DRAFT

Implementation Guidelines for Continuous Distribution in Ghana

National Malaria Control Programme

Ghana Health Service

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Summary of National Strategy

By the end of 2012, Ghana expects to have delivered 11 million LLINs to households through its universal coverage campaign. The campaign began in Northern and parts of Eastern Region in 2010 and has proceeded in 2011 with distributions in Volta, Western, Central Regions, and the remaining districts of the Eastern Region.

To maintain universal coverage after the campaign is completed, Ghana aims to target a variety of population groups with LLINs using a continuous distribution system, integrating LLIN distribution into ANC, EPI, and through schools, with a complementary retail sector active in urban areas, where nets will be available for sale according to free market principles.

Ghana's Continuous Distribution Strategy is to use the following channels to 'push' nets into households periodically throughout the growth of the household from couple to family and beyond.

- ANC (targeting pregnant women at their first ANC visit)
- EPI (targeting 18 month old children receiving their 2nd measles vaccination)
- Child Health Promotion Weeks (targeting children aged 4 years)
- Primary Schools (targeting children in primary 2 and 6)

Complementing these push strategies, additional 'pull' strategies will provide coverage for the remaining households where nets are needed:

- Sales of LLINs to students in secondary schools
- Open retail sales in urban and peri-urban areas
- NGO, CBO and FBO distributions at the community level
- Workplace programs to encourage employer purchase of LLINs for among employees

Using NetCALC to model LLIN coverage (See model output graph below), the following steps would have to be taken in LLIN supply to maintain the target of 90% ownership.

- In 2012 approximately 1.6 million LLINs would be needed for distribution through the ANC and EPI channels.
- In 2013, when Child Health Promotion Week and Primary School distribution channels are added to ANC-EPI, about 3.7 million LLIN will be needed for that year, with net needs increasing with population growth in subsequent years.
- An additional 500,000 nets would need to be sold or distributed each year through retail and other pull channels.

Graph 1: NetCALC model output graph

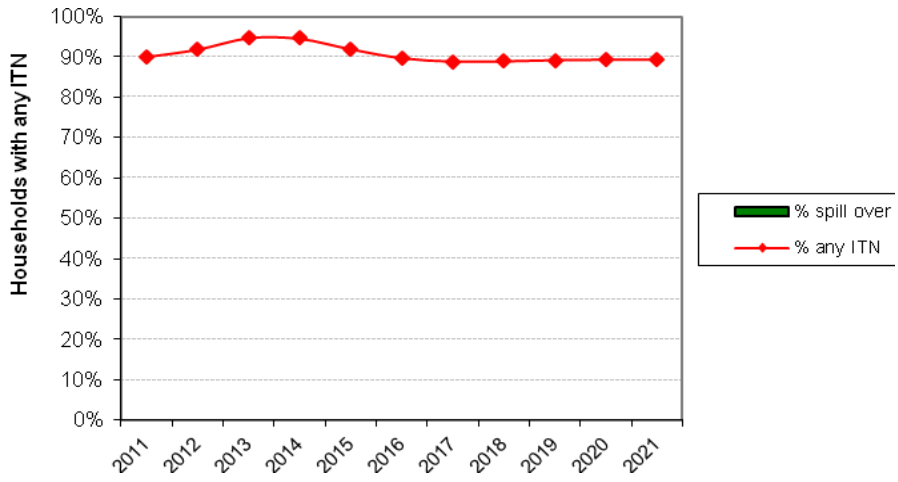


Table 1: NetCALC parameters

Variable	Value
Population 2010	24,223,431
Growth Rate	2.4%
Household size	5.0
Proportion of pop <5 years	15.0%
Proportion of pop <15 years	37.3%
Proportion of pop pregnant	4.0%
Proportion of pop age 4	2.8%
ANC attendance	95.4%
EPI attendance at <1 year	90.2%
ANC/EPI program efficiency	85%
Gross attendance ratio primary school	107.7%
Drop out rate primary school	24%
Gross attendance ratio secondary school	40%
Drop out rate secondary school	5%
Average durability of LLIN	3 years
Start Year ANC-EPI	2012
Start Year CHPW and Schools	2013
Start Year Retail/Pull	2014

Population and Household Structure

According to the 2008 DHS, pregnant women make up 4% of the population, and 15% of the population are children under 5. Primary school children (6-14) make up 16% of the population.

Looking at the broader picture in terms of households, 35% of households in Ghana have an under five. 55% have a current student in primary school. 2.6% of households have a pregnant woman. 59% of households have one or more children <5, a pregnant woman, or a primary school student and would therefore be eligible for nets under the current continuous distribution strategy. **The 41% of households not containing any of these three subgroups represents only 8% of the total population of Ghana.** This is because the mean household size of these households is 1.9. Half of these households are single-person households; one quarter are two-person households, and 13% have three persons. These households are equally divided between urban and rural areas. Of the two-person households, 60% are under 40 years of age, and 40% are couples over 40. Of the one-person households, 68% are single males while 32% are single females, with males and females living roughly equally between rural and urban areas.

The success of the continuous distribution mechanism depends on a well-designed and implemented behaviour change communication strategy. It will also depend on a solid supply chain system supported by accurate data reporting and effective support supervision. Supervision will be integrated into routine support supervision activities and tools. A detailed section on support supervision is included in the guide.

The continuous distribution strategy is led and overseen by the National Malaria Control Programme (NMCP) with support from a number of donors and implementing partners. The NMCP is responsible for coordination, strategic planning, advocacy, procurement and distribution, data collation and sharing, and quality control.

Using these Guidelines

These guidelines are intended to describe in detail the mechanisms for implementation of continuous distribution in Ghana. These standard operation procedures (SOPs) should enable both public and private sector planners, managers and practitioners to understand and implement distribution activities according to policy.

Antenatal clinic (ANC) and Expanded Program for Immunization (EPI)

Overall description of process

At health facility level (public and private), ANC nurses will give a free LLIN to every pregnant woman coming for her first ante-natal care visit. The nurse will mark the date and place of LLIN given in the pregnant woman's ANC booklet and also record information in the health facility ANC register. For each new pregnancy, the pregnant woman will be eligible for a new LLIN.

For EPI, LLIN will be given to each child receiving his or her 18-month measles vaccination (booster) and vitamin A. Receipt of LLINs will be recorded in the Child's health card, and also in the health facility EPI Tally register.

A six-month quantified stock and buffer of LLINs will be available at regional level, from which quarterly district allocations will be transported to each district. Initial quantified allocations will be provided from the district level to all health facilities. Health facilities will subsequently place requisitions for LLIN re-supply every month (based on stocks used) when monthly reports on ANC/ EPI are sent to district level.

Reporting will be done using existing ANC/RCH and EPI forms at all levels from Health Facility to sub-district to district and to region. At regional level the Malaria Focal Person will collate data from RCH and EPI and report to the NMCP at national level, who will in turn share reports with national-level stakeholders.

Roles and Responsibilities for distribution of LLINs

HEALTH FACILITY LEVEL	
Health Worker	• Register pregnant woman on first visit • Properly document LLIN (net) given (register & booklet) • Properly document LLIN given to child at measles immunization • Collate monthly ANC/EPI data and net stock
Health Facility In-Charge	• In charge of net stock and supervises implementation at health facility (HF) • Review ANC/EPI data and net stock and forward to sub-district • Makes monthly requests to district level for

	restocking of nets • Trainer of health workers at district level
SUB-DISTRICT LEVEL	
Sub-district Head	• Review and approve monthly ANC/EPI data and net stock received from all HFs • Endorse monthly HF requests for action by district storekeeper • Supervise and monitor HFs in sub-district
DISTRICT LEVEL	
District Health information Officer/ Disease Control officer	• Receive and review monthly ANC/EPI data and net stock for onward submission to RHIO • Trainer of Health Workers at district level
District Health Promotion Officer	• Responsible for BCC, education, and social mobilization for net use • Support monitoring and supervision of district level Continuous Distribution (CD) activities
District Supply Officer	• In charge of storage and security of stocks at district level • In charge of logistics flow and ensures availability of stocks • Receives and approves sub-district requests for sub-districts/ HF • Prepares quarterly requests for district
District Malaria Focal Person	• Reviews and approves ANC/EPI data from sub-districts • Endorse monthly sub-district requests • Trainer of Health Workers in district • Monitor and supervises activities within district • Coordinates CD activities in district
District Director of Health Services	• Custodian of nets for district

	• In charge of CD activities at district level • Review and approve monthly sub-district ANC/EPI data and net stocks for onward forwarding to Regional level • Review and endorse quarterly requests for nets for district • Trainer for Health Workers at district level
REGIONAL LEVEL	
Regional Health Information Officer	• Receive and review ANC/ EPI data and net data for onward submission to CHIM, NMCP, FHD, EPI at national level • Share data with RCH, EPI/ DCU, Malaria Focal Person at regional level • Member of regional CD steering committee
Regional Information Services Officer	• Coordinate BCC, education and social mobilization activities in region • Member of regional CD steering committee
Regional Supply Officer	• In charge of storage and security of net stocks at regional level • Receive and approve the release of districts quarterly requests • Monitor supply chain and logistics of region • Member of regional CD steering committee
Regional Nutrition Officer	• Coordinate Child Health Promotion Week (CHPW) • Share data on CHPW with RCH, EPI/DCU, Malaria Focal Person • Member of regional CD steering committee
Regional Disease Control Officer	• Receive and review EPI data from districts and forward to national EPI program • Monitor and supervise CD activities in CWCs in

	region • Trainer of Trainers at regional level • Member of regional CD steering committee
Regional Reproductive and Child Health Officer	• Receive and review ANC data from districts and forward to FHD at national level • Monitor and supervise CD activities in ANCs in region • Trainer of Trainers at regional level • Member of regional CD steering committee
Regional Malaria Focal Person	• Review and approve ANC/ EPI data and net stock data from districts • Endorse quarterly district requests • Monitor and supervise CD activities in region • Trainer of Trainers for district level training of HW • Coordinate all CD activities at regional level • Member of regional CD steering committee
Regional Director of Health Services/ Deputy Director of Public Health	• Custodian of nets at regional level • Review and approve monthly district ANC/ EPI data for submission to national level • Review and endorse quarterly district net requests • Head of CD steering committee at regional level
Representative of the Regional Coordinating Council	• Coordinate involvement of MDAs at all levels • Member of regional CD steering committee
NATIONAL	
NMCP	• Coordinate overall CD activities at national level • Advocate for the inclusion of distribution of nets

	in ANC/ EPI program and through schools • Monitor and supervise overall CD implementation nationwide • Review and approve semi-annual distribution of nets to regions
RCHD	• Monitor and supervise CD implementation in ANCs nationwide
EPI	• Monitor and supervise CD implementation in CWCs nationwide
CMS	• Review requests for semi-annual distribution of nets for regions • Ensure supply of semi-annual net stocks to regions
Director General, Ghana Health Service	• Communication of CD strategy of net distribution to all regions • Monitor and supervise health-based net distribution
Minister of Health	• Ensure inclusion of CD strategy in malaria vector control policy • Advocate for the inclusion of nets in the long term into the essential drug/ commodities list for the National Insurance Scheme

Training Plan

The initial rollout of any new policy requires significant training of the individuals who will be implementing activities.

Given Ghana's experience in ANC/ EPI net distribution, the following training plan will be used:

- Training at National level to orient MCH officers on new activities, distribution, and reporting (1 day). This should be combined with the National Continuous Distribution Stakeholders meeting.
- Training at Regional level to orient Regional Director of Health, Deputy Regional Director Health (PH), RCH Coordinator, Regional Disease Control Officer,

Regional Medical Stores Manager and Regional Malaria Focal on their roles and responsibilities, overall distribution logistics, reporting and supervision (1 day). The country will be zoned into two for the regional level training. Personnel from five regions will be pulled together in one location for the training

- Training at Regional level by national level trainers for District Directors, Disease Control Officers, District Malaria focal person, District Public Health nurses, selected health workers and District Store keepers on their roles and responsibilities, overall distribution logistics, reporting and supervision (1 day).
- Training of health facility staff at district level in their roles and responsibilities, overall distribution logistics, reporting and supervision (1 day). This would include ANC/EPI nurses, head of health facility, and person responsible for storage and receipt of LLINs. Training materials should be developed to draw on the content of this guideline document.

ANC Records and Reporting

Health Facility Level

- ANC nurses record the receipt of the LLIN in the pregnant woman's Maternal Health Record Book, recording "Net given/[date]/[location]".
- ANC nurses record the receipt of the LLIN in the Health Facility's ANC register, using the column adjacent to the "ITN" column (which is currently used to record use of LLINs).
- Total LLINs distributed per month is tallied in the NMCP Antenatal/Maternity Month Malaria Data Returns form which are sent to the sub-district, along with stock remaining.
- A requisition is made to the district level monthly for restocking, and is approved by the Health Facility Head, then sent to District level.

Subdistrict Level

- The Subdistrict In-charge compiles the ANC reports from all health facilities and sends to District Director of Health

District Level

- District Health Information Officer keys in ANC data into the DHIMS, and sends the DHIMS file along with hard copies to Regional Health Information Unit. District Director of Health endorses and sends to the Regional Information Unit coordinator.

Regional Level

- The hard copies go to the Unit Heads. The Unit Heads key in data from district level (with subdistrict info).
- The Regional information Unit Coordinator compiles district level data and shares pertinent information with the Unit Heads during the regular monthly data validation meeting.

- Public Health reports are reviewed by the Regional Health Director. RHD endorses and send to national level (Family Health Division, NMCP, EPI). The Regional Health Information Officer sends the DIMS to CHIM.

National Level

- The NMCP LLIN focal point shares the reports with the national level stakeholders.

EPI Records and Reporting

Health Facility Level

- Nurses record the receipt of the LLIN in the child's Road to Health booklet, recording "Net given/[date]/[location]".
- Nurses record the receipt of the LLIN in the Health Facility's EPI Tally Sheet register.
- Total LLINs distributed per month is recorded in the monthly returns which are sent to the sub-district, along with stock remaining.
- A requisition is made each month and is approved by the Health Facility Head.

Subdistrict Level

- The Subdistrict Leader (Head) compiles the EPI reports and sends to District Disease Control Coordinator

District Level

- District Health Information Officer keys in EPI data into the DHIMS, and sends the DHIMS file along with hard copies to Regional Health Information Unit. District Director of Health endorses and sends to the Regional Health Information Officer and Regional Disease Control Officer.

Regional Level

- The Regional Disease Control Officer shares the EPI LLIN reports with the Regional Malaria Focal person. The Regional Director of Health endorses the reports. The Regional Disease Control Officer submits reports to National EPI and to NMCP LLIN Focal Point.

National Level

- The NMCP LLIN focal point compiles and shares the reports with the national level stakeholders.

ANC/EPI Outreach

Outreach activities will target the same groups as ANC/EPI (i.e. first-visit ANC and children needing measles vaccinations), but are done in rural and hard-to-reach areas. LLIN should be carried along as part of regularly scheduled outreach activities, with

quantities based on previous data on number of first-time ANC and measles vaccinations given.

Additional funding should be planned to support outreach activities particularly in the hard-to-reach areas.

Supervision

Support supervision of the ANC and EPI LLIN distribution will be integrated into the already existing GHS integrated support supervision plans.

Child Health Promotion Week

Overall description of process

Child Health Promotion Week (CHPW) is a yearly activity carried out in May, intended to mop-up vaccinations and weighing for children under five. It is organized under the Regional Public Health Division, and specifically coordinated by the Nutrition Officer.

CHPW will target LLIN delivery to children coming to get their 18-month measles vaccination and children between the age of 4 and 5 (between 48 and 59 months). Children must show proof of birthdate in order to receive an LLIN at age 4, either with their Child Health Card or another proof of birthdate, such as a birth certificate.
Data obtained during CHPW is generally added to the monthly report, with a separate form used for the week that tallies all interventions by district. This form should include a space to record ITNs given for both a regular 18-month measles and for children age 4. The Regional Health Information Officer then compiles data sent up from Sub-district and District level, sharing with the Unit Heads in the same reporting lines as for EPI.

Roles and Responsibilities for distribution of LLINs

Please refer to overall roles and responsibilities section.

Training Plan

Training will be integrated into current CHPW training curricula, to reinforce how nets are given to 18 month old measles recipients and to children aged 48-59 months.

School-based distribution

Overall description of process

Primary School Distribution

Nets would be delivered free for school children in the second and last grades of primary (P2 and P6). Distribution at primary level would be done according to class registers and enrolment figures, led by the District Director of Education / District SHEP Coordinator in conjunction with the Head of School and School-based Health Coordinator and the P2 and P6 teachers. Supervision will be done by the Circuit supervisor and District Disease Control Coordinator and Regional and National level supervision teams.

Senior High School Distribution

LLINs will be specified in the prospectus (starting 2012) for all secondary school students for them to purchase at full retail cost. Schools will negotiate directly with private sector distributors on price and type; NMCP will provide a list of approved manufacturers and products in order to guarantee quality.

Roles and Responsibilities for distribution of LLINs

SCHOOL LEVEL	
Headmaster/ Class Teacher/ School SHEP Coordinator	• Distribution of nets to school children with guidelines and how to wash and air it • Education of pupils on malaria transmission and the prevention of malaria • Registration of recipients and collection of other data
CIRCUIT LEVEL	
Circuit Supervisor	• Distribute individual school's allocations to headmasters in circuit • Supervise net distribution to school children • Support the training of headmaster, class teachers and school-based coordinators on malaria transmission and prevention • Review, collate and approve registration data

	for submission to district
DISTRICT LEVEL	
District Storekeeper	• In charge of storage and security of net stocks at district level • Issues stock to circuit supervisors
District Director of Education and District Disease Control Officer	• Receives and review school distribution data • Trainer of Circuit Supervisors at district level • Monitor and supervise distribution in district
District SHEP Coordinator	• Reports to regional level on net stocks received at district level • Receives and review school distribution data and forwards to Regional SHEP Coordinator • Trainer of Circuit Supervisors at district level • Monitor and supervise distribution in district
District Director of Education	• Custodian of nets for district • Endorses net stock received at district level • Reviews and endorse school distribution data before forwarding to Regional SHEP Coordinator • Monitor and supervise distribution in district
REGIONAL LEVEL	
Regional Education Service Supply Officer	• Review reports from districts on net stocks received and forward to Regional SHEP Coordinator
Regional Chairman of Association of Private Schools	• Coordinate and supervise net distribution activities in private schools in region • Member of regional CD steering committee
Regional SHEP Coordinator	• Prepare regional enrolment data and net stocks needed for distribution

	• Review and endorse district allocations received • Monitor and supervise net distribution in region • Trainer of District SHEP Coordinators • Coordinate all school distribution activities at regional level • Review and endorse school distribution data before forwarding to National SHEP Coordinator • Member of regional CD steering committee
Regional Director of Education Service/ Deputy regional Director of Education Service	• Custodian of nets at regional level • Review and approve regional enrolment data and net stocks needed for distribution • Review and endorse district allocations received • Monitor and supervise net distribution in region • Review and endorse school distribution data before forwarding to National level
NATIONAL LEVEL	
National SHEP Coordinator, Basic Education	• Coordinate school net distribution activities at national level • Monitor and supervise school net distribution implementation nationwide • Review and approve school enrollment data for net stocks to be distributed to regions
National SHEP Coordinator, Secondary Education	• Coordinate secondary school level net distribution with NMCP and commercial sector at national level • Coordinate the distribution of nets by commercial partners to secondary schools

	• Educate headmasters, teachers and students on malaria prevention and net use
NMCP	• Facilitate the link between GES, Secondary level institutions and commercial partners • Review and approve school enrollment data for net stocks to be distributed to regions
CMS	• Review requests for distribution of nets to individual districts for school distribution • Ensure supply of net stocks to individual districts
Director General, Ghana Education Service	• Communication of school-based net distribution strategy to all regions • Monitor and supervise school-based net distribution

Training Plan

A Regional Training of Trainers will be conducted by Regional SHEP and the Regional Malaria Focal Person to train the District SHEP and District Disease Control Officers. At District Level, the District SHEP Coordinator and Disease Control Coordinators will train the Circuit Supervisors (CS) and head-teachers in their districts in a 2-3 hour orientation session, covering logistics and record keeping for LLIN distribution, the malaria educational session that the CS will give to each class, and reporting forms.

Records and Reporting

Primary School Level

- Class teacher records the names of the children receiving LLINs in the class reporting form, including the tallies of nets received and nets distributed. The Headmaster and the School SHEP sign off on the form for each class and these two forms are sent with the Circuit Supervisor for compilation at Circuit level.

Circuit Level

- The Circuit Supervisor compiles the class reports and sends to District SHEP, cc'ing District Disease Control Coordinator

District Level

- The District Director compiles the Circuit reports and sends to the Regional Education office, copying the Regional Disease Control Officer, and with the DHMT.

Regional Level

- The Regional Education office compiles the District LLIN reports and shares them with the LLIN subcommittee ().
- The Regional Malaria Focal Person reviews and endorses the reports, and sends to the NMCP LLIN focal point.

National Level

- The NMCP LLIN focal point compiles and shares the regional reports with the national stakeholders.

Supervision

Supervision of the school distributions is carried out by the CS (at each school in their circuit). District Director of Education and District Disease Control Officer will also conduct supervision visits during the distribution period, as will the Regional Director of Education and Regional Malaria Focal Person.

Retail, Subsidized Sales and NGO/CBO/FBO

Overall description of process

Apart from the purchase of full-cost nets for students entering secondary school, LLINs should be available in various areas (particularly urban or higher SES areas) for sale at full price, for those willing to buy them.

A conscious effort to stimulate and encourage individual full or co payment of LLIN should be made to take advantage of the culture of net use that will be achieved through the nationwide mass distribution and ownership of LLIN in 2011 and 2012. Bearing in mind that resources for free distribution of commodities like LLIN face challenges in the following years, the country should begin to introduce its population to contributing something for the LLIN, which may have become an essential household commodity. The private sector partners will play a crucial role in stepping up the availability of LLIN at full-cost or subsidised through the retail chain and other channels.

A number of possibilities exist for involving and promoting the private sector distributors and manufacturers of nets:

- Generic promotion using mass media for retail purchase of nets at full cost
- Subsidy or discount for NGO/CBO/FBO purchases, which could be targeted at populations not reached by the ANC-EPI-CHPW-Schools distributions: hard to reach areas; disadvantaged areas; the elderly; etc, as part of the NGO-CBO-FBO regular activities.
- Subsidy or purchase discount for employers who wish to provide LLINs to their employees and their families (e.g. mining, tourism, agricultural industries and/or cooperatives)

A full assessment of the current market will be useful in determining key areas where support to the private sector can make a significant difference

Records and Reporting

In the past, it has been difficult to capture private sector sales of nets to inform national planning; there is little incentive for distributors and scattered companies and NGOs to report back to NMCP on sales figures. For distributors to feel comfortable sharing such strategic information, confidentiality would have to be guaranteed and figures would need to be aggregated at national level before being shared with other stakeholders. Including questions in surveys about where each net in the household was purchased or received will be important to track how far retail nets are reaching into Ghana over time.

Supply Chain Management

National Level Planning

The planning process at the national level should include cost requirements, estimated quantities of LLIN required annually and a procurement plan. LLIN will be procured for ANC, EPI, Child Health Promotion Week and School based distributions on an annual basis. The procurement plan should reflect the routine nature of ANC and EPI and the annual distribution through CHPW and Schools.

Quantification of LLIN

While NetCALC is excellent for determining how different channels can be combined to reach and maintain universal coverage, it does not provide quite the right figures for procurement planning. The number of nets it provides as output reflect program efficiency (both in reaching the target population and in getting them an LLIN); if Ghana were to use the total number of nets required as stated in NetCALC, it would not be able to improve past the efficiency targets that NetCALC uses as variables. Therefore, quantification for national, regional, district and health facility needs should be based on demographic data, adjusting for current rates of attendance or enrolment at ANC, EPI, CHPW and Primary School, but leaving room for program efficiency to reach 100% rather than limit itself to 75% or 80%.

The numbers in the table below this reflect demographic data, based on national population, ANC & EPI efficiency (using regional data), the total number of 4-year olds (equivalent to 2.8% of the total population), and projected school enrolment in P2 and P6 based on 2010 enrolment data, projecting growth by a factor of 2.4% per year. We have assumed that measles rates for 9 month measles should also apply to the new 18 month measles booster; while uptake of the new vaccine will be slow, we expect that the LLINs will boost uptake over time.

Regions Active	LLIN required	ANC-EPI	CHPW	Schools	Total	LLIN status
Eastern	2012 (May-Dec)	176,649	73,872	136,000	382,149	Nets in country
Nationwide	2013	1,717,763	728,272	1,288,191	3,734,225	
Nationwide	2014	1,758,989	745,750	1,319,107	3,823,847	

Once program implementation starts, continued monitoring of LLIN stock levels at each level will be necessary to determine uptake rates and ensure that a schedule requisition process and buffer stocks prevents stock outs at all levels.

In the first year of implementation, there may be increased demands at the health facility, due to pregnant women and infants ‘catching up’ and receiving their first nets. Therefore, initial quantifications of LLIN have to be reviewed with caution in planning

for subsequent years, as the first year of the program may show higher or lower than average demand. A buffer stock of 3 months supply will be factored into the procurement for the first year and stored at the regional stores. The district will carry at any point in time a buffer stock of 2 months supply. Health facilities will carry a 1 month buffer stock in the first year of implementation and maintain it throughout subsequent annual distribution. The buffer stock is to ensure that any unexpected changes in the consumption pattern should not cause stock outs.

Table 1

Quantification at the Regional level

	pop 2010	proj pop 2012	proj pop 2013	ANC attendance	Measles rates	Expected ANC-EPI nets needed 2012	Expected ANC-EPI nets needed 2013	Expected ANC-EPI nets needed 2014	CHPW 4 year olds 2013	CHPW 4 year olds 2014	P2P6 enrollment 2013	P2P6 enrollment 2014	Total LLIN 2012 (ANC-EPI only)	Total LLIN 2013	Total LLIN 2014
Ashanti	4,725,046	4,954,570	5,073,480	97.3	93.0	334,713	342,747	350,972	142,057	145,467	242,384	248,202	334,713	727,188	744,641
Brong Ahafo	2,282,128	2,392,985	2,450,416	96.4	95.7	163,191	167,107	171,118	68,612	70,258	133,972	137,187	163,191	369,691	378,563
Central	2,107,209	2,209,569	2,262,598	92.4	87.3	140,956	144,339	147,803	63,353	64,873	132,852	136,040	140,956	340,544	348,717
Eastern	2,596,013	2,722,117	2,787,448	96.0	86.8	176,649	180,889	185,230	78,049	79,922	138,746	142,076	176,649	397,683	407,227
Greater Accra	3,909,764	4,099,685	4,198,077	95.7	92.4	273,758	280,329	287,057	117,546	120,367	147,329	150,865	273,758	545,204	558,289
Northern	2,468,557	2,588,470	2,650,593	95.6	80.5	161,819	165,703	169,680	74,217	75,998	133,635	136,842	161,819	373,554	382,520
UE	1,031,478	1,081,583	1,107,541	95.7	96.5	73,797	75,569	77,382	31,011	31,755	67,421	69,039	73,797	174,001	178,177
UW	677,763	710,686	727,742	97.6	96.6	48,995	50,171	51,375	20,377	20,866	44,201	45,261	48,995	114,749	117,503
Volta	2,099,876	2,201,880	2,254,725	91.1	92.0	143,123	146,558	150,076	63,132	64,647	105,725	108,262	143,123	315,415	322,985
Western	2,325,597	2,438,565	2,497,091	95.7	89.7	160,499	164,351	168,295	69,919	71,597	141,926	145,332	160,499	376,196	385,224
National	**24,223,431**	**25,400,108**	**26,009,711**	**95.4**	**90.2**	**1,677,503**	**1,717,763**	**1,758,989**	**728,272**	**745,750**	**1,288,191**	**1,319,107**	**1,677,503**	**3,734,225**	**3,823,847**

Procurement

The time lag between tendering and the actual supply of LLIN can be between 6 months to a year. The routine nature of distribution of LLINs through ANC clinics requires a steady flow of LLINs to the health facility throughout the year. Therefore there should be adequate stocks at the regional level at each point in time to cover at least 6 months of distribution.

Procuring LLINs in bulk has the advantage of reducing the number of times the programme has to go through the tendering process, but it also has its challenges of requiring large storage at the various levels. Agreements should be made with suppliers to supply agreed quantities of LLIN every six months at the national or regional medical stores.

Funding for LLIN currently depends on donor funding cycles. To ensure the routine system doesn't run out of LLINs, funding should be guaranteed 1 year ahead of when it will be required for the procurement process to start. Donors will therefore be required to commit funds for procurement 2 years before the LLINs being procured reaches the health facility for distribution.

LLIN will be procured through a Government or donor-selected procurement agency. LLIN procured will be delivered directly to Regional Medical Stores, with every-6-month-delivery for the ANC-EPI nets. The cost of transportation from the port to the regional stores will be incorporated into the tender.

Products and specifications

All LLINs procured to be used in the country should be in line with the WHO pesticide evaluation scheme recommendations and approved by the MoH through the Food and Drugs Board. The denier, size, material and other specifications recommended by MoH are detailed in the Integrated Malaria Vector Management Policy, Section 2.5.

Characteristics of LLINs relevant to logistics

Characteristics	**Multifilament Polyester LLIN (75 denier)**	**Monofilament Polyethylene LLIN (150 denier or move)**
Weight of LLIN	440g	625g
LLINs per bale	100	50
Weight of bale	42kg	29kg
Capacity of 20 ft container	$33.2m^3$	$33.2m^3$
Bales for 20 ft container (loaded at 90% loading capacity	157 bales	235 bales
Capacity of small truck (7-8	$20m^3$	

tons)		
Bales pers small truck (7-8 tons) (Loaded at 90% loading capacity	95	142
Capacity of flat bed pick up (double cabin)	$1.2m^3$	
Bales per flat-bed pick up	6 bales	9 bales
Practical storage estimates for medium sized warehouse	4 bales/ m^3	6 bales/m^3

Transportation

LLIN transport costs can easily become barrier to the smooth flow of LLIN from the national, regional and district levels to the health facility. Planners must be aware of and closely follow the details involved in calculating distances, truck capacity, fuel needs, as well as allowances for transporters, conveyors, and LLIN handlers. The cost of transportation form the port to the Regional Medical Stores should be factored into the LLIN procurement budget. The average cost to deliver an LLIN from the Central Medical Stores to the Regional Medical Stores is $0.10/LLIN. The average cost to deliver an LLIN from the Regional Medical Stores to the district is $0.05/LLIN.

Health Facilities often, but not always, use their internally generated funds to pay for pick up/transport of drugs from RMS. Though this system may also work for LLIN it is important that the programme decides at the time of planning where the funding for transportation from the Regional Stores or district to the health facility will come from.

Storage

The Central Medical Stores can store up to 50 40-foot containers in their warehouse in Tema. Most Regional Medical Stores can store about 5 40-foot containers at their locations countrywide. Some Regional Medical Stores may however not have adequate storage. The Eastern Regional Medical Stores for example has no storage at all for LLIN, but do have space to store continuous distribution LLIN in leave-behind containers on their compound. Alterations will have to be made to the containers to reduce the direct impact of the sun on the containers generating a lot of heat. LLIN will be transported from the Regional stores to storage at the district for ANC, EPI and CHPW. Health facilities will provide storage for their monthly supply of LLIN. Additional storage needs to be made available for the annual CHPW as the number of LLIN required for the month is nearly five times more than the usual.

We estimate that, on average, each health facility will need between 20 and 55 LLIN per month for ANC and EPI needs, and between 50 and 250 LLIN for CHPW, depending on the size of the health facility and its catchment area.

Storage guidelines

Bales of LLIN can stacked up to 5 metres without damage to the lower levels. However practical stacking height will depend on the type of store. In a large national warehouse ceiling height, facilities for stacking and safety maybe sufficient to allow high stacks. Storage capacity at national, regional and district can be easily verified. The capacity available at the stores should inform the amount of LLIN allocated to the storage at each point in time. An assessment of health facility and CHPS compound storage at the district level will ensure the estimated amount of stocks to be stored fit without disrupting other storage schedules.

Storage conditions

- The stores must be clean and dry
- The storage facility must be secure and have a functioning security system and in small health facilities LLINs are locked and access to the LLINs controlled.
- The storage must be rat-free as rats can cause substantial damage to LLINs in a short time.
- Prolonged storage should be avoided as LLINs are pesticide products and therefore have a limited (though, long) shelf-life
- LLINs can be stored against the wall as long as there are no leaks.

Storage locations

LLIN for ANC, EPI CHPW and school-based distribution will be stored at four different levels in the system. The Central Medical Stores as and when required by the international procurement arrangement, Regional Medical Level, District Health Stores and Health facility stores.

Arrangements for storage will need to take into account the quantities likely to be stored at each level including the buffer stocks.

Accountability and security of LLIN

Pilfering of LLIN

ANC and EPI

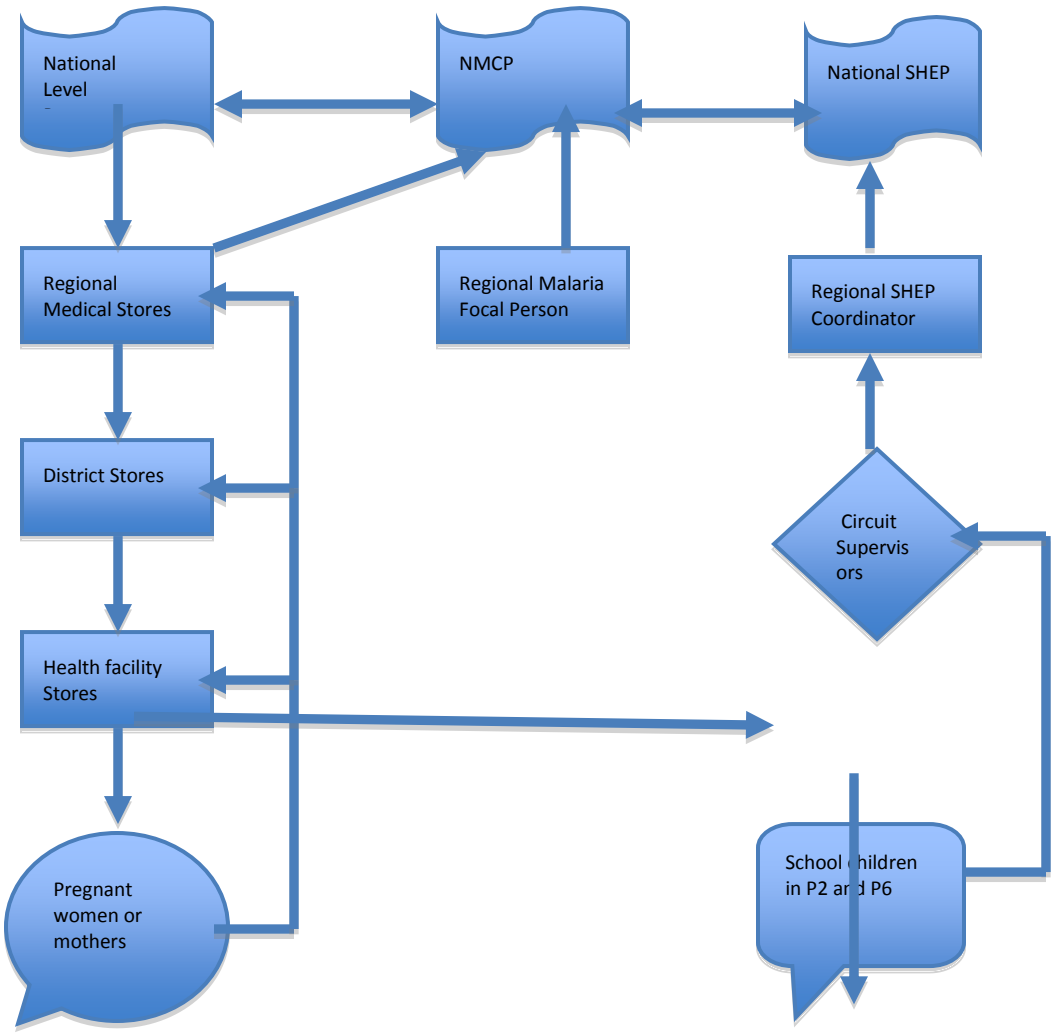
Quantification and procurement

Ghana has almost attained universal attendance of ANC. Therefore the number of expected annual pregnancies will be used to estimate the number of LLIN required for ANC LLIN distribution. The quantification of LLIN for ANC will be determined in collaboration between the national RCH unit and the Malaria programme.

All children reaching 18th months and turn up for the new measles 18-month booster vaccination will receive an LLIN. Measles vaccination at 9 months has in the previous years achieved 90% success rate. Though it is expected that the new measles booster at 18 months may not achieve the same success initially, for purposes of quantification, the same success rate of 90% will be used to estimate LLIN required for EPI annually. The quantification for EPI will be determined through collaboration between the EPI unit and the National Malaria Control Programme.

The procurement contract at the national level will request suppliers to deliver LLIN twice a year to the regional stores for ANC and EPI. An initial buffer stock of 3 months will be incorporated into the first supply of LLIN to the region. LLINs will be stored at Regional Medical Stores. Districts will make requisitions to the Regional Medical Stores every quarter based on the consumption of the district. Health facilities will in turn make requisitions to the district, also based on the health facility consumption.

Diagram 1:
Flow of LLIN distribution and data for reporting and forecasting



Allocation and requisition

The allocation of LLIN for each HF will be based on the past months number of 1st ANC attendees and the number of children coming for measles booster vaccination at 18 months and the number of LLIN given out in that month and the remaining LLIN in storage. A buffer stock of the average month's consumption is always maintained in calculating the need.

Monthly reports on LLIN distributed and stock at hand from the health facility will be sent to the district through the sub-district, as part of regular monthly reporting for ANC and EPI activities. Requisition for LLIN will be made alongside the report. The scheduled monthly requisition and supply of LLIN to the health facility will institutionalise the process and reduce chances of health facilities running out of stocks. The Malaria focal person will review the districts' requests and provide approval for the Regional Medical Stores to supply. Table 2 below demonstrates the process of allocation, consumption and requisition.

Table 2:
Example of Allocation, consumption and requisition

Region	District	Health Sub-District	HF with ANC	Expected Stock at beginning of each month (including 1 month buffer) (B)	Allocation based on previous month's report	1st ANC attendance	Month 1 LLIN given (A)	Stocks of LLIN remaining	Amount requisitioned B-A	Allocation based on previous month's report	1st ANC attendance	Month 2 LLIN given (A)	Stoc of LL rema ng
Eastern	Asuogyaman	Boso-Anum	Boso Health Centre	80	38	42	42	38	42	42	45	45	35

*Average distribution of LLIN through ANC in this HF was determined to be 40 per month

Storage

At the health facility the LLIN will be stored in the facility store and issued to the ANC clinic on ANC days. If it the HF is a small unit, for example a CHPS compound, the LLIN will be stored in a safe place by the ANC nurse and issued out to beneficiaries on ANC clinic day.

Child Health Promotion Week

Quantification and Procurement

LLIN for the CHPW will be procured annually and delivered within the relevant half year based on the pre-arranged bi-annual supply of LLIN to the regional stores. This will follow the same process of transportation and storage as for ANC and EPI at the regional level. As the CHPW takes place in May of every year, LLIN should be procured and received at the regional stores by March of each year to ensure timely delivery to districts and HFs before May.

Allocation and requisition

CHPW targets children under five who visit the health facility for any services they have missed in the past year. The estimated number of 4 year olds should be used to quantify the number of LLINs needed for the campaign. 18-month olds whose birthdays fall near CHPW will be eligible to receive an LLIN as part of the routine EPI LLIN program; children older than 18 months who are receiving their measles booster are not eligible. As the years go by adjustments can be made to include these mop-up booster jabs, but as the booster is very new, the number of children eligible for it is extremely large.

Storage and transportation

The Regional Medical Stores will store the LLIN alongside the LLIN for ANC and EPI. The first quarterly requisition for each district from the regional stores should include the quantities of LLIN required for the CHPW.

The LLIN for CHPW will be transported with LLIN for ANC and EPI in April. Districts should make special arrangement for transportation and storage to cater for the increased number of LLINs for that month (on average, each district will be receiving between 20 and 65 bales for CHPW). HF should also make special arrangements to transport the increased number of LLIN from the district to the HF (between 1 and 3 bales).

School-based distribution

Quantification and procurement

LLIN for the school-based distribution will be procured annually and delivered within the relevant half year based on the pre-arranged bi-annual supply of LLIN to the regional stores. This will follow the same process of transportation and storage as for ANC and EPI at the regional level. As the school-based distribution will take place in May of every year, LLIN should be procured and received at the regional stores by March of each year to ensure timely delivery to districts and HFs before May.

The estimated quantities of LLIN required for school-distribution nationwide should be determined by the Ghana Education Service and provided to the National Malaria Control programme to be included in the national forecast of LLIN required. Estimated quantities should be made available at least two years before the intended year of distribution to enable inclusion in the national procurement of LLIN.

LLIN for the school-based distribution will be procured once a year. The quantity of LLIN required for a region will be based on the schools enrolment history for P2 and P6 over the previous two years. The Regional SHEP Coordinator will validate and collate the estimated number of children in P2 and P6 at the regional level and send it to the national level. School distribution will happen in May so that LLIN can be transported

together with the LLIN for the CHPW. Just as the CHPW LLIN, the LLIN for school-based distribution should reach all regional stores at least two months before the distribution date in May.

Storage and transportation

LLINs procured at the national level will be delivered to the regional stores at least two months before the agreed time of the year for school-based distribution. The LLIN will then be transported to the district store at least two weeks before distribution.

Circuit Supervisors will be trained at district level, and will then collect the allocated LLIN for their circuit and distribute them to the schools under their jurisdiction. On the day of the training of Circuit Supervisors at the district level, Circuit Supervisors will collect LLIN allocated to their circuits from the district health stores. A Circuit Supervisor on the average supervises between 8 -10 schools. The supervisor will be provided T&T of GhC40 to transport the LLIN to the schools on the same day of the training. The LLIN assigned to each school will be given to the head-teacher for safe keeping awaiting distribution to the eligible children. The Circuit Supervisor will visit each of the schools, carry out an orientation for the head-teacher and staff and supervise the distribution to the eligible children in P2 and P6.

Communication and BCC

Communication and BCC are vital elements to any LLIN distribution program. For ANC and EPI we expect that BCC will occur at health facility level (when the LLIN is given, included in health education sessions with waiting mothers), at community level (through community volunteers) and via mass media (radio and television). Key messages will include information on where nets are available and to which target populations, and the promotion of net use. BCC should build on the recent door-to-door distribution campaign to encourage community use of nets, care and repair, and to reinforce intrahousehold allocation of nets to cover sleeping spaces.

During Child Health Promotion Week additional messages about LLIN distribution for measles catch-up and for 4 year olds will be needed.

For Schools, BCC will be part of the training curriculum for the Circuit Supervisors, and a leave-behind job aid (such as a poster or reference document) will be left with the teachers of P2 and P6 classes. The Circuit Supervisor will make a presentation in each class on net use, care and repair, and general malaria information, and teachers will be instructed to follow up on these messages throughout the year. Children are important agents of change within their households, and can serve as advocates for their siblings for net use and other malaria prevention and treatment actions. Communication should

also be made to inform schools of distribution dates so that head teachers can send messages home to parents and/or via the PTA about the upcoming distribution and who is eligible to receive nets.

Waste Management

Please refer to WHO guidelines on disposal of LLINs and bags.

Coordination and Supervision

At Regional level, a regional coordinating committee consisting of the Regional Director, SHEP, RCH, EPI, Malaria, Regional Coordinating Council (political) should be established.. Quarterly meetings should be held to review data and discuss implementation issues.

Supervision is an important element to ensure good implementation and to identify problems and bottlenecks in time to address them. Support supervision will be a part of the integrated support supervision plans and tools. Currently, supervision does not occur regularly, but when national supervision visits are scheduled the regional teams participate in order to supervise their respective programs. Supervision for LLIN distribution will be important especially in the start up phase of the program and should be funded specifically.

A recommended supervision plan will be as follows:

<u>Support supervision from national to level to regions</u>
Every region should be visited by a NMCP staff from the national level at least once every four months). Tasks are:

- To discuss and review progress
- To check accuracy of previous period's data
- To review regional support supervision reports from previous periods and discuss findings, action taken and action needed
- Check supply chain records and stocks to ensure the buffer system is working and being passed on to the district level.

<u>Support supervision from region to district</u>
Every district should be visited by the regional malaria focal person at least once every quarter (three months). Tasks are:

- To check availability and accuracy of supply chain records
- To discuss and review progress, challenges and needs
- To check accuracy of previous period's data
- To review district support supervision reports from previous periods and discuss findings, action taken and action needed

<u>Support Supervisions from district to health facilities</u>
Support supervision from the district or sub-district to the health facility should take place monthly. Tasks are:

- To check availability and accuracy of supply chain documents
- To check availability of stock and adequacy of storage
- To discuss and review progress, challenges and needs
- To discuss experience of ANC clients and LLIN distribution with ANC clients

- Check IEC materials and job aides are being used effectively used
- View ANC consultations and check that:
    - Every woman on first visit is given an LLIN unless known to have received one
    - Data is being recorded correctly
    - Counselling is being done correctly
    - Questions are being answered well
- Noting any staff changes for follow-up with on-the-job training
- Provide orientation to new staff
- Provide guidance to existing staff where activities can be improved

Monitoring Plan

Progress against specific monitoring indicators will be measured in line with the national monitoring and evaluation plan.

Monitoring will be made up of several components:

- Collation of monthly reports going up to national level
- Supervision visit reports
- Quarterly steering committee meetings at regional and national level
- Net Tracking database reports
- Periodic household surveys or other verification of coverage levels

The following indicators will be tracked through the listed data sources

Indicator	Data Source

Scale Up Plan

In order to maximize gains from the universal coverage campaign, while allowing time to complete the remaining region distribution, ANC and EPI distributions should begin as soon as possible following the completion of Hang Up Campaign activities on a region-by-region basis. Eastern Region will serve as a pilot region for the full combination of channels (ANC, EPI, CHPW, Schools and Retail), with a baseline evaluation in early 2012, implementation beginning in Q2 2012, and a follow up evaluation planned for last quarter of 2013 to assess the performance of the overall approach and examine the contributions of each channel to overall coverage. Lessons learned during the pilot implementation will be applied as other regions begin continuous distribution activities.

Budget/Costing

The parameters for costing continuous distribution include procurement, transportation, storage, training, reporting and supervision and monitoring. Estimated costs should be determined at the regional level and then collated into a national budget.

Below is an example of a budget for the region showing the parameters and variables for costing.

Table 4: Example of budget for continuous distribution at the regional level of LLIN

	Quantity	Cost	Total
Procurement of Nets			
ANC	78,397	5	$391,985
EPI	57,415	5	$287,075
CHPW	111,498	5	$557,490
Primary Schools	109,599	5	$547,995
Subtotal	**356,909**		**$1,784,545**
Transport from Central to RMS			CMS to District
ANC and EPI nets	135,812	0.0875	$11,883.55
CHPW	111,498	0.0875	$9,756.08
Primary Schools	109,599	0.0875	$9,589.91
Transport from RMS to District			RMS to District
ANC and EPI nets	135,812	0.0531	7,215
CHPW	111,498	0.0531	5,923
Primary Schools	109,599	0.0531	5,822
offloading/handling	356,909		
Delivery cost from District to Distribution Point			
ANC-EPI	135,812	0.01875	$2,546
CHPW	111,498	0.01875	$2,091
Primary Schools	109,599	0.01875	$2,055
Training			
ANC-EPI TOT			
26 District *2 + regional level participants TNT	83	15.625	$1,297
snacks and lunch	83	6.25	$519

			$1,816
ANC-EPI Nurse Trainings			
# health facilities *2 TNT	1182	9.375	$11,081
snacks and lunch	1182	3.75	$4,433
			$15,514
CHPW Training/Refresher			
26 districts *1 + regional participants	30	15.625	$469
snacks lunch	30	6.25	$188
District CHPW Refresher			
# health facilities *1	300	20	$6,000
snacks and lunch	300	15	$4,500
			$11,156
School Trainings			
Regional SHEP TOT of DSHEPs and District Disease Control Officers	52	15.625	$813
snacks lunch	52	6.25	$325
District Training of Heads of School and Circuit Supervisors			
1841 public and 534 private primary schools and CS	2,549	9.375	$23,897
snack	2,549	3.75	$9,559
total enrollment 2009-2010	408,875		
average per school	160		
			$34,593
Training of CS			
CS TNT	179	9.375	$1,678
snack	179	3.75	$671
Transport costs district-schools	2,192	0.938	$2,055
Transport CS to supervise LLIN distribution	179	11	$2,014
			$7,556
Printing of Forms			
waybills			
school report forms	2375	0.05	$118.75
tally sheets?			
teacher job aids	2375	0.25	$593.75
Subtotal ANC-EPI			$391,985
Subtotal CHPW			$23,003
Subtotal Schools			$17,146
Grand Total			**$432,133**
Average unit cost for delivering net			$1.2

Annex

ANC, EPI, SHEP forms etc.