

## log graphs for each county

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```
library(readxl)
library(tidyverse)
# 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
# remove UNASSIGNED and OUT OF OH data
cases <- cases %>%
  filter( (COUNTY != 'UNASSIGNED') & (COUNTY != 'OUT OF OH')) %>%
  mutate(FIPS = str_sub(UID, start = 4, end = 8)) %>%
  select(COUNTY, FIPS, DATE, CNTY_LAT, CNTY_LONG, POPULATION, CUMCONFIRMED, CUMDEATHS, NEWDEATHS, NEWCONFIRMED)
```

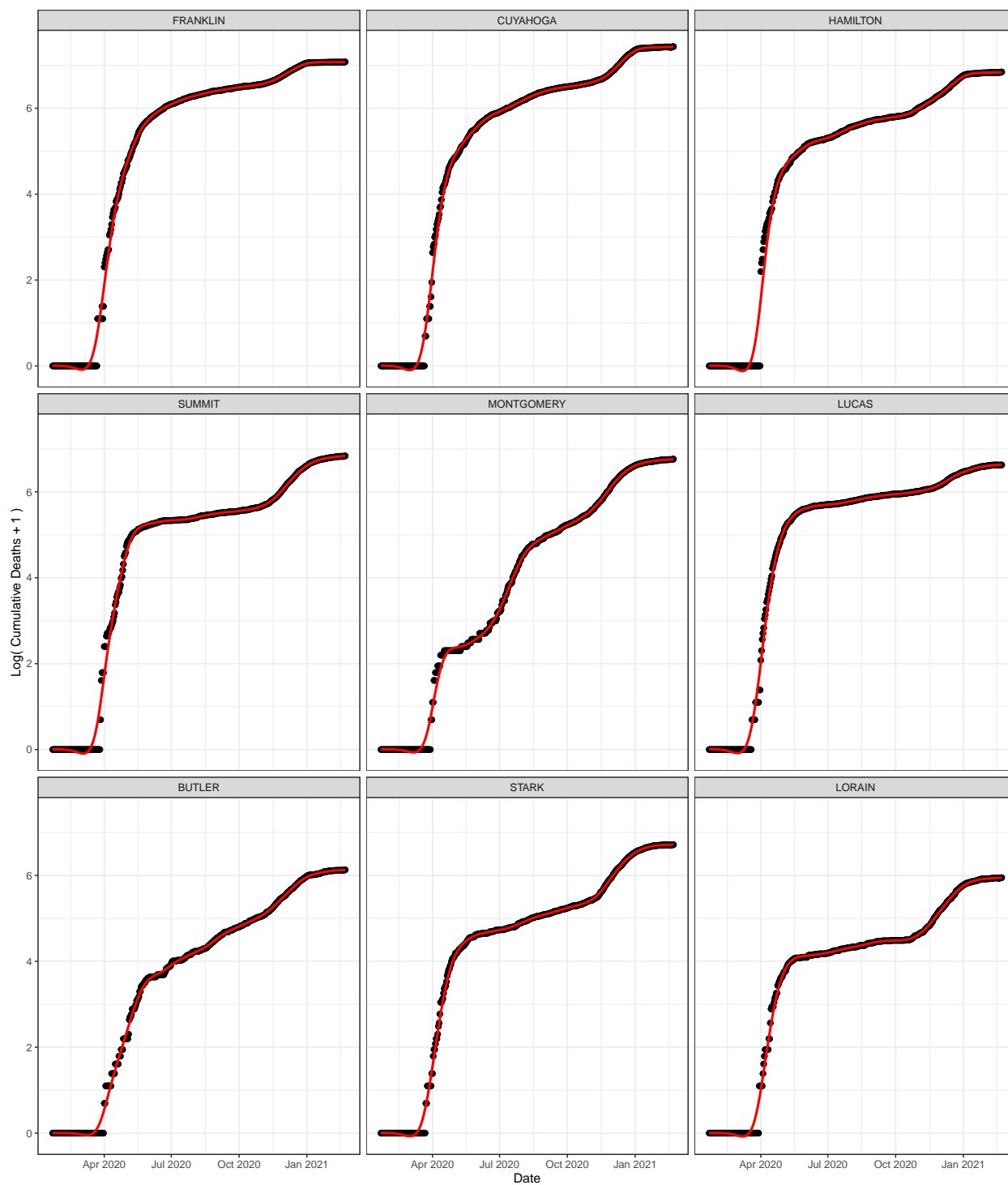
## $\text{Log}(\text{Death}_t + 1)$ for each county

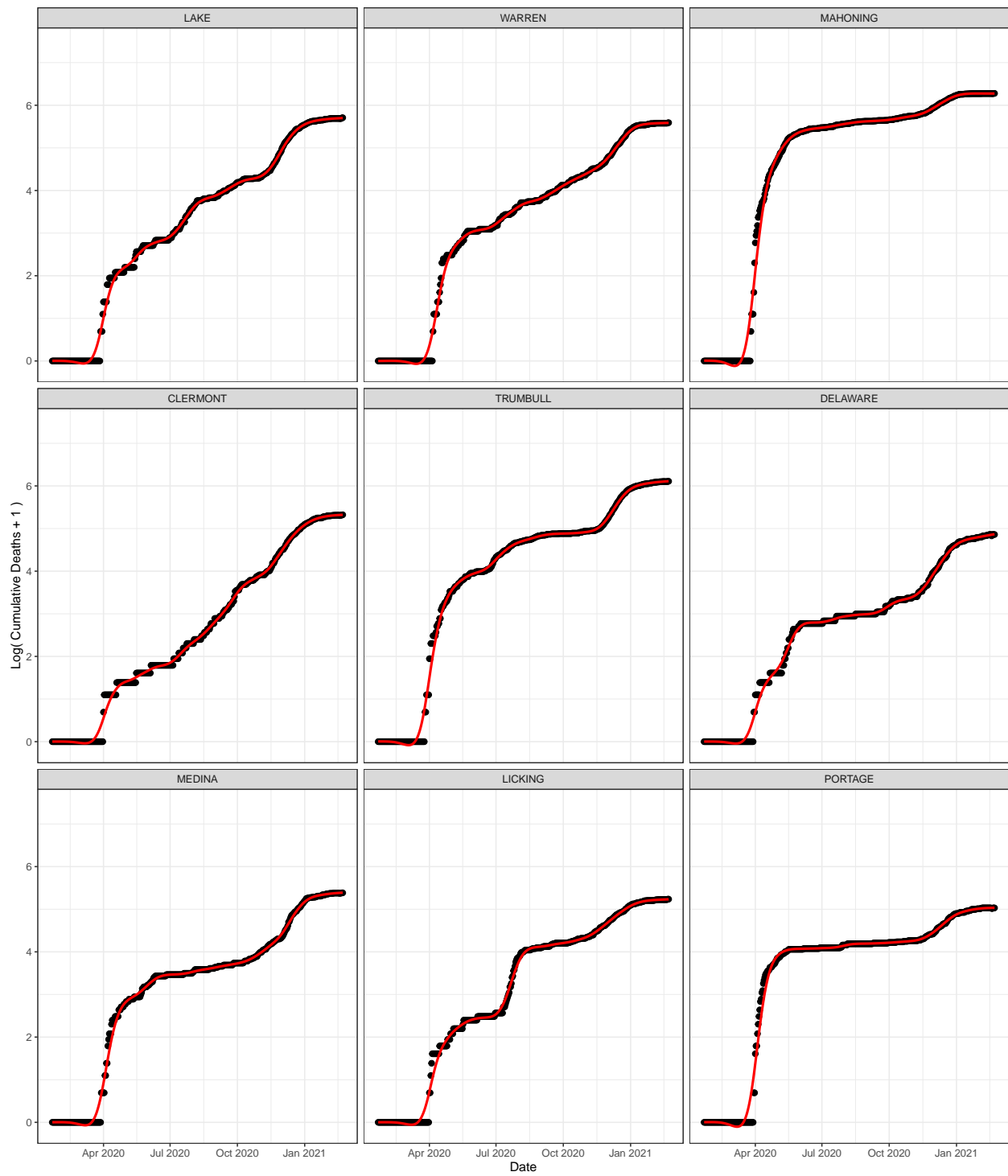
```
log_deaths_county_df <- cases %>%
  arrange(desc(POPULATION)) %>%
  group_by(COUNTY) %>%
  mutate(log_deaths = log(CUMDEATHS + 1),
         log_new_deaths = log(NEWDEATHS + 1))
# Want to order the counties by most Populous
log_deaths_county_df$COUNTY <- factor(log_deaths_county_df$COUNTY,
                                       levels = levels(fct_reorder(log_deaths_county_df$COUNTY,
                                                                    log_deaths_county_df$POPULATION, max,
                                                                    .desc = TRUE)))
```

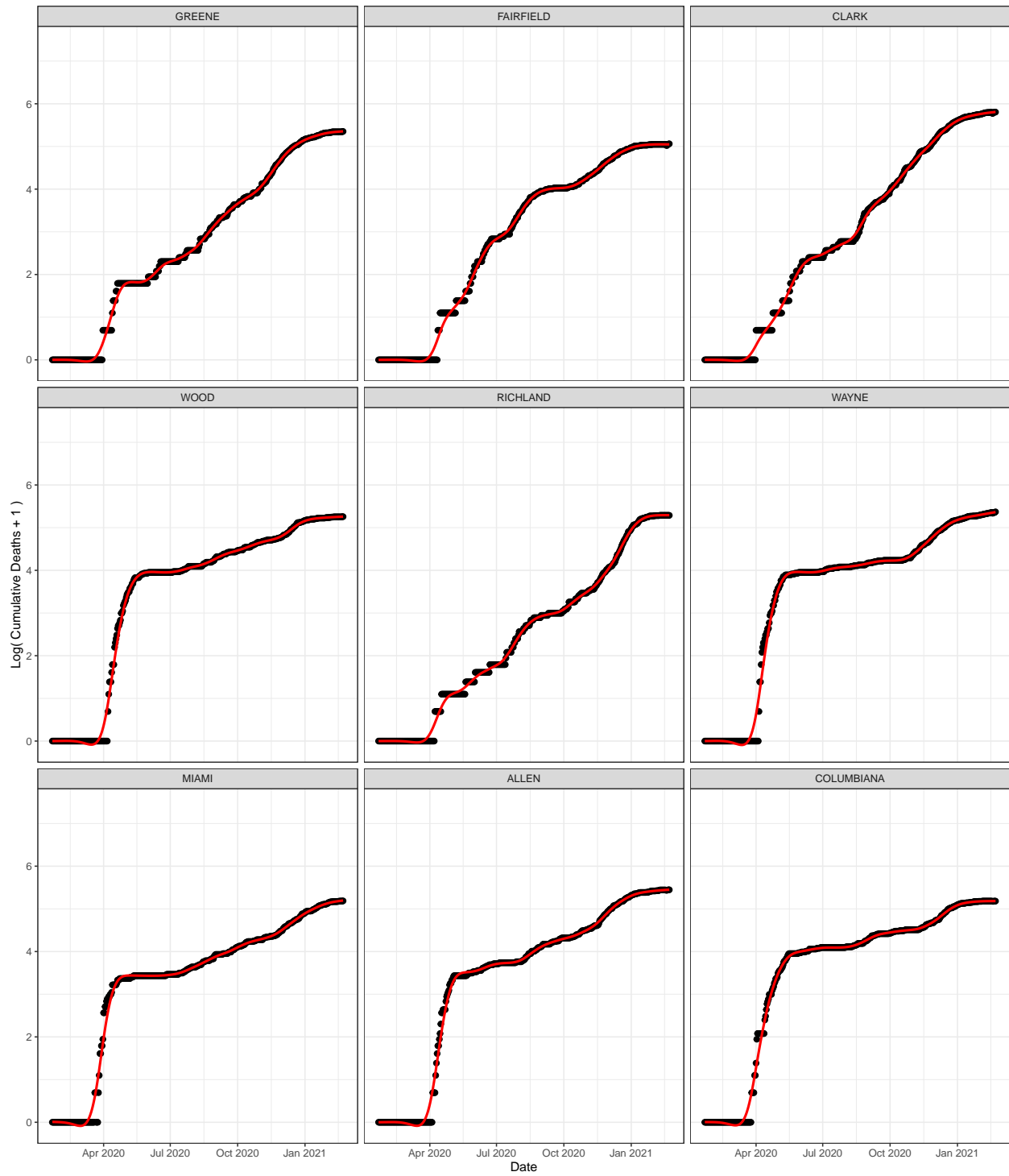
## Cumulative Deaths

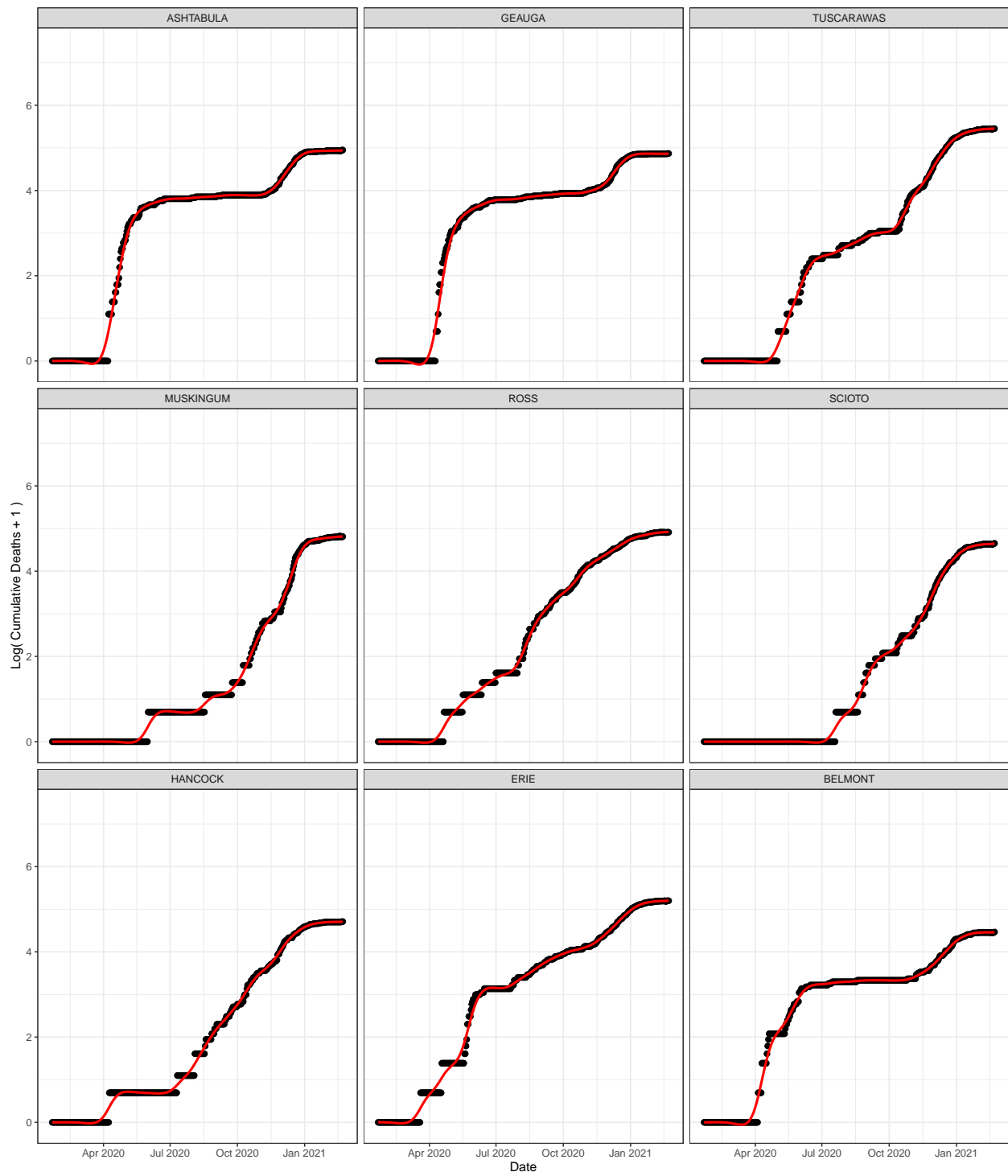
```
library(ggforce)
library(ggformula)
for(i in 1:10){
  p <- ggplot(log_deaths_county_df, aes(x = DATE, y = log_deaths)) +
    geom_point(size = 2) +
    geom_spline(aes(x = DATE, y = log_deaths), df = round(398/21, 0),
               color = "red", size = 1) +
    facet_wrap_paginate(~COUNTY, ncol = 3, nrow = 3, page = i) +
    theme_bw() +
    labs(x = "Date", y = "Log( Cumulative Deaths + 1 )")
  print(p)
```

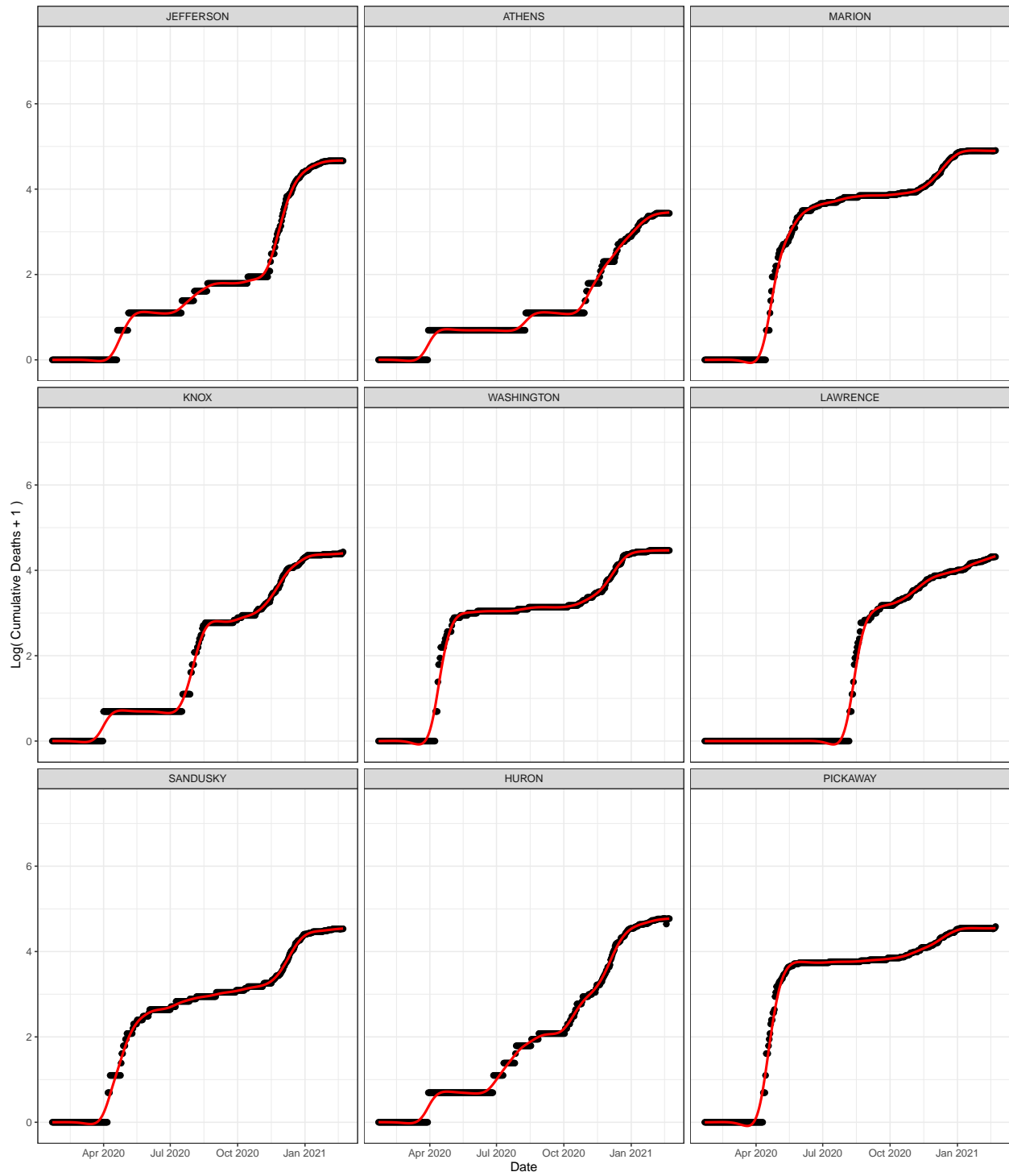
```
cat("\n\n\\newpage\n")
}
```

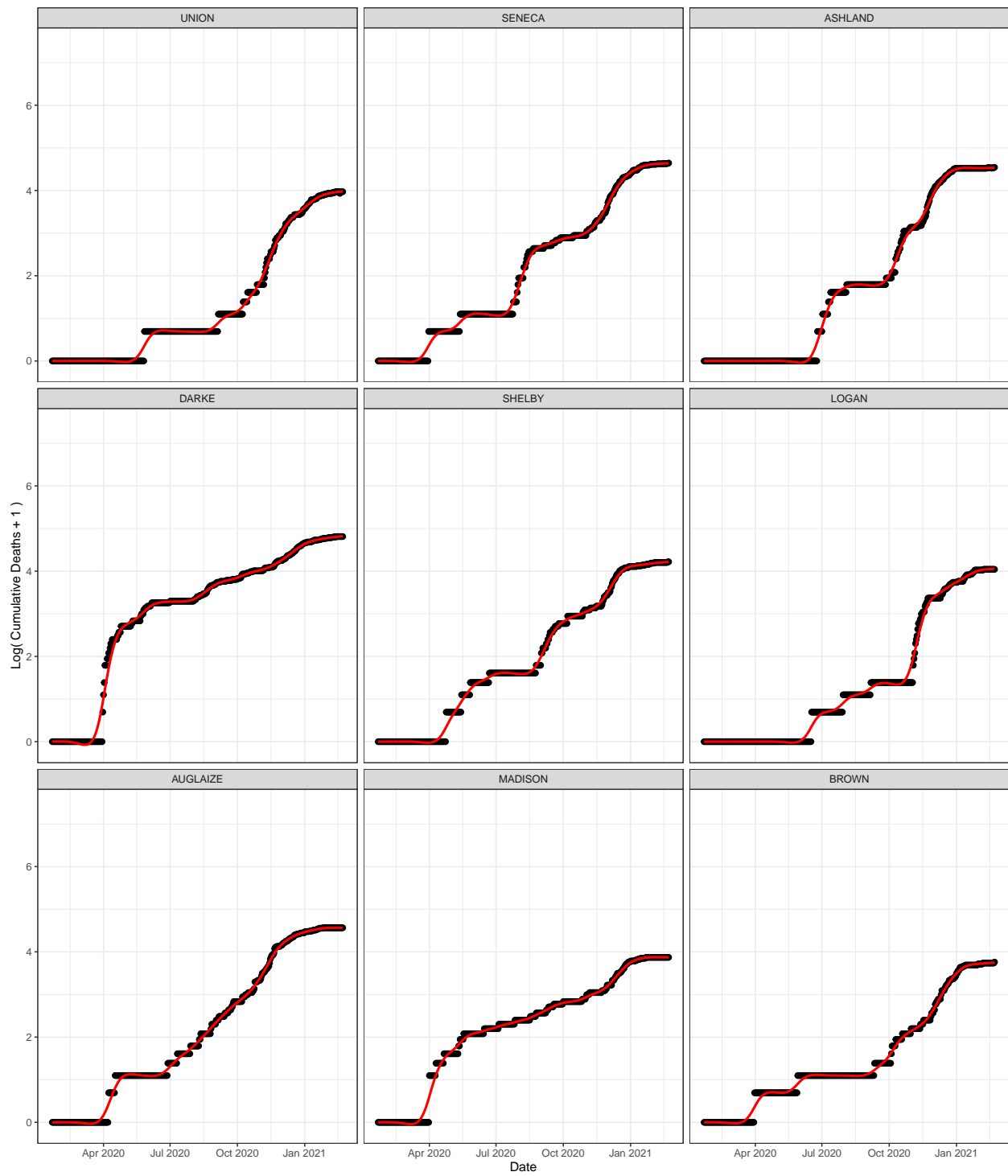


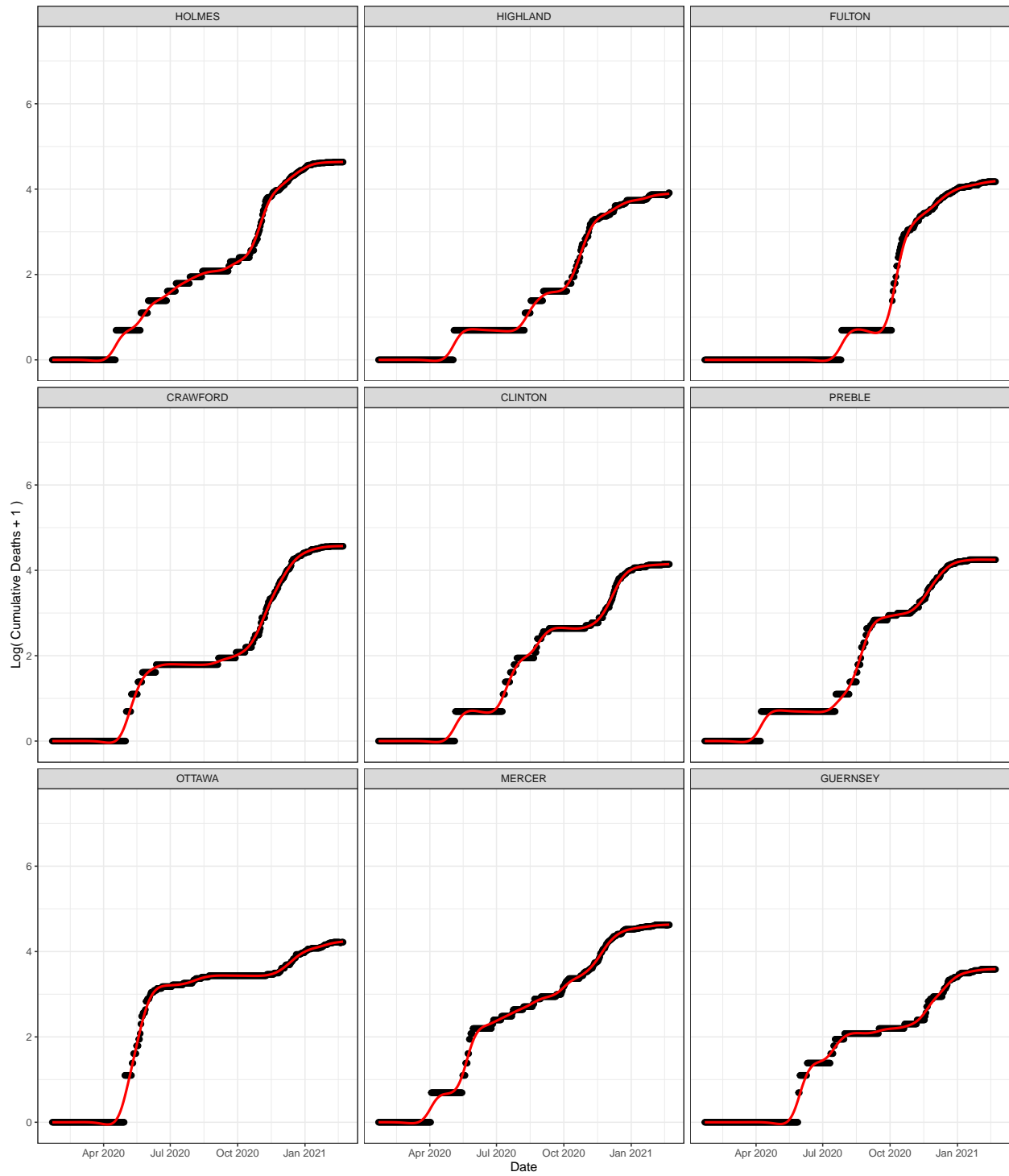




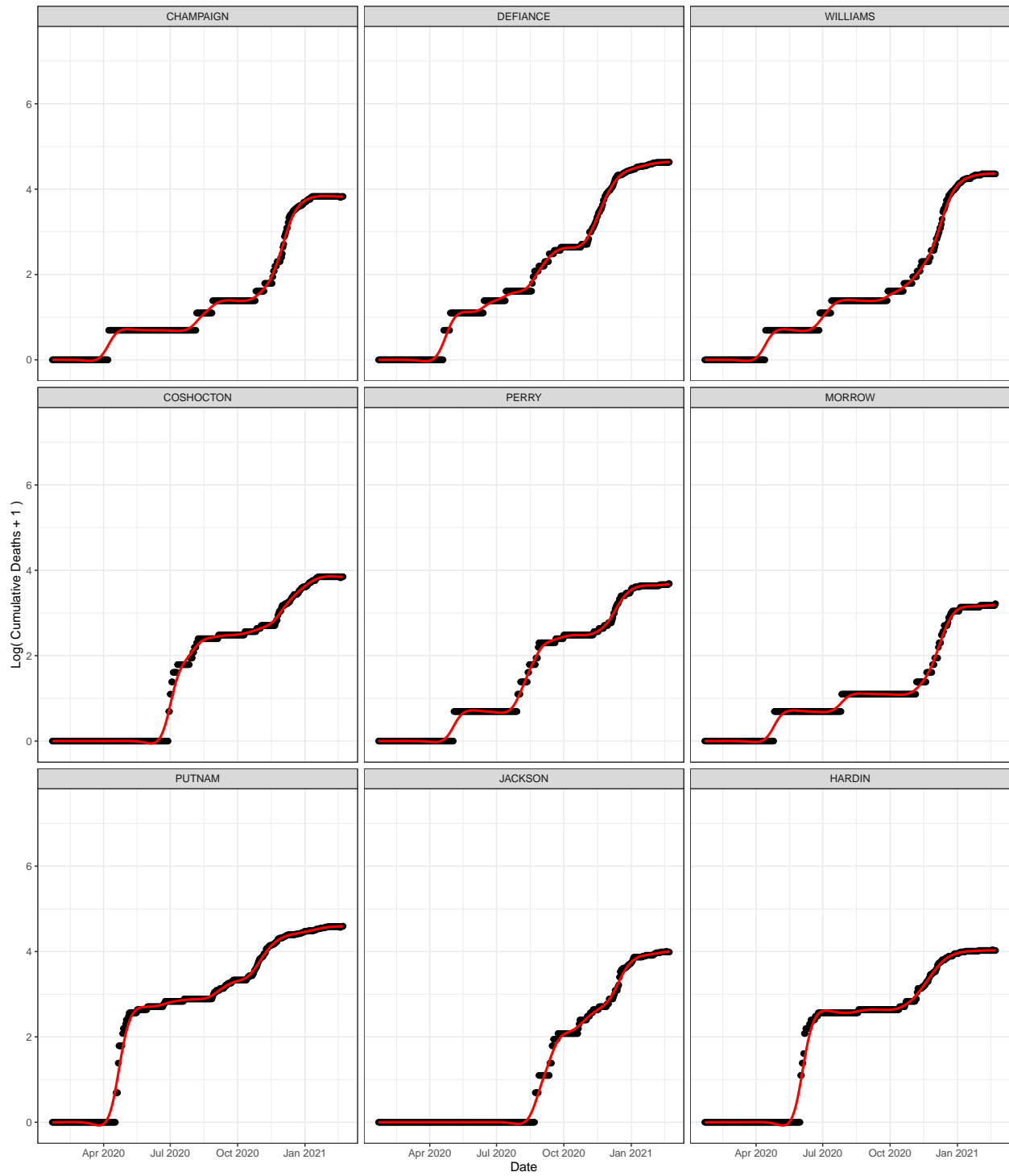


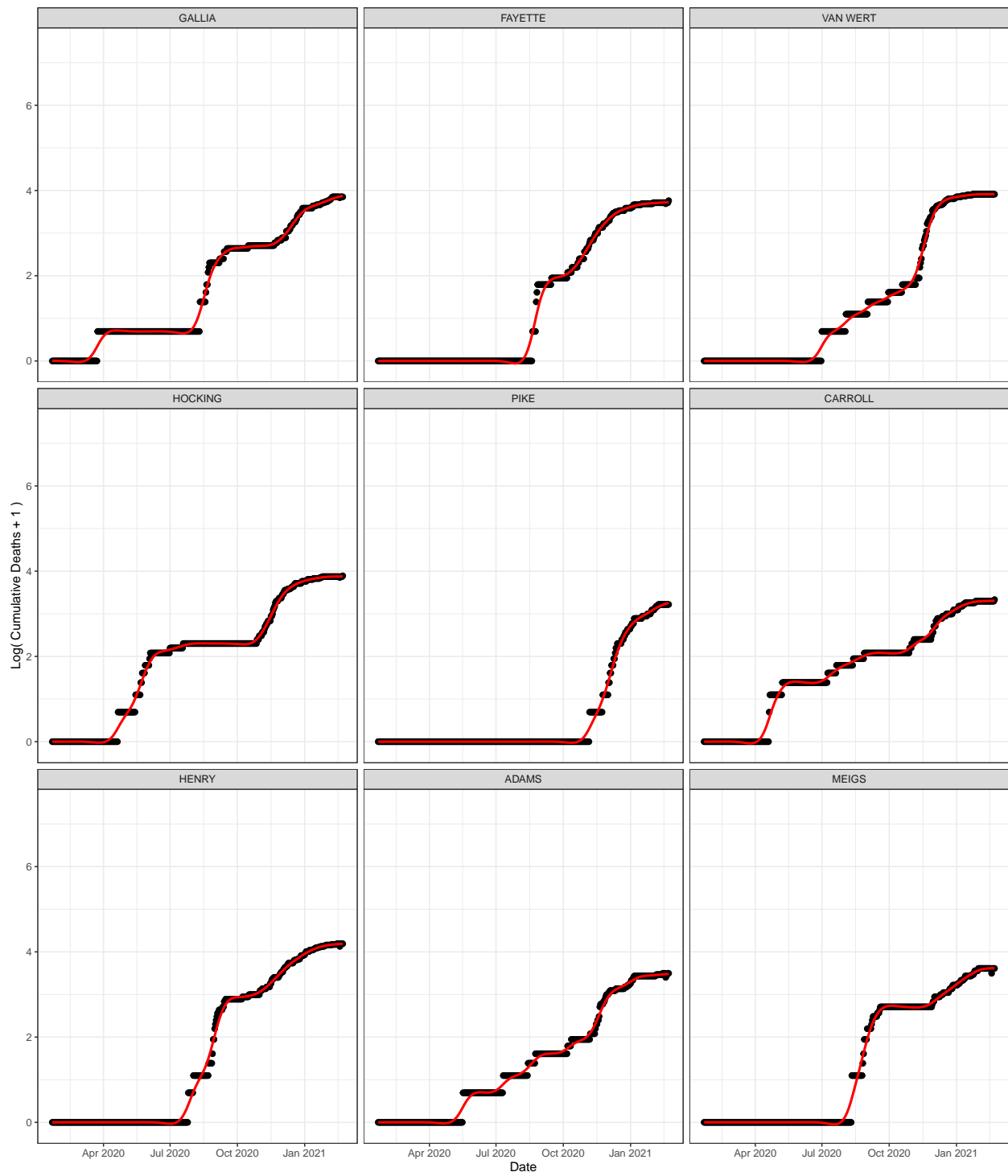


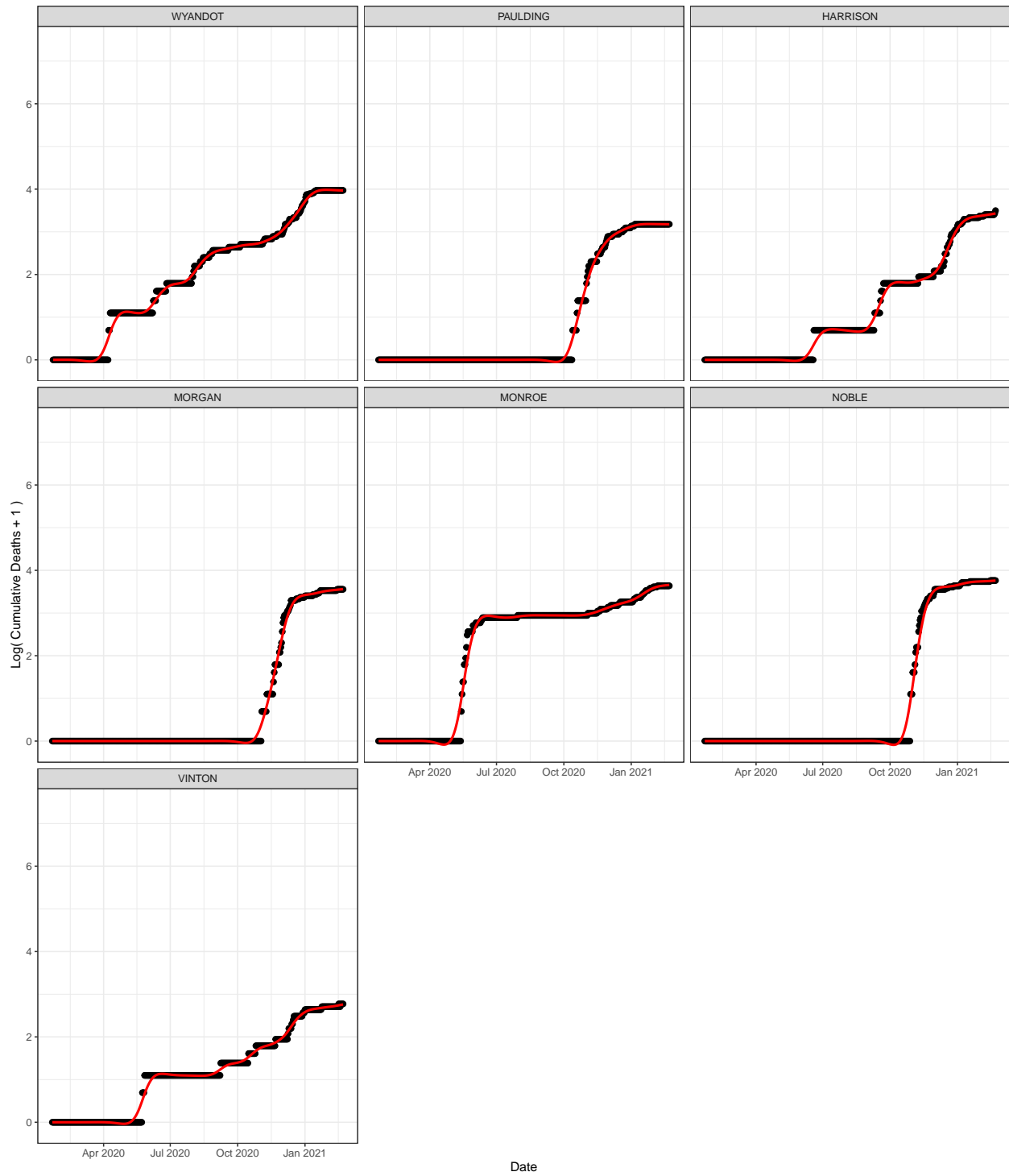












## New Deaths

```
library(ggforce)
library(splines)
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 )")
  print(p)
  cat("\n\n\\newpage\n")
}
```

