Determinants of HIV

M. Moellenkamp and N. Rosemberg

December 4th, 2014

Presentation Outline

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

Research Question & Motivation

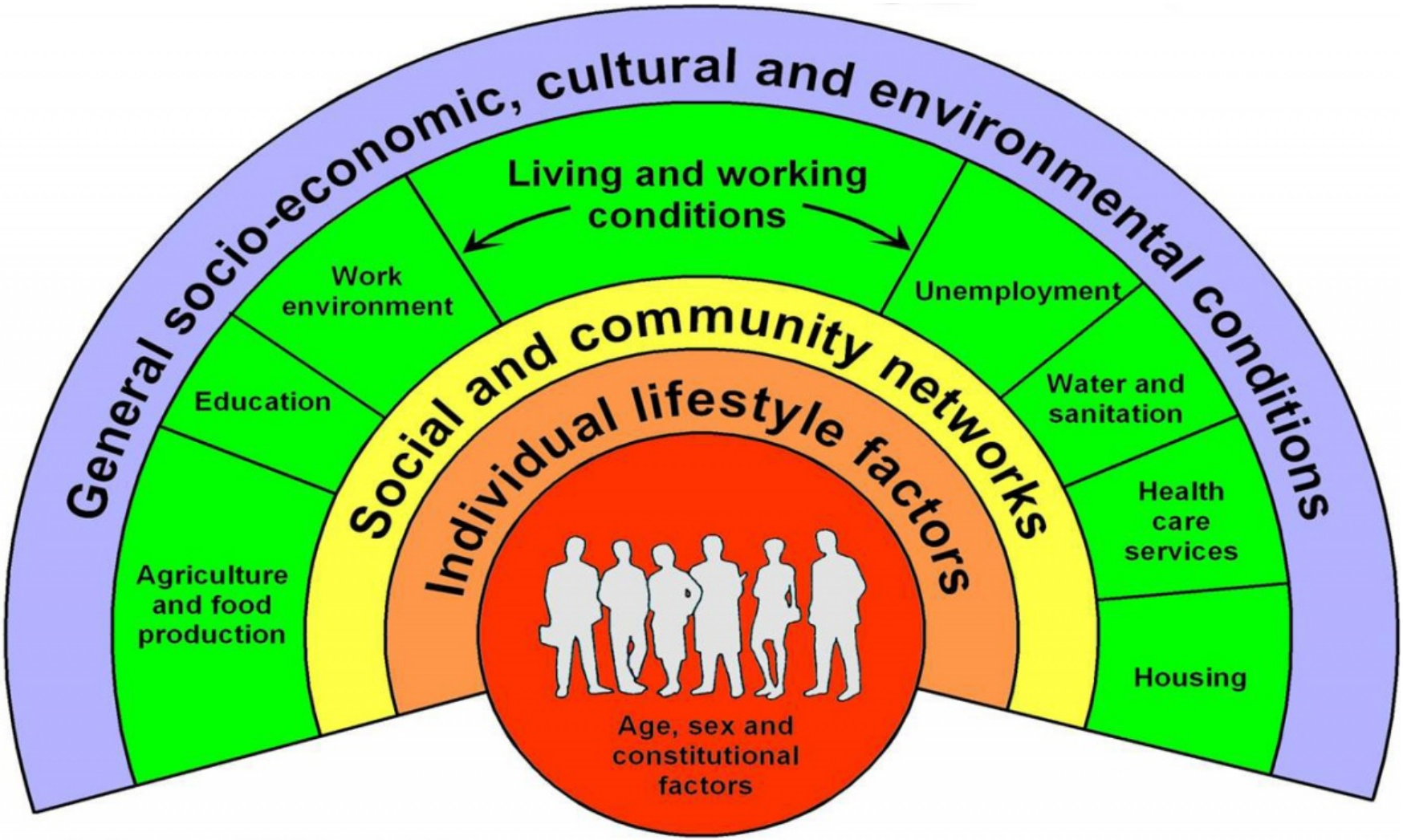
Research Question: Are community level factors significant determinants of HIV/AIDS incidence rates?

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

Theoretical Framework - Determinants of Health



Source: Dahlgren and Whitehead, 1991

Methodology

Model

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

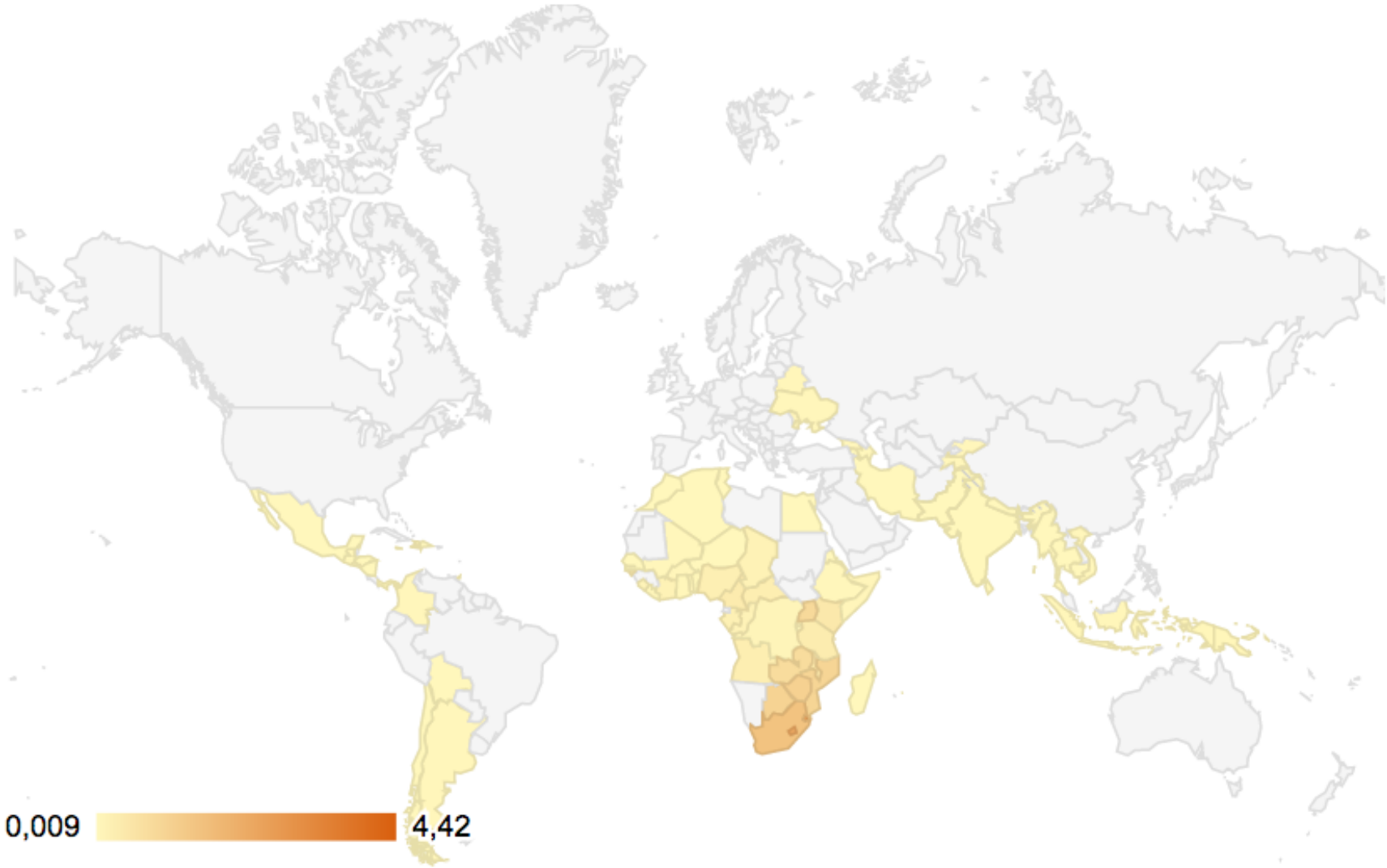
Datasets

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

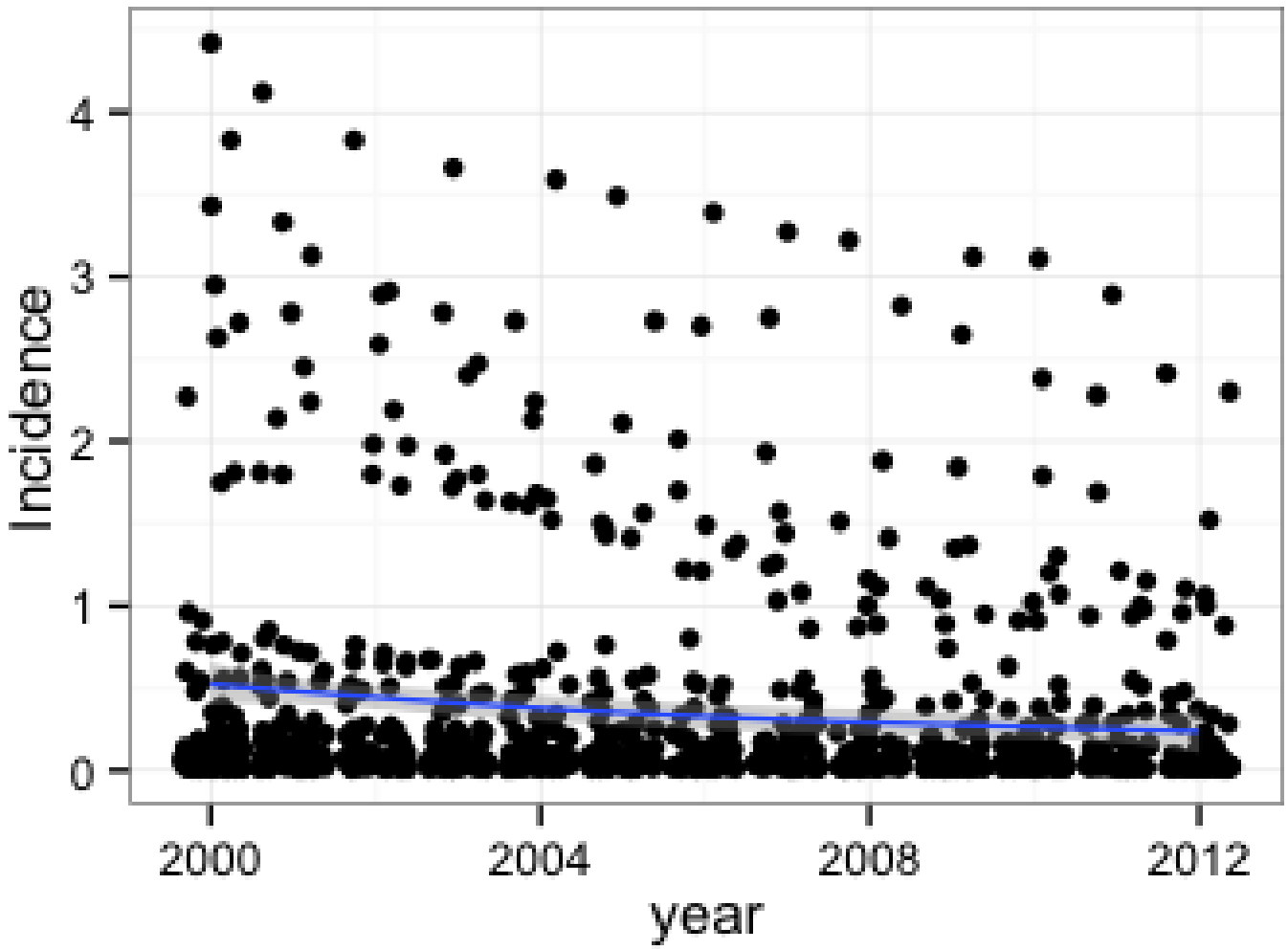
Methodology

- Model 1: Logistic Regression & Predicted Probabilities
- Model 2: Pooled OLS Regression

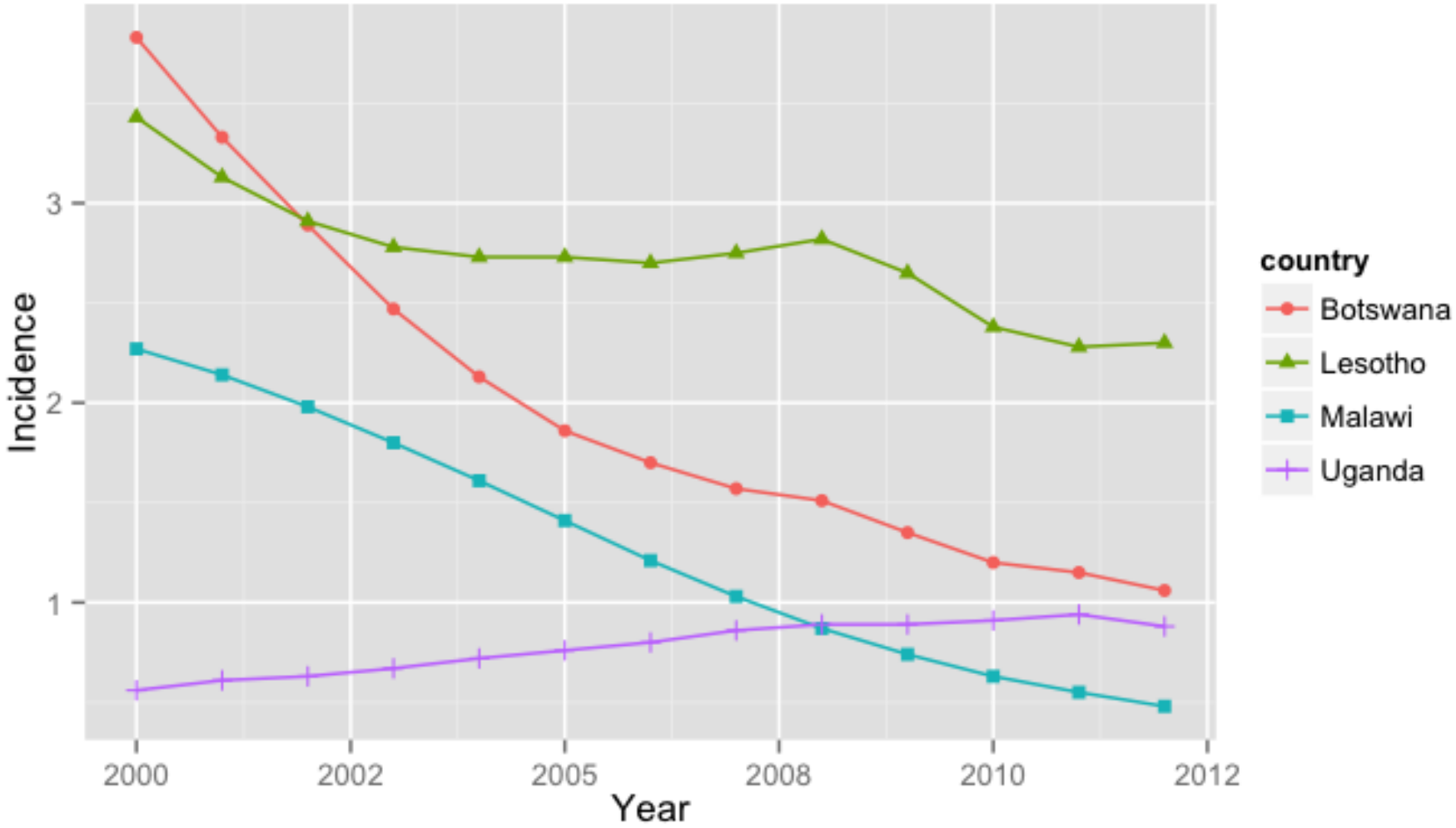
Distribution of HIV Incidence Rates



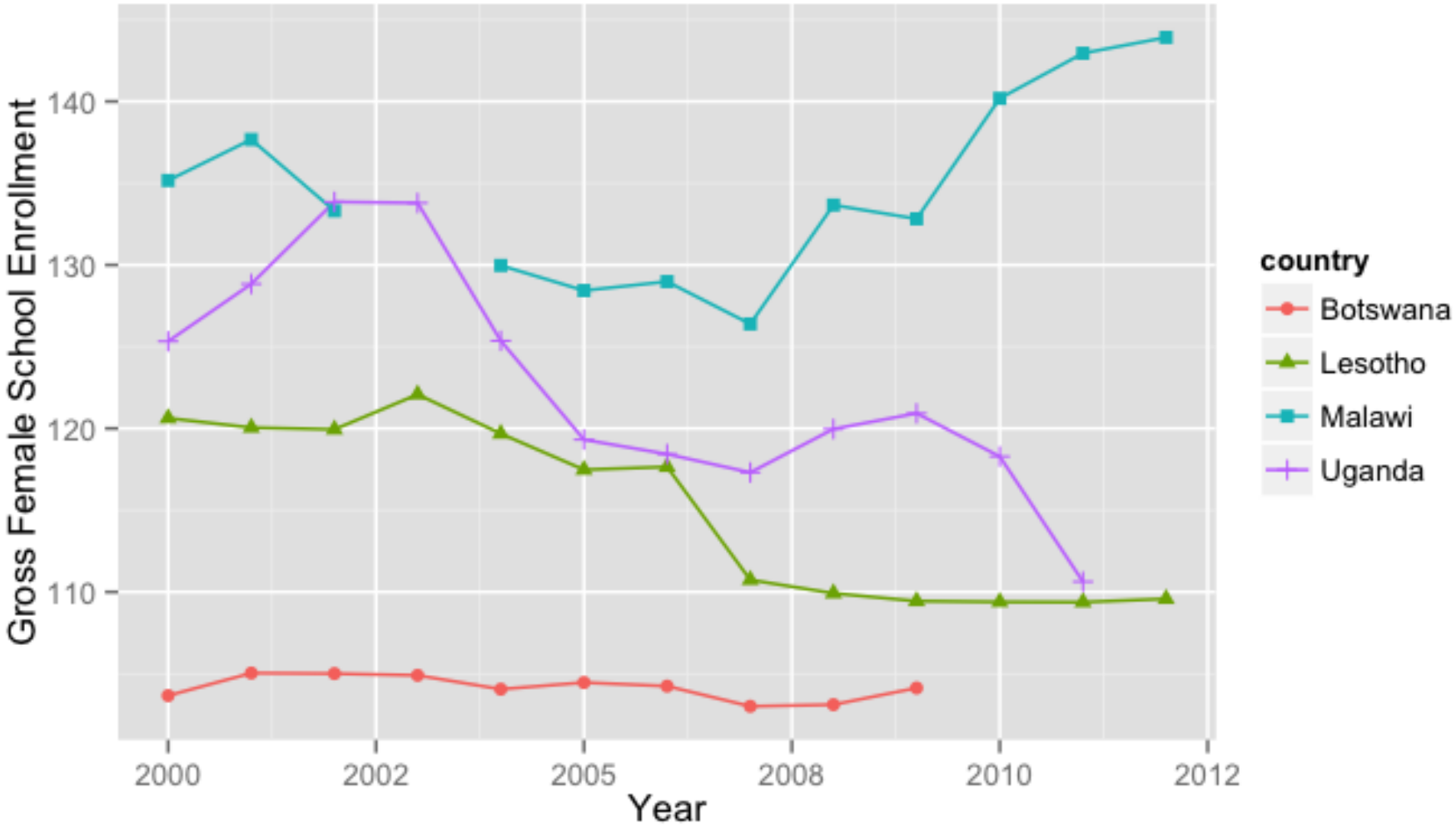
HIV Incidence Rates over Time



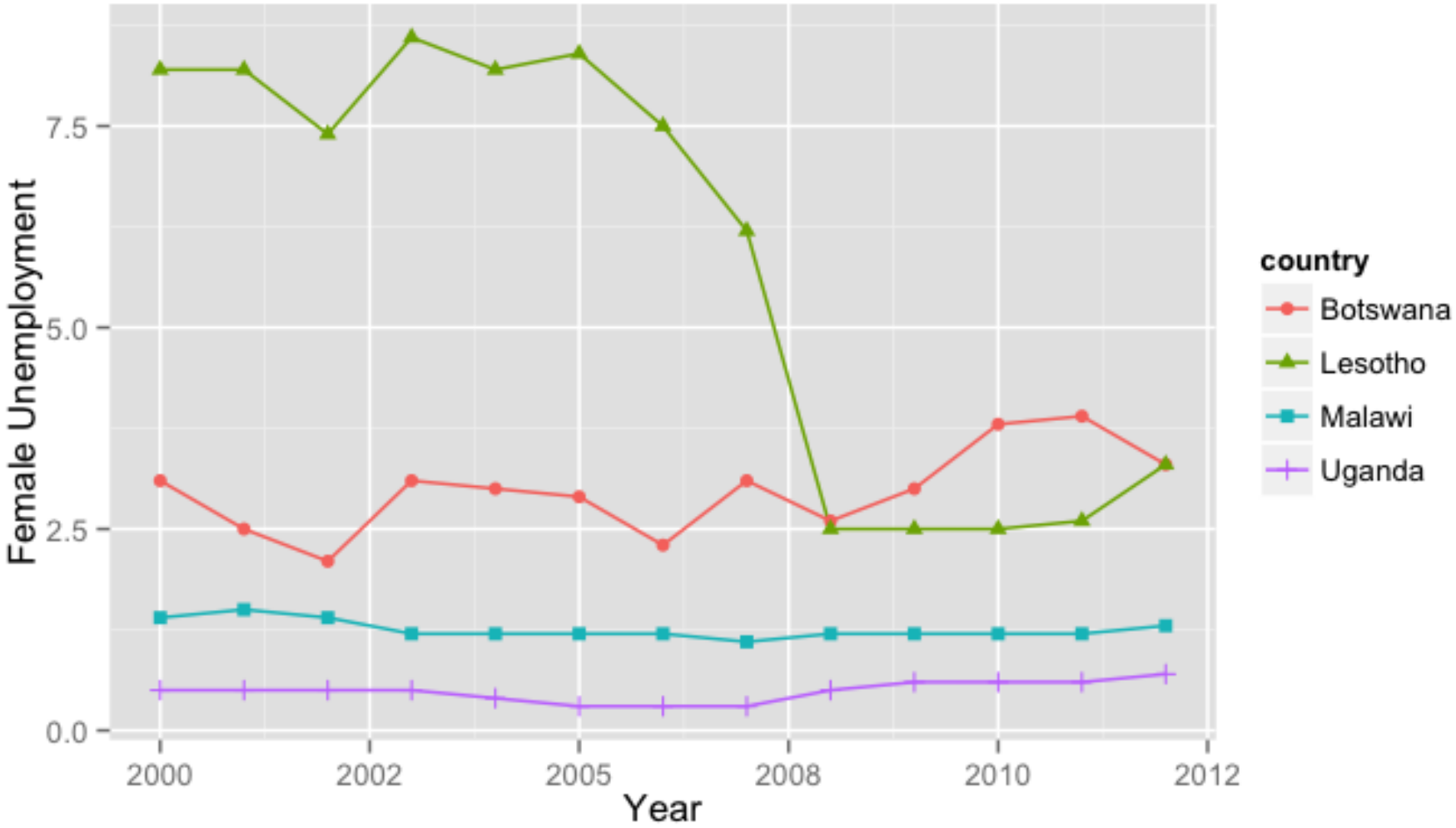
Case Studies



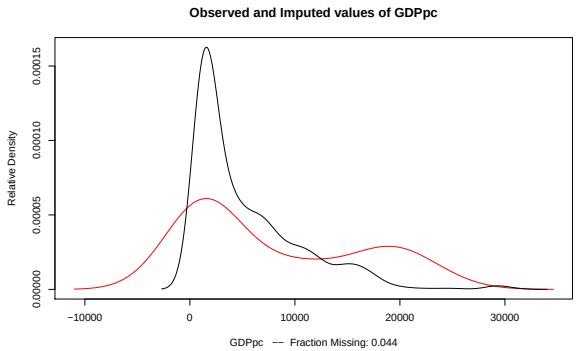
Female School Enrollment in Selected Countries

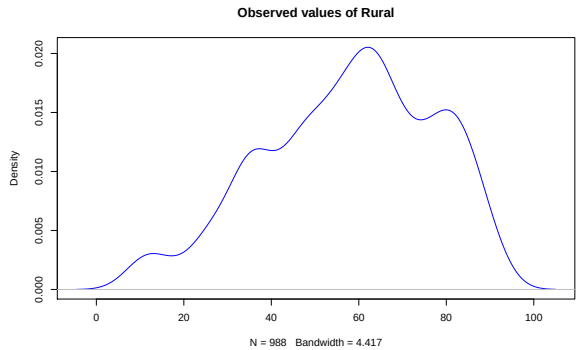


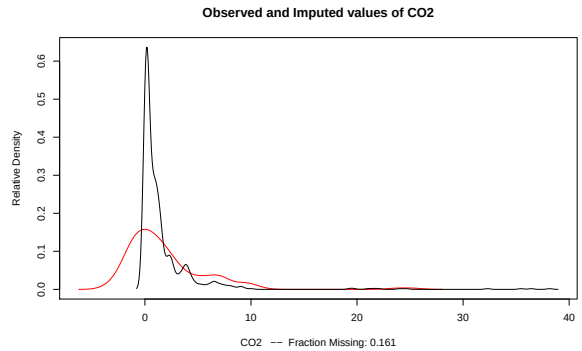
Female Unemployment compared to Total Unemployment in Selected Countries

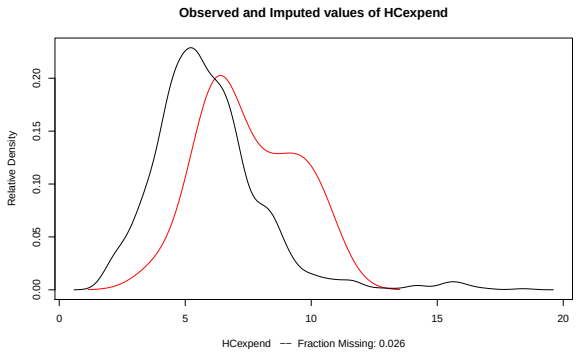


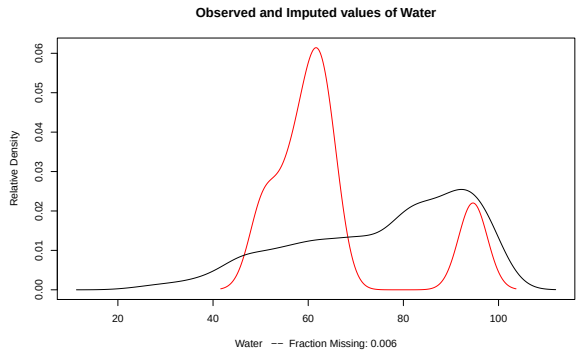
Imputed Missing Values

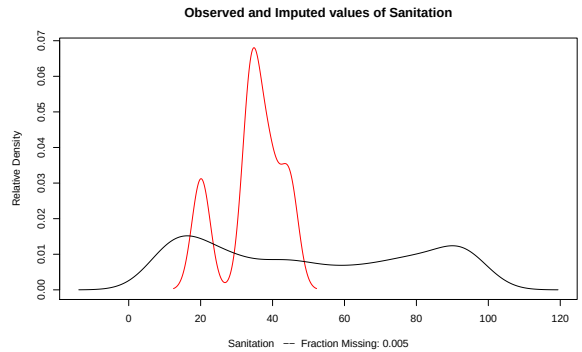


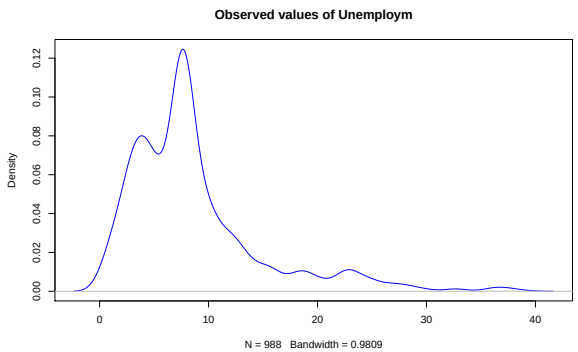


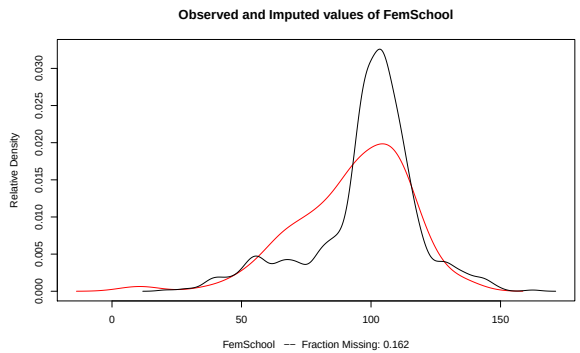


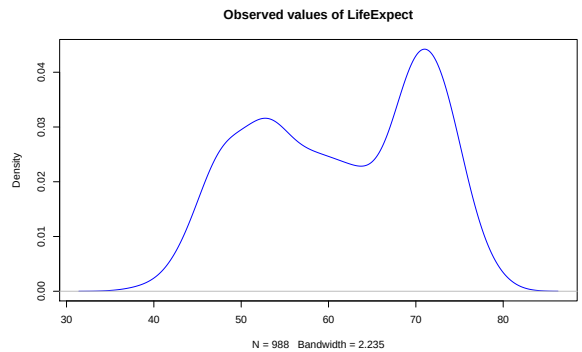












Logistic Regression Results - Model 1

Table 1: Logistic Regression Results of Model 1

Variables	Coefficients	Std. Error	T-Statistic	P-
Constant	-102.61	10.06	-10.20	
GDP per capita	-0.66	0.32	-2.10	
Share of Rural Population	-0.95	0.40	-2.37	
CO2 Emissions per capita	-1.07	0.20	-5.26	
Healthcare Expenditure	0.44	0.34	1.29	
Access to Water	0.48	0.74	0.65	
Access to Sanitation	0.26	0.24	1.09	
Life Expectancy	29.84	2.51	11.91	
Immunisation against DPT	-1.44	1.21	-1.19	
Immunisation against Measles	1.60	1.30	1.23	
Female School Enrollment	-3.55	0.52	-6.82	
Share of Female Unemployment	-0.03	0.03	-0.81	

Simple Linear Regression Results - Model 2

Table 2: OLS Regression Results of Model 2 with robust standard errors

Variables	Coefficients	Std. Error	T-Statistic	P-Val
Constant	15.95	1.54	10.39	0.
GDP per capita	0.17	0.07	2.23	0.
Rural Population	0.55	0.12	4.42	0.
CO2 Emissions	0.13	0.04	2.93	0.
Healthcare Expenditure	-0.13	0.11	-1.19	0.
Access to Water	0.25	0.19	1.37	0.
Access to Sanitation	0.00	0.07	0.01	0.
Life Expectancy	-7.10	0.30	-23.98	0.
DPT Immunisation	0.24	0.30	0.79	0.
Measles Immunisation	-0.12	0.32	-0.38	0.
Female School Enrollment	1.42	0.16	9.08	0.
Female Unemployment Share	0.13	0.02	6.86	0.

Conclusions & 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 & 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 School Enrollment 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 (!)