#1.1 Our hypothesis was, “Government sanctions effect the inequality of land ownership.”

If we were to test the hypothesis, an example of inductive research would be to use the Muller data we are given about governemnt sanctions and the GINI index over a specific period of time from countires that the United States has imposed heavy economic sanctions upon; Cuba, North Korea, China. Then I would compare the rate of change in the data in an eight year span before the sanctions to an eight year span after the sanctions.

#1.2 Our research question is , “What effects the inequality of land ownership?”.

If someone from a country with democracy is seeking out an answer to this question, they might perform everyday errors because we tend to believe, through selective observation, any nation that doesn’thave the same ideals as a democratic nation is automatically lesser. Therefore, we could be assuiming that a nation with a communistic or autocratic governemnt is the reason for the inequality in land ownership. The hypothesis seeks to combat these claims by looking to see if imposed sanctions by a country has a greater impact on inequality than the nation’s own governement.

#1.3

a) Measurment validity: I do not think this should be an issue with the hypothesis because we are gathering only quantitative data that would be pretty hard for a country to fulsify.

b) Generalizability: since I am looking at individual countries and I find that 1 specific country’s land ownership inequality significantly increased after a U.S economic sanction, I could not state that all countries that have had U.S sanctions imposed have significant increases in land ownership inequality.

c) Casual validity: There could be some concerns saying that negetive governemnt sanctions are the sole cause of inequality in land ownership because there could be other variables playing a role. For instance, the overall economic situation of the country; are they in a recession? The religious beliefs of the country; are women allowed to posses land, and if they are not, are they still being factored into the data or did we only look at eligible land owners?

#1.4 If we use this most recent 8 year period, the United States has gone through major flips in types of people who hold power and our sanctions have been way more aggressive than in previous years, prior to Trump, so we may see even more evidence of the effects of negative sanctions on land ownership inequality than before.

Problem 2

```
setwd("~/Desktop")
Kenya=read.csv("Kenya.csv",header=TRUE)
Sweden=read.csv("Sweden.csv",header=TRUE)
World=read.csv("World.csv",header=TRUE)
```

```
period1a<-seq(from=1,to=15,by=1)
period2a<-seq(from=16,to=30,by=1)
Kenya$py.total<-Kenya$py.men+Kenya$py.women
Sweden$py.total<-Sweden$py.men+Sweden$py.women
World$py.total<-World$py.men+World$py.women
```

#2.1

```
KENbirths1a<-sum(Kenya$births[period1a])
KENbirths2a<-sum(Kenya$births[period2a])
KENpersons1<-sum(Kenya$py.men[period1a]+Kenya$py.women[period1a])
KENpersons2<-sum(Kenya$py.men[period2a]+Kenya$py.women[period2a])
```

```
KENpersons<-c(KENpersons1,KENpersons2)
KENCBR1<-KENbirths1a/KENpersons1
KENCBR2<-KENbirths2a/KENpersons2
KENCBR<-c(KENCBR1,KENCBR2)

SWEbirths1a<-sum(Sweden$births[period1a])
SWEbirths2a<-sum(Sweden$births[period2a])
SWEpersons1<-sum(Sweden$py.total[period1a])
SWEpersons2<-sum(Sweden$py.total[period2a])
SWEpersons<-c(SWEpersons1,SWEpersons2)
SWECBR1<-SWEbirths1a/SWEpersons1
SWECBR2<-SWEbirths2a/SWEpersons2
SWECBR<-c(SWECBR1,SWECBR2)

WORbirths1a<-sum(World$births[period1a])
WORbirths2a<-sum(World$births[period2a])
WORpersons1<-sum(World$py.men[period1a]+World$py.women[period1a])
WORpersons2<-sum(World$py.men[period2a]+World$py.women[period2a])
WORpersons<-c(WORpersons1,WORpersons2)
WORCBR1<-WORbirths1a/WORpersons1
WORCBR2<-WORbirths2a/WORpersons2
WORCBR<-c(WORCBR1,WORCBR2)

names(KENCBR)<-c("1950-1955","2005-2010")
names(SWECBR)<-c("1950-1955","2005-2010")
names(WORCBR)<-c("1950-1955","2005-2010")
KENCBR
```

```
##  1950-1955  2005-2010
## 0.05209490 0.03851507
```

```
SWECBR
```

```
##  1950-1955  2005-2010
## 0.01539614 0.01192554
```

```
WORCBR
```

```
##  1950-1955  2005-2010
## 0.03732863 0.02021593
```

I noticed that the CBR for Kenya, Sweden and the World as a whole decresed between the 2 time periods, which means that the number of births per region decreased or remained constant while the number of person-years remained constant or increased resulting in a lesser proportion. I also noticed that the Sweden CBR remained smaller than Kenya CBR for both time periods.

#2.2

```
Kenya_period1a=Kenya[c(4:10),]
Kenya_period1a_asfr=Kenya_period1a$births/Kenya_period1a$py.women
names(Kenya_period1a_asfr)=Kenya_period1a$age
```

```r
Kenya_period2a=Kenya[c(19:25),]
Kenya_period2a_asfr=Kenya_period2a$births/Kenya_period2a$py.women
names(Kenya_period2a_asfr)=Kenya_period2a$age

Kenya_asfr=c(Kenya_period1a_asfr,Kenya_period2a_asfr)
Kenya_asfr
```

```
##      15-19      20-24      25-29      30-34      35-39      40-44
## 0.16884585 0.35596942 0.34657814 0.28946367 0.20644016 0.11193267
##      45-49      15-19      20-24      25-29      30-34      35-39
## 0.03905205 0.10057087 0.23583536 0.23294721 0.18087964 0.13126805
##      40-44      45-49
## 0.05626214 0.03815044
```

```r
Sweden_period1a=Sweden[c(4:10),]
Sweden_period1a_asfr=Sweden_period1a$births/Sweden_period1a$py.women
names(Sweden_period1a_asfr)=Sweden_period1a$age

Sweden_period2a=Sweden[c(19:25),]
Sweden_period2a_asfr=Sweden_period2a$births/Sweden_period2a$py.women
names(Sweden_period2a_asfr)=Sweden_period2a$age

Sweden_asfr=c(Sweden_period1a_asfr,Sweden_period2a_asfr)
Sweden_asfr
```

```
##        15-19        20-24        25-29        30-34        35-39
## 0.0389089519 0.1277108826 0.1252436647 0.0873641591 0.0486037714
##        40-44        45-49        15-19        20-24        25-29
## 0.0162101857 0.0013418290 0.0059709097 0.0507320271 0.1162085625
##        30-34        35-39        40-44        45-49
## 0.1322744621 0.0625923991 0.0121600765 0.0006143942
```

```r
World_period1a=World[c(4:10),]
World_period1a_asfr=World_period1a$births/World_period1a$py.women
names(World_period1a_asfr)=World_period1a$age

World_period2a=World[c(19:25),]
World_period2a_asfr=World_period2a$births/World_period2a$py.women
names(World_period2a_asfr)=World_period2a$age

World_asfr=c(World_period1a_asfr,World_period2a_asfr)
World_asfr
```

```
##       15-19       20-24       25-29       30-34       35-39       40-44
## 0.090295213 0.237633702 0.252452289 0.204164096 0.138105344 0.063608319
##       45-49       15-19       20-24       25-29       30-34       35-39
## 0.015190644 0.048489719 0.151971307 0.146980966 0.093813813 0.046689639
##       40-44       45-49
## 0.016268995 0.004510245
```

Just from looking at the data, it seems like the pattern in the AFSR follows a unimodel, slightly right skewed distarbution with the peak of fertility being amoung women ages 20-24 for period 1 for both Kenya and Sweden but switches for period 2 with Kenya maintaining the peak age group at 20-24 and Sweden changing to 25-29. This pattern, although the age group chnages, still maintains a slight skewed rightness which we could see that women in these countries are having children at greater rates in their 20s than in their 30s.

#2.3

```
Kenya_tfr1<-5*(c(Kenya_period1a_asfr))
Kenya_tfr2<-5*(c(Kenya_period2a_asfr))
Kenya_tfr<-c(sum(Kenya_tfr1),sum(Kenya_tfr2))
names(Kenya_tfr)<-c("1950-1955","2005-2010")
Kenya_tfr
```

```
## 1950-1955 2005-2010
##  7.591410  4.879568
```

```
Sweden_tfr1<-5*(c(Sweden_period1a_asfr))
Sweden_tfr2<-5*(c(Sweden_period2a_asfr))
Sweden_tfr<-c(sum(Sweden_tfr1),sum(Sweden_tfr2))
names(Sweden_tfr)<-c("1950-1955","2005-2010")
Sweden_tfr
```

```
## 1950-1955 2005-2010
##  2.226917  1.902764
```

```
WORwomen<-c(sum(World$py.women[period1a]),sum(World$py.women[period2a]))
names(WORwomen)<-c("1950-1955","2005-2010")
WORwomen
```

```
## 1950-1955 2005-2010
##   6555686  16554781
```

```
World_tfr1<-5*(c(World_period1a_asfr))
World_tfr2<-5*(c(World_period2a_asfr))
World_tfr<-c(sum(World_tfr1),sum(World_tfr2))
names(World_tfr)<-c("1950-1955","2005-2010")
World_tfr
```

```
## 1950-1955 2005-2010
##  5.007248  2.543623
```

The number of women in the world increased from 6,555,686 women in 1950-1955 range to 16,554,781 women in 2005-2010 range. However, the average number of children women give birth to if they live through their entire reproductive age decreased between the 2 periods in the world.

#2.4

```
KENdeaths1a<-sum(Kenya$deaths[period1a])
KENdeaths2a<-sum(Kenya$deaths[period2a])
KENCDR1<-KENdeaths1a/KENpersons1
KENCDR2<-KENdeaths2a/KENpersons2
KENCDR<-c(KENCDR1,KENCDR2)
names(KENCDR)<-c("1950-1955","2005-2010")
KENCDR
```

```
##  1950-1955  2005-2010
## 0.02396254 0.01038914
```

```
SWEdeaths1a<-sum(Sweden$deaths[period1a])
SWEdeaths2a<-sum(Sweden$deaths[period2a])
SWECDR1<-SWEdeaths1a/SWEpersons1
SWECDR2<-SWEdeaths2a/SWEpersons2
SWECDR<-c(SWECDR1,SWECDR2)
names(SWECDR)<-c("1950-1955","2005-2010")
SWECDR
```

```
##   1950-1955   2005-2010
## 0.009844842 0.009968455
```

```
WORdeaths1a<-sum(World$deaths[period1a])
WORdeaths2a<-sum(World$deaths[period2a])
WORpersons<-c(WORpersons1,WORpersons2)
WORCDR1<-WORdeaths1a/WORpersons1
WORCDR2<-WORdeaths2a/WORpersons2
WORCDR<-c(WORCDR1,WORCDR2)
names(WORCDR)<-c("1950-1955","2005-2010")
WORCDR
```

```
##   1950-1955   2005-2010
## 0.019318929 0.008166083
```

In Kenya, the death CDR decreased from period 1 to period 2, but in Sweden and the rest of the world the death rate increased. Also, the death rates for Kenya and Sweden are very similar.

#2.5

```
Kenya_period2a_asdr=Kenya$deaths[period2a]/(Kenya$py.women[period2a]+Kenya$py.men[period2a])
names(Kenya_period2a_asdr)=Kenya$age[period2a]
Kenya_period2a_asdr
```

```
##         0-4         5-9       10-14       15-19       20-24       25-29
## 0.020920755 0.002911301 0.002918895 0.002942986 0.003885368 0.006558131
##       30-34       35-39       40-44       45-49       50-54       55-59
## 0.010603913 0.013881062 0.013474598 0.011288057 0.011152339 0.013898334
##       60-69       70-79          80
## 0.025395531 0.061261551 0.158620510
```

```
Sweden_period2a_asdr=Sweden$deaths[period2a]/(Sweden$py.total[period2a])
names(Sweden_period2a_asdr)=Sweden$age[period2a]
Sweden_period2a_asdr
```

```
##          0-4          5-9        10-14        15-19        20-24
## 6.790712e-04 8.138094e-05 1.135496e-04 2.687775e-04 4.697344e-04
##        25-29        30-34        35-39        40-44        45-49
## 4.941440e-04 5.057066e-04 6.689578e-04 1.039256e-03 1.769621e-03
##        50-54        55-59        60-69        70-79           80
## 2.988715e-03 4.709913e-03 9.828772e-03 2.803963e-02 1.098892e-01
```

Average death rate increases as age increases.

#2.6

```
KEN_pop<-Kenya$py.total[period2a]/sum(Kenya$py.total[period2a])
SWE_pop<-Sweden$py.total[period2a]/sum(Sweden$py.total[period2a])
names(KEN_pop)<-Kenya$age[period2a]
names(SWE_pop)<-Sweden$age[period2a]
sum(Kenya_period2a_asdr*SWE_pop)
```

```
## [1] 0.02321646
```

```
KEN_pop
```

```
##         0-4         5-9       10-14       15-19       20-24       25-29
## 0.167329267 0.139518775 0.119952403 0.112321935 0.102701807 0.085055681
##       30-34       35-39       40-44       45-49       50-54       55-59
## 0.066238790 0.050043424 0.038855296 0.031800814 0.026205201 0.019889495
##       60-69       70-79          80
## 0.023300771 0.012919992 0.003866347
```

```
SWE_pop
```

```
##        0-4        5-9      10-14      15-19      20-24      25-29
## 0.05787711 0.05121759 0.06149968 0.06755209 0.06123102 0.05979620
##      30-34      35-39      40-44      45-49      50-54      55-59
## 0.06485878 0.07030027 0.07005059 0.06548210 0.06272159 0.06702610
##      60-69      70-79         80
## 0.11454018 0.07190144 0.05394527
```

```
KENCDR
```

```
##  1950-1955  2005-2010
## 0.02396254 0.01038914
```

```
SWECDR
```

```
##   1950-1955   2005-2010
## 0.009844842 0.009968455
```

The Kenya CDR with the swedish population proportion is significantly higher than the original Kenya CDR of 2005-2010. Also, as I stated before, I would have expected the death rates for a country such as Sweden to be a lot lower than the death rates of Kenya because they are a more developed country. The Swedish population has most of them being in the 60-79 age range while Kenya shows most of the population is along the younger end. Since older populations tend to have higher mortality rates, this could be a reason that the CDR for Kenya and Sweden are so similar. The CDR does not measure against specific age populations but looks at the population as a whole, so the CDR can be greatly affected by age composition of the country which could describe the differences in CDR.