Determinants of HIV

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Outline

- Motivation
- Research Question
- Methodology
- Theoretical Framework
- Descriptive Statistics
- Findings
- Conclusion
- Limitations

Motivation and Research Question

1. Understand why some countries failed to achieve MDG 6A

   - *MDG 6: Combat HIV/AIDS, malaria and other diseases*
   - *Target 6A: Have halted by 2015 and begun to reverse the spread of HIV/AIDS*

2. Explore disease-specific determinants of health

Research Question: Are community level factors significant determinants of HIV/AIDS incidence rates?

Methodology and Dataset

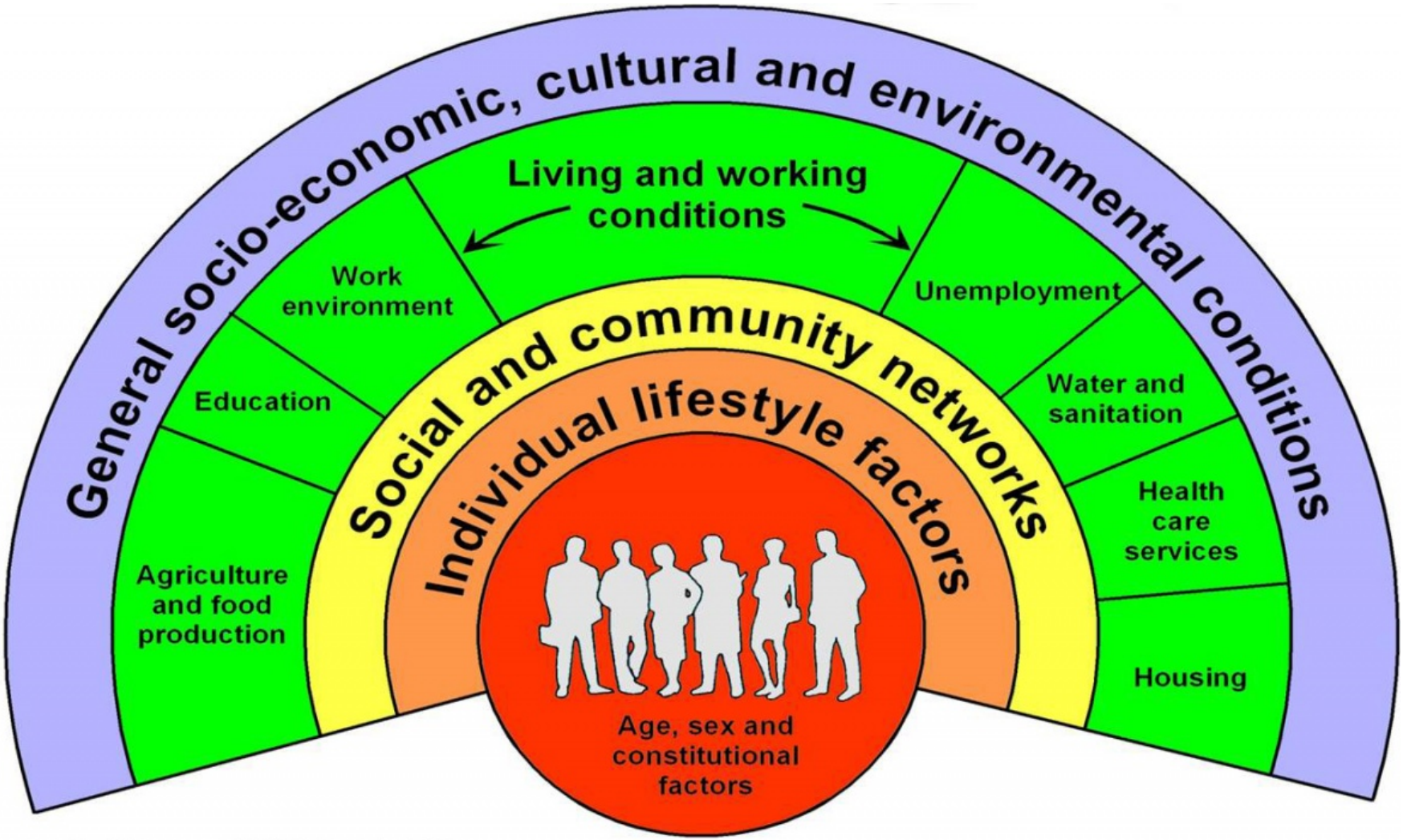
Methodology

- We will. . .

Datasets

- We will use the World Development Indicators (WDI) for the independent variables and a dataset from UNAIDS for the HIV/AIDS prevalence rate.

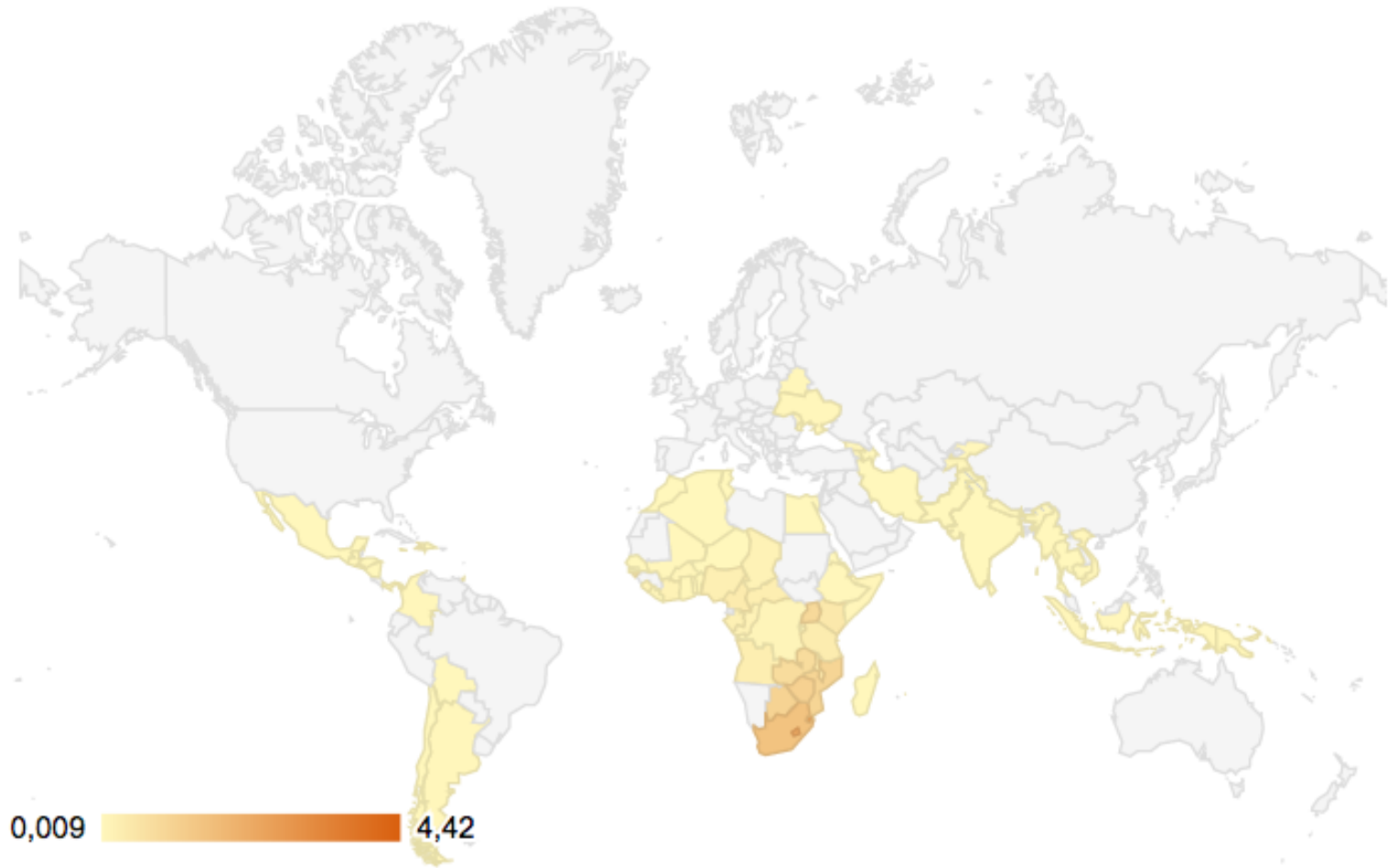
Theoretical Framework



Source: Dahlgren and Whitehead, 1991

Descriptive Statistics

Incidence



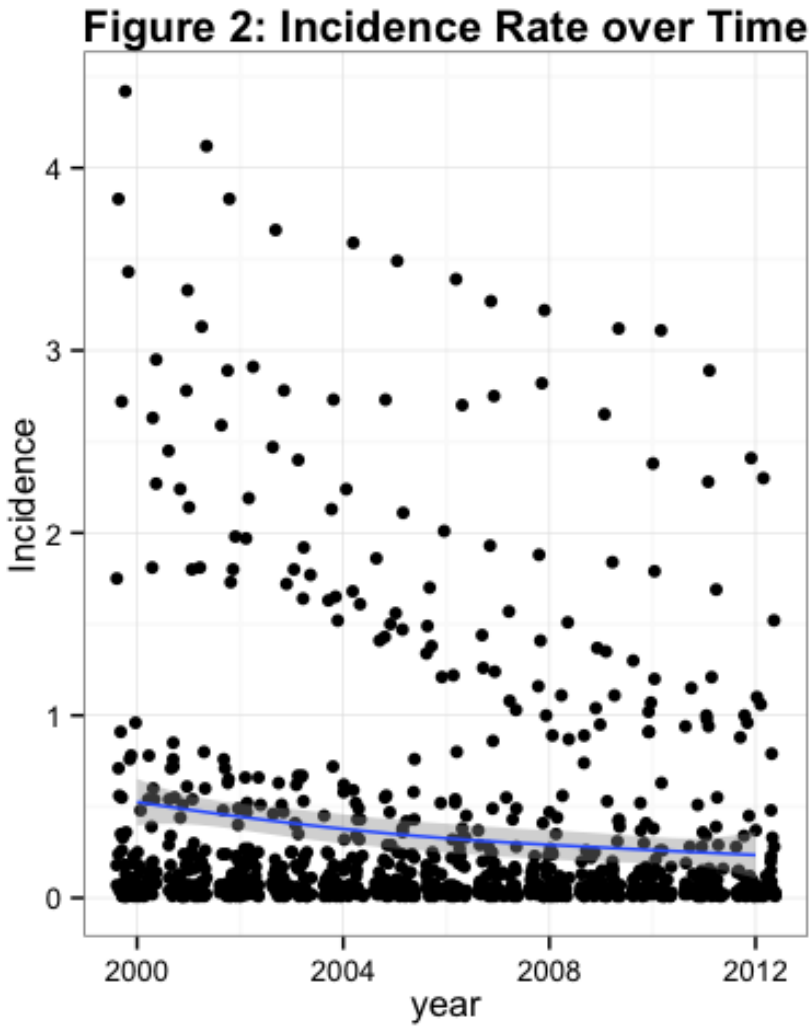
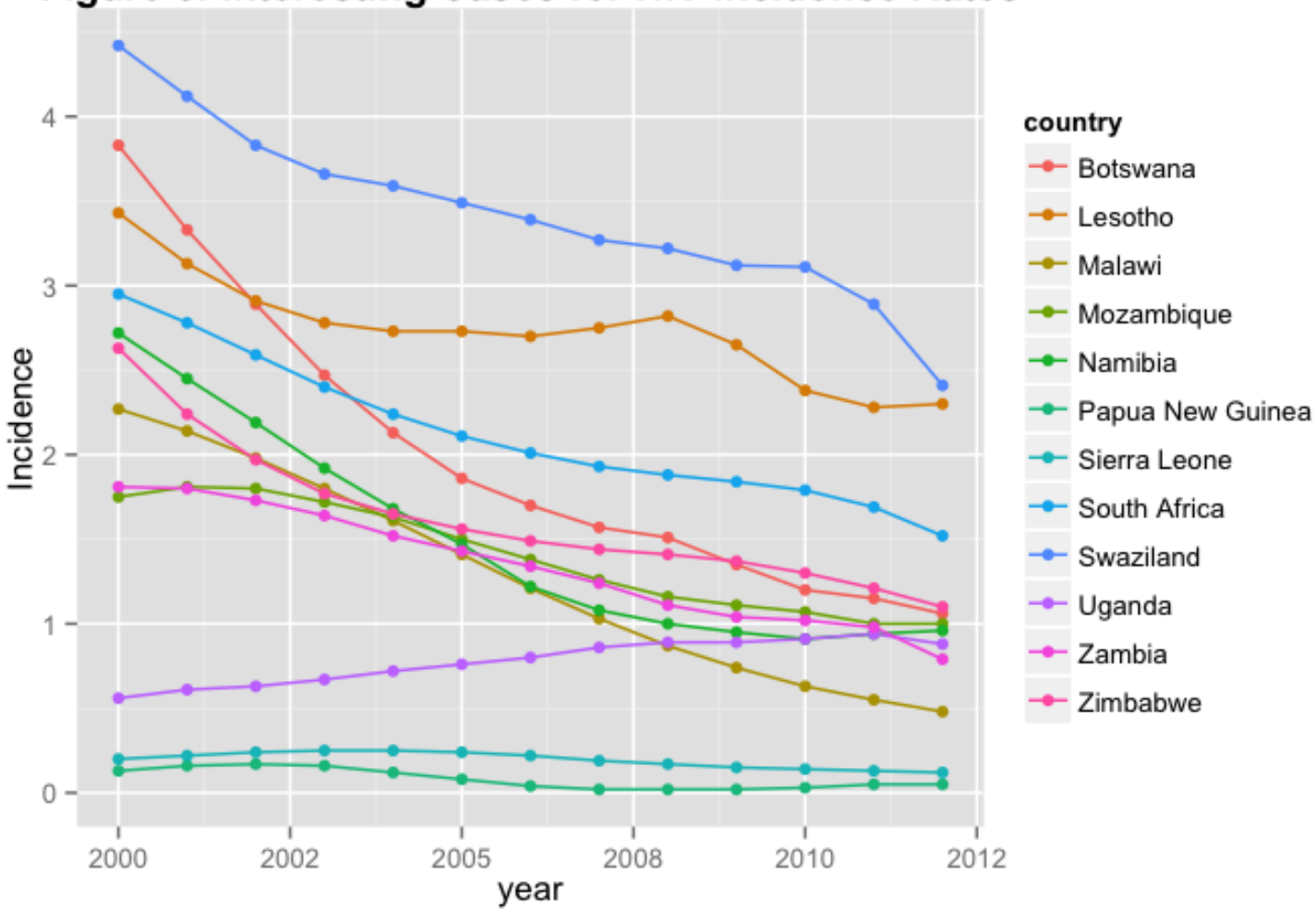
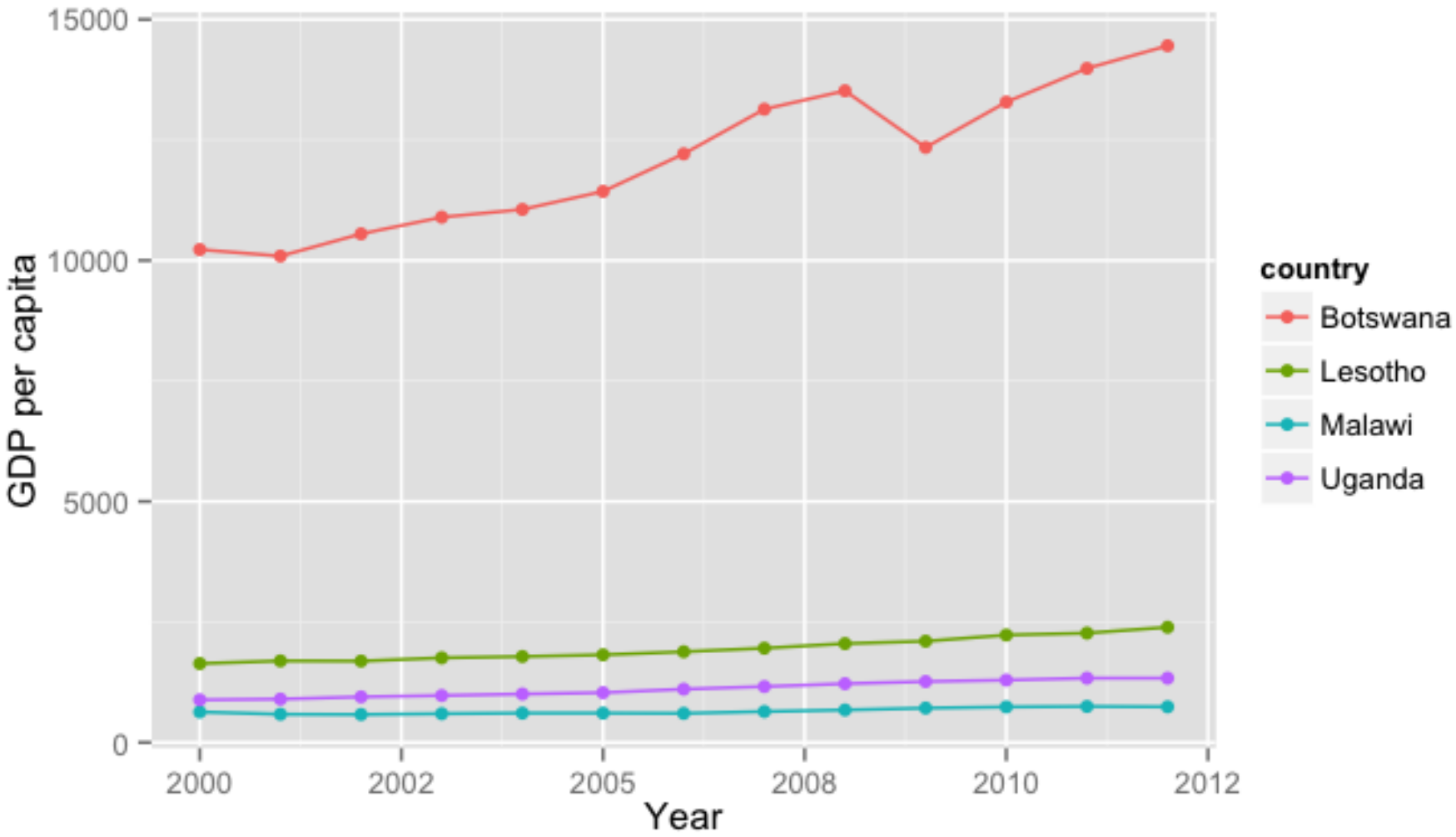
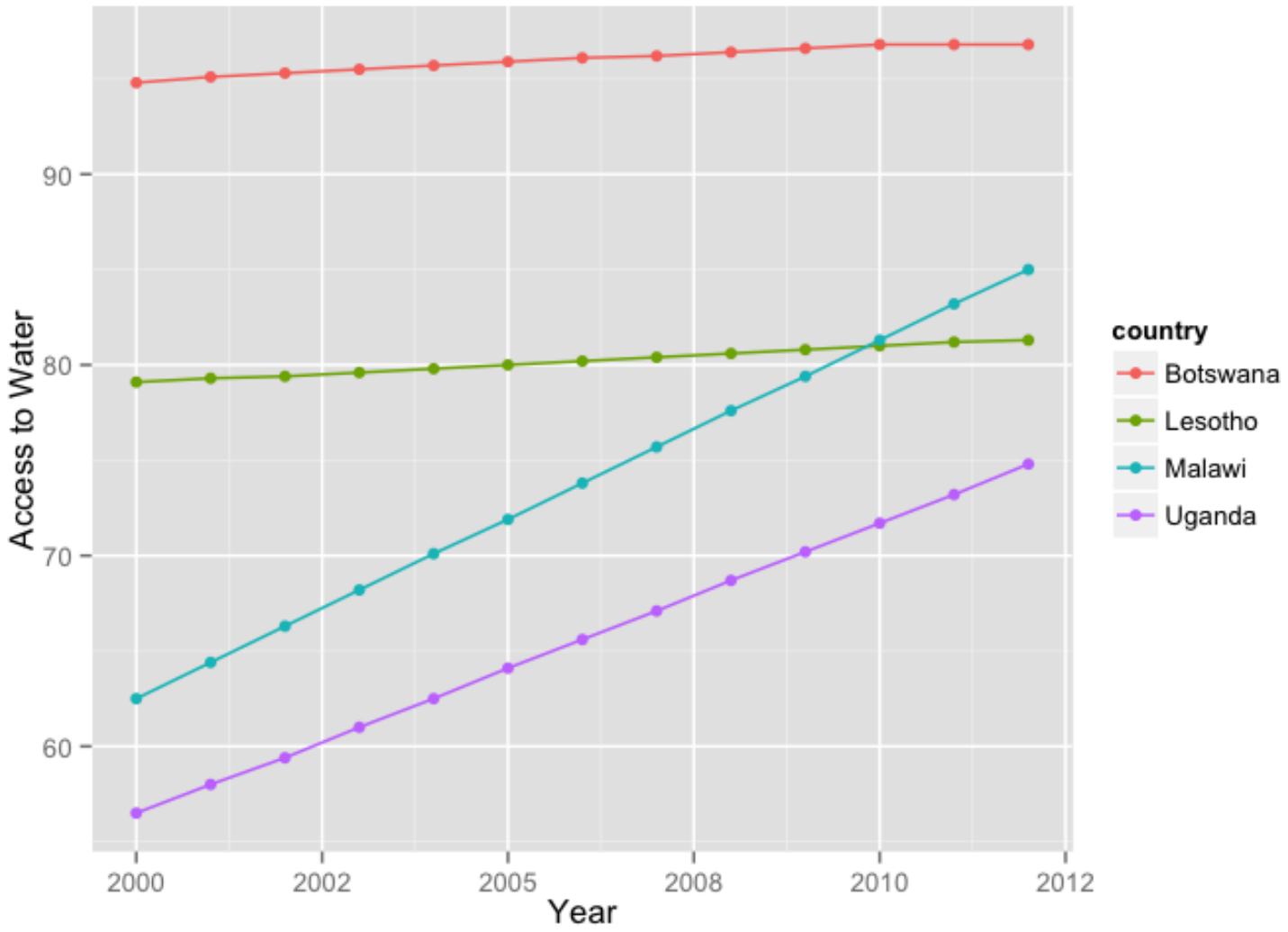


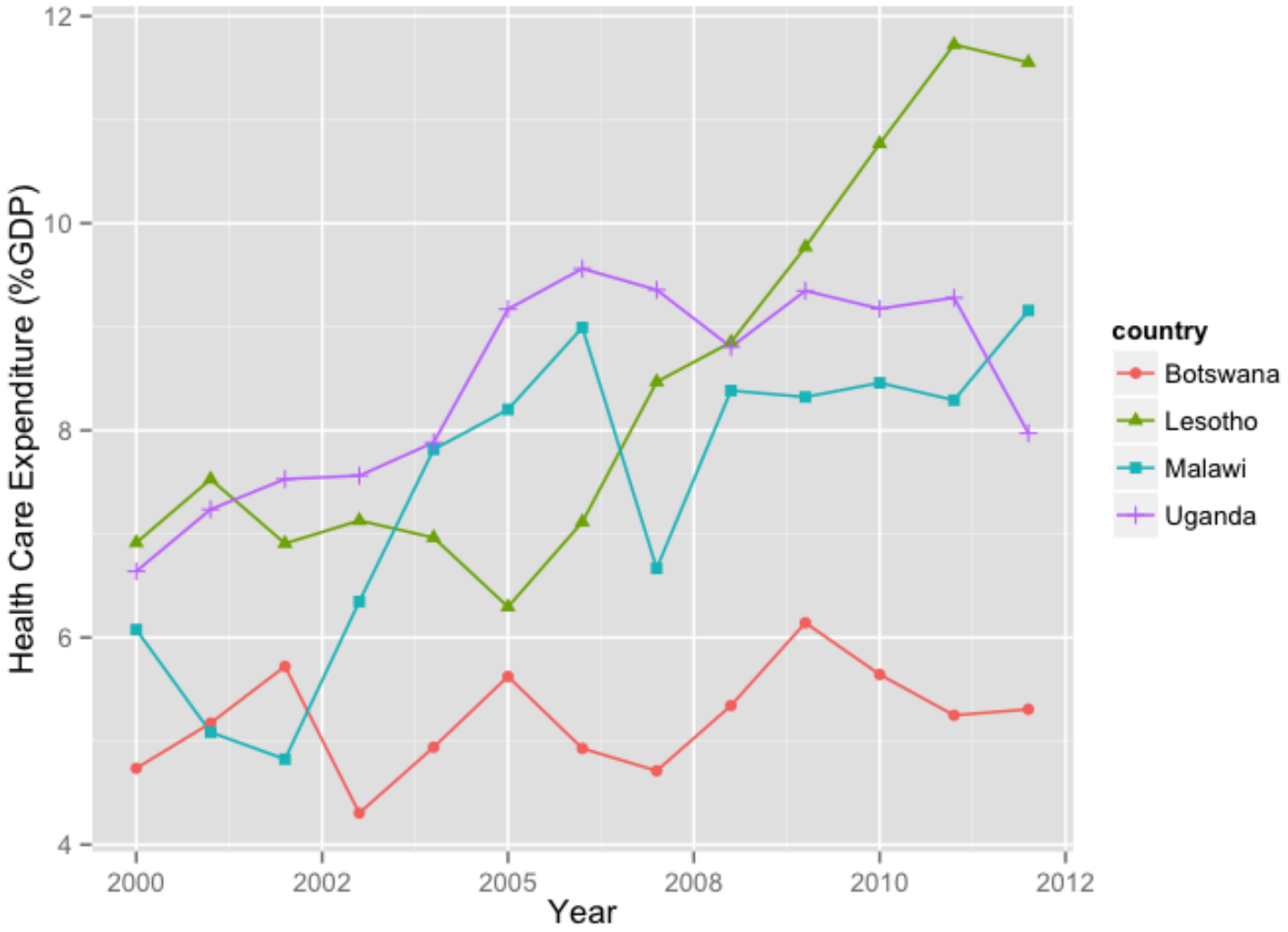
Figure 2: Incidence Rate over Time
Incidence
0
1
2
3
4
2000
2004
2008
2012
year

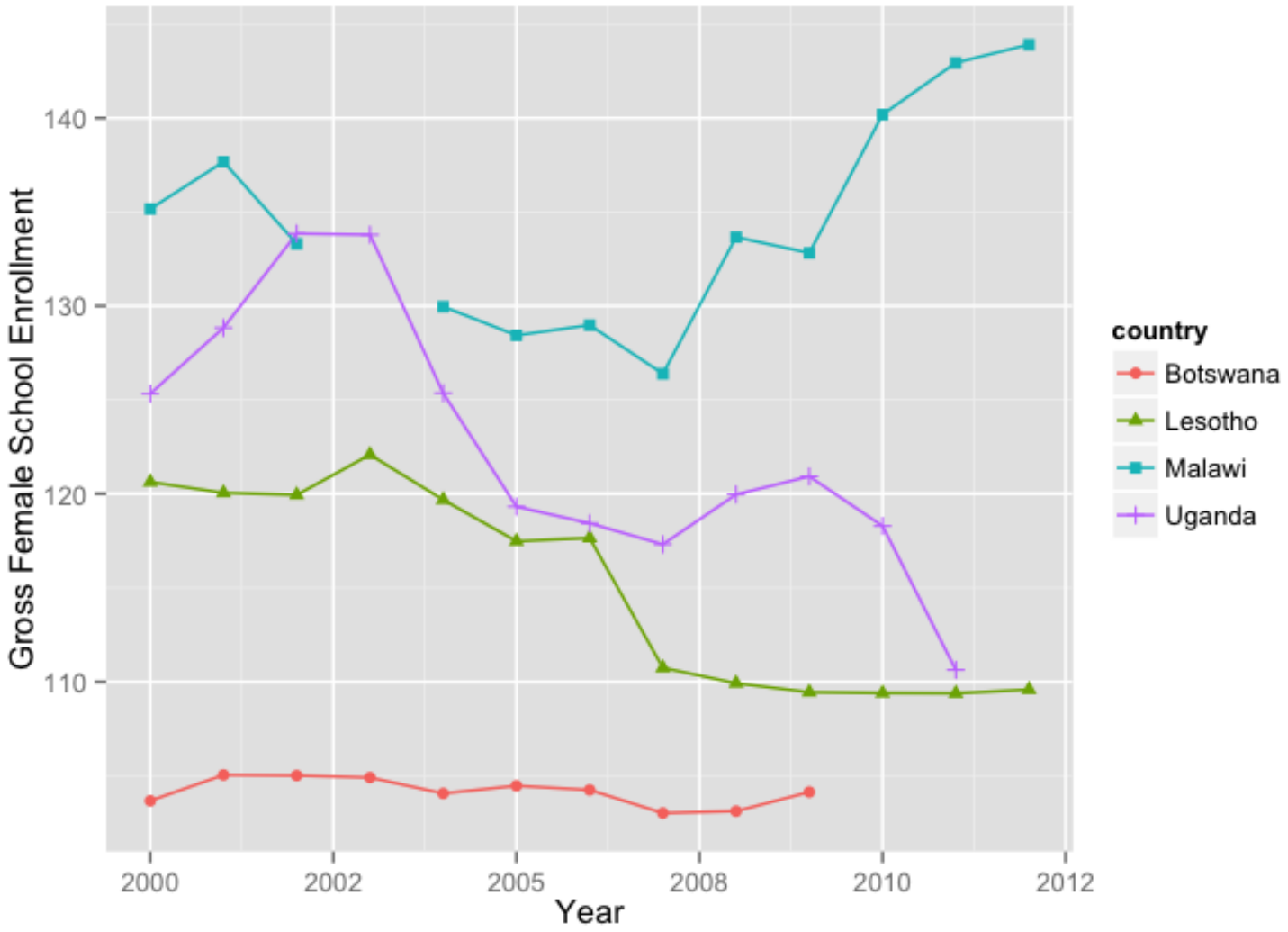
Figure 6: Interesting Cases for HIV Incidence Rates

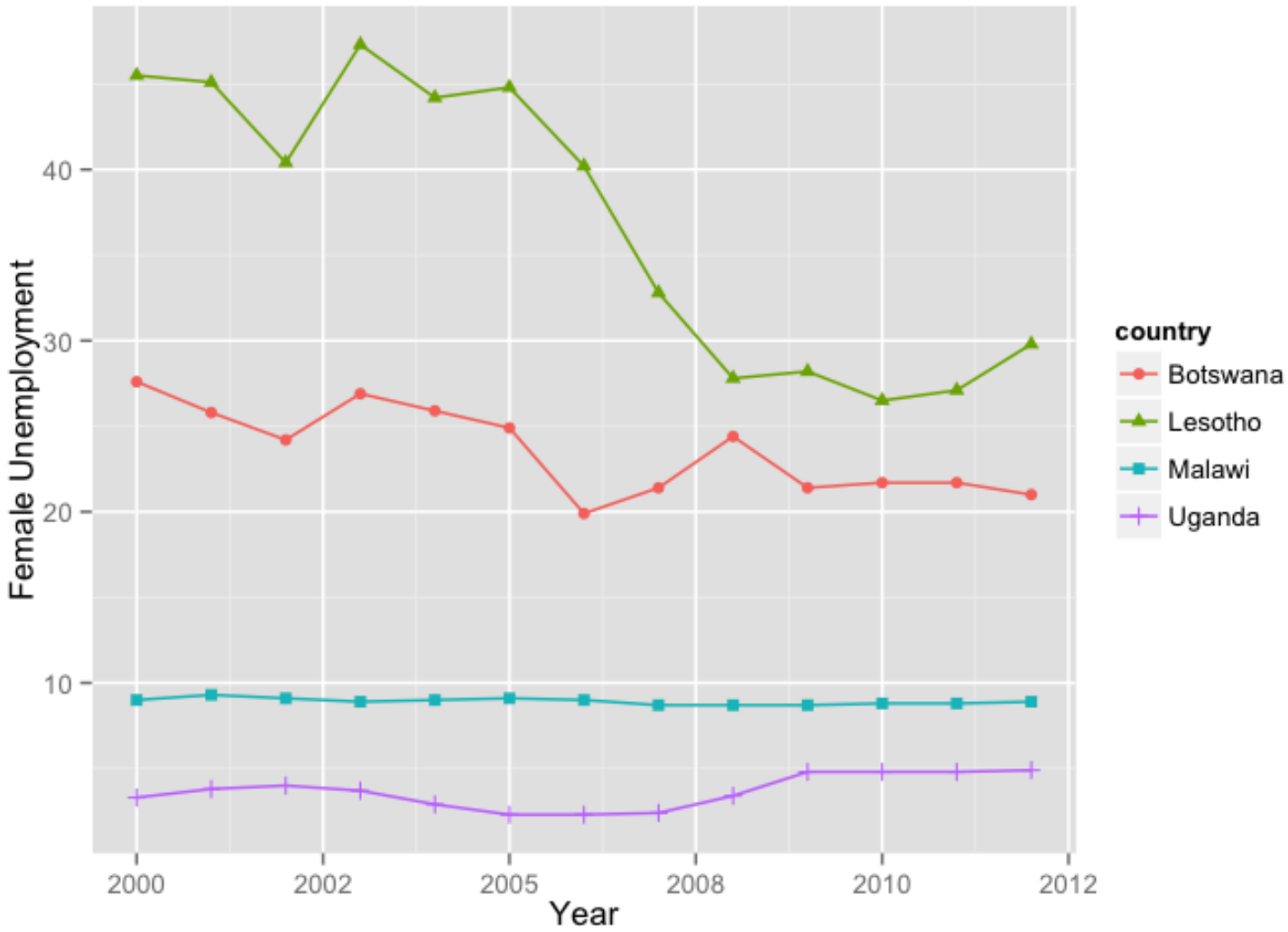



15000
10000
5000
0
GDP per capita
2000
2002
2005
2008
2010
2012
Year
country
Botswana
Lesotho
Malawi
Uganda


Access to Water
90
80
70
60
2000
2002
2005
2008
2010
2012
Year
country
Botswana
Lesotho
Malawi
Uganda


Health Care Expenditure (%GDP)
12
10
8
6
4
2000
2002
2005
2008
2010
2012
Year
country
Botswana
Lesotho
Malawi
Uganda


Gross Female School Enrollment
140
130
120
110
2000
2002
2005
2008
2010
2012
Year
country
Botswana
Lesotho
Malawi
Uganda


Female Unemployment
40
30
20
10
2000
2002
2005
2008
2010
2012
Year
country
Botswana
Lesotho
Malawi
Uganda

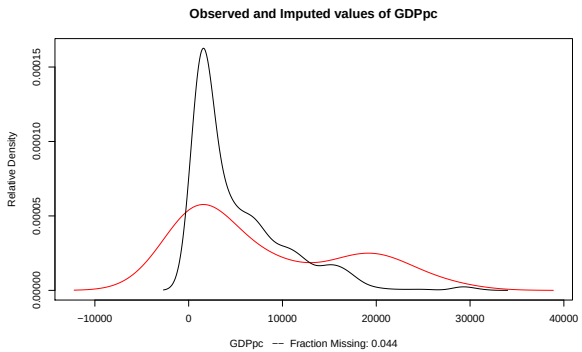
The Model

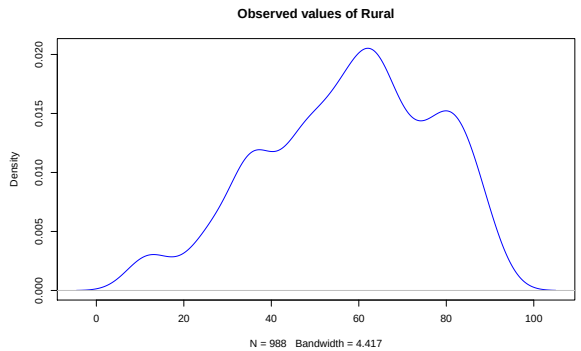
To answer our research question we will estimate the following equation:

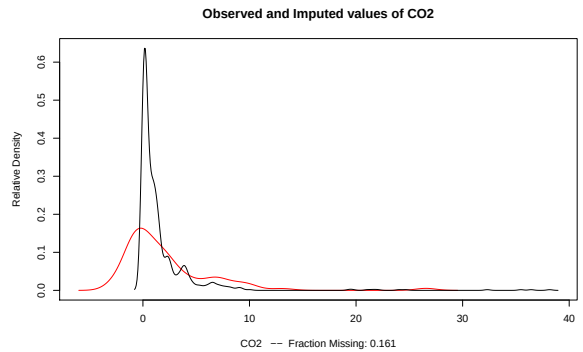
$$I_{it} = \beta_0 + \beta_1 SE_{it} + \beta_2 WLC_{it} + \beta_3 SCN_{it} + \beta_4 ILF_{it} + \epsilon_{it}$$

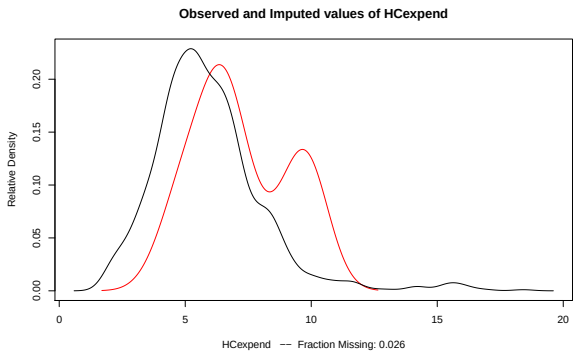
Where I stands for HIV/AIDS incidence, SE stands for socioeconomic factors, WLC stands for working and living conditions, SCN stands for social and community networks and ILF stands for individual lifestyle factors.

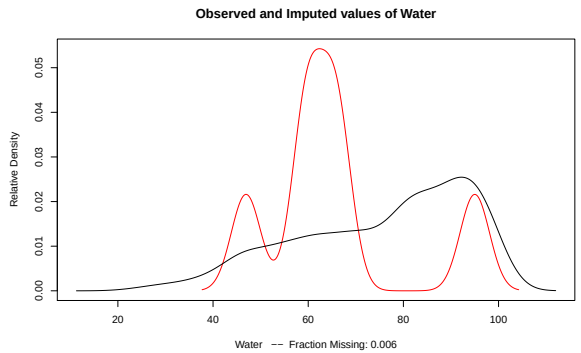
Imputed missing values

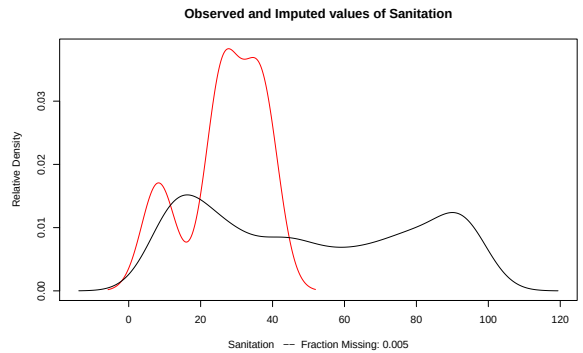


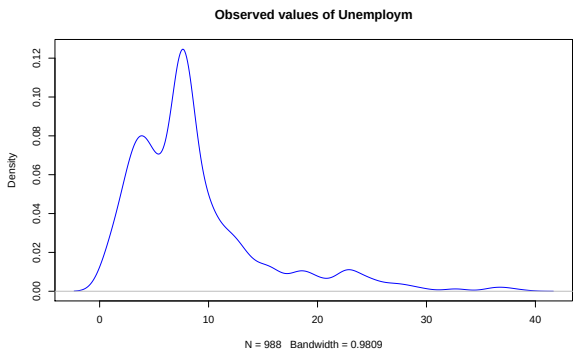


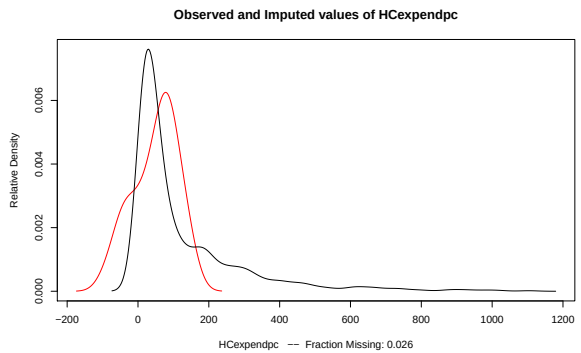


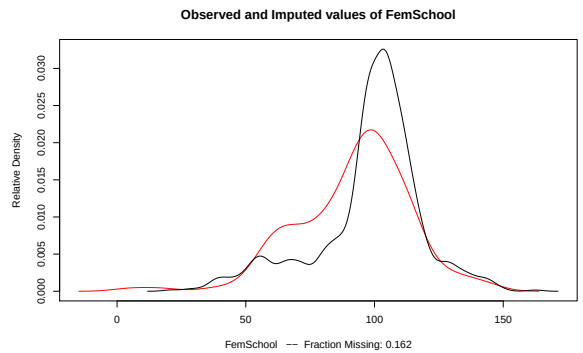








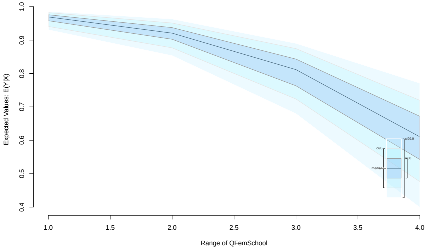


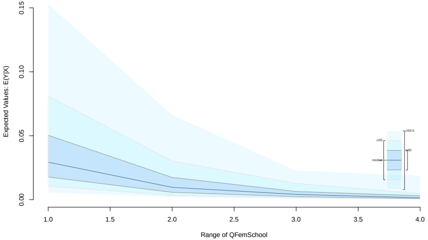


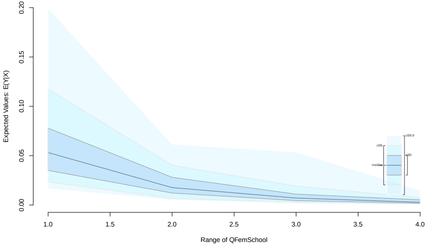
Logistic Regression Results - Model 1

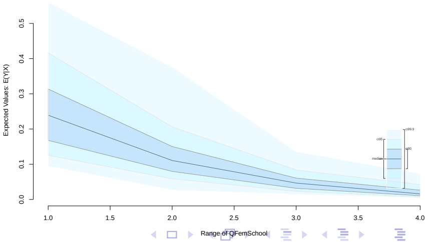
	Value	Std. Error	t-stat	p-value
(Intercept)	-37.1746929	7.2103748	-5.1557227	0.0000008
lGDPpc	0.2489572	0.3457756	0.7199966	0.4727468
lRural	-2.5413122	0.5654495	-4.4943220	0.0000110
lCO2	-0.5202531	0.2141617	-2.4292530	0.0181720
lHCexpend	0.8908174	0.3869425	2.3021958	0.0217045
lWater	-2.4404196	0.8416829	-2.8994524	0.0038103
lSanitation	0.9458424	0.2773110	3.4107641	0.0006504
lLifeExpect	19.2785139	1.7640069	10.9288198	0.0000000
lDPT	-0.5486725	1.0372650	-0.5289607	0.5972094
lMeasles	1.3664857	1.1431652	1.1953528	0.2322867
Inverse	1.8274583	0.2597700	7.0349083	0.0000000
lFemSchool	-5.6224819	0.7316914	-7.6842253	0.0000000

Predicted Probabilities - Female School Enrollment (in Quartiles)









Predicted Probabilities Female Unemployment

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## pdf
##   2
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Simple Linear Regression Results - Model 2

	Value	Std. Error	t-stat	p-value
(Intercept)	7.2577315	1.5544175	4.6691005	0.0000030
lGDPpc	-0.0073352	0.0711081	-0.1031559	0.9178406
lRural	0.2218054	0.1373740	1.6146097	0.1066197
lCO2	0.1124236	0.0308273	3.6468874	0.0002691
lHCexpend	0.3760953	0.1036964	3.6268877	0.0002905
lWater	-0.3353254	0.1796206	-1.8668540	0.0621075
lSanitation	0.0766694	0.0692372	1.1073438	0.2681743
lLifeExpect	-3.4213728	0.3251958	-10.5209613	0.0000000
lDPT	0.5907791	0.2456552	2.4049116	0.0162064
lMeasles	-0.0817581	0.2455781	-0.3329211	0.7392345
Inverse	-0.4257759	0.0472547	-9.0102427	0.0000000
lFemSchool	0.6029876	0.1533176	3.9329322	0.0002000

Fixed Effects Regression Results - Model 2

	Value	Std. Error	
(Intercept)	-0.1251196	3.5429514	-0.03
lGDPpc	0.0493379	0.1392642	0.35
lRural	2.8976187	0.5864125	4.94
lCO2	0.0543819	0.0386581	1.40
lHCexpend	-0.0016818	0.1031654	-0.01
lWater	-1.3726857	0.3590034	-3.82
lSanitation	-0.5479255	0.3298781	-1.66
lLifeExpect	-0.8062209	0.3371903	-2.39
lDPT	0.7836174	0.1988538	3.94
lMeasles	-0.7001023	0.1944063	-3.60
Inverse	-0.1160559	0.1015148	-1.14
lFemSchool	0.0116322	0.1649165	0.07
as.factor(country)Burundi	-3.7296150	0.5537583	-6.73
as.factor(country)Cameroon	-1.8280571	0.2679815	-6.82
as.factor(country)Central African Republic	-2.7076110	0.4208373	-6.50

Conclusions and Limitations - Model 1

1. ** Logistic Regression Results of Model 1 (all countries) **

- Generally in line with hypothesis
- Most of the variables are statistically significant
- Only Immunisation Variables and GDP per capital are not significant

2. ** Predicted Probabilities of Model 1 (selected countries) **

- Direction of effect of Female School Enrollment matches initial assumptions for all case studies
- Direction of effect of Female Unemployment does not match initial assumptions for any case study

Conclusions and Limitations - Model 2

3. ** Linear Regression of Model 2 (countries with incidence above mean) **

- Significance of some variables changes
- Female School Enrollment and Female Unemployment remain highly significant
- Effect of Female Schooling becomes positive (!)

4. ** Fixed Effects Regression of Model 2 (countries with incidence above mean) **

- Significance of some variables changes compared to simple linear model
- Female School Enrollment and Female Unemployment become insignificant
- Immunisation rates for DPT & Measles become highly significant (!)