



## **Multi-Country Analysis of Treatment Costs for HIV (MATCH)**

Conducted by the Clinton Health Access Initiative (CHAI) in partnership with the Governments of Ethiopia, Malawi, Rwanda, South Africa and Zambia and the Center for Global Development

Preliminary findings for discussion at the International AIDS Economics Network Pre-Conference Meeting, July 2012

The study provides a top-down assessment of the facility-based cost of ART per patient-year in a representative sample of sites

**Study coverage**



CHAI supported the governments of Ethiopia, Malawi, Rwanda, South Africa, and Zambia to conduct costing at 161 ART facilities

**Study period**

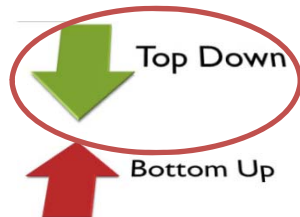
The study captured actual spend data for the most recently available full year on record – generally 2010 and no earlier than mid-2009

**Level**



The study was conducted at facility level, not at a program, patient or cohort level. It includes all ART-related spend at the facility level, but no spend incurred above or outside the facility (e.g., overhead, community programs)

**Costing approach**



Top down: total cost at a given facility, allocated to ART, divided by total patient years to arrive at an average cost per patient-year

**Patient outcome indicators**

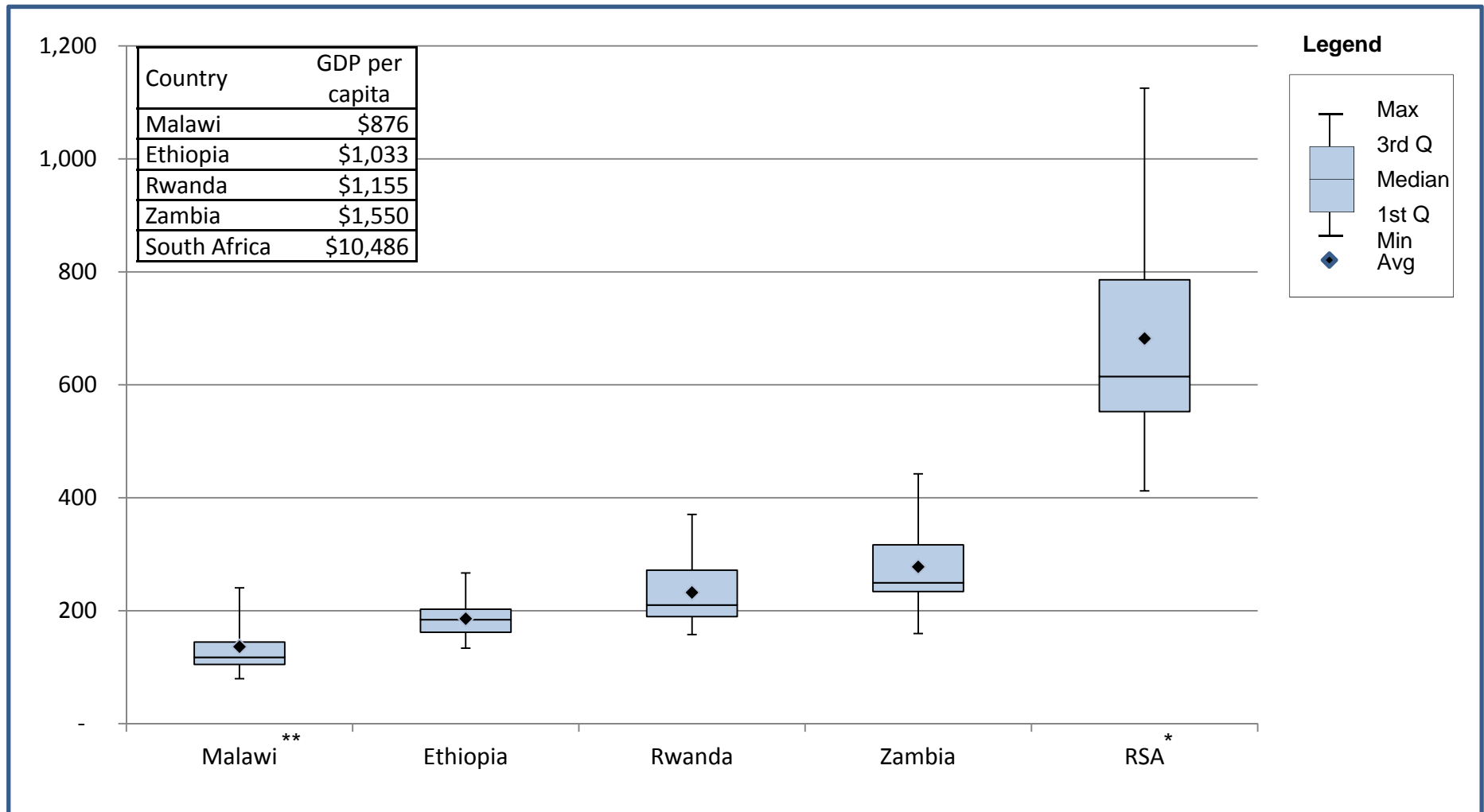


Basic complexity and outcome indicators derived from patient chart reviews. The indicators are being used to examine determinants of patient retention in multivariate regression.

Facility level costs are lower than expected in LIC/LMIC countries, at a mean of \$136 in Malawi, \$186 in Ethiopia, \$232 in Rwanda, and \$278 in Zambia. Mean cost in RSA is \$682

### Cost of treatment per ART patient year by country

US Dollars



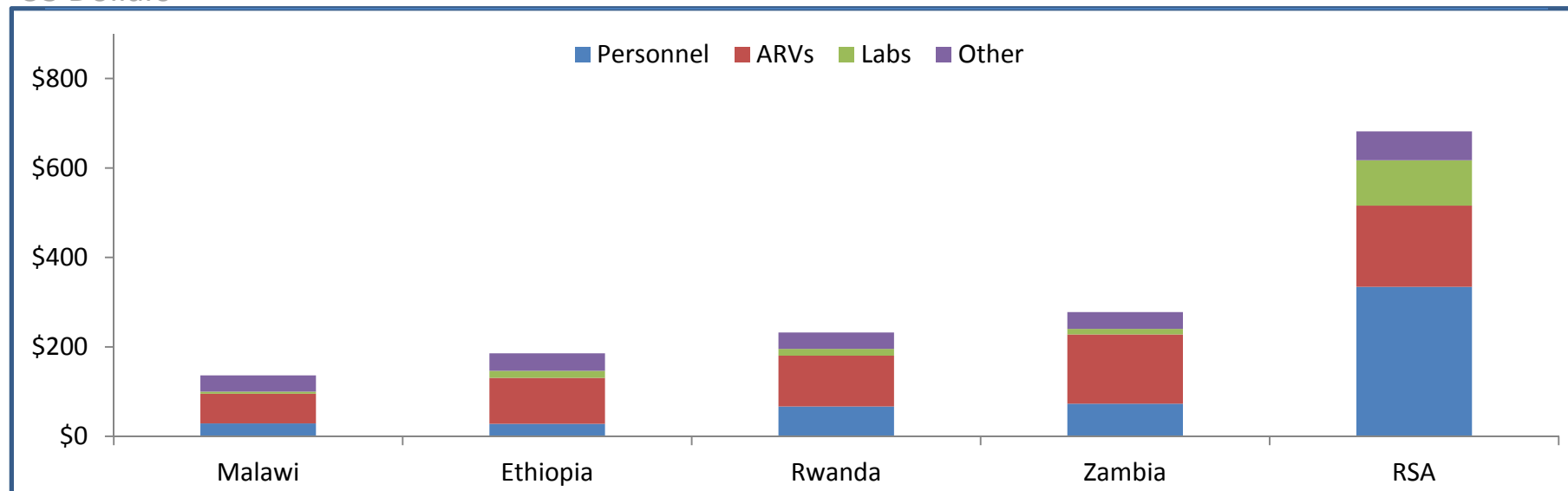
\*RSA cost include updated ARV prices, which were renegotiated by the RSA government in early 2010 and are 53% lower than those observed during the costing period

\*\* ARV costs in all countries are likely to increase as the result of guideline changes made during or after the costing period

ARVs constitute ~50% of total cost in all LIC/LMICs; ARVs and health worker salaries together constitute over 70% of total cost in all countries

### Cost of treatment per ART patient year by country

US Dollars



### Mean and median cost of treatment per ART patient year by country

US Dollar

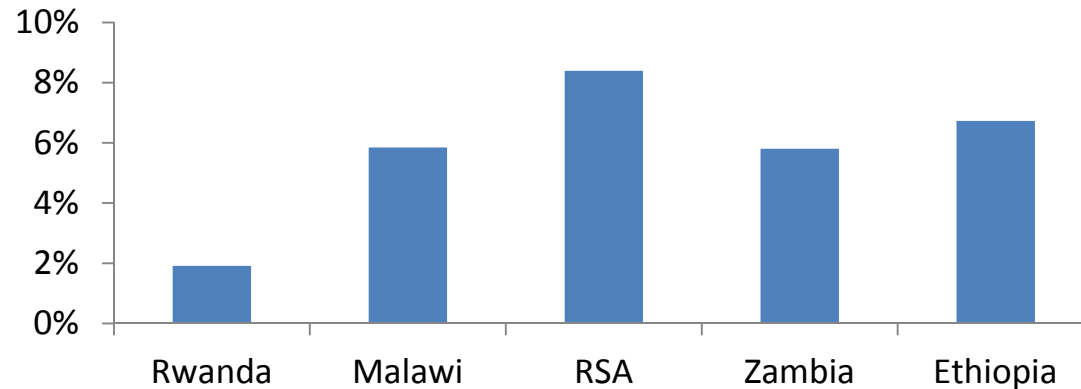
Country	ARVs		Human resources		Labs*		Other		Total Cost	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Malawi	\$66	\$63	\$29	\$22	\$5	\$1	\$36	\$32	\$136	\$117
Ethiopia	\$103	\$101	\$28	\$22	\$16	\$15	\$39	\$35	\$186	\$184
Rwanda	\$114	\$112	\$67	\$56	\$15	\$16	\$37	\$30	\$232	\$210
Zambia	\$155	\$155	\$73	\$46	\$13	\$13	\$37	\$30	\$278	\$250
RSA	\$181	\$179	\$334	\$284	\$102	\$102	\$65	\$56	\$682	\$615

\*Lab costs shown here include reagents & consumables only, except in RSA. Equipment and human resource costs embedded in other categories.

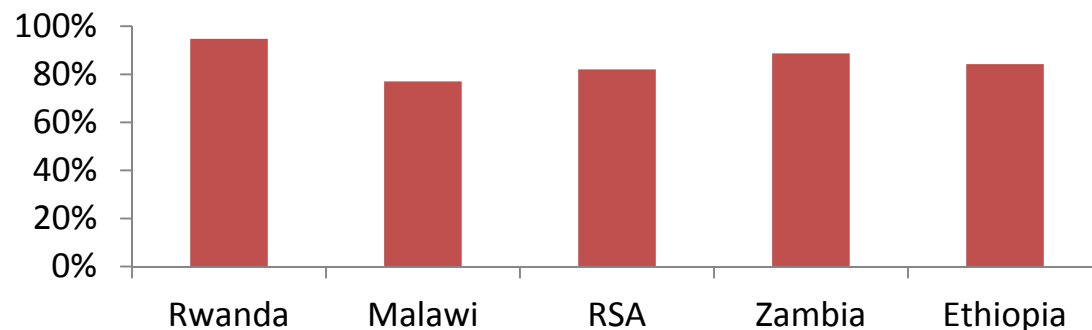
\*\* Simple average numbers are not representative of the countries. Weighted average numbers are currently being calculated which will be a better representation of the countries

Facilities have demonstrated the ability to keep patients alive and on ART at these cost levels, with variation across the sample.

Mean **attrition** (at 12 months) for **established** patients  
*Percent*



Mean **retention** (at 12 months) for **new** patients  
*Percent*



### Pending Further Analysis

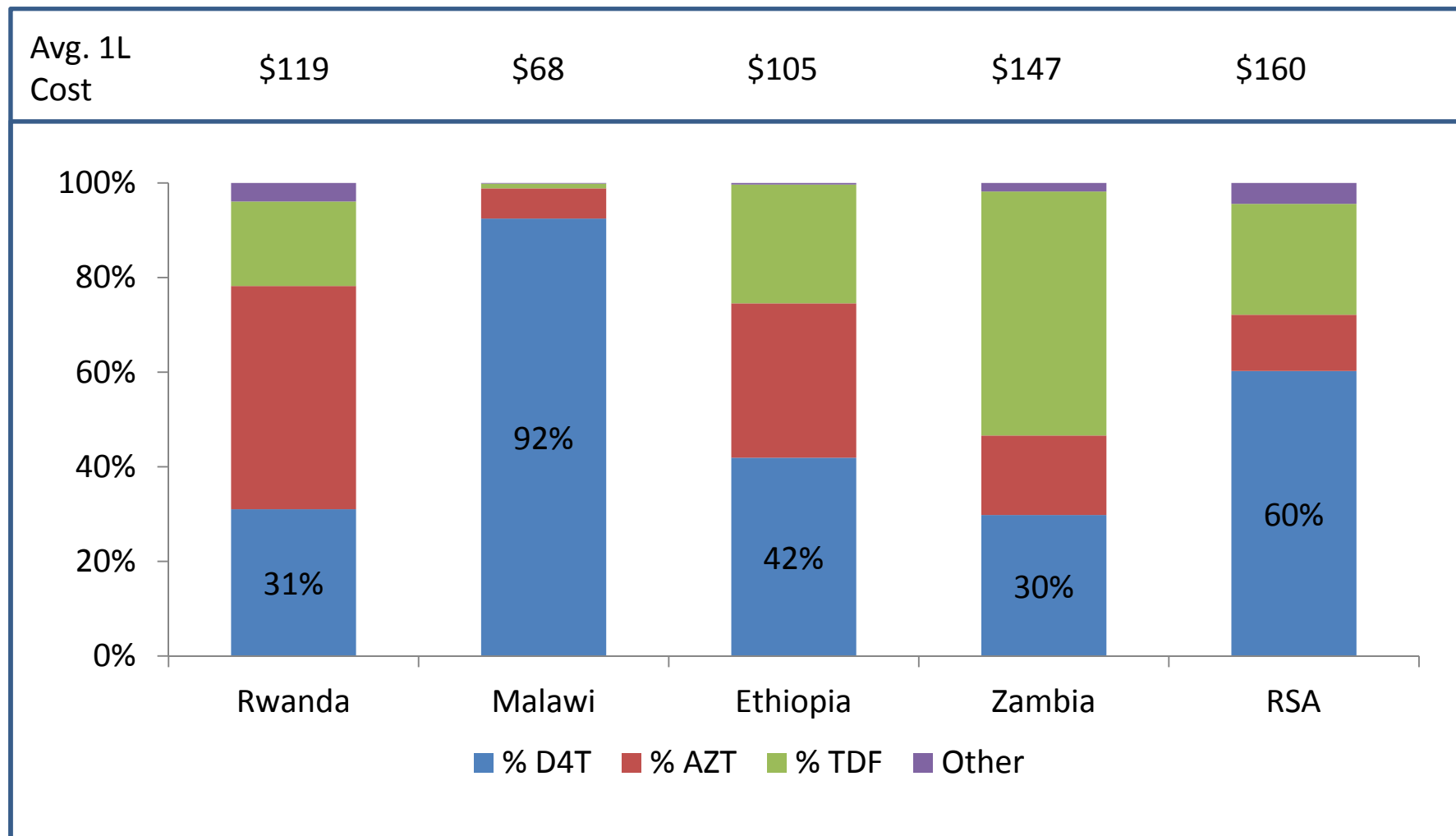
- Sites in the sample have demonstrated an ability to keep patients alive and on treatment. However, variation is significant for both new and established patients.
- Rwanda stands out for its ability to manage both newly initiated patients as well as those receiving long-term care.
- Further analysis is required to better understand the drivers of retention and observed differences across the sample.

\* Transferred patients were excluded from analysis, which may reduce retention rates for sites that transfer stable patients, and increase rates for sites that transfer sicker patients.

ARV cost is driven by regimen choice, and is primarily influenced by the proportion of D4T-based regimens

**ARV costs are driven by regimen choice**

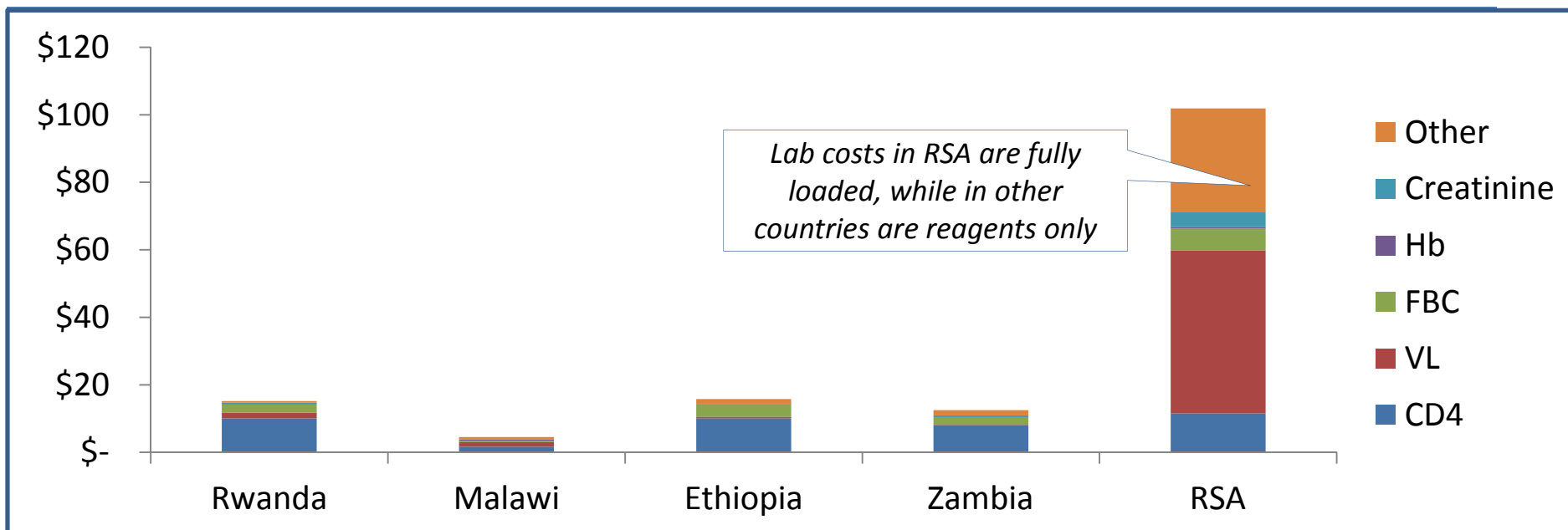
Percent



Outside of South Africa, lab reagent costs are lower than previously believed, with mean cost pppy of \$15 in Rwanda, \$5 in Malawi, \$16 in Ethiopia, and \$13 in Zambia

### Mean cost of labs reagents pppy by test type for ART patients\*

US Dollar



### Mean number of tests pppy

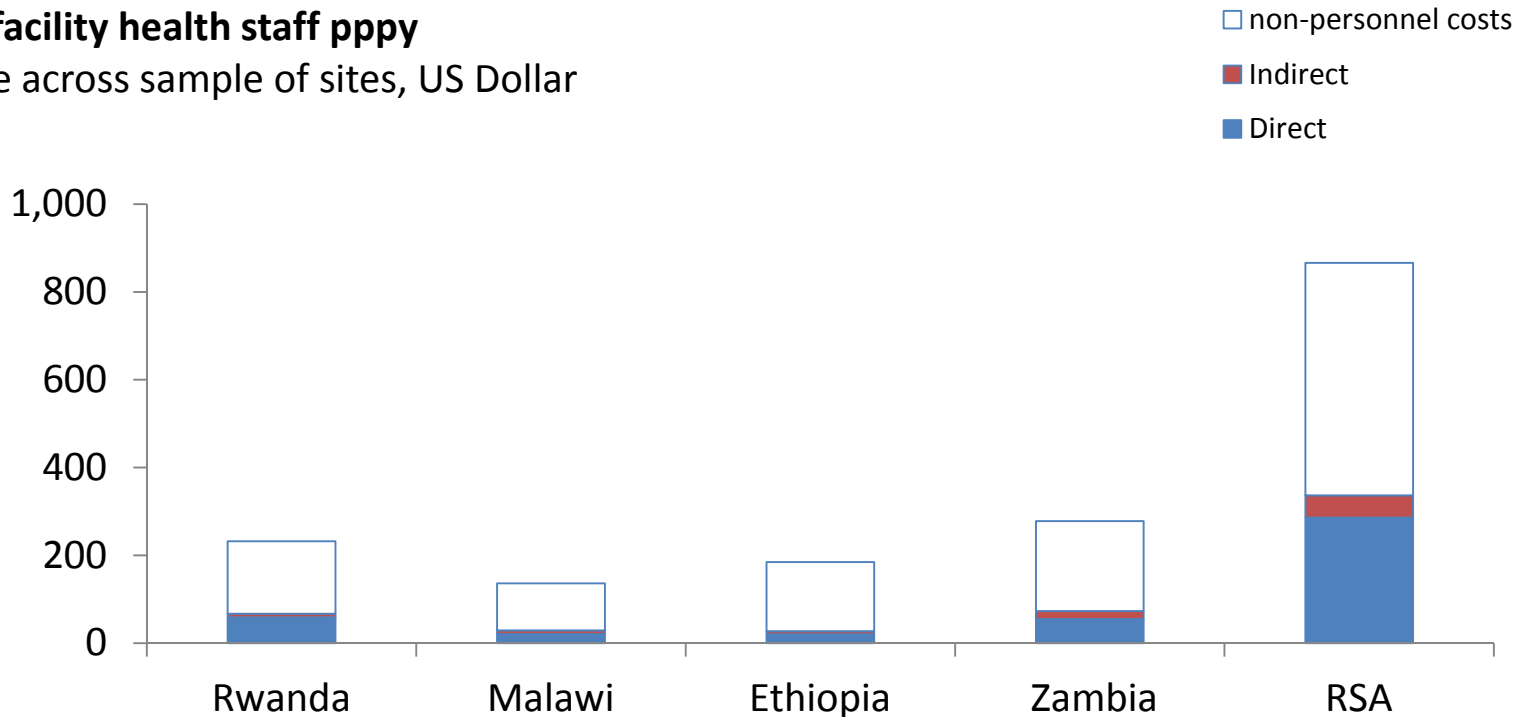
Test Type	Rwanda	Malawi	Ethiopia	Zambia	RSA
CD4	1.6	0.2	1.4	1.3	1.4
VL	0.1	0.1	0.0	0.0	1.1
FBC	1.2	0.2	1.3	1.0	1.0
Hb	0.0	0.3	0.1	0.1	0.2
Creatinine	1.2	0.0	0.2	0.4	1.3

\* Represent cost of lab reagents in Rwanda, Malawi, Ethiopia and Zambia, and fully loaded lab cost in RSA

Facility human resource costs are high in SA, but relatively low in other countries, especially in Malawi and Ethiopia

**Mean cost of facility health staff pppy**

Simple average across sample of sites, US Dollar



**Mean FTE/1,000**

	Rwanda	Malawi	Ethiopia	Zambia	RSA
Direct (ex. CWHs)	10.9	4.7	12.3	9.1	9.2
Indirect	3.1	4.1	8.1	3.3	2.9

**Mean salary**

	Rwanda	Malawi	Ethiopia	Zambia	RSA
Doctor	\$ 13,732	\$12,405	\$ 5,741	\$30,106	\$90,365
Nurse	\$ 4,626	\$4,376	\$ 1,399	\$9,676	\$35,907

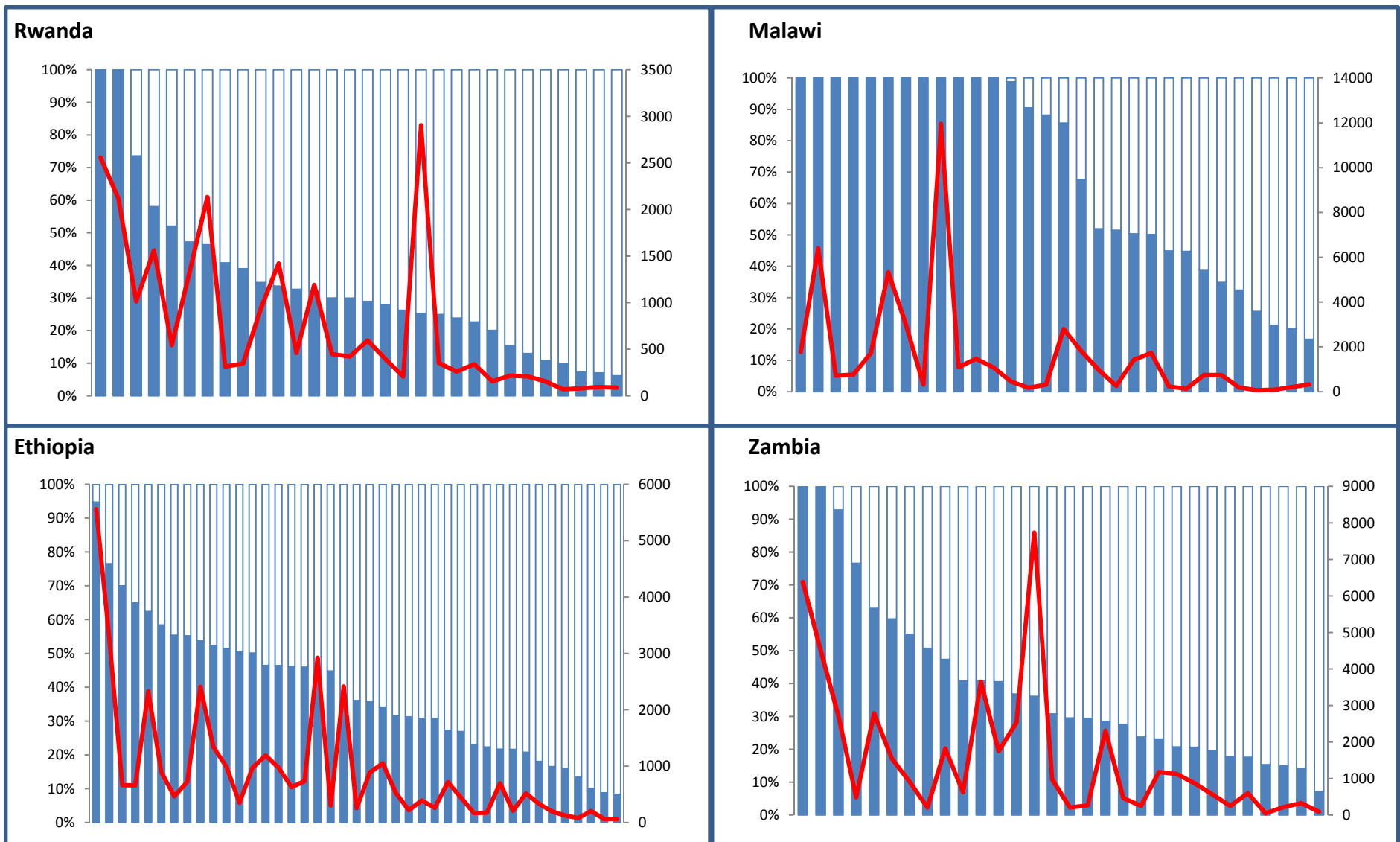
<b>Mean cost</b>	Rwanda	Malawi	Ethiopia	Zambia	RSA
	\$67	\$ 29	\$ 27	\$73	\$ 337



Outside of Malawi, theoretical utilization rates appear low at the majority of sites in the sample. Underutilized sites are largely small and poorly integrated.

**Theoretical\* utilization of Doctor, CO, Nurse and NA time for patient visits**

■ Time taken by patient visits    □ Remaining time    ■ Patient load



Note: assuming a conservative, uniform schedule of 12 visits of 15min each per year for all countries

\* Includes COs and Medical Assistants, who are paid less than nurses but perform initiation in many sites where nurses do not

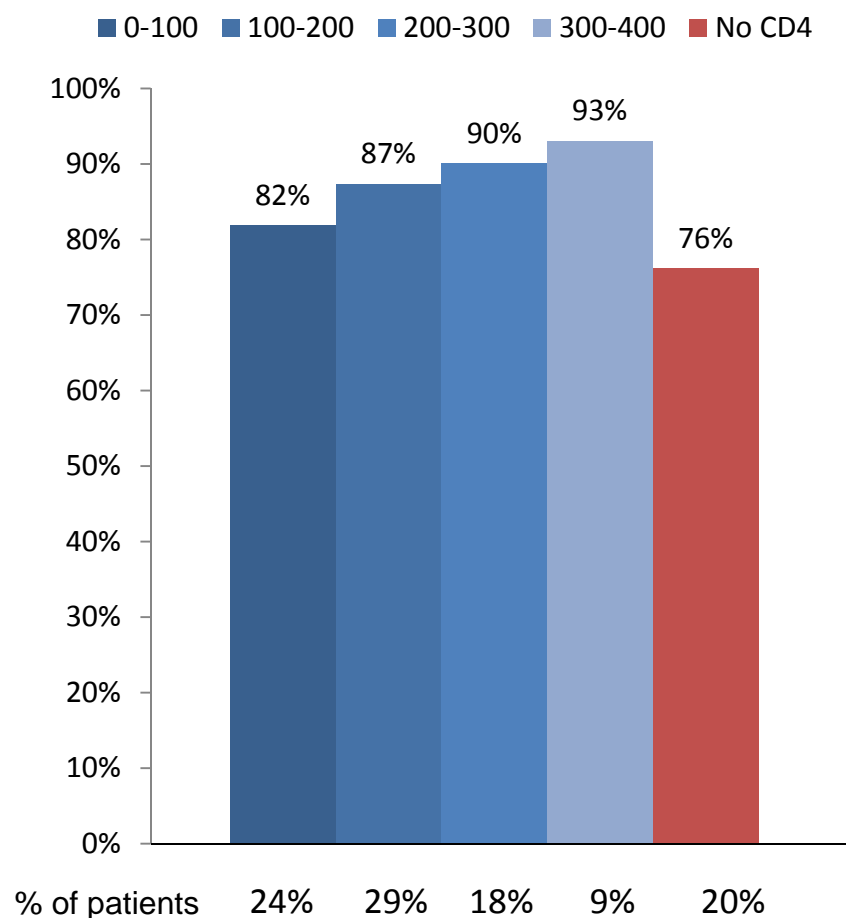
However, there are likely opportunities to improve patient outcomes without substantially increasing cost; these should be prioritized

*Driving earlier initiation will likely help to increase retention*

*Increasing uptake of cotrim to 100% would only increase costs by \$2-\$10 pppy*

### New patient retention at 12 months w/ baseline CD4

Percent, CD4 count



### Mean cost pppy of providing cotrimoxazole

US Dollar

