

## Patients Lost to Care Are More Likely to be Viremic Than Patients Still in Care

TO THE EDITOR—The study by Aghokeng et al [1] found little difference in cross-sectionally ascertained virological failure at 12 and 24 months among patients on first-line antiretroviral therapy (ART) across 7 countries in sub-Saharan Africa and Southeast Asia; however, significant country-level variations were observed, possibly reflecting programmatic weakness and poor adherence. Most ART programs report that a substantial proportion of patients are lost to care at any point in time [2, 3] and, as noted by the authors, cross-sectional approaches to evaluating virologic status in treatment cohorts could be biased by not accounting for loss to care, particularly if patients lost to follow-up (LTF) are more likely to be viremic or failing treatment than those retained.

We evaluated the last known virologic status as of mid-2012 in a cohort of treatment-naive adult patients starting ART since 2001 in Khayelitsha, South Africa [4]. Virologic status was categorized as never tested, suppressed (<400 copies/mL), viremic ( $\geq$ 400 copies/mL), or failing (viremic on consecutive tests). The analysis was restricted to patients who were retained or LTF at their last visit. Visits until the end of 2012 were observed so that all patients could potentially meet the LTF definition. In a survival model in which the period between the penultimate and last visit in patients LTF was treated as a time-varying covariate to signify imminent loss, the association between imminent loss and becoming viremic was determined, adjusted for duration on ART, baseline patient characteristics, and calendar period.

Of 29 549 adults who started ART prior to mid-2012, 1343 had died, 1712 were transferred out, and 6936 were LTF, leaving 19 558 remaining in care. Of those followed up for between 1 and 2 years who remained in care, 76% (95% confidence interval [CI], 75%–78%) were virologically suppressed compared with 58% (95% CI, 56%–61%) of those who were LTF after a similar duration on ART. This difference remained

between 2 and 5 years on ART (82% [95% CI, 81%–83%] vs 70% [95% CI, 67%–72%]) and beyond 5 years on ART (89% [95% CI, 81%–83%] vs 71% [95% CI, 66%–76%]). A substantial proportion of patients LTF were lost prior to ever receiving a viral load test (48%). Of those patients with a viral load, 27% were last tested more than a year prior to analysis closure (Table 1). A Cox proportional hazards regression model showed that across all durations on ART, patients LTF were 1.6 (95% CI, 1.4–1.7) times more likely to become viremic at the time of loss compared with retained patients followed for similar durations.

These findings suggest that cross-sectional surveys of virological status in patients on ART in high-burden settings are likely to be biased and underestimate virological failure due to the higher proportion of patients LTF who are viremic or failing at the time of loss, and who are more likely to have virologic resistance compared with patients who are still in care.

### Note

**Potential conflicts of interest.** All authors: No reported conflicts.

All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

**Table 1. Last Viral Load Category by Care Status and Duration on Antiretroviral Therapy in Mid-2012**

Virologic Status	0 y		0.25 y		1 y		2 y		5 y		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<b>Patients retained in care</b>												
Never tested	1824	97	1637	46	552	15	579	8	49	1	4641	24
Suppressed	60	3	1761	50	2756	76	5703	82	3211	89	13 491	69
Viremic	0	0	118	3	178	5	267	4	133	4	696	4
Failing	0	0	19	1	122	3	372	5	217	6	730	4
Total	1884		3535		3608		6921		3610		19 558	
<b>Patients lost to follow-up</b>												
Never tested	1586	96	1206	60	357	26	174	11	10	3	3333	48
Suppressed	66	4	677	34	815	58	1065	70	249	71	2872	41
Viremic	0	0	111	6	135	10	135	9	38	11	419	6
Failing	0	0	15	1	93	7	152	10	52	15	312	5
Total	1652		2009		1400		1526		349		6936	

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**Clinical Infectious Diseases** **2014;58(9):1344–5**

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DOI: 10.1093/cid/ciu072