Determinants of HIV

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Outline

- Motivation
- Research Question
- Methodology
- Literature Review
- Descriptive Statistics
- Findings
- Conclusion and 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*

Source: `http://www.mdgmonitor.org/goal6.cfm`

2. Explore disease-specific determinants of health

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

Methodology and Dataset

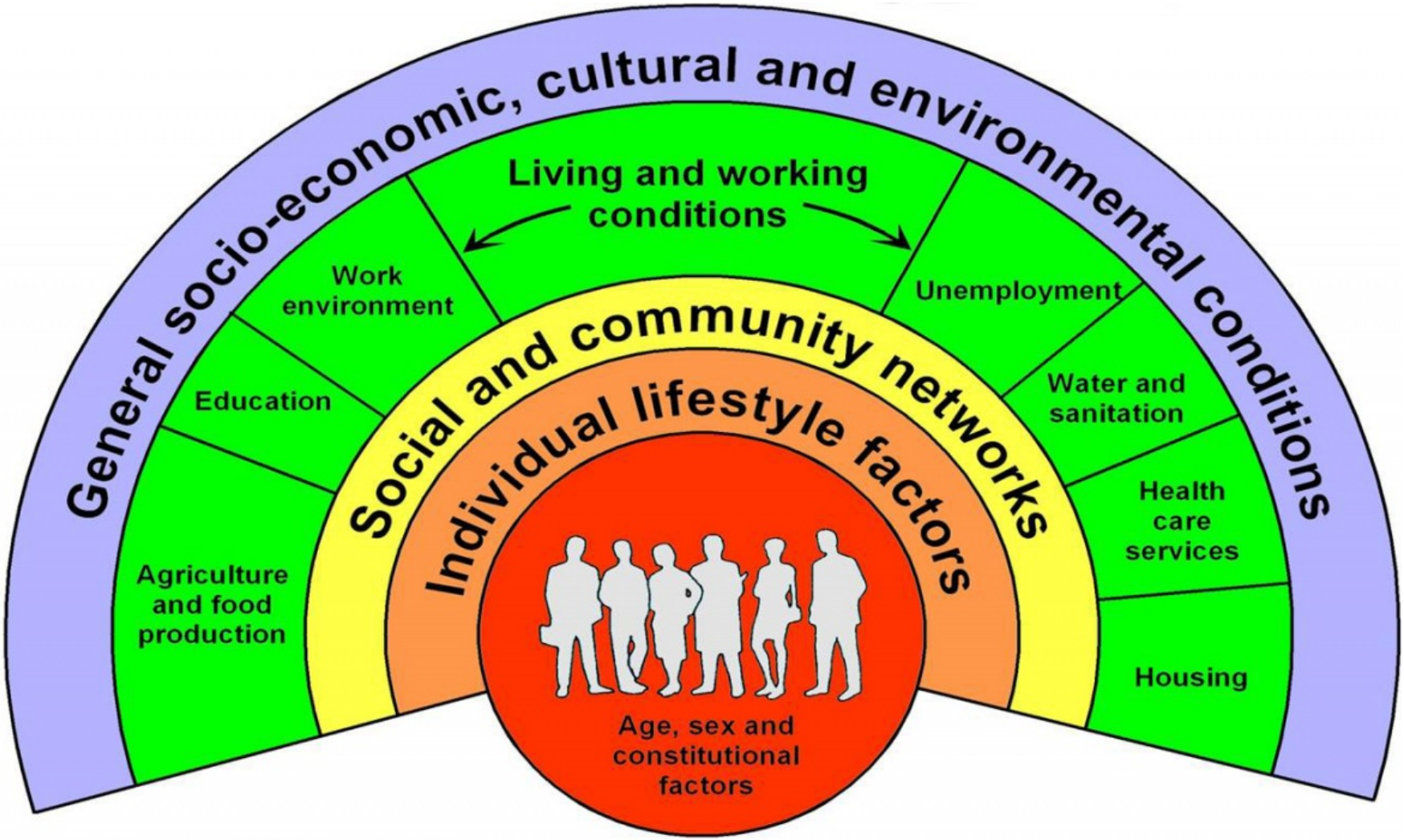
Methodology

- 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.

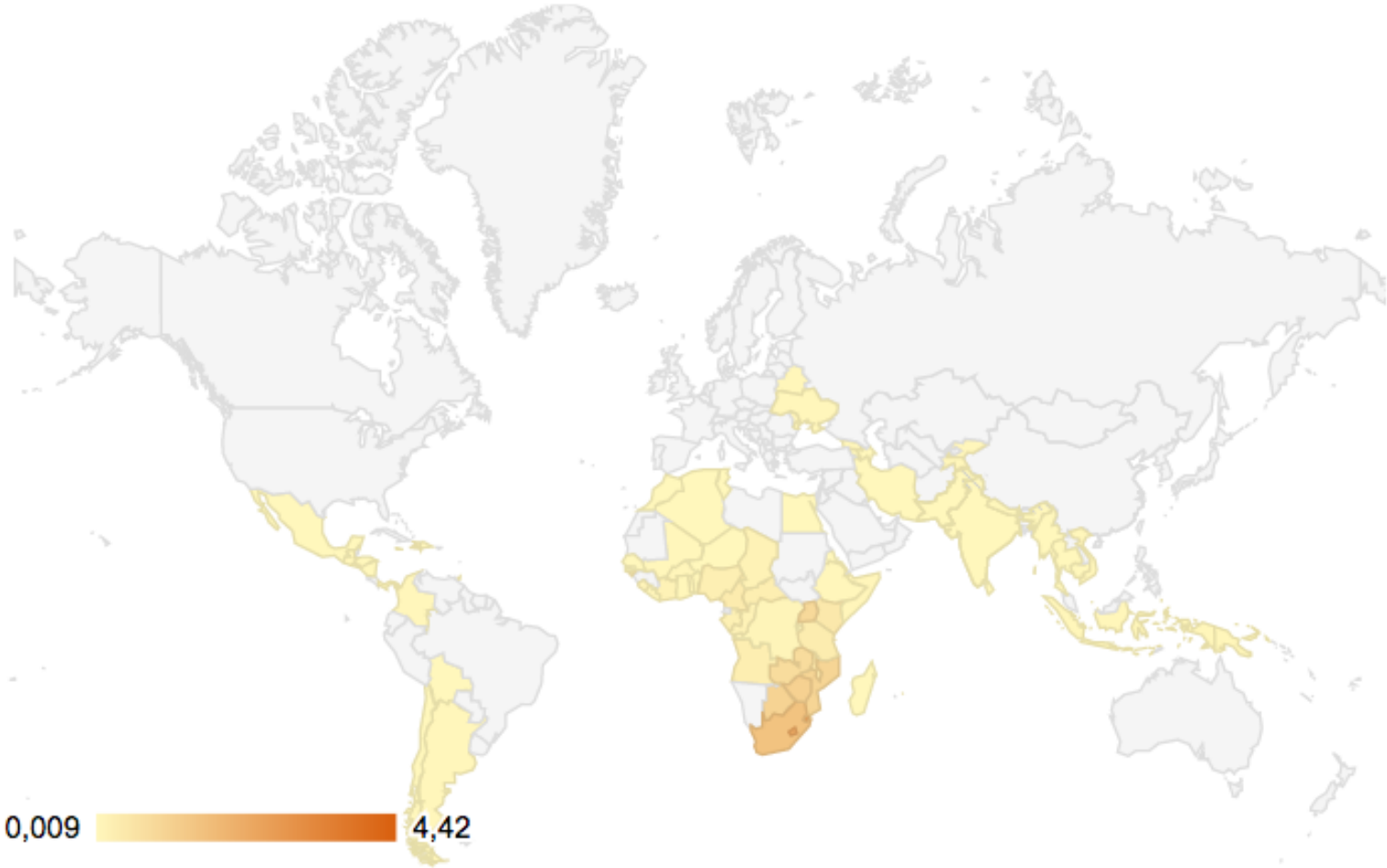
Literature Review



Source: Dahlgren and Whitehead, 1991

Descriptive Statistics

Incidence



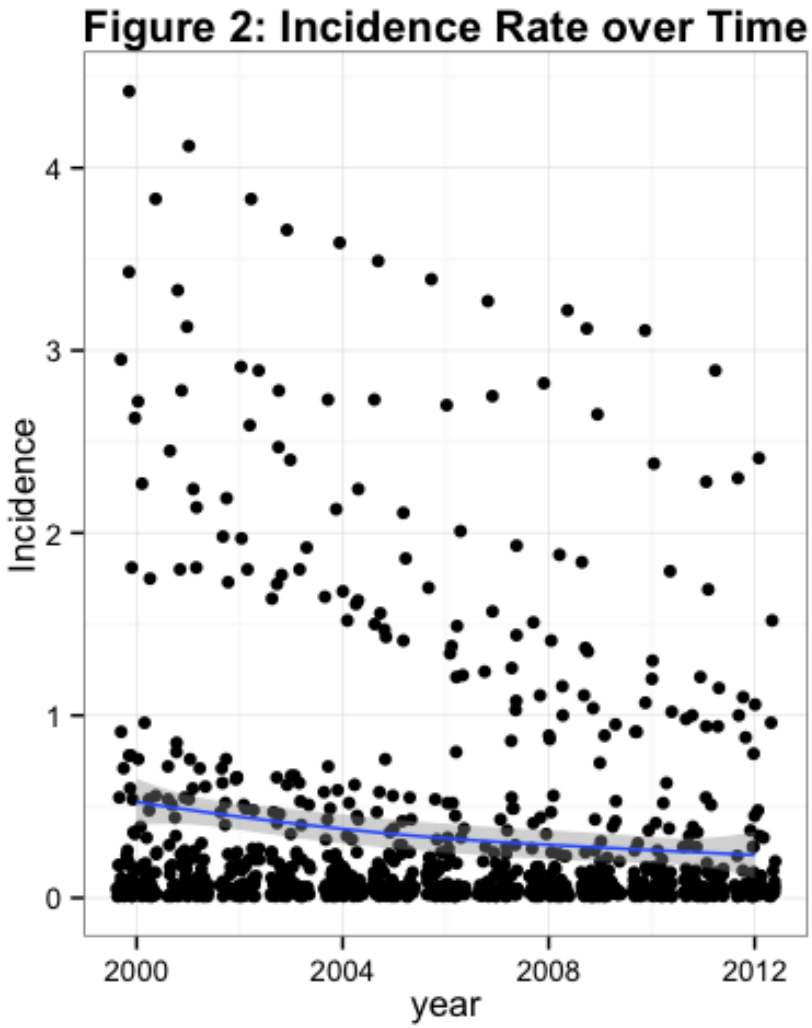
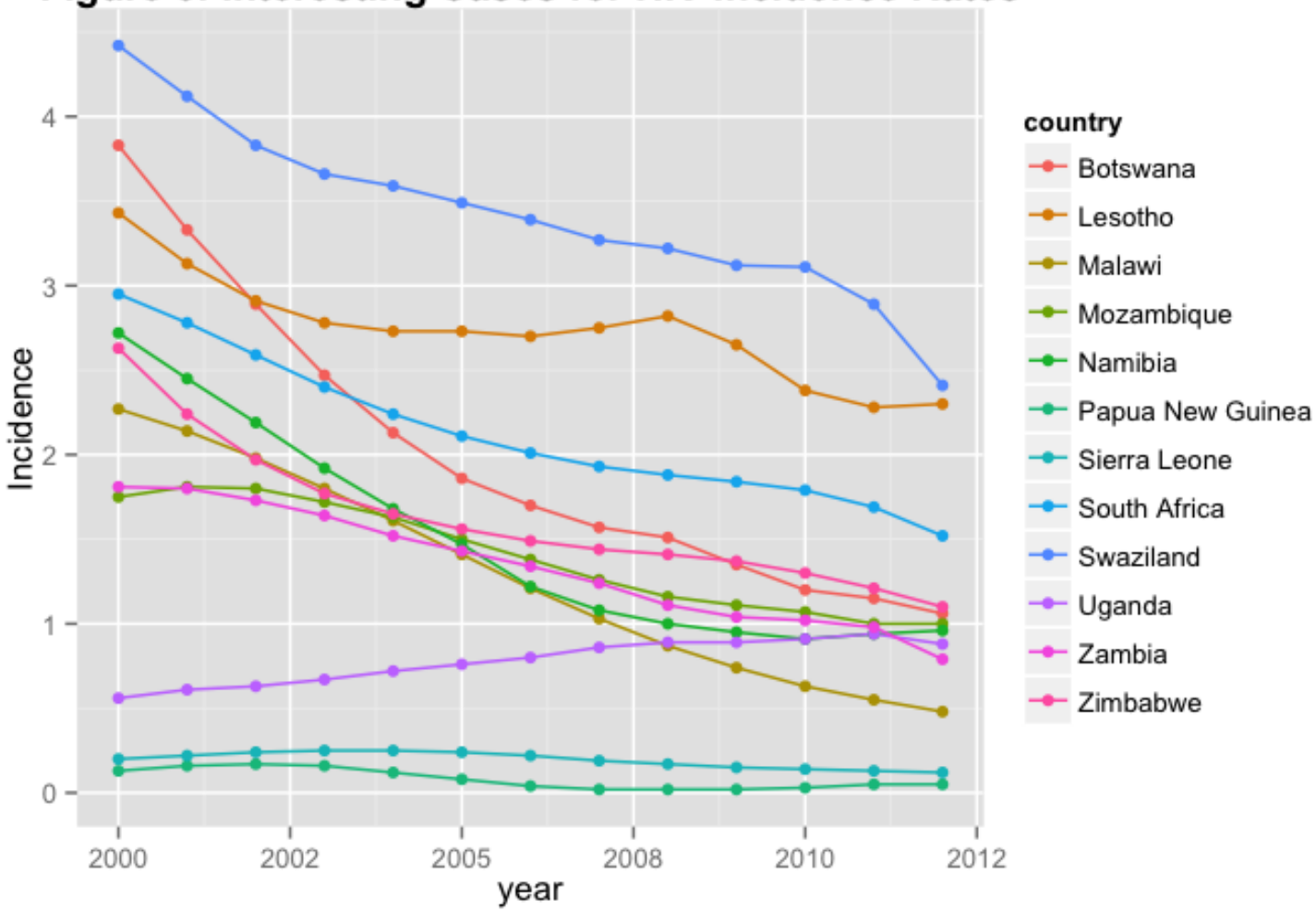


Figure 2: Incidence Rate over Time
Incidence
0
1
2
3
4
2000
2004
2008
2012
year

Figure 6: Interesting Cases for HIV Incidence Rates



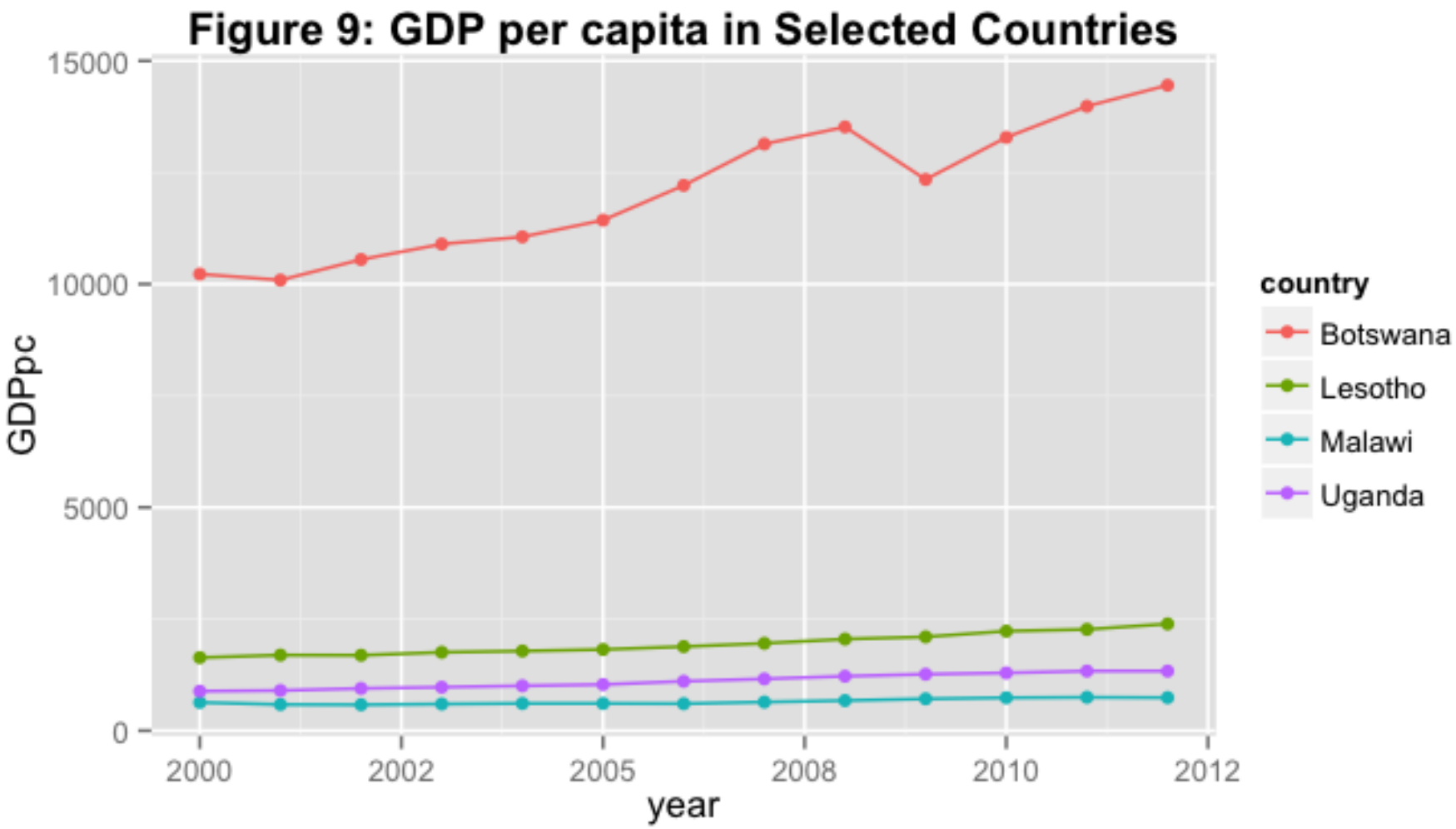


Figure 9: GDP per capita in Selected Countries
15000
10000
5000
0
GDPpc
2000
2002
2005
2008
2010
2012
year
country
Botswana
Lesotho
Malawi
Uganda

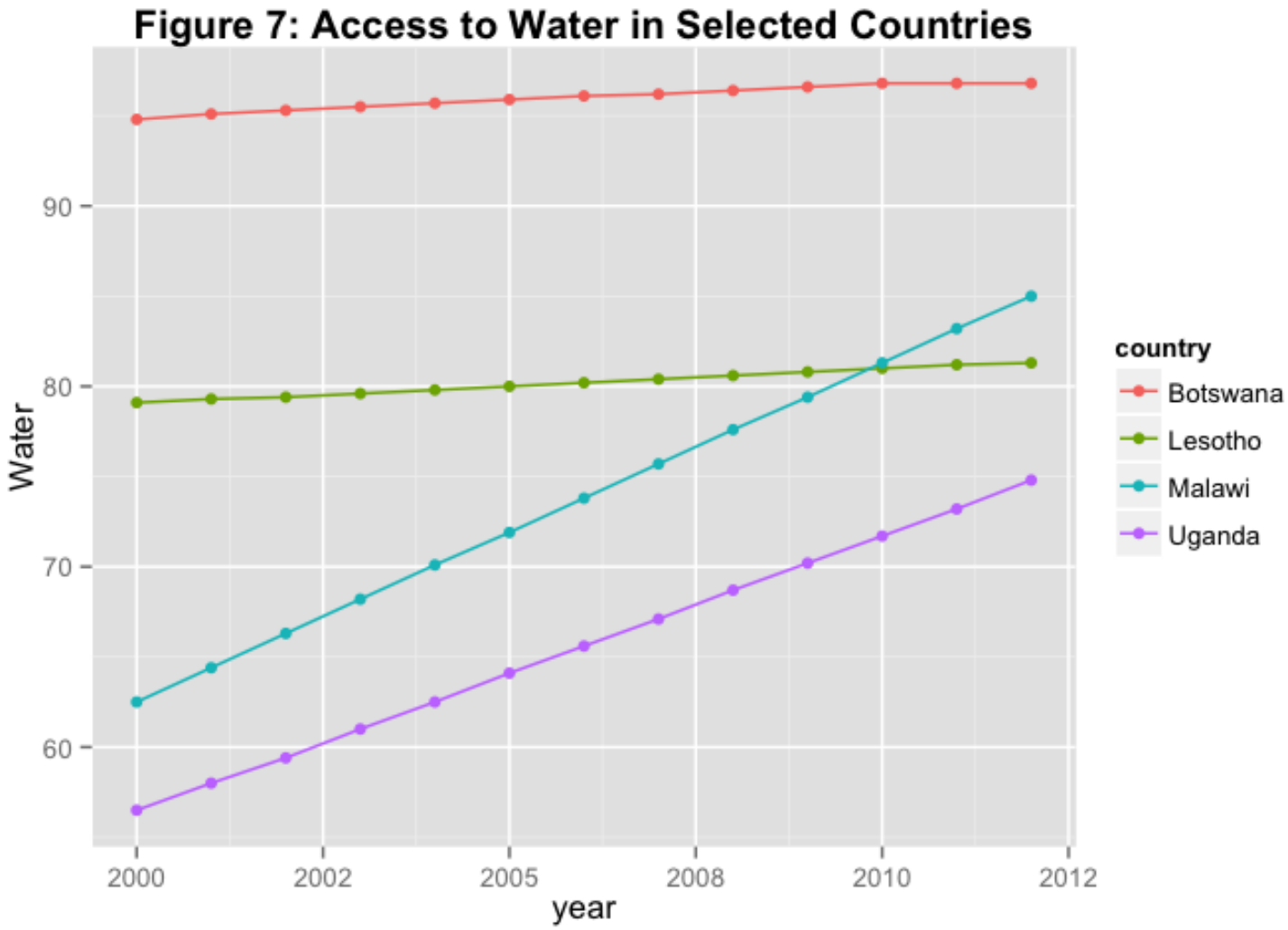


Figure 7: Access to Water in Selected Countries
Water
90
80
70
60
2000
2002
2005
2008
2010
2012
year
country
Botswana
Lesotho
Malawi
Uganda

Figure 12: Health Care Expenditure (%GDP) in Selected Countries

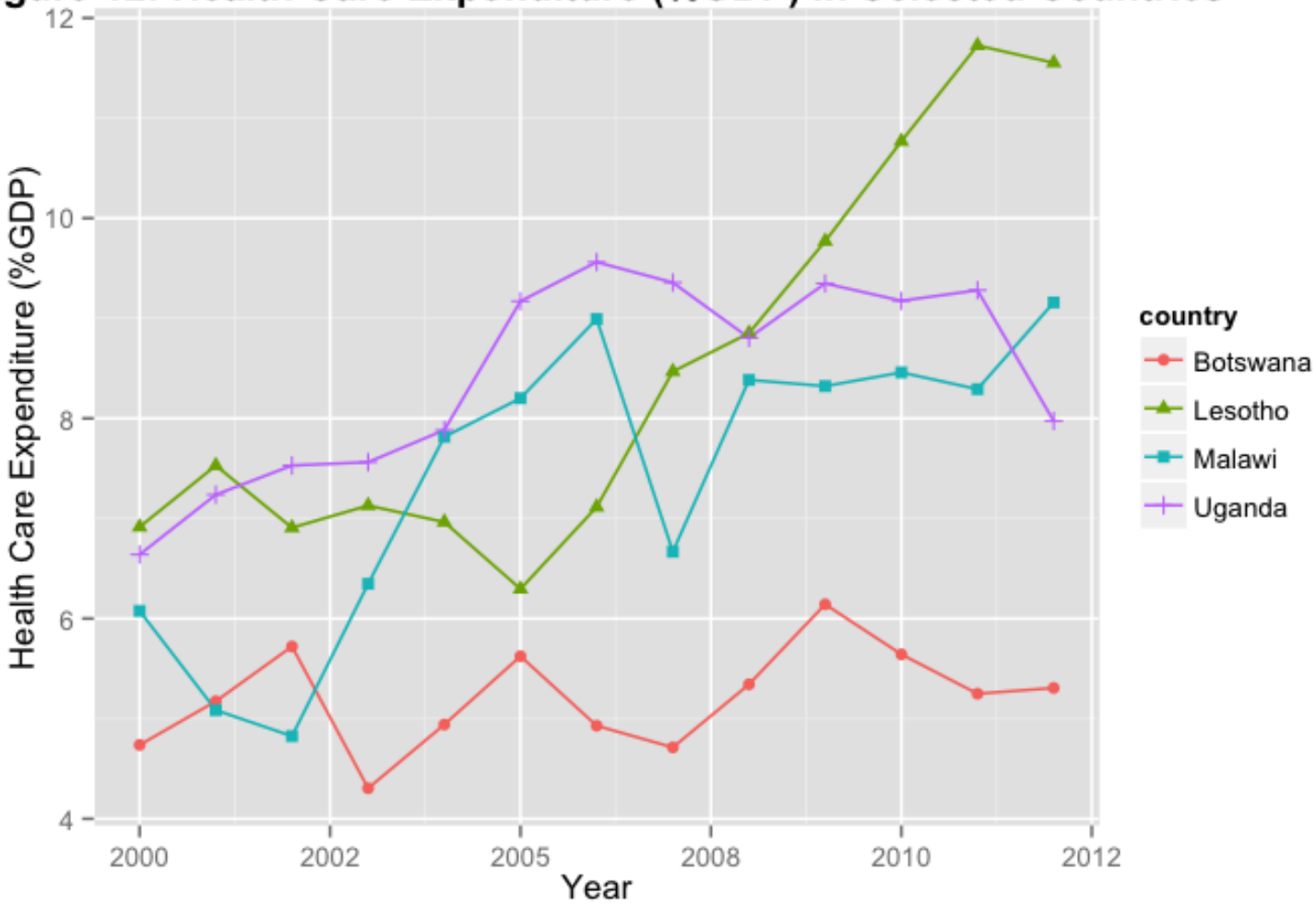


Figure 10: Level of Female Schooling in Selected Countries

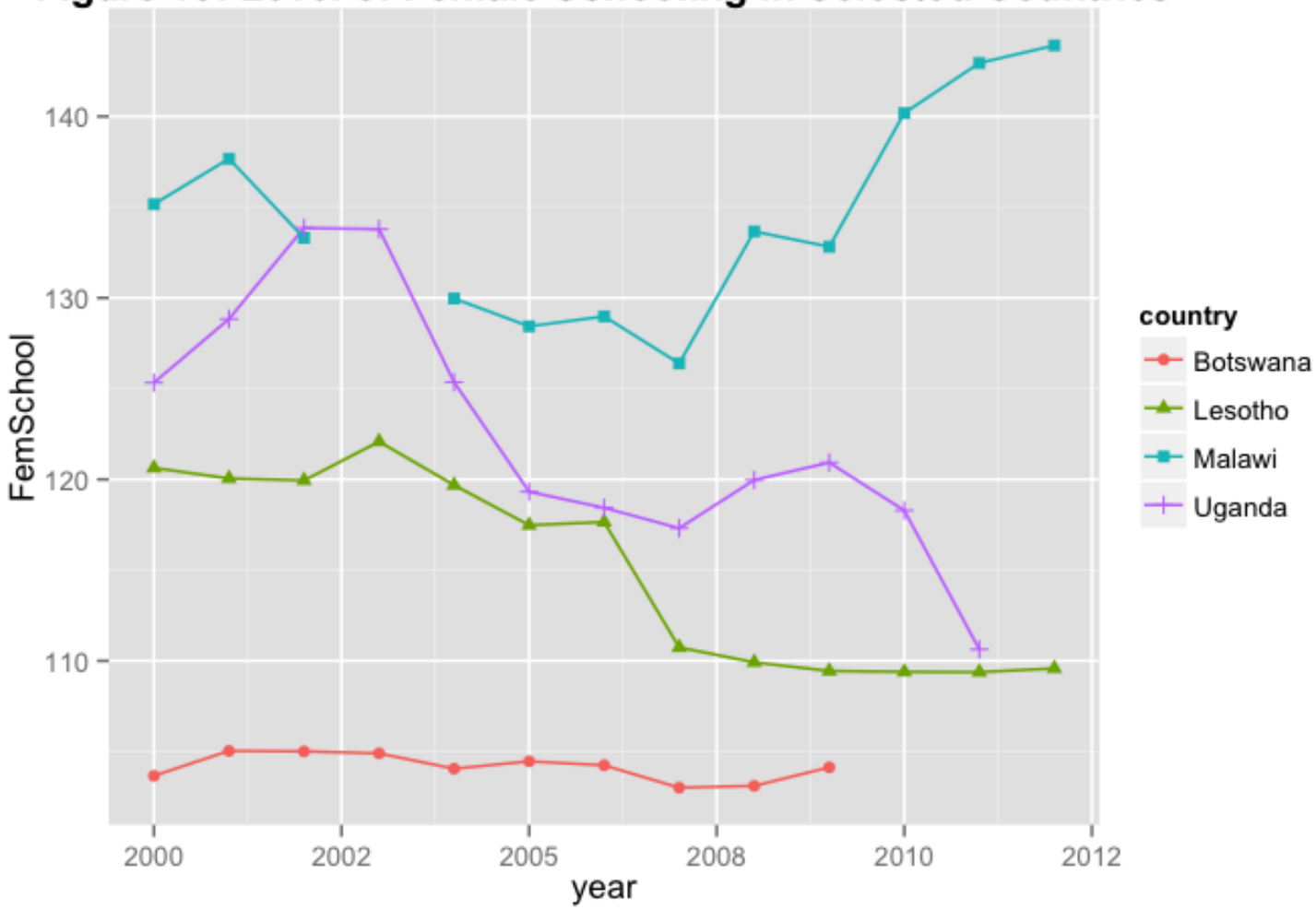
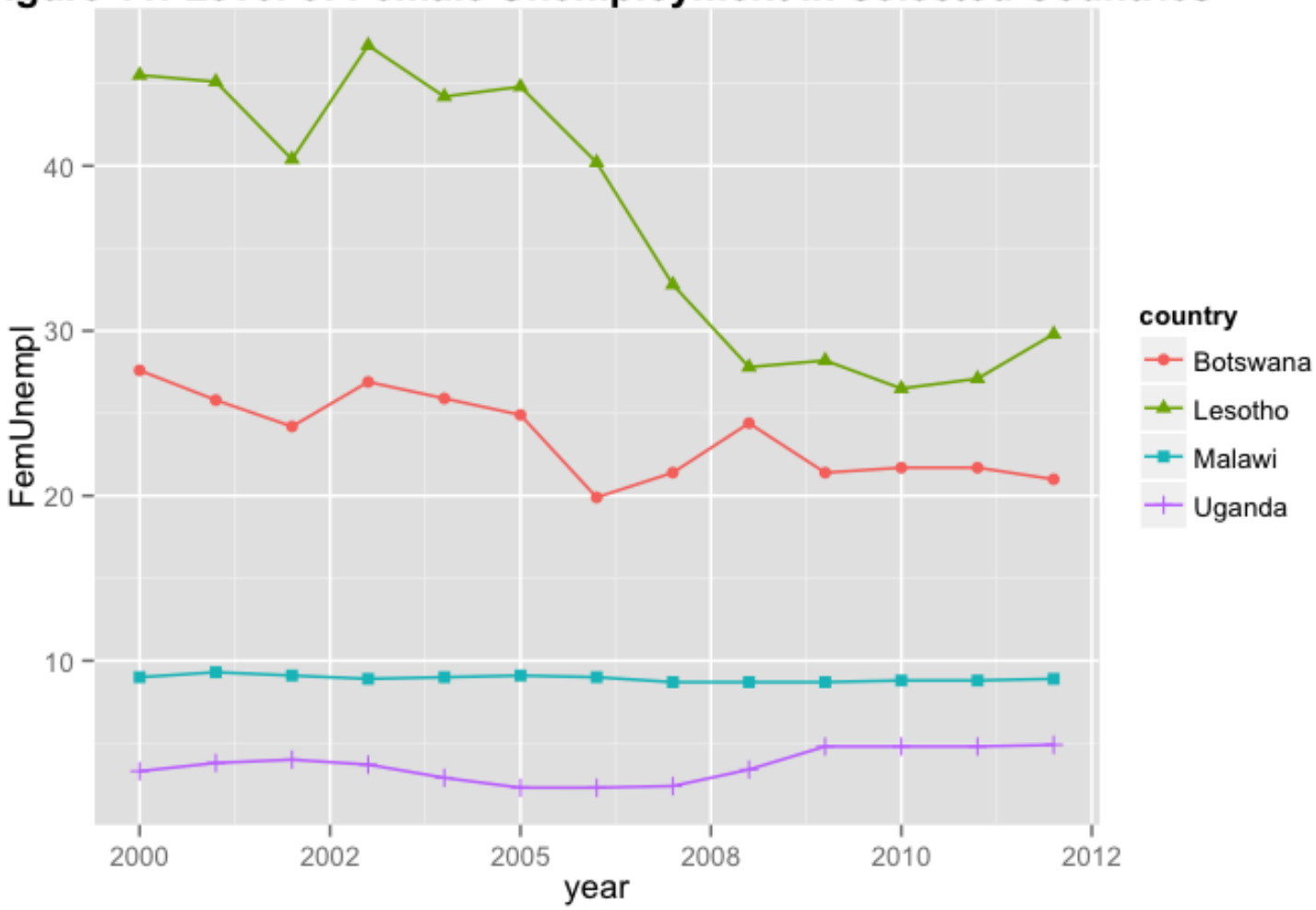


Figure 11: Level of Female Unemployment in Selected Countries



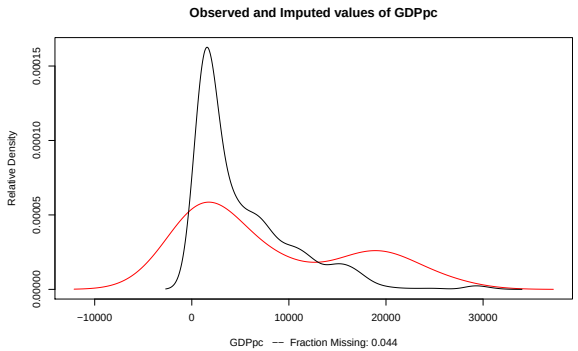
The Model

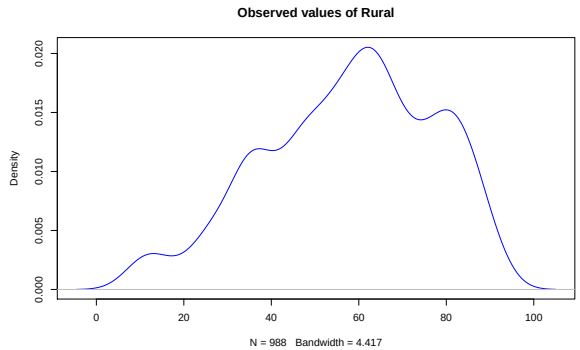
To answer our research question we will estimate the following equation:

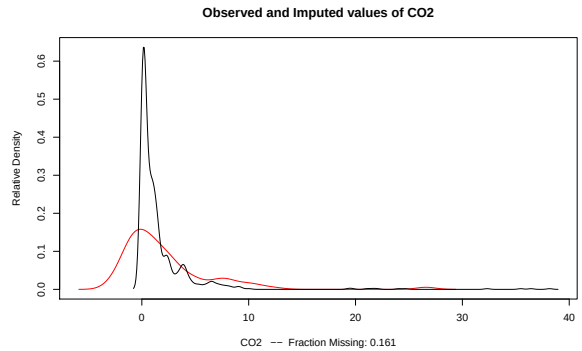
$$I_{it} = \beta_0 + \beta_1 SE_{it} + \beta_2 WLC_{it} + \beta_3 SCN_{it} + \beta_4 ILF_{it} + \epsilon_{it}$$

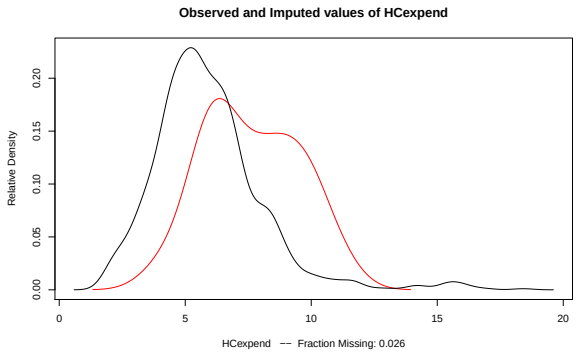
Where I stands for HIV/AIDS incidence, SE stands for socioeconomic factors, WLC stands for working and living conditions, SCN stands for social and community networks and ILF stands for individual lifestyle factors.

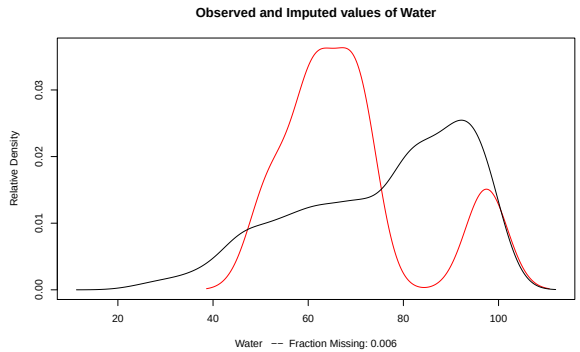
Imputed missing values

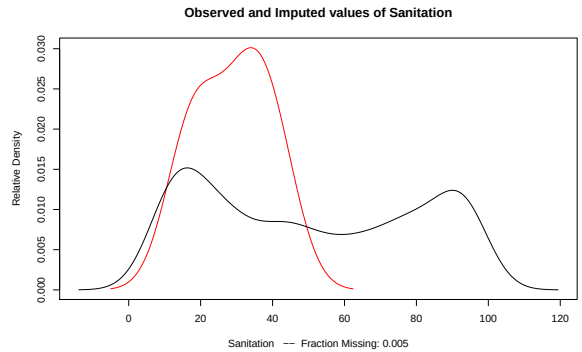


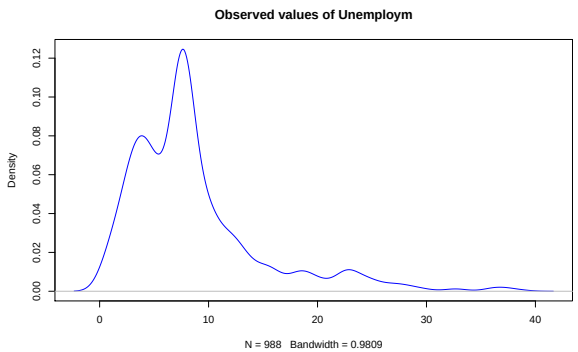


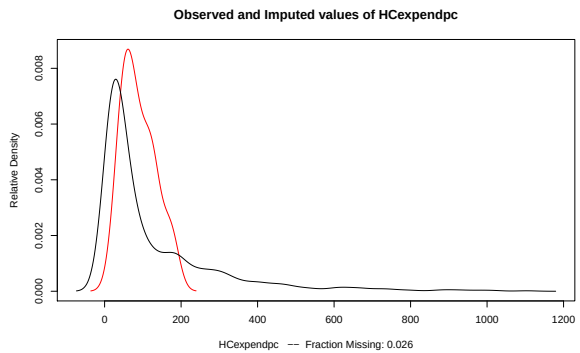


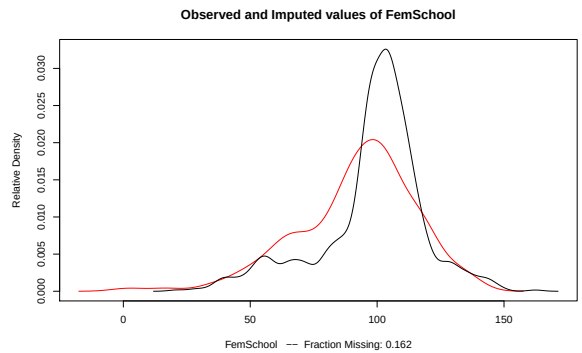










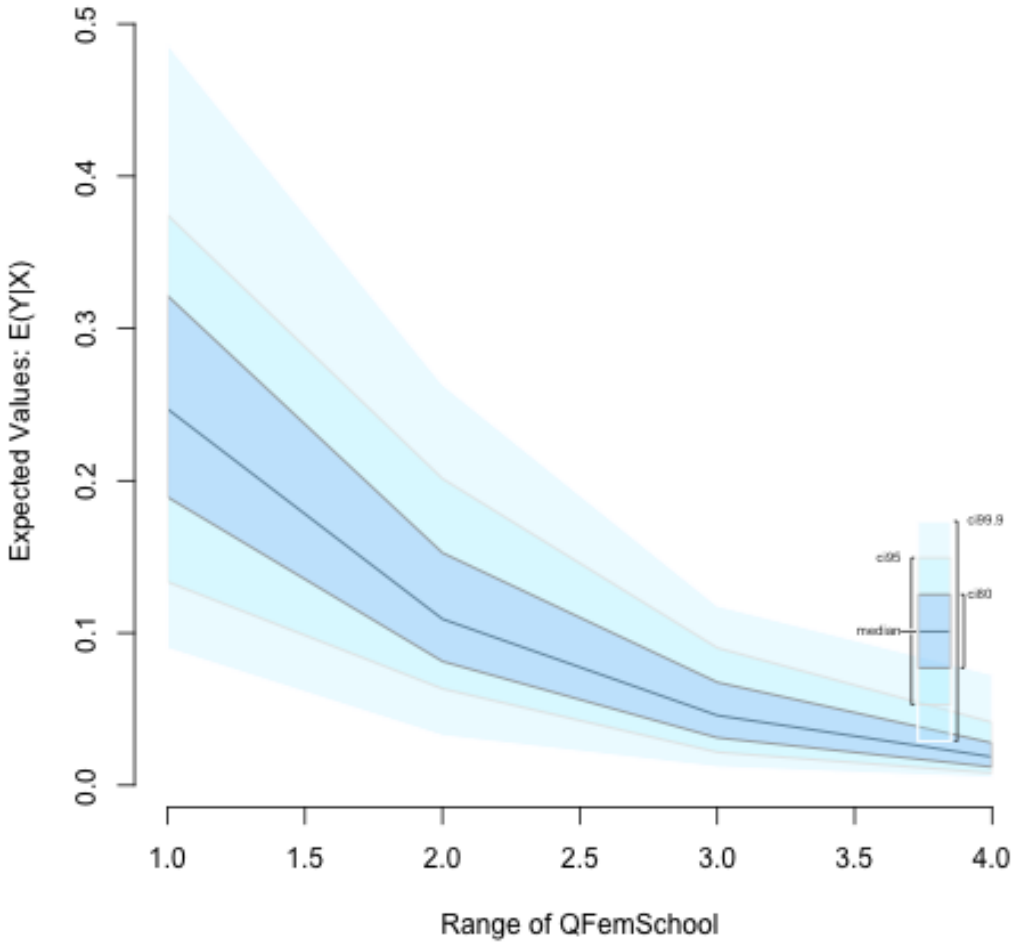


Logistic Regression Results - Model 1

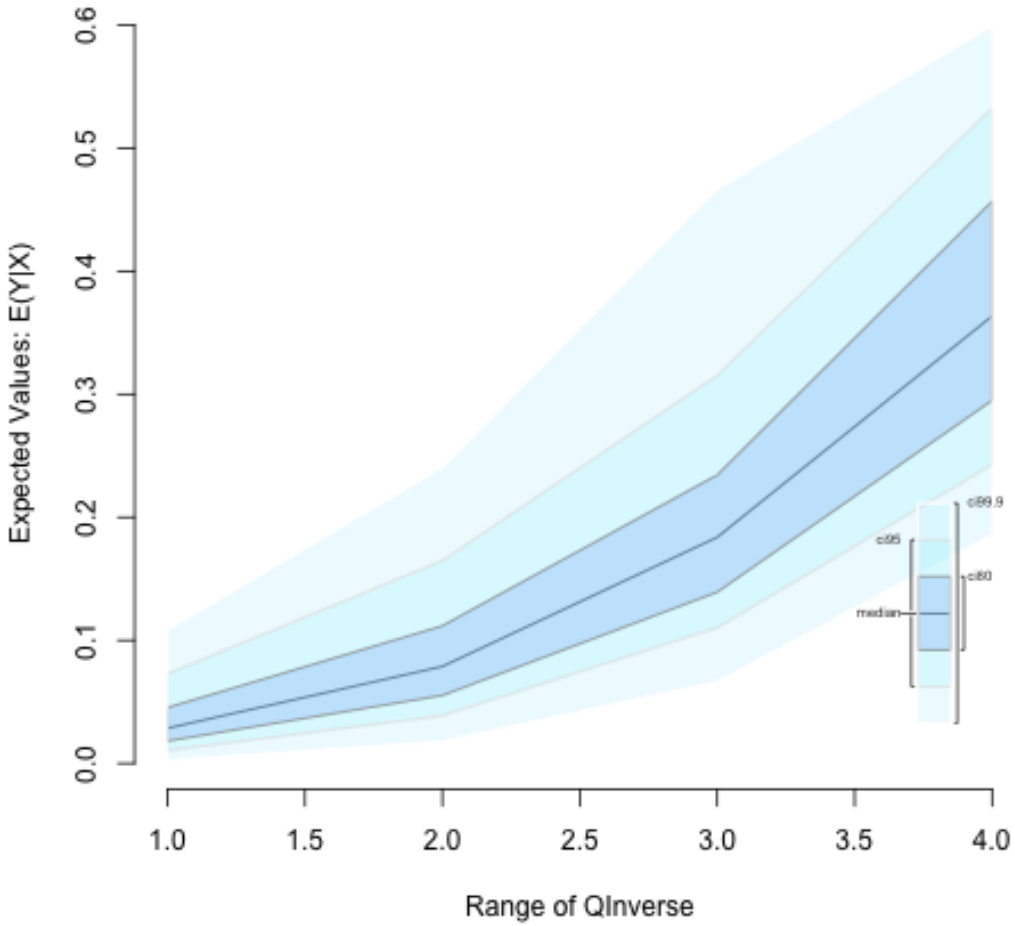
	Value	Std. Error	t-stat	p-value
(Intercept)	-38.2508052	7.5347287	-5.0766002	0.0000019
lGDPpc	0.2907925	0.3228171	0.9007966	0.3676992
lRural	-2.5607939	0.5424660	-4.7206535	0.0000025
lCO2	-0.5558177	0.1956581	-2.8407594	0.0046404
lHCexpend	0.8792600	0.4095229	2.1470348	0.0331600
lWater	-2.2861951	0.8458940	-2.7026967	0.0069257
lSanitation	0.9199439	0.2850767	3.2270044	0.0012809
lLifeExpect	19.4333077	1.8570721	10.4644875	0.0000000
lDPT	-0.7608762	1.0321724	-0.7371600	0.4614466
lMeasles	1.6719973	1.1506553	1.4530828	0.1465191
Inverse	1.8287918	0.2601606	7.0294721	0.0000000
lFemSchool	-5.7879052	0.7070115	-8.1864371	0.0000000

Predicted Probabilities

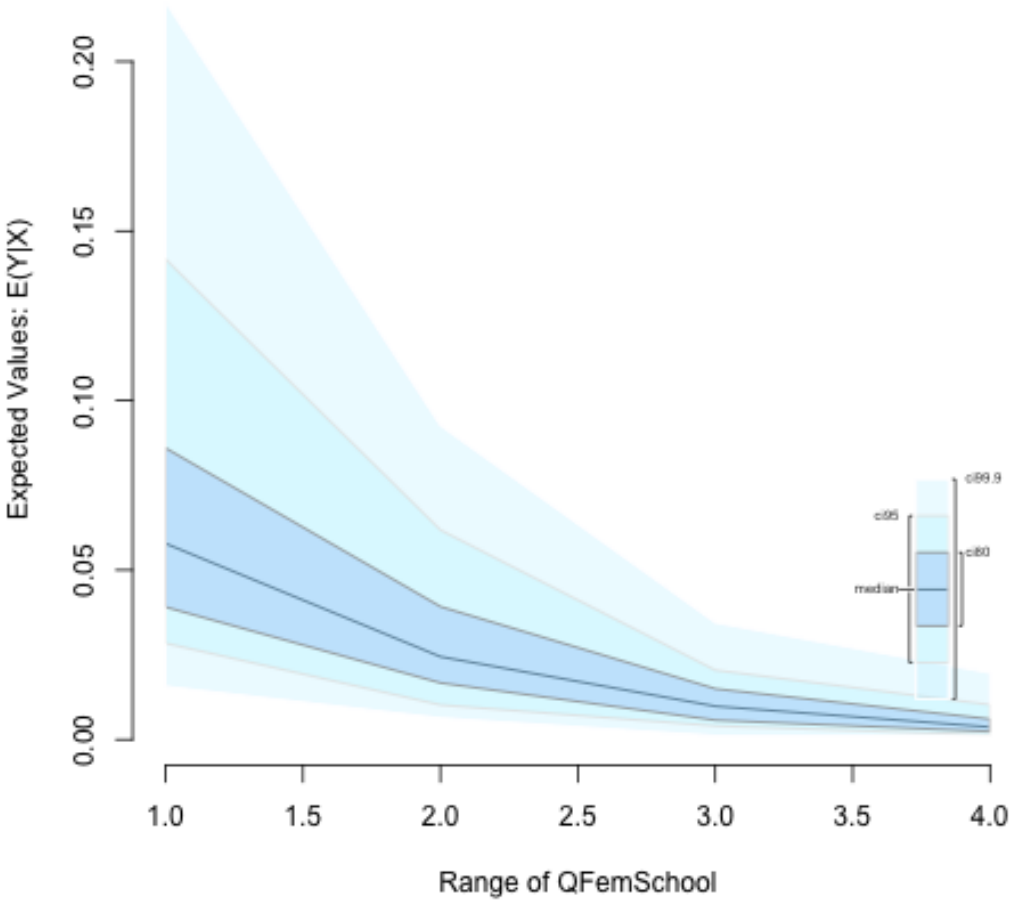
Malawi


Expected Values: E(Y|X)
0.0
0.1
0.2
0.3
0.4
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Range of QFemSchool
ci99.9
ci95
ci80
median

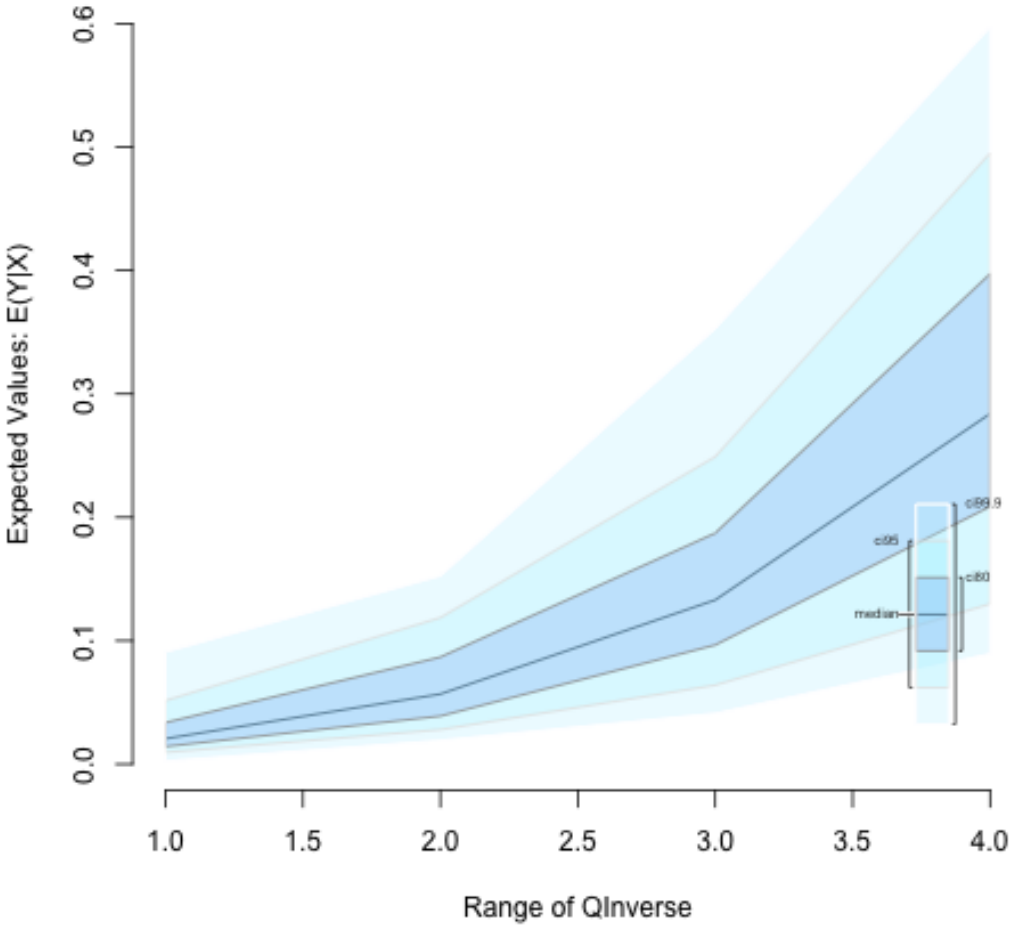
Malawi 2


Expected Values: E(Y|X)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Range of QInverse
c99.9
c95
c80
median

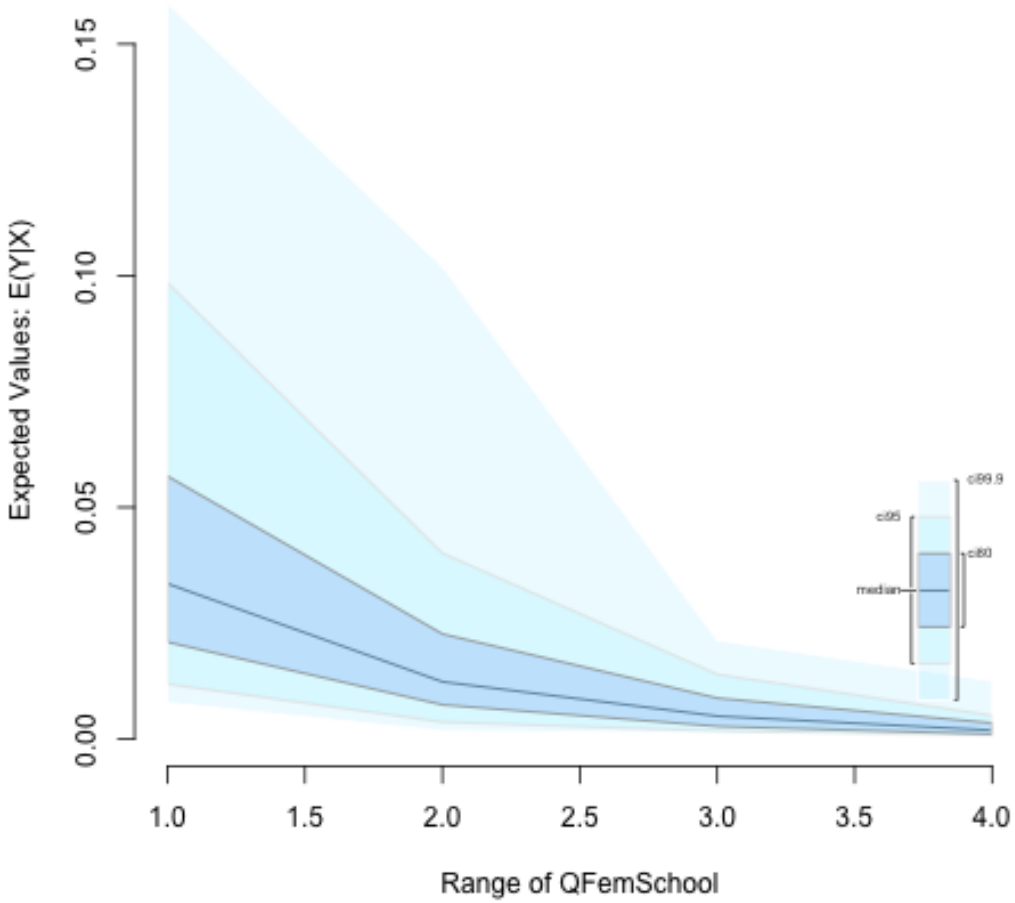
Botswana


Expected Values: E(Y|X)
0.00
0.05
0.10
0.15
0.20
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Range of QFemSchool
ci99.9
ci95
ci80
median

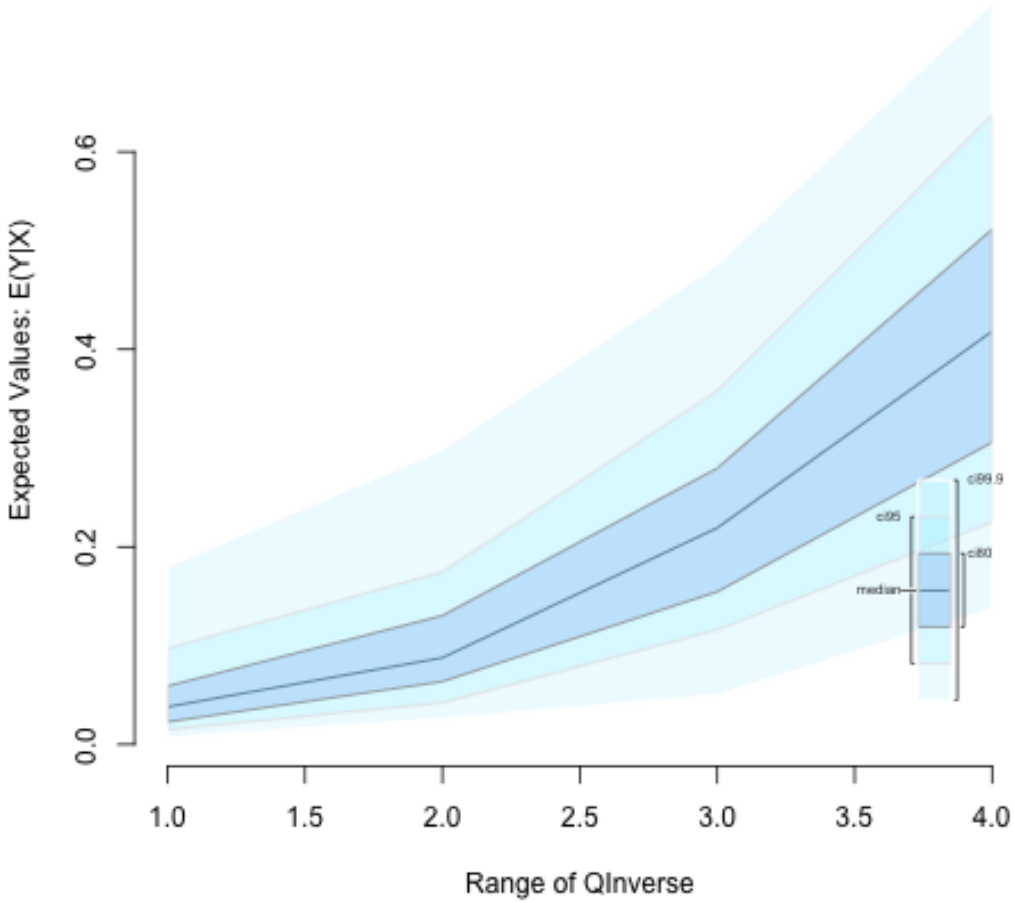
Botswana 2


Expected Values: E(Y|X)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Range of QInverse
c99.9
c95
c80
median

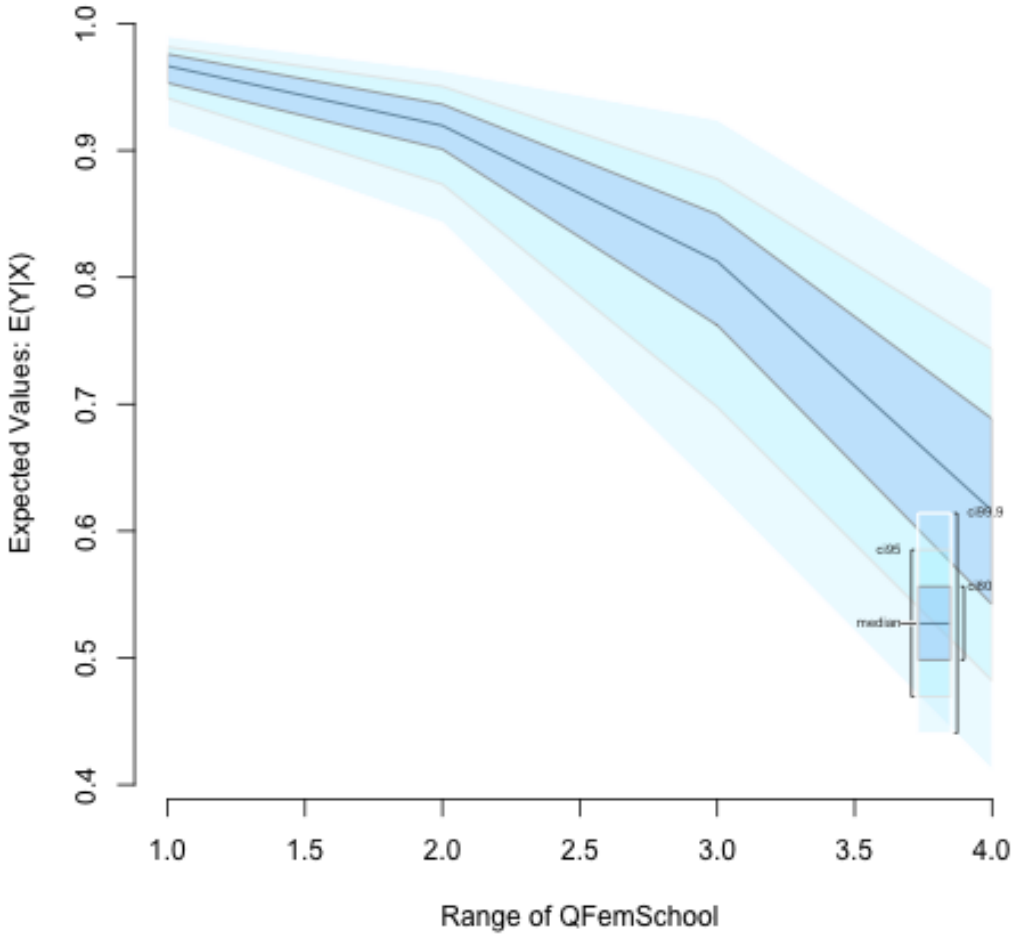
Lesotho


Expected Values: E(Y|X)
0.00
0.05
0.10
0.15
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Range of QFemSchool
ci99.9
ci95
ci80
median

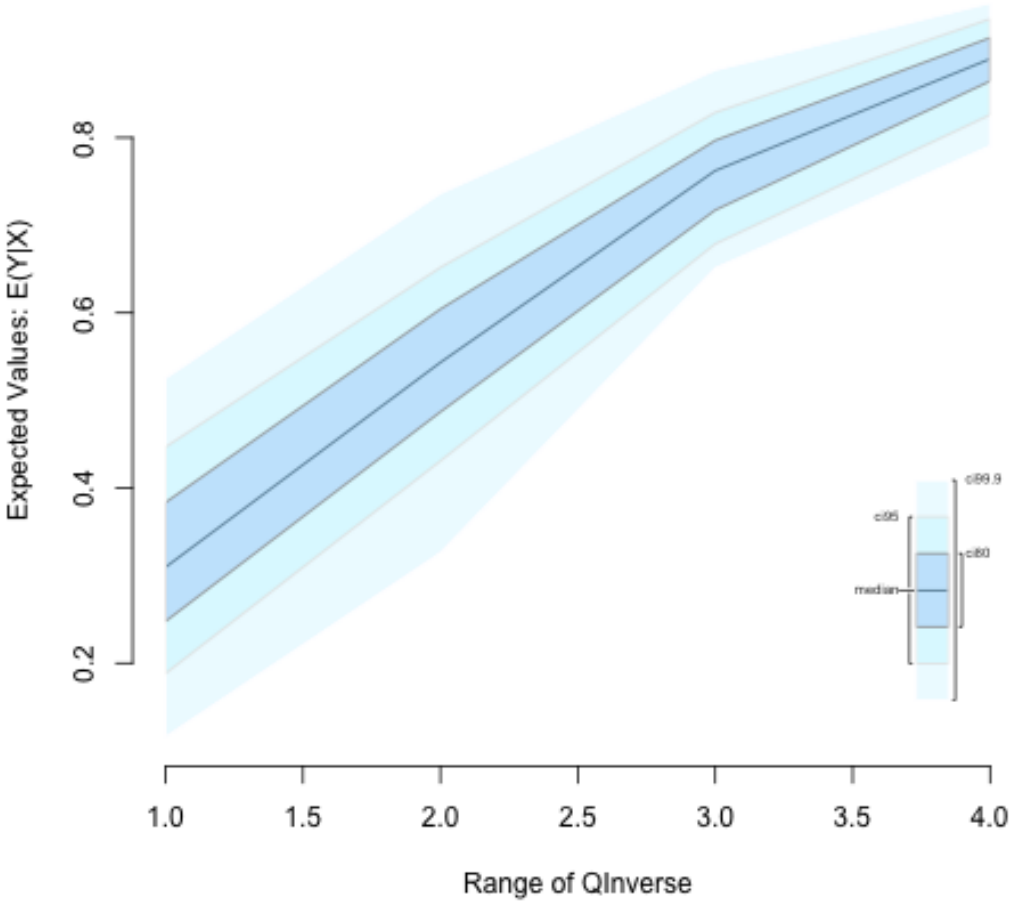
Lesotho 2


Expected Values: E(Y|X)
0.0
0.2
0.4
0.6
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Range of QInverse
ci99.9
ci95
ci80
median

Uganda


Expected Values: E(Y|X)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Range of QFemSchool
ci99.9
ci95
ci80
median

Uganda 2


Expected Values: E(Y|X)
0.2
0.4
0.6
0.8
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Range of QInverse
ci99.9
ci95
ci80
median

Simple Linear Regression Results - Model 2

	Value	Std. Error	t-stat	p-value
(Intercept)	7.2650211	1.5823357	4.5913271	0.0000045
lGDPpc	0.0034132	0.0733859	0.0465110	0.9629089
lRural	0.2191693	0.1389816	1.5769660	0.1150747
lCO2	0.1033629	0.0305032	3.3885943	0.0007036
lHCexpend	0.3847303	0.1045708	3.6791351	0.0002394
lWater	-0.3402295	0.1855757	-1.8333726	0.0672017
lSanitation	0.0731571	0.0714244	1.0242600	0.3059333
lLifeExpect	-3.4021577	0.3406152	-9.9882732	0.0000000
lDPT	0.6161315	0.2537506	2.4280980	0.0153841
lMeasles	-0.0883836	0.2531605	-0.3491209	0.7271299
Inverse	-0.4328184	0.0486439	-8.8976943	0.0000000
lFemSchool	0.5483593	0.1563143	3.5080562	0.0009067

Fixed Effects Regression Results - Model 2

	Value	Std. Error	
(Intercept)	-0.2400353	3.5785663	-0.06
lGDPpc	0.0407755	0.1399333	0.29
lRural	2.9336934	0.5943591	4.93
lCO2	0.0514981	0.0432829	1.18
lHCexpend	-0.0134500	0.1142893	-0.11
lWater	-1.3615469	0.3756882	-3.62
lSanitation	-0.5390009	0.3293092	-1.63
lLifeExpect	-0.7877887	0.3359096	-2.34
lDPT	0.7984727	0.2020277	3.95
lMeasles	-0.7102505	0.1983322	-3.58
Inverse	-0.1165212	0.1056127	-1.10
lFemSchool	-0.0115003	0.1548346	-0.07
as.factor(country)Burundi	-3.7934600	0.5346824	-7.09
as.factor(country)Cameroon	-1.8461667	0.2639081	-6.99
as.factor(country)Central African Republic	-2.8346640	0.4103788	-6.75

Conclusions and Limitation