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Assessment of the Pharmaceutical Logistics Management Capacity of REACH Grantee NGOs

July 2006

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Abbreviations

BHC	Basic Health Center
CHC	Comprehensive Health Center
DH	District Hospital
DMO	Drug Management Officer
DMU	Drug Management Unit
DSM	Drug Supply Management
EDL	Essential Drug List
EPHS	Essential Packages of Hospital Services
HF	Health Facility
HP	Health Post
HQ	Head Quarters
IMAT	Inventory Management Assessment Tool
MD	Medical Doctor
MOPH	Ministry of Public Health
MSH	Management Sciences for Health
NGO	Non Governmental Organization
PH	Provincial Hospital
REACH	Rural Expansion of Afghanistan's Community Health System
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WH	Warehouse

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1. Background

REACH supports the expansion of the Basic Package for Health Services in 14 provinces in Afghanistan, through a granting mechanism to national and international Non Governmental Organizations (NGOs), which implement health services in 14 provinces of Afghanistan.

REACH has procured pharmaceuticals and contraceptives to its grantee NGOs for a value of 8.5 million USD, over 5.6 millions of which had been distributed at the time of this report. Reach Drug Management Officers (DMOs) have also provided technical assistance to the grantee NGOs in the field of drug supply management and on-the-job training in the rational use of drugs.

By December 2005, the drugs supplied by REACH were used by the grantee NGOs in 326 health facilities and more than 5000 Community Health Workers with the necessary drugs to implement the Basic Package for Health Services in 14 provinces in Afghanistan. Some 4.3 million patients received care at these health facilities and health posts.

In order to obtain a clear end-of-project status of the of the drug supply management capacity of the REACH grantee NGOs, a formal assessment has been implemented for each NGO and each grant, both at warehouse/headquarters level and health facility level.

2. Tools and training of surveyors

The REACH Drug Management Unit (DMU) developed two structured questionnaires: one for application at warehouses and NGO headquarters, one for application at health facilities. The questionnaires cover several key aspects of pharmaceutical supply management:

Key Aspect	Warehouse/HQ	Health Facility
Staff involved in drug supply management	Yes	Yes
Ordering and purchasing	Yes	Yes
Communications	Yes	Yes
Receiving drugs	Yes	Yes
Distribution to health facilities	Yes	No
Inventory management	Yes	Yes
Storage Infrastructure and Equipment	Yes	Yes

The detailed questionnaires are given in Annex 1 and 2.

The IMAT is an application in Excel that allows data collection on a selected number of drugs (tracer drugs). Based on historical or present stock levels, and comparing records with actual stock, several indicators are calculated, which allow for a quantified appreciation of the quality of inventory control management at the investigated facility.

Four indicators are used to evaluate stock management practices.

Two indicators measure the accuracy of record keeping:

1) Ratio of inventory variation to total stock. This indicator provides a broad indication of the existence of discrepancies between inventory records and physical counts, taking into account the relative importance of each item in the total volume of stock handled.

2) Percentage of stock records that correspond with physical counts. This indicator reflects the frequency of discrepancies. It helps clarifying Indicator 1 where it is skewed by a small number of items that have large discrepancy between the physical and theoretical stock. This indicator is further specified in negative and positive discrepancies.

Two indicators measure stock level monitoring:

3) Percentage of product availability. This indicator measures a procurement and distribution system's ultimate effectiveness in fulfilling its basic mission – ensuring availability of drugs at health facilities. It is further detailed for quality assurance, measured by the presence or absence of expired items.

4) Average percentage time out of stock. This indicator measures a procurement and distribution system's capacity to maintain a constant supply of drugs at different levels of the health system, over a given period.

Annex 3 gives a detailed description of the IMAT, including some sample data from a real facility to facilitate comprehension of the indicator calculation.

In January 2006, REACH DMOs were trained in the use of two structured questionnaires, one to be applied at headquarters /warehouse and one to be applied at health facilities, and the Inventory Management Assessment Tool (IMAT), to be applied at both warehouses and facilities, in January 2006.

The DMOs first tested the tools at REACH warehouse and edited them based on the feedback obtained. In a second step, they tested the tools with one NGO warehouse/office and two facilities in Kabul city, after which the tools were further modified into their final format and content. The training, testing and modification process required five days.

3. Implementation

Between February and April 2006, the questionnaires and the IMAT were applied to a total of 26 pharmaceutical warehouses/NGO offices and 54 facilities in 14 provinces of Afghanistan:

26 Warehouses/offices
4 Provincial Hospitals
8 District Hospitals
28 Comprehensive Health Centers
14 Basic Health Centers

The questionnaires and IMAT were filled out by the DMOs based on interviews with the person in charge of the drug supply management of the visited facility. Observation questions and the IMAT were filled out with assistance of the same in-charge. Where capacity existed, the DMO left a copy of the IMAT with the in-charge for future self-monitoring of inventory management.

4. Data Processing and Analysis

Taking advantage of the pre-arranged spreadsheet template, the DMOs analyzed IMAT data for each facility at the facility and gave immediate feedback to the in-charge.

The totals of the IMAT spreadsheet were entered in an Access database routine, which allowed analysis of the data and interpretation of the indicators for the whole sample and for specific sub-samples: by NGO, by province, by Grant, by type of facility. Access queries and Excel pivot tables were used for the analysis.

The data of the structured questionnaires was entered into an Access routine and analyzed using Access queries and Excel pivot tables.

The structured questionnaires required a fair amount of data cleaning after data entry, which prolonged the data processing and analysis phase. The denominator of the questionnaire varies with the section of the questionnaire: not all warehouses or health facilities answered all questions.

4. Findings

4.1. Staffing and general facility information

4.1.1. Staffing

Figure 1 shows the proportion of visited Warehouses that had at least one staff of the listed staff types, and the proportion of those facilities that had at least one staff that was trained by REACH in different subjects that pertain to drug supply management. All visited warehouses had at least one pharmacist or pharmacist assistant on staff, and except for two warehouses, at least one of the pharmacists was trained in drug supply management by REACH. None were trained in Rational Drug Use. One fifth did not have

night guards and one fifth did not have day guards. Few warehouses had other staff dedicated to drug supply management:

			General Management		Trained in Drug Supply Management		Rational Drug Use	
	#	%	##	%	##	%	##	%
Pharmacists	25	100.0%	0	0.0%	23	92.0%	0	0.0%
Administrators	7	28.0%	0	0.0%	0	0.0%	0	0.0%
Medical Doctors	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nurses	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Midwives	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Vaccinators	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Labourers	6	24.0%	0	0.0%	0	0.0%	0	0.0%
Community Supervisors	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Drivers	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Day Guards	20	80.0%			0	0.0%		
Night Guards	20	80.0%			1	5.0%		
Others	6	24.0%			0	0.0%		
Total Interviewed	25		25		25		25	

Figure 1 – Staffing in 25 Warehouses

About two thirds of the HFs reported at least one pharmacist/pharmacist assistant involved with drug supply management and in all except one health facility there was pharmacist trained in drug supply management (see Figure 2). In the large majority (80-90%) of the visited health facilities, at least one MD, nurse, midwife, vaccinator or community health supervisor is involved in drug supply management. Few reported that any of these had received specific drug supply management training, but many received some form of general management training. UNICEF had trained most vaccinators in vaccine supply management, but this is not reflected in this table.

	#	%	Trained in					
			General Management		Drug Supply Management		Rational Drug Use	
			##	%	##	%	##	%
Pharmacists	33	61.1%	4	12.1%	32	97.0%	1	3.0%
Administrators	0	0.0%	4	0.0%	1	0.0%	0	0.0%
Medical Doctors	51	94.4%	30	58.8%	6	11.8%	0	0.0%
Nurses	47	87.0%	24	51.1%	7	14.9%	0	0.0%
Midwives	47	87.0%	24	51.1%	0	0.0%	0	0.0%
Vaccinators	53	98.1%	23	43.4%	0	0.0%	0	0.0%
Labourers	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Community Supervisors	51	94.4%	27	52.9%	0	0.0%	0	0.0%
Drivers	26	48.1%	0	0.0%	0	0.0%	0	0.0%
Day Guards	0	0.0%			0	0.0%		
Night Guards	0	0.0%			0	0.0%		
Others	0	0.0%			0	0.0%		
Total Interviewed	54		54		54		54	

Figure 2 - Staffing in 54 Health Facilities

4.1.2. Availability of reference material

The assessment checked the availability of standard reference documents (BPHS, EPHS, Essential Drug List, Drug Supply Management guide, and Warehouse Management guide) At three levels of the system: at the NGO offices, in the Warehouse, and in the Health Facilities.

Figure 3 summarizes the findings. In general, important reference materials are available at the NGO headquarters. Only the Drug Supply Management guide is found in the majority (80%) of the warehouses.

While the majority of the NGO HQ (76%) claims their HFs have a BPHS manual, less than half of the visited HFs (41%) could produce one. More HFs have a DSM Manual (61%) or an EDL (43%) than a BPHS manual (41%). These findings merit follow-up: did the NGOs really distribute BPHS manuals to the HFs; is there a high staff turn-over and did the copy of the BPHS leave with the previous HF staff; Does the HF staff not value the BPHS as a useful document?

Six out of eight hospitals visited had a copy of the EHPS available

Reference Document	Source of data			
	Warehouses/HQ		Health Facilities	
	##	%	##	%
BPHS	N = 25		N = 54	
HQ	24	96.0%	NA	
WH	7	28.0%	NA	
Fac.	19	76.0%	22	40.7%
EPHS	N = 25		N = 54	
HQ	16	64.0%	NA	
WH	4	16.0%	NA	
Fac.	11	44.0%	6	11.1%
EDL	N = 25		N = 54	
HQ	21	84.0%	NA	
WH	12	48.0%	NA	
Fac.	14	56.0%	23	42.6%
DSM	N = 25		N = 54	
HQ	14	56.0%	NA	
WH	20	80.0%	NA	
Fac.	17	68.0%	33	61.1%
WH Ops	N = 25		N = 54	
HQ	3	12.0%	NA	
WH	1	4.0%	NA	
Fac.	2	8.0%	1	1.9%

Figure 3 – Availability of standard reference documents

4.1.3. Cost recovery and non-BPHS drugs

The majority of the Warehouses (76%) claim that HF practice cost recovery, however none of the HFs claims to do so (see Figure 4). This discrepancy merits further investigation, since most NGOs submitted cost-recovery reports on quarterly basis.

	Warehouses		Health Facilities		Total	
	##	%	##	%	##	%
Practice Cost Recovery	19	76.0%	0	0.0%	19	24.1%
Have non-BPHS drugs	4	16.0%	10	18.5%	14	17.7%

Figure 4 – Cost recovery and use of non-REACH drugs

Less than a fifth of the Warehouses and HFs claim to have non-BPHS drugs in stock.

4.2. Ordering and Purchasing

4.2.1. Quantification method

Almost all Warehouses and HFs claimed to use the consumption method to quantify their needs for pharmaceuticals (96%). This is the method recommended by REACH and enforced through the need of reporting consumption data with new order requests.

About one third (39%) of the Warehouses and one fifth of the HFs (22%) claim to correct the quantities obtained through the consumption method with estimates of seasonal variations. Some Warehouses (15%) claim to also use the morbidity method for adjusting the quantities obtained with the consumption method.

	Warehouses		Health Facilities	
	##	%	##	%
Consumption	25	96.2%	52	96.3%
Consumption corrected for population	1	3.8%	0	0.0%
Consumption corrected for service level	1	3.8%	0	0.0%
Morbidity	4	15.4%	0	0.0%
Includes seasonal variations	10	38.5%	12	22.2%
Includes REACH's availability	1	3.8%	0	0.0%
Total interviewed	26		54	

Figure 5 – Quantifying drug needs

4.2.2. Ordering cycle

4.2.2.1. Ordering frequency

The majority of the Warehouses (77%) claim to order every three months from REACH, almost a fifth (19%) claims to order every six months (see Figure 6).

	Warehouses		Health Facilities	
	##	%	##	%
Monthly	0	0.0%	34	63.0%
Quarterly	20	76.9%	15	27.8%
Six monthly	5	19.2%	0	0.0%
Other	0	0.0%	4	7.4%
No answer	1	3.8%	1	1.9%

Figure 6 – Ordering Cycle

The majority of HFs (63%) order every month, almost one-third (29%) order every 3 months. No HFs order every six months, which raises some questions on how the facilities in the more remote areas ensure enough stock during winter. Two HFs order every 2 months, and two order “as need arises”.

4.2.2.2. Information required for ordering

Almost all (91%) of the HFs include information regarding their stock levels when sending an order to the NGO (see Figure 7). Most frequently (87%) they send the stock on hand and the consumption during the last order period, and two-thirds (67%) include the quantity of the last order as well. This additional information is required by REACH to validate the quantities in the order the NGO submits to REACH.

	Warehouses		Health Facilities	
	##	%	##	%
When submitting an order, Send info	NA		49	90.7%
Consumption of last period	NA		47	87.0%
Quantity of last order	NA		36	66.7%
Stock on hand	NA		47	87.0%
Have records to track orders	16	61.5%	28	51.9%
Quantities on order	15	57.7%	24	44.4%
REACH items separately	11	42.3%	20	37.0%

Figure 7 – Documentation of orders

4.2.2.3. Order tracking systems

Only about two thirds of the warehouses (61%) and half of the HFs (52%) have a record system that allows tracking orders (see Figure 8). About half of the warehouses (58%) and HFs (44%) can track quantities ordered. Less than half (42% and 37%) can track items received from REACH separately from items received from other sources.

4.2.2.4. Lead times

A factor that can negatively influence correct quantification is a long or a longer than expected lead-time between the quantification and the receipt of the ordered quantities. Figure 8 shows the estimated time in days necessary, according to the person interviewed, for quantifying order quantities, for obtaining approval of the calculated quantities, for receiving the ordered quantities after sending the order. It also shows the actual time each of these steps took in the last routine order of REACH drugs. For Warehouses, these are the lead-times for ordering from REACH; for HFs, these are the lead-times for ordering from NGOs. Both the average and the maximum lead-time is listed for each process.

	Warehouses		Health Facilities	
	Avg	Max	Avg	Max
Quantification				
Estimated	3.9	10.0	2.4	5.0
Last Order	3.8	13.0	1.7	5.0
Approval				
Estimated	2.3	10.0	1.4	20.0
Last Order	2.6	15.0	1.0	11.0
Receiving				
Estimated	19.5	60.0	8.2	47.0
Last Order	24.8	60.0	8.5	55.0
Total Interviewed	24		52	

Figure 8 – Lead times in the supply cycle

The chart in Figure 9 graphically compares the estimated and last order actual lead-time for warehouses ordering from REACH. The NGOs estimate the time needed to quantify and approve orders quite accurately, but underestimate the time needed to receive the ordered drugs from REACH (20 days vs. 25 days). On average, the last order lead-time from quantification to receipt of drugs is a month, but could take up to 88 days if we take into account the maximum values obtained for each step in the process. In fact, seven

Warehouses received their drugs more than a month after submitting the order to REACH. Two warehouses did not answer this section. Reasons for the delay may be:

- Inaccurate initial quantification which prompts corrections to which both REACH and the NGO need to agree;
- Incomplete submission of additional information by the NGO, preventing the order from being processed in REACH;
- Slow reaction by the NGO to requests from REACH for recalculation of order quantities;
- Slow processing by REACH DMU;
- Unavailability of requested drugs at REACH warehouse.
- Delay on part of NGO to pick up drugs from the warehouse

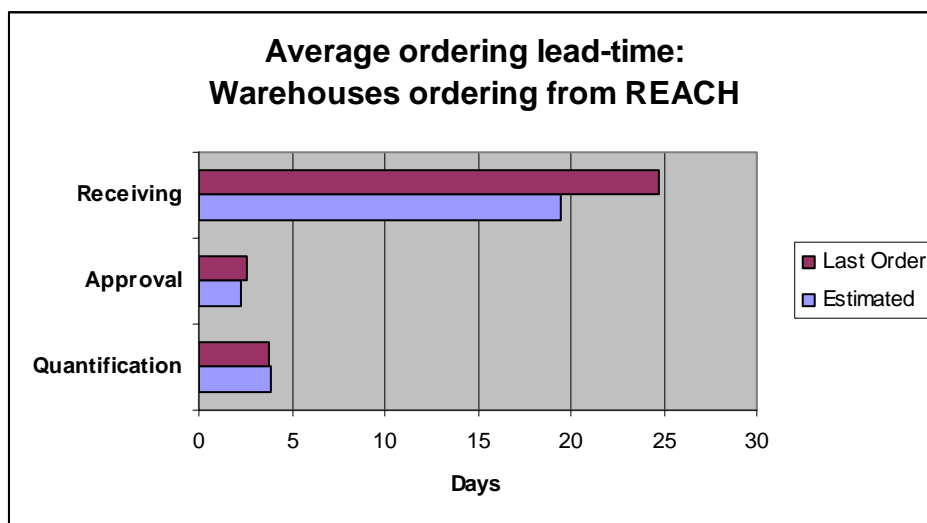


Figure 9 – Average ordering lead-time for warehouses ordering from REACH

Health Facilities seem to overestimate slightly the time needed to calculate order quantities and to get the order approved and slightly under estimate the time needed to receive the order after submission to the NGO (see Figure 11). On average the lead-time between quantification and receipt of drugs is 11 days, but can go up to 71 days if we take into account the maximum values. Ten HF's had a total lead-time of more than two weeks for their last order. Two HF's did not answer this question. Several of the HF's with longer lead-times obtain their drugs from the warehouses with long lead-times, which may indicate that lead-times at HF level may grow shorter if the warehouses manage to shorten their lead-times for orders from REACH.

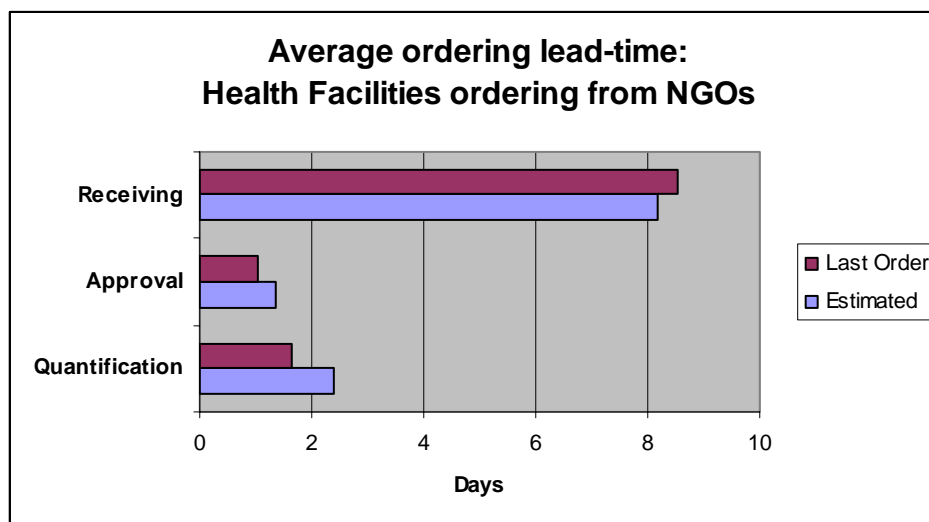


Figure 10 – Average ordering lead-time in Health Facilities

4.2.2.5. Management of incomplete orders

When faced with incomplete orders, about half of warehouses and of HFs either pickup the missing items when they become available, or issue a new order for the missing items when they become available (see Figure 11). Few warehouses (8%) and HFs (9%) just add the missing quantity to the next routine order. Some HFs substitute the missing items with substitute drugs (6%) or put the burden on the patient (9%): handing out less medicine, or telling them to buy the medicine elsewhere. One Warehouse and one HF claimed to do nothing and just suffer the stock out. One Warehouse did not answer.

The official recommendation of REACH has been that NGOs should use their cost recovery to make up for occasional shortfalls in deliveries. Few warehouses (15%) and HFs (11%) buy the missing items from other sources.

	Warehouses		Health Facilities		Total	
	##	%	##	%	##	%
Incomplete Orders						
Pickup when available	14	53.8%	27	50.0%	41	51.3%
Add to next regular order	2	7.7%	5	9.3%	7	8.8%
Issue new order when available	13	50.0%	25	46.3%	38	47.5%
Buy from other sources	4	15.4%	6	11.1%	10	12.5%
Substitute with other medicine	0	0.0%	3	5.6%	3	3.8%
Put the burden on patients	0	0.0%	5	9.3%	5	6.3%
We do nothing	1	3.8%	1	1.9%	2	2.5%
Not answered	1	3.8%	0	0.0%	1	1.3%

Figure 11 – Managing Incomplete Orders

4.2.2.6. Frequency of ordering

Warehouses on average sent 4.6 orders to REACH the last 12 months, up to 10 orders for at least one Warehouse. More than half of the Warehouses that answered send orders to REACH more frequently than once a quarter. Three Warehouses did not answer the question.

Health facilities on average sent 7.4 orders to the NGO the last 12 months, up to 24 orders for at least one HF. Eleven HFs sent at least 12 orders, and twelve send less than four orders. Three HFs did not answer the question.

4.2.2.7. Information on stock availability

Warehouses received on average 4 times a stock lists on available drugs from REACH – REACH normally distributes an updated stock list quarterly. Five Warehouses received this list more often than four times, up to ten times for one Warehouse. Ten Warehouses received the REACH stock list less than four times in the last 12 months, one Warehouse claims never to have received it and one Warehouse did not answer the question.

NGOs supposedly sent lists with available drugs to their HFs, to facilitate the re-ordering process. On average, HFs received 2 times a list with available drugs from the NGO. Twelve HFs received the list at least four times, up to 15 times for one facility. Thirty HFs (57%) claimed not to have received a list during the last 12 months, although REACH suggested monthly orders and deliveries. One HF did not answer the question.

4.2.2.8. Ordering outside REACH

Only a minority of the Warehouses (39%) and the HFs (7%) claims to buy or receive drugs from other sources than REACH. As mentioned earlier, most NGOs report on received cost recovery funds to REACH. Does this mean the HFs send the funds to the NGO without being able to use it locally? The management of the cost recovery needs further investigation.

4.3. Communications

Having ready access to means of communication will enhance the drug supply management at all levels. Figure 12 shows what proportion of NGO HQs, NGO Warehouses and HFs have access to different ways of communication, other than the standard reports and order request forms.

	NGO HQ		Warehouse		Health Facility	
	##	%	##	%	##	%
Telephone	24	92.3%	21	80.8%	34	63.0%
Fax	0	0.0%	0	0.0%	0	0.0%
Computer						
w Email	17	65.4%	7	26.9%	0	0.0%
w Internet	17	65.4%	6	23.1%	0	0.0%
for MDS	15	57.7%	NA		NA	
Radio	17	65.4%	5	19.2%	8	14.8%
Pickup	15	57.7%	5	19.2%	16	29.6%

Figure 12 – Available means of communication

The majority of NGO HQs (92%), Warehouses (81%) and HFs (63%) have access to telephones. Mostly, these are mobile phones, and often they are the private phones of the staff working in these structures. Nobody uses fax.

The majority of the NGO HQs have a computer with email (65%) and with internet access (65%). More than half have one computer primarily dedicated to drug supply management (58%), an unknown number of which is located in the Warehouse of that NGO. All NGOs had the acquisition of computers in their initial budgets, so it is surprising that not all NGOs have access to email and internet. The simple presence of the computer and internet access does not necessarily equal efficient communications, e.g. with REACH.

About a quarter of the Warehouses have a computer with email (27%) and internet access (23%). None of the HFs has access to computer.

The majority of the NGO HQs (65%), but only a minority of Warehouses (19%) and HFs (15%) have access to radio.

About half of the NGO HQs have access to a pickup (58%), for warehouses (19%) and facilities (30%) that proportion is smaller.

4.5. Receiving procedures

4.5.1. Who receives incoming drugs?

When drugs are delivered in Warehouses (see Figure 13, the In-Charge of the Warehouse will receive the drugs in the large majority of cases (84%). In many cases, this is at the same time the pharmacist. When the in-charge does receive the incoming drugs, the pharmacist (8%) or somebody else (mostly the assistant in-charge) (20%) will receive the drugs. In all Warehouses, the same staff fills out the stock card for the incoming drugs.

In the HFs, mostly the in-charge of the facility (67%) or the pharmacist (52%) will receive incoming drugs, rarely anybody else (7%).

	Warehouses		Health Facilities	
	##	%	##	%
In-Charge	21	84.0%	36	66.7%
Pharmacist/Ass.Ph.	2	8.0%	28	51.9%
Other	5	20.0%	4	7.4%

Figure 13 – Who receives incoming drugs

Very few Warehouses and HFs do not follow the recommended standard procedures (see Figure 14) when receiving drugs, but one wonders why not all HFs do, since REACH/DMU has trained all NGOs in the correct procedures.

	Warehouses		Health Facilities	
	##	%	##	%
Physical inspection of boxes	23	92.0%	51	94.4%
Inspects labels	23	92.0%	NA	
Compare quantities with packinglist	23	92.0%	52	96.3%
Compare items with order	23	92.0%	51	94.4%
Open suspected boxes	22	88.0%	47	87.0%
Other procedures	3	12.0%	5	9.3%

Figure 14 – Receiving procedures

4.5.2. Shelf life.

Figure 15 shows the how NGOs determine and handle expiring drugs. The shelf life required for incoming drugs at Warehouses is on average 7 months, with a low of 1 and a high of 12. If drugs with a shorter shelf life arrive at the Warehouse, they will either be rejected and returned to REACH (56%), or distributed to HFs on priority basis (52%). Only a minority of the Warehouses will accept the drug without special action (12%). Only one fourth (24%) of the Warehouses rejected at least one product the last six months, on average 3 items, but in one Warehouse 50 items were rejected.

HFs require on average a shelf life of 4.7 months, with a low of 1 and a high of 12. In HFs also, drugs with a shorter shelf life will either be rejected and returned to REACH (47%), or distributed to patients on priority basis (34%). Few HFs will accept drugs with short shelf life without special action (3%). Only one fourth (24%) of the Warehouses rejected at least one product the last six months, on average 2 items, but in one HF 15 items were rejected.

	Warehouses		Health Facilities	
	##	%	##	%
Shelf life required (months)				
Average	7.4		4.6	
Maximum	12		12	
Minimum	1		1	
Drugs with too short a shelflife are				
Rejected and returned	14	56.0%	37	46.8%
Distributed on priority	13	52.0%	27	34.2%
Accepted as usual	3	12.0%	2	2.5%
Other	1	4.0%	6	7.6%
Number of facilities that rejected at least 1	6	24.0%	20	25.3%
Number of items rejected in last 6 months				
Average	3.0		1.3	
Maximum	50		15	
Minimum	0		0	

Figure 15 – Shelf life and management of expiring drugs

4.5.3. Management of stock outs at facility level.

Allowing transfer of drugs between HFs is one mechanism that can diminish stock outs at the HF level. Two thirds (68%) of the NGOs claim they allow transfer between facilities in case of stock outs, but less than half (48%) of the interviewed HFs claim they are allowed to transfer drugs to or from other HFs. One can question the quality and frequency of communication between NGO and HFs.

Substitution of one drug with another with the same therapeutic action is another acceptable way to diminish the negative effect of stock outs. Two-thirds (67%) of the HFs claimed the NGO sometimes substitutes an out of stock drug with a similar drug. The examples given pertain mostly to antibiotics and analgesics. Some substitutions give reason for concern: e.g., paracetamol and ibuprofen seem to be considered interchangeable. The development of a cheat sheet for use by the NGOs could enhance the existing substitution practices.

4.6. Distribution to Health Facilities

Twenty-five Warehouses answered the section on distribution to HFs.

The average number of HFs and Health Posts served by one Warehouse varies greatly, as illustrated by Figure 16.

	Avg	Max	Min
HP	115.9	360	0
BHC	6.2	21	1
CHC	5.4	20	1
DH	0.5	2	0
PH	0.1	1	0

Figure 16 – Number of health facilities served per warehouse

The large majority of the Warehouses distribute drugs to the HFs either monthly (56%) or quarterly (44%). Few claim to also distribute six monthly (12%) or on demand (8%). It is not clear whether the alternative distribution is only for a few drugs, or when there are stock outs at facility level (see Figure 17). It is also not clear why no facilities claim to order drugs on a six monthly basis (see Figure 6) while three warehouses claim to distribute on a six monthly basis.

	Number	%
Monthly	14	56.0%
Quarterly	11	44.0%
Six monthly	3	12.0%
On Demand	2	8.0%

Figure 17 – Frequency of distribution to health facilities

Almost all Warehouses request past consumption (96%) and stock on hand (92%) and three quarters (76%) request last order quantities from the NGOs when they submit an order request (Figure 18). This corresponds with the proportion of NGOs that claim to submit this information (Figure 7).

	Number	%
Stock on hand	23	92.0%
Consumption	24	96.0%
Last order quantities	19	76.0%
Other	2	8.0%

Figure 18 – Information required from health facilities

The average estimated lead-time (see Figure 19) between receipt of an order request and delivery is 6.7 days, with a maximum of 30, which contrasts with the average 8.2 and maximum 55 days observed at the HFs (see Figure 8).

	Days
Average	6.7
Maximum	30
Minimum	1

Figure 19 – Lead-time between receipt of order and delivery

The majority of the Warehouses claim to allow transfer of drugs between HFs (92%) or substitution of drugs (72%) in case of stock-outs. The substitution pattern is similar to that reported by the HFs (see Figure 20). We saw that less than half of the HFs claim they are allowed to substitute drugs, which probably indicates a lack of efficient communication between NGOs and HFs. Both warehouses and facilities may benefit from a “cheat sheet”, listing allowable substitutes for drugs out of stock.

	Number	%
Warehouses allowing transfer between facilities	23	92.0%
Warehouses substituting drugs	18	72.0%

Figure 20 – Transfer and substitution

4.7. Inventory Management

4.7.1. Computerization of Inventory

Half (50%) of the Warehouses use a manual inventory system only; few (13%) use a computerized system only; the remaining use a mixed manual-computerized inventory system. One Warehouse did not answer the question.

Two HFs did not answer this question. All except one use a manual inventory system; the exception uses a mixed manual-computerized system.

	Warehouses		Health Facilities	
	##	%	##	%
Manual	12	50.0%	51	98.1%
Computerized	3	12.5%	0	0.0%
Mixed	10	41.7%	1	1.9%

Figure 21 – Computerization of inventory control

4.7.2. Standard Stock Card

REACH has promoted the use of a standardized stock card in Warehouses and Health Facilities through the Drug Supply Management training and the implementation of the FFSDP. Almost all Warehouses (92%) use the Standard Stock Card (SSC).

Figure 22 shows how well Warehouses follow the recommendation of REACH for the use of the stock cards. Few Warehouses (17%) have minimum and maximum stock level of each item written on the stock card. A fifth to a fourth of the Warehouses did not have updated stock cards, did not mark dates of stock outs, did not keep the stock card with the items, and was not able to track REACH drugs separately. Barely more than half (58%) of the Warehouses marked the dates and stock of physical counts on the SSC.

Health facilities show the same pattern for most of these indicators, but even a smaller proportion of HFs marks minimum and maximum stock levels on the SSC (10%) and keep the card with the items (26%).

	Warehouses		Health Facilities	
	##	%	##	%
Use standard Stock Card	24	92.3%	51	94.4%
SSC is updated	19	79.2%	41	80.4%
SSC marks stock out with dates	18	75.0%	40	78.4%
SSC marks physical count with dates	14	58.3%	25	49.0%
SSC contains daily balance	11	45.8%	34	66.7%
SSC contains min/max stock levels	4	16.7%	5	9.8%
SSC stays with item in storage	18	75.0%	13	25.5%
SSC Tracks REACH drugs separately	17	70.8%	37	72.5%

Figure 22 – Standard Stock Card (SSC)

Figure 23 shows how many facilities perform physical counts and how frequently. Almost all Warehouses (96%) claim to perform physical counts. Mostly they do this monthly (40%) or quarterly (40%); few claim to do this six monthly (12%), yearly (8%) or irregularly (4%).

Only 85% of the HFs claim to perform physical counts on a regular basis. Mostly they claim to do this quarterly (50%) or monthly (39%). Few claim to do this weekly (4%); yearly (2%), or irregularly (2%). One HF claimed to perform cycle counting.

	Warehouses		Health Facilities	
	##	%	##	%
Perform Physical Count	25	96.2%	46	85.2%
Weekly	0	0.0%	2	4.3%
Monthly	10	40.0%	18	39.1%
Quarterly	10	40.0%	23	50.0%
Six monthly	3	12.0%	0	0.0%
Yearly	2	8.0%	1	2.2%
Cycle counting	0	0.0%	1	2.2%
Irregular	1	4.0%	2	4.3%

Figure 23 – Physical Count

4.7.3. Quality of inventory management (IMAT)

One of the challenges when assessing the quality of certain processes like stock management is being able to compare repeated measures of that process with some degree of objectivity, thus enabling the evaluator to decide whether the quality improved, decreased, or remained stable. The IMAT allows to quickly measuring a number of generally accepted indicators that reflect the quality of inventory management.

In order to apply the IMAT, the DMOs selected 25 drugs that were expected to be available in all facilities (tracer drugs). Ideally, one applies the same set of tracer drugs to all facilities. That way, one can not only make statements on the quality of the inventory management of the investigated facilities, but also make statements on the availability of individual drugs in the system and the capacity to the system to respond to the diseases for which those drugs are used. The DMOs faced problem during the implementation: not all NGOs had received their last supply from the same central stock of medicine, and standard distribution lists had been modified recently. The DMOs applied two slightly different lists, reflecting the drugs that should have been present in the warehouses and HFs on the day of the visit. This still allows assessing the inventory management capacity of the NGOs, but limits the number of drugs that can be followed throughout the system. The number of drugs was further adapted to allow for exclusion of those drugs that were never used by a particular NGO.

Figure 24 summarizes the results for all the indicators: weighted average listed by type of facility, weighted average for all Health Facilities combined, weighted average for all Warehouses and weighted average for all facilities included in the assessment. Since there are great differences between different warehouses, health facilities, NGOs and

Indicator	BHC	CHC	DH	PH	HF	WH	Total
Average Number of Items included in the Survey	21.6	22.0	22.6	23.0	22.1	23.6	22.5
Max Items	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Min Items	18.0	17.0	18.0	22.0	17.0	21.0	17.0
Indicator 1. - Weighted average % of inventory variation	8.5%	7.7%	15.8%	2.3%	8.7%	5.1%	7.6%
Max % variation	59.1%	44.6%	83.3%	7.0%	83.3%	31.3%	83.3%
Min % variation	0.3%	0.0%	0.4%	0.3%	0.0%	0.0%	0.0%
Indicator 2. - Average% of Records Matching Physical stock	50.1%	51.9%	48.4%	69.8%	52.3%	74.5%	59.0%
Max % matching	84.0%	100.0%	100.0%	87.0%	100.0%	100.0%	100.0%
Min % matching	17.4%	9.1%	11.1%	54.5%	9.1%	28.0%	9.1%
Indicator 2a. - Average Number of Items less on Record than in Stock	843	372	412	397	504	1506	807
Max Number less	10004	7282	2957	1000	10004	15918	15918
Min Number less	0	0	0	0	0	0	0
Indicator 2b. - Average Number of Items More on Record than in Stock	141	90	761	363	225	5617	1857
Max Number more	585	565	2347	1310	2347	72000	72000
Max Number max	2	0	40	31	0	0	0
Indicator 3. - Average% of Tracer Items in Stock on the Day of Visit	85.8%	87.1%	84.6%	79.5%	85.8%	80.8%	84.3%
Max % in stock	100.0%	100.0%	100.0%	100.0%	100.0%	96.0%	100.0%
Min % in stock	52.4%	57.1%	50.0%	63.6%	50.0%	44.0%	44.0%
Indicator 3a. - Average% of Stock Expired on the Day of Visit	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Max % stock expired	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
Min % stock expired	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Indicator 3b. - Average % of Products with Expired Stock on the Day of Visit	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.1%
Max % products with expired stock	0.0%	0.0%	0.0%	0.0%	0.0%	4.3%	4.3%
Min % products with expired stock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Indicator 4. - Average % of Time Out of Stock	8.0%	10.2%	16.2%	12.1%	10.7%	14.6%	11.9%
Max % of time OS	18.1%	24.1%	34.1%	20.7%	34.1%	35.0%	35.0%
Min % of time OS	0.4%	0.8%	1.9%	2.8%	0.4%	3.6%	0.4%
Average number of days investigated	225	262	278	201	250	329	274
Total facilities included in the report	14	27	8	4	53	23	76

Figure 24 – Inventory management indicators

provinces for most of the indicators, the minimum and maximum values of the indicators are given as well.

One CHC and three warehouses did not have the necessary documentation available for allowing implementation of the IMAT.

Average number of items included in the survey: weighted average of individual drugs assessed for each of the break-ups.

Indicator 1 – Weighted average % of inventory variation.

This is a general indicator measuring the quality of inventory management. It reflects the discrepancy between actual stock and stock on record, as percentage of the total volume (total number of units) of each product. Ideally, the indicator should be 0. For central warehouses in developing countries a value under 5% reflects an acceptable quality of inventory management, for HFs in developing countries, one would like to see a value of 10% or less.

For the Warehouses in the assessment, the indicator is 5.1%, an acceptable average. However, there are great differences between NGOs and even between Warehouses of the same NGO in different provinces. Five Warehouses had a perfect score for this indicator; thirteen have a score of less than 1%, but six had a score greater than 5%, of which one 31%.

Score	## of WHs
< 1%	13
1 - 5%	3
> 5%	6

Figure 25 - Indicator 1 for WHs

For the HFs in the assessment, the indicator is 8.7%, an acceptable average. But here also, there is an enormous difference between individual HFs, even between different HFs of the same NGO:

Score	## of HFs
< 1%	18
1 - 4.99%	16
5 – 9.99%	6
10% or more	13

Figure 26 – Indicator 1 for HFs

The majority of HFs (75%) has a score that would rank from excellent to acceptable. More than 25% of the HFs has a score that is not acceptable, with some outliers for this indicator at 59% and 83%!

Indicator 2 – Average % of records matching physical stock.

This indicator helps refine indicator 1: are the observed differences between records and actual stock due to differences for just one or a few products, or evenly distributed among the products? Sometimes, if a product that has a big volume in stock shows differences, it may give a high value for Indicator 1, even if all other products show no difference.

For the Warehouses, for on average 75% of the products records and physical count match, or only 25% of the products show a difference between records and physical count. Here also, one sees huge differences between the warehouses:

Score	## WH
>90	9
50-90	11
<50	3

Figure 27 – Indicator 2 for Warehouses

In the facilities, for on average 52% of the products records and physical count match or almost half of the products show a difference between records and physical count. There are huge differences between facilities:

Score	## WH
>80	7
50-80	24
<50	19

Figure 28 - Indicator 2 for HFs

Indicators 2a and 2b help further qualify Indicator 2. It determines how whether there is more or less in stock than what is on record. The ideal value for both indicators is zero.

In the surveyed Warehouses, the average number of items more in stock than on record (**Indicator 2a**) is 1506, varying from zero for five Warehouses to 15918 at a maximum. Since many items come in tins of 1000 and are handled in tins in the warehouse, 1000 could be an arbitrary cut-off point. In six warehouses, Indicator 2a is above 1,000 and in 1 warehouse is above 10,000.

Score	## WH	## HF
0	5	10
1 - 1000	11	35
1000 – 10000	6	4
> 10000	1	1

Figure 29 - Indicator 2a: Items more in stock than on record

In the surveyed HFs, the average value for Indicator 2a is 504, ranging from zero for ten HFs to a maximum of 10,004 in one HF. In HFs Indicator 2a is above 1000 in four HFs and above 10000 in one HF.

The most common reason for this indicator to be different from zero is delay or forgetfulness in recording incoming items. In facilities where this indicator is far from zero, staff in charge of supply management should re-evaluate and re-enforce receiving procedures.

In the surveyed Warehouses, the average number of items less in stock than on record (**Indicator 2b**) is 5,617, ranging from zero for five warehouses to 72000 for one warehouse. Indicator 2b is above 1,000 in nine warehouses and above 10,000 in three warehouses.

Score	## WH	## HF
0	5	1
1 - 1000	11	45
1000 – 10000	9	4
> 10000	3	0

Figure 30 - Indicator 2b: Items less in stock than on record

In the surveyed HFs, the average value for Indicator 2b is 225, ranging from zero in one HF to 2,347 in one facility. In HFs Indicator 2b is above 1000 in four HFs.

When Indicator 2b is different from zero, there are fewer items in stock than on record. Common reasons are:

- Certain issues were not or wrongly recorded
- Damaged or expired items that were discarded were not or wrongly recorded
- Items are stolen.

There seems to be a greater problem on the distribution side (Indicator 2b) than on the receiving side (Indicator 2a). In general, distribution procedures should be re-evaluated and re-enforced and the distribution process should be more strictly supervised.

Indicator 3 – Average percentage of tracer drugs in stock on day of visit.

The results in this indicator may be skewed to the positive side. One normally applies one list of tracer drugs across the board, but in this study, the DMOs applied two slightly different lists, and also products never ordered/distributed by certain NGOs were not included in the denominator for that NGO.

In surveyed warehouses, on average 81% of the products on the tracer list were in stock on the day of the visit, with a high of 96% and a low of 44%. Fourteen Warehouses were on or above the average; only one warehouse had less than half the tracer drugs in stock on the day of the visit.

Score	## WH	## HF
100%	0	7
80 – 99%	14	34
50 – 79%	8	12
< 50%	1	0

Figure 31 – Indicator 3 for WHs and HFs

In surveyed health facilities, on average 86% of the products on the tracer list were in stock on the day of the visit, with a high of 100% for seven of the HFs, and a low of 50% for one HF. Thirty two HFs were on or above the average. None had less than half the tracer drugs in stock on the day of the visit.

The ultimate objective of the drug supply management system is to ensure drugs where the patients need them: in the health facilities. More than two thirds of the HFs had more than 80% of the tracer drugs in stock on the day of the visit, which leaves room for improvement but which is a good result given the challenging environment in Afghanistan.

Those with less than average results should investigate whether:

- Lead times from the NGO warehouse and from the REACH warehouse are acceptable;
- Order quantities are calculated correctly;
- An adequate minimum stock which takes into account the lead time is maintained;
- Is physical space in the warehouse big enough to correctly handle receiving and distribution;
- New activities or diseases have increased demand.

NGOs should consider the findings for the re-ordering formula of the facilities (and corresponding warehouse).

Indicators 3a (Average percentage of stock expired on the day of the visit) and 3b (Average percentage of tracer drugs with expired stock) measure quality assurance. Indicator 3a measures how much of total stock is expired; Indicator 3b further specifies whether expired items concern several products across the board, or just a few products.

No HFs had any expired stock of the tracer drugs on the day of the visit. One warehouse had some expired stock of one tracer drug on the day of the visit.

At first glance, this indicates excellent quality control of the stock at hand. One needs to take into account Indicator 3 and Indicator 4, before making a final statement about the quality control: enough drugs need to be in stock all the time, which is the case in this study.

Indicator 4 – Average percentage of time out of stock for the tracer drugs.

This indicator measures the drug supply management system’s ability to maintain sufficient stock levels continuously. The results of this indicator may look better than they really are. Ideally, one looks back in the stock records over a period of twelve months for all tracer drugs, thus including the responsiveness of the system for seasonal variations in demand. In this study, several warehouses and HFs did not have the records allowing a twelve-month retrospective study. DMOs used the maximum retrospective period possible for each warehouse and HF, and the average of that period is listed in Figure 24, under “Average number of days investigated”. In several warehouses and HFs this may exclude summer time, where a high demand on anti-diarrhea and anti malaria drugs may provoke seasonal stock-outs of these products, or it may only partially include wintertime, where anti-pneumonia drugs may be out of stock more readily.

The average percentage of time out of stock of an average of 24 tracer drugs over an average of 329 days in 23 warehouses was 15%, with a minimum of 4% and a maximum of 35%.

The average percentage of time out of stock of an average of 22 tracer drugs over an average of 250 days in 53 HFs was 11%, with a maximum of 34%.

The average percent of time out of stock is within acceptable percentages overall, it would however be worthwhile to re-asses this average when all HFs and warehouses have the records available allowing a full 12 month review.

4.7.4. Service levels (proxy)

Another way of measuring the quality of a drug supply management system is to measure the service level: how accurately does the system respond to requests for drugs at the different levels? Most often measured as the percentage of items requested that have been delivered in the quantities requested. In this assessment we looked at the percentage of drugs requested that were actually delivered, regardless of the quantities, since initially requested quantities are re-negotiated and the final quantity may be adapted to the available stock in the warehouse. Taking the initial request would under-estimate service levels, since requested quantities are deemed too high in many cases and are diminished for good reason. Taking the finally agreed upon quantities may over-estimate the service levels, since they are adapted to what is available in the warehouse. This assessment therefore compares number of items in the original request with number of items actually delivered, a less accurate proxy for the actual service level.

Figure 31 shows deliveries from the NGO warehouse to facilities. The column with title “Warehouse” shows the results, based on Warehouse records, the column titled “Health Facilities” shows the results based on HF records.

Not all warehouses (85%) and HFs (78%) had the records available that allowed review of requests and deliveries. Furthermore, while in theory the DMOs should have examined 10 in each warehouse and HF; on average they could only examine six.

	Warehouse	Health Facilities	Total
Total interviewed	20	47	67
Number of orders examined			
Total	110	290	400
Average per Fac	5.5	6.2	6.0
Maximum per Fac	10	10	10
Minimum per Fac	2	1	1
Service level			
Weighted Average	86.4%	93.2%	91.3%
Maximum	97.9%	316.0%	316.0%
Minimum	74.6%	31.5%	31.5%
Percent 100% delivered	25.5%	28.3%	7.0%

Figure 32 – Service Levels for Deliveries from Warehouses to HFs

To interpret this indicator, one looks not only at the weighted average, but also at the range of minima and maxima. Based on the warehouse records or on facility levels, one might conclude that proxy for service levels is good (around 9% for both). However, taking into account the maxima and minima, one sees that often the NGO warehouses deliver less or more than what HFs requested. Warehouses claim that only 26% of all requests were exactly 100% delivered, HFs claim that on average only 28% of all their requests were exactly 100% delivered. It means that NGOs get either less or more drugs delivered than they requested in the large majority of the NGO requests for drugs. Even without stock-outs, not delivering what was requested will provoke dissatisfaction with the client.

Number of Warehouses	19
Number of orders examined	
Total	161
Average per WH	8.473684
Maximum per WH	10
Minimum per WH	3
Service level	
Weighted Average	97.9%
Maximum	286.2%
Minimum	31.3%
Percent 100% delivered	21.1%

Figure 33 – Service level for requests from Warehouses to REACH

The requests from Warehouses to REACH show the same pattern: the weighted average for the proxy service level is close to 100%, with a minimum of 31% and a maximum of 286%, and only 21 of requested items are delivered 100% exact.

Based on the above, we may conclude that throughout the system most drugs ordered ultimately will be delivered (weighted averages that are acceptable), but most likely not as a response to a particular request (low percentage of 100% correct), but maybe added to a later request, or an additional request (high maxima). This scenario could explain the relative good stock levels over time at the health facilities, but a general discontentment with the response of REACH and Warehouses to particular requests. This may also indicate that many of the data needed for good drug supply management is available, but not necessarily adequately used.

4.8. Storage Infrastructure and equipment

4.8.1. Infrastructure and utilities

Figure 33 gives an overview of the infrastructure and utilities available in warehouses and health facilities.

		Warehouses		Health Facilities		Total	
		##	%	##	%	##	%
Wall	Holes	3	12%	6	11%	9	11%
	Smoothly Painted	22	88%	44	81%	66	84%
	Moisture traces	3	12%	7	13%	10	13%
Floor	Level	25	100%	49	91%	74	94%
	Flattened	24	96%	48	89%	72	91%
	Hardened	25	100%	53	98%	78	99%
	Moisture traces	1	4%	5	9%	6	8%
Roof	Holes	0	0%	5	9%	5	6%
	Leaking	4	16%	5	9%	9	11%
	Double insulated	15	60%	24	44%	39	49%
Windows	Broken	2	8%	10	19%	12	15%
	with Curtains	17	68%	41	76%	58	73%
	With Insect Screen	15	60%	33	61%	48	61%
Utilities	Elec. Wiring	23	92%	28	52%	51	65%
	Elec. Bulbs	19	76%	23	43%	42	53%
	Elec. Back power source	21	84%	23	43%	44	56%
	Elec. Emergency lights	0	0%	1	2%	1	1%
	Heating	7	28%	32	59%	39	49%
	AC	2	8%	2	4%	4	5%
	Fans	14	56%	12	22%	26	33%
Security	Smoke Detectors	0	0%	2	4%	2	3%
	Fire Extinguishers	10	40%	4	7%	14	18%
	Emergency Key Box	0	0%	2	4%	2	3%
	Double Locks	17	68%	30	56%	47	59%
	First Aid Box	1	4%	0	0%	1	1%
Pests		0	0%	2	4%	2	3%
Total surveyed		25		54		79	

Figure 34 – Infrastructure and utilities

Walls, floors and roofs seem generally in good condition, except for insulation of the roof and moisture traces or leaking in all.

Only about two thirds of the warehouses and HFs have windows with protection against sunlight (curtains: 68% and 76%) or insects (60% and 61%).

The majority of the warehouses are electrically equipped, with back-up power source (84%), which is the case in less than half of the HFs (43%). Emergency lights are absent across the board.

Temperature control is an issue in most Warehouses and HFs. Heating, cooling and insulation of roofs should be improved in most cases.

About two thirds of the warehouses have double locks, but fire hazard equipment is missing in the majority of the visited warehouses and HFs, as are first aid boxes.

4.8.2. Storage practices

Most of the HFs (85%) keep their drugs stored separately from the consultation room, few (7%) keep the drugs in a locked cabinet and quite a few (22%) kept the drugs on open shelves.

	Warehouses		Health Facilities		Total	
	##	%	##	%	##	%
Stock In Health Facilities						
Separate from consultation	NA		46	85.2%	NA	
In locked cabinet	NA		4	7.4%	NA	
On open shelves	NA		12	22.2%	NA	
Other	NA		5	9.3%	NA	
Zoning						
Temperature	11	44.0%	19	35.2%	30	38.0%
Humidity	14	56.0%	39	72.2%	53	67.1%
Danger	14	56.0%	14	25.9%	28	35.4%
Security	5	20.0%	13	24.1%	18	22.8%
Classification						
Therapeutic class	1	4.0%	2	3.7%	3	3.8%
Clinical Indication	0	0.0%	0	0.0%	0	0.0%
Alphabetical	15	60.0%	32	59.3%	47	59.5%
Level of use	0	0.0%	0	0.0%	0	0.0%
Administration	21	84.0%	34	63.0%	55	69.6%
Other	0	0.0%	7	13.0%	7	8.9%
Stock Management						
Apply FEFO	NA		45	83.3%	NA	
Apply FIFO	NA		46	85.2%	NA	
Store accordingly	NA		44	81.5%	NA	
Storage						
Floor	0	0.0%	6	11.1%	6	7.6%
Pallets	20	80.0%	11	20.4%	31	39.2%
Shelves	23	92.0%	53	98.1%	76	96.2%
Other	0	0.0%	0	0.0%	0	0.0%

Figure 35 – Storage practices and stock management

The data on zoning for physical conditions indicate that probably less than half of the surveyed warehouses and HFs are aware of the need to store drugs according to their different needs.

The majority of warehouses and HFs classify drugs according to administration, then according to alphabet in the storage room. This is a rational way of storing drugs. In addition more than 80% of the HFs store drugs according to FEFO/FIFO, another good practice. While this is true for the majority, some 20-30% does not comply with these principles. One needs to take into account that for many NGOs the number of different items handled increased recently with the REACH

More than 90% of the facilities use shelves to store drugs, many warehouses (80%) and some HFs (20%) use pallets. A few HFs (11%) store drugs directly on the floor, a practice they should abandon.

As shown in Figure 32, none of the DMOs considered the available drug storage space too large. They considered that space adequate in most of the warehouses (64%) and a little more than half of the HFs (57%). The storage space was too small in a third of the warehouses (36%) and almost half of the HFs (43%).

	Warehouses		Health Facilities		Total	
	##	%	##	%	##	%
Adequate	16	64.0%	31	57.4%	47	59.5%
Too small	9	36.0%	23	42.6%	32	40.5%
Too big	0	0.0%	0	0.0%	0	0.0%

Figure 36 – Adequacy of available storage space

4.8.3. Storage equipment

The large majority of the warehouses (84%) and more than half of the HFs (57%) have a thermometer present, but less claim that they check the thermometer. Neither Warehouse nor HFs check temperature twice a day on average, but almost all that check the temperature keep a written record as well. None check the temperature outside office/working hours.

Only 55% of the warehouses, have a refrigerator, the majority of which is adequately placed and working with a thermometer inside. Only half of the refrigerators have an updated temperature sheet.

Only a third of the HFs has a refrigerator, but less are adequately placed and working with at thermometer inside. Only a third of the refrigerators have an updated temperature sheet inside.

Three fourths of the warehouses have desks and chairs, less than half have computers (44%) and printers (22%).

	Warehouses		Health Facilities	
	##	%	##	%
Thermometer				
Present	21	84.0%	31	57.4%
Min/Max	14	56.0%	27	50.0%
Checked	16	64.0%	25	46.3%
Times checked per 24H	1.2		0.8	
Recorded	15	60.0%	23	42.6%
Times recorded per 24H	1.1		0.8	
Checked outside hours	0	0.0%	0	0.0%
Refrigerator				
Present	14	56.0%	18	33.3%
Dedicated to pharma	12	48.0%	19	35.2%
Outside sunlight & heat	12	48.0%	9	16.7%
Working	12	48.0%	12	22.2%
Thermometer inside	12	48.0%	10	18.5%
Temperature sheet	7	28.0%	6	11.1%
Temp. sheet updated	7	28.0%	6	11.1%
Office Equipment				
Desk	19	76.0%	NA	
Chairs	18	72.0%	NA	
Typewriter	0	0.0%	NA	
Computer	11	44.0%	NA	
Printer	6	24.0%	NA	

Figure 37 – Storage equipment

All Warehouses handle their stock by hand and manpower; no mechanical devices are used.

5. Main findings and recommendations

The findings give the impression that the system set up by REACH and the grantees NGOs generally reaches its objective: a good degree of presence of un-expired BPHS drugs at the facility level. This conclusion needs to be made with some caution, since several considerations need to be taken into account, concerning both the actual implementation of the assessment and some of the detailed results of the assessment.

Below we list some more detailed findings, with specific recommendations listed in *italics*.

5.1. Assessment implementation

As mentioned before, in order to collect sensible data in a short period in difficult circumstances, some aspects of the assessment have been modified, in fact applied less rigorously than is normally done.

The answer to one key question on the quantification by the NGOs of the needed drugs could not be analyzed: is the quantification formula used indeed accurate? *In future assessments, this question should be answered and analyzed*

Blank entries in the data collection forms were, excluded from the denominators during analysis, where feasible. This may again lead to a more positive general impression than is actually the case. *In future assessments, great care should be taken to avoid blanks in data collection forms: all questions apply to all warehouses and facilities and avoiding blanks will increase the accurateness of the results and conclusions.*

The IMAT normally applies the same set of drugs across the board, this assessment allowed for two different tracer drugs lists, depending on the phase in the re-supply cycle, and also excluded those items never used by the NGO from the denominator when calculating the inventory control indicators. This may give a slightly more positive impression of the inventory management capacity of the NGOs than is actually the case. *In future assessments, more time should be spent to come to a single acceptable list of drugs to be assessed at all levels of the system.*

Average time out of stock is low, but in many warehouses and HFs, it was impossible to trace the investigated products for a full 12-month period. This again may give a more positive impression than is actually the case. *NGOs should make sure to keep records available covering at least a 12-month period and future applications of IMAT should track stock-outs over a 12-month period.*

5.2. Specific results

- a. NGOs seem to overestimate the presence of adequate references materials (BPHS, EPHS, EDL, DSM,..) at the facilities. *NGOs should check whether reference materials are distributed and used at the facility level.*
- b. While most NGOs report quarterly on cost recovery, and many claim to allow selling of drugs at facility level, few facilities claim to do so, or are allowed to do so. *NGOs should make sure cost recovery schemes are transparent and benefit the local level.*
- c. Lead times for orders to arrive are sometimes very long, but stock outs at the REACH warehouse may have had a cascading effect on lead times of orders from facilities to warehouses. *NGOs should evaluate in detail whether longer lead times in orders from facilities to warehouses can be explained*

by delays in deliveries from REACH, and take appropriate action. NGOs should respond timely when clarifications on order requests are requested by REACH.

- d. Several findings indicate that NGOs can improve communication between central NGO level and warehouse/health facilities (e.g. cost recovery, buying from other sources, transfer in case of stock-outs,...)
- e. While in general standard procedures for receiving drugs are followed, these procedures should be followed 100%. *In case of staff turnover, procedures should be transmitted adequately to the new staff.*
- f. Substitution patterns indicate incorrect practices at warehouse level and HF level. *A standard cheat sheet indicating recommended substitutes for most of the BPHS drugs should be drafted and distributed at all levels.*
- g. While almost all warehouses and HFs use the standard stock card, key pieces of information (physical count, min/max stock) are missing on the stock cards of many facilities. *Staff of warehouses and facilities should be (re)trained in the appropriate use of all the entries on the stock card.*
- h. Six warehouses had a weighted average % of inventory variation (Indicator 1) greater than 5% and in 13 HFs this indicator was greater than 10%. *The NGOs running these warehouses and HFs should adapt and/or enforce appropriate inventory management procedures at the warehouse.*
- i. Differences between actual stock and stock on record (Indicator 2) exist for many products in most warehouses and HFs. The difference (Indicator 2b) may indicate that items leave the stock without trace, in particular in some warehouses. *Accurate and timely recording of incoming and outgoing stock should be enforced.*
- j. Neither REACH nor NGO records allowed to really assess services levels to the full extent (items requested are received/delivered in quantities requested). In fact, the documentation re-negotiation process between REACH and NGOs is documented. However, few NGOs keep record of the re-negotiated items and quantities, and can only show initial order requests and final delivery receipts. The re-negotiation between HFs and warehouses is rarely documented. *REACH should re-assess the process and its documentation, and advise the NGOs on how to conduct the same process with health facilities. Future assessments should attempt to assess exact service levels, rather than the proxy measure applied in this study.*
- k. Temperature control seems to be a possible problem in warehouses and HFs, both in summer and winter. *Investment in simple ways to insulate storerooms should be considered.*
- l. Rational classification of stored drugs could be improved in 20-30% of the HFs. *Many HFs, recently included in the grants scheme, received more drugs than they were used to handle previously. This may temporarily disturb the storage. Re-assessment of this indicator in the future would be useful to evaluate improvement.*
- m. None of the visited NGOs had an accurate appreciation of their own performance on drug supply management. Several actually underestimated their performance. *The tools used to evaluate the performance should be distributed to the NGOs for self-monitoring. In particular, the self-application of the IMAT has proven useful in other countries to allow NGOs to gradually improve, or maintain, the level of their inventory management.*

Annex 1 – Health Center Assessment Form

REACH
Pharmaceutical Supply Management Assessment

HEALTH CENTER (BHC/CHC/DH)

Facility Data

MoH facility ID number:

Name:

Province:

District:

Village/quarter:

Staffing

1. Current number of the following staff positions and number previously trained:

	Number	Number trained in		
		Supply Managt.	Rational Drug Use	General Managt.
a. MD				
b. Nurse				
c. Midwife				
d. Community Supervisor				
d. Vaccinator				
e. Pharmacist/Pharmacist assistant				
f. Administrative				
g. Labour				
h. Driver				
i. Other: _____				

2. Does the facility have a copy of the following documents:

a. BPHS	(Y/N)
b. EPHS	(Y/N)
c. Essential Drug List	(Y/N)
d. DSM Manual	(Y/N)
e. Warehouse Operations manual	(Y/N)
f. Other _____	(Y/N)

3. Does the facility stock or use drugs that are not in BPHS/EPHS?

If YES:

a. Who decided to include? _____

b. From where are they procured? _____

ORDERING AND PURCHASING

4. What persons in the facility decide on pharmaceuticals to order/purchase? List names and functions of all persons that contribute.

Name	Function

5. What methods are used to determine order quantities? (not the actual calculation)
- Consumption method
 - Morbidity method
 - Adjusted consumption method, population based
 - Adjusted consumption method, service based
 - Other: _____
6. What records or reports are used when deciding how much to order? Please provide a copy?
7. Do you use a standard formula for calculating the quantity to order? (Y/N)
If YES:
- state the formula:
 - give an example for one drug from last order (eg. Cotrimoxazole 480mg tablets)
8. Who has the ultimate decision on order quantity and source, i.e. who needs to approve any outgoing order? (Name and function)
9. How often are regular drug orders/purchases done by the facility? (Do not count emergency/exceptional orders)
- Monthly
 - Quarterly
 - Six monthly
 - Other: _____
10. What information do you send to the NGO when you order?
- Stock on hand
 - Consumption of last period
 - Quantity in last order
 - Other: _____
11. Does NGO have a record system or documents that allow keeping track of the orders (e.g. the REACH draft invoice)? (Y/N)
If YES:

- a. Does it allow tracking stock on order? (Y/N)
- b. Does it allow distinguishing between drugs ordered from REACH and drugs ordered elsewhere?
Y/N

12. Give the time (in days) for each of the following stages (note what the in-charge tells you, also review in detail the last routine order from REACH):

	In General	Last order
Calculating quantities needed		
Between finalization of calculation and approval of order		
Between approval of order and receipt of drugs from NGO		

13. How many orders (routine and emergency) did you sent to the NGO last 12 months?

14. How many times did you receive a NGO stock list during the last 12 months?

15. What happens when NGO cannot supply the full amount of drugs you ordered?

- a. We pick up the balance later, when the items become available
- b. We add the balance to the next regular order
- c. We issue a new order when the items become available
- d. We order/buy from another source
- e. Other: _____

16. What are the three major problems when ordering from the NGO:

- a.
- b.
- c.

17. Do you also order drugs from private suppliers? (Y/N)

If YES: Go to **Private Suppliers Sheet**

COMMUNICATIONS

18. What communication means do you have? List the number of each:

Telephones	
Fax	
Radio/ hand held transmitter	
Pickup or car dedicated to drugs	
Computer with email	
Computer with internet	

19. Is a computer specifically used for managing drug supplies? (Y/N)

If YES

- a. Located in what room: _____
- b. What software does it contain

- c. Do you use a software package for stock management (Y/N)

If YES

- i. Name of the inventory software package: _____
 ii. Does it allow calculation of orders based on past consumption? (Y/N)

RECEIVING DRUGS

20. Who receives drugs for the store when they are delivered?

- a. In-charge of the facility
 b. Other: _____
 c. Other: _____

21. What do you do when receiving drugs, what procedures do you follow?:

- e. Physical inspection of boxes (Y/N)
 f. Compare quantity on packing list with quantity received (Y/N)
 g. Compare name, dosage, expiry date with order (Y/N)
 h. Open suspected boxes to inspect content (Y/N)
 i. Other: _____

22. What shelf life do you require for drugs upon receipt? ____months

23. What do you do with drugs that have too short a shelf life?

- a. Reject and return
 b. Accept and distribute as priority
 c. Accept as usual for routine distribution
 d. Other: _____

24. Who decides what to do with drugs that are about to expire? _____

25. The last 6 months, how many items did you reject and return? _____

26. When drugs are out of stock in the NGO facility, can you transfer drugs from other health facilities?
 (Y/N)

27. Does the NGO sometimes substitute a drug that is out of stock with another one? (Y/N)

If YES, give three drugs were substituted the past year:

Requested drug	Substituted with

INVENTORY MANAGEMENT

28. Is your inventory system

- a. manual
- b. computerized
- c. manual and computerized

29. Do you use the standard REACH stock card? (Y/N)

30. Inspect a randomly chosen stock card. Do the following apply:

- a. Is it updated (Y/N)
- b. Does it contain stockouts with dates (Y/N)
- c. Does it contain physical counts with dates (Y/N)
- d. Does it contain a daily balance (Y/N)
- e. Are minimum and maximum stock levels noted on the card (Y/N)
- f. Does it stay with the item in the storage (Y/N)
- g. Does it allow tracking of REACH drugs separately from other drugs (Y/N)

31. How often do you take physical count?

- a. Monthly
- b. Quarterly
- c. Six monthly
- d. Yearly
- e. Cyclic counting
- f. Other: _____

32. Service level (see service level calculation sheet)

- a. Last ten deliveries from NGO

Order	# requested	# delivered	Percent
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

33. What is the ratio of emergency orders vs routine orders last 12 months? _____

34. What is the ratio of REACH drugs vs drugs from other source?

STORAGE INFRASTRUCTURE

35. Does the facility keep drugs in storage? (Y/N)

If YES

a. For how long on average (in days): _____ days

36. Is the drug storage:

- a. In a separate room from the consultation room
- b. In a locked cabinet in the consultation room
- c. On open shelves/ on the table in the consultation room
- d. Other: _____

37. If there is a separate storage room, describe the following:

- a. Walls
 - i. Holes (Y/N)
 - ii. Smoothly painted (Y/N)
 - iii. Moisture traces (Y/N)
- b. Floor
 - i. Level (Y/N)
 - ii. Flattened (Y/N)
 - iii. Hardened (Y/N)
 - iv. Moisture traces (Y/N)
- c. Roof/ceiling
 - i. Holes (Y/N)
 - ii. Water leakage (Y/N)
 - iii. Double for insulation (Y/N)
- d. Windows
 - i. Broken panes (Y/N)
 - ii. Curtains or white painted (Y/N)
 - iii. Insect screen (Y/N)
- e. Utilities:
 - i. Safe electrical wiring (Y/N)
 - ii. Sufficient electrical bulbs (Y/N)
 - iii. Backup electrical power source (Y/N)
 - iv. Number of emergency lights : _____
 - v. Number of heating elements: _____
 - vi. Number of air conditioners: _____
 - vii. Number of ventilation fans: _____
- f. Security:
 - i. Smoke Detectors (Y/N)
 - ii. Number of fire extinguishers _____
 - iii. Emergency key box (Y/N)
 - iv. Double locks on doors giving access to storage area (Y/N)
 - v. First aid box: _____
- g. Pests:
 - i. Visible traces of pests (Y/N)
 - ii. Type of pests: mice rats snakes insects

38. Estimate the overall storage area floor space: _____m x _____m = _____m²

Taking into account the operations at this facility is this floor space:

- a. Too small
- b. Adequate
- c. Too large

39. Is a thermometer present in the storage room (Y/N)

If YES

- a. Is this a minimum/maximum thermometer?
- b. How often per 24 hours is the temperature CHECKED?
- c. How often per 24 hours is the temperature RECORDED?
- d. Is temperature checked outside office working hours?

40. Is appropriate “zoning” applied for:

- a. Temperature (are drugs sensitive to cold in a heated space, are drugs sensitive to heat in a cooled space) (Y/N)
- b. Humidity (are items prone to decay through humidity stored in a dry space) (Y/N)
- c. Safety (are inflammable/explosive/corrosive items stored separately from the general storage space) (Y/N)
- d. Security (are narcotics and other items prone to theft stored in a separate locked area) (Y/N)

41. Do you have a refrigerator reserved for drugs and/or vaccines? (Y/N)

If YES

- a. Is it placed outside direct sunlight and away from heating elements (Y/N)
- b. Is there a thermometer in the refrigerator (Y/N)
- c. Is the refrigerator working on the day of the visit (Y/N)
- d. What is the temperature in the refrigerator on the day of the visit: _____ ° C
- e. Is there a temperature sheet? (Y/N)
- f. Is the temperature sheet updated (Y/N)
- g. Is there anything else in the refrigerator aside from vaccines or drugs?

42. How is the stock classified? (Mark all that apply)

- a. Therapeutic class/Pharmacologic
- b. Clinical indication
- c. Alphabetical
- d. Dosage form
- e. Other: _____

43. Do you apply: FEFO (Y/N) FIFO (Y/N)

If YES:

- a. Are drugs stored according to FEFO/FIFO (Y/N)

44. What is the principal kind of storage system is used?

- a. On the floor
- b. Pallets
- c. Shelves

45. Give three major constraints to proper storage in this facility:

- a.
- b.
- c.

DOUBLE CHECK WHETHER ALL QUESTIONS HAVE BEEN ANSWERED BEFORE LEAVING THE FACILITY

Annex 2 – Warehouse Assessment Form

REACH
Pharmaceutical Supply Management Assessment

NGO and WAREHOUSE

The following questions need to be asked from the person most informed about the particular topic, most probably the in-charge of the warehouse, but also the NGO pharmaceutical in-charge or even the head of the NGO. If a question requires pulling together some data from the files, you can agree to receive those data later on: define a specific time in the very near future (one or 2 days after the assessment) and follow-up by phone if necessary.

IDENTIFICATION

Name of the NGO: _____ Date: _____

Location of Office/Warehouse Province: _____

District: _____

Location: _____

STAFF

2. What staff is presently primarily involved in drug supply management (ask for number of positions available, actual number of staff active, and number trained in drug supply management)

Current Staff	Number of Positions	Number of staff	Trained in DSM
a. Pharmacist/Pharmacist Assistant			
b. Administrative staff			
c. Labour			
d. Guards (day)			
e. Guards (night)			
f. Other: _____			

3. Does NGO have a copy of the following documents:

	At HQ	In Warehouse	In facilities
a. BPHS	(Y/N)	(Y/N)	(Y/N)
b. EPHS	(Y/N)	(Y/N)	(Y/N)
c. Essential Drug List	(Y/N)	(Y/N)	(Y/N)
d. DSM Manual	(Y/N)	(Y/N)	(Y/N)
e. Warehouse Operations manual	(Y/N)	(Y/N)	(Y/N)
f. Other _____	(Y/N)	(Y/N)	(Y/N)

4. Does NGO stock or use drugs that are not in BPHS/EPHS?

If YES:

- a. Who decided to include the drug(s)? _____

b. From where are they procured/received? _____

4. Does NGO implement cost recovery for drugs? (Y/N)

ORDERING AND PURCHASING

5. What persons in the NGO decide on pharmaceuticals to order/purchase? List names and functions of all persons that contribute.

Name	Function

6. What methods are used to determine order quantities? (not the actual calculation)

- a. Consumption method
- b. Morbidity method
- c. Adjusted consumption method, population based
- d. Adjusted consumption method, service based
- e. Other: _____

7. What records or reports are used when deciding how much to order? Please provide a copy?

8. Do you use a standard formula for calculating the quantity to order? (Y/N)

If YES:

- a. state the formula:
- b. give an example for one drug from last order (eg. Cotrimoxazole 480mg tablets)

9. Who has the ultimate decision on order/purchase quantity and source, i.e. who needs to approve any outgoing order? (Name and function)

10. How often are regular drug orders/purchases done by the NGO? (Do not count emergency/exceptional orders)

- a. Monthly
- b. Quarterly
- c. Six monthly
- d. Other: _____

11. Does NGO have a record system or documents that allow keeping track of the orders (e.g. the REACH draft invoice)? (Y/N)

If YES:

- a. Does it allow tracking stock on order? (Y/N)
- b. Does it allow distinguishing between drugs ordered from REACH and drugs ordered elsewhere?
Y/N

12. Give the time (in days) for each of the following stages (note what the in-charge tells you, also review in detail the last routine order from REACH):

	In General	Last order
Calculating quantities needed		
Between finalization of calculation and approval of order		
Between approval of order and receipt of REACH drugs		

13. How many orders (routine and emergency) did you sent to REACH last 12 months?

14. How many times did you receive a REACH stock list during the last 12 months?

15. What happens when REACH cannot supply the full amount of drugs you ordered?

- a. We pick up the balance later, when the items become available
- b. We add the balance to the next regular order
- c. We issue a new order when the items become available
- d. We order/buy from another source
- e. Other: _____

16. What are the three major problems when ordering from REACH:

- a.
- b.
- c.

17. Do you also order drugs from private suppliers? (Y/N)

If YES: Go to **Private Suppliers Sheet**

COMMUNICATIONS

18. What communication means do you have? List the number of each:

	At HQ	At Warehouse
Telephones		
Fax		
Radio/ hand held transmitter		
Pickup or car dedicated to drugs		
Computer with email		
Computer with internet		

19. Is a computer specifically used for managing drug supplies? (Y/N)

If YES

- a. Located in HQ - Warehouse
- b. What software does it contain
- c. Do you use a software package for stock management (Y/N)

If YES

- i. Name of the inventory software package: _____
- ii. Does it allow calculation of orders based on past consumption? (Y/N)

RECEIVING DRUGS

20. Who receives drugs for the store when they are delivered?

- a. In-charge of warehouse
- b. Assistant
- c. Other: _____

21. Who enters the accepted drugs into the stock card?

- a. In-charge of warehouse
- b. Assistant
- c. Other: _____

22. What do you do when receiving drugs, what procedures do you follow?:

- a. Physical inspection of boxes (Y/N)
- b. Inspect labels (Y/N)
- c. Compare quantity on packing list with quantity received (Y/N)
- d. Compare name, dosage, expiry date with order (Y/N)
- e. Open suspected boxes to inspect content (Y/N)
- f. Other: _____

23. What minimum shelf life do you require for drugs upon receipt? ____months

24. What do you do with drugs that have too short a shelf life?

- a. Reject and return
- b. Accept and distribute as priority
- c. Accept as usual for routine distribution
- d. Other: _____

25. Who decides what to do with drugs that are about to expire? _____

26. The last 6 months, how many items did you reject and return? _____

DISTRIBUTION TO HEALTH FACILITIES

27. How many health facilities of each type are being served by this storage? Give travel time in hours to each.

Type of facility	Number	Closest (km)	Farest (km)
Provincial Hospitals			
District Hospitals			
CHC			
BHC			
Health Posts			

28. How frequently do you supply the facilities:

- Monthly
- Quarterly
- On demand
- Other: _____

29. What information do you require from the facilities when they order?

- Stock on hand
- Consumption of last period
- Quantity in last order
- Other: _____

30. Average time between receiving a requisition from a facility and providing the drugs: _____ days

31. When drugs are out of stock in the storage facility, do you allow transfers between health facilities?
(Y/N)

32. Do you sometimes substitute a drug that is out of stock with another one? (Y/N)

If YES, give three drugs you substituted to facilities the past year:

Requested drug	Substituted with

INVENTORY MANAGEMENT

33. Is your inventory system

- manual
- computerized
- manual and computerized

34. Do you use the standard REACH stock card? (Y/N)

35. Inspect a stock card. Do the following apply:

- Is it updated (Y/N)
- Does it contain stock outs with dates (Y/N)
- Does it contain physical counts with dates (Y/N)
- Does it contain a daily balance (Y/N)

- e. Are minimum and maximum stock levels noted on the card (Y/N)
- f. Does it stay with the item in the storage (Y/N)
- g. Does it allow tracking of REACH drugs separately from other drugs (Y/N)

36. How often do you take physical count?

- a. Monthly
- b. Quarterly
- c. Six monthly
- d. Yearly
- e. Cyclic counting
- f. Other: _____

37. Service level

- a. Last ten deliveries from REACH

Order	# requested	# delivered	Percent
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

- b. Last ten orders from facilities

Order	# requested	# delivered	Percent
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

38. What is the ratio of emergency orders vs routine orders last 12 months?

- a. Routine orders: _____
- b. Emergency orders: _____
- c. Ratio (b/a): _____

39. What is the ratio of REACH drugs vs drugs from other source?

- a. Percentage of total from REACH: _____
- b. Percentage of total from other sources: _____

WAREHOUSE INFRASTRUCTURE AND EQUIPMENT

40. Does the NGO keep drugs in storage? (Y/N)

If YES

a. For how long on average (in days): _____ days

41. How far is the drug storage locate from the headquarters/central office: _____ km

42. Structural condition of the storage:

a. Walls

- i. Holes (Y/N)
- ii. Smoothly painted (Y/N)
- iii. Moisture traces (Y/N)

b. Floor

- i. Level (Y/N)
- ii. Flattened (Y/N)
- iii. Hardened (Y/N)
- iv. Moisture traces (Y/N)

c. Roof

- i. Holes (Y/N)
- ii. Water leakage (Y/N)
- iii. Double for insulation (Y/N)

d. Windows

- i. Broken panes (Y/N)
- ii. Curtains or white painted (Y/N)
- iii. Insect screen (Y/N)

e. Utilities:

- i. Safe electrical wiring (Y/N)
- ii. Sufficient electrical bulbs (Y/N)
- iii. Backup electrical power source (Y/N)
- iv. Number of emergency lights : _____
- v. Number of heating elements: _____
- vi. Number of air conditioners: _____
- vii. Number of ventilation fans: _____

f. Security:

- i. Smoke Detectors (Y/N)
- ii. Number of fire extinguishers _____
- iii. Emergency key box (Y/N)
- iv. Double locks on doors giving access to storage area (Y/N)
- v. First aid box (Y/N)

g. Pests:

- i. Visible traces of pests (Y/N)
- ii. Type of pests: mice rats snakes insects

43. Estimate the overall storage area floor space: _____ m x _____ m = _____ m²

Taking into account the operations at this facility is this

- a. Too small
- b. Adequate

c. Excessive

44. Is a thermometer present in the warehouse (Y/N)

If YES

- a. Is this a minimum/maximum thermometer?
- b. How often per 24 hours is the temperature CHECKED?
- c. How often per 24 hours is the temperature RECORDED?
- d. Is temperature checked outside office working hours?

45. Is appropriate “zoning” applied for:

- a. Temperature (are drugs sensitive to cold in a heated space, are drugs sensitive to heat in a cooled space) (Y/N)
- b. Humidity (are items prone to decay through humidity stored in a dry space) (Y/N)
- c. Safety (are inflammable/explosive/corrosive items stored separately from the general storage space) (Y/N)
- d. Security (are narcotics and other items prone to theft stored in a separate locked area) (Y/N)

46. Do you have a refrigerator reserved for drugs and/or vaccines? (Y/N)

If YES

- a. Is it placed outside direct sunlight and away from heating elements (Y/N)
- b. Is there a thermometer in the refrigerator (Y/N)
- c. Is the refrigerator working on the day of the visit (Y/N)
- d. What is the temperature in the refrigerator on the day of the visit: _____ ° C
- e. Is there a temperature sheet? (Y/N)
- f. Is the temperature sheet updated (Y/N)
- g. Is there anything else in the refrigerator aside from vaccines or drugs?

47. How is the stock classified? (Mark all that apply)

- a. Therapeutic class/Pharmacologic
- b. Clinical indication
- c. Alphabetical
- d. Level of use (e.g. CHW/BHC/CHC)
- e. Dosage form
- f. Other: _____

48. What is the kind of storage system is used? (Mark all that apply)

- a. On the floor
- b. Pallets
- c. Shelves
- d. Other: _____

49. What equipment is used to handle the drugs?

- a. Manpower only
- b. Trolley carts
- c. Hand operated pallet truck
- d. Hand operated pallet lift
- e. Powered forklift

50. How much office equipment is available to the staff in the storage:

Item	Number
------	--------

Desks	
Chairs	
Typewriters	
Computers	
Printers	

51. Describe the following areas:

	Cluttered	Accessible	Enough space
Receiving area	(Y/N)	(Y/N)	(Y/N)
Issuing area	(Y/N)	(Y/N)	(Y/N)
Administrative area	(Y/N)	(Y/N)	(Y/N)

52. Give three major constraints to proper storage:

- a.
- b.
- c.

DOUBLE CHECK WHETHER ALL QUESTIONS HAVE BEEN ANSWERED BEFORE LEAVING THE NGO OFFICES OR WAREHOUSE

Annex 3 – Inventory Management Assessment Form (IMAT)

INVENTORY MANAGEMENT ASSESSMENT TOOL (IMAT) INTRODUCTION

PURPOSE/ OVERVIEW	<p>The Inventory Management Assessment Tool (IMAT) provides key indicators to assess the effectiveness of record keeping and stock management practices in a warehouse. The IMAT helps determine whether there are problems and if so, their degree of severity. The tool guides users through the process of collecting data (based on the stock position of a group of representative products over a 365 day period), calculating indicators, analyzing and interpreting the results, and identifying appropriate strategies for improvement. The IMAT can be conducted at a single warehouse, health facility, or other institution that manages stocks. It can also be used at different levels of the health system to examine record keeping and stock management practices throughout the country. Evaluators should plan for 1/2 day to implement the Inventory Management Assessment Tool in each warehouse or facility.</p>
ORGANIZATION OF THE TOOL	<p>This tool can be used electronically or manually. In either case, users start by recording the data on the page titled "Data Collection and Calculation Sheet." Users may either follow the instructions to calculate the indicators manually, or if the user has access to Excel, the tool can be loaded as a spreadsheet in order to facilitate calculations. The tool contains 9 pages (or 9 spreadsheet tabs in Excel). The names of the spreadsheet tabs and their descriptions are listed below:</p> <p>Introduction: An overview of the purpose and use of the IMAT Instructions: An explanation of how to use the tool to conduct the assessment Collection&Calculation: A data collection form. Those who receive this tool in electronic format can enter their data directly into this sheet to facilitate tabulation Results: A description of the indicators, including their ideal value and possible range. The spreadsheet is formatted to display the indicator results on this page Interpretation: Analysis guidelines to help you understand your indicator results Recommendations: Suggestions for improving your stock management and record-keeping practices for pull-type systems. Space is provided for users to identify the next steps they will take to improve stock management Graphics: A graphical representation of the results. This page also includes space for users to record the causes and possible solutions that would be appropriate for their warehouse. Annex A: An extra copy of the Collection&Calculation sheet Annex B: A sample stock card referred to in the Instructions and Recommendations sheets</p>
INDICATORS	<p>Four indicators are used to evaluate stock management practices. (Consult the "Results" sheet for a complete description)</p> <p>Two indicators measure the accuracy of record keeping:</p> <ol style="list-style-type: none"> 1) Ratio of inventory variation to total stock. 2) Percentage of stock records that correspond with physical counts. Further detailed for receiving and distribution end <p>Two indicators measure stock level monitoring:</p> <ol style="list-style-type: none"> 3) Percentage of product availability Further detailed for expired items 4) Average percentage time out of stock
INTENDED USERS	<p>The IMAT should be carried out by senior or middle managers who are responsible for the warehouse's overall performance. It can also be conducted by a Technical Assistant as part of a consultancy.</p>
FREQUENCY OF ASSESSMENT	<p>The IMAT can be used to calculate a baseline of inventory management at a warehouse and to conduct regular follow-up evaluations. It does not replace the need for routine monitoring of the warehouse's management practices.</p>

INVENTORY MANAGEMENT ASSESSMENT TOOL (IMAT) INSTRUCTIONS

Requirements

Set aside 1/2 day to implement the IMAT. It is recommended to conduct the assessment at the beginning of the day, before any new transactions have taken place. You will need basic writing implements and a calculator. In addition, if you wish to use the spreadsheet version of the tool, you will need:

System Requirements for spreadsheet users:

- An IBM-compatible computer powerful enough to run Microsoft Excel version 5.0.
- Microsoft Excel spreadsheet software program, Version 5.0 or higher, or a program that can read Microsoft Excel 5.0 files
- A compatible printer that can print on A4 paper and landscape orientation.

Skill Requirements for spreadsheet users:

- Basic computer skills
- Moderate spreadsheet skills

Step 1: Getting started

1a. Save a blank copy of the IMAT spreadsheet for future use

If you have received an electronic copy of this form, save this file somewhere so that you will have a blank copy if you chose to conduct this assessment again at a later time. Likewise, if you are conducting the study at several warehouses or facilities, create a separate copy for each site.

1b. Update stock records if recent transactions have not been recorded

Determine if stock records are up-to-date. If unrecorded receipts and distributions can be adjusted easily, before beginning the assessment, this should be done, and the recorded totals should reflect the adjustment. If the records are badly behind (e.g., several weeks or months of receipts or distributions have not been entered), use the actual recorded total on the day of the assessment, and make a note that records are not current.

1b. Print out the "Collection&Calculation" sheet

Print out the "Collection&Calculation" form (See "Collection&Calculation" sheet). Use the printed copy of this form to collect your data. Then return to the computer and record the numbers. This form is programmed to do the calculations automatically.

Step 2: Collect the data

2a. Determine the beginning of the assessment period

The assessment period should ideally cover the previous 365 calendar days, to exclude any bias due to seasonal variations in the supply cycle. In practice, define to what date it is possible to track stock records, and take the date as far back as possible, but not more than 365 days, as starting date.

2b. Select the products to include in your study

Make a list of the most frequently used products (up to 25) that you normally stock in your warehouse. Write these products in column B. (Source: reports or warehouse staff). Your list should include important products reflecting a range of categories and dosage forms. As you write the list of products, record the corresponding issue unit (i.e.: 1 Vial, 1 Liter, 1 Tab, 1 Condom, 1 packet, 1 box, etc.) in column C.

Example: Refer to the suggestions below for examples of the types of products to include.

- For **BPHS grantees**, the list should include BPHS drugs that are recommended to be present in all facilities (DH, CHC and BHC). The tool will be applied at REACH Warehouse, NGO central store, DH, CHC and BHC.
- For a **Family Planning NGO**, the list should include contraceptives, consumables such as needles, syringes, and gloves, and IEC materials.
- For an **EPI**, the list should include vaccines and consumables (such as needles, syringes, cotton, alcohol, kerosene)

2c. Count the number of DAYS each product was out of stock within the assessment period

Fill the date of the Assessment on top of the form. Assess till what date in the past stock records are available. Write that date in the heading of Column D. The spreadsheet gives the number of day for which you are performing the assessment below column B (S)

Example: Refer to the sample stock card provided in Annex B as you read the following instructions.

- Starting with the beginning of the assessment period (in our example the assessment period begins on April 26), identify the first time there was a 0 balance. According to the sample stock card, the first stockout for chloroquine was on May 4.
- Count the number of days between the day when the 0 balance began and the next receipt of stock. If the stockout began on May 4 and continued until a shipment arrived on May 11, it was out of stock for 7 days ($11 - 4 = 7$).
- Identify the next stockout (June 8).
- Count the number of days until the next receipt (9 days).
- Continue until you have counted the number of days per stockout for each time the product had a 0 balance during the assessment period.
- Total the number of days the product was out of stock. ($7 \text{ days} + 9 \text{ days} = 16$). In this example, you would write 16 in column D.

2d. Record the current recorded balance

Record the most recent balance indicated on the stock cards in column E. Do not correct any mathematical errors.

2e. Record the current physical balance

- Count the physical quantities of the products you find in the warehouse/facility, including the expired items. Write the quantity for each item in Column F
- Count the physical quantities of the expired items of each products you find in the warehouse/facility. Write the quantity of expired stock for each item in Column G

Step 3: Calculate the indicators

Option A To calculate the indicators automatically:

In the spreadsheet, enter the data in columns B-G into the table using the "Collection&Calculation" sheet. Do not leave empty spaces, not all zero values as 0. You can only enter data in the colored area. The data in the uncolored areas is calculated automatically. The value of the indicators on the "results" tab is calculated automatically. Proceed to Step 4 to analyze the findings.

Option B To calculate the indicators manually:

- Fill in columns H, I, and J of the "Collection&Calculation" tab, following instructions in the column headings.
 - Total columns D through I in the "Totals" row provided at the bottom of the table.
 - Calculate the Total for column J as indicated in the heading of the column
 - Using your recorded numbers, calculate the totals for N (the number of drugs in the assessment), K (the number of zeros in column H), L (the total number of products present (not zero) from column H), M (the total number of products with expired stock (not zero) in column G), and S (the number of days between the Starting Date in the top of column D and the Date of the assessment).
- 3e. Proceed to the "Results" tab to calculate the indicators using the formulas provided.

Step 4: Analyze the findings

Consult the guidelines for interpretation provided on the "Interpretation" tab for an explanation of the possible causes of your results. (Note that you can also view a graphical display of your results on the "Graphics" tab. Refer also to the "Recommendations" tab for ideas about how to improve your stock management and record-keeping practices.

Step 5: Summary report

In the table under the chart on the "Graph" tab, write in a few sentences your **general observations**, based on the Results and their interpretation. After exploring the **possible causes** and the **possible actions** with the in-charge of the facility, write them down as bullet points. They will serve as basis for monitoring progress with the Grantees.

INVENTORY MANAGEMENT ASSESSMENT TOOL (IMAT)

DATA COLLECTION AND CALCULATION SHEET

ORGANIZATION: **Facility Example**

Assessment Date: **28-Feb-06**

A	B	C	D	E	F	G	H	I	J
#	Name of product	Unit	# DAYS out of stock within the observed period. Starting Date: 29-Sep-05	Last stock balance (According to stock cards - do not correct errors!)	Physical quantity (based on actual count)	Expired quantity (based on actual count)	Difference between recorded and physical values (E - F + G)	Absolute value of difference between recorded and physical values	Percent of individual variation (I/F)*100
1	Aminophyllin 100mg tab	tablet	0	1,837	2,193	0	-356	356	16.23%
2	Amoxicillin 125mg/5ml syrup	bottle	1	0	0	0	0	0	0.00%
3	Amoxicillin 500mg tab/cap	tablet	39	0	0	0	0	0	0.00%
4	Cetrimide 15%+chlorhexidine gluconate 1.5%	bottle	0	1	1	0	0	0	0.00%
5	Chloroquine phos 50mg/5ml syrup	bottle	0	83	82	0	1	1	1.22%
6	Chloroquine phosphate 150mg (base) tab	tablet	0	2,721	3,302	0	-581	581	17.60%
7	Combination contraceptive pill	cycle	0	589	700	0	-111	111	15.86%
8	Condoms w/wout spermicide (nonoxinol)	piece	0	2,074	3,900	0	-1,826	1,826	46.82%
9	Cotrimoxazole (sulfmthx+tmp) 480mg tab	tablet	0	1,055	1,124	0	-69	69	6.14%
10	Co-trimoxazole 200mg+40mg/5ml	bottle	0	114	104	0	10	10	9.62%
11	Ferrous sulf + folic acid 200mg+0.25mg tab	tablet	0	2,026	2,026	0	0	0	0.00%
12	Ibuprofen 200mg tab	tablet	0	4,196	4,197	0	-1	1	0.02%
13	Isoniazid 300mg tab	tablet				0			
14	Mebendazole 100mg tab	tablet	72	0	0	0	0	0	0.00%
15	Medroxyprogesterone150 mg/1-ml depot inj	vial	0	19	20	0	-1	1	5.00%
16	Oral rehydration salts 27.g for 1l pack	sachet	0	895	904	0	-9	9	1.00%
17	Oxytocin 10 IU/ml inj	vial	0	86	96	0	-10	10	10.42%
18	Paracetamol 120mg/5ml syrup	bottle	36	0	0	0	0	0	0.00%
19	Paracetamol 500mg tab	tablet	0	4,296	4,295	0	1	1	0.02%
20	Pyrazinamide 400mg tab	tablet				0			
21	Quinine (bi)sulfate 300mg tab	tablet	0	985	985	0	0	0	0.00%
22	Rifampicine 300 mg tab	tablet				0			
23	Ringer lactate iv 1000ml	bag	0	17	17	0	0	0	0.00%
24	Salbutamol 2mg tab	tablet	0	894	899	0	-5	5	0.56%
25	Streptomycin sulfate 1g inj	bottle				0			

TOTALS:

Total number of products in the study:

148	21,888	24,845	0	2,981	2,981	12.00%
-----	--------	--------	---	------------------	-------	--------

N=

Total number of days for stock out study:

S=

(K) Total records that correspond with physical count (# of zeros in column H)	8
(L) Total products in stock (total # of drugs present (not zero) from column F)	17
(M) Total products with expired stock (total # of drugs not zero from column G)	0
Average percentage of stock expired (Total of column G / total of column F)	0.00%

(Note that the maximum number for L and M is the number of drugs listed in the assessment).

INVENTORY MANAGEMENT ASSESSMENT TOOL (IMAT)

INDICATOR RESULTS

ORGANIZATION: Facility Example

Assessment Date: 28-Feb-06

INDICATOR	PURPOSE	FORMULA	IDEAL SCORE	RANGE LIMITS	RESULTS
Record keeping indicators					
1: Ratio of inventory variation to total stock	Provides a broad indication of the existence of discrepancies between inventory records and physical counts	$\frac{\text{Total Column I}}{\text{Total Column (F-G)}} \times 100$	0	0 to total recorded	INDICATOR 1 12.00%
2: Percentage of stock records that correspond with physical counts	Indicates the frequency of discrepancies. This indicator helps indicator 1 where it is skewed by a small number of items that have large discrepancy between the physical and theoretical stock.	$\frac{K}{N} \times 100$	100	0 to 100%	INDICATOR 2 38.10%
2a: Average variation of stock records that are less than physical count.	Determines the degree of severity of discrepancies where stock records are less than physical count.	$\frac{\text{Sum of negative results in column H}}{\text{Number of negative results in column H}}$	0	maximum negative average to 0	INDICATOR 2A -296.90
2b: Average variation of stock records that are greater than physical count.	Determines the degree of severity of discrepancies where stock records are greater than physical count.	$\frac{\text{Total of positive results in column H}}{\text{Number of positive results in column H}}$	0	0 to maximum positive average	INDICATOR 2B 4.00
Stock level monitoring indicators					
3: Percentage of individual product availability at the day of the assessment	Measures a procurement and distribution system's ultimate effectiveness in fulfilling its basic mission -- providing drugs at health	$\frac{L}{N} \times 100$	100	0 to 100%	INDICATOR 3 80.95%
3b: Percentage of total stock that is expired	Measures quality assurance: Proportion of total items in stock that is expired	$\frac{\text{Total of Column G}}{\text{Total of Column F}} \times 100$	0	0 to 100%	INDICATOR 3a 0.00%
3b: Percentage of products that have expired items in stock	Helps clarify Indicator 3aB where it is skewed by a huge quantity of expired items for one product.	$\frac{M}{N} \times 100$	0	0 to 100%	INDICATOR 3b 0.00%
4: Average percentage of time out of stock	Measures of a procurement and distribution system's capacity to maintain a constant supply of drugs	$\frac{\text{Total Column D}}{N \times S} \times 100$	0	0 to 100%	INDICATOR 4 4.64%

INVENTORY MANAGEMENT ASSESSMENT TOOL (IMAT) INTERPRETATION GUIDELINES

Suggestion: Before completing this interpretation worksheet, first check for math errors on stock cards. Stock levels could have been calculated incorrectly, quantities recorded wrong, etc. Such errors will skew your results and lead to erroneous conclusions. Continue this analysis only if math errors do not appear to be the principal cause of the problem.

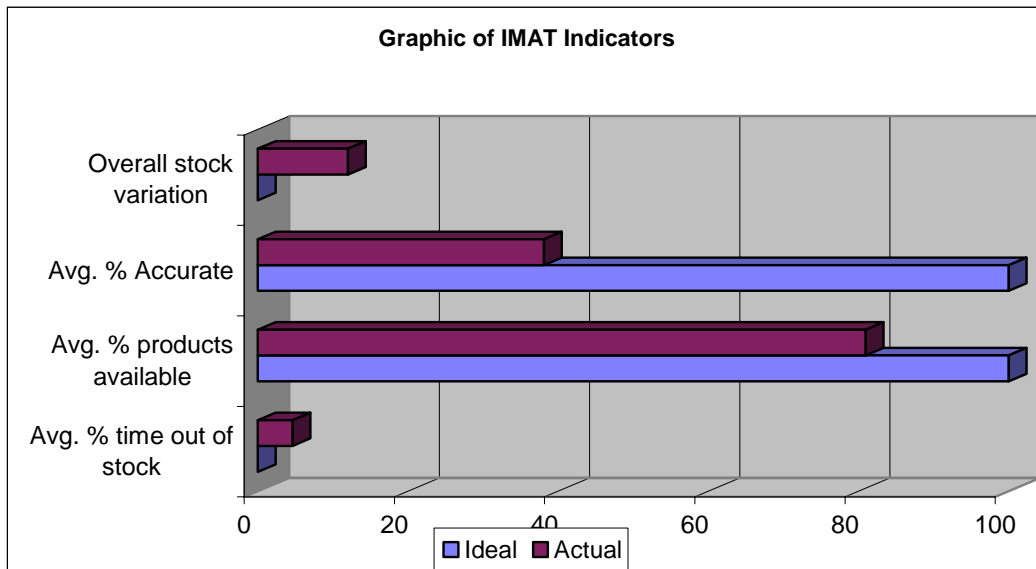
INDICATOR	RESULT	POSSIBLE INTERPRETATIONS
Record keeping indicators		
Indicator 1 Ratio of inventory variation to total stock 12.00%	Is the percentage far from zero?	There appears to be a general problem with the record keeping system. <ul style="list-style-type: none"> • Are stock cards updated regularly? • Are stock cards verified? Refer to indicator 2 to determine whether problems occur primarily on the receiving side or the distribution side. Refer to indicator 3 to determine the prevalence of the problem among all your products
	Is the percentage zero or close to zero? At least less than 5%.	Good. Your record keeping system appears to be up to date.
Indicator 2 Percentage of stock records that correspond with physical counts 38.10%	Is the percentage close to zero?	A large proportion of your records are inaccurate <ul style="list-style-type: none"> • Review general stock management procedures. It is hard to identify a single cause of your problems. It is likely that only a few, specific products are probably at the root of the problem. <ul style="list-style-type: none"> • Look down column H to identify which products have discrepancies between recorded and physical stock. Perhaps they are processed differently from the others or are received from different sources. See if procedures can be standardized for all products.
	Is the percentage close to 100?	It is possible that a large number of products have errors, but that the errors are insignificant. <ul style="list-style-type: none"> • Institute a verification process to reduce math and counting errors.
Indicator 2A -296.90	If negative variation is high...	Physical stock is greater than your records indicate. The problem appears to be on the receiving side. It is likely that certain receipts may not have been recorded.
Indicator 2B 4.00	If positive variation is high...	Physical stock is less than your records indicate. The problem appears to be on the distribution side. Check the following: <ul style="list-style-type: none"> • Certain stock issues may not have been recorded correctly • Adjustment may not have been recorded for expired or damaged items which have been removed from your stock • Products may have been stolen.
Stock level monitoring indicators		
Indicator 3 Percentage of individual drug availability 80.95%	Is the percentage much less than 100?	You have problems maintaining appropriate stock levels: <ul style="list-style-type: none"> • Is your supplier able to provide you with the quantities your request? • Are you calculating your quantity required correctly? • Do you maintain an adequate minimum stock which takes into account the period of time required for resupply? • Is there enough space in the warehouse to handle receiving and distribution? • Have there been unanticipated changes in the demand for products because of new activities? Consider making a special order to take into account such changes in program activity.
	Is the percentage close to 100?	Great! You appear to have the full range of products in stock.
Indicator 3a 0.00%	Is the much higher than zero?	You have problems ensuring the quality of your stock: <ul style="list-style-type: none"> • Are you calculating your quantity required correctly? • Are checking the shelf life of items upon receipt? • Are you adequately applying FEFO? • Are your procedures for disposing of expired items in place and adequately followed? Look at Indicator 3B to determine to identify the items to which the expired items belong The expired stock is small. Look at indicator 3B to identify how many products are concerned
	Is the percentage close to zero?	
Indicator 3b 0.00%	Is the percentage much higher than zero?	You have expired stock for large number of products: <ul style="list-style-type: none"> • You may be over-stocking routinely. • You may be accepting items with too short a shelf life. The expired stock concerns only a few items. Identify the items in Column G, and calculate the value of the expired stock. Even a small quantity of on product may represent a significant value of expired items.
	Is the percentage close to zero?	
Indicator 4 Average percentage of time out of stock 4.64%	Is the percentage much higher than zero?	Your system is not responsive to stock outs. <ul style="list-style-type: none"> • Consider increasing the minimum stock levels to account for delays in deliveries. • Try to monitor stock levels more frequently. • Update and write minimum stock levels on stock cards and check against them with each distribution.
	Is the percentage close to zero?	Great! Your stock monitoring system appears to work. <ul style="list-style-type: none"> • Check to make sure that you don't have too much stock that could expire before you are able to use it.

INVENTORY MANAGEMENT ASSESSMENT TOOL (IMAT)

GRAPHICAL REPRESENTATION OF INDICATOR RESULTS

ORGANIZATION: #REF!

Assessment Date : #REF!



Using the information from the "Interpretation" and "Recommendations" sheets, complete the space below to record the possible interpretations and actions that apply to your warehouse.

General observations:	
Possible causes	Possible Actions