Covid plots for family

April 03, 2020

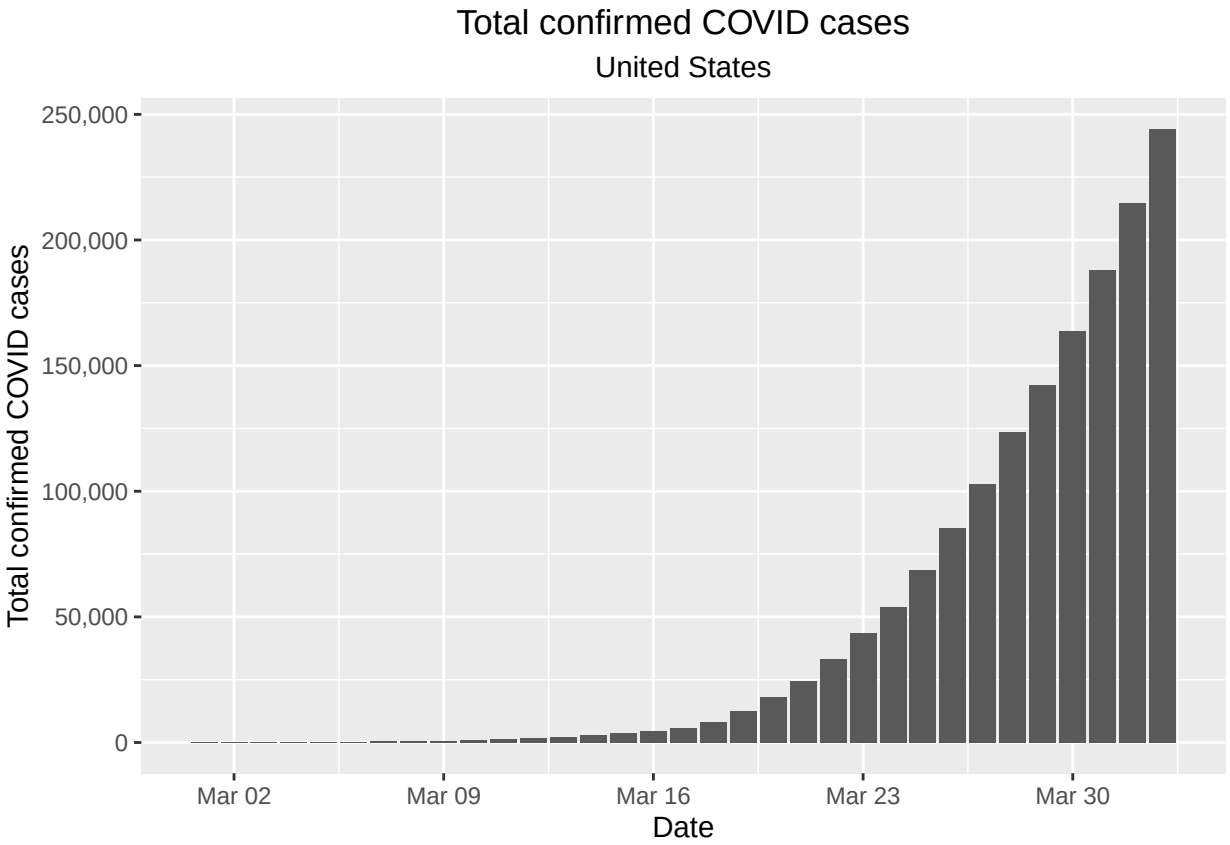
Contents

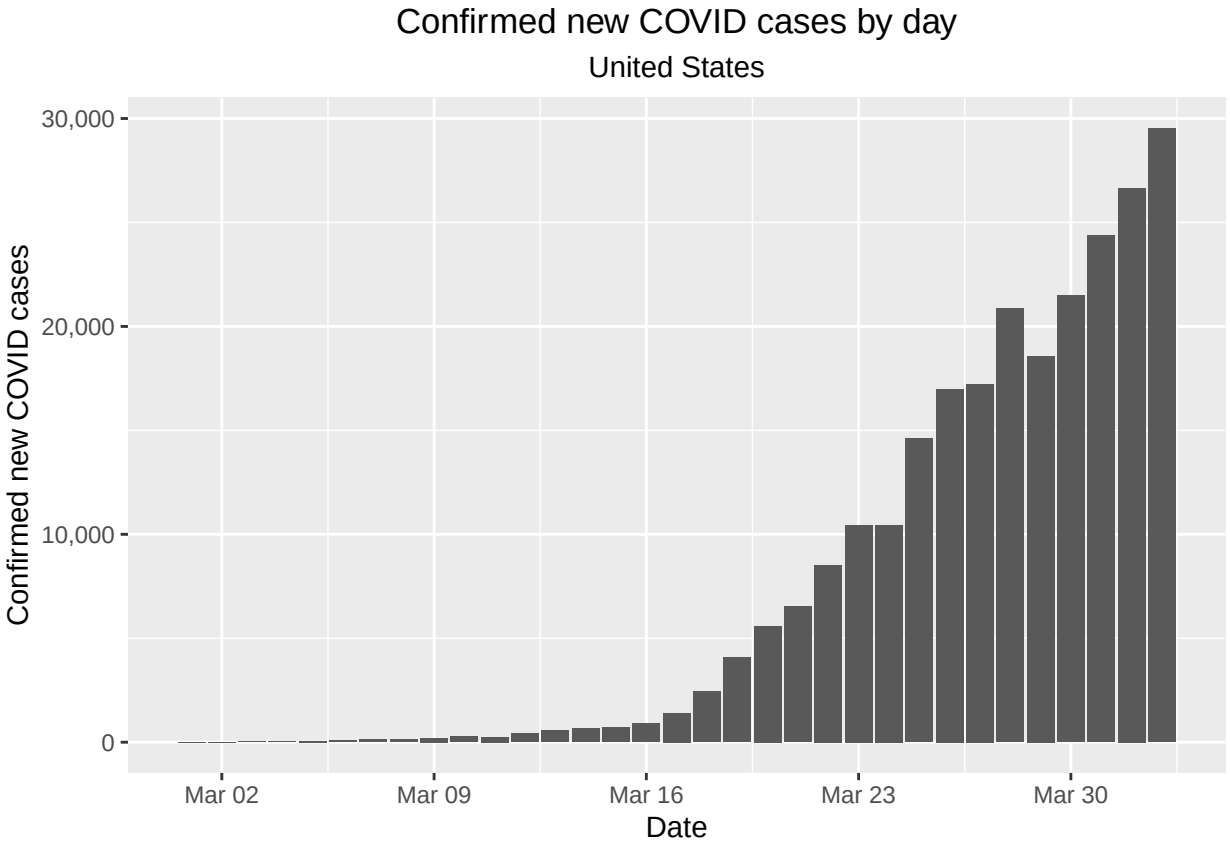
Background

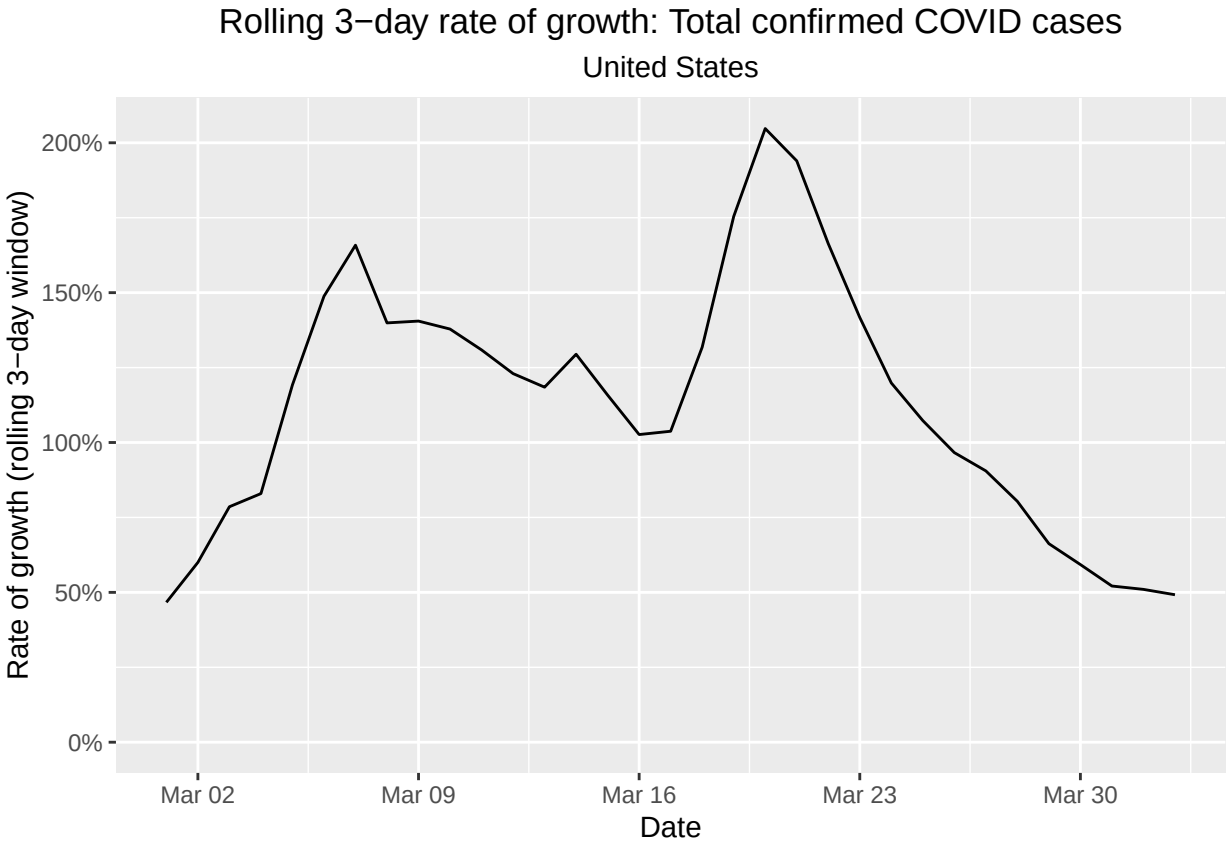
- This page shows COVID data broken down into regions that affect our family. It pulls from publicly available raw data from the NY Times, which is reported daily. It's on a one-day lag, so when you see this report, the most recent day included while be the day prior.
- The page is mostly organized by geography: It starts by showing data for all of the U.S., followed by our respective states, followed by our respective counties.
- Within each geophraphy, it shows several plots:
  - Total confirmed cases: This is the cumulative total of cases reported.
  - New confirmed cases: This is the number of new cases reported on each respective date.
  - Rolling 3-day case growth rate: This is the average daily growth rate in total cases over the previous 3 days. For instance, if it is 100%, then that means total cases are doubling every 3 days. (This isn't shown at the county level because the sample size is too small.)
  - Total deaths: This is the cumulative total of deaths reported
  - New deaths: This is the number of new deaths reported on each respective date
  - Rolling 3-day death growth rate: This is the average daily growth rate in total deaths over the previous 3 days. For instance, if it is 100%, then that means total deaths are doubling every 3 days. (This isn't shown at the county level because the sample size is too small.)
- Besides this data for each geography, it also includes some additional plots at the end:
  - It shows tables of both total cases and deaths *per million residents* for all states, and then a graph of trends of these numbers for the top 10 states (only using 10 in the graph so it's not too crowded). Showing the numbers per million helps normalize for the size of the states when looking at totals.
  - It then shows these same tables and plots for cases and deaths, but with new cases/deaths per million residents instead of total cases/deaths per million. This section uses a rolling 3-day average of new cases/deaths.
  - Finally, it shows the same rolling 3-day average of new cases per million residents, but broken out by states that have enacted stay-at-home orders and when the orders were enacted.

United States

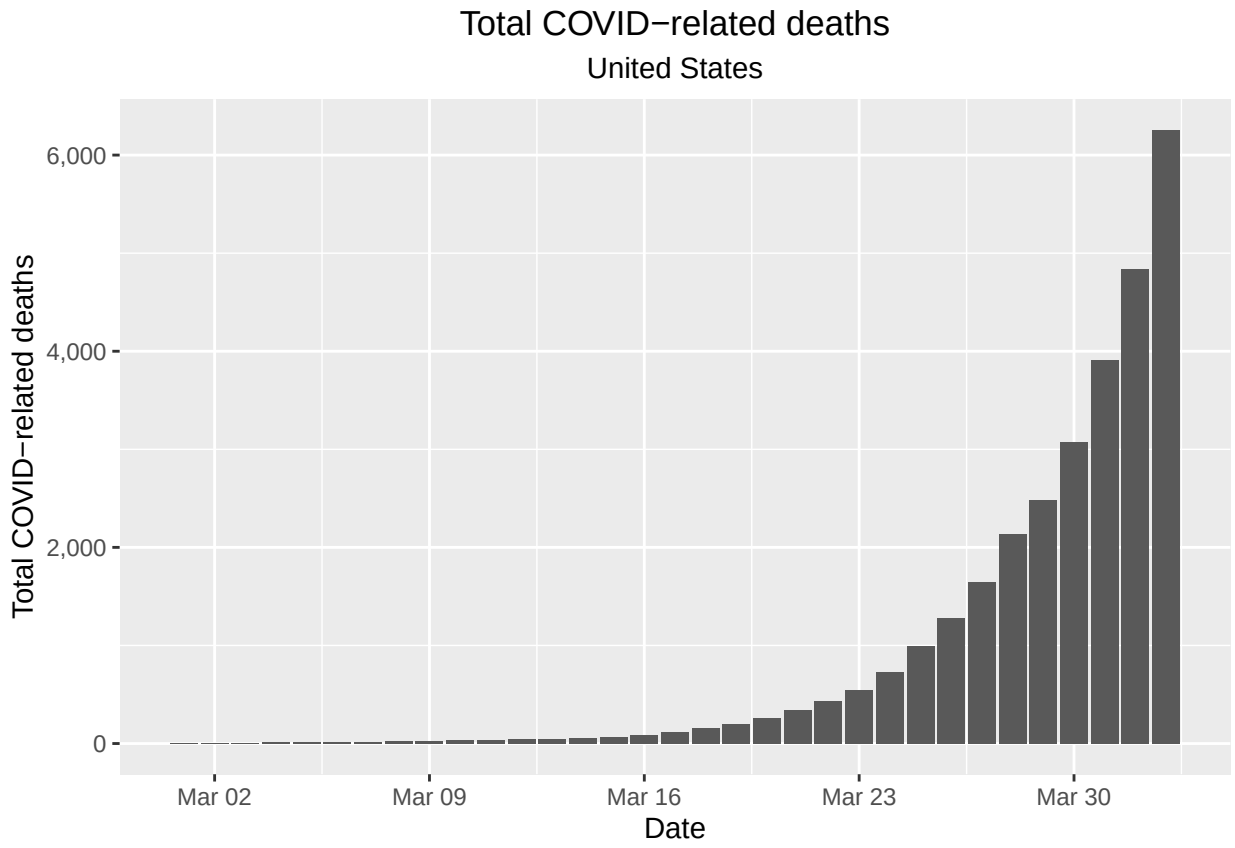
Confirmed cases

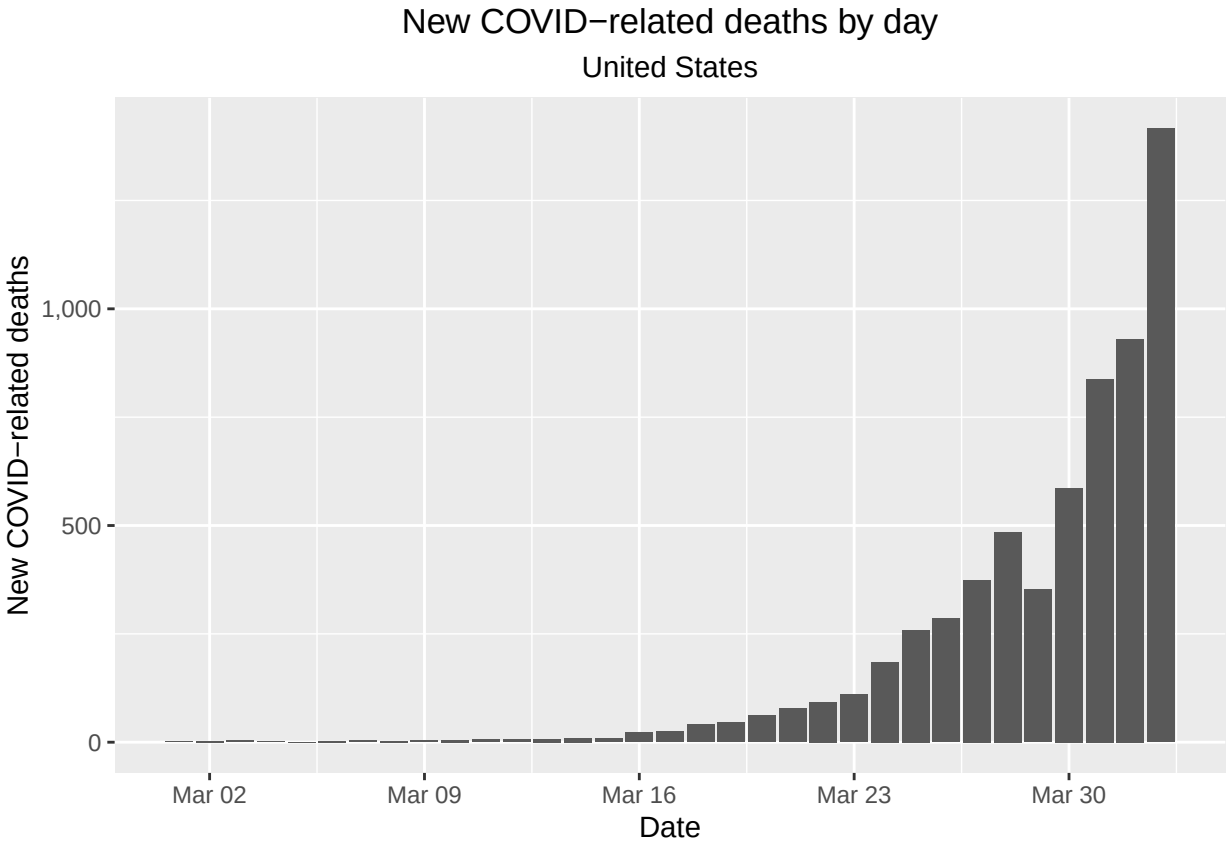


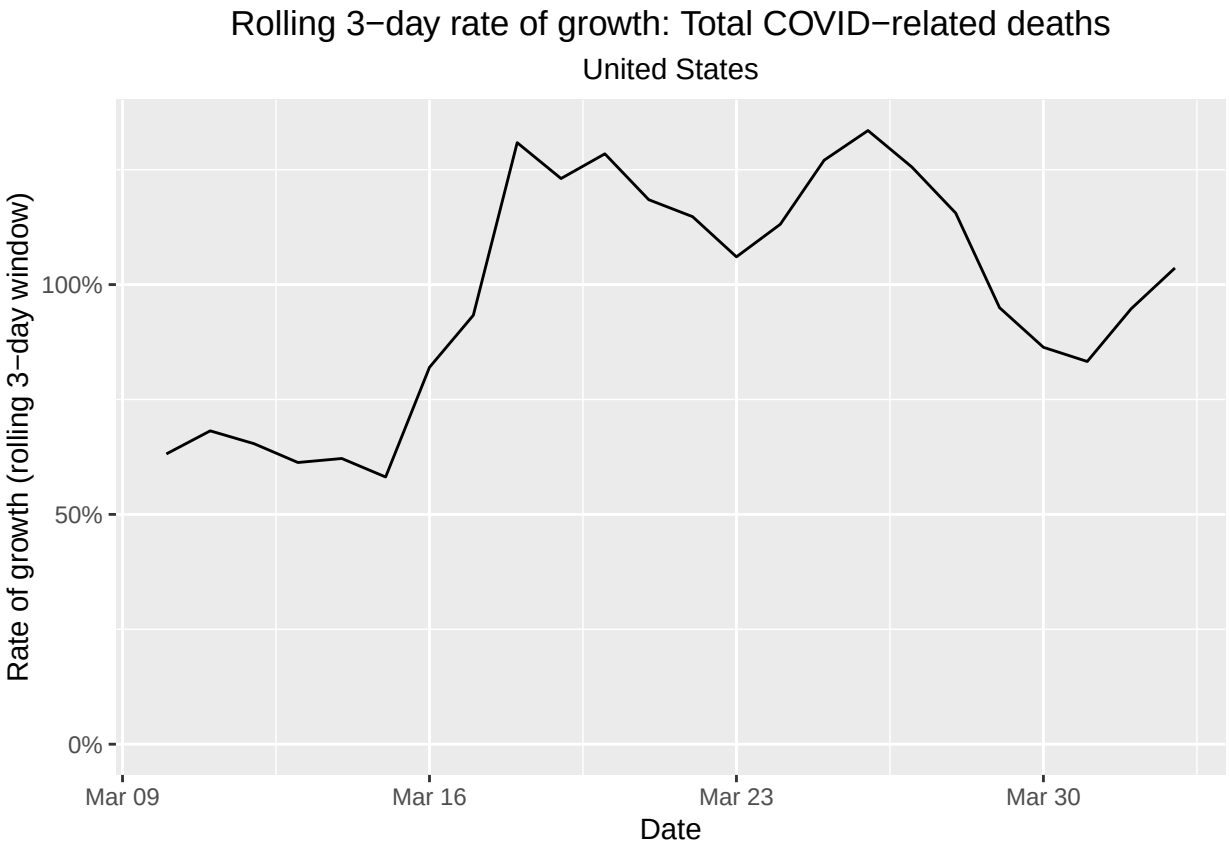

Confirmed new COVID cases by day
United States
30,000
20,000
10,000
0
Confirmed new COVID cases
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date


Rolling 3−day rate of growth: Total confirmed COVID cases
United States
Rate of growth (rolling 3−day window)
200%
150%
100%
50%
0%
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date

Deaths

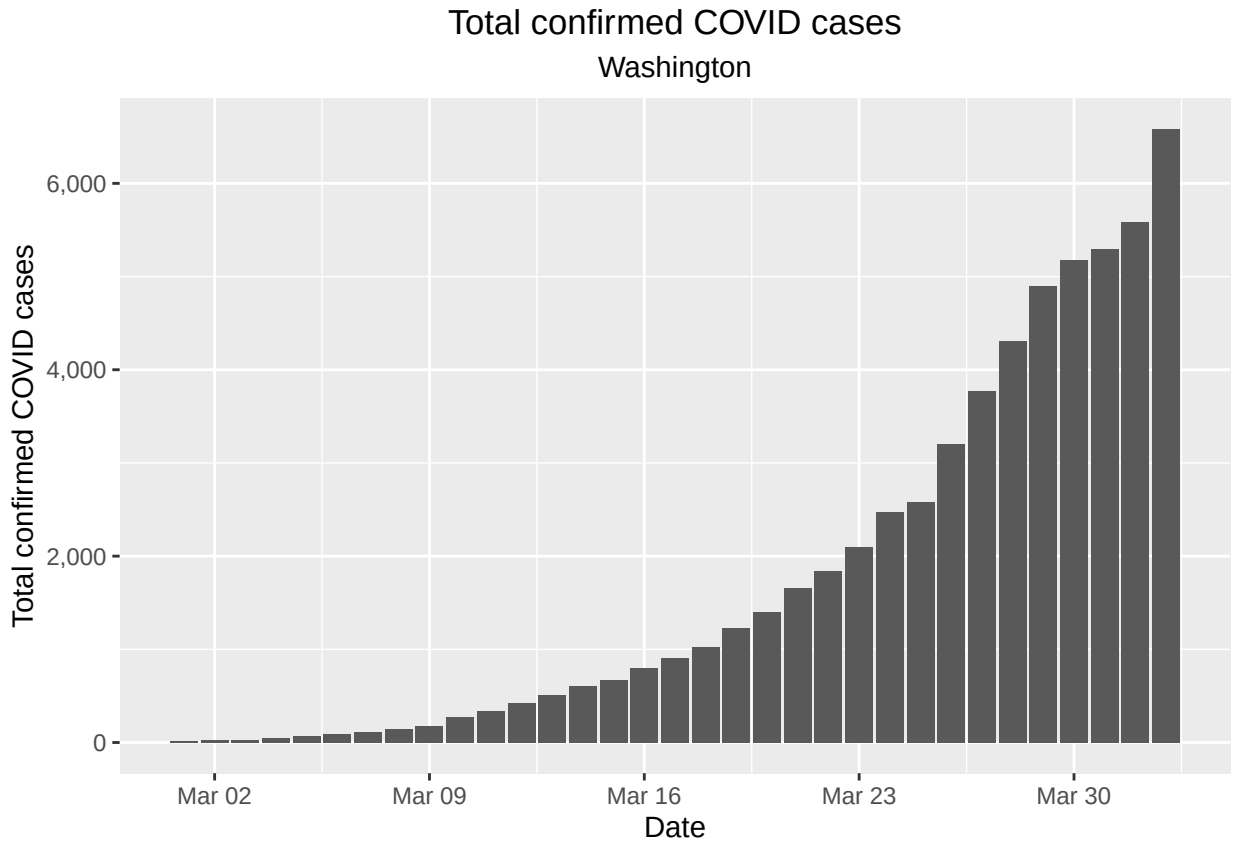

Total COVID−related deaths
United States
Total COVID−related deaths
6,000
4,000
2,000
0
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date

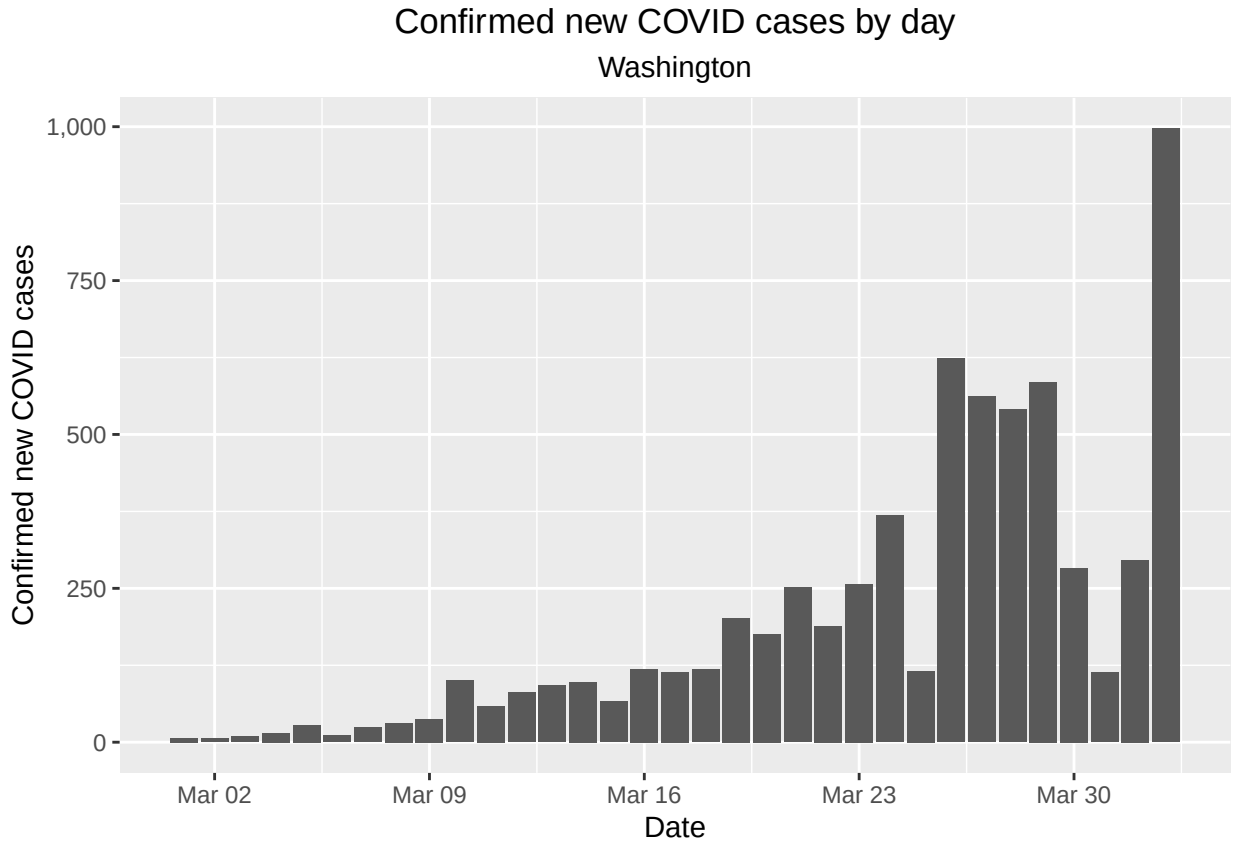

New COVID−related deaths by day
United States
New COVID−related deaths
1,000
500
0
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date

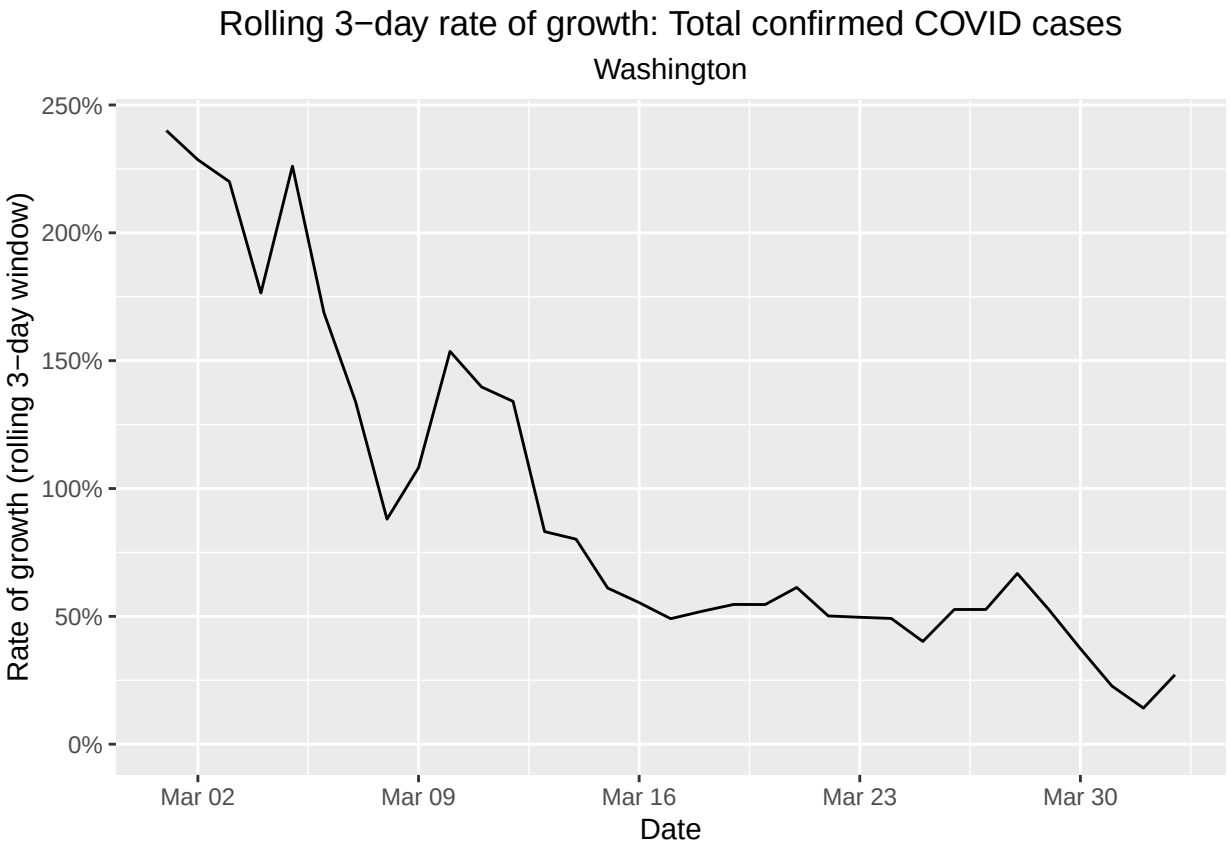

Rolling 3−day rate of growth: Total COVID−related deaths
United States
Rate of growth (rolling 3−day window)
100%
50%
0%
Mar 09
Mar 16
Mar 23
Mar 30
Date

Washington

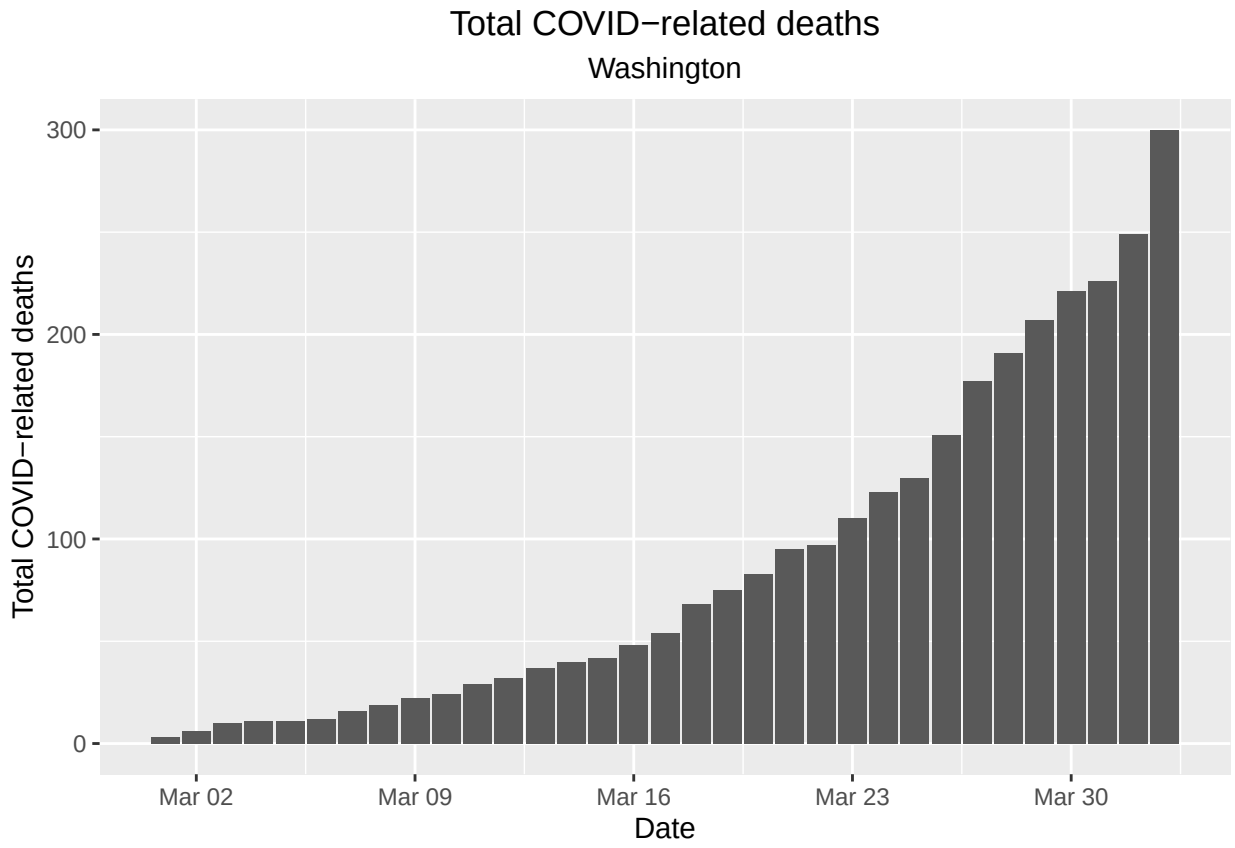
Confirmed cases

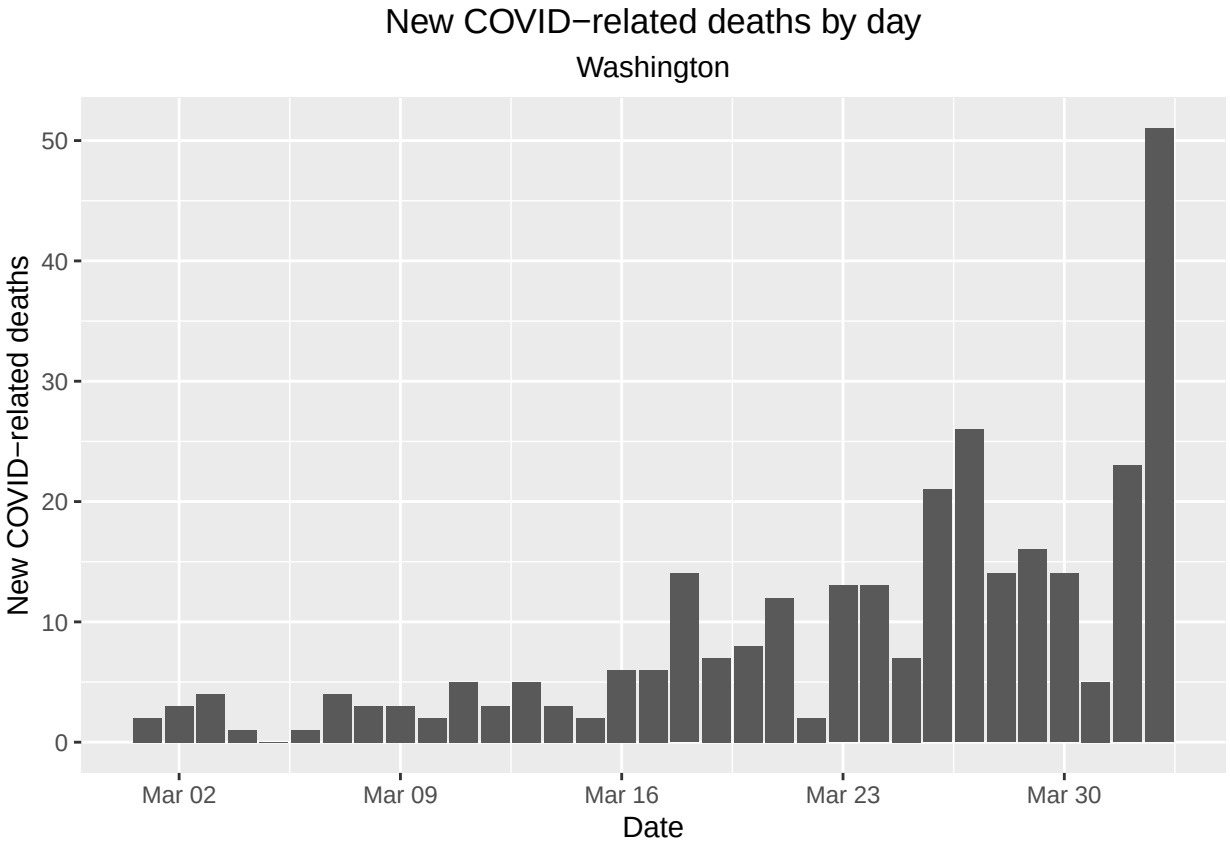


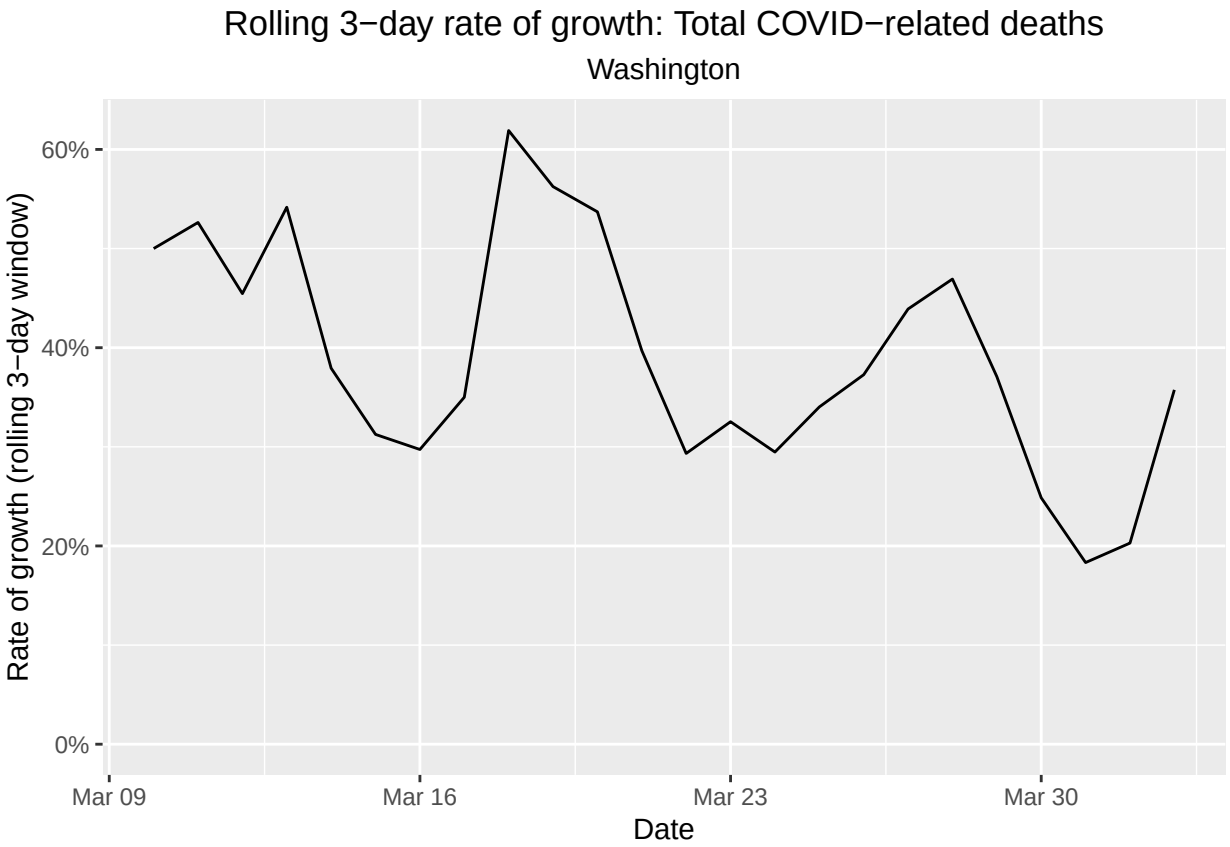

Confirmed new COVID cases by day
Washington
Confirmed new COVID cases
1,000
750
500
250
0
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date


Rolling 3−day rate of growth: Total confirmed COVID cases
Washington
Rate of growth (rolling 3−day window)
250%
200%
150%
100%
50%
0%
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date

Deaths

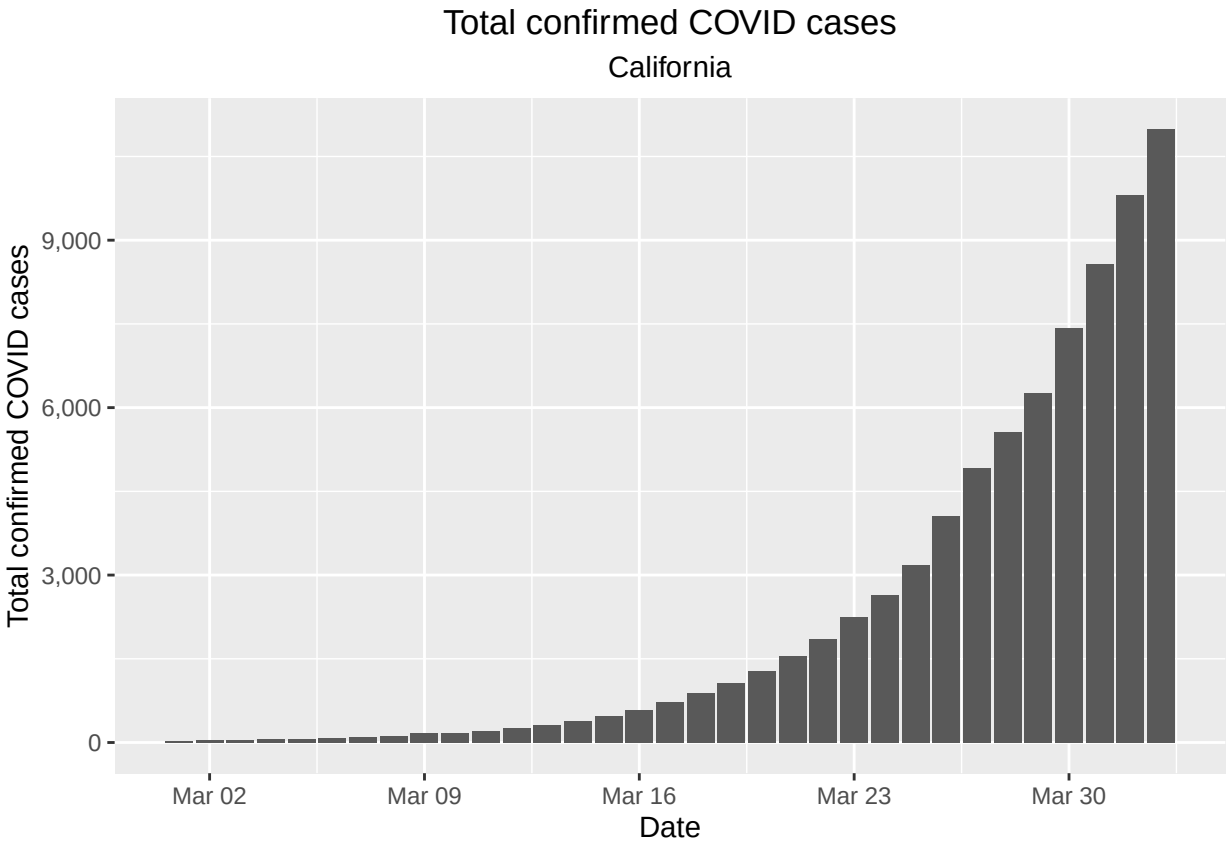

Total COVID−related deaths
Washington
300
200
100
0
Total COVID−related deaths
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date

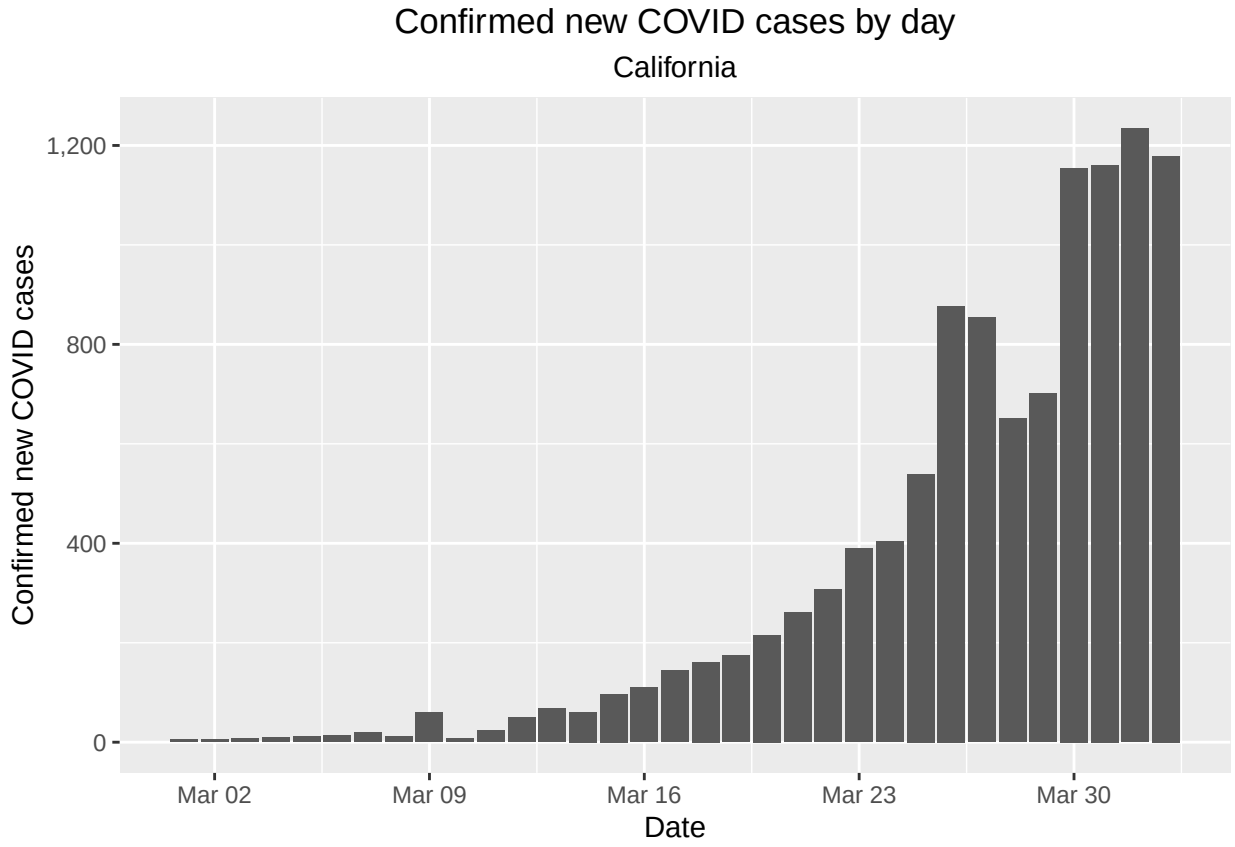

New COVID−related deaths by day
Washington
New COVID−related deaths
50
40
30
20
10
0
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date

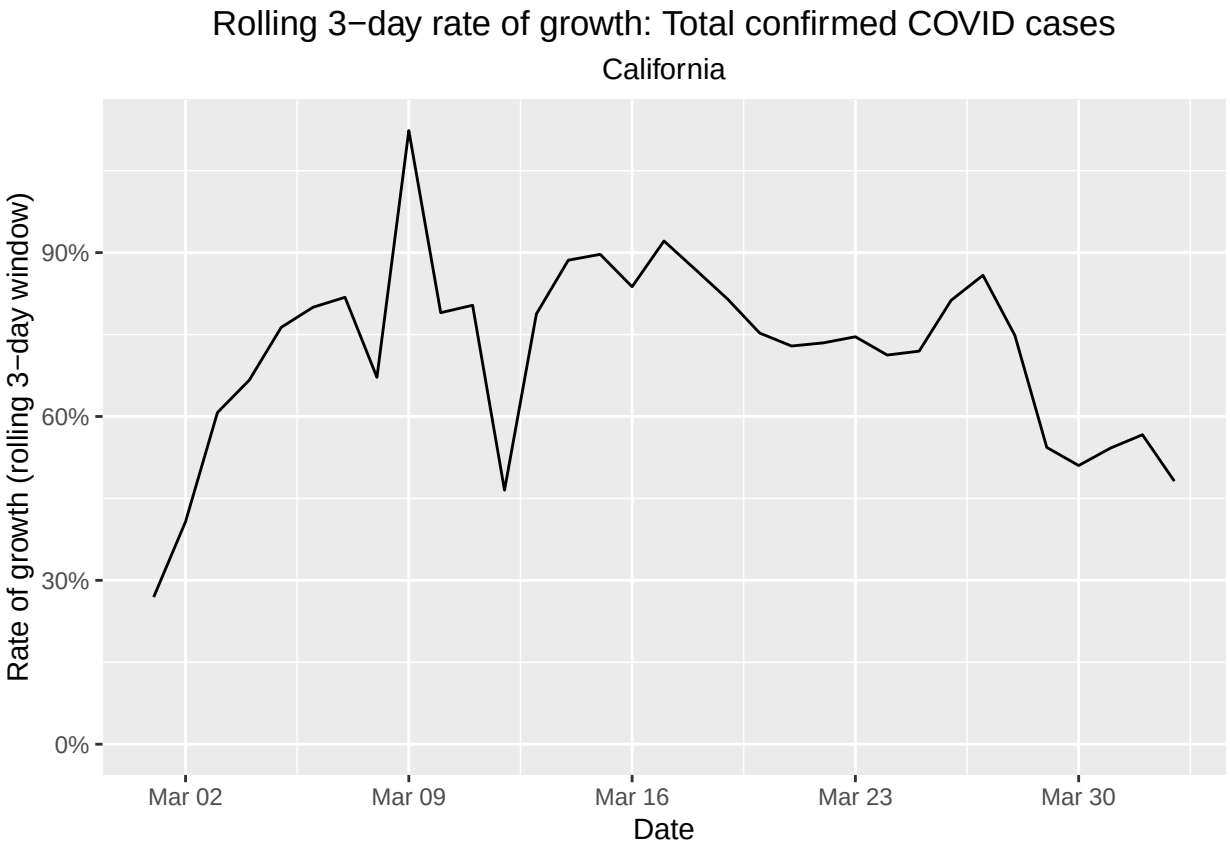

Rolling 3−day rate of growth: Total COVID−related deaths
Washington
Rate of growth (rolling 3−day window)
60%
40%
20%
0%
Mar 09
Mar 16
Mar 23
Mar 30
Date

California

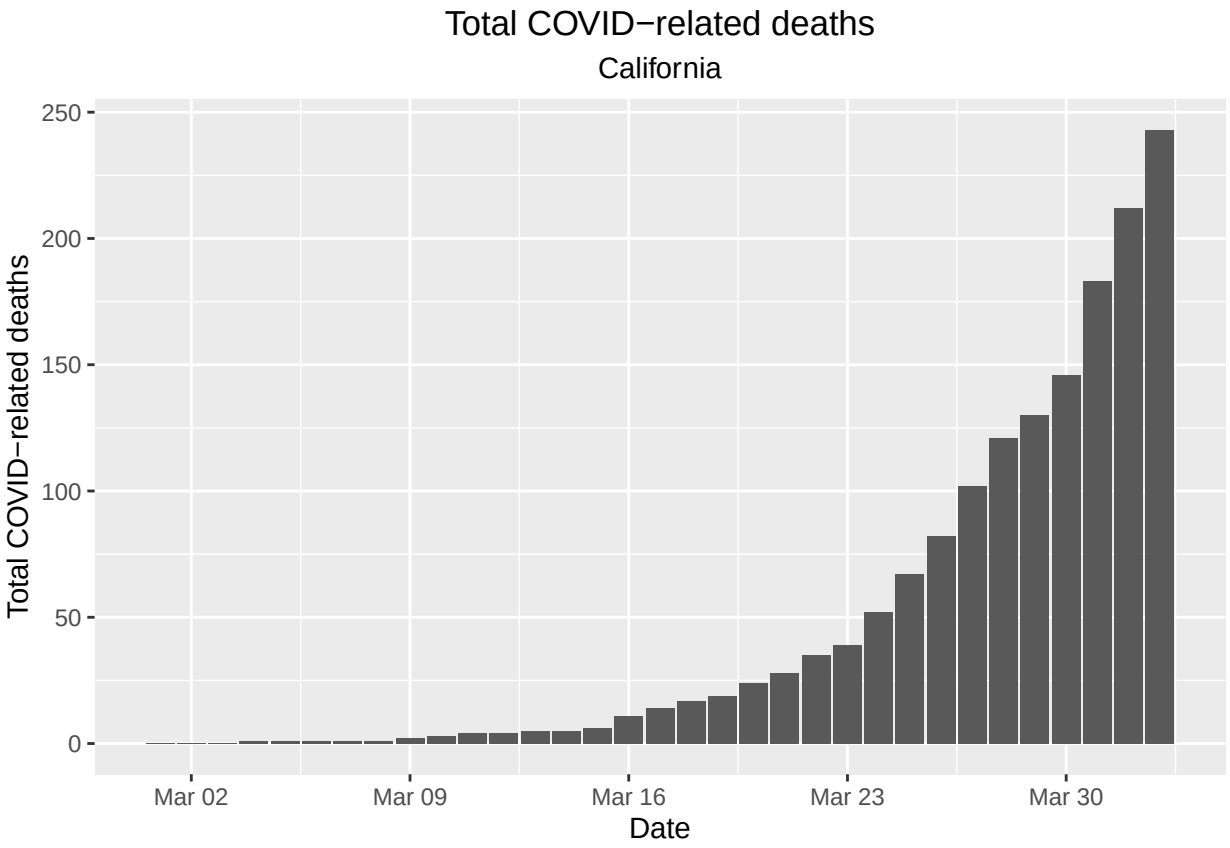
Confirmed cases

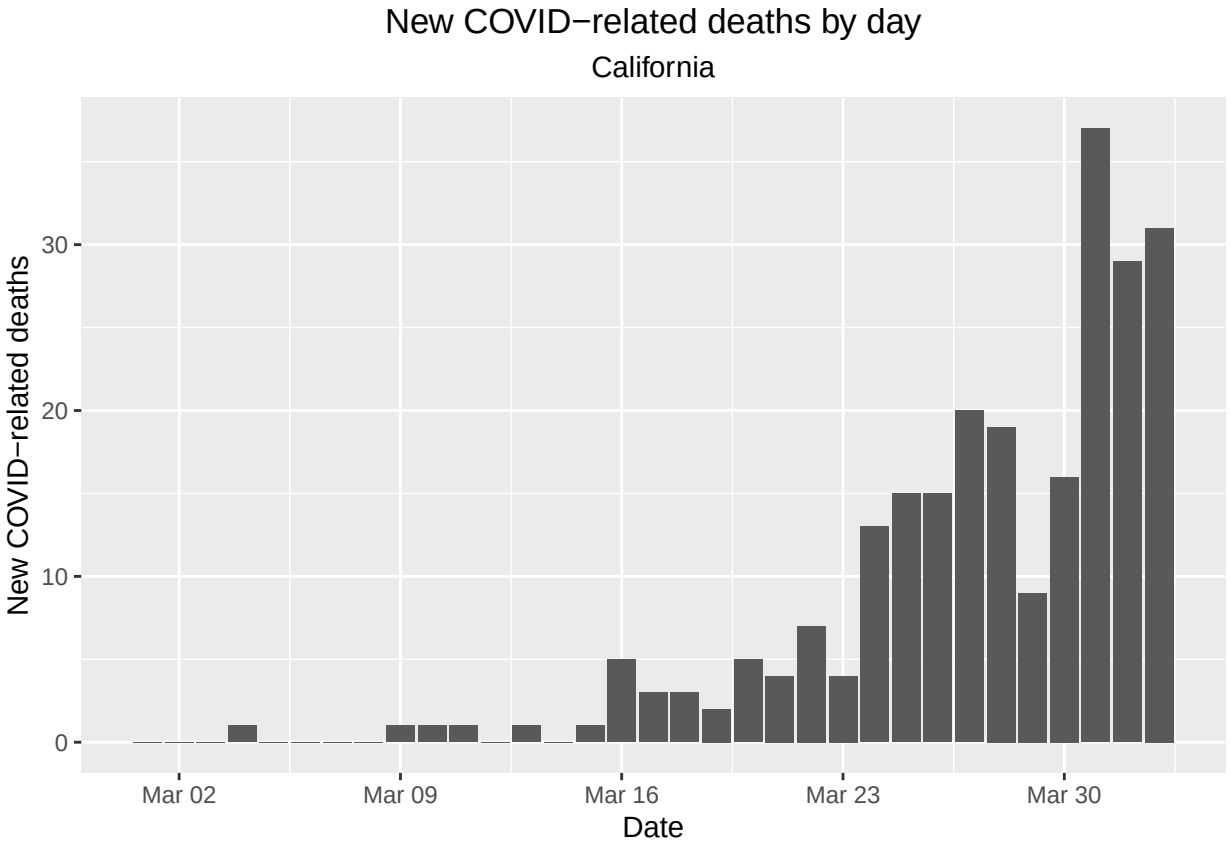


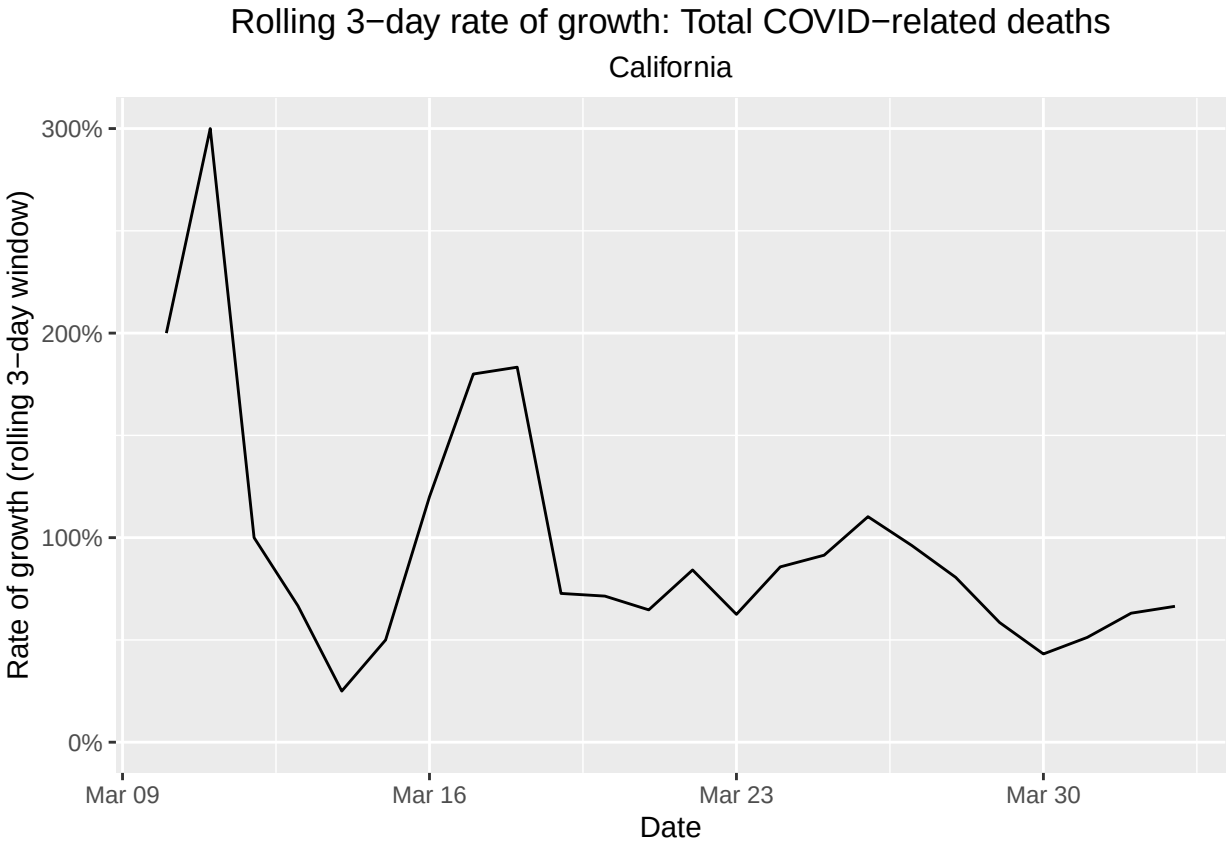

Confirmed new COVID cases by day
California
Confirmed new COVID cases
1,200
800
400
0
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date


Rolling 3−day rate of growth: Total confirmed COVID cases
California
Rate of growth (rolling 3−day window)
90%
60%
30%
0%
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date

Deaths

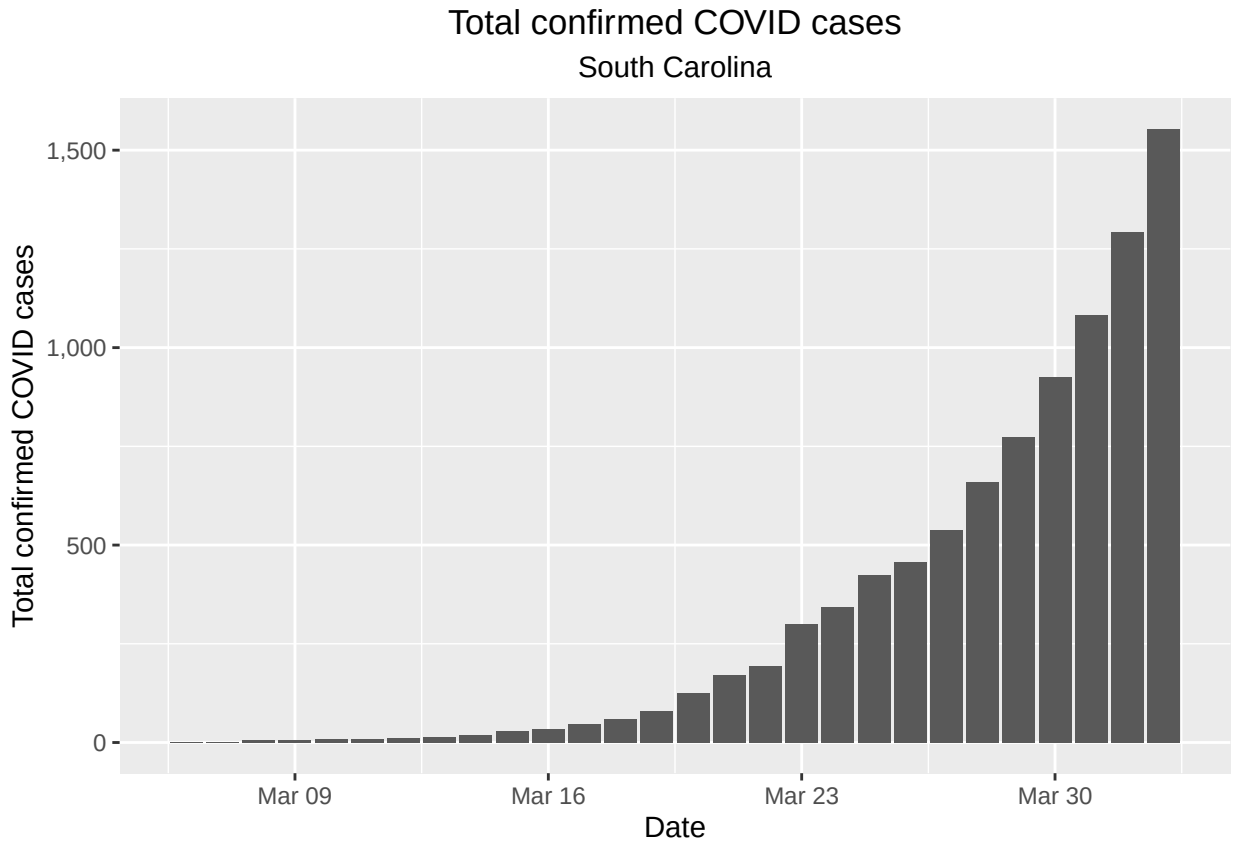

Total COVID−related deaths
California
250
200
150
100
50
0
Total COVID−related deaths
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date

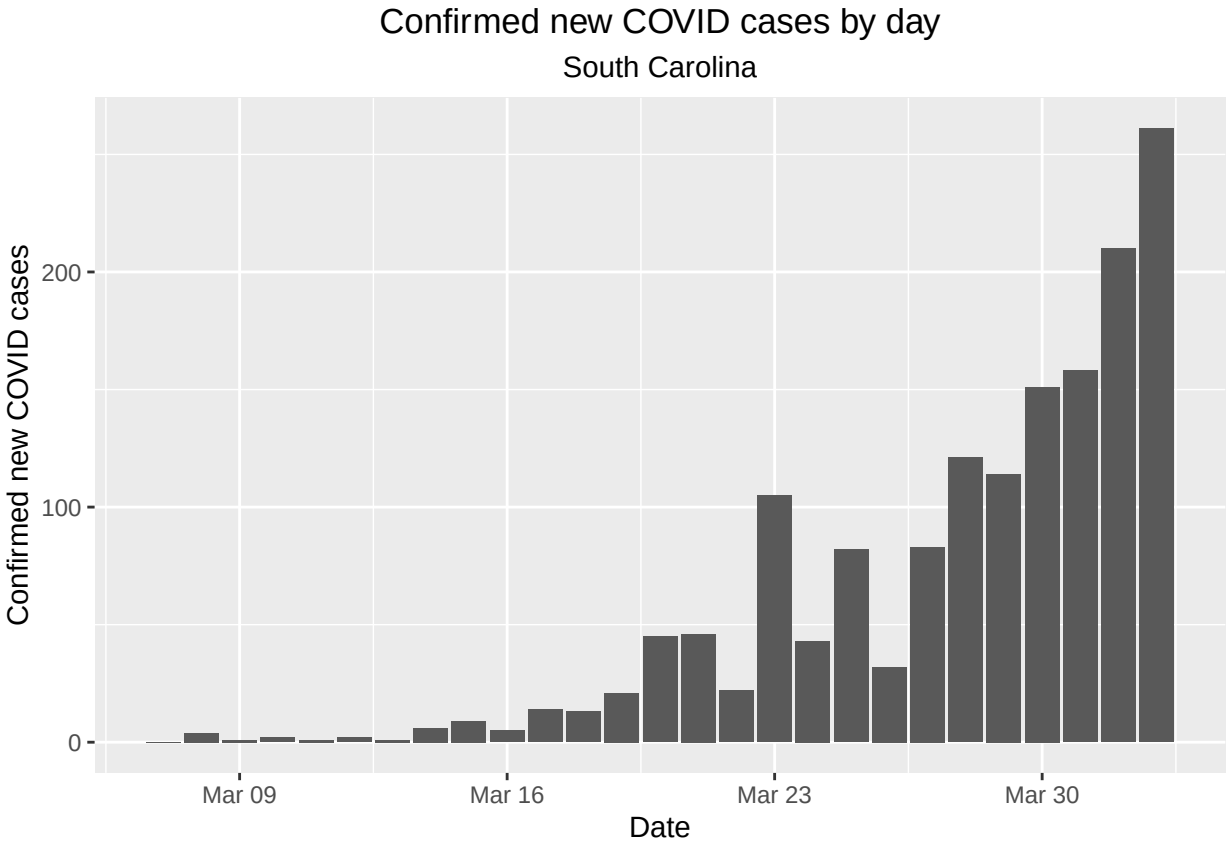

New COVID−related deaths by day
California
New COVID−related deaths
30
20
10
0
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date

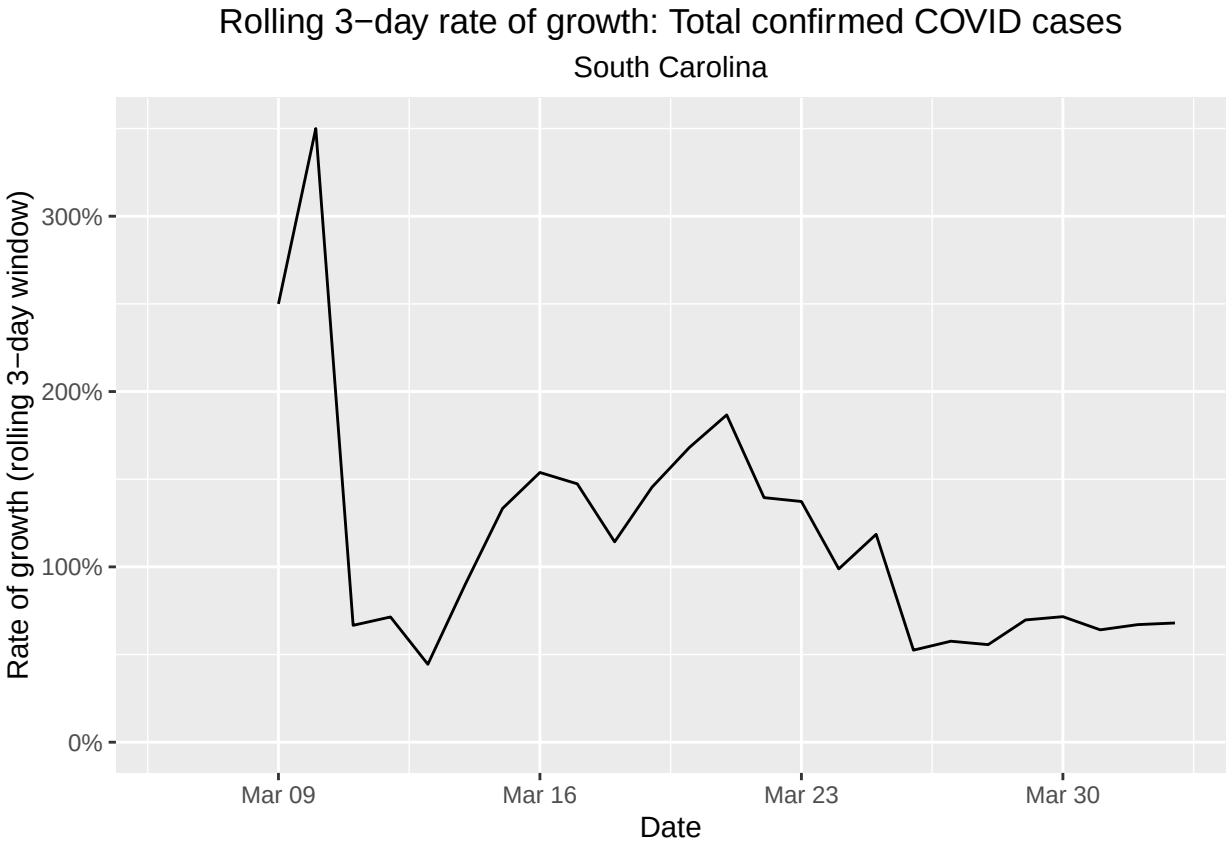

Rolling 3−day rate of growth: Total COVID−related deaths
California
Rate of growth (rolling 3−day window)
300%
200%
100%
0%
Mar 09
Mar 16
Mar 23
Mar 30
Date

South Carolina

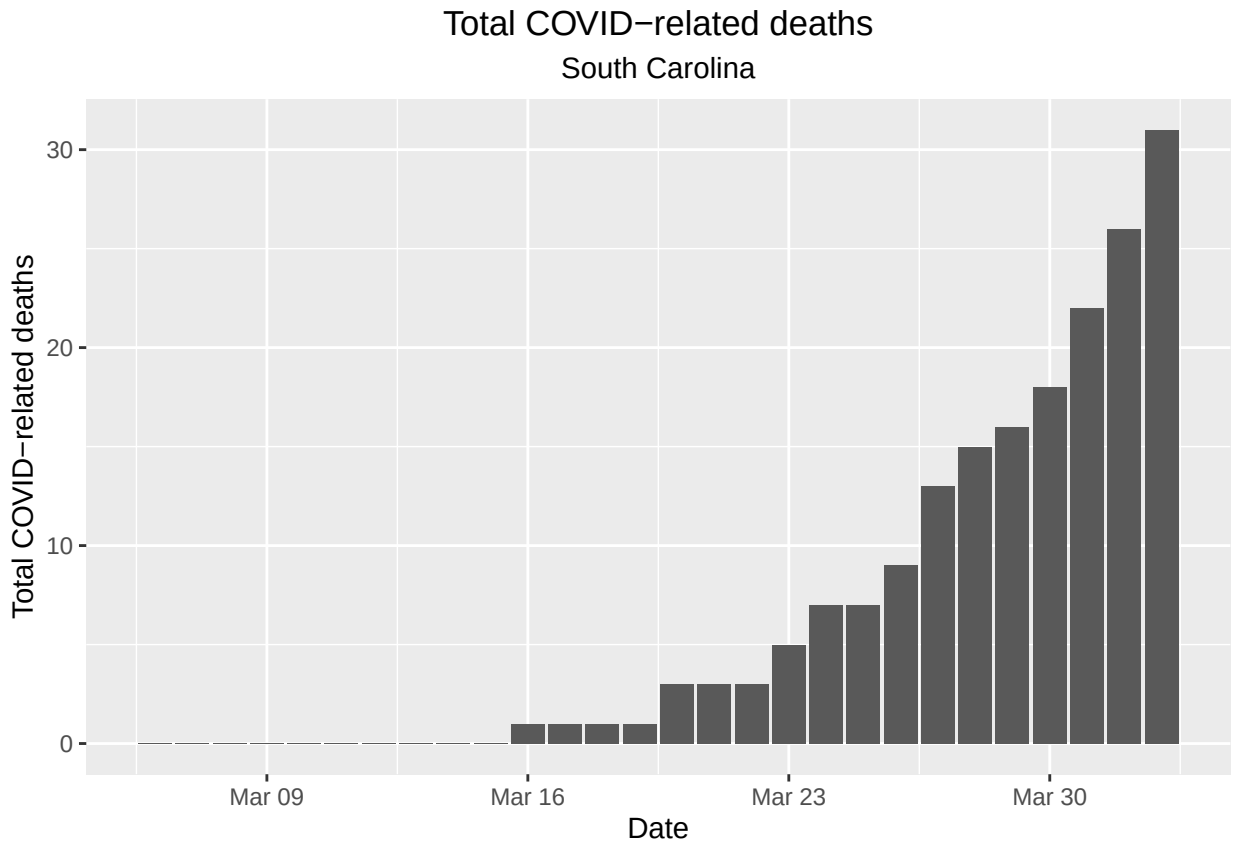
Confirmed cases

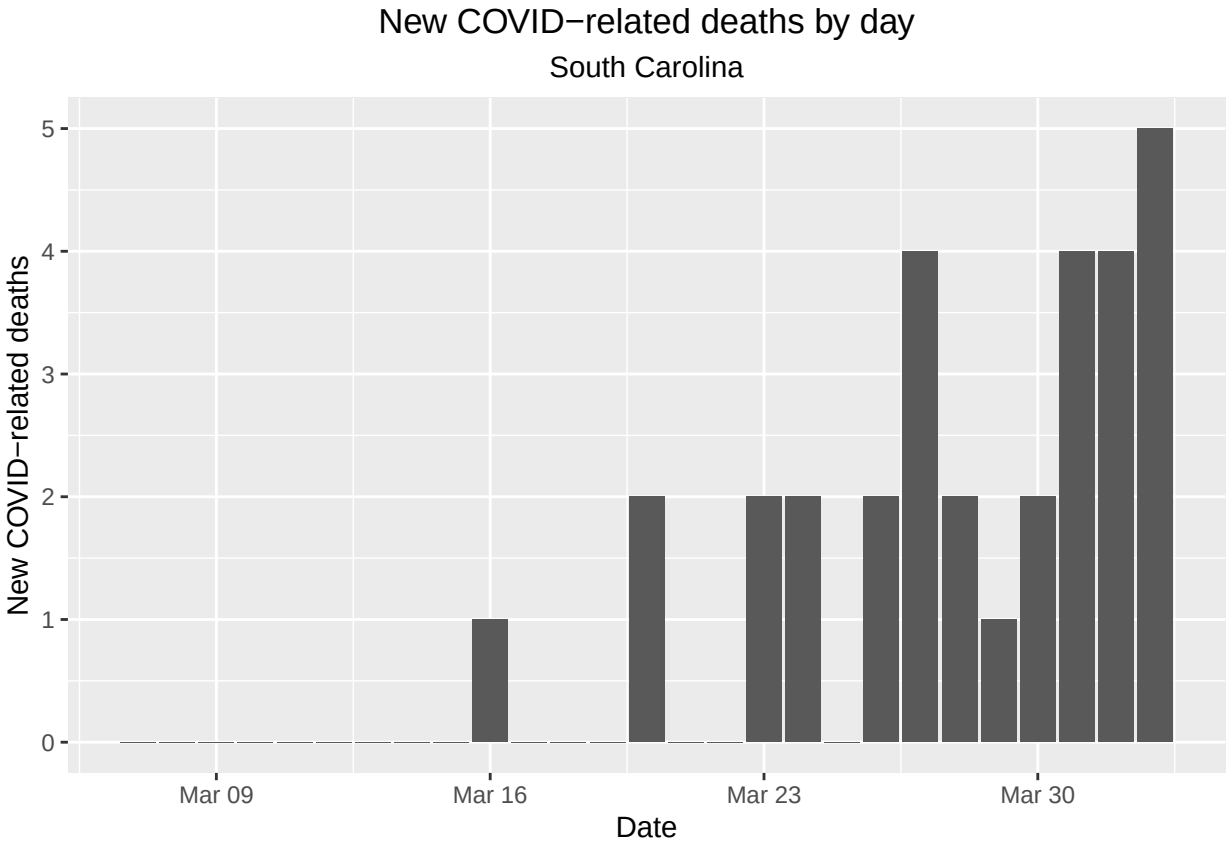


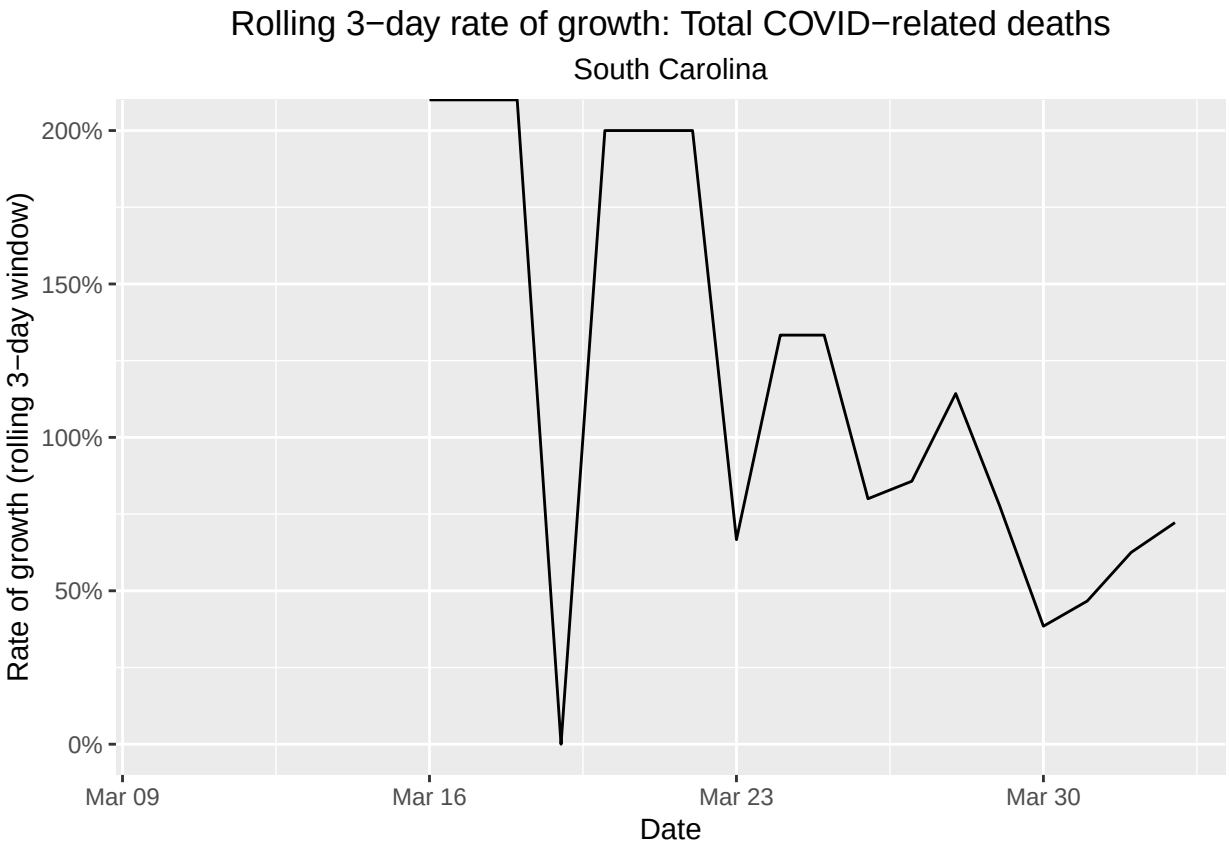

Confirmed new COVID cases by day
South Carolina
Confirmed new COVID cases
200
100
0
Mar 09
Mar 16
Mar 23
Mar 30
Date


Rolling 3−day rate of growth: Total confirmed COVID cases
South Carolina
Rate of growth (rolling 3−day window)
300%
200%
100%
0%
Mar 09
Mar 16
Mar 23
Mar 30
Date

Deaths

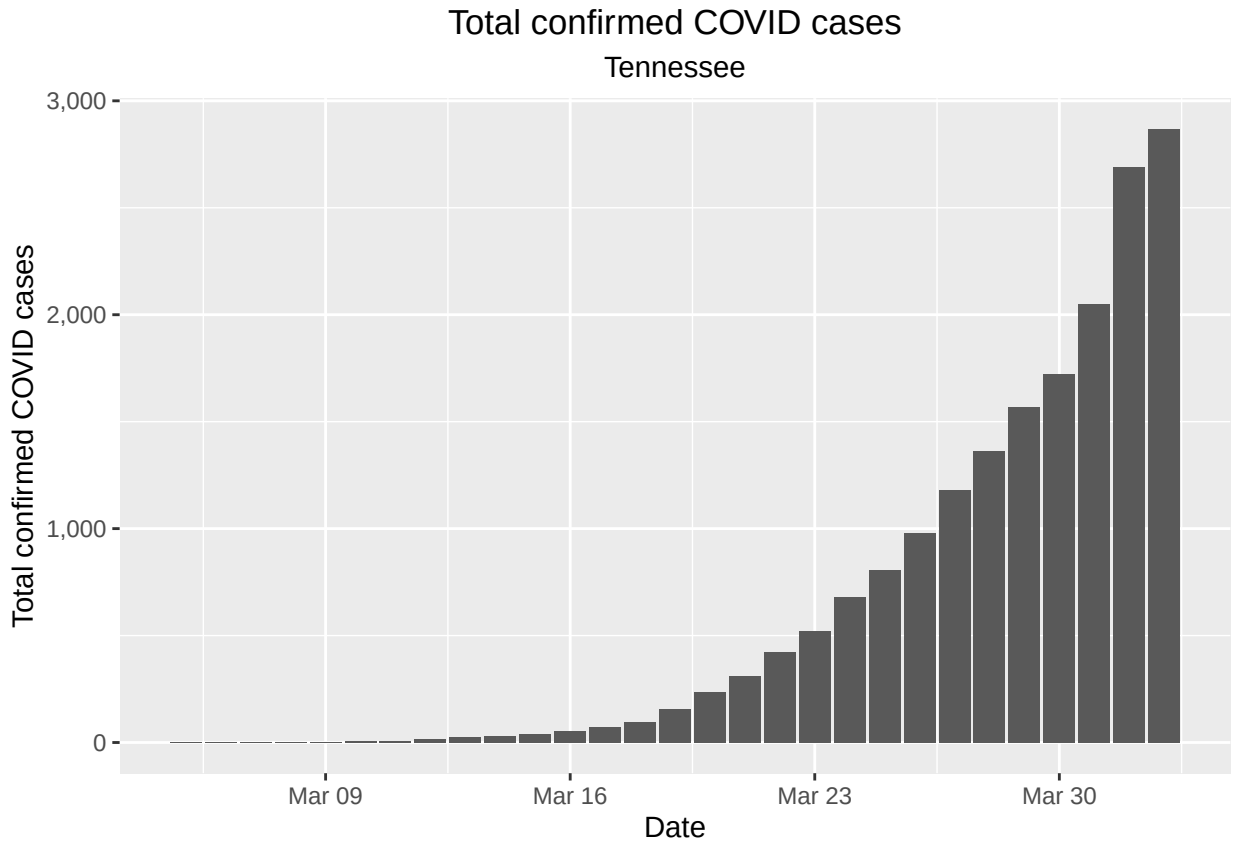

Total COVID−related deaths
South Carolina
Total COVID−related deaths
30
20
10
0
Mar 09
Mar 16
Mar 23
Mar 30
Date

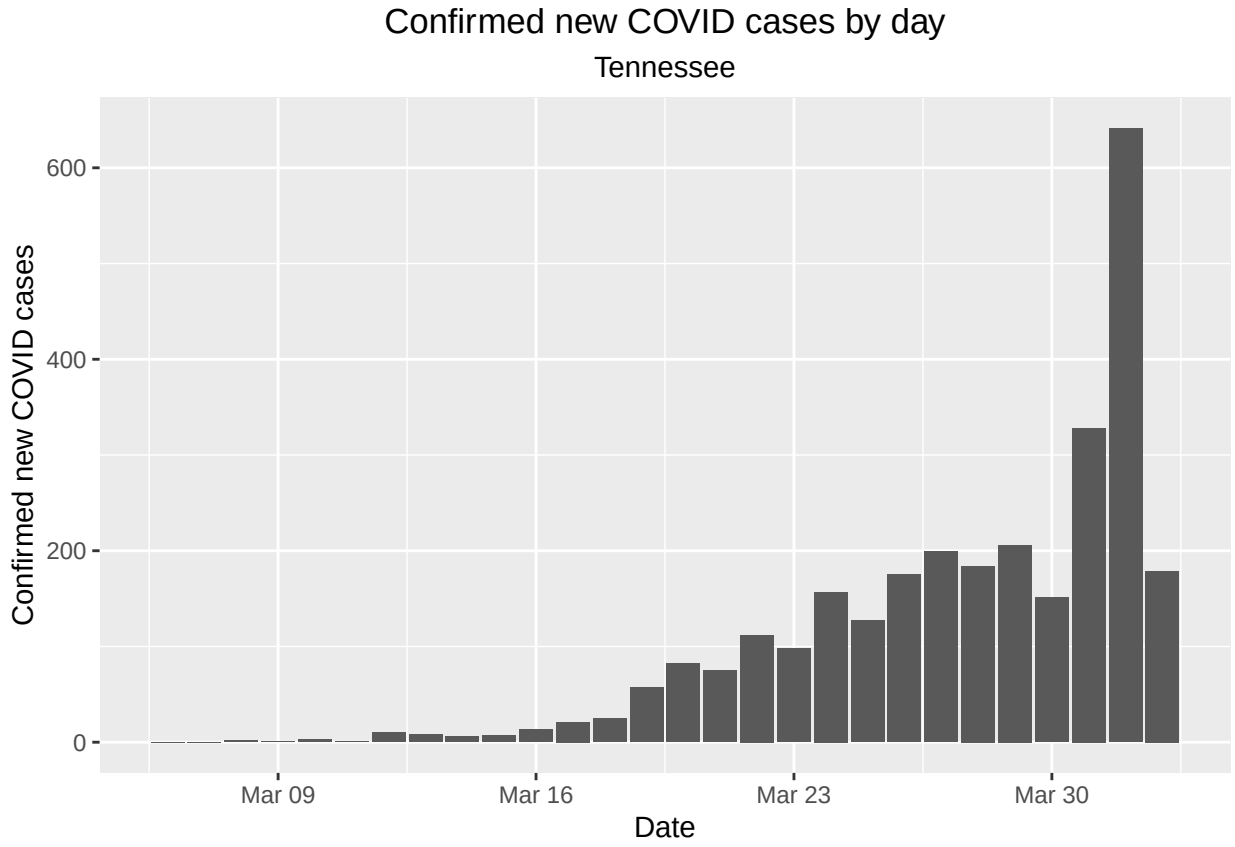

New COVID−related deaths by day
South Carolina
New COVID−related deaths
0
1
2
3
4
5
Mar 09
Mar 16
Mar 23
Mar 30
Date

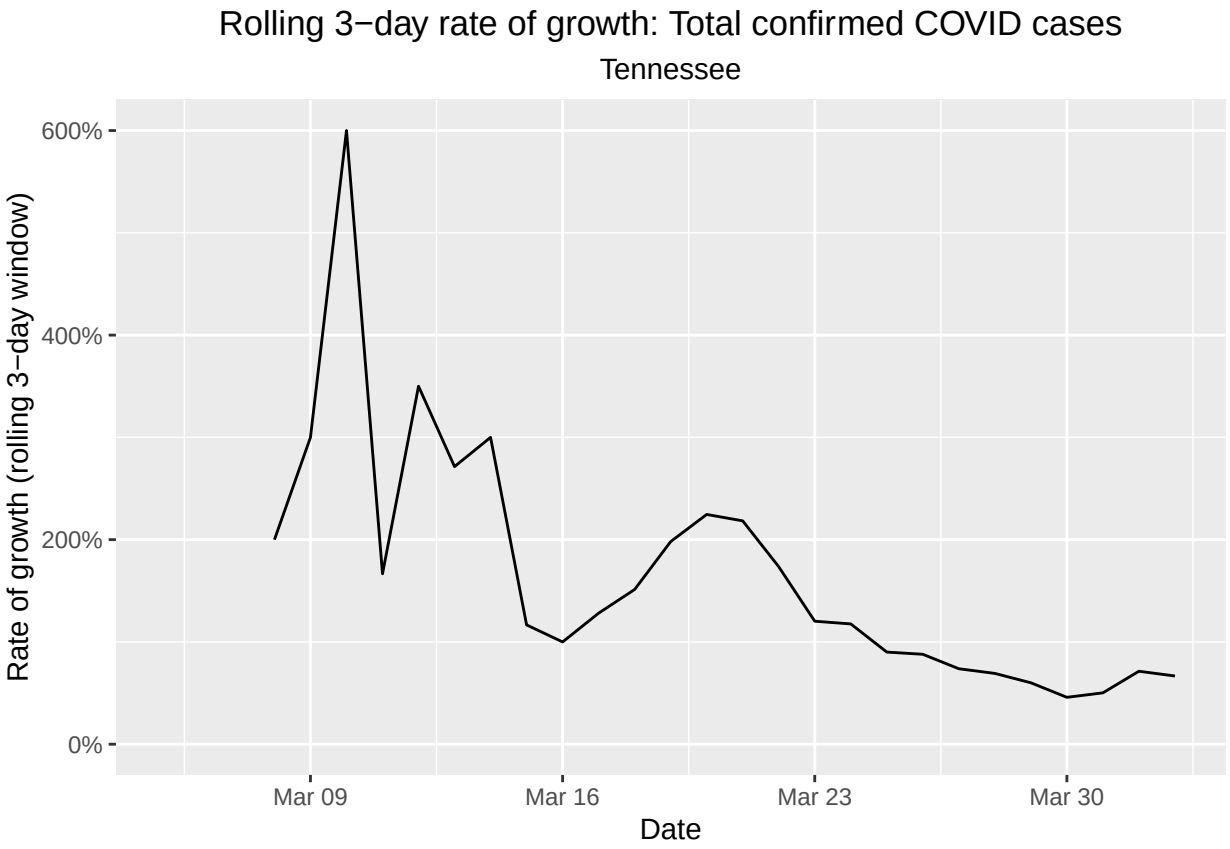

Rolling 3−day rate of growth: Total COVID−related deaths
South Carolina
Rate of growth (rolling 3−day window)
200%
150%
100%
50%
0%
Mar 09
Mar 16
Mar 23
Mar 30
Date

Tennessee

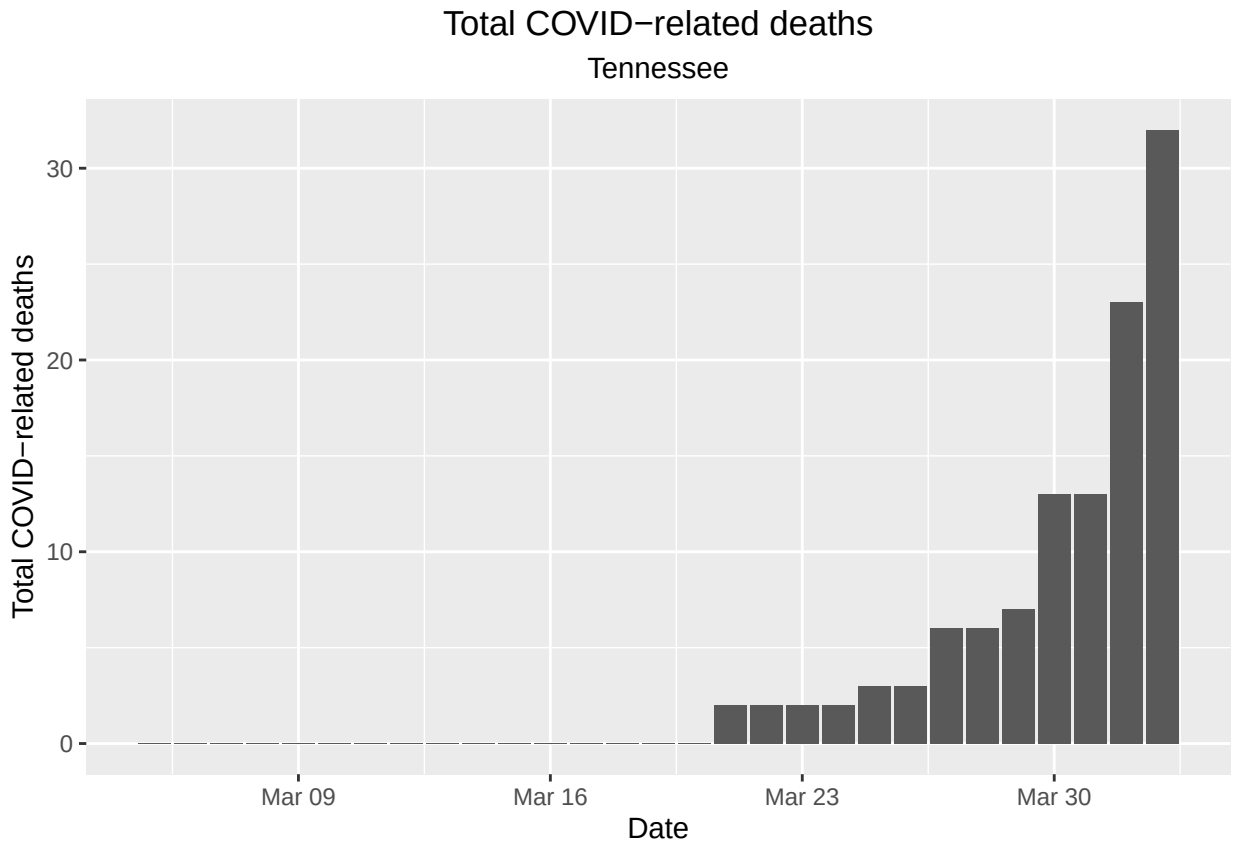
Confirmed cases

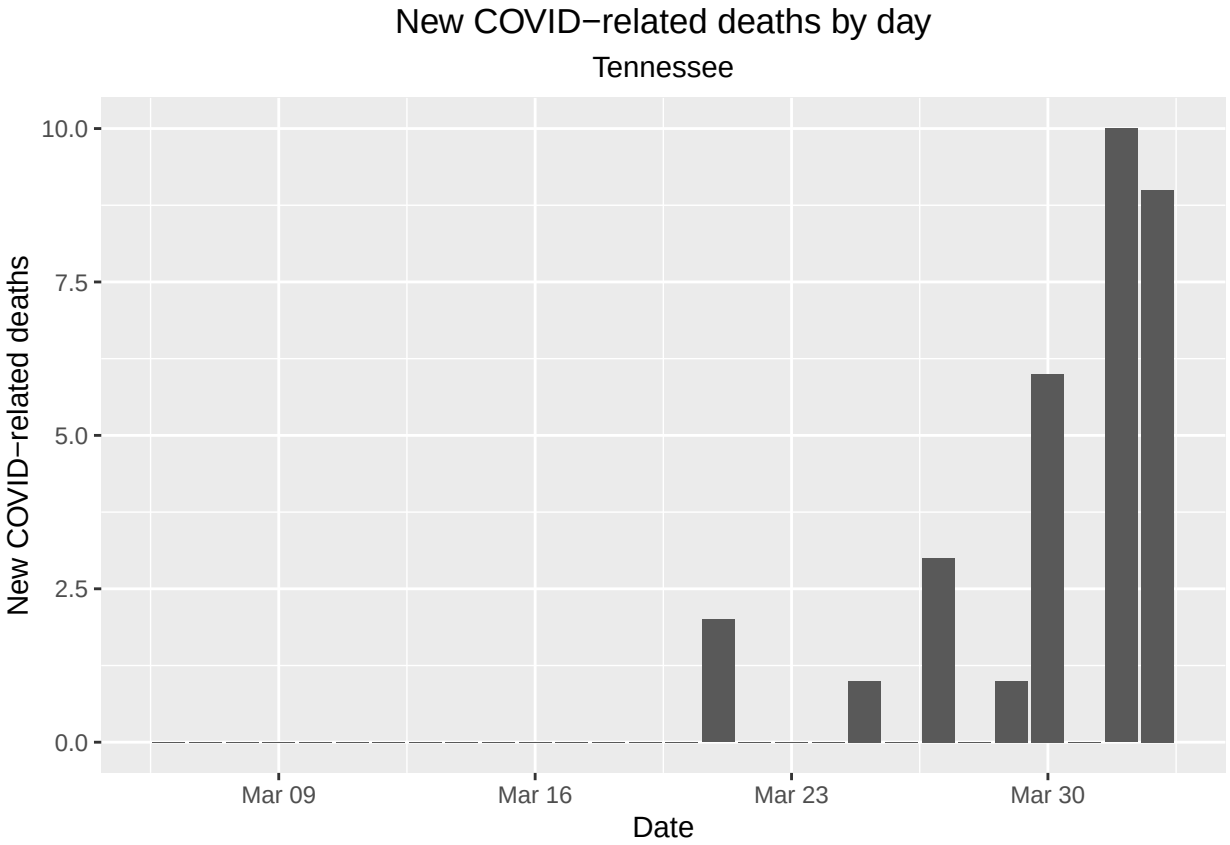


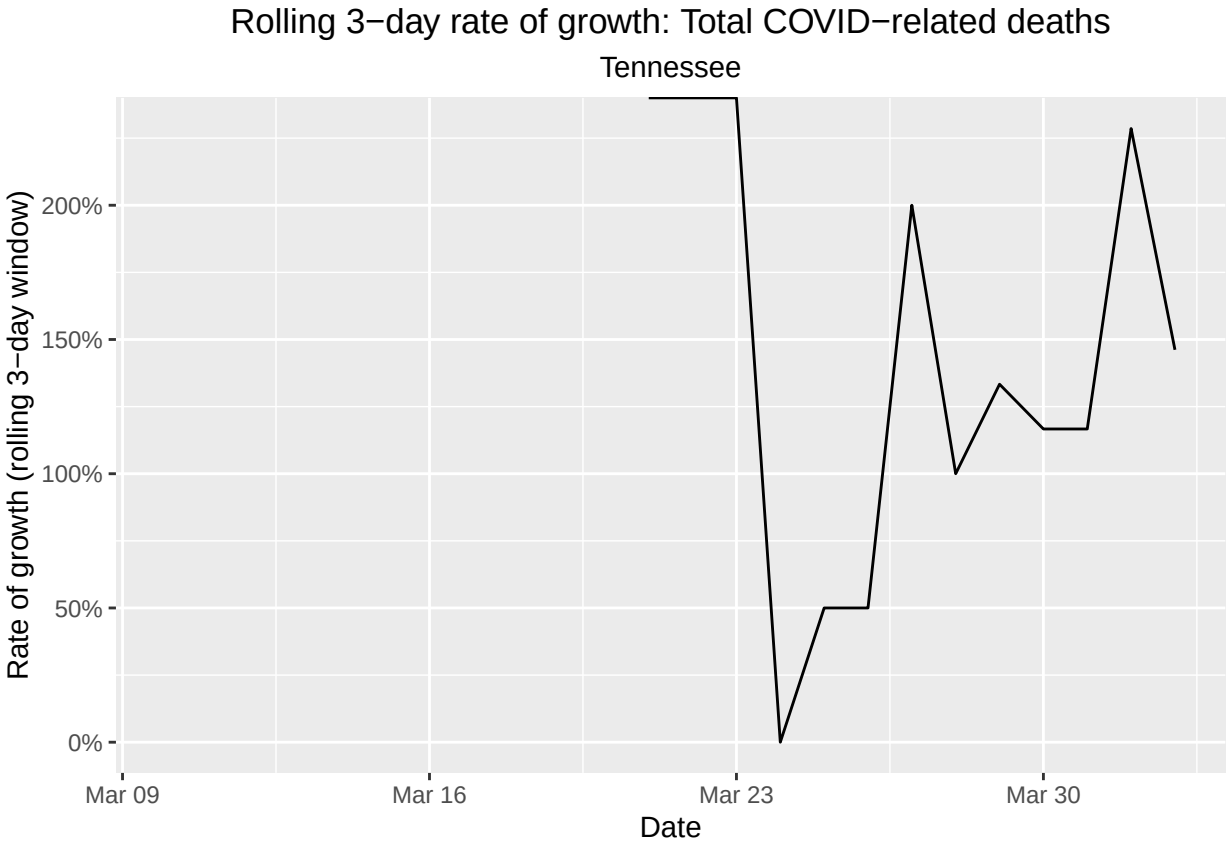

Confirmed new COVID cases by day
Tennessee
Confirmed new COVID cases
600
400
200
0
Mar 09
Mar 16
Mar 23
Mar 30
Date


Rolling 3−day rate of growth: Total confirmed COVID cases
Tennessee
Rate of growth (rolling 3−day window)
600%
400%
200%
0%
Mar 09
Mar 16
Mar 23
Mar 30
Date

Deaths

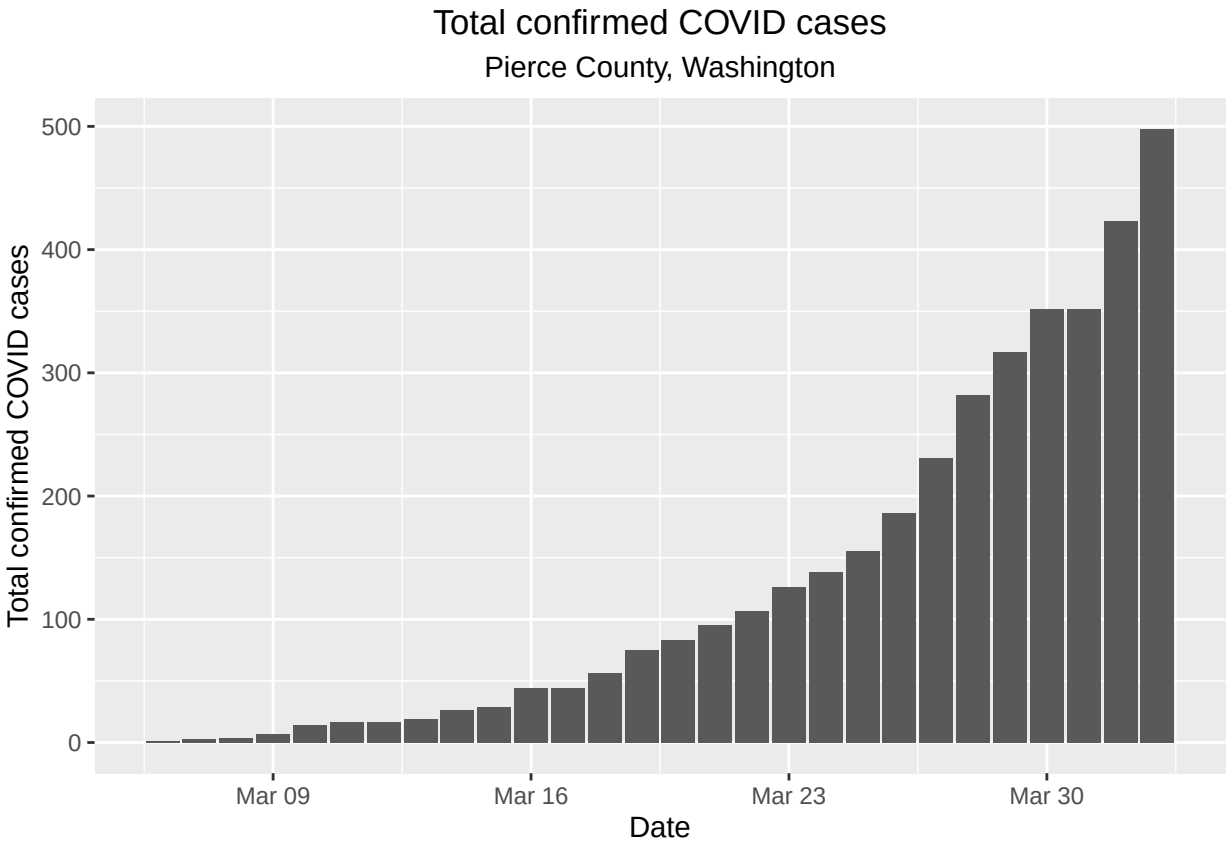

Total COVID−related deaths
Tennessee
Total COVID−related deaths
30
20
10
0
Mar 09
Mar 16
Mar 23
Mar 30
Date

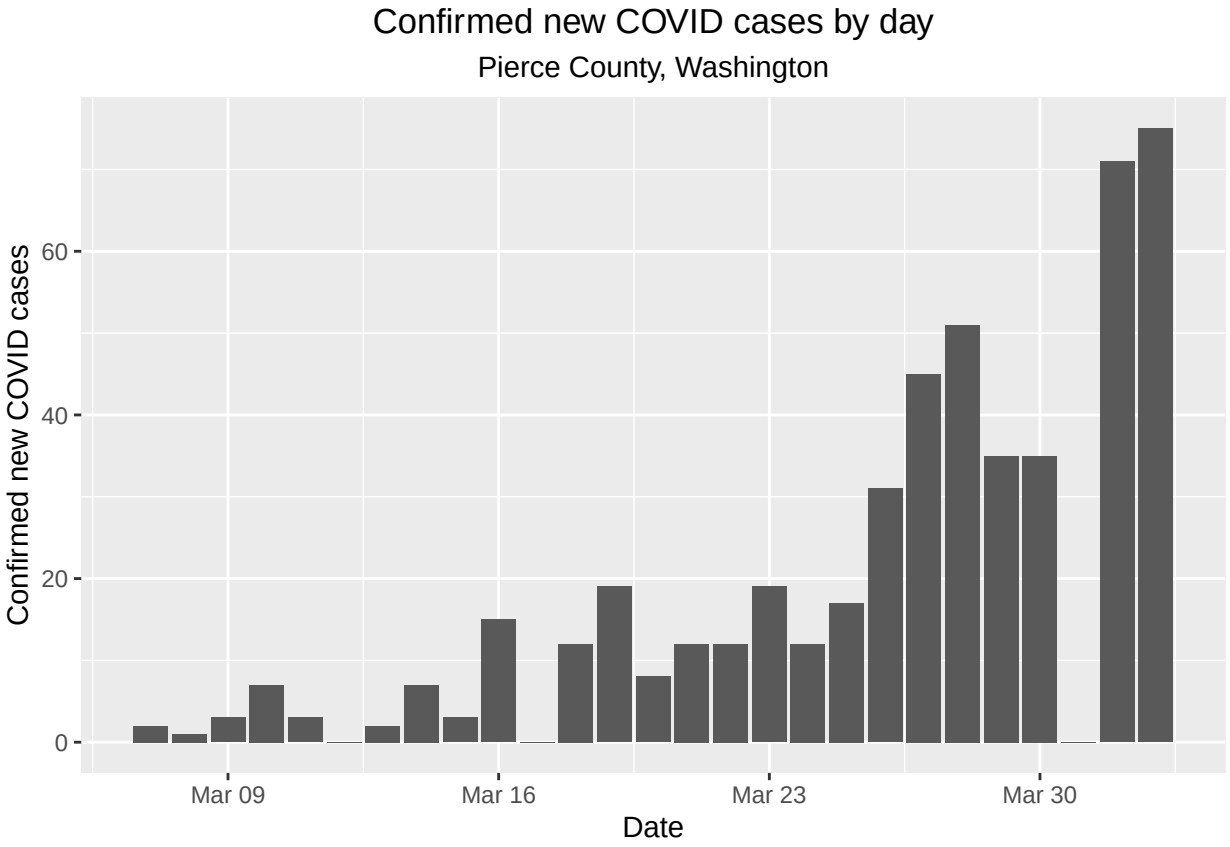

New COVID−related deaths by day
Tennessee
New COVID−related deaths
10.0
7.5
5.0
2.5
0.0
Mar 09
Mar 16
Mar 23
Mar 30
Date


Rolling 3−day rate of growth: Total COVID−related deaths
Tennessee
Rate of growth (rolling 3−day window)
200%
150%
100%
50%
0%
Mar 09
Mar 16
Mar 23
Mar 30
Date

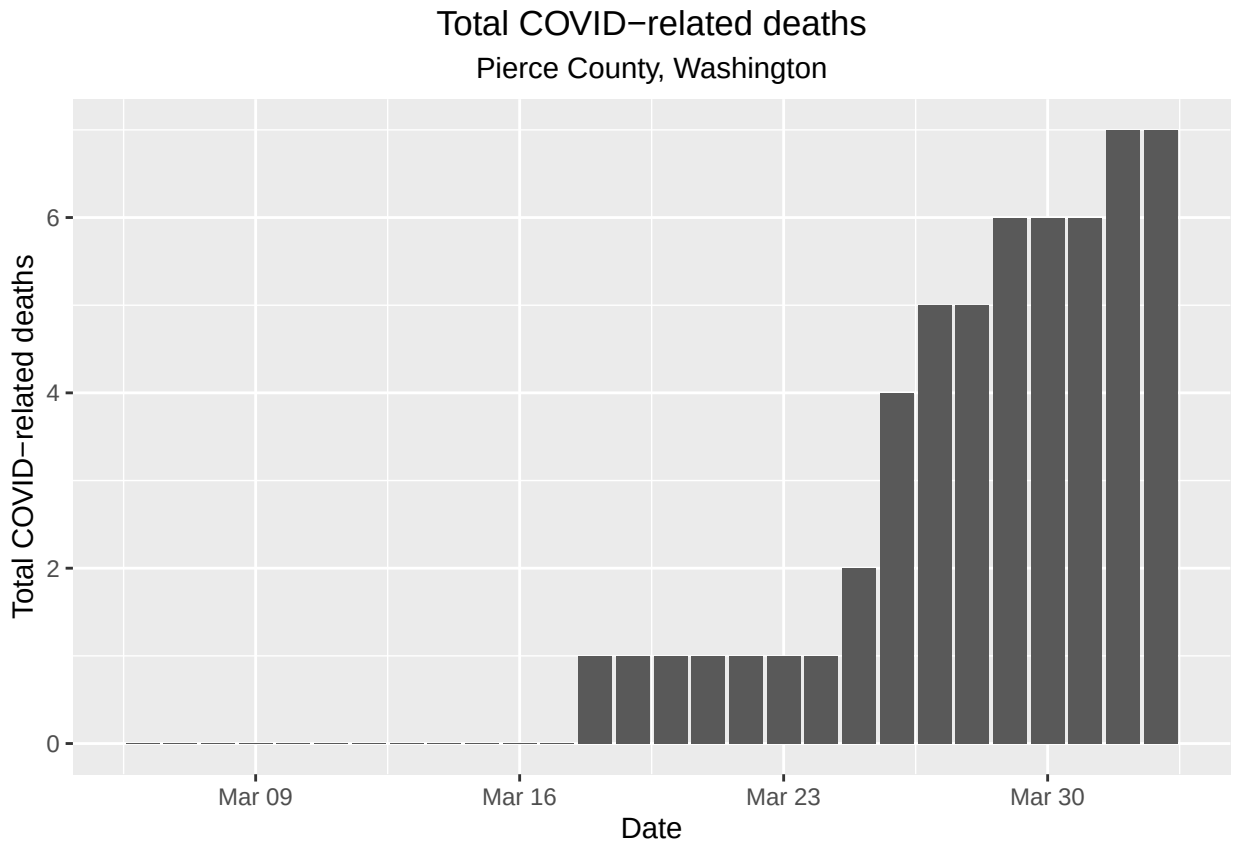
Pierce County, Washington

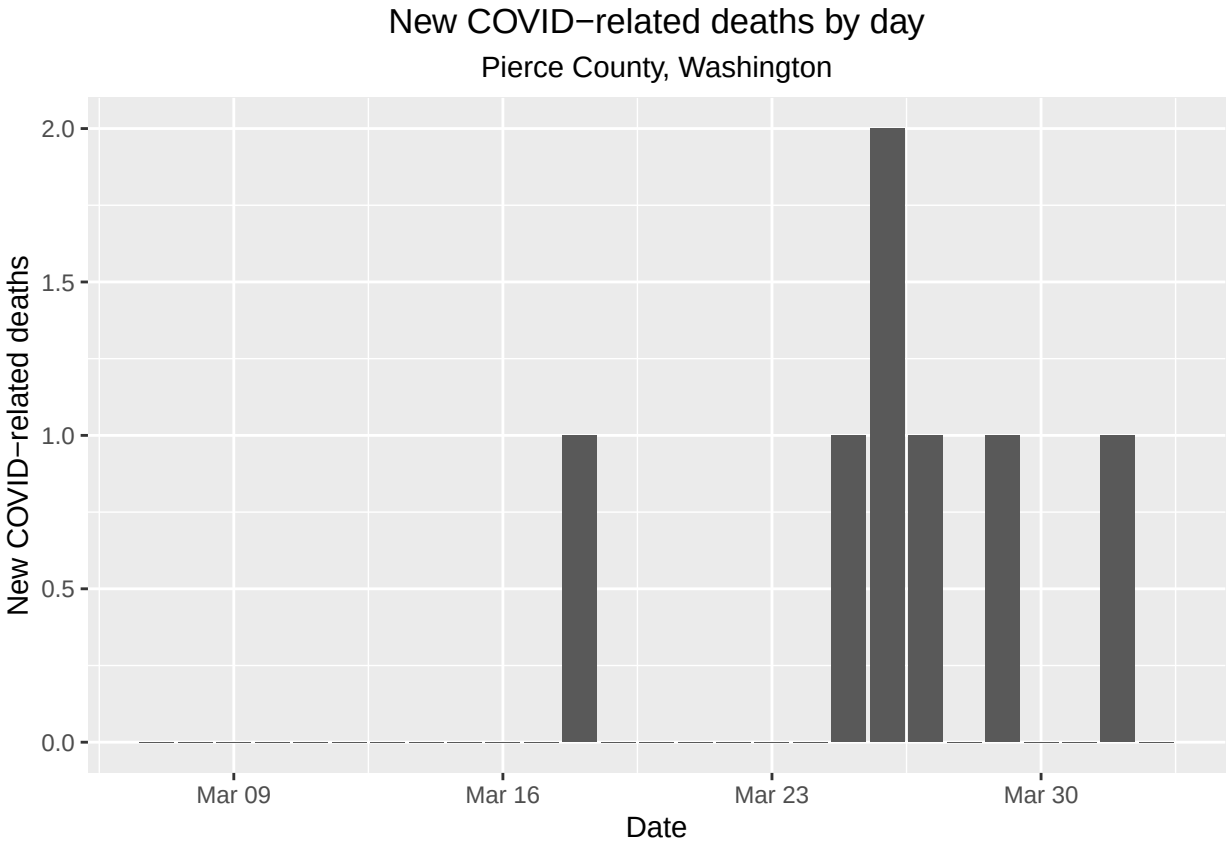
Confirmed cases




Confirmed new COVID cases by day
Pierce County, Washington
Confirmed new COVID cases
60
40
20
0
Mar 09
Mar 16
Mar 23
Mar 30
Date

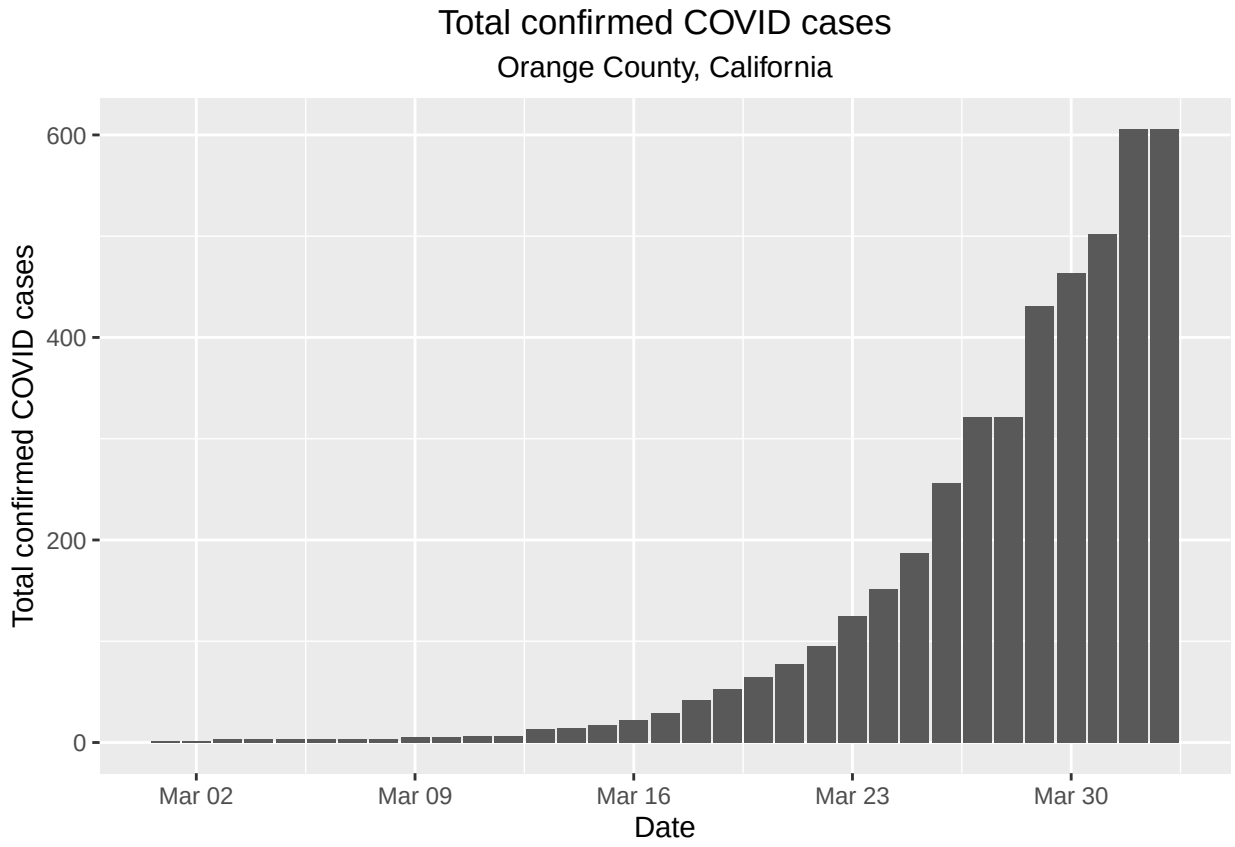
Deaths

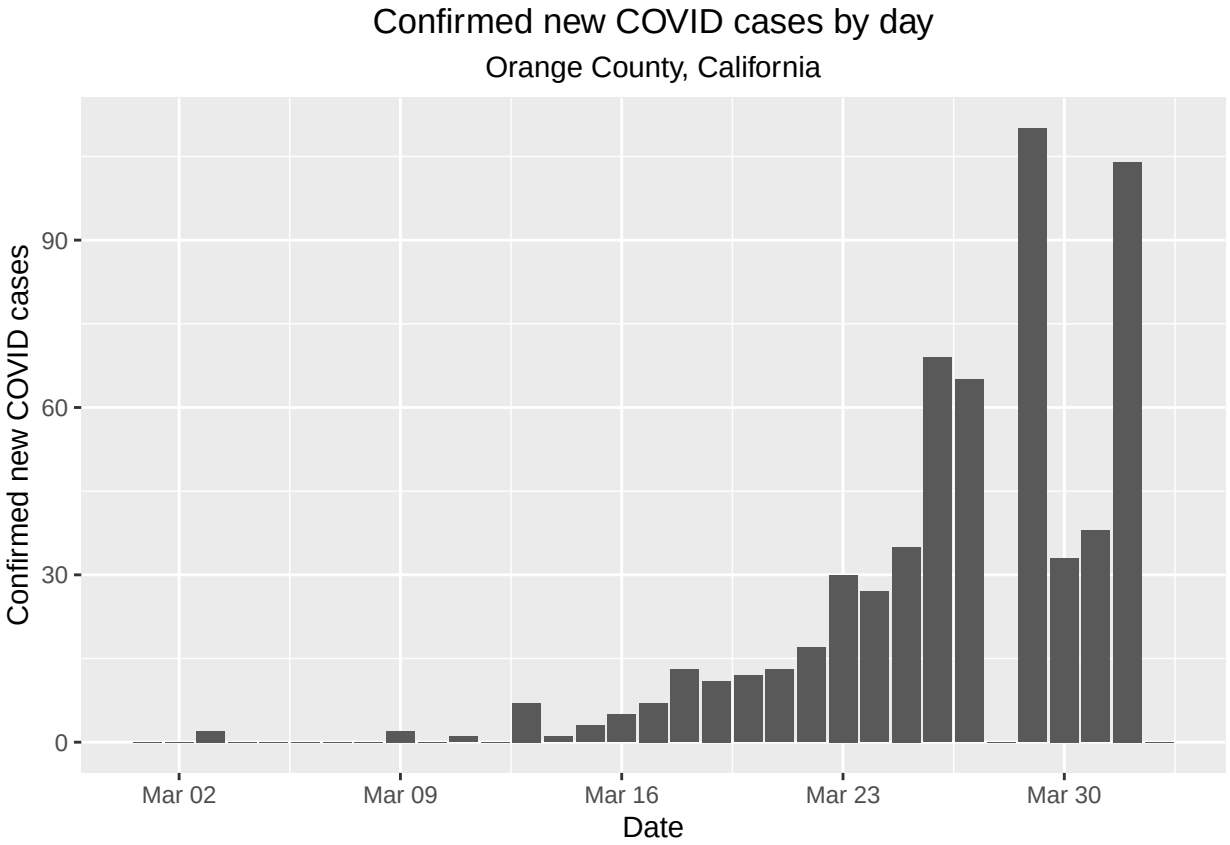

Total COVID−related deaths
Pierce County, Washington
Total COVID−related deaths
6
4
2
0
Mar 09
Mar 16
Mar 23
Mar 30
Date


New COVID−related deaths by day
Pierce County, Washington
New COVID−related deaths
2.0
1.5
1.0
0.5
0.0
Mar 09
Mar 16
Mar 23
Mar 30
Date

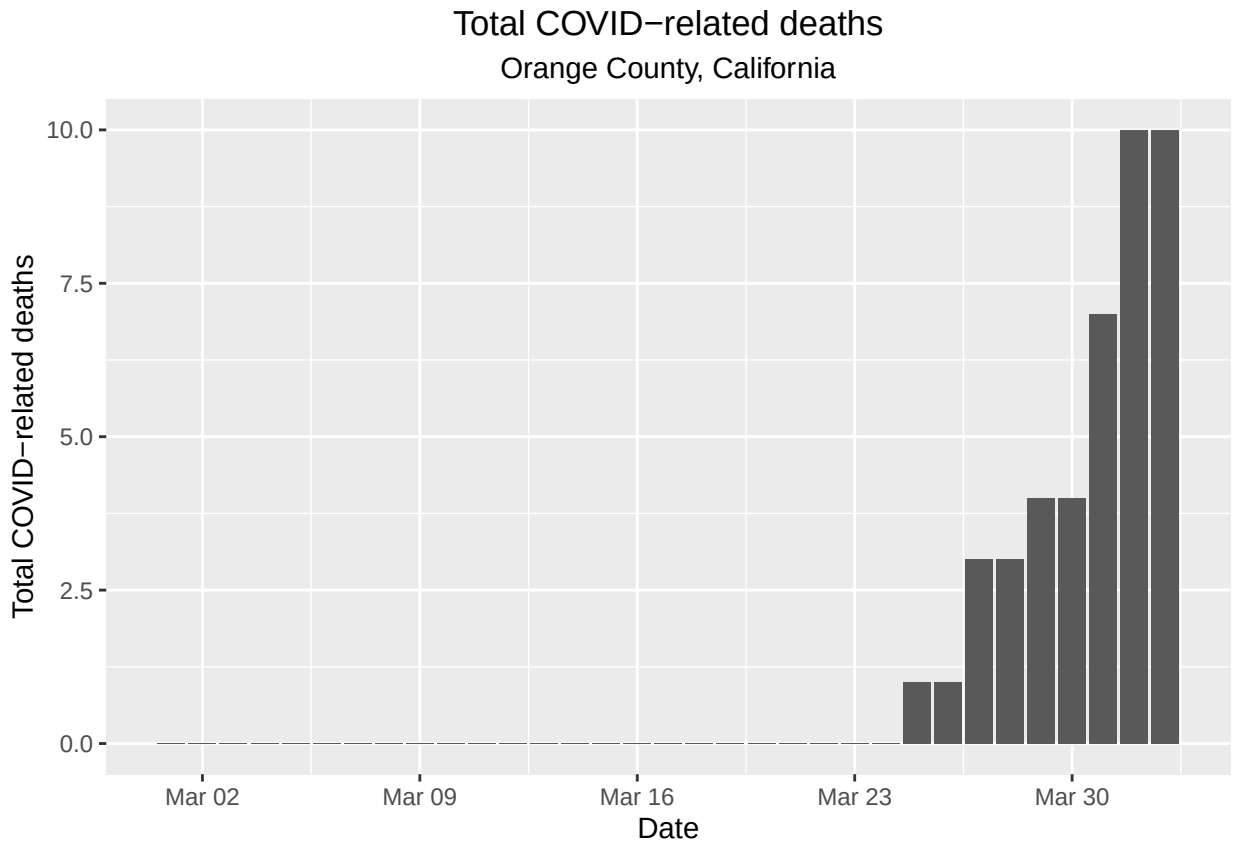
Orange County, California

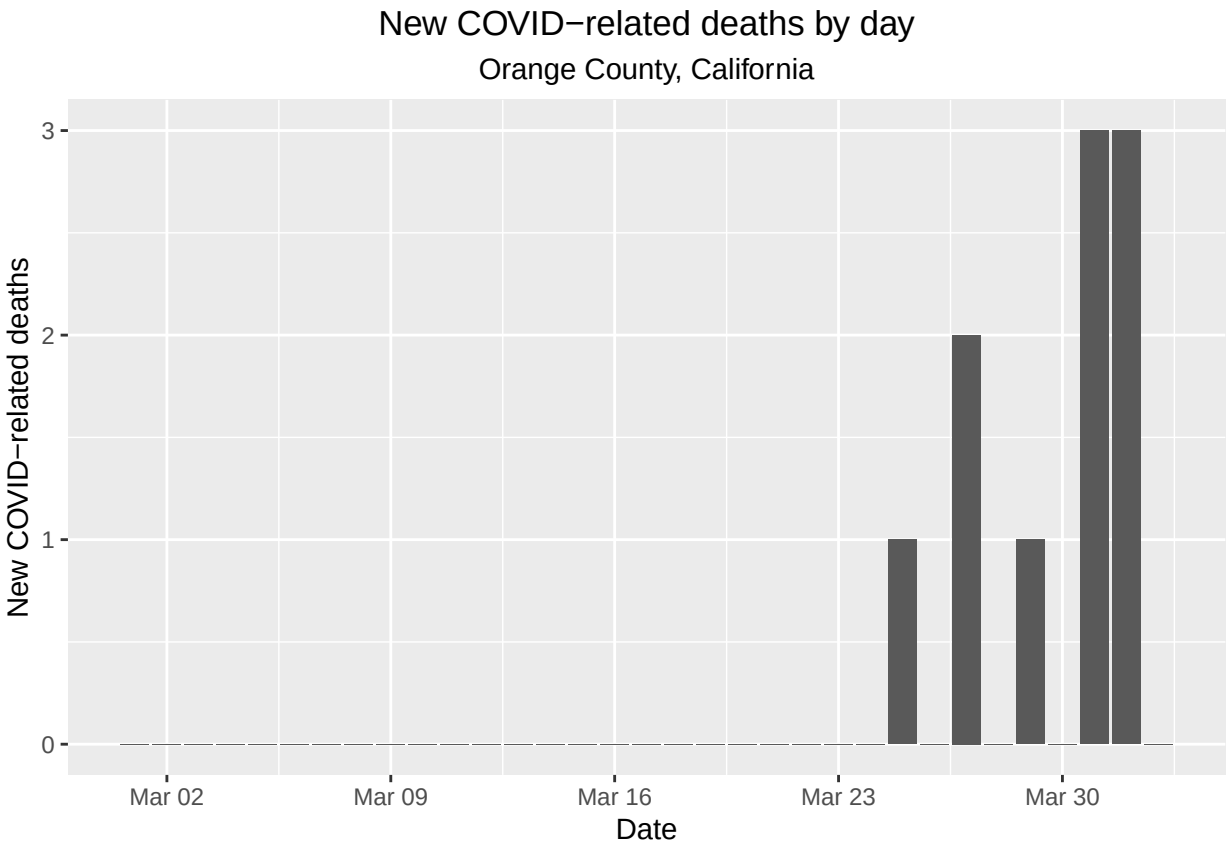
Confirmed cases




Confirmed new COVID cases by day
Orange County, California
Confirmed new COVID cases
90
60
30
0
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date

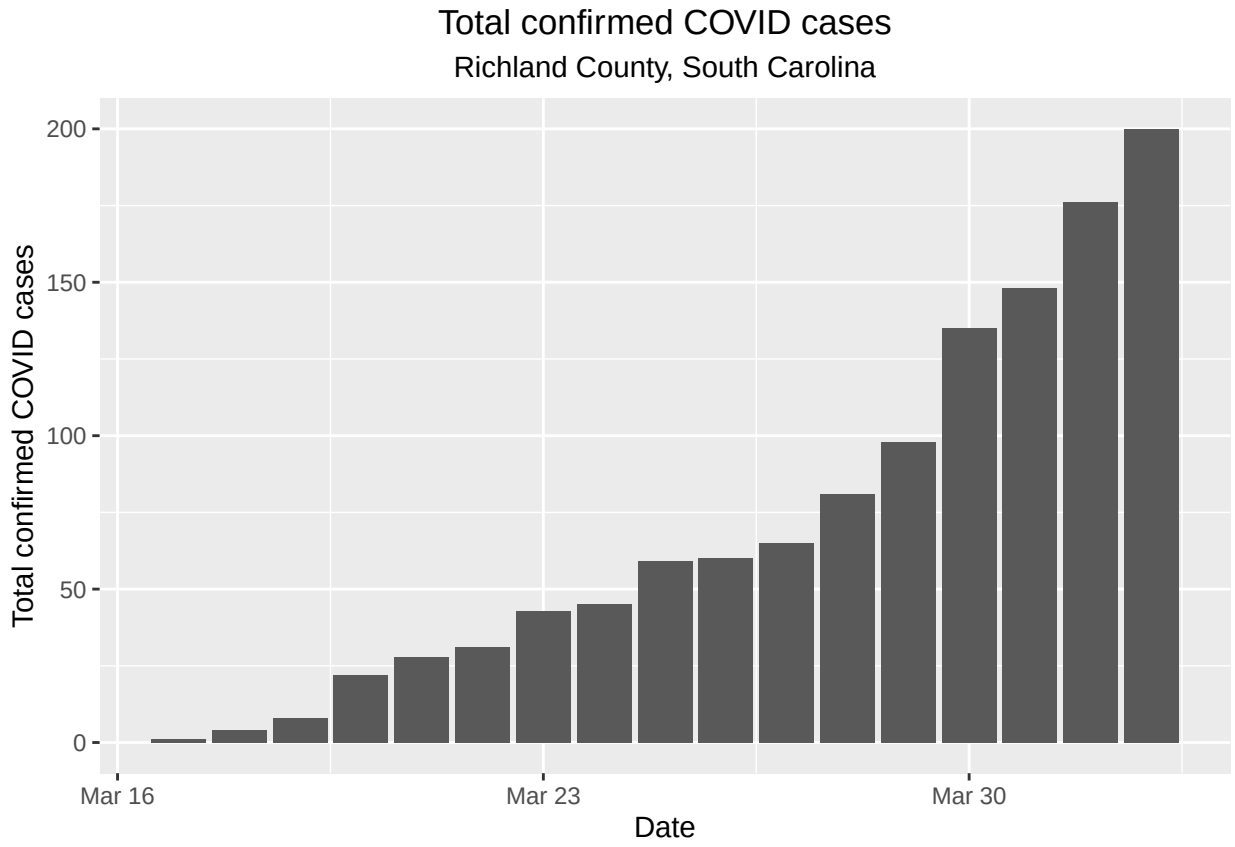
Deaths

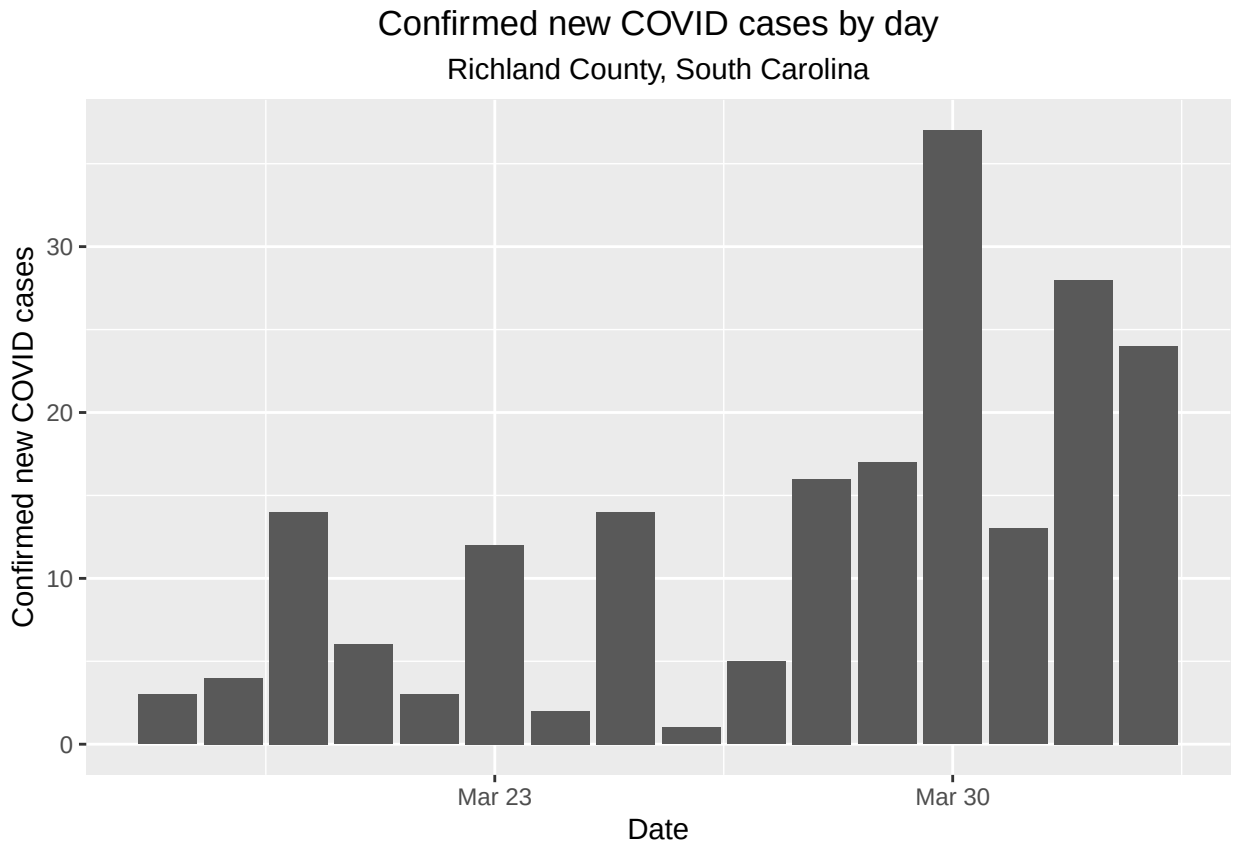

Total COVID−related deaths
Orange County, California
Total COVID−related deaths
10.0
7.5
5.0
2.5
0.0
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date


New COVID−related deaths by day
Orange County, California
New COVID−related deaths
3
2
1
0
Mar 02
Mar 09
Mar 16
Mar 23
Mar 30
Date

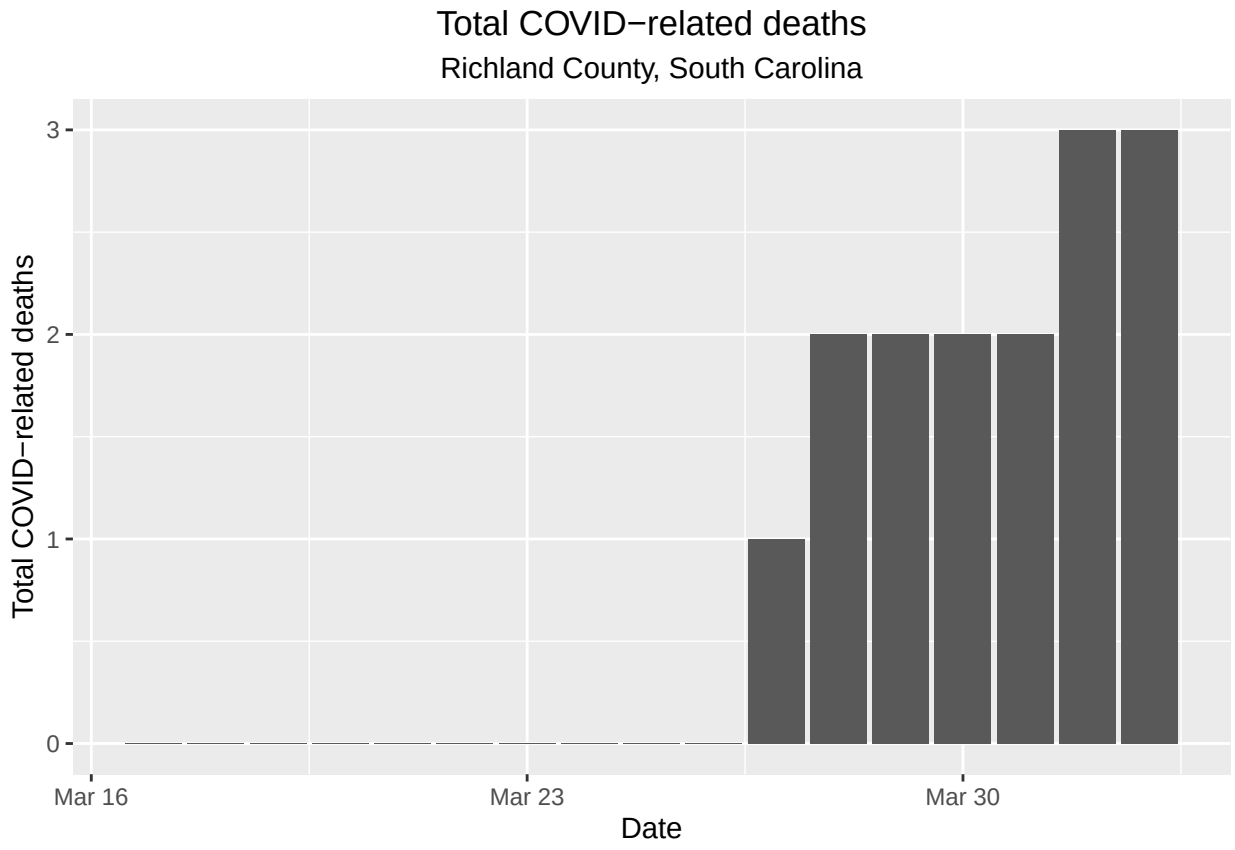
Richland County, South Carolina

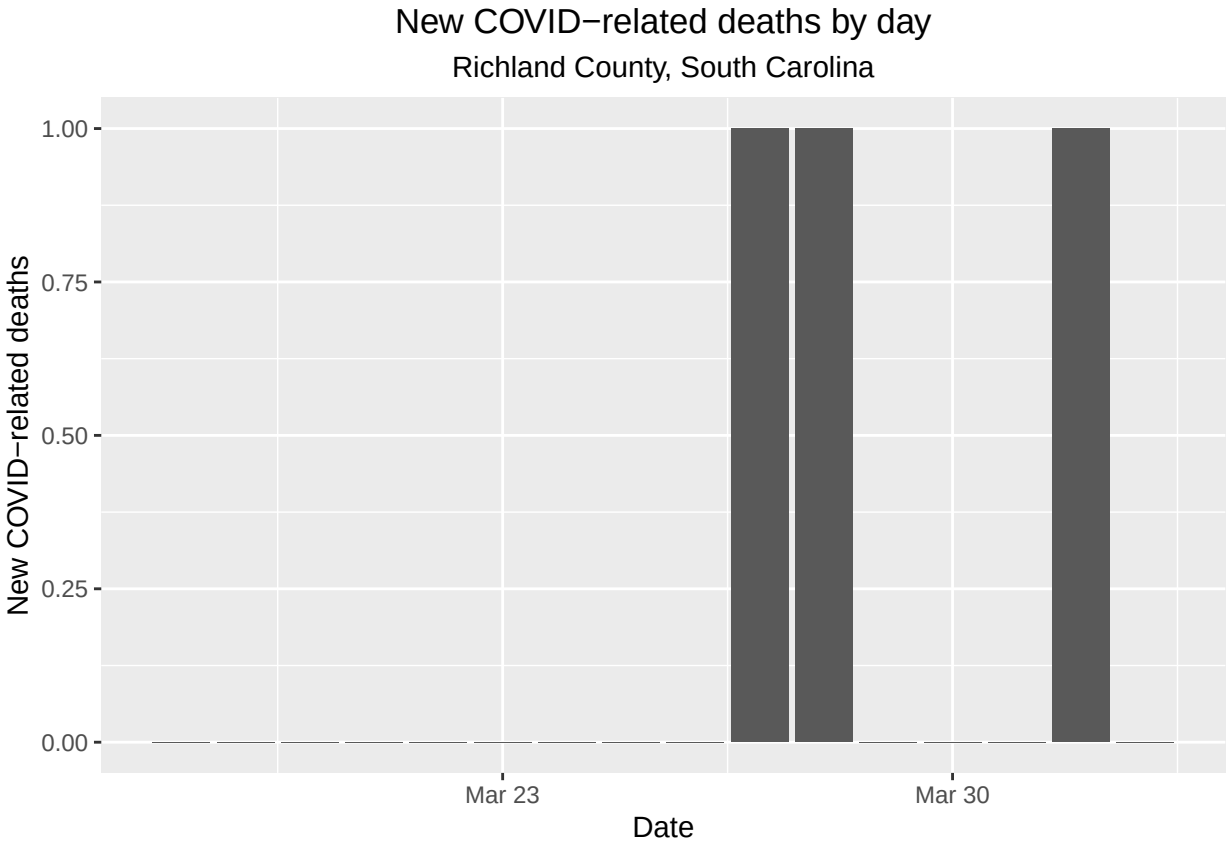
Confirmed cases




Confirmed new COVID cases by day
Richland County, South Carolina
Confirmed new COVID cases
30
20
10
0
Mar 23
Mar 30
Date

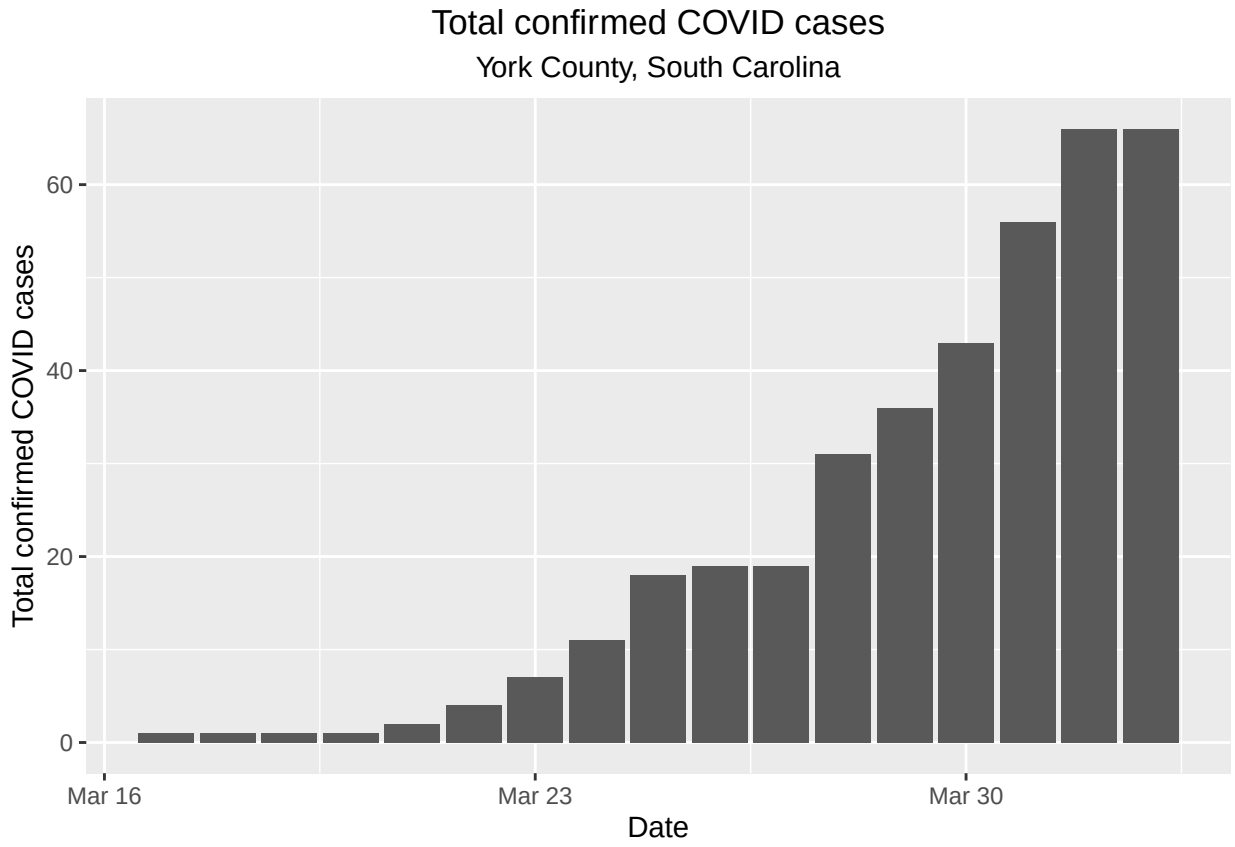
Deaths

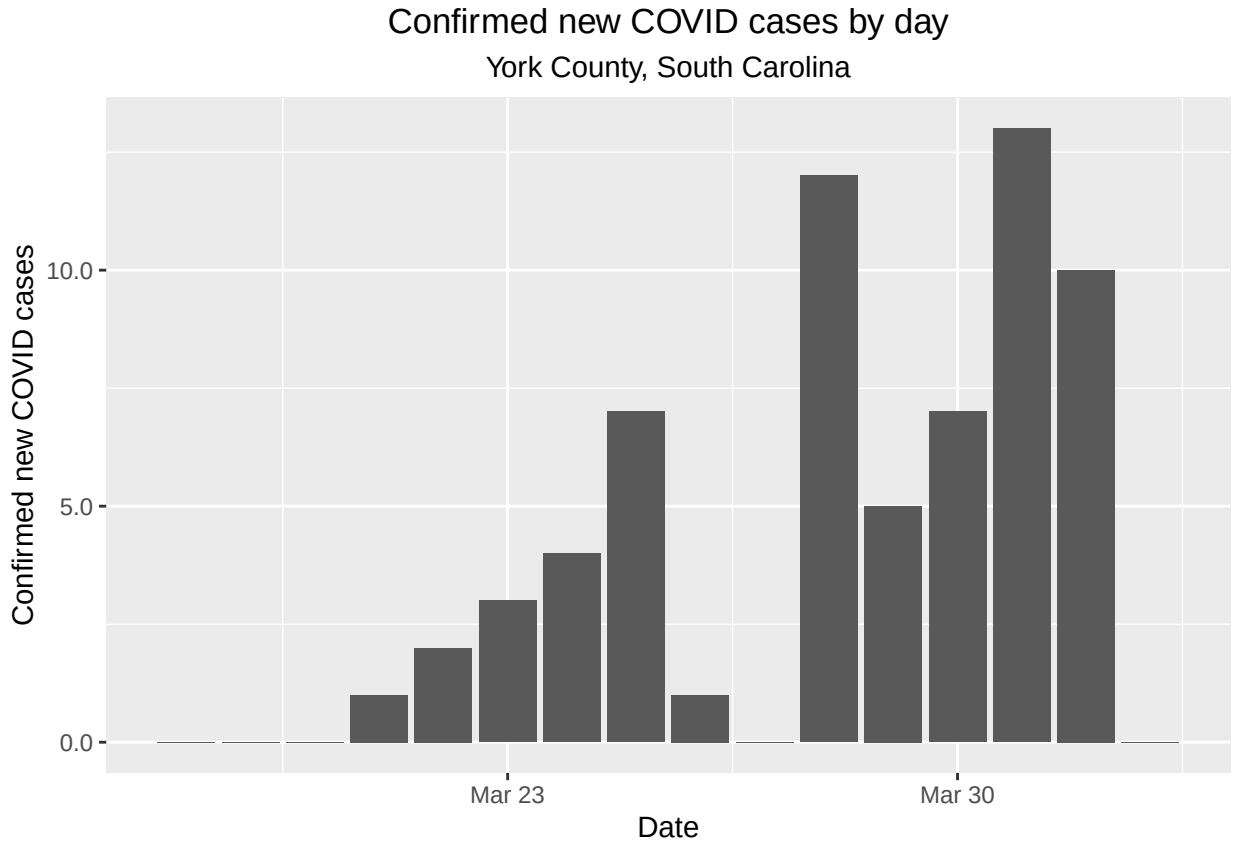

Total COVID−related deaths
Richland County, South Carolina
Total COVID−related deaths
3
2
1
0
Mar 16
Mar 23
Mar 30
Date


New COVID−related deaths by day
Richland County, South Carolina
New COVID−related deaths
1.00
0.75
0.50
0.25
0.00
Mar 23
Mar 30
Date

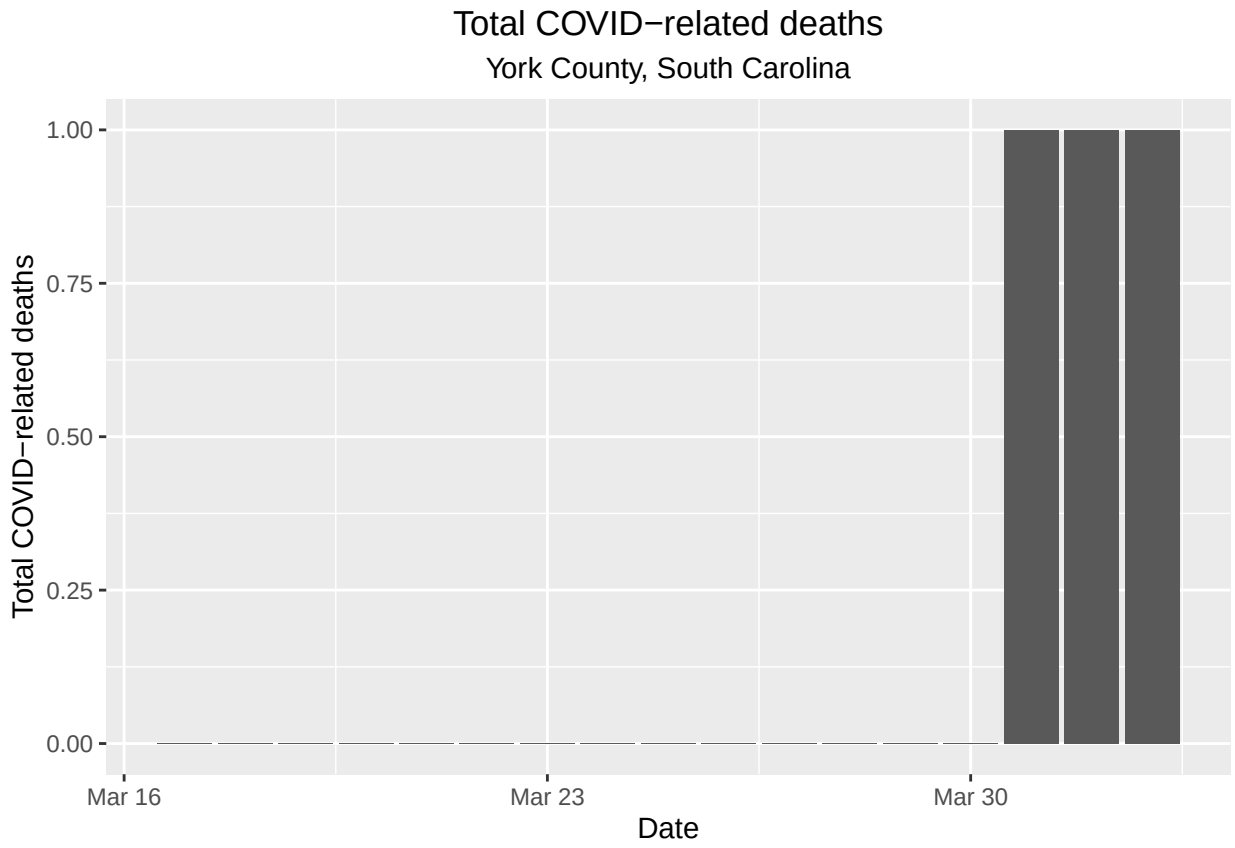
York County, South Carolina

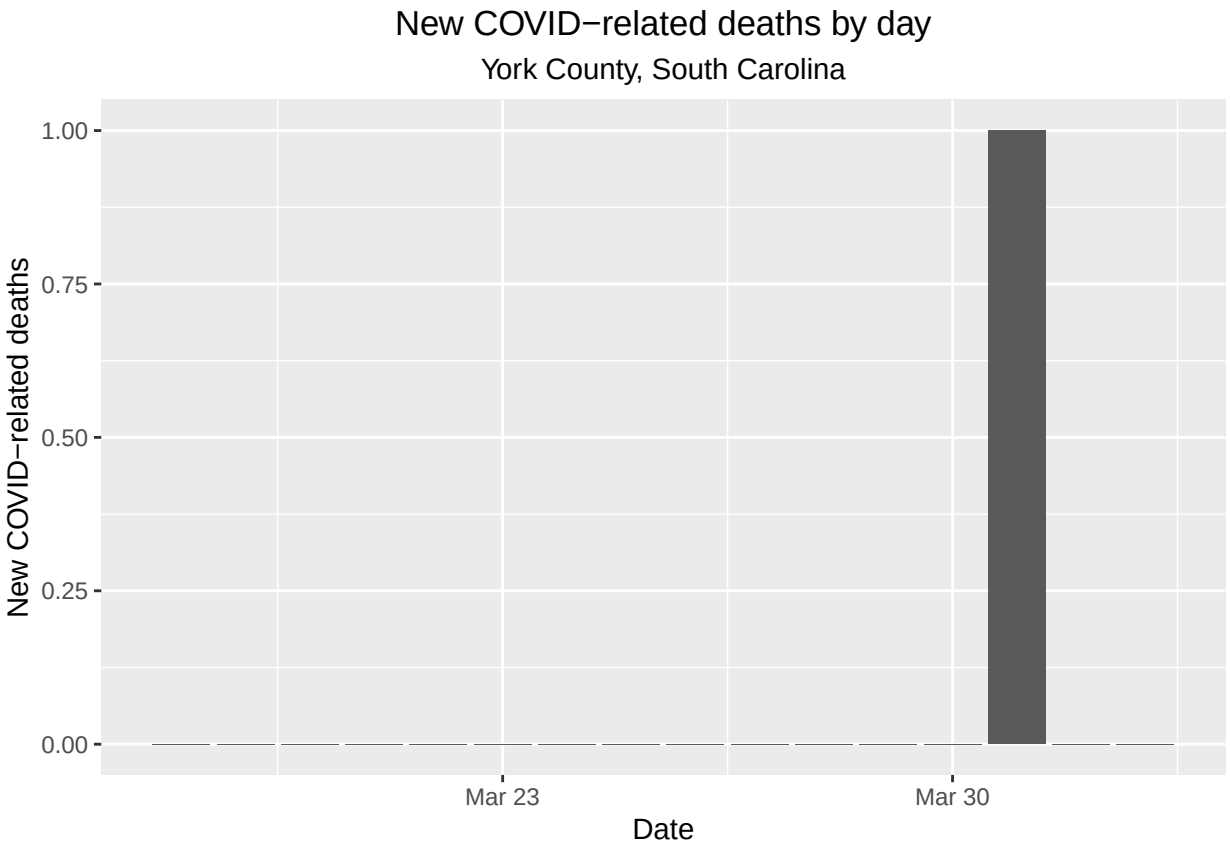
Confirmed cases




Confirmed new COVID cases by day
York County, South Carolina
Confirmed new COVID cases
10.0
5.0
0.0
Mar 23
Mar 30
Date

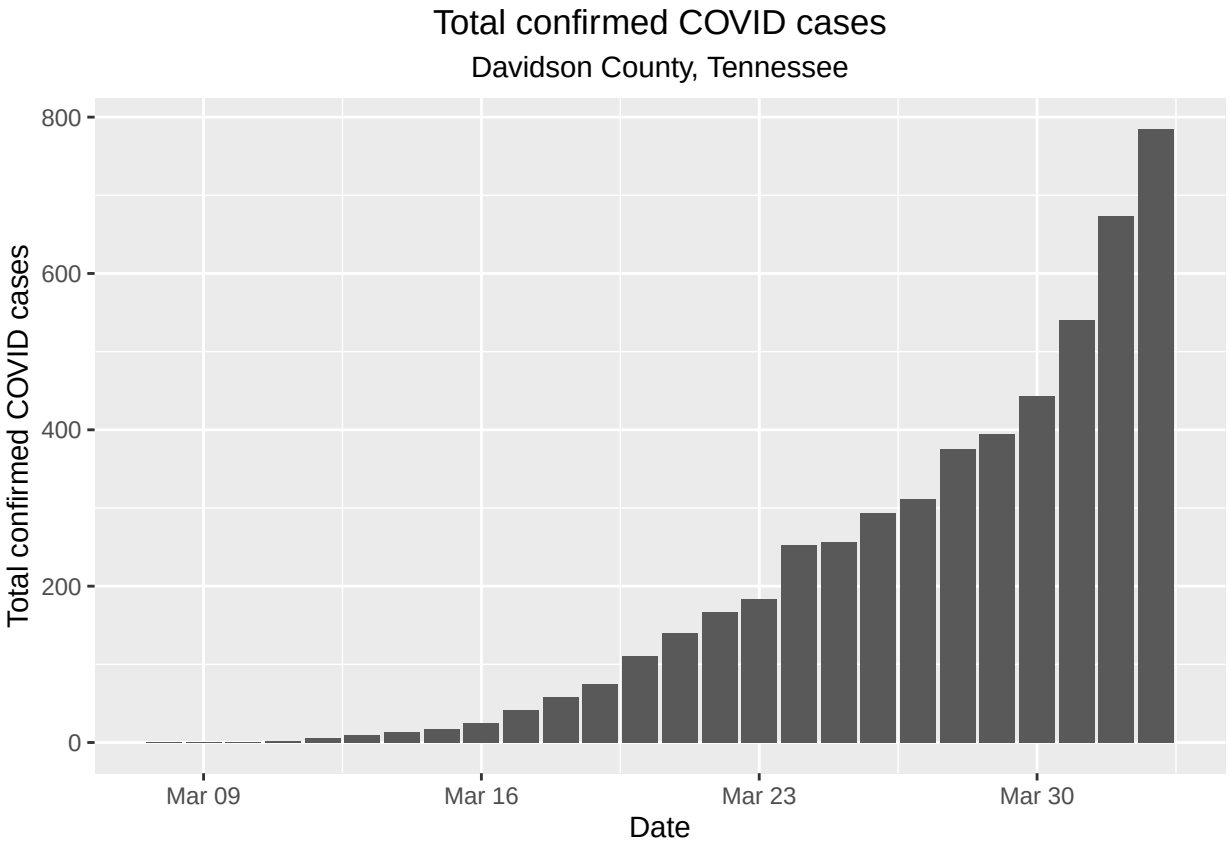
Deaths

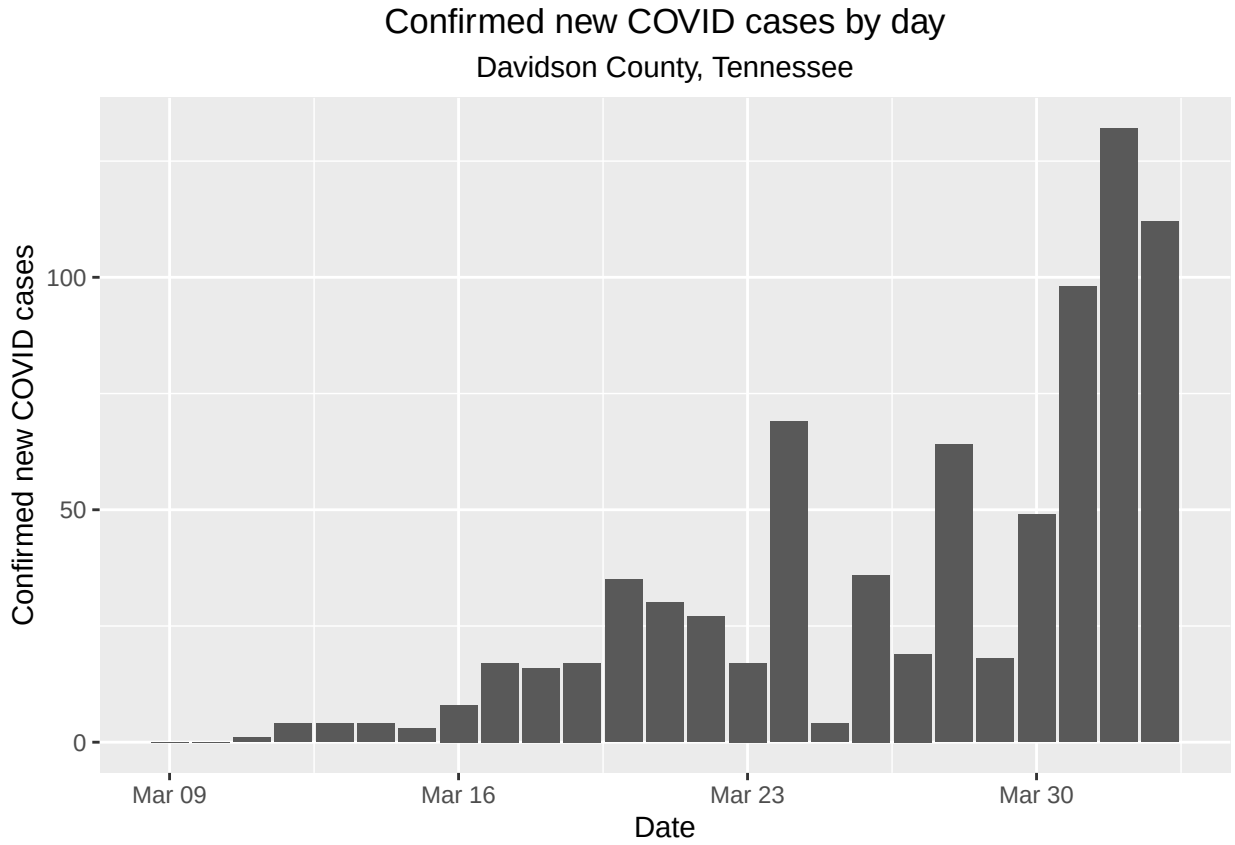

Total COVID−related deaths
York County, South Carolina
1.00
0.75
0.50
0.25
0.00
Total COVID−related deaths
Mar 16
Mar 23
Mar 30
Date


New COVID−related deaths by day
York County, South Carolina
New COVID−related deaths
1.00
0.75
0.50
0.25
0.00
Mar 23
Mar 30
Date

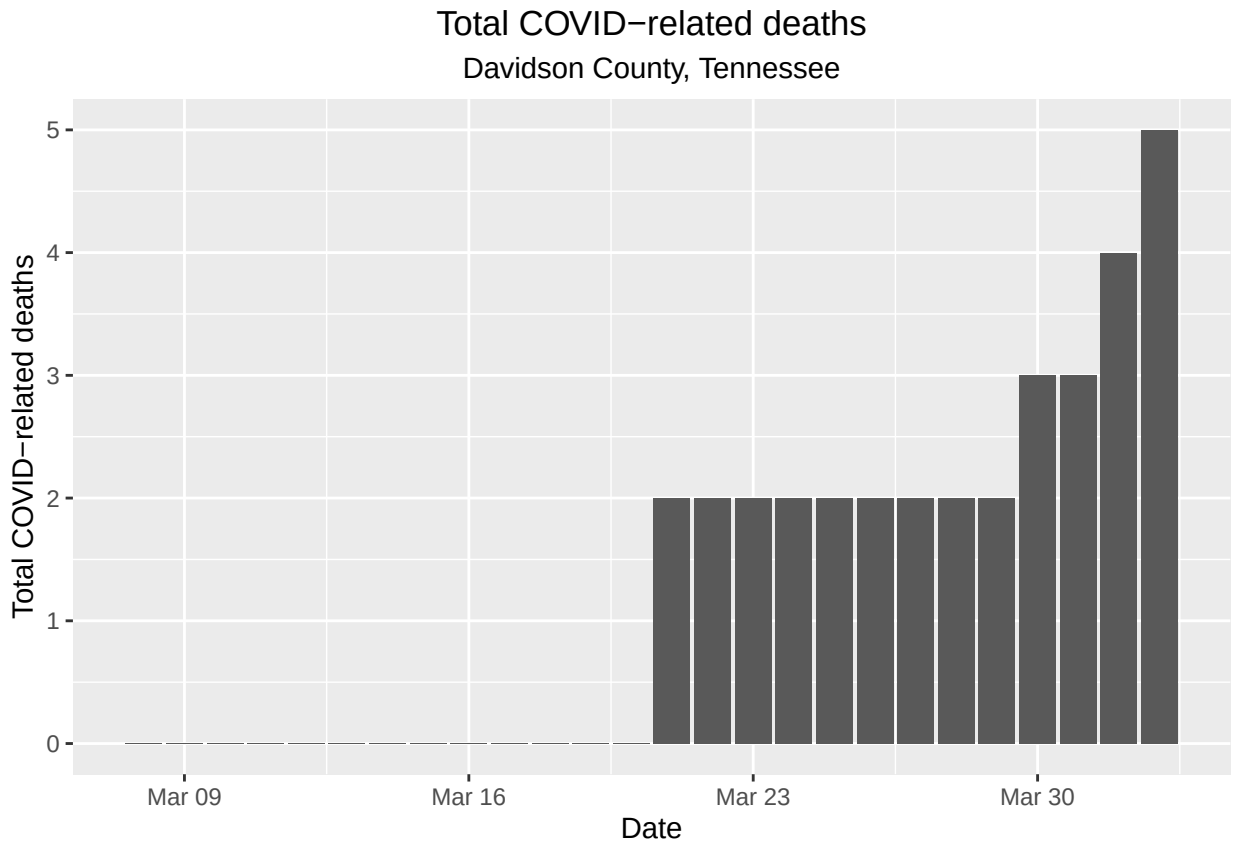
Davidson County, Tennessee

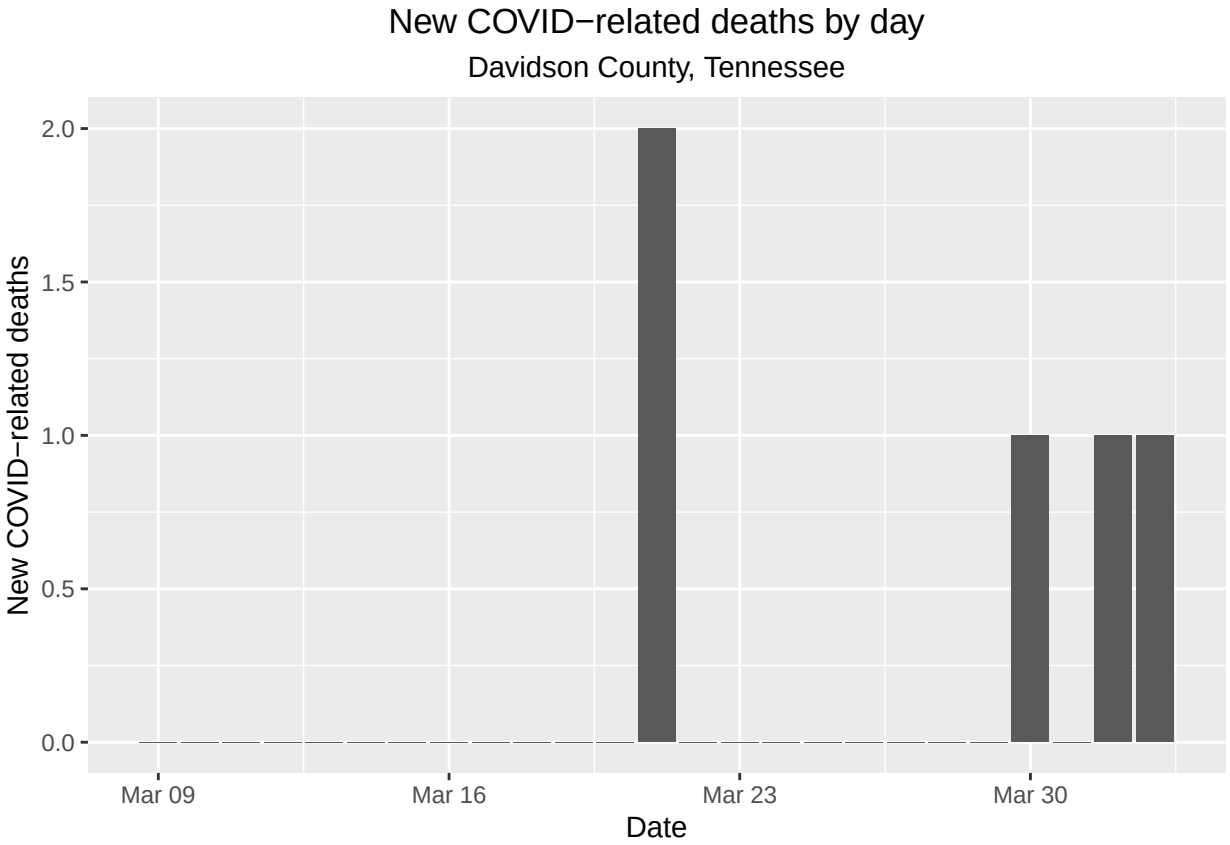
Confirmed cases




Confirmed new COVID cases by day
Davidson County, Tennessee
Confirmed new COVID cases
100
50
0
Mar 09
Mar 16
Mar 23
Mar 30
Date

Deaths


Total COVID−related deaths
Davidson County, Tennessee
Total COVID−related deaths
0
1
2
3
4
5
Mar 09
Mar 16
Mar 23
Mar 30
Date



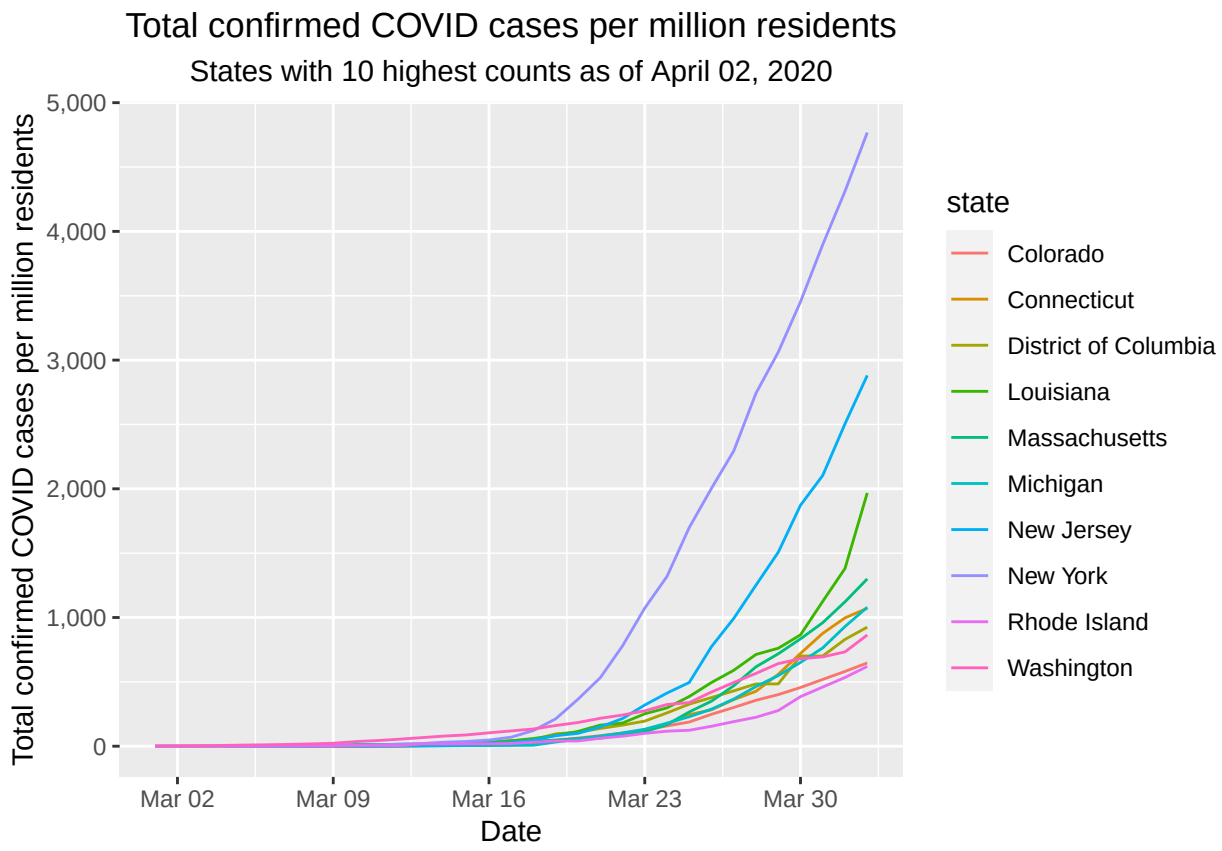
Compare state data based on population

Total confirmed cases

Table of total confirmed cases per million residents (all 50 states)

```
##                        state casesPerMillion
##  1:                 New York          4,768
##  2:               New Jersey          2,881
##  3:                Louisiana          1,968
##  4:            Massachusetts          1,300
##  5:                 Michigan          1,080
##  6:              Connecticut          1,072
##  7:     District of Columbia            925
##  8:               Washington            864
##  9:                 Colorado            647
## 10:             Rhode Island            620
## 11:                 Illinois            607
## 12:             Pennsylvania            548
## 13:                  Vermont            541
## 14:                  Georgia            512
## 15:                    Idaho            498
## 16:                   Nevada            473
## 17:                  Indiana            451
## 18:                Tennessee            420
```

```
## 19:                  Florida            419
## 20:                 Delaware            403
## 21:              Mississippi            395
## 22:                 Maryland            385
## 23:            New Hampshire            352
## 24:                     Utah            335
## 25:           South Carolina            301
## 26:                 Missouri            298
## 27:                Wisconsin            297
## 28:                    Maine            279
## 29:               California            278
## 30:                  Wyoming            264
## 31:                  Alabama            259
## 32:                     Ohio            248
## 33:                 Arkansas            226
## 34:                  Montana            225
## 35:                 Oklahoma            222
## 36:                  Arizona            219
## 37:             North Dakota            208
## 38:                   Alaska            199
## 39:                   Hawaii            199
## 40:                 Virginia            199
## 41:                   Oregon            195
## 42:                     Iowa            194
## 43:               New Mexico            192
## 44:                   Kansas            190
## 45:             South Dakota            186
## 46:           North Carolina            177
## 47:                 Kentucky            168
## 48:                    Texas            168
## 49:                 Nebraska            141
## 50:                Minnesota            131
## 51:            West Virginia            121
## 52:              Puerto Rico             98
## 53:                     Guam           <NA>
## 54: Northern Mariana Islands           <NA>
## 55:           Virgin Islands           <NA>
##                       state casesPerMillion
```

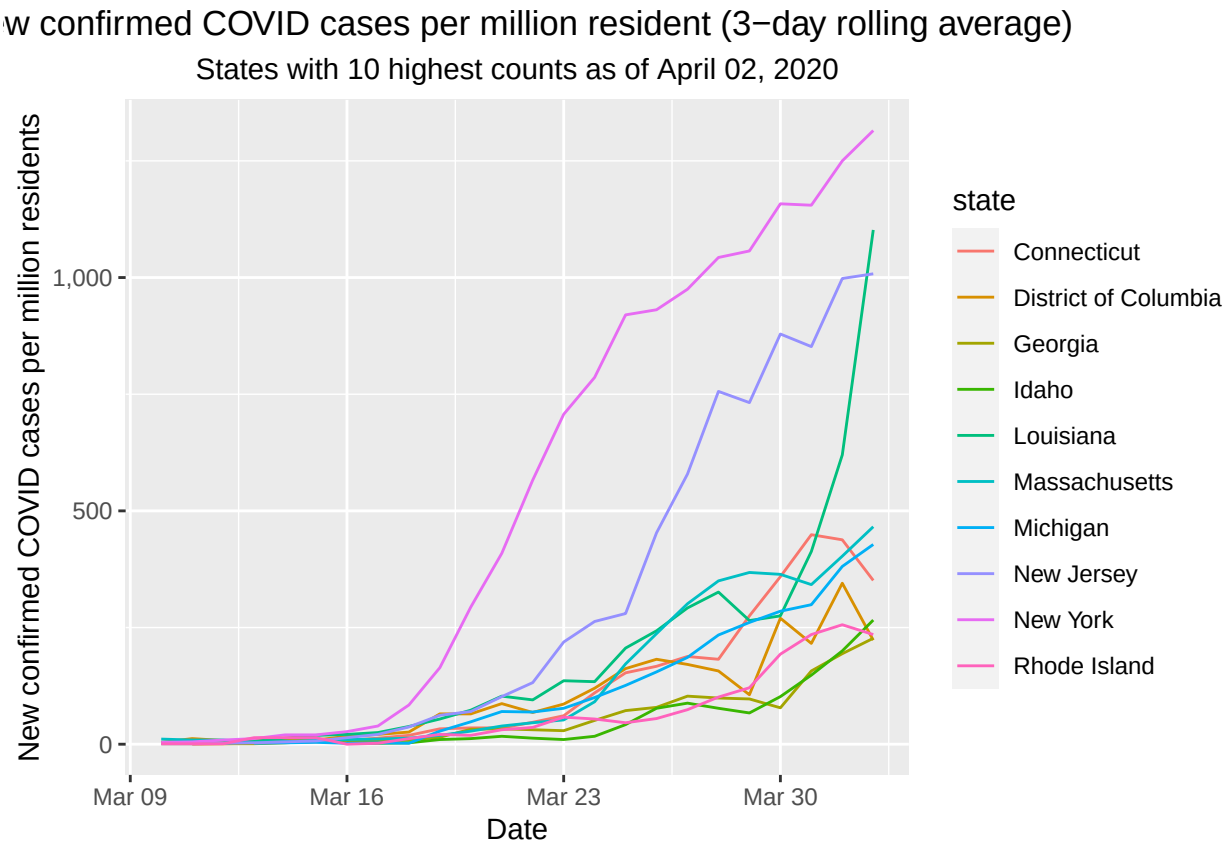


New confirmed cases

Table of new cases per million residents: rolling 3-day average (all 50 states)

```
##                       state casesNewPerMillion
##  1:                New York              1,315
##  2:               Louisiana              1,102
##  3:              New Jersey              1,008
##  4:           Massachusetts                466
##  5:                Michigan                428
##  6:             Connecticut                351
##  7:                   Idaho                266
##  8:            Rhode Island                235
##  9:                 Georgia                227
## 10:    District of Columbia                223
## 11:            Pennsylvania                223
## 12:                Illinois                207
## 13:                Colorado                191
## 14:                 Indiana                185
## 15:              Washington                184
## 16:               Tennessee                168
## 17:                 Florida                153
## 18:                Maryland                151
## 19:                  Nevada                134
## 20:                Delaware                132
```

```
## 21:                  Vermont               131
## 22:                 Missouri               127
## 23:           South Carolina               122
## 24:            New Hampshire               121
## 25:              Mississippi               110
## 26:                 Oklahoma               100
## 27:                  Wyoming               100
## 28:               California                90
## 29:                     Utah                83
## 30:                     Ohio                82
## 31:                 Virginia                80
## 32:                Wisconsin                79
## 33:                    Maine                75
## 34:             South Dakota                72
## 35:                  Alabama                65
## 36:             North Dakota                65
## 37:                    Texas                63
## 38:                   Kansas                62
## 39:                 Kentucky                61
## 40:                     Iowa                60
## 41:                  Arizona                59
## 42:                  Montana                59
## 43:               New Mexico                58
## 44:                 Arkansas                57
## 45:                   Hawaii                55
## 46:           North Carolina                52
## 47:                   Oregon                52
## 48:                 Nebraska                45
## 49:              Puerto Rico                44
## 50:            West Virginia                40
## 51:                   Alaska                36
## 52:                Minnesota                29
## 53:                     Guam              <NA>
## 54: Northern Mariana Islands              <NA>
## 55:           Virgin Islands              <NA>
##                        state casesNewPerMillion
```

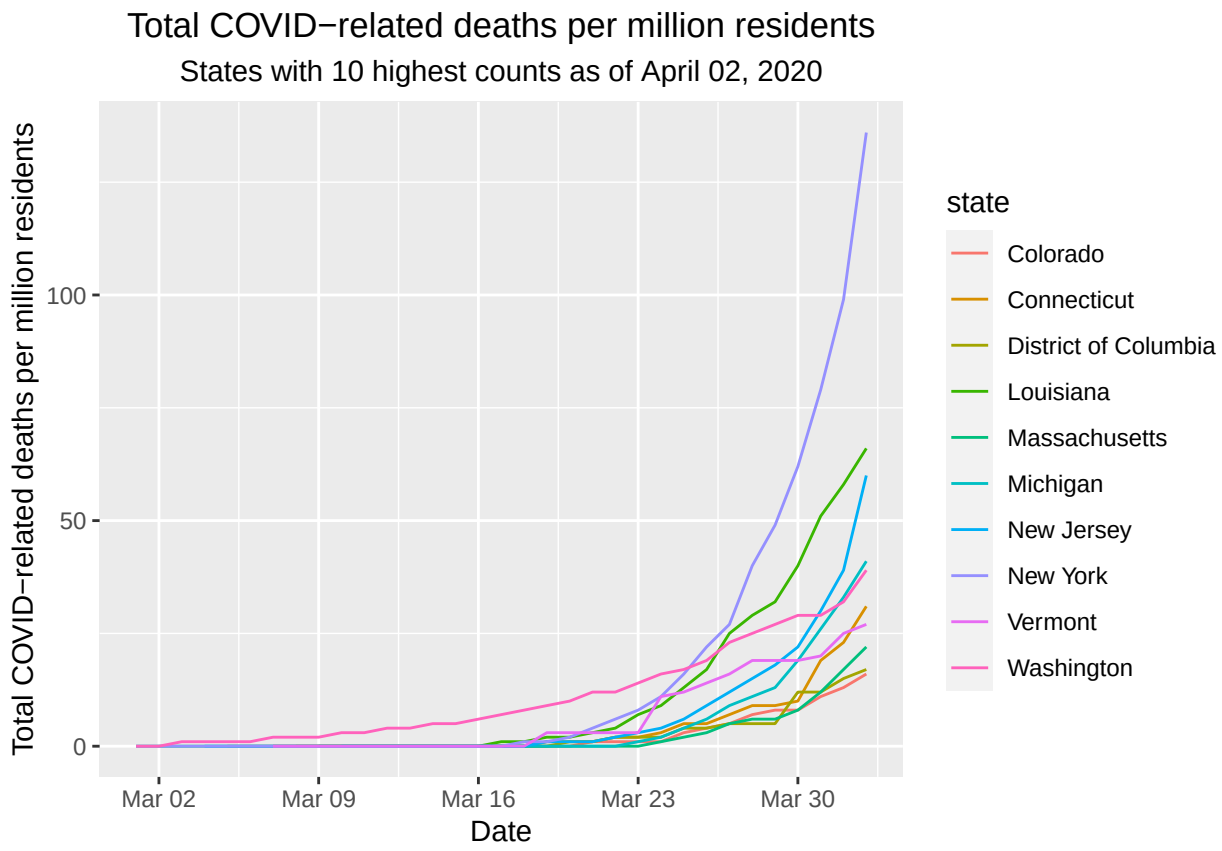


Total deaths

Table of total deaths per million residents (all 50 states)

```
##                        state deathsPerMillion
##  1:                New York              136
##  2:               Louisiana               66
##  3:              New Jersey               60
##  4:                Michigan               41
##  5:              Washington               39
##  6:             Connecticut               31
##  7:                 Vermont               27
##  8:           Massachusetts               22
##  9:    District of Columbia               17
## 10:                Colorado               16
## 11:                 Georgia               16
## 12:                Illinois               13
## 13:                Delaware               12
## 14:                  Nevada               12
## 15:                 Indiana               11
## 16:            Rhode Island               11
## 17:             Mississippi                8
## 18:                Oklahoma                8
## 19:                Kentucky                7
## 20:            Pennsylvania                7
```

```
## 21:                  Alabama                6
## 22:               California                6
## 23:                  Florida                6
## 24:                     Ohio                6
## 25:           South Carolina                6
## 26:                Wisconsin                6
## 27:                    Idaho                5
## 28:                    Maine                5
## 29:                 Maryland                5
## 30:                  Montana                5
## 31:                  Arizona                4
## 32:                   Kansas                4
## 33:                   Oregon                4
## 34:                Tennessee                4
## 35:                 Virginia                4
## 36:                 Arkansas                3
## 37:                     Iowa                3
## 38:                Minnesota                3
## 39:                 Missouri                3
## 40:                 Nebraska                3
## 41:            New Hampshire                3
## 42:               New Mexico                3
## 43:             North Dakota                3
## 44:              Puerto Rico                3
## 45:                   Alaska                2
## 46:             South Dakota                2
## 47:                    Texas                2
## 48:                     Utah                2
## 49:                   Hawaii                1
## 50:           North Carolina                1
## 51:            West Virginia                1
## 52:                  Wyoming                0
## 53:                     Guam             <NA>
## 54: Northern Mariana Islands             <NA>
## 55:           Virgin Islands             <NA>
##                        state deathsPerMillion
```

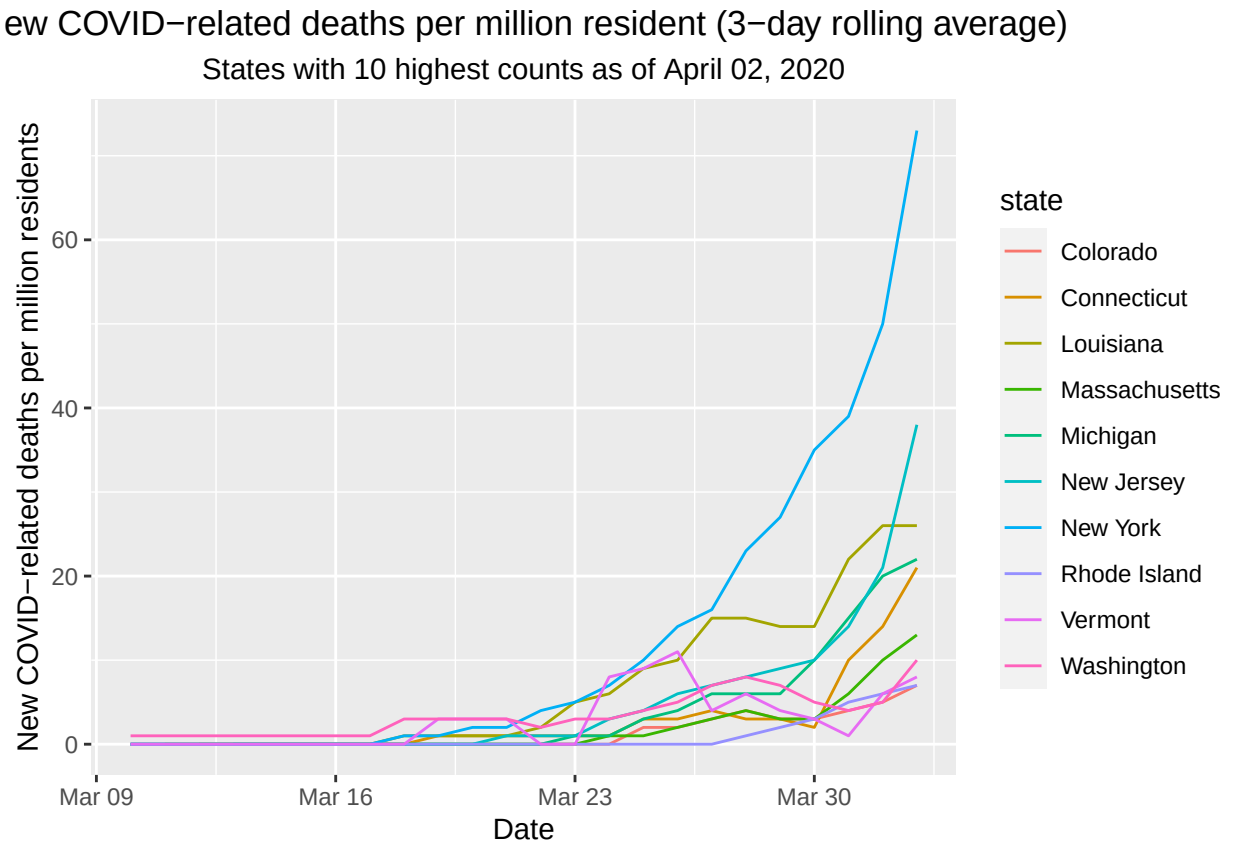


New deaths

Table of new deaths per million residents: rolling 3-day average (all 50 states)

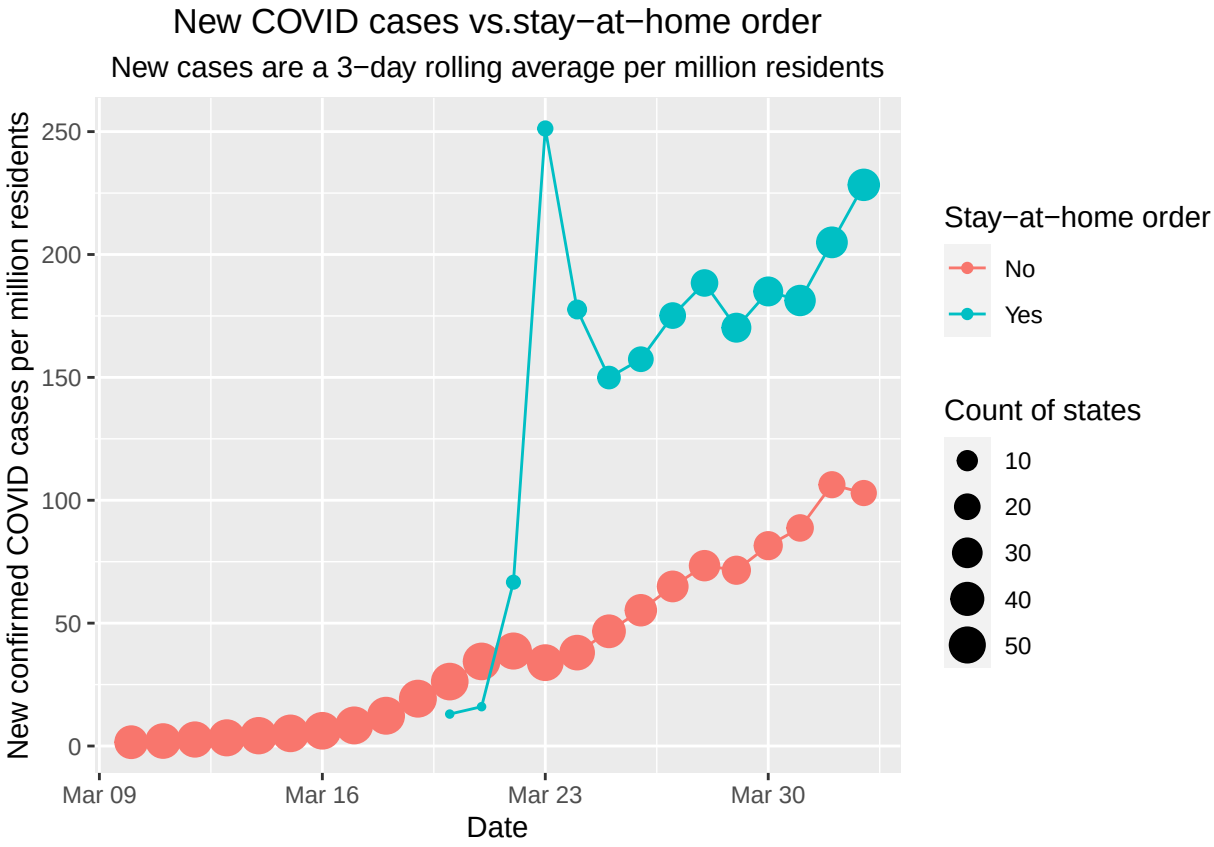
```
##                        state deathsNewPerMillion
##  1:                New York                  73
##  2:              New Jersey                  38
##  3:               Louisiana                  26
##  4:                Michigan                  22
##  5:             Connecticut                  21
##  6:           Massachusetts                  13
##  7:              Washington                  10
##  8:                 Vermont                   8
##  9:                Colorado                   7
## 10:            Rhode Island                   7
## 11:                 Georgia                   6
## 12:                Illinois                   6
## 13:                 Indiana                   6
## 14:                  Nevada                   6
## 15:                Delaware                   5
## 16:                Kentucky                   5
## 17:                 Alabama                   4
## 18:    District of Columbia                   4
## 19:                Oklahoma                   4
## 20:                 Florida                   3
```

```
## 21:                  Maryland                   3
## 22:               Mississippi                   3
## 23:                      Ohio                   3
## 24:              Pennsylvania                   3
## 25:                   Arizona                   2
## 26:                California                   2
## 27:                     Maine                   2
## 28:            South Carolina                   2
## 29:                 Tennessee                   2
## 30:                 Wisconsin                   2
## 31:                  Arkansas                   1
## 32:                    Hawaii                   1
## 33:                     Idaho                   1
## 34:                      Iowa                   1
## 35:                    Kansas                   1
## 36:                 Minnesota                   1
## 37:                  Missouri                   1
## 38:                   Montana                   1
## 39:                  Nebraska                   1
## 40:             New Hampshire                   1
## 41:                New Mexico                   1
## 42:            North Carolina                   1
## 43:                    Oregon                   1
## 44:               Puerto Rico                   1
## 45:              South Dakota                   1
## 46:                     Texas                   1
## 47:                  Virginia                   1
## 48:                    Alaska                   0
## 49:              North Dakota                   0
## 50:                      Utah                   0
## 51:             West Virginia                   0
## 52:                   Wyoming                   0
## 53:                      Guam                <NA>
## 54: Northern Mariana Islands                <NA>
## 55:            Virgin Islands                <NA>
##                         state deathsNewPerMillion
```



Compare new cases based on stay-at-home orders

- The section is a work in progress – I'll probably change and add plots over the coming days.
- I'm trying to see what effect stay-at-home orders have on spread. It's inherentely messy because some states have localized orders but not orders for their full state and because states implemented the orders at different times.
- The current plot shows the rolling 3-day average of new cases per million residents, averaged across 2 groups of states – those with a state-wide stay-at-home order in effect and those without. The size of the dots reflect the number of states in each group for each given day (so the dots are getting bigger for the group with orders over time, as more states implement those orders).
- So far, this view doesn't show if these orders are "working" or not. Instead, the biggest takeaway from the current plot is that the states that implemented orders are reacting to having worse spread, which is why the case rate is so much higher at the start for them. As a state decides it has a problem and implements an order, it joins the grouping of states with orders and drives the rate up for that group.
- Over time (if the policies work), what we'd expect is that the line for the group with orders flattens a bit, but we'll see. It also may become moot if all states issue orders.
- The next plot I want to add will show rate of spread based on how long an order has been in effect, but still thinking about how to do this. Mostly, I'm trying to decide what the right baseline is to compare against.


New COVID cases vs.stay−at−home order
New cases are a 3−day rolling average per million residents
New confirmed COVID cases per million residents
250
200
150
100
50
0
Mar 09
Mar 16
Mar 23
Mar 30
Date
Stay−at−home order
No
Yes
Count of states
10
20
30
40
50