

IDEA model fits to daily Canadian COVID-19 data

11-May-2020

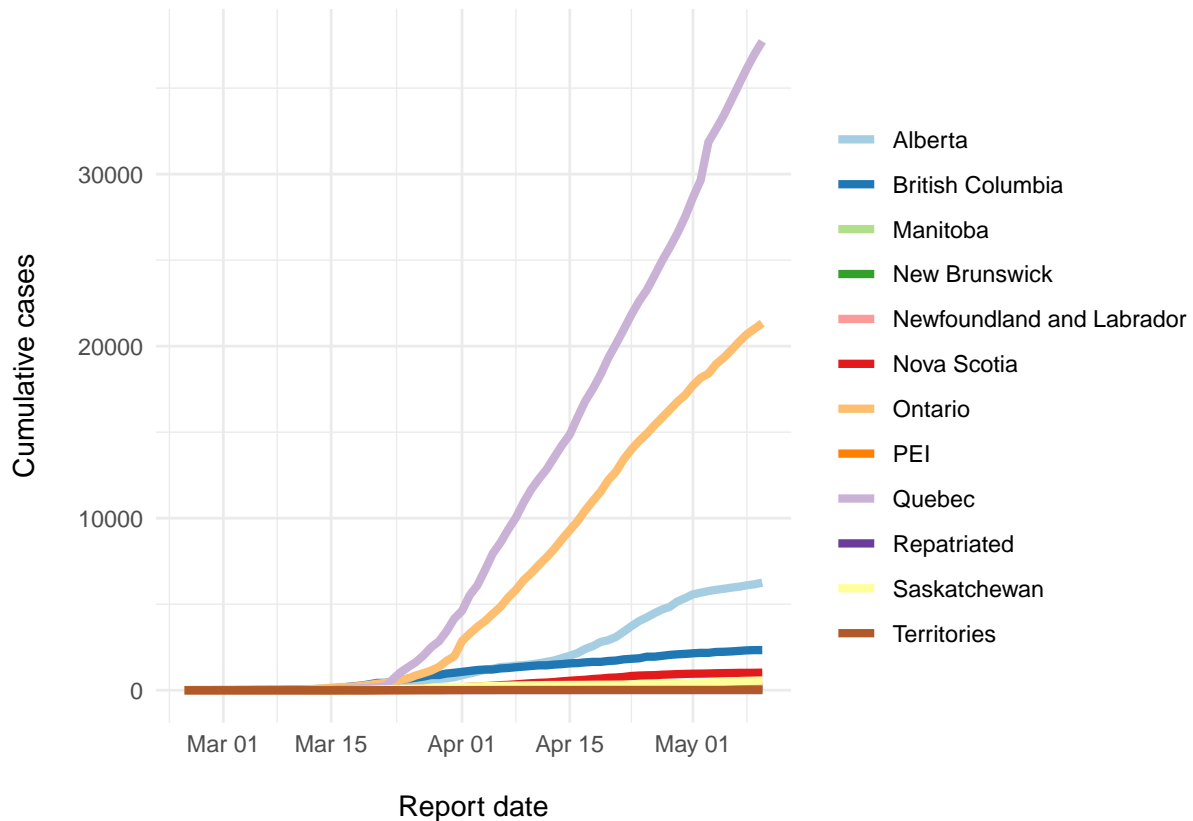


Figure 1: Cumulative cases

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 2020-05-11 07:30:25. Forecasts are based on reported case data up to 2020-05-10. Data are collected by the [COVID-19 Canada Open Data Working Group](#).

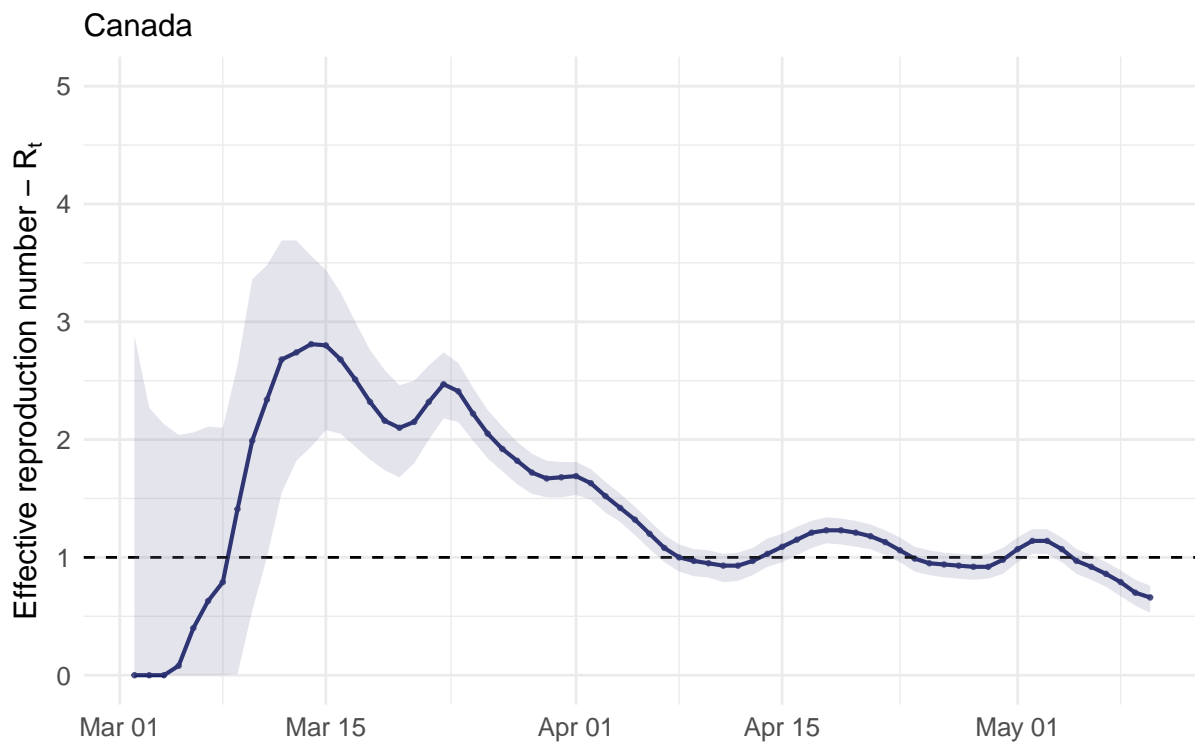
For each province, we show the model fit to incident and cumulative cases. We also include a daily estimate of the discount factor (d). The metric provides a measure of the degree of control that is occurring. A larger value is better - it suggests more control and therefore slowing epidemic growth. 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 | 0.66 | 0.53-0.76 |
| Alberta | 0.74 | 0.18-1.21 |
| British Columbia | 0.53 | 0-1.34 |
| Manitoba | 1.80 | 0-5.02 |
| New Brunswick | 0.20 | 0-4 |
| Newfoundland and Labrador | 0.00 | 0-3.14 |
| Nova Scotia | 0.48 | 0-1.98 |
| Ontario | 0.86 | 0.64-1.07 |
| Quebec | 0.57 | 0.42-0.71 |
| Saskatchewan | 0.66 | 0-1.54 |



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

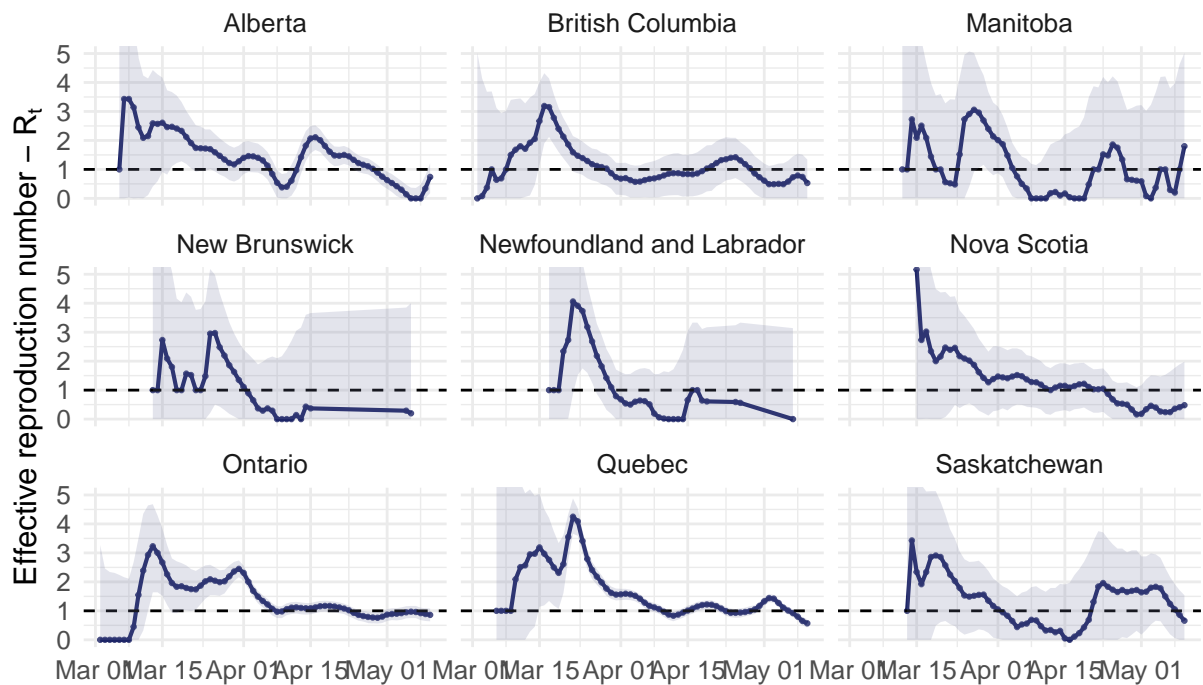


Figure 2: Alternate method for estimating effective reproductive number

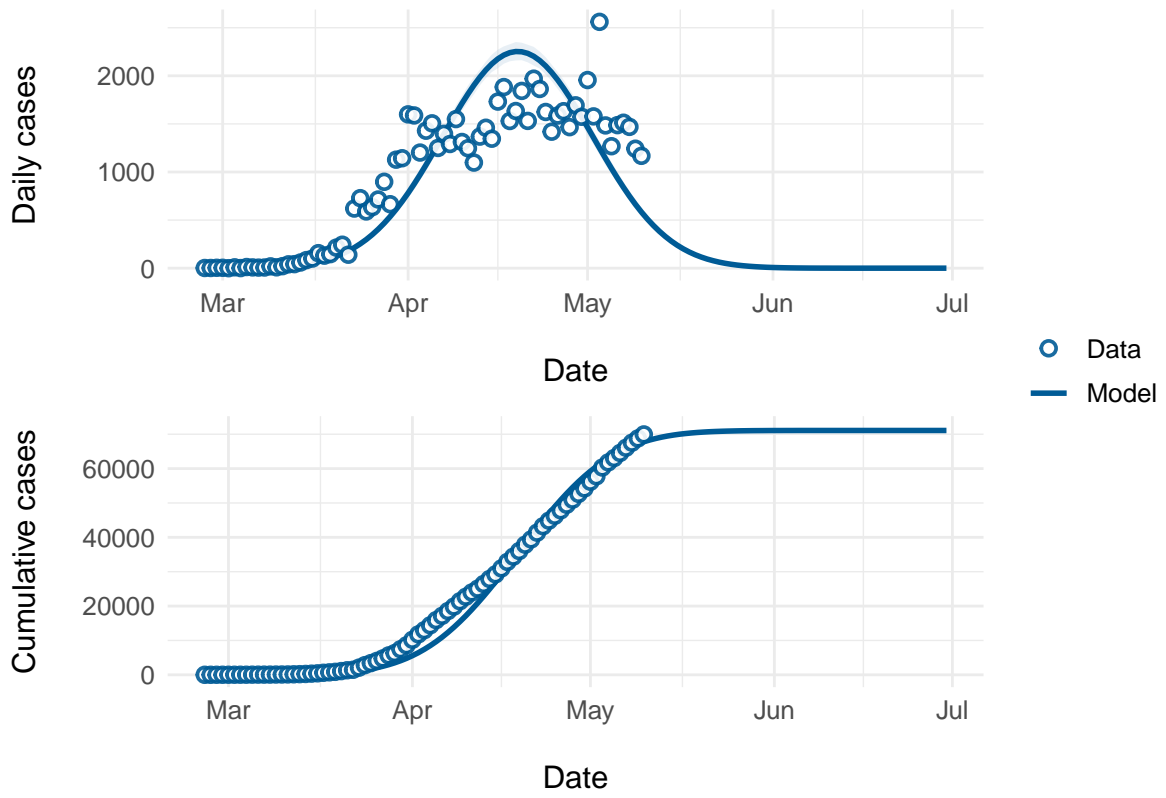


Figure 3: Canada

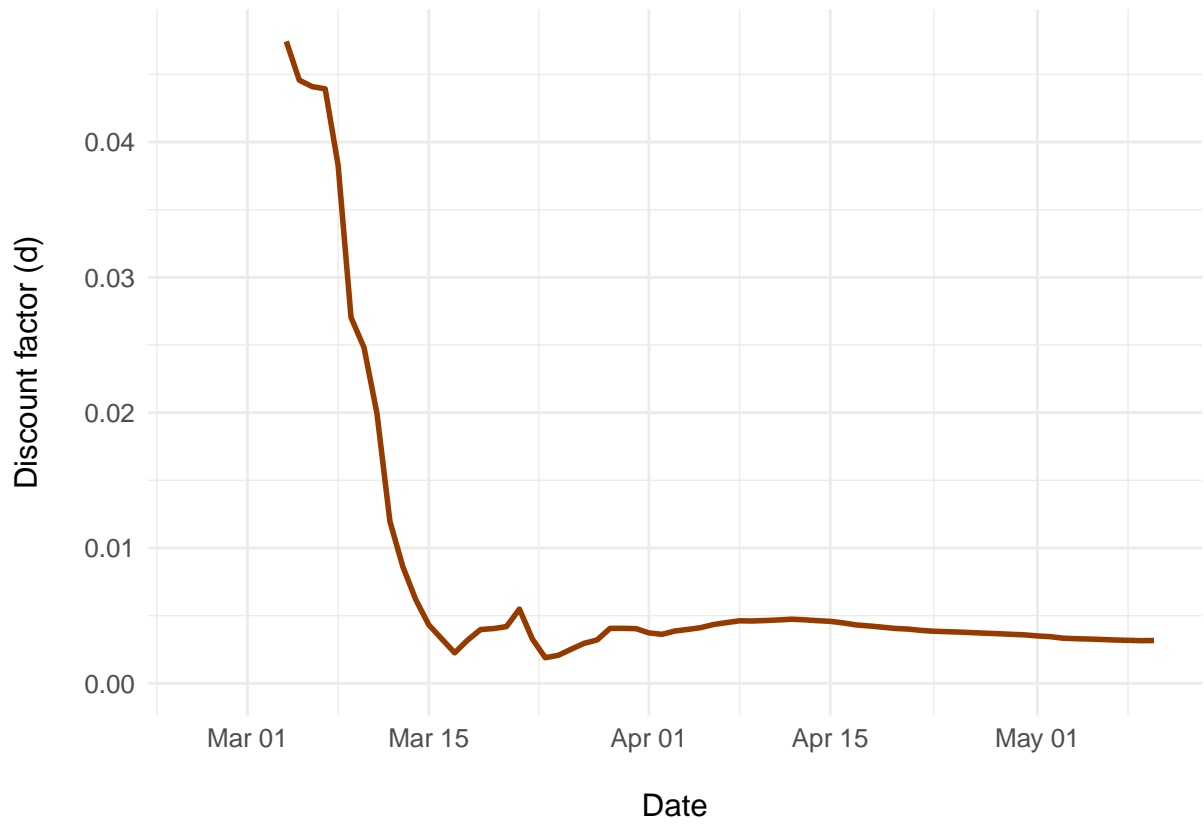


Figure 4: Discount factor - Canada

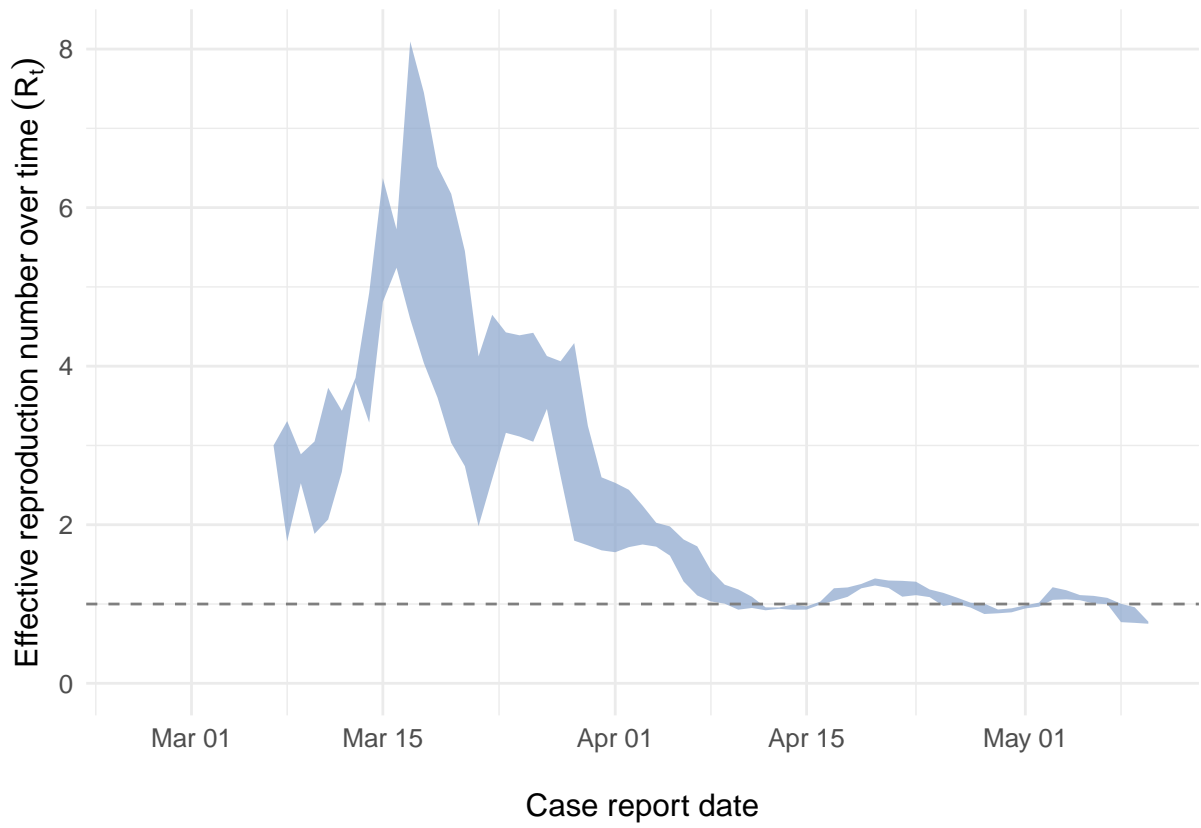


Figure 5: Effective reproductive number - Canada

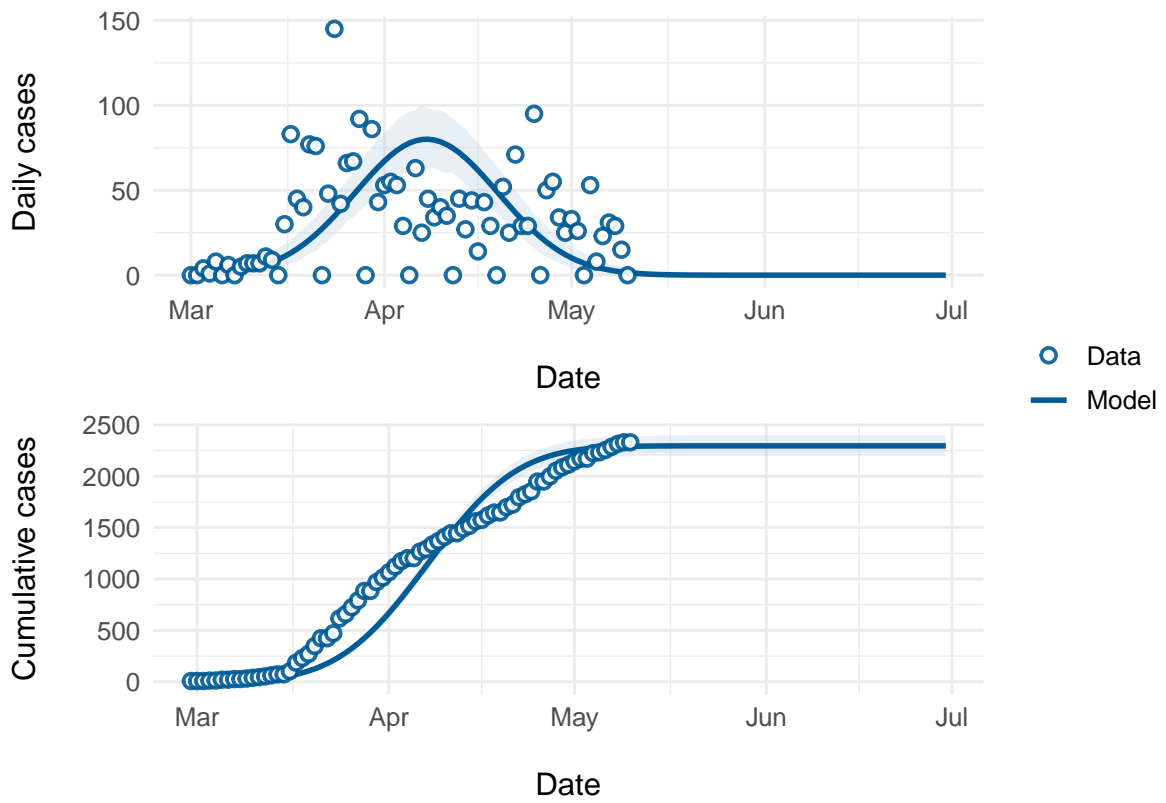


Figure 6: British Columbia

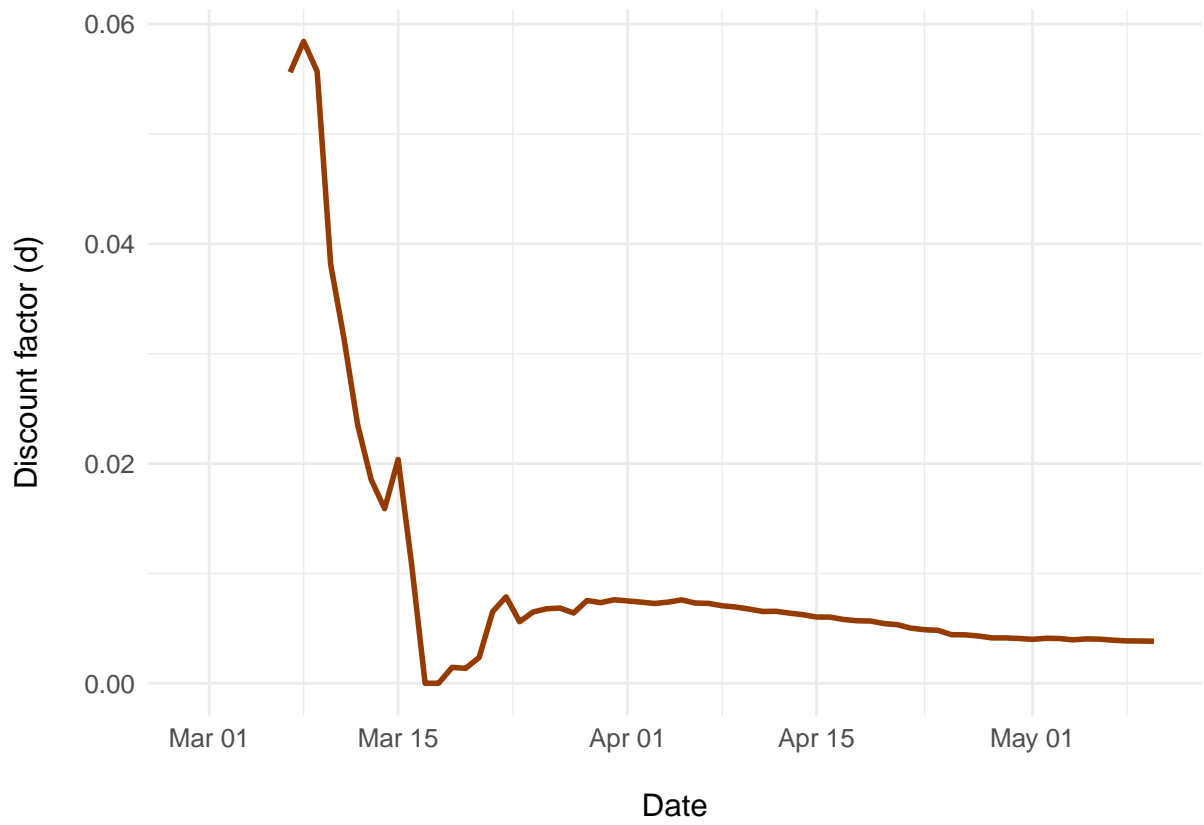


Figure 7: Discount factor - British Columbia

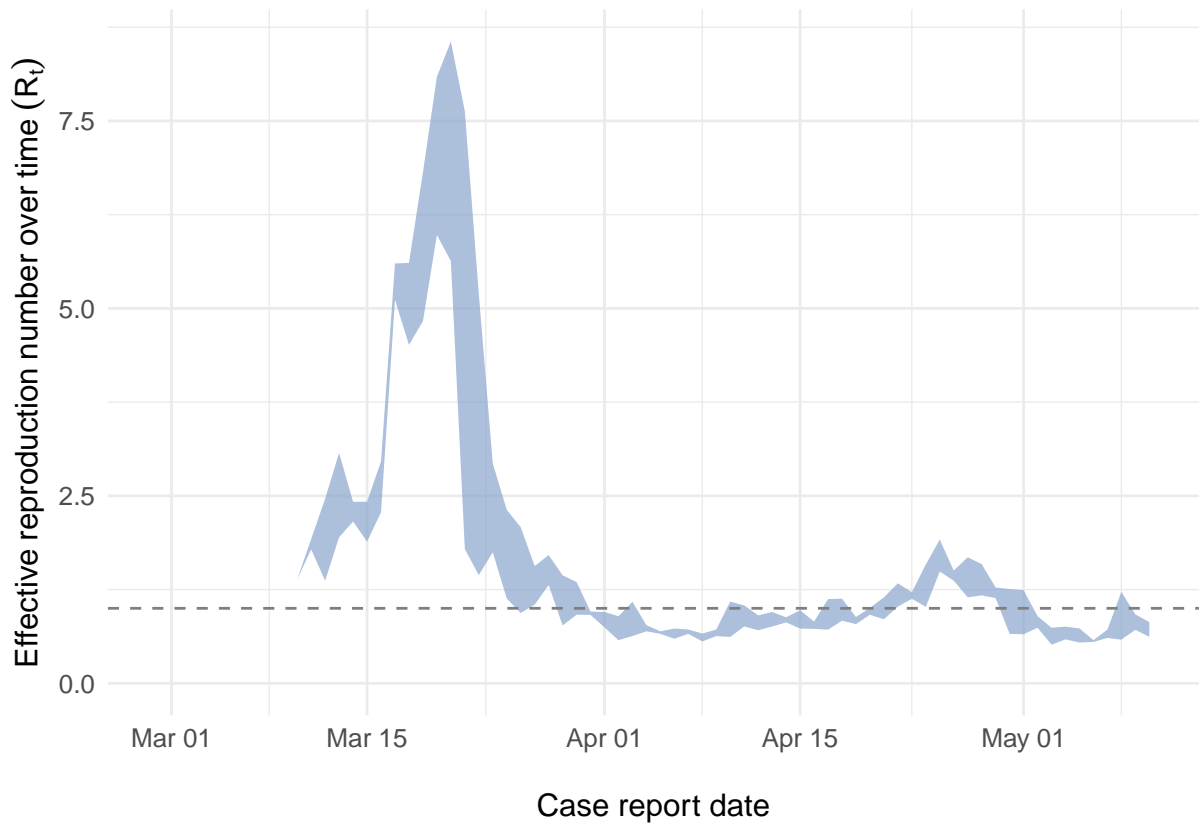


Figure 8: Effective reproductive number - British Columbia

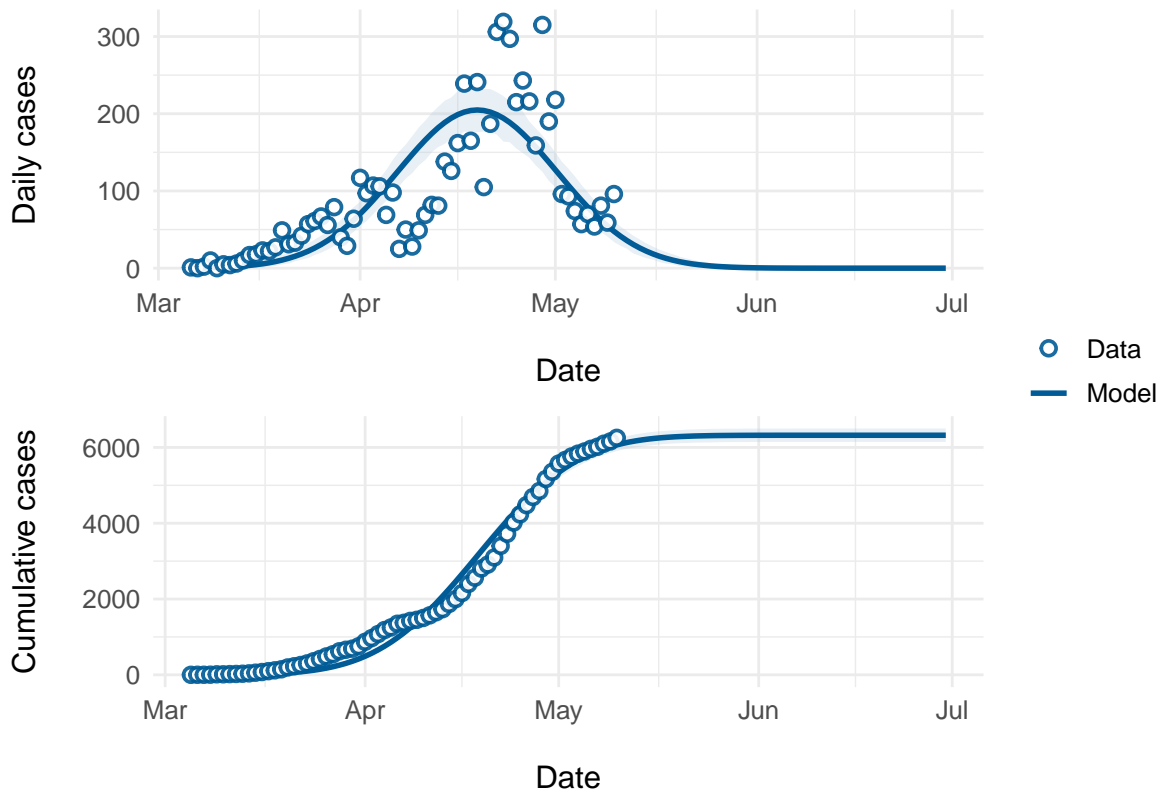


Figure 9: Alberta

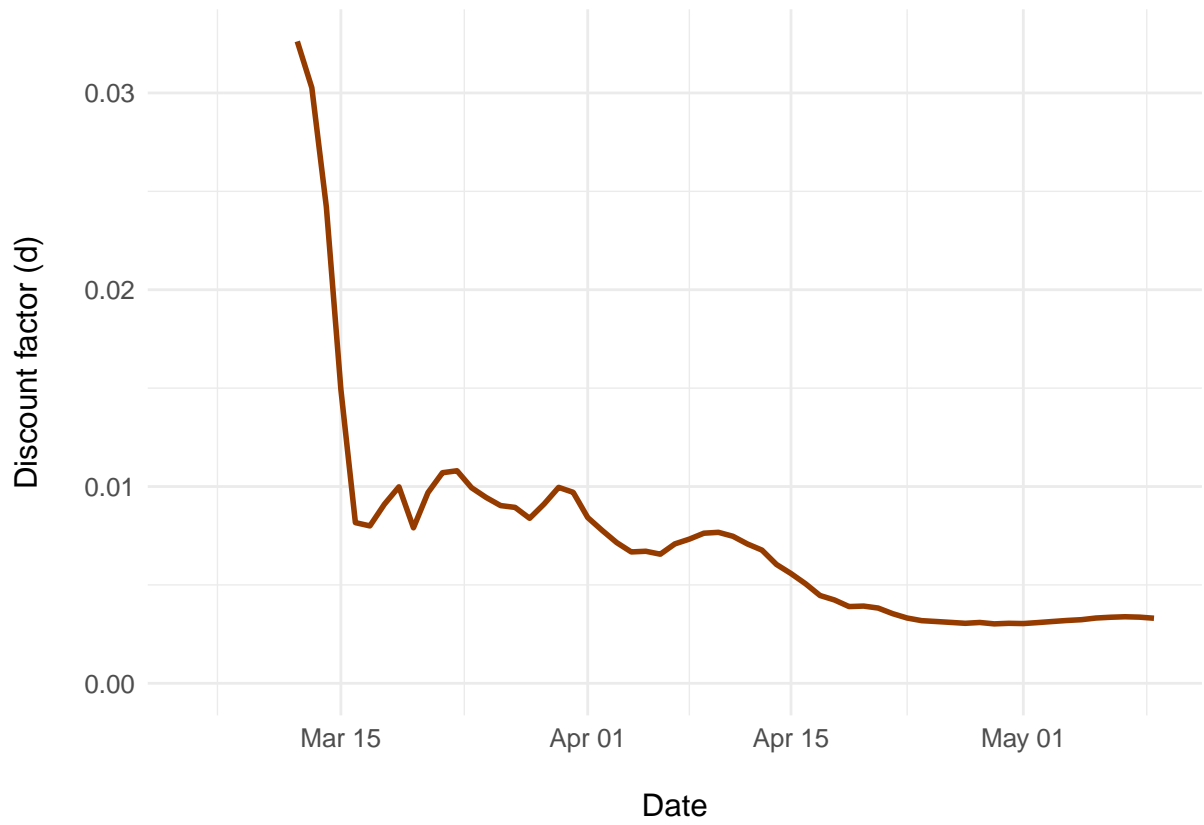


Figure 10: Discount factor - Alberta

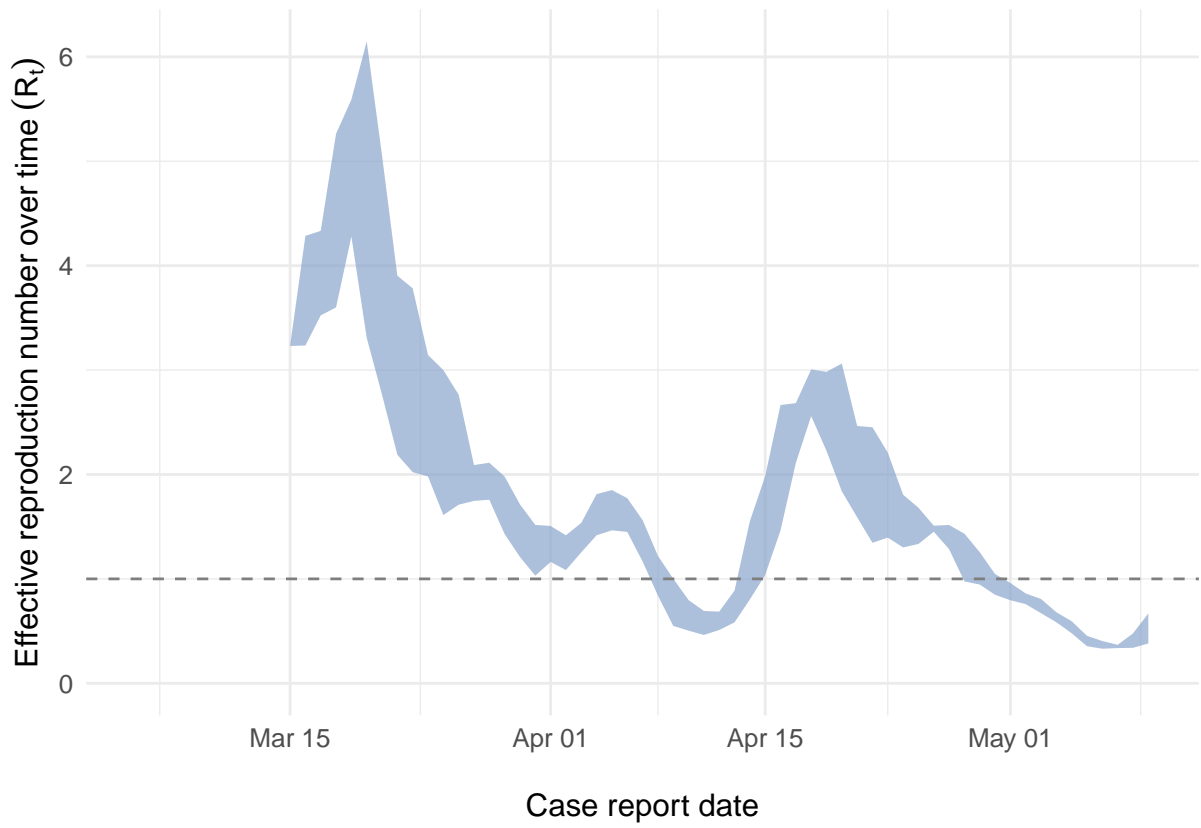


Figure 11: Effective reproductive number - Alberta

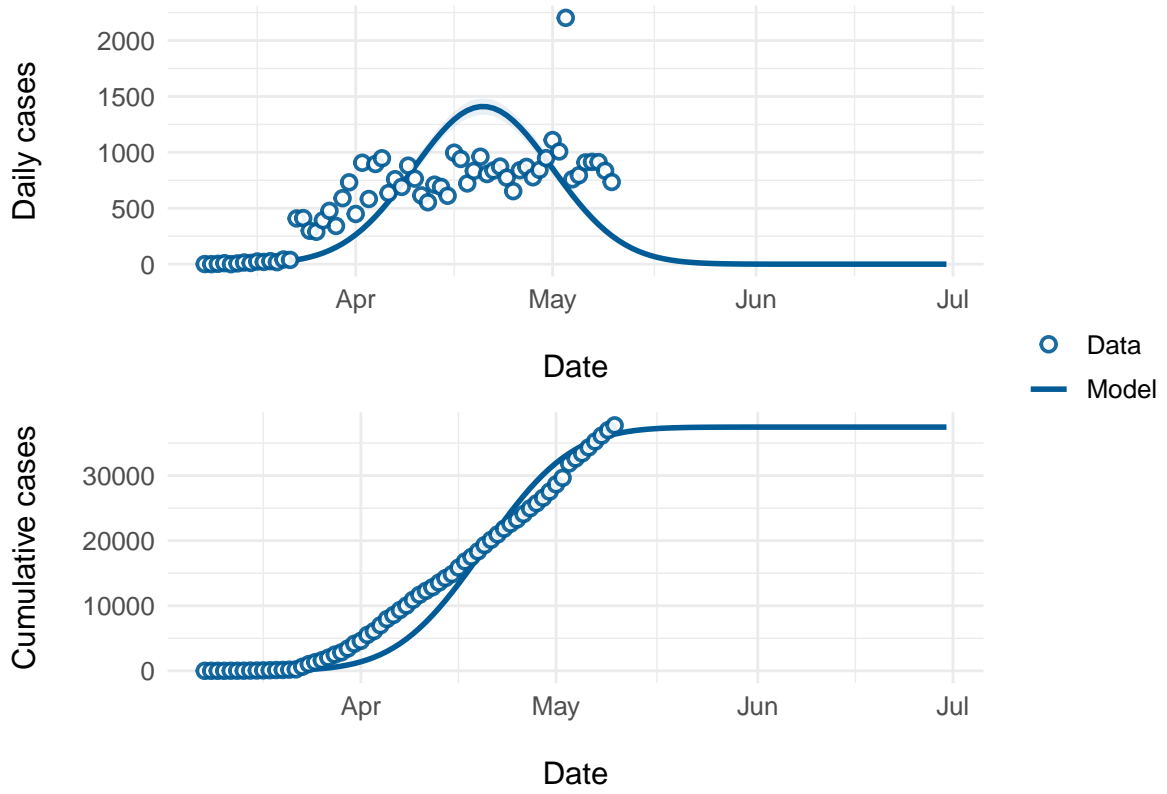


Figure 12: Quebec

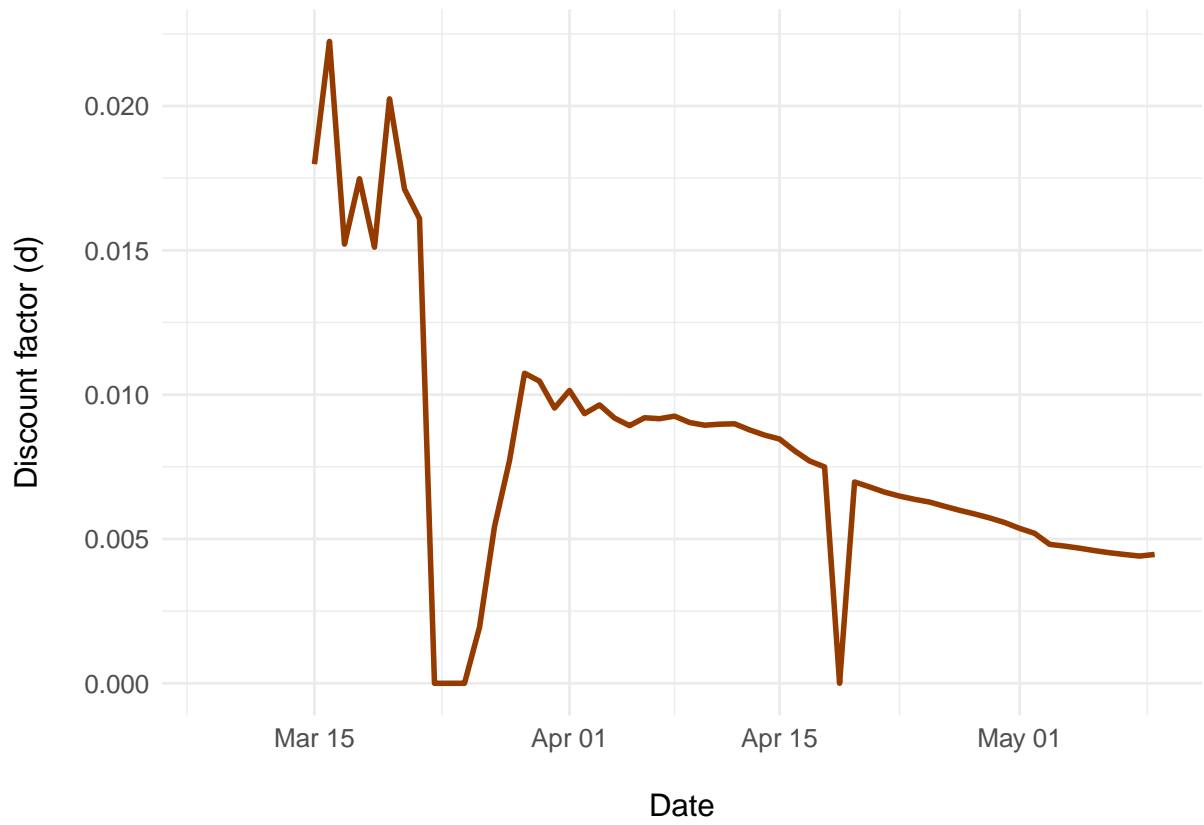


Figure 13: Discount factor - Quebec

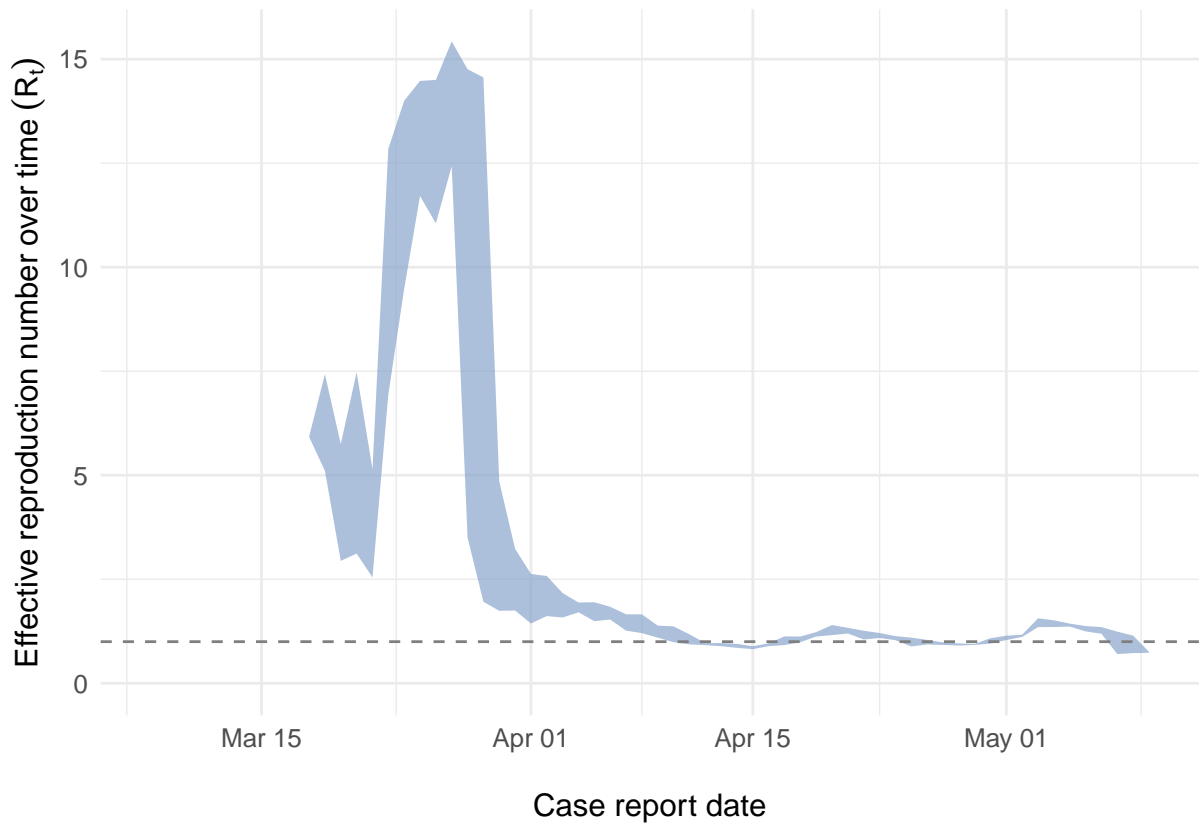


Figure 14: Effective reproductive number - Quebec

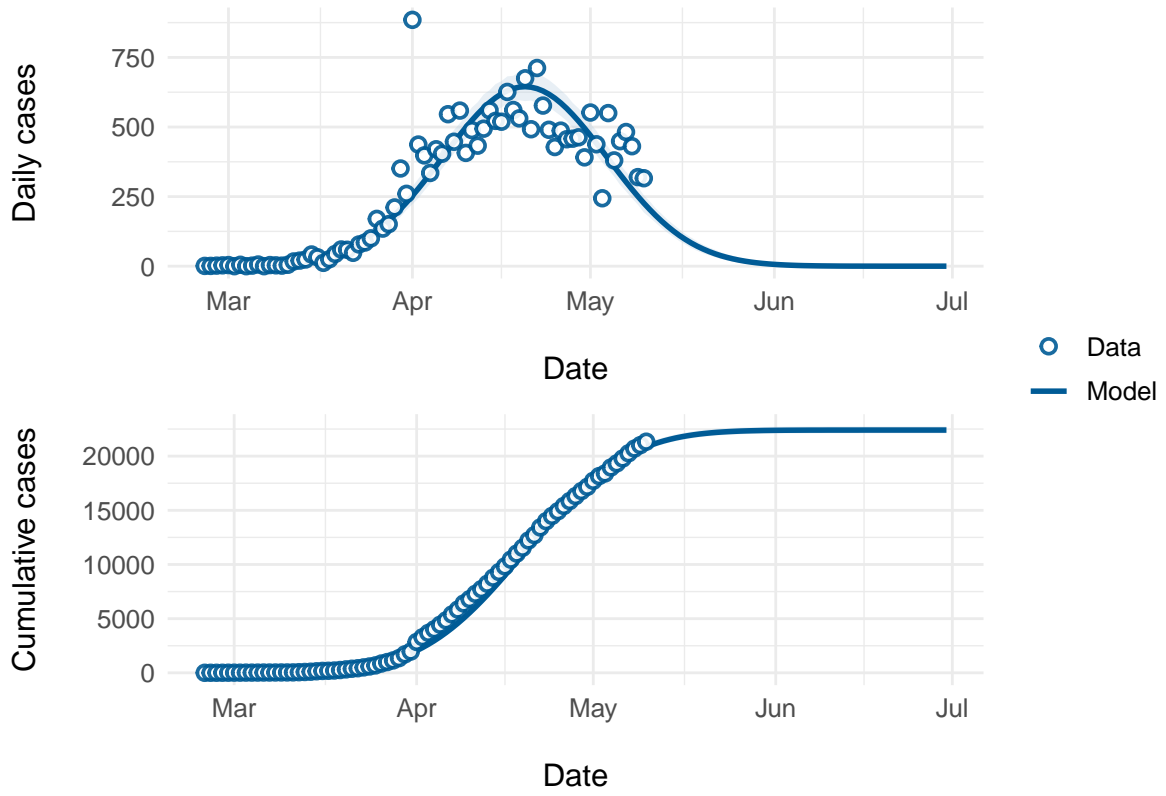


Figure 15: Ontario

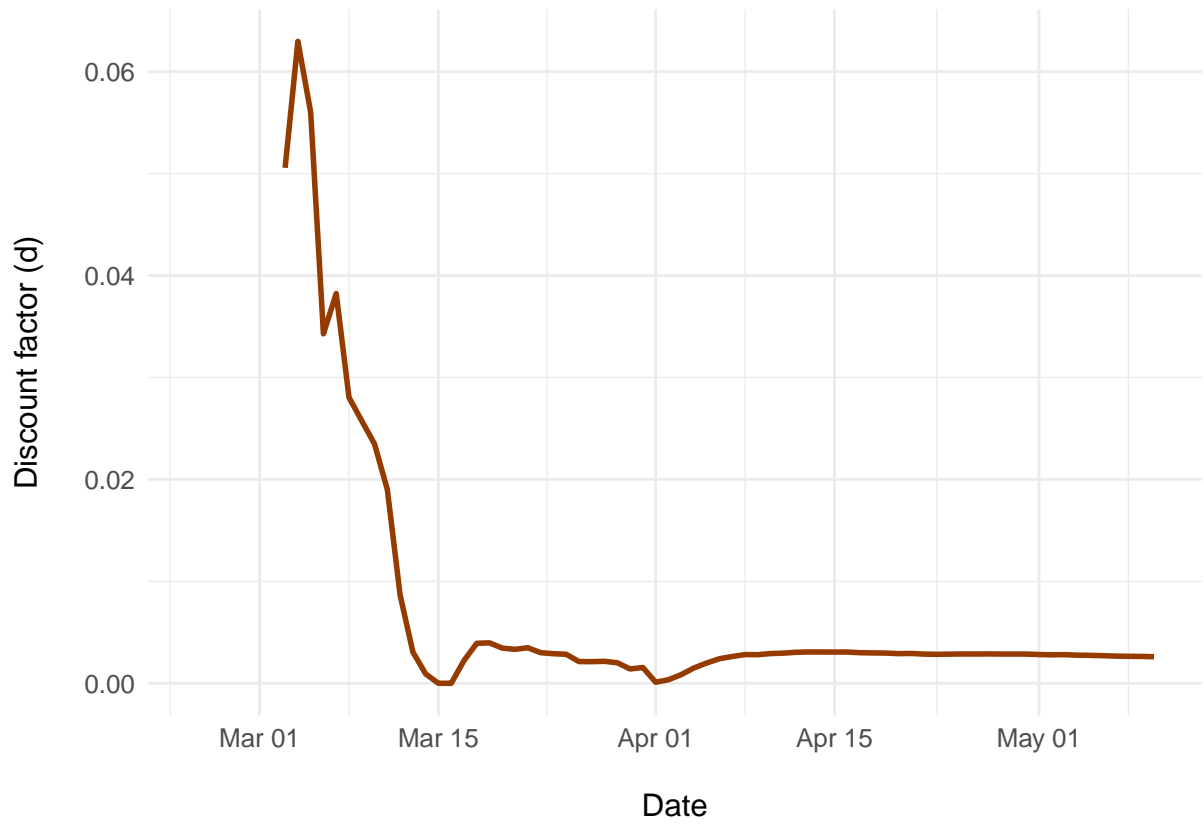


Figure 16: Discount factor - Ontario

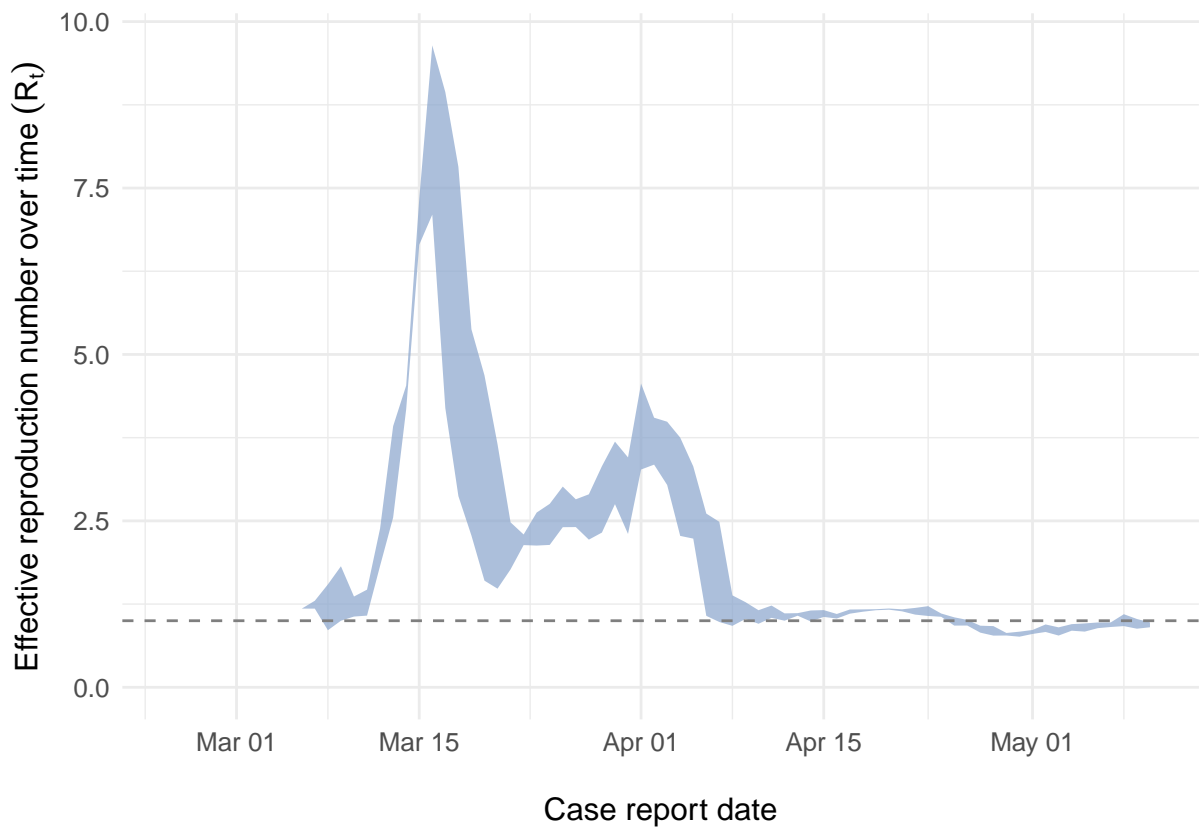


Figure 17: Effective reproductive number - Ontario

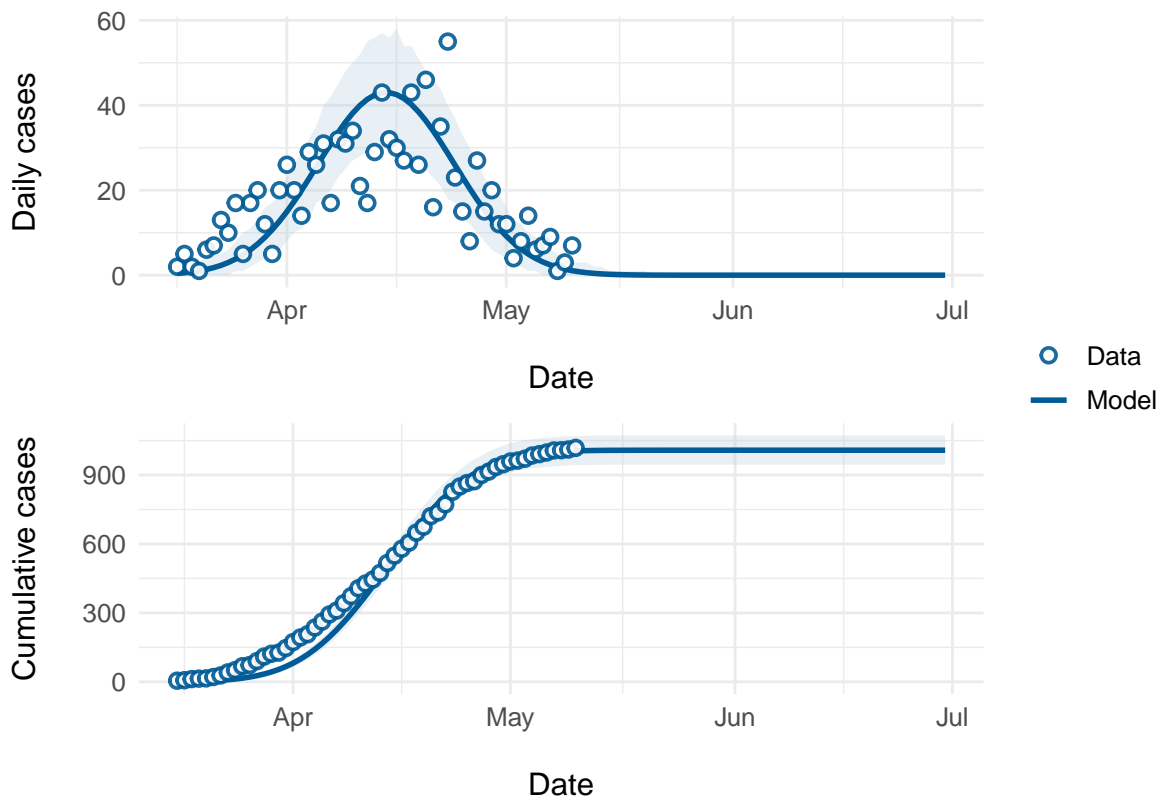


Figure 18: Nova Scotia

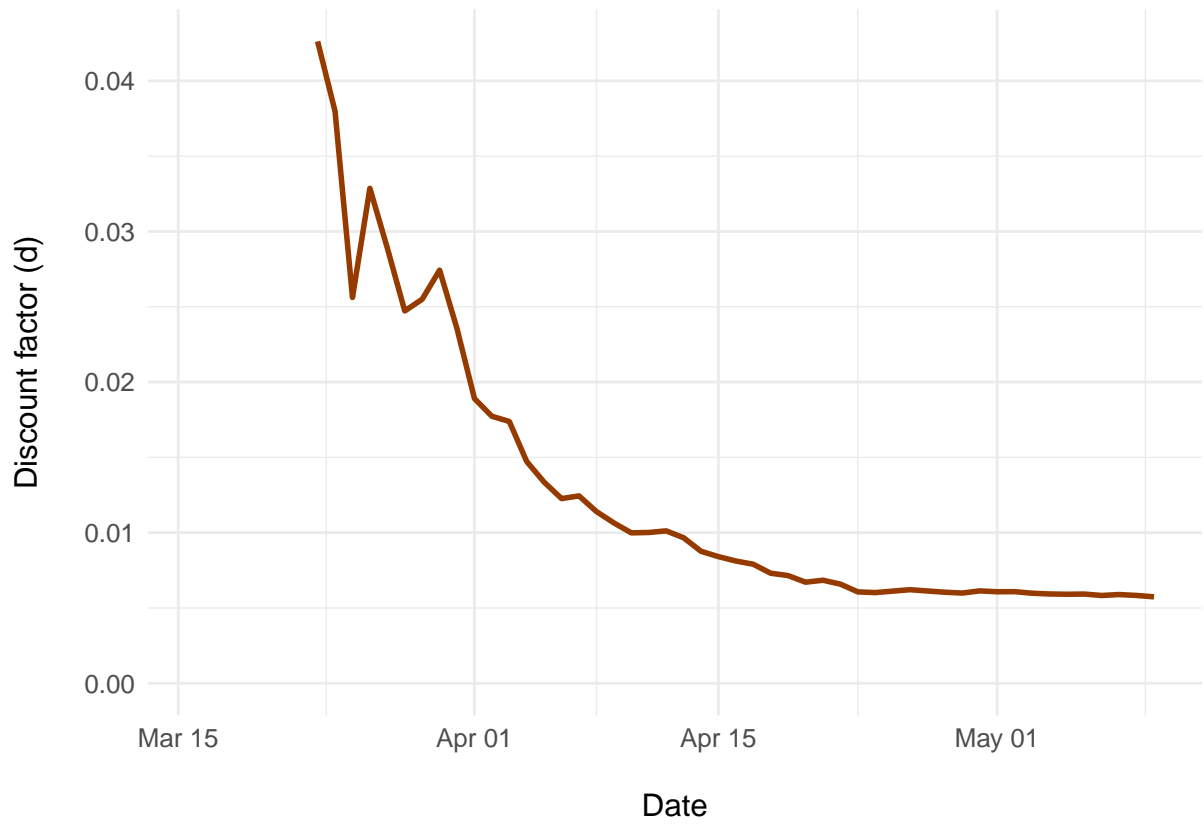


Figure 19: Discount factor - Nova Scotia

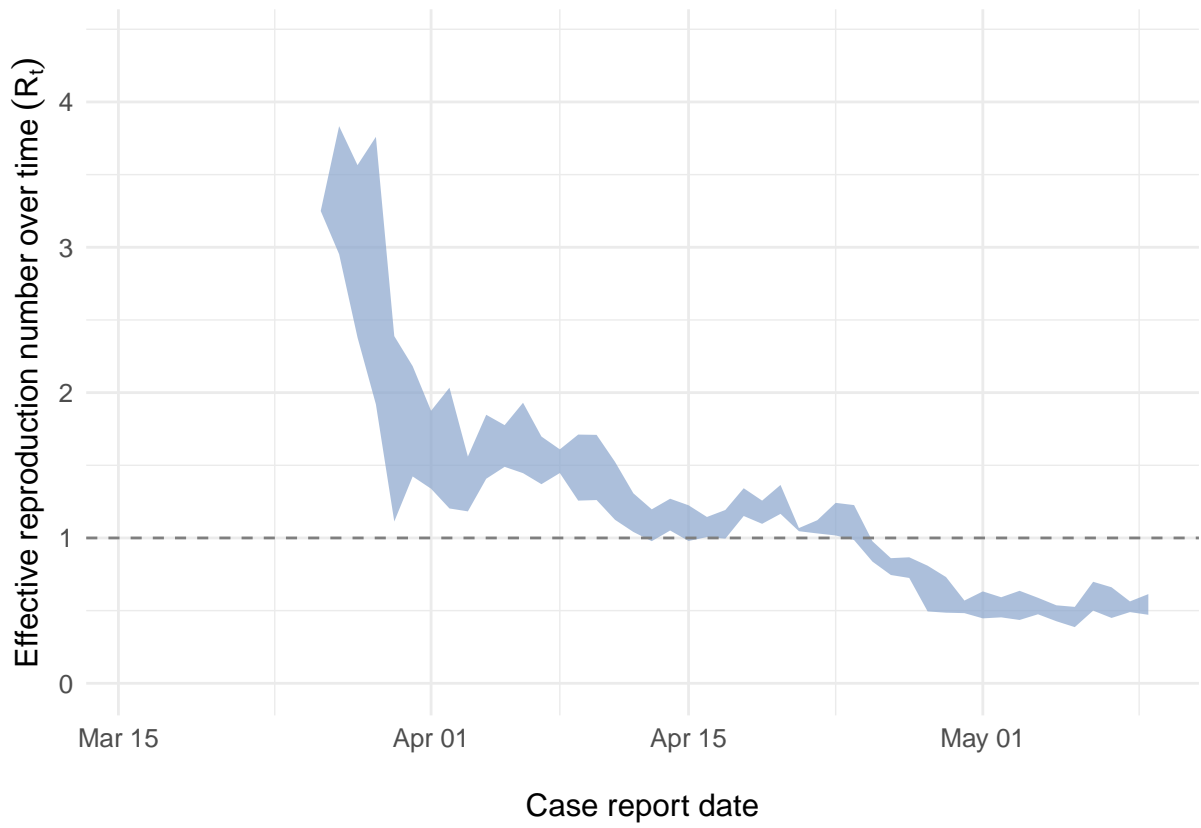


Figure 20: Effective reproductive number - Nova Scotia

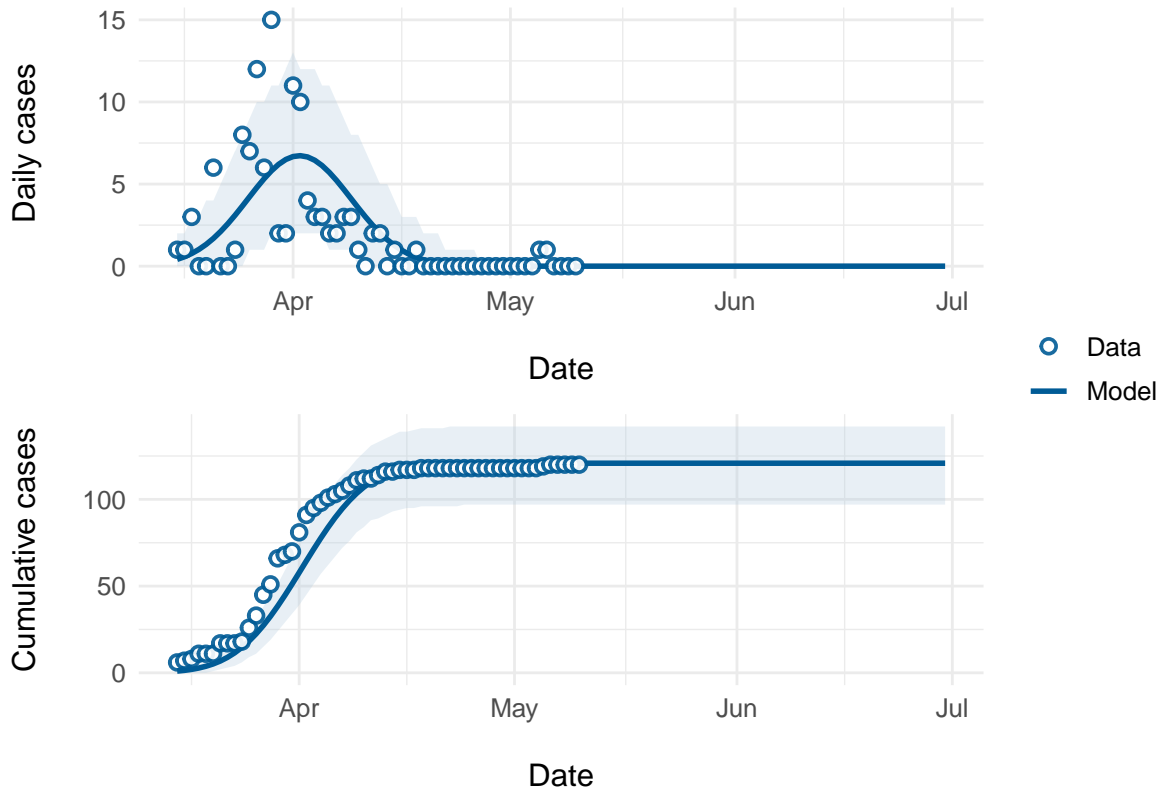


Figure 21: New Brunswick

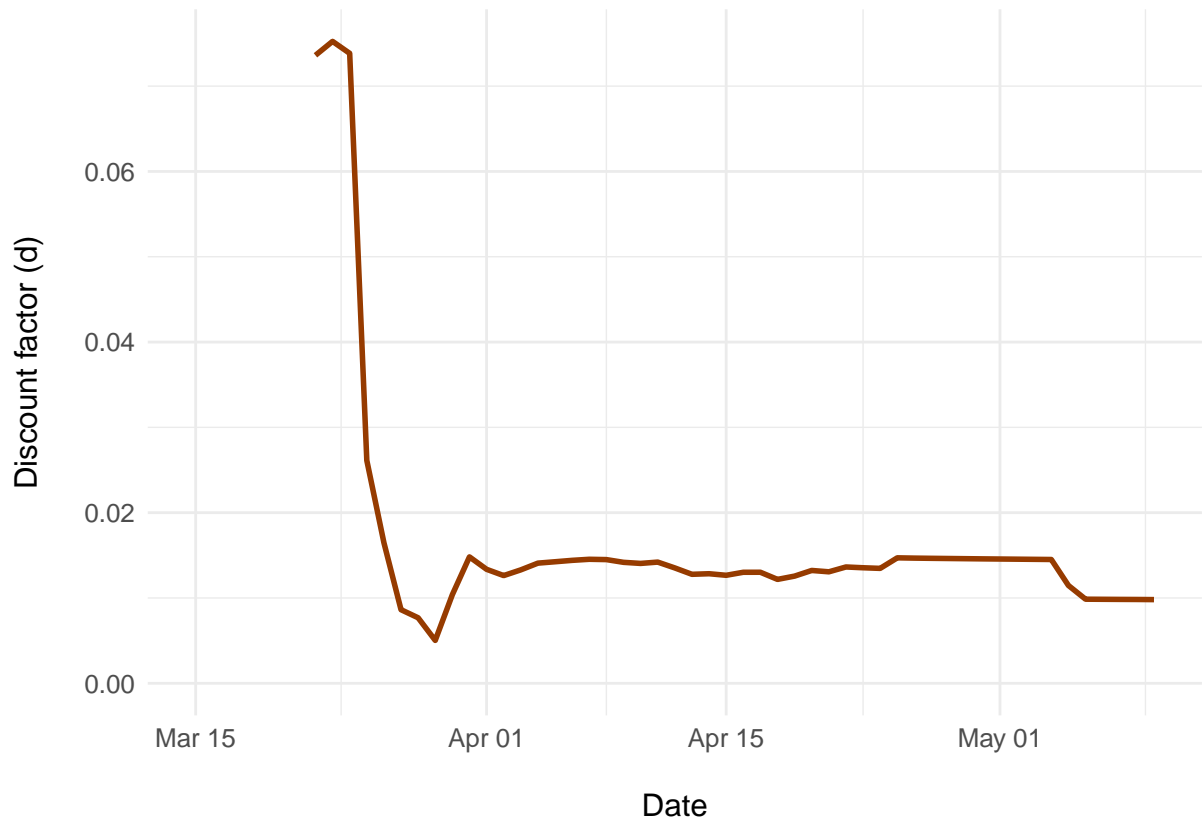


Figure 22: Discount factor - New Brunswick

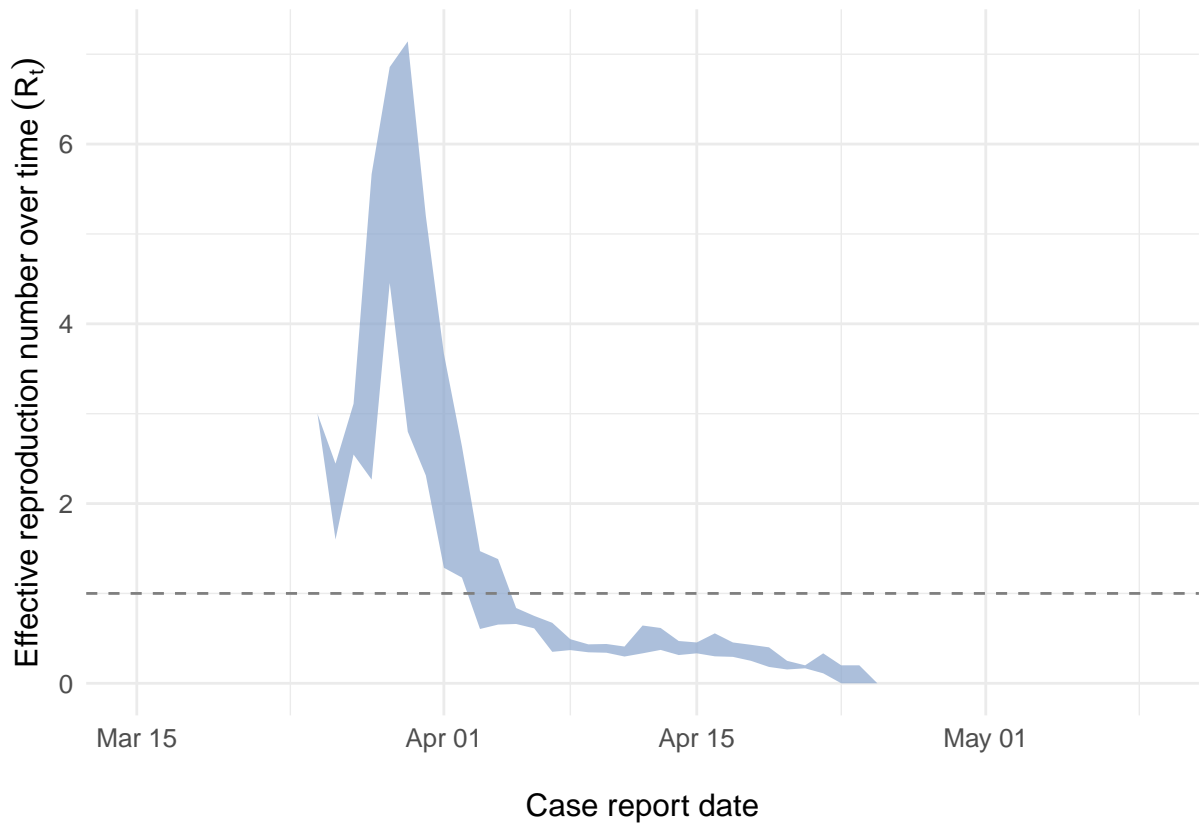


Figure 23: Effective reproductive number - New Brunswick

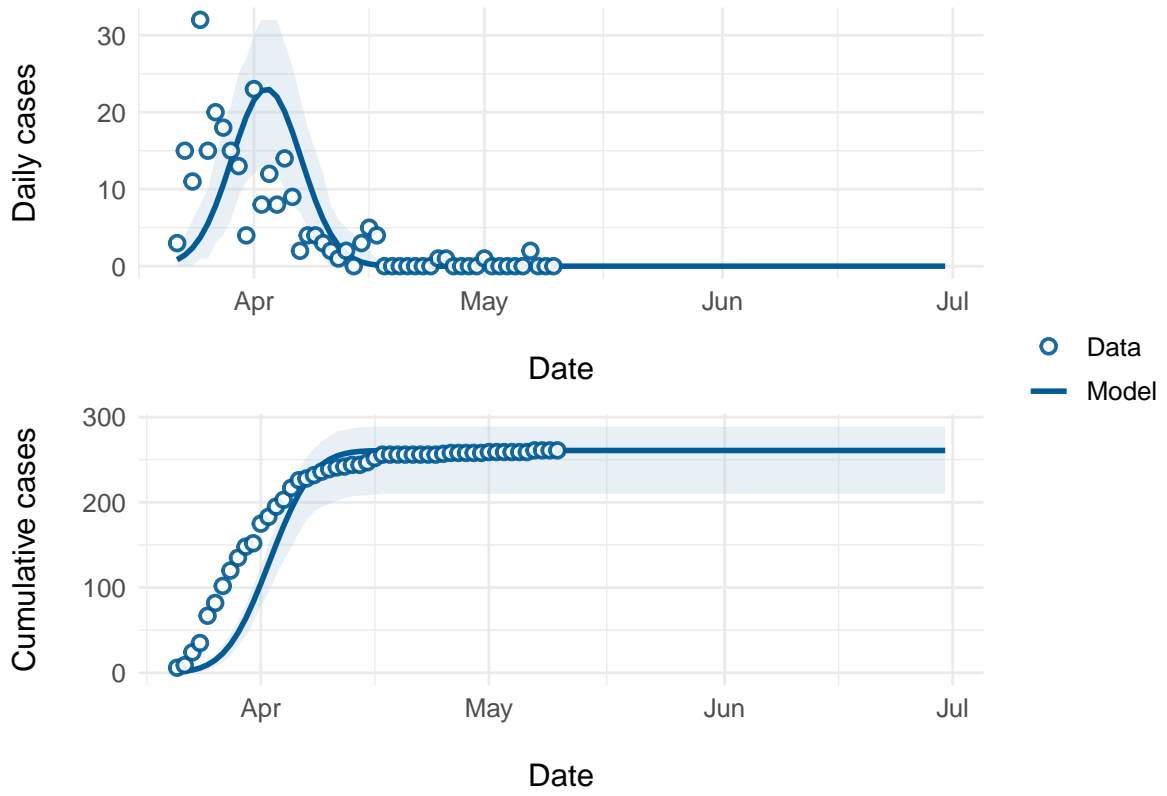


Figure 24: Newfoundland and Labrador

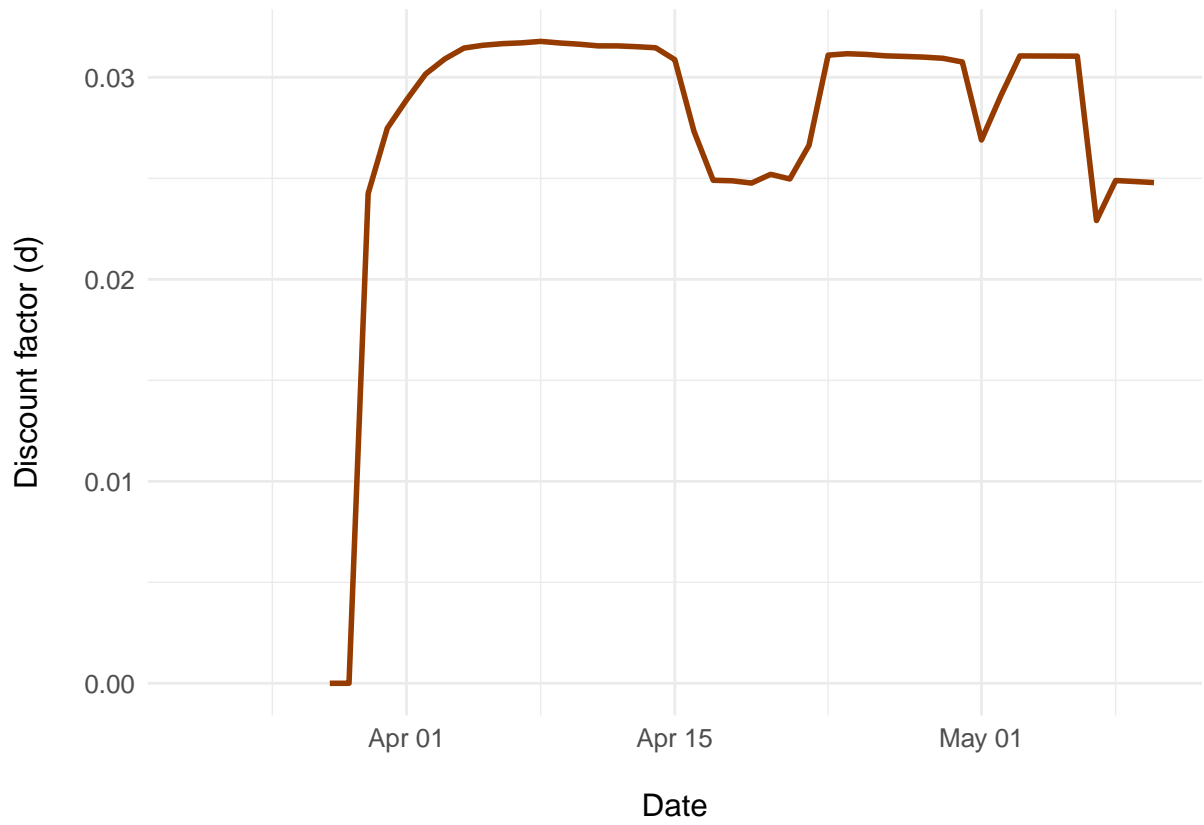


Figure 25: Discount factor - Newfoundland and Labrador

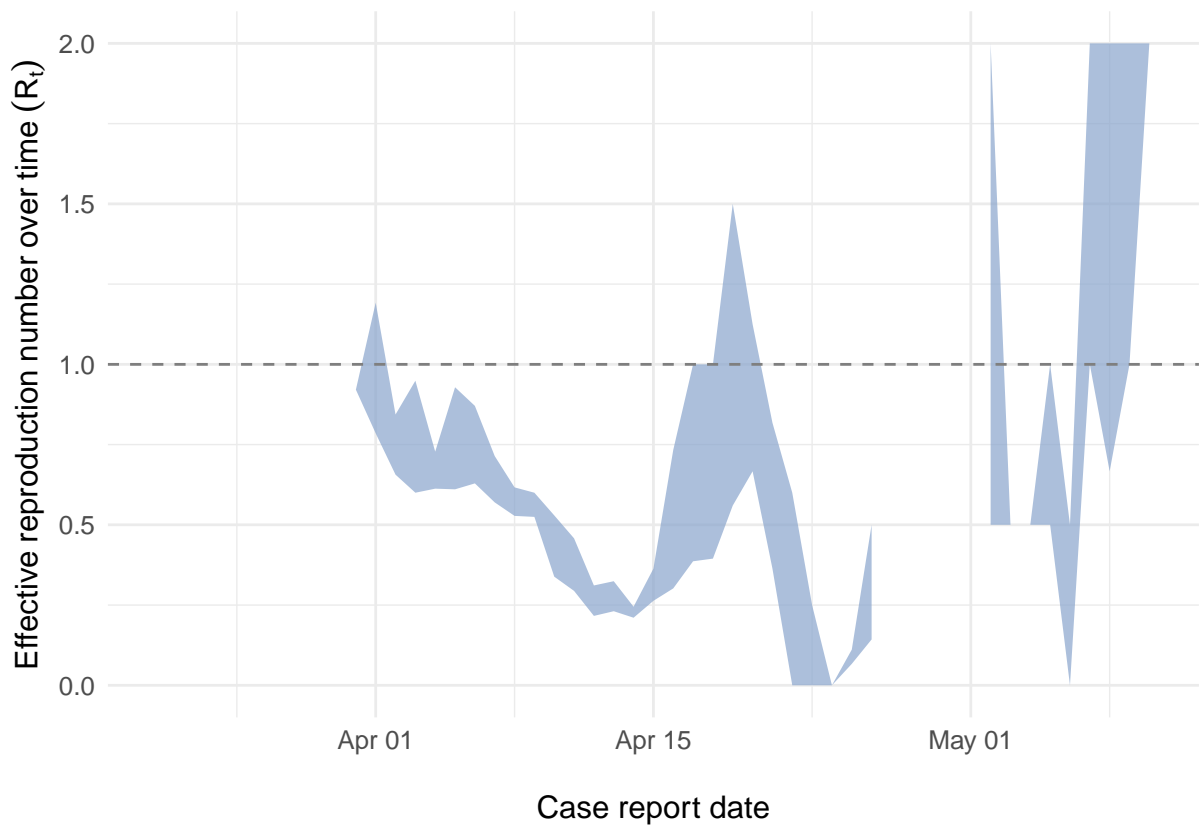


Figure 26: Effective reproductive number - Newfoundland and Labrador

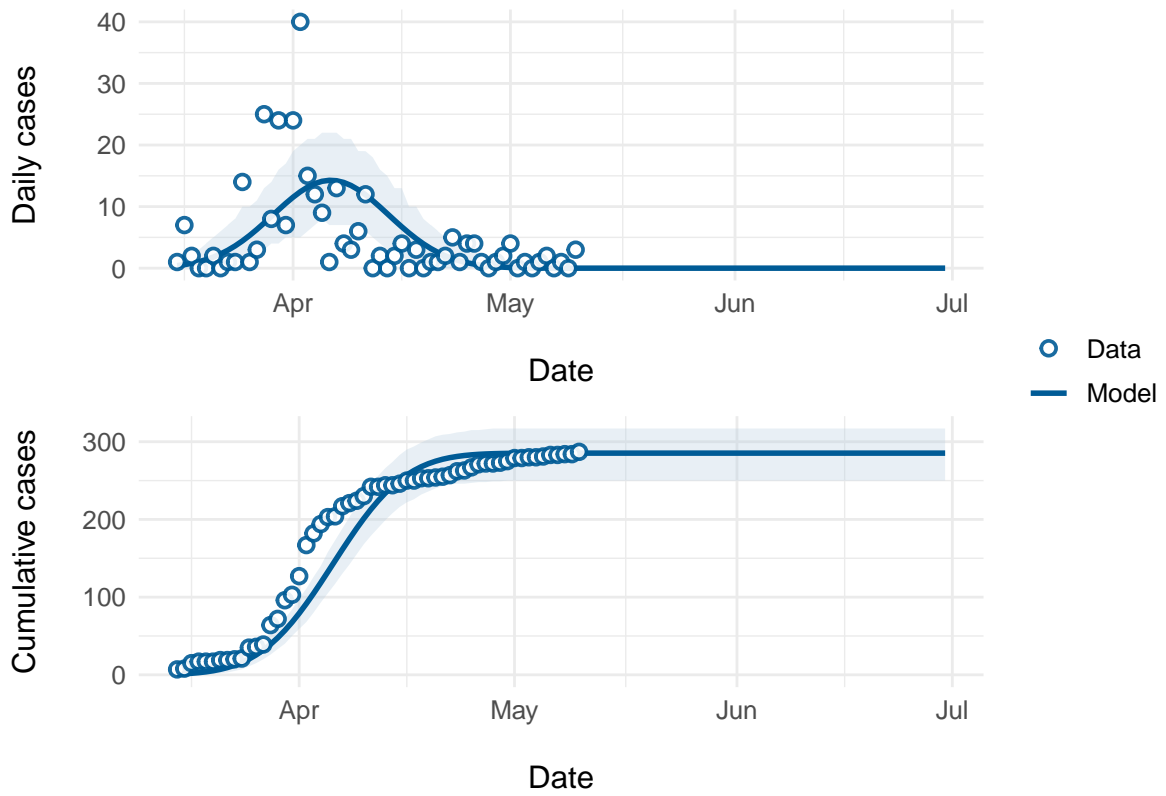


Figure 27: Manitoba

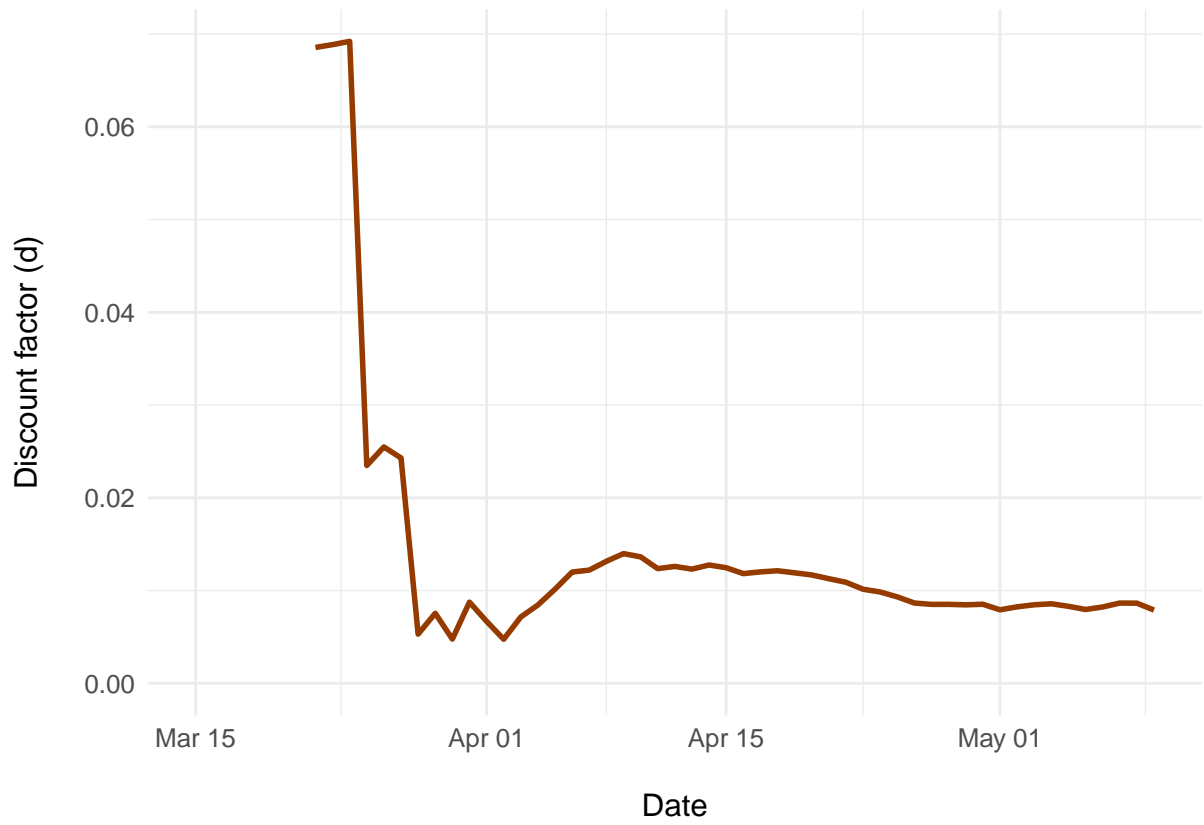


Figure 28: Discount factor - Manitoba

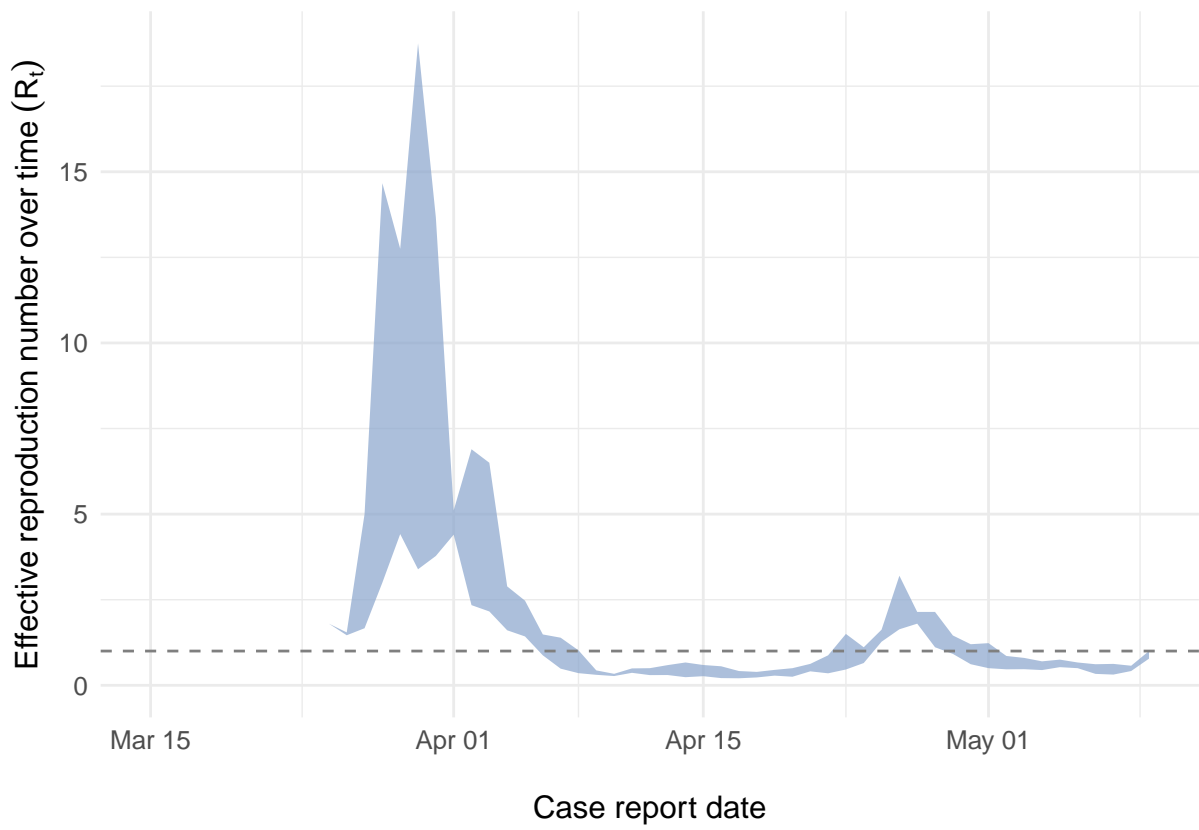


Figure 29: Effective reproductive number - Manitoba

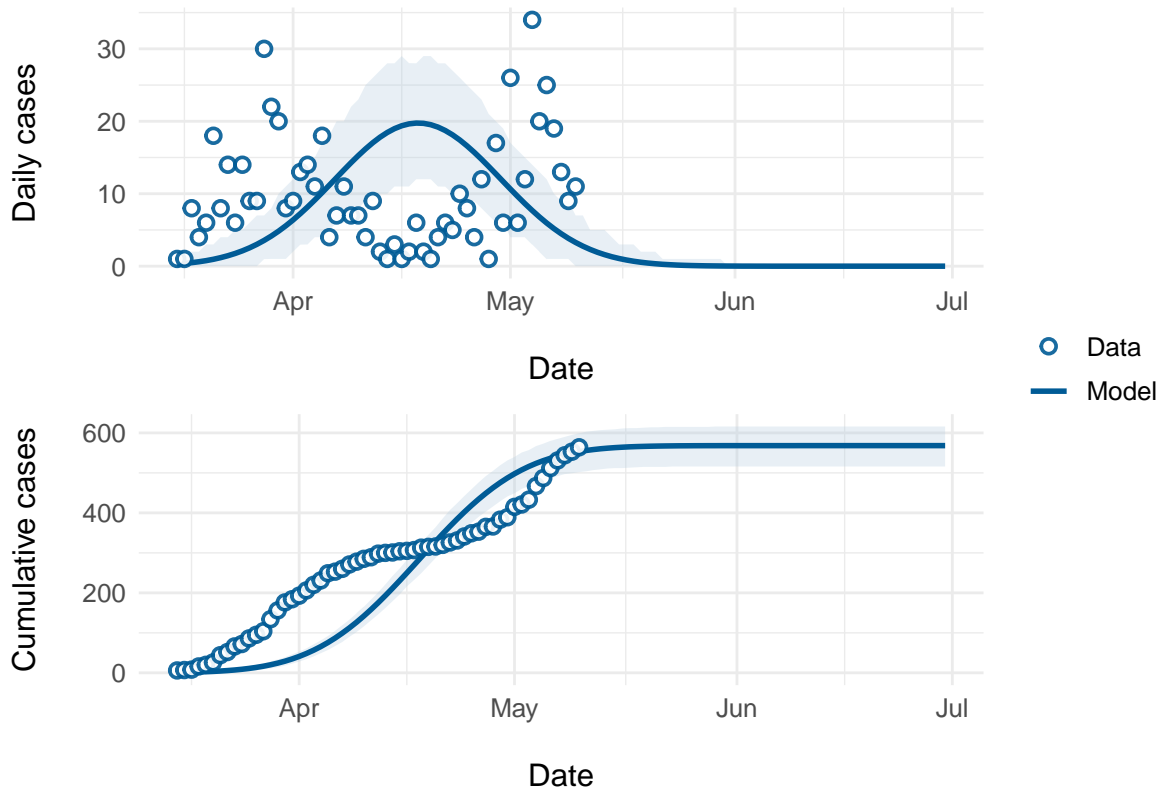


Figure 30: Saskatchewan

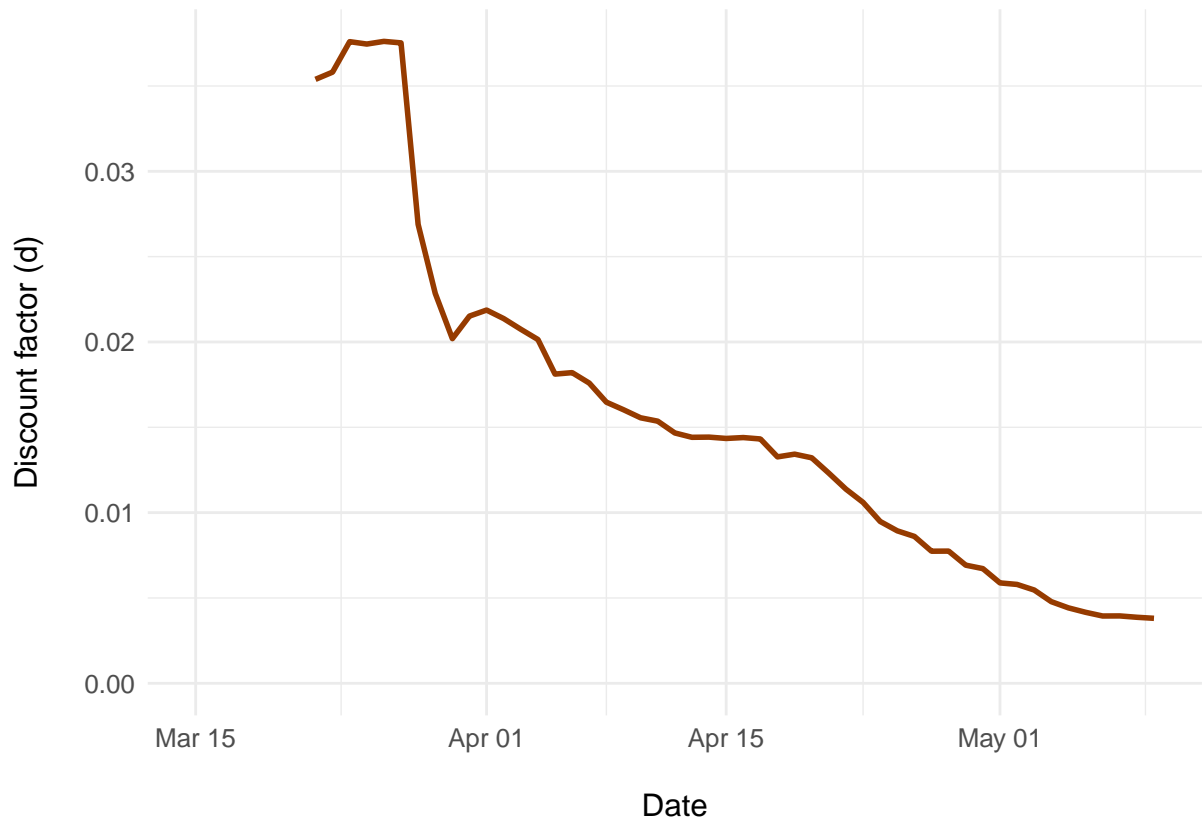


Figure 31: Discount factor - Saskatchewan

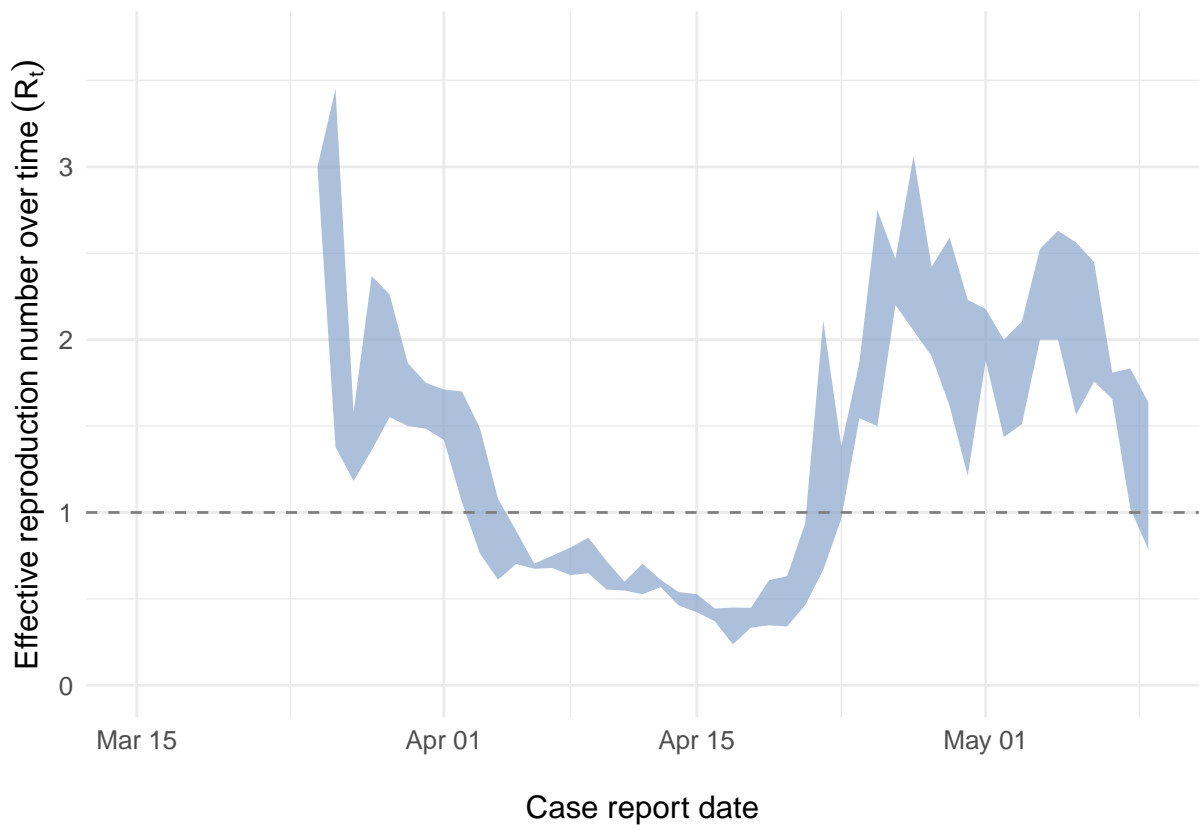


Figure 32: Effective reproductive number - Saskatchewan