

# Determinants of HIV

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December 4th, 2014

# 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

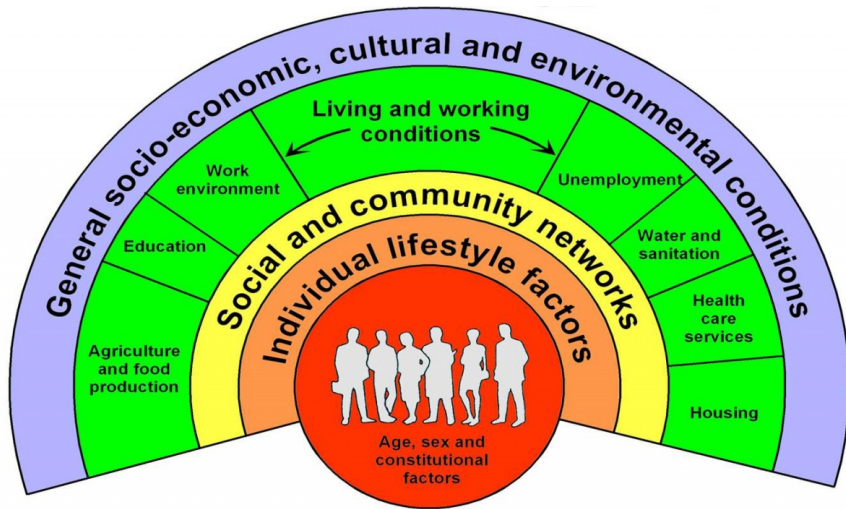
## Methodology

- 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

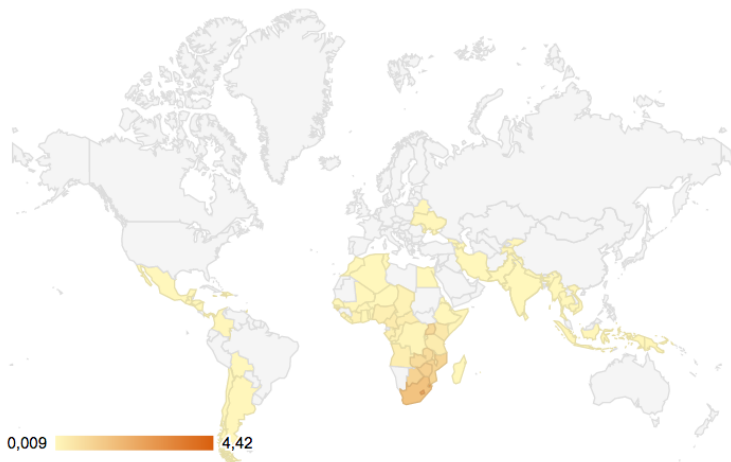


Figure 2: Incidence Rate over Time

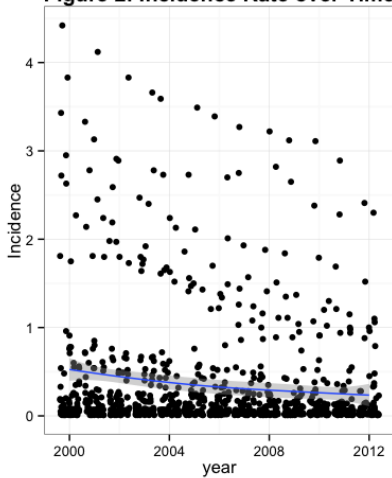
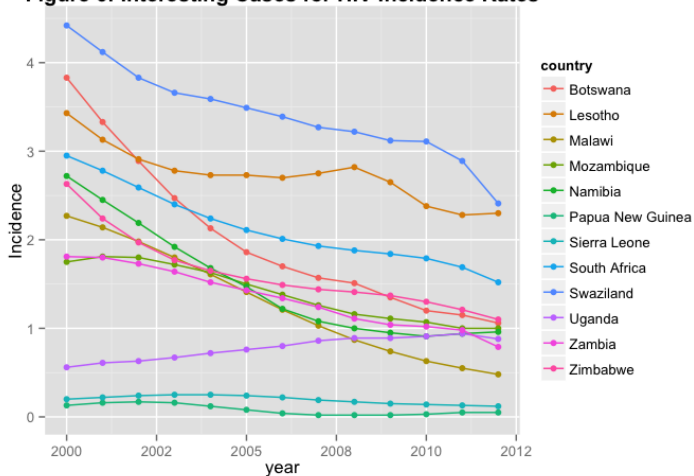
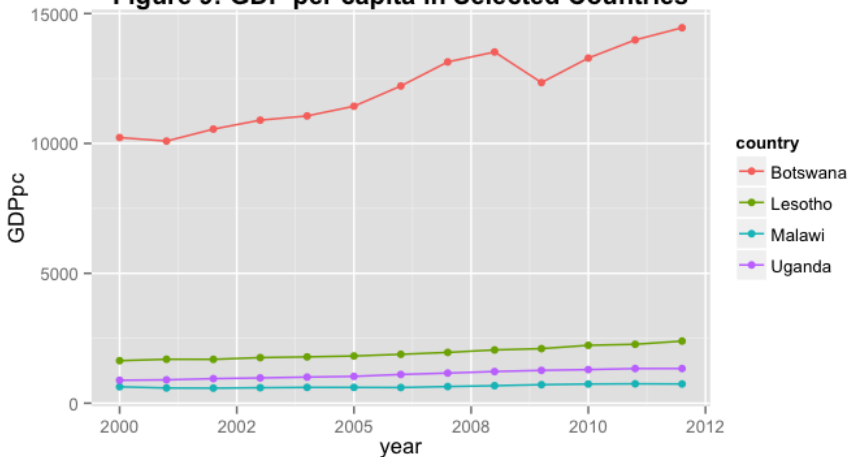




Figure 6: Interesting Cases for HIV Incidence Rates



**Figure 9: GDP per capita in Selected Countries**



**Figure 7: Access to Water in Selected Countries**

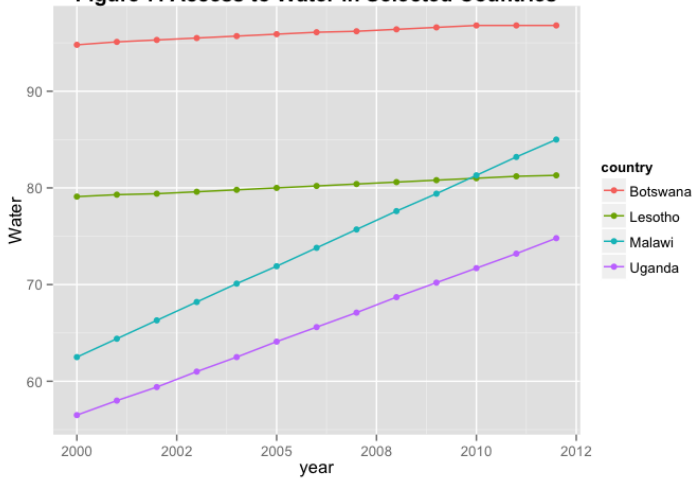
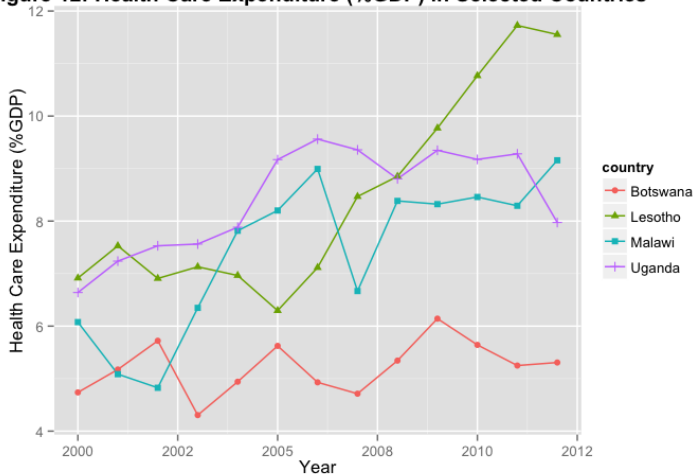
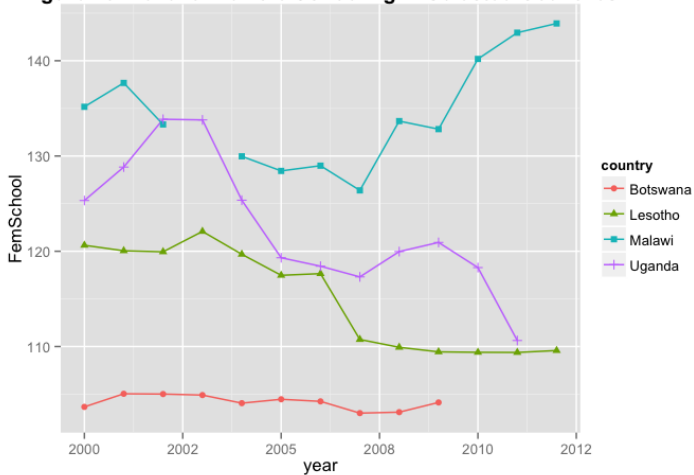


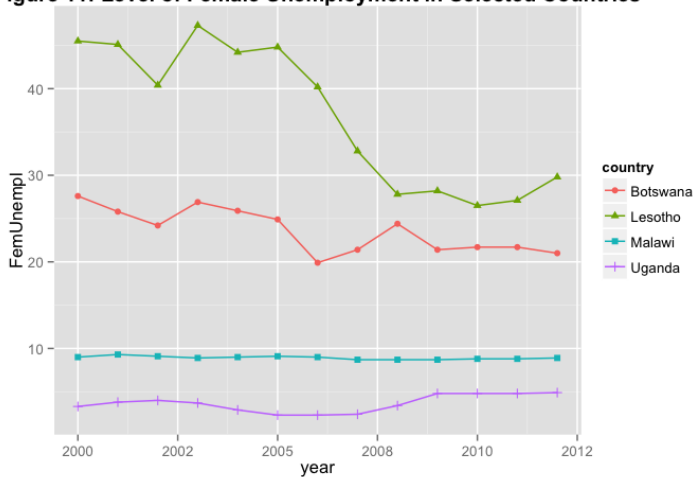
Figure 12: Health Care Expenditure (%GDP) in Selected Countries



**Figure 10: Level of Female Schooling in Selected Countries**



**Figure 11: Level of Female Unemployment in Selected Countries**



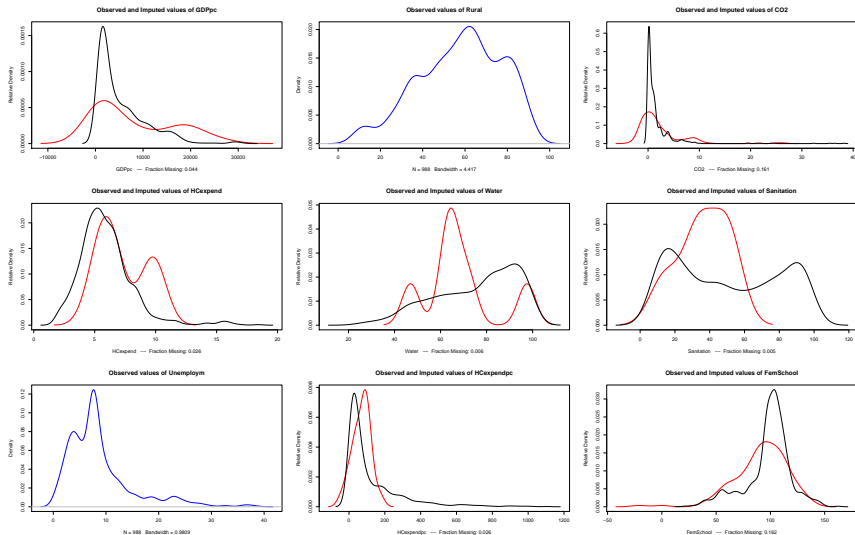
# The Model

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



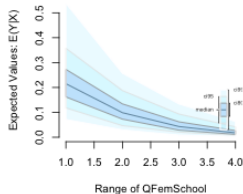
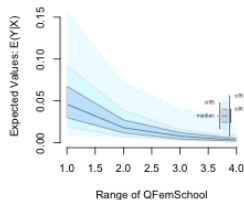
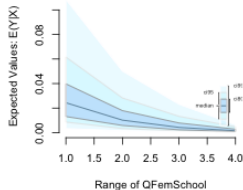
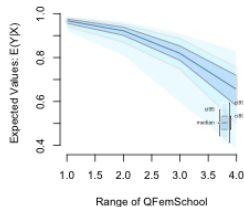


# Logistic Regression Results - Model 1

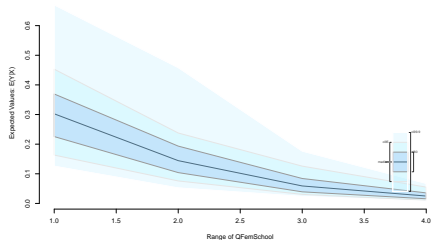
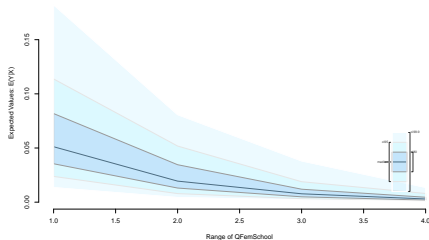
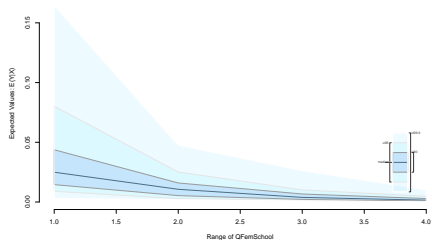
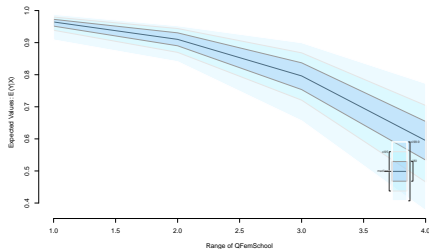
	Value	Std. Error	t-stat	p-value
(Intercept)	-36.0776310	6.8646353	-5.2555787	0.0000002
IGDPpc	0.1866171	0.3636709	0.5131484	0.6094873
IRural	-2.5665287	0.5490222	-4.6747267	0.0000034
ICO2	-0.4506914	0.1908245	-2.3618110	0.0183994
IHCexpend	0.9024232	0.3955869	2.2812261	0.0231843
IWater	-2.3046235	0.9095906	-2.5336931	0.0125176
ISanitation	0.8355776	0.2965467	2.8176932	0.0053085
ILifeExpect	18.9735067	1.7744598	10.6925535	0.0000000
IDPT	-0.6221619	1.0358132	-0.6006507	0.5484599
IMeasles	1.5523050	1.1459436	1.3546086	0.1758397
Inverse	1.8257653	0.2575489	7.0890049	0.0000000
IFemSchool	-5.5971714	0.7123059	-7.8578195	0.0000000

# Predicted Probabilities

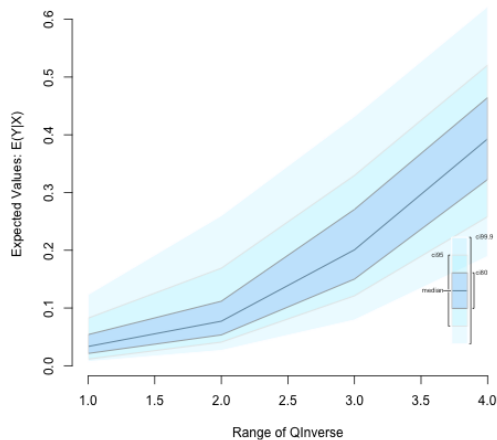
# Malawi



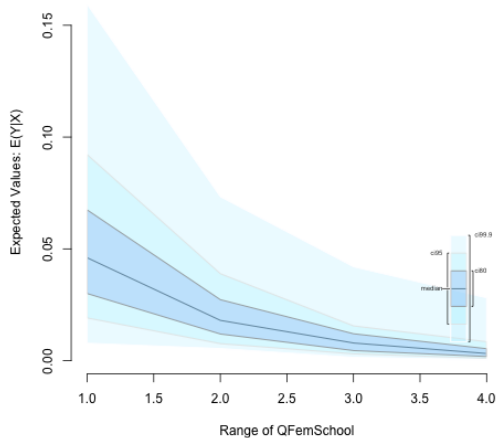
# Predicted Probabilities



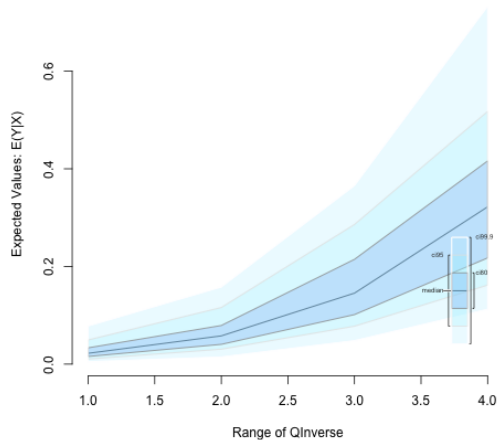
# Malawi 2



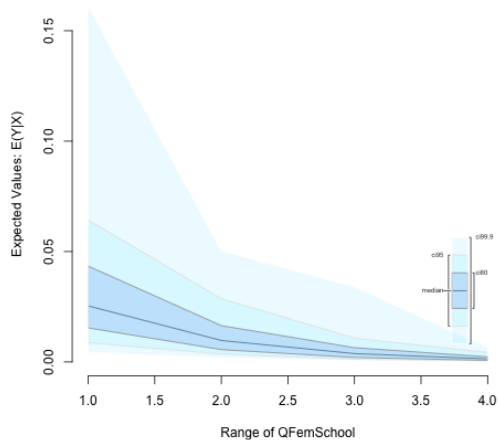
# Botswana



# Botswana 2

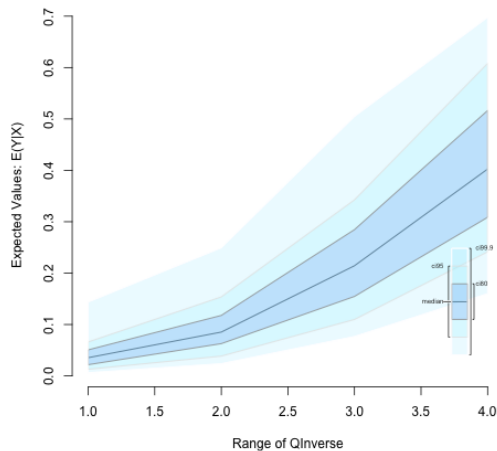


# Lesotho

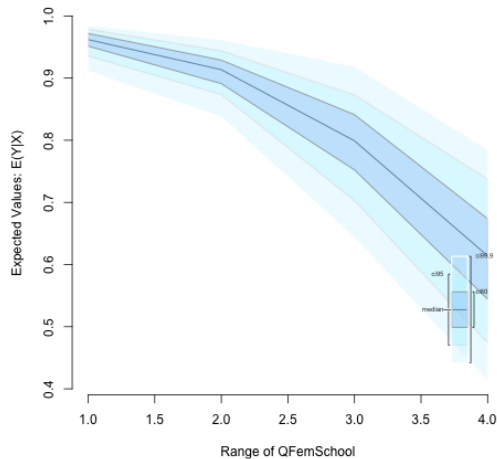




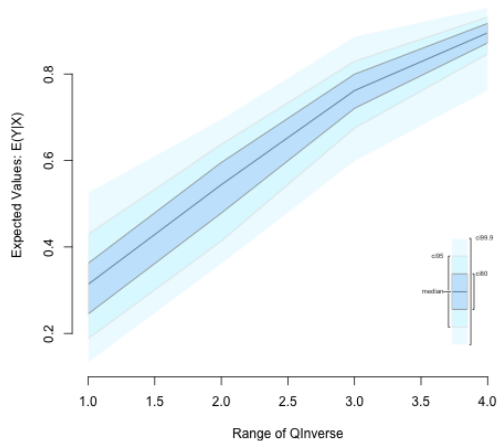
# Lesotho 2



# Uganda



# Uganda 2



## Simple Linear Regression Results - Model 2

	Value	Std. Error	t-stat	p-value
(Intercept)	7.4498239	1.6096034	4.6283600	0.0000044
IGDPpc	0.0032015	0.0781252	0.0409791	0.9673815
IRural	0.2041600	0.1392433	1.4662104	0.1430518
ICO2	0.1089287	0.0322015	3.3827251	0.0008595
IHCexpend	0.3960791	0.1141970	3.4683833	0.0007897
IWater	-0.3456350	0.1936719	-1.7846424	0.0766287
ISanitation	0.0643750	0.0724753	0.8882334	0.3749287
ILifeExpect	-3.4298601	0.3495758	-9.8114932	0.0000000
IDPT	0.5965885	0.2447571	2.4374717	0.0148068
IMeasles	-0.0720650	0.2420726	-0.2976998	0.7659388
Inverse	-0.4302697	0.0480162	-8.9609364	0.0000000
IFemSchool	0.5581984	0.1578556	3.5361329	0.0009380

## Fixed Effects Regression Results - Model 2

	Value	Std. Error	
(Intercept)	-0.3080706	3.6470804	-0.08
IGDPpc	0.0428059	0.1397653	0.30
IRural	2.9502001	0.6164271	4.78
ICO2	0.0603335	0.0483555	1.24
IHCexpend	-0.0109519	0.1156796	-0.09
IWater	-1.3667079	0.3575396	-3.82
ISanitation	-0.5250274	0.3228189	-1.62
ILifeExpect	-0.8357651	0.3327694	-2.51
IDPT	0.7991539	0.1985394	4.02
IMeasles	-0.7044658	0.1945363	-3.62
Inverse	-0.1170890	0.1013992	-1.15
IFemSchool	0.0104509	0.1271734	0.08
as.factor(country)Burundi	-3.7506218	0.5306729	-7.06
as.factor(country)Cameroon	-1.8206610	0.2652903	-6.86
as.factor(country)Central African Republic	2.7776647	0.4227520	6.55

# 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 (!)