

Abstract Title: The impact of HIV on education supply in sub-Saharan Africa, in the era of ART, and with the prospect of treatment failure and need of second-line therapy.

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Objective

Assessment of economic and human resource impact of HIV on education provision in sub-Saharan Africa (SSA) in the era of increasing first-line ART (FLART) use, treatment failure and second-line ART (SLART) needs.

Methods

We used the Ed-SIDA model with data from Ministries of Health and Education and UN agencies to assess the impact of HIV, FLART and SLART on education supply in 41 SSA countries. Ed-SIDA combines a UNAIDS epidemiological model with education planning capability to project teacher supply needs. Cost estimates of treatment scenarios and high, low and medium epidemiological projections were compared.

Results obtained

Under current ART use, teacher mortality and absenteeism are projected to remain around or above current levels. If FLART can be provided to all teachers requiring it, a significant and rapid decline in mortality and absenteeism will ensue, accompanied by an increase in HIV positive teachers (figs 1&2).

The costs to the education sector are lower where ART is provided (fig 3). Universal access to VCT and FLART would reduce impact costs by ~80%. Increased coverage from 2007-2015 would cost \$470M with a consequent \$1.06Bn reduction in HIV impact costs, implying a return of \$2.24 on the dollar.

In Botswana, where resistance is an emerging issue, SLART provision could significantly decrease teacher mortality in coming years (figs 4&5). Elsewhere, economic rather than humanitarian concerns may be paramount; in Kenya (Table 1), providing required SLART to teachers until 2015 could cost over \$0.5M, where such investment would save just 60 teachers' lives and provide a return of under \$0.5M.

Conclusion

The immediate and sustained provision of FLART to all teachers requiring it up to 2015 in SSA is cost-saving. This is in addition to other returns on education; those humanitarian and educational benefits of keeping teachers alive and healthy. Increases in FLART provision are inevitably followed by drug resistance, necessitating SLART in the coming and subsequent decades if increases in mortality are to be prevented. Teachers are the primary providers of education, which is protective *per se* against HIV infection. NACs could consider protecting teachers as part of their national multisectoral response to HIV.

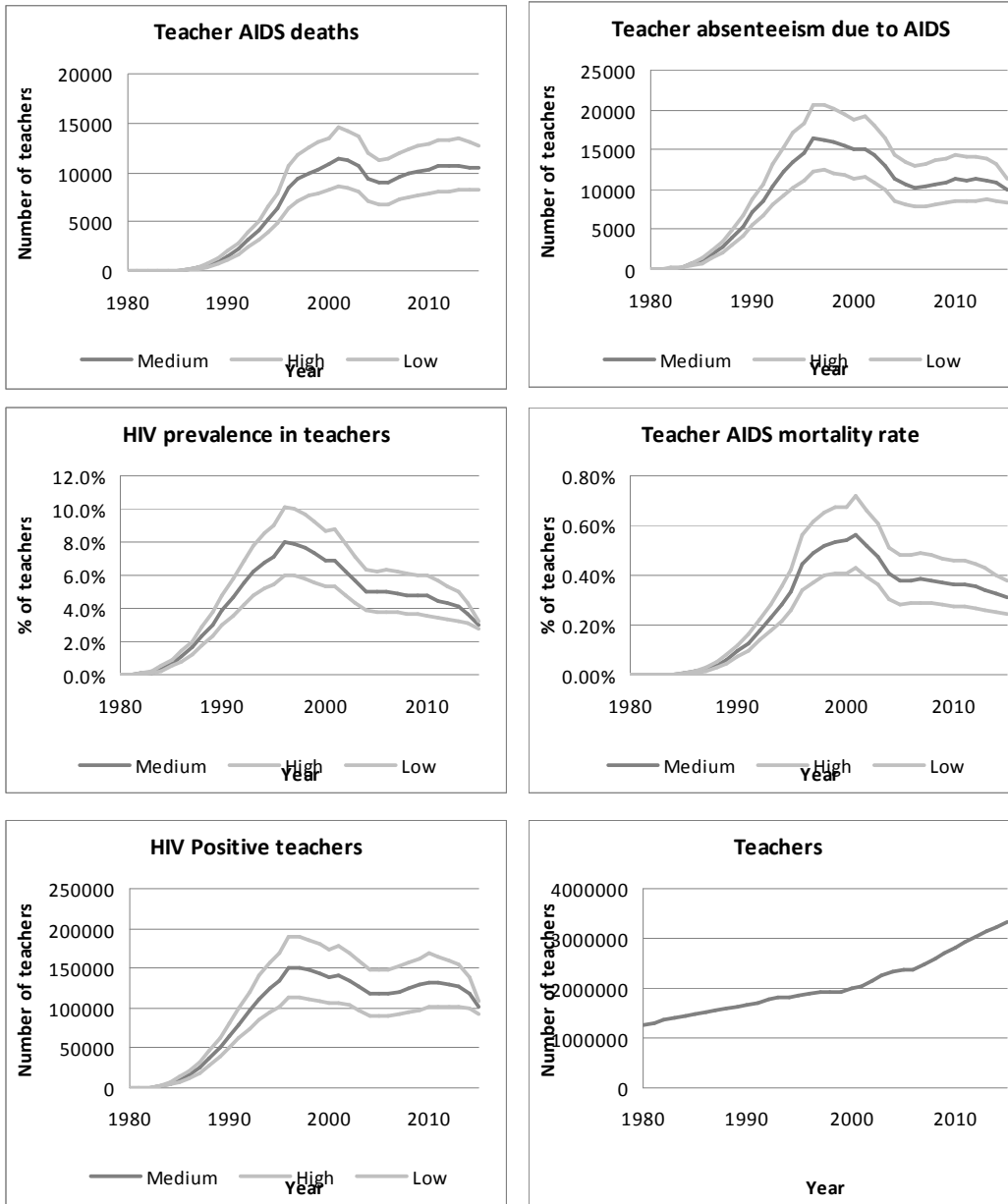


Figure 1: ART use maintained at current levels

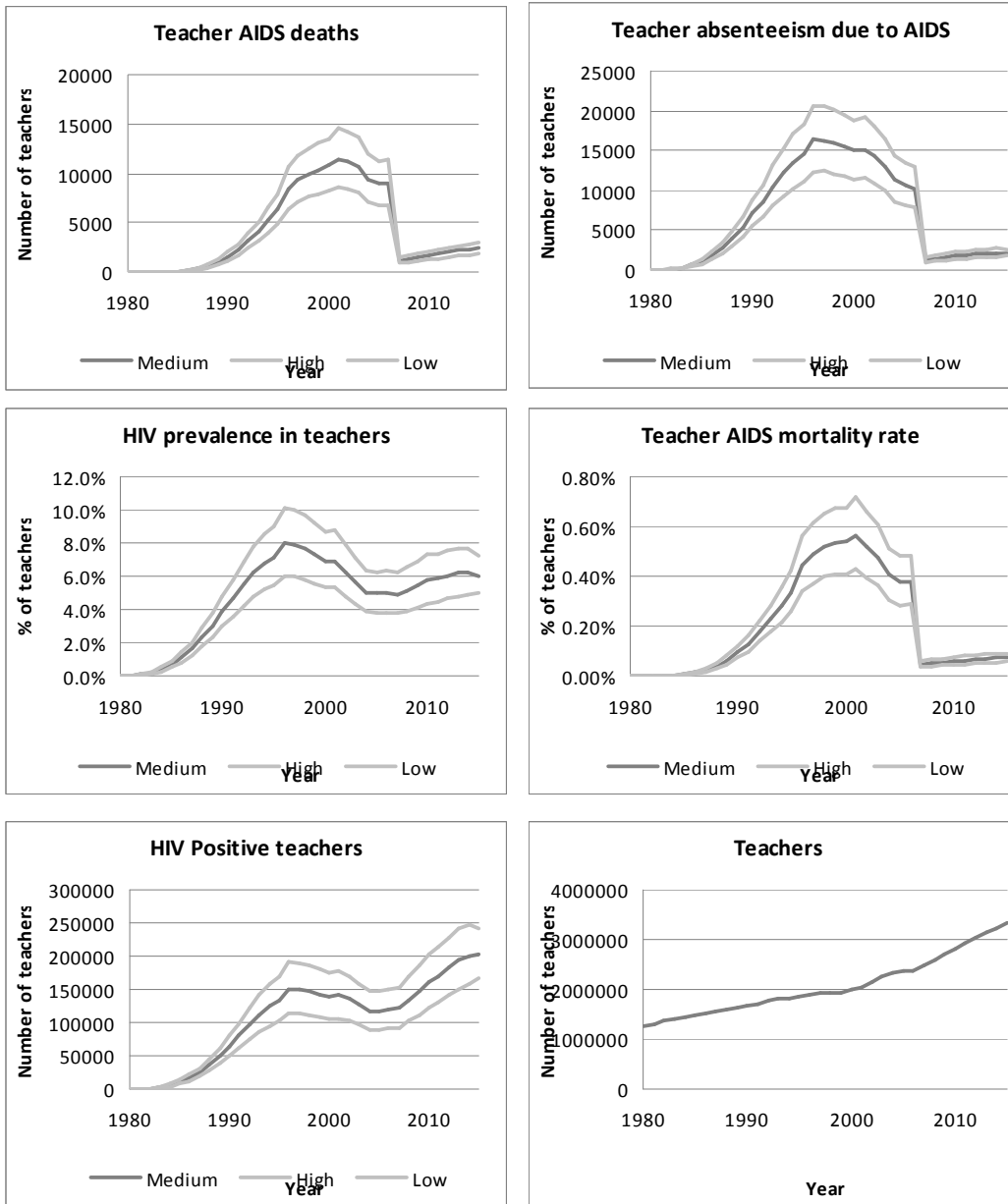


Figure 2: FLART and SLART access provided for all teachers requiring it

ART maintained at current levels between now and 2015

ART immediately increased to enable access for all teachers who need it

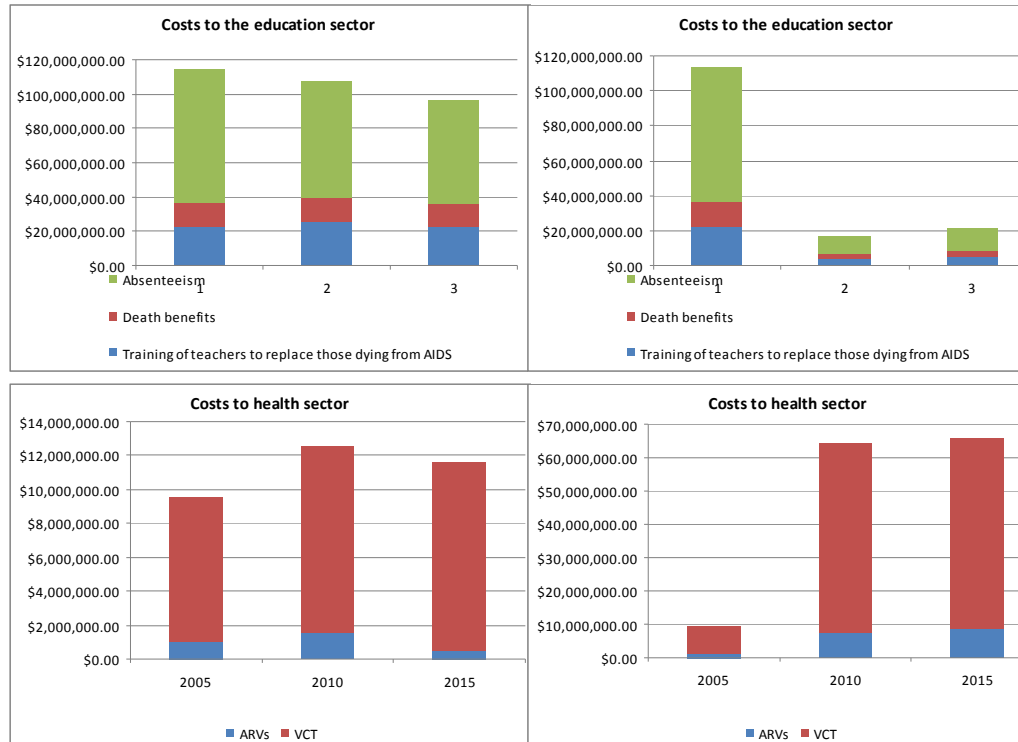


Figure 3: Costs of HIV to the to health and education sectors of the impact of HIV on education

KENYA		First line	First and second line
		therapy only	therapy provided where required
Costs	Cost of increasing ART provision	\$1,726,000	\$2,248,000
	Cost of increasing VCT	\$32,378,000	
Benefits	Teachers' lives saved	3190	3250
	Teacher-years of absenteeism prevented	2750	2810
	Total saving 2007-2015 to MoE of increasing ART and VCT use	\$22,488,000	\$22,936,000

Table 1: Costs and benefits associated with the impact of providing second-line therapy to teachers in Kenya compared to just first-line therapy

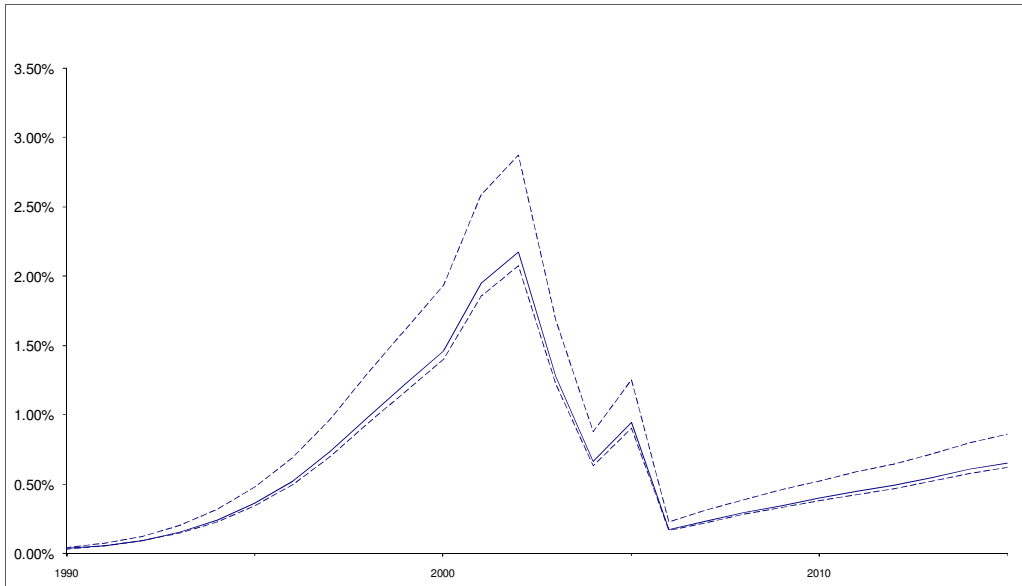


Figure 4: Percent of teachers dying of AIDS in Botswana, where 80% of teachers needing therapy from 2007 get first- or second-line therapy

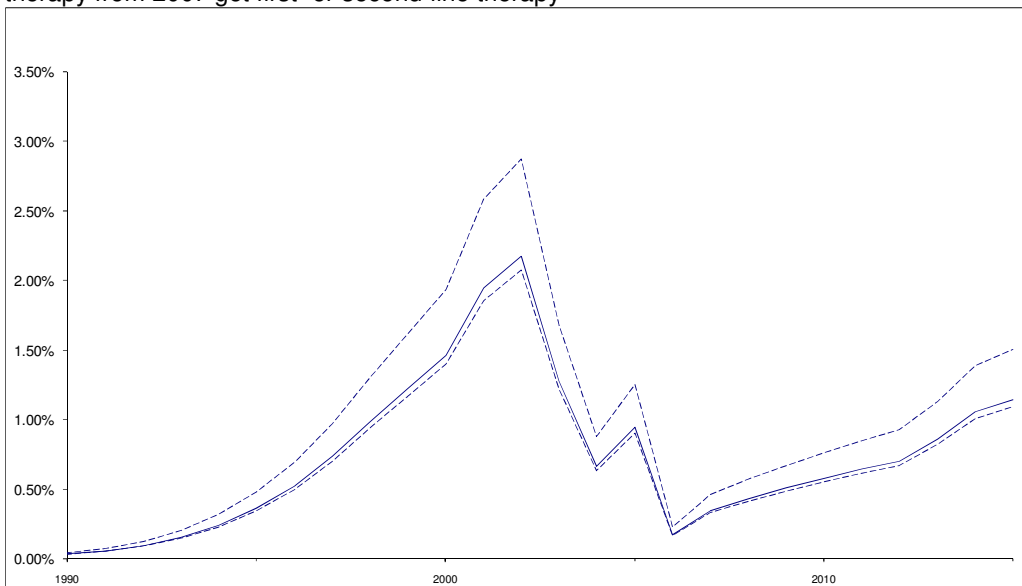


Figure 5: Percent of teachers dying of AIDS in Botswana, where 80% of teachers needing first-line therapy receive it from 2007, but second-line therapy is not made available.