Ebola Forecasting Analysis

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Data Input and Cleaning

```
rm(list=ls())
source("outbreak_vis.R")
```

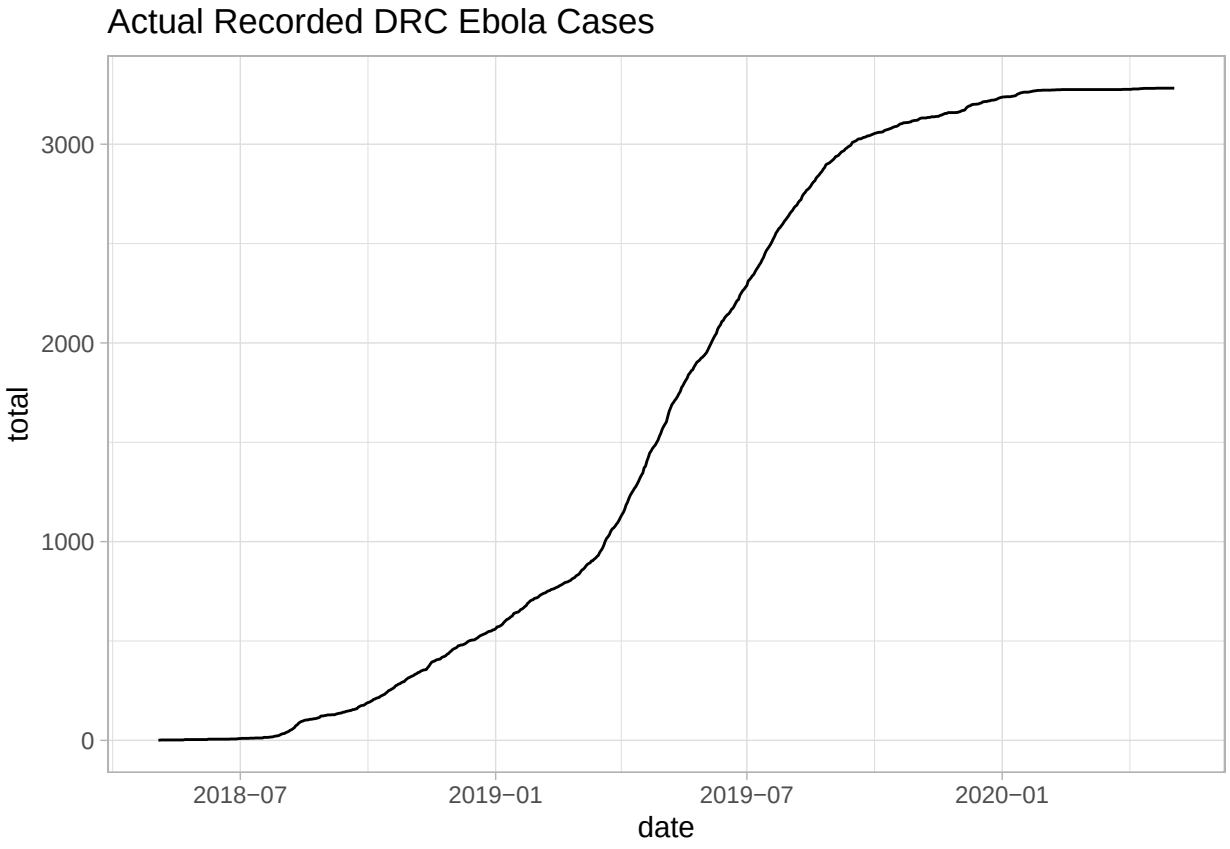
```
## -- Attaching packages ---------------------------------------------------------------------------
## v ggplot2 3.3.2     v purrr   0.3.4
## v tibble  3.0.1     v dplyr   1.0.0
## v tidyr   1.1.0     v stringr 1.4.0
## v readr   1.3.1     v forcats 0.5.0
## -- Conflicts ------------------------------------------------------------------------------------
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
##
## Attaching package: 'lubridate'
## The following objects are masked from 'package:base':
##
##     date, intersect, setdiff, union
```

```
rgx <- "\\d{1,2}\\/\\d{1,2}\\/\\d{4}" #date structure regex
true <- read.csv("/Volumes/GoogleDrive/.shortcut-targets-by-id/15UGkfREtfqH3LdfHmCsSpFJ5SrTnSeyt/ebola/
true <- true[str_detect(true$Date, rgx),] #omits rows without a date
colnames(true) <- c("date", "cases")
true$date <- mdy(true$date)
true$cases[is.na(true$cases)] <- 0
true <- true %>% mutate(total = cumsum(cases))
last_date <- true$date[length(true$date)]
last_case <- true$total[length(true$total)]
```

Actual Recorded DRC Ebola Cases

```
p <- ggplot(data = true,
            mapping = aes(x = date, y = total)) +
  geom_line() + theme_light() # graph of runninng total of cases

p + labs(title = "Actual Recorded DRC Ebola Cases")
```

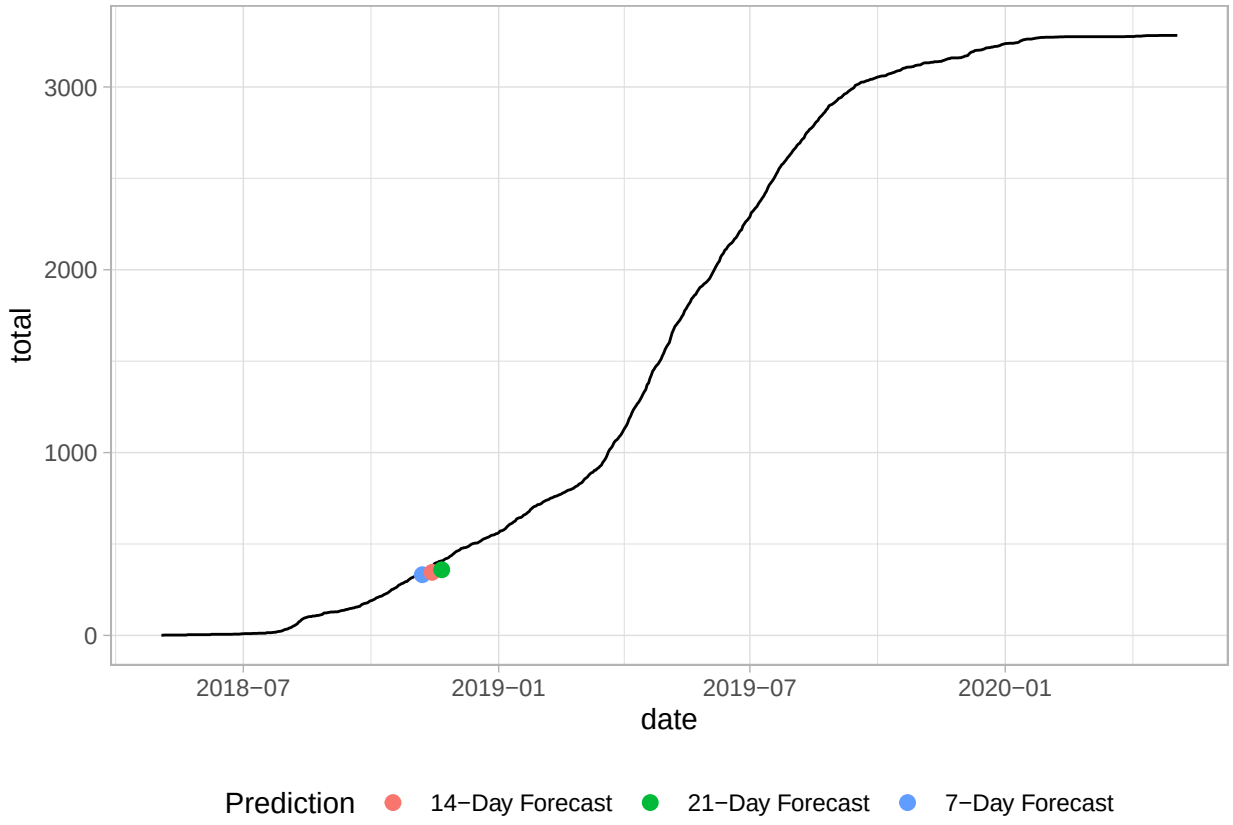


Accuracy of Hawkes Projections

Single Forecast Visualization for Entire Outbreak

Shows predicted vs actual for one forecast with respect to entire outbreak.

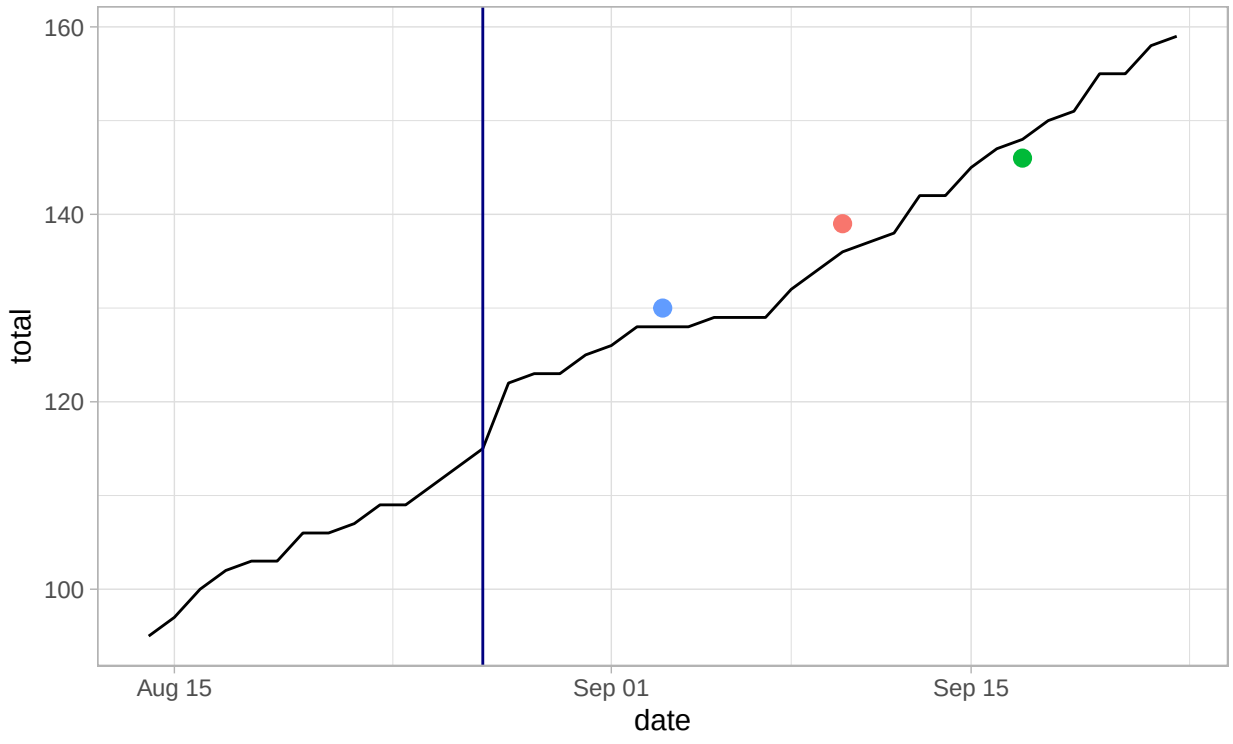
```
full_forecast("2018-10-31",c(15,28,42))
```



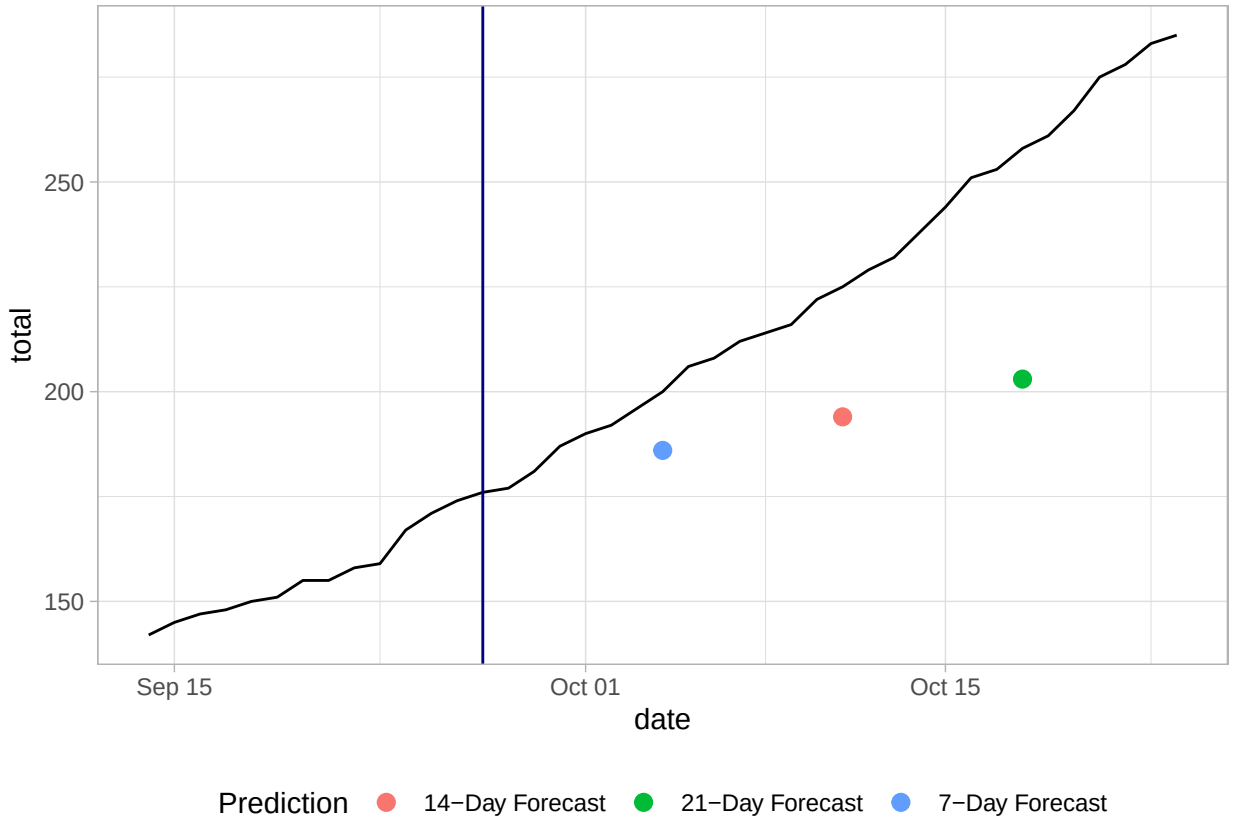
Single Forecast Visualization

Shows predicted vs actual for one forecast with respect to that date range.

```
multi_forecast("2018-08-27",c(15,24,31)) #shows predicted vs actual for one forecast
```



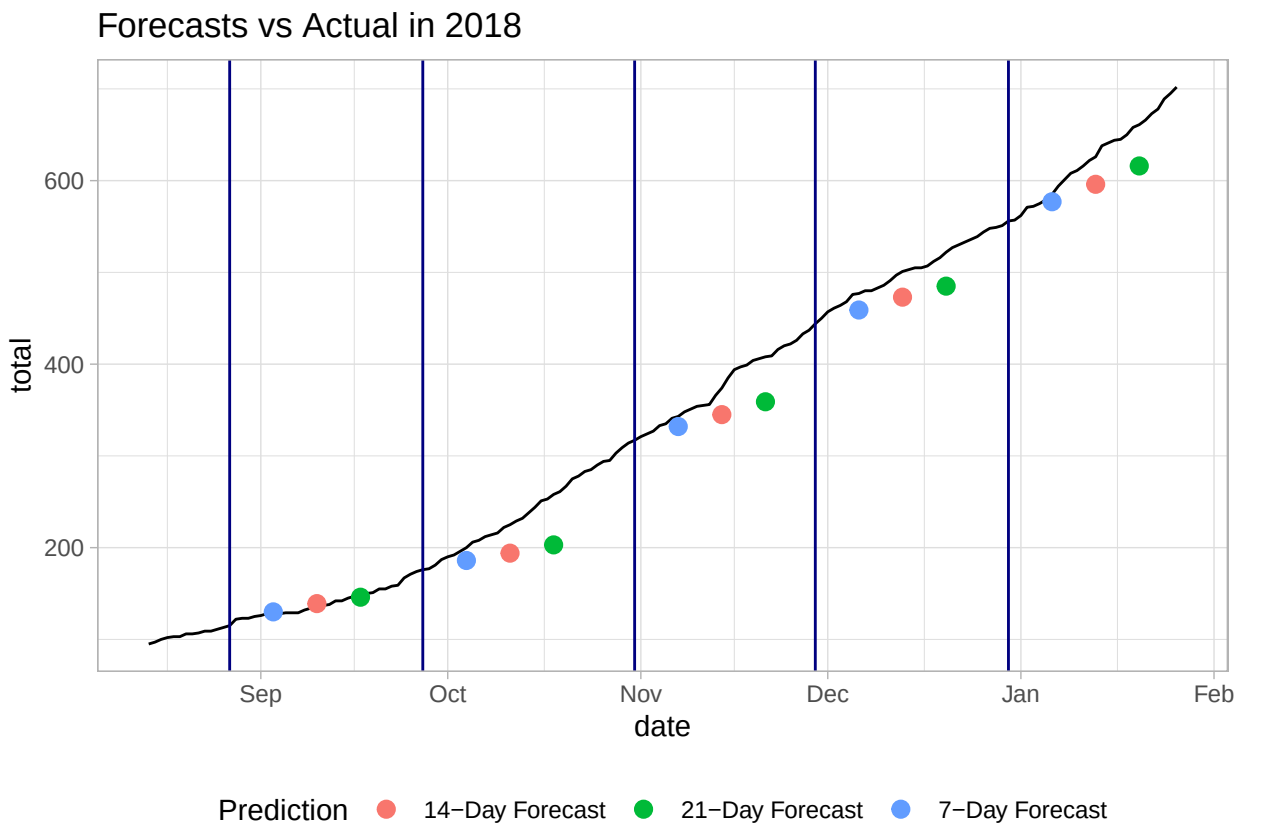

```
multi_forecast("2018-09-27",c(10,18,27)) #shows predicted vs actual for one forecast
```



Forecasts vs Actual in 2018

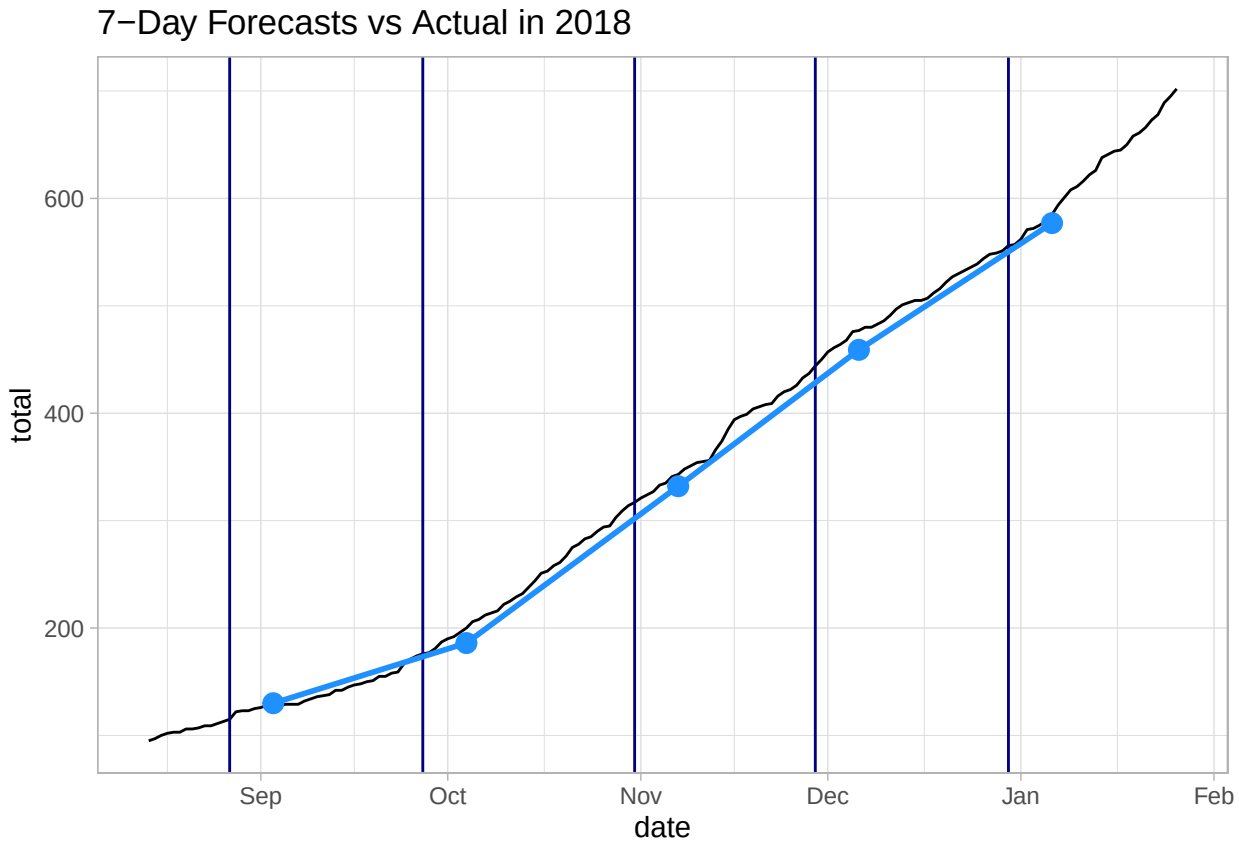
Monthly forecasts during all available data in 2018.

```
title <- "Forecasts vs Actual in 2018"
dv <- c("2018-08-27","2018-09-27","2018-10-31","2018-11-29","2018-12-30")
mt <- cbind(c(15,24,31),c(10,18,27),c(15,28,42),c(15,29,41),c(21,40,60))
multi_forecast(dv, mt, title = title)
```



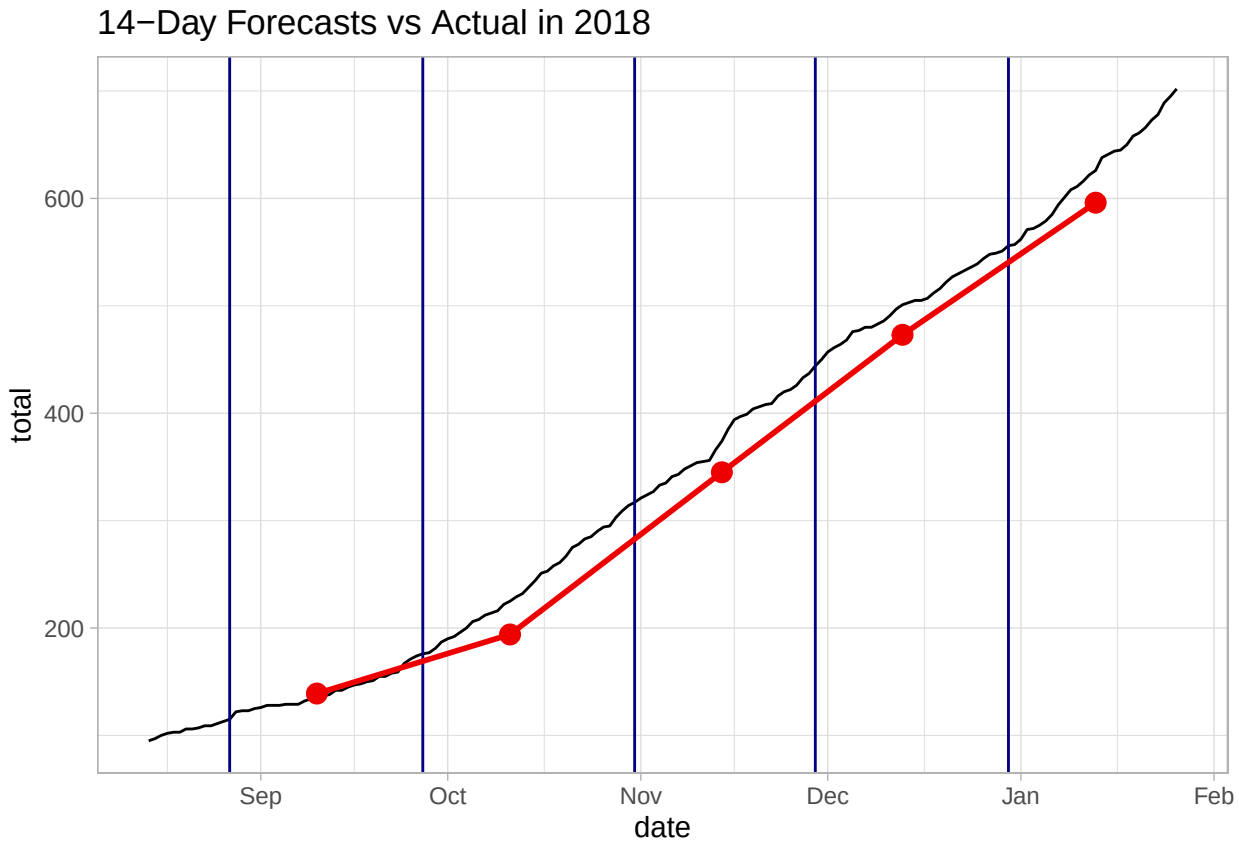
2018 7-day Forecasts

```
title <- "7-Day Forecasts vs Actual in 2018"
single_forecast(dv, mt, days = 7, title = title)
```



2018 14-day Forecasts

```
title <- "14-Day Forecasts vs Actual in 2018"
single_forecast(dv, mt, days = 14, title = title)
```



2018 21-day Forecasts

```
title <- "21-Day Forecasts vs Actual in 2018"
single_forecast(dv, mt, days = 21, title = title)
```