log graphs for each county

Cheyenne Ehman

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```
library(readxl)
library(tidyverse)
library(ggformula)
# read in OHIO_CASES_DATA
cases <- read_excel("COVID_CASES_OH_CNTY_20210223_pop.xlsx")
cases$DATE <- as.Date(cases$DATE, "%m/%d/%Y") # convert dates
cases <- cases%>%
  filter( (COUNTY != 'UNASSIGNED') & (COUNTY !='OUT OF OH'))%>% # remove UNASSIGNED and OUT OF OH data
  mutate(FIPS = str_sub(UID,start = 4,end = 8),
         NEWDEATHS = ifelse(is.na(NEWDEATHS),0,NEWDEATHS))%>%
  select(COUNTY,FIPS,DATE,CNTY_LAT,CNTY_LONG,POPULATION,CUMCONFIRMED,CUMDEATHS,NEWDEATHS,NEWCONFIRMED) %
  arrange(DATE)
```

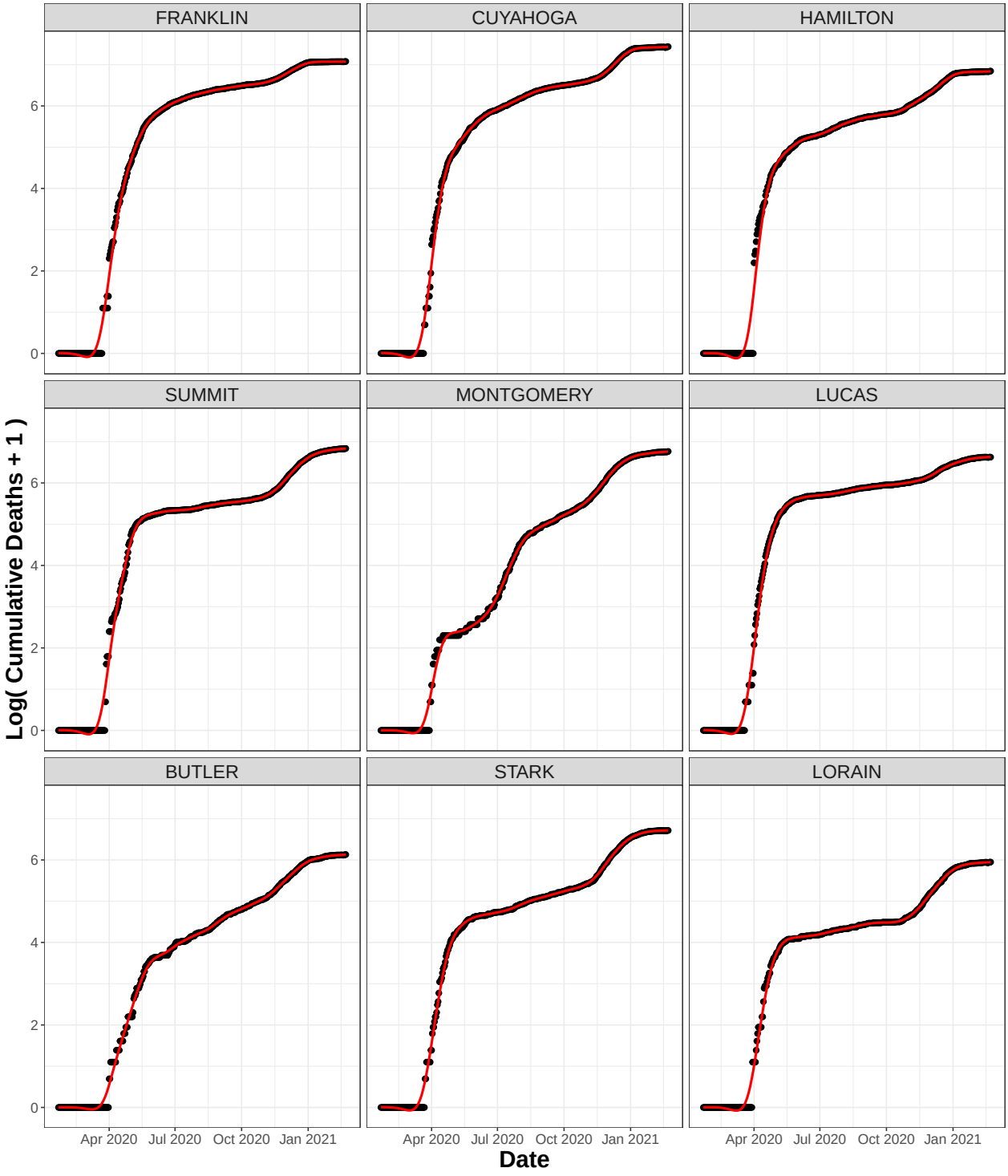
$Log(Death_t + 1)$ for each county

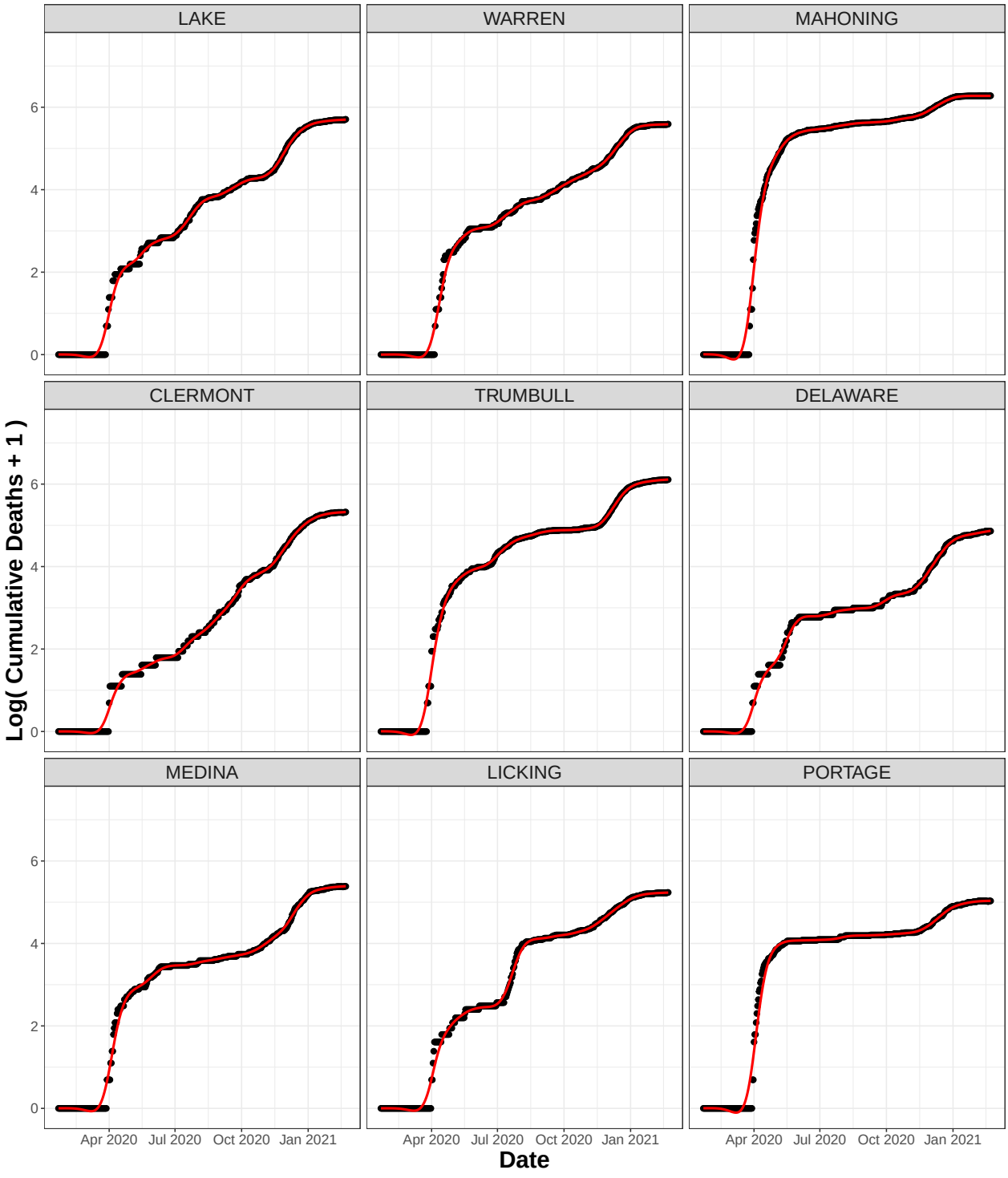
```
log_deaths_county_df <- cases %>%
  group_by(COUNTY) %>%
  mutate(log_deaths = log(CUMDEATHS + 1),
         log_new_deaths = log(NEWDEATHS + 1),
         smoothed.spline = smooth.spline(DATE,log_deaths,
                                         df = round(398/21,0))$y)
#Want to order the counties by most Populous
log_deaths_county_df$COUNTY <- factor(log_deaths_county_df$COUNTY,
                                      levels = levels(fct_reorder(log_deaths_county_df$COUNTY,
                                                                  log_deaths_county_df$POPULATION,max,
                                                                  .desc = TRUE)))
```

Cumulative Deaths

```
library(ggforce)
for(i in 1:10){
  p <- ggplot(log_deaths_county_df, aes(x = DATE, y = log_deaths)) +
      geom_point(size = 2)+
      geom_line(aes(x = DATE,y = smoothed.spline), color = "red",size = 1)+
      facet_wrap_paginate(~COUNTY, ncol = 3, nrow = 3, page = i)+
      theme_bw() +
      labs(x = "Date", y = "Log( Cumulative Deaths + 1 )")+
      theme(axis.text=element_text(size=12),
```

```
        axis.title=element_text(size=20,face="bold"),
        strip.text.x = element_text(size = 16))
  print(p)
  cat("\n\n\\newpage\n")
}
```

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MAHONING
CLERMONT
TRUMBULL
DELAWARE
MEDINA
LICKING
PORTAGE
Log(Cumulative Deaths + 1)
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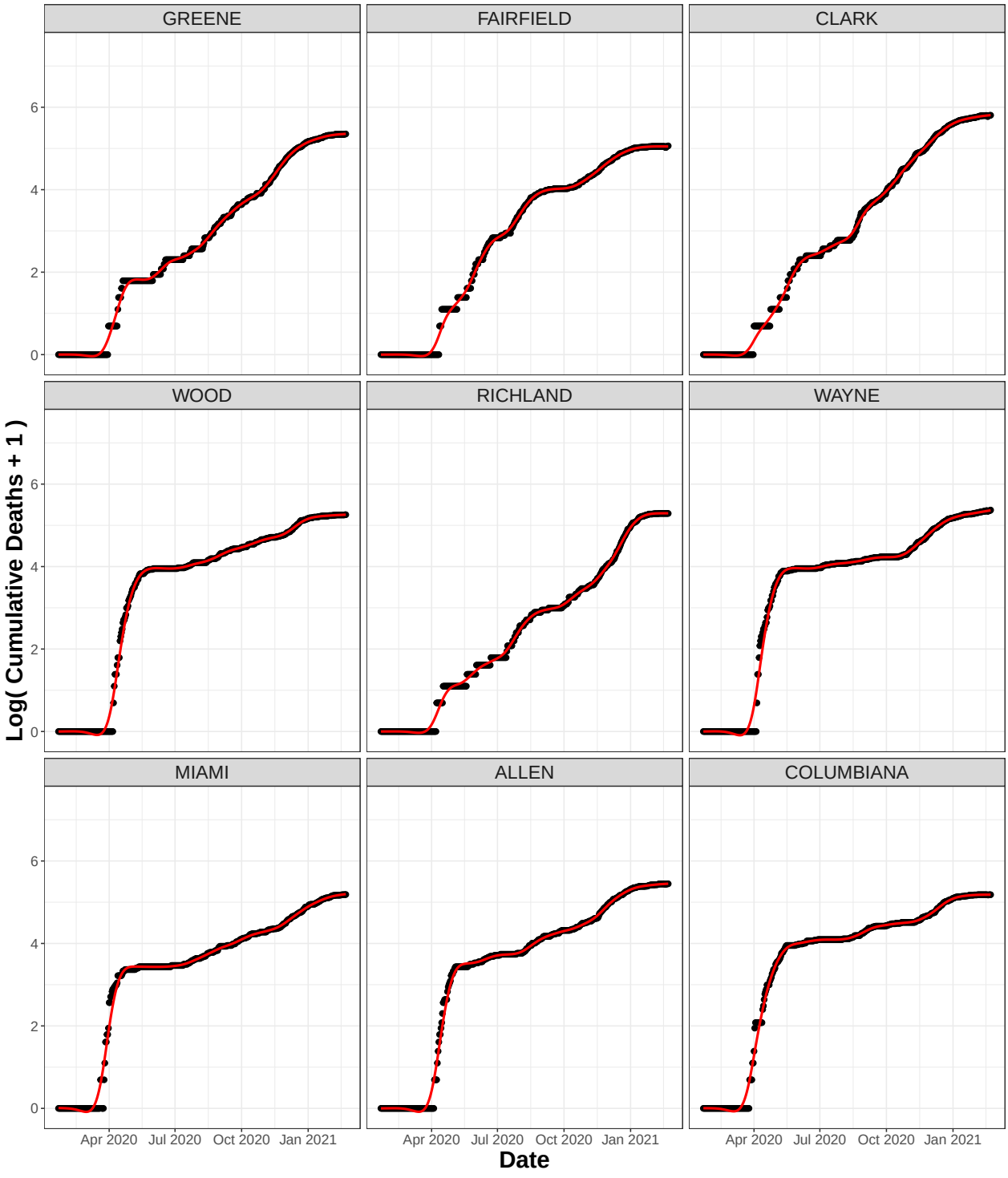
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Date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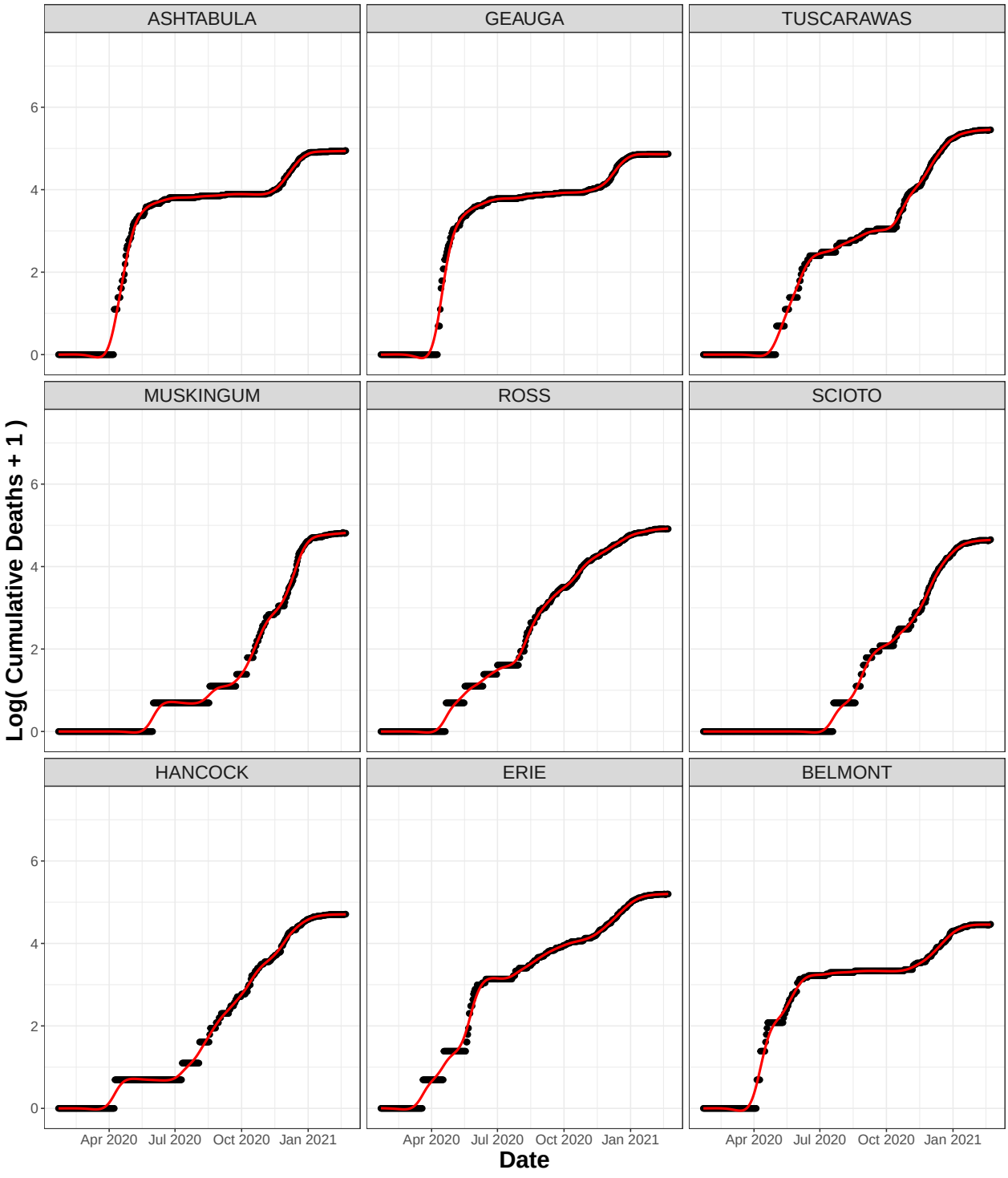
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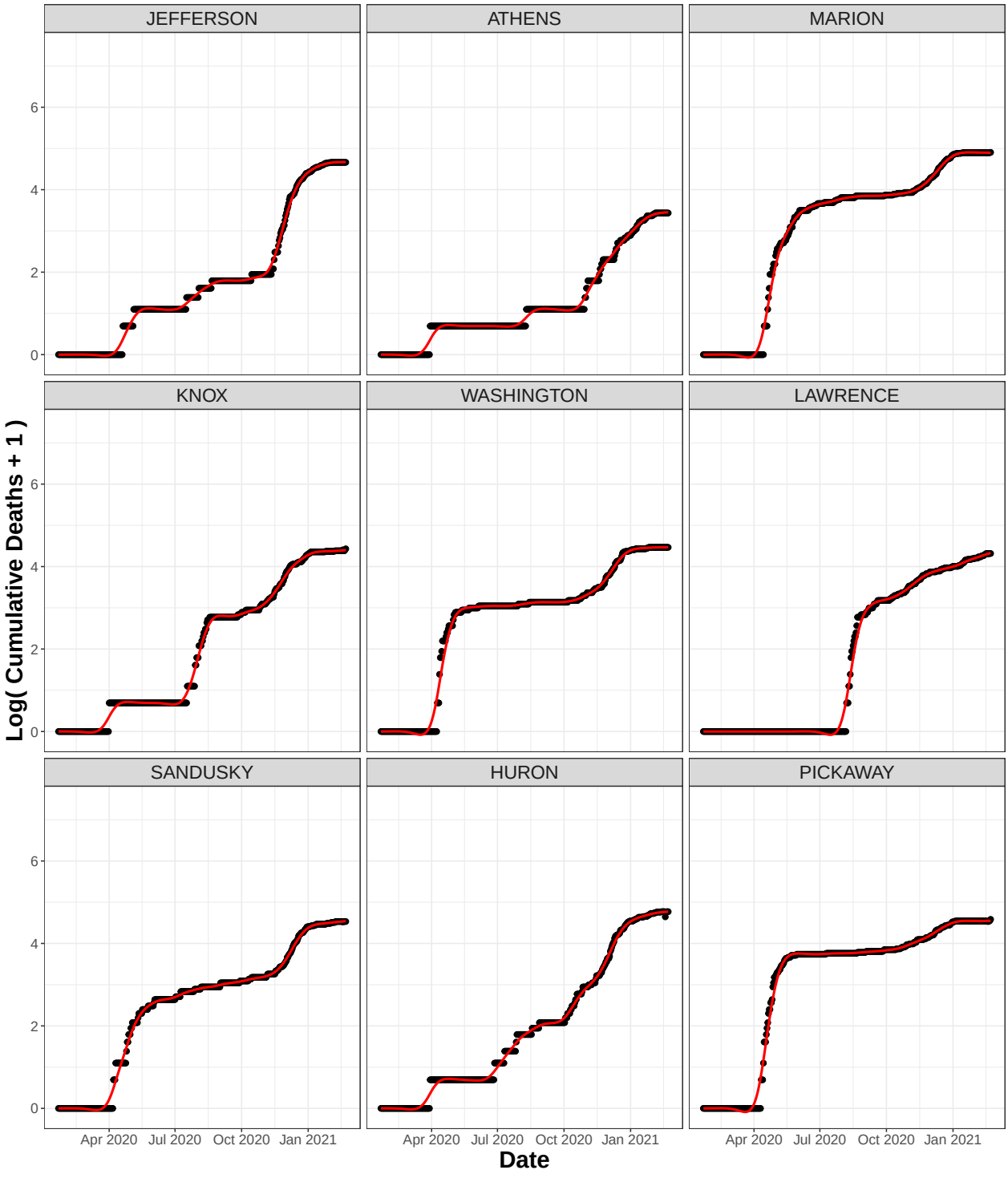
JEFFERSON
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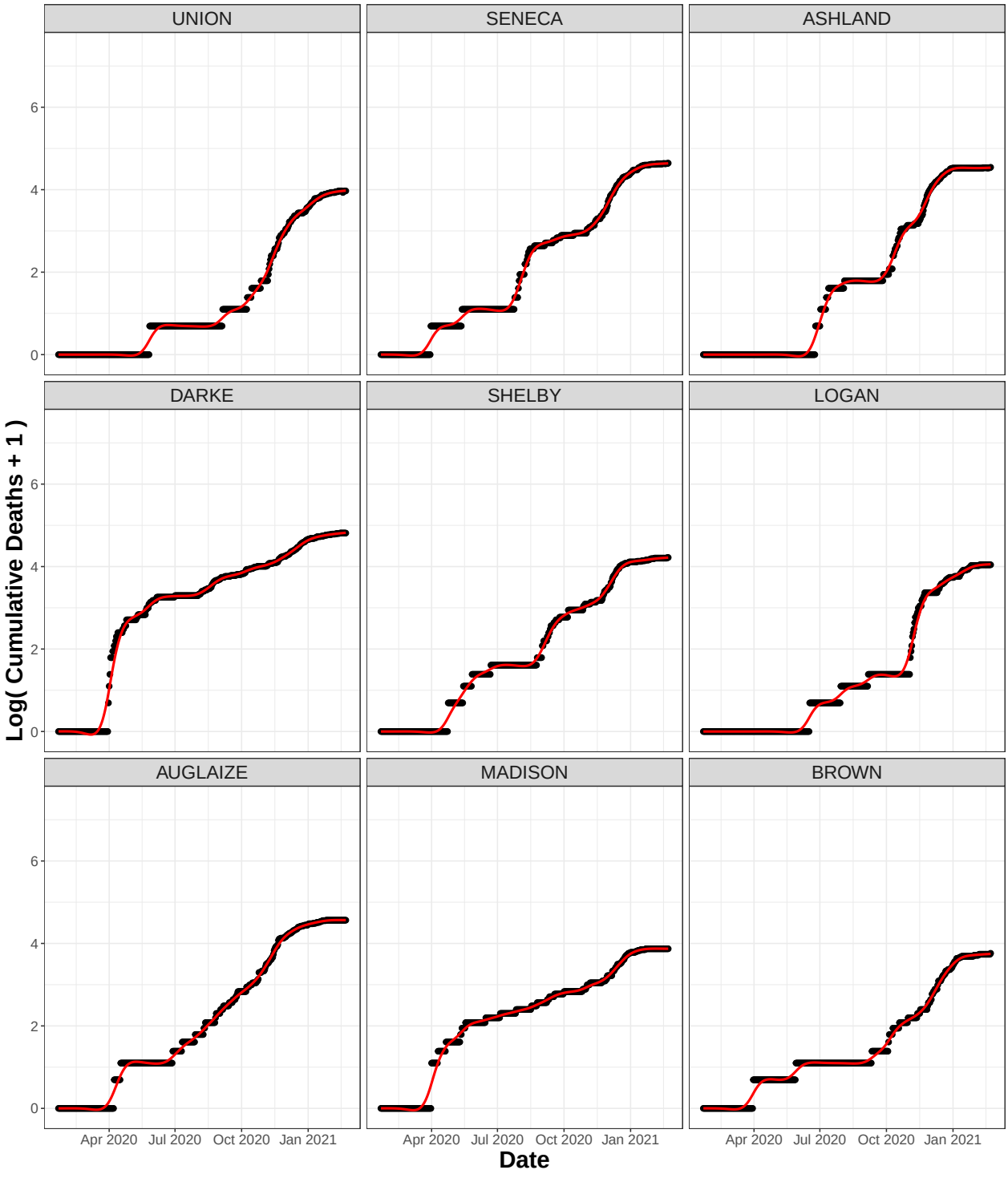
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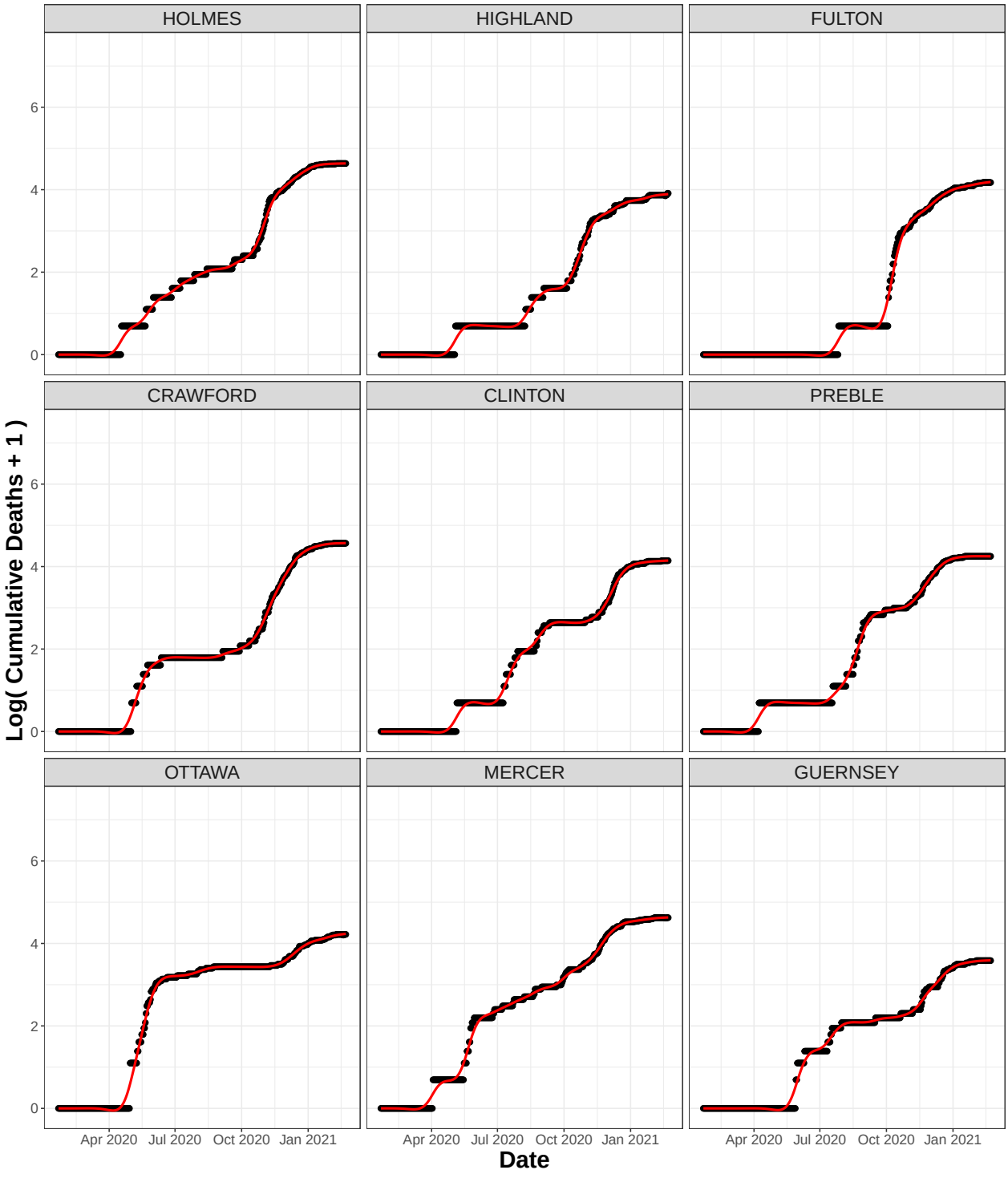
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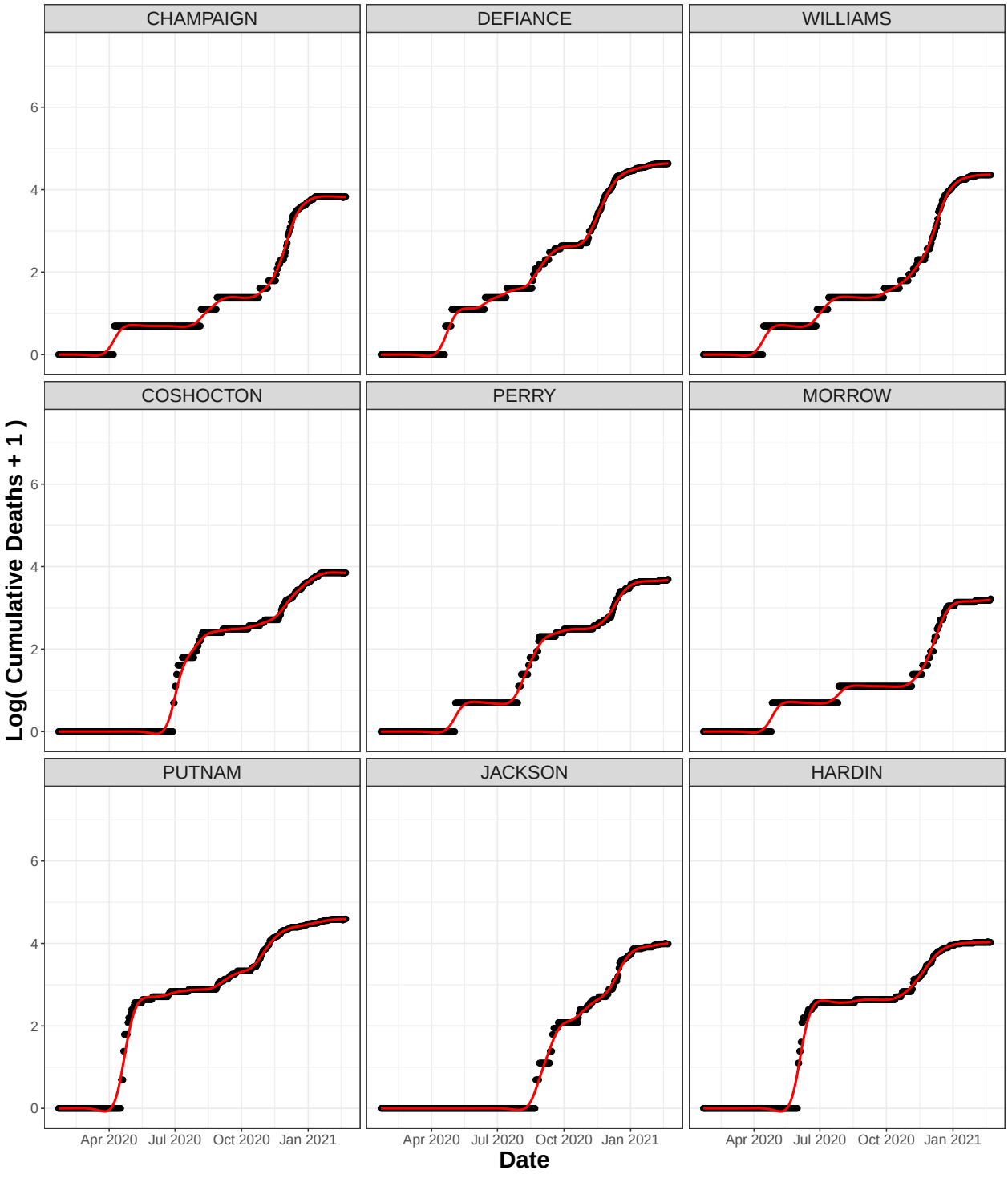
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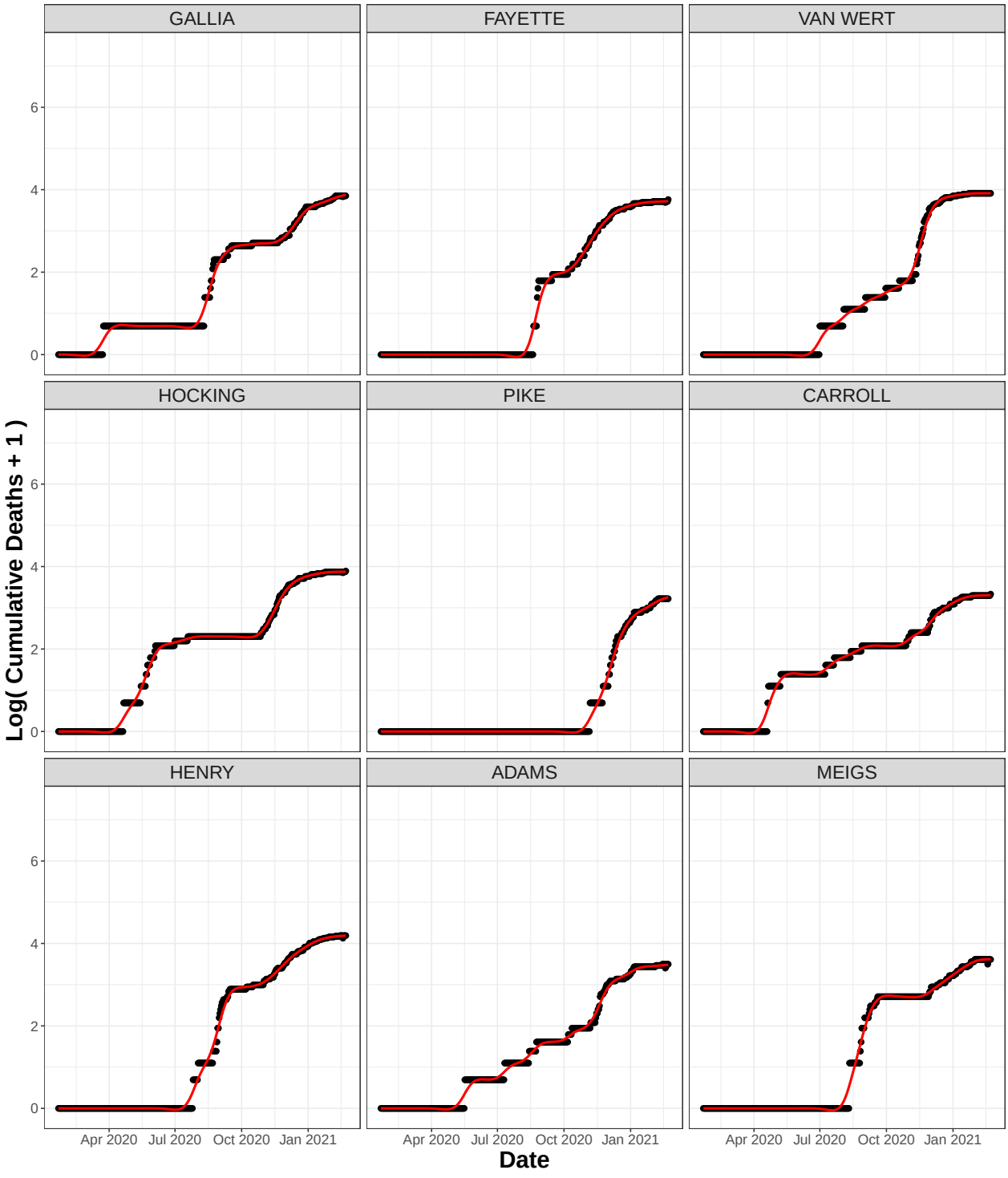
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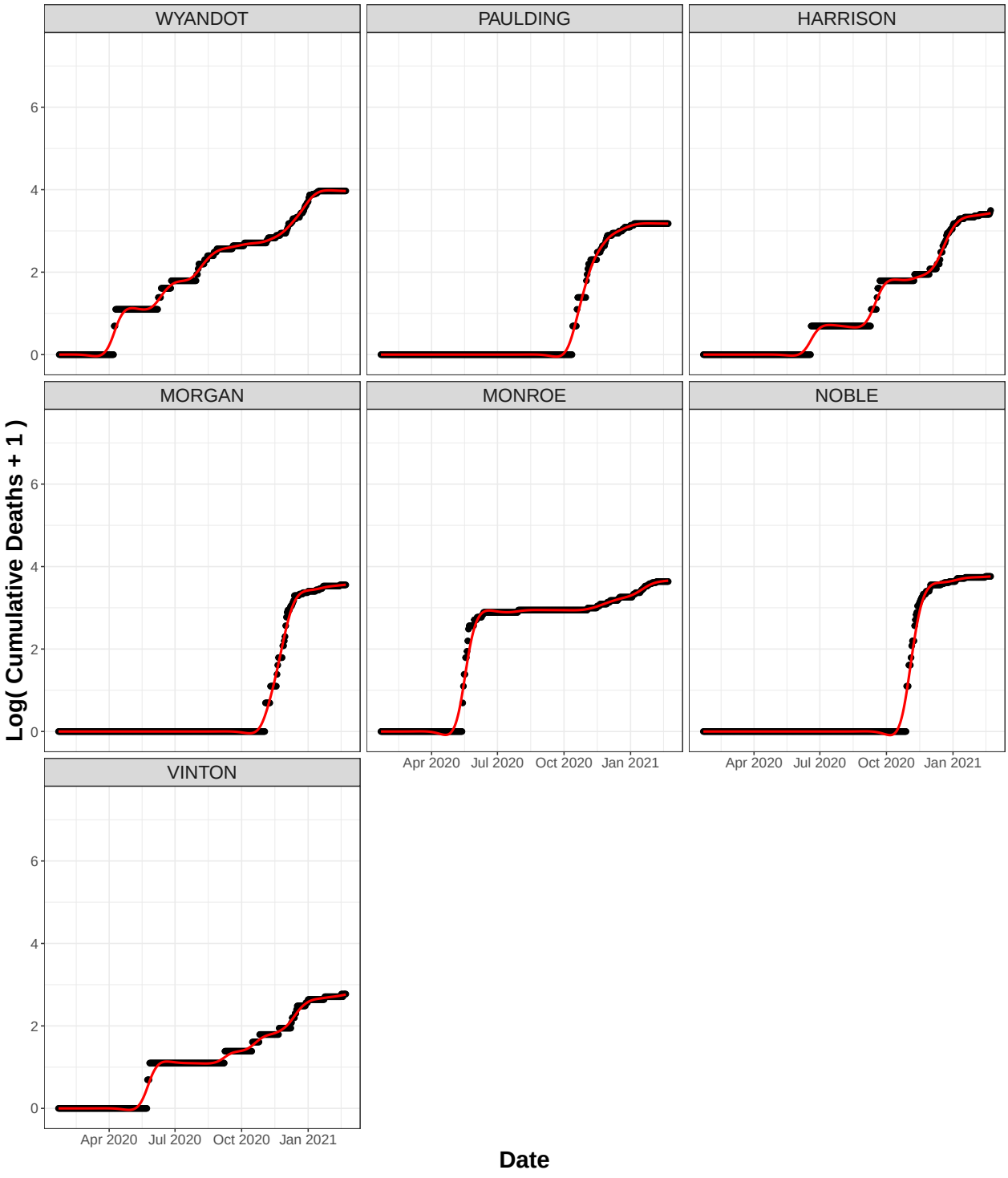
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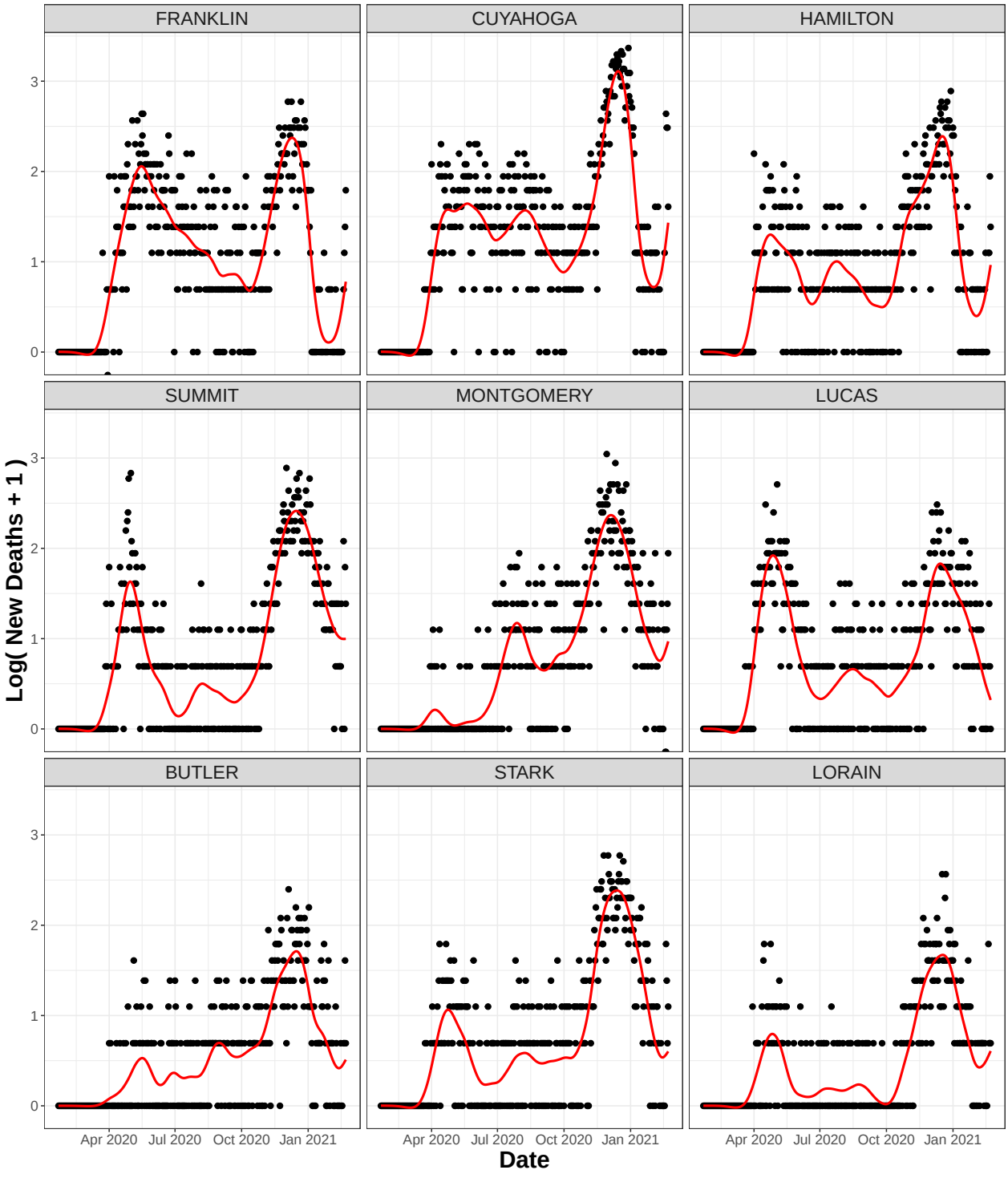
New Deaths

```
for(i in 1:10){
  p <- ggplot(log_deaths_county_df, aes(x = DATE, y = log_new_deaths)) +
      geom_point(size = 2) +
      geom_spline(aes(x = DATE, y = log_new_deaths),df = round(398/21,0),
                color = "red",size =1)+
      facet_wrap_paginate(~COUNTY, ncol = 3, nrow = 3, page = i)+
      theme_bw() +
      labs(x = "Date", y = "Log( New Deaths + 1 )")+
      theme(axis.text=element_text(size=12),
        axis.title=element_text(size=20,face="bold"),
        strip.text.x = element_text(size = 16))
  print(p)
  cat("\n\n\\newpage\n")
}
```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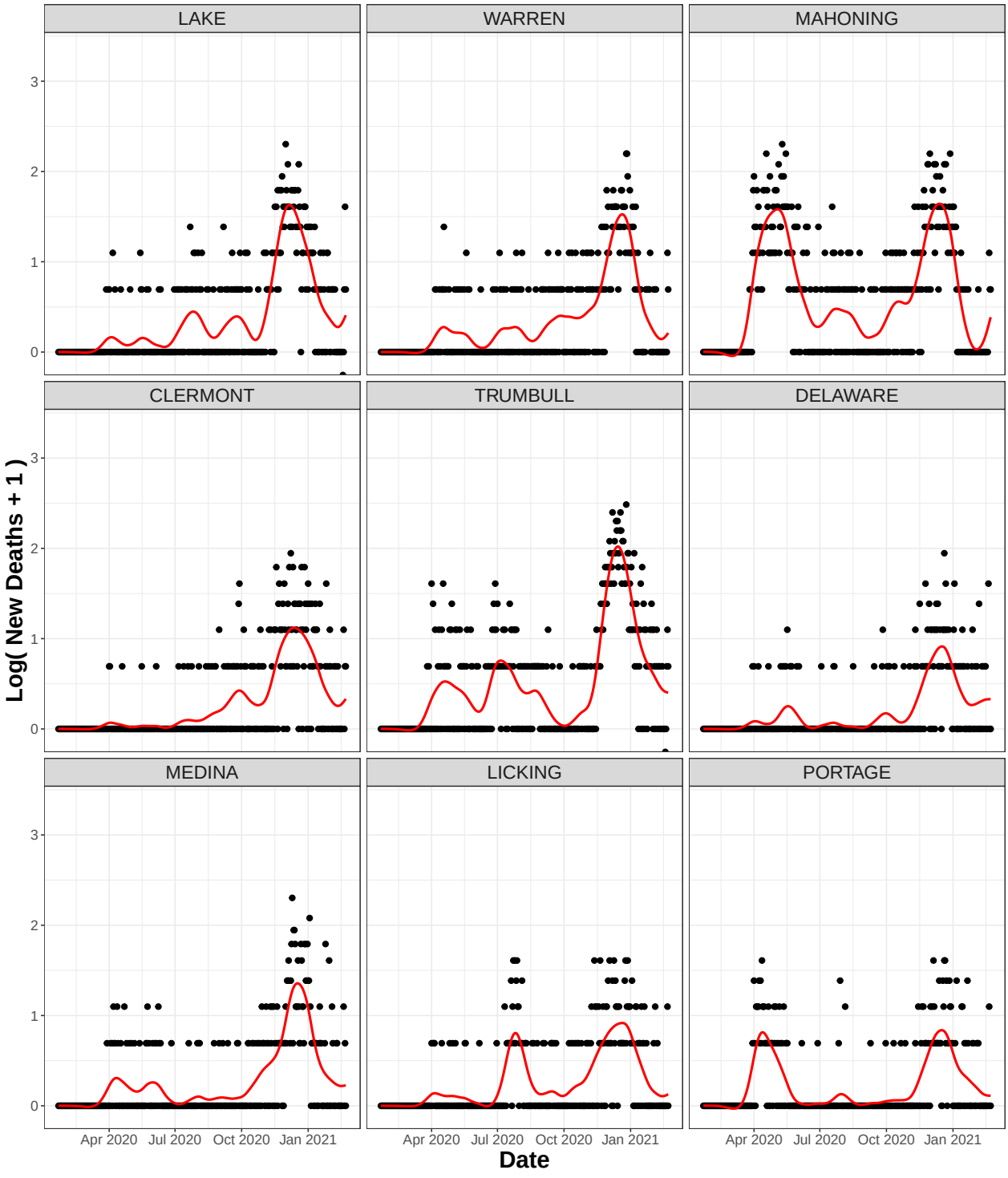
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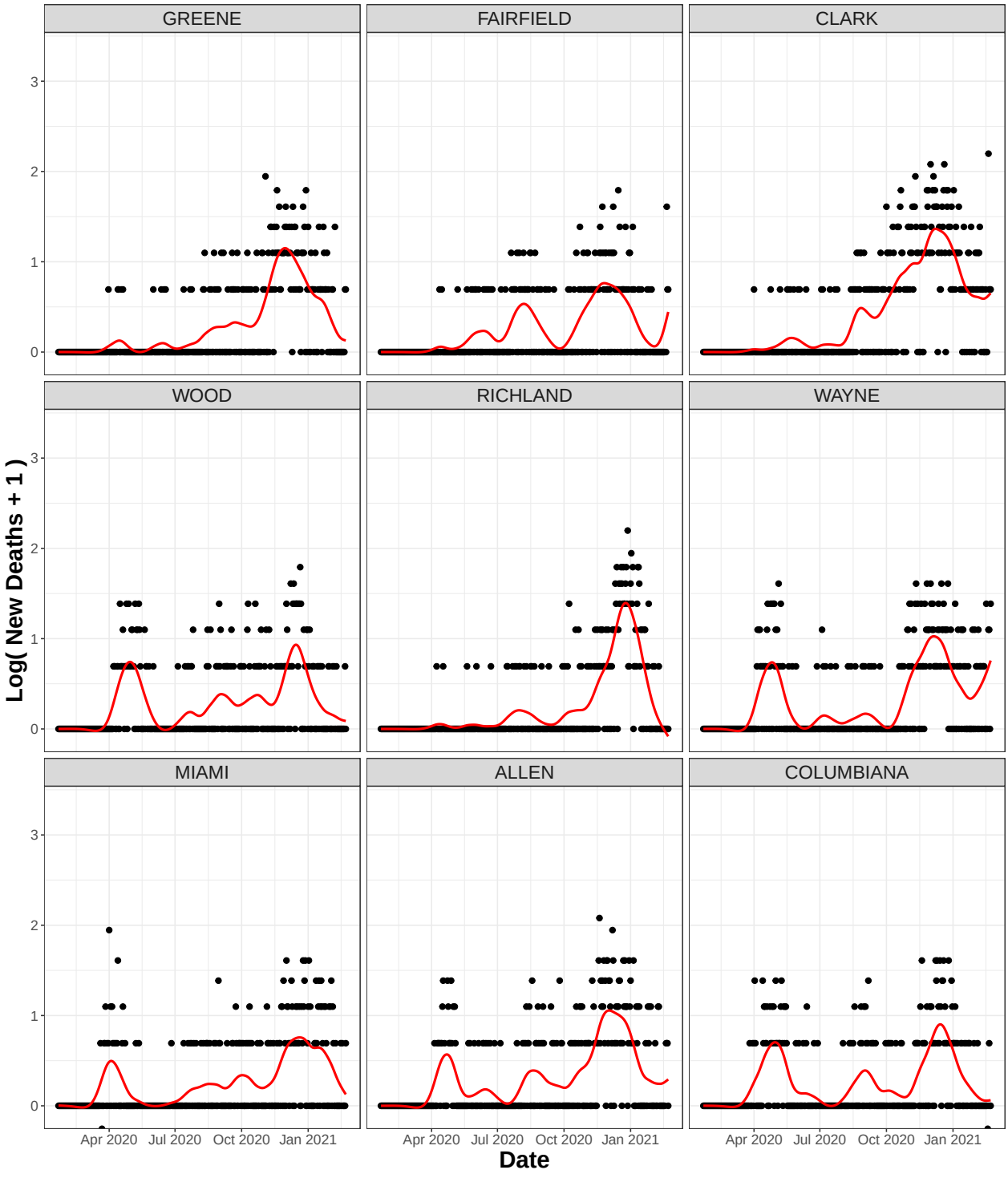
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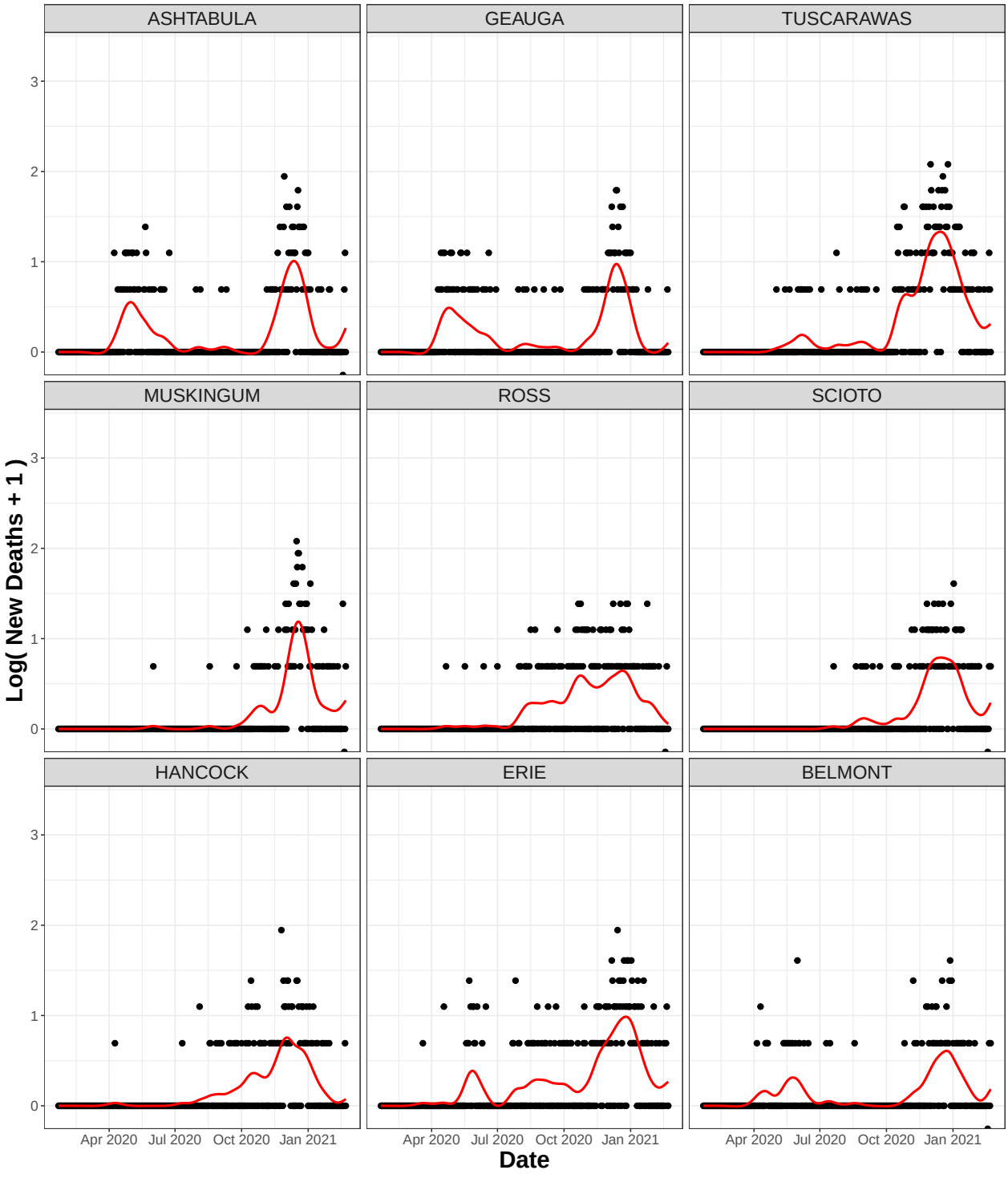
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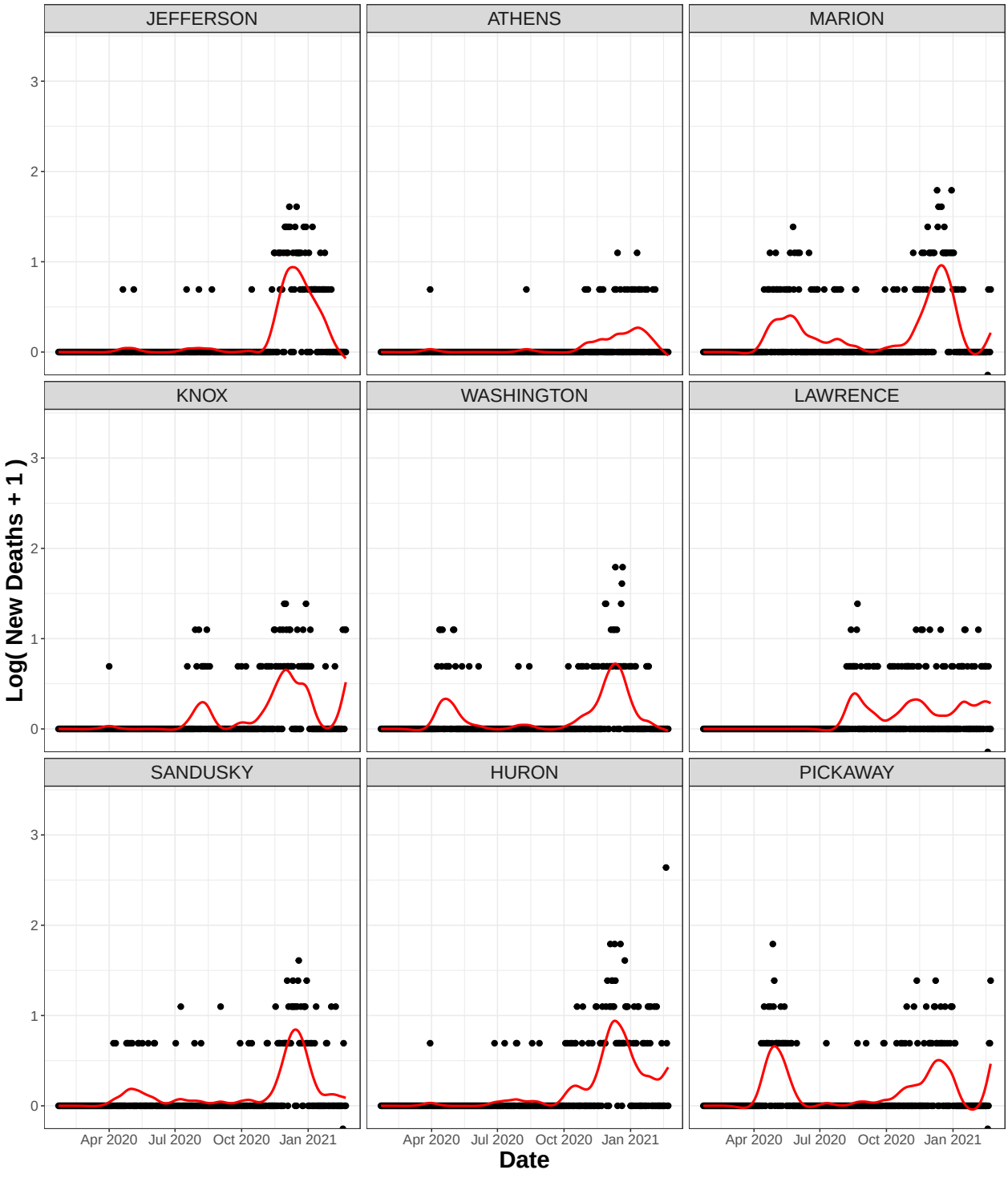
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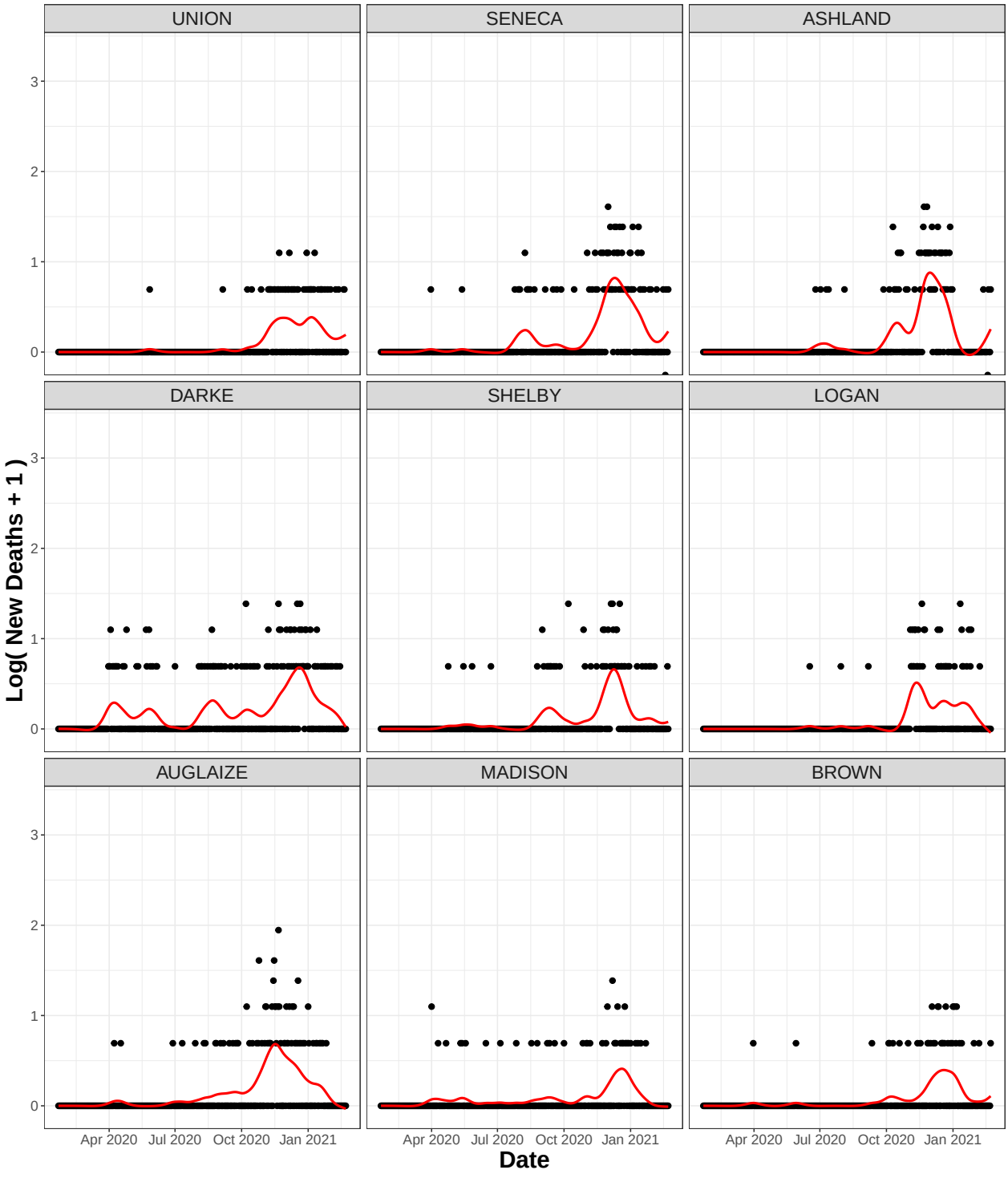
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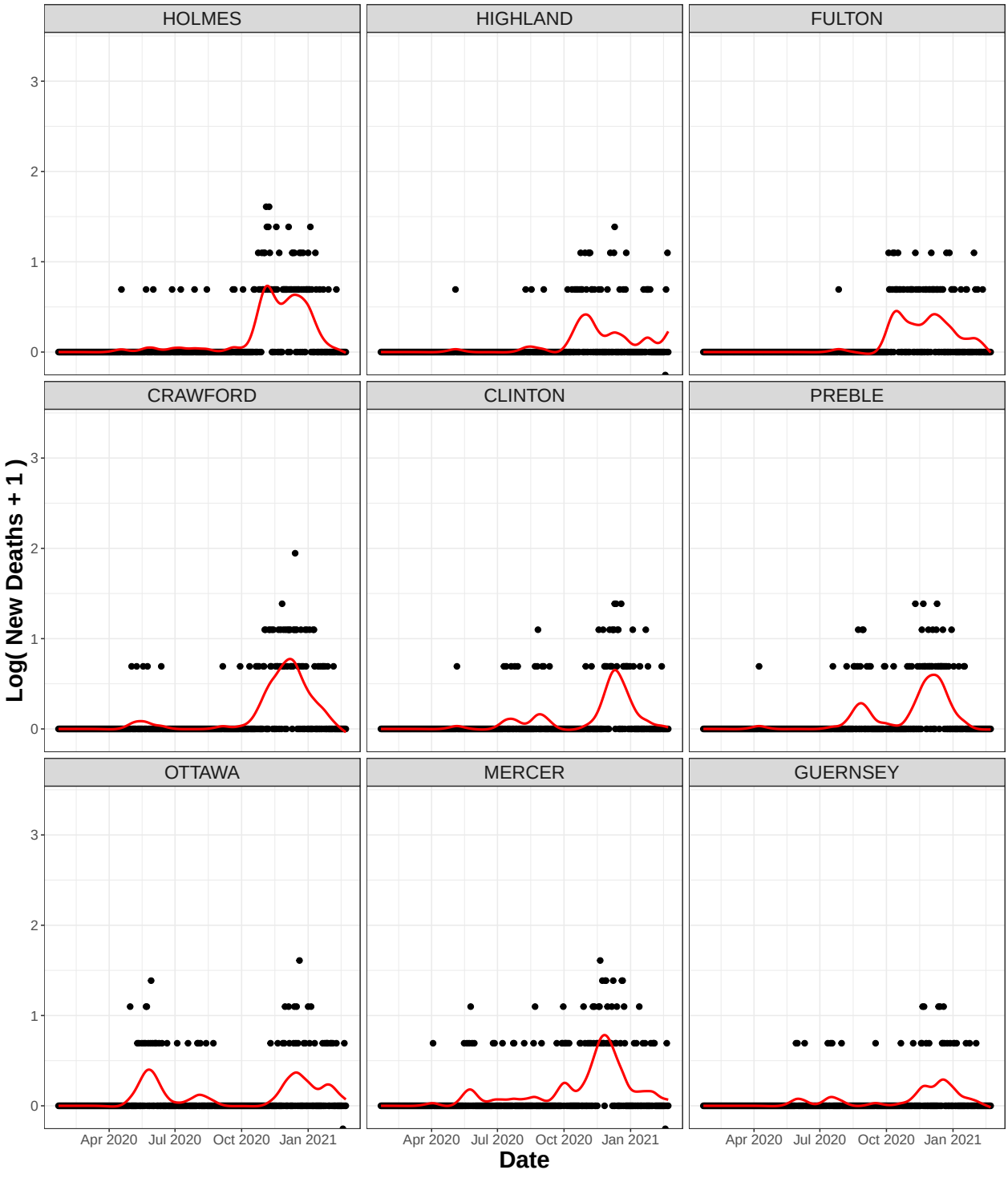
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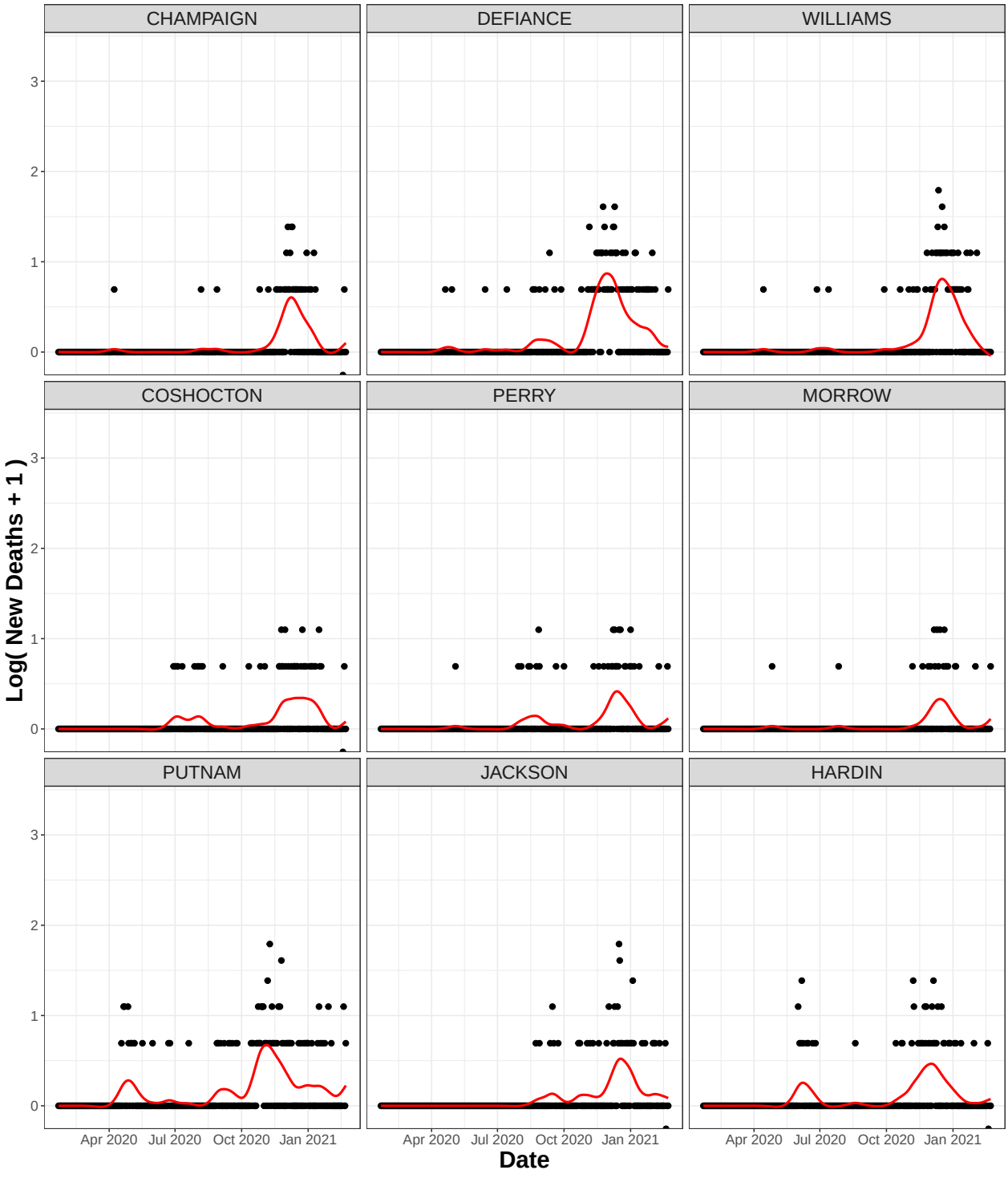
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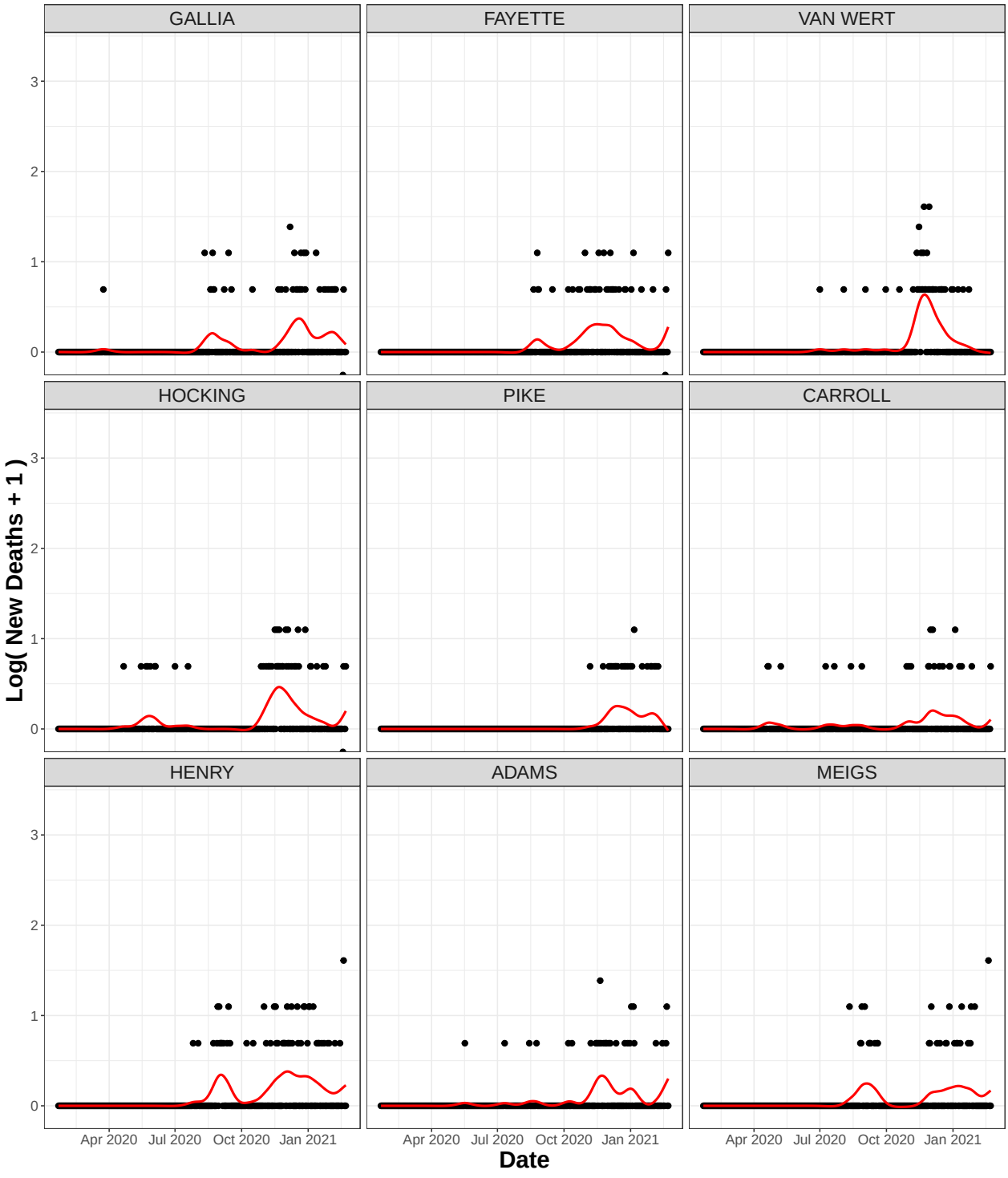
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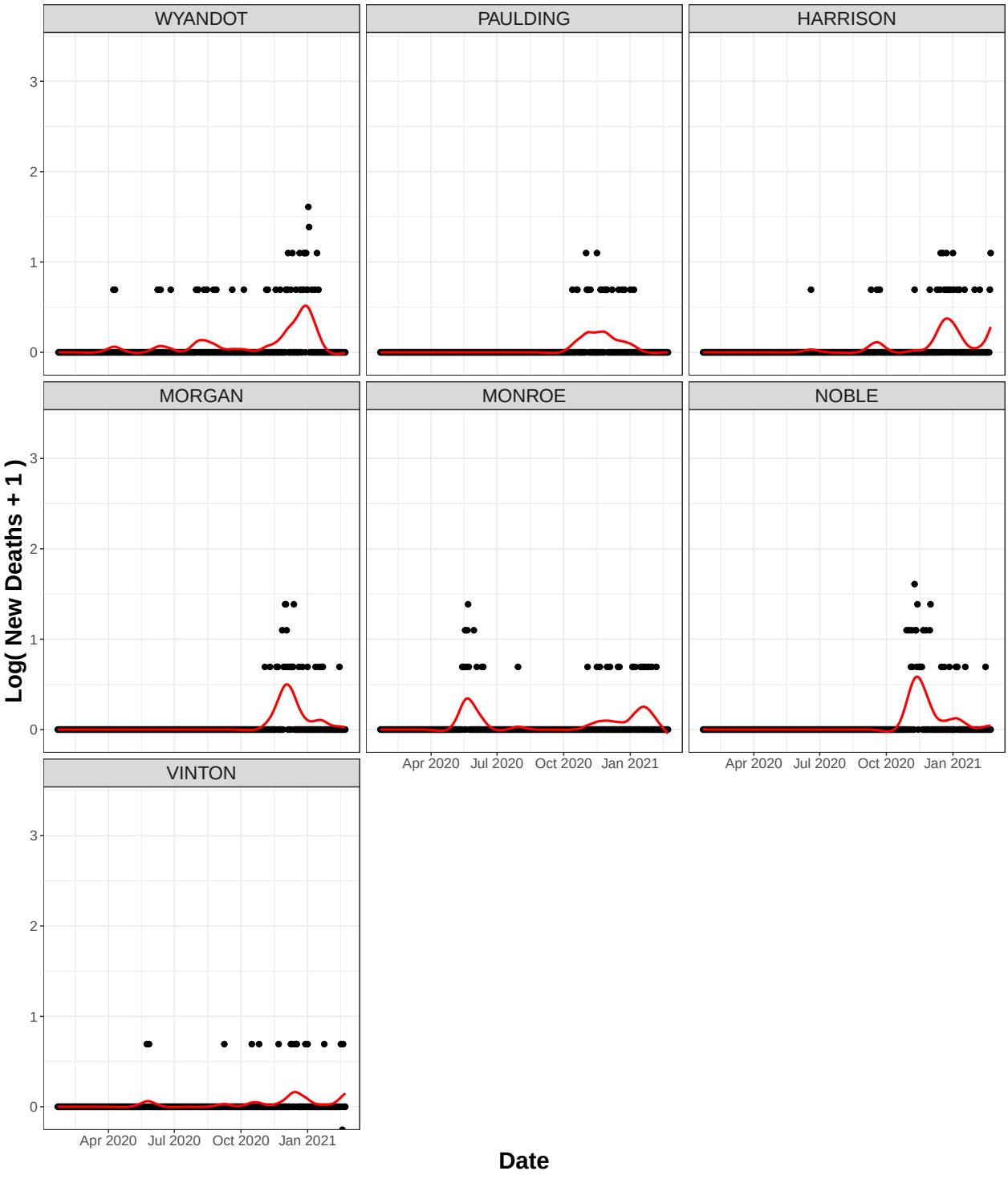
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