Technical report on interoperability and IT support provided to public sector antiretroviral treatment health facilities in Namibia

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Systems for Improved Access
to Pharmaceuticals and Services

Technical report on interoperability and IT support provided to public sector antiretroviral treatment health facilities in Namibia

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September 2015

About SIAPS

The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program is to assure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the SIAPS result areas include improving governance, building capacity for pharmaceutical management and services, addressing information needed for decision-making in the pharmaceutical sector, strengthening financing strategies and mechanisms to improve access to medicines, and increasing quality pharmaceutical services.

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Key Words

Interoperability, Data linkage, Decentralization, NIMART, EDT, ART, EDT Mobile, Data Quality, e-TB Manager, Rx Solution, Pharmadex, HIVDR EWI, DRTB

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Acronyms and Abbreviations

AIDS	acquired immune deficiency syndrome
AMR	antimicrobial resistance
ART	antiretroviral therapy
ARV	antiretroviral medicine
Div:PhSs	Division: Pharmaceutical Services (of the MoHSS)
DRTB	drug resistant tuberculosis
DSP	Directorate of Special Programs (of the MoHSS)
EDT	Electronic Dispensing Tool
eLMIS	electronic logistics management information system
EPMS	Electronic Patient Management System
e-TB Manager	Electronic TB Management Information System
eTBM	Electronic TB Management Information System
EWI	HIVDR Early Warning Indicator
HIV	human immunodeficiency virus
HIVDR	HIV drug resistance
HMIS	health management information system
IMAI	integrated management of adults and adolescents illnesses
MDR-TB	multi-drug resistant tuberculosis
mEDT	EDT Mobile
MoHSS	Ministry of Health and Social Services
MSH	Management Sciences for Health
NDB	EDT national database (NDB)
NIMART	nurse initiated and managed ART
NMRC	Namibia Medicines Regulatory Council
NTLP	National TB and Leprosy Programme (of the MoHSS)
ODBC	open database connectivity
Pharmadex	pharmaceutical products registration software
PHC	primary health care
Rx Solution	Pharmacy Management Software Rx Solution
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
SQL	Structured Query Language
TB	tuberculosis
USAID	U.S. Agency for International Development

Background

Namibia is one of the southern Africa countries significantly affected by the human immunodeficiency virus (HIV) and AIDS epidemic, with HIV prevalence among adults estimated at 16.9 per cent as of 2014[1]. Namibia's Ministry of Health and Social Services (MoHSS) manages approximately 350 public health facilities in 14 regions. Fifty (50) of these facilities are designated as main sites for antiretroviral therapy (ART), including 35 hospitals, 9 health centers and 6 clinics. Another 108 primary health care (PHC) health centers and clinics are designated as nurse initiated and managed ART (NIMART) sites.

The USAID-funded Systems for Improved Access to Pharmaceuticals and Services (SIAPS) program continues to support the MoHSS to improve pharmaceutical service delivery and care of people living with HIV, including those with HIV/TB co-infections by ensuring optimal use of innovative patient and medicine management tools for the efficient delivery of ART and multi-drug resistant tuberculosis (MDR-TB) treatment services in Namibia. SIAPS-supported pharmaceutical management information software include the Electronic Dispensing Tool (EDT), the electronic TB Management Information System (e-TB Manager), the medicines registration system - Pharmadex, and the pharmacy management software – Rx Solution. SIAPS aims to ensure that these tools are interoperable with existing tools and are built on open source standards that support data-interchange with new systems.

The EDT is a desktop application currently in use at the 50 main ART pharmacies of the MoHSS to dispense antiretroviral (ARV) medicines, manage patients on ART and manage the inventory of ARV medicines. The EDT Mobile (mEDT) is a hand-held device that is used (by nurses) to dispense to patients on ART at primary health care (PHC) facilities. SIAPS continues to support the MoHSS to roll out the mEDT to PHC level nurse initiated and managed ART (NIMART) sites as part of the ministry's decentralization initiative. Efficient use of the mEDT ensures availability of data from PHC facilities at district, regional and national level, reduces waiting times for clients, eliminates the burden of managing a paper based dispensing system, improves client appointments planning, ARV stock management by PHC facilities and data quality and visibility for the ART program. EDT data is used by the ART program, including the MoHSS' Directorate of Special Programs (DSP) and the Division: Pharmaceutical Services (Div:PhSs).

The e-TB Manager is a web-based application for managing all the information needed by national TB control programs. It integrates data across all aspects of TB control, including information on suspects, patients, medicines, laboratory testing, diagnosis, treatment, and outcome. In Namibia, e-TB Manager is currently in use by the National TB and Leprosy Programme (NTLP) for managing drug resistant tuberculosis (DR TB) at 13 treatment sites serving the 14 regions of Namibia. Data from the EDT and e-TB Manager (eTBM) is used to strengthen interventions to contain antimicrobial resistance (AMR) and improve rational use of medicines.

As part of the MoHSS' health management information systems (HMIS) strategy, which is still in draft form, SIAPS is collaborating with MoHSS stakeholders and partners to support the initiative and implement interoperability standards for patient level systems, including the EDT and electronic Patient Management System (ePMS).

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[1] MoHSS, Namibia. Surveillance Report of the 2014 National HIV Sentinel Survey. [Internet]. Windhoek: MoHSS, Directorate of Special Programmes, Response Monitoring and Evaluation Sub-division; 2014 [cited 2015 Sep 30]. Available from:
http://www.mhss.gov.na/files/downloads/12f_2014%20National%20HIV%20Sentinel%20Survey.pdf

Interventions

In FY15, SIAPS provided technical support to MoHSS in ensuring availability and use of data for pharmaceutical management both for the ART and TB control programs. This was achieved by implementing activities that maximize the availability of SIAPS-supported pharmaceutical information management tools and strengthening collaborations with various MoHSS stakeholders and partners to ensure that the Electronic Dispensing Tool (EDT) and the Electronic Patient Management System (ePMS) are interoperable as they form the basis for patient level systems at public health facilities in Namibia. SIAPS also provided technical support in updating the EDT to ensure that ART data is highly available and visible to program managers through the implementation of the pharmaceutical ART and electronic logistics management information system (eLMIS) dashboard.

SIAPS revised EDT and eTB Manager system documentation and continued to mentor IT staff assigned to regions with a high prevalence of HIV in the maintenance of the tools. SIAPS revamped the Namibia Medicines Regulatory Council's (NMRC) website, to allow online search of registered products and manufacturers. SIAPS provided technical assistance in setting up the IT infrastructure at the new office premises of the NMRC to ensure that the Pharmadex tool continues to be in use and to minimize service interruptions of the council. SIAPS continued to provide routine IT support and helpdesk support to minimize downtime of the EDT, e-TB Manager, Pharmadex, and the Rx Solution.

In October and November 2014, SIAPS conducted national IT support visits to all the 50 main ART sites using the EDT in the 14 regions of Namibia. The activity involved performing updates of the EDT system, reloading the Windows Operating System hosting the EDT, updating antivirus software, updating and installing the EDT Mobile.

In February 2015 SIAPS supported the MoHSS to introduce an EDT Helpdesk to assist in logging and resolving all EDT queries to create a knowledge base for training MoHSS IT staff to be able to support the EDT. During November 2014 to February 2015, SIAPS supported the redesign and development of the NMRC Website.

SIAPS continued to ensure that the EDT is gradually updated, while minimizing service interruptions at facility level, to support interoperability with the ePMS and other systems to enable efficient sharing or interchange of ART data for decision making based upon defined data standards. SIAPS provided technical input during collaborations with various stakeholders where health management information systems (HMIS) interoperability issues were discussed and action plans devised. As part of the activity list compiled in collaboration with IntraHealth (Annex F), SIAPS analyzed the EDT database structure, identified key data elements that are unique to the EDT, and developed a data dictionary to serve as a basis for the next steps of continued work on the activity. SIAPS updated the EDT database structure and developed scripts based on the SQL standard, to enable data import of key data elements relevant to the EDT from the ePMS system, including the ePMS unique number (Annex G). In FY16, SIAPS will update the EDT system with a graphic user interface for performing data import or export based on defined formats, including creating an interface for importing patient recruitment information from the ePMS, among other tasks.

SIAPS supported MoHSS to update the EDT standard list of regimens and medicines to include the new TDF/FTC/EFV FDC and the TDF/FTC formulations. Both medicines and regimens were assigned codes, and can be dispensed to using the EDT and mEDT. The list of health facilities, were updated

based on the master facility list that was generated based on 2009 health facility census, as suggested in meetings with various stakeholders. SIAPS revised the SQL queries for EWI data abstraction to improve the efficiency of the data abstraction process and make them ready for data-interchange using the SQL standard. SIAPS also supported MoHSS to perform the EWI 2015 data abstraction exercise for the 50 ART sites using the EDT.

During the mEDT roll out, SIAPS conducted an analysis of current practices at NIMART sites in the provision of ART services to understand what is normally captured by nurses during patient follow up visits. This information was discussed during collaborations with IntraHealth who would further determine the key data elements that needs to be captured during follow up visits. Possibilities for nurses to use one tool, the mEDT, for both clinical and pharmacy related data capturing are being explored. In October 2014, the mEDT and EDT software were upgraded to improve integration between the two interrelated tools. The mEDT is now able to dispense to patients who are marked lost-to-follow-up (LTFU) on the EDT, which allows the nurse or pharmacy staff to have full control of the tool. The tool allows dispensing to patients marked as LTFU who were actually in-transit at a different facility, or have undergone counseling and it was determined that they should continue taking their medication. The EDT was updated to automatically set the status of the patient upon upload of dispensing data, apart from setting the next appointment date.

SIAPS also introduced and integrated the SMS-based adherence reminder system database with the EDT database, to enable seamless flow of information from one application database to the other. The main key identifier for both systems is the patient ART number generated by the EDT system. The SMS-based adherence reminder app is used to notify patients about their pharmacy appointments and to encourage adherence to pill taking. SIAPS launched the app at two health facilities in Khomas region as part of the pilot phase and plans to extend its use to eight more EDT sites in regions with a high HIV prevalence during FY16.

In order to improve visibility of EDT data, SIAPS is supporting MoHSS and began the implementation of the pharmaceutical ART and eLMIS dashboard in July 2015. The implementation of the dashboard is planned to run until May 2016. SIAPS developed the software requirements specifications document and begun the customization and testing of the dashboard software. As the main data source for the dashboard, the EDT national database (NDB) has been updated using the SQL standard to generate data elements for visualization on the dashboard, including patient numbers by regimen and status, ARV pill pickups by patients. SIAPS is currently updating the NDB to be able to generate the current ART monthly report for import into the dashboard. The data elements that will be extracted from the NDB will include patient numbers by status (active, LTFU, deceased, etc.) by regimen, adherence data, on time pill pickup data, ARV stock status data, etc. The dashboard is being built to be interoperable with the EDT, ePMS and other systems or dashboards, and supports various means of data interchange, including from flat files (e.g. csv), Excel or direct data entry.

SIAPS also provided IT support during the roll out of the mEDT to Kavango and Zambezi regions, in October 2014 and February 2015; the pharmacist assistant (PA) forum in March 2015 and the national EDT training in June 2015.

Results

IT support and interoperability of the patient-level systems

SIAPS ensured the update, availability and uptime of the EDT and mEDT at the 50 main ART sites and 22 PHC facilities across Namibia for continued use in the provision of ART services. Data from these sites was collated regularly, analyzed on the EDT national database (NDB) and used to inform the decision making process of the ART program in Namibia.

SIAPS also ensured that the e-TB Manager is also accessible over the Internet and in use at the 13 DRTB treatment sites serving the 14 regions of Namibia. SIAPS also continued to support the use of the Rx Solution in use at Intermediate Hospital Oshakati, and deployed the new NMRC website in March 2015, which provides online search functionality for registered medicines and manufacturers from the NMRC's products and manufacturers registers.

SIAPS also developed the simplified e-TB Manager user guide, the NMRC website administration manual, and the mEDT toolkit comprising three one-pager pamphlets of visual "EDT Mobile Dispensing Guide", "EDT Mobile Maintenance Guide", and "EDT Mobile Common Medicines Dispensing Codes" which are essential tools during training on the mEDT (Annex C, D, and E). SIAPS also developed the software requirements specification document for the implementation of the pharmaceutical ART and eLMIS dashboard, and began the customization of the web-based tool that will ensure visibility of ART data from the EDT and ePMS, and serve as an early warning system for ARV stock status and other pharmaceutical commodities in the country.

SIAPS contributed to the MoHSS HMIS strategy, and improved the interoperability of the EDT with the ePMS. SIAPS developed revised data dictionaries for the EDT database, SQL standard based queries for data abstraction of various data elements, including HIV drug resistance (HIVDR) early warning indicators (EWI), such as on-time pill pickup (EWI1), retention in care (EWI2), and dispensing practices (EWI4). SIAPS developed SQL-based queries for extracting and sharing of data with other systems using comma separated flat file format, or direct database level linkage using the SQL over open database connectivity (ODBC) or other common application programming interfaces (APIs). Data elements currently supported include those that are part of the current ART monthly report. SIAPS is in the process of automating the import of data from the NDB into the ART/eLMIS dashboard. SIAPS also developed an instruction manual with the steps to perform EWI abstraction from the EDT NDB. SIAPS supported MoHSS to perform the EWI 2015 data abstraction exercise for the 50 ART sites using the EDT.

SIAPS developed SQL-based data import functionality that allows for auto-addition of new patient details to the EDT from the ePMS system and generation of the EDT ART identifiers while retaining the ePMS unique number. SIAPS updated the EDT and mEDT with the new regimen and medicines formulation, upgraded the mEDT to improve its integration with the EDT, and is exploring means of integrating the tool with the ePMS through collaborations with IntraHealth. SIAPS piloted the SMS-based adherence reminder service at Okuryangava and Khomasdal clinics in Khomas region. The app is fully integrated with the EDT and is based on Microsoft SQL Server database.

Mentoring of MoHSS IT staff working in regions with a high prevalence of HIV

SIAPS mentored and supported two (2) MoHSS IT staff based in the northern regions of the country. SIAPS supported MoHSS IT staff to install and configure new computers with the Rx Solution at

Intermediate Hospital Oshakati and updated the installation and configuration guides thereof. MoHSS IT staff were also mentored on supporting the EDT and eTB Manager in their regions, including Kavango East, Kavango West, Ohangwena, Omusati, Oshana, Oshikoto, and Zambezi regions.

Roll out of EDT Mobile to new NIMART sites and Onsite Training

In FY15, SIAPS supported MoHSS to successfully roll out the EDT Mobile to 11 PHC facilities in Zambezi region, seven (7) PHC facilities in Kavango East region, three (3) PHC facilities in Kavango West region, and one (1) health centre in Omusati region, bringing the total number of new mEDT installations in use at NIMART sites to 22. SIAPS also provided onsite training of nurses and pharmacy staff in these regions, and handed over the mEDT toolkit for use during mentoring of others and as reference materials for maintaining and ensuring proper use of the mEDT. In the Zambezi region, 2,979 patients, representing 37% of patients on ART in the region, were directly managed at PHC facilities using the mEDT after it was rolled out. Overall as of March 2015, 12 293 patients representing 10% of a total of 136 324 patients were accessing ART through the mEDT while the remainder are being managed using the EDT at the 50 main ART sites.

National EDT Training

In June 2015, SIAPS successfully conducted a national EDT and mEDT training, in which 43 healthcare workers including pharmacists, pharmacists' assistants and nurses were trained. SIAPS provided TA to MoHSS to setup 20 training computers with the EDT. EDT computers were prepared with empty databases to facilitate learning by practical simulation and enable trainees to clearly see how input data affects reporting. Participants were provided with three one-pager pamphlets constituting the EDT Mobile toolkit to assist them in their NIMART nurse training duties.

Target participants at the pharmacist assistant (PA) forum with TOT training on EDT mobile

In March 2015, SIAPS successfully trained 44 healthcare workers, mostly pharmacists' assistants (PAs) from public sector health facilities in the 14 regions of Namibia. Participants were trained on the use of the EDT Mobile at the inaugural PAs forum conducted in Otjiwarongo. The training was designed to enable them to pass on the skills gained to NIMART nurses in their respective districts. Participants were also provided with three one-pager pamphlets constituting the EDT Mobile toolkit to assist them in their NIMART nurse training duties.

Conclusion

Effective use of pharmaceutical management information systems, such as the EDT, ensures the availability and use of data for evidence-based decision making by the ART program. Optimal use of these tools improves the quality of data on ART/TB services at various levels, leads to improved ART/TB treatment outcomes and saves the lives of patients on ART and/or TB treatment.

Pictorial Highlights

A SIAPS facilitator demonstrates use of the EDT to a group of participants during a practical session of the EDT training in June 2015. Photo by SIAPS/Namibia Staff

The EDT Mobile Snapshot

Trainees discuss and use the EDT during a practical session of the training in June 2015. Photo by SIAPS/Namibia Staff

SIAPS staff take NIMART trained Nurses on use of the EDT for data management at PHC facilities. Photo by SIAPS/Namibia Staff

ANNEXES

Annex A: EDT ART Recruitment Form

Ministry of Health and Social Services

EDT ART Recruitment Form

Field	Value	Field	Value
PHC Site Name:		Date of Visit:	D D / M M / Y Y Y Y
Main Site Name:		Nurse-In-Charge:	
EDT ART No:		Therapy Start Date*:	D D / M M / Y Y Y Y
First Name (s)*:		Unique No:	
Last Name*:		CD4 Count:	
Current Regimen*:		Start Regimen:	

Other (Name/Strength)

	TDF/FTC/EFV (300/200/600)mg	TDF/3TC (300/300)mg	AZT/3TC (300/150)mg	NVP 200mg	EFV 600mg		
QTY Disp. (# Tabs)							

Status*:	Active	Transferred-In	PMTCT-OPTION B+

Transfer In From Site:		Cell Phone No*:	
Language:*		Date of Birth*:	D D / M M / Y Y Y Y

Gender*:	Male	Female	Weight:	

Pregnant (Y/N):		Expected Date of Delivery (EDD):	D D / M M / Y Y Y Y
Physical Address*:		Town*:	

Date of Next Appointment*: D D / M M / Y Y Y Y

Caregiver's name:

Caregiver's Physical Address:

Other Diseases/Conditions:

* - Represents fields that are required

Additional notes:
Therapy Start Date: If the patient is being transferred in, the date will be the original date when the patient initiated therapy in the past.
Status: Check both **Active** and **PMTCT-Option B+** for pregnant women starting on ART

Additional notes:_____

_____

Annex B: Routine Activities for NIMART nurses manging EDT mobile

EDT.M.U.S.v.1.0

Ministry of Health and Social Services

EDT Mobile Use Schedule (Routine tasks)

#	Activity	Site Responsible	Timeframe
1.	Receive all required tools from the Main Site. Dispense using the EDT Mobile or Fill in the ART Recruitment Form for your new or transferred in patients; update appointment lists –with regimen changes.	**PHC Site** (RN/EN/PA)	$1^{st} - 24^{th}$ of Month
2.	Do a stocktake and update the ARVs Lists with the Stock On Hand (SOH) at the PHC site.	**PHC Site** (RN/EN/PA)	Before 25th day of Month
3.	Send the updated EDT Mobile device, ARVs Lists (w. SOH), Appointment Lists and ART Recruitment Forms to Main Site. Minimise the number of appointments during the last week of the month.	**PHC Site** (RN/EN/PA)	Latest 25th day of Month
4.	a) Load and verify PHC Site ART data from the EDT Mobile devices onto the EDT database. b) Enter data from ART Recruitment Forms into the EDT and fill in the forms with the generated EDT ARTID. c) Send updated client data to the EDT Mobile (including new patients) d) Print Appointment Lists for coming 2 months & previous 3 months. e) Prepare ARVs to be sent to PHC Site; remember to deduct the stock on hand based on the ARVs Lists you received from the PHC site.	**MAIN Site** (PA/Ph)	Last week of Month
5.	Send Appointments Lists + ARVs Lists + EDT Mobile Device + ARVs + ART Recruitment Forms with EDT ARTID to the PHC site	**MAIN Site** (PA/Ph)	Last Friday of Month
	Repeat cycle every month		

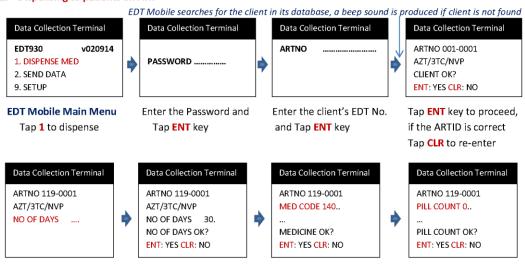## Annex C: Visual EDT Mobile Dispensing Guide

EDT.M.D.G.v.1.0

Ministry of Health and Social Services

EDT Mobile Dispensing Guide

Screen layouts below show visually how to dispense using the EDT Mobile:

1. Dispensing to patients on ART

EDT Mobile searches for the client in its database, a beep sound is produced if client is not found

Data Collection Terminal	Data Collection Terminal	Data Collection Terminal	Data Collection Terminal
EDT930 v020914 1. DISPENSE MED 2. SEND DATA 9. SETUP	PASSWORD	ARTNO	ARTNO 001-0001 AZT/3TC/NVP CLIENT OK? ENT: YES CLR: NO
EDT Mobile Main Menu Tap **1** to dispense	Enter the Password and Tap **ENT** key	Enter the client's EDT No. and Tap **ENT** key	Tap **ENT** key to proceed, if the ARTID is correct Tap **CLR** to re-enter

Data Collection Terminal	Data Collection Terminal	Data Collection Terminal	Data Collection Terminal
ARTNO 119-0001 AZT/3TC/NVP NO OF DAYS	ARTNO 119-0001 AZT/3TC/NVP NO OF DAYS 30. NO OF DAYS OK? ENT: YES CLR: NO	ARTNO 119-0001 MED CODE 140.. ... MEDICINE OK? ENT: YES CLR: NO	ARTNO 119-0001 PILL COUNT 0.. ... PILL COUNT OK? ENT: YES CLR: NO
Enter No. of Days dispensed and Tap **ENT** key to proceed	Tap **ENT** key to confirm entry Tap **CLR** to re-enter	Enter MED CODE, PILL COUNT, DIPENSED QTY Tap **ENT** key to confirm entry or **CLR** to re-enter	

*After you confirm the DISPENSED QTY the EDT Mobile **automatically saves** and prompts data for the next medicine*

Data Collection Terminal	Data Collection Terminal	Data Collection Terminal	Data Collection Terminal
ARTNO 119-0001 DISPENSE QTY 30. ... DISPENSE QTY OK? ENT: YES CLR: NO	ARTNO 119-0001 MED CODE	ARTNO	EDT930 v020914 1. DISPENSE MED 2. SEND DATA 9. SETUP
EDT Mobile continues to prompt for medicine code. Tap **CLR** TWICE to dispense to the next client.		Tap **CLR** again to see Main Menu.	Tap **1** to dispense

2. Dispensing to New or Transferred-In Patients

The EDT Mobile cannot be used to dispense to new or transferred-in patients. In order to dispense to dispense to them follow the steps below:

Complete the ART Recruitment Form

Dispense to the patient and update the ART Recruitment Form

At month-end send the recruitment forms for the month to the main site so that each patient is recorded on the main EDT system and assigned an ARTID

ART Recruitment Forms will be returned from the main site after assigning the ARTID

Follow on dispensing will be done using the EDT Mobile

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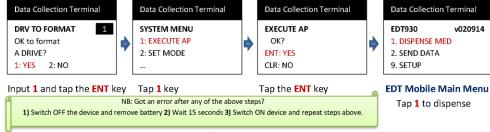## Annex D: Visual EDT Mobile Maintenance Guide

EDT.M.M.G.v.1.0

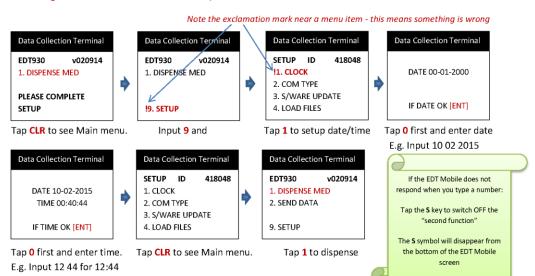**Ministry of Health and Social Services**

EDT Mobile Maintenance Guide

Screen layouts below will help you to maintain the EDT Mobile to eventually get access to the main dispensing menu:

1. How to get to the Main Dispensing Menu

Data Collection Terminal	Data Collection Terminal	Data Collection Terminal	Data Collection Terminal
DRV TO FORMAT [1] OK to format A DRIVE? 1: YES 2: NO	**SYSTEM MENU** 1: EXECUTE AP 2: SET MODE ...	**EXECUTE AP** OK? ENT: YES CLR: NO	EDT930 v020914 1. DISPENSE MED 2. SEND DATA 9. SETUP

Input **1** and tap the **ENT** key   Tap **1** key   Tap the **ENT** key   **EDT Mobile Main Menu**
Tap **1** to dispense

NB: Got an error after any of the above steps?
1) Switch OFF the device and remove battery 2) Wait 15 seconds 3) Switch ON device and repeat steps above.

2. Message "PLEASE COMPLETE SETUP": Date/Time Incorrect

Note the exclamation mark near a menu item - this means something is wrong

Data Collection Terminal	Data Collection Terminal	Data Collection Terminal	Data Collection Terminal
EDT930 v020914 1. DISPENSE MED PLEASE COMPLETE SETUP	EDT930 v020914 1. DISPENSE MED !9. SETUP	**SETUP ID 418048** !1. CLOCK 2. COM TYPE 3. S/WARE UPDATE 4. LOAD FILES	DATE 00-01-2000 IF DATE OK [ENT]

Tap **CLR** to see Main menu.   Input **9** and   Tap **1** to setup date/time   Tap **0** first and enter date
E.g. Input 10 02 2015

Data Collection Terminal	Data Collection Terminal	Data Collection Terminal
DATE 10-02-2015 TIME 00:40:44 IF TIME OK [ENT]	SETUP ID 418048 1. CLOCK 2. COM TYPE 3. S/WARE UPDATE 4. LOAD FILES	EDT930 v020914 1. DISPENSE MED 2. SEND DATA 9. SETUP

Tap **0** first and enter time.   Tap **CLR** to see Main menu.   Tap **1** to dispense
E.g. Input 12 44 for 12:44

If the EDT Mobile does not respond when you type a number:

Tap the **S** key to switch OFF the "second function"

The **S** symbol will disappear from the bottom of the EDT Mobile screen

3. Message "PLEASE COMPLETE SETUP": Files Not Completely Loaded at Main Site

Before you collect/send the EDT Mobile make sure these screens do not show by completing setup as shown below:
Note the exclamation mark near a menu item - this means something is wrong

Data Collection Terminal	Data Collection Terminal	Data Collection Terminal
EDT930 v020914 1. DISPENSE MED PLEASE COMPLETE SETUP	EDT930 v020914 1. DISPENSE MED !9. SETUP	SETUP ID 418048 1. CLOCK 2. COM TYPE 3. S/WARE UPDATE !4. LOAD FILES

Tap **CLR**   Input **9** and   **Action:** *Send EDT Mobile back to main site to complete setup.*

Annex E: EDT Mobile Common Medicine Codes

EDT.M.C.M.C.v.1.0

Ministry of Health and Social Services
EDT Mobile Common Medicines Dispensing Codes

Medicine	Dispensing Code
3TC 150mg TABS	420
ABC 300mg TABS	510
AZT 300mg TABS	330
AZT 300mg/3TC 150mg TABS	240
AZT 300mg/3TC 150mg/NVP 200mg TABS	140
EFV 600mg TABS	630
LPV/R 200mg/50mg TABS	660
NVP 200mg TABS	570
TDF 300mg TABS	390
TDF 300mg/3TC 300mg TABS	230
TDF 300mg/FTC 200mg/EFV 600mg TABS	150
TDF 300mg/FTC 200mg	270

Page 1 of 1

Annex F: Activity list on interoperability of patient level systems

#	Activity / Task	Sub-Activities, examples	Deliverable	Partner(s)
	ANALYSIS			
1	Systems Analysis of HTC, ePMS, EDT and possibly Lab (Meditech)	> Identify unique data elements & functionality vs. common data elements, entities and functionality. Include current data definitions in use. > Define primary data sources for the data entities/objects, and data flow diagrams from one system to the other.	Current Systems Design Document including high-level systems-relationship diagrams and feature list;	IH & MSH
2	Business Process Analysis at five (5) selected sites with HTC, ePMS, EDT (and Lab)	> Collect and analyse user information needs for specific roles (e.g. clinicians, pharmacists and program managers) > Identify functional gaps within each system based on user's data needs > Review data flow diagrams from one system to the other considering timeliness of data entry > Review above tasks and discuss in detail (with patners) additional tasks to include in the BPA process	BPA document including list of user information needs by role and mapping to primary data source	IH & MSH
	DESIGN & IMPLEMENTATION			
3	Development of open data exchange standards for HTC, ePMS, EDT (and Lab) enabled to support interoperability with other systems	> Define database level interoperability standards and formats, data access standards (APIs) for sharing of data across patient-level systems and with dashboards > Define data definition, data formats and coding standards for content to ensure that the same meaning of data is communicated across systems	Standards document for the HIE layer and internal systems databases (patient ID, definitions, formats, protocols, coding)	IH & MSH
4	Implementation of data standards through customisation of HTC, ePMS, EDT (and Lab)	> Define and implement data interchange interfaces of specific patient data elements for sharing with/between site-level systems (e.g. HTC, ePMS, EDT, Lab) according to user information needs > Customise systems and implement role based views of relevant data elements of the shared health record (for EDT & ePMS only) > Define and implement data exchange interfaces of summarized site-level ART data on patients and ARVs for import into different dashboards	HIE layer implemented through data interfaces from various patient-level systems, Updated HTC, ePMS and EDT, HIE layer with summarised data for sharing with dashboards	IH & MSH

5	Strengthen linkages between the EDT and the ePMS system (by means of a unique patient identifier)	> Define key data elements (includes the UID) for the common patient registry, i.e. HTC and Pilot-test patient UID implementation at 3 sites (1 hospital, 1 HC, 1 clinic) > Update both the ePMS and EDT to be able to use this UID and import the patient profile from HTC > Explore means for efficient data interchange, e.g. use of 3G modems, ADSL (i.e. mobile or fixed broadband), USB, etc. > Integrate common patient header file sharing process into existing facility workflows, e.g. use of USB, 3G, etc. > Standardise and improve coordination of updates of the master health facility list and sharing with patient-level systems	Interoperable HTC, ePMS and EDT	IH & MSH
6	Explore possibilities to adapt the EDT Mobile for use at PHCs to capture key data elements for the ePMS and EDT.	> Review NIMART site process to ensure consistent update of patient care booklets > Identify key data elements required for data collection for the ePMS and explore possibilities to update the EDT Mobile	EDT Mobile in use for both ePMS & EDT	IH & MSH
7	Adapt patient level systems to use international coding systems and dictionaries, e.g. ICD10, ATC, etc.			IH & MSH
8	Train and mentor MoHSS IT staff to maintain both the EDT and ePMS and provide supports visits to sites		Functional Helpdesk for HIV tools	IH & MSH
9	Provide TA to establish mechanisms to ensure integration and interoperability of the EDT with other systems	> Improve site level reports through tracking inter-facility pt. movements > Improve site-level and national HIVDR EWI data abstraction mechanisms > Customize the EDT stock module	Improved data quality on patient statistics Improved data abstraction process Updated EDT	MSH
10	Interoperability of EDT and eTBM to ensure HIE on HIV/TB co-infection patterns	Incorporate the UID from the primary data source (HTC) into the eTBM Ensure that the eTBM can operate offline and sync at given intervals	Interoperable HTC, ePMS, EDT, eTBM	MSH
11	Provide TA towards integration of services at site level to minmise the number of patients lost between the point of HIV-testing to treatment (OPD, ANC, PMTCT, WARD, HTC, ART, TB/HIV)	> Review DQA processes and tools and develop a standard operating procedure for data verifications		IH
12	Review data migration process and implement corrective measures to eliminate duplicates and improve data quality for Onandjokwe hospital			IH
13	Design and implement an integrated EDT national database upon which data interfaces to national dashboards can be built.		Integrated NDB	MSH
14	Considerations to redesign patient-level systems using standardised approaches and open source web-technology	> Assess current system architectures and lifespan of use vs. efforts in standardisation to ensure integration > Re-design patient-level systems (ePMS, EDT) using web-technology based on standardised database architecture and user interfaces that support interoperability across patient level systems * Ensure that patient level systems can operate offline and sync at given intervals to the national database	Web-based & interoperable EDT, ePMS & HTC modules	IH & MSH

Annex G: EPMS to EDT data fields mapping of key patient details

EPMS	EDT	Description
Unique_ART_No	BSAStart	Unique number
Address_Rx_Supporter	CaregiverAddress	Caregiver Address
At_Start_ART_CD4	OtherDrugs	CD4 count at ART initiation
At_Start_ART_Weight	WeightStart	Starting weight
Death_Date	StatusChange	Date deceased
DOB	DOB	Date of birth
Given_Name	FirstName	First Name
last_Follow_Up_date	DateofNextApp	Date of next appointment
Last_Name	LastName	Last Name
last_Visit_date	DateofVisit	Date of last visit
Physical_Address	Address	Patient's address
Start_ART	TherapyStart	Date of therapy start
Treatment_Supporter	Caregiver	Caregiver name
Curr_Reg_EDT	PAMREMID	Current regimen code
Initial_Reg_EDT	RegimenStart	Initial regimen code
Gender_EDT	Gender	Gender
IMAI_Code	PAMluRefID	IMAI/Outreach facility code

Annex H: EPMS to EDT regimen mapping for Engela District Hospital

EPMS_Regimen_Code	EPMS_Current_Therapy	EDT Regimen	EDT_Reg_Code
99	ABC/3TC/EFV (99 / 00)	ABC/3TC/EFV	1006
88	ABC/3TC/EFV (99 / 00)	ABC/3TC/EFV	1006
99	ABC/3TC/LPV-r (99 / 00)	ABC/3TC/LPV/r	1007
88	ABC/3TC/LPV-r (99 / 00)	ABC/3TC/LPV/r	1007
99	ABC/ddI/LPV-r (2c / 5a)	ABC/ddI/LPV/r	1009
88	AZT/3TC/ABC (99 / 00)	AZT/3TC/ABC	1011
99	ABC/3TC/AZT/LPV-r (3c /9a)	AZT/3TC/ABC/LPV/r	1012
88	ABC/3TC/AZT/LPV-r (3c /9a)	AZT/3TC/ABC/LPV/r	1012
4	AZT/3TC/EFV (1b / 4d)	AZT/3TC/EFV	1015
7	AZT/3TC/LPV-r (99 / 4e)	AZT/3TC/LPV/r	1018
3	AZT/3TC/NVP (1a / 4b)	AZT/3TC/NVP	1019
23	TDF/AZT/3TC/LPV-r (2a)	AZT/3TC/TDF/LPV/r	1025
2	D4T/3TC/EFV (1d / 4c)	D4T/3TC/EFV	1038
88	D4T/3TC/LPV-r (99 / 00)	D4T/3TC/LPV/r	1040
8	D4T/3TC/LPV-r (99 / 4f)	D4T/3TC/LPV/r	1040
1	D4T/3TC/NVP (1c / 4a)	D4T/3TC/NVP	1041
6	TDF/3TC/EFV (1f)	TDF/3TC/EFV	1059
9	TDF/3TC/LPV_r	TDF/3TC/LPV/r	1062
9	TDF/3TC/LPV_r (1g)	TDF/3TC/LPV/r	1062
99	TDF/3TC/LPV-r (99 / 00)	TDF/3TC/LPV/r	1062
88	TDF/3TC/LPV-r (99 / 00)	TDF/3TC/LPV/r	1062
5	TDF/3TC/NVP (1e)	TDF/3TC/NVP	1063
88	Other (99 / 00)	Other 3LR	1074
99	Other (99 / 00)	Other 3LR	1074

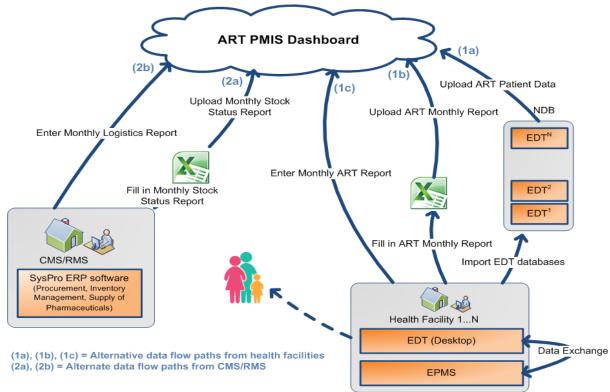## Annex I: Pharmaceutical ART and eLMIS Dashboard Data Flow

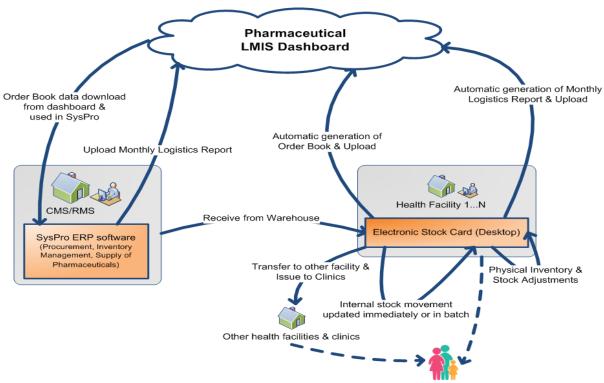

Figure 1: Pharmaceutical ART Dashboard Proposed Data Flow

Figure 2: Pharmaceutical LMIS Dashboard Proposed Data Flow