



Ghana

Supply Chain for Neglected Tropical Diseases (SC-NTD)

Assessment of the supply chain for NTD drugs

July 17 – August 5, 2014

Acknowledgement

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Acronyms

ADR	Adverse drug reaction
BMGF	Bill & Melinda Gates Foundation
CDD	Community drug distributor
CMS	Central medical stores
CO	Clinical Officer
DHMT	District Health Management Teams
DMO	District Medical Office/Officer
DNTDC	District NTD Coordinator
FLHW	Front-line health worker
HF	Health facility
JSI	John Snow, Inc.
LF	Lymphatic filariasis
LMIS	Logistics Management Information System
M&E	Monitoring & evaluation
MDA	Mass drug administration
MDA1	MDA of ivermectin and albendazole for LF and onchocerciasis in communities
MOH	Ministry of Health
NTD	Neglected Tropical Diseases
NTDD	Neglected Tropical Disease Drugs
NTDP	Neglected Tropical Diseases Program
PMU	Pharmaceutical Management Unit
RMO	Regional Medical Office/Officer
RMS	Regional medical store
RNTDC	Regional Neglected Tropical Disease Coordinator
SAC	School-aged children
SAE	Serious adverse events
SC-NTD	Improved Supply Chains for NTD Drugs Project (BMGF-JSI)
SHT	School health teacher
SOPs	Standard operating procedures
STH	Soil-transmitted helminth
T1	MDAs of praziquantel and albendazole for schistosomiasis and STHs for SAC
T2	MDAs of praziquantel only for schistosomiasis for SAC
USAID	United States Agency for International Development
WHO	World Health Organization

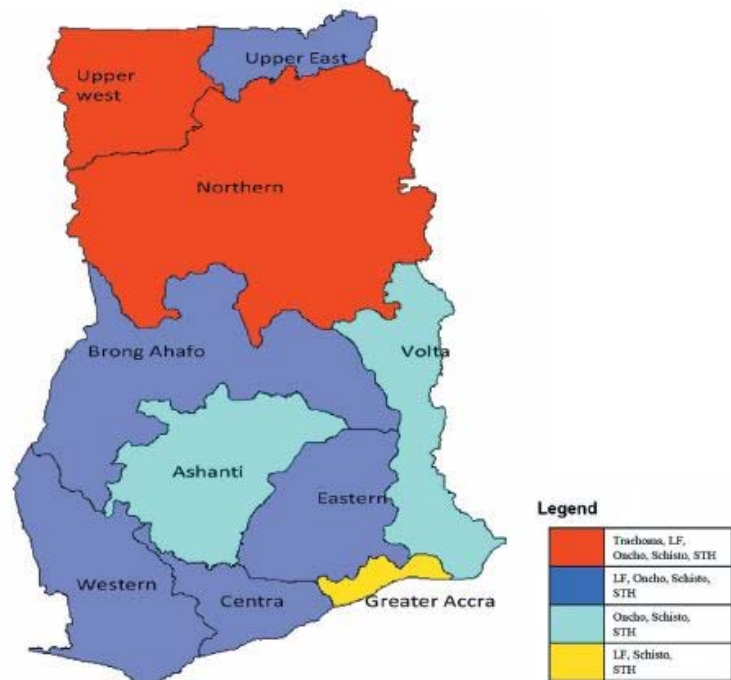
Background and Purpose

The July-August 2014 Ghana NTD drug supply chain assessment is a key component of a year-long initiative, the Improved Supply Chains for NTDs (SC-NTD) Project, funded by the Bill & Melinda Gates Foundation (BMGF) and carried out by John Snow, Inc. (JSI). The purpose of the project is to contribute to strengthening “last mile” supply chains for neglected tropical disease (NTD) drugs. In the context of SC-NTD, “last mile” supply chains include all in-country aspects of NTD drug supply from the moment the goods are delivered to the Ministry of Health (MOH)-designated warehouse to the point of service delivery at mass drug administrations (MDAs). Key objectives include the following:

- Identify strengths and weaknesses in existing “last mile” NTD drug supply chains to develop solutions for improving reliability and efficiency, and
- Ensure that proposed “last mile” solutions are aligned with “first mile” supply chain partners.

Ghana NTDP Background

Control of the five “core” PCT NTDs¹ in Ghana dates back to a vector control program for onchocerciasis that began in 1974. Preventive chemotherapy (PCT) for onchocerciasis began in 1999 with the introduction of ivermectin, and by 2008, all five core NTDs were under the umbrella of the integrated NTD program (NTDP) featuring MDA of PCT drugs. Figure 1 on the right presents the distribution and co-endemicity of the five PCT diseases in Ghana. One or more NTD is found in each of the ten regions of Ghana. *The program treats over 12 million people for onchocerciasis and lymphatic filariasis and over 4 million school-aged children for schistosomiasis (bilharzia) and soil transmitted helminthiasis annually.*² Today NTDP is well established with a strong national management team coordinating efforts to control and eliminate



¹ Onchocerciasis, Lymphatic Filariasis, Trachoma, Schistosomiasis, Soil Transmitted Helminthes

² MOH NTDP Master Plan (2013-2017)

lymphatic filariasis (LF), onchocerciasis, schistosomiasis, soil-transmitted helminths (STHs), and trachoma. Trachoma is only found in a few communities in the Northern Region and the trachoma program will conduct an epidemiological prevalence survey in 2015 as part of the WHO certification process of declaring Ghana free of blinding trachoma.

The USAID-funded END in Africa program led by FHI360 recently noted the following major successes for the Ghana NTDP:

- *The Ghana NTD program has documented the prevalence of all five targeted NTDs and it is delivering mass treatment to all communities where disease was found, nationwide.*
- *Treatment campaigns for trachoma have been so successful that all 29 districts originally targeted have been able to discontinue mass treatment.*
- *Four districts have been able to stop mass treatment for lymphatic filariasis after successfully meeting the criteria to stop treatment.*
- *Since 2009, Ghana has provided approximately 94.5 million NTD treatments to almost 47 million people.*
- *In 2013 alone, approximately 14.7 million NTD treatments were delivered to over 8 million people.*

In summary, after five years of MDA, the Ghana NTDP is poised to achieve its 2020 goals to eliminate LF and trachoma and to control STHs, onchocerciasis, and schistosomiasis.

The Ghana NTDP Master Plan (2013-2017), however, notes weaknesses and threats to success such as:

- *Poor understanding of NTDs by health workers,*
- *Competing health activities and resource constraints,*
- *Lack of donor drugs for some NTDs,*
- *Inadequate transport to carry out MDA activities, and*
- *Demand for incentives by community drug distributors and competing health activities and incentives.*

Methodology

This assessment was conducted over the course of three weeks from July 15 - August 4, 2014 by JSI staff member, Mr. Steven Perry, working with counterparts from the Ghana MOH Neglected Tropical Disease Program (NTDP). In particular, Mr. Samuel Odoom of the NTDP was essential in leading the team on the field component of the assessment which took place in the Northern and Central Regions.

The assessment began with central-level meetings in Accra with Dr. Nana Biritwum, National NTDP Coordinator, and Mr. Odoom to outline the strategies and procedures for the annual MDAs and drug distribution campaigns. This was followed by visits to the Central Medical

Stores (CMS) and NTDP supporting partner (FHI360). The team then departed for the Northern and Central Regions where they met with the NTDP leadership in the regions and with the regional medical stores (RMSs) staff to review storage and transport capacities. The team visited two districts in each region and two sub-districts/health facilities in each district. NTDP coordinators, front-line health workers (FLHWs), and volunteer community drug distributors (CDDs) provided insight into the capacities, procedures, and successes of the campaign drug distribution system.

Selection of regions, districts, and facilities was based on the judgment of the local team regarding how to maximize the explanatory power of the exercise given the limited timeframe of the assessment and the availability of Regional and District NTD Coordinators (DNTDCs) at the time of the assessment.

The team implemented the SC-NTD assessment tool which featured three associated yet distinct versions: the Central Level tool, Intermediate Level tool, and Health Facility Level tool. The tools and methodology included direct observation exercises (i.e. warehouse/storeroom evaluation, stock counts, and vehicle observation) and structured small group in-depth interviews with officers. Sessions with CDDs and school health teachers (SHTs) were unstructured interviews.

The assessment culminated in a presentation of findings on August 4, 2014 at the NTDP national offices, attended by a variety of stakeholders from the NTDP, CMS, and FHI360.

Findings and Recommendations

Storage, transport, and distribution

Findings

The Ghana NTDP is well served by the Ghana CMS capacities and policies. In particular, the program benefits from the CMS waiver on all handling fees for NTD drugs (NTDDs). This compares favorably with Malawi and Tanzania where the NTDP, or the MOH on the program's behalf, are required to pay handling fees of 6% and 17%, respectively, based on the declared value of the products. In Ghana where the value of the 2013 Mectizan donation alone was \$64 million this would result in an unsustainable financial burden on the program and the partners that support it.



The CMS central warehouse is located in Tema, just outside of Accra. It is a comparatively well managed facility with the human resources and physical capacities more than adequate to receive, store, track, and distribute the NTDDs on behalf of the program. While annual shipments of each NTD drug arrive at one time, the total space requirements are manageable and a short-term issue for CMS. On occasion, when the timing has been tight to meet campaign deadlines, the NTDP has supplemented CMS transport with commercial contracted vehicles.

Ghana CMS distributes health commodities from its location in Tema to the RMSs located in the capital cities of the ten regions. From RMS, the drugs and materials are delivered directly to the health facility level for most public health programs. However, the NTDP has elected to utilize the districts as the lead implementing management level for the MDAs and do not take

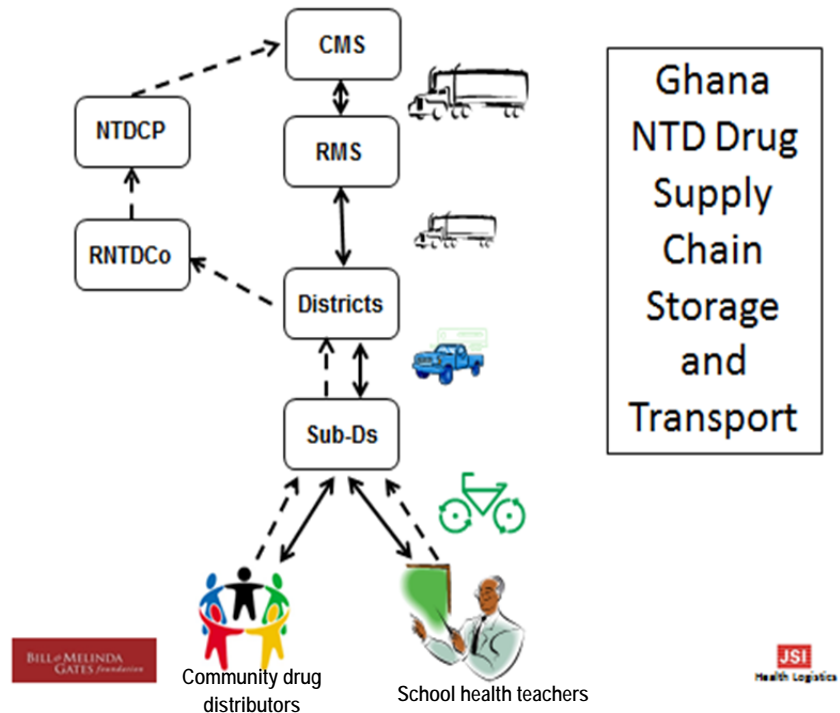
advantage of the RMS distribution to health facilities capacity and schedule.



Despite RMS transport capacities having been recently strengthened with enclosed delivery trucks donated by The Global Fund to Fight AIDS, Tuberculosis and Malaria, districts report that on many occasions they are required to use district vehicles to collect the

NTDDs from RMS facilities in order to meet the campaign start dates. The drugs are received at the district health authority stores and managed by district pharmacists in coordination with DNTDCs. Immediately preceding the campaigns the drugs are distributed to the sub-districts.

The ten regions (RMS) do not always deliver the drugs to the districts. The 170 districts frequently collect the drugs from the RMSs and deliver the drugs to the 1,270 sub-districts. The DNTDCs rely on district vehicles and funds to both collect the drugs from the regions and to distribute them to the sub-districts. The sub-districts are required to distribute the drugs to another 2,000 health facilities



nation-wide.³ The NTDP estimates that these facilities distribute NTDDs to over 21,000 primary schools for the school based (T1) campaigns and to roughly 20,000 volunteer CDDs for the last step of the distribution to the communities where the community-based (MDA1) NTD campaigns are implemented. In addition to the drugs, the districts, sub-districts, and CDDs and SHTs must also collect registers, measuring cups for pediatric syrups, and measuring sticks or tapes.

The primary concerns regarding NTDD storage and distribution capacities are as follows:

- District level resources and commitment for NTDD distribution and collection: The September 2012 MOH Health Commodity Supply Chain Master Plan notes: *“Delivery within the (MOH) public sector supply chain is limited (lower levels generally collect)”*. This requires funding from district transport budgets for both the collection of drugs from the RMSs and the distribution to the districts and then down to the sub-districts. This has been covered to date by district health management teams (DHMTs). What is not covered and not in current policies is the funding to return remaining drugs after the MDAs. Sub-districts and districts are intended to use their own resources to return NTDDs to higher levels.
- Community & facility level reverse logistics: The bulk of NTDDs in balance after campaigns remain at the lowest levels. Current NTDP reverse logistics plans highlight

³ Statistics available from the NTDP Master Plan (2013-2017)

the responsibilities of lower levels to return NTDDs to higher levels until they arrive at the RMSs where they are to be counted into drug management planning. This is problematic for the CDDs and SHTs as well as FLHWs who are under-funded and under-motivated for this task. There is no systemically available compensation for public transport or public sector (fuel) facility transport to return NTDDs remaining after MDA campaigns.

- Orientation of CMS, RMS, and district pharmaceutical management units (PMUs) to the particular requirements of campaign drugs: *“Facilities, programs, the 10 RMSs and CMS all make distribution related decisions, depending on the commodity or programs involved. Coordination of these decisions is minimal.”*⁴ This general statement of coordination and planning is particularly acute for “non-standard” campaign distribution programs. PMUs do not fully plan for, nor are oriented to, the requirements of the campaign distribution needs of the NTDP.
- Staff at lower levels were uncertain of the MOH/NTDP policy regarding “open vials”. This is particularly important for costly NTDDs in bottles of 500 tablets such as ivermectin.
- Lack of standard operating procedures (SOPs) for the management of NTDDs.

Recommendations: Storage, transport, and distribution

1. CDDs and SHTs should be incentivized to return NTDDs remaining after campaigns through a “second tier” stipend paid **after** the submission of records and reports and the return of left over NTDDs within one month of the end of the MDA.
2. SOPs should be developed and encased in short, level-appropriate guidelines for MOH PMUs. The SOPs should include clear and manageable guidelines for the open vial policy.
3. CMS, RMS, and district PMU staff should be oriented through training to the timing, management, and data (LMIS) requirements of the NTDP.
4. DHMTs should be oriented to the collection of drugs remaining in balance at the sub-districts following campaigns and compensated for fuel and per diems.

⁴ The MOH Health Commodity Supply Chain Master Plan (September 2012)

Data recording and reporting

Findings

Management of the NTDDs is driven by LMIS data collected at the SDPs in schools and communities and reported upwards in summary reports. The Ghana NTDP does not operate a separate LMIS for the management of NTDDs. The logistics data (quantities received, used, and in balance) are reported together with the service delivery data such as target populations, treatments provided, coverage, adverse drug reactions, and numbers of people not treated. Additionally, inventory control records (e.g., bin cards) are maintained for NTDDs at the CMS and RMS levels and in some of the districts and sub-district stores.

NTED TROPICAL DISEASES CONTROL PROGRAMME										SUB-DISTRICT				
MDA/ CDTI REPORTING FORMAT										DRUG DISTRIBUTION DATES (PERIOD)				
Treatment by Gender		Total Number treated	Total pop. Coverage	Albendazole			Ivermectin			Adverse Reaction	Non-Eligible			
M	F			Received	Used	Balance	Received	Used	Balance		Pregnant	Mothers breastfeeding children <	Seriously Sick	Under Height
379	356	765	84.4	450	45	15	150	150	0	11	1	0	69	
271	270	541	82.5	560	550	10	100	946	54	0	6	2	150	
267	410	677	69.7	550	544	6	1490	1455	5	0	21	7	466	
60	663	1223	74.3	1200	1215	7	2340	2333	5	0	35	14	759	
4	188	282	77.0	290	288	2	760	753	7	0	4	0	0	

At all levels in the system LMIS data were less likely to be accurately recorded and reported than the service delivery data. Only the data for quantities used are relatively complete and accurate; this is essential for establishing coverage which is the driving metric of NTDPs. Accurate receipts and balances data from lower levels are rarely available at higher levels.

The NTDP has identified reverse logistics as a significant challenge and has mounted initiatives to identify and retrieve “missing” balances at lower levels. Review of summary reports, inventory records, and physical balances during the assessment indicate that a large proportion of the “missing” drugs are simply unreported as being in balance. Even in “high functioning” districts large quantities of drugs were found at the sub-districts, but which were not included in the sub-district reports. In one Central Region district demonstrating 100% timely and complete reporting from all sub-districts following the campaign that ended only four weeks earlier, the under-reporting of balances was still very high (see the table below).

Source of Drug Balance Data	Ivermectin	Albendazole
Sub-district (NTDP) Summary Report	2,837	2,084
Bin Card	14,000	5,800
Physical Balance	21,000	8,200

The DNTDC receiving the sub-district summary report would comprehend that there were relatively small volumes of drugs in balance at the sub-district, where in fact there were over USD \$30,000⁵ worth of donated products to be collected and included in the balance reported from the district. This pattern of under-reporting of balances was found in both the Central and Northern regions. This practice undermines the requirement that unused drugs are returned to the RMSs, included in the national balance when requesting drugs for the next year, and used in the next campaign. Given there are over 1200 reporting sub-districts in Ghana, these under-estimates and subsequent loss of drugs remaining after MDA represents a large risk to the investment made in NTDDs.

There are several causes for the under-reporting of NTDD balances, but the most important is the design of the LMIS component of the Summary Report. The logic of NTDP reporting is that register data is aggregated for each indicator (e.g., treatments provided to women) and the number of treatments provided by the sub-districts is simply the aggregation of all the treatments provided to women recorded in all the registers used in that sub-district. This logic does not work for reporting drug balances. Sub-districts need to add the quantities of drugs remaining in their own store to the balances reported by CDDs in the registers.

Adding a table such as the one below to each sub-district and district Summary Report will help address the problem, but will need to be supported with an enhanced focus on reporting drug balances during the cascade training and supervision. Having an accurate picture at higher levels of where there are significant balances of NTDDs after the end of the MDAs is a prerequisite for managing the balances and reducing wastage.

	Ivermectin	Albendazole
Balance from CDD Registers		
Balance in Sub-district Store		
Total Sub-district balance		

The burden of reporting on under-motivated and lightly trained CDDs and over-worked FLHWs is a leading cause of the general poor quality of the LMIS data. Another key determinant is that the LMIS data do not drive decision making by the NTDP regarding how many drugs to issue to which facility. That decision is based on population data and balance remaining data when available.

⁵ Value based on unit costs provided by the MOH based on 2013 Pro Forma Invoices used in the importation of the drugs.

Additional challenges to accurate recording and reporting of drug supply data are listed below.

- Volunteer motivation and training hampers efforts to improve the LMIS. CDDs reported low motivation and high attrition of volunteers from one year to the next. The under-funded program has had to combine the NTD cascade training with trainings for other programs in order to stretch budgets. This has resulted in more “new” volunteers receiving less training.
- CDDs and SHTs do not summarize the data in their registers following MDA. They submit “raw” registers to the sub-districts requiring the NTD in-charge at the sub-district to go page by page through fifty to sixty registers, tally each column for each page, and aggregate all pages and then all registers to complete the sub-district.
- There are no reference booklets/pamphlets highlighting key messages and SOPs disseminated to the lowest levels.
- There are different reporting formats in use at the same time. The newer registers are designed to improve the capture and reporting of drug supply data, but the continued use of the old registers undermines the program’s ability to improve LMIS data.
- Many of the facilities visited do not maintain inventory control records for the NTDDs that they may consider to be “pass through” products for which they have very limited responsibility.

Recommendations: Data recording and reporting

1. The post-MDA Summary Reports should be modified as proposed above to improve the reporting of drug balances.
2. The Ghana NTDP should consider mHealth reporting (using basic cell phones) of LMIS data, or at least the drug balance data, to ease reporting and improve the use of drug data for purposes such as redistribution during campaigns, return and reuse of drugs remaining after MDA, and for quantifications of requirements at all levels.
3. The key messages regarding recording and reporting LMIS data should be included in level-appropriate SOP “booklets” that should be developed for FLHWs, CDDs, and SHTs and disseminated during the cascade training.
4. The NTDP and partners should identify adequate resources for implementing the full training schedule rather than splitting the time and costs with other programs.

Human capacity development

Findings

The NTDP is managed by a dedicated team with long experience in the management of NTDs and with cross-cutting skills in monitoring & evaluation, planning, budgeting, and program implementation. They are responsible for managing the program budget, coordinating supervision and training, and reporting progress to the MOH.

Overall, the Ghana NTDP team is a comparatively well-resourced national management team in terms of both staffing and physical capacities (office, transport, etc.). Furthermore, they receive strong support from dedicated implementing partners.

The central level is the only level in the NTDP with dedicated staff. Regions, districts and sub-districts all rely on DNTDCs recruited by the program who wear many hats and have many duties unrelated to NTDs. Coordinators report that implementation of the NTDP campaigns and requirements utilizes about twenty to thirty percent of their time each year.

The program is knit together by the annual training program and supervision schedule. Trainings are conducted in a cascading fashion: they begin with national-level leaders training regional staff who in turn train district staff; district staff train sub-district staff; and sub-district staff train CDDs and SHTs. The annual training is two days for regional coordinators, a day for district coordinators, and less for sub-districts and volunteers. In 2014 there were resource constraints that led to “shared” training in which the time and costs were split with the Guinea Worm program. This reduced the amount of time dedicated to NTDs.

The principal challenges in human resources for NTDP supply chain management are as follows:

- The community level campaigns rolling out treatments to over twelve million Ghanaians annually rest on the shoulders of an estimated 20,000 volunteers who receive minimal training, supervision, and monetary support (stipends). NTDCs identified low motivation and high attrition for the CDDs as a risk to the continued success of the program.
- Lack of training materials or reference guidelines for health facility staff, CDDs and SHTs. The PowerPoint presentations used for training regional, district, and sub-district staff are not available for the training of CDDs and SHTs due to lack of computers at the sub-district training sites.
- Training and guideline limitations result in inaccurate quantification at district level and below.

Recommendations: Human capacity development

1. Develop and disseminate clear quantification wall charts for staff at all levels.