Estimating the impact of HIV and AIDS on the supply of basic education

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Outline

- Introduction to the impact of HIV on education and the study
- Presentation of study
  - Methods and the Ed-SIDA modelling tool
  - Quantitative impacts
  - Financial impacts
  - Comparison with impact data
- Conclusions

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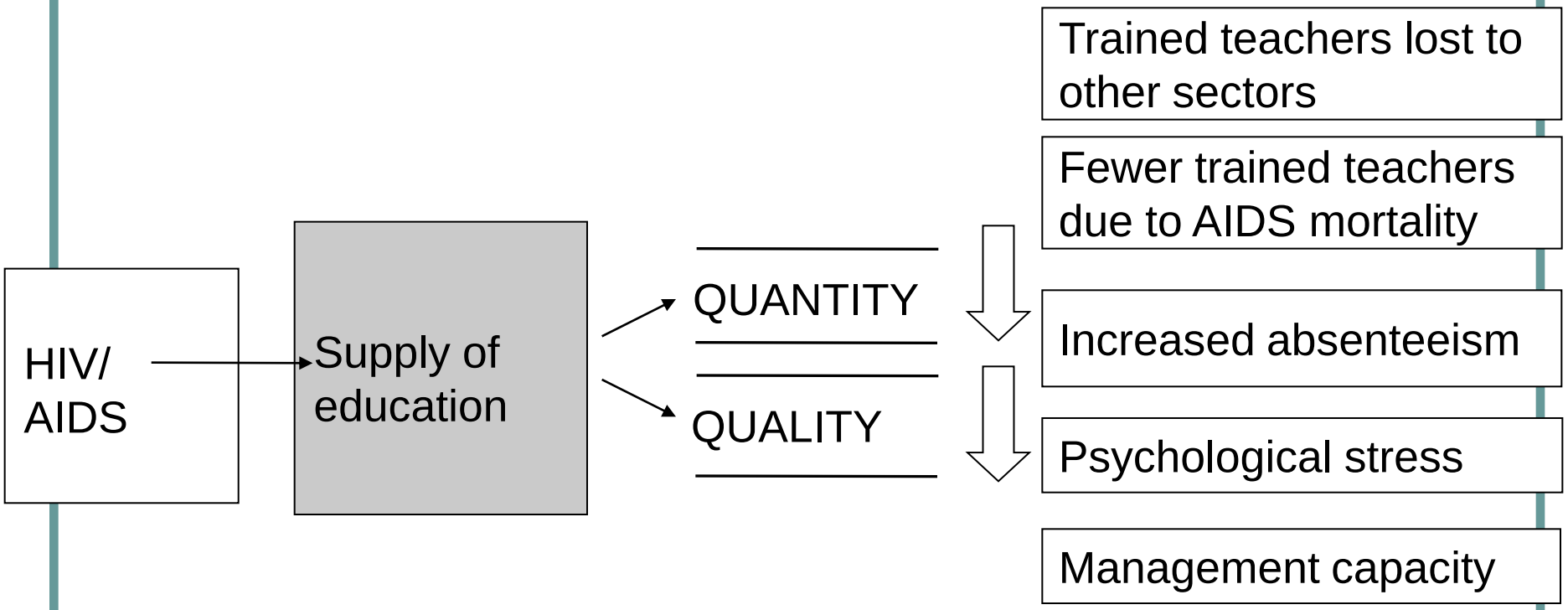
Impacts of HIV and AIDS on education supply



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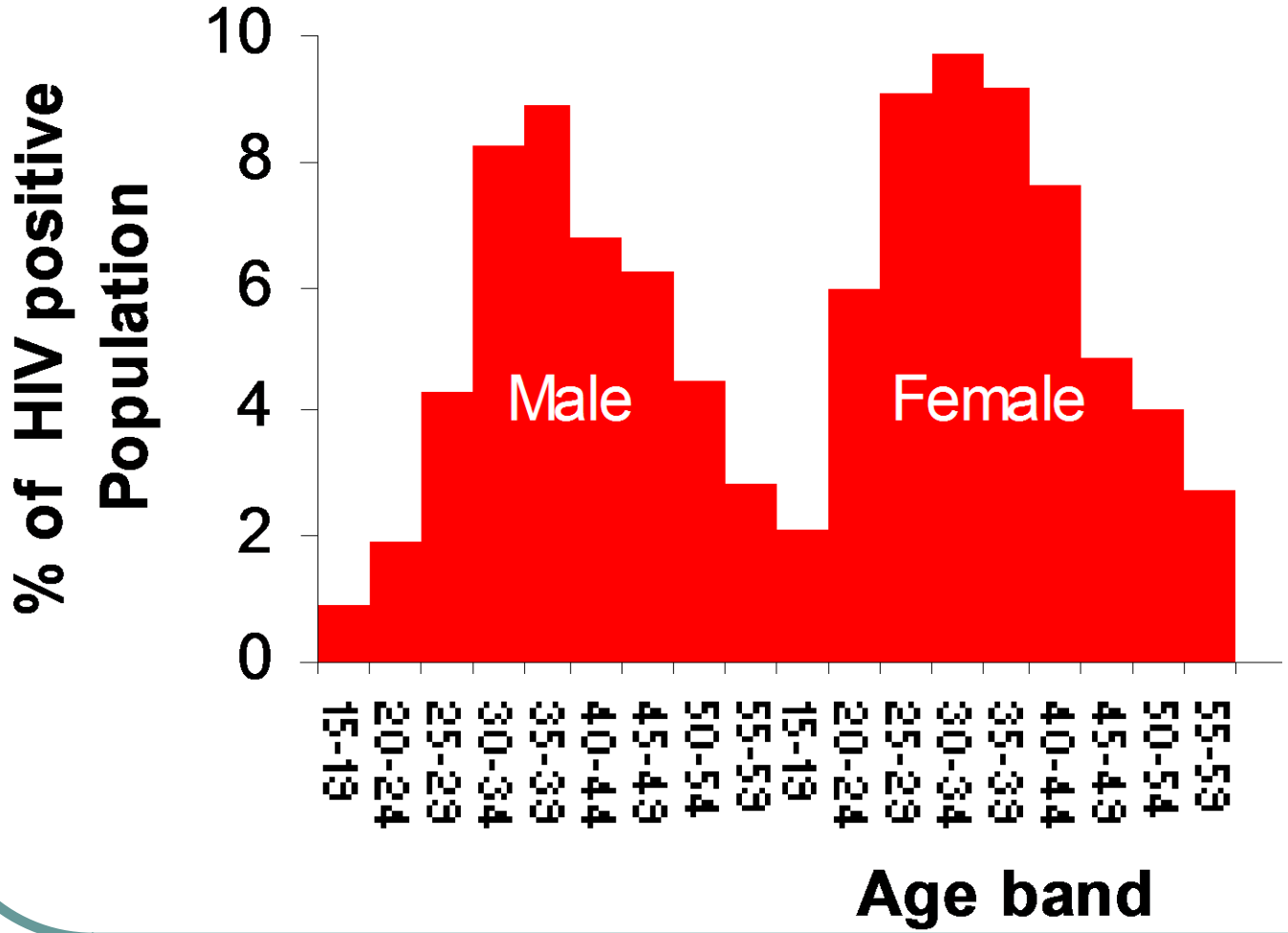
Teachers with HIV and AIDS

Teachers have different characteristics to the general population which means they have a different susceptibility to HIV infection

Age distribution of HIV infection



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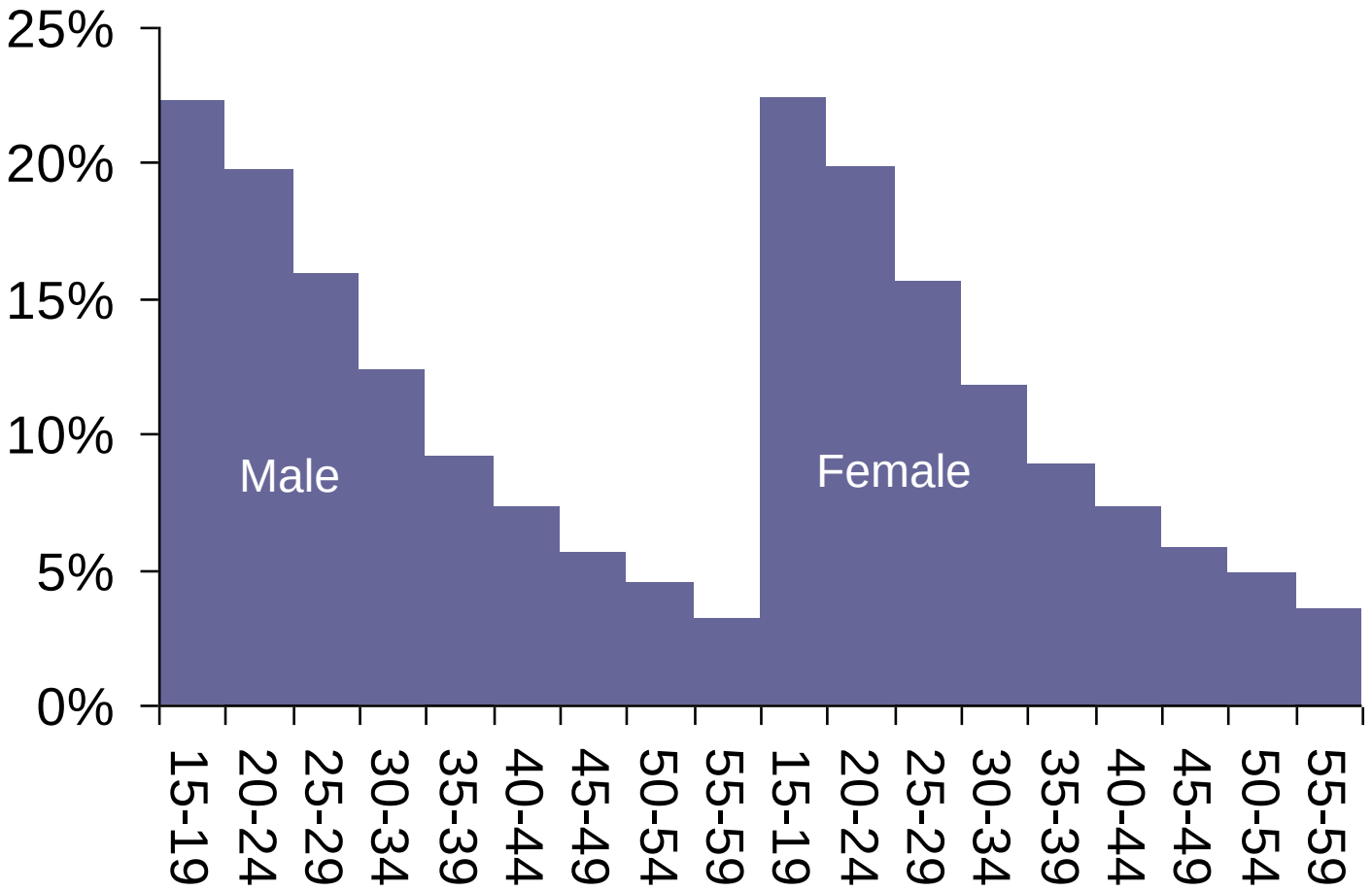
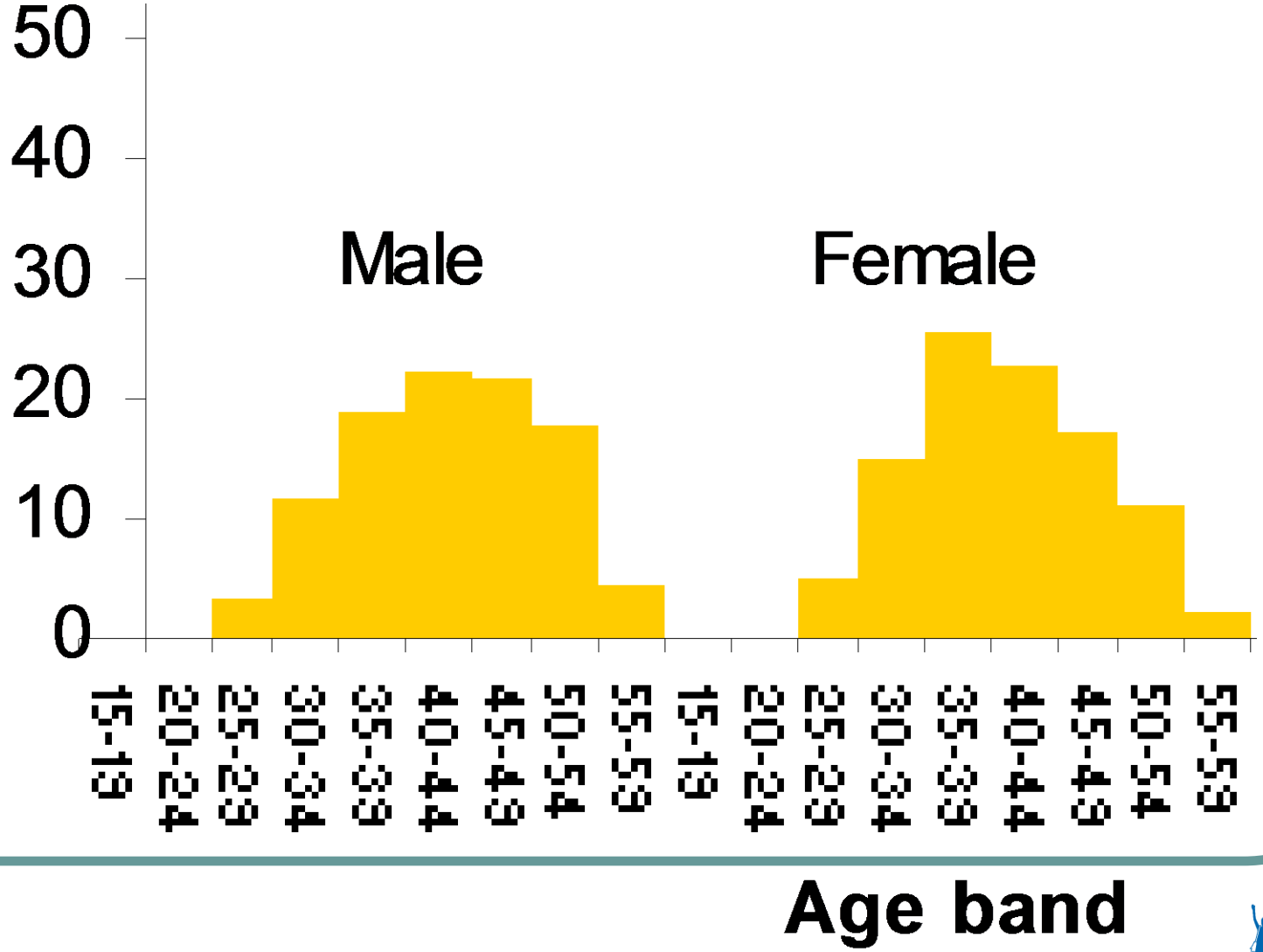
Age distribution of population (same country)



Age distribution of teachers



Gender distribution of teachers

Region	Percent female teachers
Sub-Saharan Africa	46%
Caribbean	80%
South-East Asia	69%

Countries are countries involved in this study, data from UIS

Socio-economic characteristics of teachers

Wealth and Mobility

- Both might increase teacher's risk of acquiring HIV
- We don't know by how much

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Socio-economic characteristics of teachers

Region	Ratio of teacher salary to GDP pc
Sub-Saharan Africa	5.1
Latin America and the Caribbean	2.6
East Asia/Pacific	2.9

Source: Schooling Quality in a Cross Section of Countries Lee and Barro 2000

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Socio-economic characteristics of teachers

Education

- Education *per se* is protective against HIV acquisition
- Teachers in many countries are trained to teach others how to avoid infection directly

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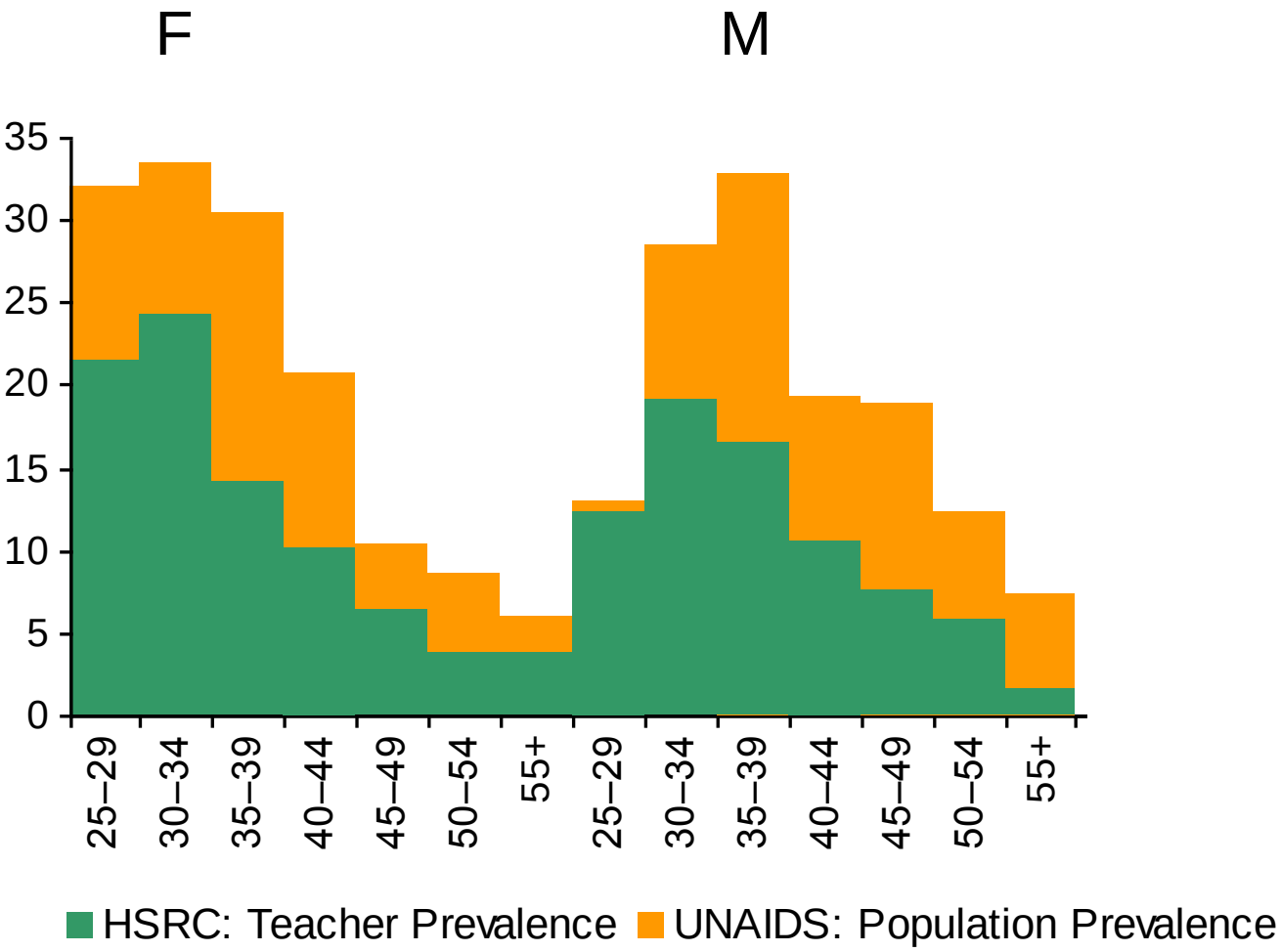
Teacher Relative Risk



Purpose of study

- To examine the systemic impact of HIV on the supply of education in countries with generalised epidemics in three continents
  - What are the quantitative effects on teachers
  - What are the cost implications of HIV on the achievement of Education For All
  - In the era of Anti-Retroviral therapy, what impact would the immediate provision of universal therapy have?

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Main findings

- In Sub-Saharan Africa, it is cost effective to implement universal testing and treatment of teachers
- In the Caribbean, the savings to the education sector generated by universal treatment would pay for all necessary drugs
- The additional teacher recruitment required to achieve EFA in SSA can be reduced to very low levels through universal access to VCT & ART

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Approach

- Models used:
  - UNAIDS models of HIV in the population
  - Ed-SIDA model of the impact of HIV on education
- Runs were performed for 53 countries with generalised epidemics across three continents
- Results were aggregated by continent

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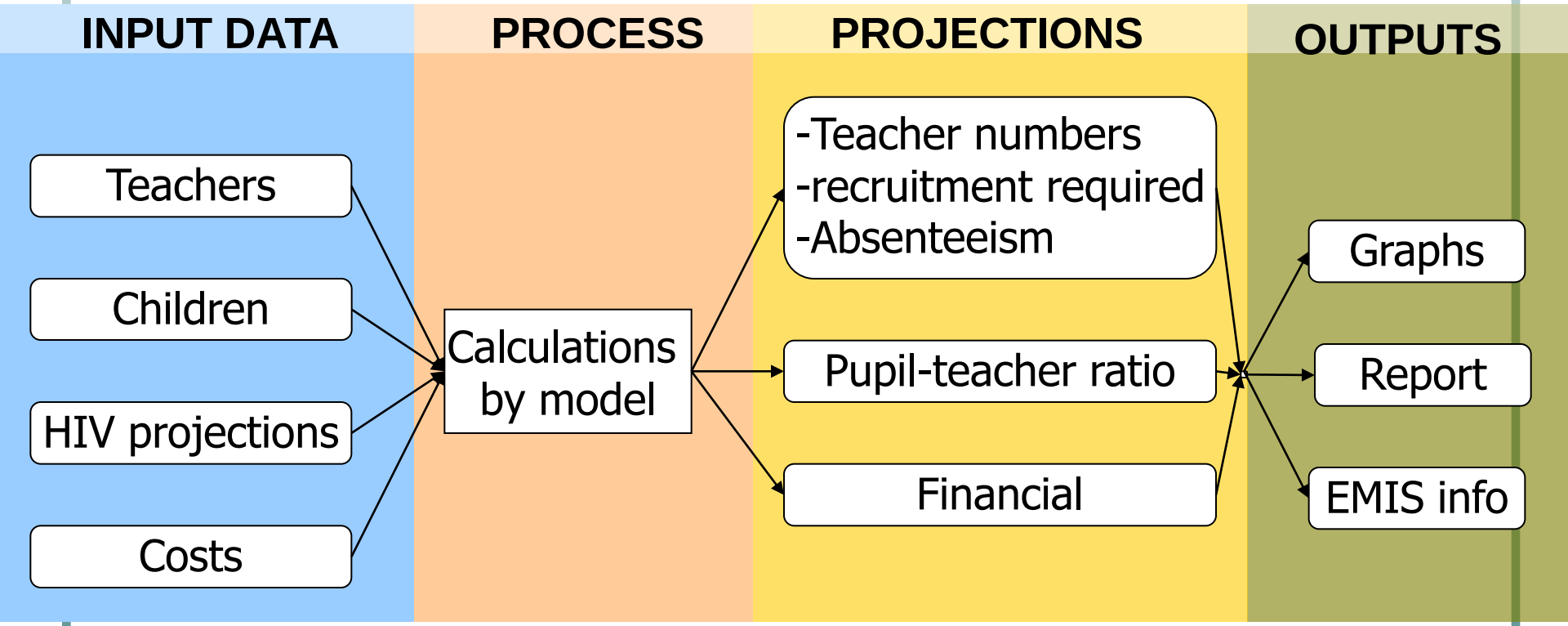
The **Ed-SIDA** Model of the impact of HIV and AIDS on education systems

Ed-SIDA modelling process



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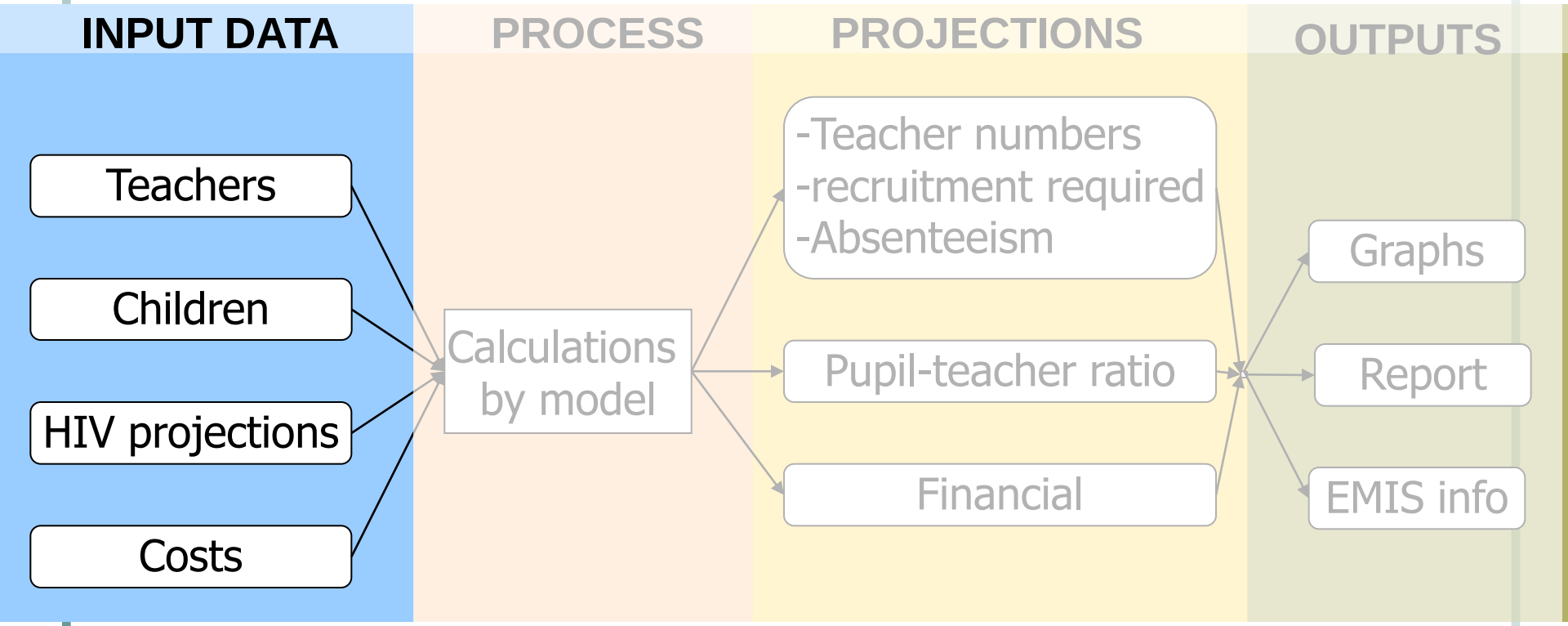
Ed-SIDA modelling process

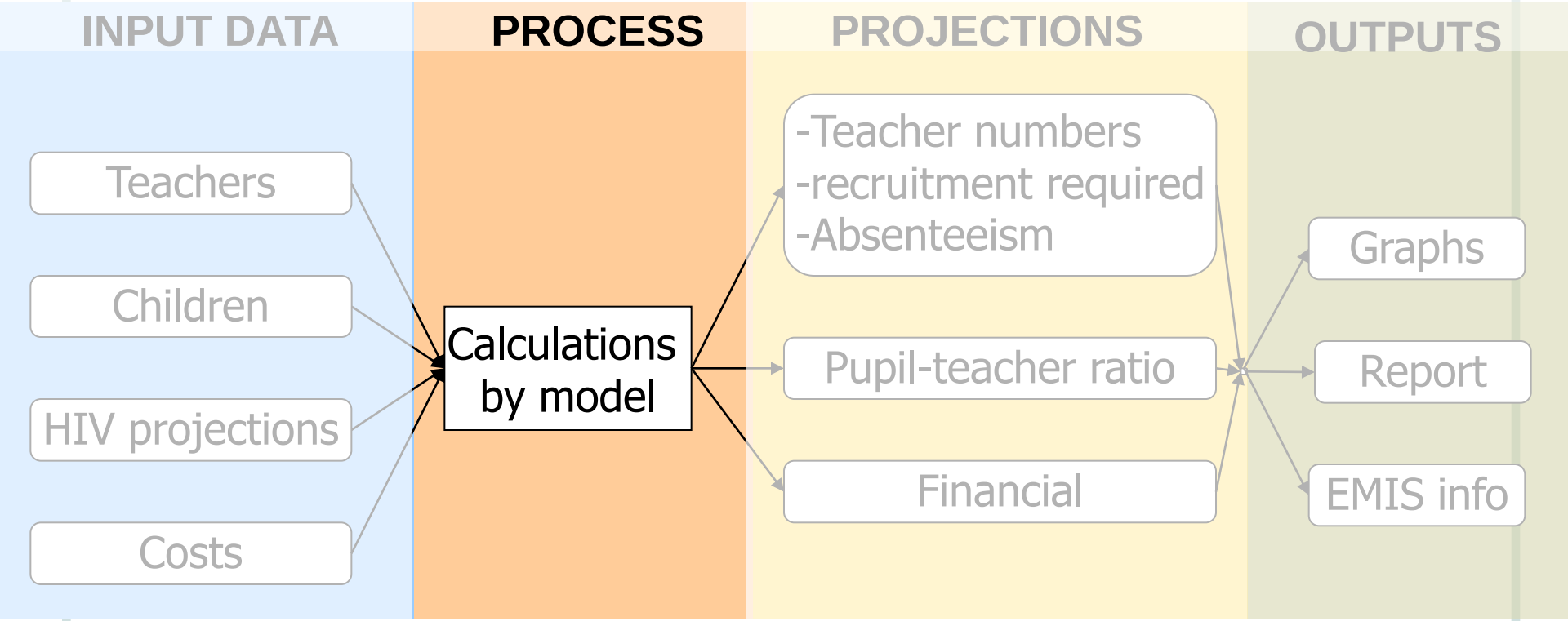


Year	1990	1991	1992	1993	1
Absolute number of teachers (entered from records)	96850	98174	1013		

Inputs to the model

- Demographic information on teachers
- Teacher relative risk of infection
- UNAIDS model outputs
- Costs:
  - Salary of replacement teacher
  - Cost of training a new teacher
  - Death benefit payable to families
  - ART per year and VCT per visit

Ed-SIDA modelling process

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=IF((D151+D150)<D119,D119,(D151+D150))
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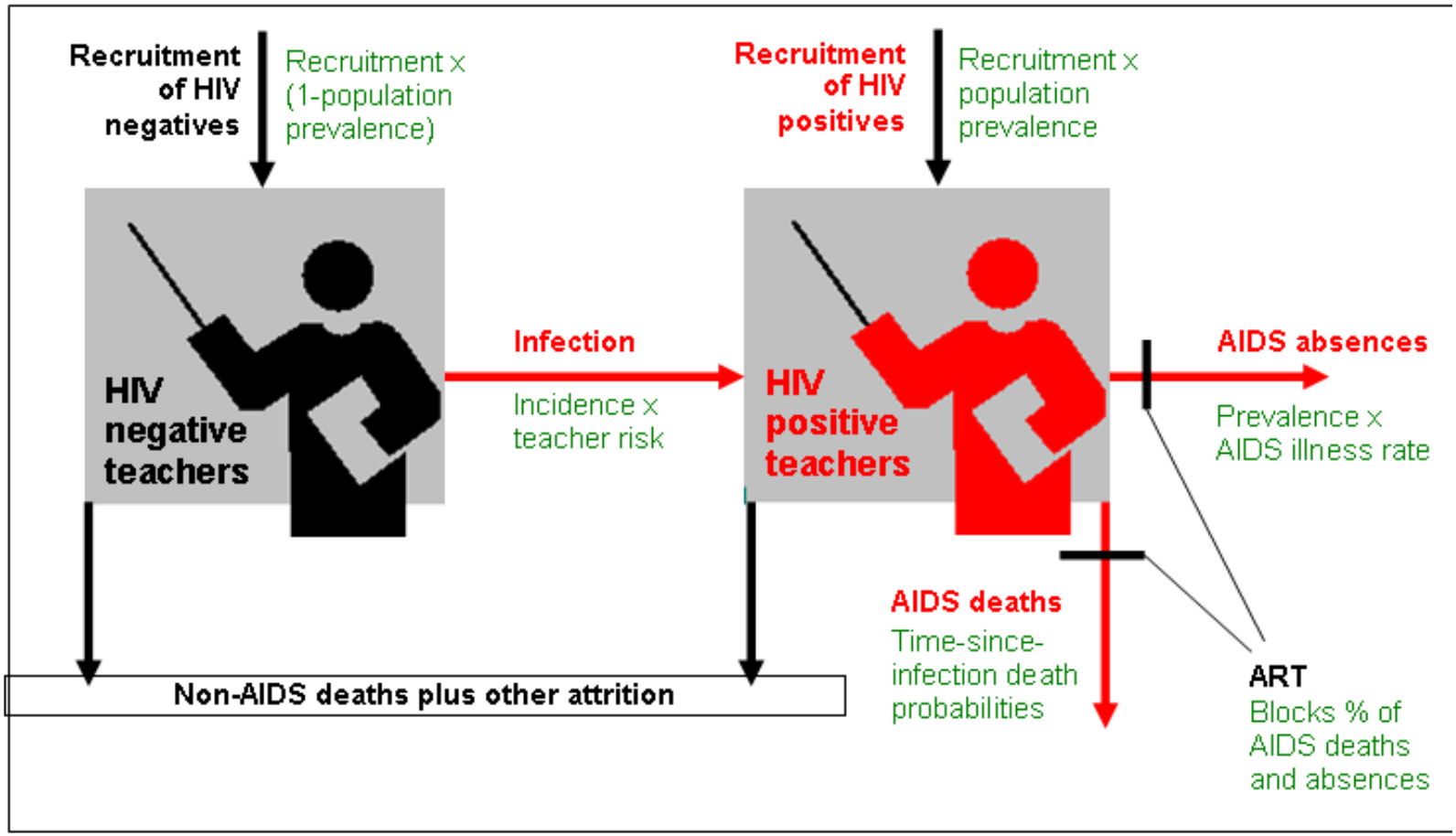
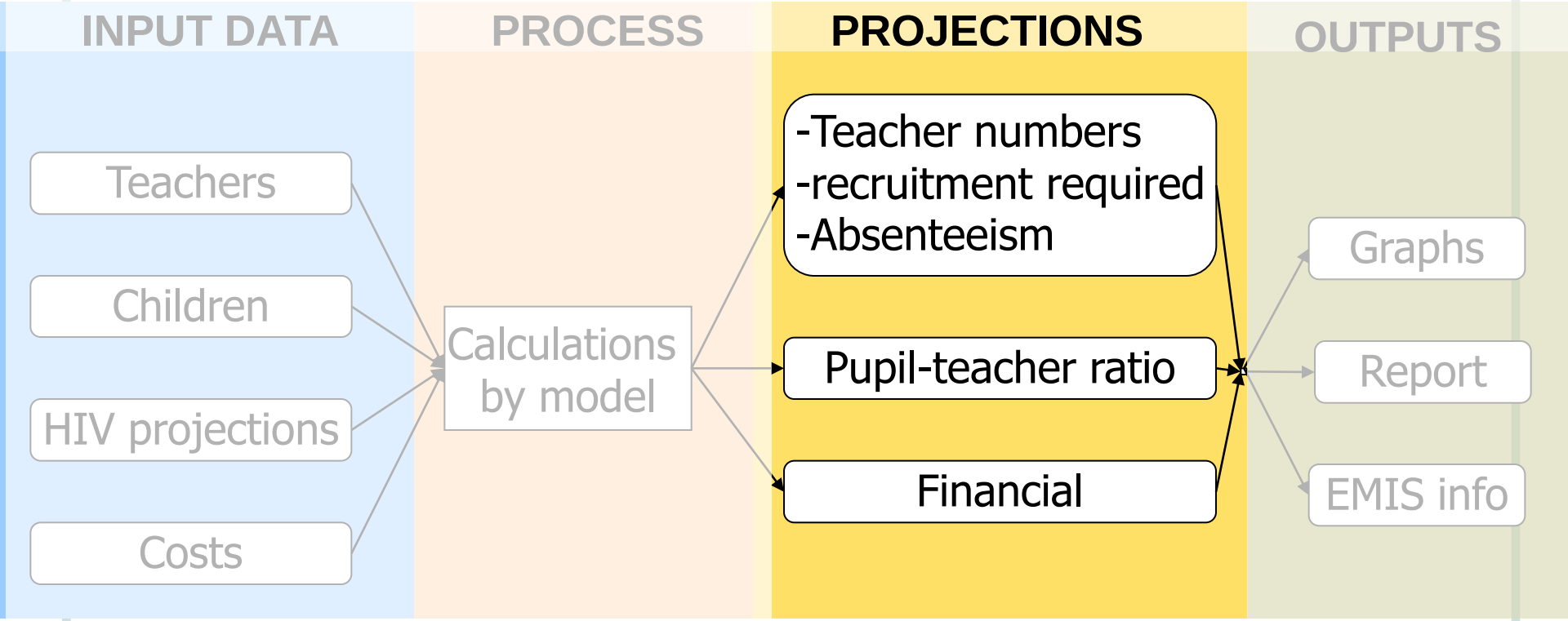
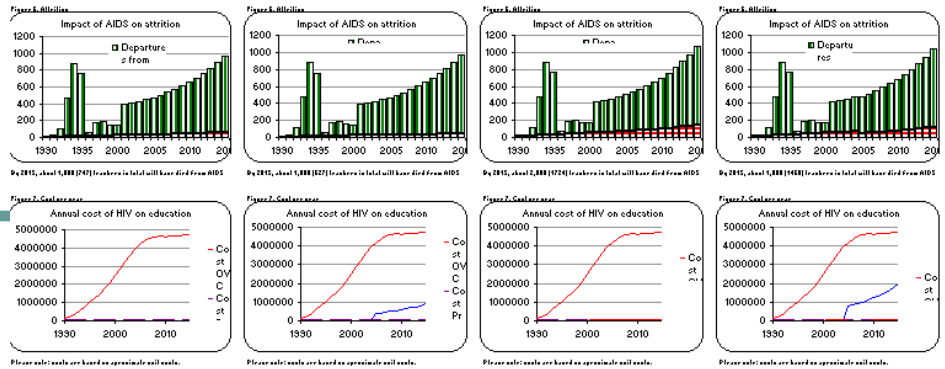
Model diagram



Ed-SIDA modelling process





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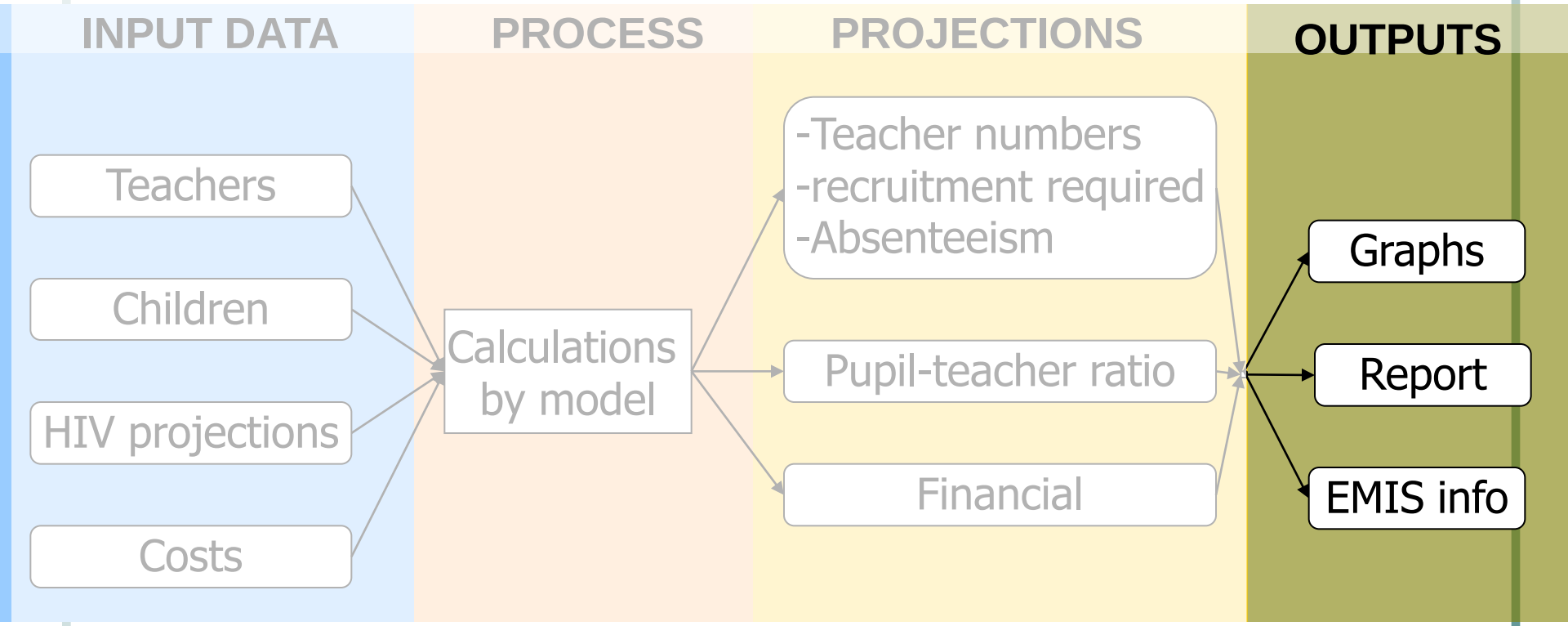
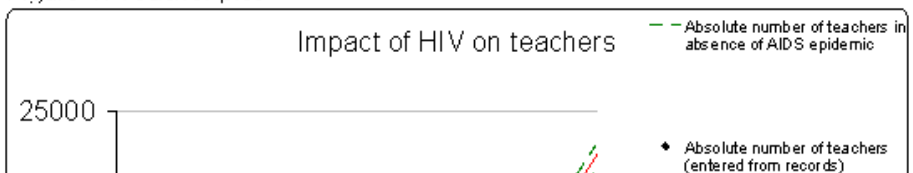


Ed-SIDA results scenario 1: Optimistic, no ART provided

Average prevalence; 0x increase in risk fom 2005; Teachers 1x at risk compared to population; 0% teachers who require ART treated in 2015

Figure 1. Teacher plot



Ed-SIDA

- A Planning Tool. It outputs the teacher recruitment rate required to achieve:
  - 100% enrolment
  - Low PTR (<40)
- Scenario analysis, allowing the user to explore:
  - High/low impact scenarios
  - Treatment provision scenarios

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Multi-country analyses

- Model was run for
  - 40 sub-Saharan African countries
  - 8 Caribbean countries
  - 5 South-East Asian countries
- Where data were unavailable
  - Data were sourced from the nearest country
  - Costs were scaled on per capita GDP

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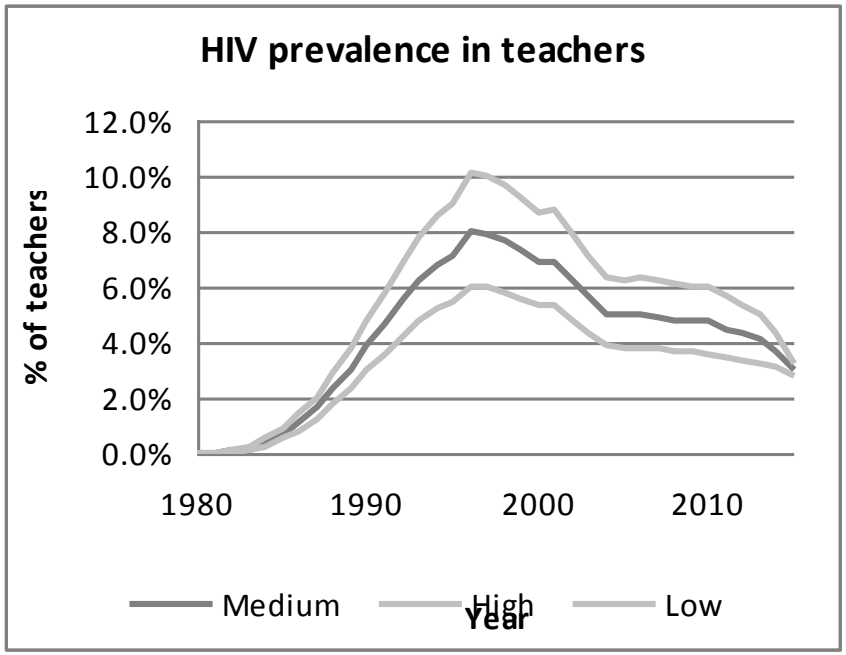
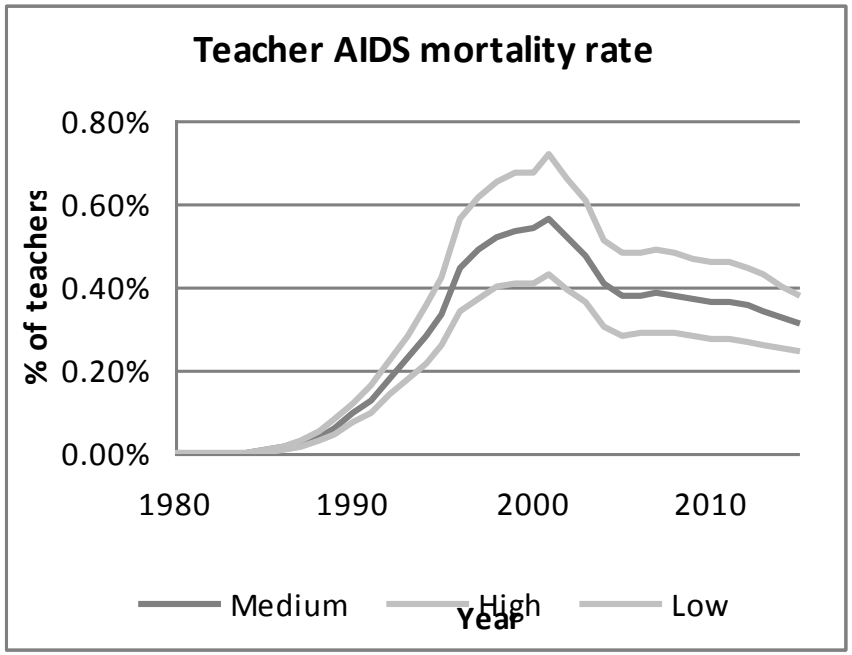
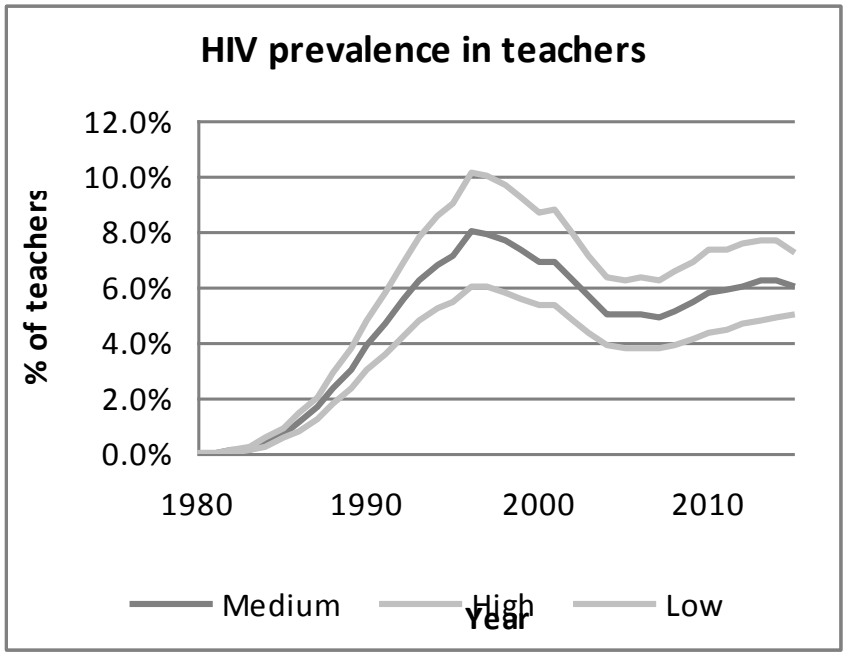
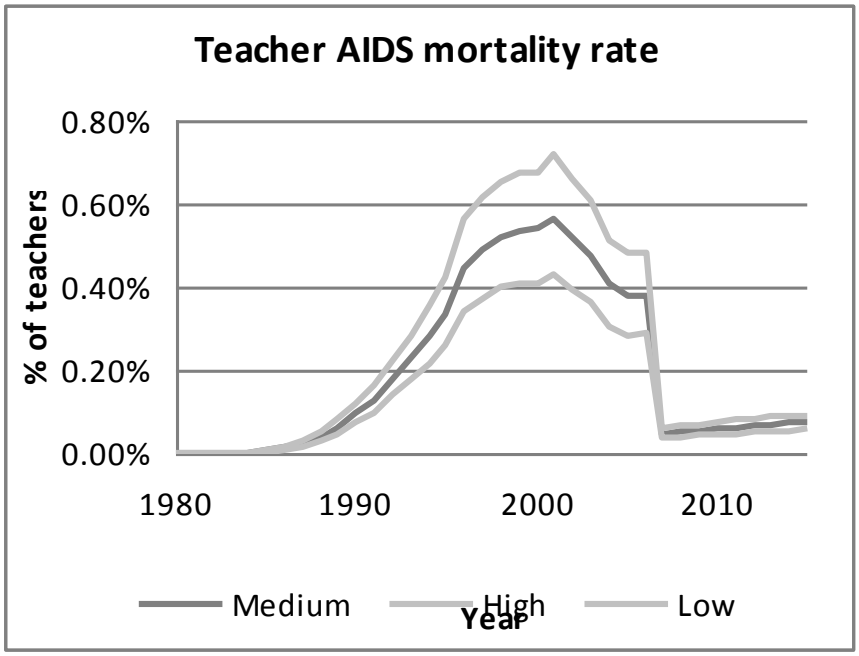
Sub-Saharan African countries ART at current levels



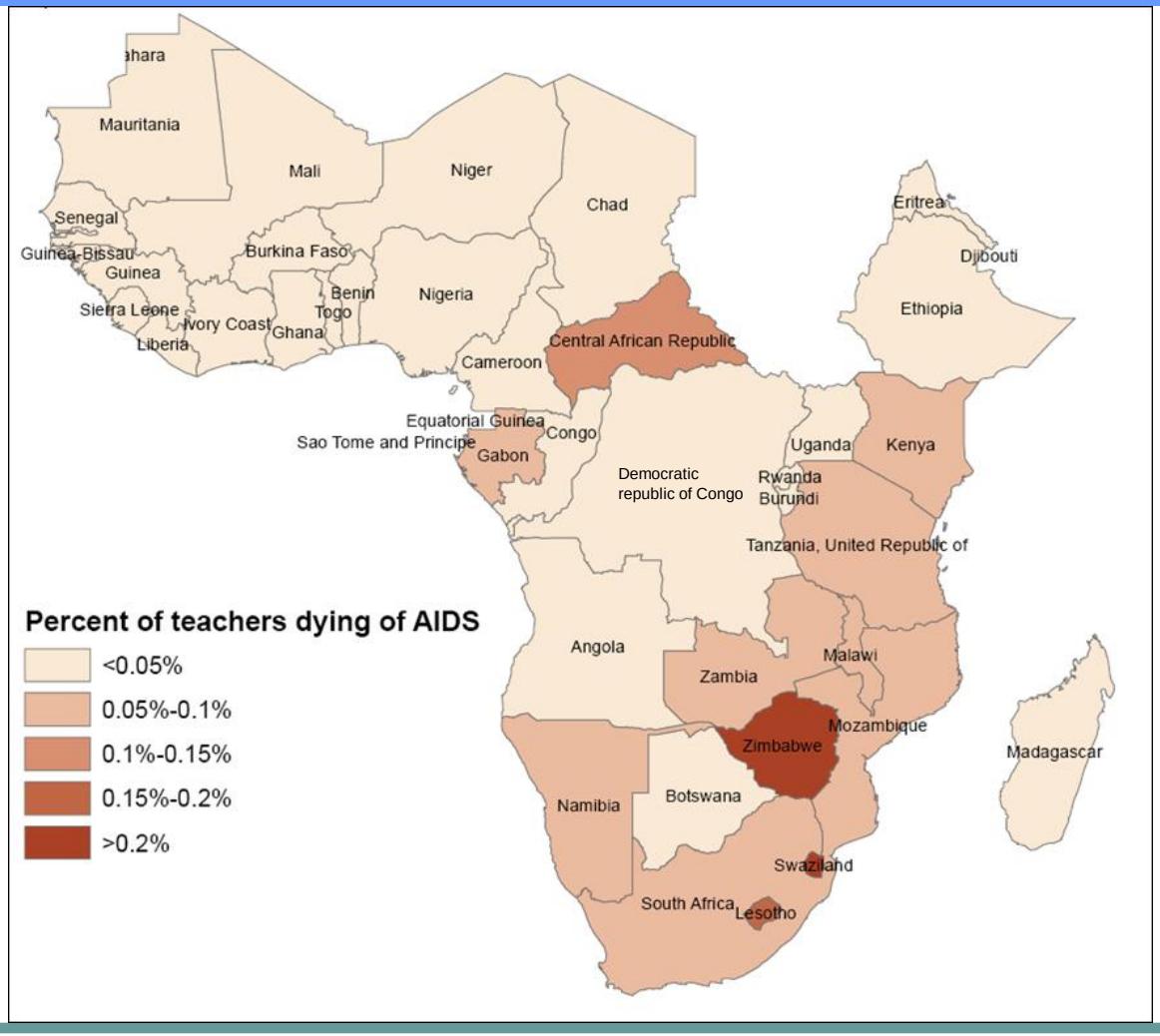


Sub-Saharan African countries
ART accessed by all teachers requiring it

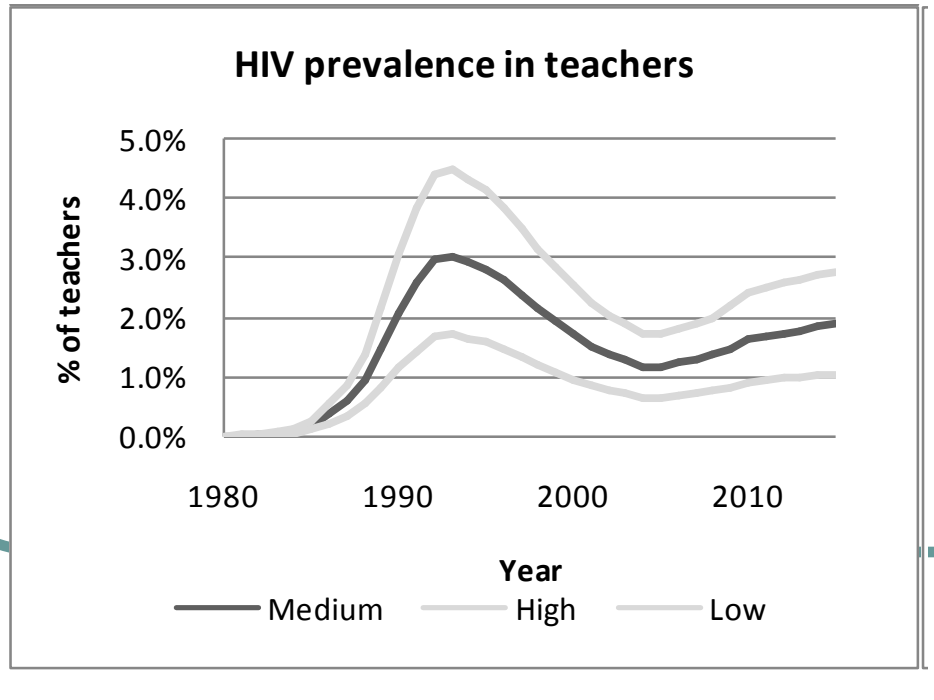


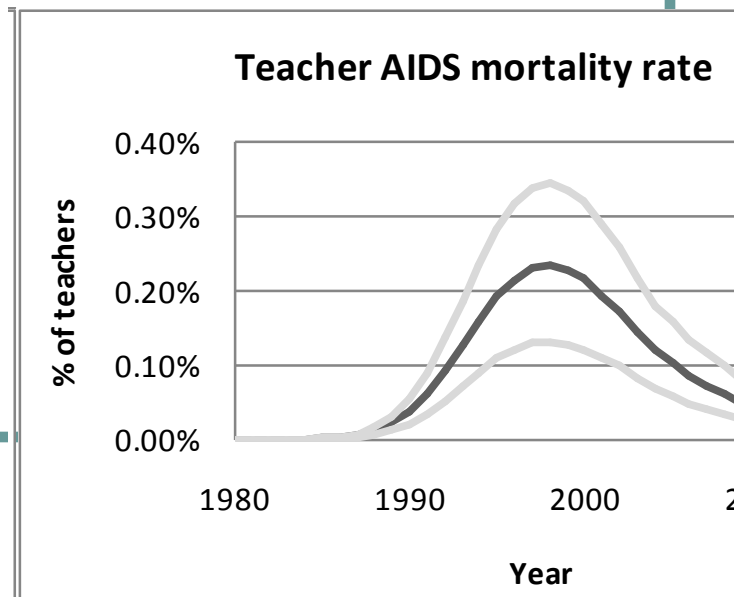


Mortality rate of teachers in 2006

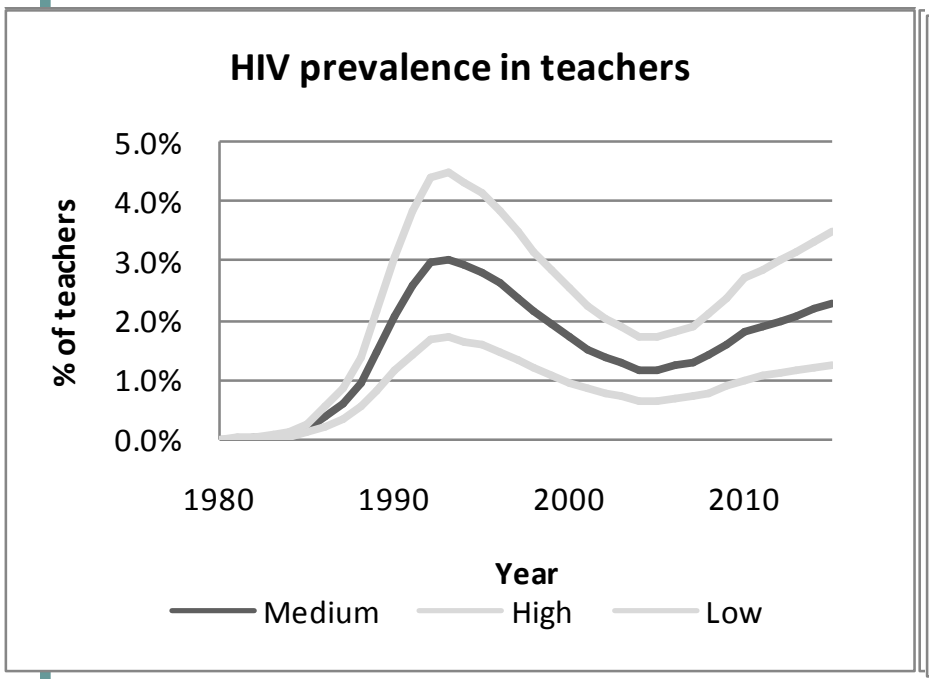


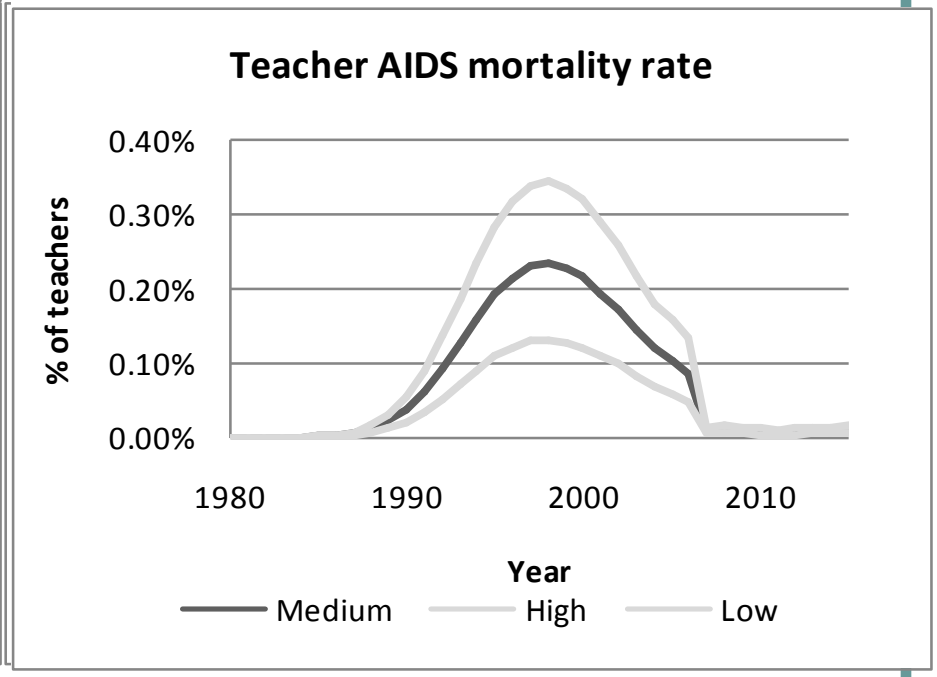
Caribbean countries, ART at current levels





Caribbean countries
ART accessed by all teachers requiring it





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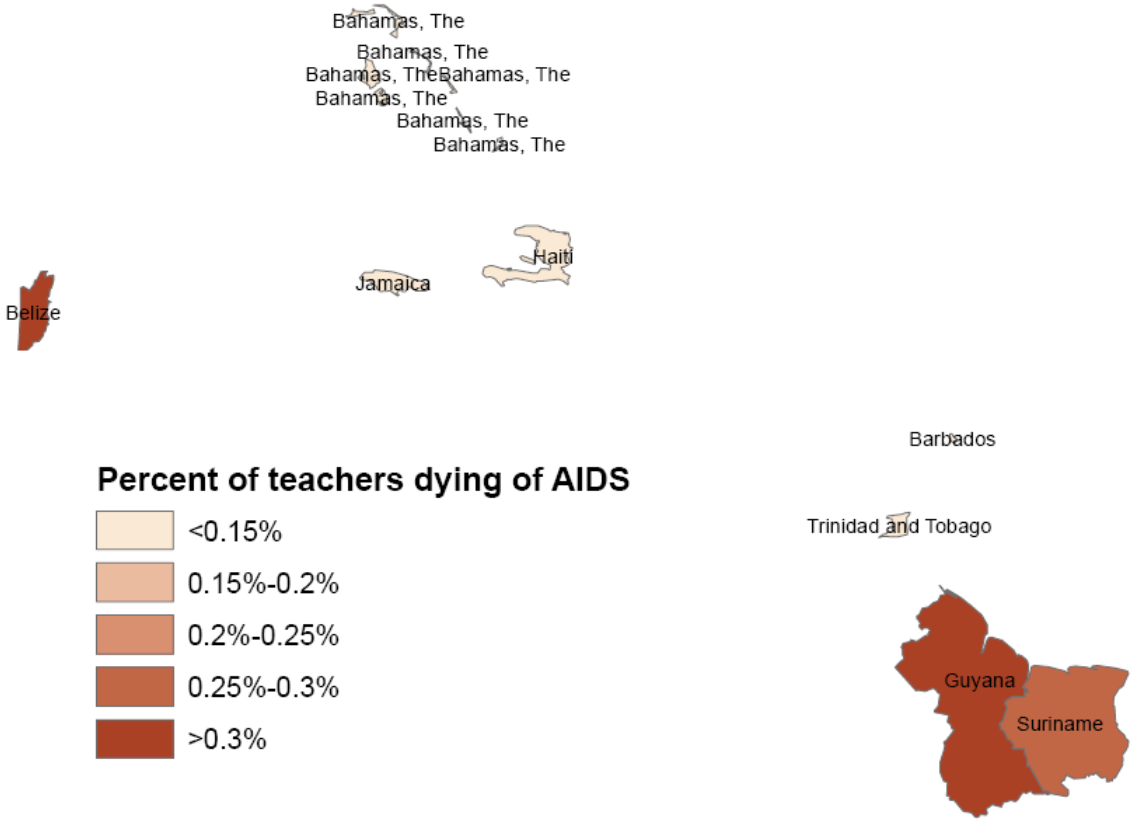
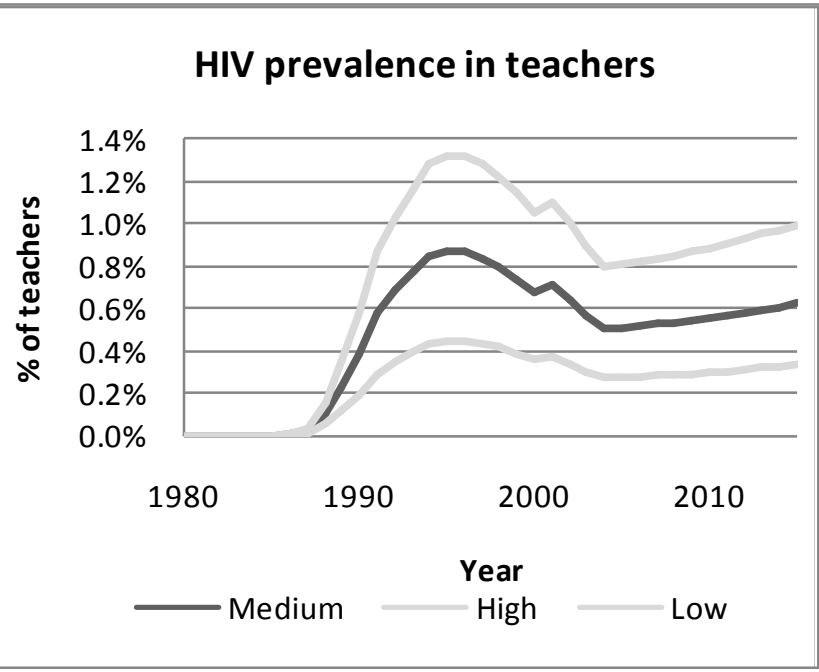
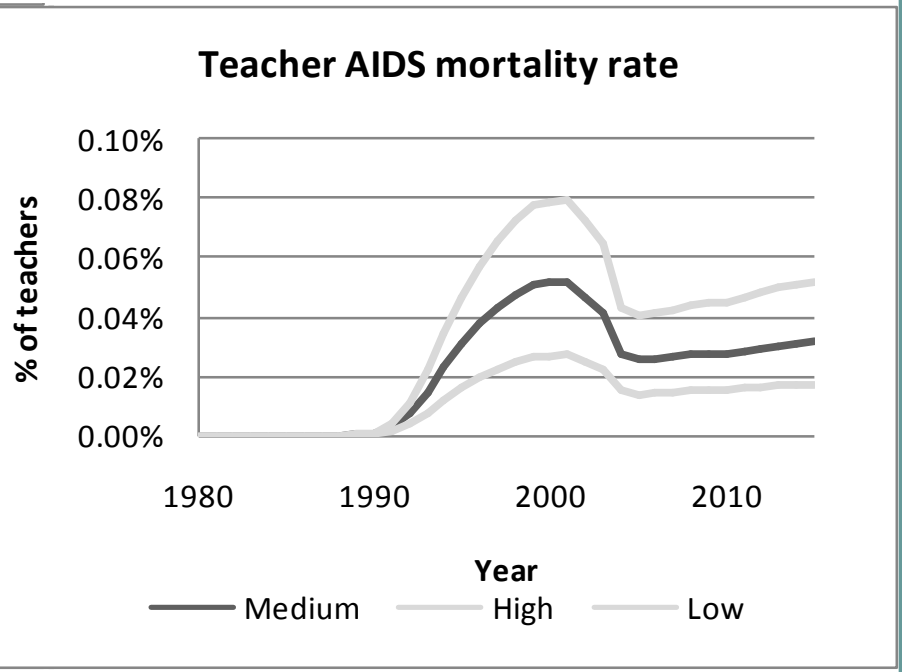
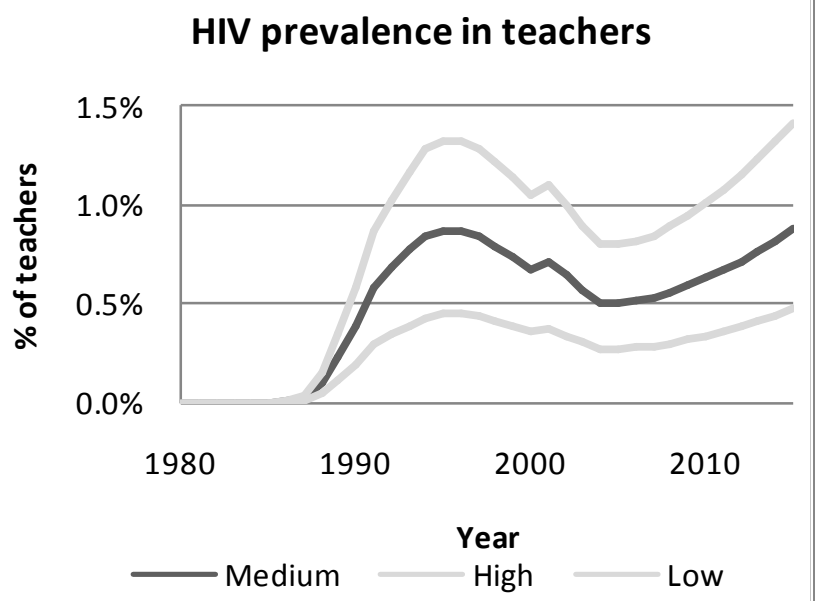


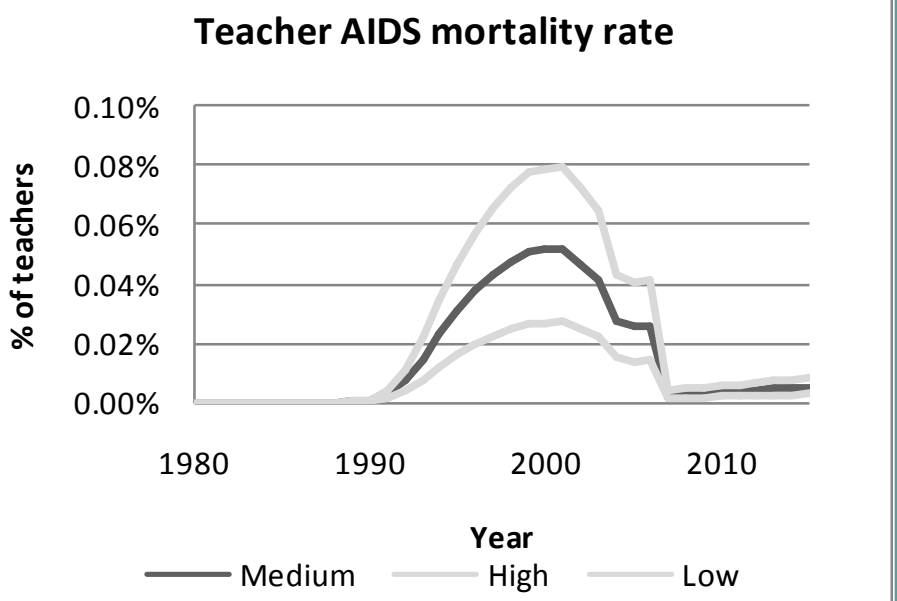
South-East Asian countries, ART remains at current levels





South-East Asian countries
ART accesed by all teachers requiring it





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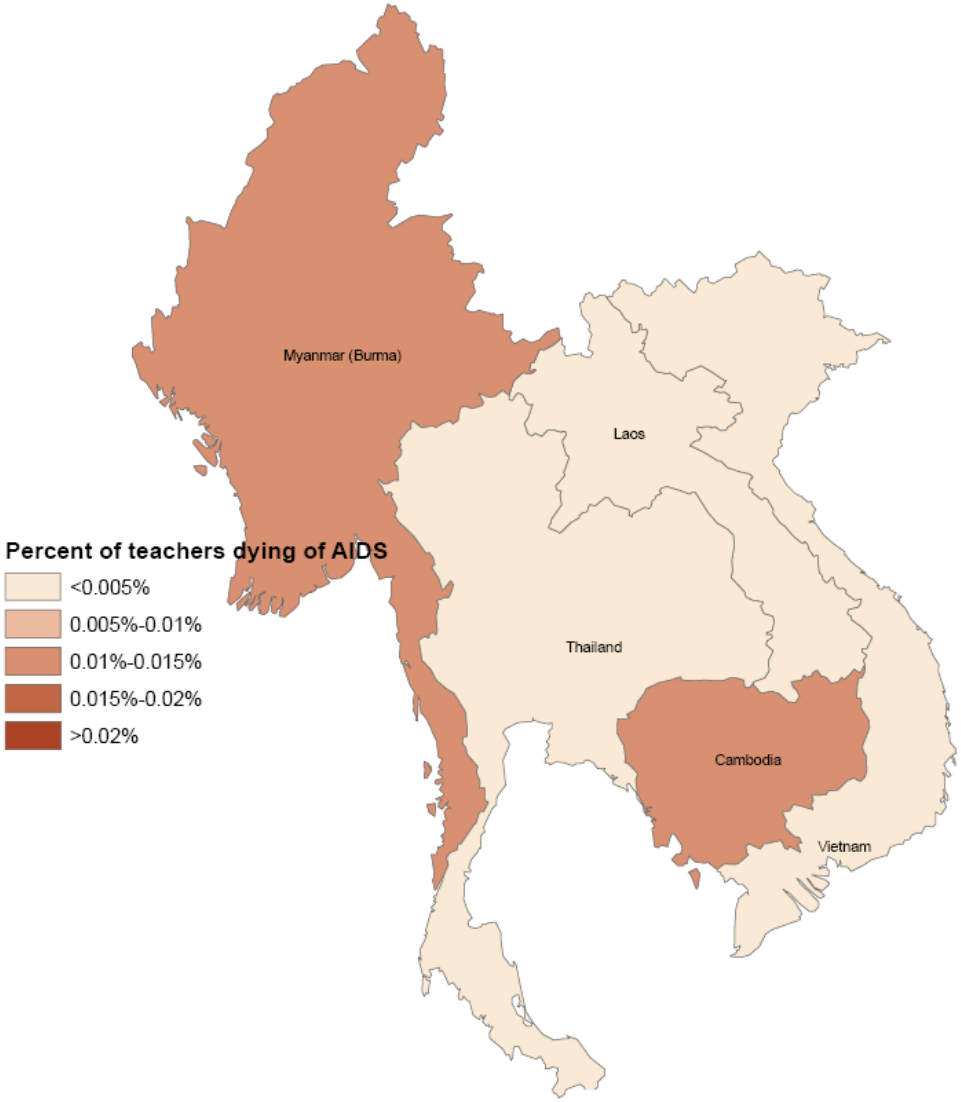

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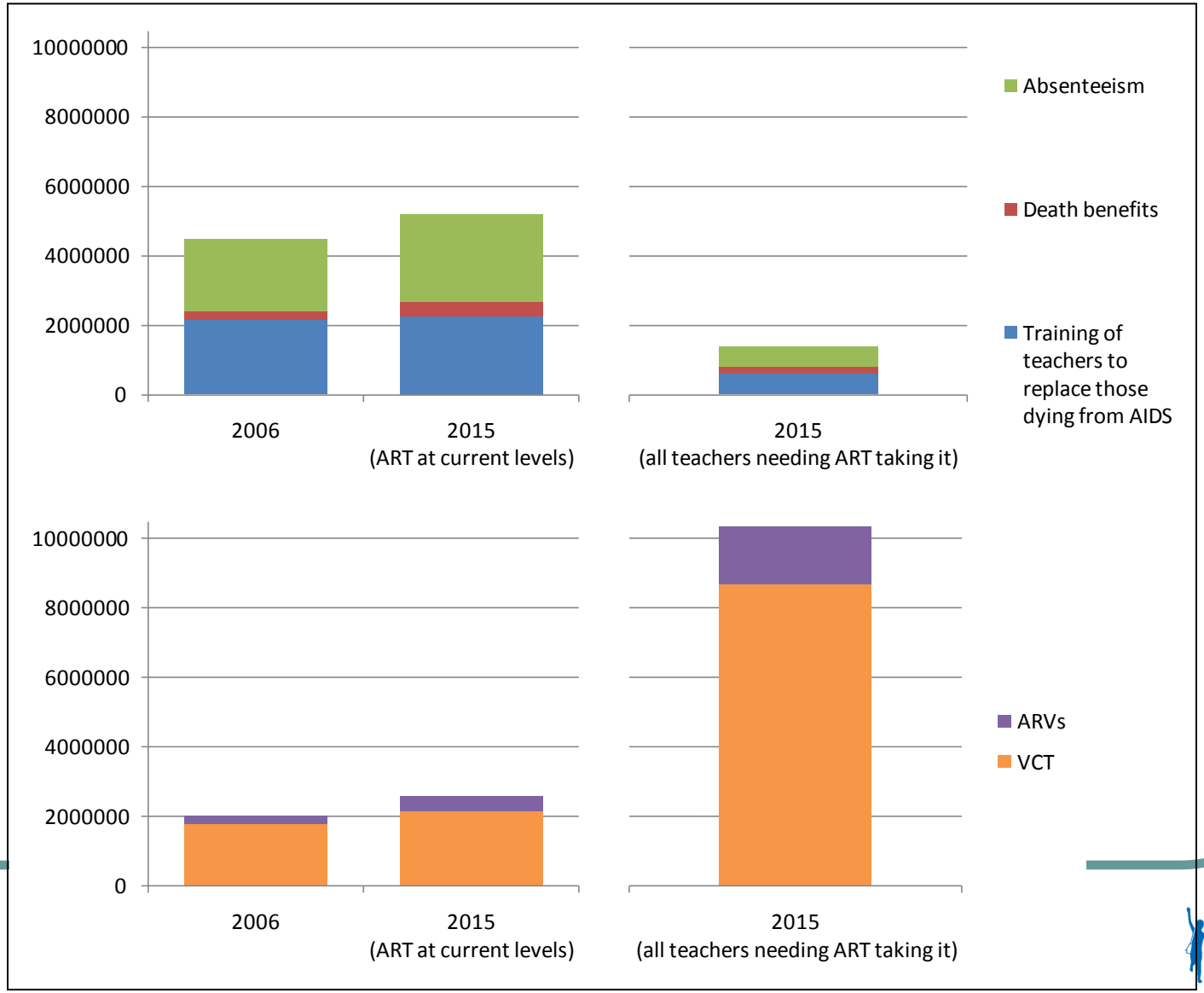
Sub-Saharan African countries, costs of the impact of HIV on education to health and education sectors

Education

Health



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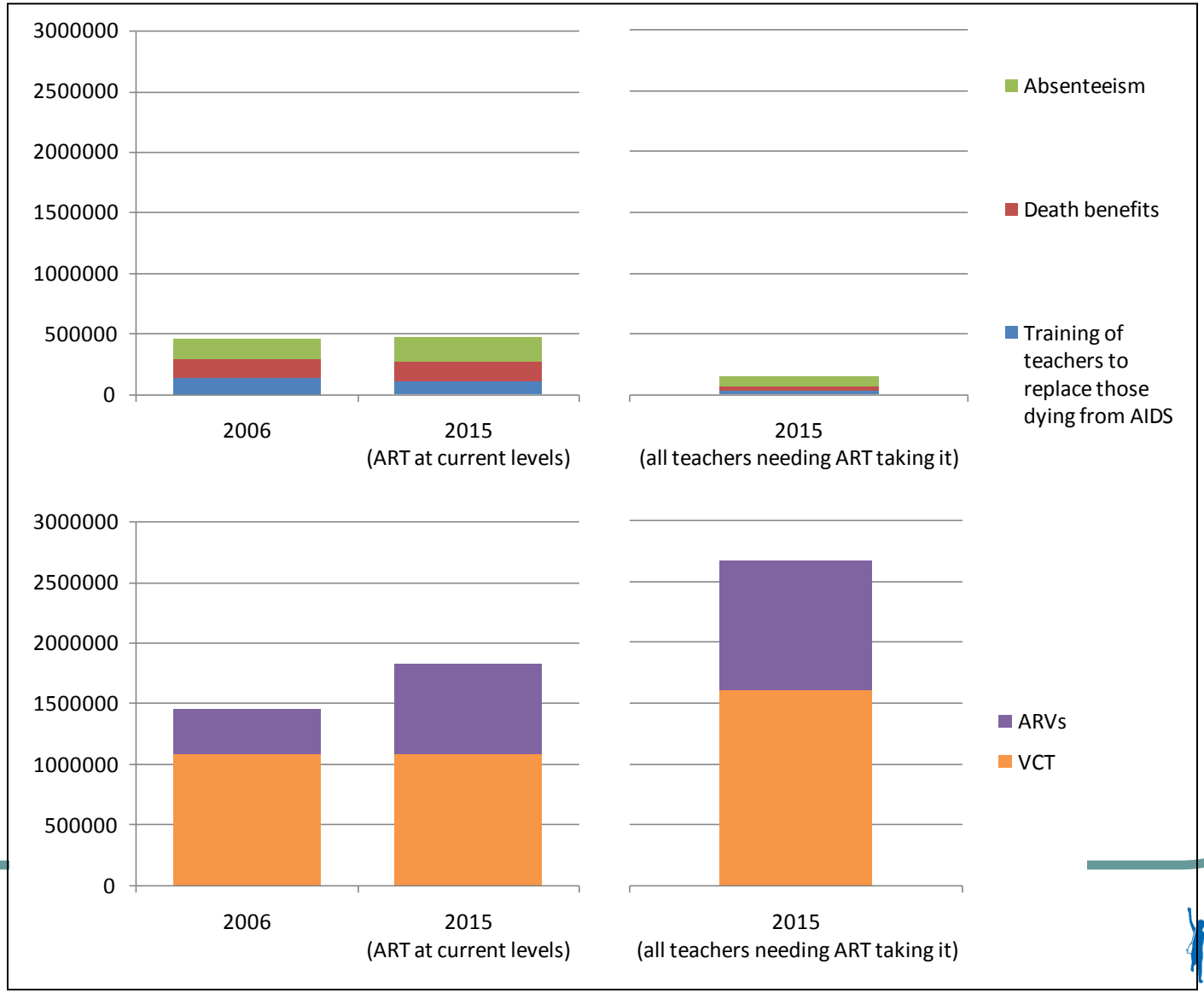

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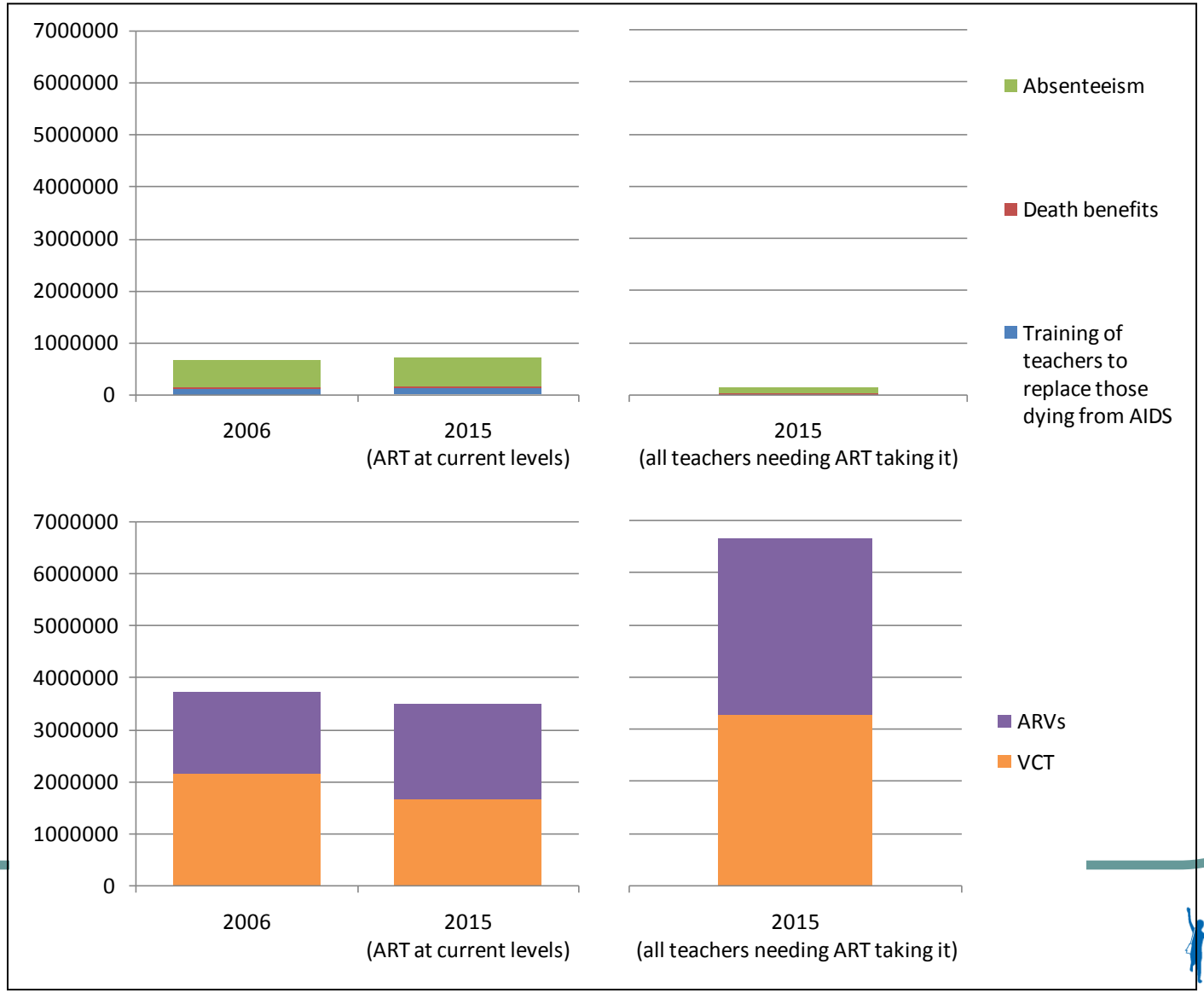

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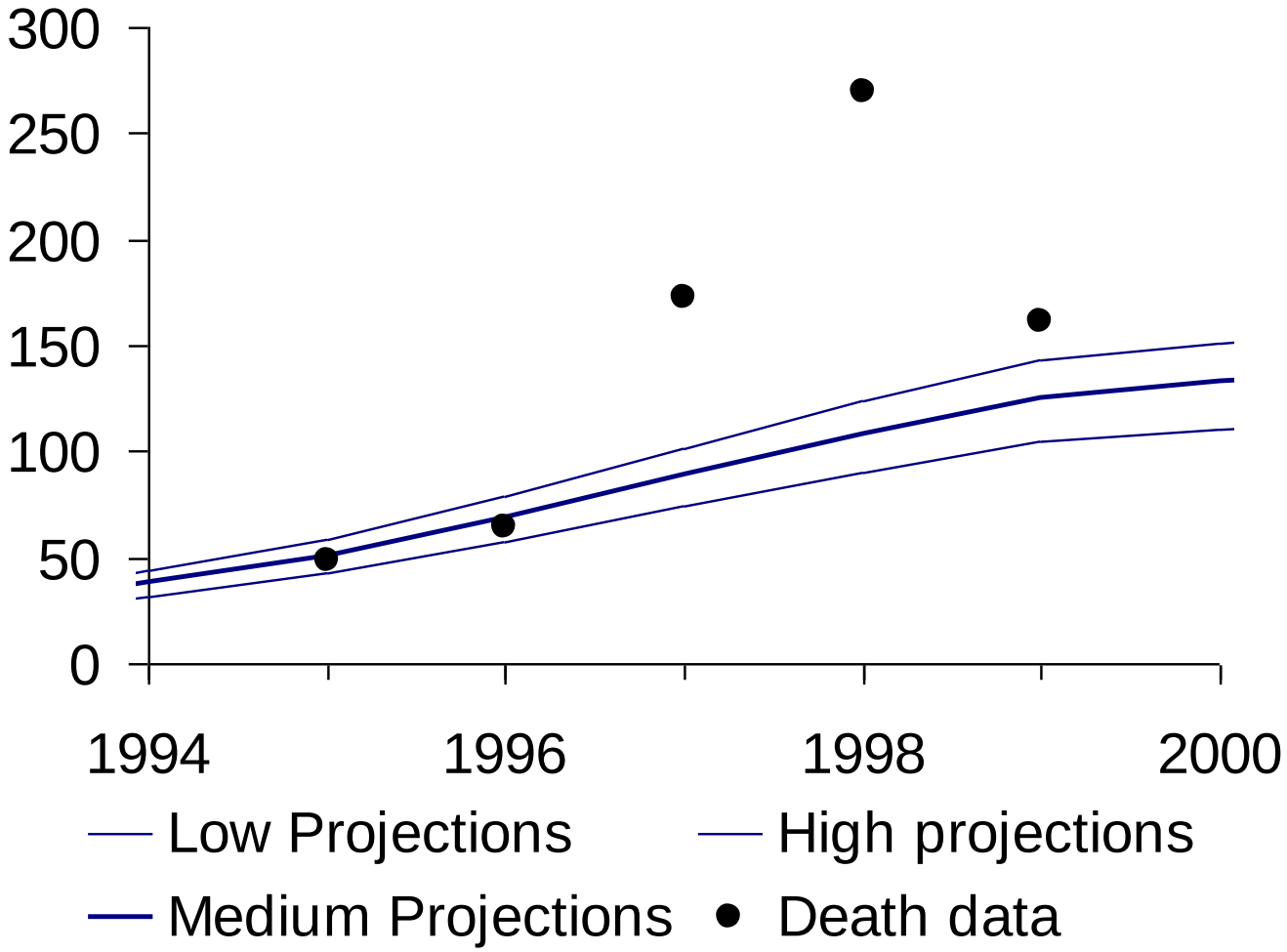
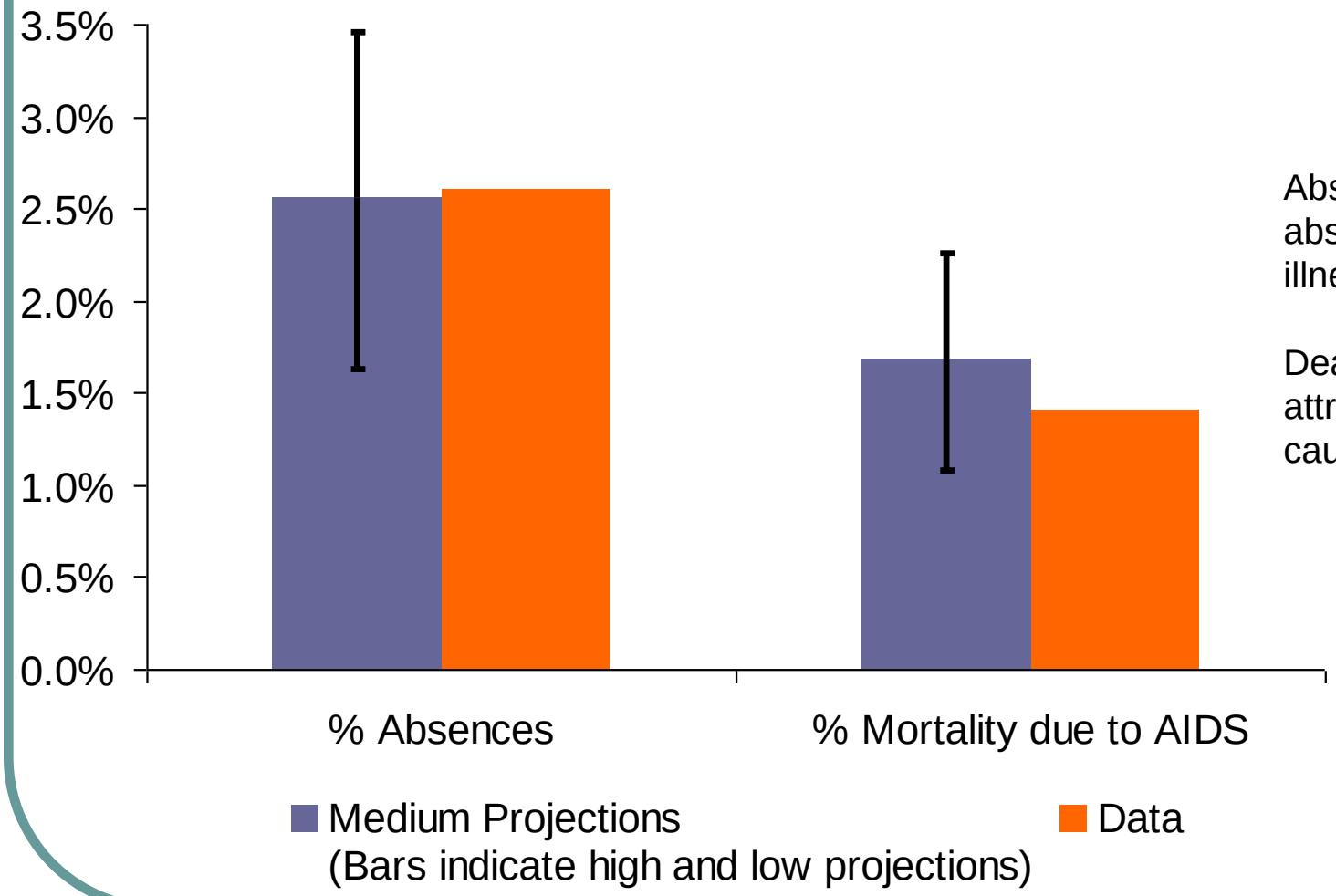
Teacher deaths in Ghana 95-99



Source: Ministry of Education Workplan 2003

Impact data from Swaziland 2004



Absence statistic is absences due to illnesses

Death statistic is attrition due to death, cause undetermined

Data source: Bennell 2006 Countering the impact of the AIDS epidemic on the education sector in Swaziland

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Comparison with previous cost estimates of the impact of HIV on EFA achievement

Annual cost to education supply	2002 EFA Global Monitoring Report	Bruns et al. 2003	Present study
To the education sector in SSA	$300,000,000	$287,000,000	$111,000,000

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Conclusions (1)

- The 2006 estimates of the cost of HIV for education supply are lower than the 2002 estimates, reflecting the lower prevalence of infection and a better understanding of the impact of HIV on the sector.

Costs and savings associated with increasing ART and VCT provision from current levels to 100%

	South-East Asia medium scenario x1000 US$			**Caribbean medium scenario x1000 US$**			**Sub-Saharan Africa medium scenario x1000 US$**		
		ART at current levels	ART at 100%		ART at current levels	ART at 100%		ART at current levels	ART at 100%
	2006	2015	2015	2006	2015	2015	2006	2015	2015
Total saving 2007-2015 to MoE of increasing ART and VCT use	$7,265			$4,595			$1,059,091		
Total cost of increasing ART between 2007-2015	$11,217			$2,207			$59,401		
Total cost of increasing VCT between 2007-2015	$16,530			$5,559			$411,641		

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Conclusions (2)

- Universal access by teachers to VCT and ART is beneficial to education supply in all the three regions assessed.
- In sub-Saharan Africa, where the impact of HIV is greatest, the investment in universal access is cost-effective on the returns to education supply alone.
- In the Caribbean, the savings to the education sector generated by universal treatment would pay for all necessary drugs

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Extra teacher recruitment required to achieve EFA in sub-Saharan Africa

ART at current levels	**4.4%**
ART accessed by all teachers requiring it	0.2%

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Conclusions (3)

- The additional teacher recruitment required to achieve EFA in SSA can be reduced to very low levels through universal access to VCT & ART

Acknowledgements

- Lesley Drake and all members of the Partnership for Child Development
- Nick Grassly, Kamal Desai, Tim Hallet, Peter White of the Department of Infectious Disease Epidemiology, Imperial College London.