

Final Project

Covid-19 Data Analysis

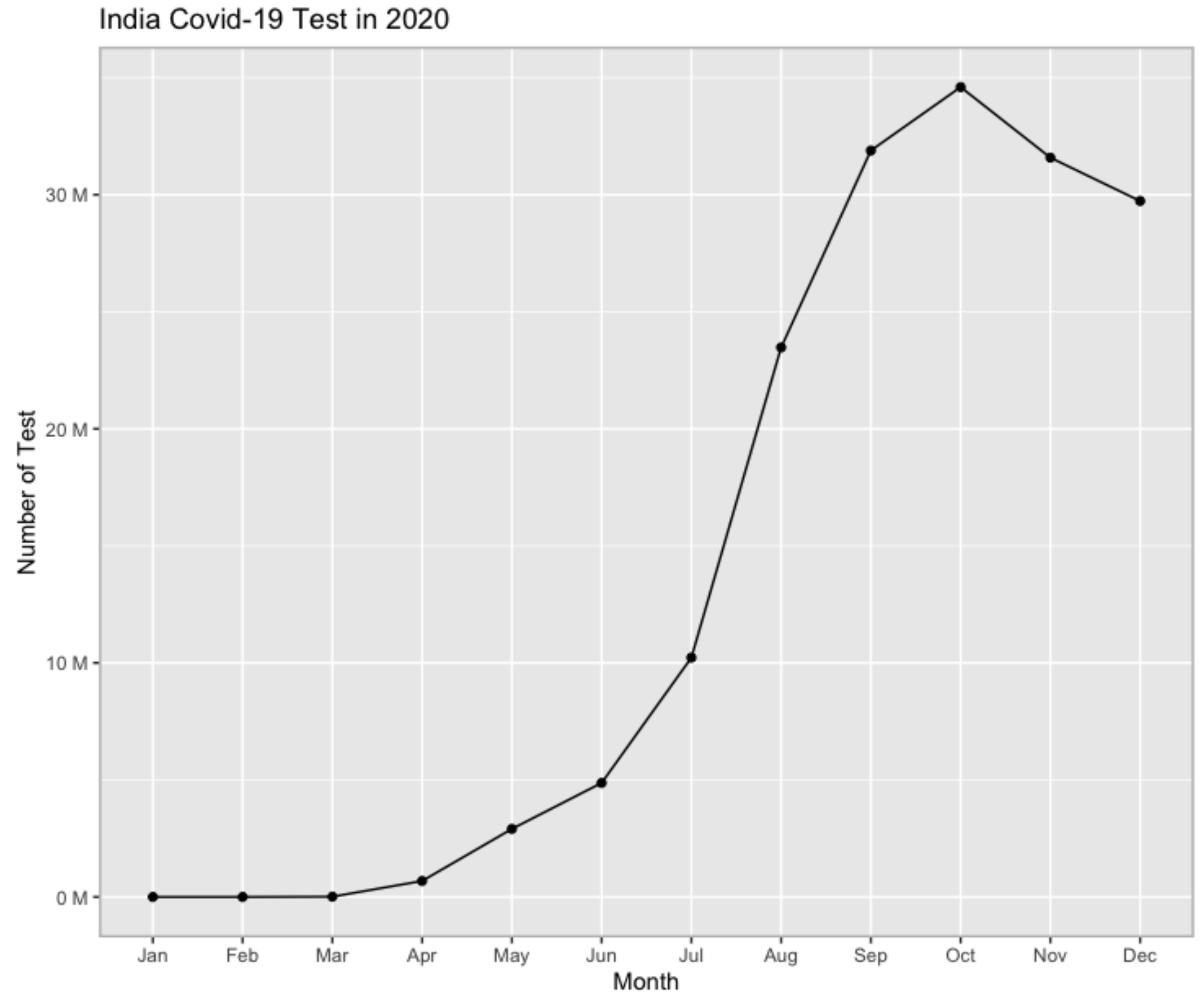
Yuri Jeong

Dec 15, 2021

Covid-19 Test

India in 2020

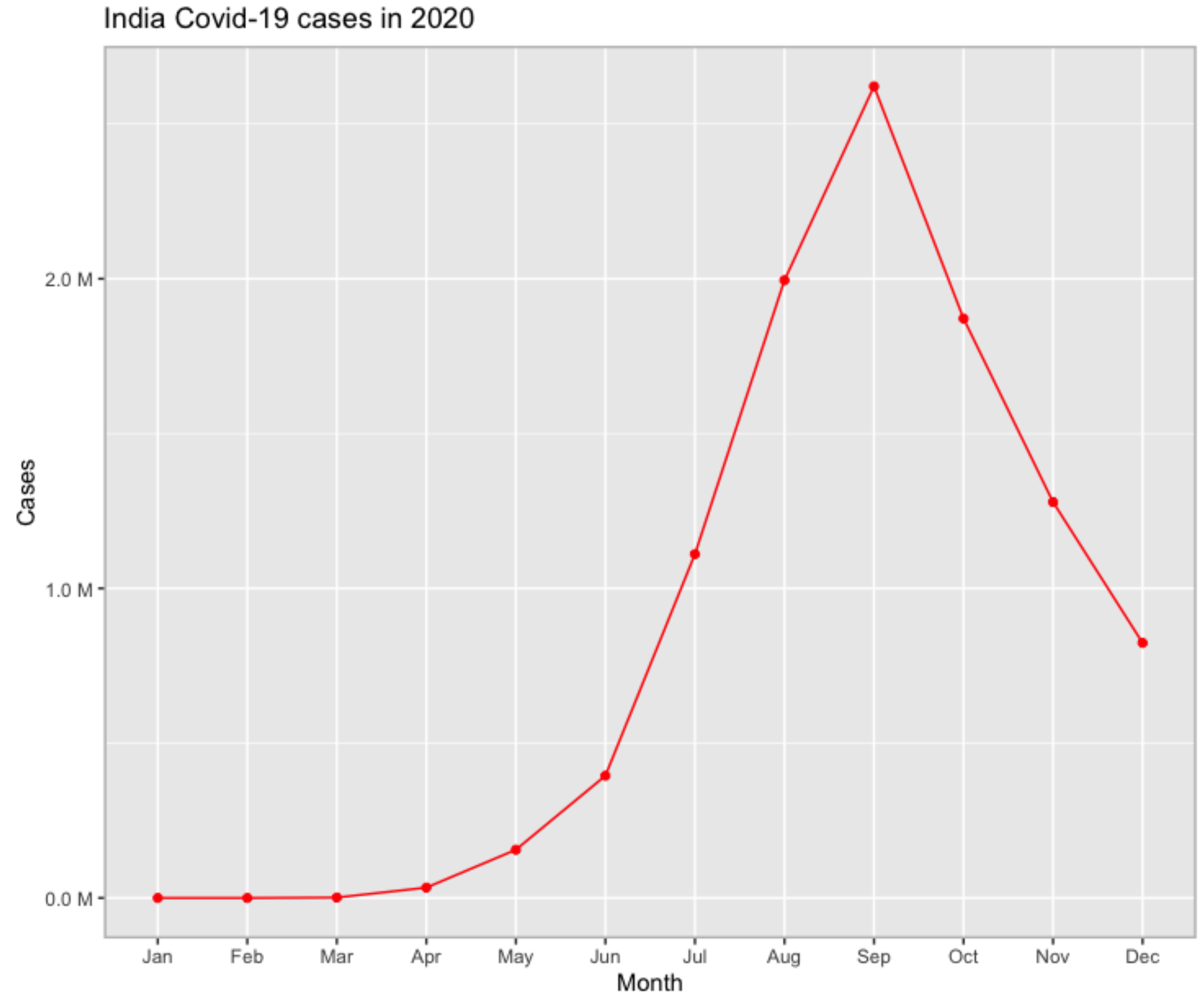
- Started to increase in April 2020
 - About 35 millions in October 2020
- Decreased in December 2020
 - About 30 millions in December 2020



Covid-19 Case

India in 2020

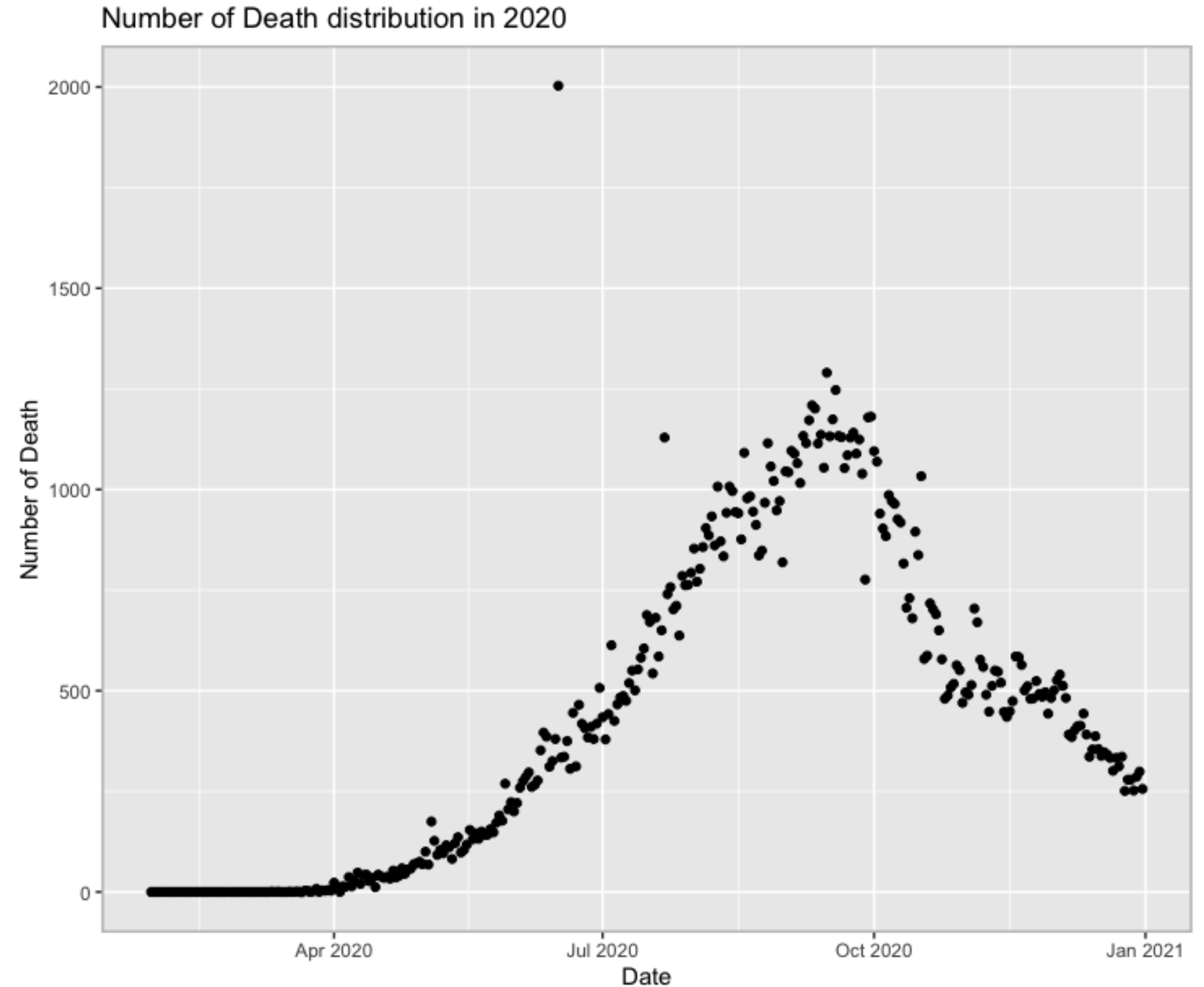
- Started to increase in April 2020
 - Over 2.5 millions in September 2020
- Decreased in December 2020
 - Under 1 million in December 2020



Number of Deaths

India in 2020

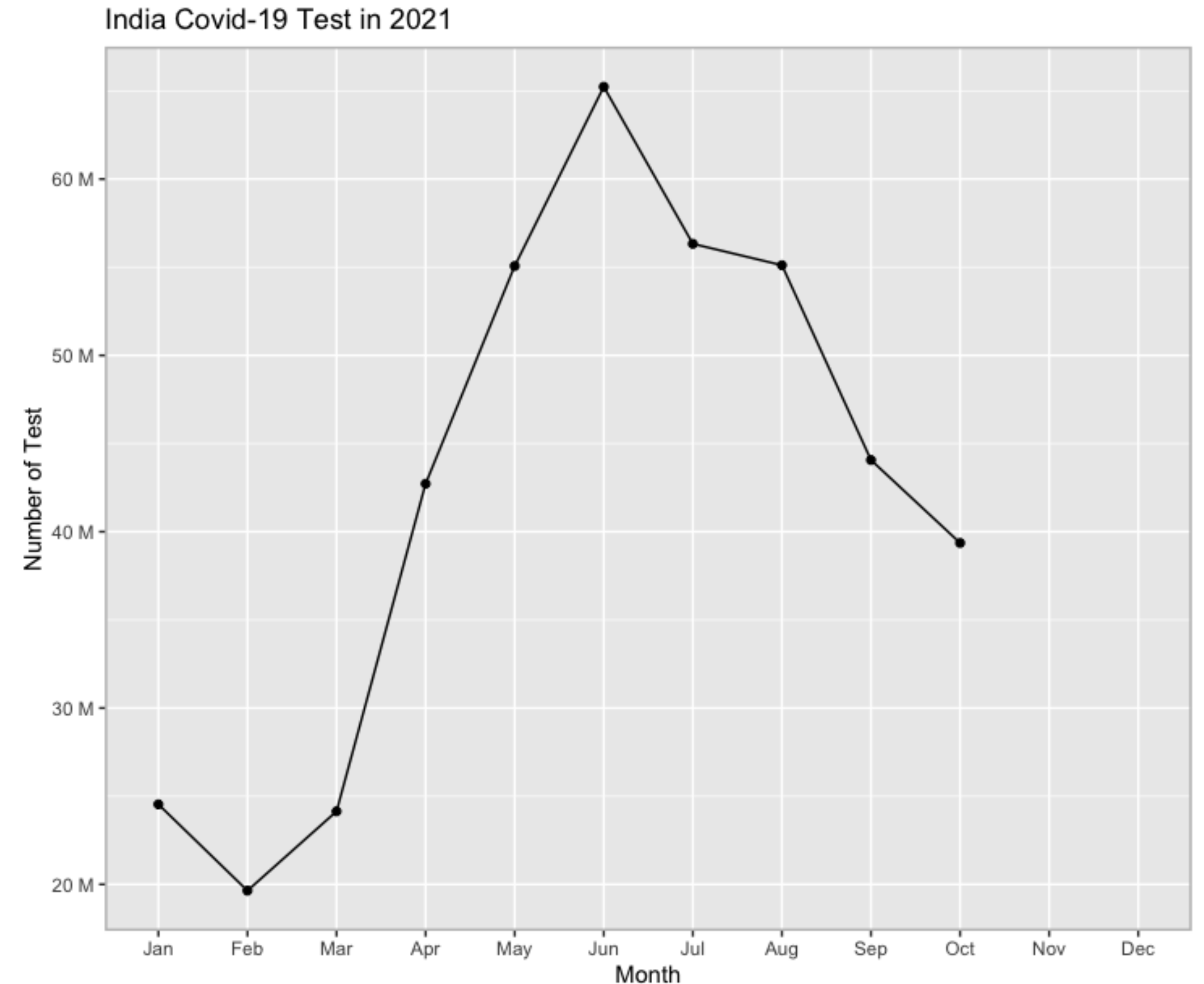
- Increased from April to September 2020
 - Over 1,000 deaths in September 2020
- Started to decrease in October 2020
- Less than 500 deaths in December 2020



Covid-19 Test

India in 2021

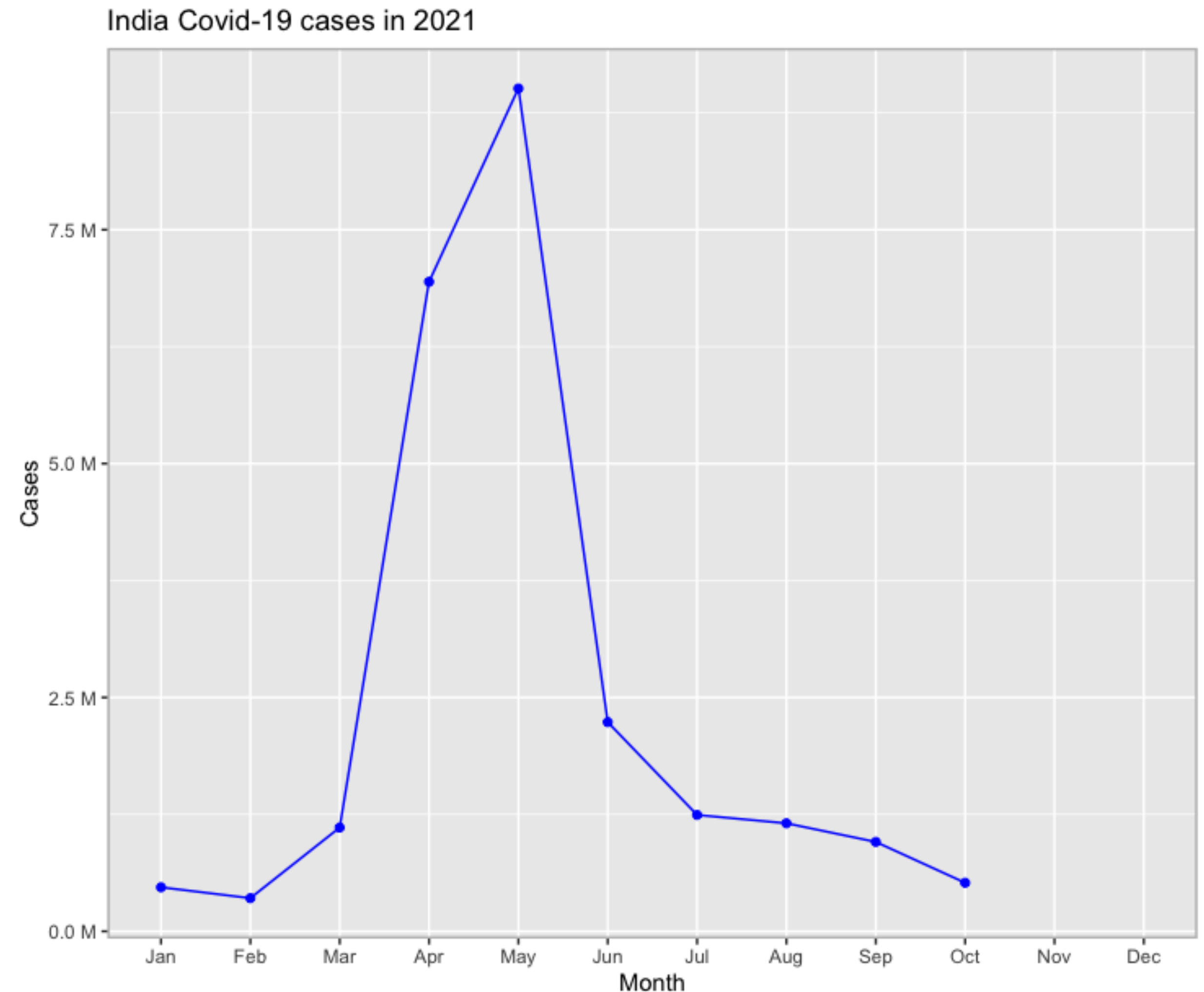
- Decreased until February in 2021
- It rapidly increased from March to June 2021
 - Over 60 millions in June 2021
- Decreased in October 2021
 - Under 40 millions in October 2021



Covid-19 Case

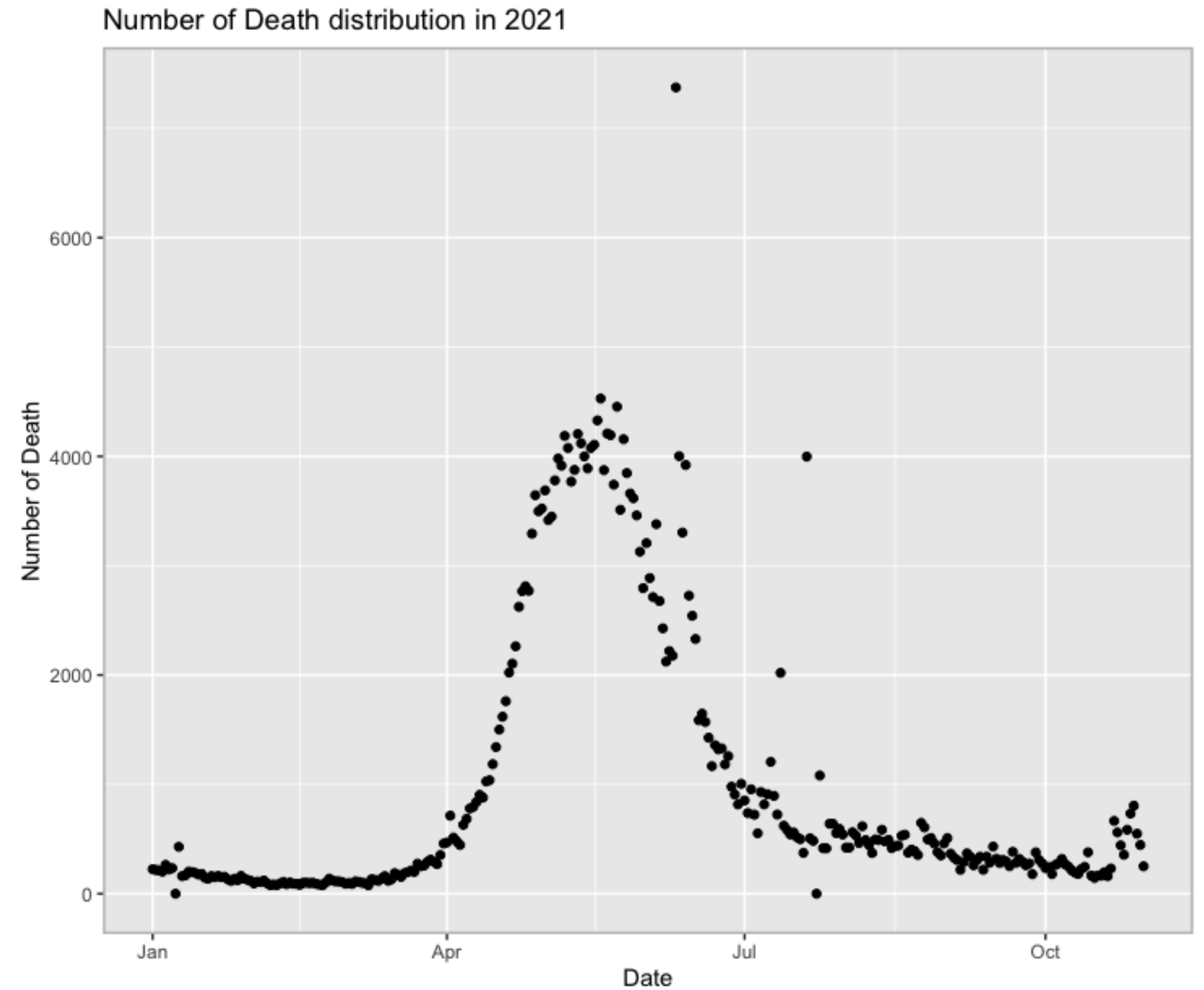
India in 2021

- Decreased from last year to February 2021
- Increased rapidly from March to May 2021
 - Over 7.5 millions in May 2021
- Decreased in June 2021
 - Less than 2.5 millions since June 2021



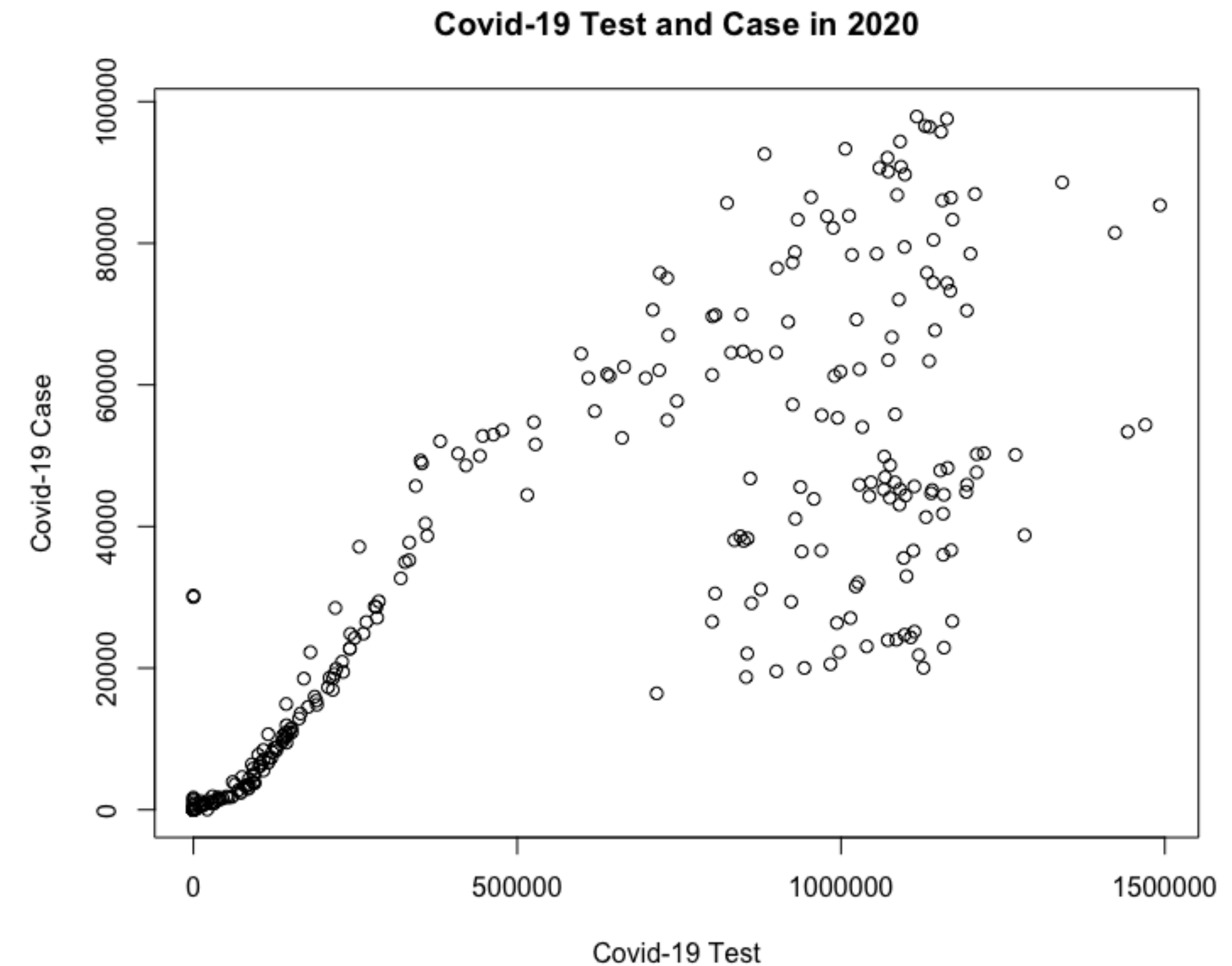
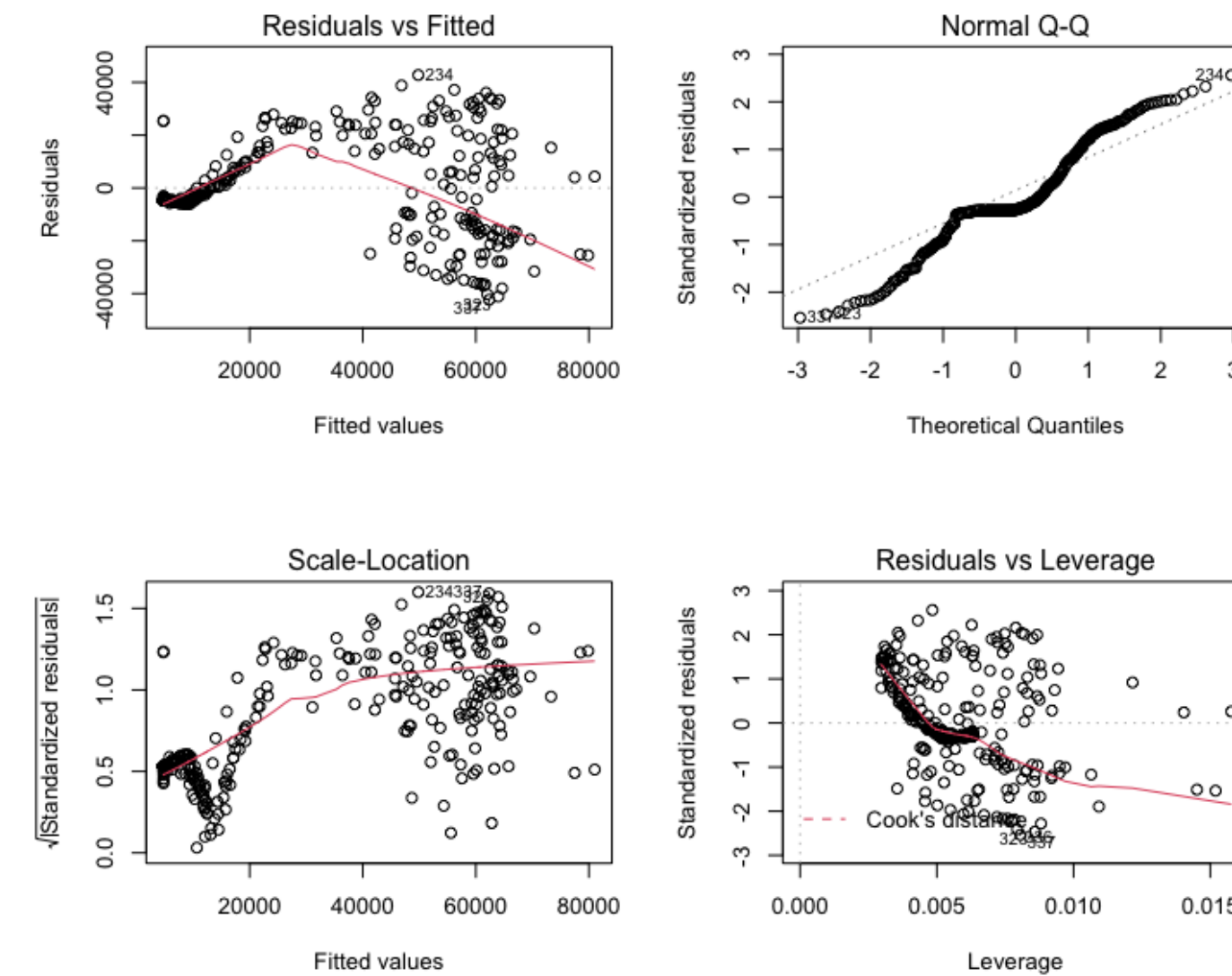
Number of Deaths India in 2021

- Started to increase in April 2021
 - Over 4,200 in May 2021
- Started to decrease in May
 - Under 1,000 in July 2021



Covid-19 Test and Case India in 2020

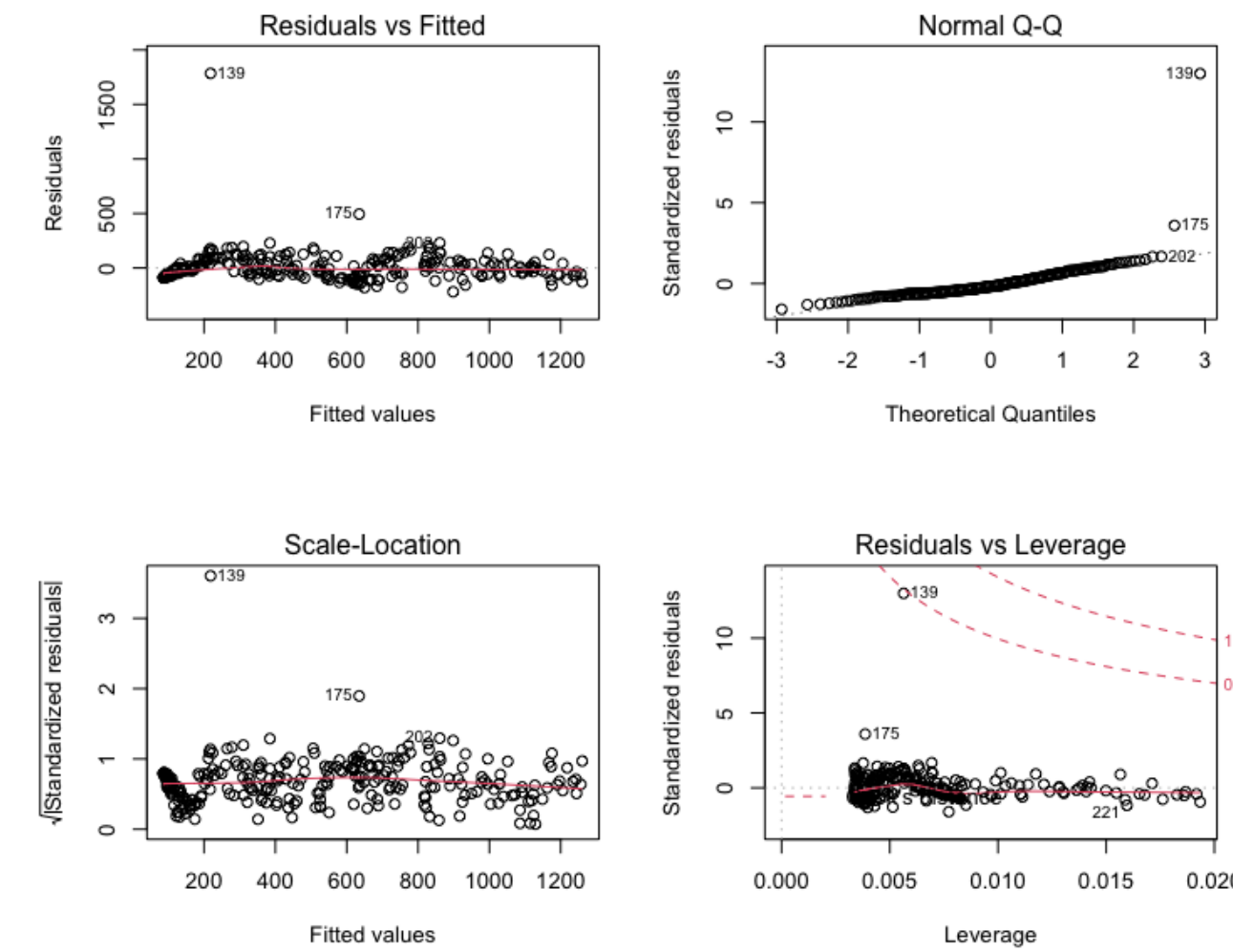
- Null hypothesis: $H_0: \beta_1 = 0$,
Alternative hypothesis: $H_1: \beta_1 \neq 0$
- The coefficient: 0.051, y-intercept: 4746.098
- $y = 4746.098 + 0.051x$
- R-squared: 0.6794, Adjusted R-squared: 0.0784
- We do not reject null hypothesis
- There is no relationship between Covid-19 test and case numbers in 2020



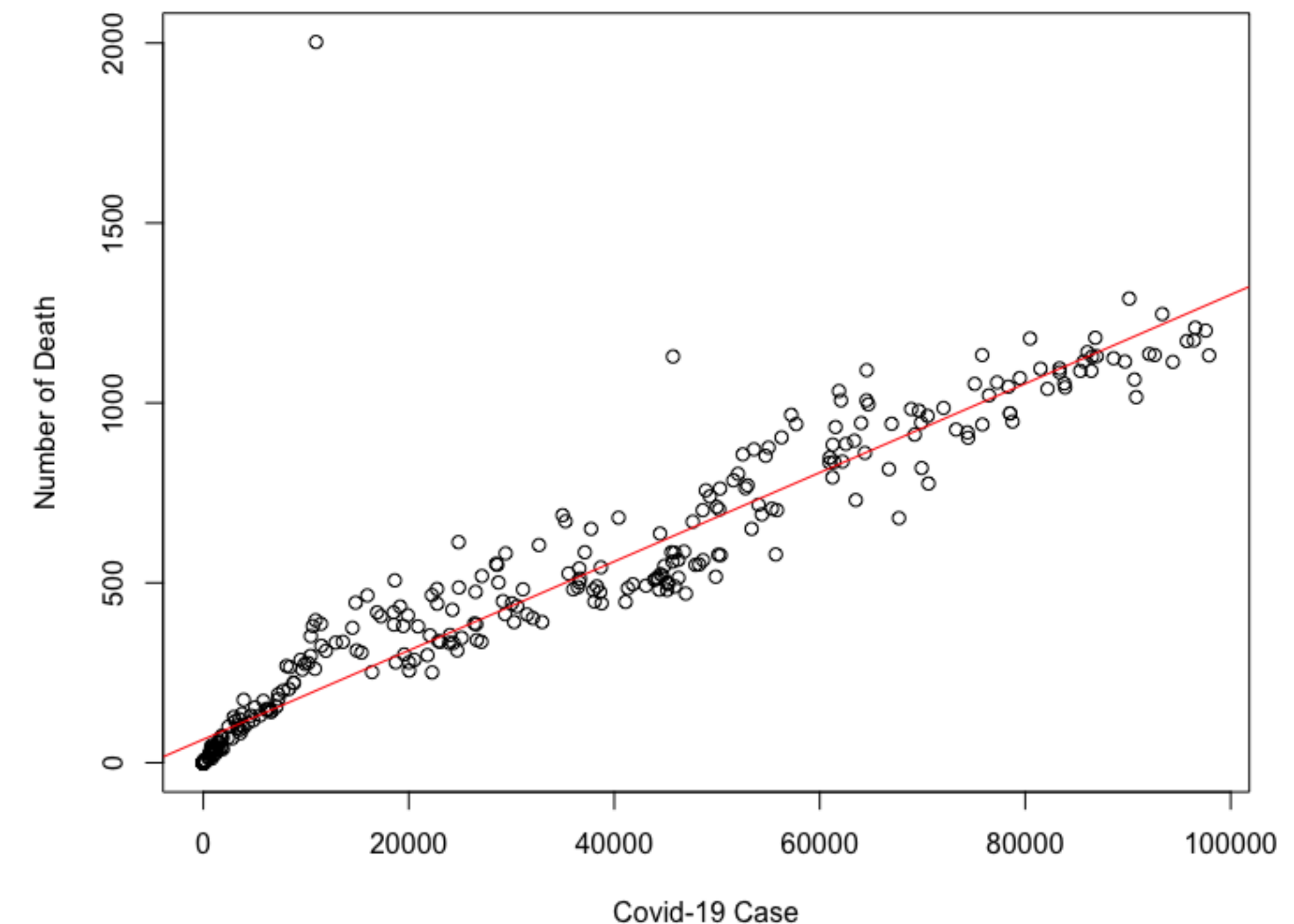
Covid-19 Case and Deaths

India in 2020

- Null hypothesis: $H_0: \beta_1 = 0$,
Alternative hypothesis: $H_1: \beta_1 \neq 0$
- The coefficient: 0.011, y-intercept: 86.716
- $y = 86.716 + 0.011x$
- R-squared: 0.8655, Adjusted R-squared: 0.865
- We reject null hypothesis
- There is a positive relationship between Covid-19 case and death numbers in 2020



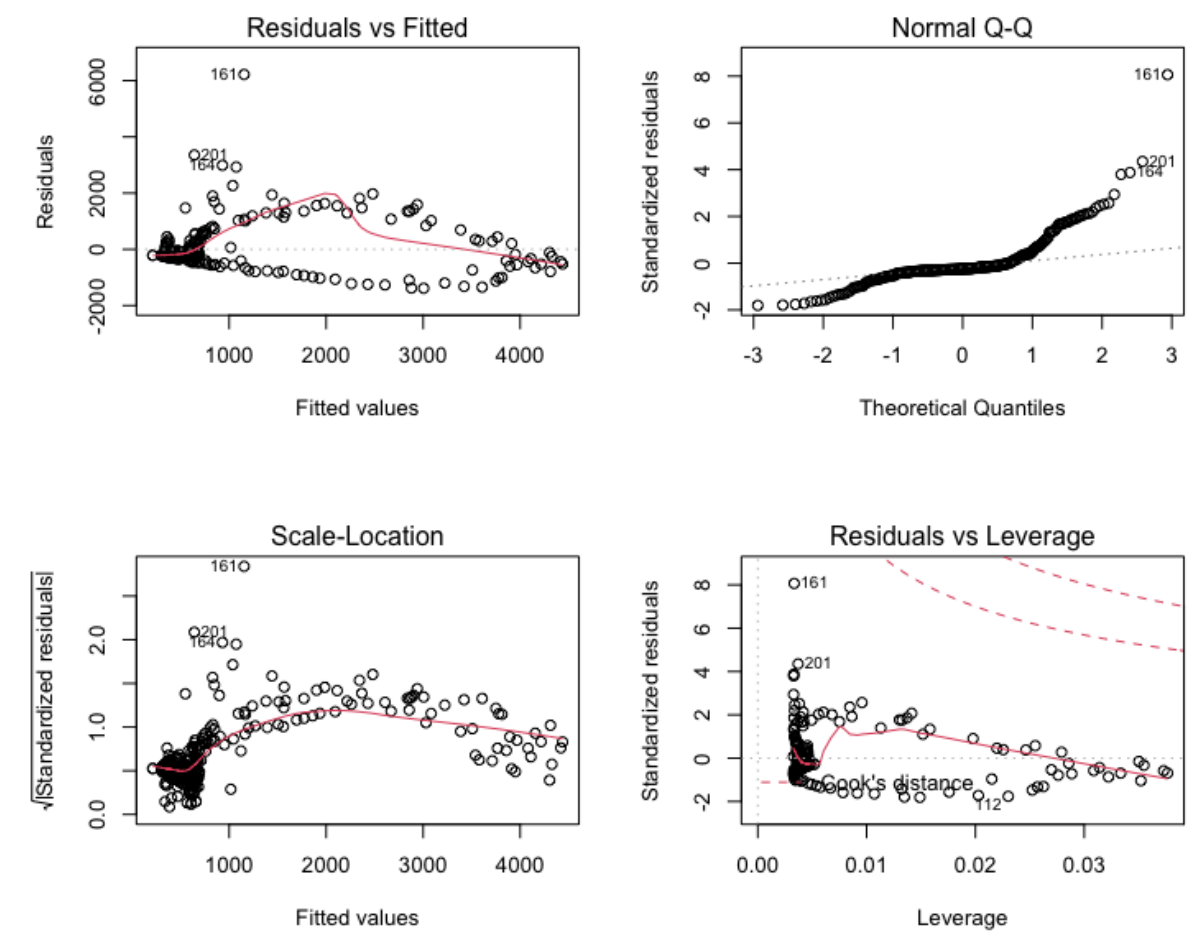
Covid-19 Cases and Number of Death in 2020



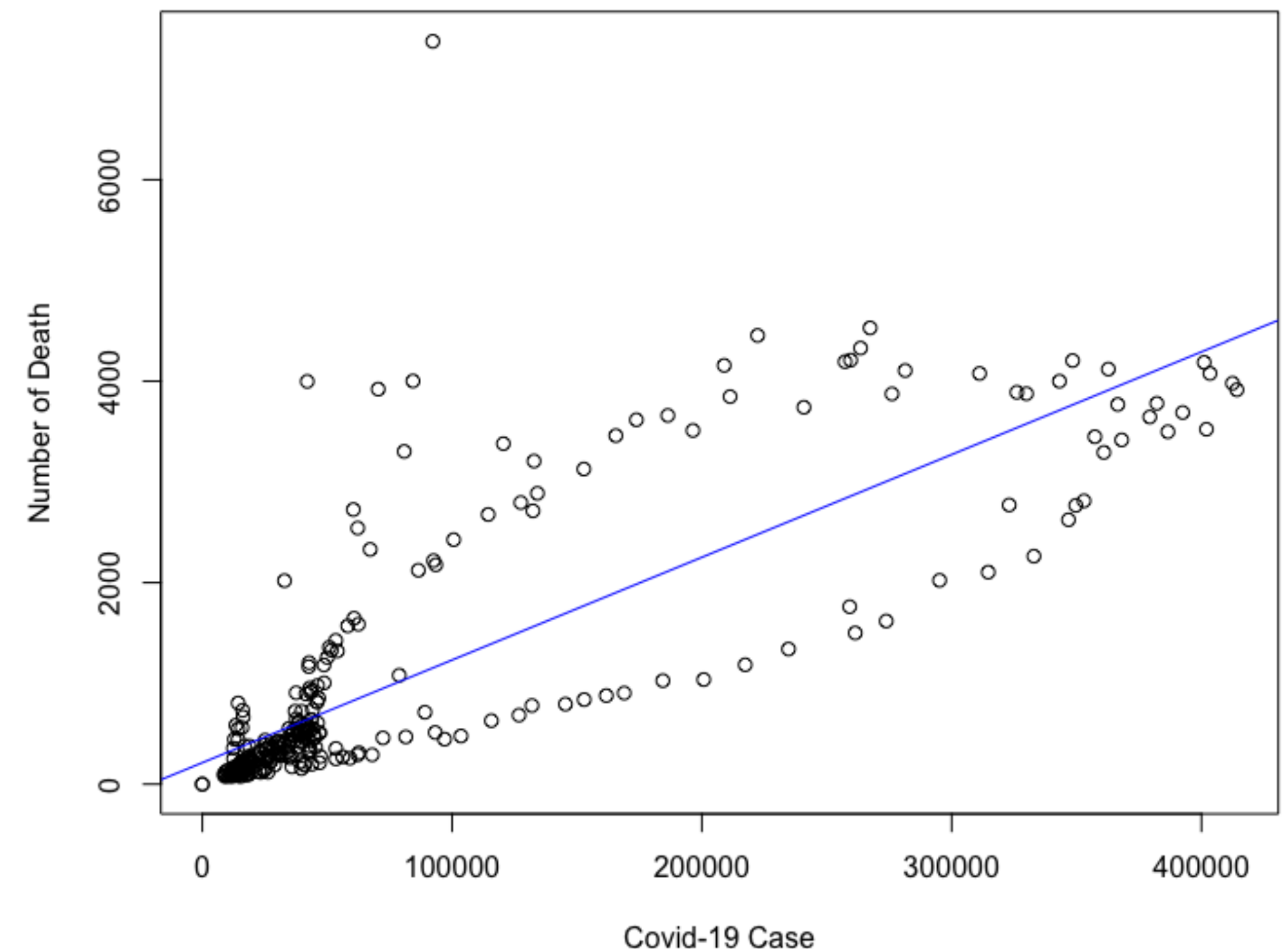
Covid-19 Case and Deaths

India in 2021

- Null hypothesis: $H_0: \beta_1 = 0$,
Alternative hypothesis: $H_1: \beta_1 \neq 0$
- The coefficient: 0.010, y-intercept: 212.720
- $y = 212.720 + 0.010x$
- R-squared: 0.6536, Adjusted R-squared: 0.6524
- We do not reject null hypothesis
- There is no relationship between Covid-19 test and case numbers in 2020



Covid-19 Cases and Number of Death in 2021



Conclusion

India Covid-19 Data Analysis

- Is there a relationship between number of Covid-19 tests conducted and recorded Covid-19 cases?
 - Did not have a relationship
 - Subtle positive relationship at the beginning of 2020 → potentially meaning the test was only available for people who had strong Covid-19
 - Later test were probably more widely available, even with slight symptoms so that the test result did not impact to the Covid-19 cases
- Did the number of Covid-19 cases have an impact on the numbers of deaths in India 2020 and 2021?
 - Only 2020 has a positive relationship
 - Covid-19 had severe impact to entire mortality rate in 2020
 - Later probably the policies such as keeping distance, wearing mask or vaccinations might have protected from Covid-19 so did not have a relationship in 2021

Thank you

Reference

- Data on COVID-19 (coronavirus) by Our World in Data, <https://github.com/owid/covid-19-data/tree/master/public/data> (Dec 12, 2021)
- Selva Prabhakaran, Linear Regression, <http://r-statistics.co/Linear-Regression.html> (Dec 12, 2021)
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- Zach, How to Interpret a Scale-Location Plot (With Examples), Statology, Nov 25.2020, <https://www.statology.org/scale-location-plot/> (Dec 13, 2021)
- Zach, Understanding the Null Hypothesis for Linear Regression, Statology, May 14.2021, <https://www.statology.org/null-hypothesis-for-linear-regression/> (Dec 13, 2021)
- Zach, What is a Residuals vs. Leverage Plot? (Definition & Example), Statology, Sep 7.2021, <https://www.statology.org/residuals-vs-leverage-plot/> (Dec 13, 2021)