

GDP_Analysis

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2/21/2021

Imports & Pre-processing

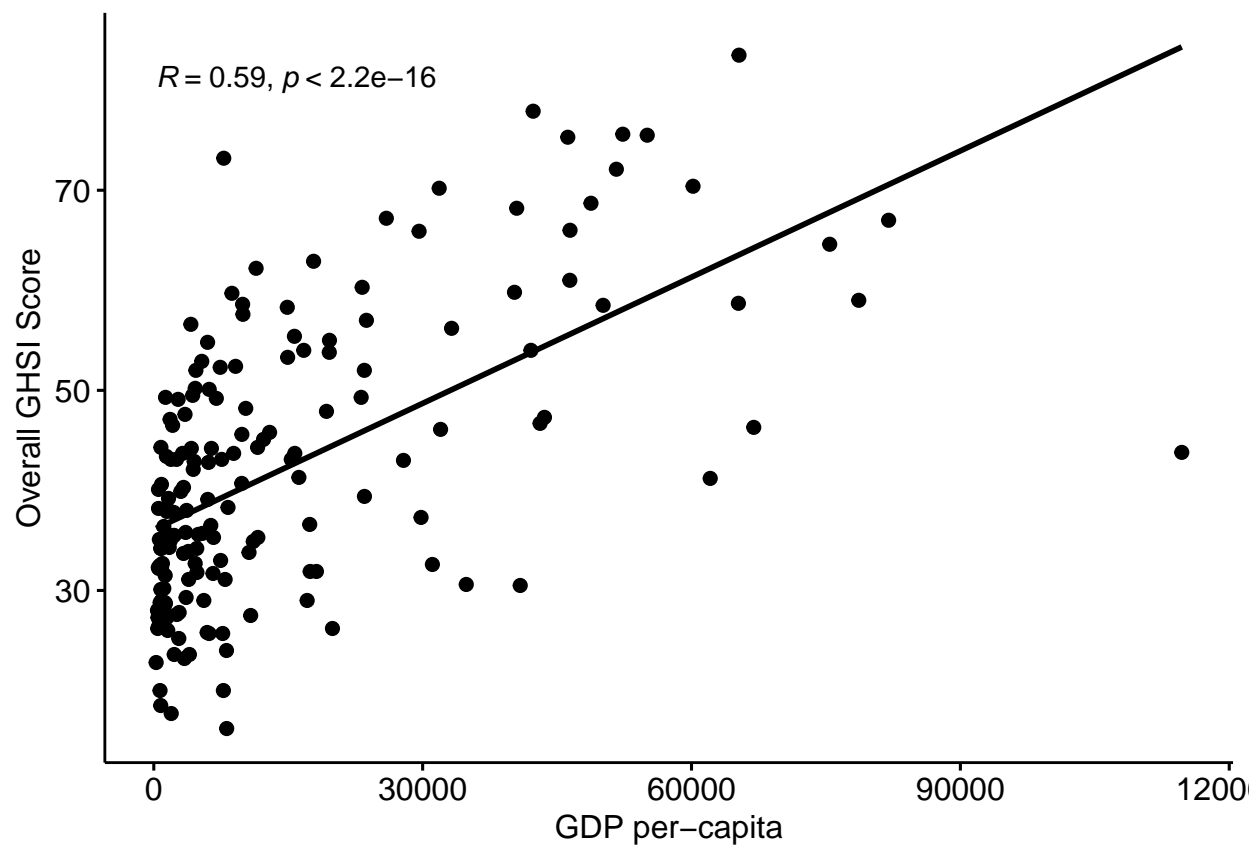
```
# import libraries
library(tidyverse)
library(lubridate)
library(ggpubr)
library(dplyr)

# load sixmonth data, omitting NA values
sixmonth_data = na.omit(read.csv(".\\prepped_data\\sixmonth.csv", check.names = FALSE))

# add gdp_pc quartile
sixmonth_data$gdp_pc_quartile <- ntile(sixmonth_data$gdp_pc, 4)
```

Correlation between GDP per-capita and overall GHSI index

```
ggscatter(sixmonth_data,x='gdp_pc' ,y='overall',  
          add='reg.line',cor.coef=TRUE,cor.method='pearson',  
          xlab='GDP per-capita',ylab='Overall GHSI Score')
```



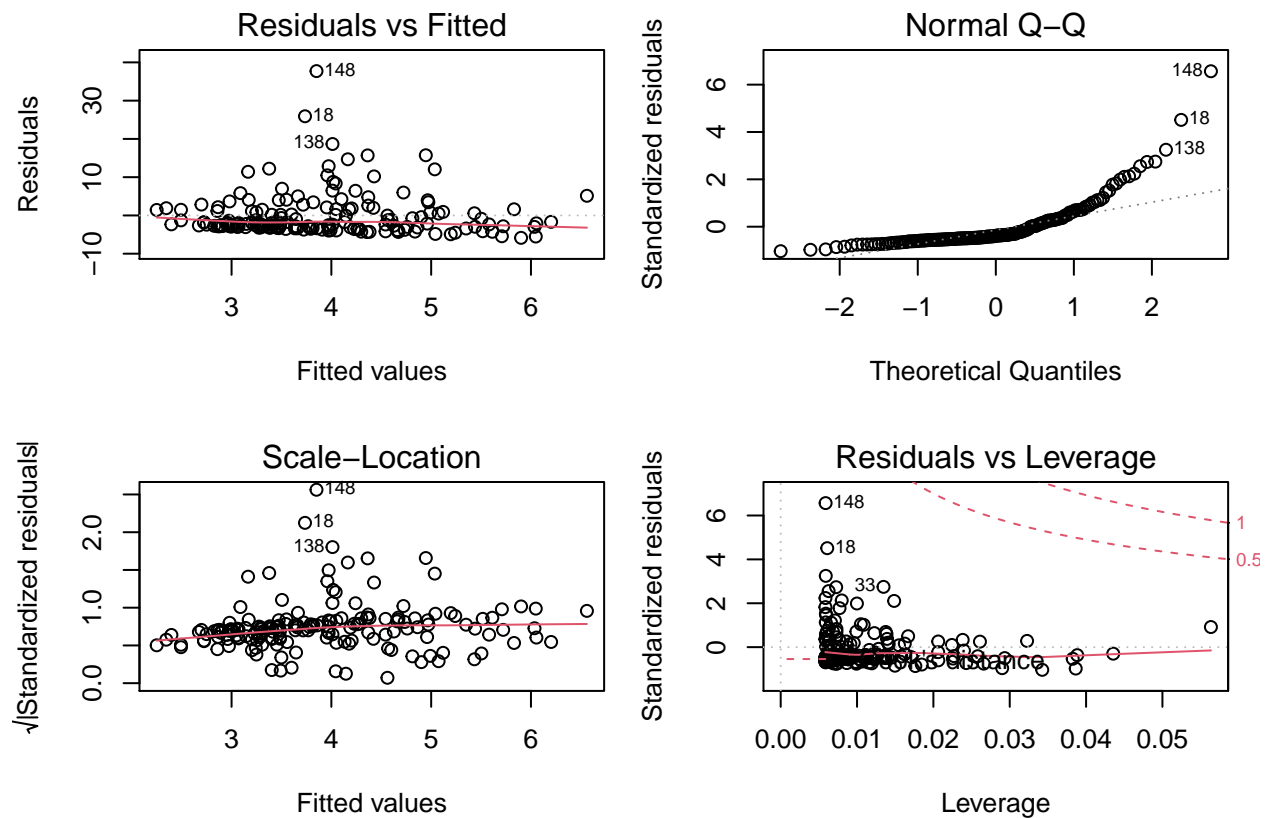
Baseline: Outcomes vs overall GHSI

Cases per-capita vs overall GHSI

```
summary(lm(casepc ~ overall, data = sixmonth_data))$coefficients
```

```
##               Estimate Std. Error  t value    Pr(>|t|)
## (Intercept)  1.21187052  1.40027022  0.8654548 0.38801614
## overall      0.06405954  0.03142626  2.0384078 0.04306759
```

```
par(mfrow=c(2,2),mar=c(5,4,2,1))
plot(lm(casepc ~ overall, data = sixmonth_data))
```

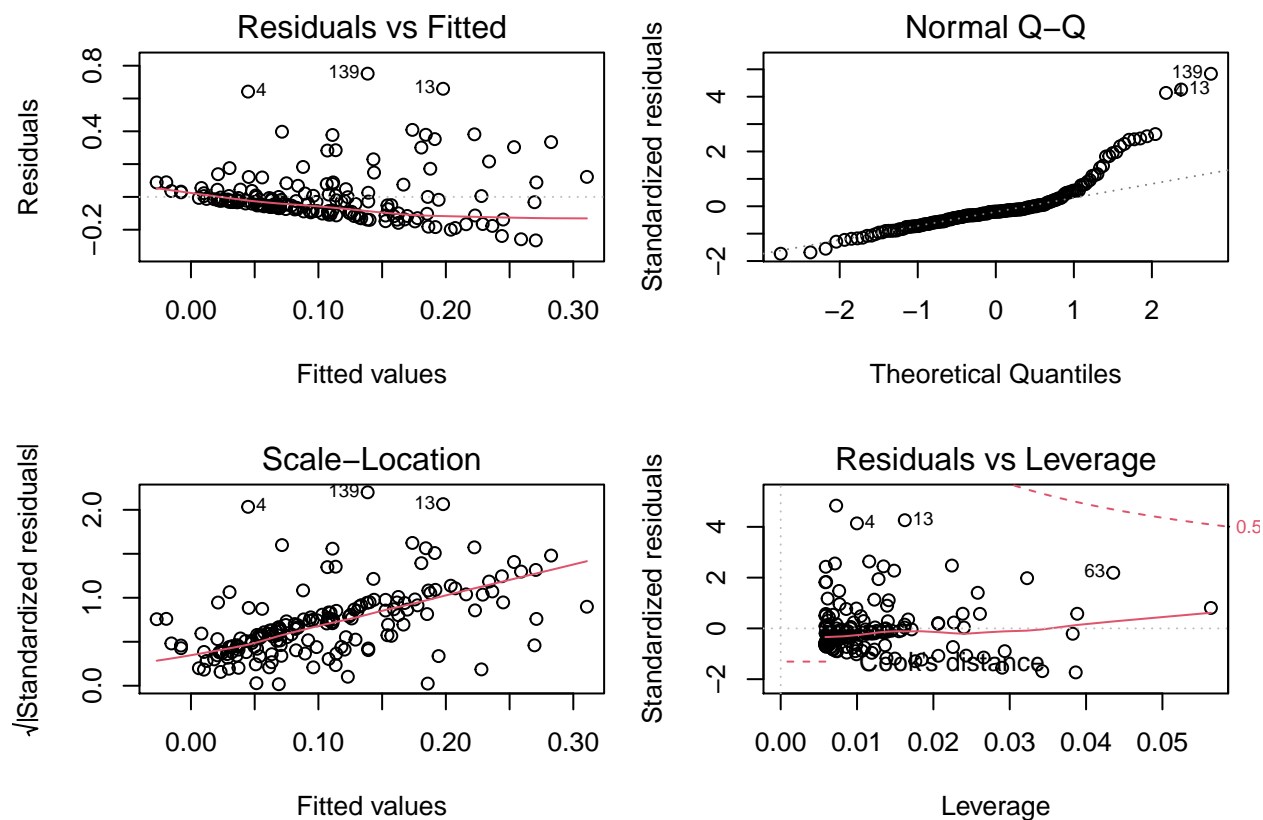


Deaths per-capita vs overall GHSI

```
summary(lm(deathpc ~ overall, data = sixmonth_data))$coefficients
```

```
##              Estimate Std. Error  t value    Pr(>|t|)
## (Intercept) -0.108134228 0.0379110729 -2.852313 4.882255e-03
## overall      0.005015641 0.0008508381  5.894941 1.983611e-08
```

```
par(mfrow=c(2,2),mar=c(5,4,2,1))
plot(lm(deathpc ~ overall, data = sixmonth_data))
```

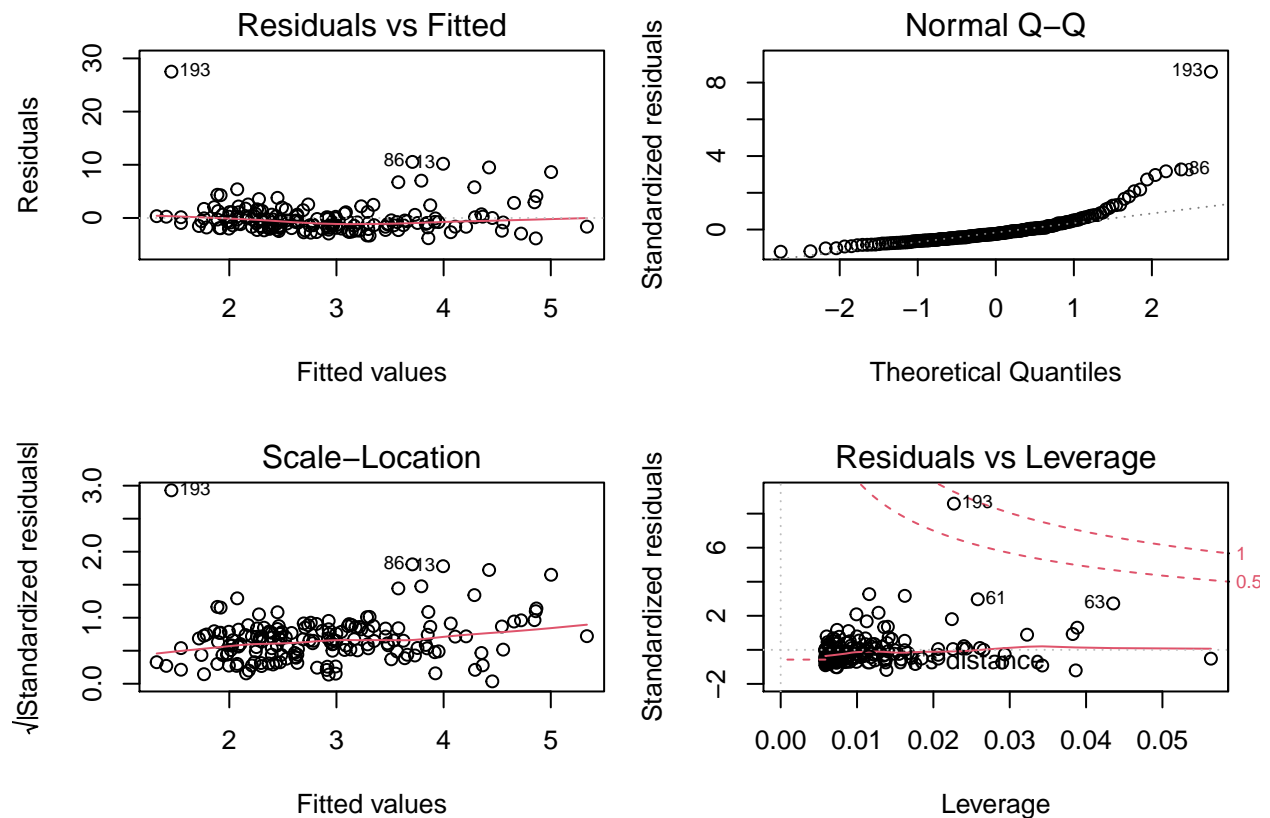


Case-fatality ratio vs overall GHSI

```
summary(lm(cfratio ~ overall, data = sixmonth_data))$coefficients
```

```
##              Estimate Std. Error t value    Pr(>|t|)
## (Intercept) 0.35619156 0.78762500 0.452235 0.6516796540
## overall      0.05965234 0.01767667 3.374637 0.0009167863
```

```
par(mfrow=c(2,2),mar=c(5,4,2,1))
plot(lm(cfratio ~ overall, data = sixmonth_data))
```



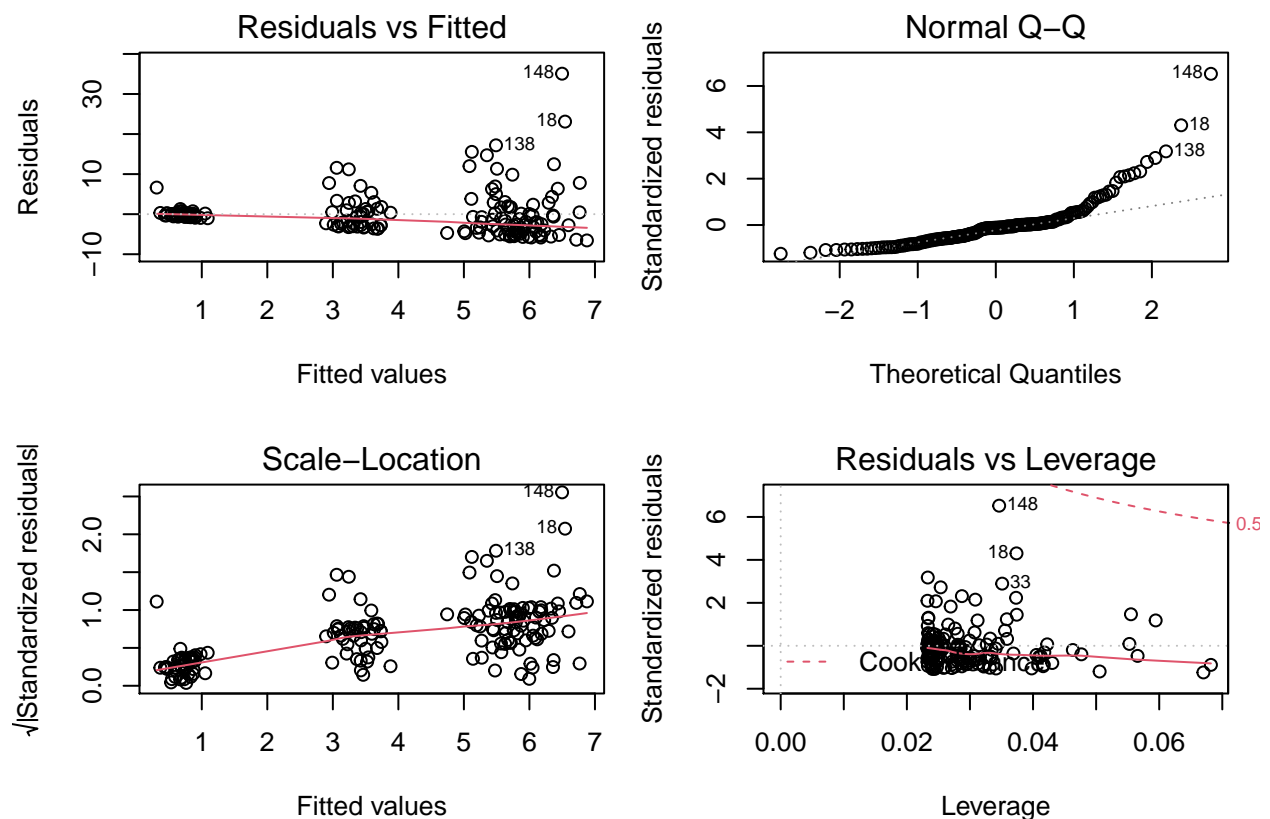
Confounding GDP per-capita (quartiles): Outcomes vs overall GHSI

Cases per-capita vs overall GHSI & GDP per-capita quartiles

```
summary(lm(casepc ~ overall + factor(gdp_pc_quartile), data = sixmonth_data))$coefficients
```

```
##              Estimate Std. Error  t value    Pr(>|t|)
## (Intercept)      1.55776251  1.50561734   1.034634 3.023449e-01
## overall          -0.02527216  0.03787453  -0.667260 5.055326e-01
## factor(gdp_pc_quartile)2  2.76984317  1.19249030   2.322739 2.140674e-02
## factor(gdp_pc_quartile)3  5.03675100  1.23358525   4.083018 6.897863e-05
## factor(gdp_pc_quartile)4  5.98175241  1.47560607   4.053760 7.731597e-05
```

```
par(mfrow=c(2,2),mar=c(5,4,2,1))
plot(lm(casepc ~ overall + factor(gdp_pc_quartile), data = sixmonth_data))
```

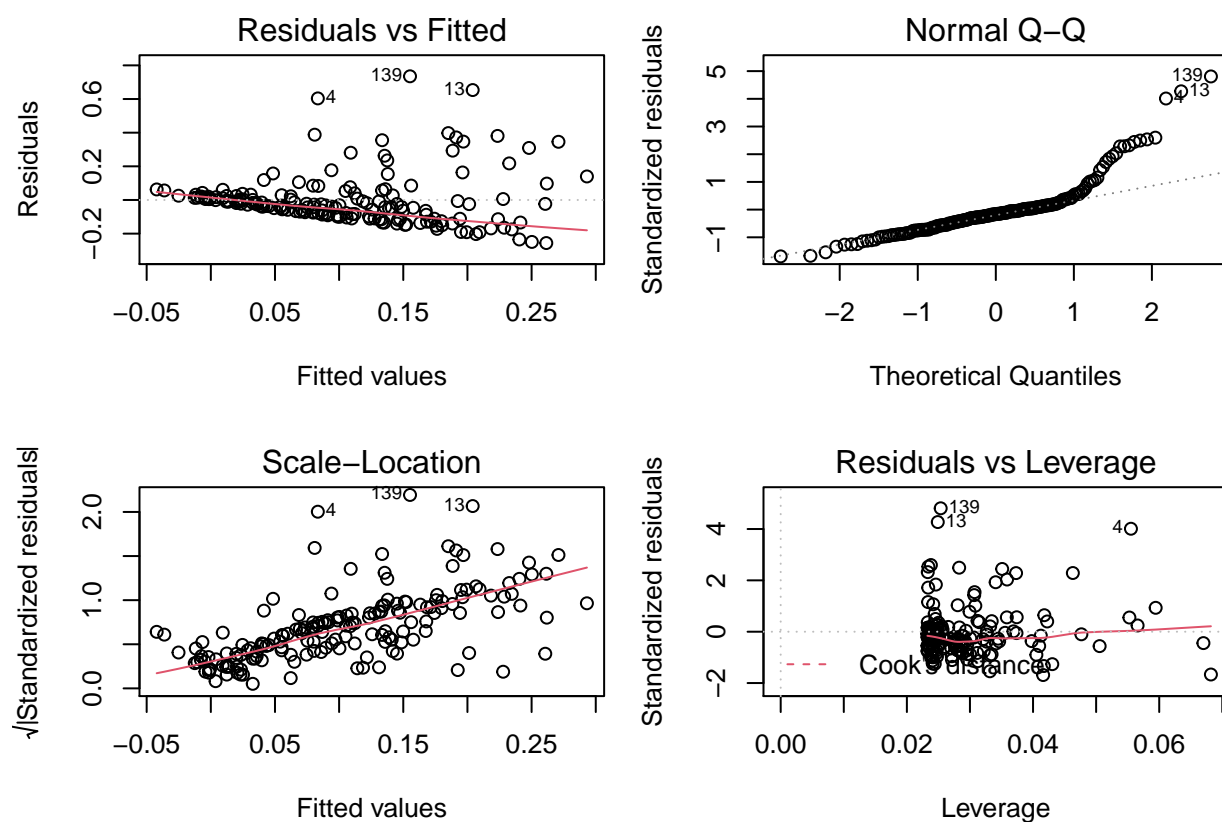


Deaths per-capita vs overall GHSI & GDP per-capita quartiles

```
summary(lm(deathpc ~ overall + factor(gdp_pc_quartile), data = sixmonth_data))$coefficients
```

```
##              Estimate Std. Error  t value    Pr(>|t|)
## (Intercept)   -0.115369404  0.042609873  -2.707574  0.0074872119
## overall        0.003956551  0.001071872   3.691254  0.0003023344
## factor(gdp_pc_quartile)2  0.054665989  0.033748191   1.619820  0.1071691733
## factor(gdp_pc_quartile)3  0.075954095  0.034911202   2.175637  0.0309963860
## factor(gdp_pc_quartile)4  0.078097574  0.041760536   1.870129  0.0632266298
```

```
par(mfrow=c(2,2),mar=c(5,4,2,1))
plot(lm(deathpc ~ overall + factor(gdp_pc_quartile), data = sixmonth_data))
```

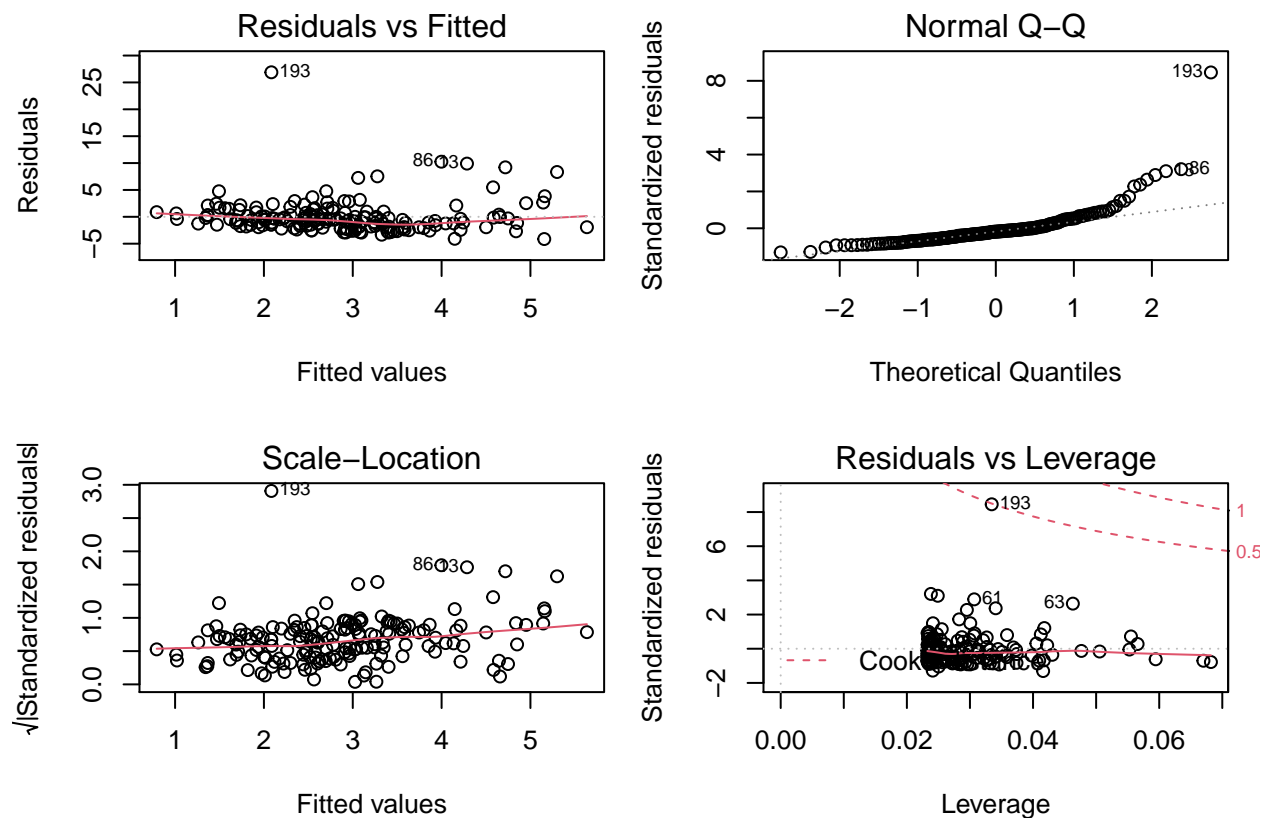


Case-fatality ratio vs overall GHSI & GDP per-capita quartiles

```
summary(lm(cfratio ~ overall + factor(gdp_pc_quartile), data = sixmonth_data))$coefficients
```

```
##              Estimate Std. Error  t value    Pr(>|t|)
## (Intercept)    0.97370161 0.88994222  1.094118 0.275488399
## overall        0.06000638 0.02238692  2.680421 0.008094517
## factor(gdp_pc_quartile)2 -1.02194884 0.70485869 -1.449863 0.148983314
## factor(gdp_pc_quartile)3 -1.15292749 0.72914914 -1.581196 0.115736788
## factor(gdp_pc_quartile)4 -0.34845304 0.87220312 -0.399509 0.690031701
```

```
par(mfrow=c(2,2),mar=c(5,4,2,1))
plot(lm(cfratio ~ overall + factor(gdp_pc_quartile), data = sixmonth_data))
```



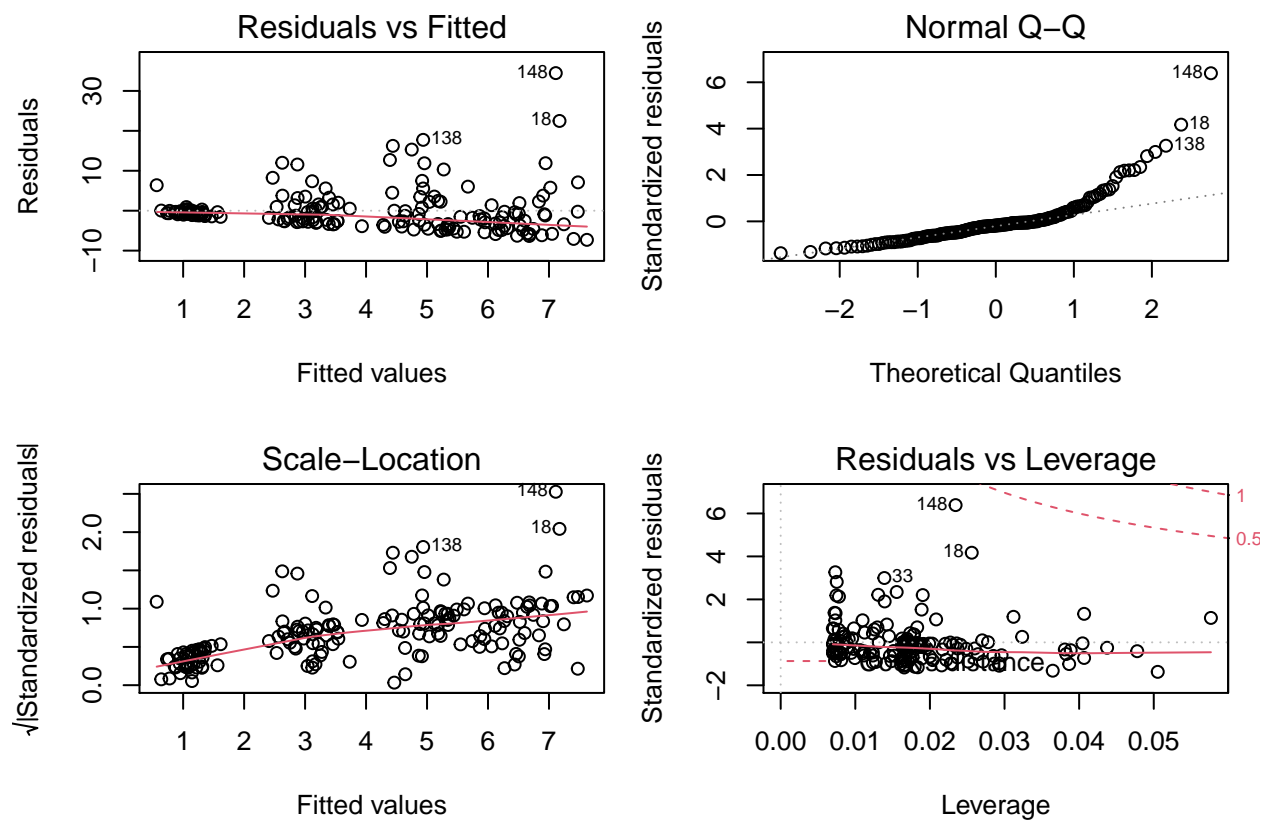
Confounding GDP per-capita (raw): Outcomes vs overall GHSI

Cases per-capita vs overall GHSI & GDP per-capita

```
summary(lm(casepc ~ overall + gdp_pc_quartile, data = sixmonth_data))$coefficients
```

```
##              Estimate Std. Error    t value    Pr(>|t|)
## (Intercept)   0.15499708 1.34705187   0.1150639 9.085319e-01
## overall      -0.03405252 0.03687764  -0.9233920 3.571273e-01
## gdp_pc_quartile 2.08988585 0.46359870   4.5079632 1.222963e-05
```

```
par(mfrow=c(2,2),mar=c(5,4,2,1))
plot(lm(casepc ~ overall + gdp_pc_quartile, data = sixmonth_data))
```

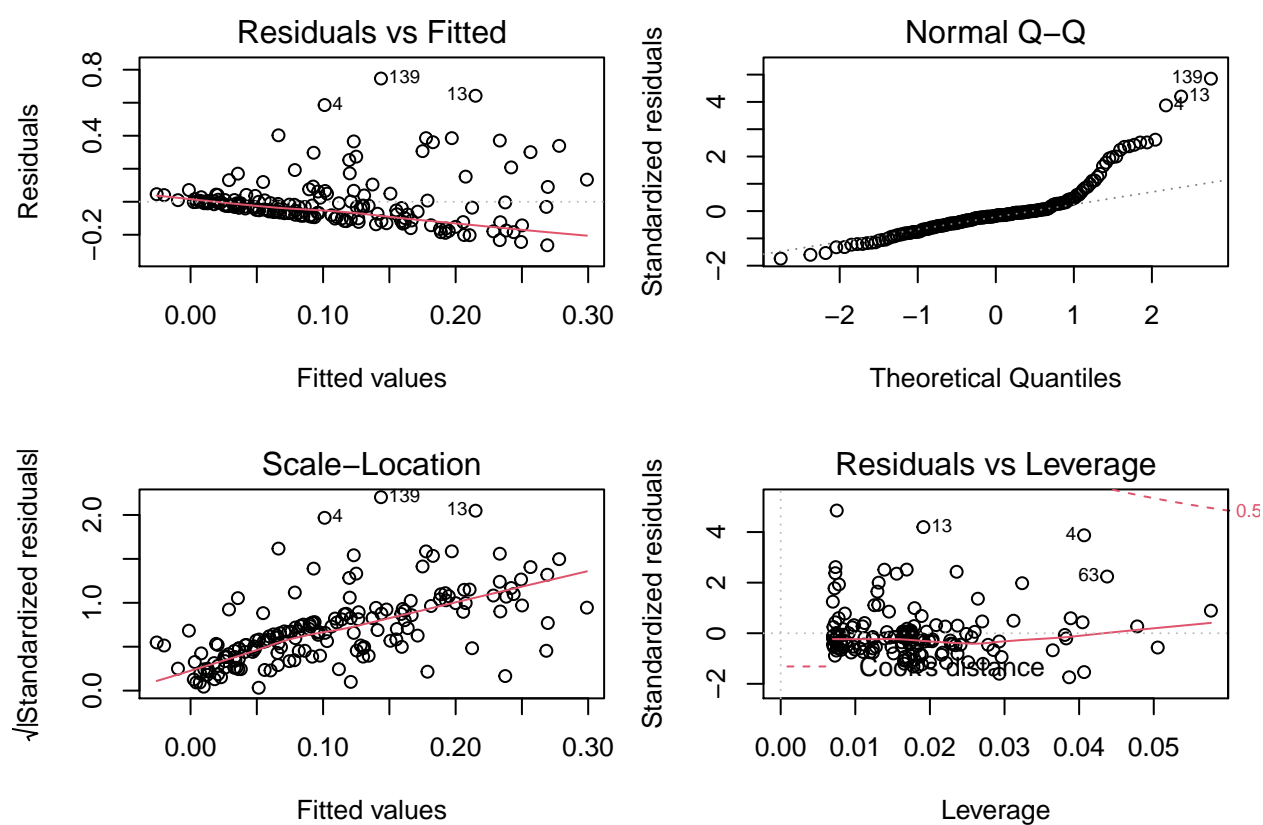


Deaths per-capita vs overall GHSI & GDP per-capita

```
summary(lm(deathpc ~ overall + gdp_pc_quartile, data = sixmonth_data))$coefficients
```

```
##              Estimate Std. Error  t value    Pr(>|t|)
## (Intercept)  -0.121937928 0.038125125 -3.198361 0.001652065
## overall      0.003734211 0.001043735  3.577740 0.000453059
## gdp_pc_quartile 0.027295753 0.013121067  2.080300 0.039015890
```

```
par(mfrow=c(2,2),mar=c(5,4,2,1))
plot(lm(deathpc ~ overall + gdp_pc_quartile, data = sixmonth_data))
```



Case-fatality ratio vs overall GHSI & GDP per-capita

```
summary(lm(cfratio ~ overall + gdp_pc_quartile, data = sixmonth_data))$coefficients
```

```
##              Estimate Std. Error    t value    Pr(>|t|)
## (Intercept)   0.44796082 0.80117689   0.5591285 0.576818617
## overall       0.06817149 0.02193346   3.1081043 0.002211686
## gdp_pc_quartile -0.18146664 0.27573145  -0.6581282 0.511356584
```

```
par(mfrow=c(2,2),mar=c(5,4,2,1))
plot(lm(cfratio ~ overall + gdp_pc_quartile, data = sixmonth_data))
```

