

EPI Info CDC

Nick Lauerman

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Libraries Used

```
library(tidyverse)
```

```
## -- Attaching packages -----
## v ggplot2 3.3.0    v purrr  0.3.3
## v tibble  3.0.0    v dplyr  0.8.5
## v tidyr   1.0.2    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()
```

```
library(lubridate)
```

```
##
## Attaching package: 'lubridate'

## The following objects are masked from 'package:dplyr':
##
##   intersect, setdiff, union

## The following objects are masked from 'package:base':
##
##   date, intersect, setdiff, union
```

Load CDC data

Read CSV File

```
cdc <- read_csv(file = "../data/CDC_data.csv")

## Warning: Missing column names filled in: 'X3' [3]
## Warning: Duplicated column names deduplicated: '25 mar data' => '25 mar
## data_1' [12]
```

Clean data and calculate cumulative number of cases

```
names(cdc)[1:2] <- c("Date",
                    "Number of new cases")
cdc$cum <- cumsum(cdc$`Number of new cases`)
cdc$Date <- as.Date(cdc$Date,
                  format = "%d-%b-%y")
```

Visualize all data

```
epi <- ggplot(data = cdc)

epi + geom_point(aes(x = Date,
                    y = `Number of new cases`))+
#   geom_line(aes(x = Date,
#                 y = `Number of new cases`),
#             linetype = 2) +
  geom_smooth(aes(x = Date,
                  y = `Number of new cases`),
              color = "red",
              fill = "blue") +
  labs(y = "Cases",
       title = "Number of New Cases of COVID-19 Reported to the CDC")

## `geom_smooth()` using method = 'loess' and formula 'y ~ x'

epi + geom_col(aes(x=Date,
                  y=`Number of new cases`),
               fill="blue") +
  geom_smooth(aes(x=Date,
                  y=`Number of new cases`),
              color = "red") +
  labs(y = "Cases",
       title = "Number of New Cases of COVID-19 Reported to the CDC")

## `geom_smooth()` using method = 'loess' and formula 'y ~ x'

epi + geom_point(aes(x = Date,
                    y = cum))+
#   geom_line(aes(x = Date,
#                 y = `cum`)) +
  geom_smooth(aes(x = Date,
                  y = `cum`),
              color = "red",
```

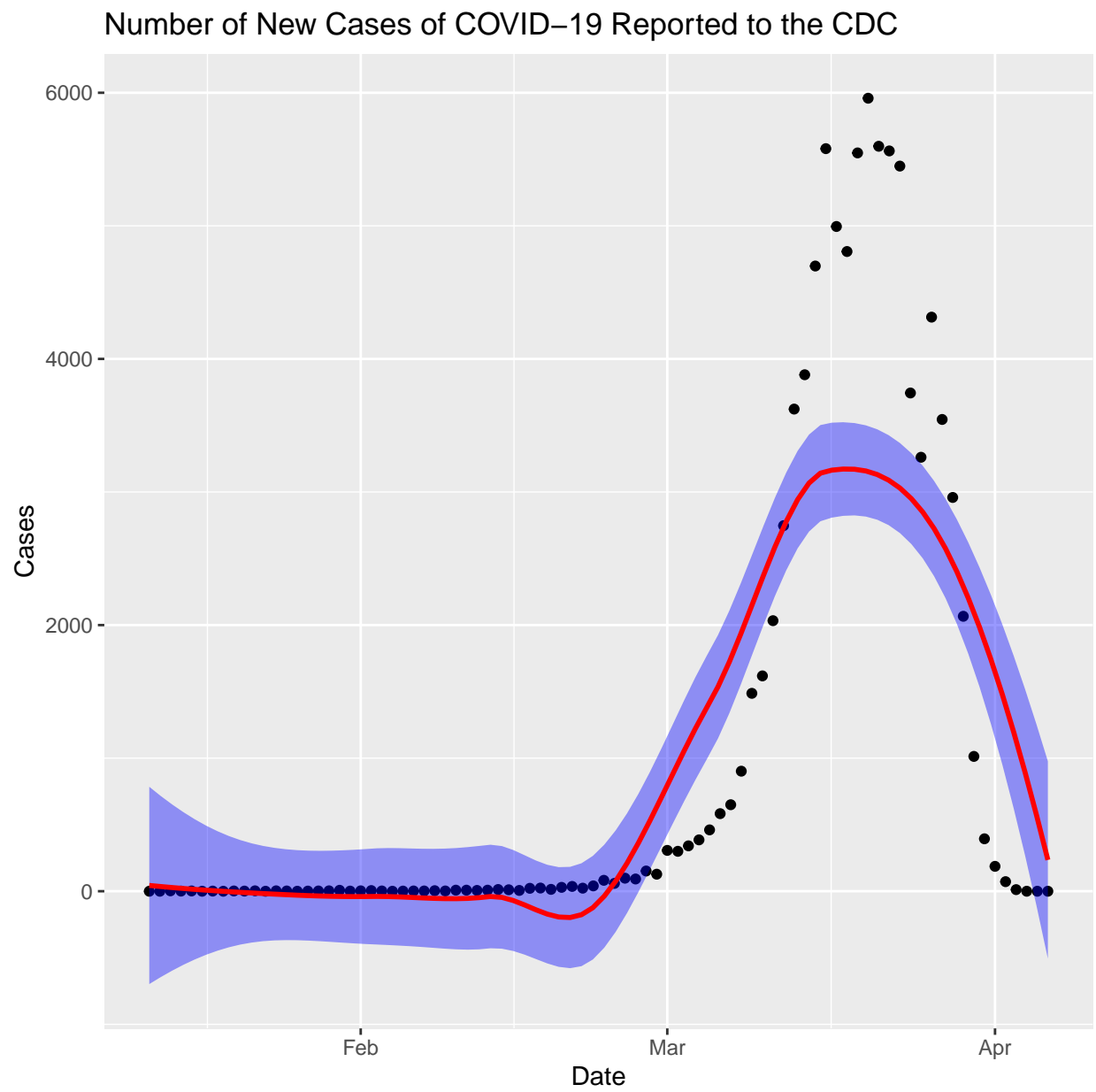


Figure 1: Epi curve 1

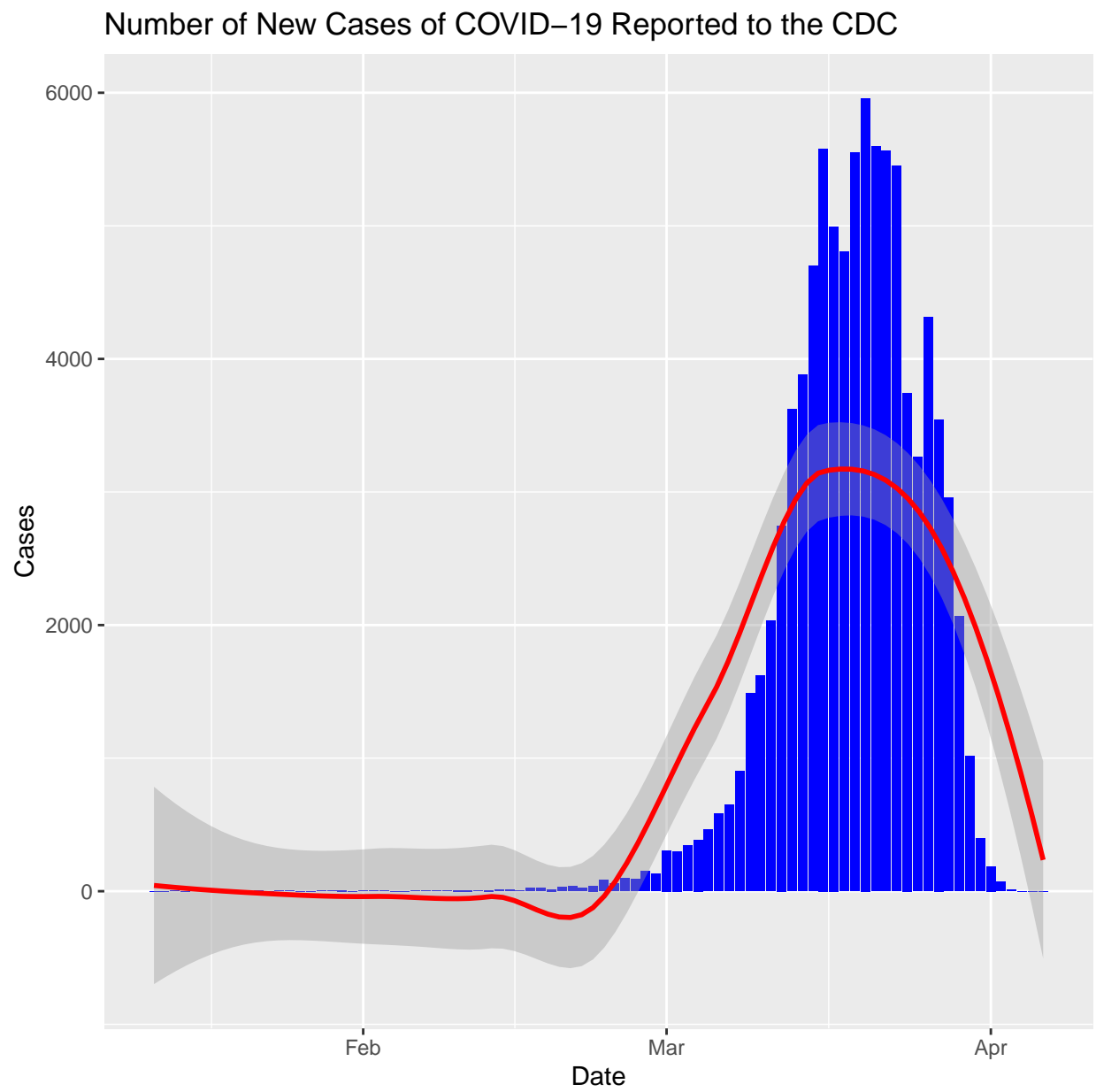


Figure 2: Epi curve 2, traditional

```

    fill = "blue") +
  labs(y = "Cumulative number of cases",
       title = "Cumulative Number of Cases of COVID-19 Reported to the CDC") +
  geom_hline(yintercept = mean(cdc$cum)) +
  geom_hline(yintercept = median(cdc$cum),
             lty = 2)

```

```
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
```

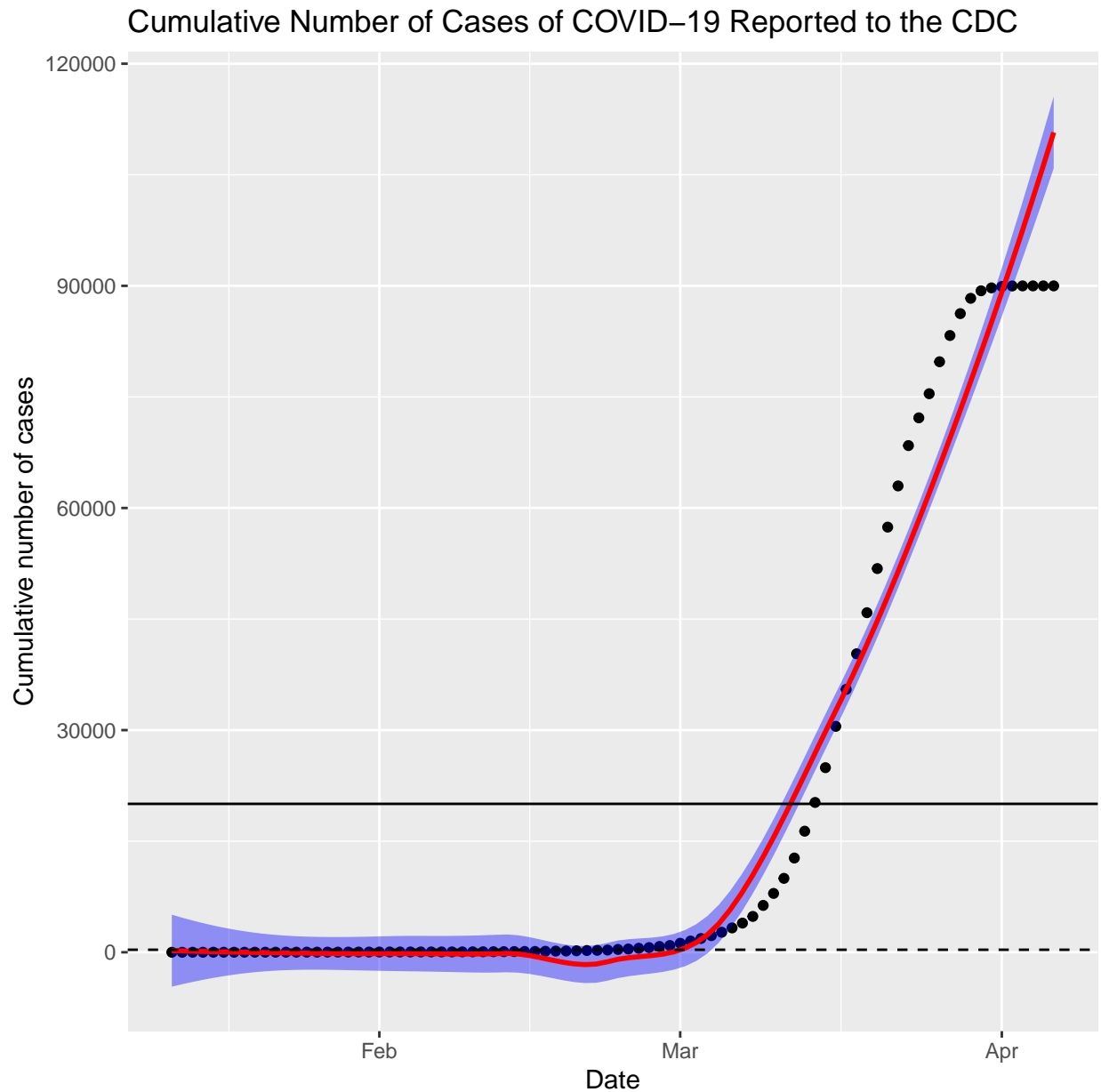


Figure 3: Cumulative cases

```

gr <- cdc %>%
  filter(`Number of new cases` != 0)
ggplot(data = gr) +

```

```
geom_line(aes(y = `Number of new cases`,
              x = cum)) +
scale_x_log10() +
scale_y_log10() +
geom_smooth(aes(y = `Number of new cases`,
                x = cum))
```

`geom_smooth()` using method = 'loess' and formula 'y ~ x'

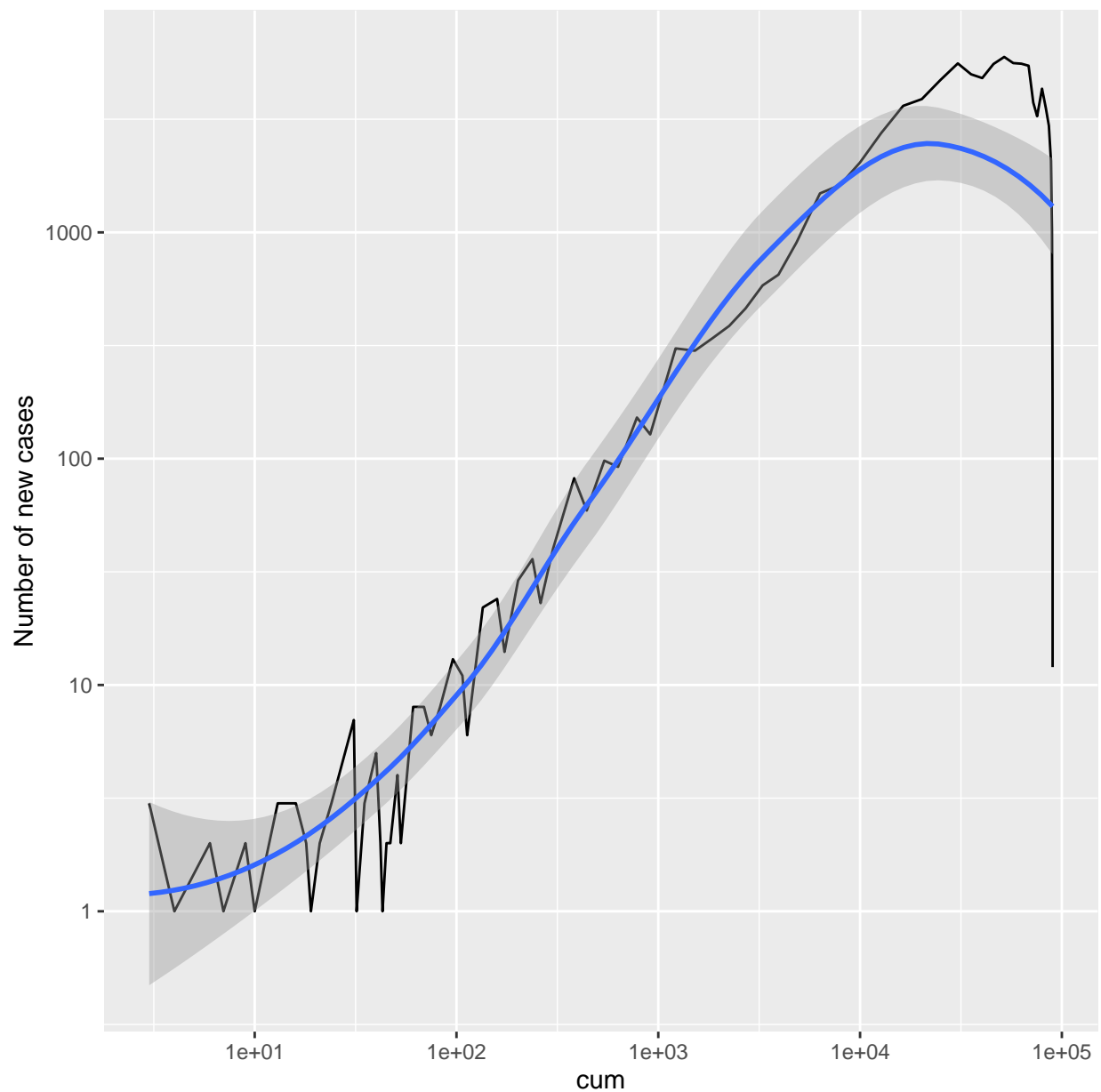


Figure 4: Growth Rate

Filter to remove incomplete reporting

remove dates on or after 25 March as this data may not be completely reported

```
cdc <- cdc %>%  
  filter(Date < as.Date("2020-03-25"))
```

update with g

Visualize

```
epi <- ggplot(data = cdc)
```

```
epi + geom_point(aes(x = Date,  
  y = `Number of new cases`))+  
#   geom_line(aes(x = Date,  
#     y = `Number of new cases`),  
#     linetype = 2) +  
geom_smooth(aes(x = Date,  
  y = `Number of new cases`),  
  color = "red",  
  fill = "blue") +  
labs(y = "Cases",  
  title = "Number of New Cases of COVID-19 Reported to the CDC")
```

```
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
```

```
epi + geom_col(aes(x=Date,  
  y=`Number of new cases`),  
  fill= "blue") +  
geom_smooth(aes(x=Date,  
  y=`Number of new cases`),  
  color = "red") +  
labs(y = "Cases",  
  title = "Number of New Cases of COVID-19 Reported to the CDC")
```

```
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
```

```
epi + geom_point(aes(x = Date,  
  y = cum))+  
# geom_line(aes(x = Date,  
# y = `cum`)) +  
geom_smooth(aes(x = Date,  
  y = `cum`),  
  color = "red",  
  fill = "blue") +  
labs(y = "Cumulative number of cases",  
  title = "Cumulative Number of Cases of COVID-19 Reported to the CDC") +  
geom_hline(yintercept = mean(cdc$cum)) +  
geom_hline(yintercept = median(cdc$cum),  
  lty = 2)
```

```
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
```

```
gr <- cdc %>%  
  filter(`Number of new cases` != 0)  
ggplot(data = gr) +  
  geom_line(aes(y = `Number of new cases`),
```

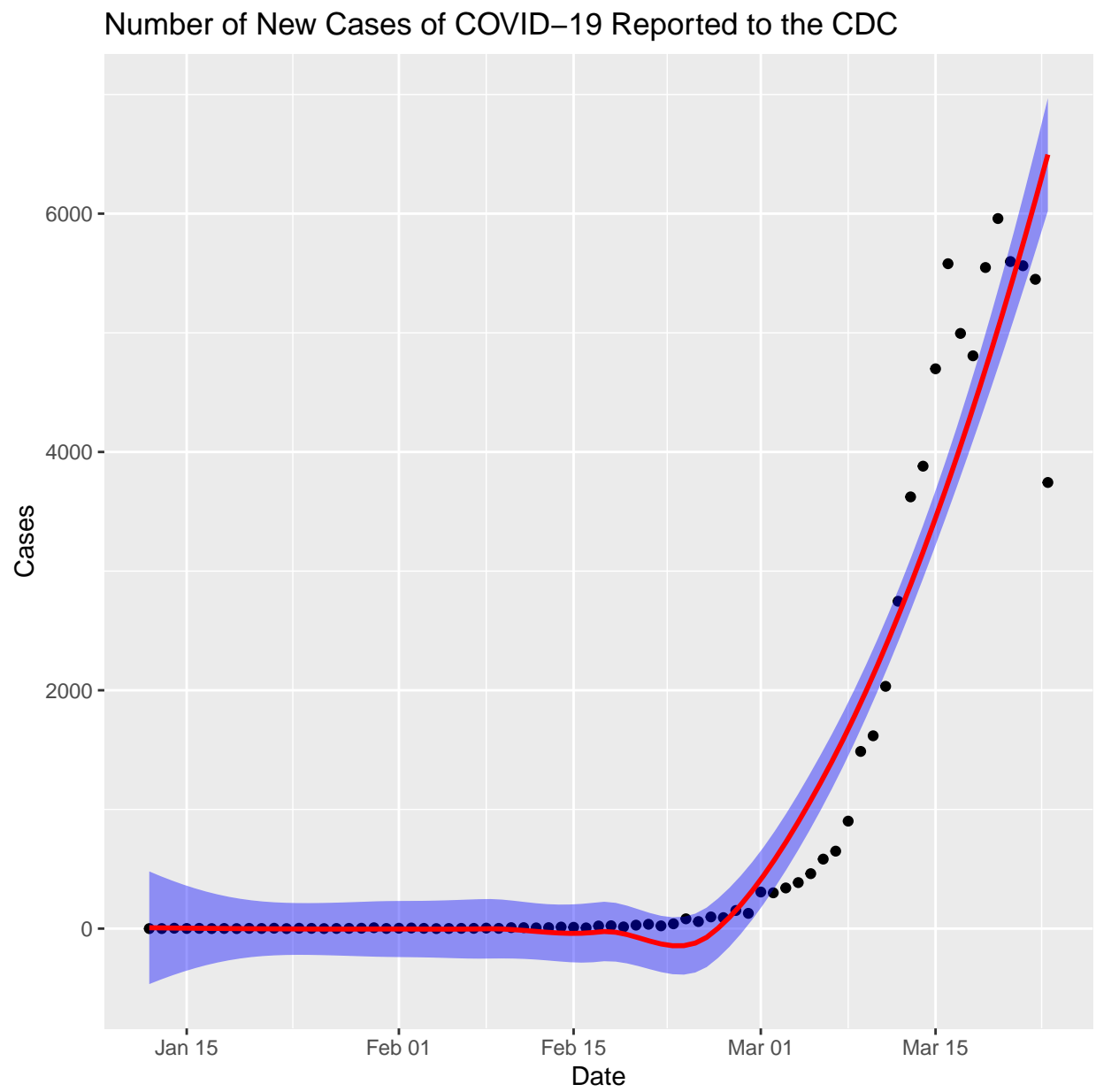


Figure 5: Epi curve 1

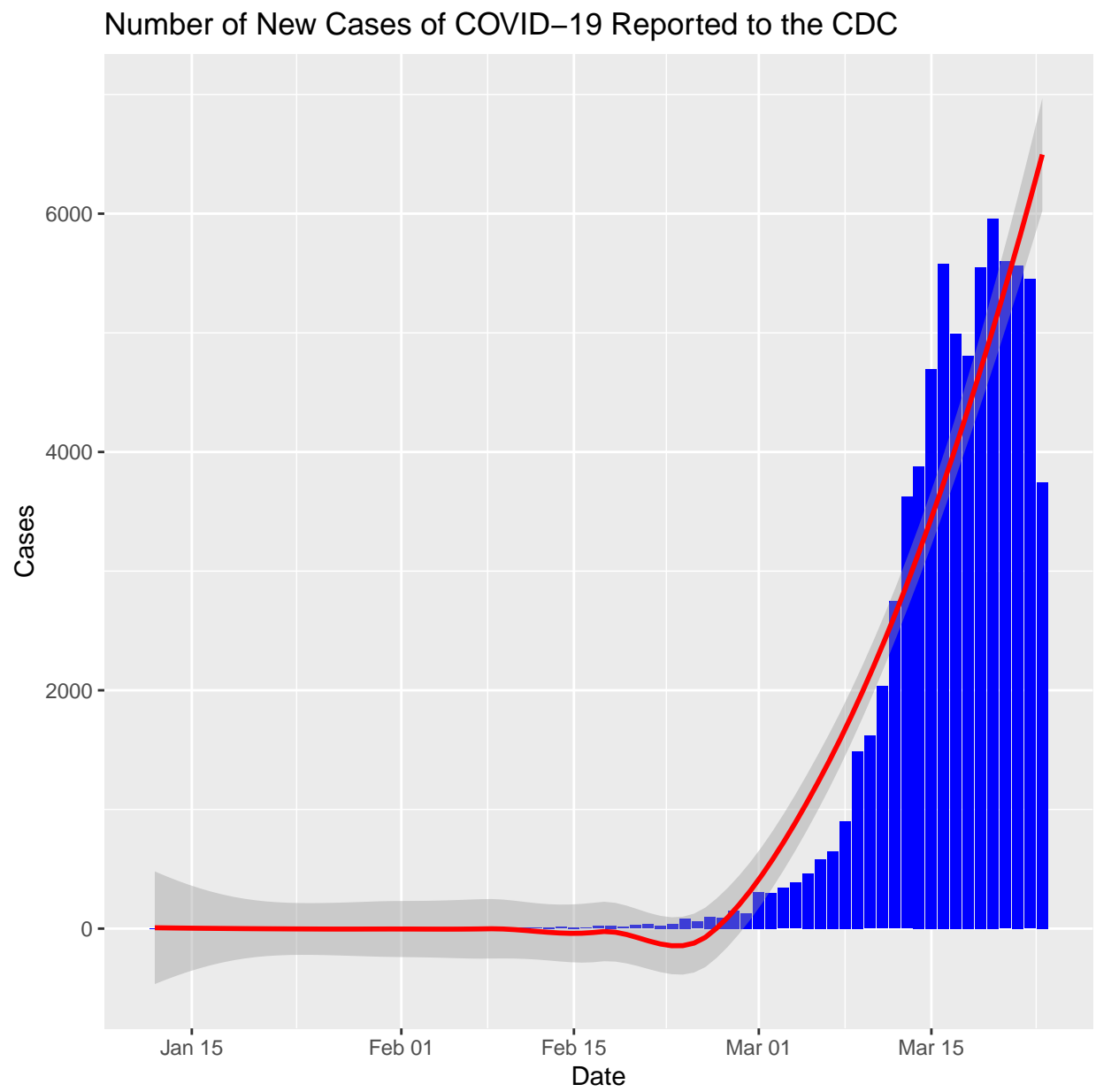


Figure 6: Epi curve 2, traditional

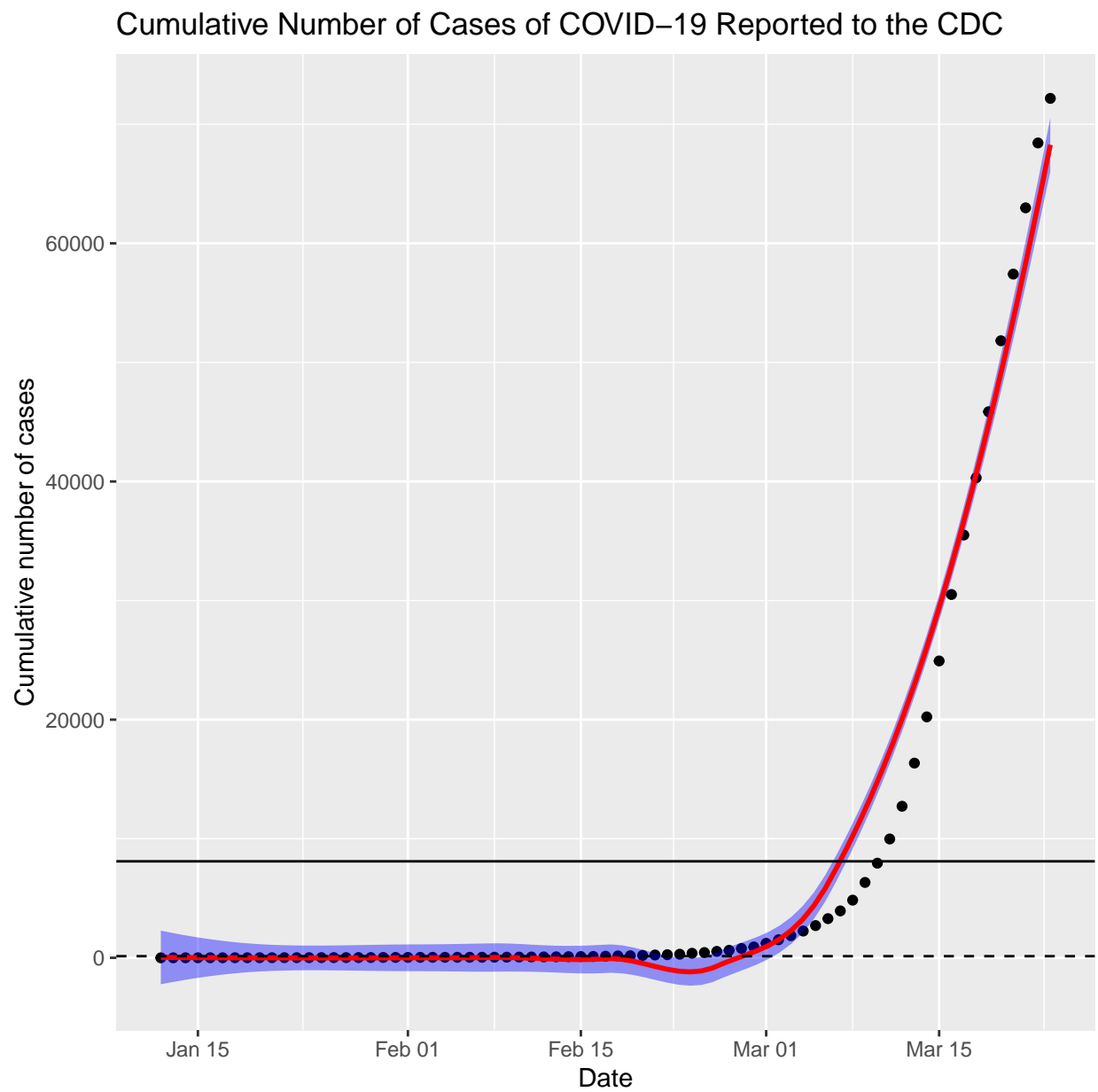


Figure 7: Cumulative cases

```

x = cum)) +
scale_x_log10() +
scale_y_log10() +
geom_smooth(aes(y = `Number of new cases`,
x = cum))

```

`geom_smooth()` using method = 'loess' and formula 'y ~ x'

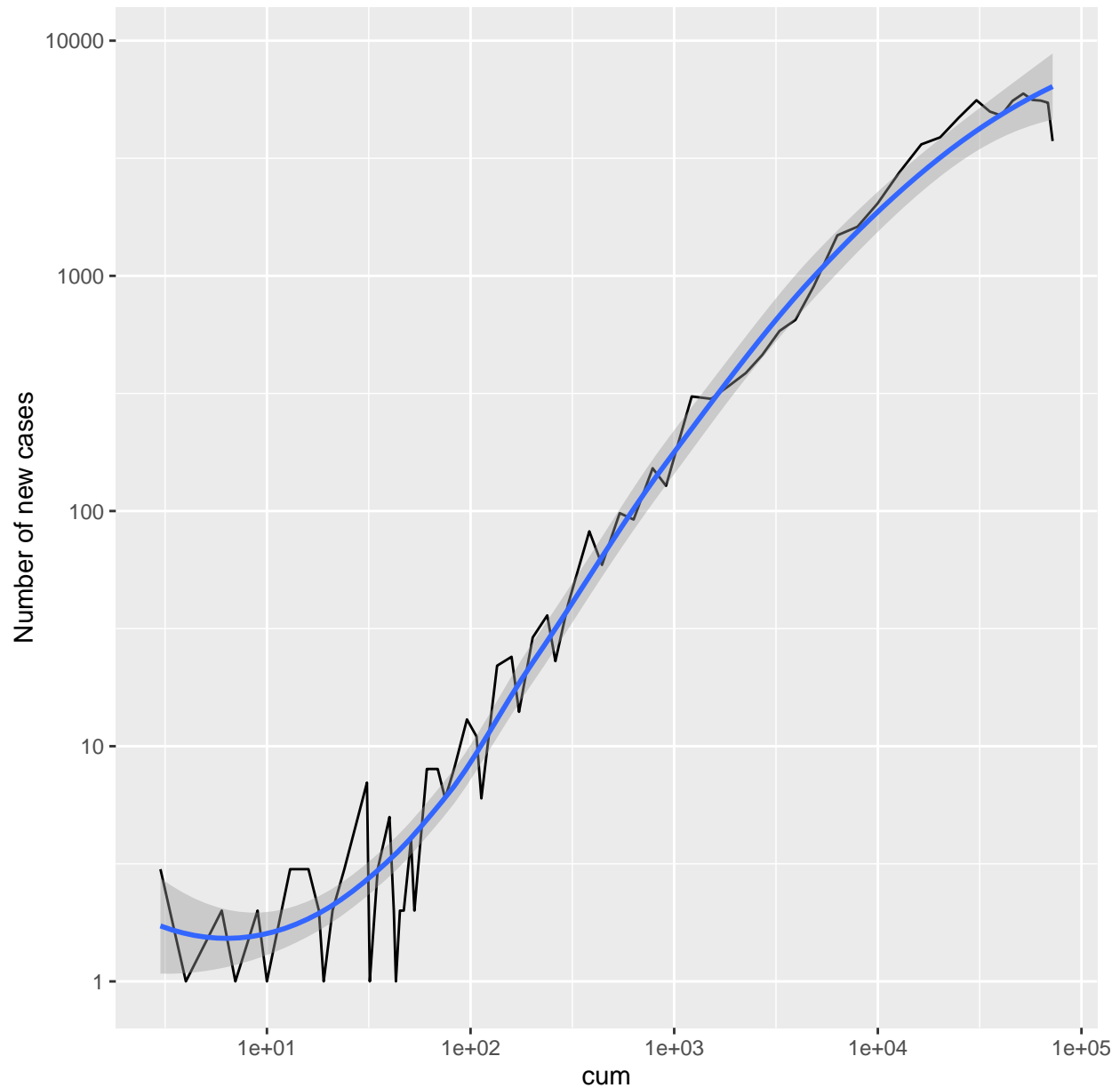


Figure 8: Growth Rate