

# Costs and outcomes of delivering antiretroviral therapy (ART) in the private and public sectors in Uganda

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**HIPS** Health Initiatives for the Private Sector Project

## BACKGROUND

A unique Ugandan national program allows accredited private facilities to distribute publicly purchased antiretroviral drugs (ARVs). The USAID-funded Health Initiatives for the Private Sector (HIPS) project, implemented by Cardno Emerging Markets USA, Ltd., assists private providers to obtain accreditation.

In addition to supporting the accreditation system, the HIPS project creates comprehensive workplace health programs and researches the role of the private sector in health service delivery. In 2011, HIPS partnered with the Center for Global Health and Development at Boston University to study the provision of ART at accredited private sector sites.

### Study goals:

- Estimate the costs and 12-month patient outcomes of delivering ART in the private sector;
- Compare to a sample of public sector sites; and
- Estimate any savings to the Government and donors as a result of ART provision at accredited private clinics.

## METHODS

- Cost-outcomes analysis with a retrospective medical record review

- Based on the COAT model (Costs and Outcomes of AIDS Treatment) developed by Sydney Rosen and colleagues at Boston University. For a detailed explanation of the methodology see:

Rosen S, Long L and Sanne I. The outcomes and outpatient costs of different models of antiretroviral treatment delivery in South Africa. *Tropical Medicine and International Health* 2008; 3(8):1005-1015.

- Medical record data** are extracted from patient files and analyzed to tally all outpatient resources used during the first 12 months on treatment and to assess patient outcomes at 12 months.
- Cost data** are calculated at the facility level. Unit costs (for ARV drugs, labs, non-ARV drugs, staff costs per visit) are calculated based on facility records and multiplied by the total number of units used by each patient. Total fixed costs (buildings, maintenance, vehicles, etc.) are divided by the number of active ART patients at the site to determine a fixed cost per patient-month.

## METHODS II

### Site selection

Convenience sample of 6 sites; 3 private sector and 3 public sector sites. Each private site had received technical support in the past from the HIPS Project.

### Sample selection within each site

A consecutive sample of 50 or 150 adult patients who initiated ART no later than October 31, 2009 was enrolled.

Cohorts are smaller at private sites due to fewer total ART patients at these facilities.

### Inclusion criteria for each individual

- Initiated ART at the study site. Never on ART previously at another site.
- Did not transfer to another site during the first 12 months on treatment
- 18 years or older on day of ART initiation

### Definitions of outcomes

Each patient is grouped into 1 of 3 categories at the 12 month endpoint: in care and responding, in care and not responding, or no longer in care (stopped attending or death).

To be categorized as "In care and responding" a patient must:

- be no more than 3 months late for their most recent clinic visit;
- have an undetectable viral load (<400) if one was drawn;
- have an acceptable CD4 count if one was drawn (greater than baseline, greater than 100 cells/mm<sup>3</sup>, and no more than 50% decline from peak value on treatment); and
- no new or recurrent WHO Stage III/IV condition in the last three months of study period (months 9-12 after ART initiation)

### Ethical approvals

The study was approved by, and conducted in accordance with the regulations of, the Boston University Medical Center Institutional Review Board, the Uganda National Council for Science and Technology, and the Ministry of Health of the Republic of Uganda.

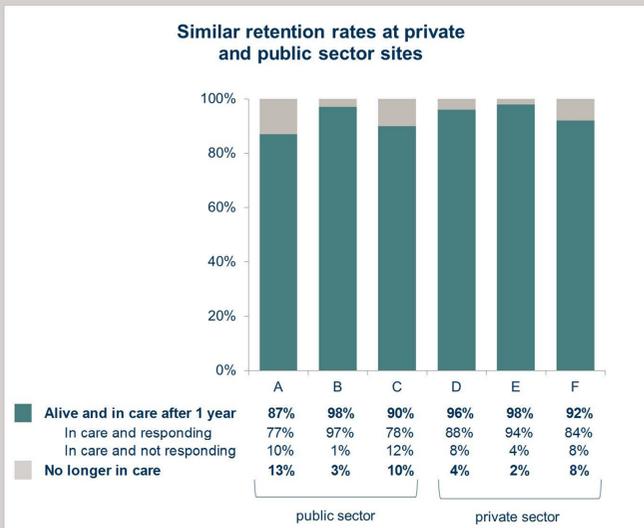
## RESULTS

### Baseline characteristics of each sample

A total of 599 patients were included in this analysis. Except for patients at site E, almost all had a baseline CD4 count available. Median baseline CD4 counts per site ranged from 90 to 201 cells/mm<sup>3</sup>.

	A	B	C	D	E	F
	periurban referral hospital	rural hospital	large urban clinic	employer based clinic	employer based clinic	for profit urban clinic
n=	150	150	150	50	50	49
% Female	63%	72%	57%	58%	48%	54%*
% with baseline CD4 available	100%	83%	100%	100%	38%	100%
Median baseline CD4 count	119	142	102	116	90	201
Median age at ART initiation (years)	33.3	35.9	34.0	36.0	35.0	36.8

### Patient outcomes 12 months after ART initiation



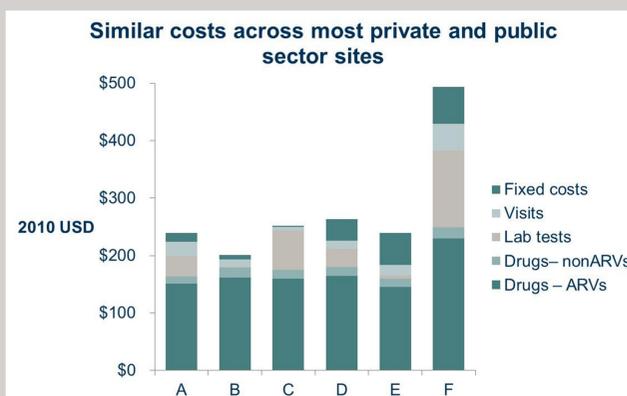
Outcomes were similar across sites with retention rates of 87-98%. Each sector had one site with remarkably low attrition (sites B & E). Site B patients had a significantly lower risk of being no longer in care compared to Site A [RR 0.20, 95% CI 0.07-0.57]. No other sites had significant differences in outcomes and no trend was observed between the public and private sectors.

### Resource utilization per patient-year

Patients had a similar number of clinic visits across sites (10-13 visits in the first year on ART), but which providers they saw varied greatly. Private sector sites relied more on doctors for patient care rather than clinical officers. Site B relied heavily on the use of expert clients instead of nurses for registration, triage, and counseling which also contributed to the low costs observed at that site. Sites C, D, and E all relied on nurses to also dispense drugs and do the majority of counseling rather than having dedicated staff for these functions.

Resources used	A	B	C	D	E	F
Visits per patient-year	10.5	13.1	10.6	11.6	12.4	13.5
% of visits with doctor	13%	<.1%	12%	78%	78%	16%
% of visits with clinical officer	46%	97%	81%	6%	24%	78%
ARV regimens (% of pt-months prescribed)*						
Regimens including AZT (zidovudine)	76	90	97	96	74	55
Regimens including D4T (stavudine)	17	10	2	2	21	0
Regimens including TDF (tenofovir)	3	0	0	0	0	39

### Cost per patient in care and responding

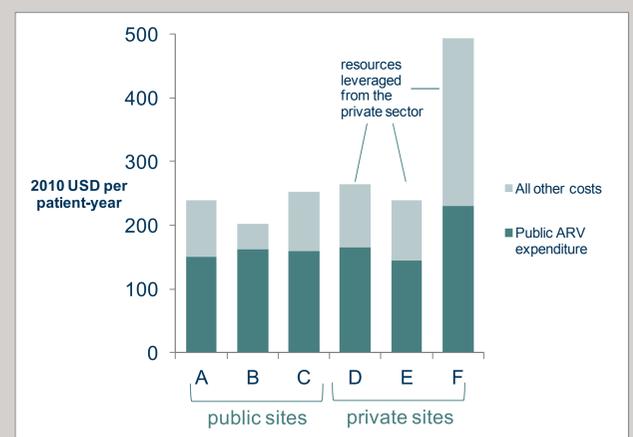


Aside from higher cost at private Site F, there was little difference in total cost among study sites (\$202-264 per year at sites A-E). On average, ARVs account for 60% of the total cost per patient. Site B had the lowest total costs but also did the fewest labs per patient (only 1 test, of any kind, per patient-year). Site F had the highest costs; but they were the only site regularly prescribing a tenofovir-based ARV regimen (in 40% of patient-months) and they did over 12 lab tests per patient-year in care.

### Leveraging private resources

\$90-\$100 per patient year was spent at private sites D and E to cover all costs aside from ARVs. The public sector would have spent approximately \$90 per year to treat these same patients at public sector sites A and C.

Provision of ART at accredited private sector sites saved the public sector approximately \$90 per patient-year.



### Limitations

- Due to lack of diagnostics, the differentiation between responding and not responding patients relies solely on clinical condition, which may not be well documented in patient files. For this reason we have focused on presenting outcomes as 'alive and in care' versus 'no longer in care'.
- Outcomes are only for the first 12 months following ART initiation.

## CONCLUSIONS

Patient outcomes were similar across private and public sector sites. With few diagnostic tests conducted it is possible that the percent of patients in care and responding is artificially high. Provision of ARVs from Government and donor stocks to accredited private providers results in ART reaching additional patients without increasing the rolls at Government treatment sites, saving both public and donor funds. The Government saves \$90 per patient-year for every patient treated in a private clinic.

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