

Stable Outcomes and Costs in South African Patients' Second Year on Antiretroviral Treatment

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Objectives and Methods

Rationale and Objectives

- Little is known about the costs of providing treatment for HIV/AIDS under different models of delivery.
- Most estimates are based on early experience or atypical providers or compare different drug or monitoring regimens, not delivery models.
- Research questions for this study:
 - For different models of treatment delivery, how much does it cost per patient initiated on ART and to produce a patient who remains in care and responding to therapy after 12 or 24 months?
 - What are the main determinants of ART costs and of differences between sites?
 - What is the relationship between outcomes and costs? (I.e., does investing more resources produce better outcomes?)

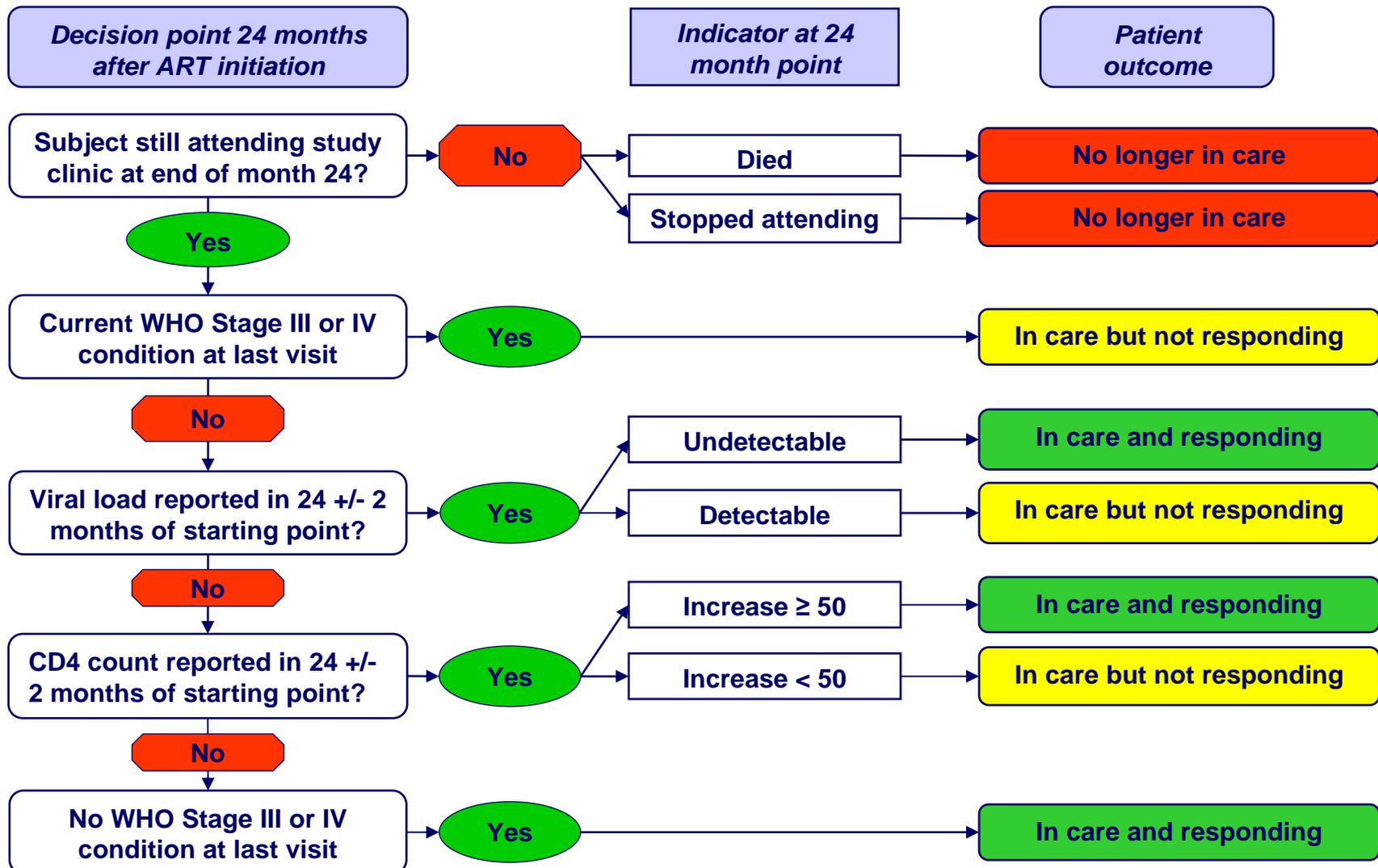
Study Design

- Study site is a large, urban, public sector hospital in Gauteng Province, South Africa.
- Retrospective medical record review of a systematic sample of 200 adult ART patients who started ART > 24 months ago at the study site.
- Determined each study subject's outcome 12 and 24 months after initiation of ART.
- Calculated the cost of all resources used to treat each subject during the 24 months following initiation.
- Estimated the average cost per patient treated, per outcome achieved, and to produce a patient in care and responding in first two years after initiation.
- Excluded patients who transferred to another site or never started ART.

Definition of Outcomes

- Outcomes assessed based on medical record data reported 12 and 24 months (+ / - 2 months) after date of starting ART.
- NIC: “No longer in care at study clinic”
 - Died; or
 - No longer attending clinic (missed a visit or medication pickup > 3 months).
- NR: “In care but not responding”
 - WHO Stage 3 or 4 condition at last visit; or
 - Detectable viral load (>400 copies); or
 - < 50 cells increase in CD4 count.
- IC: “In care and responding”
 - Undetectable viral load (<400 copies); or
 - If no viral load done, CD4 increase > 50 cells; or
 - If no CD4 count done, no current WHO Stage 3 or 4 condition at last visit.

Determination of Outcomes



Estimate of Costs

- Variable costs = quantity used x cost per item.
 - Drugs, lab tests, and clinic visits.
 - Drugs and lab tests priced at actual current cost to site.
 - Current salaries and number of consultations at the site used to determine an average cost per visit.
- Fixed costs = average fixed cost/month for each calendar year x number of months each subject was in care.
 - Infrastructure, vehicles, equipment, general supplies.
 - Support staff, counselors, and some specialists.
 - Depreciation plus maintenance and operating costs.
 - Estimated market rental used for clinic building.
- All costs were estimated at 2006 prices; exchange rate ZAR 6.8 = \$1.

Results

Patient Outcomes at 24 Months

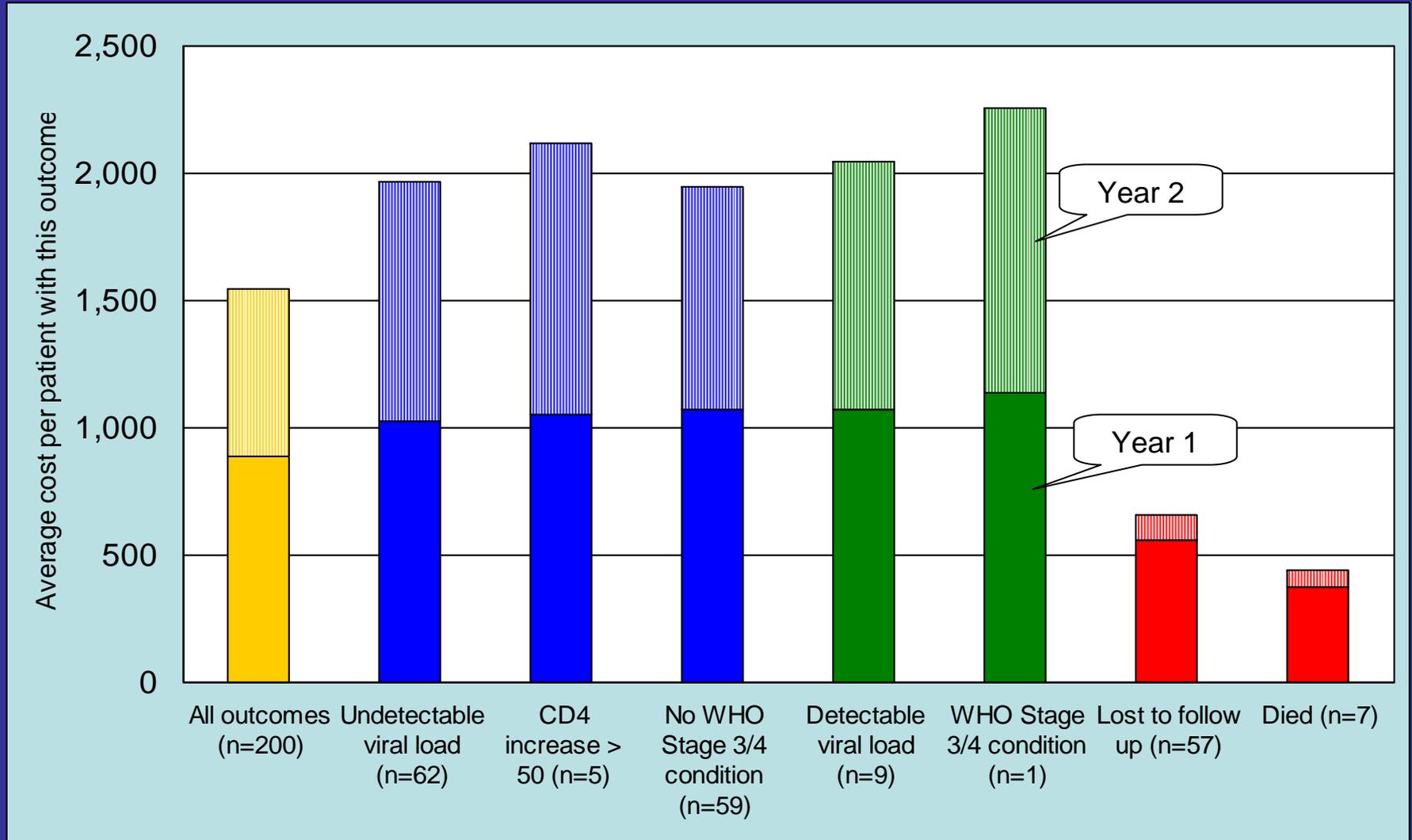
Outcomes	n	%	Median starting CD4
All outcomes (patients started)	200	100%	95
In care and responding (IC)	126	63%	102
Undetectable viral load	62	31%	98
Acceptable CD4 change	5	3%	172
No WHO Stage III/IV condition	59	30%	102
In care but not responding (NR)	10	5%	101
WHO Stage III/IV condition	1	1%	63
Detectable viral load	9	5%	107
Unacceptable CD4 change	0	0%	n.a.
No longer in care (NIC)	64	32%	74
Died	7	4%	42
Stopped attending site	57	29%	92

Changes in Outcomes Between 12 and 24 Months

Outcome at Month 12	Total at 12 months	Outcome at Month 24		
		In care and responding at 24 mos	In care but not responding at 24 mos	No longer in care at 24 mos
In care and responding at 12 months	134	107	9	18
In care but not responding at 12 months	14	12	1	1
No longer in care at 12 months	52	7	0	45
Total at 24 months	n.a.	126	10	64

Cells shaded blue show outcomes that changed from Month 12 to Month 24

Average Cost Per Outcome



*All costs are in 2006 USD.

Average Cost Per Outcome (Cont)

Outcome	Year 1	Year 2	Difference (Year 1-Year 2)	% difference
Average per patient started (all)	\$ 886	\$ 659	\$ 228	26%
Remaining in care (IC + NR)	\$ 1,050	\$ 923	\$ 127	12%
In care and responding (IC)	\$ 1,048	\$ 918	\$ 129	12%
In care but not responding (NR)	\$ 1,081	\$ 987	\$ 95	9%
Not in care (NIC)	\$ 539	\$ 96	n.a.	n.a.
Average cost to produce a patient in care and responding	\$ 1,407	\$ 1,046	\$ 361	26%

*All costs are in 2006 USD.

Breakdown of Costs for Patients In Care and Responding at 24 Months

Cost component	Year 1	Year 2	Difference (Year 1 - Year 2)
Drugs	41%	46%	\$ 2
Lab tests	19%	23%	- \$ 8
Visits	19%	14%	\$ 68
Fixed costs	21%	17%	\$ 67
Total cost	100%	100%	\$ 129

Economies of Scale in Fixed Costs

Year	# Active ART patients	Fixed cost per patient-year	% reduction
2005	2,841	\$ 232	n.a.
2006	5,047	\$ 154	34%
2007	6,935	\$ 133	14%

Resource Utilization Per Patient

Resource utilization per patient remaining in care and responding at 24 months

Resource	Year 1	Year 2
Doctor/ nurse visit	6.6	5.0
Pharmacy visit	10.2	8.0
Viral load	1.6	1.8
CD4 count	1.8	1.8
Full blood count	1.6	2.0
ALT	2.0	1.8
AST	1.9	1.8
Lactate test	0.3	0.9

Conclusions

Summary of Key Findings

- 63% of study patients who started ART in 2005 were in care and responding to therapy after 2 years. Of the rest:
 - 5% in care but not responding, 4% known to have died, 28% lost to follow up.
- Average cost per study patient starting ART is \$886 in Year 1 and \$659 in Year 2.
 - 42% ARVs and other drugs, 20% lab tests, 20% fixed costs, 17% clinic visits
- Average cost to produce a patient in care and responding after 24 months is \$1,406 in Year 1 and \$1,046 in Year 2.
- For patients who remained in care for 24 months, costs in Year 2 were 12% less than in Year 1.
- Costs at this site are less than those at NGO sites and almost identical to those estimated for a public hospital in Cape Town. (Harling, G JAIDS 2007)

Limitations of the Study

- This treatment site might not be typical of rollout sites in Gauteng Province.
- Estimates are of average, not marginal, costs.
- Analysis does not take patient differences into account.
- Data are for patients initiated in 2005; outcomes and resource utilization could be different now.
- Excludes some potentially important costs:
 - Inpatient care at hospital or elsewhere
 - Care provided by other facilities
 - Costs to patients themselves
 - Programme management above the level of the clinic (e.g. hospital managers, provincial offices, etc.)

Acknowledgements

- Site hospital and management
- Clinic and its Medical Director, Staff, and Patients
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