

REDUCING TIME FOR HIV VIRAL LOAD RESULT DELIVERY TO ANTIRETROVIRAL TREATMENT FACILITIES IN MALAWI

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BACKGROUND

The success of any national HIV program requires an efficient result delivery system for appropriate and timely management of HIV-positive patients. In Malawi, HIV viral load (VL) and early infant diagnostic (EID) specimens are collected from 650 antiretroviral treatment (ART) facilities and sent to centralized laboratories for testing (1). There is a national specimen transport network which delivers paper-based results to health facilities by motorcycle courier. This, coupled with high VL testing volumes, has resulted in an increase in diagnostic result turnaround times (TAT); some reports indicating up to 90 days (1). Paper reporting systems add enormous strain on already overburdened facilities and healthcare workers, leading to delays in appropriate patient management, lost/misplaced results and difficulties in scheduling patient return appointments (2,3).

To improve the overall efficiency and management of result delivery, SystemOne (Boston, MA, USA) in collaboration with the Malawian Ministry of Health, Partners in Hope and EQUIP-Malawi, interfaced 12 centralised VL testing sites to enable rapid result reporting to ART facilities through a solar-powered, digital reporting terminal, called Aspect Reporter™. The purpose of this assessment was to demonstrate the impact of Aspect Reporter on time to delivery of HIV VL and EID results from centralized laboratories to remote facilities in Malawi.

PILOT

Reporter Design

- Small footprint device
- Contains solar power & network connection powered by global SIM
- Receives results from lab in real-time and displays on a Android tablet.

Reporter Features

- Healthcare worker (HCW) can review acknowledge and search for results
- Abnormal results are flagged for quick identification
- HCW receives alert if repeat specimen needed

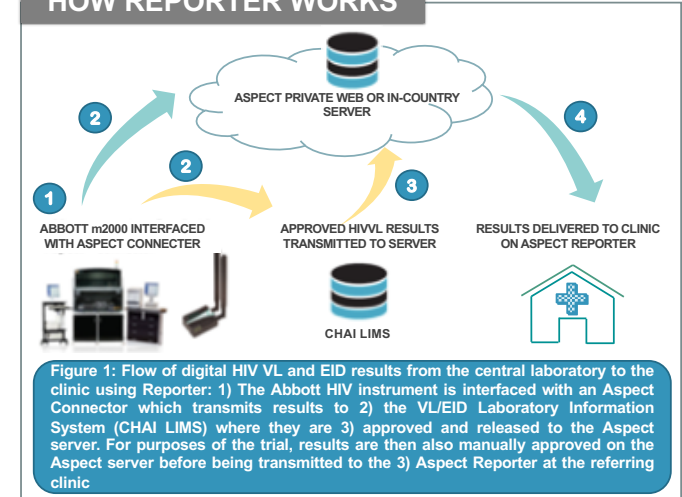
Installation for Pilot

- Sites: 12 clinics in Lilongwe, Dedza and Dowa Districts selected
- Reporter, including solar power, was installed at each clinic between August 22nd and 31st 2017.

Training for Pilot

- 77 HCW and 20 PIH mentoring staff were trained on the use of device and basic HIV-related care
- Training took approx. three-hours

HOW REPORTER WORKS



ANALYSIS

To determine the impact of Reporter on laboratory result delivery in Malawi, data was collected to compare reliability (% loss of results), and time to result receipt (from test completion to result receipt at facility), pre- (paper reporting) and post-Reporter (digital reporting).

DATA COLLECTION PRE-REPORTER (PAPER)

A subset of 9 ART facilities were randomly chosen for data collection

- Time points collected by manual clinic register review:
 - Date of result approved in lab;
 - Date of result receipt at clinic.

DATA COLLECTION POST-REPORTER (DIGITAL)

To compare changes in TAT after the intervention, data was collected 4 months post-pilot initiation

- Time points extracted from Aspect server
 - Date result approved on CHAI LIMS;
 - Date result delivered to Reporter

DEFINITION OF TAT

For the purposes of this study, TAT is defined as:

- T1 = Day on which result was approved at the laboratory/CHAI LIMS
- T2 = Day result was received at the clinic
- TAT = Time in days between T1 and T2

COMPARISON OF TAT PRE- AND POST-REPORTER

Mean, standard deviation (SD), median (range) TATs were reported in days and compared across 9 clinics. The % of results received in defined time categories was assessed pre- and post-Reporter. Overall improvement in Reporter TAT over 4mo is also reported.

RESULTS

COMPARISON OF TAT (TABLE 1)

Pre-Reporter

- Across 9 clinics, 5% (23/459) of paper results were reported missing in the clinic registers.
- The overall mean time to deliver a paper result was 22 days (SD=30.8).

Post-Reporter:

- No digital results reported missing on Reporter
- The overall mean time to deliver a digital result was 1 day (SD=2), an improvement of 95.4% versus paper reporting (P<0.001).

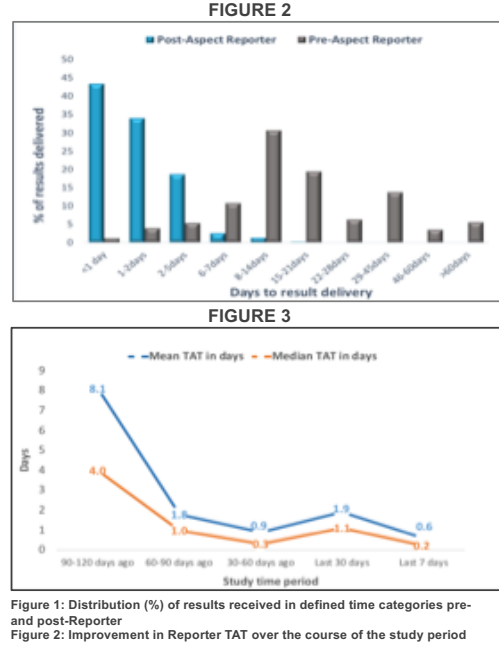
DISTRIBUTION OF RESULTS (FIGURE 2)

- Pre-Reporter, the majority of results (79%) took >1 week to arrive in the clinic.
- Post-Reporter, 77% of results were available within 2 days.

IMPROVEMENT IN REPORTER TAT (FIGURE 3)

- The mean time to deliver a result to Reporter has been steadily improving over the course of the study, from 8.1 days four months ago to just 0.6 days currently.

Clinics	Distance from lab	Pre-Aspect				Post-Aspect			
		n=	Missing n=	Mean (SD)	Median (range)	n=	Mean (SD)	Median (range)	
Chankhungu	39km	74	0	12.8 (6.2)	11.5 (6-29)	44	0.7 (0.6)	0.5 (0-2)	
Chileka	43km	29	4	91.8 (90.9)	107 (4-472)	104	1.2 (1.4)	1 (0-6)	
Chitezde	16km	22	0	27.8 (13.0)	35 (1-41)	78	2.1 (1.3)	1.7 (0-5)	
Daeyang	17km	71	5	17.8 (13.2)	17 (1-49)	382	1.5 (2.5)	0.9 (0-35)	
Dzoole	43km	71	5	20.9 (19.1)	14 (1-71)	123	2.8 (2.7)	2 (0-12)	
Kabudula	42km	24	1	31.8 (5.4)	33 (21-47)	265	1 (2.0)	0.2 (0-11)	
Lobi	50km	55	2	15.3 (16.6)	9 (0-87)	161	0.4 (0.5)	0.2 (0-3)	
Malingunde	23km	58	2	16.2 (16.4)	10 (1-86)	185	2 (2.0)	1.1 (0-12)	
Mponela	43km	55	4	15.2 (8.6)	14 (1-48)	113	1.2 (2.6)	0.3 (0-25)	
TOTALS		459	23	22 (30.8)	14 (0-472)	1455	1 (2)	1 (0-35)	



CONCLUSION

Aspect Reporter facilitated timely and reliable availability of digital HIVVL/EID results at ART facilities:

- ✓ 100% of results delivered
- ✓ 92% of results acknowledged by HCWs
- ✓ 95% reduction in TAT versus paper-based reporting

This improved the laboratory-clinical interface:

- Allowed HCW's to easily access and identify abnormal results within a significantly shortened TAT
- Facilitated more timely patient management.
- Allowed HCW's to schedule follow-up visits more easily and reliably
- Decreased the number of repeat testing requested

Aspect Reporter has application for rapid reporting of other laboratory-based results to remote clinics.

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