Analysis of the Social and Political Factors for Success/Failure in Tackling the Covid-19 Pandemic

## Introduction

The Coronavious pandemic has led to social and economic disruption on an unprecidented scale with every country in the world being affected in some way. COVID-19 has dominated business, trade, politics and the media, leading many to question exactly what factors of a nation’s governence have lead to fewer COVD-19 deaths. Some of the most prevelent beleifes sorounding this include:

* Richer countries better or worse at handling the pandemic than poorer countries.
* Countries led by women more successful than those led by men
* The success in dealing with the pandemic related the proportion of older people living in a country
* Democratic countries more successful at dealting with the pandemic than autoritrian ones?

By using data from countries around the world, namely relating to; wealth, age, the gender of a nation’s leader and the strength of democratic institutions as well as statisitcal analysis of these varibles, I am able to further understand the effect these vairbles have on the total deaths per million in a country. This will help me in determining the validity of these hypothesis or if they have no effect on the level of COVID-19 deaths at all (This is known as the null hypothesis).

## Justification:

## The Results:

To examine this

## Table

Understanding the

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Name of the Relevant MCT | Value of the MCT | Name of the Relevant MD | Value of the MD |
| Total Deaths Per Million | Continuous | 140.40 | variance and/or standard deviation | 209.88 |
| GDP Per Capita | Continuous | 14910.69 | variance and/or standard deviation | 16071.77 |
| Female Head of Government | Nominal | 0 (Male) = 107 1 (Female) = 9 | proportion in each category | 0 (Male) = 0.92 1 (Female) = 0.08 |
| V-Dem Polyarchy | Continuous | 0.56 | variance and/or standard deviation | 0.22 |

*Table 1. The Name of the Relevant Measure of Central Tendency (MCT) and Measure of Dispersion with their values*

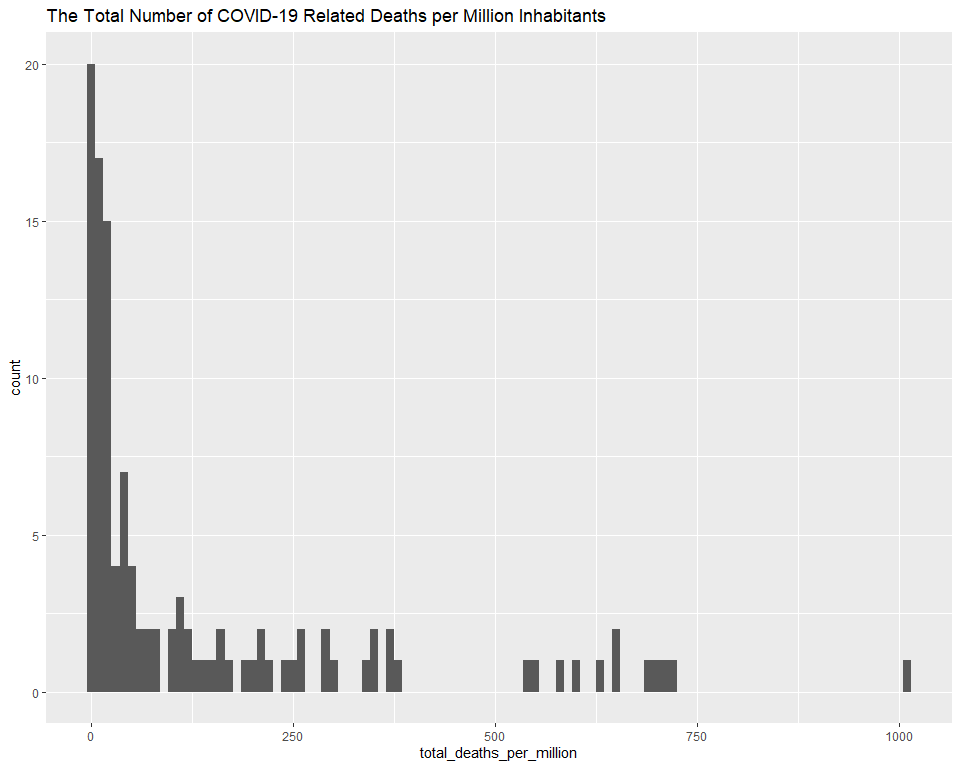


Figure 1.

## `stat\_bin()` using `bins = 30`. Pick better value with `binwidth`.

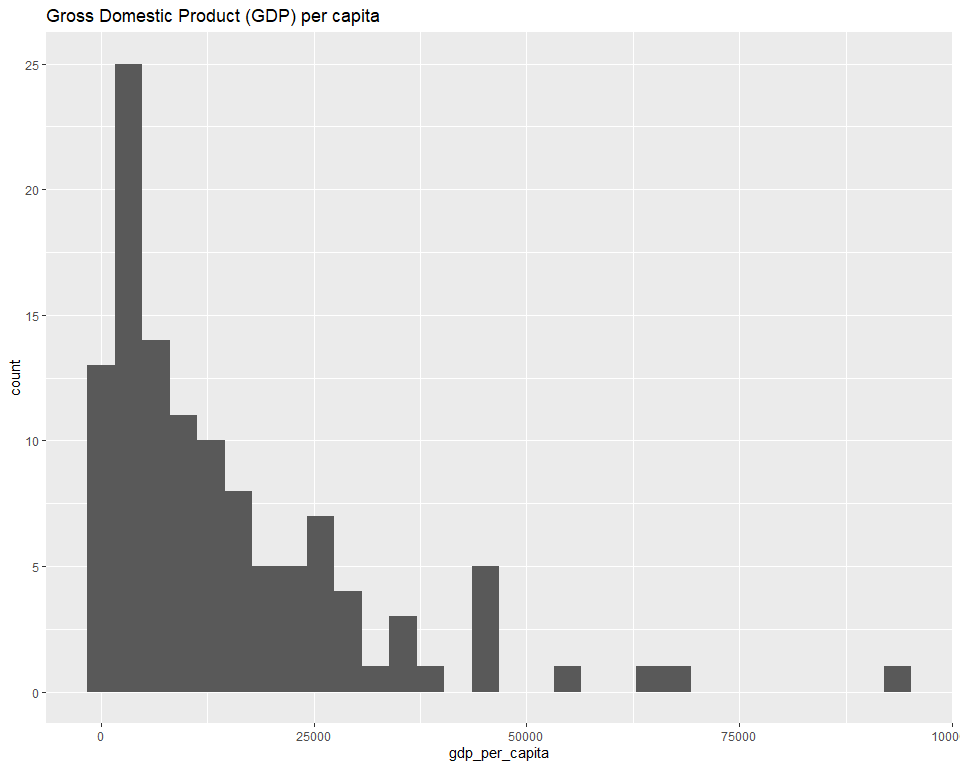


Figure 2.

## mapping: label = ~location   
## geom\_text: parse = FALSE, check\_overlap = FALSE, na.rm = FALSE  
## stat\_identity: na.rm = FALSE  
## position\_identity

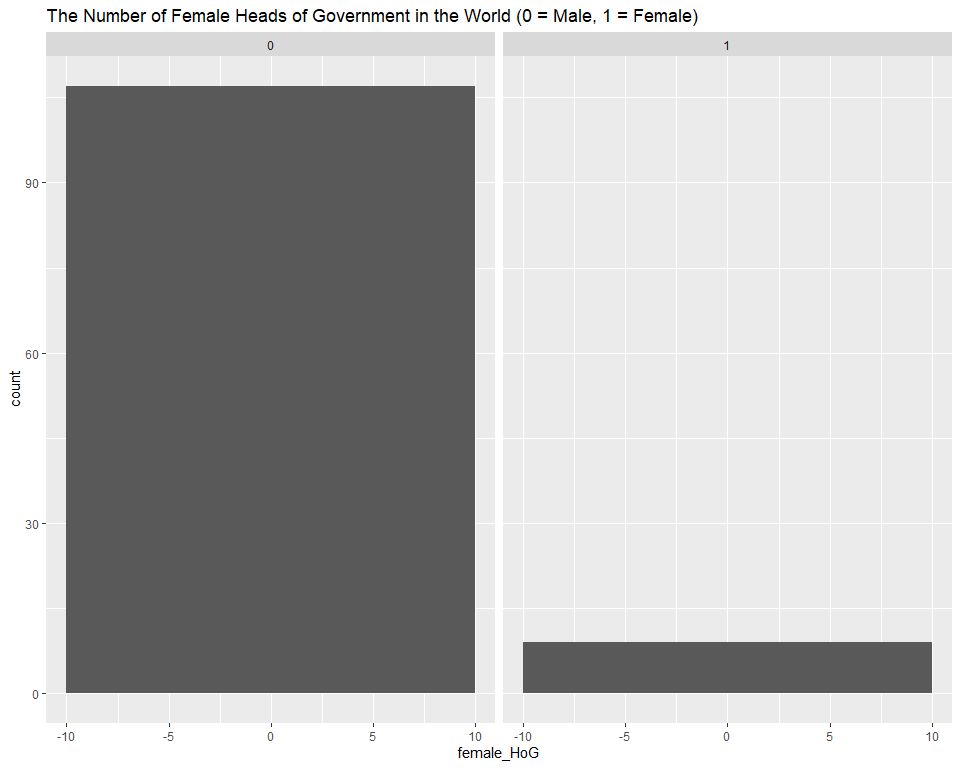


Figure 3.

## `stat\_bin()` using `bins = 30`. Pick better value with `binwidth`.

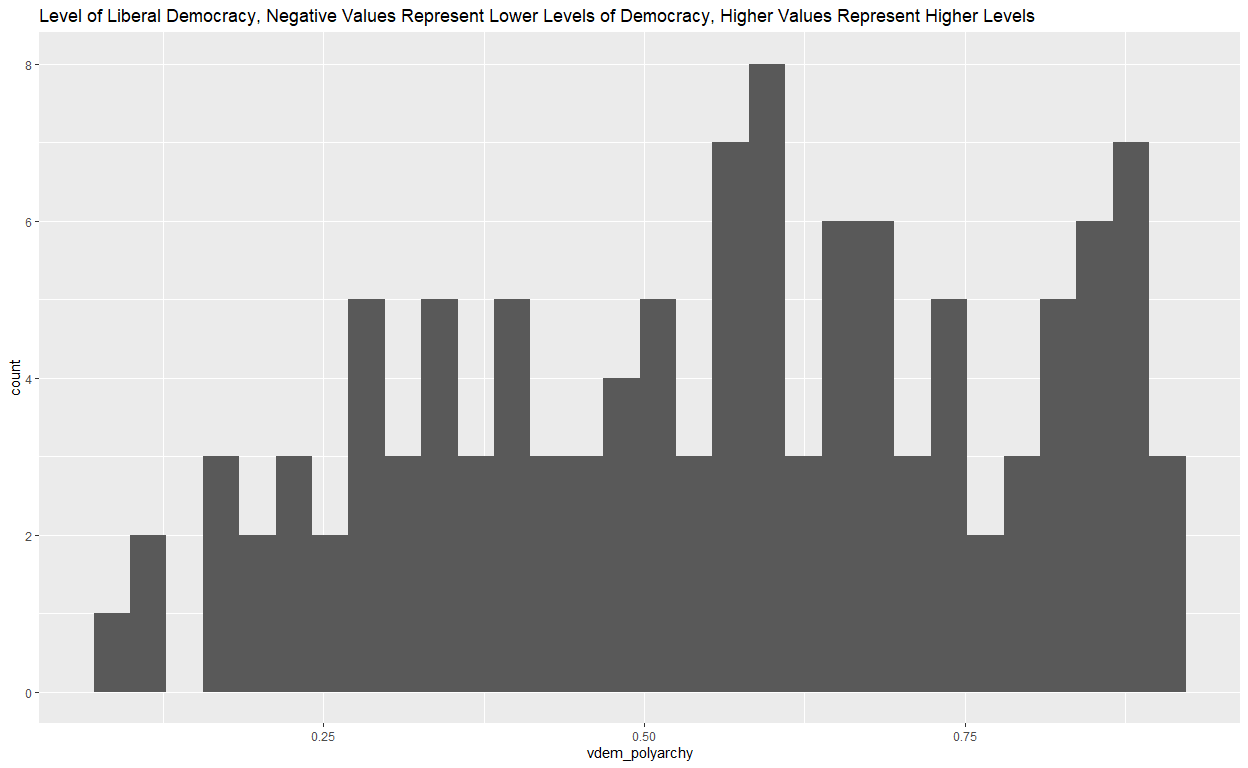


Figure 4.

## `stat\_bin()` using `bins = 30`. Pick better value with `binwidth`.

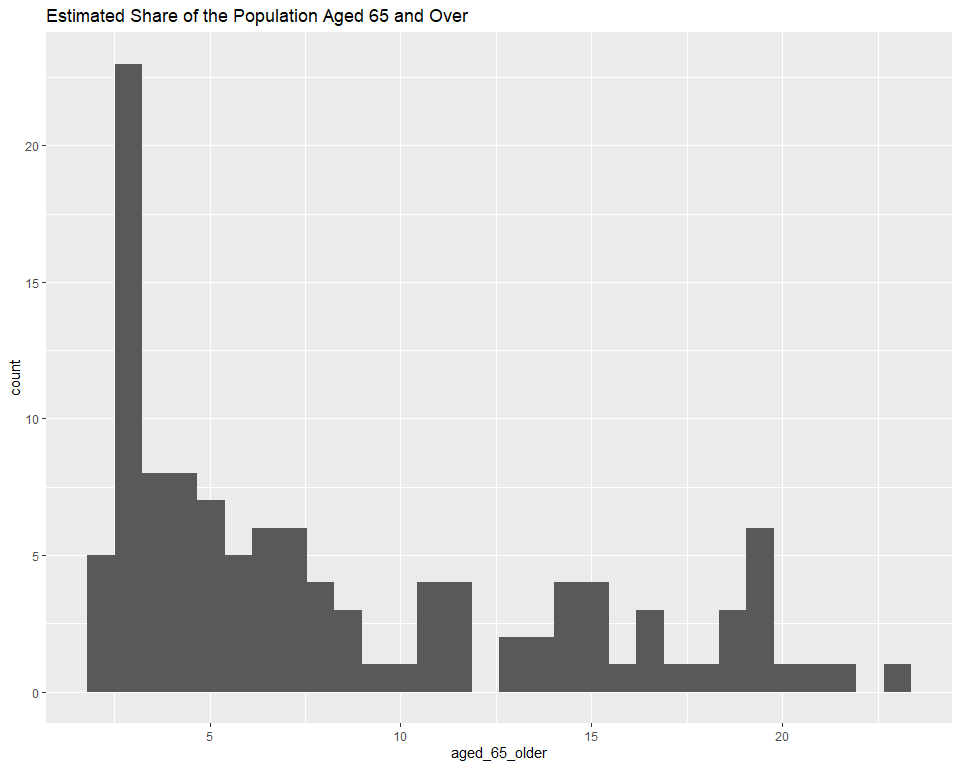


Figure 5.

#### Richer Countries do better than Poorer countries.

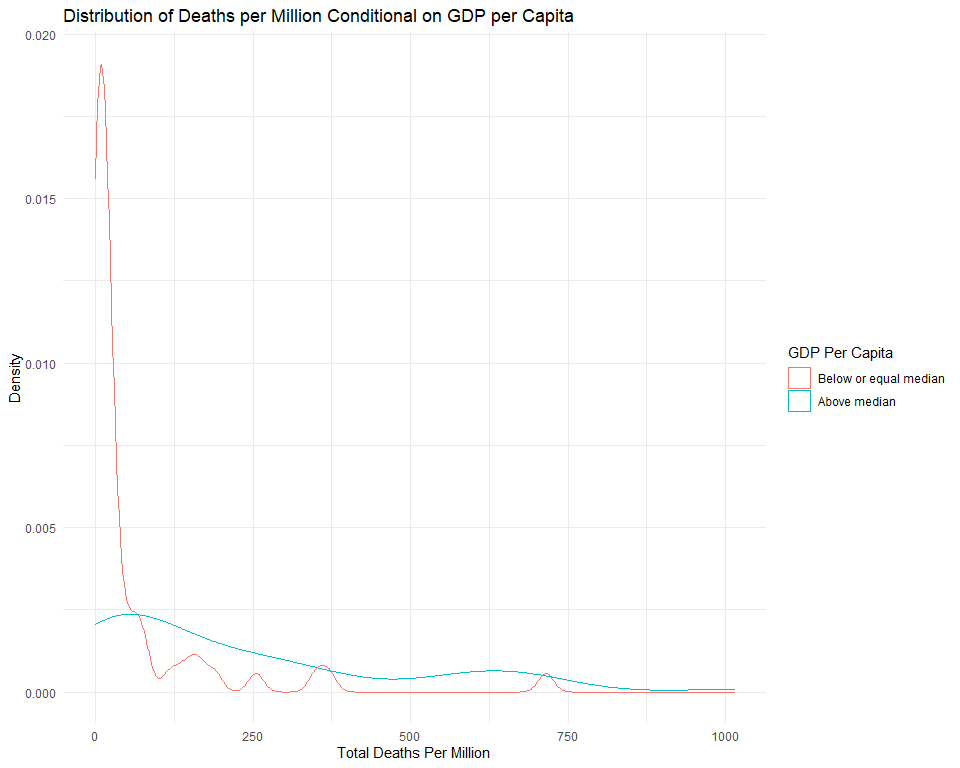


Figure 7.

#### Countries led by women are more successful than those led by men.

#### The success in dealing with the pandemic is related to the proportion of older people living in the country.

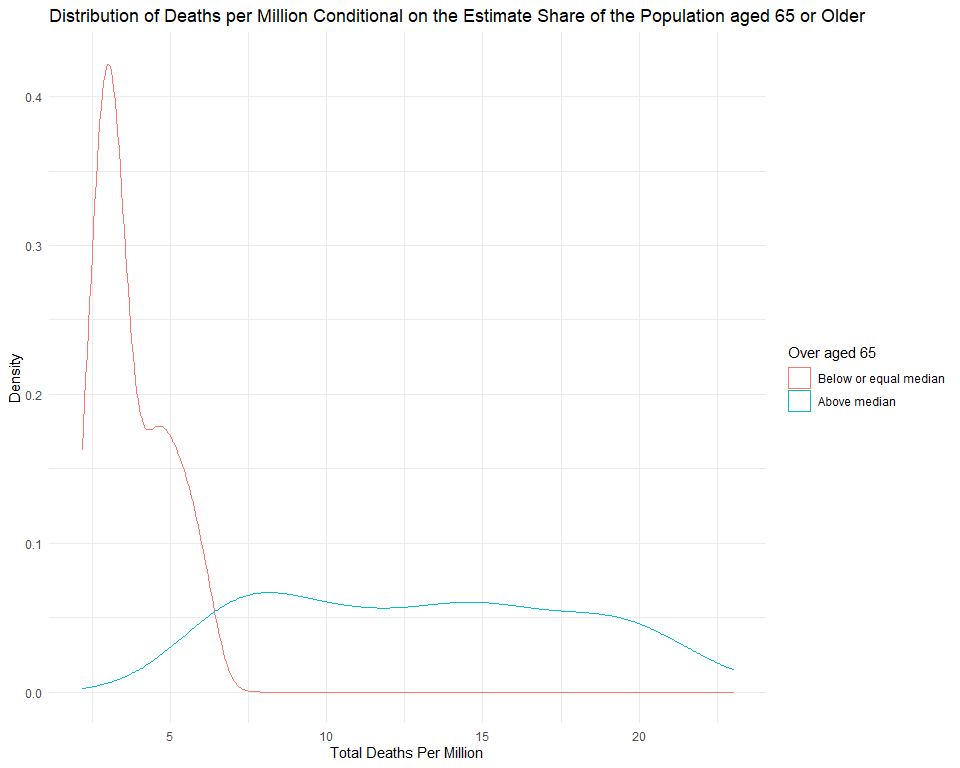


Figure 8.

#### Democratic countries are more successful than authoritarian countries.

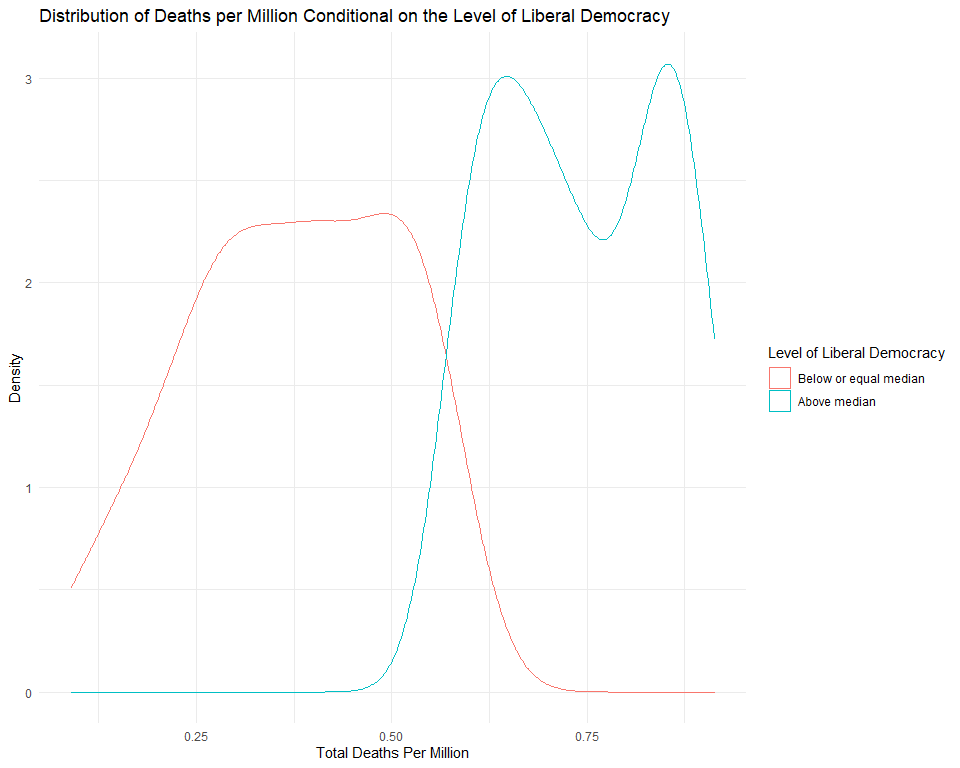


Figure 9.

## Conclusion:

## Code:

#### INSTALL LIBRARYS: ####  
library("ggplot2")  
library(tidyverse)  
library(tidyr)  
#### INPUT DATASET: ####  
dataset <- read.csv("https://raw.githubusercontent.com/QMUL-SPIR/Public\_files/master/datasets/Covid2020.csv")  
dataset\_omit <- read.csv("https://raw.githubusercontent.com/QMUL-SPIR/Public\_files/master/datasets/Covid2020.csv")  
dataset\_omit <- drop\_na(dataset\_omit, extreme\_poverty)  
head(dataset)  
  
#### EXAMINE THE RELEVENT VARIABLES: ####  
  
# Total Deaths Per Million:  
  
# MCT:  
   
tdm\_mean <- mean(dataset\_omit$total\_deaths\_per\_million)  
tdm\_mean  
  
# MD:  
  
sd(dataset\_omit$total\_deaths\_per\_million)  
  
# GDP Per Captia:  
# MCT:  
  
gdp\_per\_cap <- mean(dataset\_omit$gdp\_per\_capita)  
gdp\_per\_cap  
  
# MD:  
  
sd(dataset\_omit$gdp\_per\_capita)  
  
# Female Head of Government:   
  
# MCT:  
  
fem\_hog <- table(dataset\_omit$female\_HoG)  
fem\_hog  
  
# MD:  
  
fem\_hog\_dev <- prop.table(table(dataset\_omit$female\_HoG))  
fem\_hog\_dev  
  
# Aged 65 of Older:  
  
# MCT:  
  
old\_age <- mean(dataset\_omit$aged\_65\_older)  
old\_age  
  
# MD:  
  
sd(dataset\_omit$aged\_65\_older)  
  
# VDEM Polyarchy:  
  
# MCT:  
  
vdem <- mean(dataset\_omit$vdem\_polyarchy)  
vdem  
  
# MD:  
  
sd(dataset\_omit$vdem\_polyarchy)  
  
#### A TABLE WITH ALL THE VARIBALE AND MEASURE OF CENTRAL TENDENCY: ####  
  
# This will be added in Rmd  
  
#### A RELEVENT PLOT FOR EVERY VARIABLE ####  
  
# Total Deaths Per Million:  
gg\_total\_deaths\_per\_mil <- ggplot(dataset\_omit, aes(x = total\_deaths\_per\_million))  
gg\_total\_deaths\_per\_mil + geom\_histogram(binwidth = 10)  
  
# GDP Per Capita:  
gg\_gdp\_per\_cap <- ggplot(dataset\_omit, aes(x = gdp\_per\_capita))  
gg\_gdp\_per\_cap + geom\_histogram()  
  
# Female Head of Government:  
gg\_female\_HoG\_deaths <- ggplot(data = dataset\_omit, aes(x = female\_HoG)) +  
 geom\_histogram(binwidth = 20)  
  
geom\_text(size = 2,   
 colour = "red",   
 aes(label = location))  
  
gg\_female\_HoG\_deaths + facet\_wrap(~ female\_HoG)  
  
# Aged 65 or Older:  
gg\_aged\_65\_plus <- ggplot(data = dataset\_omit, aes(x = aged\_65\_older))  
gg\_aged\_65\_plus + geom\_histogram()  
  
# VDEM Polyarchy:  
gg\_vdem <- ggplot(data = dataset\_omit, aes(x = vdem\_polyarchy))  
gg\_vdem + geom\_histogram()  
  
#### RECODES FOR VARIBELS OF INTREST (BINARY)####  
  
# calculate median GDP Per Capita  
med\_gdp <- median(dataset\_omit$gdp\_per\_capita)  
  
# create new variable using case\_when()  
dataset\_omit <- dataset\_omit %>% # pipe the dataset  
 mutate( # create new variable  
 gdp\_var = # name the new variable  
 factor(case\_when(  
 gdp\_per\_capita > med\_gdp ~ 1,  
 gdp\_per\_capita <= med\_gdp ~ 0)))  
  
# calculate median 65 or Older  
med\_65\_plus <- median(dataset\_omit$aged\_65\_older)  
  
# create new variable using case\_when()  
dataset\_omit <- dataset\_omit %>% # pipe the dataset  
 mutate( # create new variable  
 sixty\_five\_var = # name the new variable  
 factor(case\_when(  
 aged\_65\_older > med\_65\_plus ~ 1,  
 aged\_65\_older <= med\_65\_plus ~ 0)))  
  
# calculate median vdem Polyarchy  
med\_vdem <- median(dataset\_omit$vdem\_polyarchy)  
  
# create new variable using case\_when()  
dataset\_omit <- dataset\_omit %>% # pipe the dataset  
 mutate( # create new variable  
 vdem\_var = # name the new variable  
 factor(case\_when(  
 vdem\_polyarchy > med\_vdem ~ 1,  
 vdem\_polyarchy <= med\_vdem ~ 0)))  
  
  
  
#### RELATIONSHP BETWEEN TOTAL COVID 19 DEATHS AND THE RELEVENT VARIABLES ####  
  
 #### CONDITIONAL DISTRIBUTION PLOTS ####  
  
# Distribution of Deaths per Million Conditional on GDP per Capita  
  
gdp\_dist <- ggplot(data = dataset\_omit, aes(total\_deaths\_per\_million, group = gdp\_var)) +   
 geom\_density(aes(colour = gdp\_var)) +  
 labs(x = "Total Deaths Per Million", # clearer x axis label  
 y = "Density", # clearer y axis label  
 title = "Distribution of Deaths per Million Conditional on GDP per Capita") + # title   
 scale\_color\_discrete(name = "GDP Per Capita", # change legend title  
 labels = c("Below or equal median", # change legend labels  
 "Above median")) +   
 theme\_minimal()  
  
gdp\_dist  
  
# Distribution of Deaths per Million Conditional on median 65 or Older  
  
sixtyfive\_dist <- ggplot(data = dataset\_omit, aes(aged\_65\_older, group = sixty\_five\_var)) +   
 geom\_density(aes(colour = sixty\_five\_var)) +  
 labs(x = "Total Deaths Per Million", # clearer x axis label  
 y = "Density", # clearer y axis label  
 title = "Distribution of Deaths per Million Conditional on the Estimate Share of the Population aged 65 or Older") + # title   
 scale\_color\_discrete(name = "Over aged 65", # change legend title  
 labels = c("Below or equal median", # change legend labels  
 "Above median")) +   
 theme\_minimal()  
  
sixtyfive\_dist  
  
# Distribution of Deaths per Million Conditional on median vdem Polyarchy  
  
vdem\_dist <- ggplot(data = dataset\_omit, aes(vdem\_polyarchy, group = vdem\_var)) +   
 geom\_density(aes(colour = vdem\_var)) +  
 labs(x = "Total Deaths Per Million", # clearer x axis label  
 y = "Density", # clearer y axis label  
 title = "Distribution of Deaths per Million Conditional on the Level of Liberal Democracy") + # title   
 scale\_color\_discrete(name = "Level of Liberal Democracy", # change legend title  
 labels = c("Below or equal median", # change legend labels  
 "Above median")) +   
 theme\_minimal()  
  
vdem\_dist  
  
 #### TWO SAMPLE T-TESTS ####  
  
# T-Test: GDP  
  
t.test(vdem\_polyarchy ~ vdem\_var, # formula y ~ x  
 data = dataset\_omit, # dataset where the variables are found  
 mu = 0, # difference under the null hypothesis  
 alt = "two.sided", # two sided test (difference in means could be smaller or larger than 0)  
 conf = 0.95) # confidence interval  
  
# T-Test: Aged 65 Plus  
  
t.test(aged\_65\_older ~ sixty\_five\_var, # formula y ~ x  
 data = dataset\_omit, # dataset where the variables are found  
 mu = 0, # difference under the null hypothesis  
 alt = "two.sided", # two sided test (difference in means could be smaller or larger than 0)  
 conf = 0.95) # confidence interval  
  
# T-Test: VDEM Polyarchy  
  
t.test(vdem\_polyarchy ~ vdem\_var, # formula y ~ x  
 data = dataset\_omit, # dataset where the variables are found  
 mu = 0, # difference under the null hypothesis  
 alt = "two.sided", # two sided test (difference in means could be smaller or larger than 0)  
 conf = 0.95) # confidence interval