



**M t w a r a      L i n d i      M b e y a      T a n g a**

# **Availability and Management of Medicines and Medical Supplies**

Findings from an Assessment of 87 Health Facilities in Four Regions in  
Tanzania

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## Acronyms

CAG	Controller and Auditor General
CHF	Community Health Fund
CHMT	Council Health Management Team
DMO	District Medical Officer
DR	Dispensing Register
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GmbH)
HF	Health Facilities
HMIS	Health Management Information Systems
ILS	Integrated Logistic System
MoHSW	Ministry of Health and Social Welfare
MSD	Medical Stores Department
PDP	Private Medicine Purchases
PFM	Public Financial Management
PMO-RALG	Prime Minister's Office Regional Administration and Local Government
RMO	Regional Medical Officer
RHMT	Regional Health Management Team
R&R	Request and Report
TFDA	Tanzania Food Medicines Authority
TGPSH	Tanzanian German Programme to Support Health

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## Executive Summary

### Background

Availability of medicines and medical equipment is the major indicator of quality in health care for most people living in Tanzania (Alba et al. 2010). However, shortages and/or stock-outs<sup>1</sup> of medicines are a persistent problem in the delivery of health services. Most leading causes of death such as malaria, infectious diseases, and HIV/AIDS can only be prevented or treated effectively by having appropriate medicines consistently available. The Tanzanian German Programme to Support Health (TGPSH) aims to support the Ministry of Health and Social Welfare (MoHSW) in its efforts to improve the Tanzanian population's access to quality health services. Despite tackling policy issues at the national level, the programme is supporting partners in the implementation of innovative approaches in the Regions of Mtwara, Lindi, Tanga and Mbeya Regions. A situation assessment has been conducted in these four Regions which aims to guide the programme and its partners in implementing interventions effectively, and which can also serve as a basis for monitoring and evaluation.

### Approach

The assessment aimed to assess the availability of essential medicines (i.e. the extent of the problem) as well as to identify bottlenecks that lead to unavailability of medicines. For physical assessment of the availability of medicines, a stratified sample of 87 lower-level public health facilities (health centres and dispensaries) was taken from four Regions (total number of Districts: 29). Three health facilities from each District were selected, comprising one health centre and two dispensaries. One selection criterion was the distance of the facility from the District town, in order to generate results that were representative for the selected Regions. Medicine availability was measured by physical count in Mtwara and Lindi Region, and by analysis of Medical Stores Department (MSD) order fulfilment in Mbeya and Tanga Regions.

### Findings

Primary care public health facilities (dispensaries and health centres) in the four Regions face severe stock-outs of essential medicines and medical equipment. Essential medicines such as Oxytocin and supplies such as the Rapid Diagnosis Test for malaria (RDT) were not available in most visited health facilities in Lindi and Mtwara (75% stock-out of RDT and 50-70% stock-out of Oxytocin). Major bottlenecks observed were two-fold:

- Incomplete supply by MSD of medicine requests from health facilities, with average MSD order fulfilment rates of 65% in Tanga and Mbeya Regions
- Health facilities' lack of capacity to order medicines correctly, including predicting medicine needs, and to manage stock-keeping.

### Recommendations

Two major recommendations are pointed out within the study. An alternative procurement system could enable districts to access medicines from complementary sources to MSD. The alternative procurement system could be set-up on the Regional level and mandated to a Prime Vendor. The second recommendation refers to the problems lower level health facilities have with proper medicines management and ordering. The overall procedure of ordering medicines need to be revised, as well trainings offered to health facility in-charges and District Pharmacists that are ensuring a correct ordering of medicines as well as stock-taking.

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<sup>1</sup> Stock-out is defined as the total unavailability (0%) of medicines at the health facility.

## 1. Rationale and Methodology

The provision of health care services in Tanzania is not only challenged by insufficient funds, but also by an ineffective flow of resources to service providers. This is the case for funds as well as for medicines. A major obstacle for the population's ability to access quality services is the lack of essential medicines (notably for malaria treatment) and medical equipment in health facilities (Alba et al. 2010, MoHSW 2009). In order to overcome these challenges, the Tanzanian German Programme to Support Health (TGPSH) is working with selected Regions and Districts in improving their financial management systems and the availability and management of medicines in Districts. Interventions in this area aim at making the flow of funds more transparent, increasing the resources generated for health services, and decreasing stock-out of medicines.

Although the assessment described here was part of a broader assessment focusing not only on medical supply management issues but also on public financial management processes at District level, this report focuses exclusively on findings in the area of medical supply management. The aim is to review current levels of shortages and especially of essential medicines in the four Regions, as well as to identify bottlenecks that could be tackled through different interventions by the programme and its partners.

### 1.1 Methodology

Both quantitative and qualitative methods were used during the assessment. Medicine shortage levels were determined using quantitative measures, while bottlenecks were identified with mainly qualitative methods.

Medicine availability was assessed in public dispensaries and health centres in Lindi and Mtwara Regions by physical examination of "tracer drug items" on the day of survey. A tracer list of 42 essential medicines considered necessary in lower-level health care facilities was used for this purpose, derived from a list of medicines compiled by the pharmaceutical advisory team at the Ministry of Health (MoHSW). The list was completed by the Regional Health Management Teams (RHMTs), which added medicines considered essential for the specific Region and which are commonly out-of-stock.

Working with health facility officials, medicine storage facilities were visited and the level of availability was determined for each listed item on the day of survey. Individual health facility officials were asked to project how long the available medicines would last (less than a week, less than two weeks, less than a month, or more than a month) and this information was compared to the next scheduled delivery. Medicines could thus be identified that were not yet totally out-of-stock but could be predicted to reach critical levels within the next few days. However, due to the unreliability of predictions from health facility officials, only complete stock-outs observed on the day of the assessment were taken into account in this report. In cases where drugs were available but estimated to be sufficient for less than seven days, and with the next supply scheduled to arrive in more than two weeks, this data was used as background information. The physical count was

also complemented by double-checks of medicines that had previously been out-of-stock according to the health facility's medicine ledger. The medicine ledger is used to track supplies of medicines in the health facility and to keep an overview of the medicine inventory.

One method used to determine medicine stock-outs in Mtwara and Lindi, as well as partly in Mbeya Region (Kyela District), was to carry out a comparison between the medicines that were prescribed to patients (indicated in the patient register) and the medicines that were actually distributed to the patient (indicated in the dispensing register) over a period of three months. The difference between prescribing and dispensing provided a proxy indicator of medicine stock outs. If, for example, malaria had been diagnosed and a specific medication prescribed as part of the treatment, the non-appearance of the patient's name in the dispensing register on that specific date would indicate that the medicine was not available. However, the method presented some problems and could not be used as a precise indicator. This was due to difficulties in data management on the health facility level (patient registers were found to be not precise in some facilities), and also because of cases where "corridor prescription" could be assumed, i.e. patients were not recorded in the patient register but still received medicines, likely due to "under the counter" payments.

Since bottlenecks were identified at MSD and District level as well as at Health Facilities, a third method was applied in Mbeya Region. The gap between MSD supply and both the District and Health Facility demand was determined through the order fulfilment rate. In Lindi, Tanga and Mtwara, however, a gap in data availability in Zonal offices made it impossible to determine the ability of MSD to supply requested medicines in these Regions. Table 2 gives an overview of the indicators used in the assessment at different levels.

**Table 1:** Levels of Data collection and Indicators

Level of data collection	Indicator
<b>MSD Zonal Store Department</b>	<ul style="list-style-type: none"> <li>• Order fulfilment rate: % of medicines supplied by MSD as requested from District (Mbeya Region)</li> <li>• Order fulfilment rate: % of medicines supplied by MSD as requested from Health Facility (Mbeya/Tanga)</li> </ul>
<b>District level</b>	<ul style="list-style-type: none"> <li>• % of medicines requested from MSD by Health Facility (Mbeya Region)</li> </ul>
<b>Health facility</b>	<ul style="list-style-type: none"> <li>• % of tracer list medicines out-of-stock (Mtwara/Lindi/Tanga)</li> <li>• % of five essential medicines and one vaccine available (Mtwara/Lindi/Tanga)</li> <li>• % of medicines dispensed (based on prescribed medicines) (Mtwara/Lindi)</li> </ul>



Qualitative data about medicine availability and, especially, details about bottlenecks and potential interventions was acquired using semi-structured questionnaires administered to the Regional Health Management Teams (RHMTs) and Council Health Management Teams (CHMTs). Other officials consulted included the District Executive Directors (DEDs), District Treasures (DTs), District health accountants, District and Regional pharmacists, and health facility officials. Throughout the data collection period, the assessment team was accompanied by one RHMT, and a CHMT member accompanied the assessment team during data collection within each District. The intention was to permit a future follow-up, directly facilitated by these study participants and channelled back to the relevant authorities in the District and the Regions. In addition, these individuals provided valuable insights as well as facilitating access to data.

## **1.2 Research Area and Sample Selection**

Data collection took place in the four regions during November–December 2010 (Tanga Region), January–February 2011 (Mbeya Region), May–June 2011 (Lindi Region) and July–August 2011 (Mtwara Region). For physical assessment of the availability of medicines, a stratified sample of 87 public health facilities at primary health care level was selected from four Regions. Three health facilities were selected from each District, including one health centre and two dispensaries. A further selection criterion was the distance from the District Town. Usually, the team tried to consider distances from District Towns in order to ensure representative results for the selected Regions. One health facility was selected that was close to the District Town, while the other two facilities were far from it and located in opposite directions.

## **1.3 Limitations**

Data availability was a continuous concern, and in many cases data were difficult to gather. In particular, MSD Zonal Offices in Tanga and Mtwara were not able to make relevant data available regarding requested medicines (from Districts and health facilities) and MSD supply. Therefore, MSD supply gap could only be fully established in Mbeya Region. Data quality was also a serious issue. Patient registers were found to be inaccurate for comparison between prescription and dispensing rates. This led to a shift in data collection methodology, basing the assessment on physical counting (in Lindi and Mtwara Regions) rather than on registers. It should also be taken into account that the availability of medicines was assessed at a particular point in time; although the most recent and the next delivery dates from MSD were taken into consideration, it is likely that some health facilities might face larger or smaller stock-outs if visited at another point in time. Results may also have been affected by the fact that health facilities were selected based on distances from District Towns, and it should be noted that selection was also influenced by District Officials (e.g. Health Officers, CHF Coordinators, DMOs) that accompanied the team.

## 2. Findings

### 2.1 Essential Medicines Availability in Mtwara and Lindi Regions

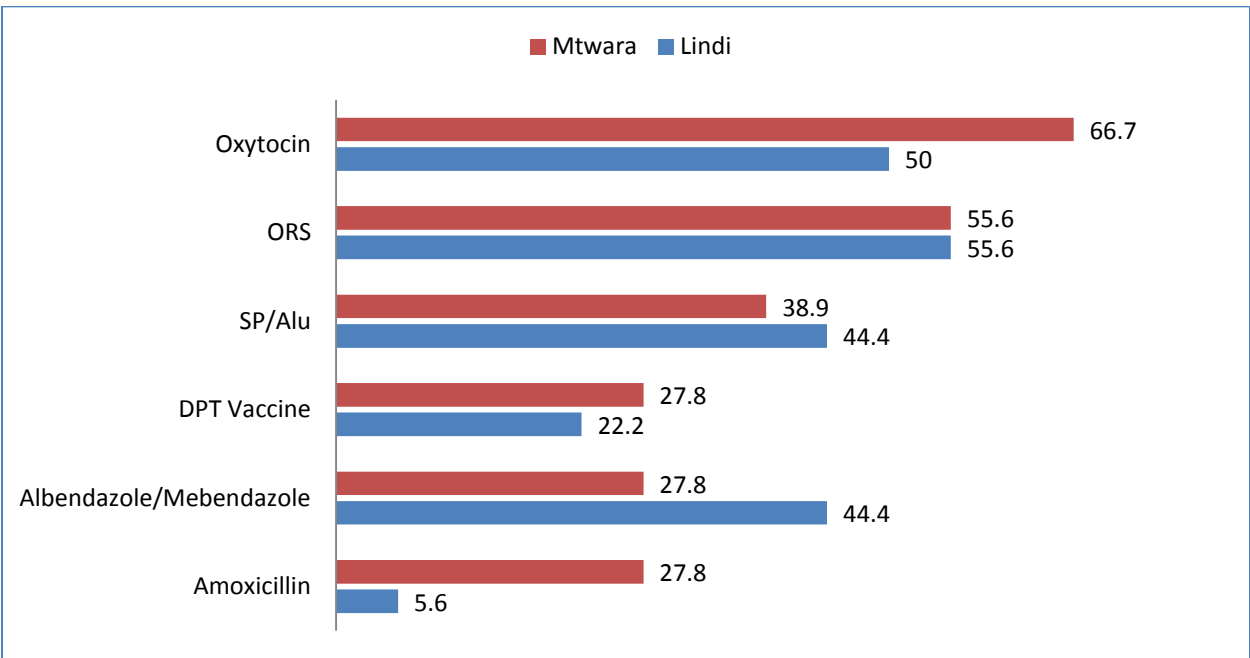
In Mtwara and Lindi Region, the assessment team assessed the availability of a tracer list of 42 essential medicines. The list, previously compiled by the MoHSW and modified by the Regional Health Management Teams (see Annex 1), was used to assess the stock-out of these medicines on the day of the survey.

Since not all items on the tracer list were equally relevant to the burden of disease in the country, the assessment introduced a special focus on the availability of five essential medicines and DPT (Diphtheria, Pertussis, Tetanus) vaccine, and also took account of five medicines known to be frequently out-of-stock.

When comparing availability in the selected health facilities in Districts across the two Regions, it was found that in Mtwara Region, an average of 44.5% of the 42 essential medicines were out-of-stock or at critical level (available but out-of-stock expected within 14 days), while in Lindi Region the figure was 33.3%.

A more detailed analysis found that the situation was especially serious for several medicines used to treat diseases that current impose a high burden on the health of the population of Tanzania (Figure 1).

**Figure 1:** Percentage of Essential Medicines Out-of-Stock in Mtwara and Lindi Regions



For example, 66.7% of visited public health facilities in Mtwara Region and 50% in Lindi Region had stock-outs of Oxytocin, the medicine of choice for treatment of complications during labour. (More

information on this specific issue can be found in the separate box below.) Another essential medicine that was more than 50% out-of-stock was Oral Rehydration Salts (ORS), which is important for treating dehydrated patients and those with diarrhoea.

DPT (diphtheria, pertussis, and tetanus) vaccine was out-of-stock at 27.8% of health centres and dispensaries in Mtwara, and 22.2% in Lindi.

Two malaria medications, SP and Alu (standing for Sulphadoxine-Pyrimethamine and Artemether-Lumefrantrine), were commonly out-of-stock, at 44.4% in Lindi and 38.9% in Mtwara. Given that malaria is one of the top-five leading causes of death in Tanzania, unavailability of these medicines can be considered an emergency situation at health service provider level. In addition, Lindi Region faced not only high stock-out levels of malaria medication, but also of Rapid Diagnosis Test (RDTs) which has serious implications for malaria diagnosis and treatment.

Albendazole/Mebendazole, a medicine for treating worm infestations, were out-of-stock in 27.8% of visited health facilities in Mtwara and 44.4% in Lindi.

Stock-outs were also registered of Amoxicillin, a broadband antibiotic that is commonly used for treating pneumonia, urinary tract infections, skin infections and ear inflammations. Stock-outs were high in Mtwara Region at 27.8% of health facilities, and lower in Lindi at 5.6%.

### **Out-of-stock of oxytocin: a barrier to reducing maternal mortality**

Oxytocin is used for induction and augmentation of labour as well as for uterine stimulation after delivery. It is also the medicine of choice for excessive bleeding after delivery, which is the major cause of maternal mortality and morbidity. Its availability in health centres is therefore highly important to maternal mortality reduction. However, the assessment found that stock-outs of Oxytocin might be caused by an issue related to the ordering forms in the health facilities. Oxytocin falls under category C according to official guidelines, with hospitals being the lowest level to receive this medicine. Health Centres and Dispensaries are therefore not allowed to officially order or use Oxytocin. Even though this is done in some cases due to high demand, most of Oxytocin seems to be delivered through vertical programme supply rather than by MSD. In order to rectify this obstacle, it may be necessary to revise the classification used at MSD, as well as the National Essential Medication list, in order to revise the Medicine Ordering Request and Report Forms accordingly.

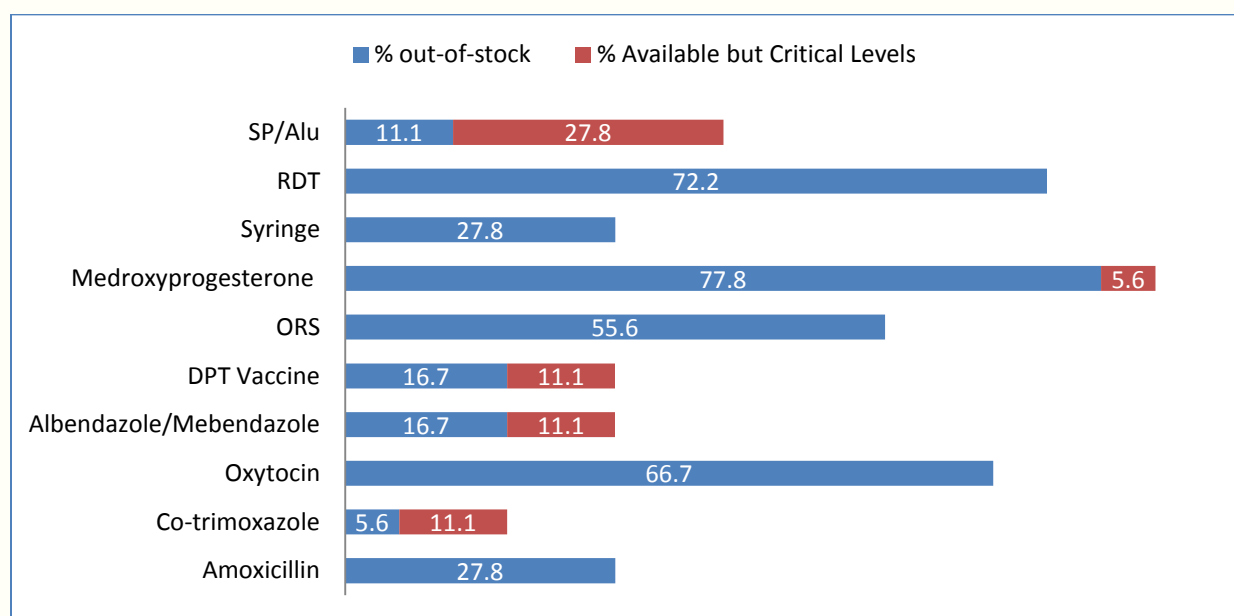
## 2.2 Mtwara Region: Medicine Shortages in Health Facilities

In Mtwara Region, 18 health facilities were visited and the availability of essential medicines was physically assessed.

As seen in Figure 2, Medroxyprogesterone, used to treat conditions such as absent or irregular menstrual periods, or abnormal uterine bleeding, was not available in 77.8% (n=14) health facilities visited. In one case, it was available for less than seven days, with no re-supply scheduled within the next 14 days.

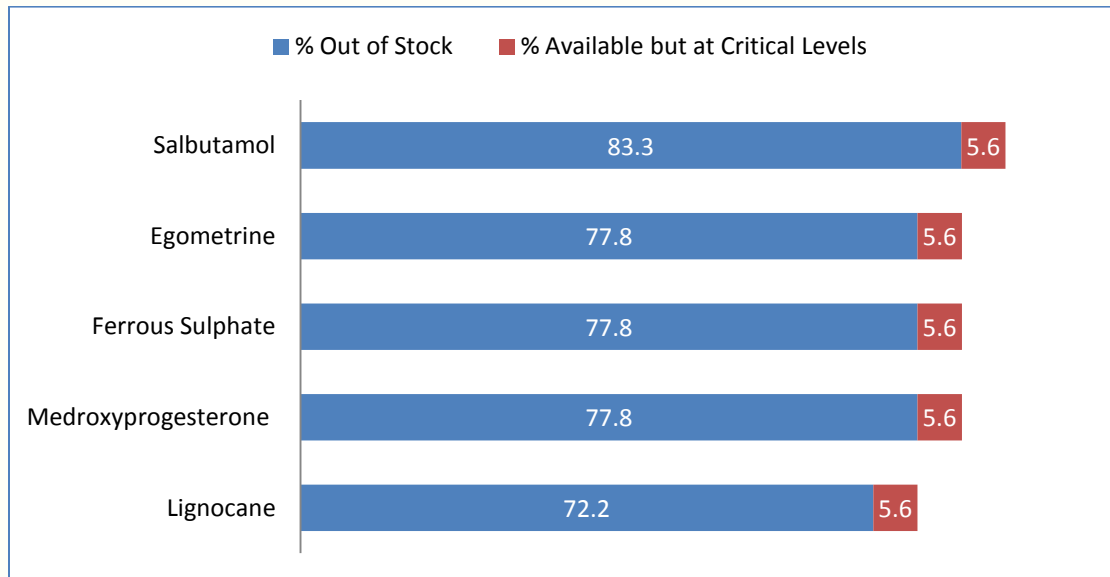
Oxytocin was out-of-stock in 66.7% of health facilities (n=12) and RDTs for malaria in 72.2%.

**Figure 2:** Percentage of Stock-Outs and Critical Levels of Medicines in Mtwara Region



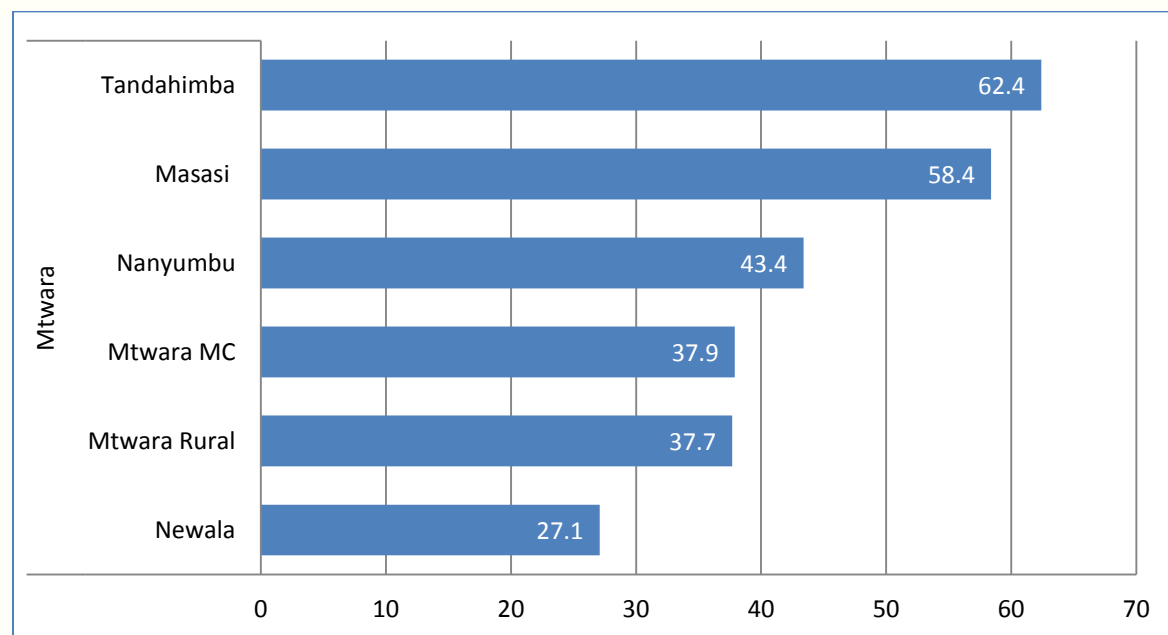
The five items that were most often out-of-stock were Salbutamol, Egometrine, Ferrous sulphate, Medroxyprogesterone, and Lignocaine, all of which were at stock-out levels in over 70% of health care facilities on the assessment day (see Figure 3).

**Figure 3: Top Five Medicines Out-of-Stock or at Critical Level in Mtwara Region**



Comparing Districts in Mtwara, there was a variance observed in availability of the 42 tracer items. In Tandahimba, these items were out-of-stock in 62.3% of visited health facilities, compared to 58.4% in Masasi and 43.3% in Nanyumbu (see Figure 4).

**Figure 4: Stock-Outs of Tracer List Medicines by District within Mtwara Region**



Stock-outs peaked at 73.7% of items in Mihambwe Dispensary in Tandahimba District. Health facilities with lowest levels of stock-out were found in Newala, where less than 30% of tracer-list medicines were found to be unavailable (Figure 4 and Table 2).

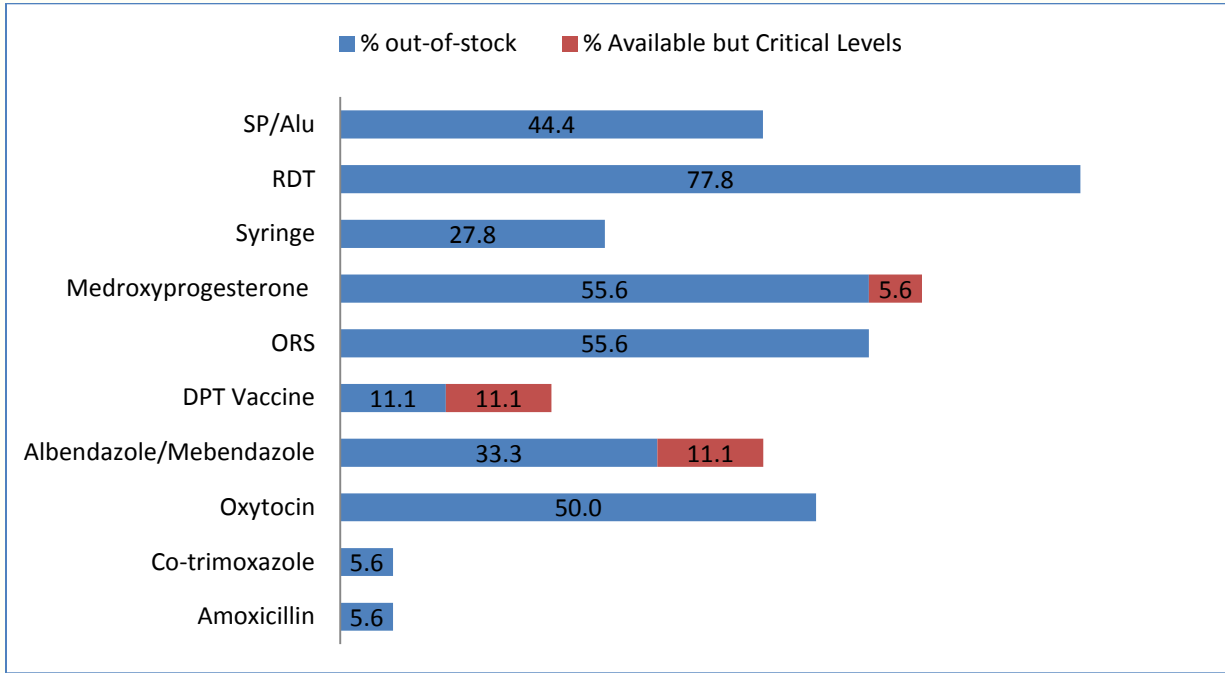
**Table 2:** Stock-Outs of Tracer List Medicines by District in Mtwara Region

Districts	Facilities	District Stock-Out Median	% of list Out-of-Stock
<b>Tandahimba</b>	Mihambwe Dispensary	62.4	<b>73.7%</b>
	Namikupa Health Centre		<b>62.2%</b>
	Maputa Dispensary		<b>51.4%</b>
<b>Newala</b>	Lengo Dispensary	27.1	21.6%
	Kitangali Health Centre		34.2%
	Nambungu Dispensary		25.6%
<b>Mtwara MC</b>	Ufukoni Dispensary	37.9	28%
	Mikeindani Health Centre		26.3%
	Naliendele Dispensary		<b>59.5%</b>
<b>Masasi</b>	Mkululu Dispensary	58.4	<b>54.1%</b>
	Nagaga Health Centre		<b>61.1%</b>
	Chungutwa Dispensary		<b>60%</b>
<b>Nanyumbu</b>	Mkonona Dispensary	43.4	37.8%
	Nanyumbu Health Centre		32%
	Masuguru Dispensary		<b>60.5%</b>
<b>Mtwara Rural</b>	Msimbati Dispensary	37.7	41%
	Mahurunga Health Centre		<b>50%</b>
	Naumbu Dispensary		22.2%

### 2.3 Lindi Region: Medicine Shortages in Health Facilities

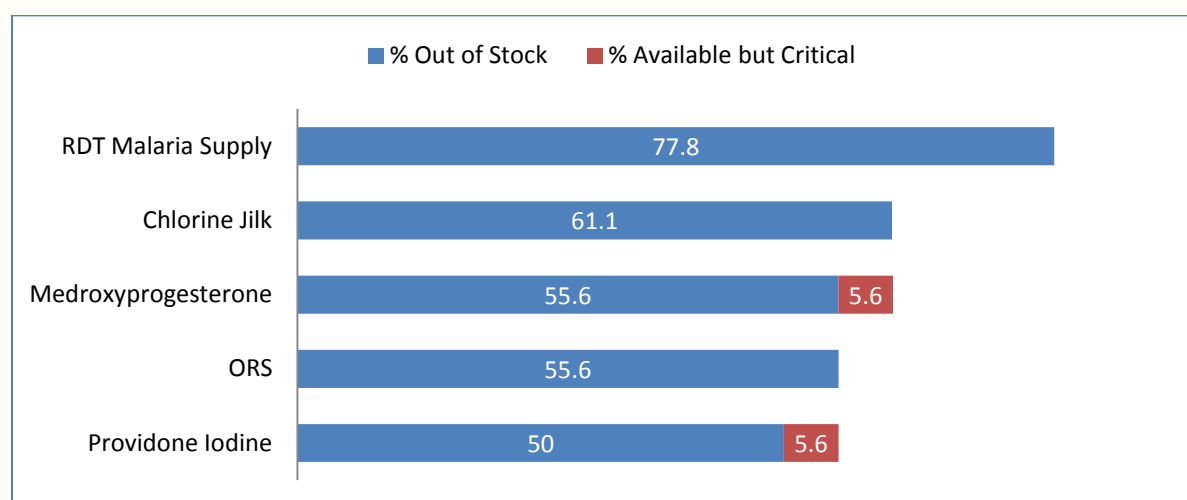
In Lindi Region, health facilities suffered especially from unavailability of Rapid Diagnosis Tests for malaria: 77.8% of health facilities had no RDTs in stock. Other critical items were Medroxyprogesterone (55.6% out-of-stock), ORS (55.6%) and Oxytocin (50%).

**Figure 5:** Percentage of Stock-Outs and Critical Levels of Medicines in Lindi Region

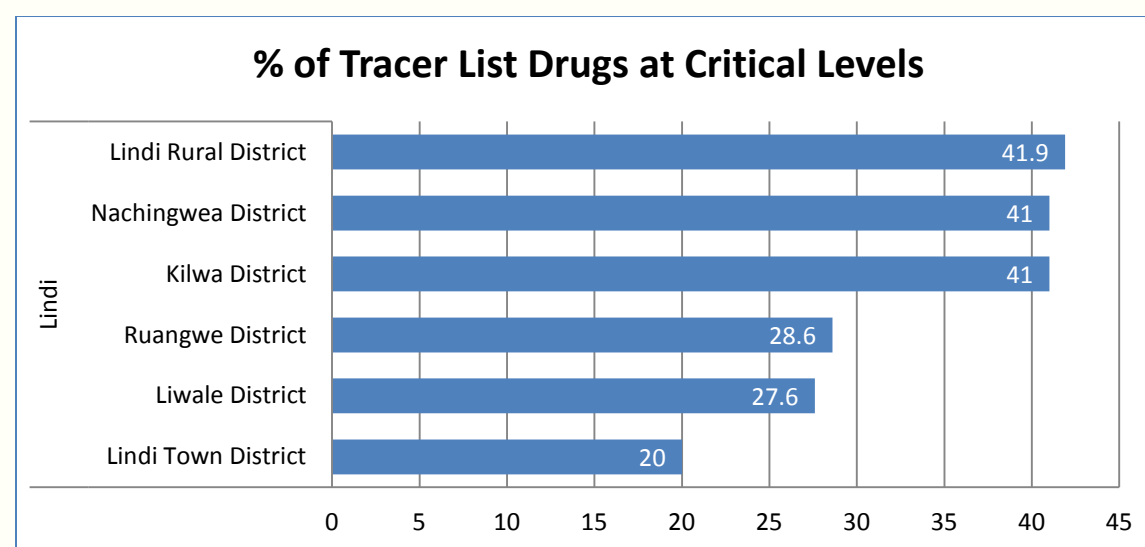


The top five medicines that were out-of-stock were RDTs for malaria (77.8%), Chlorine Jilk (61.1%), Medroxyprogesterone (55.6%), ORS (55.6%) and Providone Iodine (50%).

In particular, the stock-out of RDTs for malaria seems critical: when the assessment team asked how malaria was diagnosed in dispensaries, the common answer was that medical personal used the “observation method” and would diagnose malaria when a patient had typical symptoms such as high fever. Malaria is one of the most common diseases in Tanzania and a correct diagnosis is essential for proper treatment and care of patients as well as surveillance of the disease. Studies have shown that malaria is only diagnosed correctly in about half of tested cases in Tanzania (McMorrow, Masanja et al., 2010), suggesting that lack of testing might lead to major over-diagnosis of malaria, with further consequences such as improper treatment, wastage of medicines, and resistance to the few available medicines (Mosha, Conteh et al., 2010). Another reason stated for non-usage of RDTs in Lindi, as well as in Mtwara Region, was the unreliability of tests. Medical personnel were suspicious of the sensitivity of tests and stated that negative results were too often reported. It remained unclear whether this observation of the personnel was supported by another diagnostic method.

**Figure 6: Top Five Medicines Out-of-Stock or at Critical Level in Lindi Region**

Differences were observed between the Districts. Health facilities in Lindi Rural, Nachingwea and Kilwa District all had more than 40% of the tracer medicines out-of-stock on the assessment day (see Figure 7).

**Figure 7: Stock-Outs of Tracer List Medicines by District within Lindi Region**

There were also variances between health facilities within one District. In Kilwa, for example, two assessed dispensaries had a relatively low level of stock-out at less than 30% (Migurawa Dispensary and Mavuji Dispensary) while the Health Centre (Tingi Health Centre) had extremely high levels, at almost 70% of the items that were physically assessed. Bottlenecks identified in this case related especially to bad administrative practices and management at the health facility level. A similar



situation was found in Lindi Rural and Nachingwea. The health facilities that least affected by stock-outs were found in Lindi City District, with only 8% of items out-of stock in the Town Health Centre (see Table 3). Although part of the reason for this low level of stock-out was a recent re-supply by MSD, the findings still indicated problems related to MSD's inability to supply all essential medicines (see also "Mbeya Region: Medicine Shortage at MSD" below).

**Table 3:** Stock-Outs of Tracer List Medicines by District in Lindi Region

Districts	Facilities	District Stock-Out Median	% of list Out-of-Stock
<b>Kilwa</b>	Tingi HC	41.0	<b>68.6%</b>
	Migurawe Dispensary		28.6%
	Mavuji Dispensary		25.7%
<b>Ruangwa</b>	Nkowe HC	28.6	28.6%
	Mbekenyele Dispensary		28.6%
	Mnacho Dispensary		28.6%
<b>Liwale</b>	Kibutukwa HC	27.6	25.7%
	Barikuwa Dispensary		34.3%
	Mbaya Dispensary		22.9%
<b>Nachingwea</b>	Kilimarongo HC	41.0	42.9%
	Ulai Dispensary		22.9%
	Mtua Dispensary		<b>57.1%</b>
<b>Lindi Rural</b>	Mapingo Dispensary	41.9	34.3%
	Rutamba HC		<b>54.3%</b>
	Mahumbika Dispensary		37.1%
<b>Lindi CC</b>	Tulieni	20.0	25.7%
	Town HC		8.6%
	Nachingwea Dispensary		25.7%

## 2.4 Tanga Region: Medicine Shortages in Health Facilities

Drug management seems to pose a serious challenge in the Region, despite the fact that the Ministry of Health and Social Welfare and other partners are supporting direct supply of medicines from MSD to health facility level (MSD 2011). During the study, the team focused on order fulfilment and gaps in supply from MSD to health facilities. It visited selected health facilities in order to obtain information and verify the ability of MSD to directly deliver the requested items. In addition to the shortage of drugs in dispensaries, it was observed that Health Centres were not adequately resourced by MSD. While improvised coping mechanisms may work well, drug storage in the Health Centres are put under unnecessary pressure at times by the untimely delivery of drugs.

The MSD Supply Gap (i.e. the gap between what was ordered and what was delivered, measured in number of medicines) was observed in Tanga Region when assessing the facility requests to MSD and the actual MSD deliveries. The supply gaps ranged from 20% at Mbuzii Dispensary in Lushoto to 73% at Songe Health Centre in Kilindi. Over-supply (more medicines delivered than ordered) was observed at Magati Dispensary in Mkinga District.

**Table 4:** Supply Gap and Order Fulfilment in Tanga Region Health Facilities

Districts	Facilities	% Supply Gap	% Median Supply Gap	% Order fulfilment rate
Lushoto	Mbelei Dispensary	44.0	34.3%	65.7%
	Mbuzii Dispensary	20.7		
	Soni Health Centre	38.2		
Korogwe DC	Mbagai Korogwe DC	55.8	55.8%	44.2%
Korogwe TC	Mgombezi Dispensary	26.6	45.2%	54.8%
	Kilole Dispensary	63.9		
Mkinga	Magati Dispensary	-29.9	7.0%	93.0%
	Maramba Health Centre	44.0		
Pangani	Boza Dispensary	39.3	39.3%	60.7%
Kilindi	Mafisa Dispensary	46.3	48.3%	51.7%
	Gombero Dispensary	25.6		
	Songe Health Centre	73.0		
AVERAGE				61.7%

In Tanga Region, District Pharmacists reported repeatedly that they would manually redistribute items according to their sense of individual health facility needs.

## 2.5 Mbeya Region: Medicine Shortages at MSD and in Health Facilities

In Mbeya Region, it was possible to obtain data from MSD about District Demand and MSD Supply because the packing of medicines is done centrally at Dar es Salaam Office and data were communicated and accessible. At other MSD Zonal Offices in Mtwara, Lindi and Tanga, it was not possible to easily obtain the same kind of data since drug ordering forms from health facilities were kept separate from account balances and MSD Supply Sheets.

The Mbeya data and experience show that medicine stock-outs in health facilities are due to problems on different levels. First, health facilities are often not able, or are reluctant to fill out the ordering forms for MSD and have problems both in stock-keeping as in projecting their needs. The District therefore may sometimes order medicines on behalf of health facilities without properly investigating their needs. When the order reaches MSD, it may therefore not be based on real needs but on a rough estimate by the District pharmacist. In addition, MSD is not always able to supply fully the ordered medicines. In Mbozi District, for example, only 54.6% of District orders could be supplied. While the highest level of order fulfilment was found in Rungwe District, at 76.6% availability (see Table 5), in general MSD order fulfilment rates in Mbeya Region varied between 54.6% and 76.6%.

**Table 5:** Demand, Supply Gap and Order Fulfilment in Mbeya Region Districts

Districts*	District Demand in TSh	MSD Supply In TSh	Supply Gap In TSh	% Supply Gap	% Order Fulfilment rate
Mbozi District	66,910,900	36,533,700	30,377,200	45.4%	54.6%
Mbarali District	47,210,800	31,529,000	15,681,800	33.2%	66.8%
Chunya District	57,290,720	38,702,600	18,588,120	32.5%	67.6%
Mbeya Rural	172,770,500	117,681,447	55,089,052	31.9%	68.1%
Kyela District	44,921,550	31,416,800	13,504,750	30.1%	69.9%
Rungwe District	68,878,089	52,768,529	16,109,560	23.4%	76.6%
<b>AVERAGE</b>					67.3%

\*No data available for Mbeya CC and Ileje

**Source:** Assessment data collection and MSD information for FY 2008-09. Note that in December 2009 the exchange rate was 1 USD = 1320 Tsh.

### **Under-the-counter payments and “corridor prescription” in Mbeya Region**

The assessment team came across several cases in which the patient register did not match the dispensing register and contained fewer patients than shown on the dispensing register. While, for example, the dispensing register indicated the provision of medicines to 30 patients on one day, the patient register indicated only 21 patients had been admitted for treatment in the health facility. This is either the result of improper data management or of “corridor prescriptions”, in which patients are not officially admitted in the records but medicines are still prescribed, with undocumented payments made to doctors.

In addition, some facilities in Kyela District were charging extra fees of around 200 TSh per patient for medicines, regardless of CHF or NHIF membership. The reasons given by the health facility heads were the need to pay for security services. Such payments were also not recorded or audited, and were part of an undocumented payment system in which funds can easily be utilized for purposes other than health service delivery.

## 2.6 Expired Medicines and Manual Redistribution

During the assessment it was observed that while there was unfulfilled demand for certain medicines in some health facilities, stocks of these medicines had expired in large quantities in other places. Since the MSD “push system” has been revised into a “pull” system, medicines are no longer supposed to be supplied in pre-defined amounts but through an integrated system in which facilities must order their own medicines. However, large quantities of medicines are still sent unrequested to health facilities. An additional problem, according to District officials interviewed in the four Regions, is that some of the medicines that arrive are often near expiration. Moreover, since these medicines were not specifically ordered for use in the District, facilities often were unable to utilize these medicines before their scheduled expiry dates. Medicines were also found physically by the assessment team in all Districts that were near expiry. Acknowledging the challenges associated with the push-system, MSD frequently continues to push medicines rather than using the pull-approach. Moreover, officials of the District Medical Office could not estimate the total value of expired medicines.

**Expired Medicines at the Mbarali District Hospital in Mbeya Region**



MSD Zonal Office staff indicated that they sometimes recovered expired medicines; however, the rules on their destruction are stringent and it could take two to four years before expired medicines are disposed of. The Zonal Offices also do not document the value of the recovered expired medicines since the recovery exercises are irregular. Attempts to acquire relevant data on this issue from the respective facilities were unsuccessful. However, the CAG Audit Report of the Central Government from 2009/10 states that a loss of “Shs. 4,707,078,071 relates to expired drugs with the Medical Stores Department in various regions of Tanzania. Moreover, it was noted that the losses had accumulated from the year 2003/2004” (NAO URT 2009/10: 130).

Related to the issue of expired medicines but also to difficulties that health facilities have with drug ordering is the topic of transfer of medicines and medical equipment within the Districts across health facilities. Almost all District Pharmacists have reported that they redistribute medicines between health facilities due to oversupply or underutilization. Since medicines often do not arrive where they are mostly needed, they may be re-distributed manually by District Pharmacist. Often this is not accompanied by a fund re-distribution or drug ledger adjustment, leading to incorrect ledgers and inaccurate account balances; this also introduces an element of unfairness since the health facility that has medicines taken away is not compensated with other medicines instead or with funds to purchase other items according to future needs. In some Districts, the manual re-distribution was recorded in the ledgers, but MSD health facility account balances were not aligned. While this practice can sometimes provide medicines to people who might not otherwise have had access to them, it is a highly ad hoc practice (when processes have already gone wrong), as vulnerable to non-transparent arrangements and fraud.

## 2.7 Other Determinants of Medicine Shortage

Other determinants in shortages of medicines were identified through qualitative interviews in facilities and District offices.

First, the overall budget for drugs allocated to health facilities appears to be insufficient. Fund allocation for medicines is currently changing from a procedure that only differentiates by type of health facility to one that takes into account other measurements such as catchment population and geographical factors. Still, demand for medicines at health facilities seems to be higher than the resources that the government is currently allocating for medicines. At the beginning of the financial year, late disbursement of funds can make it difficult for MSD to purchase sufficient medicines, and creates the first bottleneck.

At the District level, medical supply management has also been observed as being weak. It is usually under the supervision of the District Pharmacist, whose capacities (including know-how and time) for managing databases used in medicine stock management and oversight are in general low.

Other challenges include facilities' problems with ordering medicines. Health facility officials' problems with ordering medicine (based on the ILS 2A form), include a lack of understanding about how to quantify drug units. In Kyela District in Mbeya Region, for example, Ndobu Dispensary was unable to order medicines and (at the time of the interview in January 2011) had not received any pharmaceutical deliveries since May 2010; the Dispensary also had very low levels of patient visits given its population and catchment area. Facilities also tend to have problems with keeping data that would have helped in estimating medicine needs. Some facility officials are unable to anticipate medicine shortages, with the result that some medicines hit zero-stock-levels. In some cases, the officials are not trained in medical logistics, especially in the area of forecasting and projecting facility medicine needs.

These problems have not only been identified at lower level health facilities, but were also observed in the case study of medical supply management in Kyela, which included District public and private hospitals. Even in these cases, no computerized patient registration or medicine dispensing systems had been implemented.

### 3. Conclusion

Stock-outs of medicines and medical supplies could be observed in all health facilities that were visited, although the degree of stock-out varied across health facilities, Districts and Regions. Essential medicines found largely unavailable in health facilities in Lindi and Mtwara Regions include Rapid Diagnosis Test for malaria (75% out-of-stock) Oxytocin (58.35% out-of-stock), ORS (55.6% out-of-stock), SP/Alu (41.7% out-of-stock), and DPT Vaccine (25% out-of-stock). In addition, certain medicines in some health facilities were often only available at critical level, with no MSD delivery scheduled to the District or, in the Tanga case, health facility. Given the burden of disease in Tanzania due to malaria and maternal mortality, stock-outs of RDTs and Oxytocin should be considered an emergency situation.

One of the weaknesses of drug supply in Tanzania still lies at the level of the Medical Stores Department. Essential medicines are often out-of-stock at MSD Central Office, but Districts and health facilities are not notified of this during the lengthy waiting period between the order being made and the actual supply (or non-supply) of medicines. Thus, Districts and health facilities are not able to pursue alternative sources of procurement. In the selected Regions where MSD fulfilment rates could be assessed (Mbeya and Tanga Regions), MSD had an average order fulfilment rate around 65% (with a range from 44% to 93%). Since a major percentage of drugs is unavailable at MSD, out-of-stock situations “downstream” in public health facilities inevitably occur due both to late notification and to insufficient funds and capacity to purchase the missing items from alternative suppliers.

The assessment’s analysis was constrained by the fact that several forms of information could not be collected from MSD by the assessment team. For example, MSD Central Medical Stores in Dar es Salaam was only able to provide information on order fulfilment rates for Mbeya Region, where the Central Store is also in charge of the packing of items for the Zonal Office. In other Regions, MSD Zonal Offices were not keeping records consistently and were unable to provide an overview of such important data. This is consistent with findings from other studies such as the Drug Tracking Study (URT, 2007).

Other factors in medicine shortages were found at District level as well at the health facility level itself. District Pharmacists are overburdened by their supervisory and oversight role, and health facility officials are challenged by low capacity to carry out correct drug ordering. Although Districts are able to procure medicines from alternative suppliers in case of medicine stock-outs at MSD level, they face practical challenges stemming from procurement processes, lack of funding at District level, and inadequate communication with MSD Zonal Stores, which prevents make timely procurements from alternative suppliers.

## 4. Recommendations

### 4.1 Alternative Procurement System

The assessment's findings on medical supply management identified a variety of bottlenecks that contribute to the unavailability of medicines and/or medicine wastage. Recommendations can be made for different levels. First, MSD supply has the capacity to provide only 65% of ordered medicines on average. This indicates a need for alternative avenues of medicine procurement from other suppliers to complement MSD delivery.

While there are clearly several bottlenecks at health facility level that contribute to incorrect medicine ordering and inadequate supply, MSD Zonal Offices are usually unable to meet all demand. Ordering procedures linking MSD Head Office in Dar es Salaam via the Zonal Offices to the District and/or directly to the health facilities are time consuming and often lead to a disconnect between medicine demand and supply. Alternative procurement systems are therefore crucial in order to overcome MSD supply gaps. As councils (local government authorities) are increasing their own resources (e.g. from CHF or other cost sharing funds), it may be possible to make use of these funds for procurement from alternative suppliers when MSD is out-of-stock.

In the past, the Tanzanian German Programme to Support Health (TGPSH) supported the set-up of a District buffer fund scheme in Lushoto District under which missing medicines at MSD would be replenished from alternative suppliers at the District level, and funded through Cost Sharing, especially CHF, funds. However, it was found that the District is easily overburdened with procurement and tendering processes, as well with keeping close communication with MSD. Further adaptation of the system, such as the recently-started pilot for direct medicine supply by MSD to front-line health facilities, is needed.

There is a need to discuss how the District-based buffer stock system promoted by TGPSH can be better linked to MSD medicine supply system, e.g. by shifting the buffer stock to the Regional level and linking it with MSD Zonal Office. A regional alternative procurement system could procure the missing items on behalf of the Districts from alternative suppliers, with MSD delivering both stocks (MSD and alternative supplier items) to the health facilities in one consignment. A pre-condition for implementation of this proposal would be a close collaboration between the Districts and MSD: the Districts would have to mandate the supply and procurement activities for the buffer stock items to MSD, or alternatively to a different medicine management structure at regional level. This should be done on the basis of a contractual arrangement. An agreement between District and Zonal MSD brokered by MSD Area Manager/PMO-RALG (Prime Minister's Office Regional Administration and Local Government), and monitored by PMO-RALG at Region level, could be a way forward to overcome these challenges. The District would mobilize the funds to bridge the supply demand gap and even have an incentive to better manage and utilize funds from cost-sharing.

In this kind of collaboration, the proposed Regional Alternative Procurement System (under the Regional Medical Officer, who could possibly outsource this task to private companies) would



manage the District Buffer Accounts. In the event of anticipated shortfalls in the Zonal MSD supply, this collaboration would permit purchases to be made from pre-qualified suppliers in time for District health facility orders to be processed and deliveries made to health facilities. The Districts would receive invoices for the extra medicines that were procured as supplements to those ordered from MSD. The Regional Structure would draw from District funds, and invoice only for shipped supplies per facility. PMO-RALG could ensure value-for-money and performance standards through participation in the pre-qualification of suppliers and also by monitoring the scheme.

### **4.2 Simplifying Medicine Ordering and Data Management at Facility Level**

The second recommendation refers to the medicine ordering process at the health facility and District level. Health facility officials are faced with numerous forms and templates for monitoring and reporting. For efficient medical supply management, the medicine ledger as well as “bin cards” (i.e. stock management forms) and MSD Ordering Forms (R &R Forms) need to be correctly maintained. It was noted that the R&R Form for correct MSD ordering could be simplified, and that its use could contribute to better prediction of medicine needs. Since health facility officials do not always make an estimate of the stock that is still available when making their next order for medicines, and stock-keeping capacity is relatively weak, two measures could strengthen the management of medicines at the health facility level: first, simplifying medicine ordering procedures (including the forms); and second, providing on-the-job training to health facility officials in inventory and stock-keeping and correct ordering.

## References

- Alba, Dillip, Hetzel et al (2010): Improvements in access to malaria treatment in Tanzania following community, retail sector and health facility interventions -- a user perspective. *Malar J.* 2010; 9: 163.
- McMorrow, Masanja, Kahigwa et al (2010): Quality assurance of rapid diagnostic tests for malaria in routine patient care in rural Tanzania, *Am J Trop Med Hyg*, Volume 82 (1)
- Medical Stores Department (2011): Presentation on Pilot Study on Direct Delivery of Medicines, Medical Supplies and Equipment to Public Dispensaries and Health Centres in Tanga Region. Presented to TC SWAP on 10/02/2011
- Ministry of Health and Social Welfare (2009): In-depth assessment of the medicines supply system in Tanzania. Document produced with the financial assistance of the European Community and the technical support of the World Health Organization.
- Mosha, Conteh, Tediosi et al. (2010): Cost implications of improving malaria diagnosis: findings from north-eastern Tanzania, *PLoS One*, Volume 5 (1)
- National Audit Office (2011): Annual General Report of the Controller and Auditor General on the Audit of the Financial Statements of the Central Government for the year ended 30/06/2010  
[[www.nao.go.tz/files/GENERAL-20REPORT-20CENTRAL-20GOVERNMENT-202009-2010.pdf](http://www.nao.go.tz/files/GENERAL-20REPORT-20CENTRAL-20GOVERNMENT-202009-2010.pdf)]
- United Republic of Tanzania (2007): Drug Tracking Study. Euro Health Group, Submitted to the Royal Danish Embassy Dar es Salaam in 08/2007 [[http://hdptz.esealtd.com/fileadmin/documents/Key\\_Sector\\_Documents/Tanzania\\_Key\\_Health\\_Documents/Tanzania\\_Drug\\_tracking\\_study\\_final\\_report.pdf](http://hdptz.esealtd.com/fileadmin/documents/Key_Sector_Documents/Tanzania_Key_Health_Documents/Tanzania_Drug_tracking_study_final_report.pdf)].

## Annexes

### Annex 1: Tracer List items of Medicines and Medical Supply

#	Tracer List Items	Stock Levels	
		Critical level	out of stock
1	Amoxicillin caps		
2	Co-trimoxazole tabs		
3	Erythromycin tabs		
4	Ferrous sulphate& folic acid tabs		
5	Metronidazole tabs		
6	Paracetamol tabs		
7	Quinine tabs		
8	Amoxicillin suspension		
9	Povidone iodine liquid 10%		
10	Adrenaline inj		
11	Ceftriaxone powder inj		
12	Diazepam inj		
13	Oxytocin		
14	Quinine inj		
15	Qloves surgical and disposable		
16	Syringes		
17	Cotton wool		
18	Chlorine /jik		
19	Infusions (ringers lactate and dextrose 5%)		
20	Catheter and urine bags		
21	Ephedrine tbs		
22	Methylated spirit		
23	Water for inj		
24	Magnesium sulphate injection		
25	Lignocane		
26	Aminphylin caps/ iv		
27	Folic acid		
28	Pen v		
29	Sp/Alu		
30	Albendazole/ Mebendazole		
31	DPT3 Vaccine		
32	ORS		
33	Medroxyprogesterone inj		
34	Syringe, needles		
35	RDT Malaria or Microscopy supplies		
36	Egometrine		
38	Salbutamol tabs		
39	Hemocue Machine		
40	Urine Albumin		
41	Centrifuge Machine		
42	EDTA Tube (Vacutainer with nuddle)		

## Annex 2: Questionnaires

### Medicines Out of Stock

Questions asked to: MSD Zonal Office, District Pharmacist

Item 1 – Supply Year 1	Value in Tsh	Drugs Out of Stock
Medicines Requested By Facilities		
Medicines Authorized by District Pharmacist		
Medicines Supplied by MSD		
Variance		
Item 1 –Supply Year 2	Value in Tsh	Drugs Out of Stock
Medicines Requested by Facilities		
Medicines Authorized by District Phar.		
Medicines Supplied by MSD		
Variance		

#### MSD ZONAL OFFICE

Q1. Could you kindly outline the process of drug supply, from request to delivery? (MSD)

Q2. Could you identify stages of the supply chain which contribute to drug shortages? (MSD)

Q3. Does MSD supply drugs which are 4-months to expiry? Yes\_\_No\_\_(MSD)

Q4. What quality assurance strategies do you employ to ensure drugs delivered are not near to expiring? (MSD)

**Expired Drugs**

Questions asked to: District Pharmacist+ Facility In-Charge

Q5. Do you check the expiry dates of drugs supplied by MSD?

Q6. What is the means of verification?

Q7. Do you at times get drugs that are 4months near to expiring from MSD?

Q8. How will you rate the ability of MSD to supply drugs on time?

<b>Highly Capable</b>	<b>Indifferent</b>	<b>Satisfactory</b>	<b>Not too good</b>	<b>Disappointing</b>
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Q9. How will you rate the quality of MSD drugs Supplied?

<b>Premium Quality</b>	<b>Average Quality</b>	<b>Disappointing</b>
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Q10. How will you rate the adequacy of MSD Drug Supply?

<b>Adequate</b>	<b>Average Quantity</b>	<b>Inadequate</b>
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Q11. Do you perceive the Zonal MSD to be having a role in drug shortage in the district? Yes\_\_ No\_\_

Q12 How many patients are registered in the Patients Register for the following months;

January-2011	February	March

Q13 How many patients are registered in the Dispensing Register for the following months

January-2011	February	March

### Recourse to Private Drug Purchases

Questions asked to: District Pharmacist+ Facility In-Charge

Q1. How much private drug purchases was made during the 2009/2010 Financial Years  
Tsh\_\_\_\_\_

Q2. How much is available in the Drug Revolving fund? \_\_\_\_\_Tsh

Q3. Are the facility in-charges able to order drugs themselves?

1/4 ☐ , 2/4 ☐ , 3/4 ☐ , 4/4 ☐

Q4. Does the District Pharmacist have a Drug Database? (See Evidence of Database system)

Q5. Does the district Pharmacists keep MSD Sales invoices? Check for 2009/2010

1/4 ☐ , 2/4 ☐ , 3/4 ☐ , 4/4 ☐

Q6. Do facility in-charges keep MSD sales Invoices? Check for 2009/2010

1/4 ☐ , 2/4 ☐ , 3/4 ☐ , 4/4 ☐

Q7. How much was budgeted for drugs for the 2009/2010 Financial Years (Payment  
Voucher @Health Accountants)\_\_\_\_\_Tsh

Q8. Are you able to fill 2A form? Yes\_\_\_ No \_\_\_ (Facility In-charges\_ Evidence of 2A form @  
facility)

Q9. Are there drugs currently at 20-0stock? Yes\_\_\_ No\_\_\_

Q10. How long have these drugs been @ the level?\_\_\_\_\_

Q11. Do HFGC participate in planning for funds? Yes\_\_\_\_\_ No\_\_\_\_\_ (See Minutes)