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GS1 Standards Implementation: Guidance for USAID In-Country LMIS Projects

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Scope of the Effort

- Deliverable 4 seeks an assessment of how to leverage GS1 standards in logistics management information systems (LMISs)
- Two specific contexts:
  - Ethiopia health-care management information system (HCMIS)
  - Tanzania LMIS
- The focus of each effort was slightly different:
  - Ethiopia: focus on **use** of GS1 standards (both in pilots and in HCMIS functions)
  - Tanzania: focus on **implementation** of GS1 standards as backbone foundational elements, plus **use** of standards around core LMIS functions related to inventory

Glossary of Terms

Aligning GHSC terminology with GS1 and supply chain management (SCM) terminology

Term Used in this Deliverable	Definition	Global Health / PSM Term
Commodity (type)	Generic type of product (e.g., aspirin 325 mg)	Product
Trade items	Anything that may be priced, ordered, or invoiced anywhere in the supply chain. Can be an item, case, pallet, etc. – whatever packaging configurations that a manufacturer offers for sale. Often informally referred to in industry as "products."	Item
Product master	Authoritative database of product information. Data source for any/all other systems across the enterprise that need product information.	Datamart, Product Catalog, Data Store, etc.
Transactions	Electronic data interchange or paper-based business documents/messages exchanged between trading partners, e.g., purchase order, invoice, advance ship notice (ASN), packing slip.	Transactions
Business process	An activity or set of activities to accomplish an organizational and/or operational goal, e.g., shipping, receiving.	Transactions
Business step	Individual steps/physical activities performed as part of a business process.	Transactions

Ethiopia

Ethiopia Internal Supply Chain and HCMIS

- In-country, Ethiopia's supply chain consists of movement of product through:
  - **Central Medical Store (CMS)** – moves product mainly at the case level
  - **Hubs** – moves product mainly at the case level
  - **Sub-Hubs** – moves product mainly at the case level
  - **Facilities** – receives mainly at the case level and breaks down to items
- HCMIS includes two versions:
  - **HCMIS warehouse**: used for warehouse management and inventory control in CMS, hubs, and sub-hubs
  - **HCMIS facility**: used to manage and account for all health commodities managed by facilities, including production of R&R inventory report and replenishment request

Key Question:

- *How can HCMIS leverage GS1 standards to attain visibility of health-care commodities moving through Ethiopia?*

ASSUMPTIONS

The recommendations and approaches provided in this section assume that:

1. There is a product master database that stores the Global Trade Item Number (GTIN) and a set of standardized GTIN attributes for each product received by Ethiopia.
2. The attributes include the hierarchy attributes *(explained on next slide)*, quantity attributes, and any other product master data used by HCMIS screens and functions.
3. Pallets are identified and marked (barcodes) with GS1 Serial Shipping Container Codes (SSCCs).
4. Homogeneous cases are identified with GTINs and marked with barcodes encoding GTIN, batch/lot, and expiration date.
5. Heterogeneous cases (partial or mixed) are identified and marked with barcodes encoding SSCCs.
6. Suppliers provide Ethiopia with ASNs, including pallet SSCCs with aggregation information about the cases on board (i.e., GTINs, batch/lot, expiration date and quantity, or SSCC).

ASSUMPTIONS (continued)

Hierarchy:

- GTINs are assigned to "trade items," which are anything that can be priced, ordered, or invoiced:
  - Can include individual units ("eaches"), multi-packs, cases, even pallets (depending on what orderable units a manufacturer chooses to offer)
- Unique GTINs are assigned to each packaging level.
- The relationship between the packaging levels (known as "hierarchy") are communicated in GTIN attributes.
- Example*: GTIN hierarchy attributes for a case carrying four packs of 50 eaches:

Attribute ▸ / Pack Level ▼	GTIN	Child	Quantity of next lower-level trade item	Net content and unit of measure	Quantity of children	Total quantity of next lower-level trade item
EACH	00614141123452	n/a	n/a	1 ONZ	n/a	n/a
PACK	10614141123459	00614141123452	50	n/a	1	50
CASE	20614141123456	10614141123459	4	n/a	1	4

SOURCE: Foodservice GS1 US GDSN Attribute Guide R1.0 (GDSN v3.1.1)
https://www.gs1us.org/documents?Command=Core_Download&EntryId=548

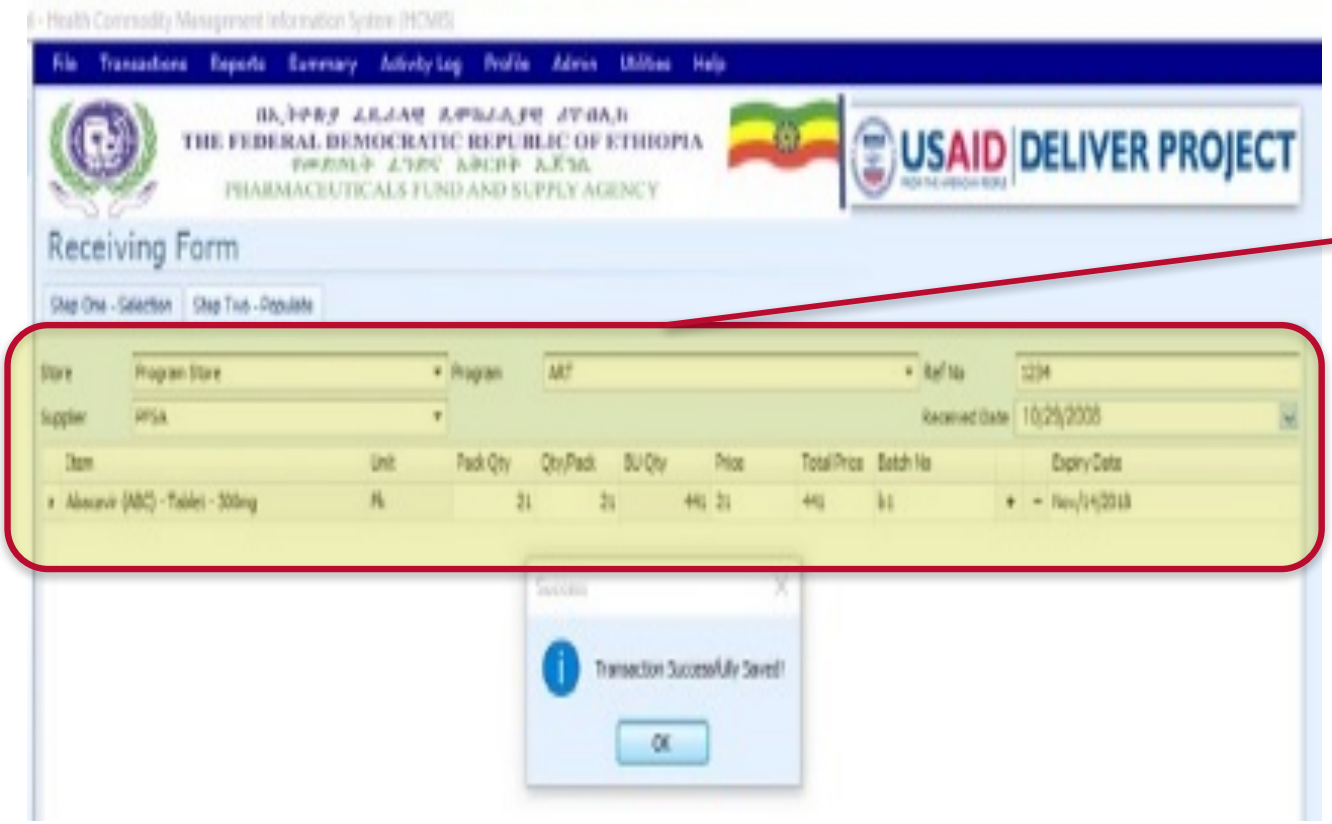
Recommendation 1:

Enhance HCMIS warehouse receiving and shipping functions to capture event-based traceability information using GS1 Standards

- Visibility and traceability are enabled by collecting/storing traceability information during key business steps known as critical tracking events (CTEs).
  - Examples: shipping, receiving
- The traceability information to be collected/recorded for each CTE are known as key data elements (KDEs).
  - Examples: location, trading partner, GTIN, quantity
- Two types of CTEs are already being captured in the HCMIS warehouse today: receiving and shipping (in the receiving, issuing, and transferring functions):
  - However, the data being captured for these events would need to be supplemented to include the necessary KDE for case-level traceability.
  - In addition to those events, the HCMIS warehouse could be supplemented with functions to record unpacking and packing events

Recommendation 1 *(continued)*

HCMIS Warehouse – Receiving screen

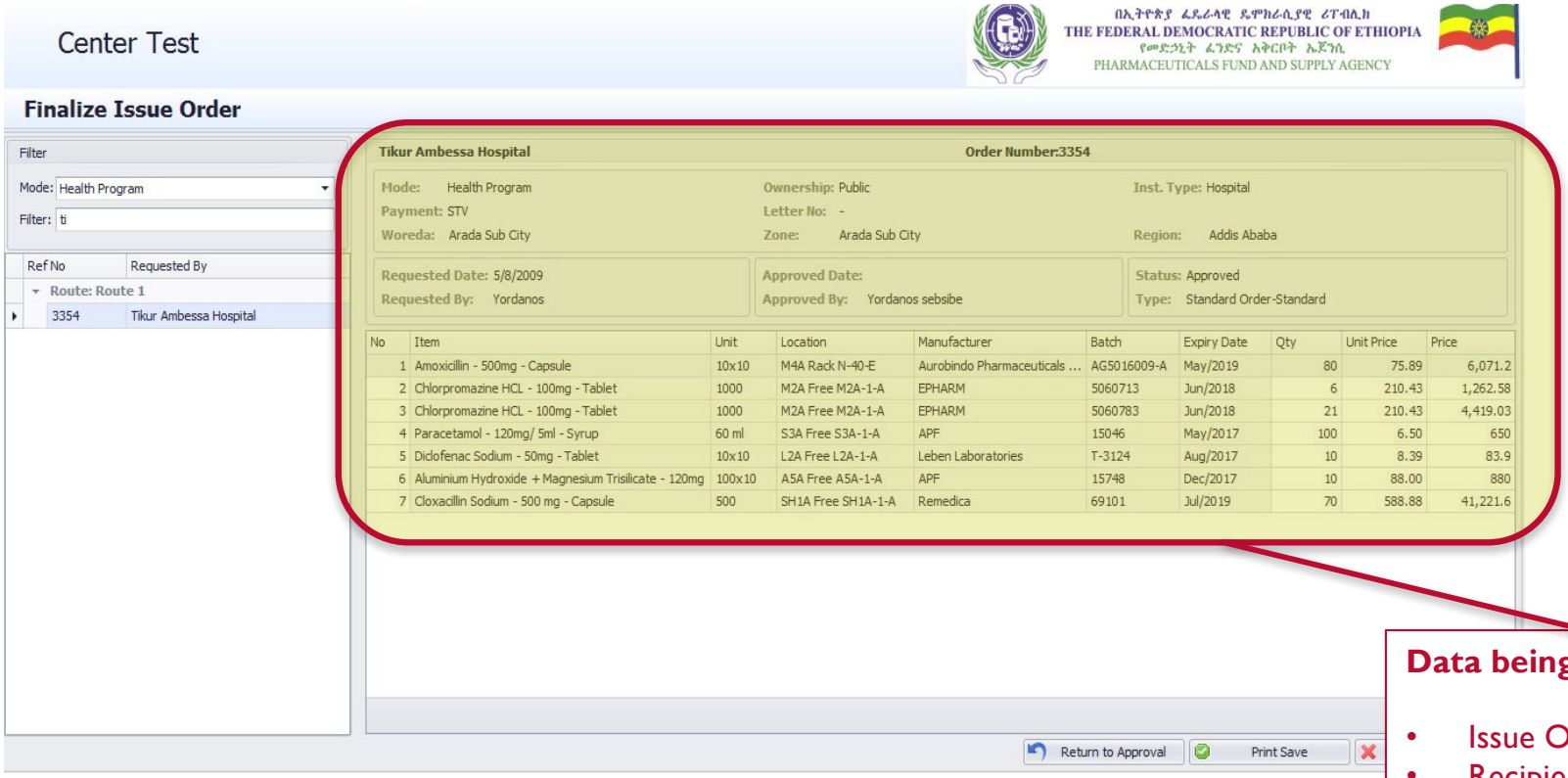


Data being captured:

- Store
- Supplier
- Program
- Commodity
- Unit
- Pack Quantity
- Etc.

Recommendation 1 *(continued)*

HCMIS Warehouse – Finalize Issue Order screen



Data being captured:

- Issue Order #
- Recipient
- Quantity
- Batch/Lot
- Expiration Date
- Etc.

Recommendation 1 *(continued)*

The table below lists data elements that could be added in the HCMIS Warehouse functions to create Receiving & Shipping event records in HCMIS with the KDE needed to support case-level visibility and traceability.

KDE	Values
Business step	Receiving; shipping, packing, unpacking, etc.
Date/time of data capture	YYYYMMDD:MM:HH:SS
Event location	GLN (recommended) or internal ID # (permissible) *
Trading partner	GLN (recommended) or internal ID # (permissible) *
Transaction/activity type	ASN, purchase order, transfer order, R&R, etc.
Transaction/activity number	ASN, purchase order #, transfer order #, R&R #, etc.
Identifier	SSCC or GTIN
Unit of measure	Pallet, case, pack, each, etc.
Expiration date	YYMMDD
Quantity	Positive number

Capturing these data elements for each receiving, issuing, and transferring event will create "event records" in HCMIS with the KDE needed to support case-level visibility and traceability

Recommendation 1 *(continued)*

Implementation Notes:

- The KDE can be found in GS1 barcodes on cases, human-readable text on case labels, and in transactions, e.g., purchase orders, invoices, advance ship notices.
- GTIN and GS1 barcode standards are integral to this effort.
  - If suppliers use their own proprietary numbers and barcodes, barcode scanners at Pharmaceuticals Fund and Supply Agency (PFSA) locations will not be able to read them.
  - For the barcodes to be interoperable, they must be based on standards.
- GS1 data standards are essential to promote data quality and support data exchange with partners in the global health supply chain.
  - GS1 EPCIS Core Business Vocabulary should be used to select permissible values for transaction type and business step (this vocabulary can be used even without EPCIS to promote data quality and alignment)
  - Global Data Synchronization Network (GDSN)/Global Data Dictionary (GDD) data standards should be followed for the remaining fields.
- To facilitate connection of transactions for traceability, transfer orders, Requests & Requisitions (R&Rs), issue orders, etc. will need identifiers in HCMIS. (Proprietary, system-generated identifiers are acceptable.)

Recommendation 2:
CMS Receiving Inbound Shipments

- Receiving functions serve to validate what was received against what was ordered/shipped, and add the received goods into inventory. When large quantities are received (e.g., multiple pallets), some trading partners may prefer to record receipt of the pallet and then confirm the cases and add them to inventory when the pallets are unpacked.
- Today, the receiving function in HCMIS occurs at the case level when the pallets are unpacked. (Event information to be collected for this approach is provided below as Option1.)
- If desired, receiving could be accomplished at the pallet level by simply scanning the SSCC on the pallet and connecting to the ASN. (Event information to be collected for this approach is provided below as Option 2A.)
- Then, if FMHACA customs documents included pallet SSCCs and/or ASN numbers, HCMIS would be able to connect legal entry documents to supply chain documents.
- The contents of the pallet could then be confirmed and added to inventory on hand during an Unpacking event. (Event information to be collected is provided below as Option 2B.)

Recommendation 2: *(continued)*

OPTION 1: CMS Receiving at the case level

KDE	Values
Business Step	Receiving
Date/Time of data capture	YYYYMMDD:MM:HH:SS
Event Location	GLN (recommended) or Internal ID #
Trading Partner	GLN (recommended) or Internal ID #
Transaction/Activity Type	Purchase Order, Transfer Order, R&R, etc.
Transaction/Activity Number	Purchase Order #, Transfer Order #, R&R #, etc.
Contents of Receipt:	capture data below for each case:
Identifier	GTIN
Unit of Measure (UOM)	Case
Lot/Batch	Lot/Batch Number
Expiration Date	YYMMDD
Quantity	Positive number

Recommendation 2: *(continued)*

OPTION 2A: CMS Receiving at the pallet level

KDE	Values
Business Step	Receiving
Date/Time of data capture	YYYYMMDD:MM:HH:SS
Event Location	GLN (recommended) or Internal ID #
Trading Partner	GLN (recommended) or Internal ID #
Transaction/Activity Type	ASN
Transaction/Activity Number	ASN #
Contents of Receipt:	capture data below for each pallet:
Identifier	SSCC
Unit of Measure (UOM)	Pallet
Lot/Batch	Lot/Batch Number (if used)
Expiration Date	YYMMDD (if used)
Quantity	1 (because SSCCs are serialized identifiers)

Recommendation 2: *(continued)*

OPTION 2B: CMS Unpacking pallets (to validate receipt & add into inventory)

KDE	Values
Business Step	Unpacking
Date/Time of data capture	YYYYMMDD:MM:HH:SS
Event Location	GLN (recommended) or Internal ID #
Trading Partner	GLN (recommended) or Internal ID #
Transaction/Activity Type	Purchase Order, Transfer Order, R&R, etc.
Transaction/Activity Number	Purchase Order #, Transfer Order #, R&R #, etc.
Pallet ID	SSCC
Contents of Receipt:	capture data below for each case:
Identifier	GTIN
Unit of Measure (UOM)	Case
Lot/Batch	Lot/Batch Number (if used)
Expiration Date	YYMMDD (if used)
Quantity	Positive number

NOTE: *The sample events provided in Recommendation 2 are based on CMS receiving and shipping operations. Hub receiving and shipping operations are slightly different. Therefore, Hub receiving and shipping operations should be analyzed in order to determine if/how the sample event tables for CMS can be modified to support Hub operations.*

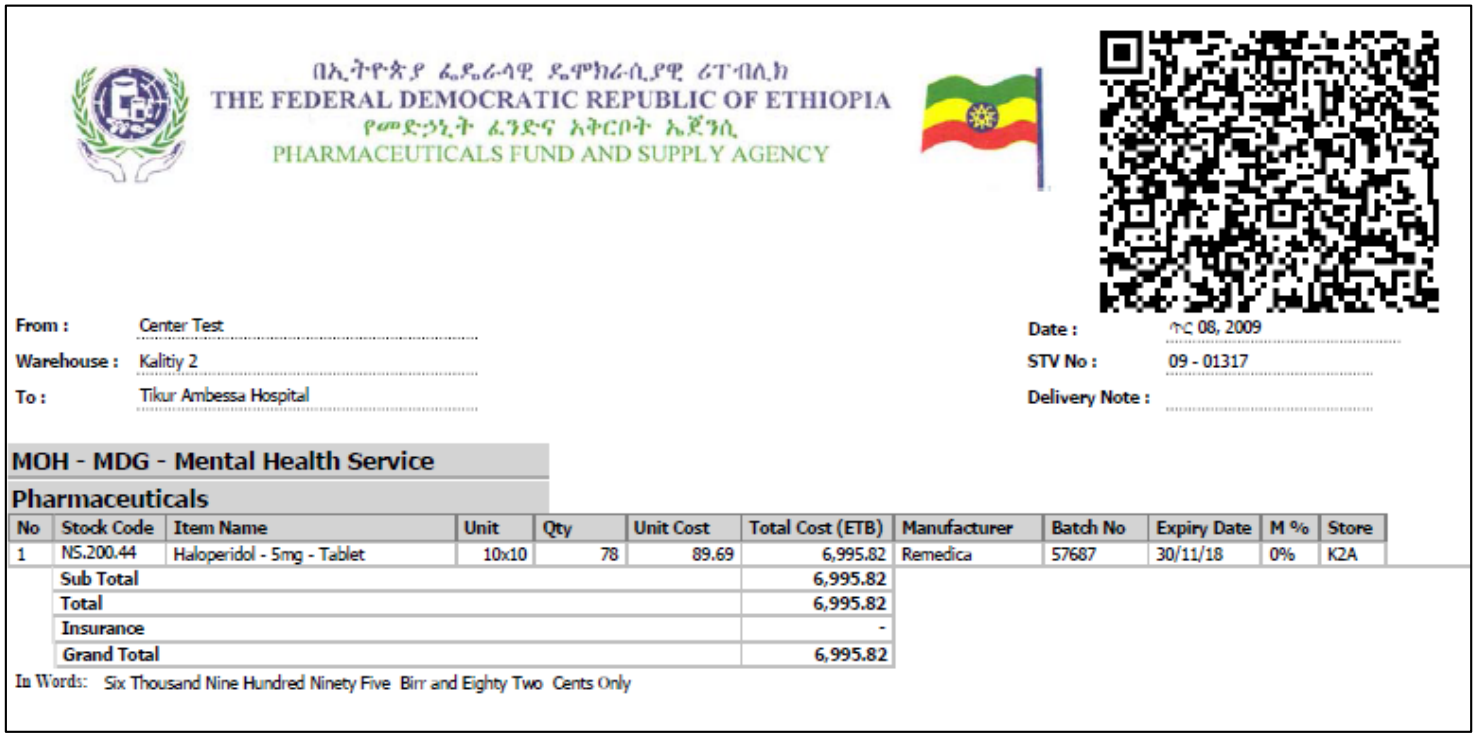
Recommendation 3: CMS Unpacking

- Once pallets are broken down, an approach needs to be developed both operationally and in HCMIS to establish the linkage of cases to its in-bound shipment and receiving information:
  - Cases marked with SSCCs can be tied back directly to the ASN of in-bound shipment, thereby maintaining the history.
  - Cases marked with a GTIN plus serial number can be tied back directly to the ASN of in-bound shipment, thereby maintaining the history.
  - Cases marked with GTIN plus batch/lot and expiration date cannot be tied back directly to a specific ASN.
- However, depending on the fulfillment scenarios in Ethiopia, the combination of batch/lot and expiration date with GTIN may be able to narrow the number of possible in-bound shipment and receiving scenarios
  - e.g., how many sources supply that specific product/GTIN to Ethiopia?; how many different shipments/ASNs could carry cases of the same GTIN, batch/lot and expiration date? etc.
  - In some cases, this level of visibility can be sufficient if it narrows the possible shipments to an acceptable number.

Recommendation 4:
CMS Packing for Outbound Shipments to Hubs

- Currently approach to outbound shipments to Hubs:
  - aggregations created for outbound shipments (e.g., pallets, shrink-wrapped case groupings, etc.) are not assigned an identifier.
  - documentation for outbound shipments include a **picklist** and a **voucher** that include an Order Number, Date, and To and From locations, the Product Numbers, Batches/Lots, Expiration Dates, and Quantities (among other

Recommendation 4 *(continued)*



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THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
የመድኃኒት ፈንድና አቅርቦት ኤጀንሲ
PHARMACEUTICALS FUND AND SUPPLY AGENCY

From : Center Test
Warehouse : Kalitiy 2
To : Tikur Ambessa Hospital

Date : ጥር 08, 2009
STV No : 09 - 01317
Delivery Note :

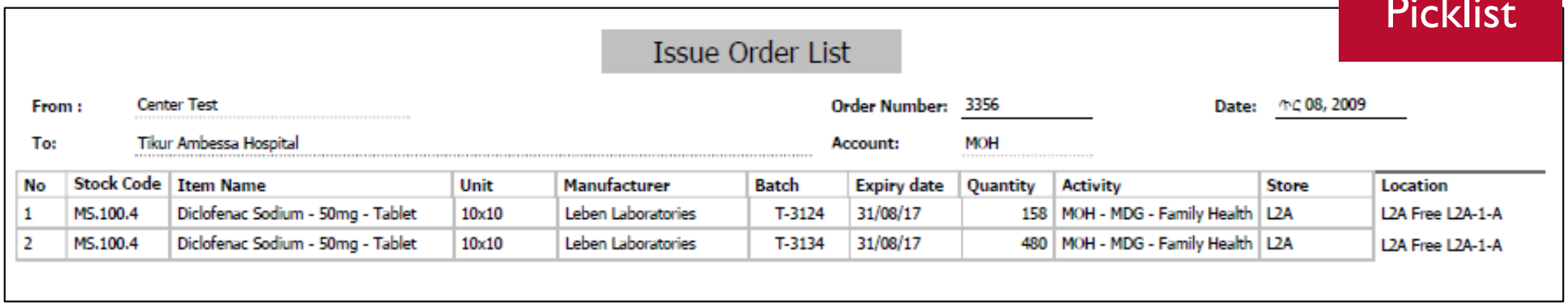
MOH - MDG - Mental Health Service

Pharmaceuticals

No	Stock Code	Item Name	Unit	Qty	Unit Cost	Total Cost (ETB)	Manufacturer	Batch No	Expiry Date	M %	Store
1	NS.200.44	Haloperidol - 5mg - Tablet	10x10	78	89.69	6,995.82	Remedica	57687	30/11/18	0%	K2A
	Sub Total					6,995.82					
	Total					6,995.82					
	Insurance					-					
	Grand Total					6,995.82					

In Words: Six Thousand Nine Hundred Ninety Five Birr and Eighty Two Cents Only

Voucher



Issue Order List

From : Center Test
To: Tikur Ambessa Hospital

Order Number: 3356
Account: MOH

Date: ጥር 08, 2009

No	Stock Code	Item Name	Unit	Manufacturer	Batch	Expiry date	Quantity	Activity	Store	Location
1	MS.100.4	Diclofenac Sodium - 50mg - Tablet	10x10	Leben Laboratories	T-3124	31/08/17	158	MOH - MDG - Family Health	L2A	L2A Free L2A-1-A
2	MS.100.4	Diclofenac Sodium - 50mg - Tablet	10x10	Leben Laboratories	T-3134	31/08/17	480	MOH - MDG - Family Health	L2A	L2A Free L2A-1-A

Picklist

Recommendation 4 *(continued)*

Question of whether to assign SSCCs to aggregations created for outbound shipments:

- One benefit of SSCC = identification of the aggregation in AIDC format
  - Facilitates identification (e.g., on the truck or trailer for unloading).
  - Expedites receiving (at the hub).
- SSCCs would be recommended for:

  (1) trucks/trailers containing aggregations for multiple orders/hubs (where SSCC could promote accuracy in unloading) and/or

  (2) high-volume deliveries to hubs (e.g., where scanning pallet SSCCs would expedite receiving).
- Consult with hubs and transport teams to gain insight into value.

Recommendation 4 *(continued)*

Question of whether to use ASNs for outbound shipments to hubs:

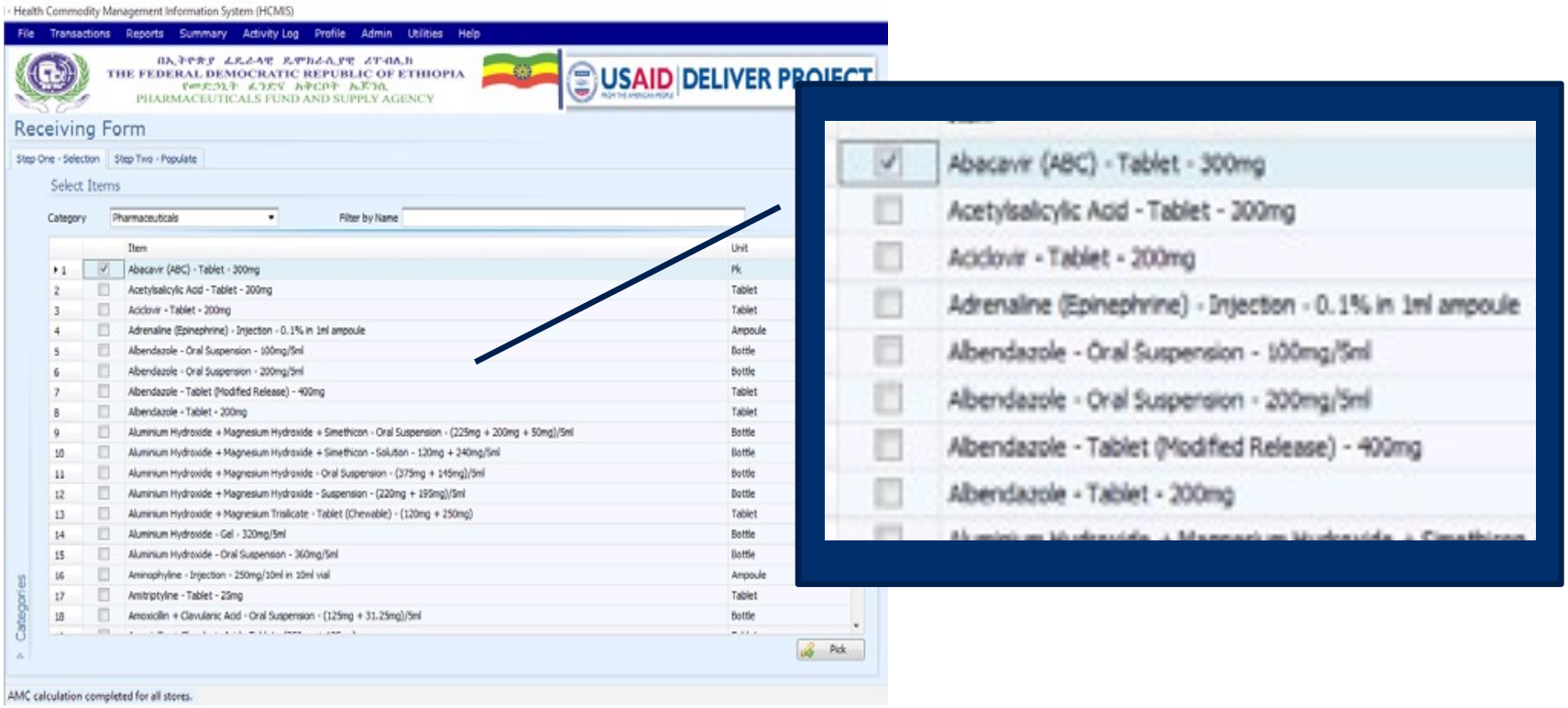
- The picklist and voucher currently contain the key pieces of data to pass about a shipping event.
  - Unclear if there is an added value-add to ASN for in-country distribution.
- Instead: if SSCCs are implemented, these document could then be supplemented to include the SSCC and case aggregation information.

Recommendation 5:
HCMIS Product Master Design

- Add a field for GTIN following GS1 meta-data standards.
- Develop attribute list to include standardized GDSN attributes and any additional internal data elements.
- Use GDSN metadata/format standards for all fields whenever they are defined even if you do not use GDSN to exchange data.
- Add a field for designating Ethiopia's approved commodity category (as shown in the *Receiving* screen).
  - Manually populate this field for every product/GTIN to tie every product to its designated commodity category in the database.

Recommendation 6: Commodity Classifications

As shown in the *Receiving Form Step 1 – Selection* screen, the list of approved commodities is well developed in HCMIS.



Recommendation 6 *(continued)*

Need for a standardized "Health Commodity Classification Code"

- Within Ethiopia, there is an opportunity for PFSA to work with Food, Medicine and Health Care Administration and Control Authority (FMHACA) to further align the commodity categories across PFSA and the regulatory environment to support further integration between supply chain and regulatory applications where beneficial.
- Beyond Ethiopia, there is a need for these commodity categories/classifications to be standardized across the global health supply chain so that all of the donor organizations and recipient countries use the same commodity codes/values.
  - GHSC-PSM was working on commodity categories/classifications.
  - Ethiopia could show them their list and coordinate with them to generate momentum toward a standardized Health Commodity Classification Code (HCCC) system.
- In the meantime, the commodity list shown on the HCMIS *Receiving* screen could be used as the "Ethiopian HCCC."

Recommendation 7:
Use GTIN/Commodity Code Linkage to Streamline HCMIS Processes

Example 1: HCMIS Warehouse Receiving

- *Receiving Form Step 1 – Selection:*
  - With cases marked with GS1 barcodes and Ethiopia's approved commodity category stored for every GTIN, the receiving process could be further automated:
    - Users scan the case barcode to capture the GTIN.
    - The system retrieves the commodity category associated with that GTIN from the product master (automating to improve efficiency and accuracy).
- *Receiving Form Step 2 – Populate:*
  - *Can be further automated using GTIN master data and GS1 barcodes:*
    - Pull any information stored as product attributes in the Product Master (like pack quantity) to automatically populate based on the scanned GTIN barcode.
    - If batch number and expiry are encoded in GS1 barcodes (depending on Ethiopia's supplier requirements), populate these automatically populated when the barcode is scanned

Recommendation 7 *(continued)*

Example 2: HCMIS Facility Inventory and R&R/Issue

- Same strategy of using storing Ethiopia's approved commodity category as an attribute/field for every product
- Above used as a method for improving and automating the receiving process in the HCMIS warehouse.
- Here, that same strategy can improve and automate the inventory and R&R/issue processes in the HCMIS facility:
  - Products in the facility will be marked with a barcode encoding (at a minimum) their GTIN.
  - HCMIS can scan the barcode of any commodity it is inventorying to capture the GTIN.
  - HCMIS can retrieve the commodity code associated with that GTIN from the product master to support the inventory and issue functions.
- *Helpful tip: If item-level GTIN barcodes are not available but case-level GTIN barcodes are:, when cases are unpacked at the facility, cut the case panel where the barcode appears and put it in the bin with the items. Because the system is using only the GTIN to pull the commodity category, the case GTIN can be used for that purpose.*

Tanzania

Tanzania Internal Supply Chain and Systems

- In-country, Tanzania supply chain consists of movement of product through:
  - **Medical Stores Department (MSD)** – moves product mainly at the case level
  - **Zonal warehouses** – moves product mainly at the case level
  - **Facilities** – receives mainly at the case level and breaks down to items

- Tanzania health supply chain systems:
  - **EPICORE 9**: used by MSD and zonal warehouse
    - Primarily a financial enterprise resource planning system with significant customizations to track the MSD and zonal warehouse inventories (E9 has the inbound country shipments once they've been received into inventory, the stock on hand, and the distribution orders down to the zonal warehouses)
  - **Tanzania (TZ) eLMIS**: used by facilities
    - Provides inventory management reporting for the stock at the facility level only, for all products
    - In most hospitals and a few urban centers and dispensaries, staff will enter data directly into the eLMIS. For the rest of the facilities, eLMIS is updated quarterly by district pharmacists who manually enter the data they receive from each facility's requisition order (paper form).

Background: Intersection of 2 Efforts

- **Effort 1: USAID Business Intelligence and Analytics (BI&A) Tanzania End-to-End (TZ E2E) Data Visibility Project**
  - Effort to gain insight into health commodity supply chain and inventories in Tanzania to provide a complete picture of the availability of commodities and an understanding of the commitments and budgets of the MSD and TZ development partners (donor community)
  - Given access to facility-level inventory data: rare opportunity to gain real-time visibility of health commodity inventories down to the facility level.
  - However, the facility-level data from Tanzania required significant data harmonization efforts that highlighted the seek solutions to the underlying issues.
- **Effort 2: VillageReach LMIS Development Effort**
  - Update Tanzania LMIS system (funded by the Gates Foundation)

Opportunity

- IMMEDIATE OPPORTUNITY: Examine the issues discovered in the TZ E2E project and identify areas where GS1 Standards could be leveraged in the update to Tanzania's LMIS to help address the data issues in Tanzania
  - USAID brought subject matter experts from BI&A (Intellicog), GHSC-PSM, VillageReach, Tanzania and Zambia partners, and RC Partners (on GS1 Standards) together
- LARGER OPPORTUNITY: potential to help improve LMIS systems in other countries as VillageReach can leverage the standards insights in their work with other country LMIS systems as well
  - And other members of the global heath supply chain community

TZ E2E Context – Dashboards and Reporting for:

- Inventory management
- Pipeline management
- Demand planning
- Supply plan management and adjustment

Problem Statement

- Looking to the Tanzania example, the effort to harmonize data to use it effectively is complicated by many factors:
  - Numerous data elements, e.g., commodity type, unit of measure, quantities
  - Numerous locations/parties, e.g., regions, provinces, warehouses, RDC, local facilities, hospitals, pharmacies
  - Numerous supply chains, e.g., pharmaceuticals, medical devices, testing kits, lab equipment
  - No data standards, e.g., naming conventions, abbreviations, field formats, definitions
  - Various data capture mechanisms, e.g., barcodes, manual data entry of an identifier, manual data entry of a product name, manual data entry of a commodity description

Key Question:

- *How/where can GS1 Standards be leveraged in the update to Tanzania's LMIS to help address the data issues?*

Approach

- USAID brought together subject matter experts from:
  - BI&A (Intellicog)
  - GHSC-PSM
  - VillageReach
  - Tanzania and Zambia partners
  - RC Partners
- to examine the issues and identify areas where GS1 Standards could be leveraged in the update to Tanzania's LMIS to help address the data issues.
- Focus: leverage as much as possible right now to begin the process of addressing the data issues
  - Even though levels of GS1 adoption, implementation, and use are mixed

Brainstorming Session

- Examined a variety of data types and a variety of data capture mechanisms, as listed in the table below:

Types of data	Types of data capture
• **Product attributes, e.g., brand name; manufacturer, quantity,**	• Supplier provides electronically
• **Party/location data, e.g., name, address, role**	• Supplier provides on paper – manually entered
• **Secondary item-specific data, e.g., batch/lot, expiration date, serial number**	• Barcode – scanned
• **Transaction data, e.g., purchase order, invoice, ASN, packing slip**	• Barcode – manually entered
• **Event data, e.g., MSD and zonal warehouse shipping and receiving)**	• Product label – manually entered

Approaches for leveraging GS1 Standards in Tanzania LMIS were discussed at length, and key strategies and recommendations exchanged and defined.

RECOMMENDATIONS FOR PRODUCT DATA

- Product master
- GTIN field properly formatted
- Same standardized product attribute set regardless of identifier used
- Use of GDSN meta-data standards for all GTIN product attributes
- Product attributes defined by suppliers and shared with/provided to Tanzania for product master
- Mechanisms for product data from suppliers (e.g., portal, spreadsheet, etc.) leverage same GDSN meta-data standards for all GTIN product attributes

SAME AS FOR PSM

RECOMMENDATIONS FOR PARTY/LOCATION DATA

- Location master
- GLN field properly formatted
- Same standardized attributes set regardless of identifier used
- Use of GS1 meta-data standards for all GLN attributes
- Party/location attributes defined by suppliers for their parties/locations and shared with/provided to Tanzania for party/location master
- Mechanisms for data from suppliers (e.g., portal, spreadsheet, etc.) leverage same GS1 meta-data standards for all GLN attributes

SAME AS FOR PSM

RECOMMENDATIONS FOR LMIS INVENTORY FUNCTIONS – GTIN CAPTURE

- As GS1 Standards become more widely implemented, facilities using LMIS to capture and manage inventories will be able to use barcodes to capture product information.
- Nonetheless, those facilities can have varying levels of technical capabilities depending on resources, electricity, and Internet.
  - Therefore, they may enter the data by scanning the barcode or by manually entering/typing the GTIN and product information, e.g., batch/lot, expiration date, serial number.
- RECOMMENDATION: Integrate GS1 "Check Digit" logic into GTIN fields in LMIS.
  - This will alert users typing in GTINs if there is a problem with the GTIN they entered (i.e., "GTIN invalid") so they can check/fix it immediately.

RECOMMENDATIONS FOR LMIS INVENTORY FUNCTIONS – GLN CAPTURE

- Ultimate vision: Using GLNs in LMIS will enable location/party data to be pulled from a database instead of manually entered everywhere.
  - minimizes data entry errors and creating multiple versions of the same party/address in systems that need to reconciled later (e.g., AVE vs Avenue; District A Clinic vs Dist A Clinic; etc.).
  - This new approach is to only enter a GLN and then let the system pull the party/address data in from the database.
- When a system is connected to the database, the database will likely alert a user that there is something wrong with the GLN they typed in (e.g., at the very least – "GLN not found").
- BUT – with varying levels of technical capabilities depending on resources, electricity and Internet, may have scenarios where database is inaccessible
- RECOMMENDATION: Integrate GS1 "Check Digit" logic into GLN fields in LMIS.
  - Will alert user in real time that there is a problem with the GLN they entered (i.e., "GLN invalid") even when they are not connected so they can fix it right then and there –
  - enabling the system to pull the correct party/location information from the database when its available (because the GLN will be correct).

Bringing all learnings together…

The view from 30,000 feet

- Although Ethiopia's focus was on use, Ethiopia still needs to implement the foundational elements discussed for Tanzania.
- Although Tanzania focused on foundational elements related to data issues, they can and should still leverage the techniques presented to Ethiopia.

- **Bringing all recommendations together shows the roadmap for LMIS starting to leverage GS1 Standards**

Overview of the GS1 Standards Discussed

Data elements	GS1 standards
Product identification	GTIN
Party/location identification	GLN
Product data/attributes	GDD and GDSN
Location attributes	GS1 US data hub location (best resource at this point)
Item specific product information (batch, expiration, serial)	GS1 AI standards
Event transaction type and business step	GS1 EPCIS core business vocabulary

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The USAID Global Health Supply Chain-Procurement and Supply Management project provides commodity procurement and logistics services, strengthens supply chain systems, and promotes commodity security.
We support USAID programs and Presidential Initiatives in Africa, Asia, Latin America, and the Caribbean, focusing on HIV/AIDS, malaria, and population and reproductive health commodities.