

Are public or retail sector patients more likely to complete treatment?

An analysis of patient adherence to artemether-lumefantrine in southern Tanzania

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Introduction

Patient adherence is important in ensuring treatment effectiveness. Adherence to artemisinin-based combination therapies (ACTs) for malaria has ranged from 7%-100%.

Few studies have assessed adherence to ACTs obtained from the private sector, where many patients seek care for malaria.

As ACTs become widely available, there is a need to understand patient adherence in both public and private retail sectors.



We conducted two parallel and contemporaneous studies in Mtwara, Tanzania from Sep – Nov 2012 to compare levels and determinants of patient adherence to artemether-lumefantrine (AL) obtained from public health facilities (HFs) and drug stores (ADDs).

Methods

For the public sector observational study, 40 HFs were randomly selected. The study in ADDs consisted of a cluster randomized trial of an intervention to improve dispenser knowledge and patient adherence to AL, with only data from the 37 ADDs in the control arm.

All patients seeking treatment for fever were registered by dispensers at the selected outlets. Eligible patients who were prescribed ACTs at HFs or purchased AL at ADDs were followed up three days later. Consenting patients or their caregivers were administered a detailed questionnaire about when and how each dose of AL was taken, and patients were asked to present their blister packs for a pill count.

Data analysis: The effect of health sector on adherence controlling for potential confounders was assessed using logistic regression with a random effect for outlet. Variables related to care obtained at the outlet were assessed for their association with adherence in each sector separately using logistic regression with robust standard errors. Variables significant in the unadjusted analyses were included in the multivariate models.

Box 1 – Adherence definitions

Completed treatment: Patient reported taking all doses by the time of the follow-up visit (day 4), verified by counting any remaining pills in the blister pack.

Timely completion: Patient took the second dose at the Swahili time of day¹ corresponding with 8 hours after the first dose, and took each subsequent dose at the Swahili time of day corresponding with 12 hours after the previous dose, with the correct number of tablets taken for each dose.

¹Swahili times of day are: alfajiri (early morning), asubuhi (morning), mchana (afternoon), jioni (evening), usiku (night), and usiku sana (late night)



Table 1– Patient characteristics, treatment, and adherence

	Public HFs (N=572)	ADDs (N=450)	p-value
Male	43%	53%	0.007
Age 12 years and older	23%	50%	<0.0001
Patient or caregiver completed primary school	58%	72%	0.007
In wealthiest quintile of wealth index	10%	32%	<0.0001
AL obtained in the evening	4%	28%	<0.0001
Tested for malaria outlet	54%	11%	<0.0001
Took first dose of AL at outlet	41%	10%	<0.0001
Recalled correct instructions given by dispenser on dose regimen	61%	60%	0.7
Tested positive by mRDT at interview	50%	28%	0.001
Adherent by “verified completed treatment”	75%	70%	0.2
Adherent by “verified timely completion”	46%	35%	0.003

Table 2- Comparison of adherence between sectors

	Verified completed treatment		Verified timely completion	
	Adjusted odds ratio ¹ (95% CI)	p-value	Adjusted odds ratio ¹ (95% CI)	p-value
Attended ADDO vs. HF	0.65 (0.43, 1.00)	0.048	0.69 (0.47, 1.01)	0.056
Patient or caregiver completed primary school	1.68 (1.20, 2.36)	0.003	1.06 (0.77, 1.45)	0.9
<i>Socioeconomic status</i>				
1 st quintile (most poor, ref)	---	---	---	---
2 nd quintile	0.98 (0.62, 1.57)	0.9	1.04 (0.66, 1.64)	0.9
3 rd quintile	1.17 (0.73, 1.88)	0.5	1.10 (0.70, 1.75)	0.7
4 th quintile	2.25 (1.33, 3.81)	0.003	1.64 (1.03, 2.65)	0.039
5 th quintile (least poor)	2.24 (1.28, 3.81)	0.005	2.34 (1.40, 3.93)	0.001
<i>Time of day drug was obtained</i>				
Morning (ref)	---	---	---	---
Afternoon	0.96 (0.62, 1.47)	0.8	0.70 (0.48, 1.03)	0.070
Evening	0.93 (0.50, 1.70)	0.8	0.35 (0.19, 0.64)	0.001

¹Also adjusted for patient age, distance from home to outlet, and time between obtaining AL and interview.

Results

- We interviewed 572 public HF and 450 ADDO patients. Completed treatment was 75% among HF patients and 70% among ADDO patients (p=0.2), while timely completion was 46% and 35% respectively (p=0.003).
- ADDO patients were older, more educated, wealthier, and more likely to seek treatment later in the day. Controlling for patient characteristics, the adjusted odds of completed treatment and timely completion for ADDO patients were 0.65 (95% CI: 0.43, 1.00) and 0.69 (95% CI: 0.47, 1.01) times that of HF patients.
- Higher economic status was associated with both measures of adherence, while completion of primary school was associated with completed treatment and obtaining AL in the evening was negatively associated with timely completion.
- In sector-specific models, recalling correct instructions on the dose regimen was associated with both adherence measures. In HF patients, but not ADDO patients, taking the first dose of AL at the outlet was associated with timely completion.

Conclusions

When controlling for patient characteristics, there was some evidence that the adjusted odds of completed treatment and timely completion for ADDO patients were lower than for HF patients. In both sectors, adherence was sub-optimal, indicating the need for additional interventions to improve adherence to ACTs.

These might include:

- targeted text messages
- community education
- improved packaging instructions for patients obtaining AL later in the day
- encouraging effective provision and uptake of advice.



See also: Bruxvoort K, Festo C, Kalolella A, Cairns M, Lyaruu P, Kenani M, Kachur SP, Goodman C, Schellenberg D: **Cluster Randomized Trial of Text Message Reminders to Retail Staff in Tanzanian Drug Shops Dispensing Artemether-Lumefantrine: Effect on Dispenser Knowledge and Patient Adherence.** *Am J Trop Med Hyg* 2014