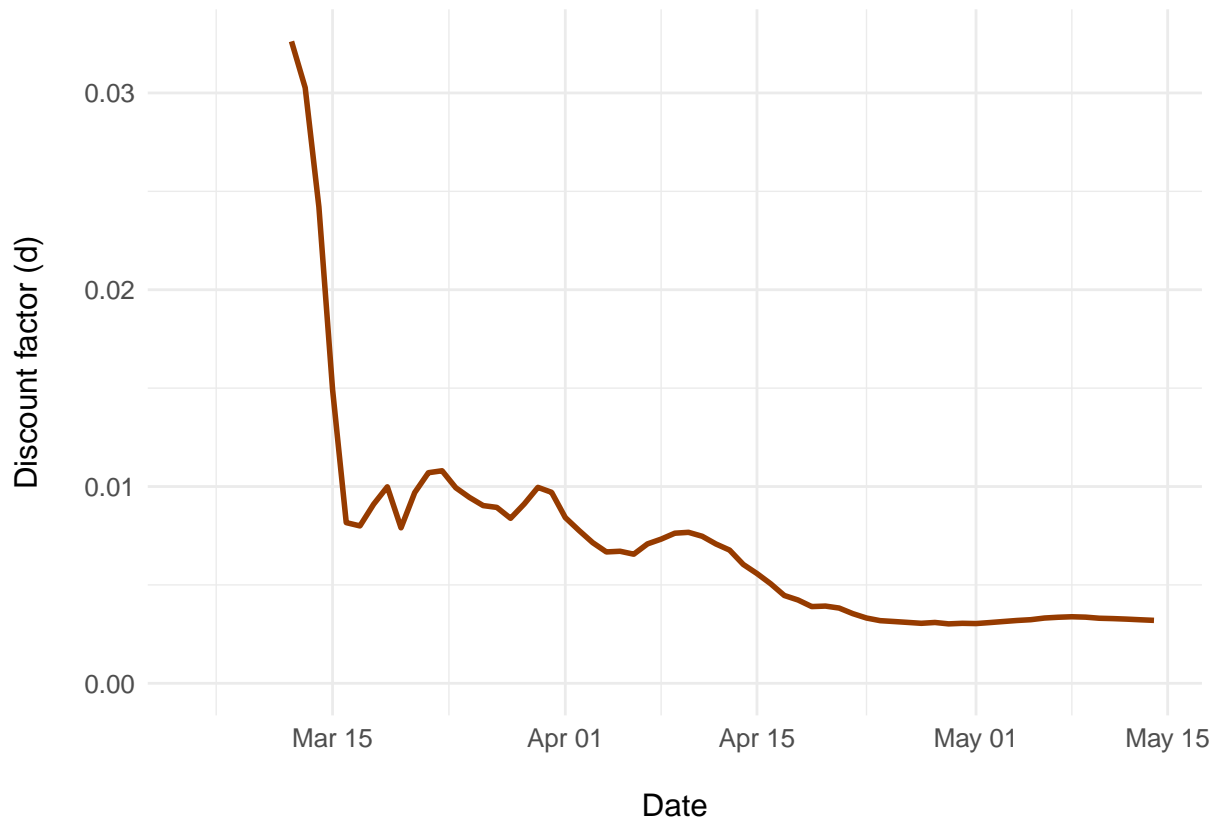


Figure 10: Discount factor - Alberta

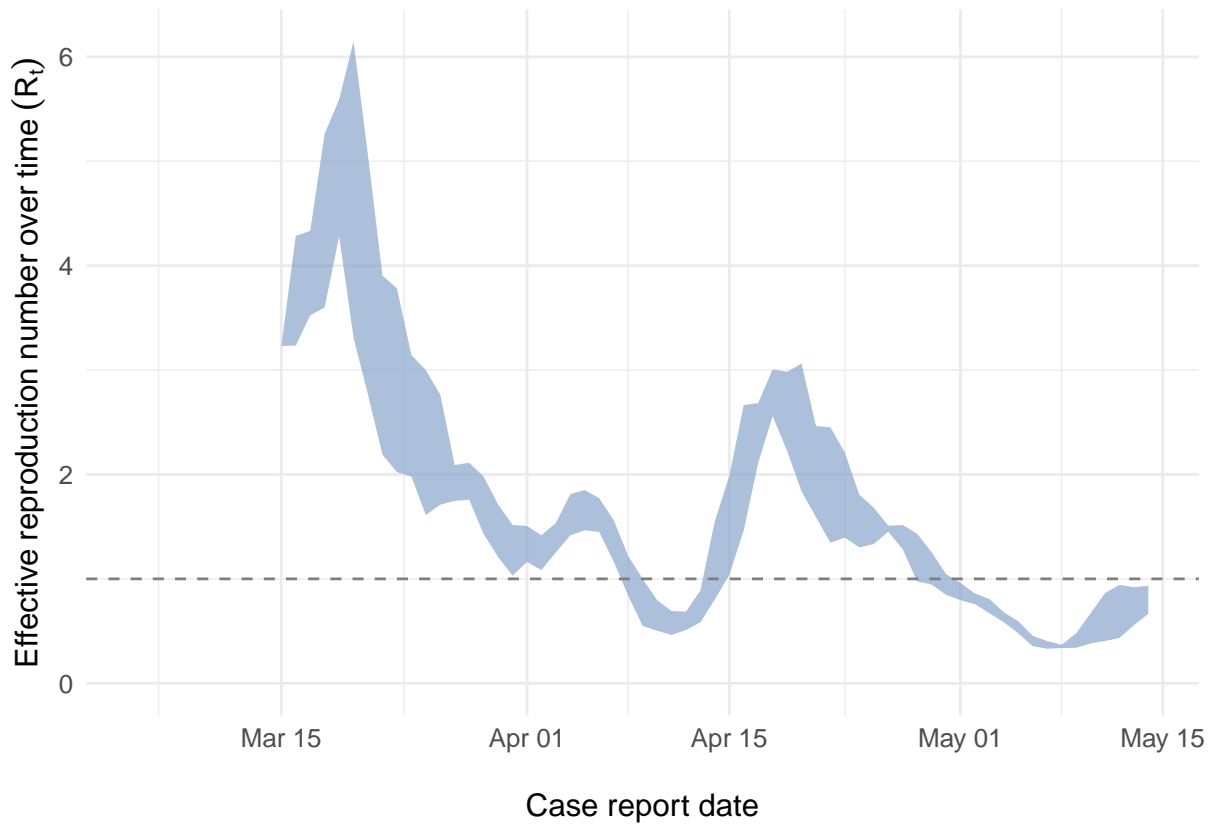


Figure 11: Effective reproductive number - Alberta

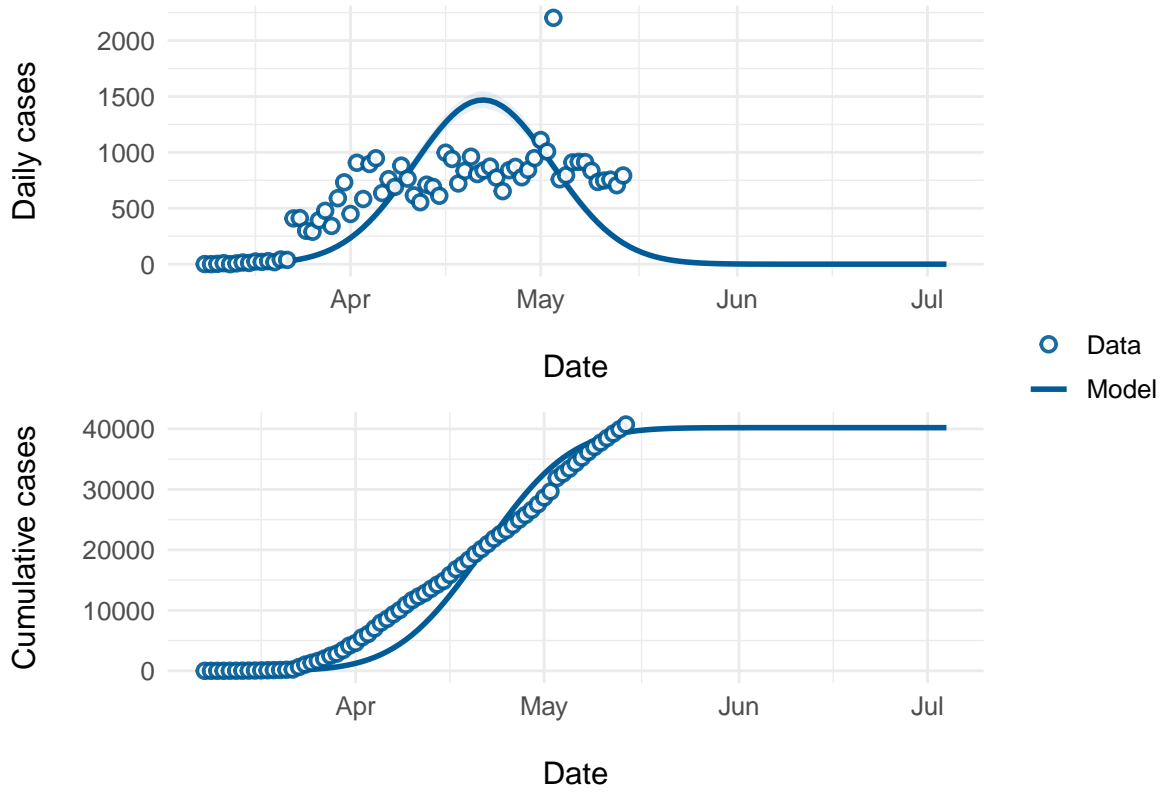


Figure 12: Quebec

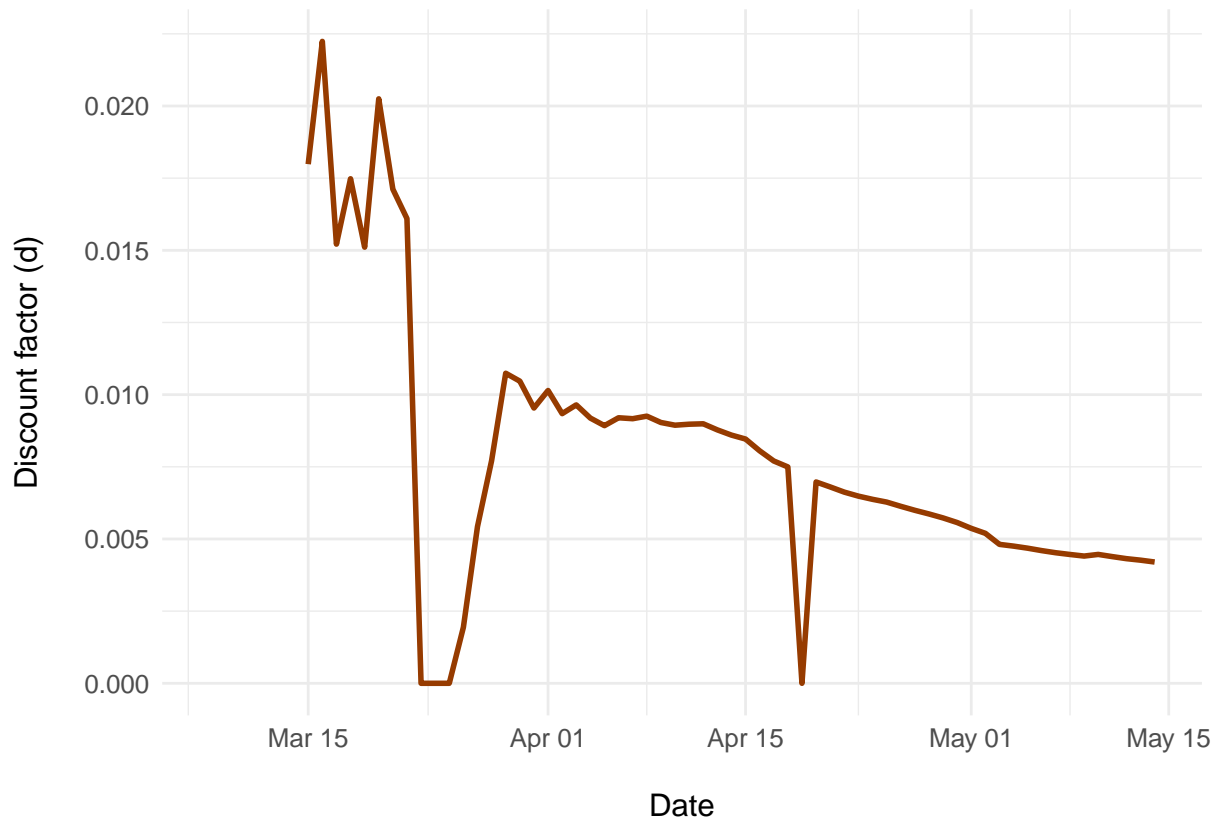


Figure 13: Discount factor - Quebec

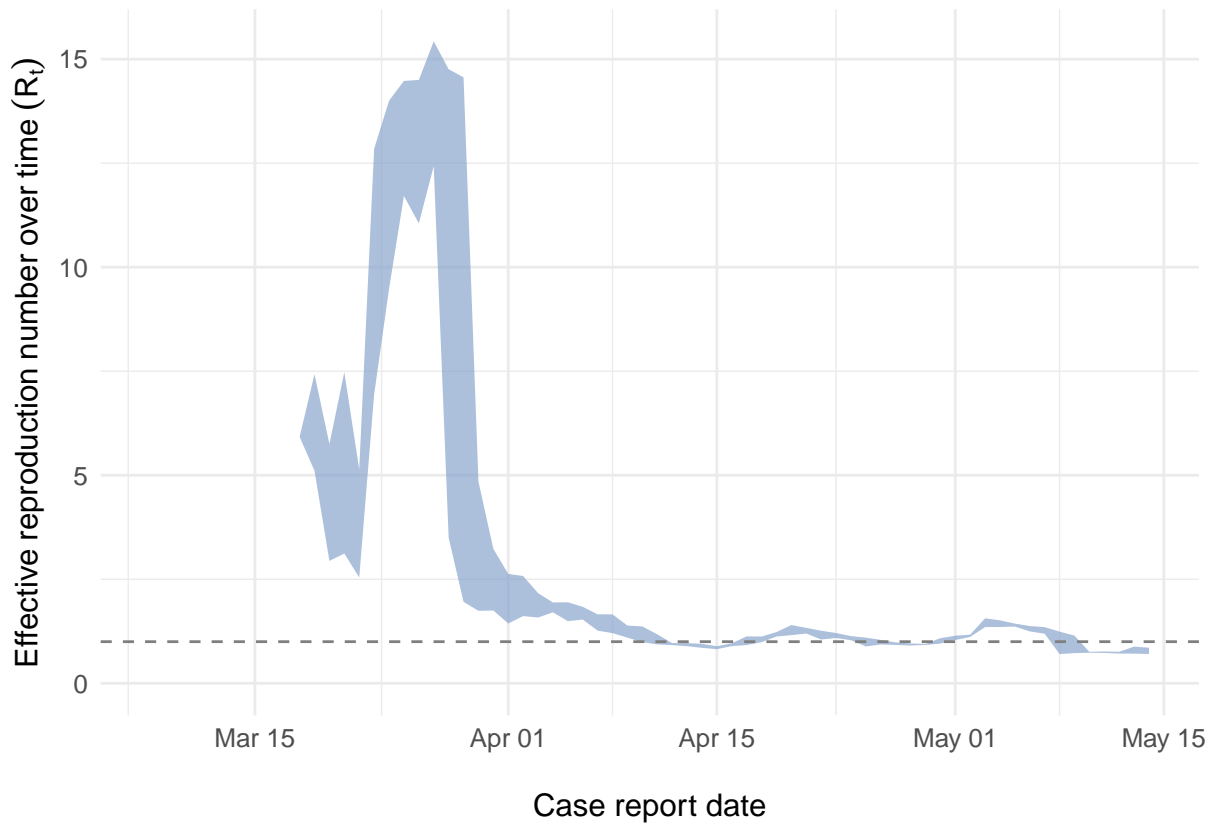


Figure 14: Effective reproductive number - Quebec

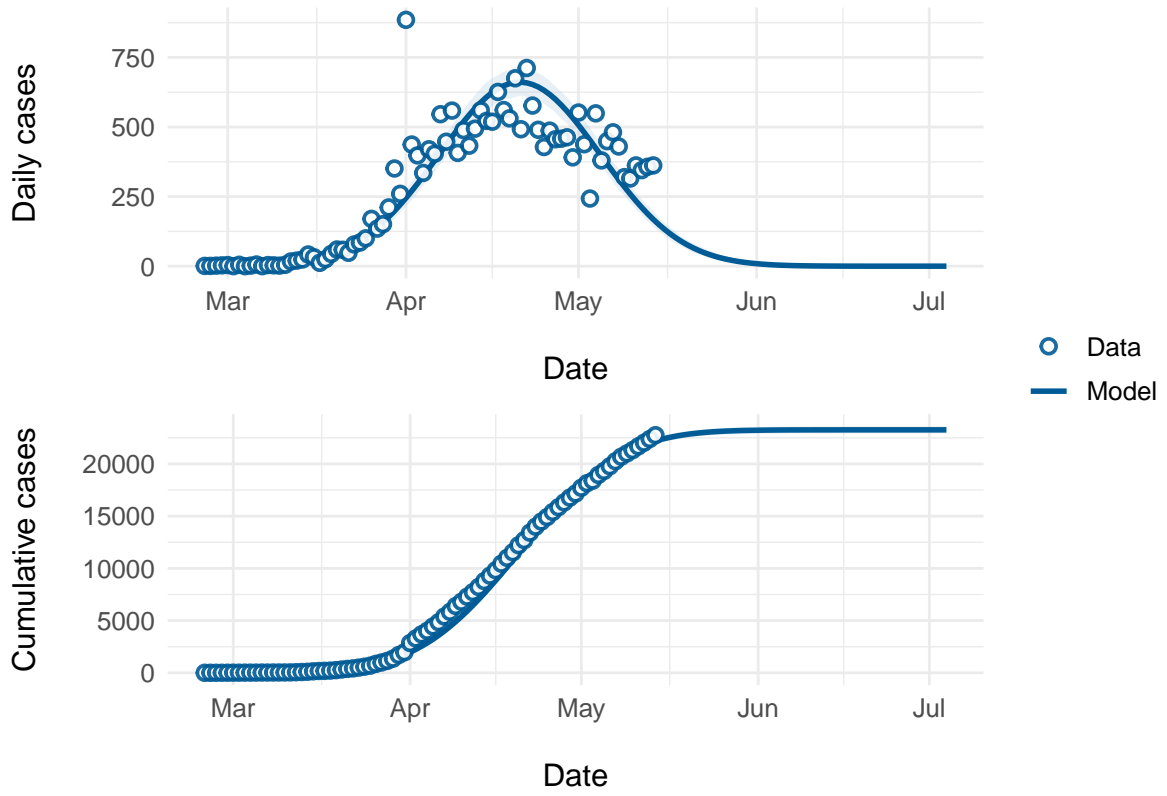


Figure 15: Ontario



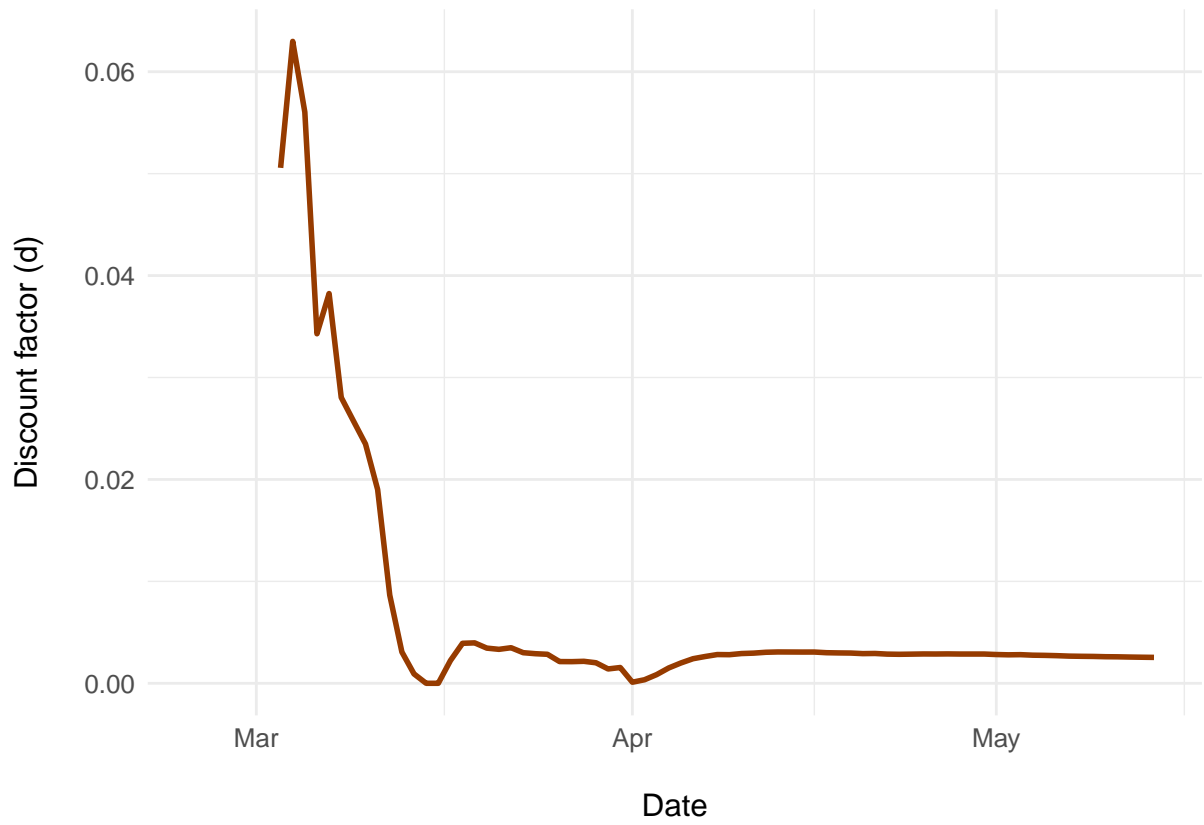


Figure 16: Discount factor - Ontario

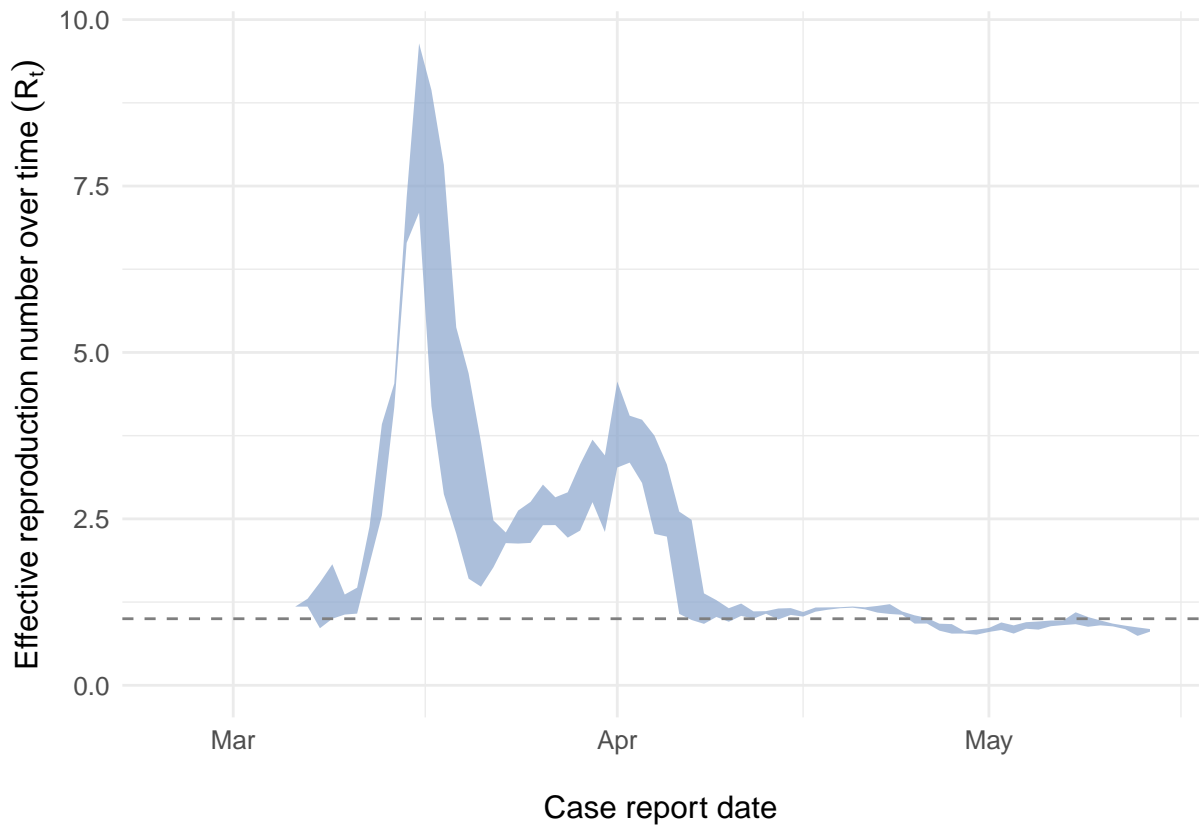


Figure 17: Effective reproductive number - Ontario

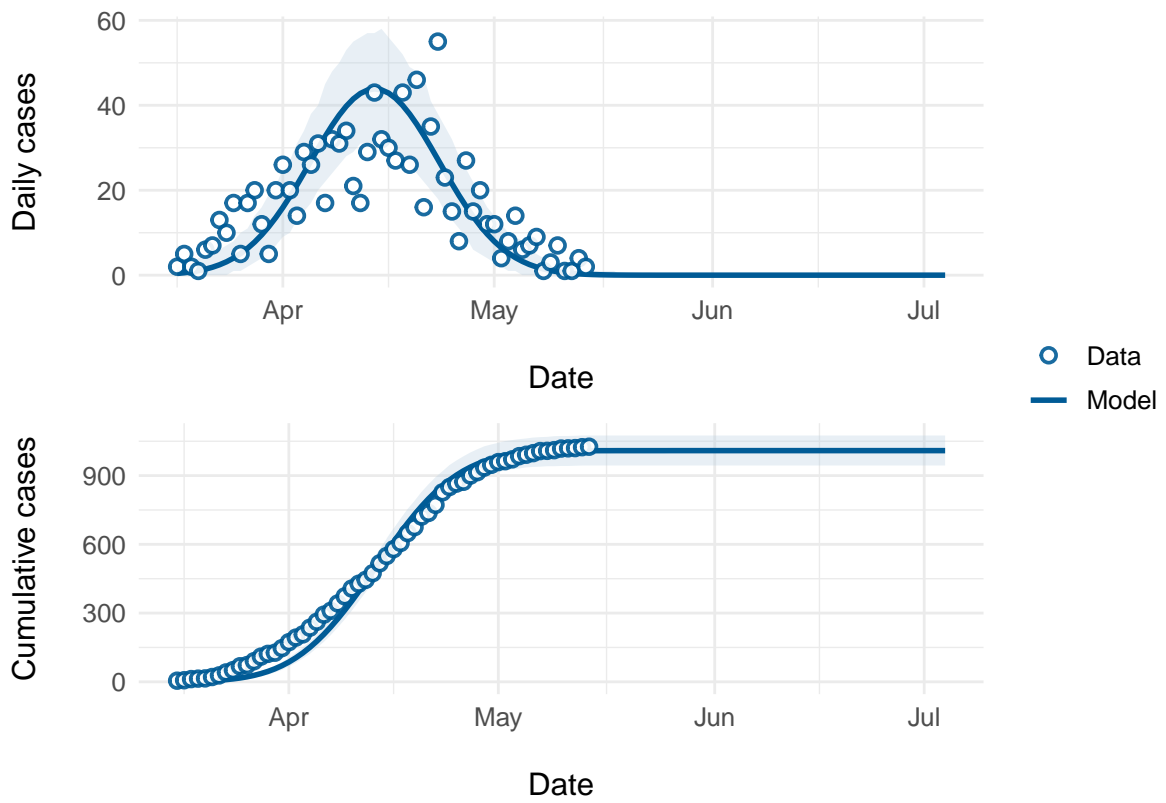


Figure 18: Nova Scotia

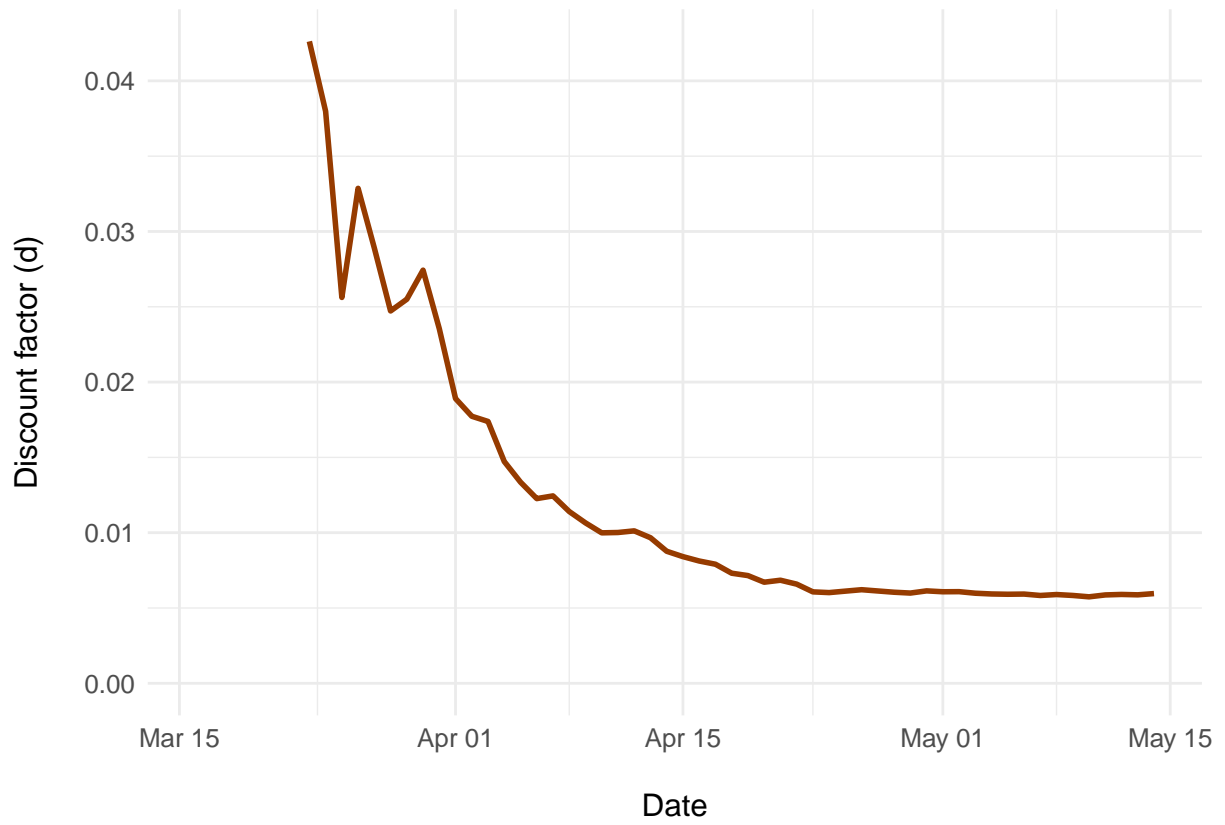


Figure 19: Discount factor - Nova Scotia

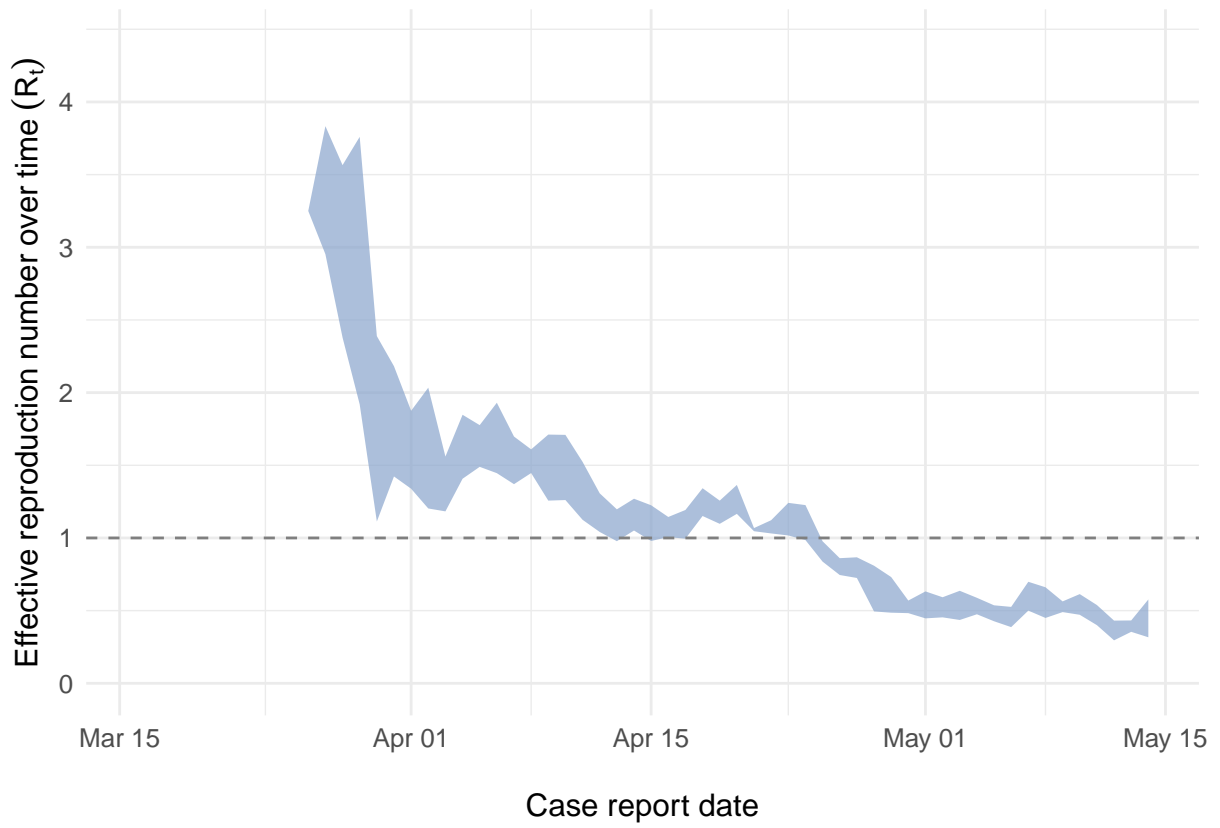


Figure 20: Effective reproductive number - Nova Scotia

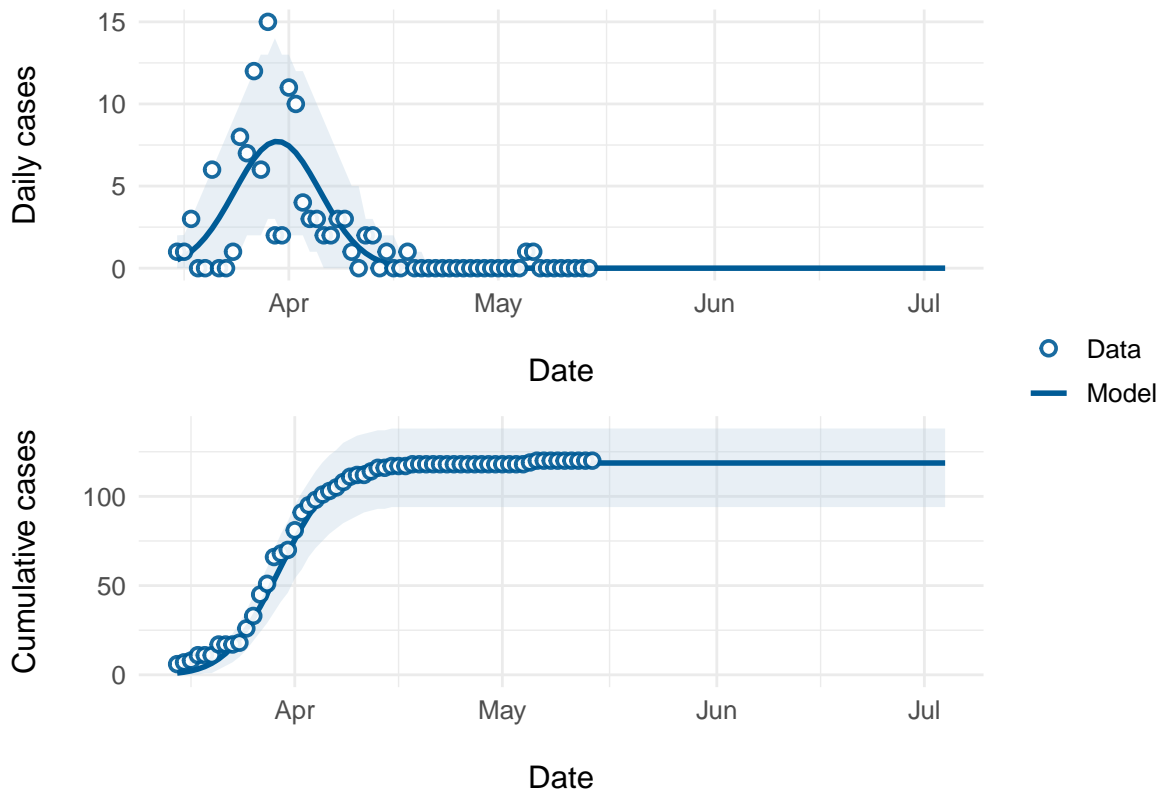


Figure 21: New Brunswick

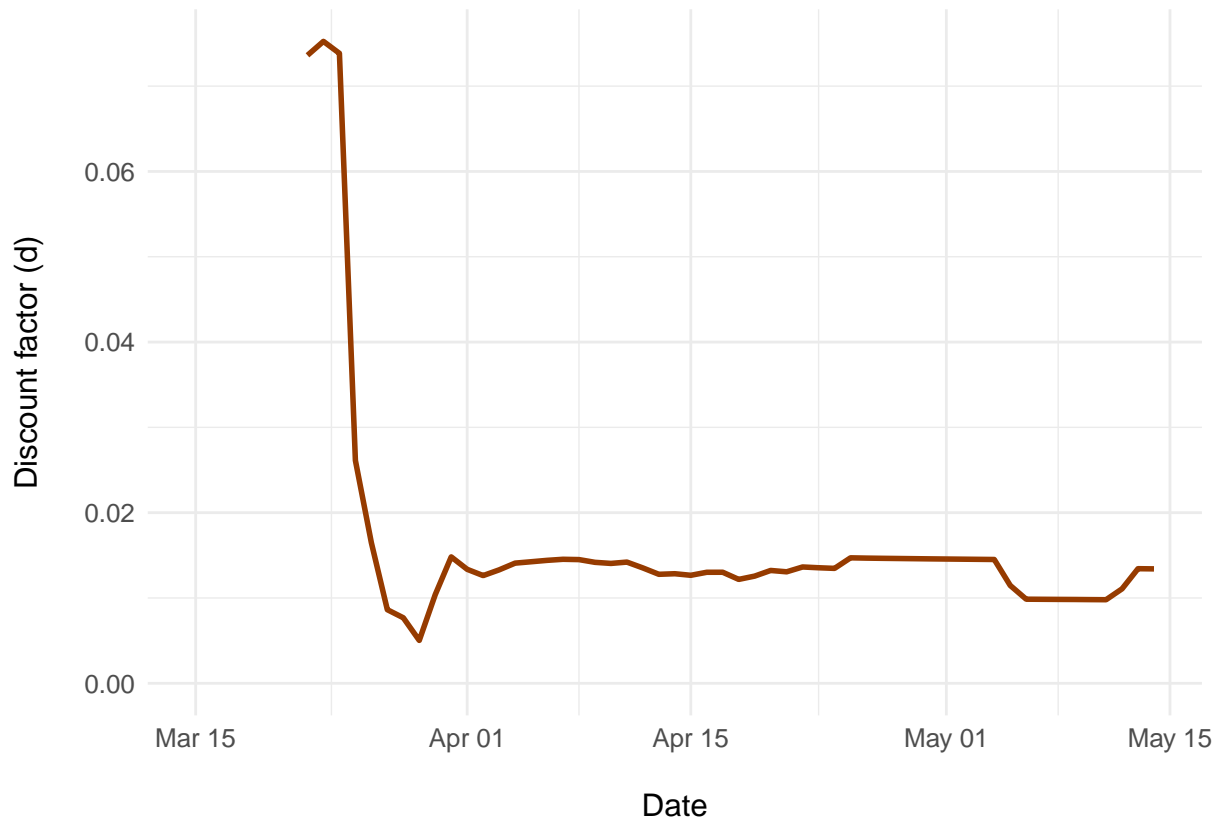


Figure 22: Discount factor - New Brunswick

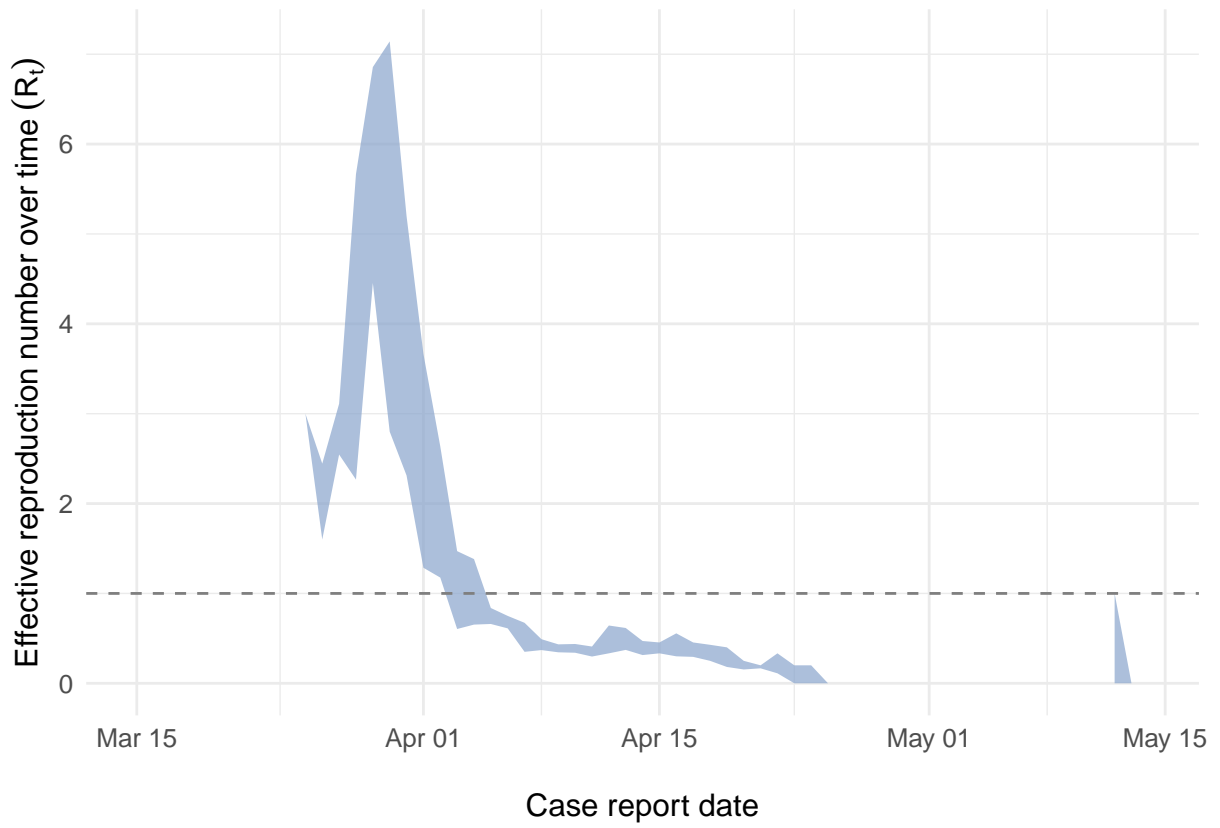


Figure 23: Effective reproductive number - New Brunswick



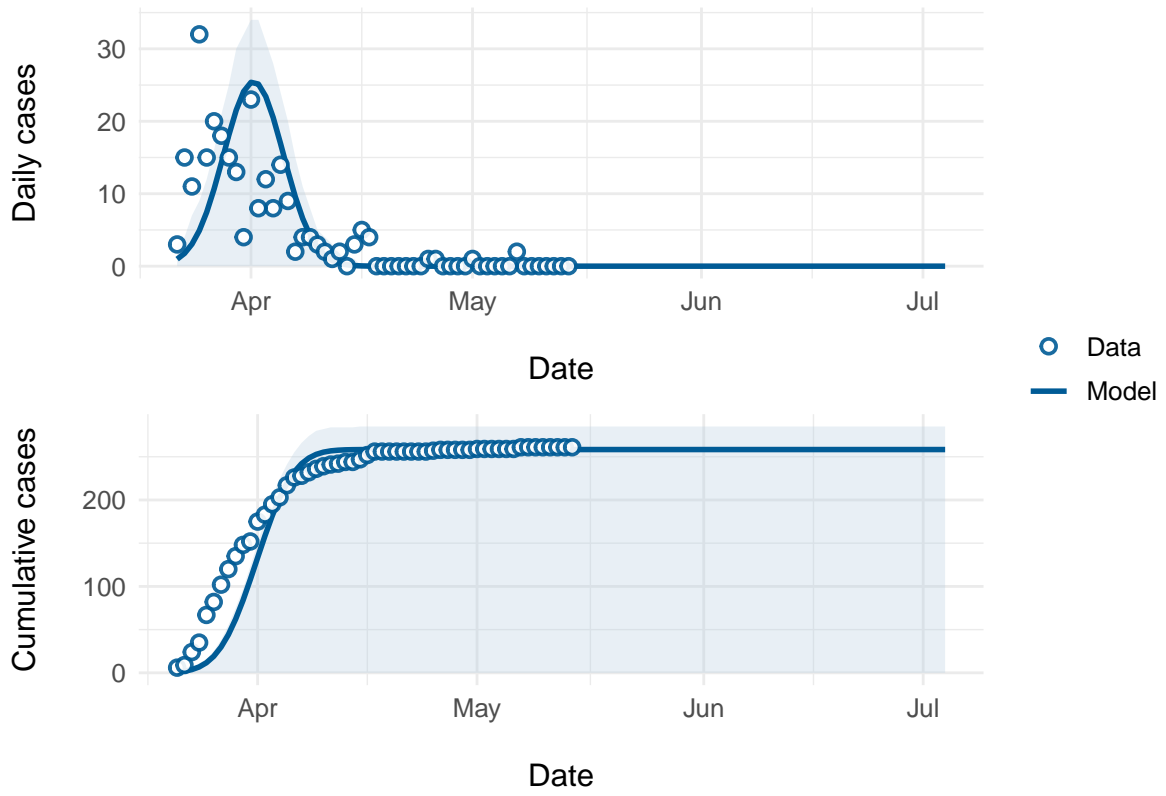


Figure 24: Newfoundland and Labrador

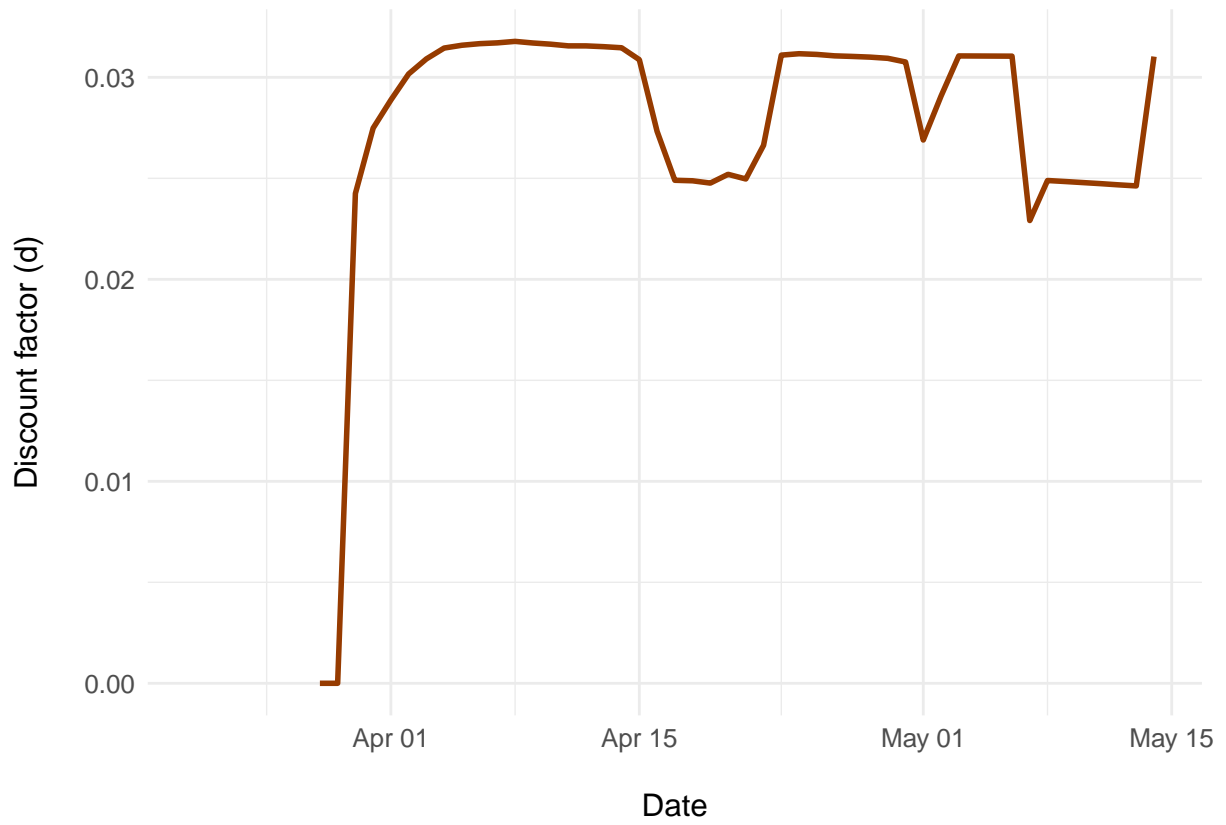


Figure 25: Discount factor - Newfoundland and Labrador

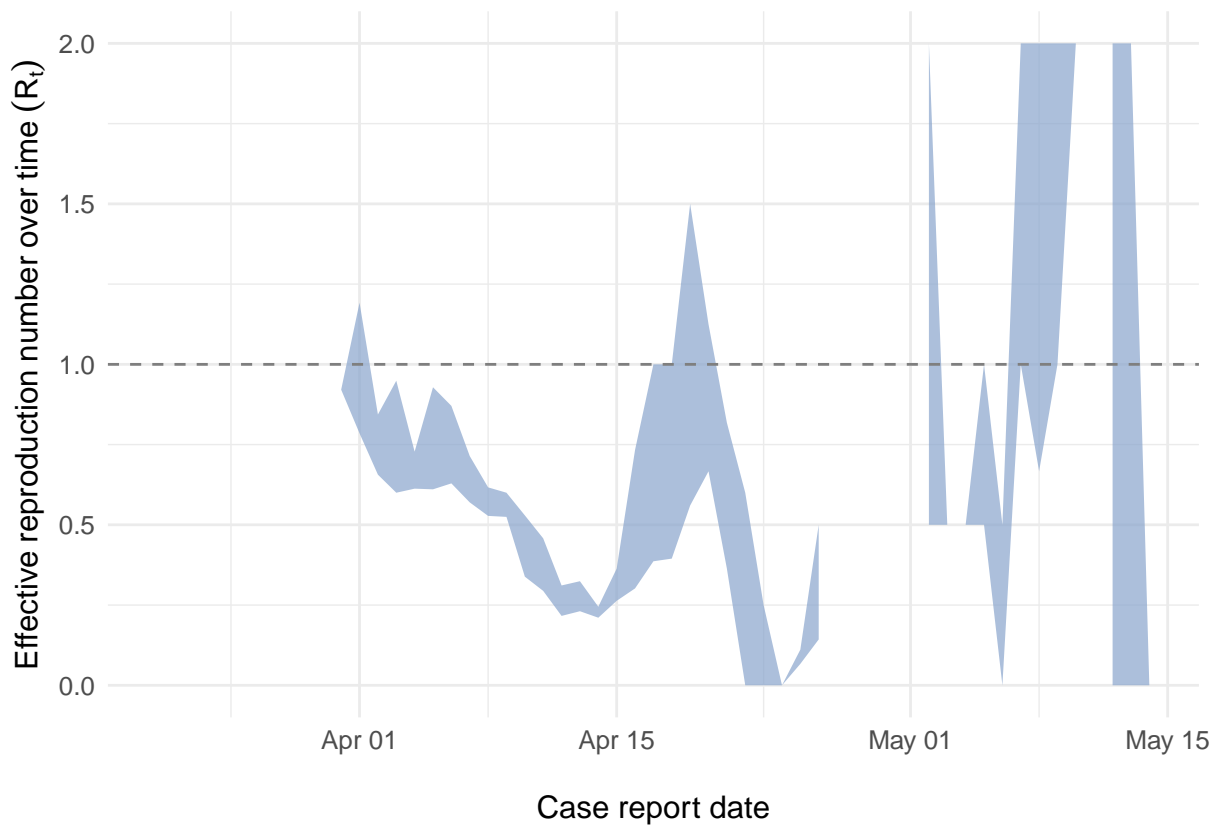


Figure 26: Effective reproductive number - Newfoundland and Labrador

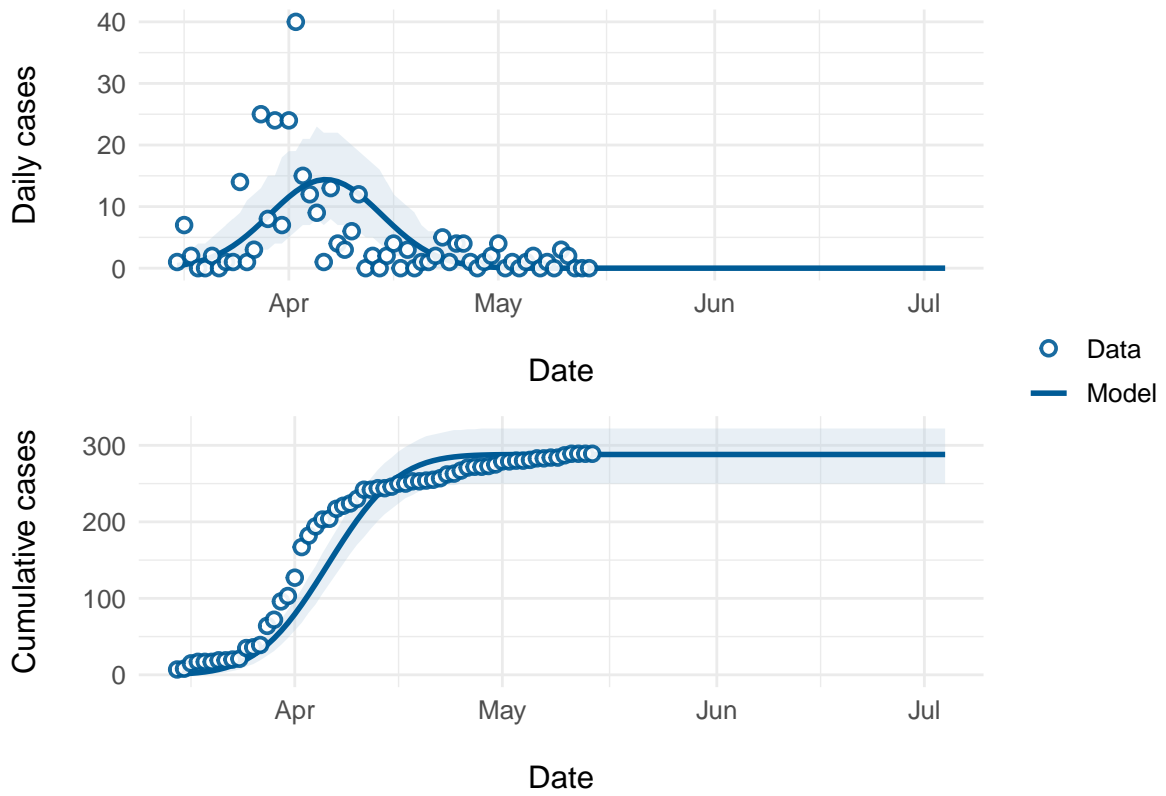


Figure 27: Manitoba

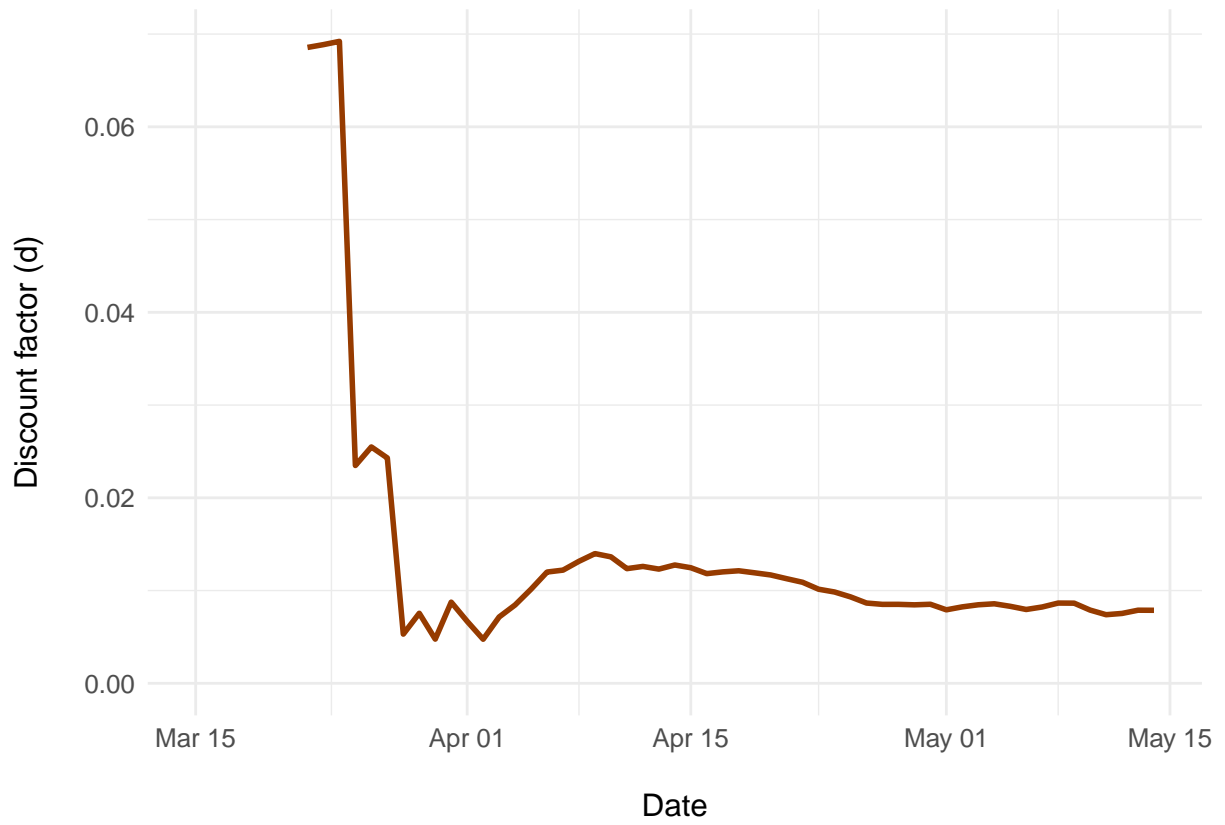


Figure 28: Discount factor - Manitoba

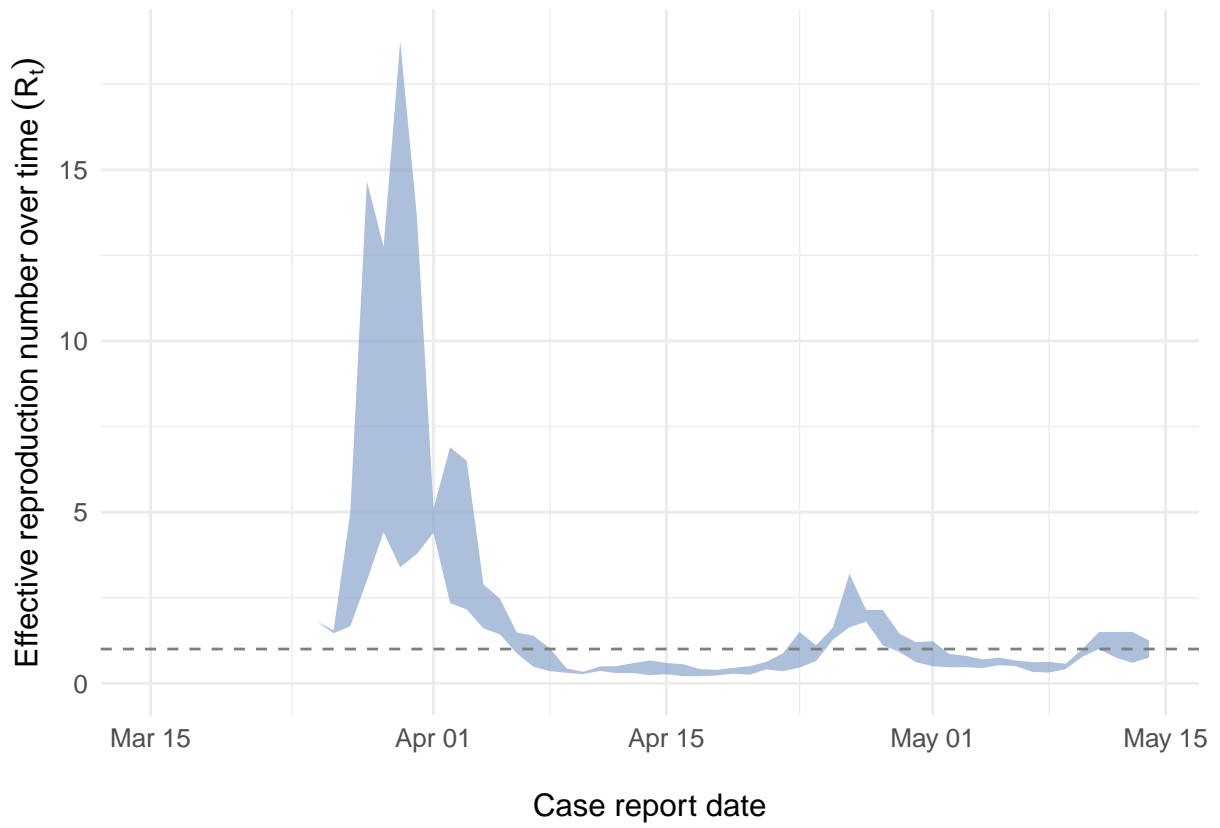


Figure 29: Effective reproductive number - Manitoba

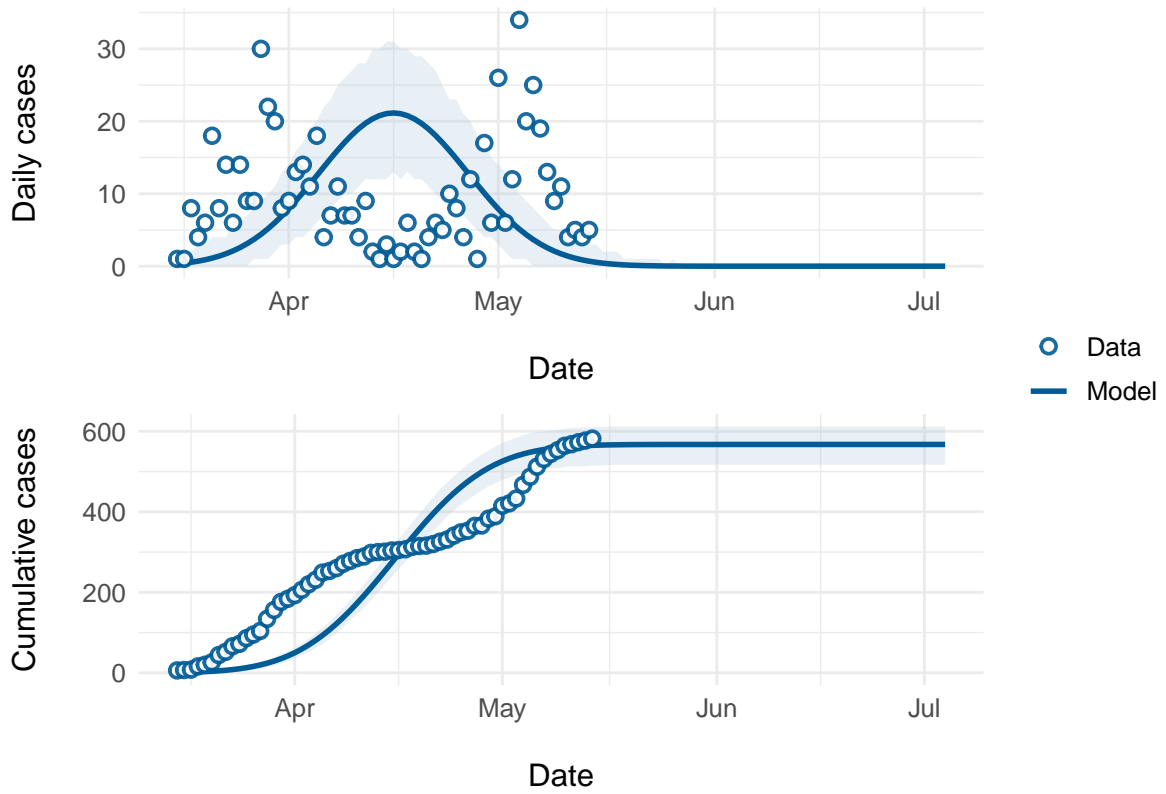


Figure 30: Saskatchewan

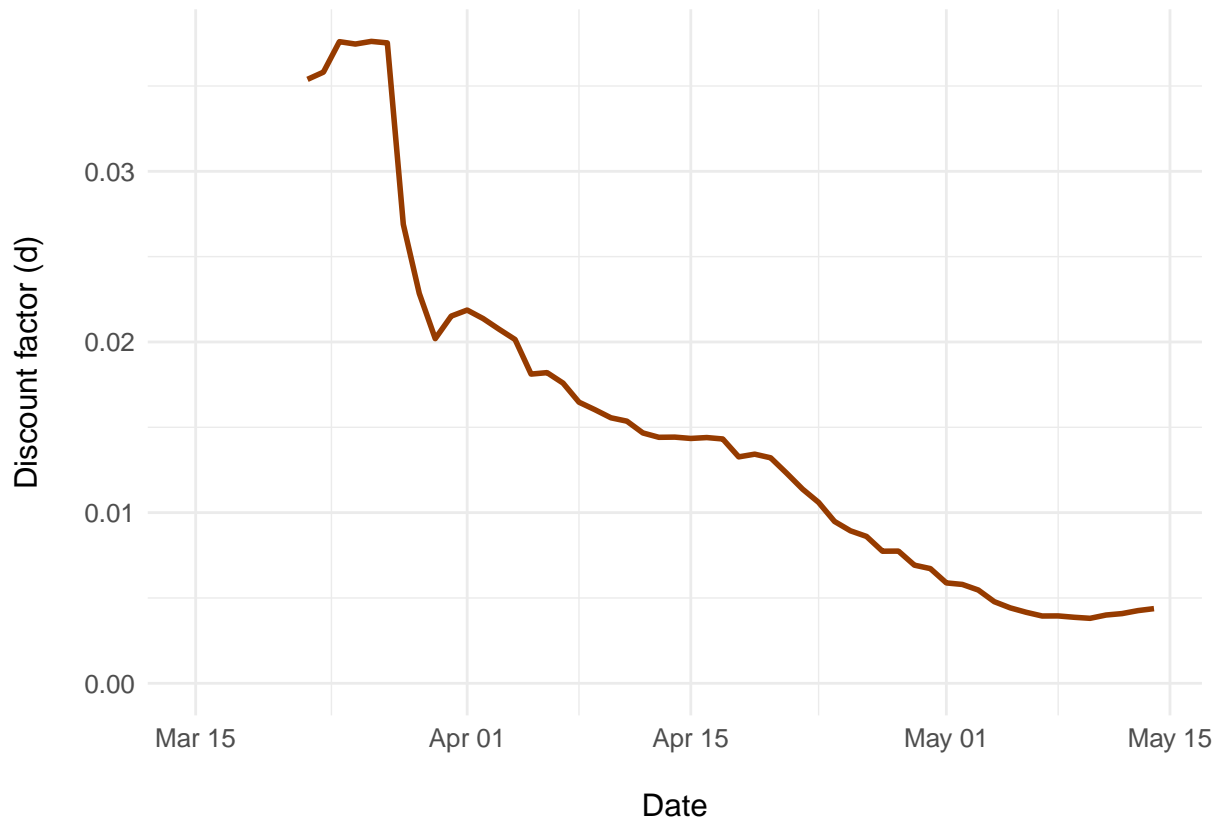


Figure 31: Discount factor - Saskatchewan



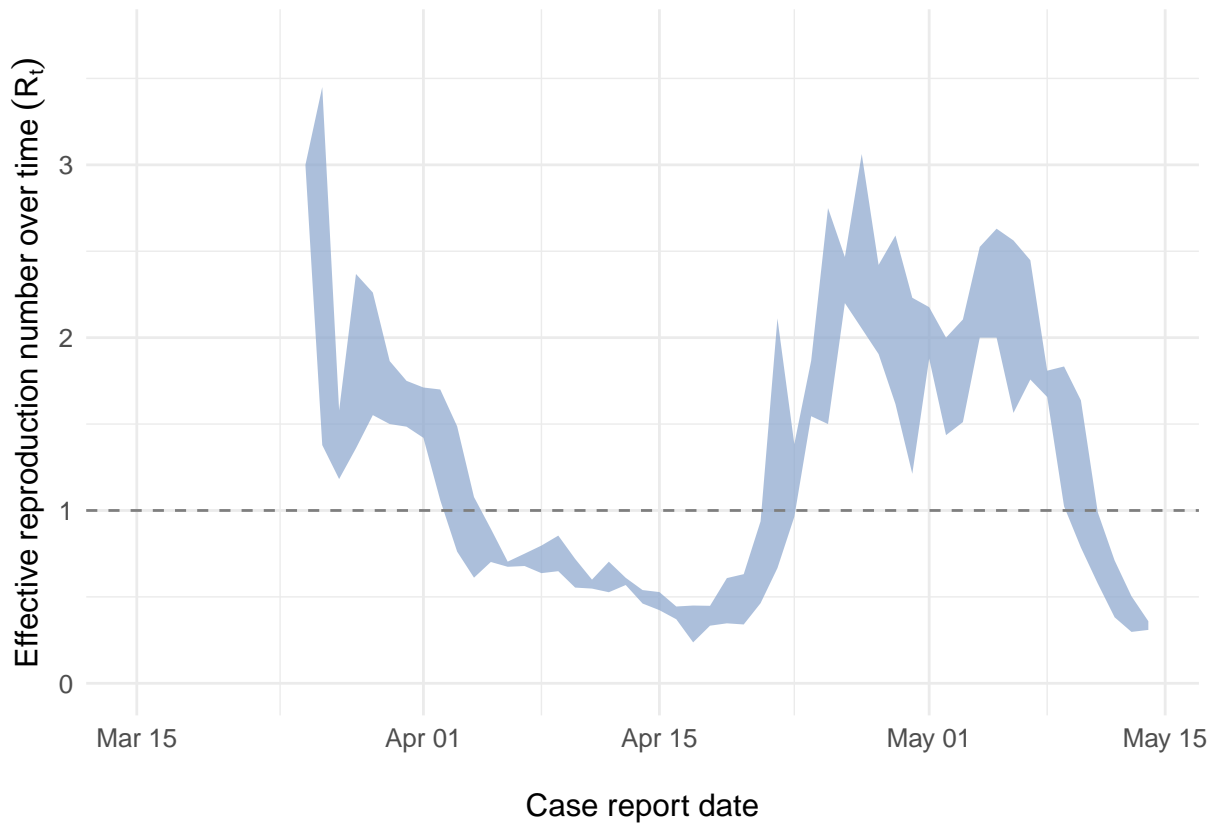


Figure 32: Effective reproductive number - Saskatchewan