

Determinants of HIV

M. Moellenkamp and N. Rosenberg

December 4th, 2014

Presentation Outline

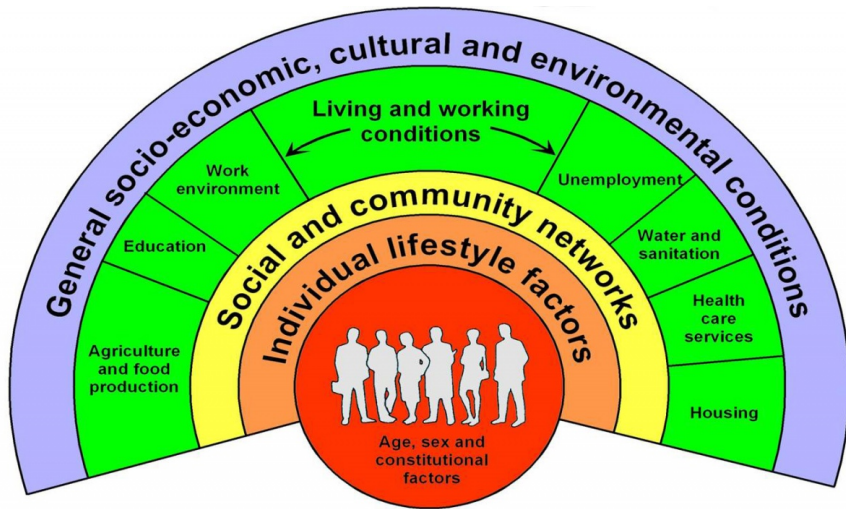
- Research Question & Motivation
- Theoretical Framework
- Methodology
- Descriptive Statistics
- Findings
- Conclusion & Limitations

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

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

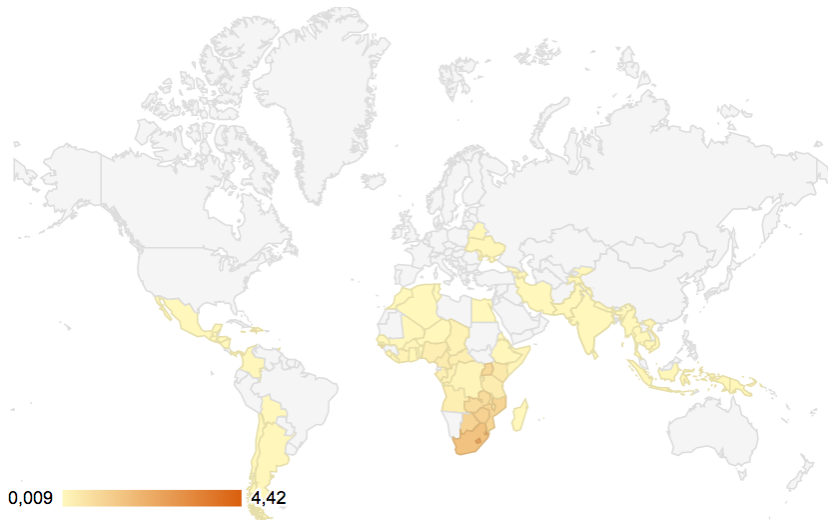
Datasets

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

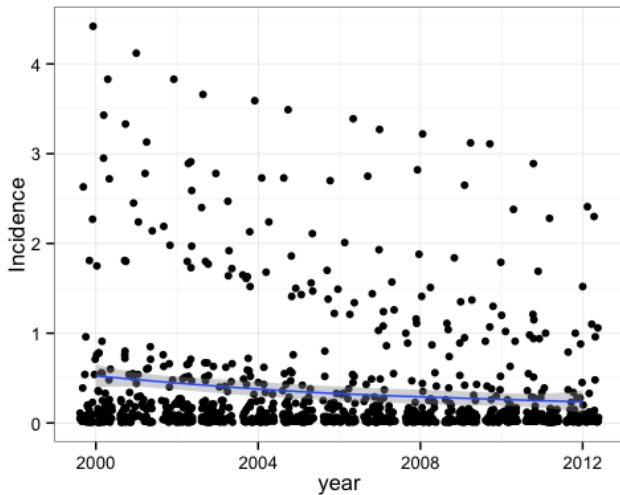
Methodology

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

Distribution of HIV Incidence Rates

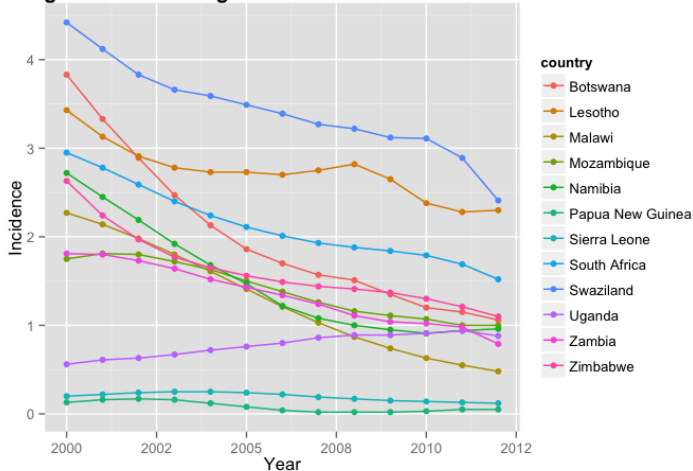


HIV Incidence Rates over Time

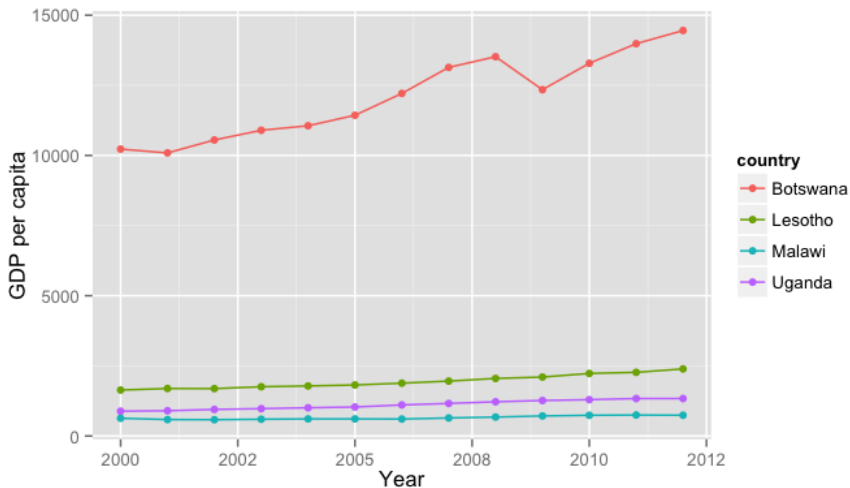


Interesting Cases for HIV Incidence Rates

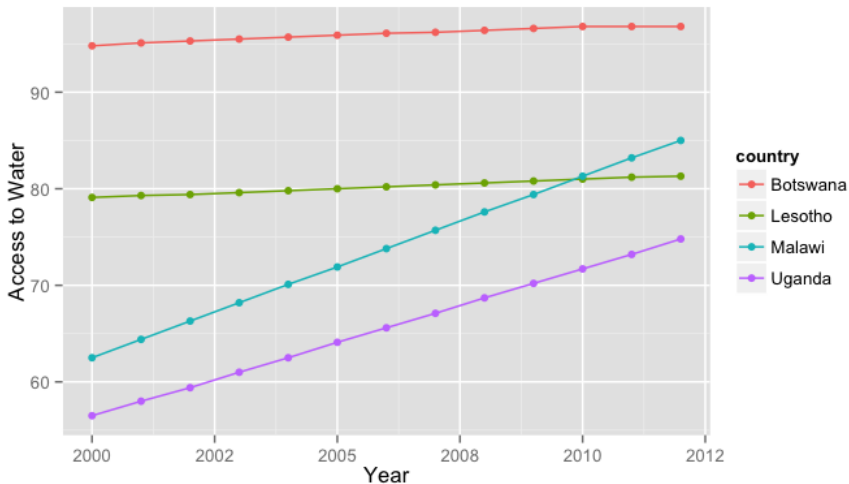
Figure 6: Interesting Cases for HIV Incidence Rates



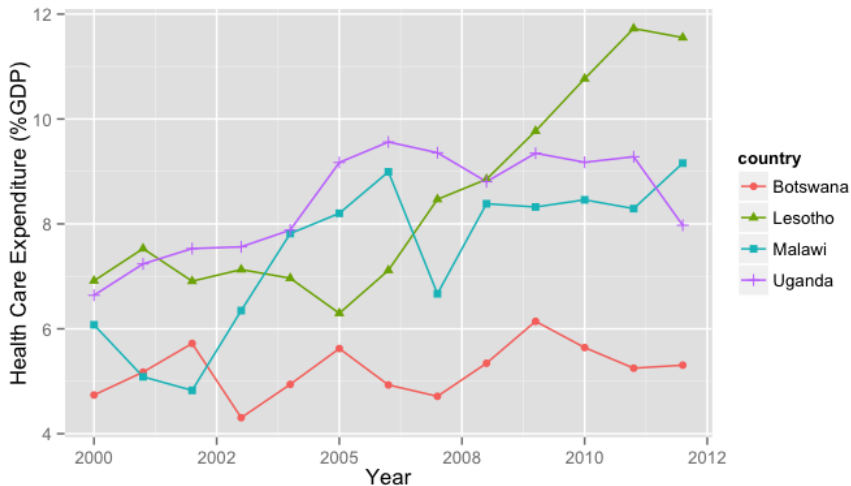
GDP per capita in Selected Countries



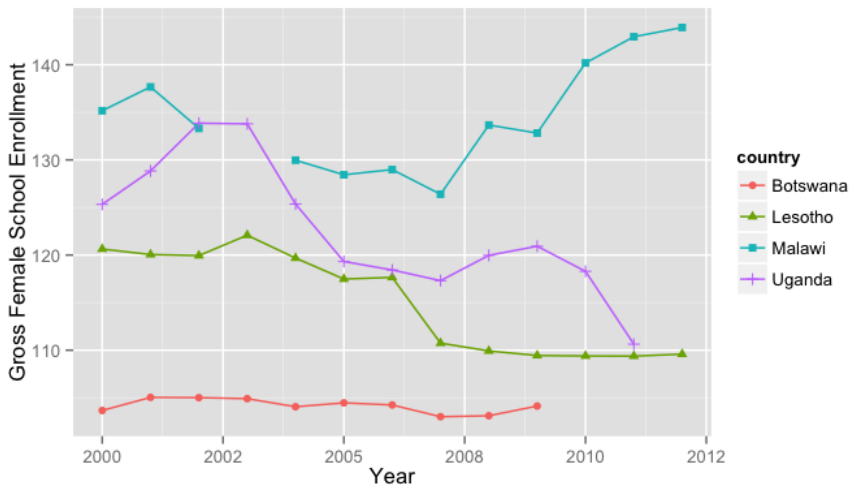
Access to Water in Selected Countries



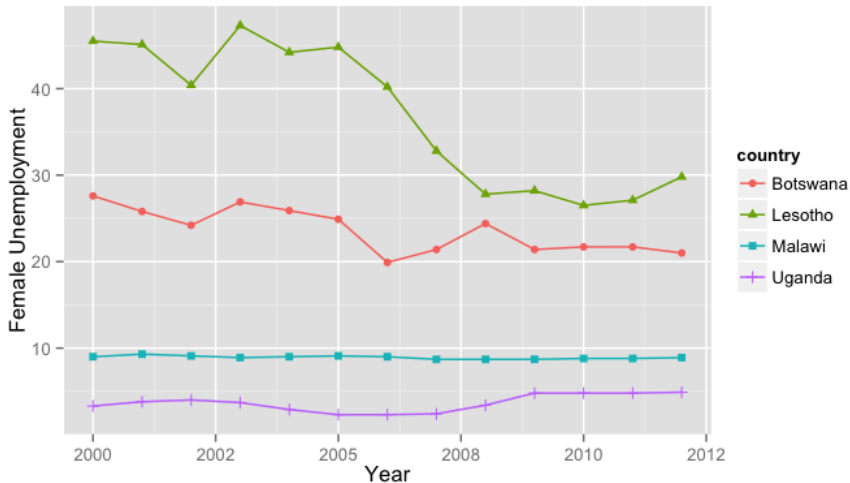
Health Care Expenditure in Selected Countries



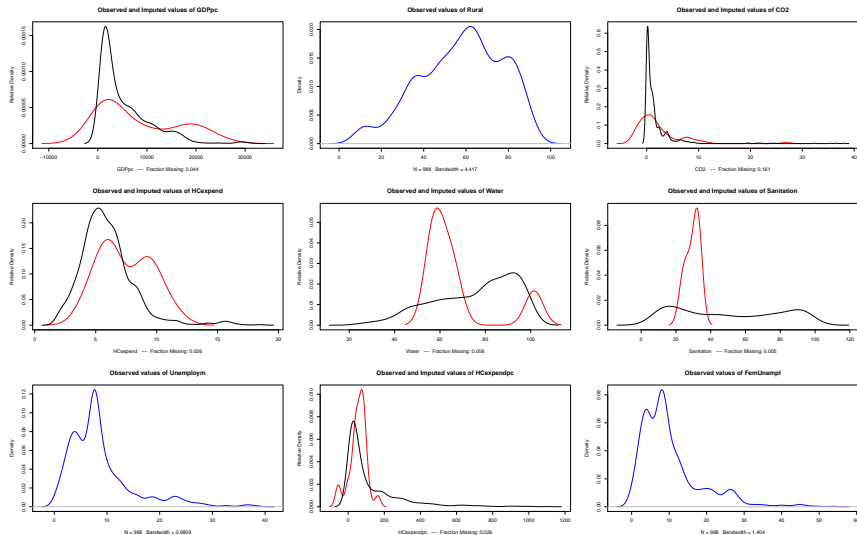
Female Schooling in Selected Countries



Female Unemployment in Selected Countries



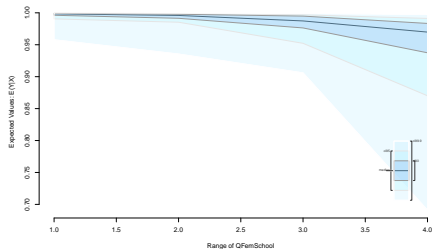
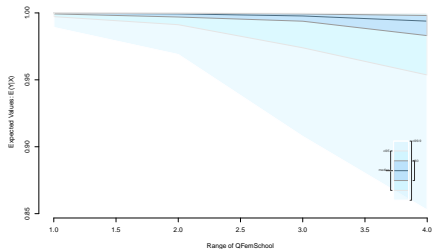
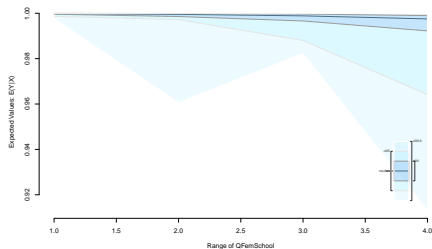
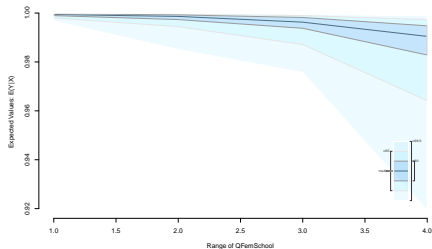
Imputed Missing Values



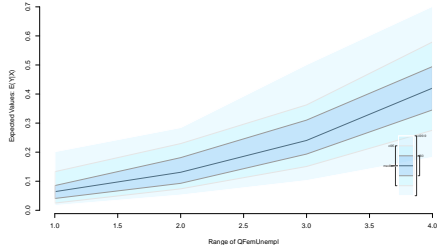
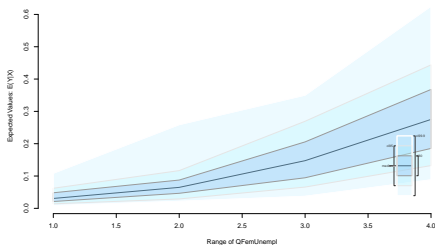
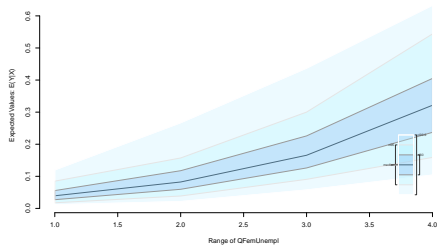
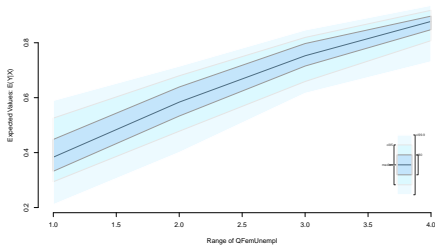
Logistic Regression Results - Model 1

	Value	Std. Error	t-stat	p-value
(Intercept)	-36.5896615	6.8786875	-5.3192795	0.0000001
IGDPpc	0.2479931	0.3305123	0.7503294	0.4532384
IRural	-2.5392906	0.5408157	-4.6952974	0.0000028
ICO2	-0.4980485	0.2026756	-2.4573675	0.0150365
IHCexpend	0.8508394	0.3903886	2.1794677	0.0297434
IWater	-2.4105764	0.8470398	-2.8458832	0.0044888
ISanitation	0.8956104	0.2779395	3.2223217	0.0012763
ILifeExpect	19.2066126	1.7027269	11.2799135	0.0000000
IDPT	-0.9377386	1.0716538	-0.8750387	0.3829638
IMeasles	1.8465081	1.1987140	1.5404075	0.1249106
IFemUnempl	-1.7964681	0.2547641	-7.0514972	0.0000000
IFemSchool	-5.7471216	0.7099762	-8.0948083	0.0000000

Predicted Probabilities - Female School Enrollment



Predicted Probabilities - Female Unemployment



Simple Linear Regression Results - Model 2

	Value	Std. Error	t-stat	p-value
(Intercept)	7.6016212	1.6480727	4.6124308	0.0000053
IGDPpc	0.0073405	0.0735743	0.0997700	0.9205507
IRural	0.1948995	0.1397198	1.3949311	0.1635197
ICO2	0.1060814	0.0318163	3.3341863	0.0008930
IHCexpend	0.4191853	0.1044114	4.0147447	0.0000647
IWater	-0.3531032	0.1844598	-1.9142562	0.0561682
ISanitation	0.0646558	0.0711061	0.9092850	0.3633758
ILifeExpect	-3.4307092	0.3594631	-9.5439809	0.0000000
IDPT	0.6137324	0.2451574	2.5034217	0.0123071
IMeasles	-0.0918037	0.2433666	-0.3772238	0.7060123
IFemUnempl	0.4244171	0.0480081	8.8405218	0.0000000
IFemSchool	0.5286584	0.1505558	3.5113781	0.0006434

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 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 (!)