

# Visualizations for CDC 2024

2024-09-28

Import Libraries

Read in Cleaned Data

```
DT <- read_csv("Datasets/Death_And_Trips_Per_State.csv")
```

```
## Rows: 282 Columns: 12
## -- Column specification -----
## Delimiter: ","
## chr (1): Jurisdiction
## dbl (11): Year, Month, Covid_Deaths, Total_Deaths, Pneumonia_Deaths, Influen...
##
## i Use 'spec()' to retrieve the full column specification for this data.
## i Specify the column types or set 'show_col_types = FALSE' to quiet this message.
```

```
head(DT)
```

```
## # A tibble: 6 x 12
##   Year Month Jurisdiction Covid_Deaths Total_Deaths Pneumonia_Deaths
##   <dbl> <dbl> <chr>          <dbl>      <dbl>      <dbl>
## 1  2019    12 California          0      11730      1227
## 2  2019    12 Florida            0       8480       492
## 3  2019    12 Georgia             0       3626       224
## 4  2019    12 New York            0       6638       686
## 5  2019    12 North Carolina        0       3960       250
## 6  2019    12 Wyoming              0        374        33
## # i 6 more variables: Influenza_Deaths <dbl>, Pneumonia_Influenza_Deaths <dbl>,
## #   Pneumonia_Influenza_Covid <dbl>, Local_Trips <dbl>, Interstate_Trips <dbl>,
## #   Long_Distance_Trips <dbl>
```

California Stats

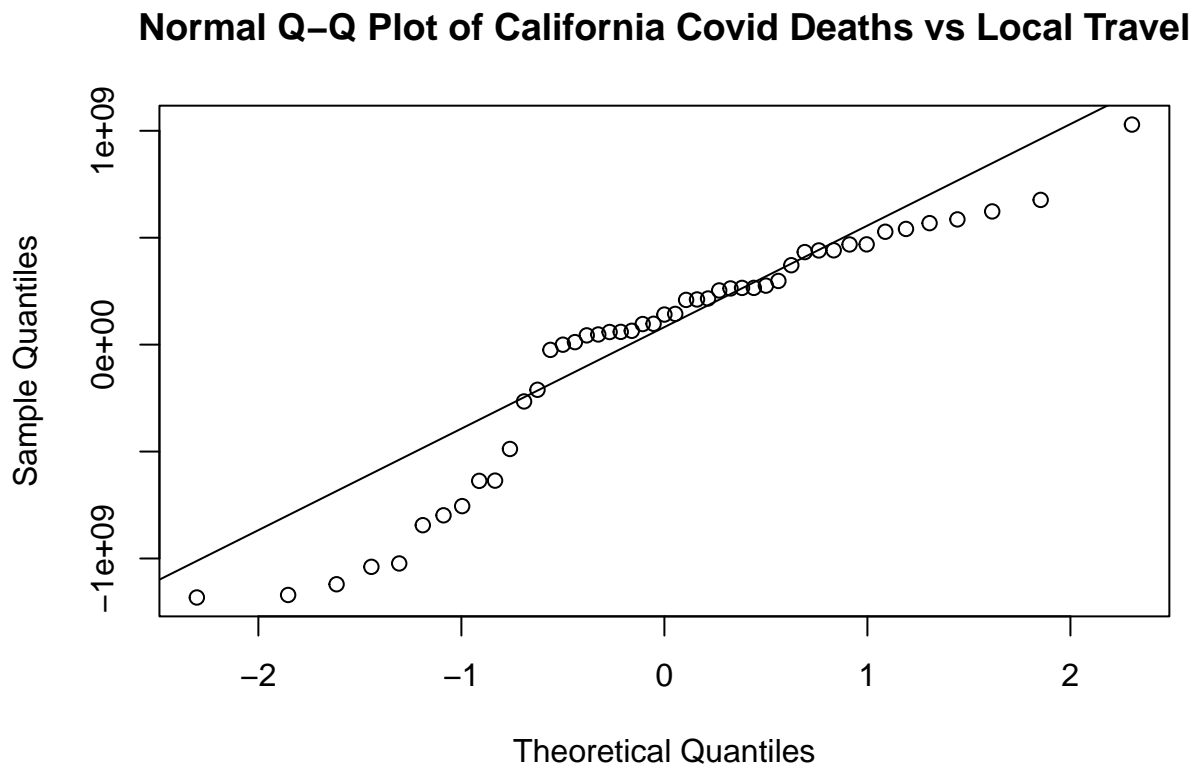
California Covid Deaths vs Local Travel

```
CA = DT[DT$Jurisdiction == 'California',]
head(CA)
```

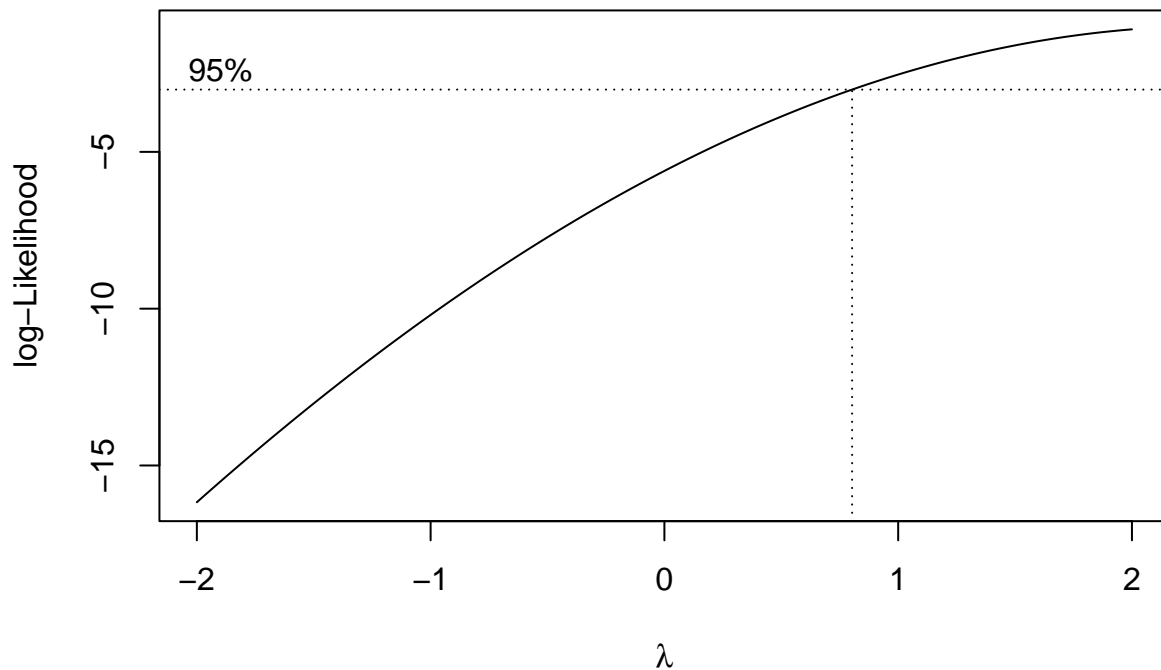
```
## # A tibble: 6 x 12
##   Year Month Jurisdiction Covid_Deaths Total_Deaths Pneumonia_Deaths
##   <dbl> <dbl> <chr>          <dbl>      <dbl>      <dbl>
## 1  2019    12 California          0      11730      1227
## 2  2020     1 California      456     46204      4788
## 3  2020     2 California      912     45776      4745
```

```
## 4 2020      3 California      2078      56890      6405
## 5 2020      4 California      3998      47496      5962
## 6 2020      5 California      4896      55824      6633
## # i 6 more variables: Influenza_Deaths <dbl>, Pneumonia_Influenza_Deaths <dbl>,
## #   Pneumonia_Influenza_Covid <dbl>, Local_Trips <dbl>, Interstate_Trips <dbl>,
## #   Long_Distance_Trips <dbl>
```

```
model <- lm(CA$Local_Trips ~ CA$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of California Covid Deaths vs Local Travel")
qqline(model$residuals)
```



```
CA$CookD = cooks.distance(model)
CAC <- CA[which(CA$CookD < 0.5),]
bc <- boxcox(CAC$Local_Trips ~ CAC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
CAC$Local_Trips1 <- (((CAC$Local_Trips)^lambda - 1) / lambda)
new_model <- lm(CAC$Local_Trips1 ~ CAC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = CAC$Local_Trips1 ~ CAC$Covid_Deaths)
##
## Residuals:
```

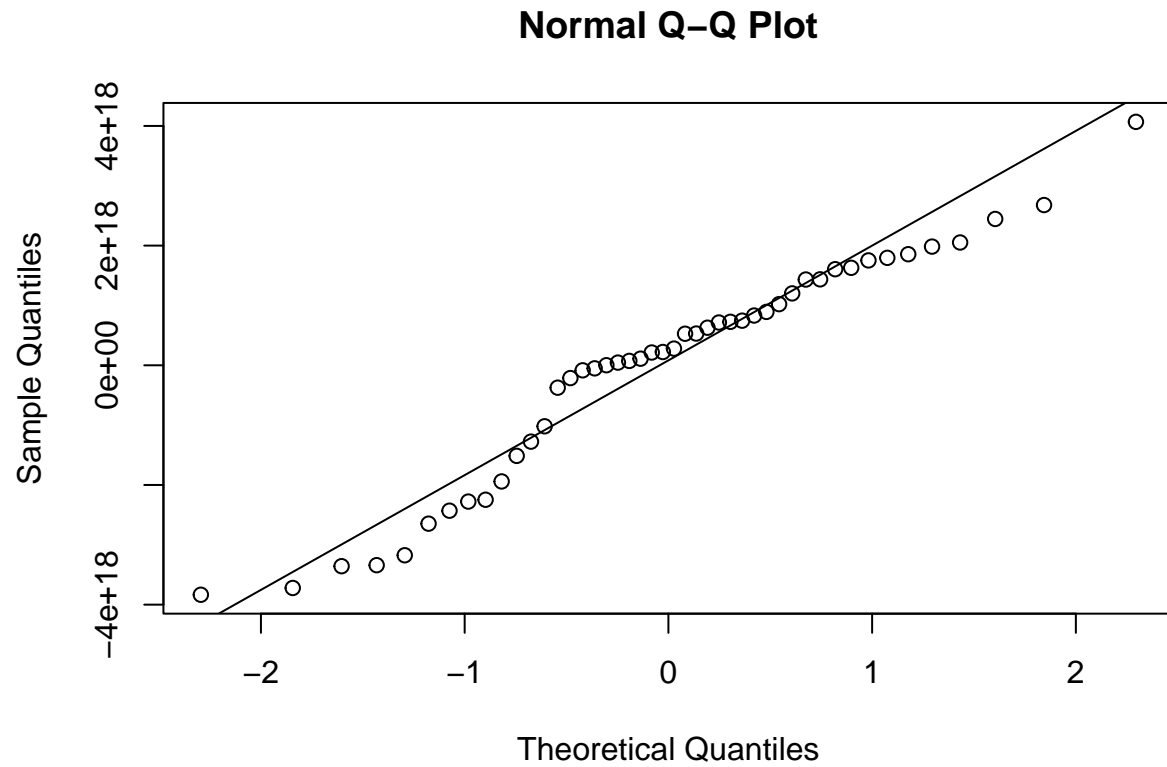
	Min	1Q	Median	3Q	Max
##	-3.835e+18	-1.212e+18	2.507e+17	1.375e+18	4.068e+18

```
##
## Coefficients:
```

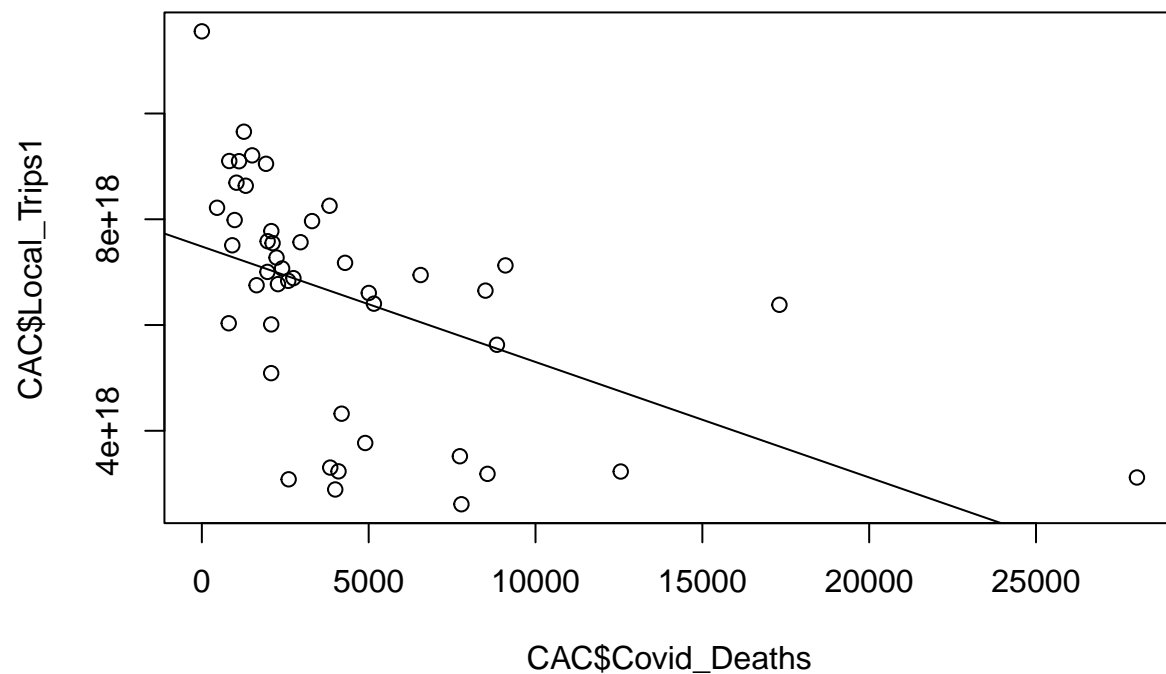
	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	7.485e+18	3.734e+17	20.047	< 2e-16 ***
## CAC\$Covid_Deaths	-2.184e+14	5.683e+13	-3.843	0.000387 ***

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.888e+18 on 44 degrees of freedom
## Multiple R-squared:  0.2513, Adjusted R-squared:  0.2343
## F-statistic: 14.77 on 1 and 44 DF, p-value: 0.000387
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(CAC$Local_Trips1 ~ CAC$Covid_Deaths)
abline(new_model)
```



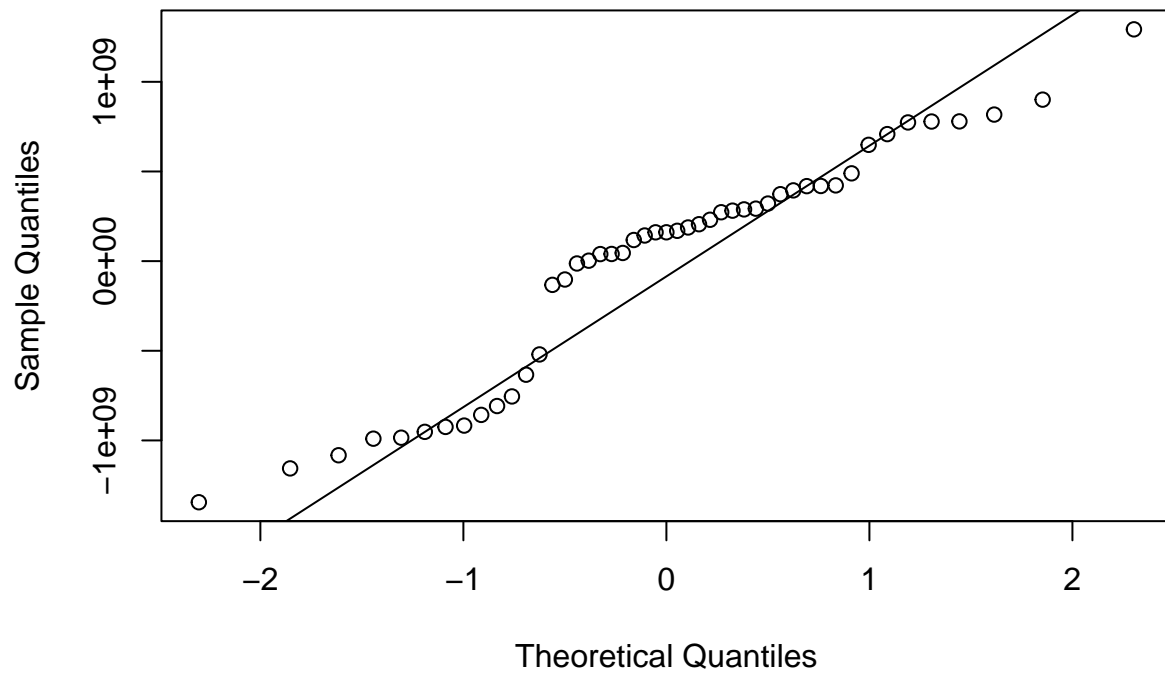
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %        97.5 %
## (Intercept)    6.732428e+18  8.237407e+18
## CAC$Covid_Deaths -3.329148e+14 -1.038586e+14
```

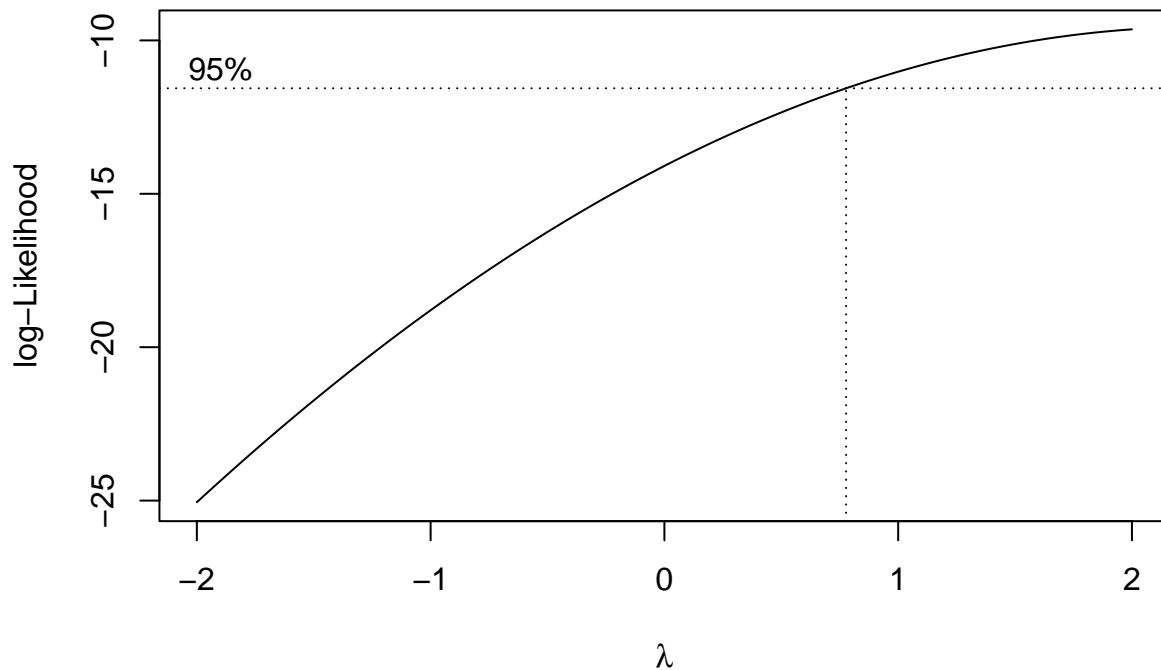
California Influenza Deaths vs Local Travel

```
model <- lm(CA$Local_Trips ~ CA$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of California Influenza Deaths vs Local Travel")
qqline(model$residuals)
```

## Normal Q–Q Plot of California Influenza Deaths vs Local Travel



```
CA$CookD = cooks.distance(model)
CAI <- CA[which(CA$CookD < 0.5),]
bc <- boxcox(CAI$Local_Trips ~ CAI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
CAI$Local_Trips1 <- (((CAI$Local_Trips)^lambda - 1) / lambda)
new_model <- lm(CAI$Local_Trips1 ~ CAI$Influenza_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = CAI$Local_Trips1 ~ CAI$Influenza_Deaths)
##
## Residuals:
```

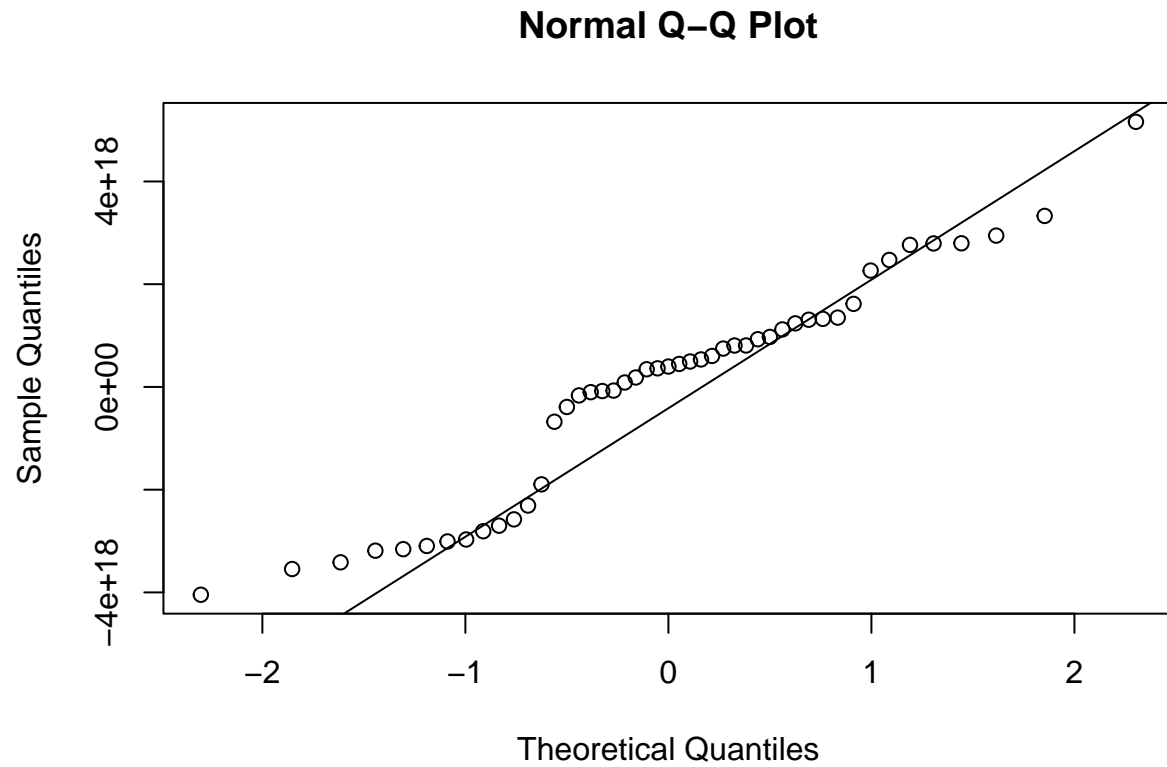
	Min	1Q	Median	3Q	Max
	-4.045e+18	-2.103e+18	3.970e+17	1.273e+18	5.160e+18

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	6.113e+18	3.922e+17	15.59	<2e-16 ***
CAI\$Influenza_Deaths	3.040e+15	2.112e+15	1.44	0.157

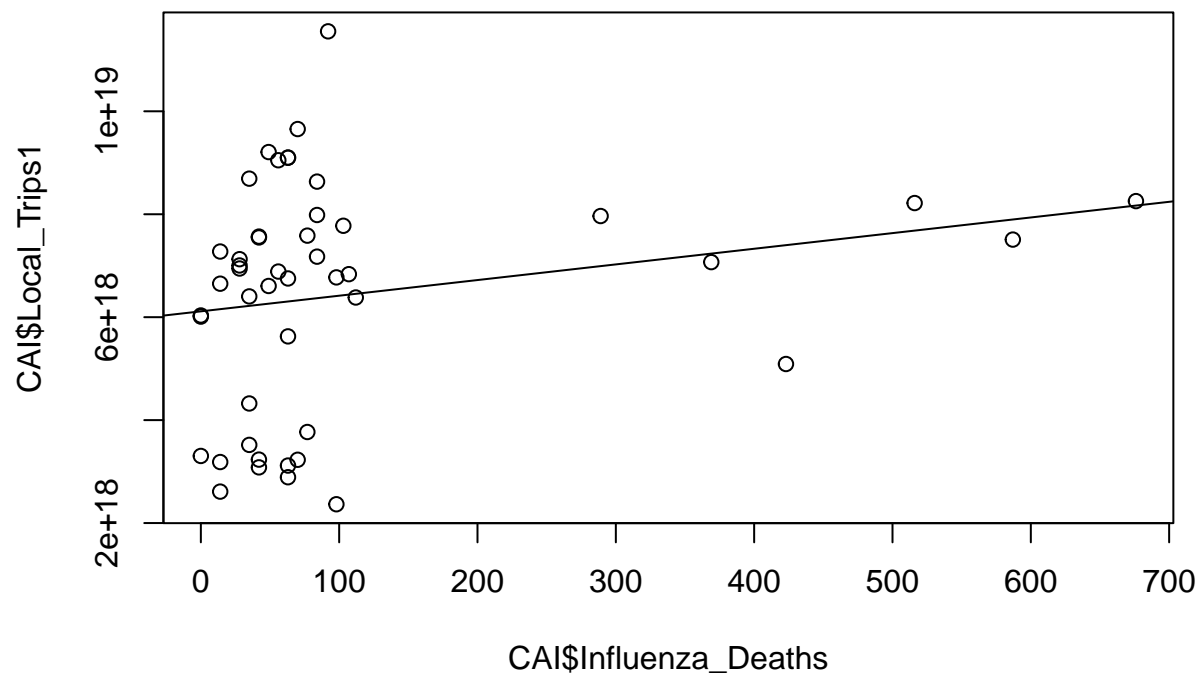
```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.193e+18 on 45 degrees of freedom
## Multiple R-squared:  0.04404,    Adjusted R-squared:  0.0228
## F-statistic: 2.073 on 1 and 45 DF,  p-value: 0.1568
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(CAI$Local_Trips1 ~ CAI$Influenza_Deaths)
abline(new_model)
```





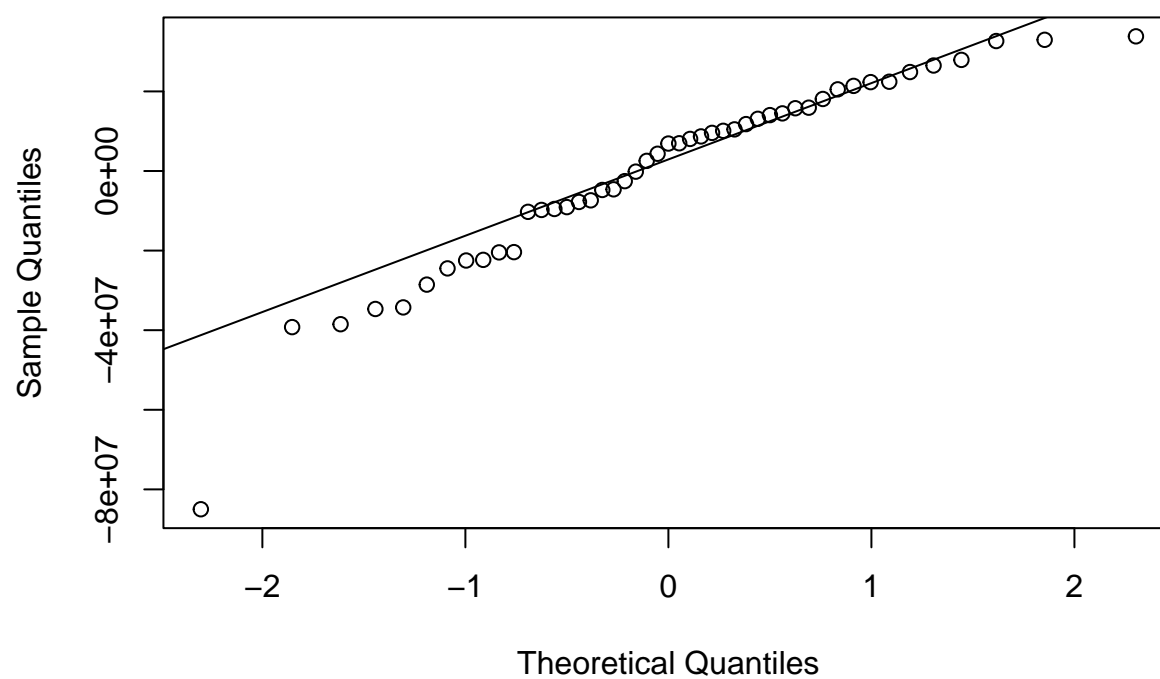
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)      5.323084e+18 6.903048e+18
## CAI$Influenza_Deaths -1.212697e+15 7.293562e+15
```

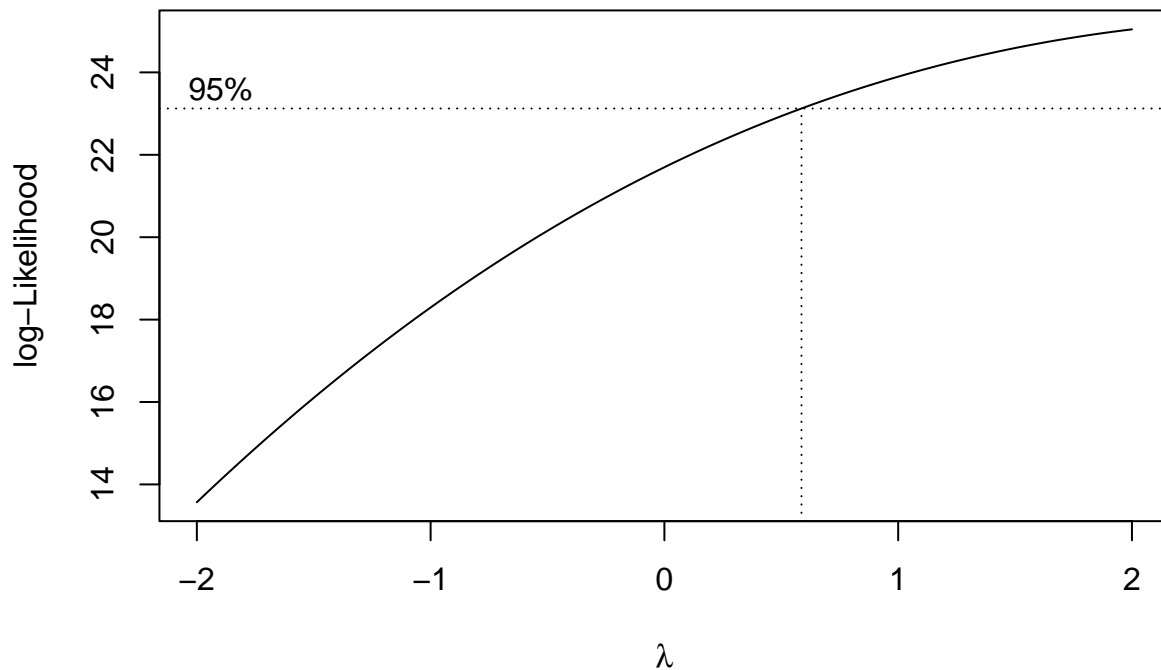
California Covid Deaths vs Interstate Travel

```
model <- lm(CA$Interstate_Trips ~ CA$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of California Covid Deaths vs Inter Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of California Covid Deaths vs Inter Travel



```
CA$CookD = cooks.distance(model)
CAC <- CA[which(CA$CookD < 0.5),]
bc <- boxcox(CAC$Interstate_Trips ~ CAC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
CAC$Interstate_Trips1 <- (((CAC$Interstate_Trips)^lambda - 1) / lambda)
new_model <- lm(CAC$Interstate_Trips1 ~ CAC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = CAC$Interstate_Trips1 ~ CAC$Covid_Deaths)
##
## Residuals:
```

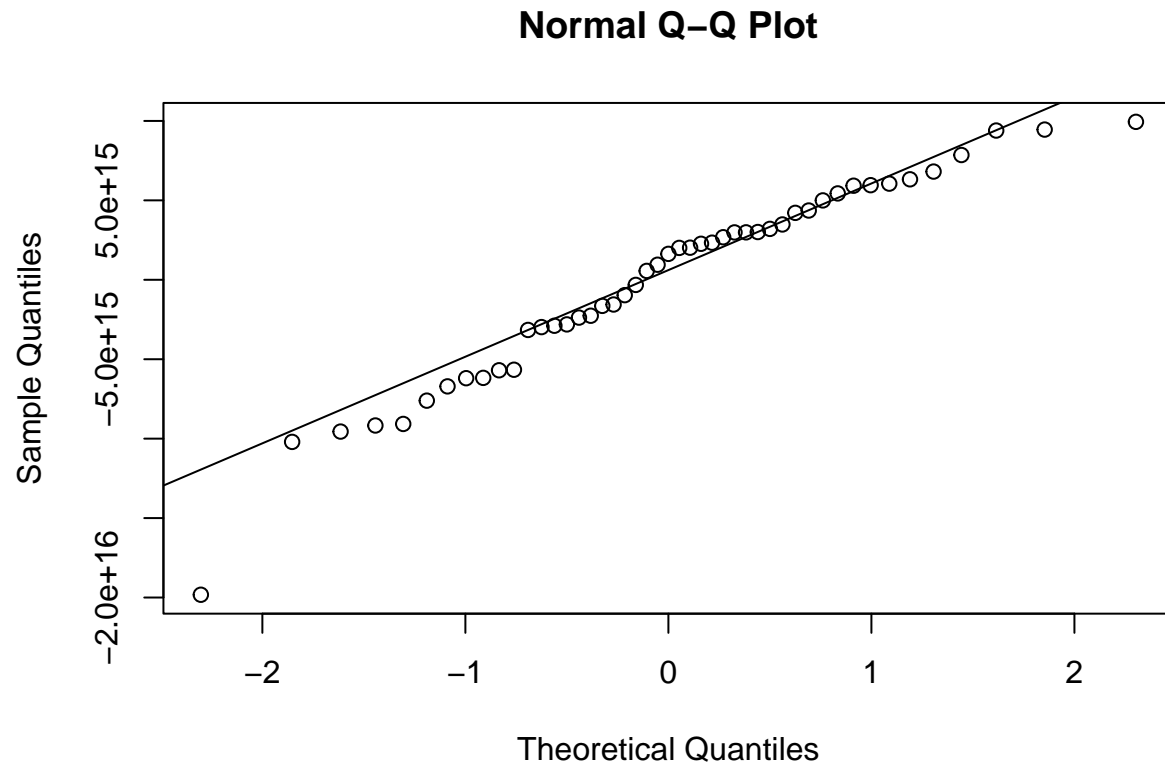
	Min	1Q	Median	3Q	Max
	-1.983e+16	-3.067e+15	1.632e+15	4.288e+15	9.942e+15

```
##
## Coefficients:
```

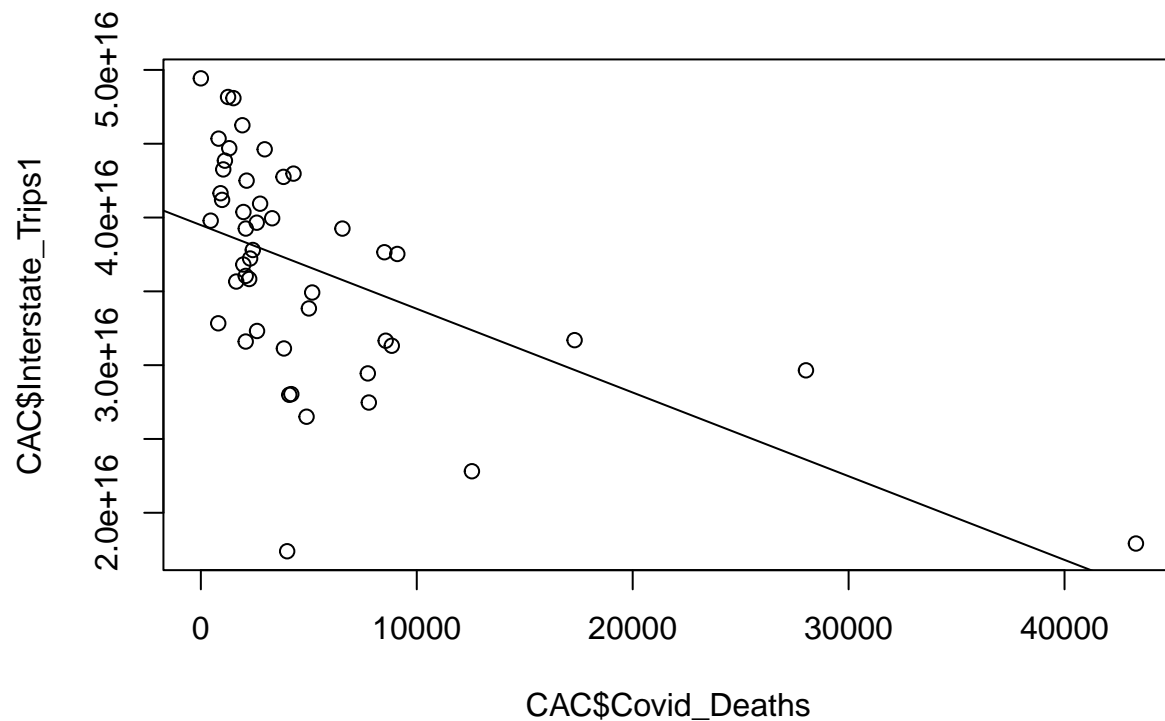
	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	3.949e+16	1.112e+15	35.50	< 2e-16 ***
CAC\$Covid_Deaths	-5.670e+11	1.227e+11	-4.62	3.22e-05 ***

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.241e+15 on 45 degrees of freedom
## Multiple R-squared:  0.3217, Adjusted R-squared:  0.3067
## F-statistic: 21.35 on 1 and 45 DF,  p-value: 3.219e-05
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(CAC$Interstate_Trips1 ~ CAC$Covid_Deaths)
abline(new_model)
```



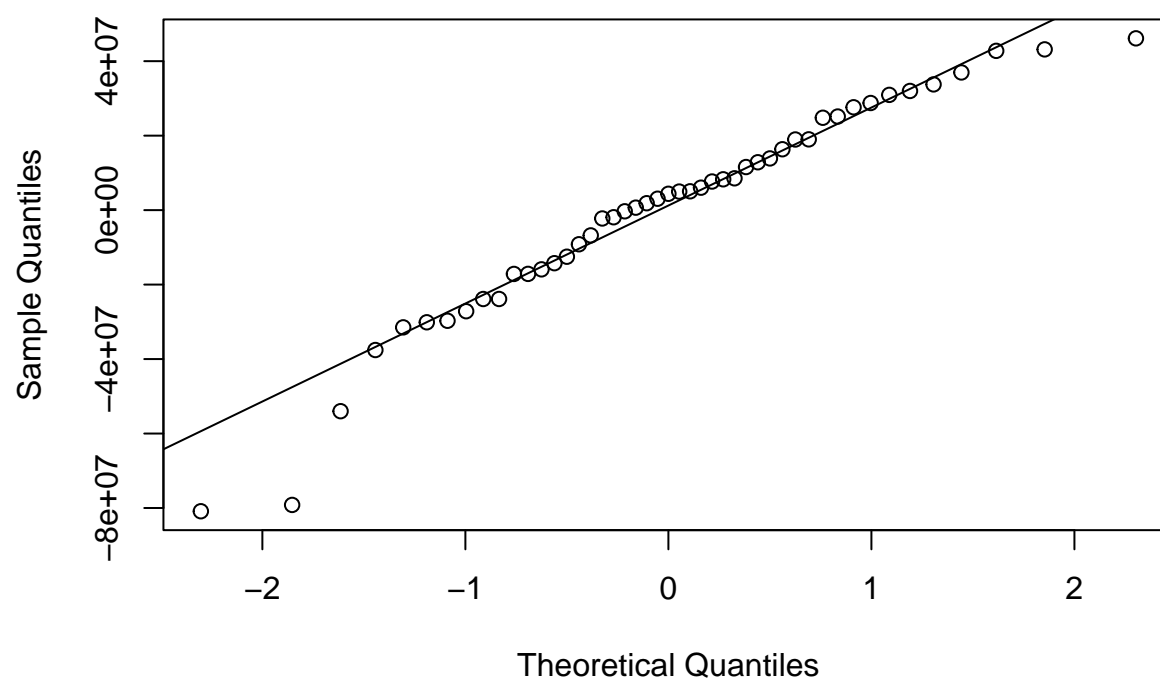
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %        97.5 %
## (Intercept)    3.724632e+16  4.172704e+16
## CAC$Covid_Deaths -8.141648e+11 -3.198252e+11
```

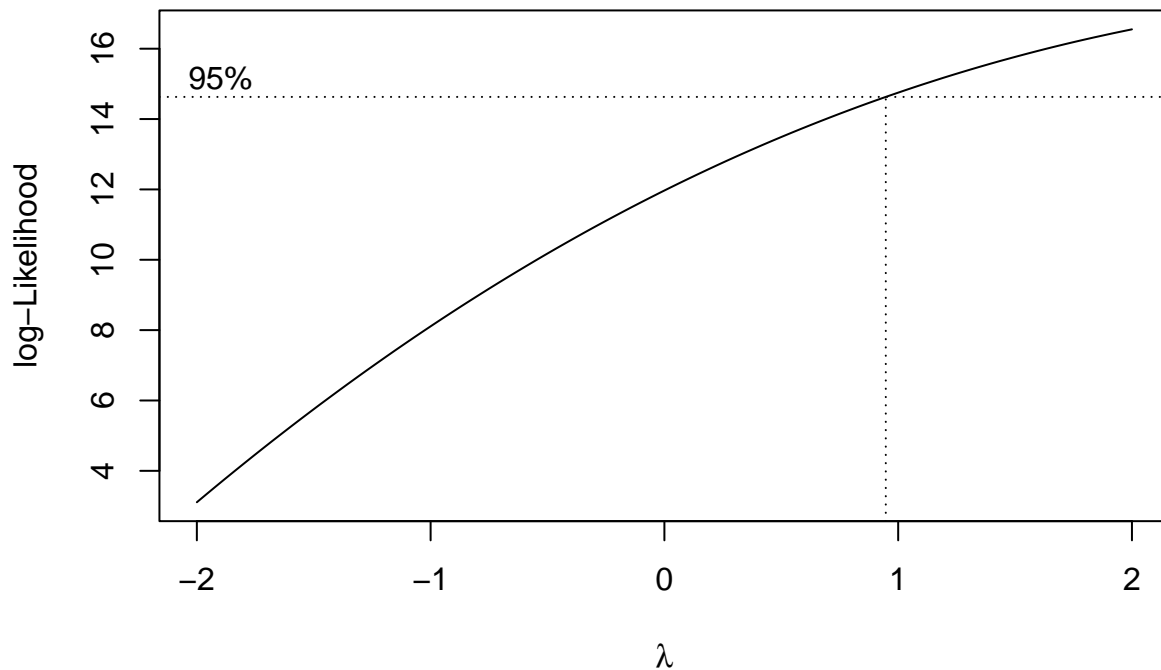
California Influenza Deaths vs Interstate Travel

```
model <- lm(CA$Interstate_Trips ~ CA$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of California Influenza Deaths vs Inter Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of California Influenza Deaths vs Inter Travel



```
CA$CookD = cooks.distance(model)
CAI <- CA[which(CA$CookD < 0.5),]
bc <- boxcox(CAI$Interstate_Trips ~ CAI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
CAI$Interstate_Trips1 <- (((CAI$Interstate_Trips)^lambda - 1) / lambda)
new_model <- lm(CAI$Interstate_Trips1 ~ CAI$Influenza_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = CAI$Interstate_Trips1 ~ CAI$Influenza_Deaths)
##
## Residuals:
```

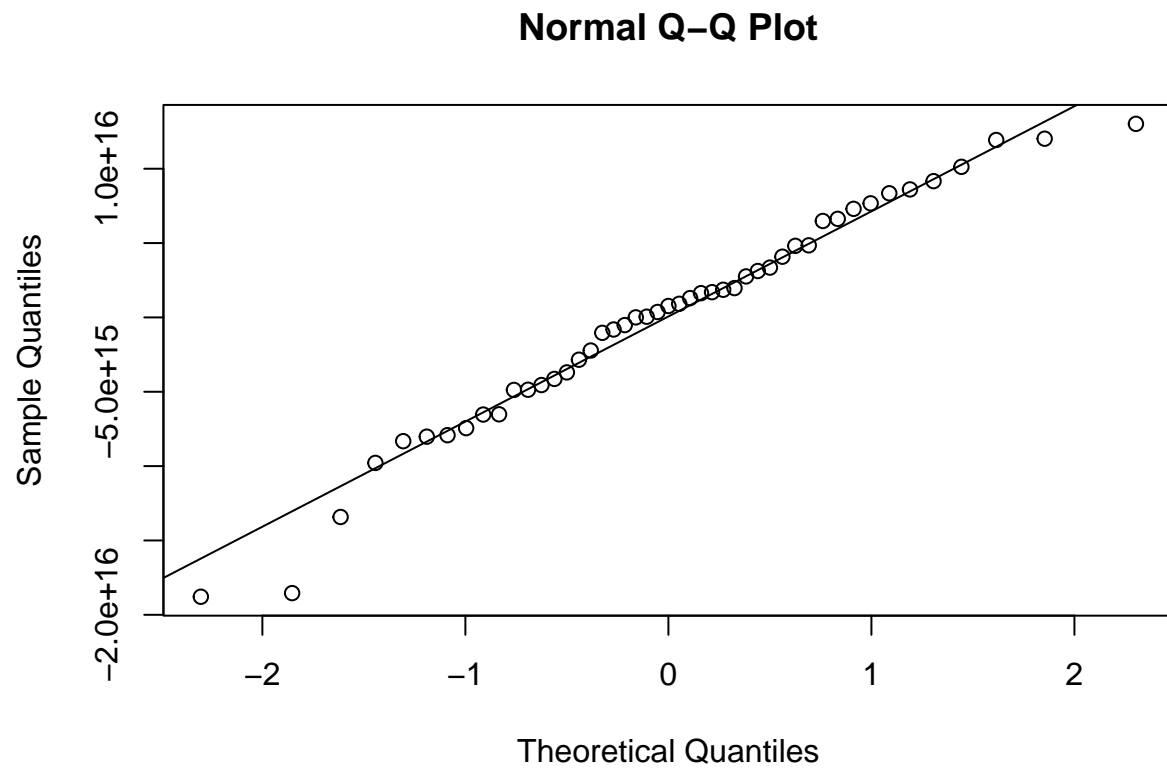
	Min	1Q	Median	3Q	Max
##	-1.879e+16	-4.706e+15	7.675e+14	4.831e+15	1.302e+16

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	3.568e+16	1.337e+15	26.677	<2e-16 ***
## CAI\$Influenza_Deaths	7.955e+12	7.201e+12	1.105	0.275

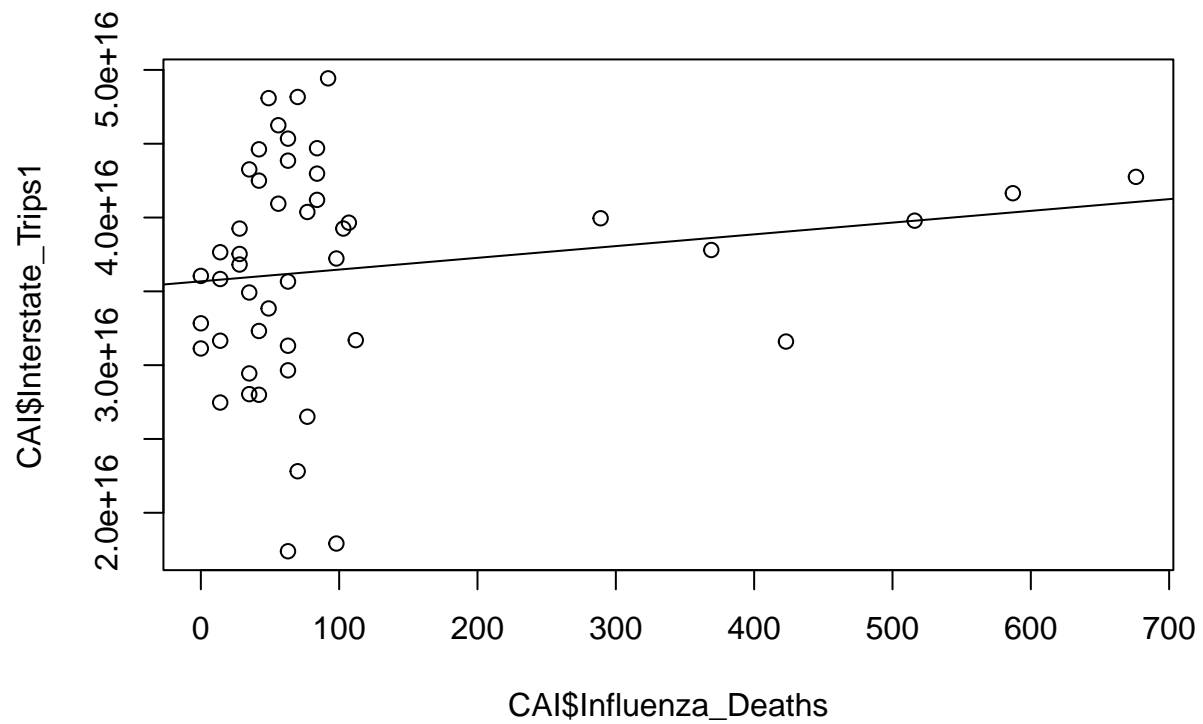
```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 7.478e+15 on 45 degrees of freedom
## Multiple R-squared:  0.02641,    Adjusted R-squared:  0.004772
## F-statistic: 1.221 on 1 and 45 DF,  p-value: 0.2751
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(CAI$Interstate_Trips1 ~ CAI$Influenza_Deaths)
abline(new_model)
```





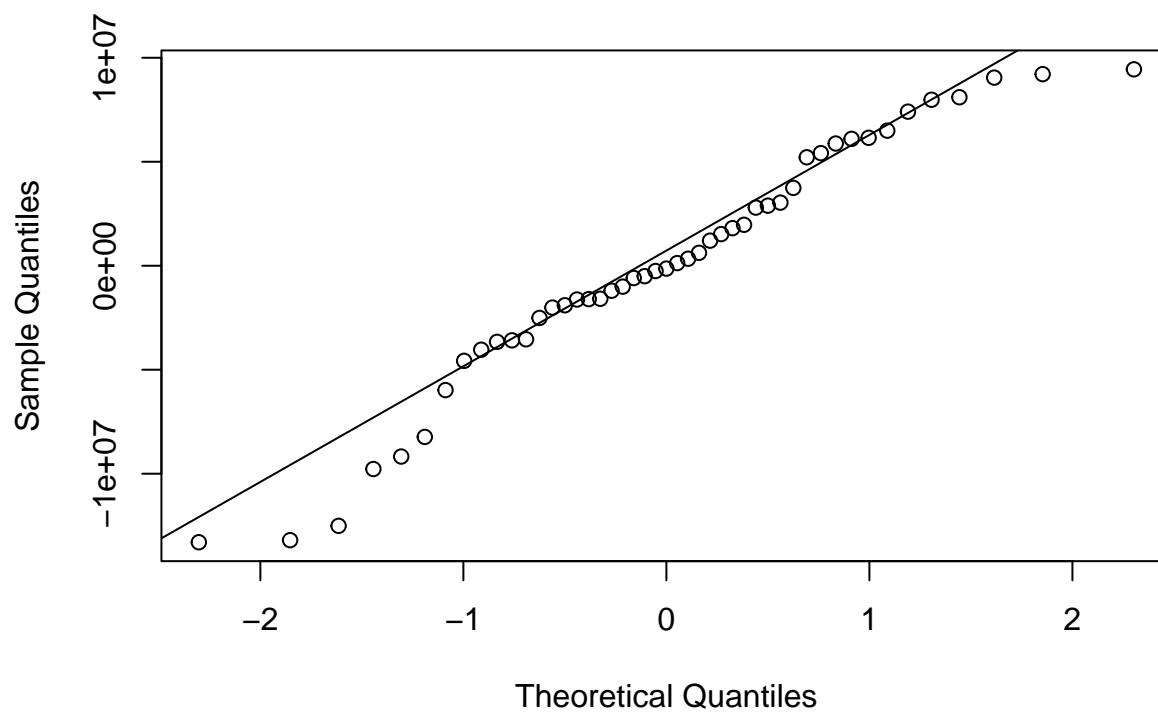
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)      3.298493e+16 3.837246e+16
## CAI$Influenza_Deaths -6.547580e+12 2.245799e+13
```

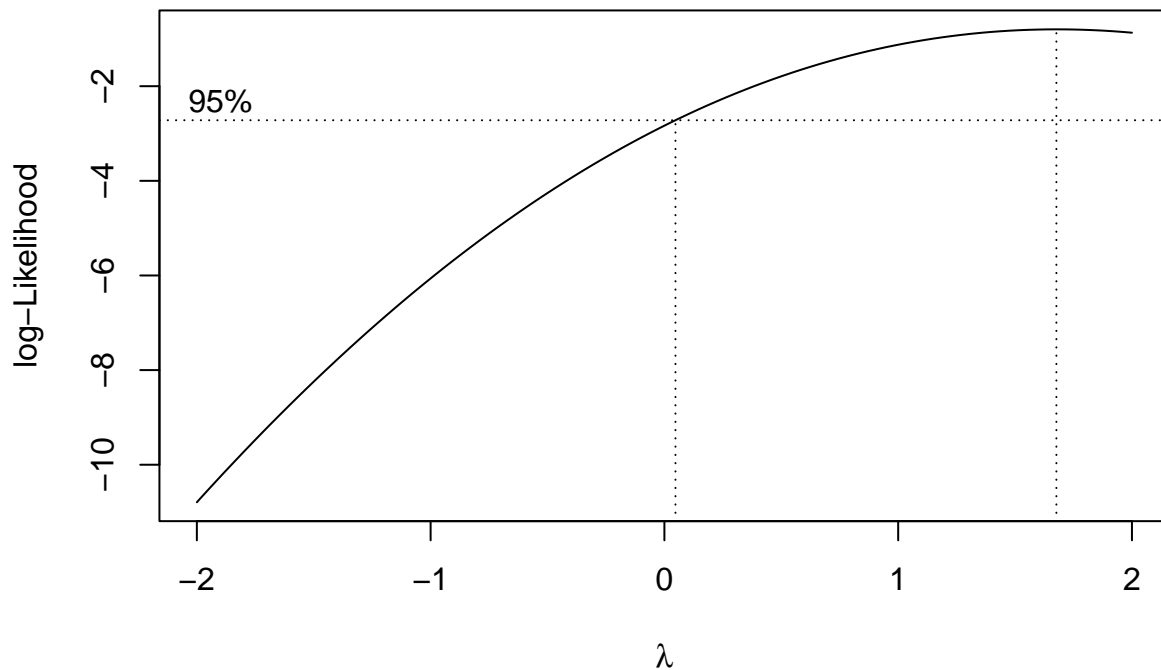
California Covid Deaths vs Long Distance Trips

```
model <- lm(CA$Long_Distance_Trips ~ CA$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of California Covid Deaths vs Long Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of California Covid Deaths vs Long Travel



```
CA$CookD = cooks.distance(model)
CAC <- CA[which(CA$CookD < 0.5),]
bc <- boxcox(CAC$Long_Distance_Trips ~ CAC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
CAC$Long_Distance_Trips1 <- (((CAC$Long_Distance_Trips)^lambda - 1) / lambda)
new_model <- lm(CAC$Long_Distance_Trips1 ~ CAC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = CAC$Long_Distance_Trips1 ~ CAC$Covid_Deaths)
##
## Residuals:
```

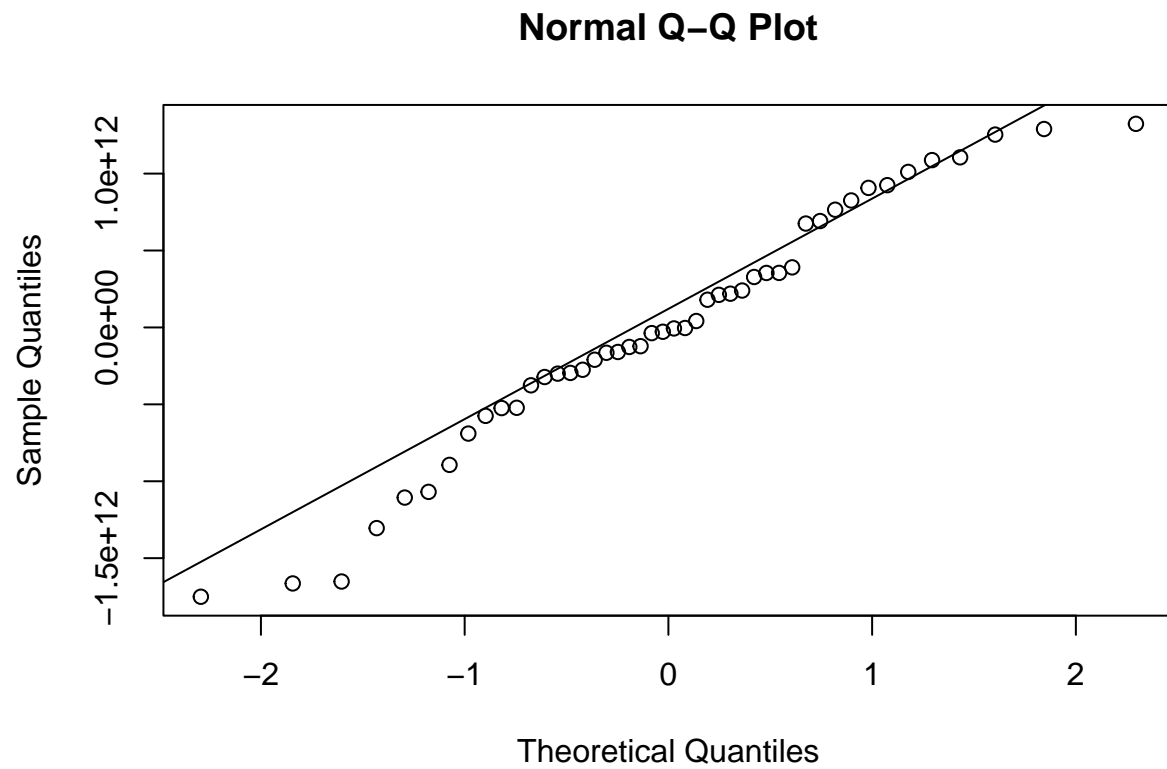
	Min	1Q	Median	3Q	Max
##	-1.751e+12	-3.628e+11	-1.733e+10	6.042e+11	1.324e+12

```
##
## Coefficients:
```

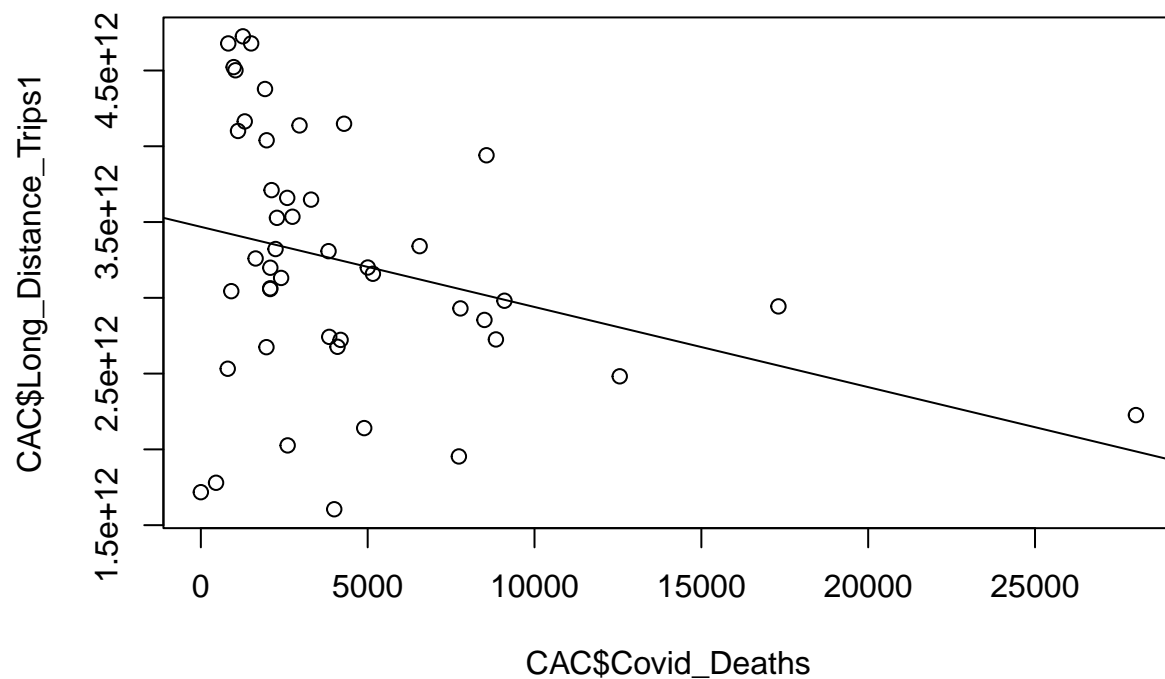
	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	3.468e+12	1.589e+11	21.824	<2e-16 ***
## CAC\$Covid_Deaths	-5.288e+07	2.419e+07	-2.186	0.0342 *

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 8.035e+11 on 44 degrees of freedom
## Multiple R-squared:  0.09798,    Adjusted R-squared:  0.07748
## F-statistic: 4.779 on 1 and 44 DF,  p-value: 0.03417
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(CAC$Long_Distance_Trips1 ~ CAC$Covid_Deaths)
abline(new_model)
```



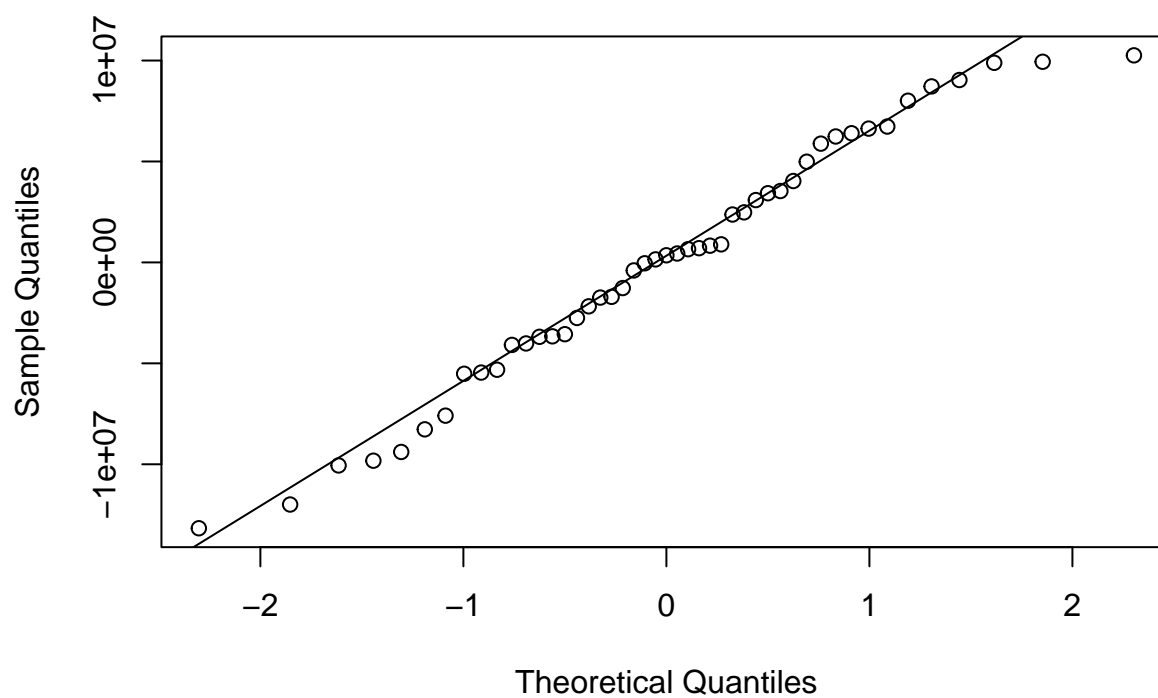
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %        97.5 %
## (Intercept)    3148066746944 3788661451360
## CAC$Covid_Deaths -101628600   -4130768
```

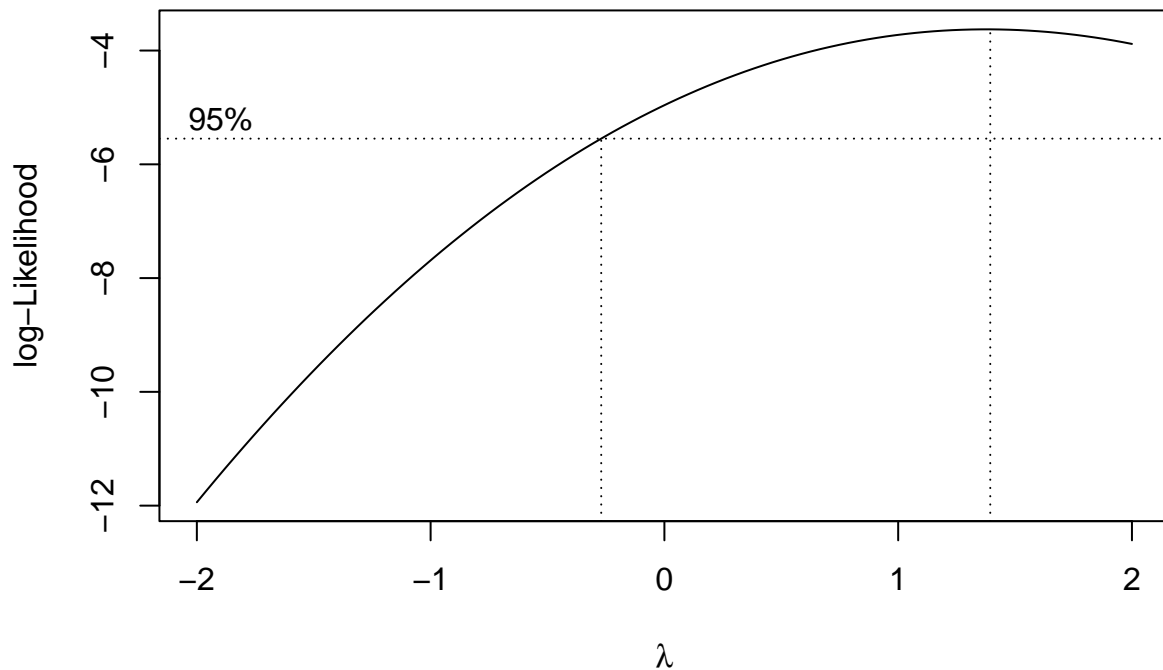
California Influenza Deaths vs Long Distance Trips

```
model <- lm(CA$Long_Distance_Trips ~ CA$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of California Influenza Deaths vs Long Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of California Influenza Deaths vs Long Travel



```
CA$CookD = cooks.distance(model)
CAI <- CA[which(CA$CookD < 0.5),]
bc <- boxcox(CAI$Long_Distance_Trips ~ CAI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
CAI$Long_Distance_Trips1 <- (((CAI$Long_Distance_Trips)^lambda - 1) / lambda)
new_model <- lm(CAI$Long_Distance_Trips1 ~ CAI$Influenza_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = CAI$Long_Distance_Trips1 ~ CAI$Influenza_Deaths)
##
## Residuals:
```

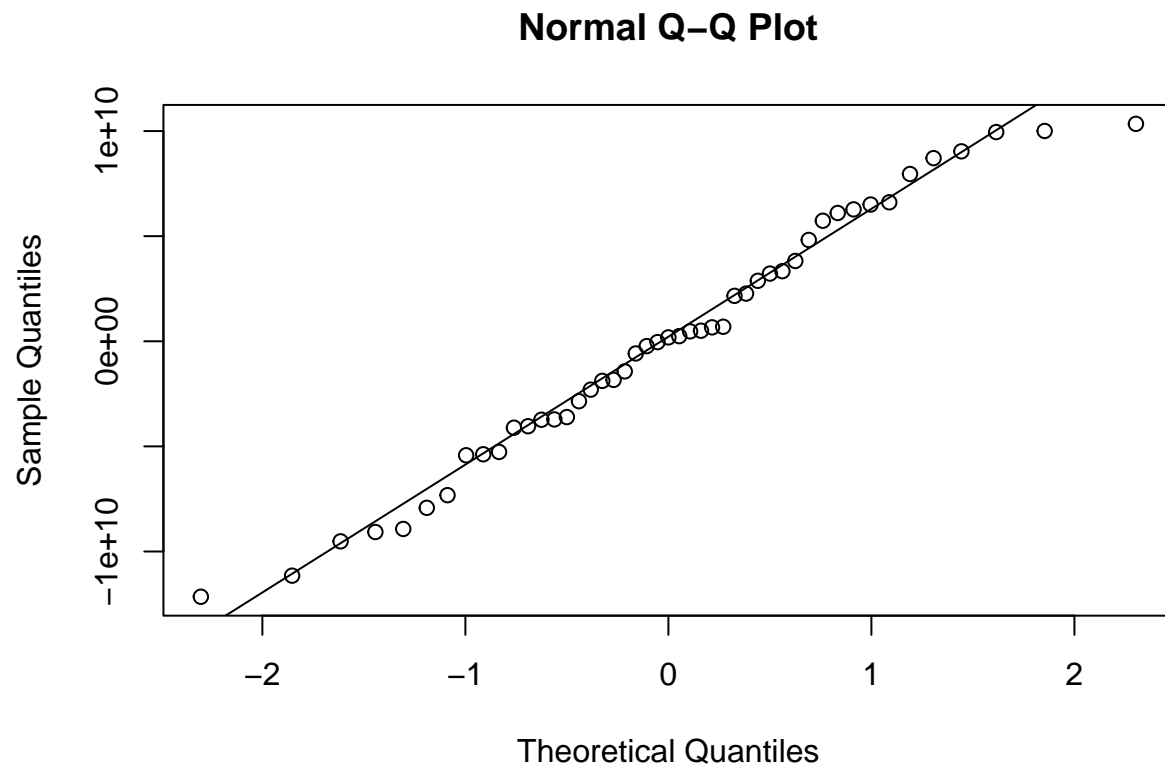
	Min	1Q	Median	3Q	Max
	-1.215e+10	-3.887e+09	1.845e+08	4.320e+09	1.034e+10

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	2.784e+10	1.075e+09	25.905	<2e-16 ***
CAI\$Influenza_Deaths	-3.737e+06	5.787e+06	-0.646	0.522

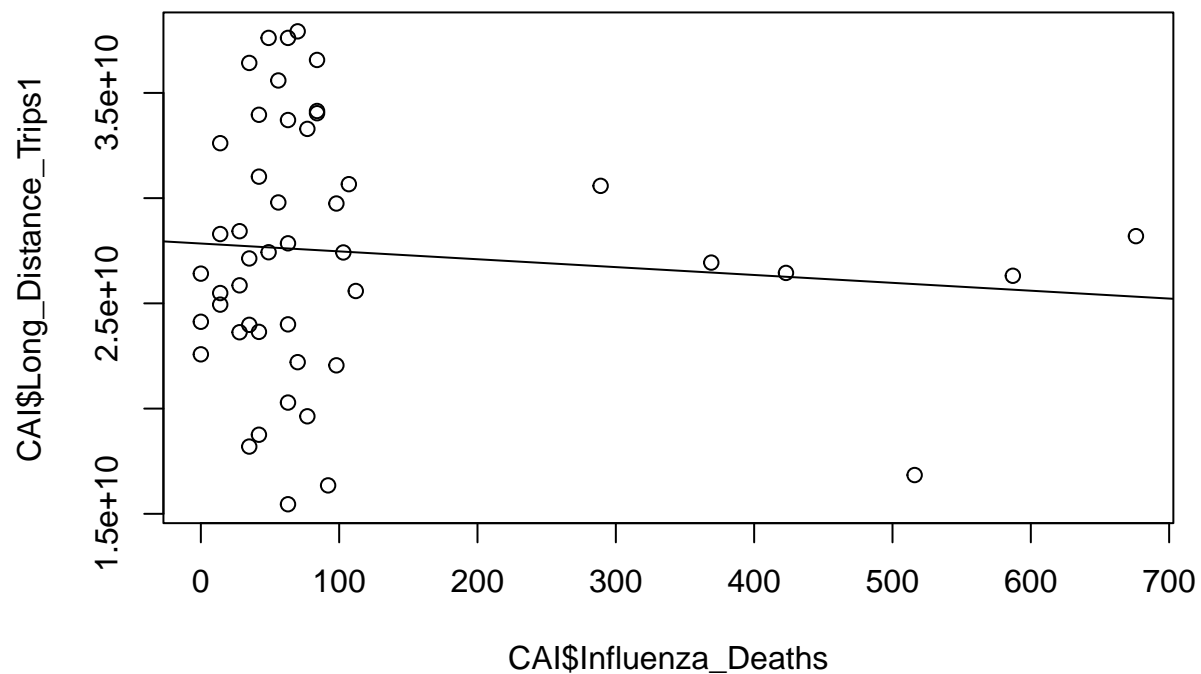
```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 6.01e+09 on 45 degrees of freedom
## Multiple R-squared:  0.009181, Adjusted R-squared: -0.01284
## F-statistic: 0.417 on 1 and 45 DF, p-value: 0.5217
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(CAI$Long_Distance_Trips1 ~ CAI$Influenza_Deaths)
abline(new_model)
```





```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##              2.5 %      97.5 %
## (Intercept) 25679400277 30009199525
## CAI$Influenza_Deaths -15392301  7918612
```

North Carolina Stats

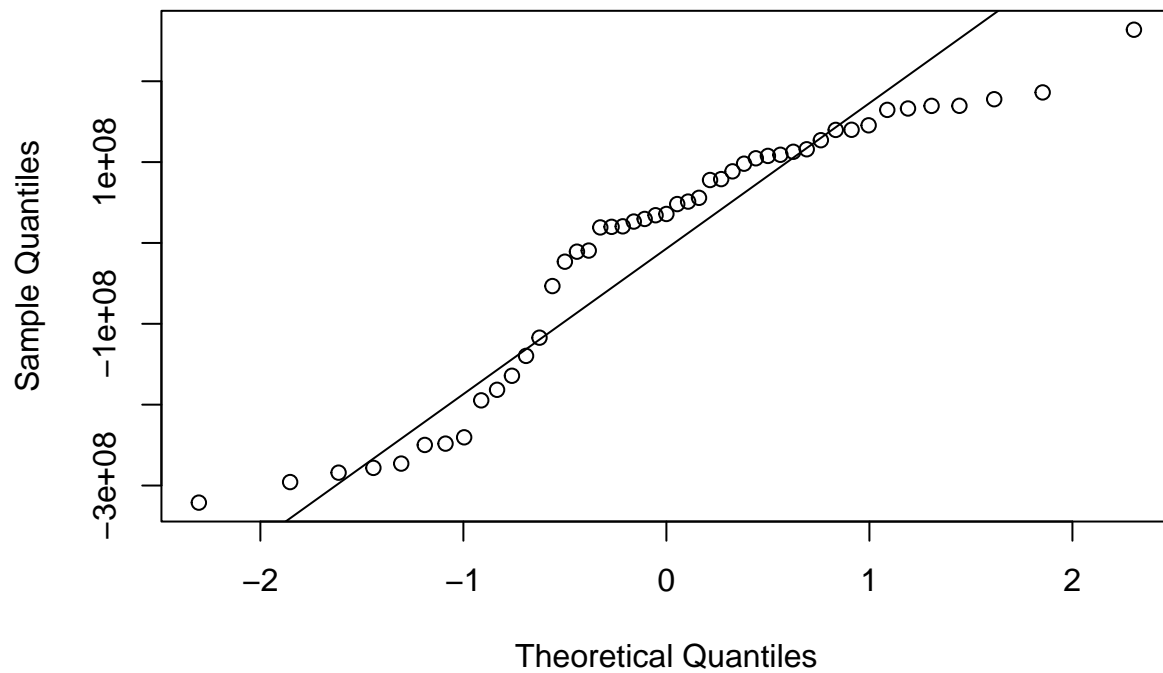
North Carolina Covid Deaths vs Local Trips

```
NC = DT[DT$Jurisdiction == 'North Carolina',]
head(NC)
```

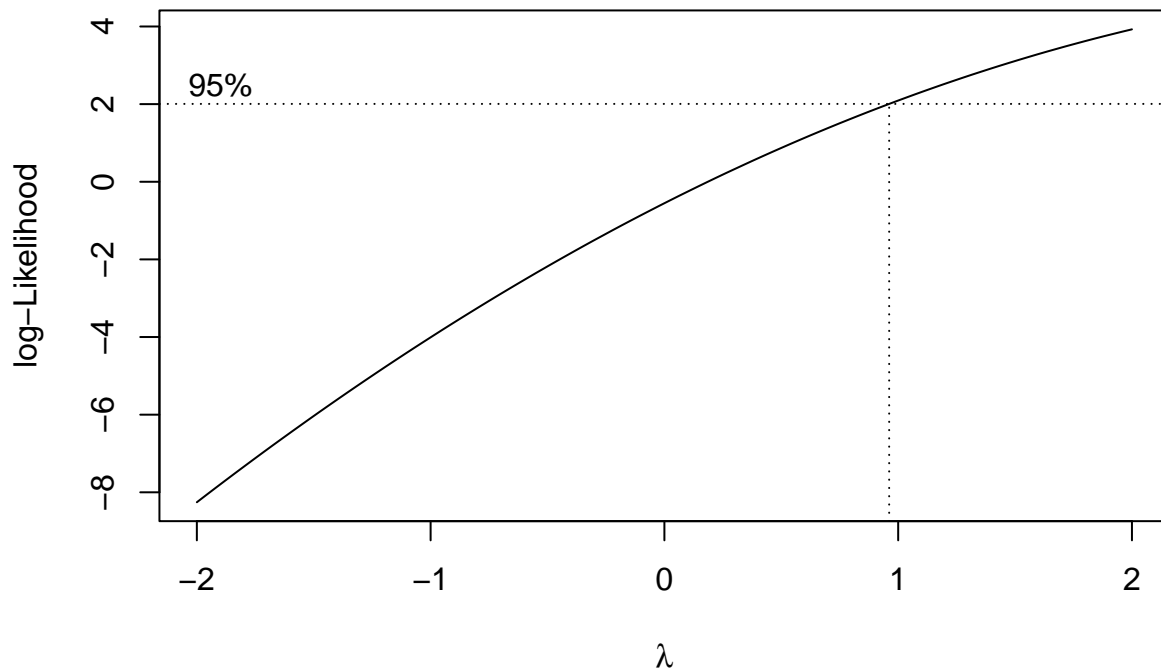
```
## # A tibble: 6 x 12
##   Year Month Jurisdiction Covid_Deaths Total_Deaths Pneumonia_Deaths
##   <dbl> <dbl> <chr>          <dbl>      <dbl>      <dbl>
## 1  2019    12 North Carolina         0       3960        250
## 2  2020     1 North Carolina         0      15590       1431
## 3  2020     2 North Carolina        178      15944       1184
## 4  2020     3 North Carolina         906      19874       1375
## 5  2020     4 North Carolina         888      16142       1264
## 6  2020     5 North Carolina        1244      20160       1456
## # i 6 more variables: Influenza_Deaths <dbl>, Pneumonia_Influenza_Deaths <dbl>,
## #   Pneumonia_Influenza_Covid <dbl>, Local_Trips <dbl>, Interstate_Trips <dbl>,
## #   Long_Distance_Trips <dbl>
```

```
model <- lm(NC$Local_Trips ~ NC$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of North Carolina Covid Deaths vs Local Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of North Carolina Covid Deaths vs Local Travel



```
NC$CookD = cooks.distance(model)
NCC <- NC[which(NC$CookD < 0.5),]
bc <- boxcox(NCC$Local_Trips ~ NCC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
NCC$Local_Trips1 <- (((NCC$Local_Trips)^lambda - 1) / lambda)
new_model <- lm(NCC$Local_Trips1 ~ NCC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = NCC$Local_Trips1 ~ NCC$Covid_Deaths)
##
## Residuals:
```

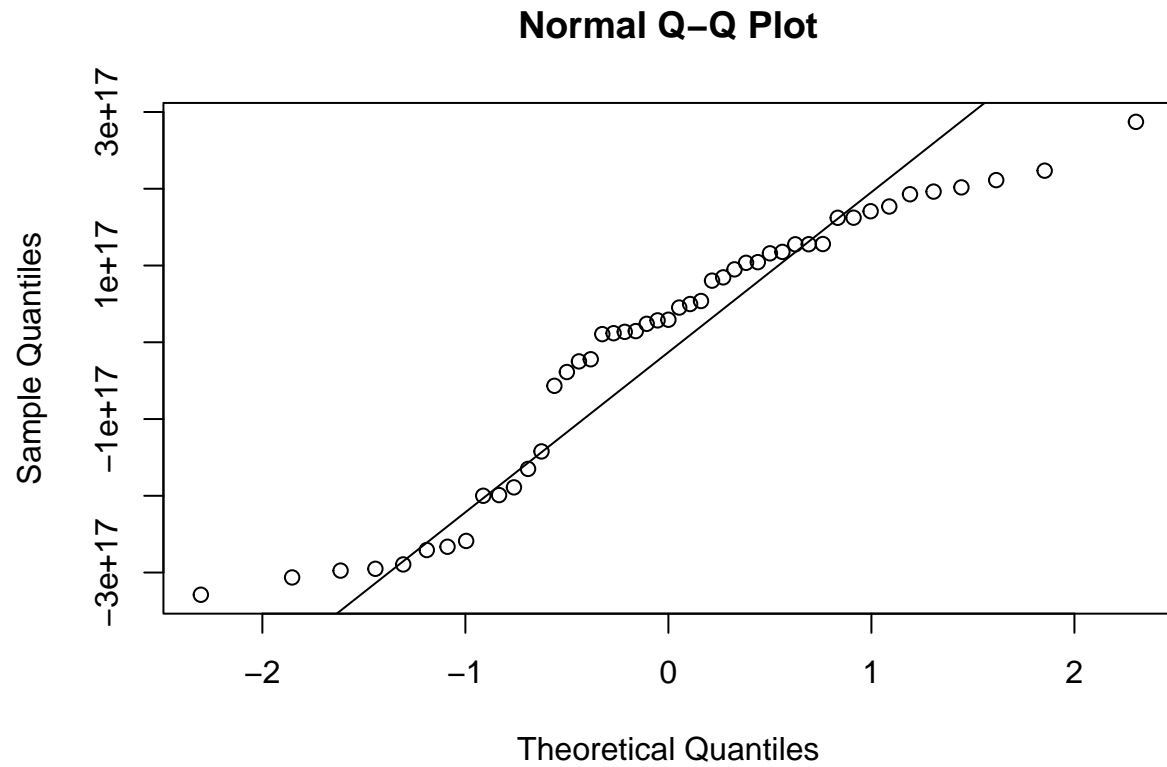
	Min	1Q	Median	3Q	Max
	-3.289e+17	-1.536e+17	2.936e+16	1.277e+17	2.872e+17

```
##
## Coefficients:
```

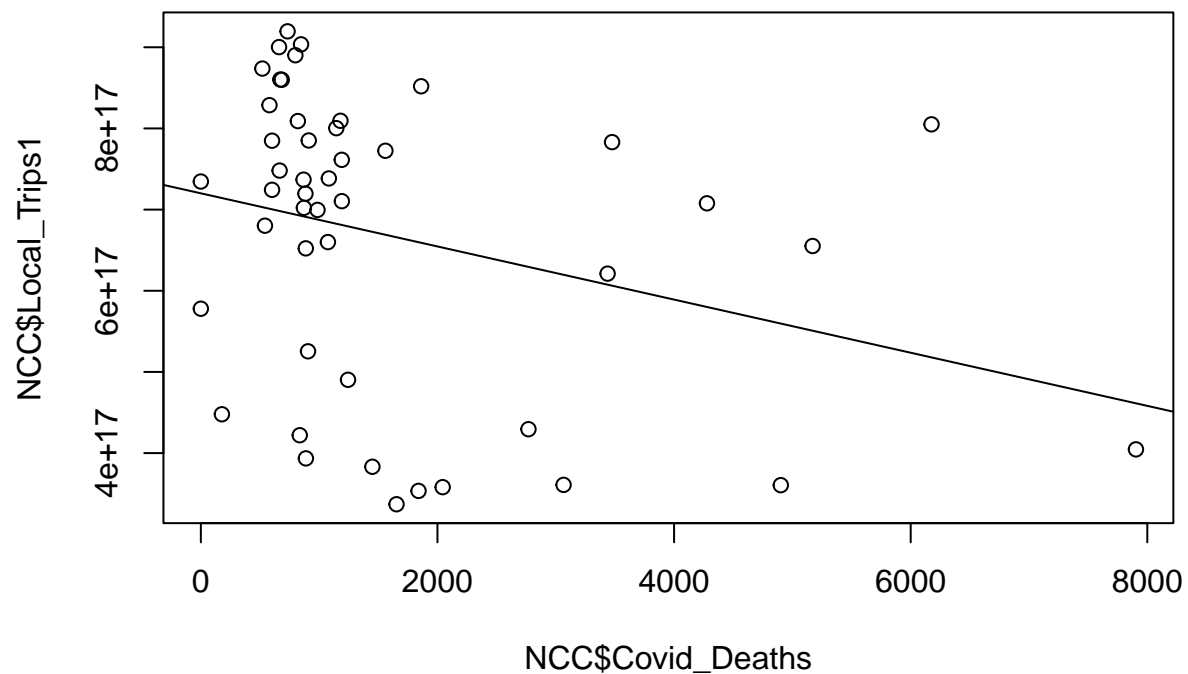
	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	7.201e+17	3.599e+16	20.007	<2e-16 ***
NCC\$Covid_Deaths	-3.273e+13	1.556e+13	-2.104	0.041 *

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.75e+17 on 45 degrees of freedom
## Multiple R-squared:  0.08959,    Adjusted R-squared:  0.06935
## F-statistic: 4.428 on 1 and 45 DF,  p-value: 0.04097
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NCC$Local_Trips1 ~ NCC$Covid_Deaths)
abline(new_model)
```



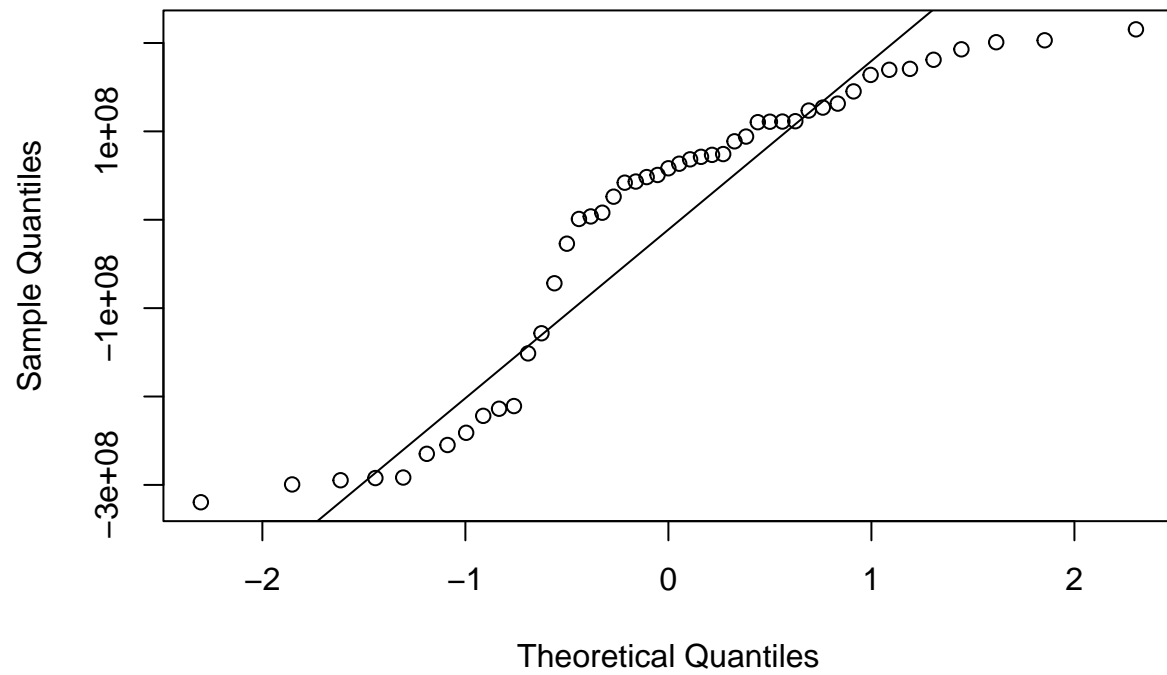
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %          97.5 %
## (Intercept)    6.475643e+17  7.925421e+17
## NCC$Covid_Deaths -6.406522e+13 -1.403058e+12
```

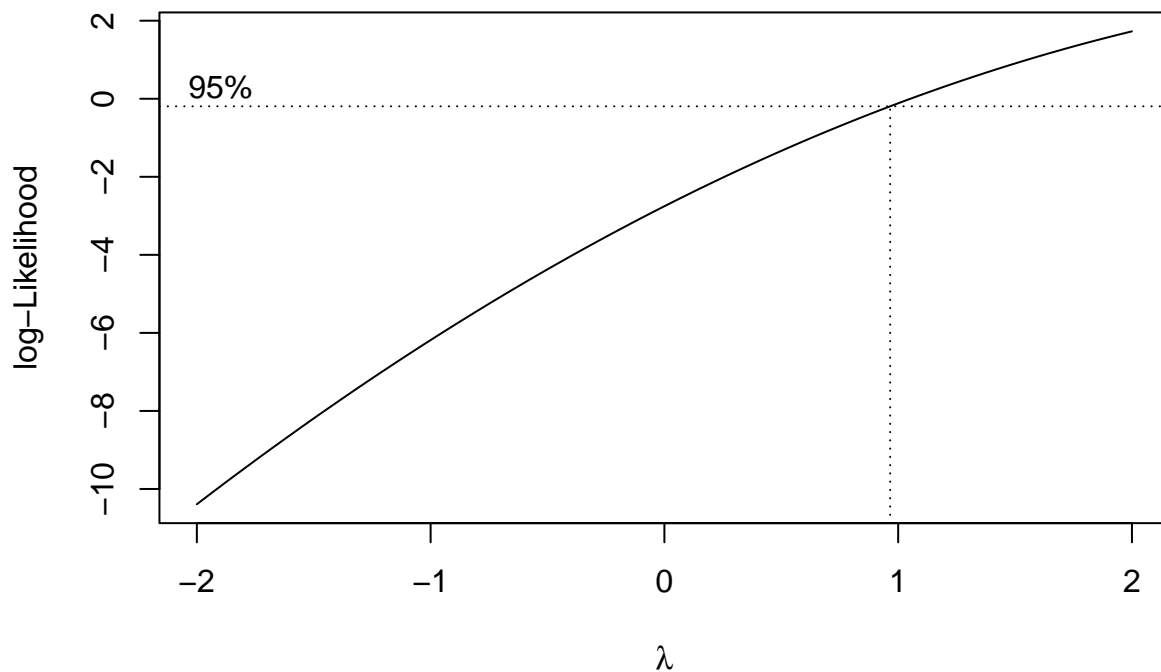
North Carolina Influenza Deaths vs Local Trips

```
model <- lm(NC$Local_Trips ~ NC$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of North Carolina Influenza Deaths vs Local Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of North Carolina Influenza Deaths vs Local Trave



```
NC$CookD = cooks.distance(model)
NCI <- NC[which(NC$CookD < 0.5),]
bc <- boxcox(NCI$Local_Trips ~ NCI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
NCI$Local_Trips1 <- (((NCI$Local_Trips)^lambda - 1) / lambda)
new_model <- lm(NCI$Local_Trips1 ~ NCI$Influenza_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = NCI$Local_Trips1 ~ NCI$Influenza_Deaths)
##
## Residuals:
```

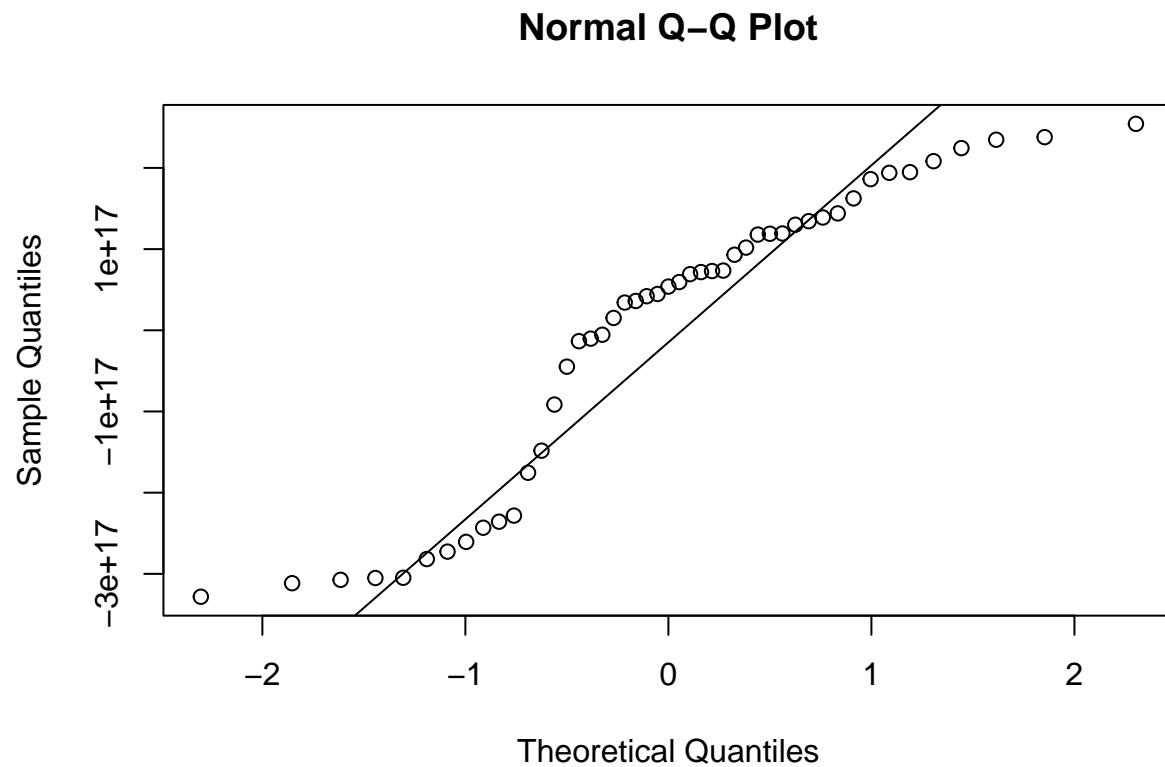
	Min	1Q	Median	3Q	Max
	-3.282e+17	-1.619e+17	5.388e+16	1.322e+17	2.543e+17

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	6.650e+17	3.068e+16	21.674	<2e-16 ***
NCI\$Influenza_Deaths	5.759e+13	5.081e+14	0.113	0.91

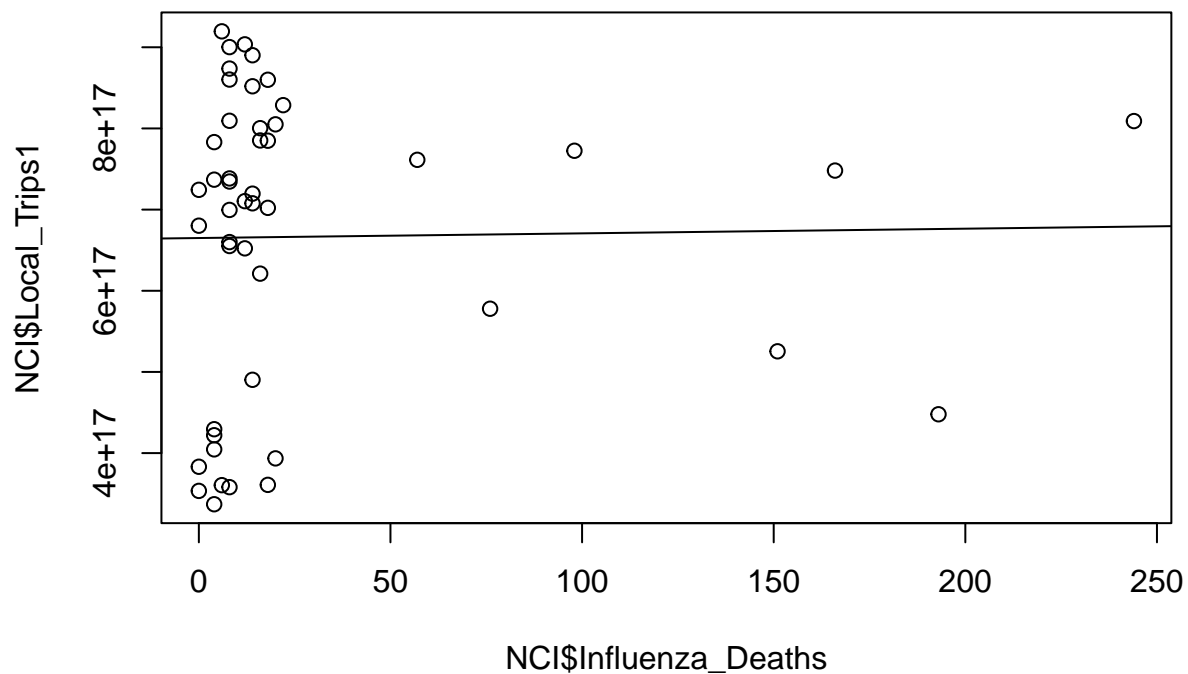
```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.834e+17 on 45 degrees of freedom
## Multiple R-squared:  0.0002853, Adjusted R-squared:  -0.02193
## F-statistic: 0.01284 on 1 and 45 DF, p-value: 0.9103
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NCI$Local_Trips1 ~ NCI$Influenza_Deaths)
abline(new_model)
```





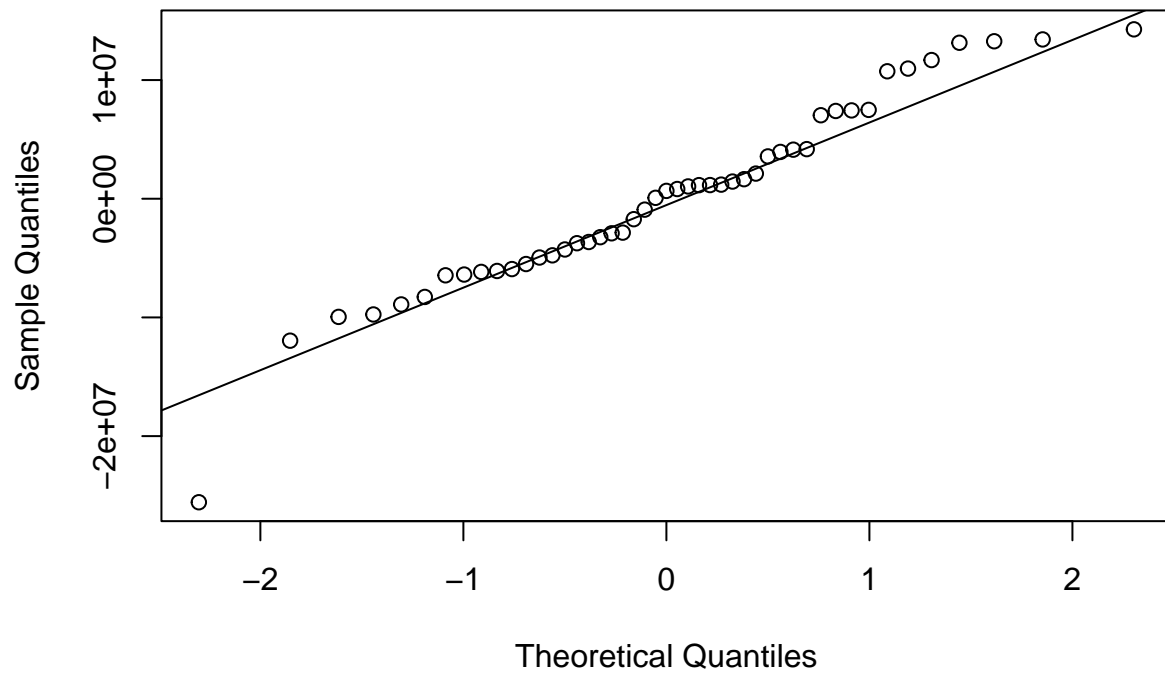
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)      6.031775e+17 7.267671e+17
## NCI$Influenza_Deaths -9.658750e+14 1.081053e+15
```

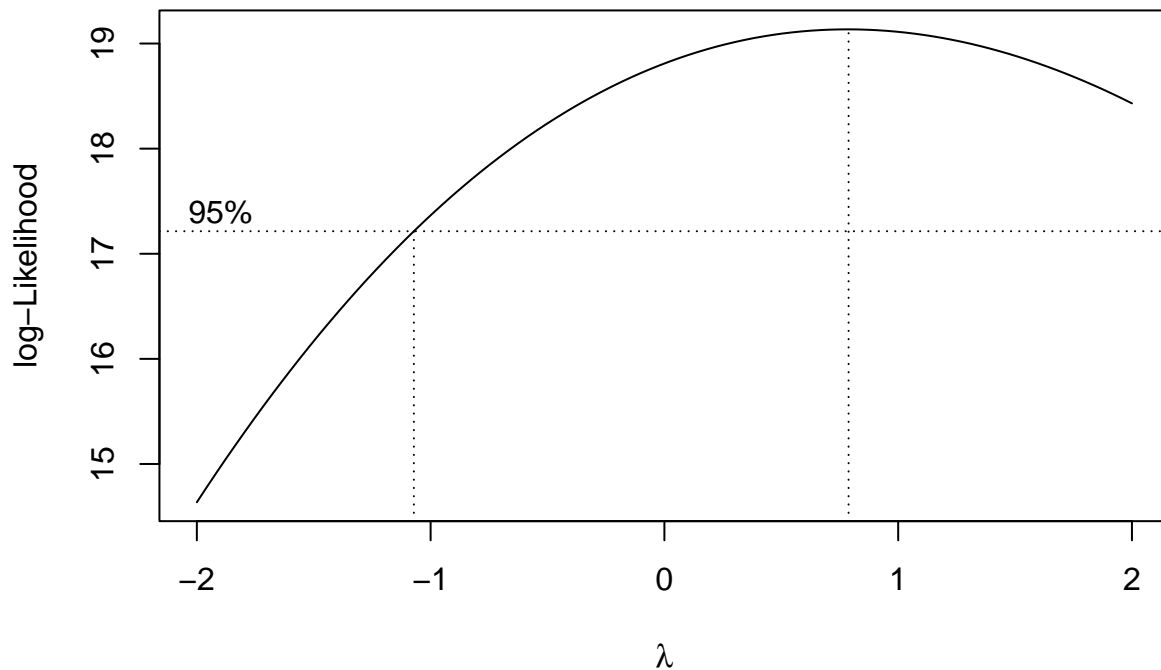
North Carolina Covid Deaths vs Interstate Trips

```
model <- lm(NC$Interstate_Trips ~ NC$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of North Carolina Covid Deaths vs Interstate Travel")
qqline(model$residuals)
```

## Normal Q–Q Plot of North Carolina Covid Deaths vs Interstate Travel



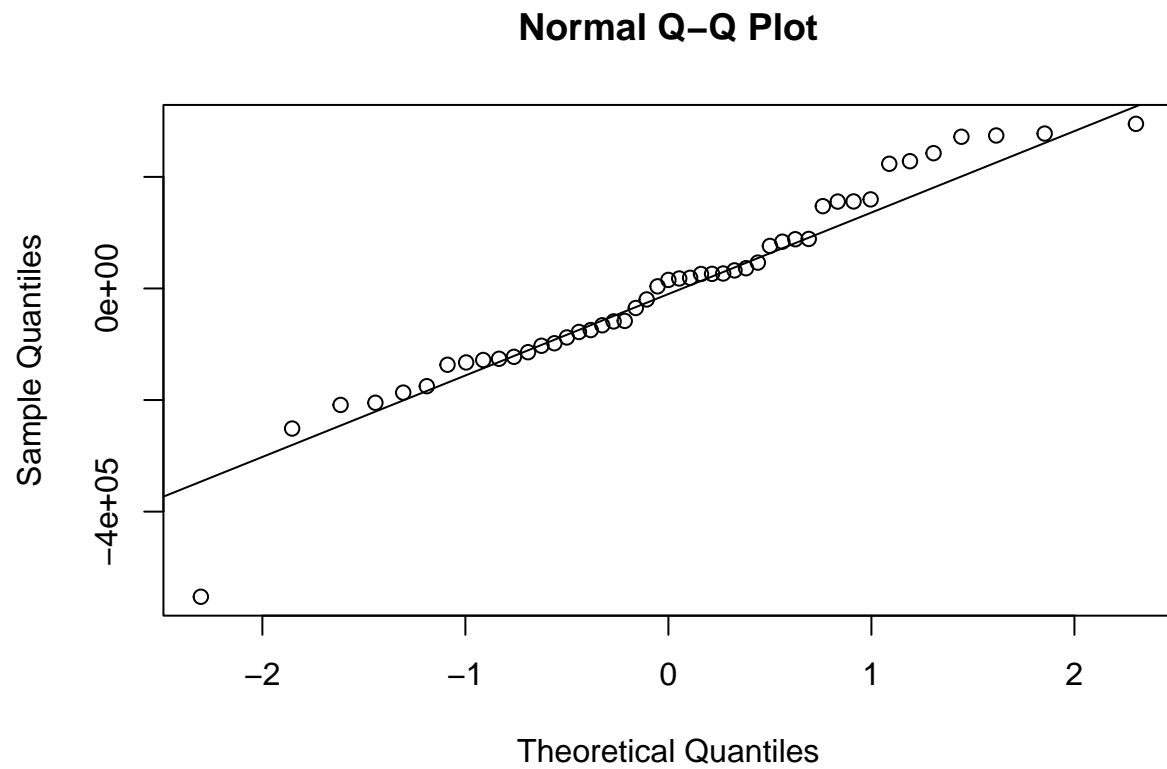
```
NC$CookD = cooks.distance(model)
NCC <- NC[which(NC$CookD < 0.5),]
bc <- boxcox(NCC$Interstate_Trips ~ NCC$Covid_Deaths)
```



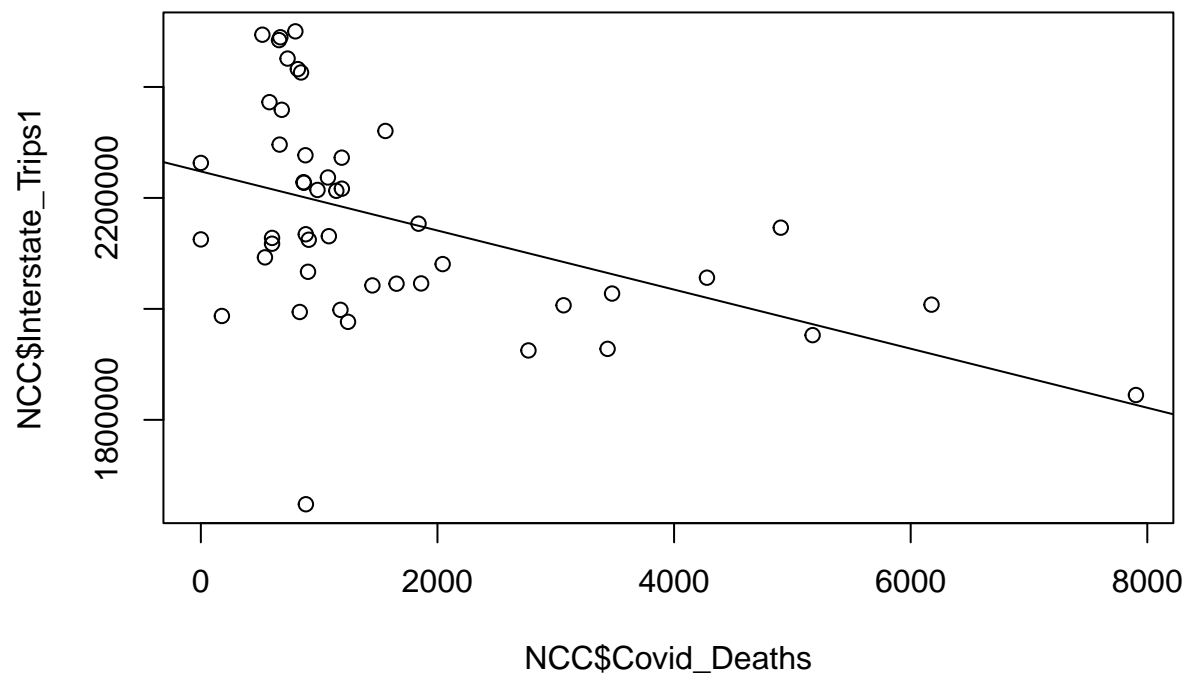
```
lambda <- bc$x[which.max(bc$y)]
NCC$Interstate_Trips1 <- ((NCC$Interstate_Trips)^lambda - 1) / lambda
new_model <- lm(NCC$Interstate_Trips1 ~ NCC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = NCC$Interstate_Trips1 ~ NCC$Covid_Deaths)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -552564 -108470   15307    88497   295039
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   2247736.65   34602.27   64.96 < 2e-16 ***
## NCC$Covid_Deaths    -53.25     14.96   -3.56 0.000888 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 168300 on 45 degrees of freedom
## Multiple R-squared:  0.2198, Adjusted R-squared:  0.2024
## F-statistic: 12.68 on 1 and 45 DF, p-value: 0.0008885
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NCC$Interstate_Trips1 ~ NCC$Covid_Deaths)
abline(new_model)
```



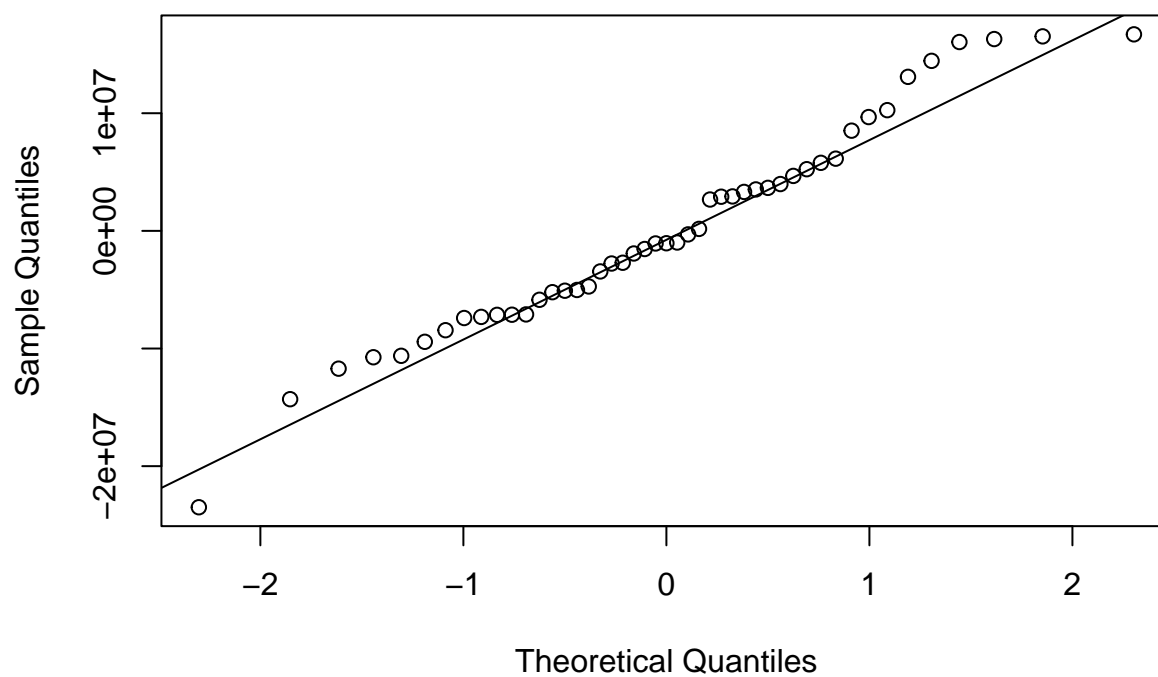
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %        97.5 %
## (Intercept)    2178044.10036 2317429.20306
## NCC$Covid_Deaths -83.36854    -23.12368
```

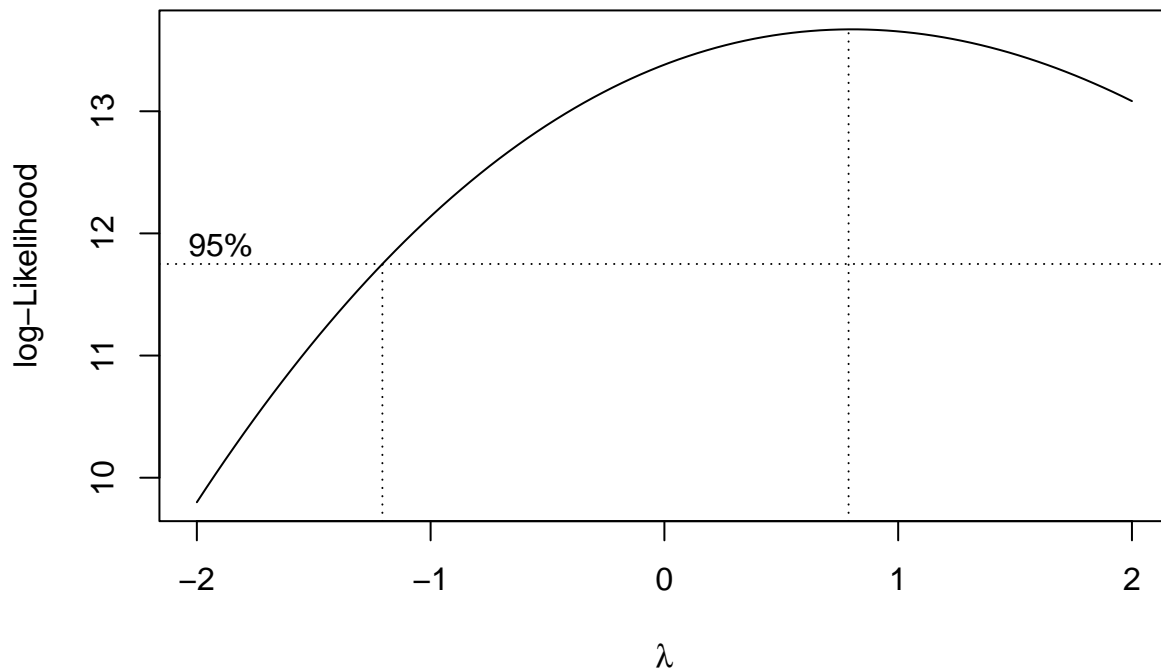
North Carolina Influenza Deaths vs Interstate Trips

```
model <- lm(NC$Interstate_Trips ~ NC$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of North Carolina Influenza Deaths vs Interstate Travel")
qqline(model$residuals)
```

## Normal Q–Q Plot of North Carolina Influenza Deaths vs Interstate Tra



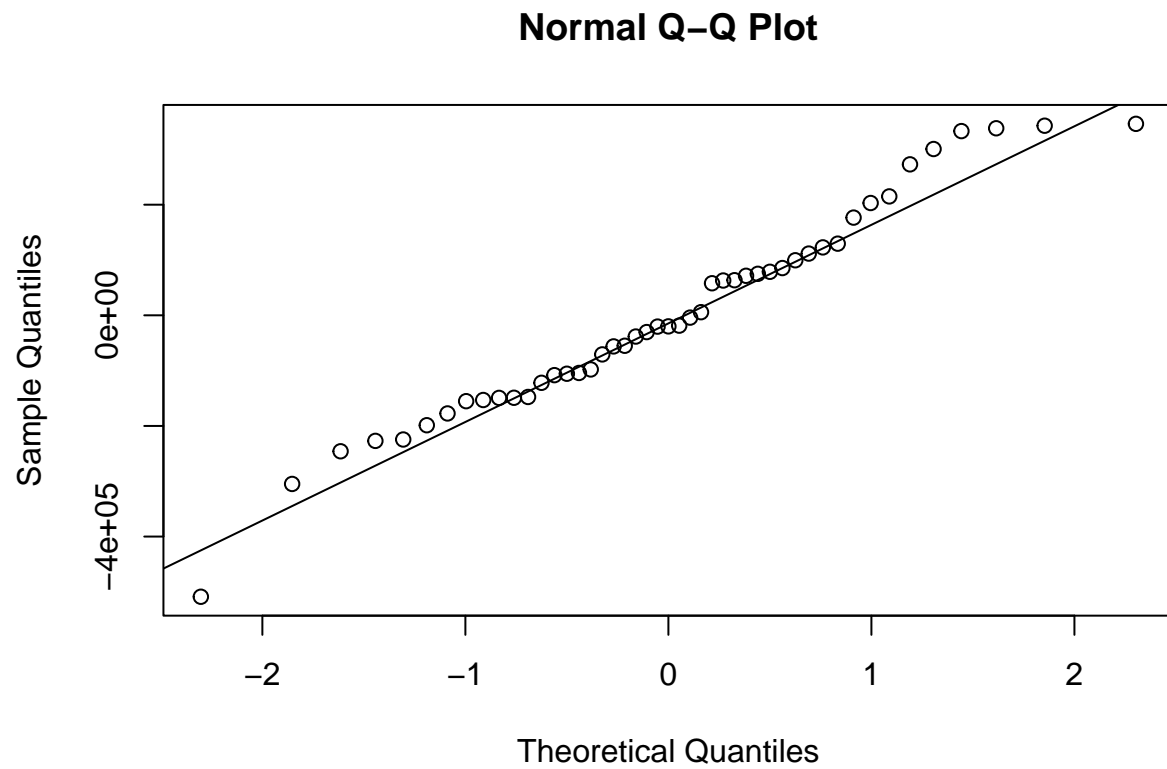
```
NC$CookD = cooks.distance(model)
NCI <- NC[which(NC$CookD < 0.5),]
bc <- boxcox(NCI$Interstate_Trips ~ NCI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
NCI$Interstate_Trips1 <- ((NCI$Interstate_Trips)^lambda - 1) / lambda)
new_model <- lm(NCI$Interstate_Trips1 ~ NCI$Influenza_Deaths)
summary(new_model)
```

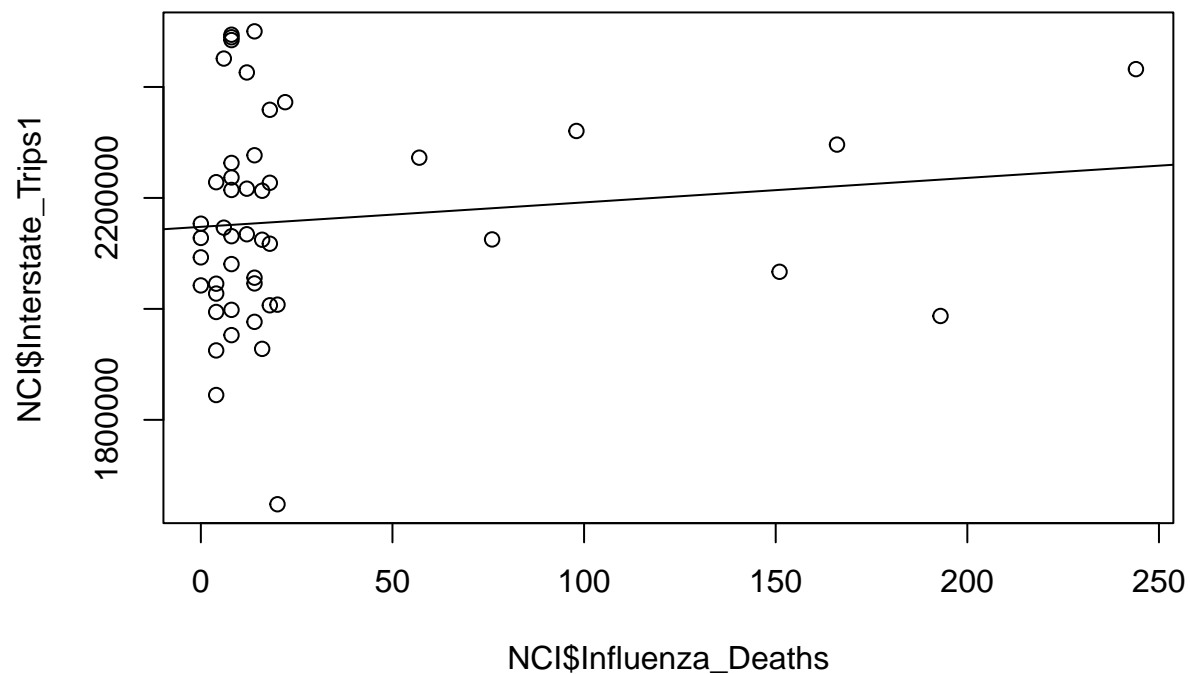
```
##
## Call:
## lm(formula = NCI$Interstate_Trips1 ~ NCI$Influenza_Deaths)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -508807 -134797  -19983   105591   346181
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2147877.1    31619.9   67.928  <2e-16 ***
## NCI$Influenza_Deaths     441.0      523.7    0.842    0.404
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 189000 on 45 degrees of freedom
## Multiple R-squared:  0.01551,    Adjusted R-squared:  -0.006366
## F-statistic: 0.709 on 1 and 45 DF,  p-value: 0.4042
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NCI$Interstate_Trips1 ~ NCI$Influenza_Deaths)
abline(new_model)
```





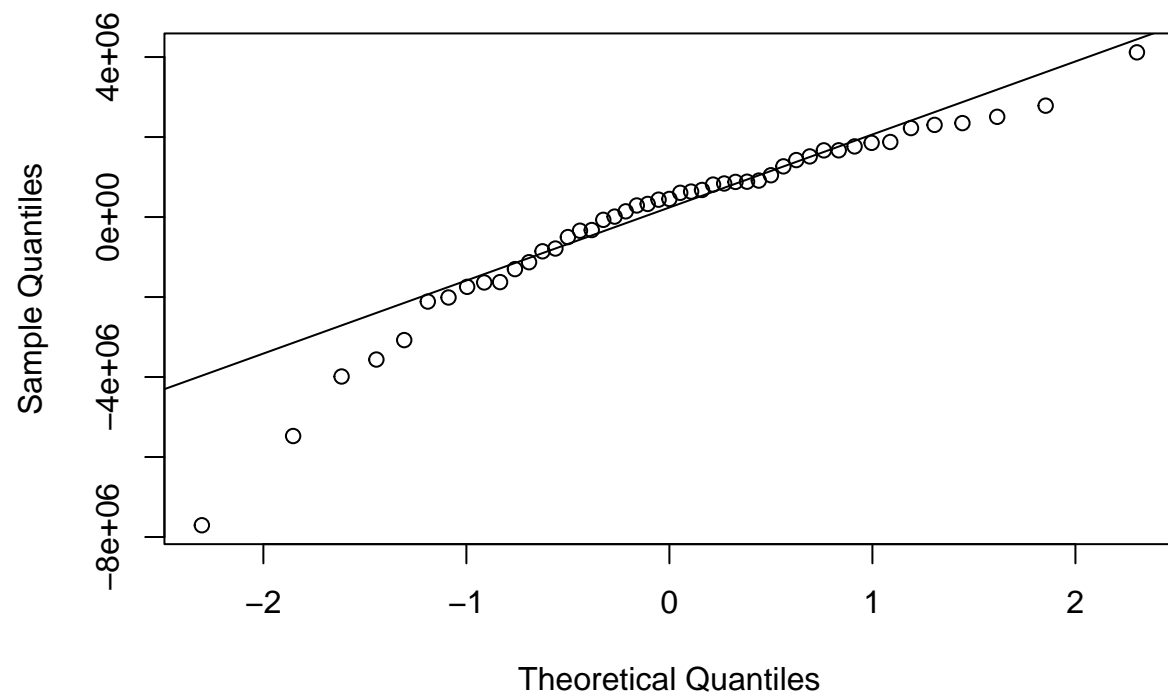
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)    2084191.3734 2211562.750
## NCI$Influenza_Deaths -613.8083   1495.756
```

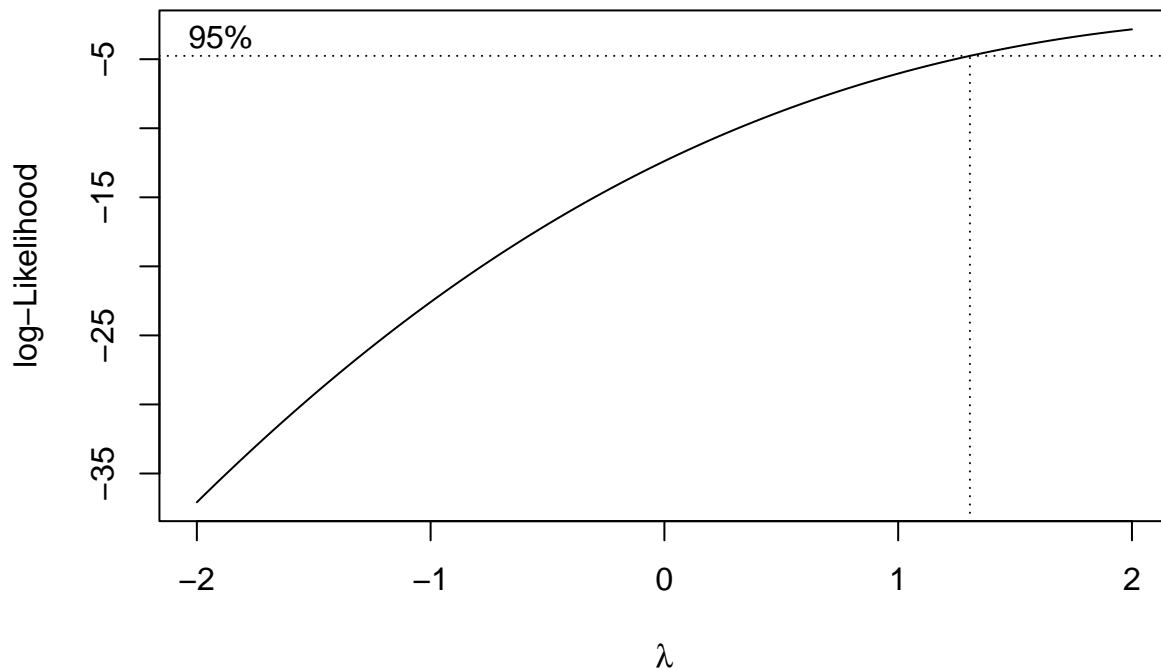
North Carolina Covid Deaths vs Long Distance Trips

```
model <- lm(NC$Long_Distance_Trips ~ NC$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of North Carolina Covid Deaths vs Long_Distance Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of North Carolina Covid Deaths vs Long\_Distance Tr



```
NC$CookD = cooks.distance(model)
NCC <- NC[which(NC$CookD < 0.5),]
bc <- boxcox(NCC$Long_Distance_Trips ~ NCC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
NCC$Long_Distance_Trips1 <- (((NCC$Long_Distance_Trips)^lambda - 1) / lambda)
new_model <- lm(NCC$Long_Distance_Trips1 ~ NCC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = NCC$Long_Distance_Trips1 ~ NCC$Covid_Deaths)
##
## Residuals:
```

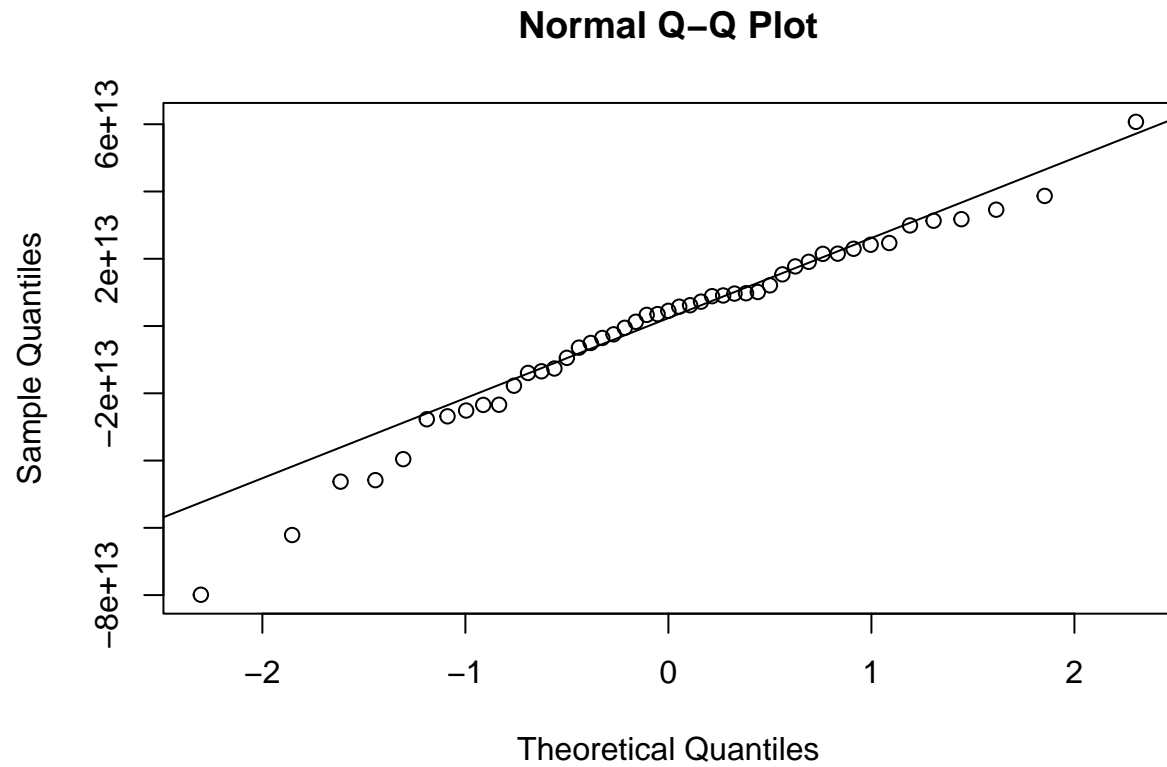
	Min	1Q	Median	3Q	Max
	-7.989e+13	-1.370e+13	4.520e+12	1.841e+13	6.071e+13

```
##
## Coefficients:
```

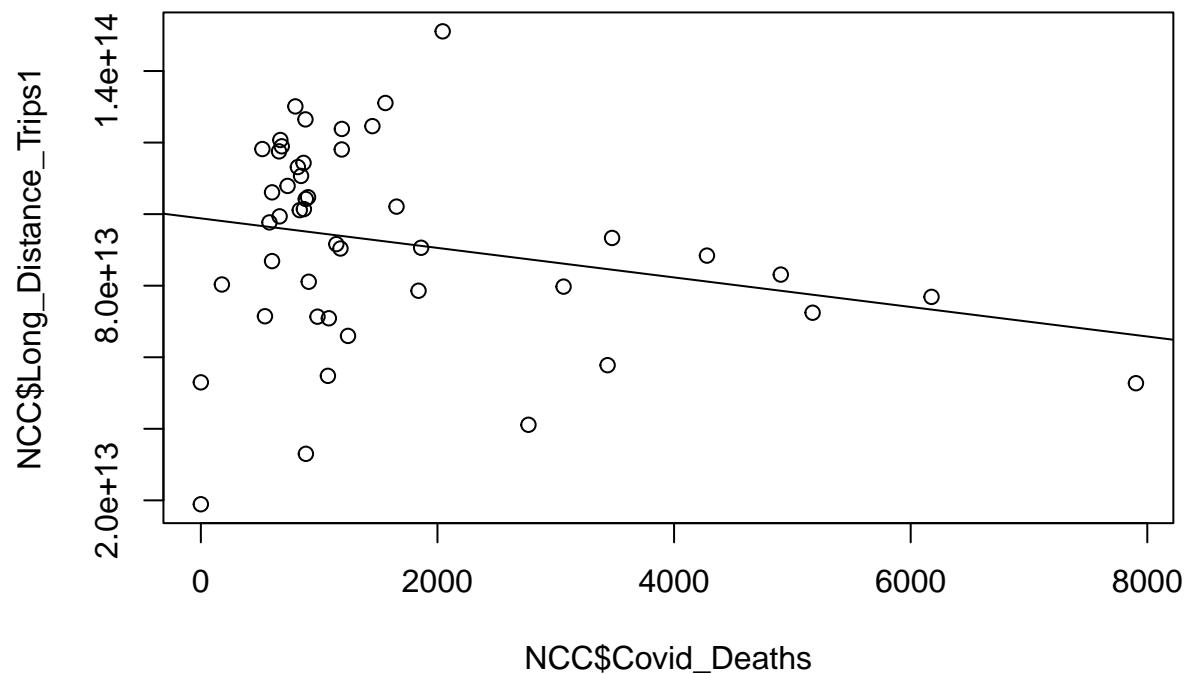
	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	9.881e+13	5.642e+12	17.513	<2e-16 ***
NCC\$Covid_Deaths	-4.126e+09	2.439e+09	-1.692	0.0976 .

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.744e+13 on 45 degrees of freedom
## Multiple R-squared:  0.0598, Adjusted R-squared:  0.03891
## F-statistic: 2.862 on 1 and 45 DF, p-value: 0.09759
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NCC$Long_Distance_Trips1 ~ NCC$Covid_Deaths)
abline(new_model)
```



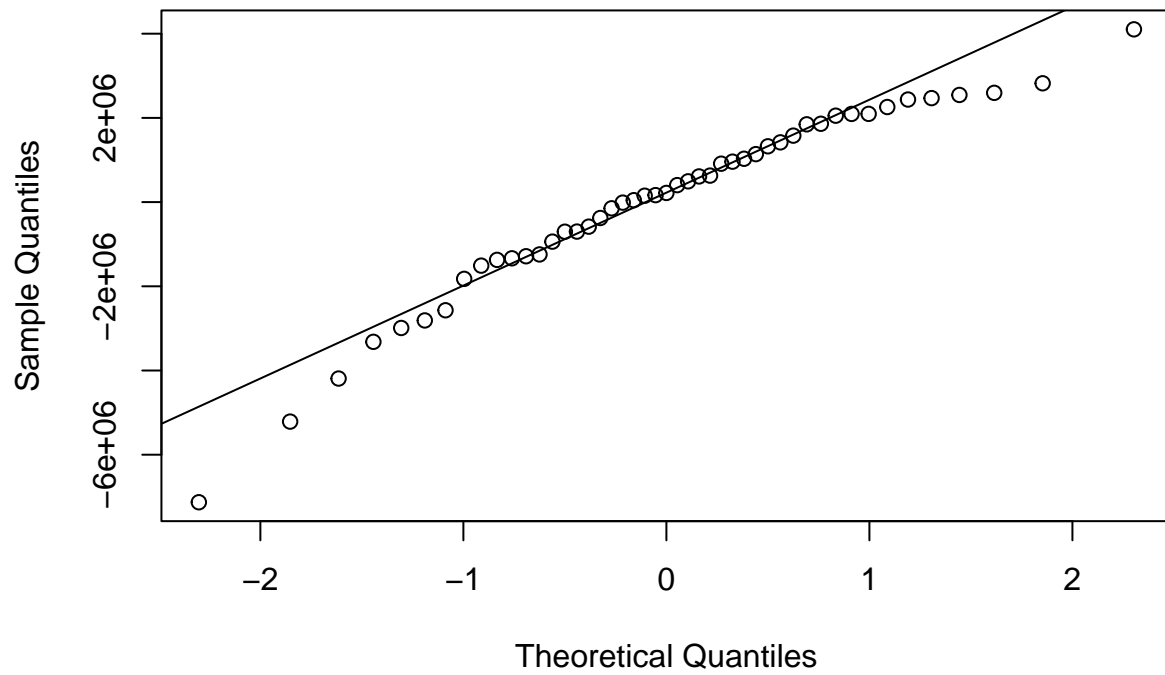
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %        97.5 %
## (Intercept)    8.744630e+13 1.101744e+14
## NCC$Covid_Deaths -9.037677e+09 7.858470e+08
```

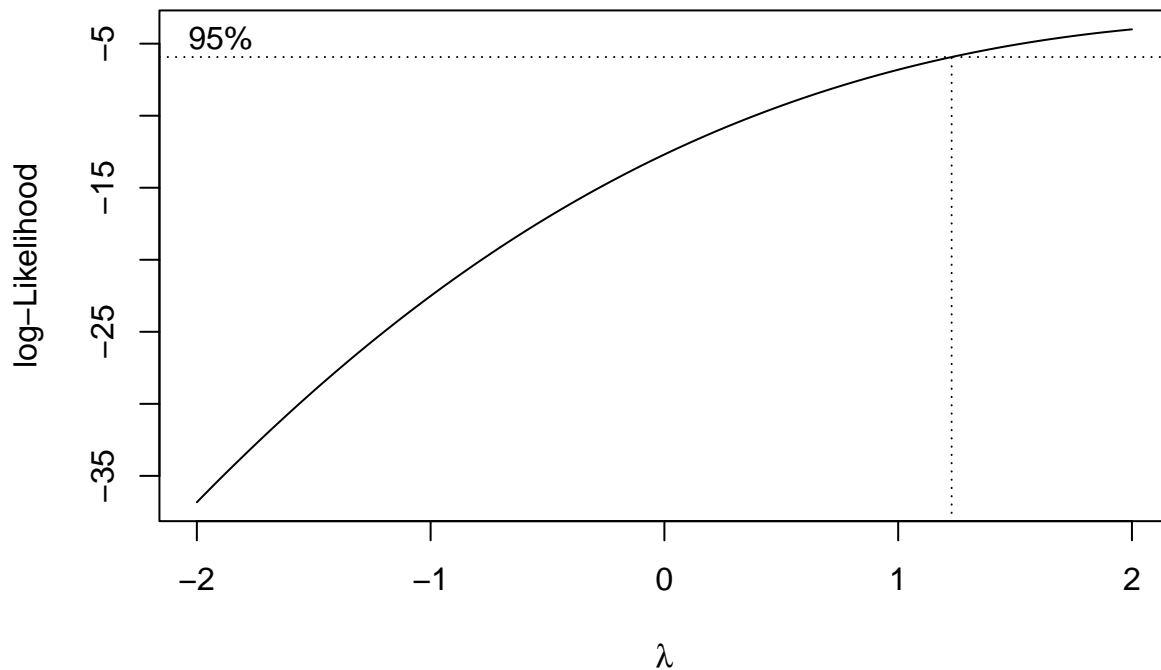
North Carolina Influenza Deaths vs Long Distance Trips

```
model <- lm(NC$Long_Distance_Trips ~ NC$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of North Carolina Influenza Deaths vs Long_Distance Tra
qqline(model$residuals)
```

## Normal Q-Q Plot of North Carolina Influenza Deaths vs Long\_Distance



```
NC$CookD = cooks.distance(model)
NCI <- NC[which(NC$CookD < 0.5),]
bc <- boxcox(NCI$Long_Distance_Trips ~ NCI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
NCI$Long_Distance_Trips1 <- (((NCI$Long_Distance_Trips)^lambda - 1) / lambda)
new_model <- lm(NCI$Long_Distance_Trips1 ~ NCI$Influenza_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = NCI$Long_Distance_Trips1 ~ NCI$Influenza_Deaths)
##
## Residuals:
```

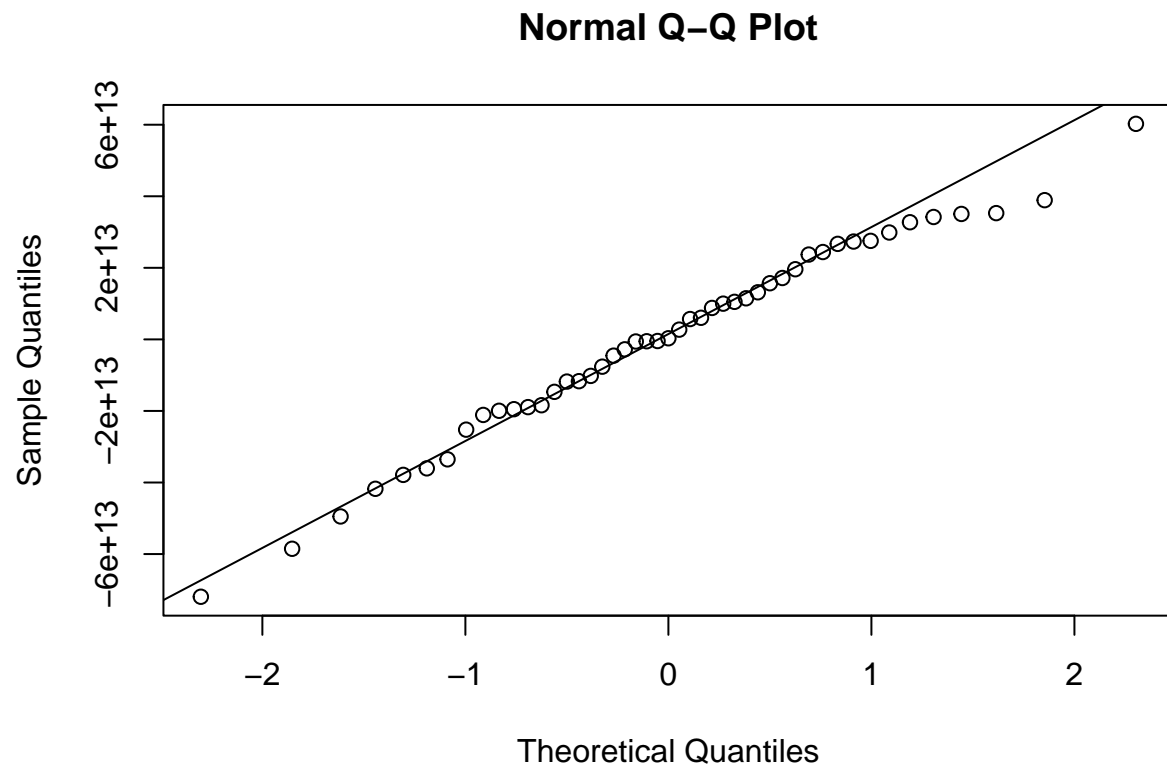
	Min	1Q	Median	3Q	Max
	-7.193e+13	-1.867e+13	3.137e+11	2.166e+13	6.024e+13

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	9.039e+13	4.706e+12	19.209	<2e-16 ***
NCI\$Influenza_Deaths	5.731e+10	7.793e+10	0.735	0.466

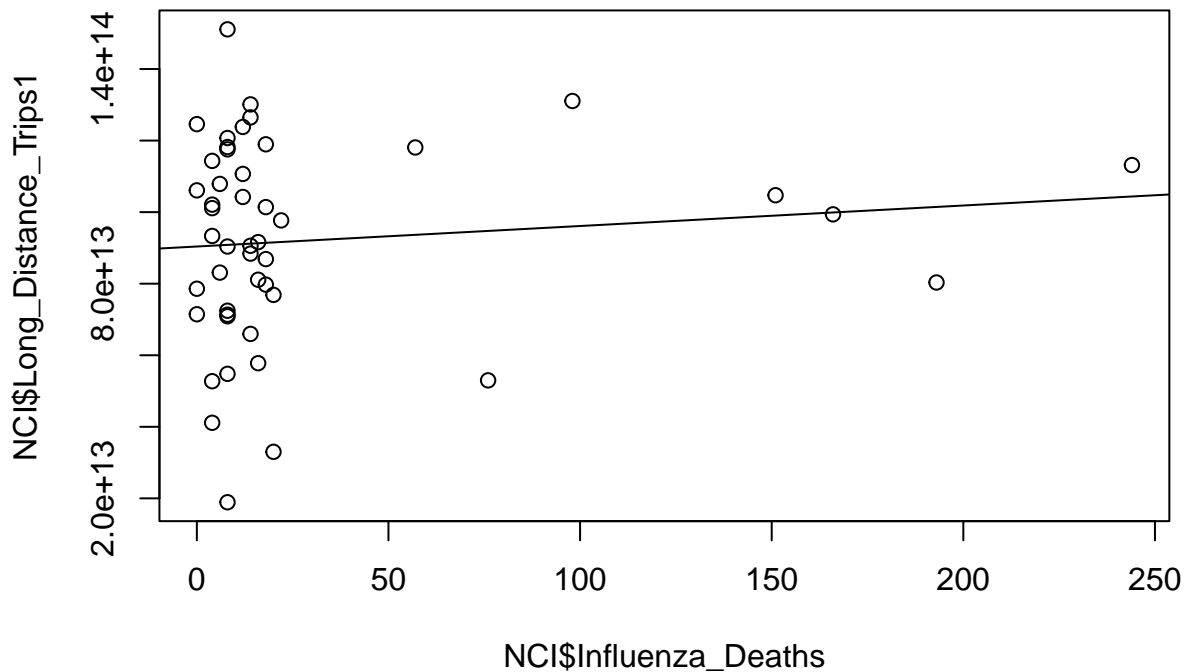
```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.813e+13 on 45 degrees of freedom
## Multiple R-squared:  0.01188,    Adjusted R-squared:  -0.01008
## F-statistic: 0.5408 on 1 and 45 DF,  p-value: 0.4659
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NCI$Long_Distance_Trips1 ~ NCI$Influenza_Deaths)
abline(new_model)
```





```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)      8.091108e+13 9.986600e+13
## NCI$Influenza_Deaths -9.965566e+10 2.142815e+11
```

Georgia Stats

Georgia Covid Deaths vs Local Trips

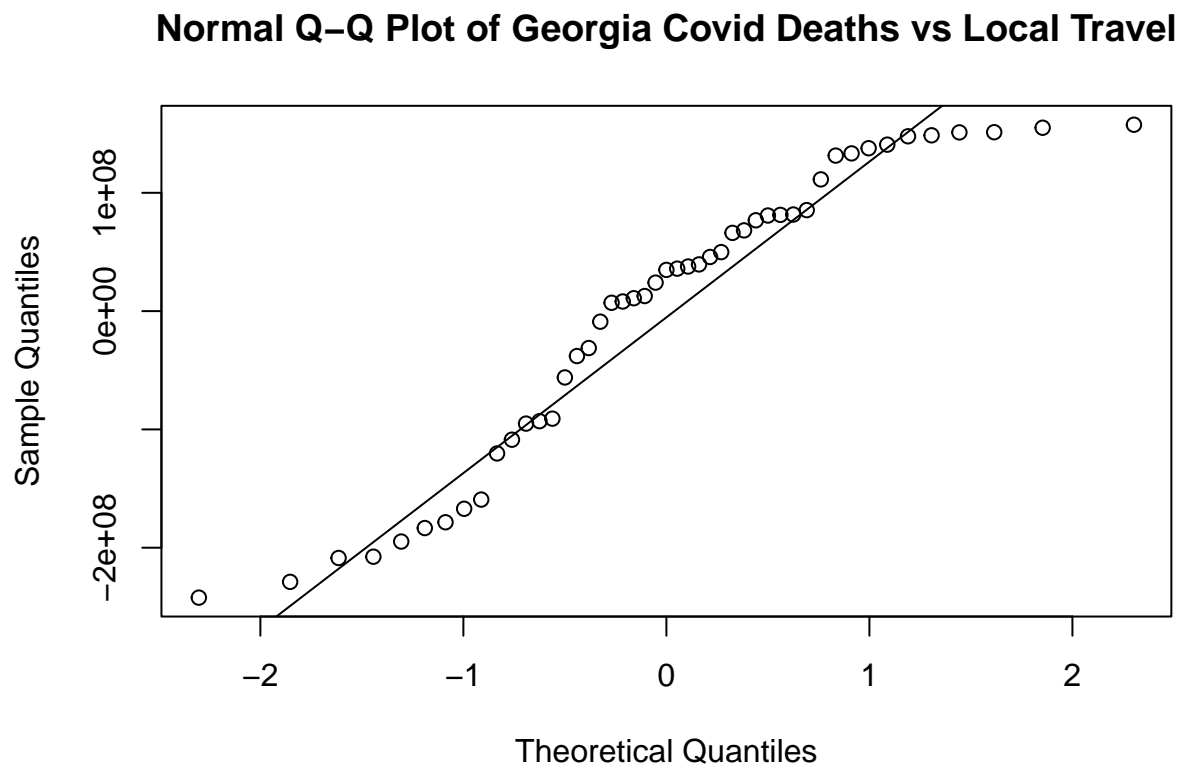
```
GA = DT[DT$Jurisdiction == 'Georgia',]
head(GA)
```

```
## # A tibble: 6 x 12
##   Year Month Jurisdiction Covid_Deaths Total_Deaths Pneumonia_Deaths
##   <dbl> <dbl> <chr>          <dbl>         <dbl>         <dbl>
## 1  2019   12 Georgia             0           3626           224
## 2  2020    1 Georgia             0          14298           874
## 3  2020    2 Georgia            174          14272           872
## 4  2020    3 Georgia           1167          18266          1459
## 5  2020    4 Georgia           2026          16102          1858
## 6  2020    5 Georgia           1668          18796          1642
## # i 6 more variables: Influenza_Deaths <dbl>, Pneumonia_Influenza_Deaths <dbl>,
## #   Pneumonia_Influenza_Covid <dbl>, Local_Trips <dbl>, Interstate_Trips <dbl>,
## #   Long_Distance_Trips <dbl>
```

```

model <- lm(GA$Local_Trips ~ GA$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Georgia Covid Deaths vs Local Travel")
qqline(model$residuals)

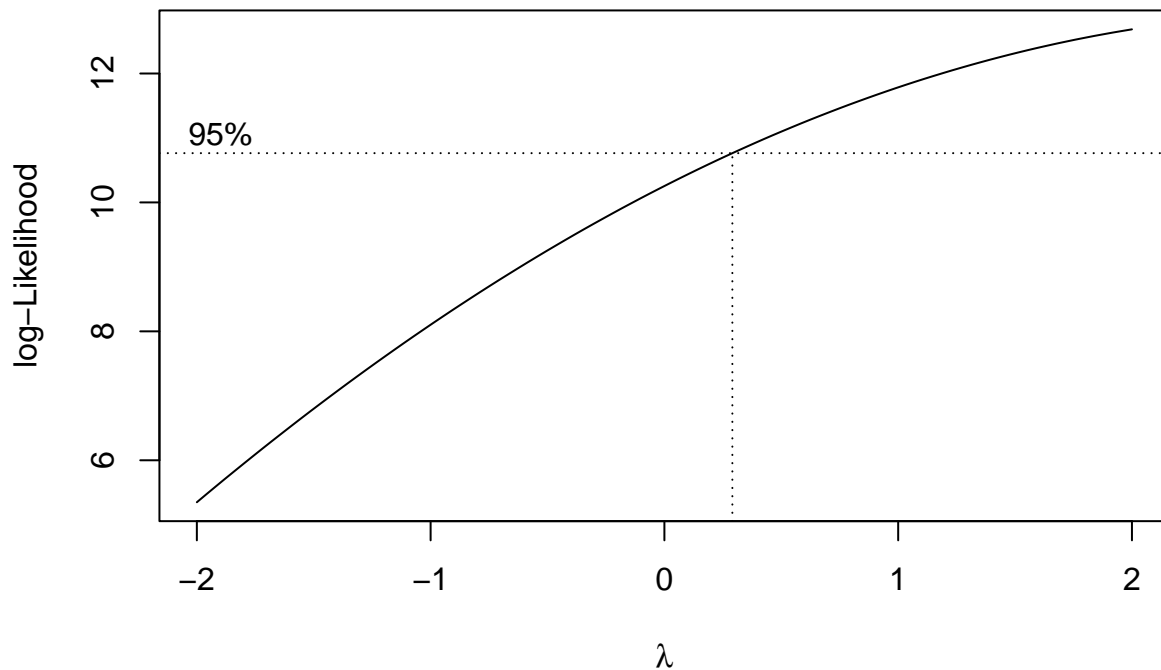
```



```

GA$CookD = cooks.distance(model)
GAC <- GA[which(GA$CookD < 0.5),]
bc <- boxcox(GAC$Local_Trips ~ GAC$Covid_Deaths)

```



```
lambda <- bc$x[which.max(bc$y)]
GAC$Local_Trips1 <- (((GAC$Local_Trips)^lambda - 1) / lambda)
new_model <- lm(GAC$Local_Trips1 ~ GAC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = GAC$Local_Trips1 ~ GAC$Covid_Deaths)
##
## Residuals:
```

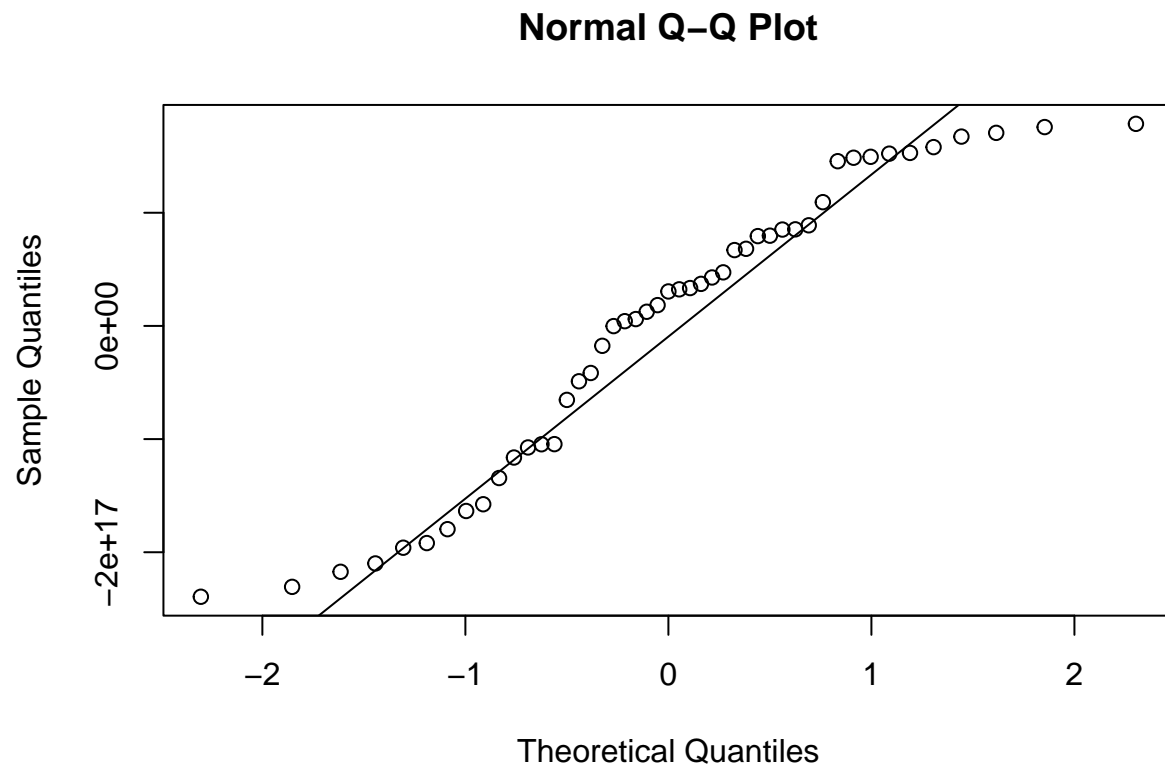
	Min	1Q	Median	3Q	Max
	-2.393e+17	-1.060e+17	3.046e+16	8.712e+16	1.786e+17

```
##
## Coefficients:
```

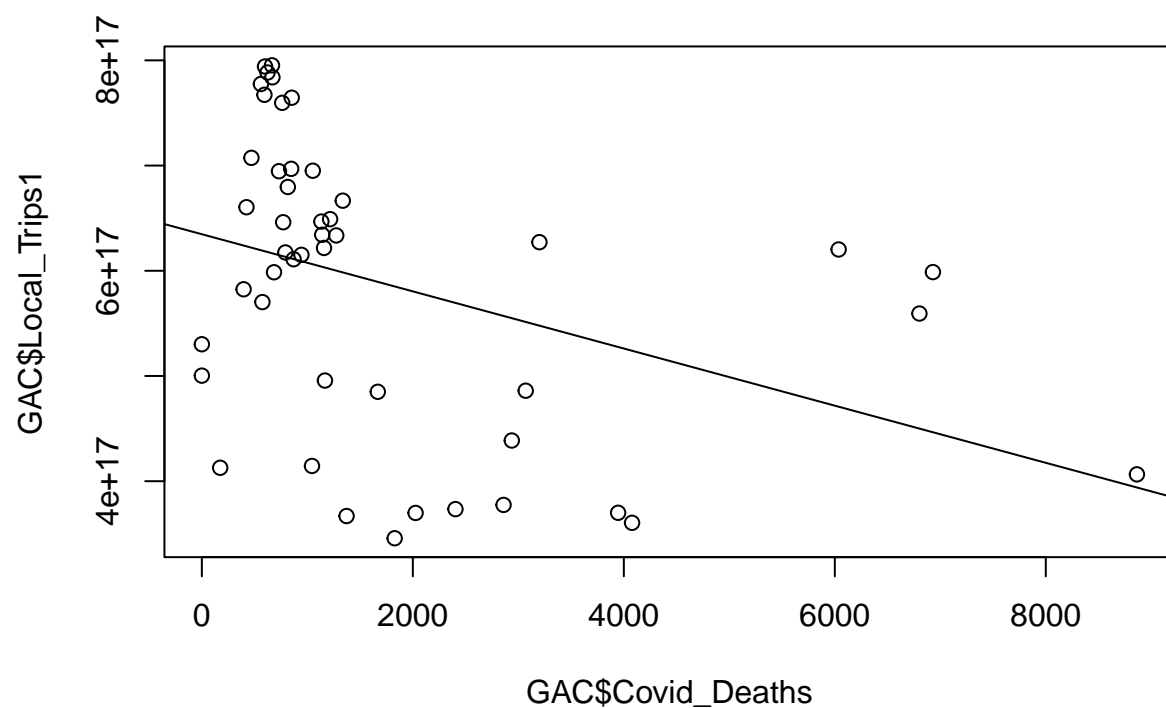
	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	6.348e+17	2.559e+16	24.802	< 2e-16 ***
GAC\$Covid_Deaths	-2.716e+13	9.839e+12	-2.761	0.00832 **

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.297e+17 on 45 degrees of freedom
## Multiple R-squared:  0.1448, Adjusted R-squared:  0.1258
## F-statistic: 7.621 on 1 and 45 DF,  p-value: 0.00832
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(GAC$Local_Trips1 ~ GAC$Covid_Deaths)
abline(new_model)
```



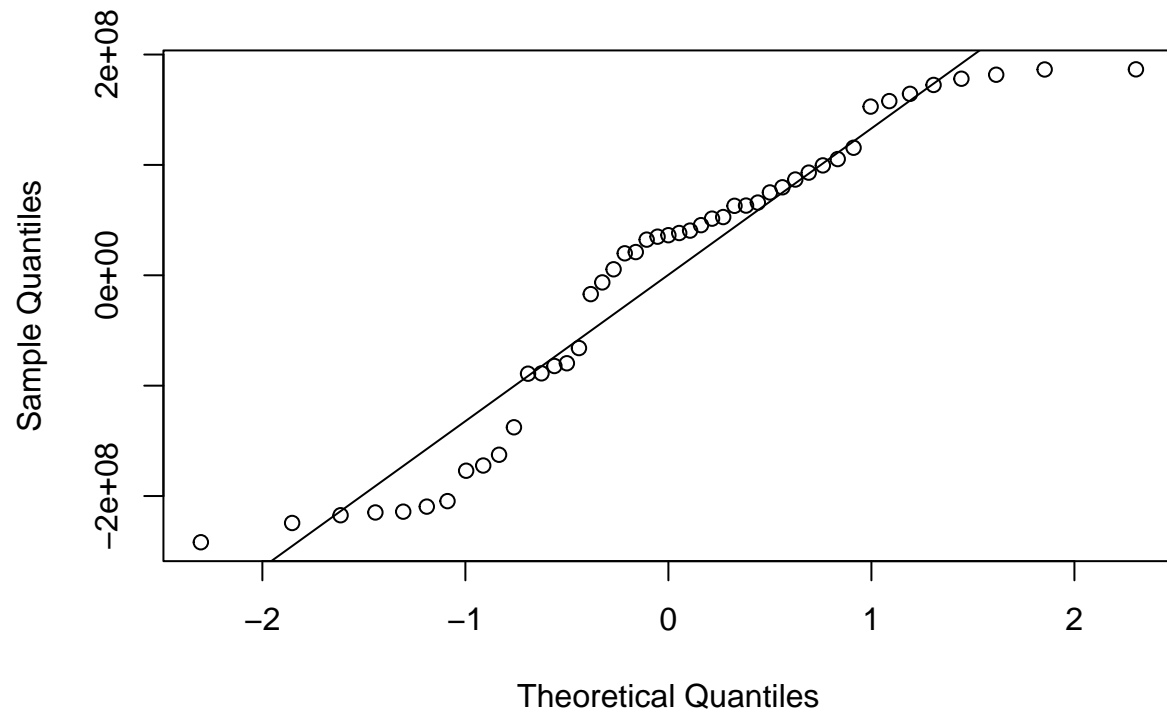
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %        97.5 %
## (Intercept)    5.832099e+17  6.863035e+17
## GAC$Covid_Deaths -4.697708e+13 -7.344002e+12
```

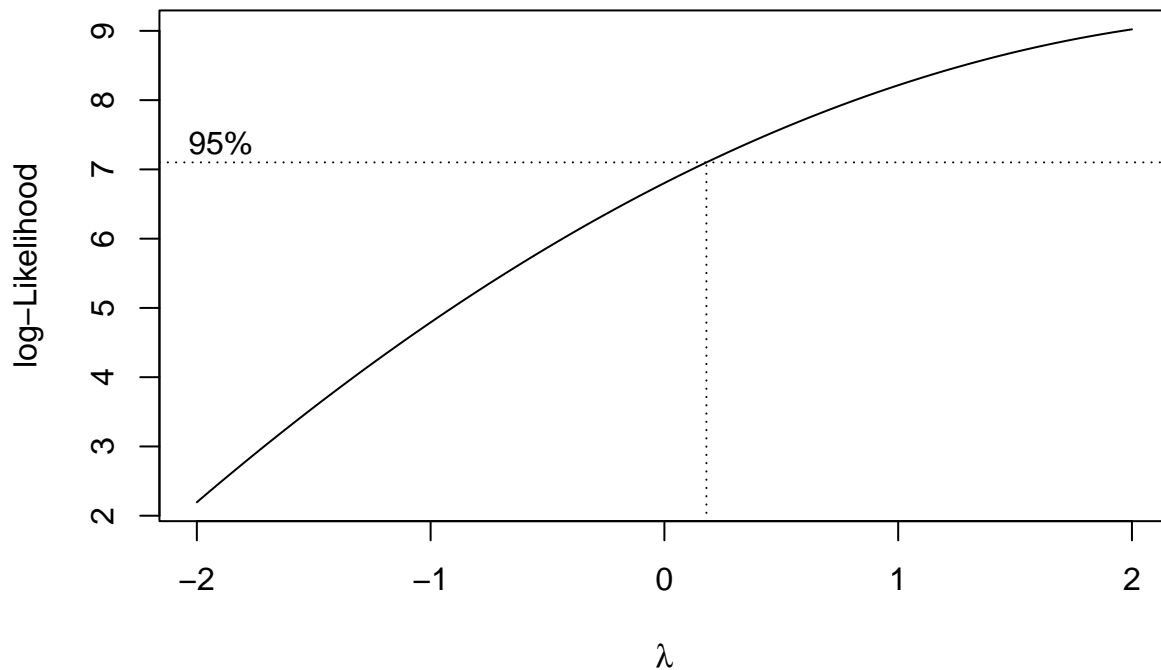
Georgia Influenza Deaths vs Local Trips

```
model <- lm(GA$Local_Trips ~ GA$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Georgia Influenza Deaths vs Local Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Georgia Influenza Deaths vs Local Travel



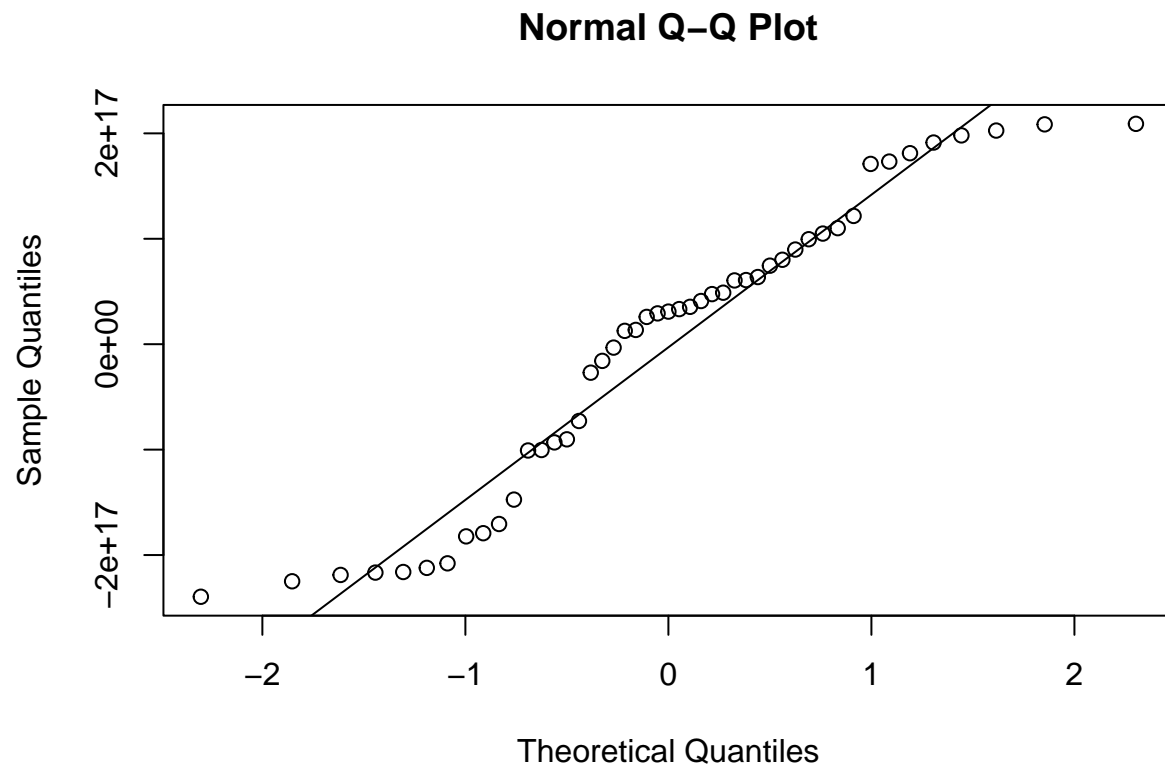
```
GA$CookD = cooks.distance(model)
GAI <- GA[which(GA$CookD < 0.5),]
bc <- boxcox(GAI$Local_Trips ~ GAI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
GAI$Local_Trips1 <- ((GAI$Local_Trips^lambda - 1) / lambda)
new_model <- lm(GAI$Local_Trips1 ~ GAI$Influenza_Deaths)
summary(new_model)
```

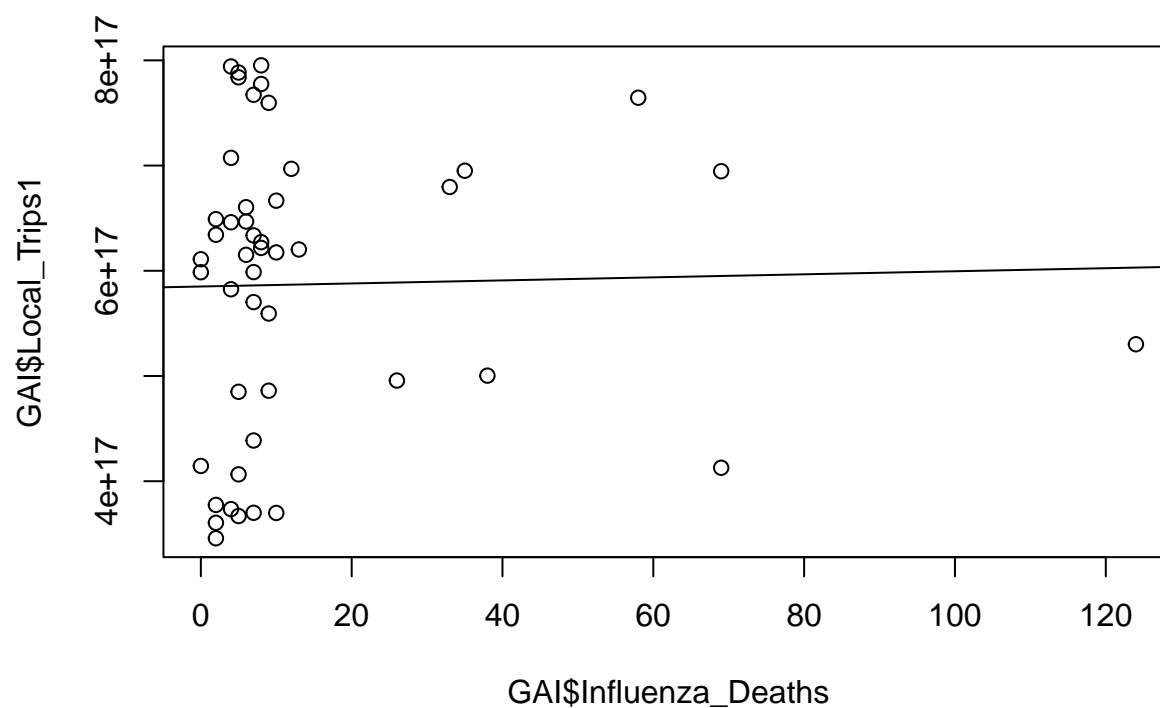
```
##
## Call:
## lm(formula = GAI$Local_Trips1 ~ GAI$Influenza_Deaths)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.396e+17 -1.006e+17  3.092e+16  9.469e+16  2.090e+17
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    5.851e+17  2.421e+16  24.168  <2e-16 ***
## GAI$Influenza_Deaths 1.449e+14  8.944e+14   0.162    0.872
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.402e+17 on 45 degrees of freedom
## Multiple R-squared:  0.0005827, Adjusted R-squared:  -0.02163
## F-statistic: 0.02624 on 1 and 45 DF, p-value: 0.8721
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(GAI$Local_Trips1 ~ GAI$Influenza_Deaths)
abline(new_model)
```





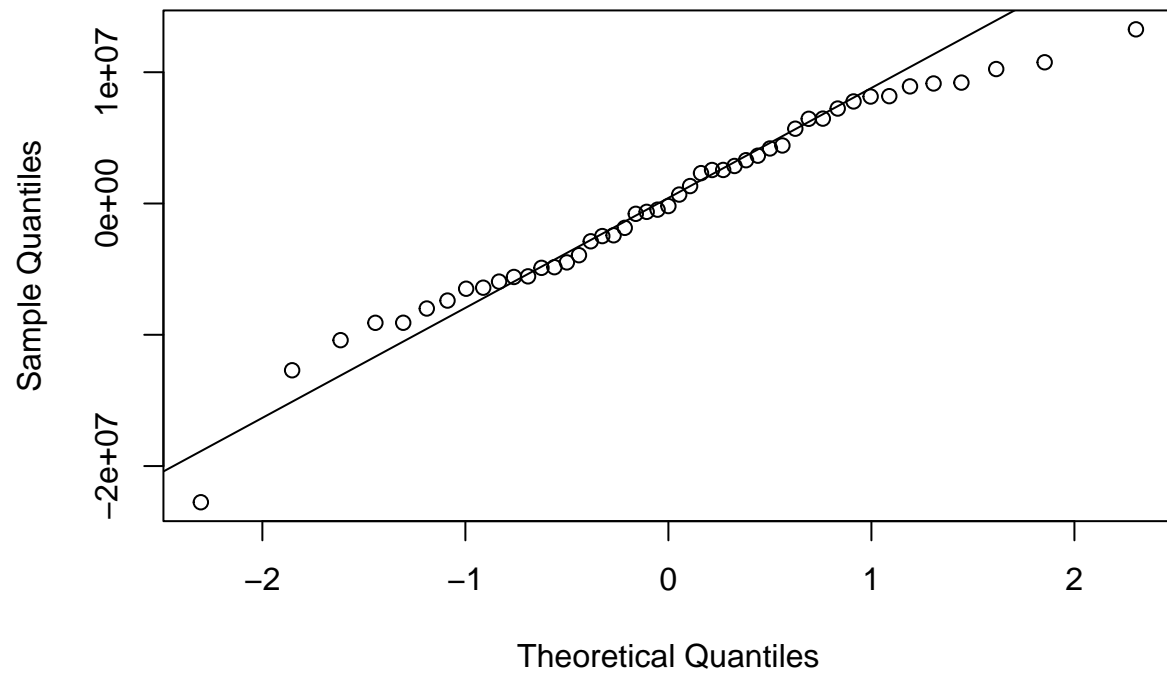
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)      5.363074e+17 6.338226e+17
## GAI$Influenza_Deaths -1.656460e+15 1.946184e+15
```

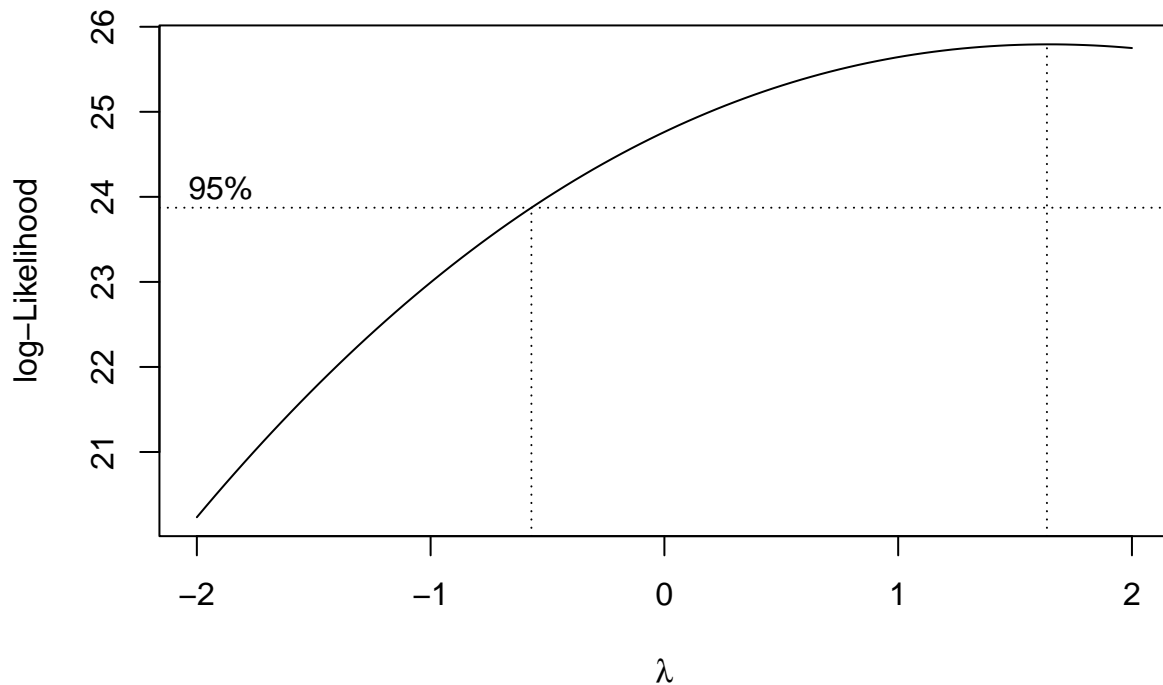
Georgia Covid Deaths vs Interstate Trips

```
model <- lm(GA$Interstate_Trips ~ GA$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Georgia Covid Deaths vs Interstate Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Georgia Covid Deaths vs Interstate Travel



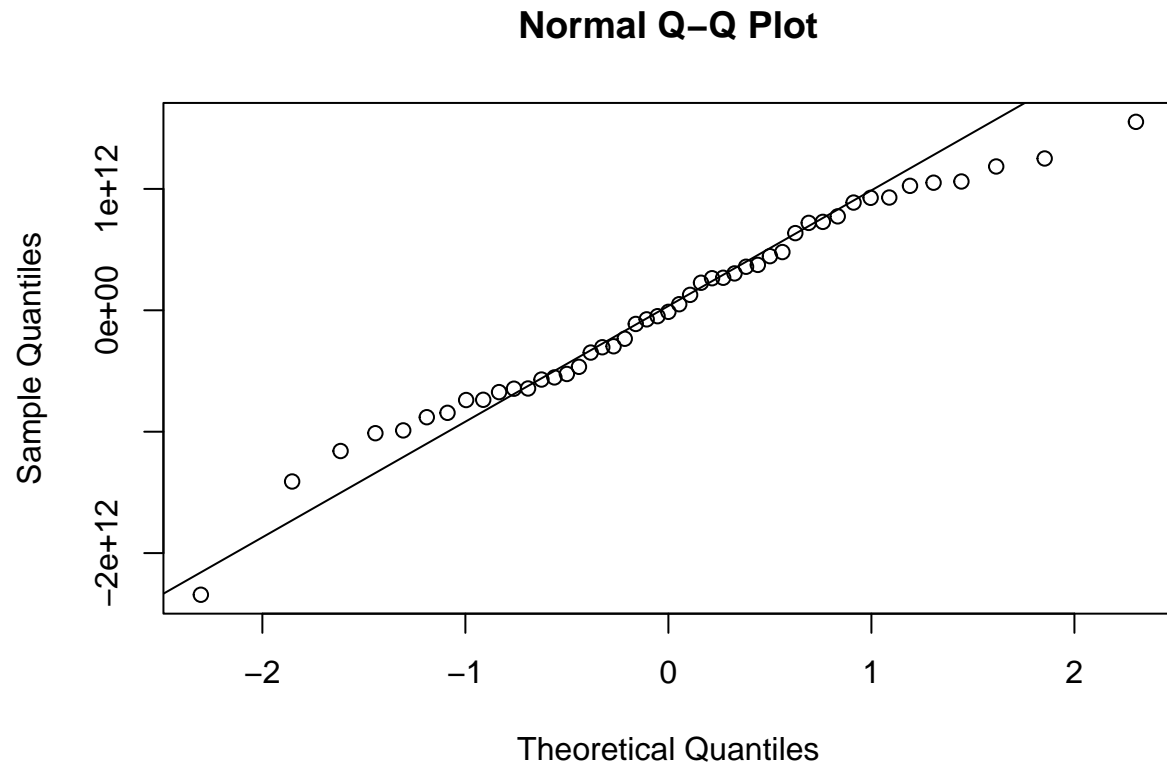
```
GA$CookD = cooks.distance(model)
GAC <- GA[which(GA$CookD < 0.5),]
bc <- boxcox(GAC$Interstate_Trips ~ GAC$Covid_Deaths)
```



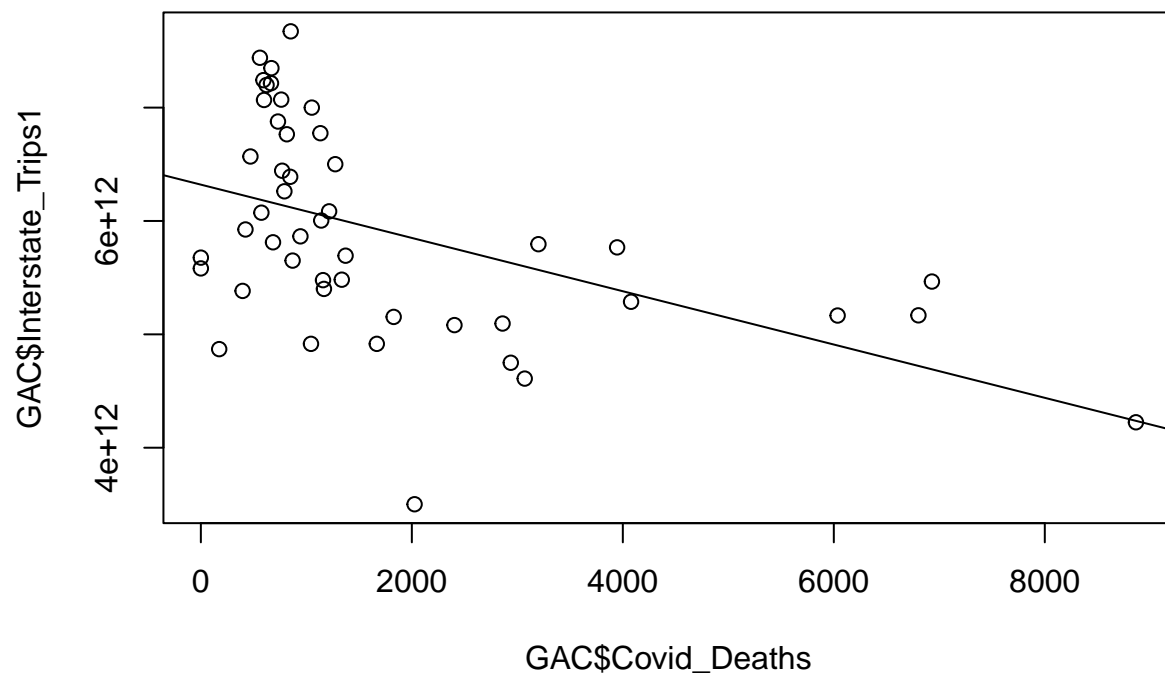
```
lambda <- bc$x[which.max(bc$y)]
GAC$Interstate_Trips1 <- (((GAC$Interstate_Trips)^lambda - 1) / lambda)
new_model <- lm(GAC$Interstate_Trips1 ~ GAC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = GAC$Interstate_Trips1 ~ GAC$Covid_Deaths)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.343e+12 -6.072e+11 -1.267e+10  6.779e+11  1.552e+12
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   6.321e+12  1.622e+11  38.957 < 2e-16 ***
## GAC$Covid_Deaths -2.351e+08  6.237e+07  -3.769 0.000475 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 8.221e+11 on 45 degrees of freedom
## Multiple R-squared:  0.2399, Adjusted R-squared:  0.223
## F-statistic: 14.2 on 1 and 45 DF, p-value: 0.0004751
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(GAC$Interstate_Trips1 ~ GAC$Covid_Deaths)
abline(new_model)
```



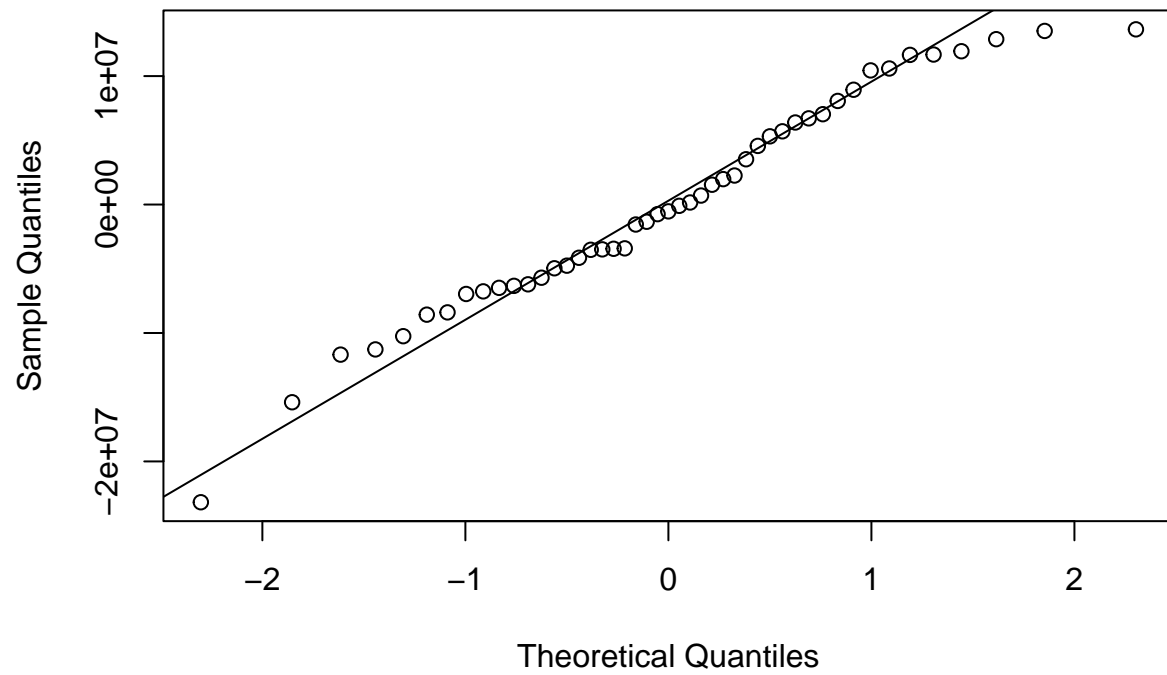
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %        97.5 %
## (Intercept)    5993921643930 6647492428806
## GAC$Covid_Deaths -360703365  -109446018
```

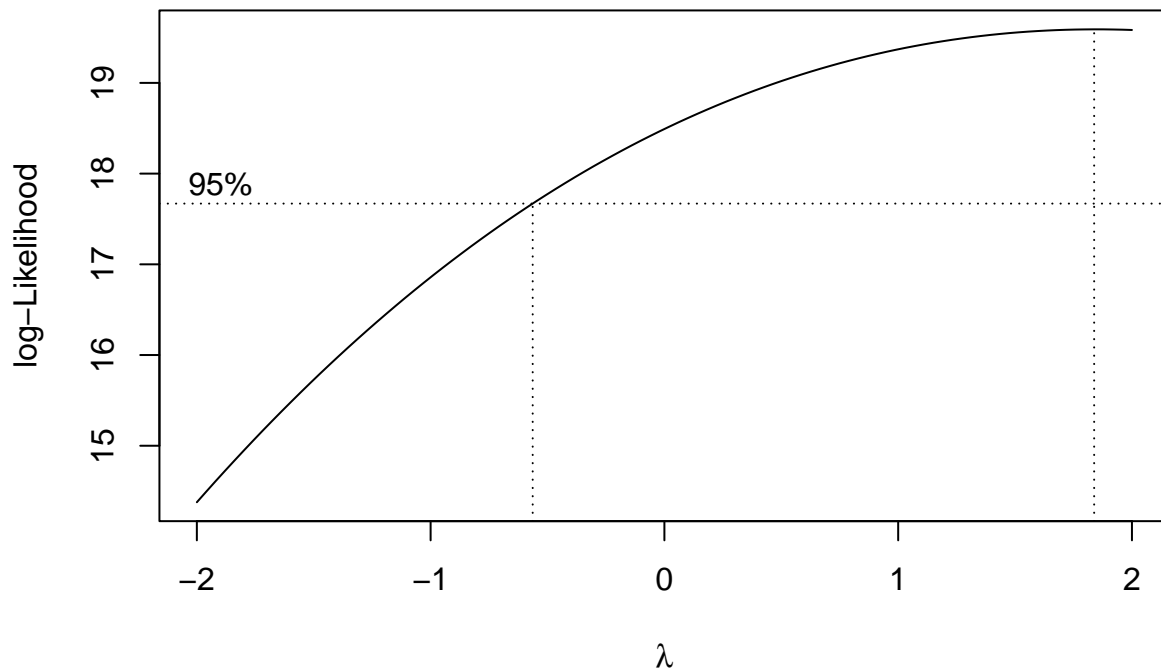
Georgia Influenza Deaths vs Interstate Trips

```
model <- lm(GA$Interstate_Trips ~ GA$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Georgia Influenza Deaths vs Interstate Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Georgia Influenza Deaths vs Interstate Travel



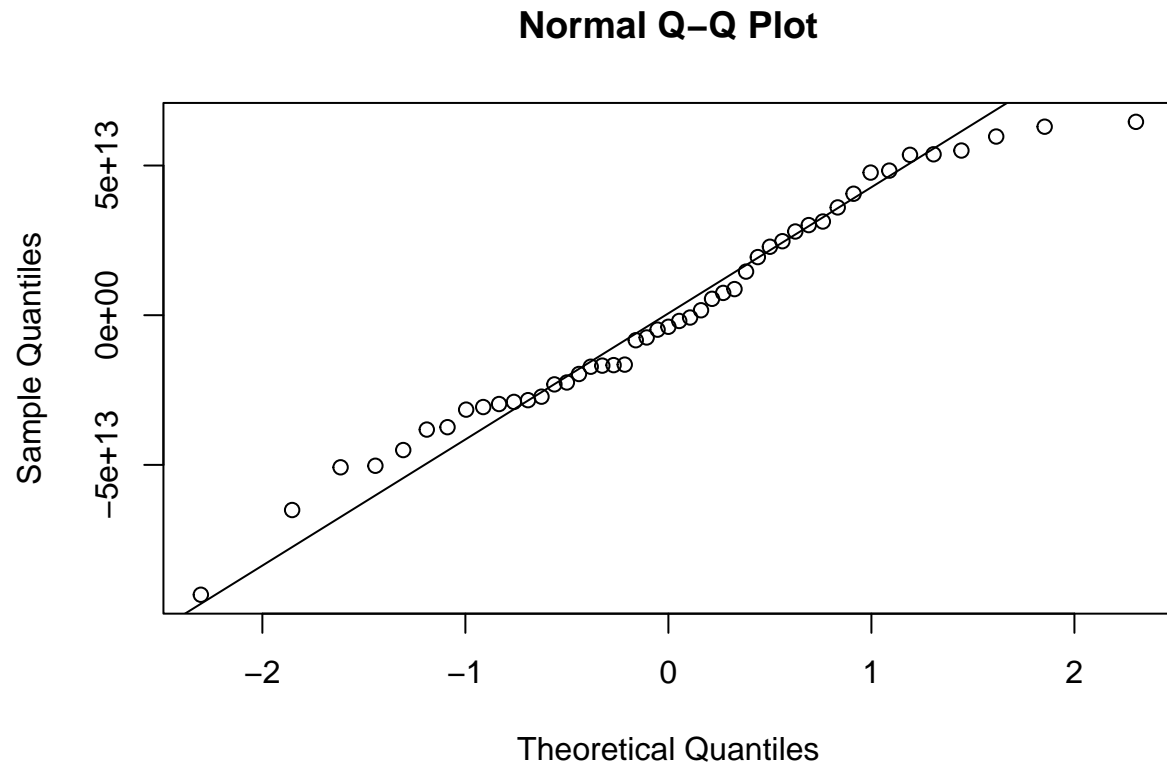
```
GA$CookD = cooks.distance(model)
GAI <- GA[which(GA$CookD < 0.5),]
bc <- boxcox(GAI$Interstate_Trips ~ GAI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
GAI$Interstate_Trips1 <- (((GAI$Interstate_Trips)^lambda - 1) / lambda)
new_model <- lm(GAI$Interstate_Trips1 ~ GAI$Influenza_Deaths)
summary(new_model)
```

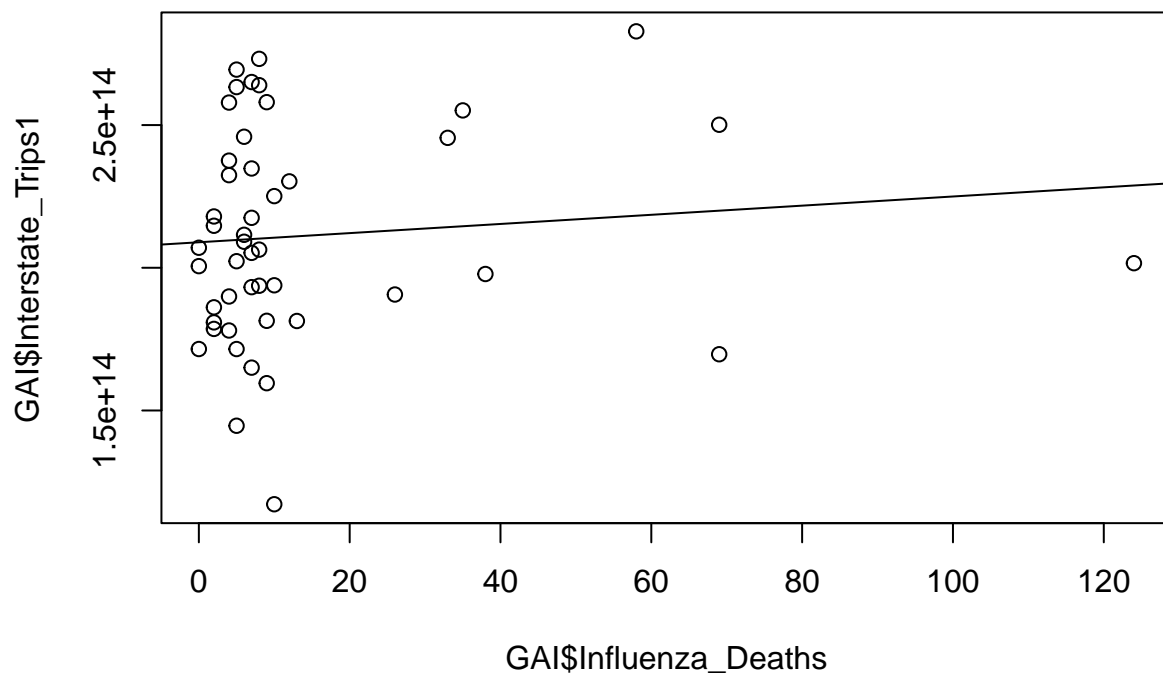
```
##
## Call:
## lm(formula = GAI$Interstate_Trips1 ~ GAI$Influenza_Deaths)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -9.338e+13 -2.780e+13 -3.865e+12  2.904e+13  6.459e+13
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.089e+14  6.486e+12  32.216  <2e-16 ***
## GAI$Influenza_Deaths 1.604e+11  2.396e+11  0.669    0.507
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.756e+13 on 45 degrees of freedom
## Multiple R-squared:  0.009862, Adjusted R-squared:  -0.01214
## F-statistic: 0.4482 on 1 and 45 DF, p-value: 0.5066
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(GAI$Interstate_Trips1 ~ GAI$Influenza_Deaths)
abline(new_model)
```





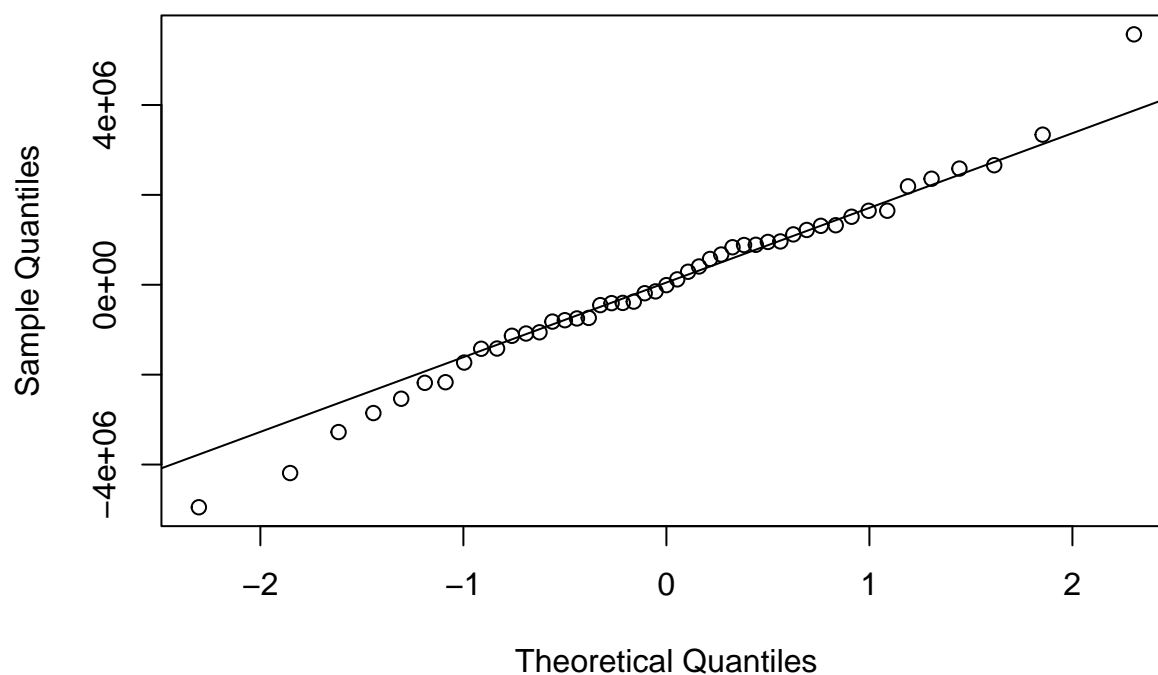
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)    1.958738e+14 2.219988e+14
## GAI$Influenza_Deaths -3.221752e+11 6.429970e+11
```

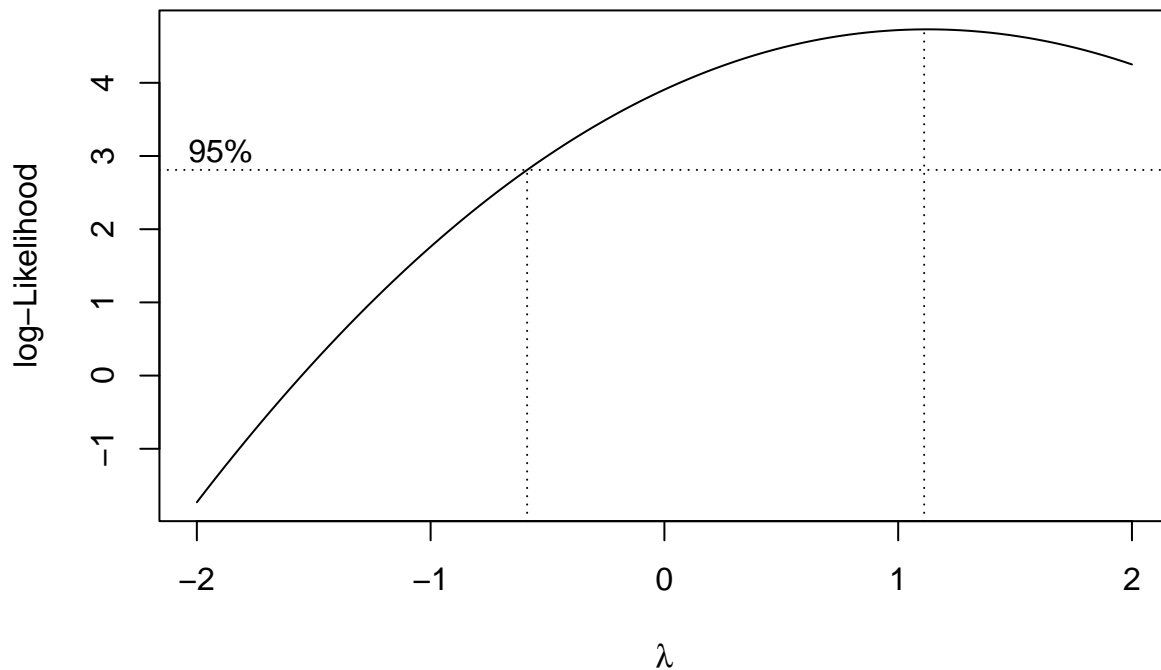
Georgia Covid Deaths vs Long Distance Trips

```
model <- lm(GA$Long_Distance_Trips ~ GA$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Georgia Covid Deaths vs Long_Distance Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Georgia Covid Deaths vs Long\_Distance Trave



```
GA$CookD = cooks.distance(model)
GAC <- GA[which(GA$CookD < 0.5),]
bc <- boxcox(GAC$Long_Distance_Trips ~ GAC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
GAC$Long_Distance_Trips1 <- (((GAC$Long_Distance_Trips)^lambda - 1) / lambda)
new_model <- lm(GAC$Long_Distance_Trips1 ~ GAC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = GAC$Long_Distance_Trips1 ~ GAC$Covid_Deaths)
##
## Residuals:
```

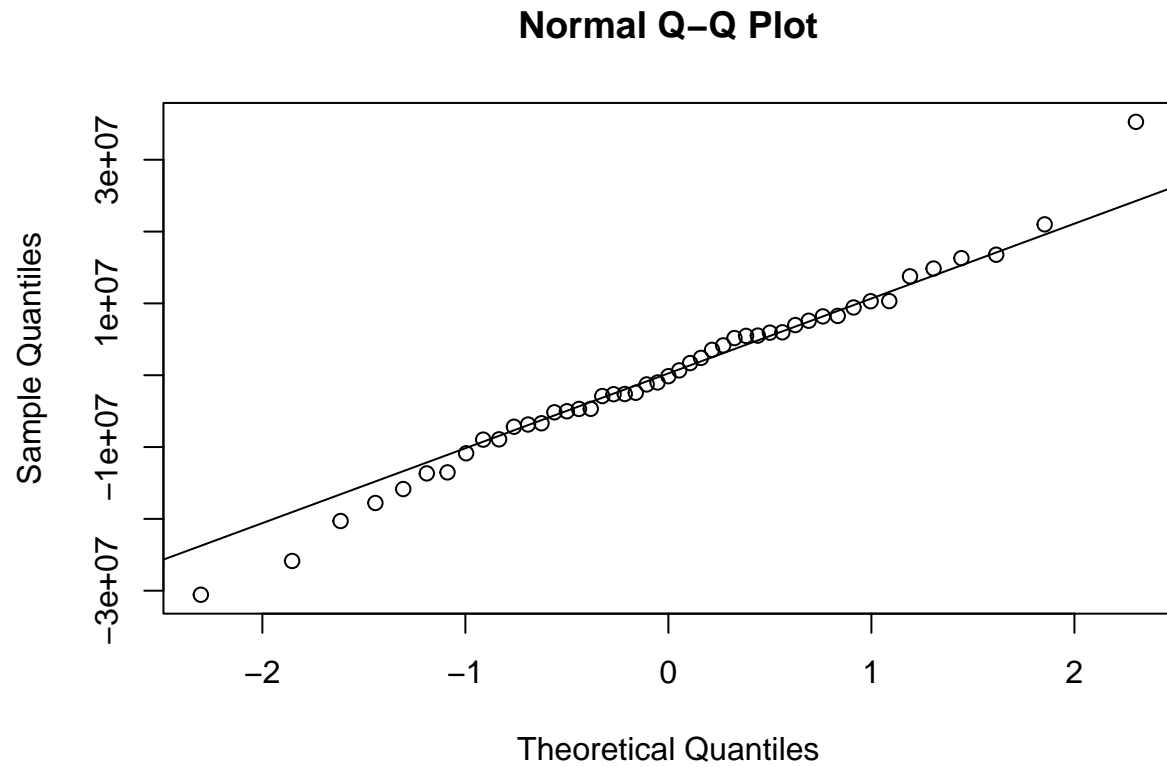
	Min	1Q	Median	3Q	Max
	-30563271	-6774789	-133450	7286600	35277393

```
##
## Coefficients:
```

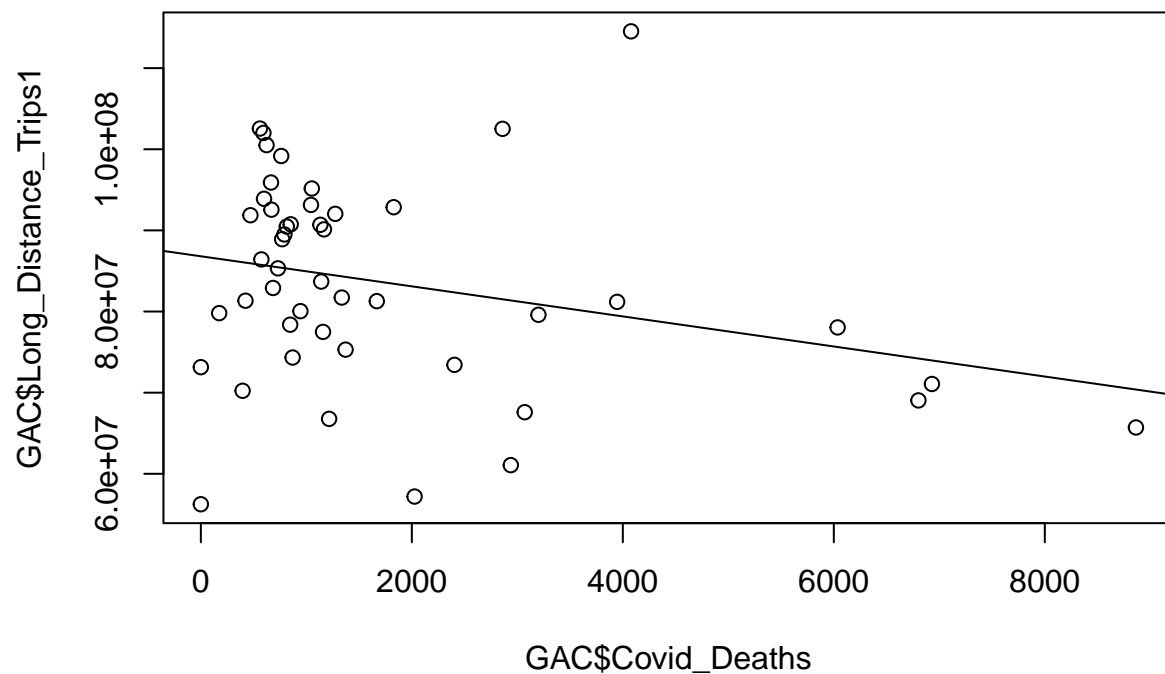
	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	86811549.8	2441074.4	35.563	<2e-16 ***
GAC\$Covid_Deaths	-1853.1	938.4	-1.975	0.0545 .

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 12370000 on 45 degrees of freedom
## Multiple R-squared:  0.07974,    Adjusted R-squared:  0.05929
## F-statistic: 3.899 on 1 and 45 DF,  p-value: 0.05446
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(GAC$Long_Distance_Trips1 ~ GAC$Covid_Deaths)
abline(new_model)
```



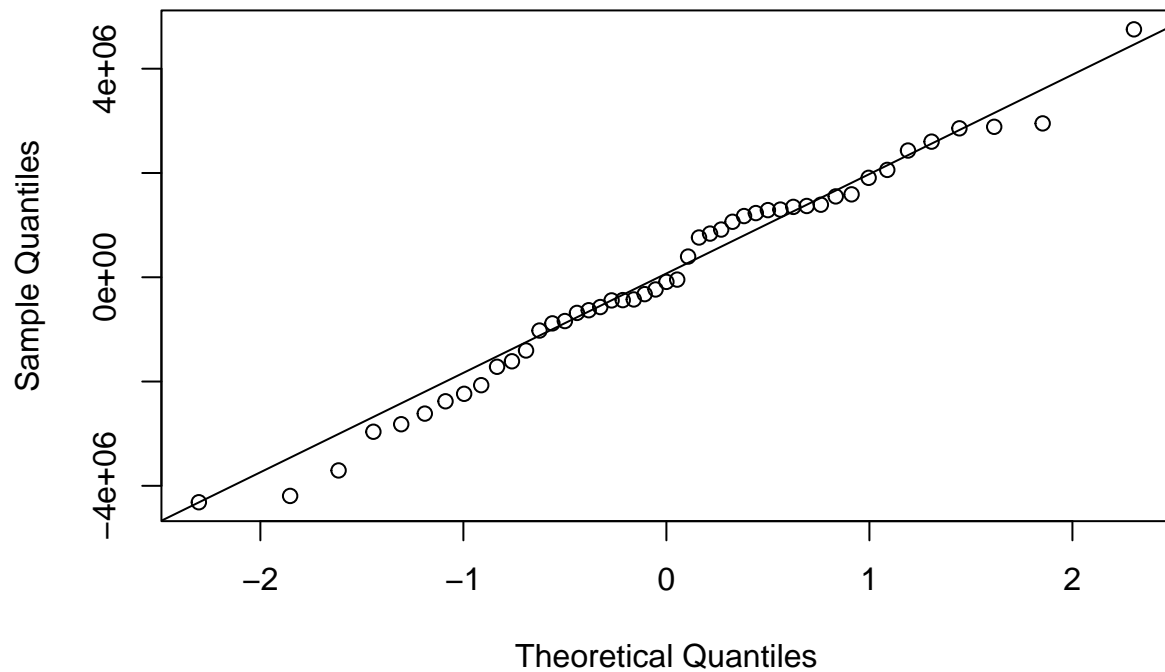
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)    81894973.64 9.172813e+07
## GAC$Covid_Deaths -3743.26 3.697583e+01
```

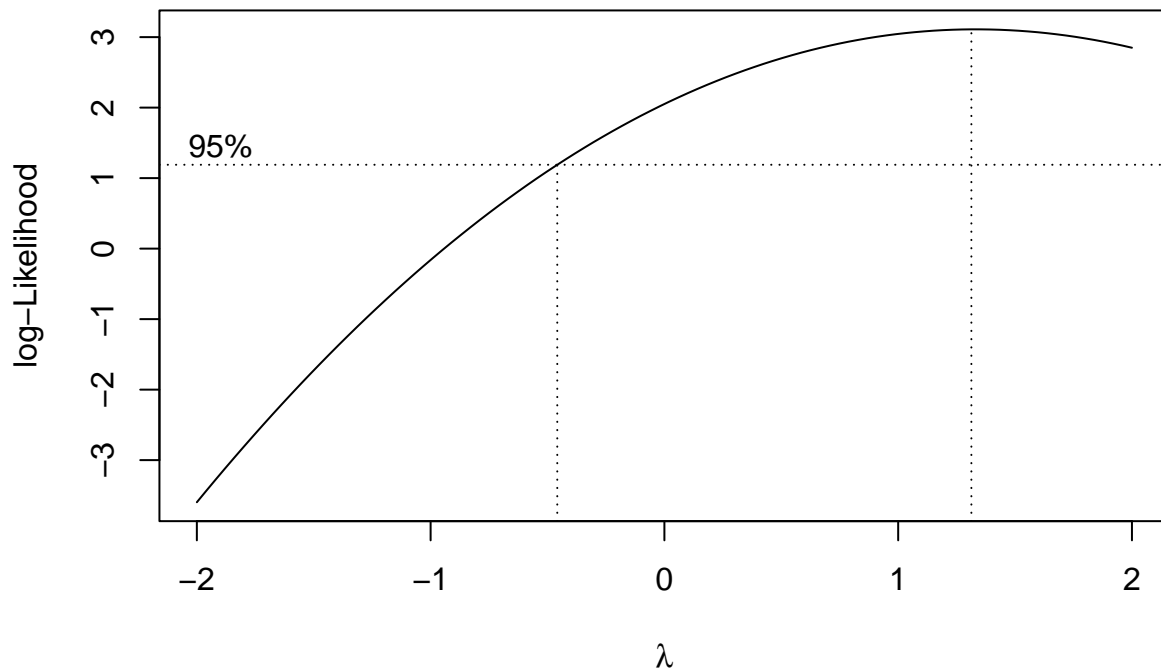
Georgia Influenza Deaths vs Long Distance Trips

```
model <- lm(GA$Long_Distance_Trips ~ GA$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Georgia Influenza Deaths vs Long_Distance Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Georgia Influenza Deaths vs Long\_Distance Trav



```
GA$CookD = cooks.distance(model)
GAI <- GA[which(GA$CookD < 0.5),]
bc <- boxcox(GAI$Long_Distance_Trips ~ GAI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
GAI$Long_Distance_Trips1 <- (((GAI$Long_Distance_Trips)^lambda - 1) / lambda)
new_model <- lm(GAI$Long_Distance_Trips1 ~ GAI$Influenza_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = GAI$Long_Distance_Trips1 ~ GAI$Influenza_Deaths)
##
## Residuals:
```

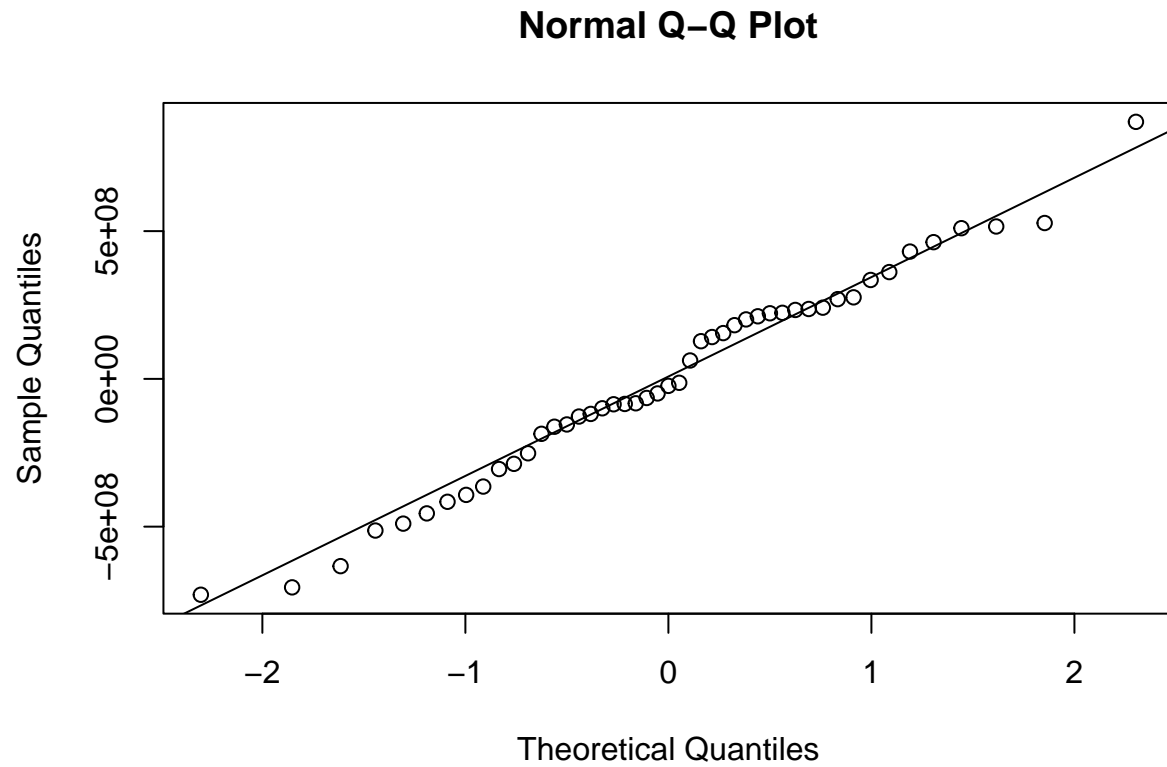
	Min	1Q	Median	3Q	Max
	-730422109	-218849815	-23625093	234900416	869778598

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	2017507430	61986559	32.547	<2e-16 ***
GAI\$Influenza_Deaths	-1778713	2290058	-0.777	0.441

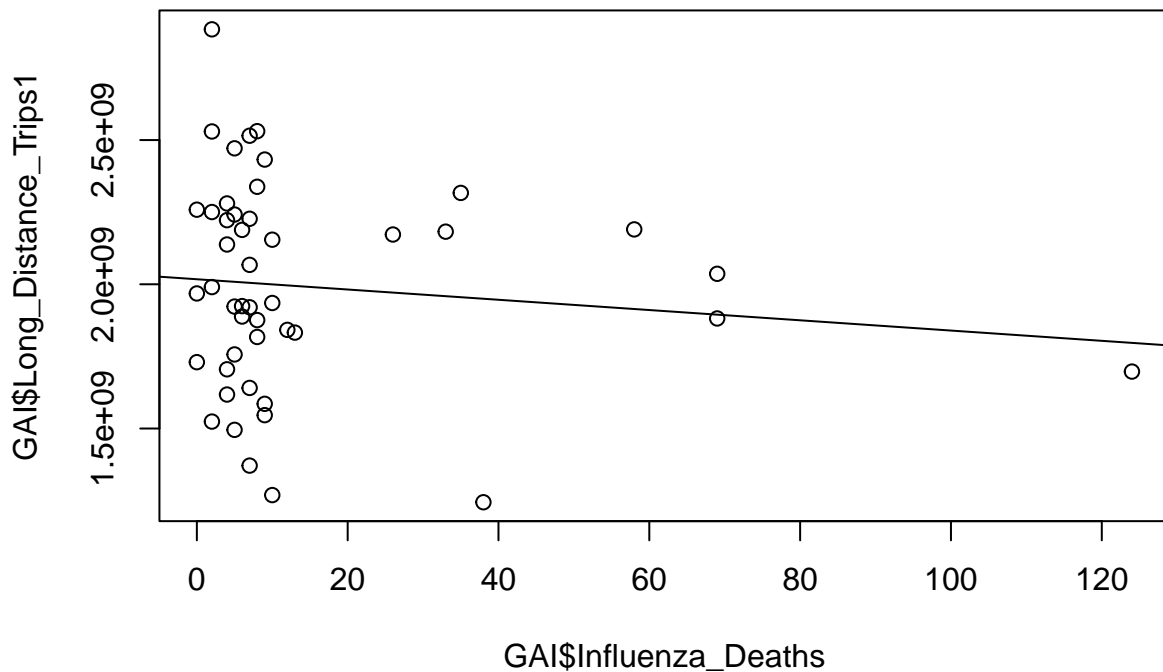
```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 358900000 on 45 degrees of freedom
## Multiple R-squared:  0.01323,    Adjusted R-squared:  -0.008699
## F-statistic: 0.6033 on 1 and 45 DF,  p-value: 0.4414
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(GAI$Long_Distance_Trips1 ~ GAI$Influenza_Deaths)
abline(new_model)
```





```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##              2.5 %    97.5 %
## (Intercept) 1892660093 2142354768
## GAI$Influenza_Deaths -6391126 2833700
```

New York Stats

New York Covid Deaths vs Local Trips

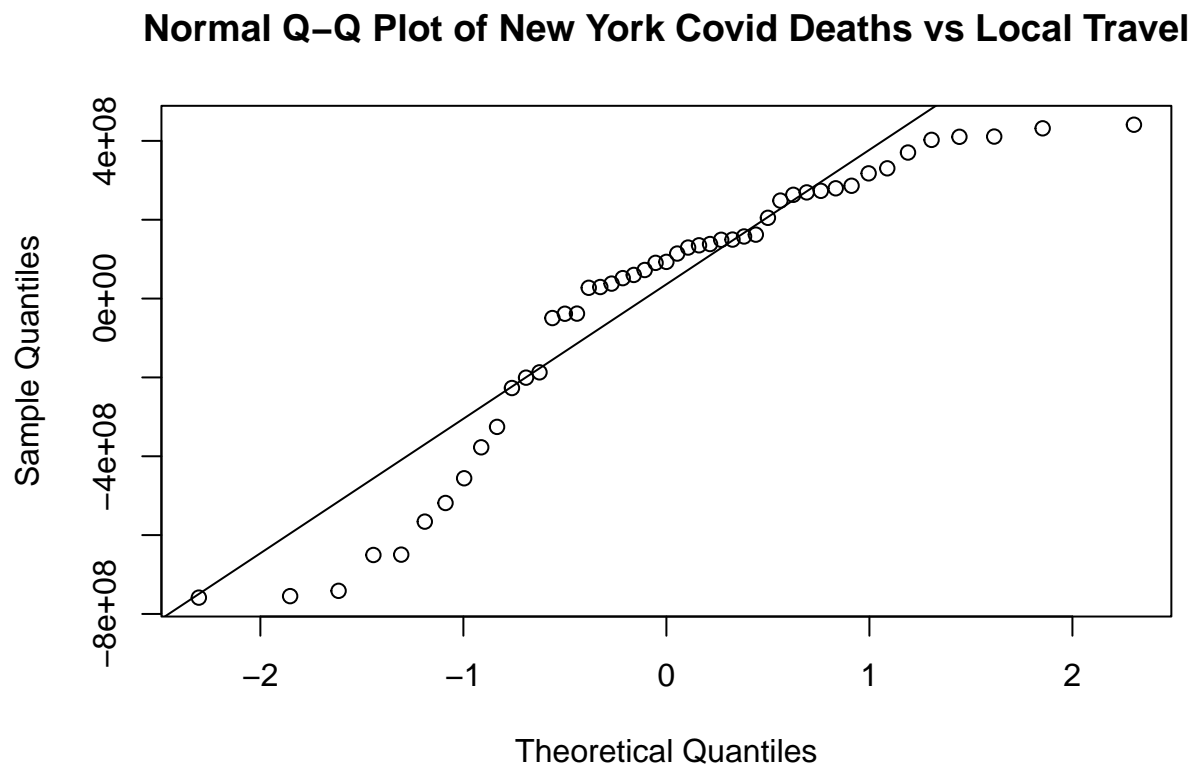
```
NY = DT[DT$Jurisdiction == 'New York',]
head(NY)
```

```
## # A tibble: 6 x 12
##   Year Month Jurisdiction Covid_Deaths Total_Deaths Pneumonia_Deaths
##   <dbl> <dbl> <chr>          <dbl>      <dbl>          <dbl>
## 1  2019    12 New York             0        6638           686
## 2  2020     1 New York            244       27028          2605
## 3  2020     2 New York            854       25816          2553
## 4  2020     3 New York           13156      55658          9877
## 5  2020     4 New York          40567      75640         20088
## 6  2020     5 New York          11070      40153          6270
## # i 6 more variables: Influenza_Deaths <dbl>, Pneumonia_Influenza_Deaths <dbl>,
## #   Pneumonia_Influenza_Covid <dbl>, Local_Trips <dbl>, Interstate_Trips <dbl>,
## #   Long_Distance_Trips <dbl>
```

```

model <- lm(NY$Local_Trips ~ NY$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of New York Covid Deaths vs Local Travel")
qqline(model$residuals)

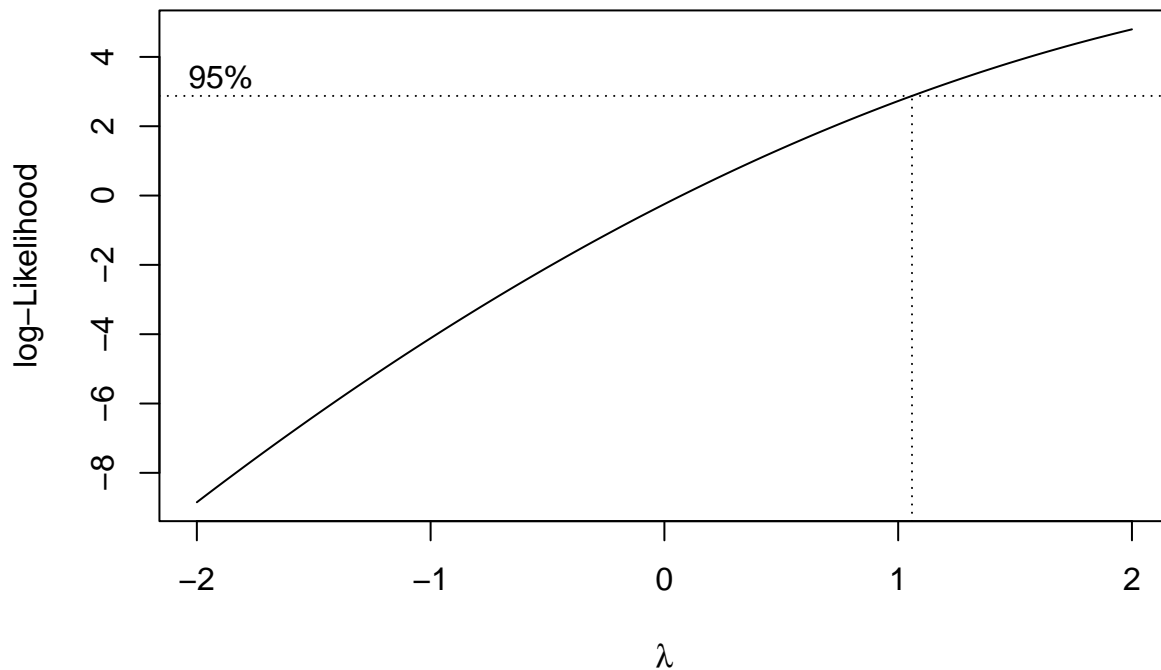
```



```

NY$CookD = cooks.distance(model)
NYC <- NY[which(NY$CookD < 0.5),]
bc <- boxcox(NYC$Local_Trips ~ NYC$Covid_Deaths)

```



```
lambda <- bc$x[which.max(bc$y)]
NYC$Local_Trips1 <- (((NYC$Local_Trips)^lambda - 1) / lambda)
new_model <- lm(NYC$Local_Trips1 ~ NYC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = NYC$Local_Trips1 ~ NYC$Covid_Deaths)
##
## Residuals:
```

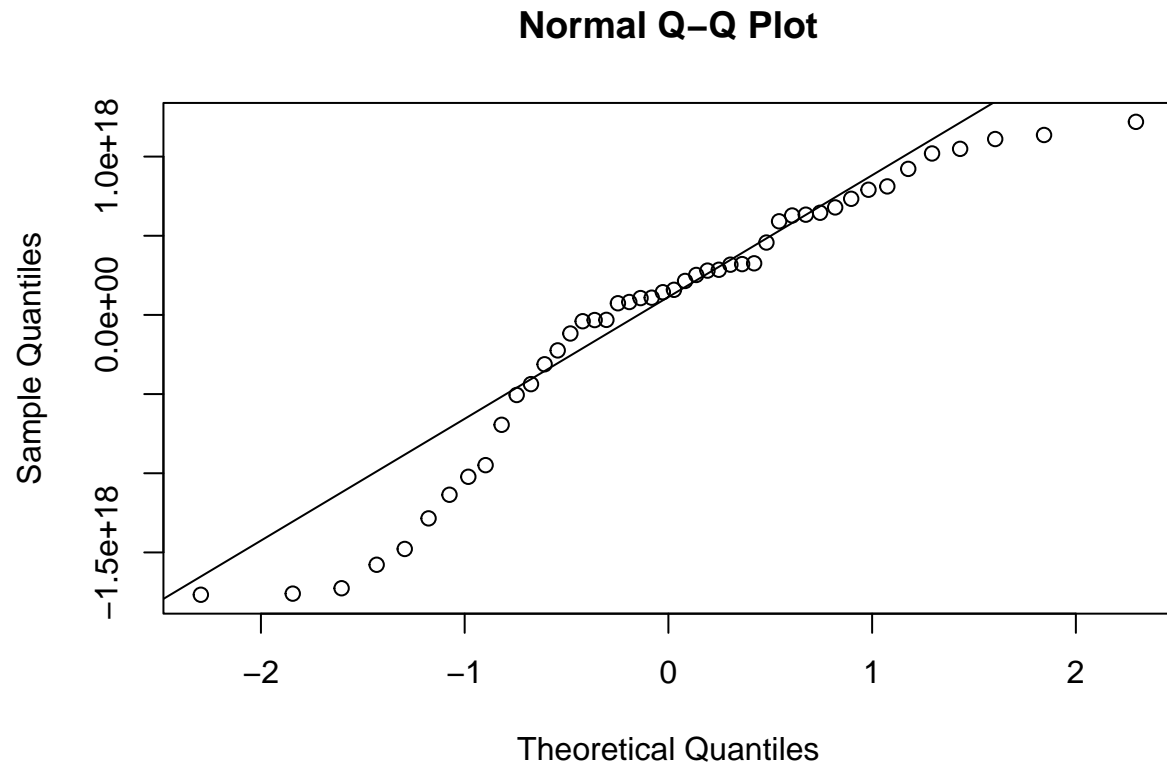
	Min	1Q	Median	3Q	Max
##	-1.767e+18	-4.057e+17	1.510e+17	6.319e+17	1.219e+18

```
##
## Coefficients:
```

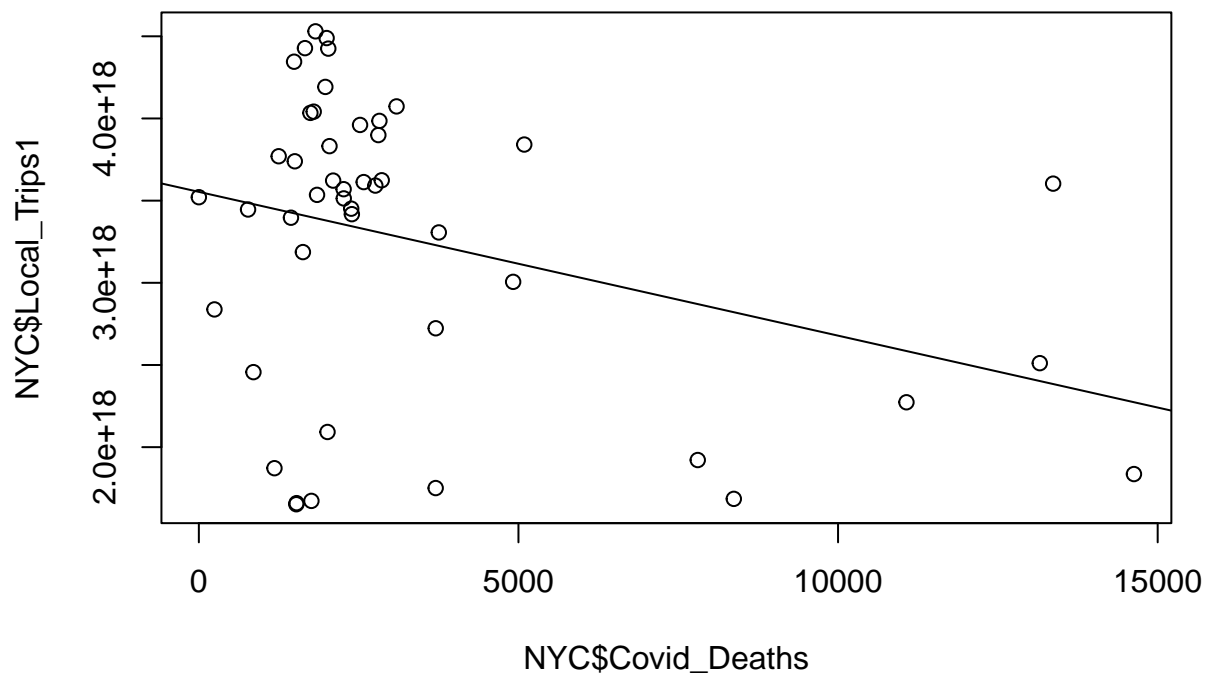
	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	3.553e+18	1.758e+17	20.216	<2e-16 ***
## NYC\$Covid_Deaths	-8.749e+13	3.682e+13	-2.376	0.0219 *

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 8.471e+17 on 44 degrees of freedom
## Multiple R-squared:  0.1138, Adjusted R-squared:  0.09361
## F-statistic: 5.648 on 1 and 44 DF,  p-value: 0.0219
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NYC$Local_Trips1 ~ NYC$Covid_Deaths)
abline(new_model)
```



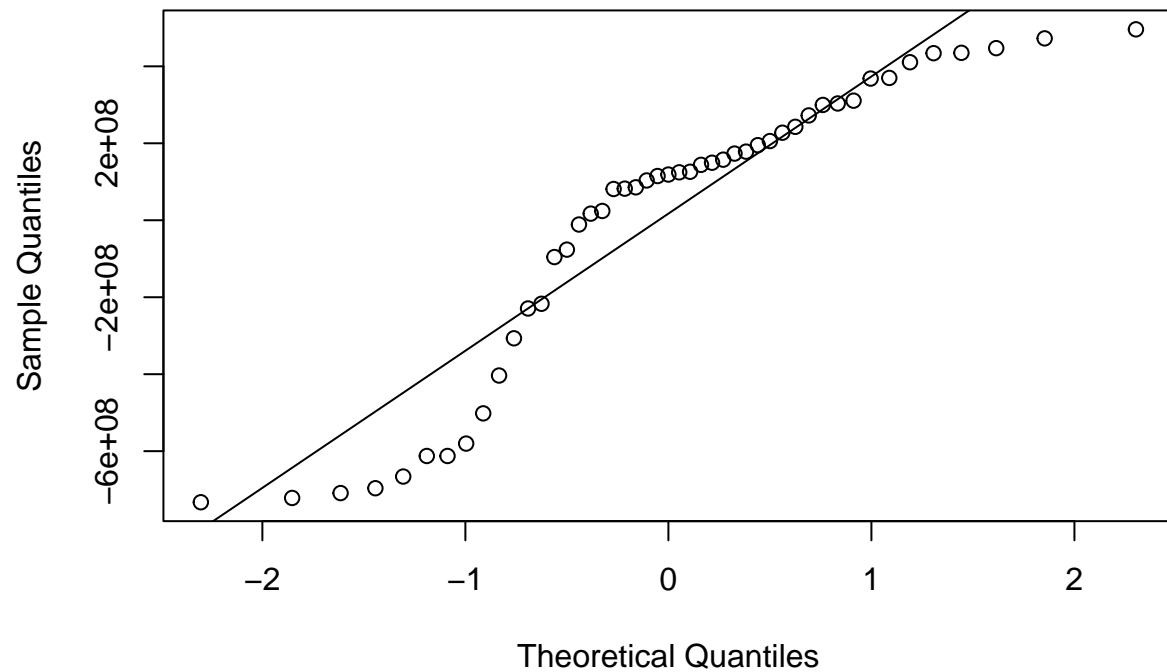
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %          97.5 %
## (Intercept)    3.199144e+18  3.907637e+18
## NYC$Covid_Deaths -1.616902e+14 -1.329457e+13
```

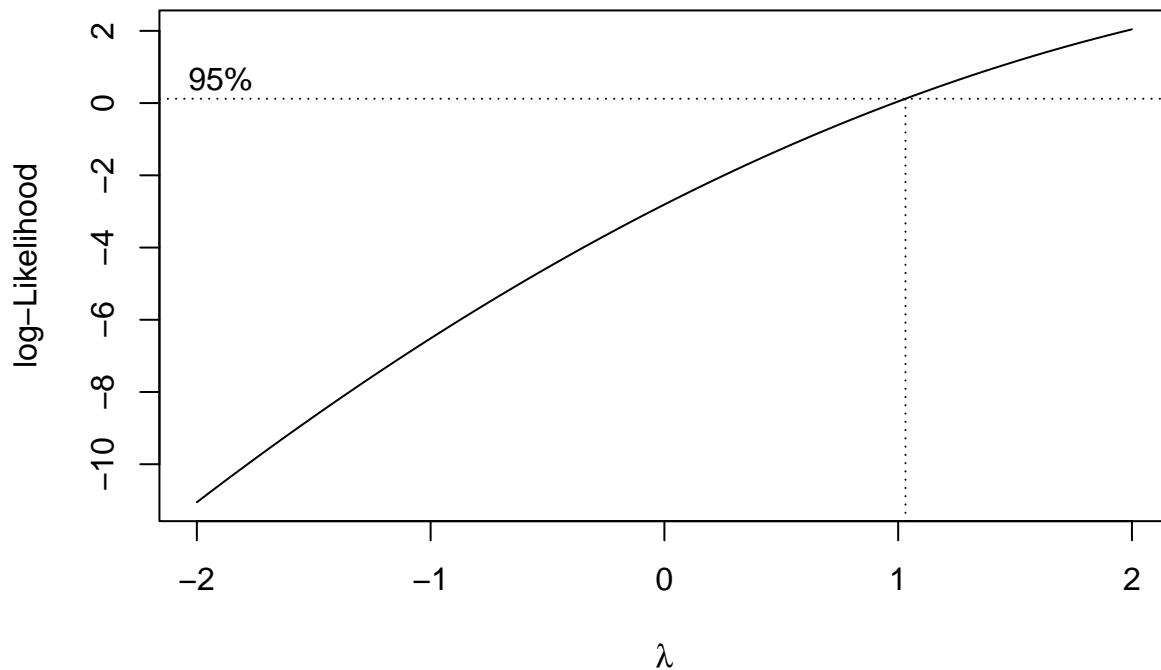
New York Influenza Deaths vs Local Trips

```
model <- lm(NY$Local_Trips ~ NY$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of New York Influenza Deaths vs Local Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of New York Influenza Deaths vs Local Travel



```
NY$CookD = cooks.distance(model)
NYI <- NY[which(NY$CookD < 0.5),]
bc <- boxcox(NYI$Local_Trips ~ NYI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
NYI$Local_Trips1 <- (((NYI$Local_Trips)^lambda - 1) / lambda)
new_model <- lm(NYI$Local_Trips1 ~ NYI$Influenza_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = NYI$Local_Trips1 ~ NYI$Influenza_Deaths)
##
## Residuals:
```

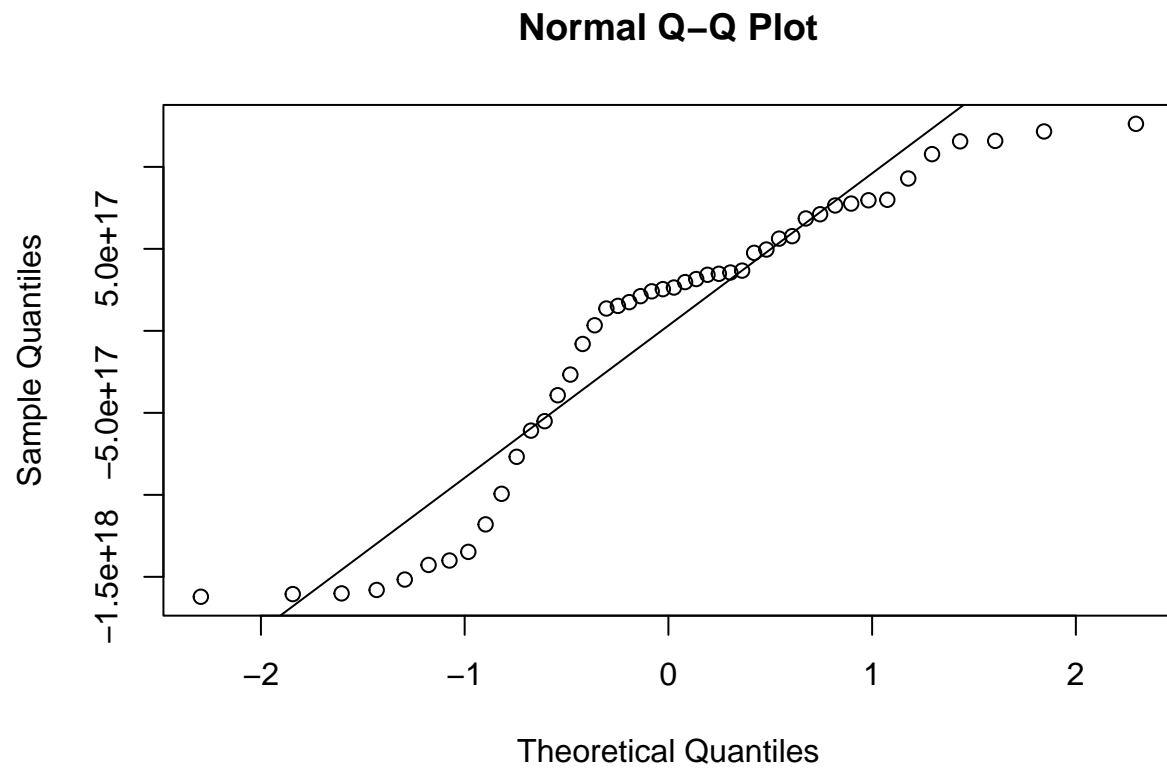
	Min	1Q	Median	3Q	Max
	-1.621e+18	-5.940e+17	2.593e+17	6.585e+17	1.262e+18

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	3.276e+18	1.525e+17	21.486	<2e-16 ***
NYI\$Influenza_Deaths	-1.986e+14	9.227e+14	-0.215	0.831

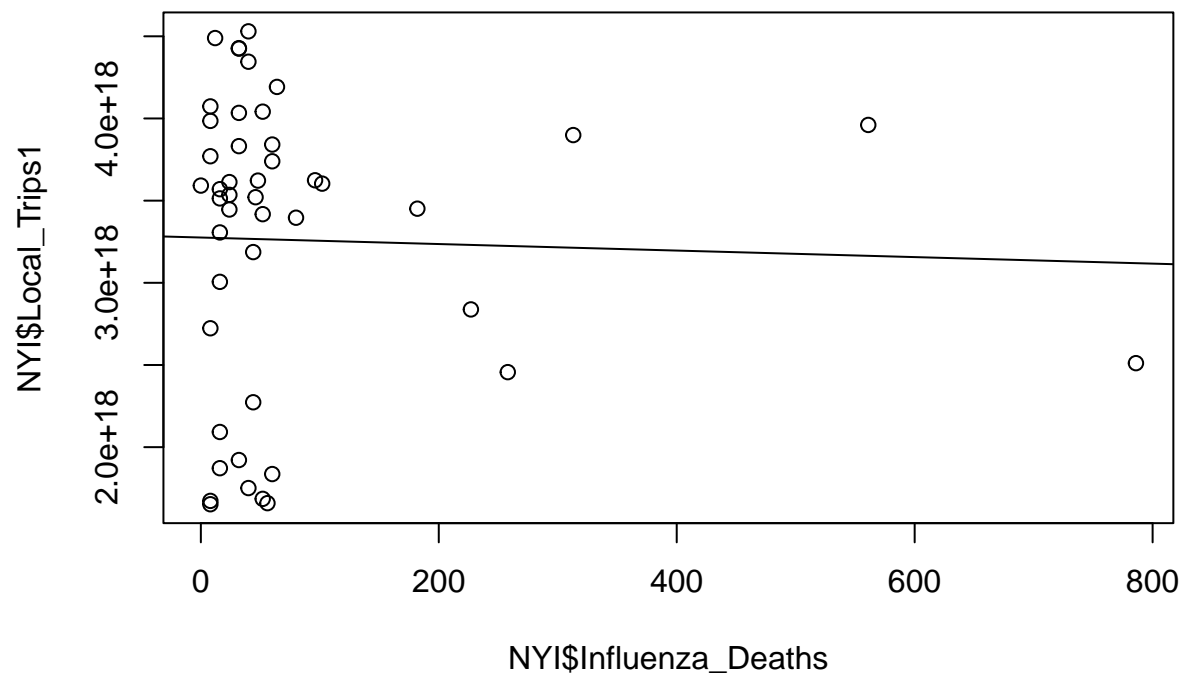
```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 8.993e+17 on 44 degrees of freedom
## Multiple R-squared:  0.001052,    Adjusted R-squared:  -0.02165
## F-statistic: 0.04634 on 1 and 44 DF,  p-value: 0.8306
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NYI$Local_Trips1 ~ NYI$Influenza_Deaths)
abline(new_model)
```





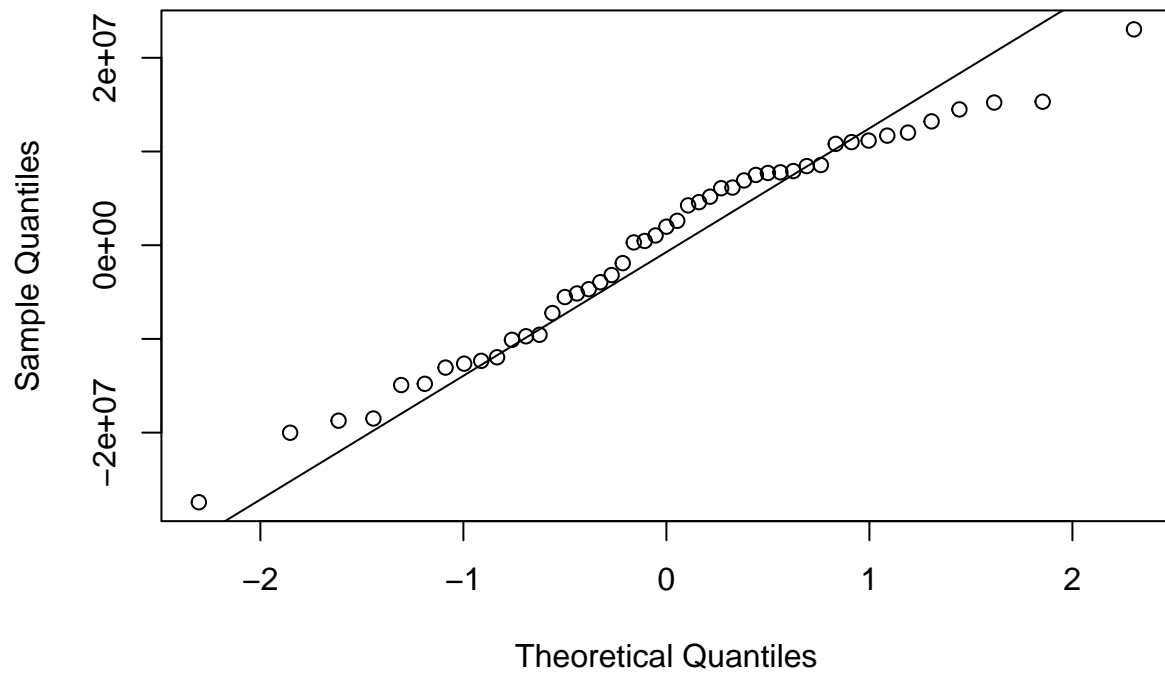
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)    2.968402e+18 3.582908e+18
## NYI$Influenza_Deaths -2.058152e+15 1.660901e+15
```

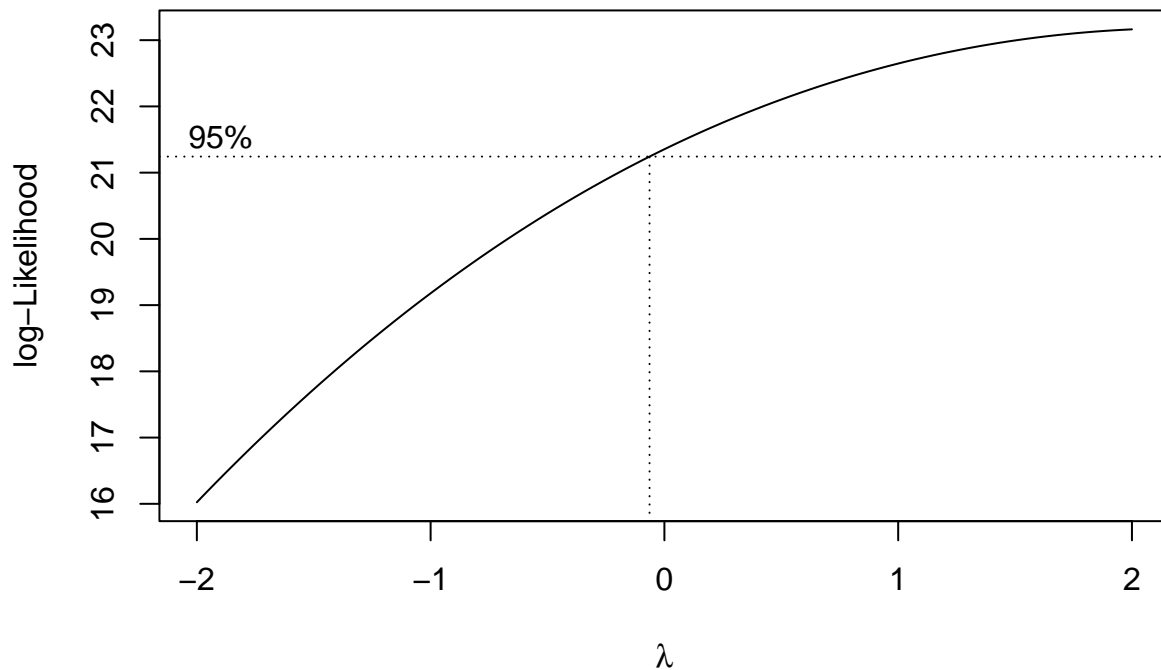
New York Covid Deaths vs Interstate Trips

```
model <- lm(NY$Interstate_Trips ~ NY$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of New York Covid Deaths vs Interstate Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of New York Covid Deaths vs Interstate Travel



```
NY$CookD = cooks.distance(model)
NYC <- NY[which(NY$CookD < 0.5),]
bc <- boxcox(NYC$Interstate_Trips ~ NYC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
NYC$Interstate_Trips1 <- ((NYC$Interstate_Trips)^lambda - 1) / lambda
new_model <- lm(NYC$Interstate_Trips1 ~ NYC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = NYC$Interstate_Trips1 ~ NYC$Covid_Deaths)
##
## Residuals:
```

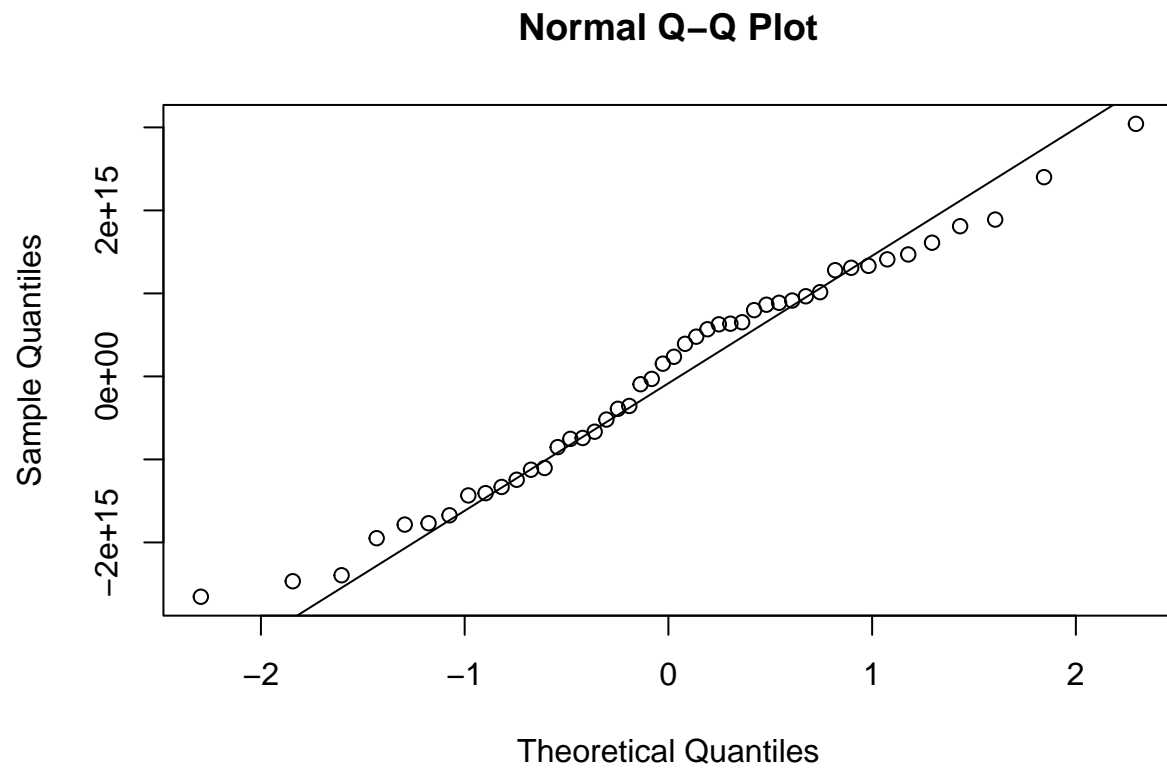
	Min	1Q	Median	3Q	Max
	-2.654e+15	-1.119e+15	1.950e+14	9.527e+14	3.043e+15

```
##
## Coefficients:
```

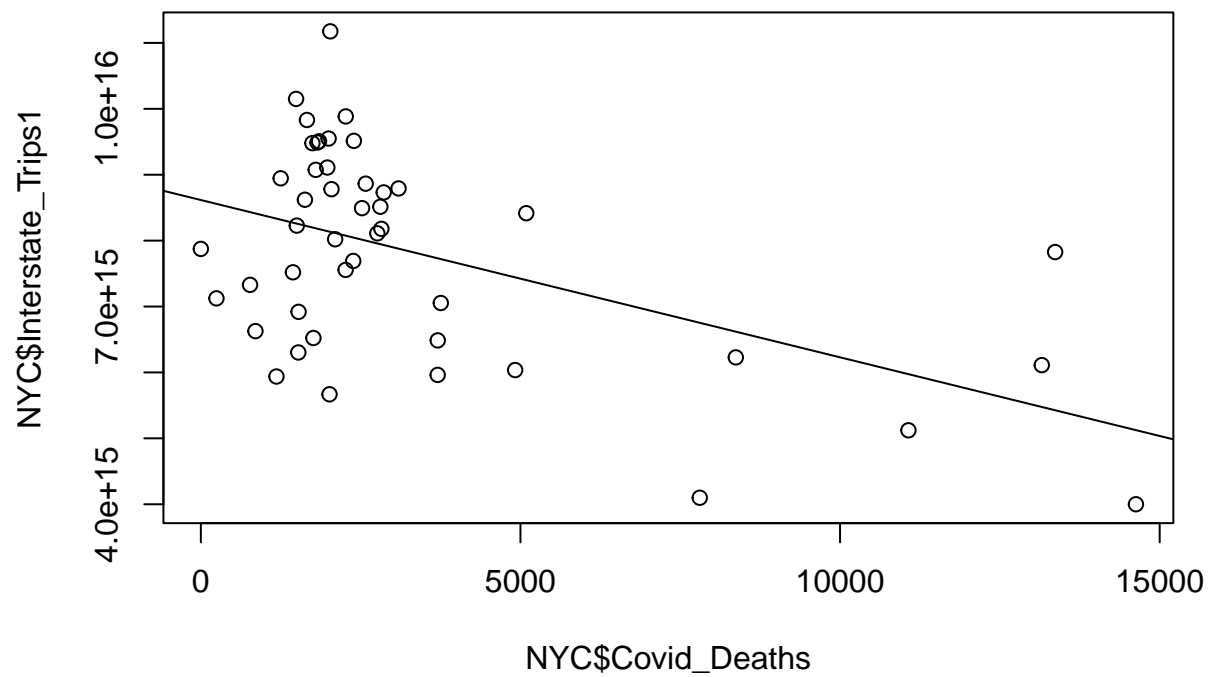
	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	8.616e+15	2.887e+14	29.842	< 2e-16 ***
NYC\$Covid_Deaths	-2.387e+11	6.047e+10	-3.947	0.000281 ***

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.391e+15 on 44 degrees of freedom
## Multiple R-squared:  0.2615, Adjusted R-squared:  0.2447
## F-statistic: 15.58 on 1 and 44 DF,  p-value: 0.0002814
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NYC$Interstate_Trips1 ~ NYC$Covid_Deaths)
abline(new_model)
```



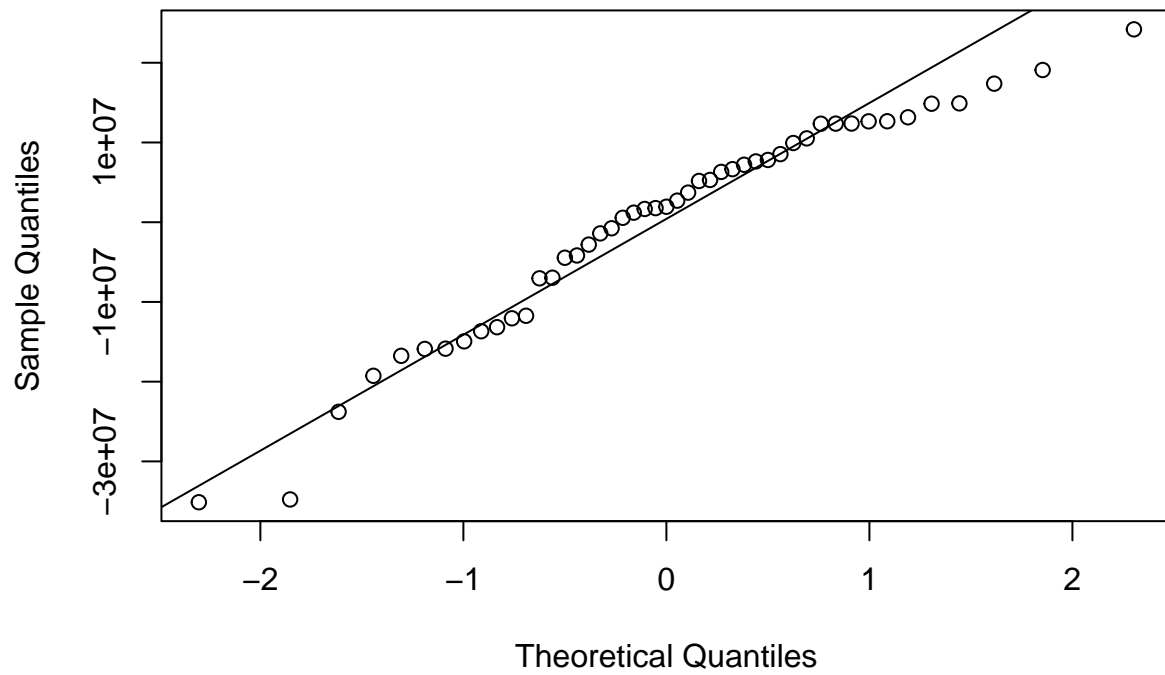
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %        97.5 %
## (Intercept)    8.034247e+15  9.198030e+15
## NYC$Covid_Deaths -3.605743e+11 -1.168168e+11
```

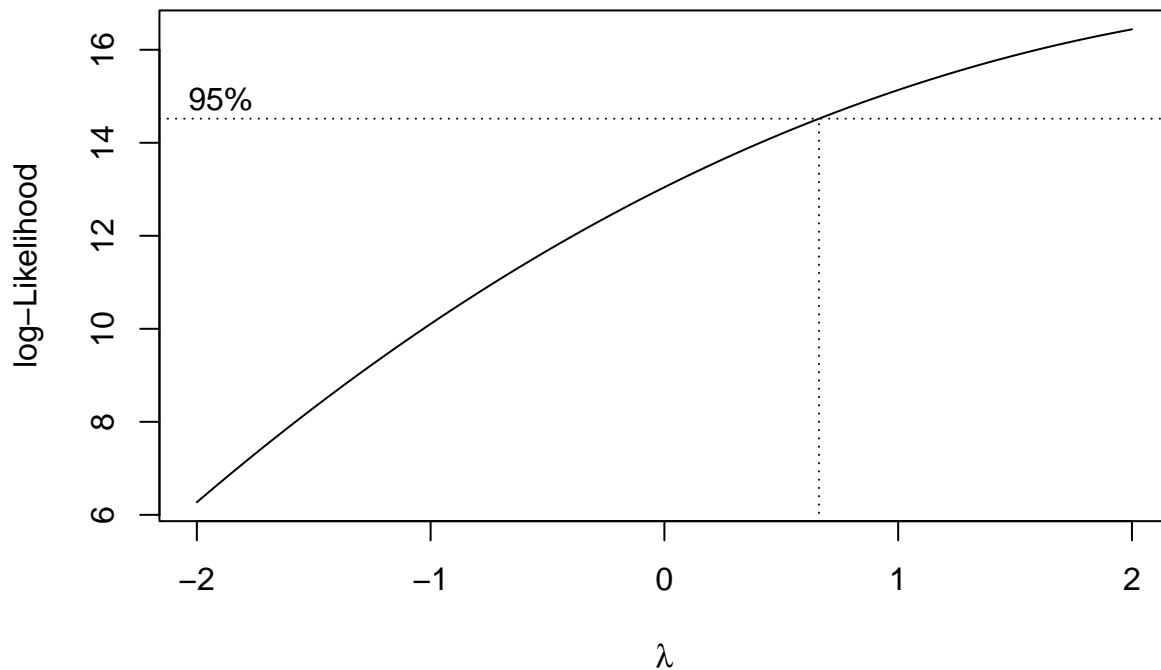
New York Influenza Deaths vs Interstate Trips

```
model <- lm(NY$Interstate_Trips ~ NY$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of New York Influenza Deaths vs Interstate Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of New York Influenza Deaths vs Interstate Travel



```
NY$CookD = cooks.distance(model)
NYI <- NY[which(NY$CookD < 0.5),]
bc <- boxcox(NYI$Interstate_Trips ~ NYI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
NYI$Interstate_Trips1 <- (((NYI$Interstate_Trips)^lambda - 1) / lambda)
new_model <- lm(NYI$Interstate_Trips1 ~ NYI$Influenza_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = NYI$Interstate_Trips1 ~ NYI$Influenza_Deaths)
##
## Residuals:
```

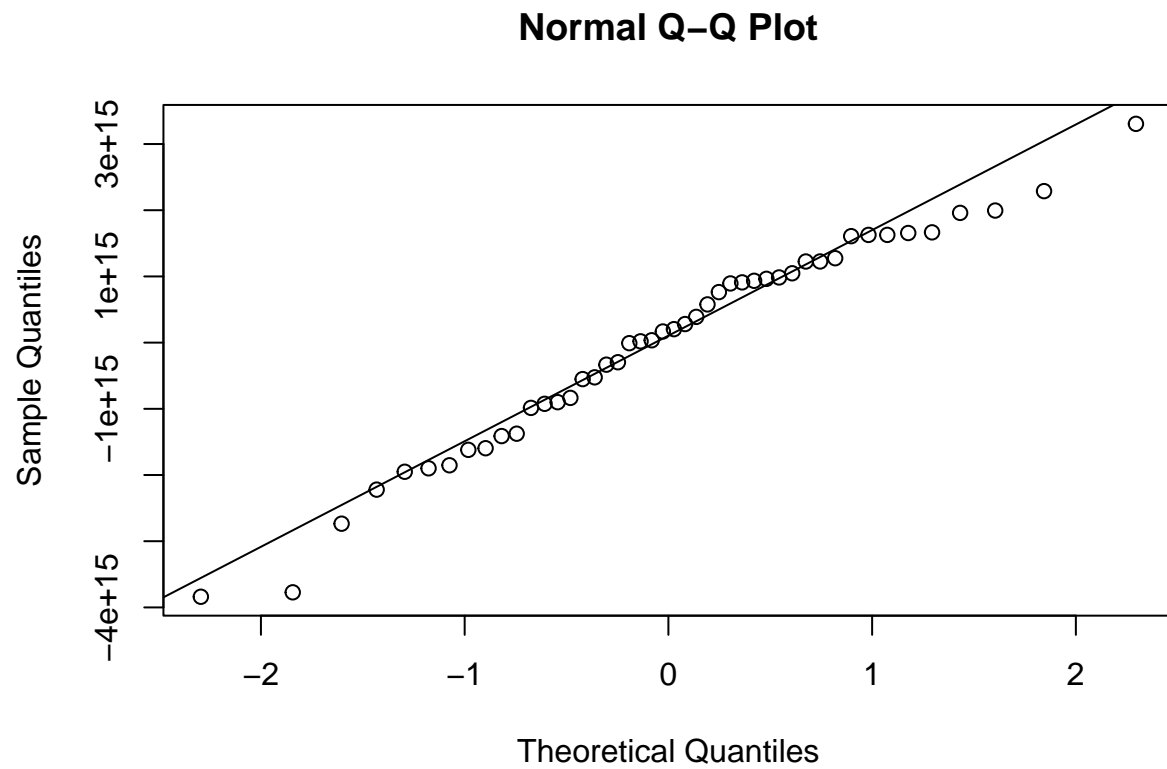
	Min	1Q	Median	3Q	Max
	-3.839e+15	-9.706e+14	1.858e+14	1.181e+15	3.305e+15

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	7.907e+15	2.730e+14	28.96	<2e-16 ***
NYI\$Influenza_Deaths	-1.140e+12	1.652e+12	-0.69	0.494

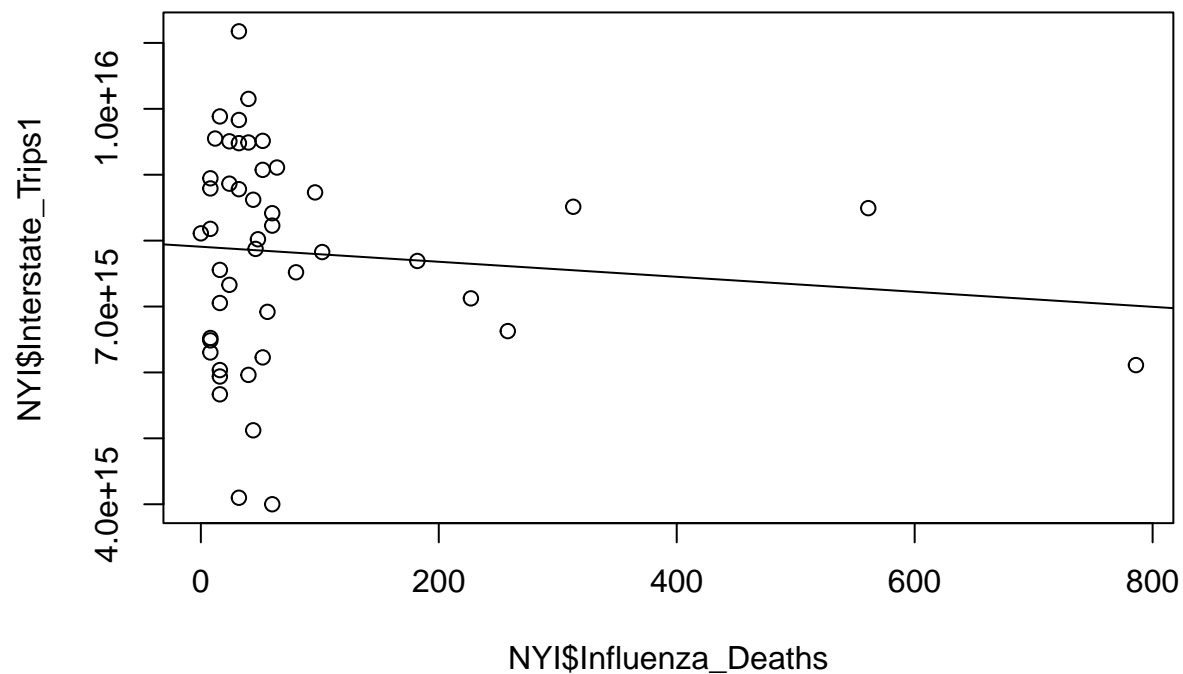
```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.61e+15 on 44 degrees of freedom
## Multiple R-squared:  0.0107, Adjusted R-squared:  -0.01178
## F-statistic: 0.4759 on 1 and 44 DF, p-value: 0.4939
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NYI$Interstate_Trips1 ~ NYI$Influenza_Deaths)
abline(new_model)
```





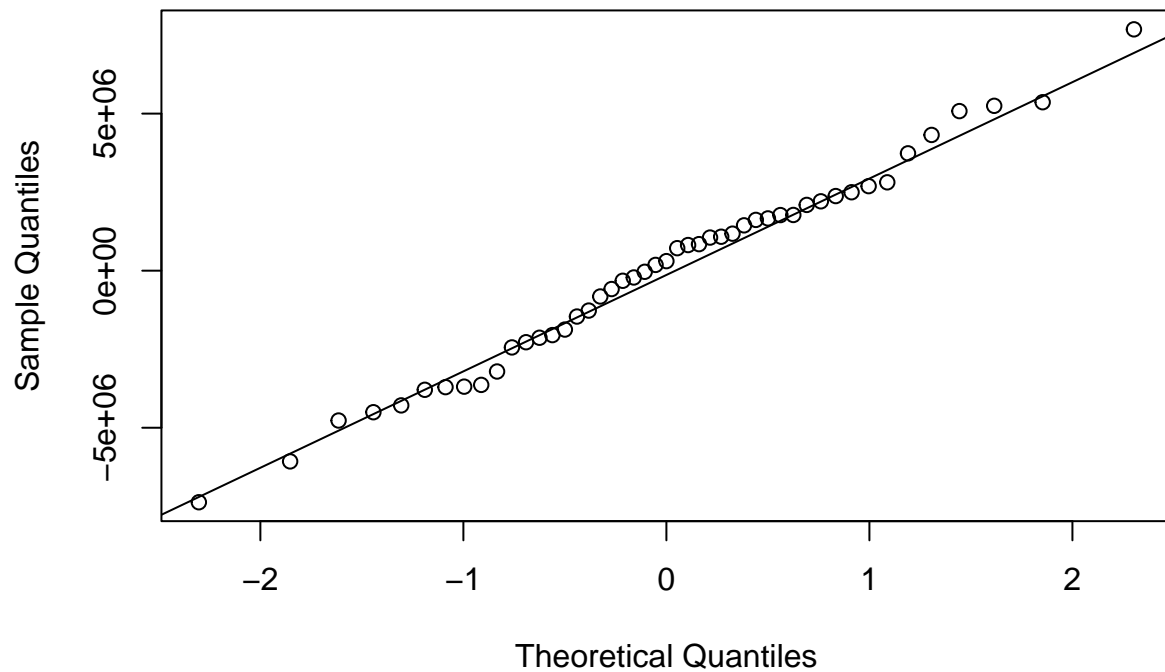
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)      7.356980e+15 8.457386e+15
## NYI$Influenza_Deaths -4.469737e+12 2.190033e+12
```

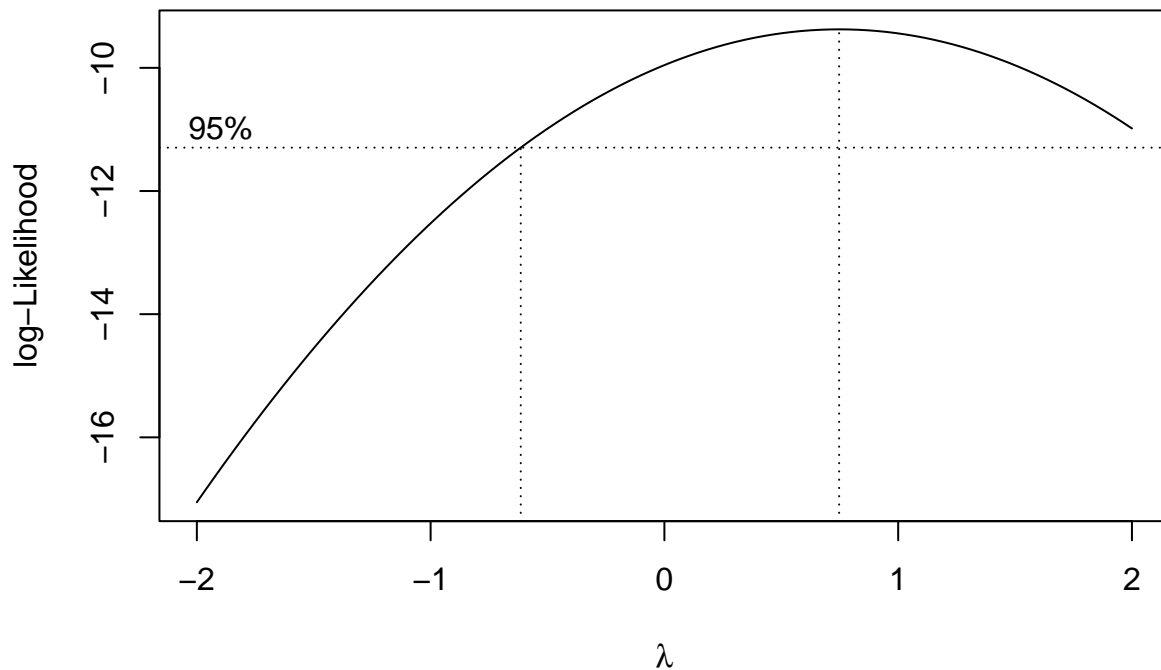
New York Covid Deaths vs Long Distance Trips

```
model <- lm(NY$Long_Distance_Trips ~ NY$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of New York Covid Deaths vs Long_Distance Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of New York Covid Deaths vs Long\_Distance Travel



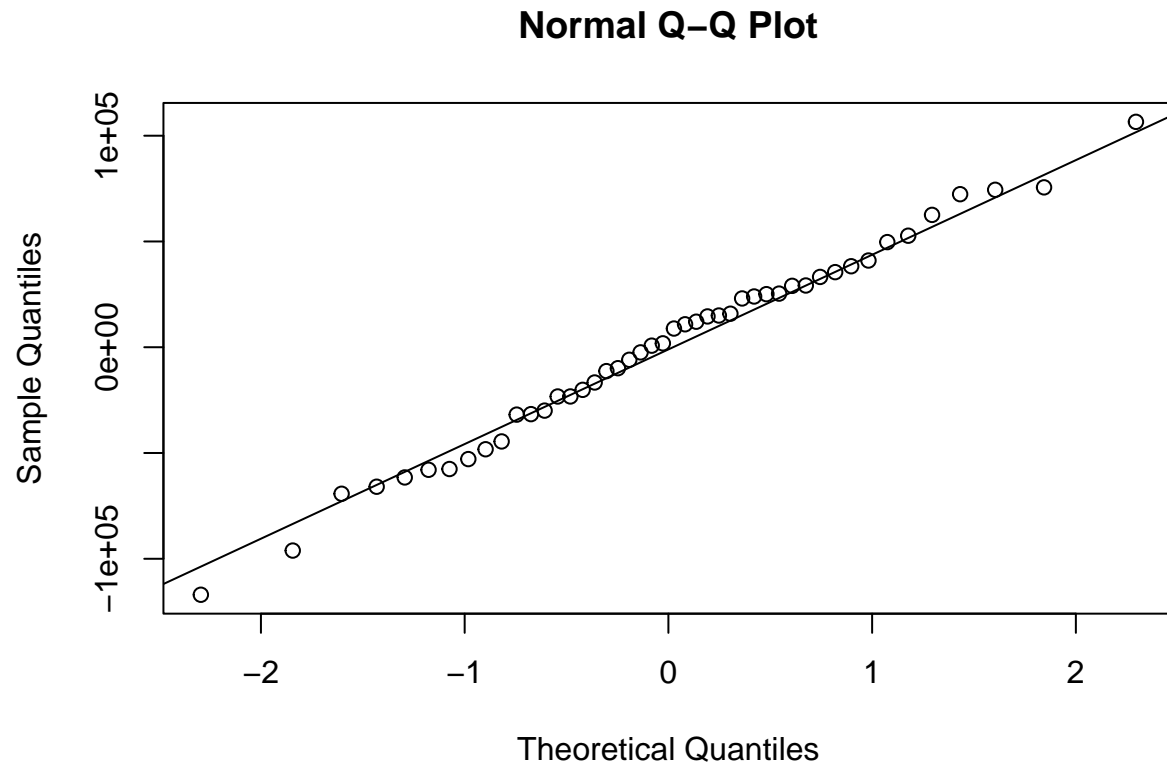
```
NY$CookD = cooks.distance(model)
NYC <- NY[which(NY$CookD < 0.5),]
bc <- boxcox(NYC$Long_Distance_Trips ~ NYC$Covid_Deaths)
```



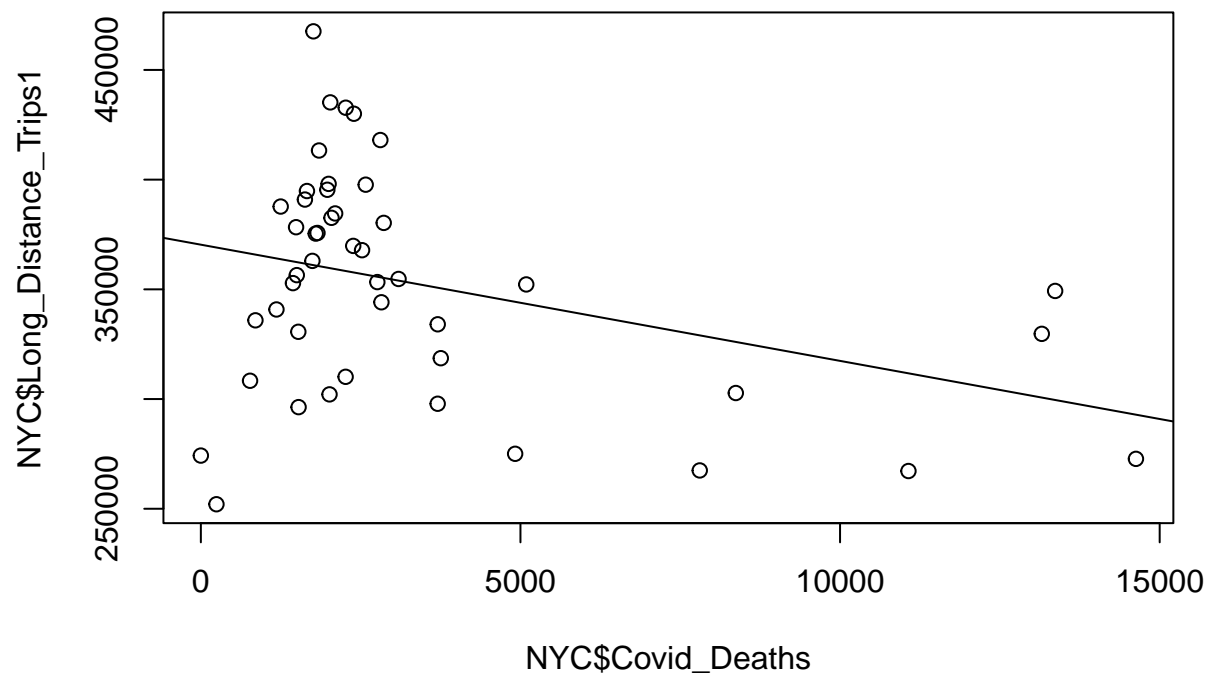
```
lambda <- bc$x[which.max(bc$y)]
NYC$Long_Distance_Trips1 <- (((NYC$Long_Distance_Trips)^lambda - 1) / lambda)
new_model <- lm(NYC$Long_Distance_Trips1 ~ NYC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = NYC$Long_Distance_Trips1 ~ NYC$Covid_Deaths)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -117008  -31209   5342    29150  106552
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    370356.767   10001.495   37.030  <2e-16 ***
## NYC$Covid_Deaths     -5.296     2.095   -2.528   0.0151 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 48200 on 44 degrees of freedom
## Multiple R-squared:  0.1268, Adjusted R-squared:  0.107
## F-statistic: 6.392 on 1 and 44 DF, p-value: 0.01513
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NYC$Long_Distance_Trips1 ~ NYC$Covid_Deaths)
abline(new_model)
```



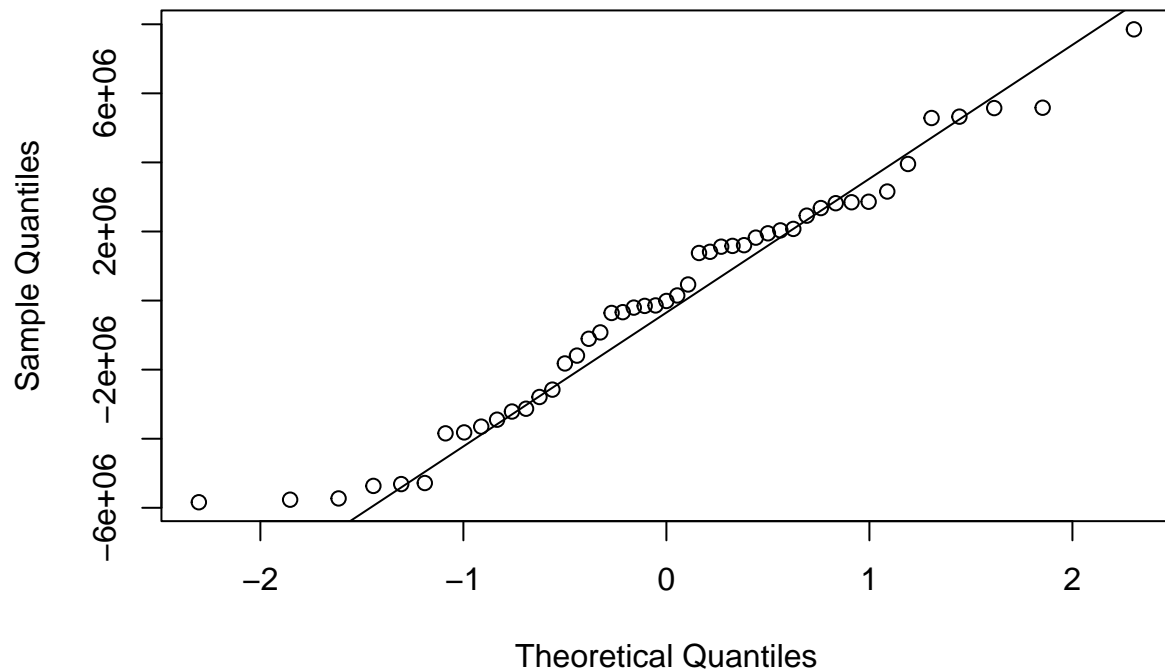
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %        97.5 %
## (Intercept)    350200.077734 390513.457134
## NYC$Covid_Deaths -9.518082   -1.074337
```

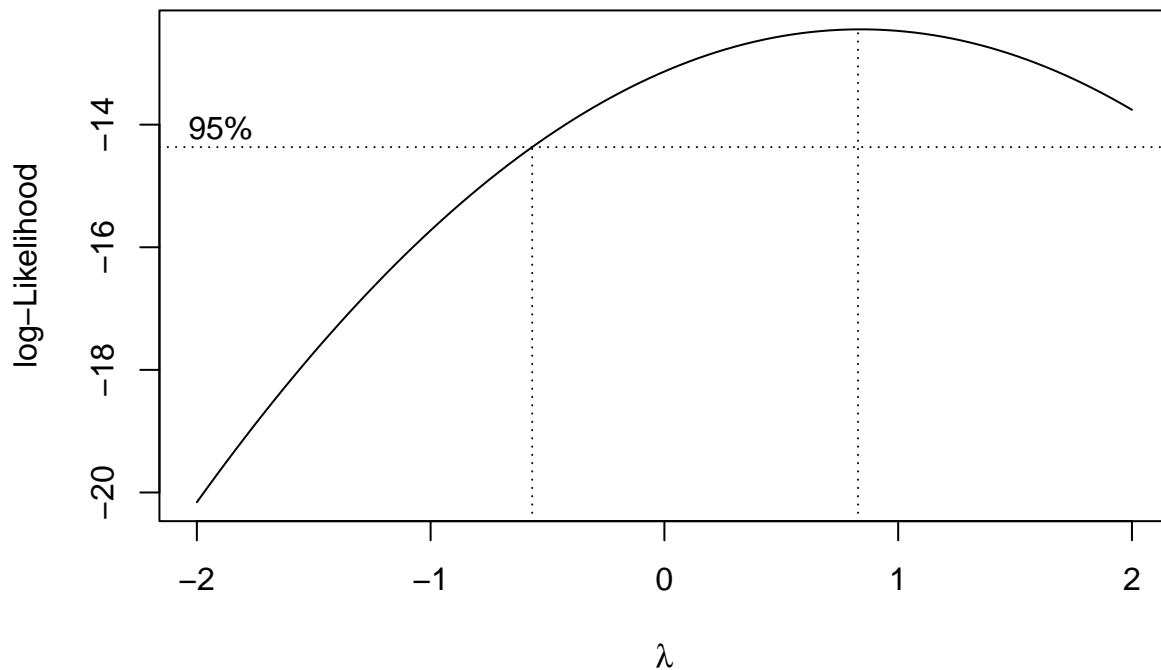
New York Influenza Deaths vs Long Distance Trips

```
model <- lm(NY$Long_Distance_Trips ~ NY$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of New York Influenza Deaths vs Long_Distance Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of New York Influenza Deaths vs Long\_Distance Tra



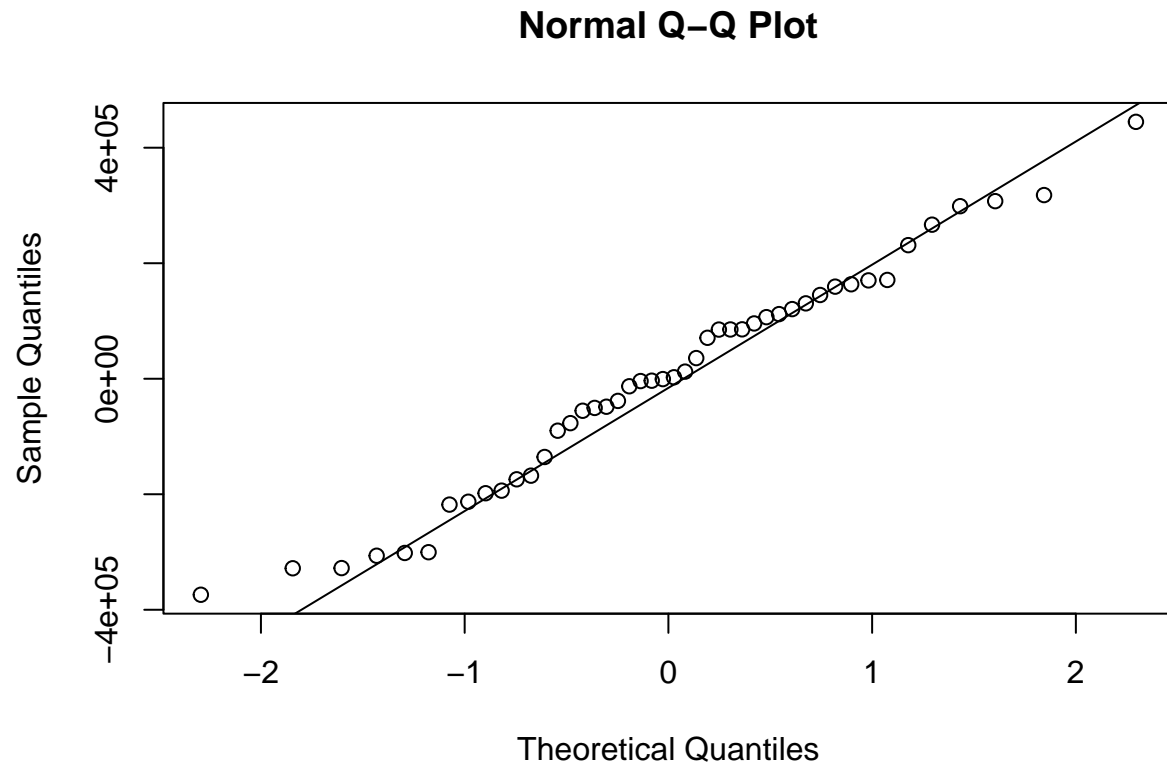
```
NY$CookD = cooks.distance(model)
NYI <- NY[which(NY$CookD < 0.5),]
bc <- boxcox(NYI$Long_Distance_Trips ~ NYI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
NYI$Long_Distance_Trips1 <- (((NYI$Long_Distance_Trips)^lambda - 1) / lambda)
new_model <- lm(NYI$Long_Distance_Trips1 ~ NYI$Influenza_Deaths)
summary(new_model)
```

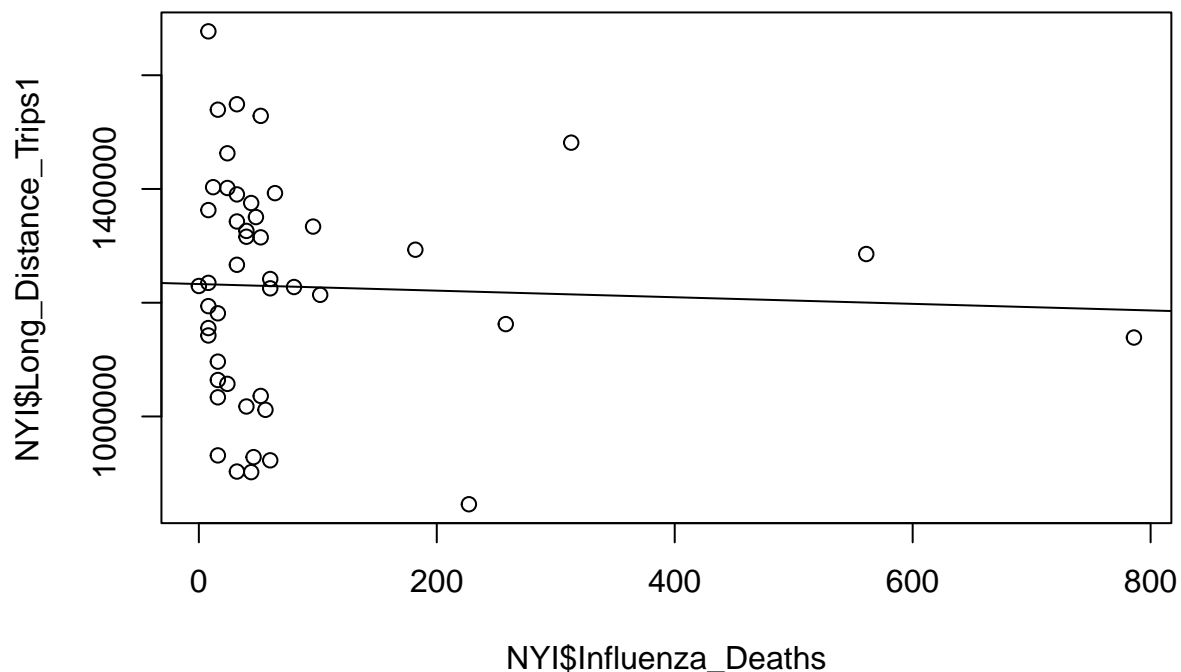
```
##
## Call:
## lm(formula = NYI$Long_Distance_Trips1 ~ NYI$Influenza_Deaths)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -373989 -159708     970  128018  444782
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    1232822.98   33635.35  36.653  <2e-16 ***
## NYI$Influenza_Deaths     -58.02    203.56  -0.285    0.777
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 198400 on 44 degrees of freedom
## Multiple R-squared:  0.001843, Adjusted R-squared:  -0.02084
## F-statistic: 0.08123 on 1 and 44 DF, p-value: 0.777
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(NYI$Long_Distance_Trips1 ~ NYI$Influenza_Deaths)
abline(new_model)
```





```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##              2.5 %      97.5 %
## (Intercept) 1165035.3941 1300610.5619
## NYI$Influenza_Deaths -468.2736   352.2414
```

Wyoming Stats

Wyoming Covid Deaths vs Local Trips

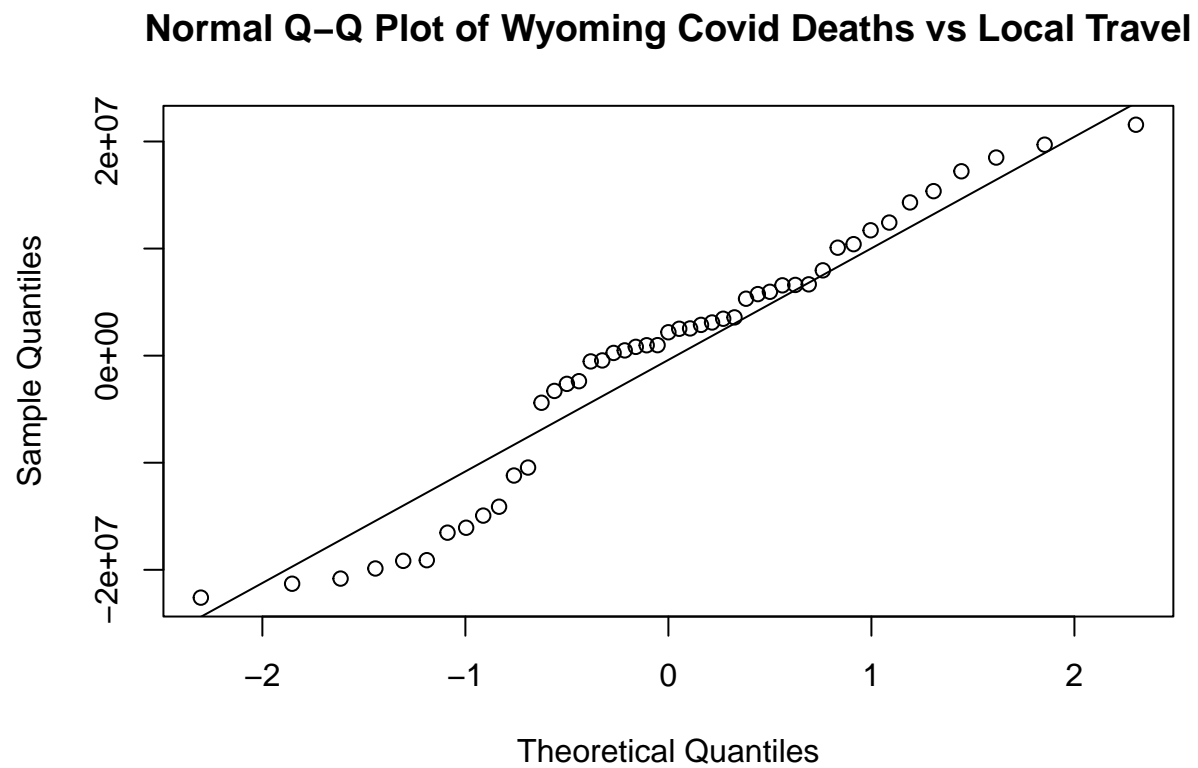
```
WY = DT[DT$Jurisdiction == 'Wyoming',]
head(WY)
```

```
## # A tibble: 6 x 12
##   Year Month Jurisdiction Covid_Deaths Total_Deaths Pneumonia_Deaths
##   <dbl> <dbl> <chr>          <dbl>      <dbl>          <dbl>
## 1  2019   12 Wyoming             0        374             33
## 2  2020    1 Wyoming             0        950            120
## 3  2020    2 Wyoming             0       1019            123
## 4  2020    3 Wyoming            32       1391            170
## 5  2020    4 Wyoming           144        948            132
## 6  2020    5 Wyoming           144       1210            143
## # i 6 more variables: Influenza_Deaths <dbl>, Pneumonia_Influenza_Deaths <dbl>,
## #   Pneumonia_Influenza_Covid <dbl>, Local_Trips <dbl>, Interstate_Trips <dbl>,
## #   Long_Distance_Trips <dbl>
```

```

model <- lm(WY$Local_Trips ~ WY$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Wyoming Covid Deaths vs Local Travel")
qqline(model$residuals)

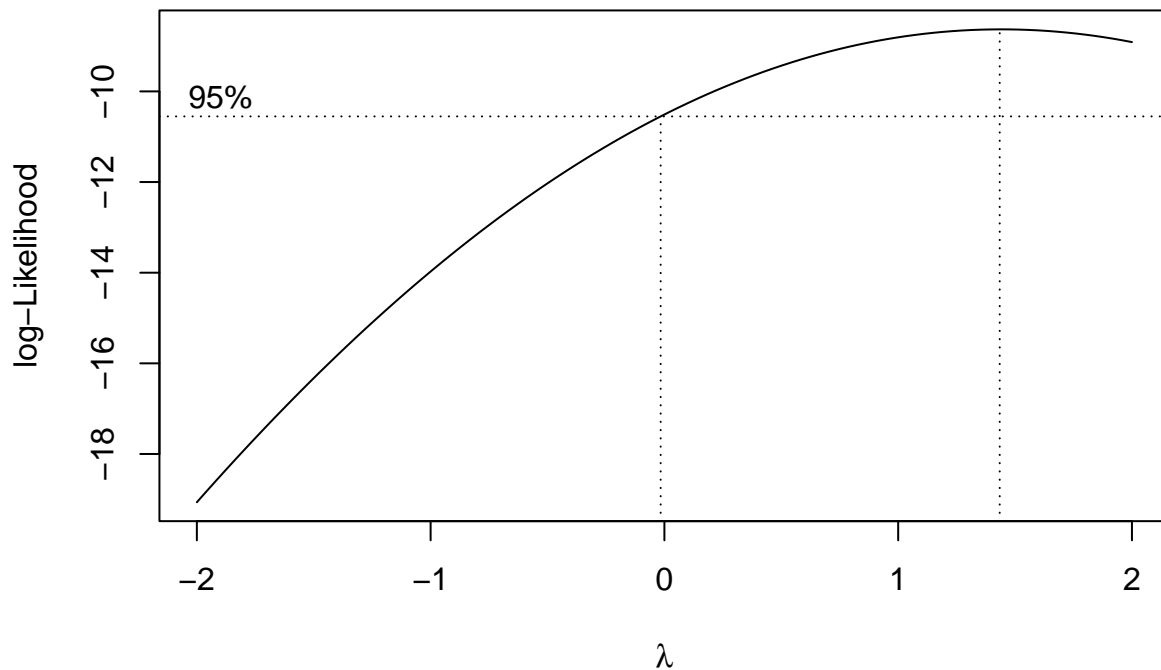
```



```

WY$CookD = cooks.distance(model)
WYC <- WY[which(WY$CookD < 0.5),]
bc <- boxcox(WYC$Local_Trips ~ WYC$Covid_Deaths)

```



```
lambda <- bc$x[which.max(bc$y)]
WYC$Local_Trips1 <- (((WYC$Local_Trips)^lambda - 1) / lambda)
new_model <- lm(WYC$Local_Trips1 ~ WYC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = WYC$Local_Trips1 ~ WYC$Covid_Deaths)
##
## Residuals:
```

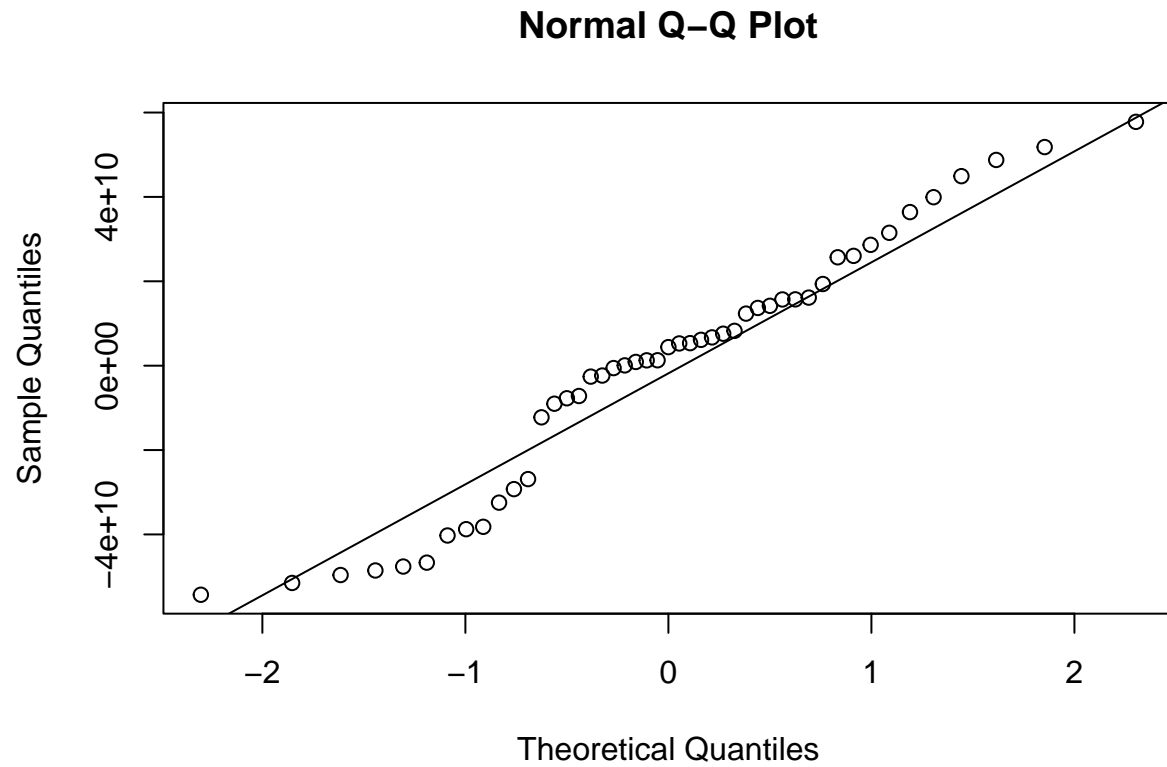
	Min	1Q	Median	3Q	Max
	-5.429e+10	-1.956e+10	4.397e+09	1.593e+10	5.779e+10

```
##
## Coefficients:
```

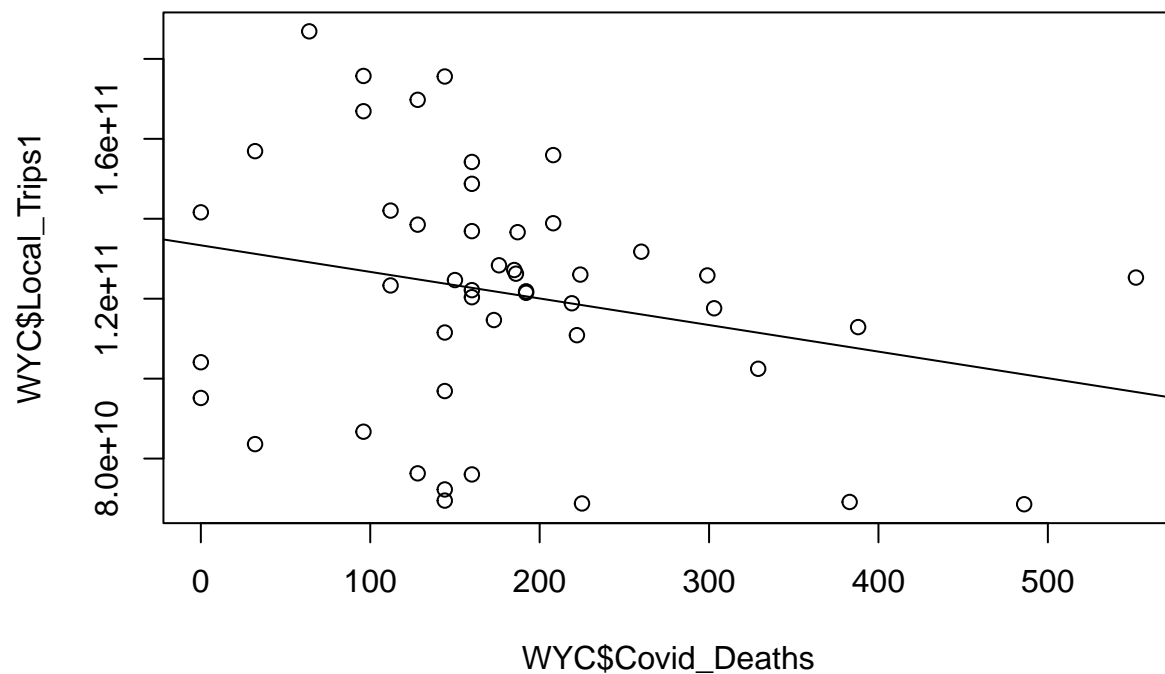
	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	1.334e+11	8.331e+09	16.006	<2e-16 ***
WYC\$Covid_Deaths	-6.649e+07	3.936e+07	-1.689	0.0981 .

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.014e+10 on 45 degrees of freedom
## Multiple R-squared:  0.05964,    Adjusted R-squared:  0.03874
## F-statistic: 2.854 on 1 and 45 DF,  p-value: 0.09807
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(WYC$Local_Trips1 ~ WYC$Covid_Deaths)
abline(new_model)
```



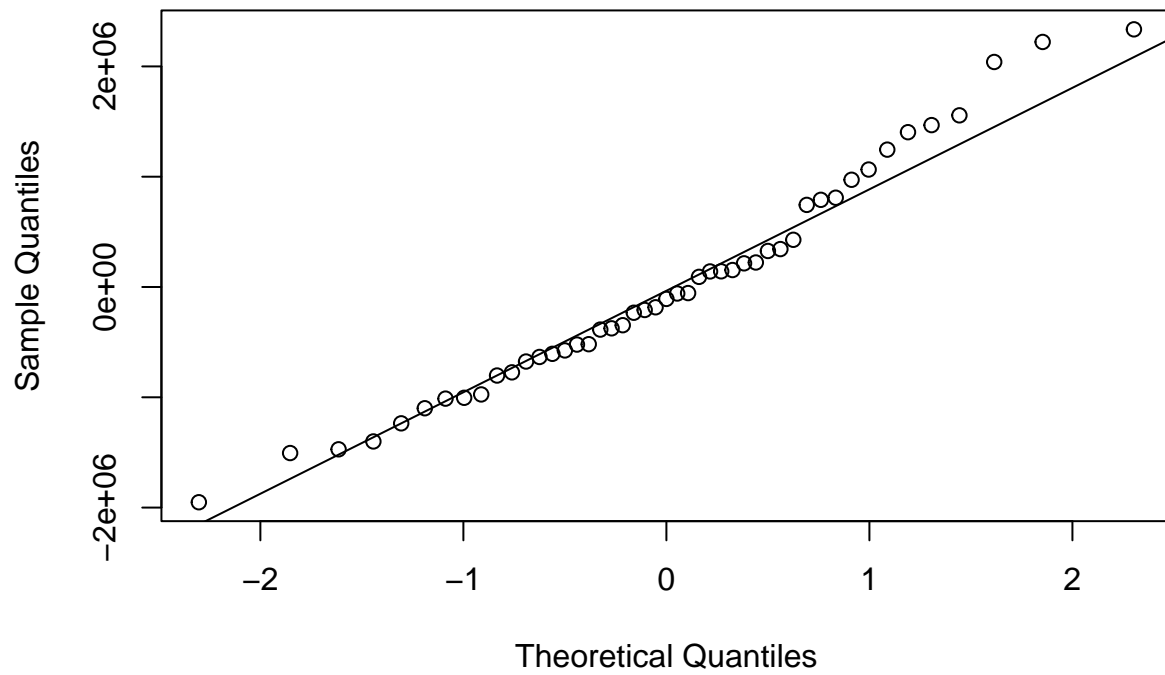
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)    116574411633 150134988516
## WYC$Covid_Deaths -145763032   12780995
```

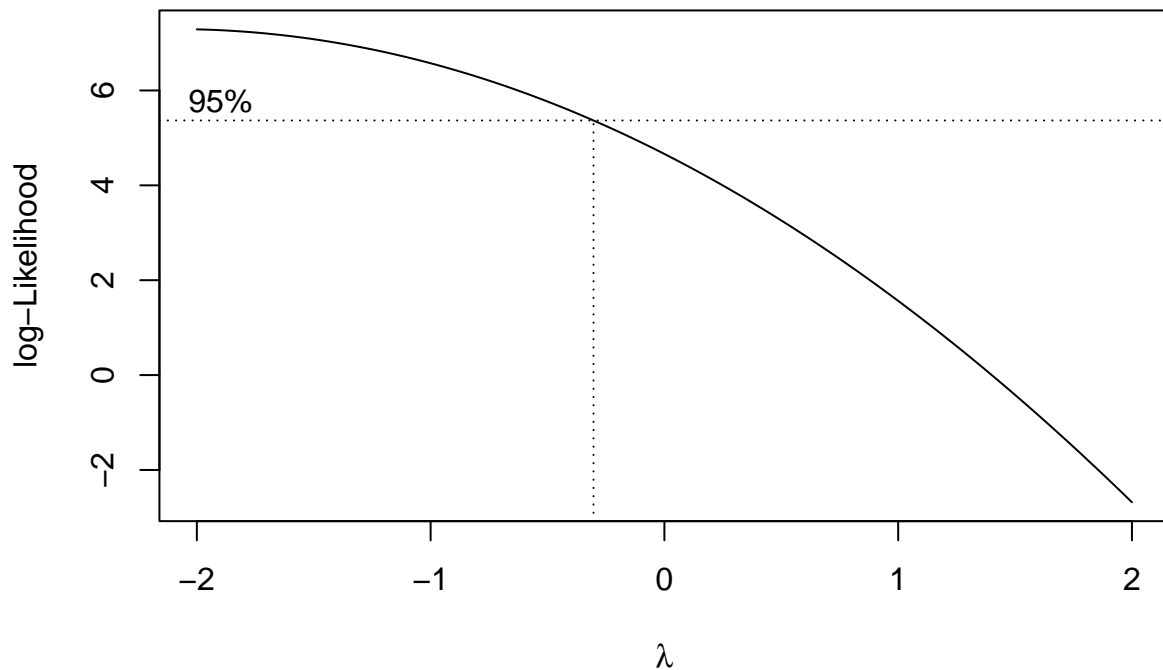
Wyoming Covid Deaths vs Interstate Trips

```
model <- lm(WY$Interstate_Trips ~ WY$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Wyoming Covid Deaths vs Interstate Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Wyoming Covid Deaths vs Interstate Travel



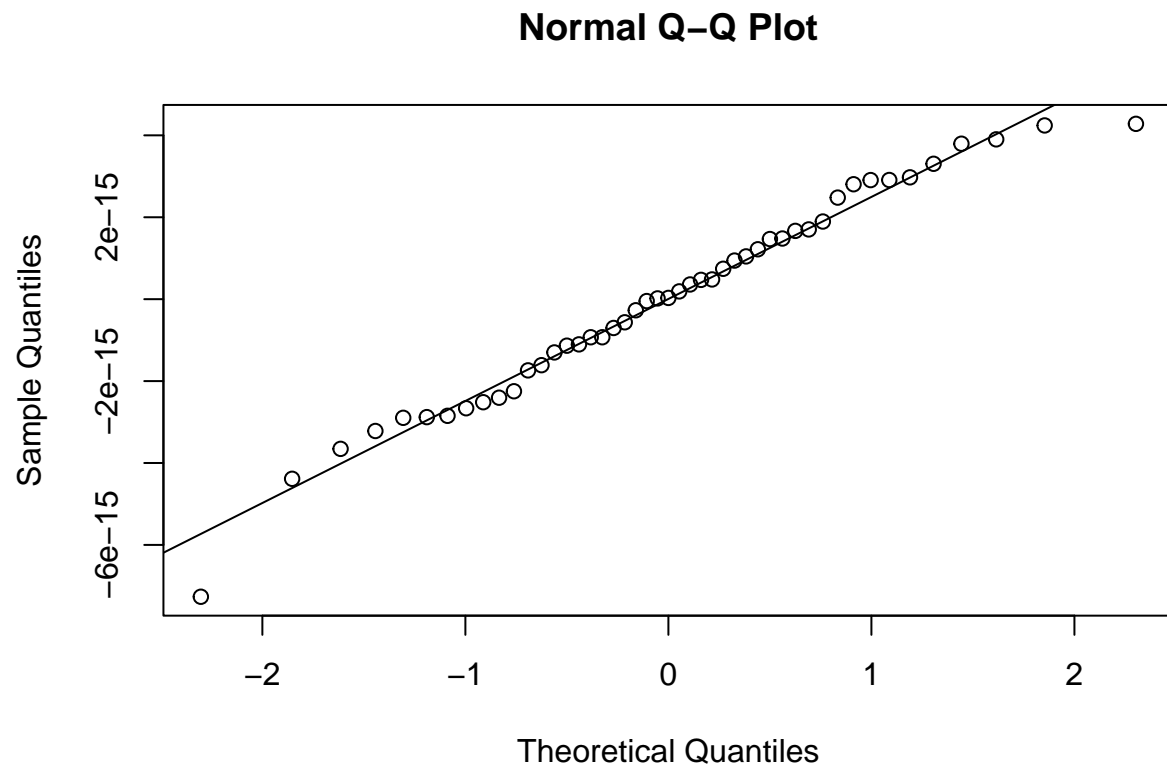
```
WY$CookD = cooks.distance(model)
WYC <- WY[which(WY$CookD < 0.5),]
bc <- boxcox(WYC$Interstate_Trips ~ WYC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
WYC$Interstate_Trips1 <- (((WYC$Interstate_Trips)^lambda - 1) / lambda)
new_model <- lm(WYC$Interstate_Trips1 ~ WYC$Covid_Deaths)
summary(new_model)
```

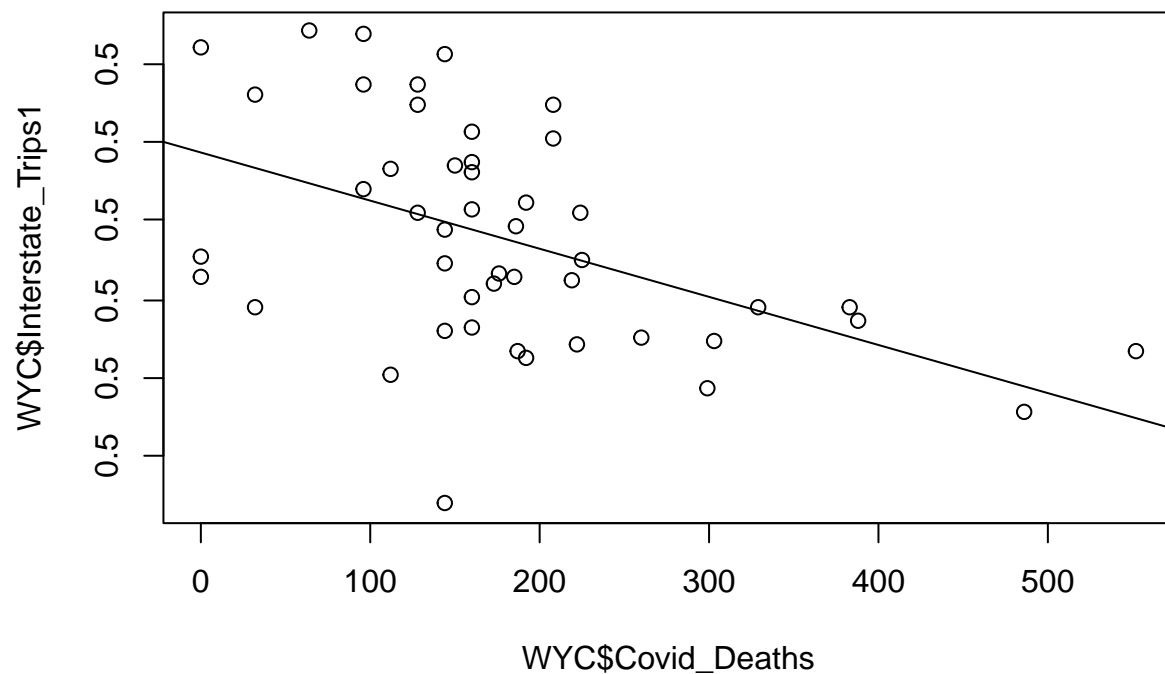
```
##
## Call:
## lm(formula = WYC$Interstate_Trips1 ~ WYC$Covid_Deaths)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -7.266e-15 -1.675e-15  3.050e-17  1.685e-15  4.281e-15
##
## Coefficients:
##              Estimate Std. Error    t value Pr(>|t|)
## (Intercept)    5.000e-01  7.044e-16  7.099e+14 < 2e-16 ***
## WYC$Covid_Deaths -1.237e-17  3.327e-18 -3.718e+00 0.000555 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.548e-15 on 45 degrees of freedom
## Multiple R-squared:  0.2322, Adjusted R-squared:  0.2152
## F-statistic: 13.61 on 1 and 45 DF, p-value: 0.0006041
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(WYC$Interstate_Trips1 ~ WYC$Covid_Deaths)
abline(new_model)
```





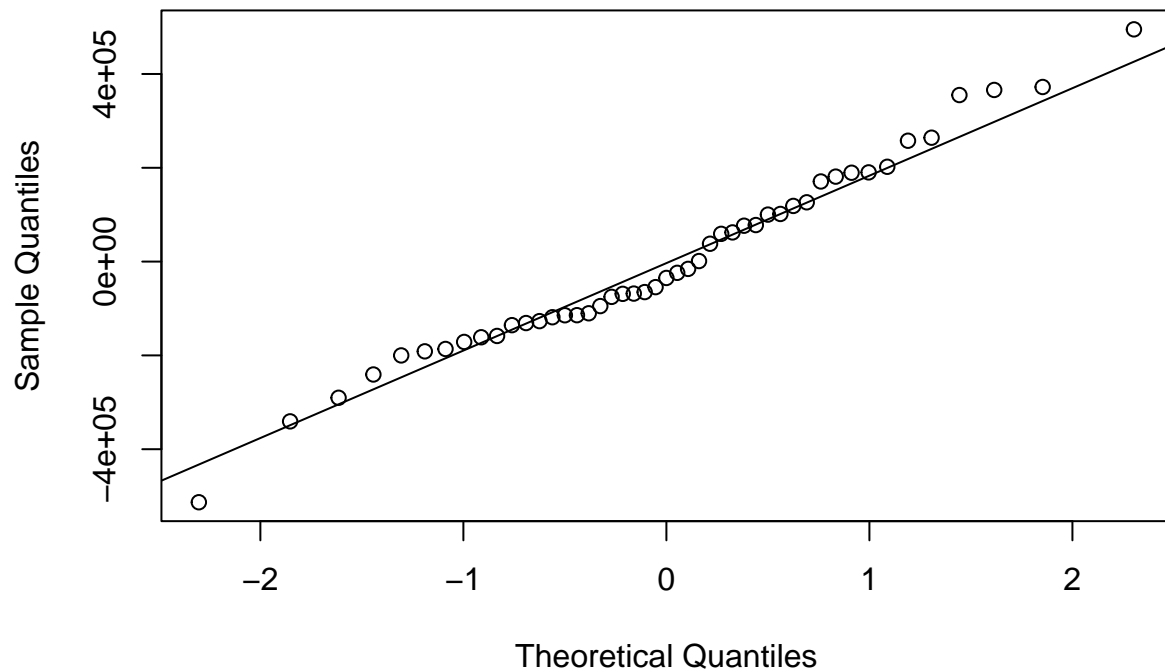
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %          97.5 %
## (Intercept)    5.000000e-01  5.000000e-01
## WYC$Covid_Deaths -1.907184e-17 -5.668175e-18
```

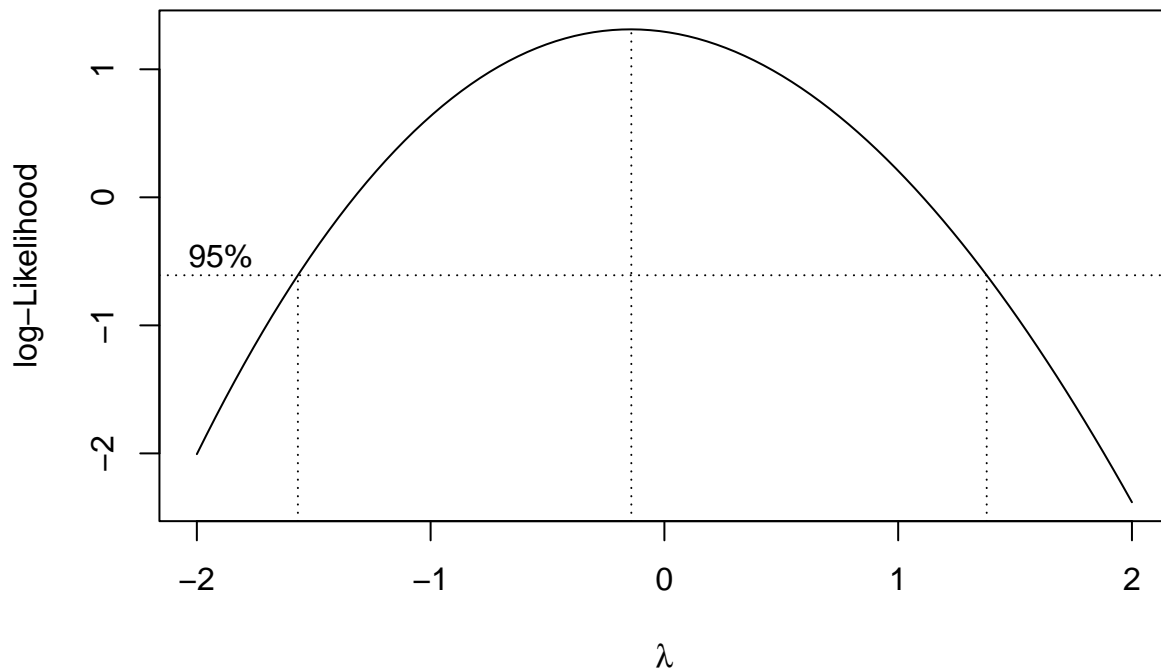
Wyoming Covid Deaths vs Long Distance Trips

```
model <- lm(WY$Long_Distance_Trips ~ WY$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Wyoming Covid Deaths vs Long_Distance Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Wyoming Covid Deaths vs Long\_Distance Travel



```
WY$CookD = cooks.distance(model)
WYC <- WY[which(WY$CookD < 0.5),]
bc <- boxcox(WYC$Long_Distance_Trips ~ WYC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
WYC$Long_Distance_Trips1 <- (((WYC$Long_Distance_Trips)^lambda - 1) / lambda)
new_model <- lm(WYC$Long_Distance_Trips1 ~ WYC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = WYC$Long_Distance_Trips1 ~ WYC$Covid_Deaths)
##
## Residuals:
```

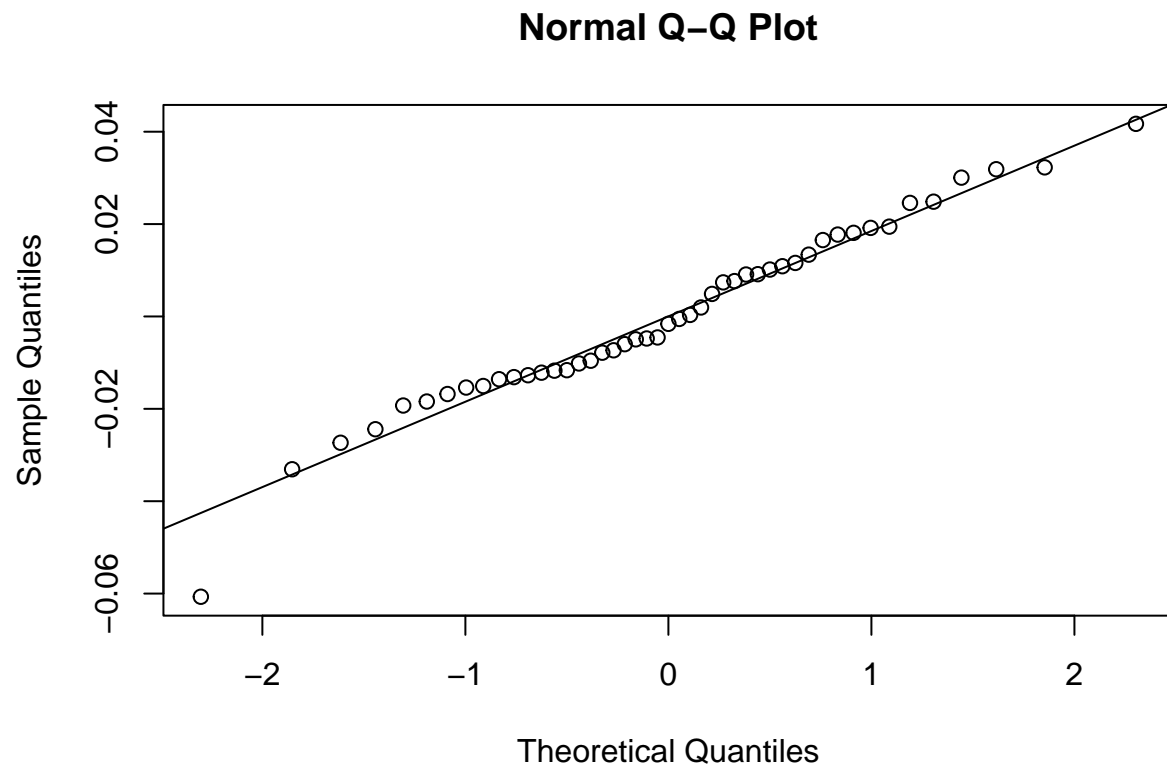
	Min	1Q	Median	3Q	Max
##	-0.060683	-0.012446	-0.001598	0.012485	0.041701

```
##
## Coefficients:
```

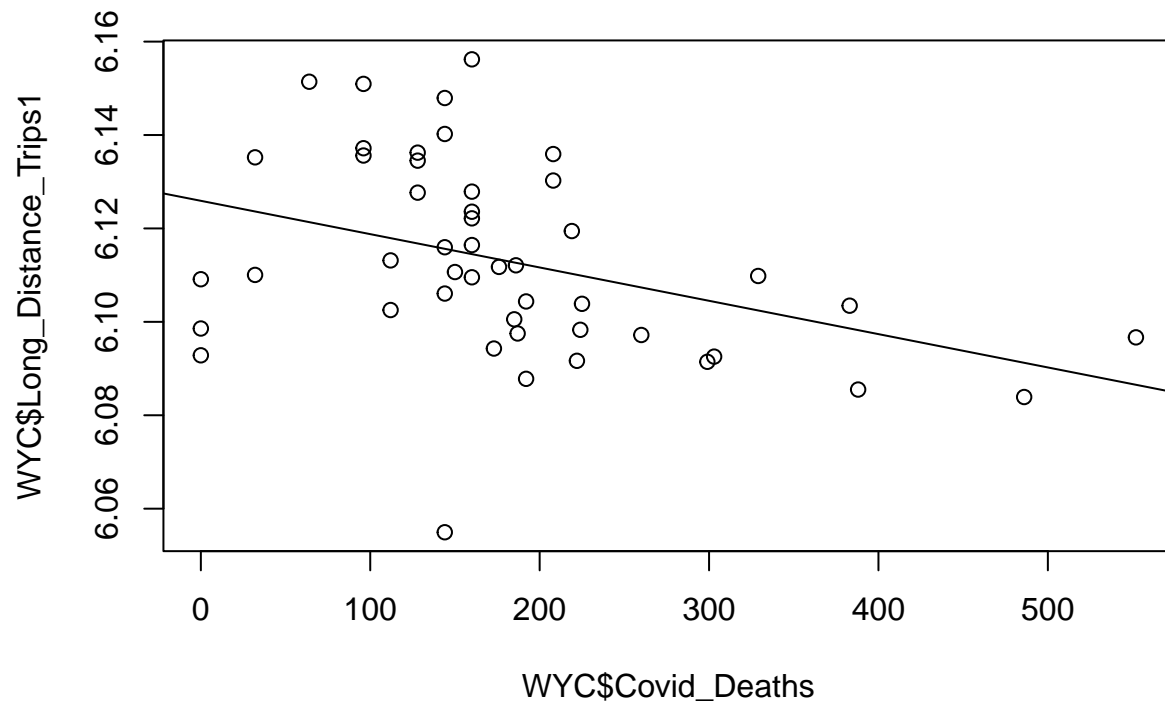
	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	6.126e+00	5.429e-03	1128.279	< 2e-16 ***
## WYC\$Covid_Deaths	-7.136e-05	2.565e-05	-2.782	0.00786 **

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.01964 on 45 degrees of freedom
## Multiple R-squared:  0.1468, Adjusted R-squared:  0.1278
## F-statistic:  7.74 on 1 and 45 DF, p-value: 0.007863
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(WYC$Long_Distance_Trips1 ~ WYC$Covid_Deaths)
abline(new_model)
```



```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %          97.5 %
## (Intercept)      6.1149804330  6.136851e+00
## WYC$Covid_Deaths -0.0001230206 -1.970006e-05
```

Wyoming had no Influenza Deaths

Florida Stats

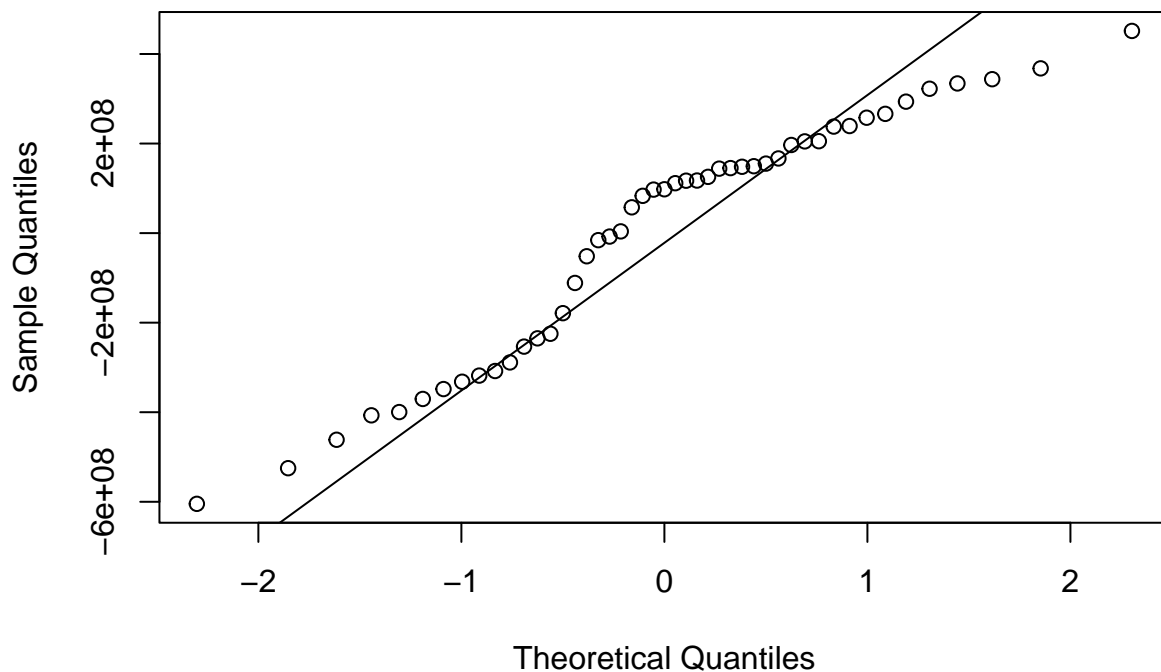
Florida Covid Deaths vs Local Trips

```
FL = DT[DT$Jurisdiction == 'Florida',]
head(FL)
```

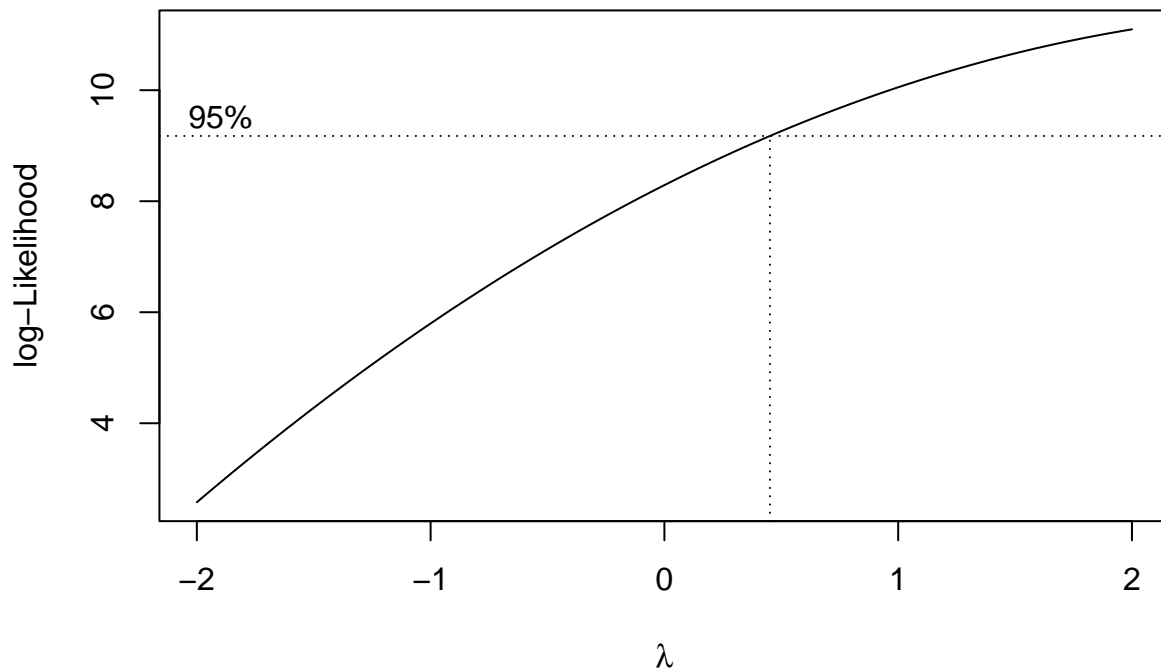
```
## # A tibble: 6 x 12
##   Year Month Jurisdiction Covid_Deaths Total_Deaths Pneumonia_Deaths
##   <dbl> <dbl> <chr>          <dbl>      <dbl>          <dbl>
## 1  2019    12 Florida             0      8480            492
## 2  2020     1 Florida             0     34304           2541
## 3  2020     2 Florida             0     33944           2652
## 4  2020     3 Florida          1283     43164           4400
## 5  2020     4 Florida          2502     35160           3623
## 6  2020     5 Florida          2490     42388           3838
```

```
## # i 6 more variables: Influenza_Deaths <dbl>, Pneumonia_Influenza_Deaths <dbl>,  
## #   Pneumonia_Influenza_Covid <dbl>, Local_Trips <dbl>, Interstate_Trips <dbl>,  
## #   Long_Distance_Trips <dbl>  
  
model <- lm(FL$Local_Trips ~ FL$Covid_Deaths)  
qqnorm(model$residuals, main = "Normal Q-Q Plot of Florida Covid Deaths vs Local Travel")  
qqline(model$residuals)
```

## Normal Q-Q Plot of Florida Covid Deaths vs Local Travel



```
FL$CookD = cooks.distance(model)  
FLC <- FL[which(FL$CookD < 0.5),]  
bc <- boxcox(FLC$Local_Trips ~ FLC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
FLC$Local_Trips1 <- ((FLC$Local_Trips)^lambda - 1) / lambda
new_model <- lm(FLC$Local_Trips1 ~ FLC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = FLC$Local_Trips1 ~ FLC$Covid_Deaths)
##
## Residuals:
```

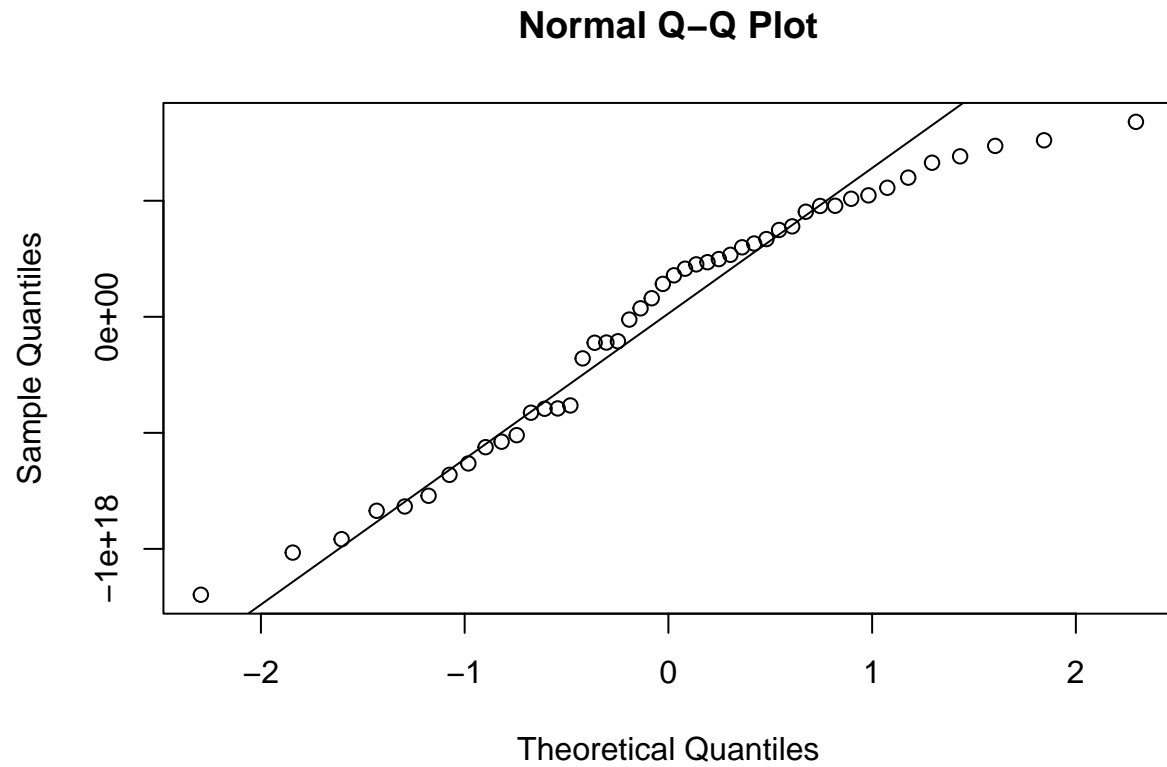
	Min	1Q	Median	3Q	Max
##	-1.198e+18	-4.089e+17	1.602e+17	4.370e+17	8.400e+17

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	2.683e+18	1.155e+17	23.229	< 2e-16 ***
## FLC\$Covid_Deaths	-8.522e+13	2.531e+13	-3.367	0.00159 **

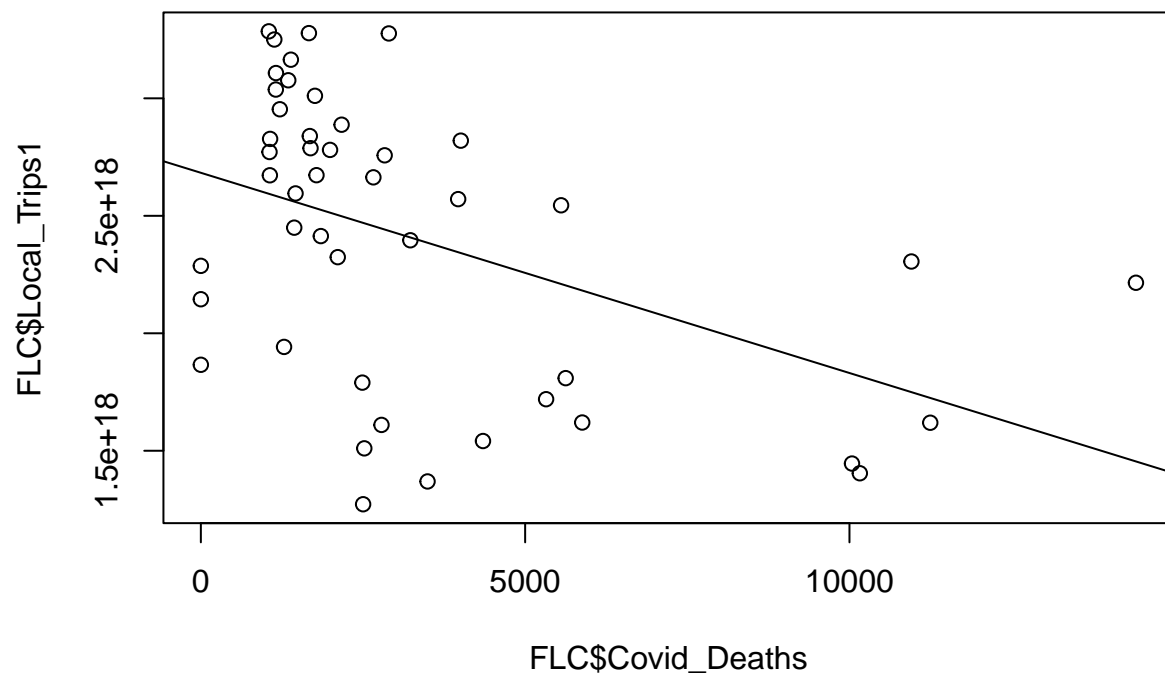
```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 5.501e+17 on 44 degrees of freedom
## Multiple R-squared:  0.2049, Adjusted R-squared:  0.1868
## F-statistic: 11.34 on 1 and 44 DF, p-value: 0.001586
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(FLC$Local_Trips1 ~ FLC$Covid_Deaths)
abline(new_model)
```





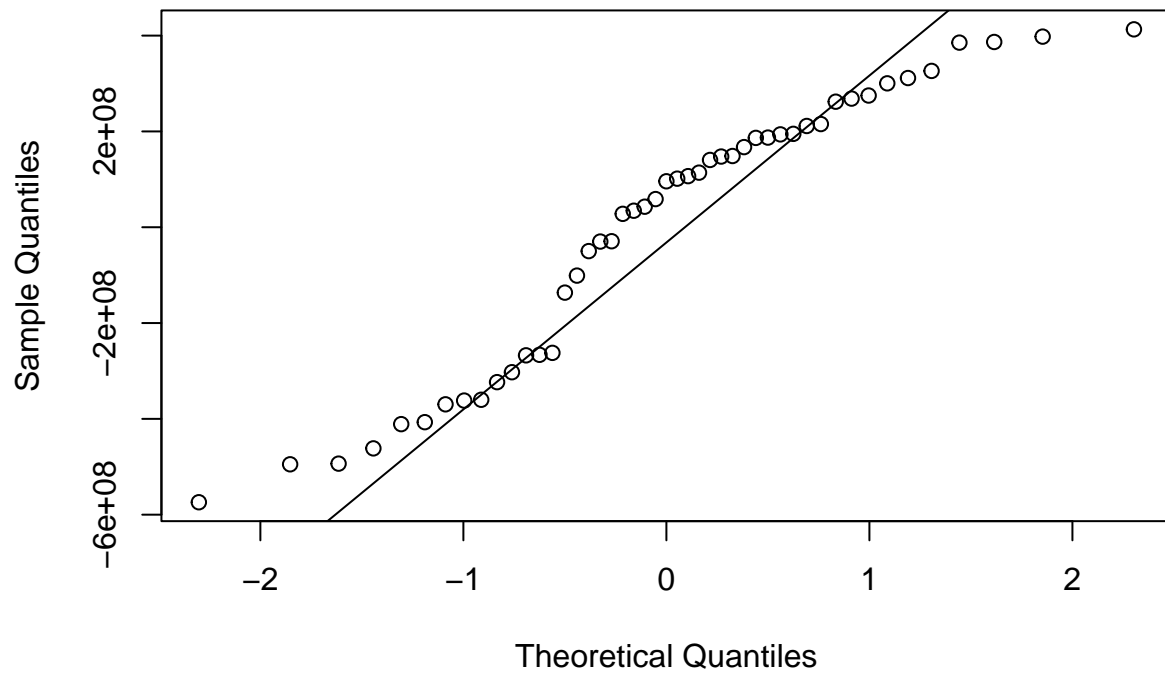
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %        97.5 %
## (Intercept)    2.450338e+18  2.915917e+18
## FLC$Covid_Deaths -1.362337e+14 -3.421269e+13
```

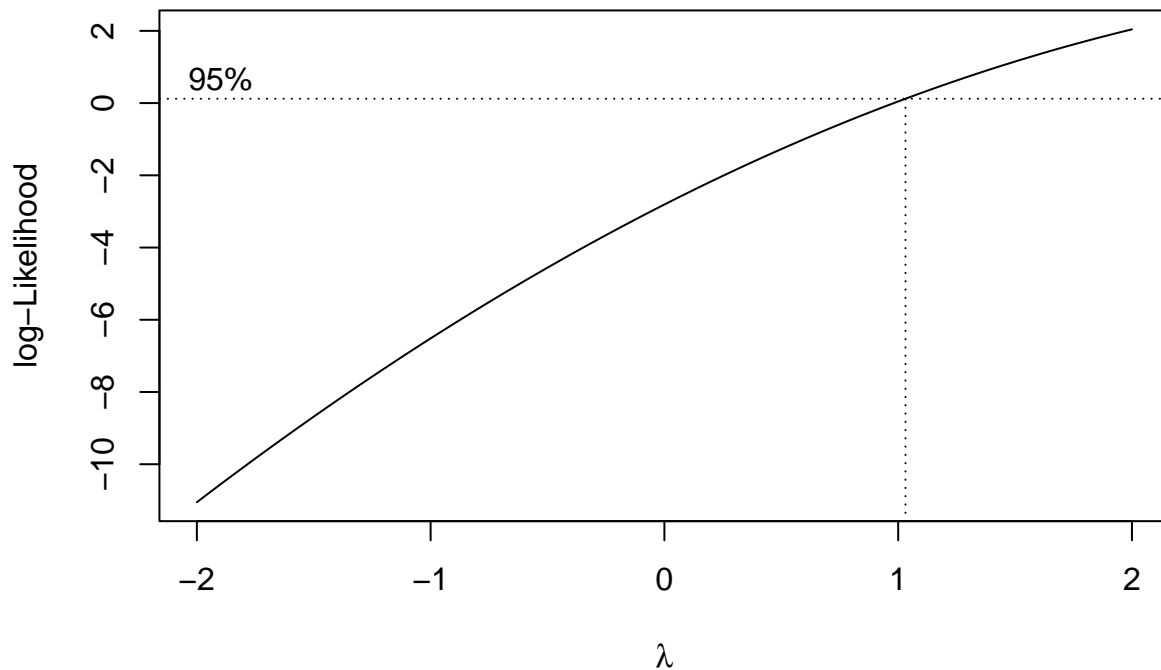
Florida Influenza Deaths vs Local Trips

```
model <- lm(FL$Local_Trips ~ FL$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Florida Influenza Deaths vs Local Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Florida Influenza Deaths vs Local Travel



```
FL$CookD = cooks.distance(model)
FLI <- NY[which(NY$CookD < 0.5),]
bc <- boxcox(FLI$Local_Trips ~ FLI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
FLI$Local_Trips1 <- (((FLI$Local_Trips)^lambda - 1) / lambda)
new_model <- lm(FLI$Local_Trips1 ~ FLI$Influenza_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = FLI$Local_Trips1 ~ FLI$Influenza_Deaths)
##
## Residuals:
```

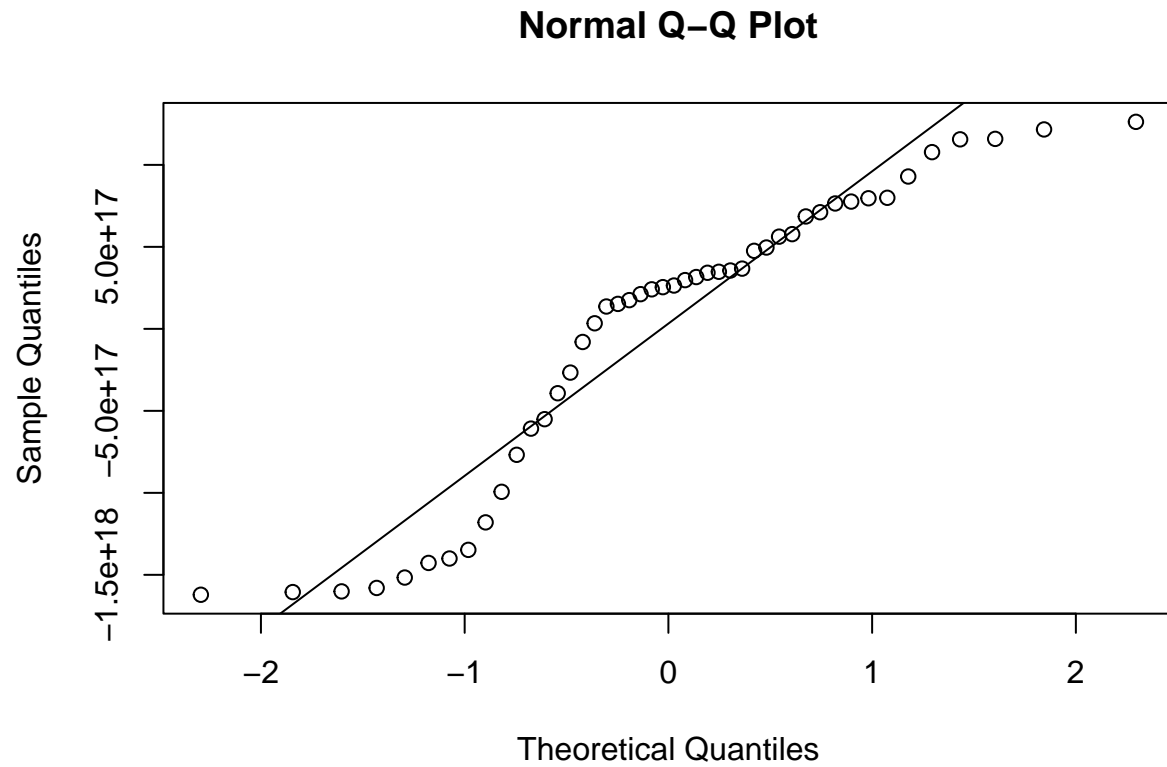
	Min	1Q	Median	3Q	Max
	-1.621e+18	-5.940e+17	2.593e+17	6.585e+17	1.262e+18

```
##
## Coefficients:
```

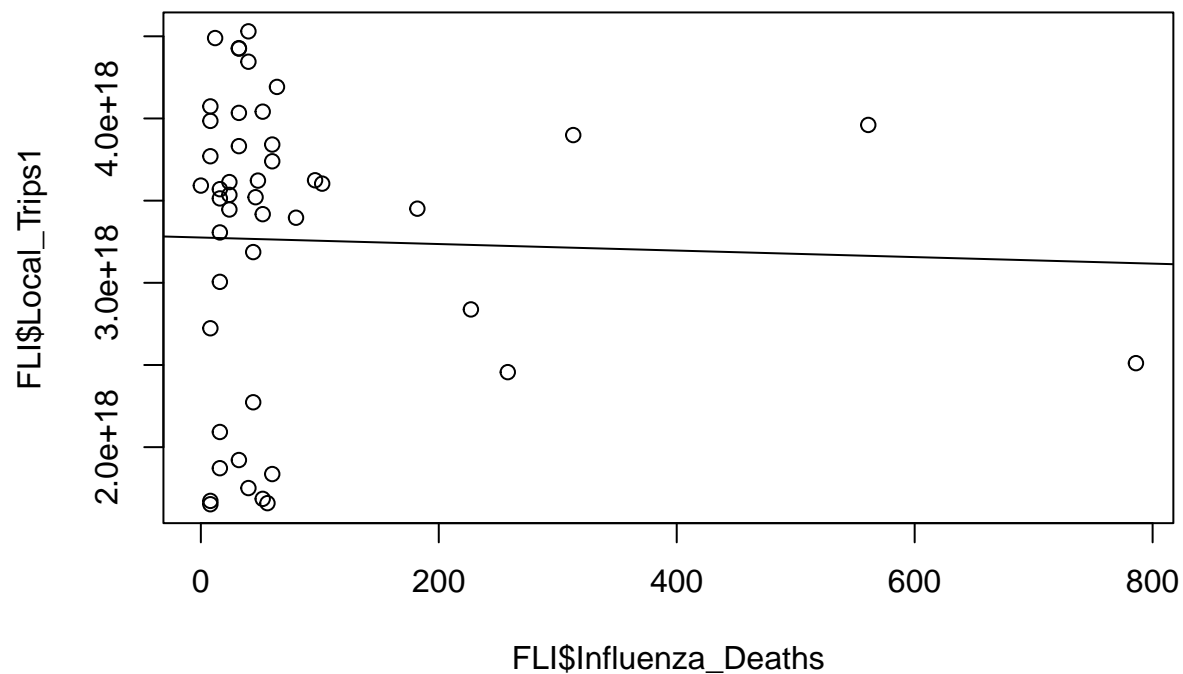
	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	3.276e+18	1.525e+17	21.486	<2e-16 ***
FLI\$Influenza_Deaths	-1.986e+14	9.227e+14	-0.215	0.831

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 8.993e+17 on 44 degrees of freedom
## Multiple R-squared:  0.001052,    Adjusted R-squared:  -0.02165
## F-statistic: 0.04634 on 1 and 44 DF,  p-value: 0.8306
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(FLI$Local_Trips1 ~ FLI$Influenza_Deaths)
abline(new_model)
```



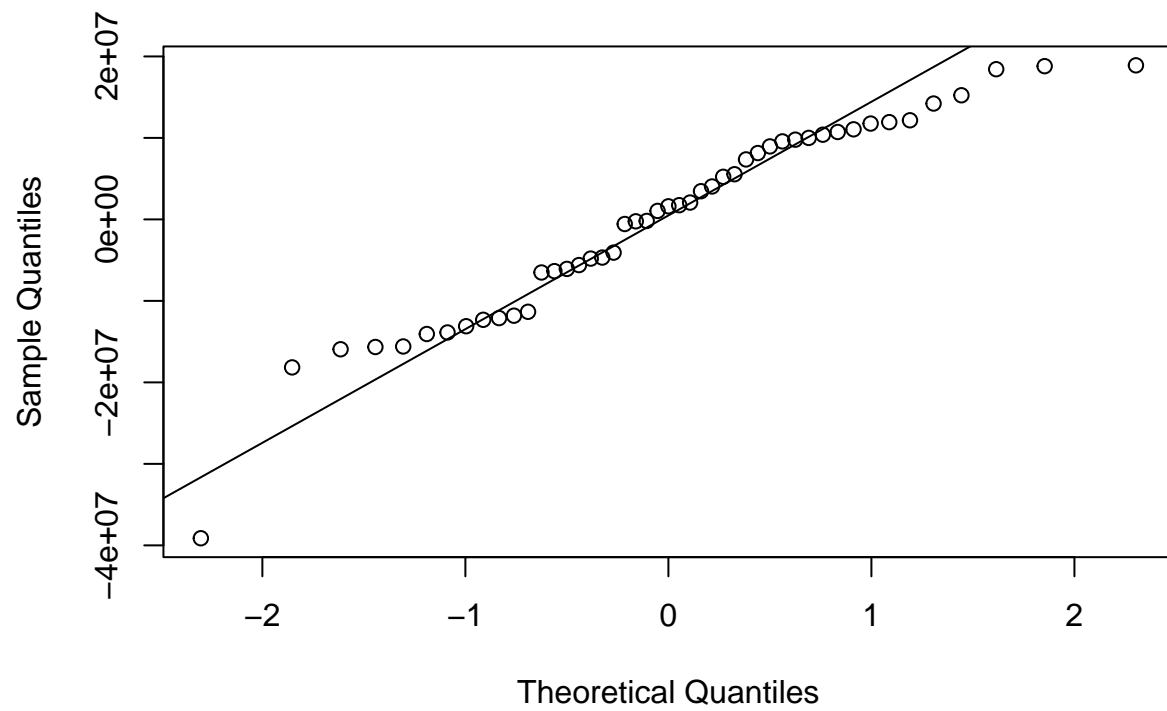
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)    2.968402e+18 3.582908e+18
## FLI$Influenza_Deaths -2.058152e+15 1.660901e+15
```

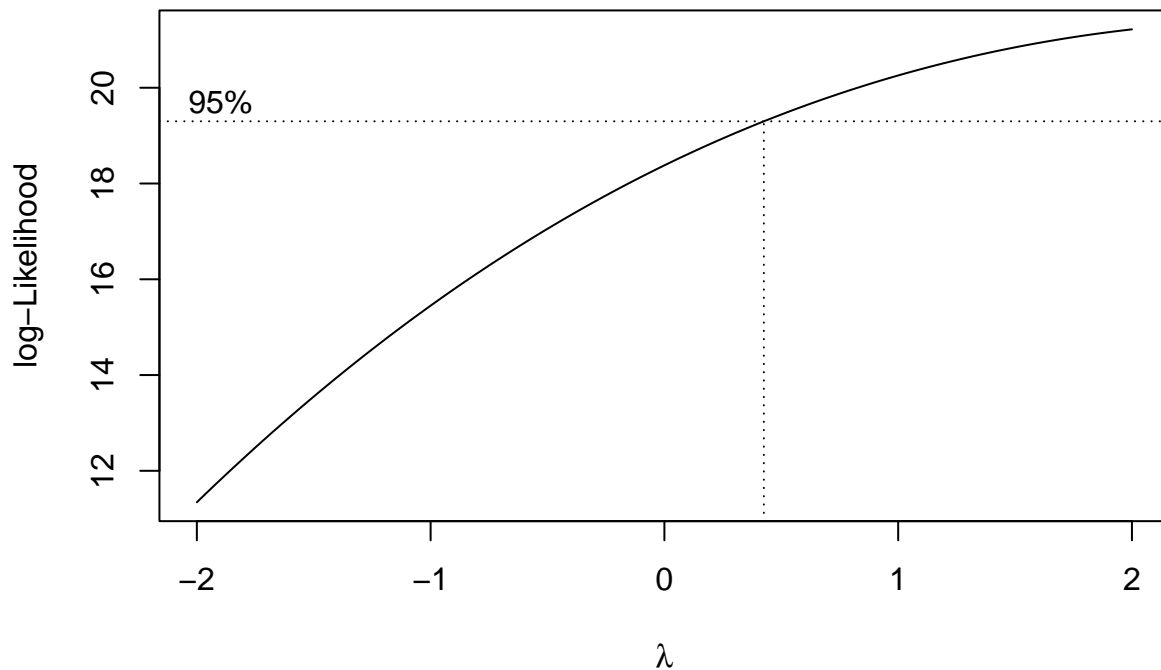
Florida Covid Deaths vs Interstate Trips

```
model <- lm(FL$Interstate_Trips ~ FL$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Florida Covid Deaths vs Interstate Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Florida Covid Deaths vs Interstate Travel



```
FL$CookD = cooks.distance(model)
FLC <- FL[which(FL$CookD < 0.5),]
bc <- boxcox(FLC$Interstate_Trips ~ FLC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
FLC$Interstate_Trips1 <- (((FLC$Interstate_Trips)^lambda - 1) / lambda)
new_model <- lm(FLC$Interstate_Trips1 ~ FLC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = FLC$Interstate_Trips1 ~ FLC$Covid_Deaths)
##
## Residuals:
```

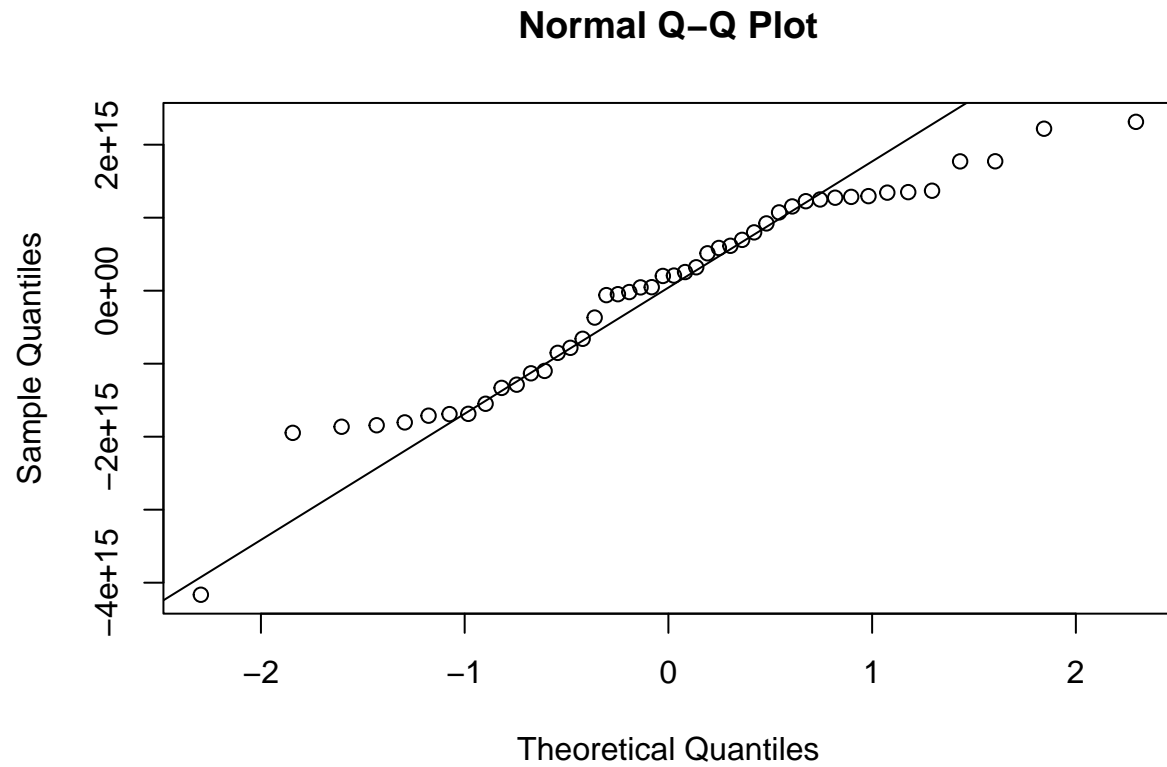
	Min	1Q	Median	3Q	Max
##	-4.165e+15	-1.123e+15	2.043e+14	1.208e+15	2.313e+15

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	8.287e+15	2.934e+14	28.246	< 2e-16 ***
## FLC\$Covid_Deaths	-2.343e+11	6.429e+10	-3.644	0.000704 ***

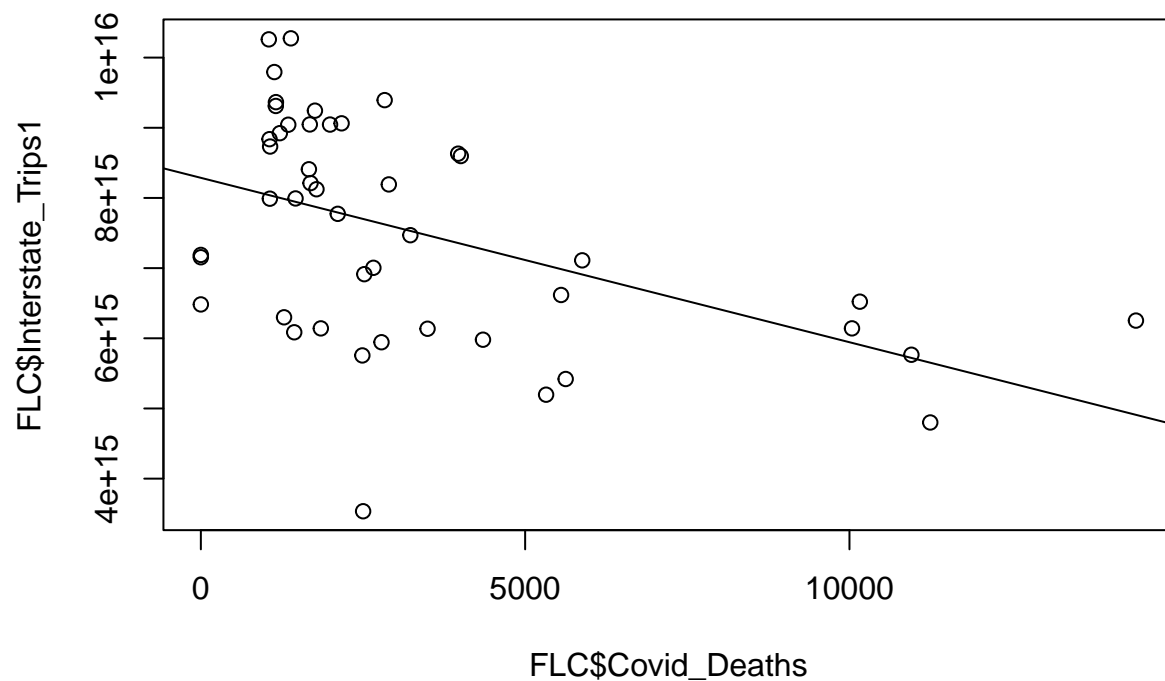
```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.397e+15 on 44 degrees of freedom
## Multiple R-squared:  0.2318, Adjusted R-squared:  0.2144
## F-statistic: 13.28 on 1 and 44 DF, p-value: 0.0007045
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(FLC$Interstate_Trips1 ~ FLC$Covid_Deaths)
abline(new_model)
```





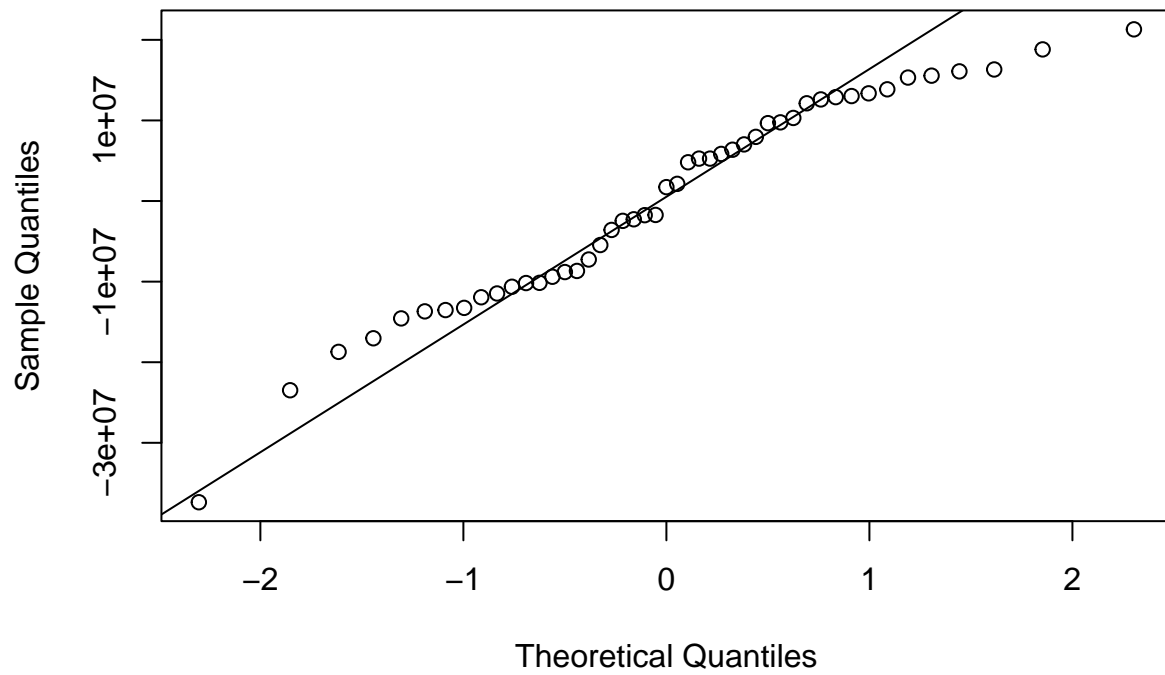
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %        97.5 %
## (Intercept)    7.695359e+15  8.877876e+15
## FLC$Covid_Deaths -3.638328e+11 -1.047113e+11
```

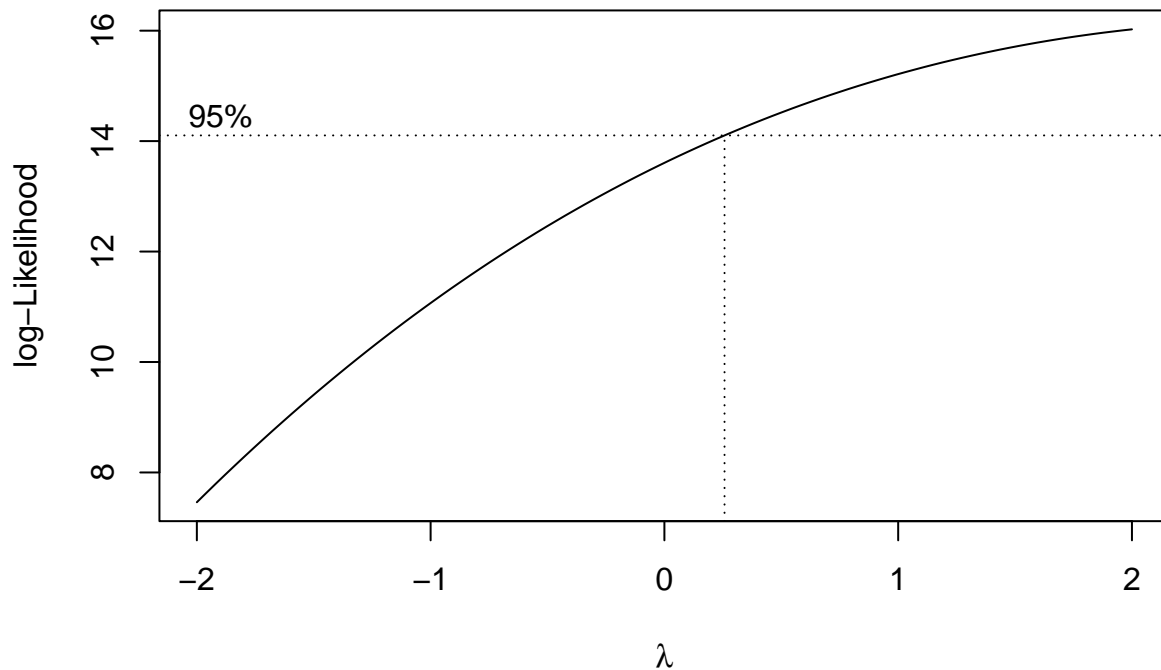
Florida Influenza Deaths vs Interstate Trips

```
model <- lm(FL$Interstate_Trips ~ FL$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Florida Influenza Deaths vs Interstate Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Florida Influenza Deaths vs Interstate Travel



```
FL$CookD = cooks.distance(model)
FLI <- FL[which(FL$CookD < 0.5),]
bc <- boxcox(FLI$Interstate_Trips ~ FLI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
FLI$Interstate_Trips1 <- (((FLI$Interstate_Trips)^lambda - 1) / lambda)
new_model <- lm(FLI$Interstate_Trips1 ~ FLI$Influenza_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = FLI$Interstate_Trips1 ~ FLI$Influenza_Deaths)
##
## Residuals:
```

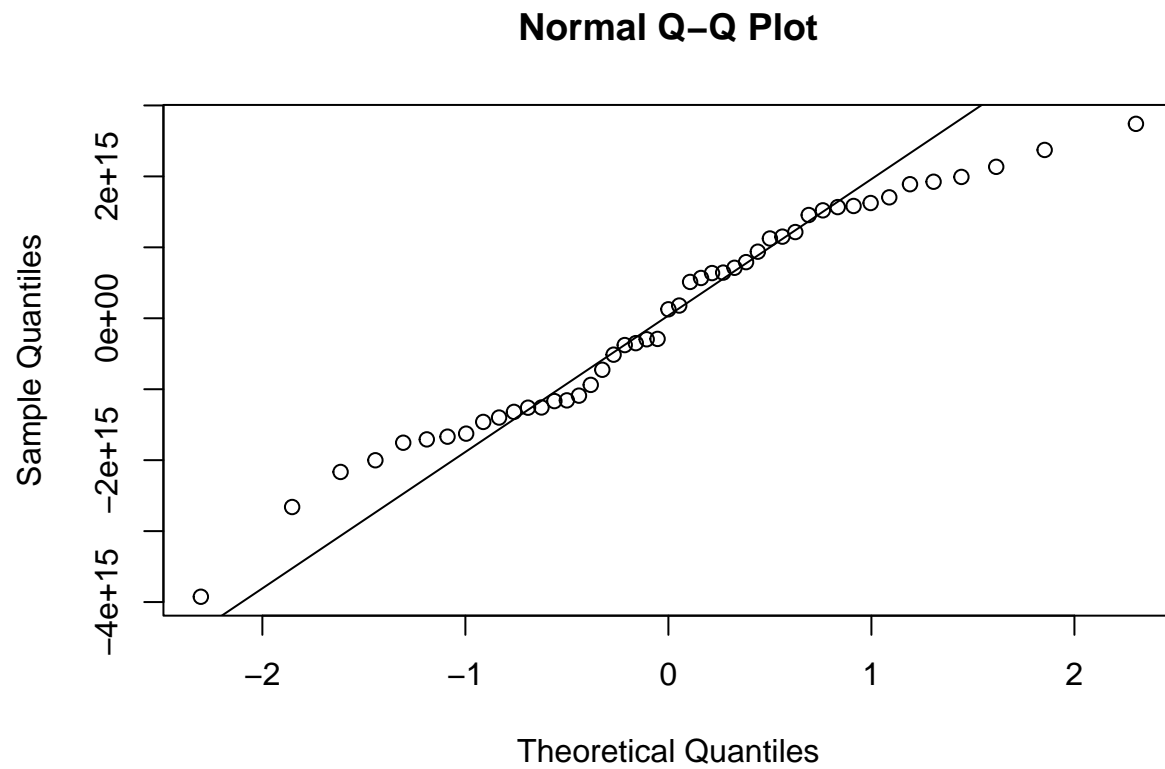
	Min	1Q	Median	3Q	Max
##	-3.925e+15	-1.259e+15	1.265e+14	1.335e+15	2.741e+15

```
##
## Coefficients:
```

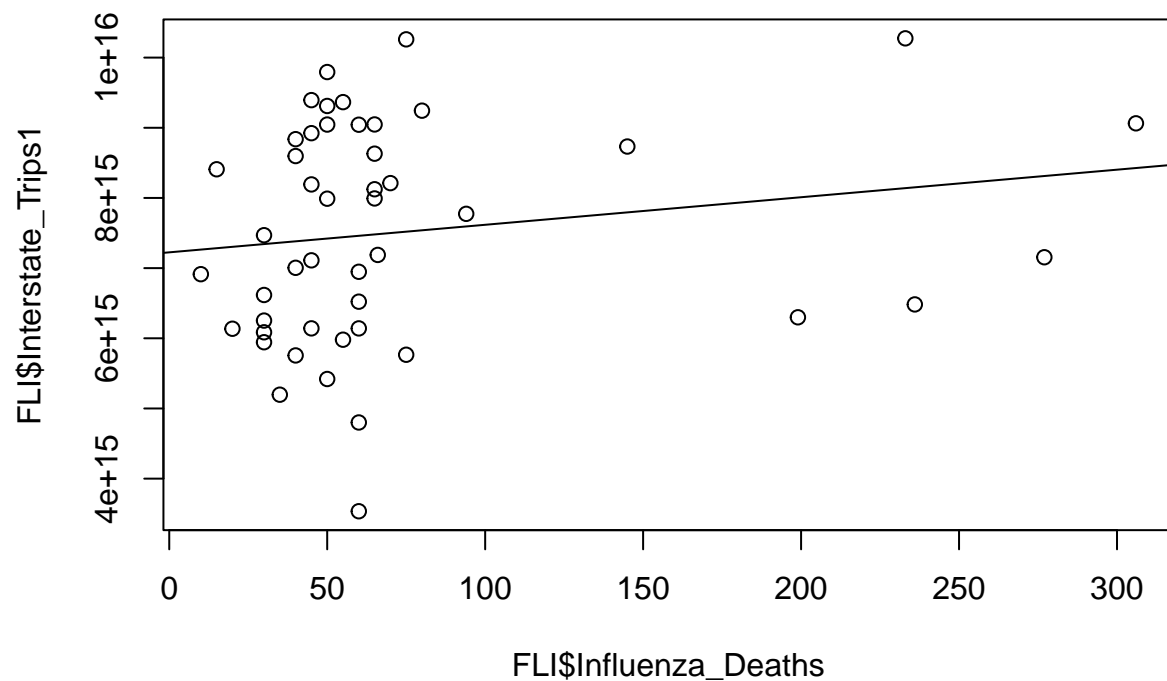
	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	7.225e+15	3.402e+14	21.234	<2e-16 ***
## FLI\$Influenza_Deaths	3.926e+12	3.452e+12	1.137	0.261

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.556e+15 on 45 degrees of freedom
## Multiple R-squared:  0.02795,    Adjusted R-squared:  0.006344
## F-statistic: 1.294 on 1 and 45 DF,  p-value: 0.2614
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(FLI$Interstate_Trips1 ~ FLI$Influenza_Deaths)
abline(new_model)
```



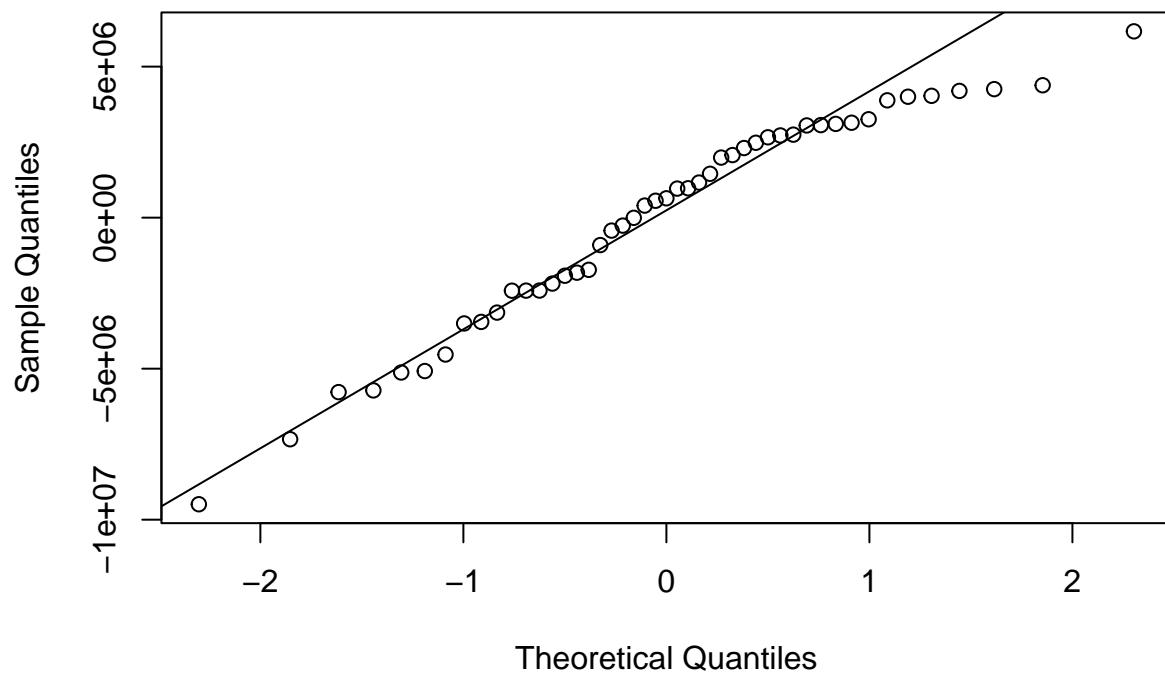
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)      6.539581e+15 7.910173e+15
## FLI$Influenza_Deaths -3.025935e+12 1.087747e+13
```

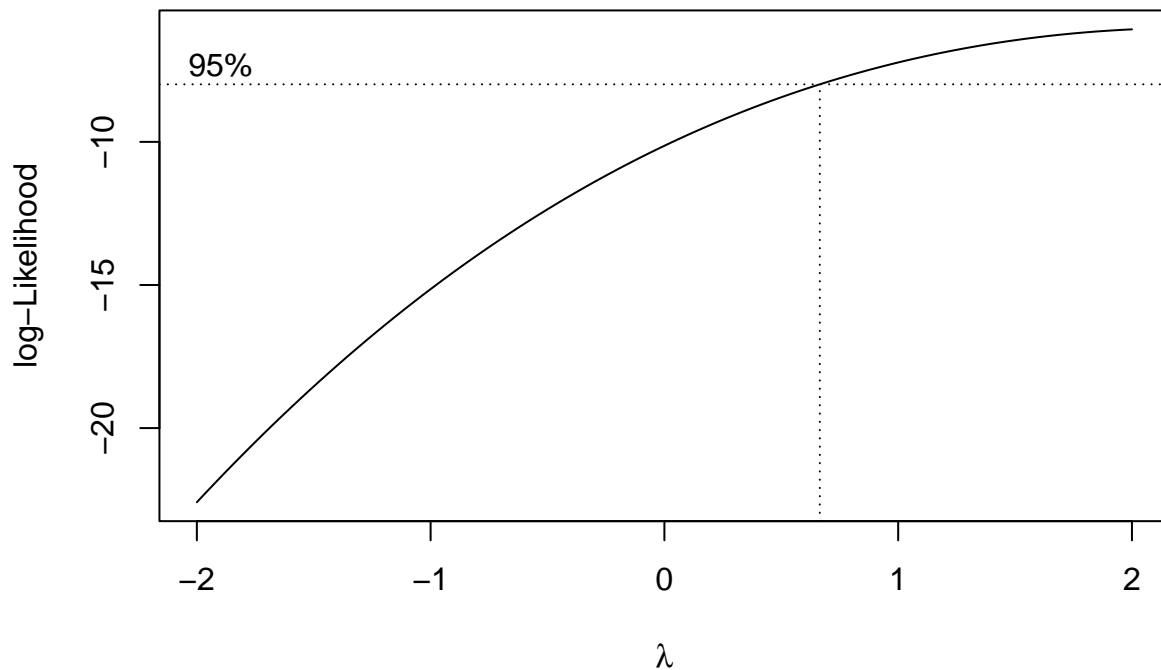
Florida Covid Deaths vs Long Distance Trips

```
model <- lm(FL$Long_Distance_Trips ~ FL$Covid_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Florida Covid Deaths vs Long_Distance Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Florida Covid Deaths vs Long\_Distance Travel



```
FL$CookD = cooks.distance(model)
FLC <- FL[which(FL$CookD < 0.5),]
bc <- boxcox(FLC$Long_Distance_Trips ~ FLC$Covid_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
FLC$Long_Distance_Trips1 <- (((FLC$Long_Distance_Trips)^lambda - 1) / lambda)
new_model <- lm(FLC$Long_Distance_Trips1 ~ FLC$Covid_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = FLC$Long_Distance_Trips1 ~ FLC$Covid_Deaths)
##
## Residuals:
```

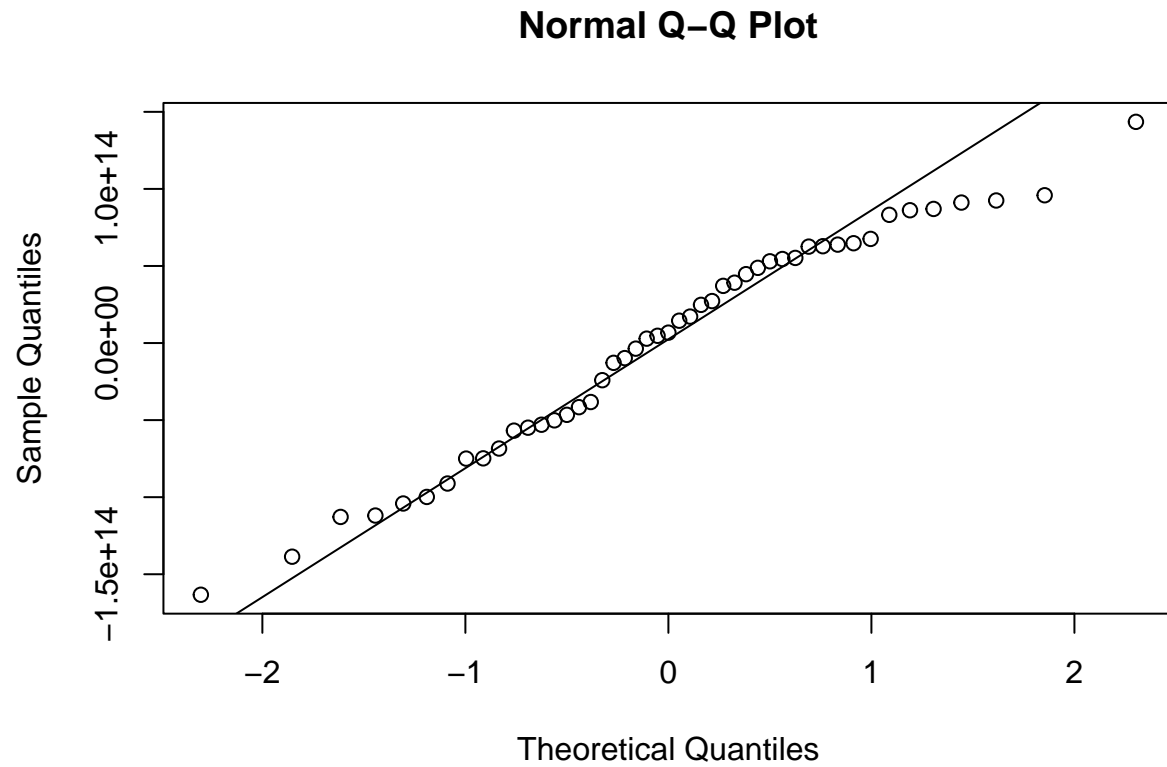
	Min	1Q	Median	3Q	Max
##	-1.633e+14	-5.395e+13	6.747e+12	5.891e+13	1.435e+14

```
##
## Coefficients:
```

	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	2.389e+14	1.395e+13	17.124	<2e-16 ***
## FLC\$Covid_Deaths	-2.664e+09	2.427e+09	-1.097	0.278

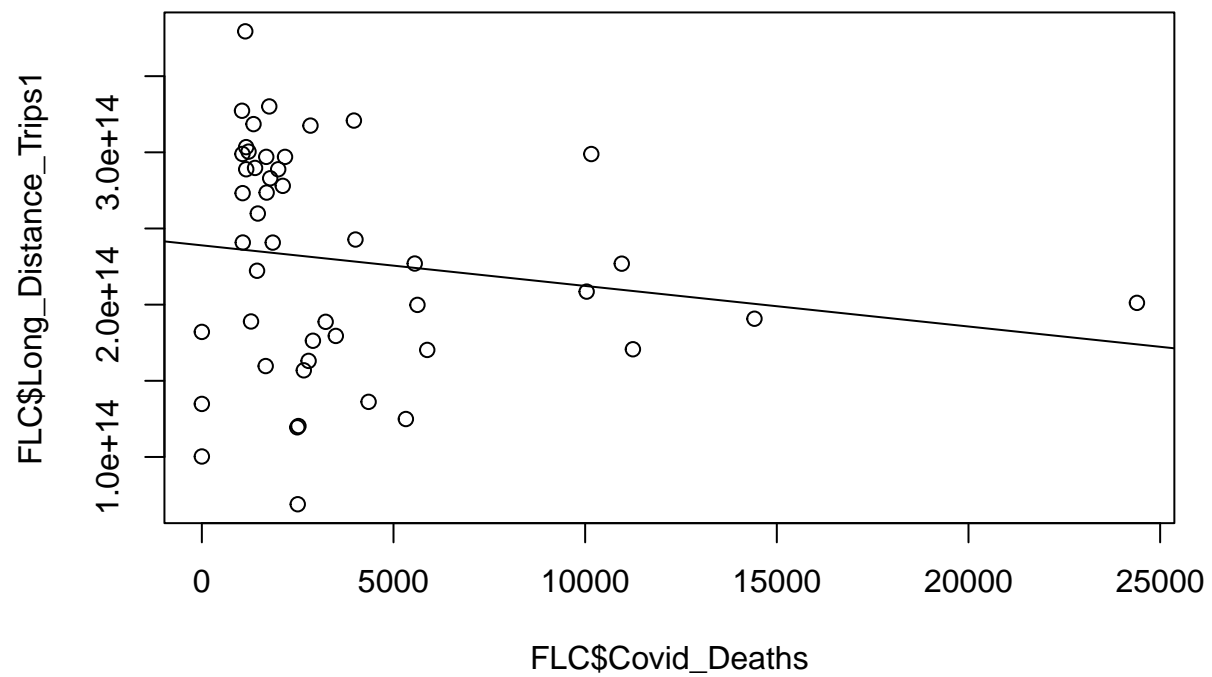
```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 7.322e+13 on 45 degrees of freedom
## Multiple R-squared:  0.02607,    Adjusted R-squared:  0.004425
## F-statistic: 1.204 on 1 and 45 DF,  p-value: 0.2783
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(FLC$Long_Distance_Trips1 ~ FLC$Covid_Deaths)
abline(new_model)
```





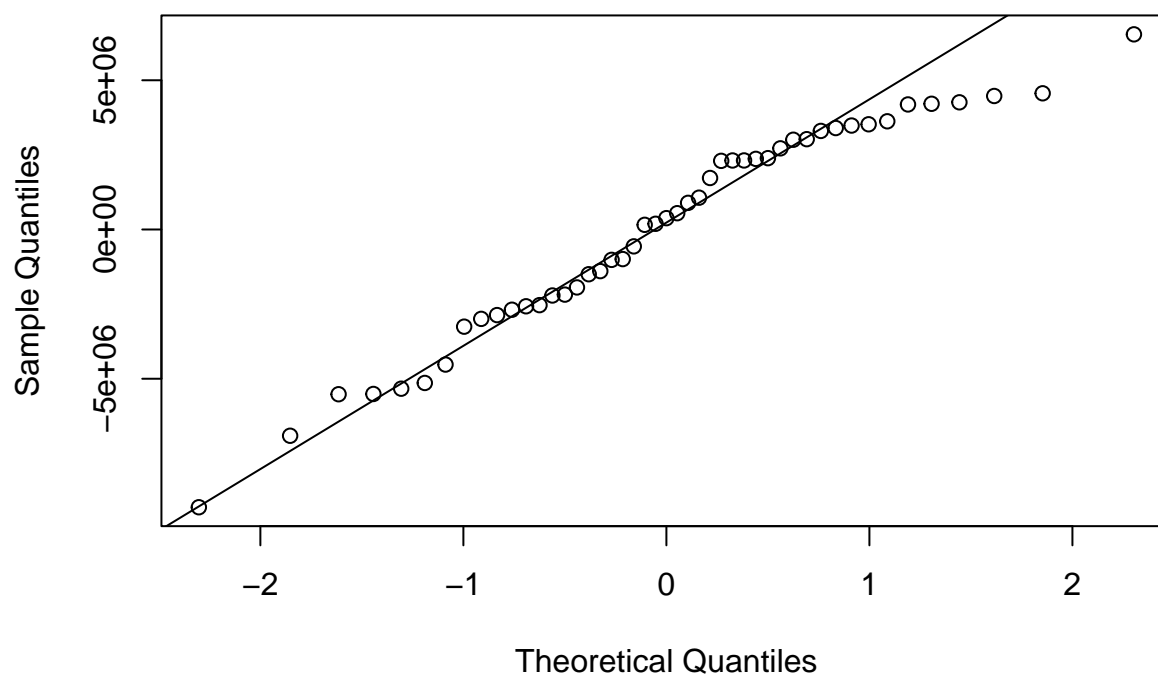
```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)    2.108289e+14 2.670351e+14
## FLC$Covid_Deaths -7.552660e+09 2.224917e+09
```

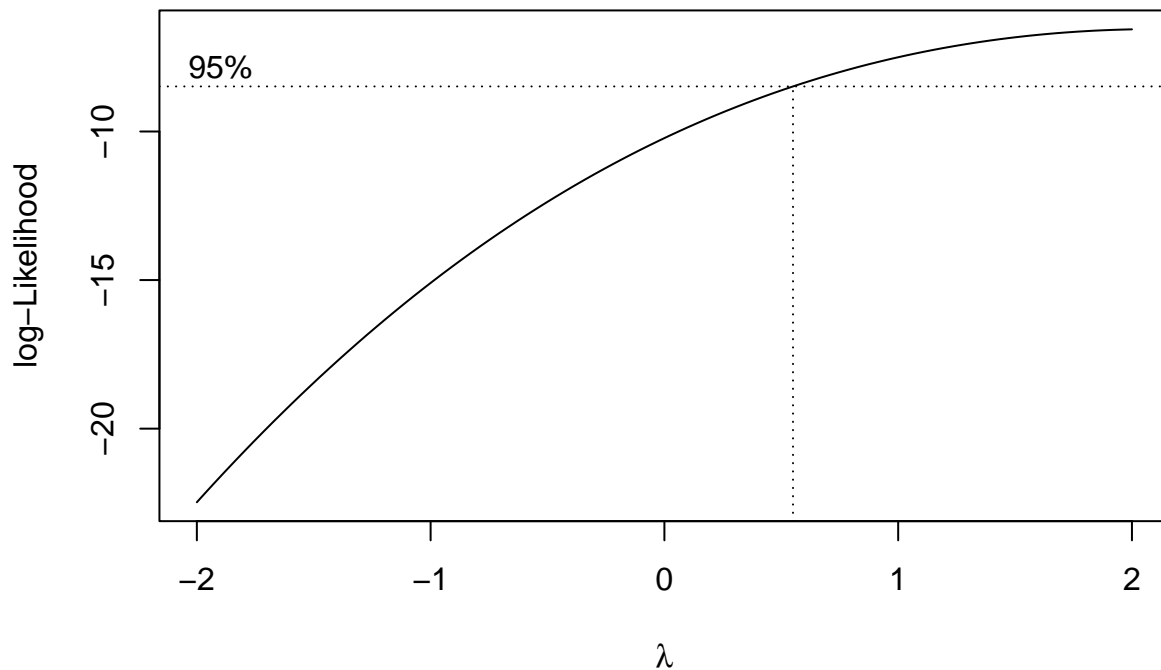
Florida Influenza Deaths vs Long Distance Trips

```
model <- lm(FL$Long_Distance_Trips ~ FL$Influenza_Deaths)
qqnorm(model$residuals, main = "Normal Q-Q Plot of Florida Influenza Deaths vs Long_Distance Travel")
qqline(model$residuals)
```

## Normal Q-Q Plot of Florida Influenza Deaths vs Long\_Distance Trav



```
FL$CookD = cooks.distance(model)
FLI <- FL[which(FL$CookD < 0.5),]
bc <- boxcox(FLI$Long_Distance_Trips ~ FLI$Influenza_Deaths)
```



```
lambda <- bc$x[which.max(bc$y)]
FLI$Long_Distance_Trips1 <- (((FLI$Long_Distance_Trips)^lambda - 1) / lambda)
new_model <- lm(FLI$Long_Distance_Trips1 ~ FLI$Influenza_Deaths)
summary(new_model)
```

```
##
## Call:
## lm(formula = FLI$Long_Distance_Trips1 ~ FLI$Influenza_Deaths)
##
## Residuals:
```

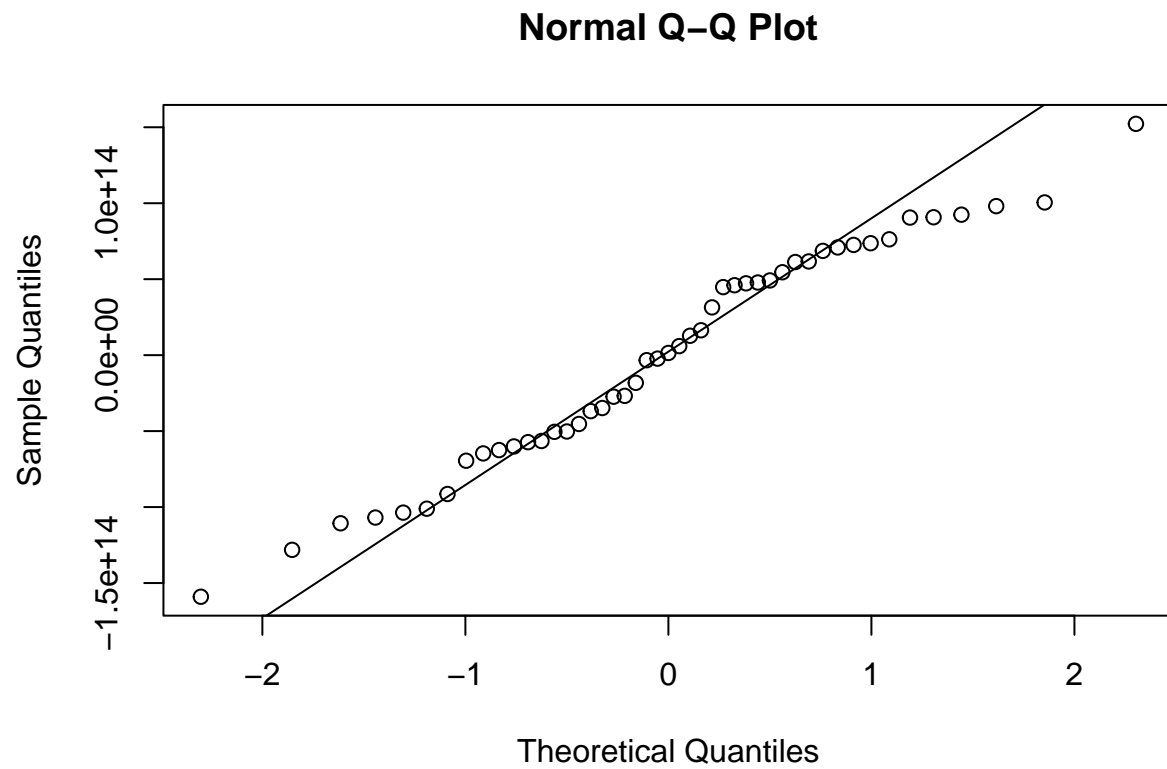
	Min	1Q	Median	3Q	Max
##	-1.590e+14	-5.689e+13	1.429e+12	6.149e+13	1.522e+14

```
##
## Coefficients:
```

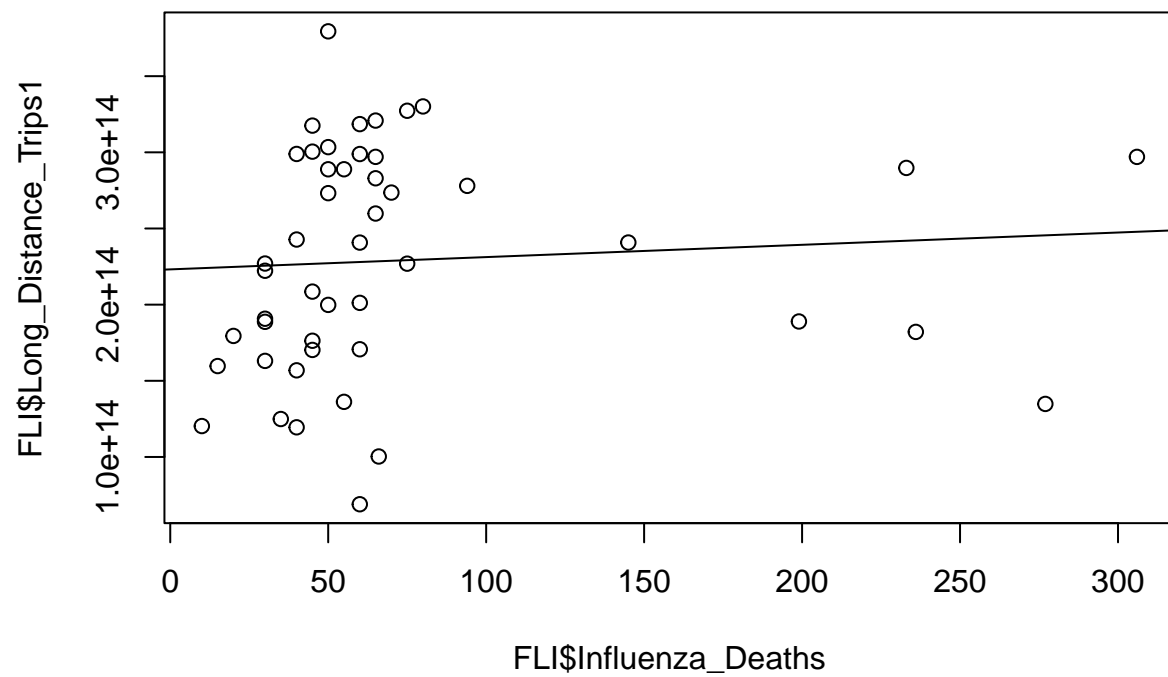
	Estimate	Std. Error	t value	Pr(> t )
## (Intercept)	2.232e+14	1.618e+13	13.795	<2e-16 ***
## FLI\$Influenza_Deaths	8.069e+10	1.641e+11	0.492	0.625

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 7.4e+13 on 45 degrees of freedom
## Multiple R-squared:  0.005345, Adjusted R-squared: -0.01676
## F-statistic: 0.2418 on 1 and 45 DF, p-value: 0.6253
```

```
qqnorm(new_model$residuals)
qqline(new_model$residuals)
```



```
plot(FLI$Long_Distance_Trips1 ~ FLI$Influenza_Deaths)
abline(new_model)
```



```
conf_intervals <- confint(new_model, level = 0.95)
print(conf_intervals)
```

```
##                2.5 %      97.5 %
## (Intercept)    1.905729e+14 2.557337e+14
## FLI$Influenza_Deaths -2.498077e+11 4.111892e+11
```