

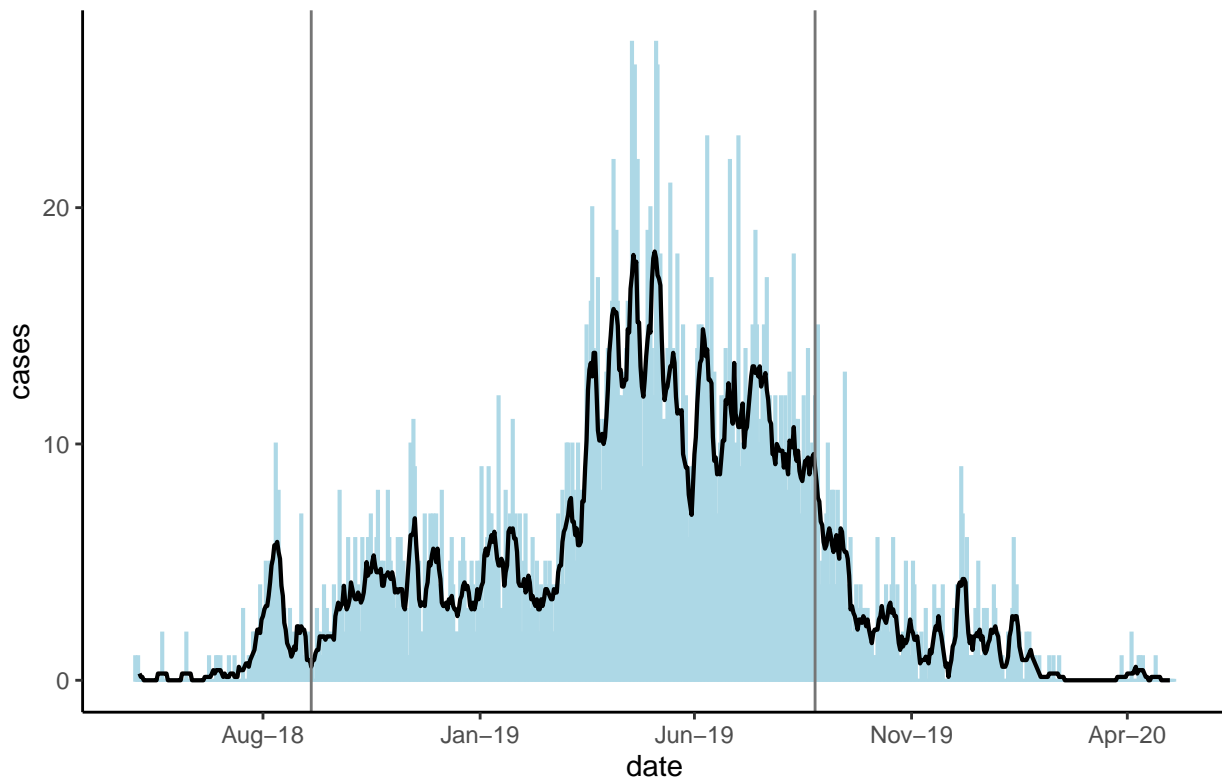
# Ebola Forecasting - Residual Analysis

Andy Shen

9/11/2020

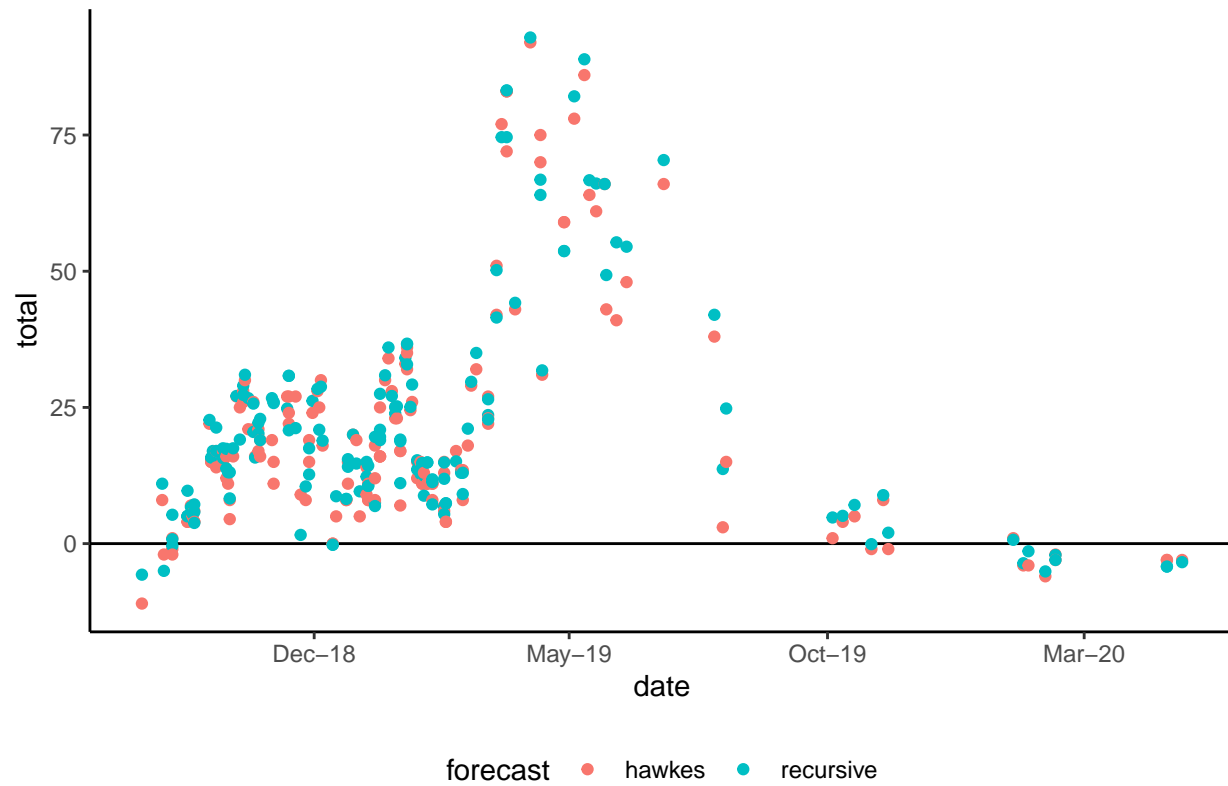
## 1 New Ebola Cases by Day

The figure below shows the number of new Ebola cases in West Africa by day during the outbreak.



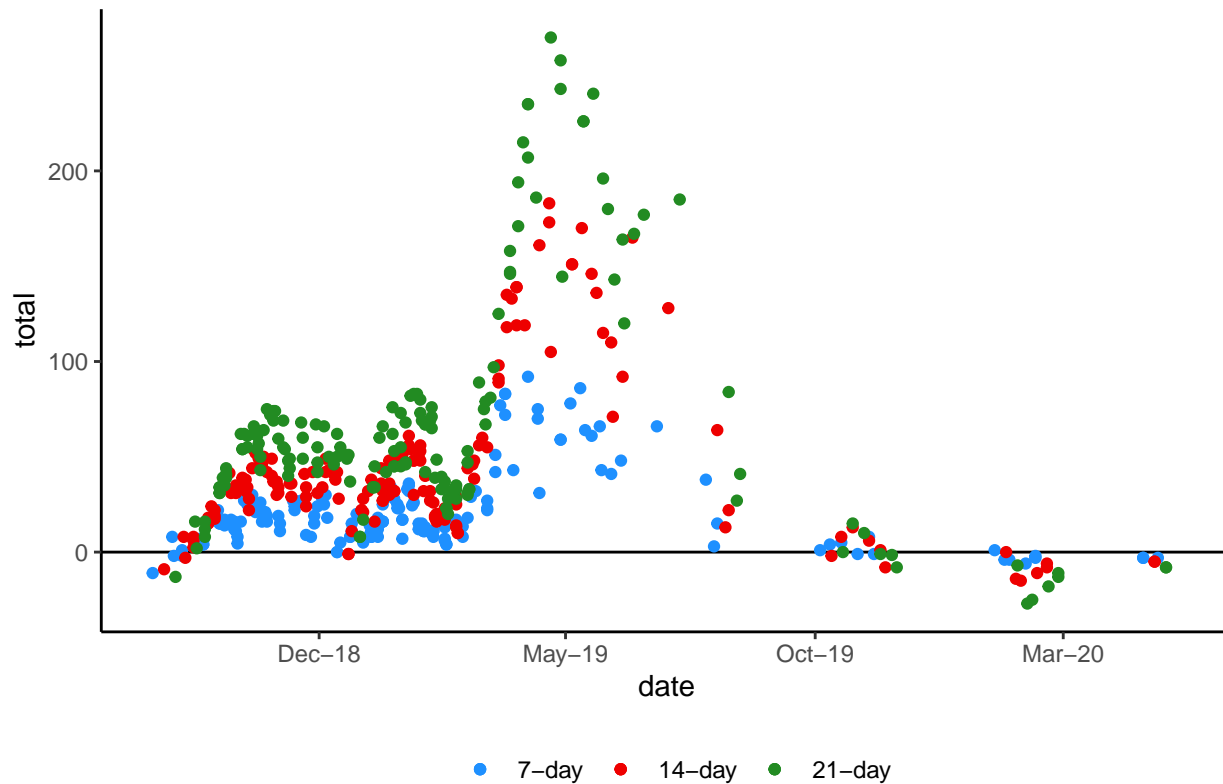
Ebola Cases by Day in West Africa with 7-day Rolling Average.  
Grey lines represent boundaries between the beginning, middle and end of the outbreak (see section 5.1).

## 2 Hawkes vs Recursive 7-Day



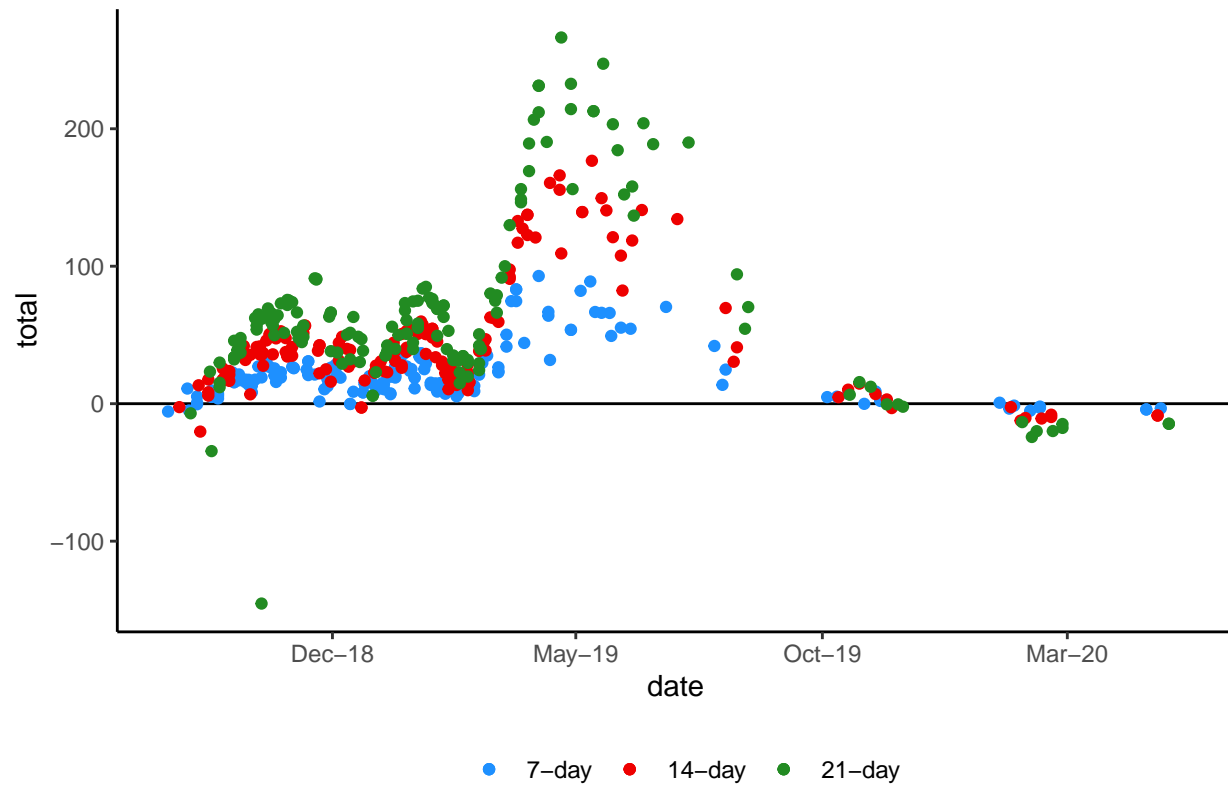
Residual plot of Hawkes and Recursive 7-day models

### 3 Hawkes-Only Residual Plot



Residual plot of Hawkes 7-, 14-, and 21-day models

## 4 Recursive-Only Residual Plot



Residual plot of Recursive 7-, 14-, and 21-day models

## 5 RMSE Calculation During Outbreak

### 5.1 Setup

We define the beginning, middle, and end of the outbreak such that the beginning is from May 3, 2018 to September 4, 2018; the middle from September 5, 2018 to August 25, 2019, and the end from August 26, 2019 to May 4, 2020.

### 5.2 RMSE Calculation

The figure below shows the RMSE values from both the Hawkes and Recursive models during the beginning, middle, and end of the outbreak. The dates for each section are defined in section 5.1.

Table 1: 7-Day Hawkes and Recursive RMSE values during the outbreak

	Hawkes	Recursive
Beginning	5.70	5.88
Middle	30.75	31.72
End	3.80	4.35