



NetWorks End of Project Report

2009–2014

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USAID
FROM THE AMERICAN PEOPLE



President's Malaria Initiative

NetWorks

The goal of the NetWorks Project was to build sustainable long-lasting insecticide-treated net (ITN) systems to prevent malaria. Linking six institutions, NetWorks helped bridge key technical areas of advocacy, policy, distribution, monitoring and communications to increase net access and use in malaria-endemic countries. The NetWorks project was made possible with support from the U.S. Agency for International Development and the President's Malaria Initiative from 2009 to 2014. NetWorks was composed of the Johns Hopkins University Center for Communication Programs, Malaria Consortium, Catholic Relief Services, Mennonite Economic Development Associates, Tropical Health LLP, Swiss Tropical and Public Health Institute, consultants from the London School of Hygiene and Tropical Medicine and International Procurement Agency, and a wide range of in-country collaborating partners.

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Acronyms

ACT	artemisinin-based combination therapies
AMP	Alliance for Malaria Prevention
ANC	antenatal care
BCC	behavior change communication
CCPN	Center for Communication Programs Nigeria
CDD	Community-based Drug Distributors (Nigeria)
COMMIT	Communication and Malaria Initiative in Tanzania
CWC	Child Welfare Clinic (Ghana)
EPI	Expanded Programme on Immunization
GES	Ghana Education Service
GHS	Ghana Health Service
Global Fund	The Global Fund to Fight AIDS, Tuberculosis and Malaria
GMP	Global Malaria Programme
IEC	Information, education, and communication
ITN	insecticide-treated net
LGA	Local Government Area (Nigeria)
M&E	monitoring and evaluation
MAPS	Malaria Action Programme for States (Nigeria)
MERG	Monitoring and Evaluation Reference Group
MPAC	Malaria Policy Advisory Committee
NMEP	National Malaria Elimination Program (Nigeria)
NMCP	National Malaria Control Program
pHI	proportionate hole index
PMI	President's Malaria Initiative
PRoMPT	Promoting Malaria Prevention and Treatment (Ghana)
RBM	Roll Back Malaria
SBCC	strategic behavior change communication
SHEP	School Health Education Program (Ghana)
SMEP	State Malaria Elimination Programs (Nigeria)
Swiss TPH	Swiss Tropical and Public Health Institute
TSHIP	Targeted States High Impact Project (Nigeria)
USAID	U.S. Agency for International Development
VCTEG	Vector Control Technical Expert Group (WHO)
VCWG	Vector Control Working Group (RBM)
WHO	World Health Organization

1 Highlights, 2009–2014

NetWorks by the Numbers

1. Implemented field activities in 13 countries
2. Received \$30,142,000 total in funding, 70% of which was field support
3. NetWorks e-coupon pilot in Ghana led to \$8.5 million in scale-up funding from other donors
4. Published 28 papers, 8 of which are “highly accessed”
5. Designed and/or implemented 7 continuous distribution pilots
6. Delivered nearly 11 million long-lasting insecticide-treated nets in five countries
7. Improved ITN quantification for campaign planning, resulting in ITN coverage for 80 million additional people and an estimated 200,000 lives saved since 2010.

2 Impact Highlights

Continuous distribution pilots results

- Developed the concept of continuous distribution and planning tools.
- Planned and implemented continuous distribution through two operations research studies and four pilots in five President’s Malaria Initiative (PMI) countries.
- Boosted insecticide-treated net (ITN) ownership to 76% in school distribution pilot project in Cross River State, Nigeria, compared to 48% in the control area.
- Increased ITN ownership to more than 80% in community distribution pilot project in South Sudan compared to 66% at baseline, and increased intra-household access from 40% to 66%.

Continuous distribution planning

- Introduced 18 of the President’s Malaria Initiative (PMI) focus countries to the continuous distribution approach, using planning workshops and the Excel-based NetCALC modeling tool to develop distribution strategies.
- Of these 18 countries, 8 (Ghana, Liberia, Madagascar, Nigeria, Senegal, Tanzania, Zambia, and Zimbabwe) have completed or developed pilots and have written continuous distribution activities into Global Fund concept notes, malaria operational plans (for fiscal year 2014) or other donor funding plans.

Improved campaign planning

- Changed policy to quantify procurement needs to better account for odd-numbered households, using population divided by 1.8.
- This change in policy contributed to an increase in ITN coverage for 160 million more people.
- Improved campaign implementation by providing specialized technical assistance to specific countries, creating detailed guidance on campaign planning, and determining when to count existing nets against overall procurement needs.

Monitoring and evaluation support

- Published seminal articles recalculating the net use gap, which showed the gap to be very small

- when measured correctly.
- Developed and promoted improved universal coverage indicators for all endemic countries.
- Consolidated, refined, and disseminated standard malaria behavior change communication (BCC) indicators, which BCC planners at NMCPs and PMI implementing agencies now use.

Net durability results

- Established that significant predictors of net condition were primarily household-related; for example: whether people tied up the net during the day and attitudes toward care and repair. Demonstrated that different ecological and cultural zones influenced net longevity, from a 2.7-year median lifespan up to 5.2 years.

3 NetWorks Indicators

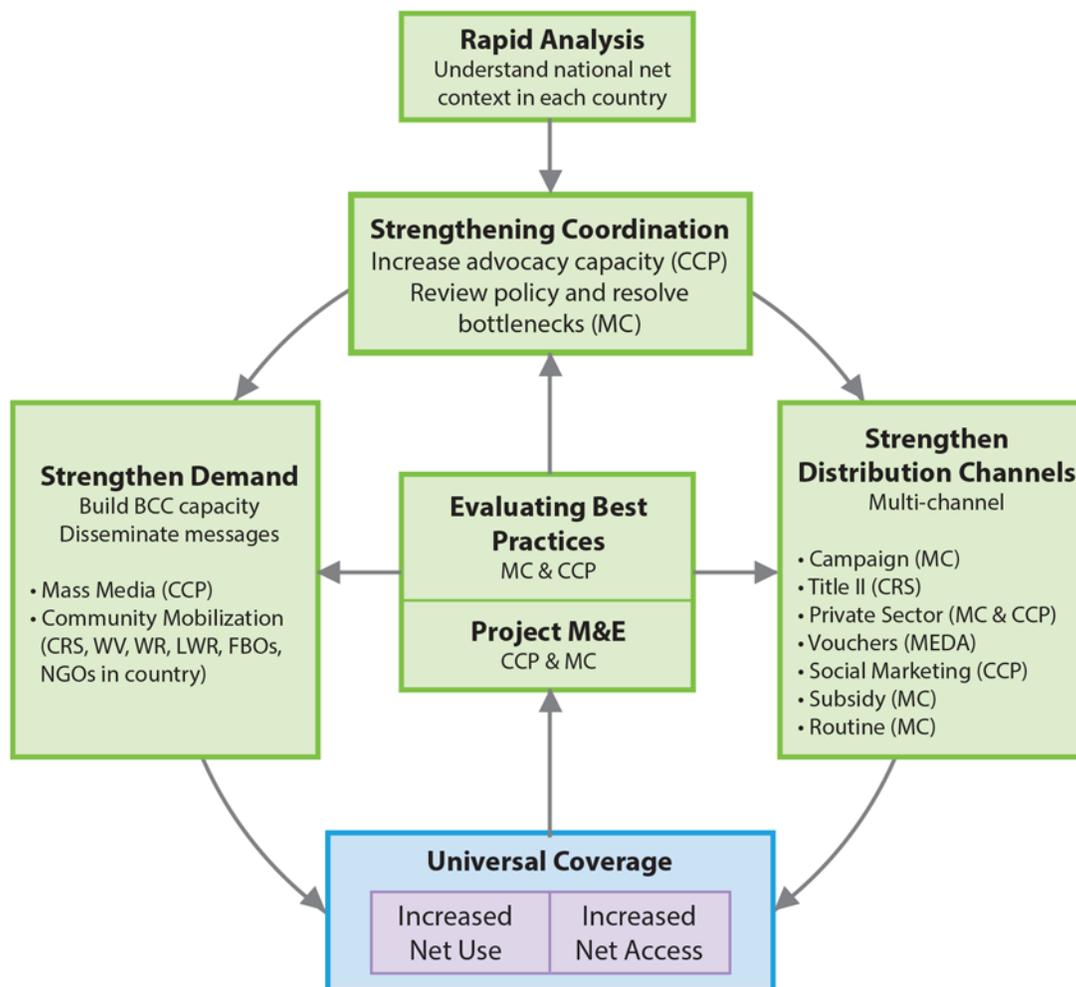
Table 1: NetWorks objectives and intermediate results

Project objective: Increased ownership and use of ITNs		
<p>IR 1 Develop and promote appropriate policies at both the international and national levels to encourage sustained, high levels of ITN and related technologies ownership and use.</p> <ul style="list-style-type: none"> • Developed 10 policy documents to improve ITN distribution • 18 countries adopted policies developed by NetWorks to improve ITN distribution 		
<p>IR 2 Develop, promote and support efficient and effective distribution approaches to ensure sustained high-level coverage of ITNs and related technologies in communities, particularly among the targeted populations.</p> <ul style="list-style-type: none"> • Developed 14 tools to improve planning and implementation of continuous and campaign distribution • 18 countries adopted tools developed by NetWorks to improve campaign and continuous distribution of ITNs 	<p>IR 3 Increase demand for and use of ITNs and related technologies to promote sustainable high levels of ITN ownership and use.</p> <ul style="list-style-type: none"> • 5 countries are using new BCC indicators • 29 countries have updated strategic plans • Trained 186 people in BCC methods across 30 countries • Developed 16 tools for ITN BCC 	<p>IR 4 Design, conduct and analyze strategic operational research to pilot, document and scale up innovative best practices that contribute toward achieving and maintaining high levels of ITN and related technologies ownership and use.</p> <ul style="list-style-type: none"> • Tested 7 research questions • Produced 28 peer reviewed articles disseminating study results
<p>Project management</p> <ul style="list-style-type: none"> • Eleven PMI focus countries provided field support funding through NetWorks, plus two countries receiving malaria funds • 57 technical assistance visits • \$1,843,604.19 total cost share 		

4 Policy Change

Effective policymaking is based on presentation of credible evidence and the perceived value of policy action to decision makers. Working from the Action Cycle (), NetWorks contributed to vital policymaking, which improved ITN policies around net integrity, continuous distribution and elements of campaign planning. The project worked closely with global stakeholders including Roll Back Malaria (RBM), the World Health Organization (WHO) Global Malaria Program, donors and working groups to move findings from research through policy discussions and into appropriate guidance notes for program implementation.

Figure 1: NetWorks Action Cycle



4.1 ITN Integrity

During the course of the project, NetWorks developed and refined the methodology adopted by WHO to measure net integrity by measuring holes in ITNs and relating them to the overall surface area through the proportionate hole index (pHI). WHO incorporated the new methodology into two technical guidance documents: the 2011 WHO Guidance on monitoring the durability of ITNs under operational conditions [1] and a 2014 Vector Control Technical Expert Group (VCTEG) guidance note for estimating the longevity of ITNs in malaria control [2], which further explained how to accurately construct the numerator and denominators for the net survival calculations. The durability of nets is a critical factor in planning for

replacement; nets that last longer may provide cost savings if procurements can be spaced further apart and can provide more substantive protection against malaria for the whole of their useful lifetime. To facilitate other ITN durability studies, NetWorks developed a set of training PowerPoints, job aids and instructions for training survey fieldworkers to count holes in nets. The project also chaired the Vector Control Working Group Durability work stream, facilitating meetings of leading researchers, donors and others to agree on ways to move forward on standardizing durability monitoring. As ITN durability monitoring becomes more common to track investments in nets and inform planning, NetWorks' and PMI's key role in this process is widely recognized.

NetWorks also facilitated a series of meetings between malaria stakeholders and several international textile-testing institutes to begin developing tests of net strength that would correlate better to field conditions than "bursting strength," a method that is used currently. Stakeholders have made significant progress toward establishing testable standards to inform donor procurements.

4.2 Continuous Distribution

Along with net durability, continuous distribution has been the centerpiece of the NetWorks project. The project spearheaded the writing and discussion of a consensus statement in 2011 outlining the rationale for continuous distribution. Under the aegis of the RBM Vector Control Working Group (VCWG) continuous distribution work stream (co-chaired by NetWorks since 2010), the project developed the following planning tools: (1) planning documents to take country program teams step by step through a decision making algorithm to identify potential continuous distribution channels, (2) an Excel-based modeling tool called NetCALC, (3) a research editorial outlining the fragile gains made during the beginning of the universal coverage era [3] and (4) a review of options for implementing distribution via antenatal care (ANC) and Expanded Programme on Immunization (EPI) channels. With these initial tools completed, NetWorks launched a series of country-level workshops to introduce the planning tools and drafted strategies for continuous distribution in 18 PMI focus countries and 3 countries receiving malaria funds (Table 3). Working closely with the continuous distribution work stream and WHO Global Malaria Programme, the project disseminated regular updates on the results of pilot activities and facilitated an expert discussion of continuous distribution in the VCWEG. That discussion resulted in the adoption of continuous distribution technical guidelines by the WHO Malaria Policy Advisory Committee (MPAC) in 2013 [4]. These WHO technical recommendations on continuous distribution legitimize inclusion of continuous distribution activities in national strategies and concept notes for Global Fund support. NetWorks worked closely with the RBM Harmonization Working Group to train consultants to support the inclusion of continuous distribution activities in Global Fund concept notes. Because NetWorks championed this issue from the early stages of initial discussions, consensus-building and evidence collection all the way to its incorporation in WHO policy and Global Fund awards, countries are receiving the critical support they need to ensure continuous access to ITNs at the household level.

NetWorks' support for the RBM VCWG continuous distribution work stream meetings at the annual VCWG meeting and at American Society of Tropical Medicine and Hygiene meetings maintained momentum and brought together program implementers to discuss specific distribution channels, offering cross-fertilization of ideas and improvements for operational issues. The continuous distribution work stream also worked closely with the Malaria in Pregnancy Working Group and the Alliance for Malaria Prevention (AMP) to develop and issue a joint consensus statement on the importance of prioritizing ITNs for ANC/EPI distribution channels during campaigns to ensure continuous coverage of biologically vulnerable populations.

The NetWorks pilot project in Eastern Region of Ghana provided valuable evidence about the feasibility of using mobile phone technology to distribute subsidies to consumers for ITN purchases through commercial-sector retail shops. The potential role of the private sector to support sustainable continuous distribution channels is complex but remains an important issue for exploration and eventual policy action.

4.3 Campaigns

Mass campaigns are still the primary mechanism for ITN distribution worldwide and NetWorks contributions in this area have had a significant impact on policy. The 2010 publication of recommendations for calculating the number of nets to procure to reach universal coverage was groundbreaking [5] and resulted in global policy change from purchasing one net for every two people to one net for every 1.8 people, which allowed for meeting universal coverage needs in households with odd numbers of people. NetWorks shepherded this recommendation through the RBM VCWG and WHO Global Malaria Programme advisory bodies, who then adopted it as a global policy. NetWorks collaborated with the RBM Harmonization Working Group to ensure effective implementation of the policy through Global Fund programs. It is estimated that since the publication and implementation of this procurement practice that began in late 2010, more than 40,000,000 additional ITNs were procured as a direct result, leading to an additional 200,000 lives saved¹. Stakeholders have debated how to account for existing nets when planning mass campaigns and whether to subtract them from procurement estimates or replace them. NetWorks led discussions on how to

Stories from the field: Mass campaigns in Benin, Guinea, Liberia and Burundi

NetWorks provided technical assistance for mass campaigns in Benin, Guinea, Liberia and Burundi in close collaboration with the Alliance for Malaria Prevention, a working group within Roll Back Malaria that focuses on supporting mass ITN campaigns. Each country submitted requests for specific technical assistance needs, most often for general planning and logistics support. In Benin, a Togo-based consultant made four trips in four months in mid-2014, helping the National Malaria Control Program and partners with microplanning, logistics support, overall timing and distribution. Burundi received extensive support over 15 months, in a series of five visits plus distance support, including analysis of rapid assessment data to check on household registration completeness and logistics planning. Liberia received support primarily in logistics planning to ensure that the Global Fund was satisfied with the logistics plan, and communication support to produce radio spots in 17 local languages. The Ebola outbreak delayed planning and resulted in some distance support, but NetWorks facilitated local pretesting of the campaign messages in time for production and dissemination. Guinea received assistance in planning and logistics over 57 days in two visits in mid-2013. Overall, the four countries distributed nearly 22 million ITNs (Table 2).

¹ The Cochrane review of ITNs [6] calculates 5.5 lives are saved per year for every 1000 ITNs being used by children under five. Of the 40,000,000 additional ITNs procured since the end of 2010, we estimate, based on several DHS datasets, that 30% of them were used by children under five. Assuming each net lasts on average 3 years, we divide 40,000,000 by (1000 x 5.5 x 3 x 0.30) and obtain approximately 200,000 lives saved.

account for nets and the consequences of doing so at different population coverage levels. Based on these discussions, NetWorks drafted recommendations, which the Harmonization Working Group used in their Global Fund guidance note in 2011, and published a journal article in 2013 [7]. The article found that setting a threshold of 40% population access (proportion of the population with access to an ITN within their household) was the best balance between the costs of replacing newer nets and the costs of extensive household registration steps to assess and account for existing nets. The findings removed uncertainties about whether to replace existing nets for most countries planning mass campaigns, and established the value-for-money rationale for replacement that major donors required. The practice of not counting existing viable nets during household registration should lead to significant improvements in ITN ownership and intra-household access, because households will be more likely to have sufficient nets for all family members, and result in improved protection from malaria for more people.

NetWorks also supported more long-term thinking about the role of campaigns. Two articles from its partners at Swiss Tropical and Public Health Institute (TPH) used the OpenMalaria transmission modeling platform to model factors that influence the duration of the protective benefits from mass distributions [8;9]. These studies highlighted the importance of taking into account local contextual factors, such as historical intensity of transmission and the availability of case management, when planning integrated vector control measures.

4.4 Stimulating Global Policy Action through the VCWG and VCTEG

During the VCWG continuous distribution work stream meeting in 2013, participants raised the issue of how National Malaria Control Program (NMCP) managers should react to likely shortages of ITNs, given the funding and manufacturing shortfalls expected that year. There was no WHO policy guidance at that time

Stories from the field: Zambia

In Zambia, NetWorks led an extensive assessment of options for continuous distribution to maintain universal coverage in the province of Luapula, which was about to undertake its first mass ITN campaign. Working closely with the National Malaria Control Program and local partners, NetWorks devised a combined school and community strategy, opting for school distribution in the urban districts of the province and relying on community distribution in the more rural districts where school attendance was lower. Zambia will pilot this strategy in 2015. At the same time, NetWorks facilitated a workshop for national behavior change communication (BCC) partners on developing a care and repair BCC intervention, presenting data from the Uganda and Nigeria pilots and formative research from Senegal, Mali, Nigeria and Uganda. NetWorks oriented participants on various aspects of net care and repair and how to apply it to malaria BCC in Zambia.

for such a situation, and no clear epidemiologically-based strategy to try to minimize the negative impact of insufficient nets to reach universal coverage. NetWorks quantified the issue through a paper exploring Global Fund commitments and ITN delivery records [3]. Building on that evidence, NetWorks began investigating the potential ramifications of prioritizing ITN distribution by either target population or geographic criteria (high transmission/low transmission), and focused on developing epidemiologically sound measures to mitigate increased burden resulting from ITN shortages.

Using two different malaria transmission modeling software programs developed by Swiss TPH and the Imperial College London, NetWorks facilitated global-level policy discussions on when and how to prioritize ITNs under conditions of scarcity, using the models to answer key questions based on a set of specific parameters. At a workshop in October 2013 in Basel, Switzerland, three modeling groups (the two above plus the Clinton Health Access Initiative group)

discussed key issues and clarified areas of agreement between the various models. These broad areas of agreement included two main conclusions: (1) continue providing vulnerable populations (pregnant women and infants) with ITNs everywhere; (2) if ITNs are insufficient, begin prioritizing allocation by withholding ITNs from historically lowest transmission areas first, and shift that threshold up the transmission scale until the ITNs available are sufficient to provide universal coverage within the selected areas. An underlying message was for NMCPs and partners to immediately begin resource mobilization to try and fill the gap as quickly as possible to reduce the additional burden of disease to the minimum.

NetWorks shepherded proposed recommendations in the form of a white paper through the VCTEG and the MPAC, the review bodies of the WHO Global Malaria Programme. While the MPAC declined to adopt them, GMP has incorporated the findings into the new Global Technical Strategy.

4.5 Social and Behavior Change Communication for Malaria Control

NetWorks rapidly recognized that social and behavior change communication (SBCC) is under-utilized and under-appreciated in malaria control programs and ignored in policy. The reasons have been largely due to a perceived lack of credible evidence, due in part to a lack of professional standards to ensure quality SBCC programming and reporting of results. NetWorks undertook a series of activities to establish professional standards for reporting results from malaria SBCC activities through a task force on monitoring and evaluation (M&E) of SBCC for malaria, which included key stakeholders such as PMI and key implementing partners. NetWorks also began collecting evidence on the impact of SBCC activities through surveys and analyses of activities in Senegal, Uganda, Zambia and Tanzania. Key outputs with policy implications for continued follow-up include protective behaviors to increase the effective lifespan of ITNs (care and repair behaviors and attitudes) [10;11], an analysis of the impact of SBCC messaging on net use in Zambia [12] and perceptions of the value of net use in the context of reduced malaria burden [13]. These activities resulted in a policy-focused editorial in the *Malaria Journal* [14] urging malaria control programs to recognize the value of effective SBCC.

5 ITN Distribution

NetWorks not only contributed significantly to ITN policy, but also implemented and provided support to ITN distributions in ten countries. The project designed and/or implemented pilot continuous distribution in six countries, delivered nearly seven million nets in Senegal, and provided campaign technical assistance in six PMI focus countries (Table 2). Project staff also assisted with transition planning, mentoring NMCP officers in campaign planning, providing online trainings in continuous distribution planning and NetCALC and facilitating training sessions at AMP mass campaign trainings.

Table 2: ITNs distributed with NetWorks' assistance, 2009–2014

Country	ITNs distributed by NetWorks (mass campaign)	ITNs distributed by NetWorks (continuous distribution)	ITNs distributed by another partner with NetWorks technical assistance	Campaign ITNs with NetWorks funded technical assistance	Total
Senegal	6,874,114	102,869			6,976,983
Ghana		3,894,215			3,894,215
Nigeria		50,138	196,500		246,638
South Sudan		28,696			28,696
Mali				2,599,614	2,599,614
Burundi				5,158,410	5,158,410
Guinea				5,912,222	5,912,222
Benin				6,050,272	6,050,272
Liberia				2,026,069*	2,026,069
Madagascar			43,498		43,498
	6,874,114	4,075,918	239,998	21,746,587	32,936,617
	10,950,032				

* ITNs to be distributed April 2015

5.1 Continuous Distribution

In 18 PMI focus countries and 3 countries receiving malaria funds, NetWorks facilitated workshops to design draft continuous distribution strategies, using NetCALC to model ITN coverage contributed by various channels, including schools, community distribution and sometimes retail or subsidized sales (Table 3). NetCALC was translated into French for use in francophone countries. In Tanzania in 2011, NetWorks contributed to an in-depth month-long assessment of options for maintaining universal coverage [15], and this process was used as a model in other countries for ensuring stakeholder inputs and full assessment of operational issues alongside the modeled coverage provided by NetCALC. Ghana's national assessment followed in late 2011 and pilot activities for continuous distribution in Eastern Region commenced in 2012, combining school and health facility distribution, and later testing an innovative e-coupon program to issue discounted vouchers for ITNs at participating retail points. South Sudan implemented a community-based distribution pilot in Lainya County, and Madagascar piloted a similar community-based distribution pilot in Toamasina II District. Nigeria tested both school (Cross River State) and community (Nasarawa State) channels (Figure 2). All pilots were conducted alongside delivery of nets through ANC/EPI distribution channels to pregnant women and infants. Senegal also began implementation of school, health facility and community distribution in 2013.

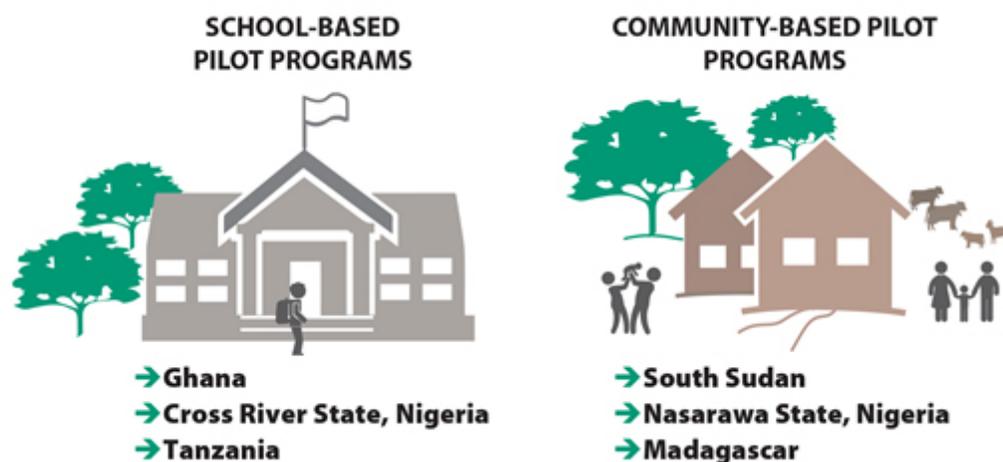
Table 3: Continuous distribution country assessments and outcomes

Country	Date of visit	Type of support	Outcome
Tanzania	Jul 2011	Full assessment (funded by the Swiss Tropical and Public Health Institute, team lead provided by NetWorks). Led to design and inclusion of school distribution in country strategy.	Pilot school net program in three regions in 2013, 2014 and 2015.
South Sudan*	Jun 2011	Assessment in two states. Presentation of tools and possible outcomes to the National Malaria Control Program (NMCP) and its partners. Led to decision to conduct continuous distribution pilot in Equatoria State.	Pilot community distribution in Lainya County.
Ghana	Jun and Nov 2011	Full country assessment. Led to development of strategy and implementation guidelines for continuous distribution. NMCP and partners trained on NetCALC tool.	Pilot school and health facility distribution in 2013 and 2014.
Nigeria	Nov 2011	Introduction of NetCALC and use of tool to convince Integrated Vector Control team about the need to focus on continuous distribution after mass campaigns. Assessment led to design of continuous distribution in Nasarawa and Zamfara States.	Operations research in Nasarawa and Cross River States in 2012, 2013 and 2014.
Uganda	Mar 2012	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.
Liberia	Jul 2012	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.
Senegal	Aug 2012	Full continuous distribution assessment and workshop for malaria stakeholders. Malaria stakeholders developed and validated a continuous distribution strategy.	School, health facility and community-based organization distribution began in 2013.
Benin	Sept 2012	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.
Rwanda	Sept 2012	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.
Kenya	Nov 2012	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.

Country	Date of visit	Type of support	Outcome
Burundi*	Jan and May 2013	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.
Guinea	Jan 2013	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.
Madagascar	Mar 2013	Full continuous distribution assessment and workshop for malaria stakeholders. Malaria stakeholders developed and validated a continuous distribution strategy.	Pilot community distribution in Toamasina II district in 2013–2014.
Mozambique	Apr 2013	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.
Mali	May 2013	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.
Zimbabwe	Sept 2013	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced; implementation guidelines drafted for pilot.
Burkina Faso*	Feb 2014	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.
Cambodia	Mar 2014	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.
Angola	Apr 2014	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced.
Democratic Republic of the Congo	May 2014	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Suggestions proposed for further development of continuous distribution strategy.
Zambia	Jan and Oct 2014	Continuous distribution workshop for NMCP, its partners and donors. Included training in NetCALC.	Draft continuous distribution strategy produced; implementation guidelines drafted for pilot.

* South Sudan, Burundi, and Burkina Faso receive USAID malaria funds.

Figure 2: Locations of school and community pilot continuous distribution programs designed and/or implemented by NetWorks



Data from the pilots showed that both school and community distribution channels can successfully deliver ITNs to maintain universal coverage. Ownership of at least one ITN, population access to ITNs, and the proportion of households with one net for every two people increased in South Sudan, Madagascar and Cross River State in Nigeria. In Ghana and Tanzania, where ITN coverage levels were lower at baseline than anticipated, distributions were able to maintain ownership, access and universal coverage, compared to much more significant losses in the control areas. Beginning continuous distribution activities within 12 months of the previous mass campaign is vital to build upon the existing ITN coverage, versus falling behind on universal coverage due to loss of nets after the campaign. This timing issue, as well as the quality of implementation, were crucial predictors of how well the continuous distribution system performed. Delays in ITN deliveries and confusion about where to implement the strategy contributed to reduced performance in Nasarawa State's community-based distribution pilot.

5.1.1 E-coupons

With funding from USAID's Africa Bureau, NetWorks piloted a subsidized ITN distribution program in Ghana using private sector supply chains in the urban Koforidua

Stories from the field: Mali

Mali's universal coverage distribution plan was a rolling campaign, interrupted by the 2012 coup and its aftermath. In 2011 a process evaluation conducted for the Sikasso Region revealed significant planning strengths in ITN transportation, but some weaknesses in the quality of training, planning for volunteers and time needed to complete registration and distribution, and an ITN shortage in some areas. By the 2013 Kayes campaign, many of these issues had been resolved, while other new challenges cropped up. Just prior to the coup events of 2012, NetWorks completed fieldwork for the Mali Culture of Net Use study [14]. These findings informed the updating of the national malaria communication strategy in 2014, co-funded with the USAID – funded Health Communication Capacity Collaborative (HC3) project, and allowed Mali to move its malaria messaging forward to match its national strategic plan.

area of Eastern Region in 2013–2014. A local ITN distributor procured nets and made them available at participating retail shops and outlets within the town and at two participating agricultural plantations. Target groups received subsidies via mobile phone codes, with values ranging from 7.00 GHC and up (\$3.00 at the time of the pilot). Target groups included pregnant women at private health clinics (50% subsidy), school children in selected urban schools (full subsidy), employees at the plantations (full subsidy) and the general population (50% subsidy). NetWorks conducted a process evaluation several months into the pilot implementation period to identify strengths and challenges of the program. The evaluation found that the e-coupons issued through promotional, untargeted activities to the general population had very low redemption rates. In addition, cellphone network ‘downtimes’ delayed or impeded issuing and redemption of the e-coupons at several points. However, the strategy provides an efficient method of administering subsidies to specific populations at flexible levels, allows management of logistics through the private sector instead of the public sector, and allows tracking of net consumption in real time. Real-time tracking of progress by geographic area and target populations enables an improved response time to solve programmatic challenges based on real-time data analyses.

5.1.2 Case Studies of Continuous Distribution

NetWorks developed a series of 12 *Lessons in Brief* case studies on continuous distribution in seven countries, which provide lessons learned about particular operational aspects of health facility, school and community distribution. Disseminated through the VCWG and RBM groups and available in English and in French, these case studies showcase the successes and challenges of implementing continuous distribution in a variety of settings.

5.1.3 Capacity Strengthening

NetWorks supported Senegal NMCP during its transition to assume the primary responsibilities of the implementation and evaluation of ITN continuous distribution operations. This support included advising NMCP on staffing plans, orienting the staff, passing along implementation guidelines for mass campaign and continuous distribution, training on supervision and reporting tools, and realigning the tested communication materials to future phases of the mass campaigns and the selected continuous distribution channels. Finally, NetWorks bridged the gap of coordination between the many partners including national and local government, local leaders, imams (Islamic leaders), schools, medical professionals, community volunteers and Peace Corps volunteers. In Ghana, NetWorks implemented continuous distribution activities in close collaboration with NMCP and prepared detailed standard operating procedures ready to use when new partners or NMCP take on distribution activities.

5.2 Campaigns

Working under the AMP technical assistance model, NetWorks provided technical assistance for mass campaign planning in Benin, Liberia, Burundi and Guinea to match providers of technical, logistics and M&E/communication technical assistance with countries. In Mali, NetWorks conducted two process

evaluations following different stages of the country's universal coverage campaign. It identified strengths and weak points and improved planning materials, training manuals and microplanning tools for greater successes in subsequent rounds. Overall, through its technical assistance to mass campaigns, NetWorks facilitated the distribution of nearly 22 million ITNs.

In Senegal, NetWorks innovated a weekly email update for the rolling universal coverage campaign to keep local and national stakeholders informed on progress, barriers and challenges. NetWorks refined Senegal's strategy of assessing the number of uncovered sleeping spaces by employing campaign focal points and local accountants to manage funds and activities—a model that NMCP adopted when it transitioned to direct-government funding and began continuous distribution activities. In Senegal, NetWorks distributed nearly 7 million ITNs in partnership with NMCP.

In 2012 NetWorks facilitated the production of the second edition of the [Alliance for Malaria Prevention Toolkit](#), which is now available in English and French. NetWorks supported the production of the updated toolkit with co-funding from the International Federation of the Red Cross and Red Crescent Societies. The second edition greatly expanded the available sample tools, and focused on universal coverage strategies rather than on under-five campaigns and integration with vaccination programs. In all, the project printed and disseminated 1,250 copies to NMCPs across sub-Saharan Africa, and to PMI resident advisors. Nearly all mass ITN campaigns have used the toolkit since 2012.

Online training modules in using NetCALC reached 125 people who downloaded the tool and explored the training course between May 2012 and December 2014 (Table 4). While only 10 people completed the entire training, NetWorks staff built capacity in using NetCALC directly with one-on-one mentoring in 18 countries and provided distance support to national and district staff in creating models for NetCALC following the continuous distribution workshops. This approach is more targeted to those most likely to benefit from knowing how to use NetCALC, while the

Stories from the field: Mekong Region

NetWorks led three research activities in the Mekong Region after conducting a vector control assessment of malaria prevention activities, including ITNs and alternative personal protection options in three countries: Thailand (border areas), Cambodia and Myanmar. One of the major information gaps identified during this assessment was the lack of evidence and understanding of consumer preferences for malaria prevention tools in Myanmar. A qualitative assessment found that migrant workers, farm workers and forest-goers were considered most vulnerable, but as foreigners, most of them were not eligible for the local ITN distributions. Migrants and forest-goers again preferred single-size nets, whereas community members preferred family-size nets. Smoke and repellents or coils were often used when nets were not practical. Communication messages seldom reached the migrants and forest-goers and the study recommended further outreach to these marginal populations.

The second study examined malaria care-seeking and personal protection behaviors among the at-risk mobile and migrant populations in Pathoumphone and Taoy Districts of Champasak and Saravan Provinces, in the Forest Triangle area between Laos, Viet Nam and Cambodia. Community members primarily used ITNs or untreated nets (if they did not have enough ITNs), while forest-goers used hammock nets, ITNs, repellents/lotions, and coils and long sleeves for protection. Community members preferred larger nets than migrants and forest-goers. There was a lack of language-appropriate BCC materials for the migrants in particular, and the report recommended additional workplace programs to reach marginalized employees. NetWorks produced a draft BCC strategy based on the study findings.

online training was less targeted, and used more as a reference tool. During the 2010 AMP BCC and M&E trainings, NetWorks staff facilitated francophone and anglophone sessions on BCC for mass campaigns, monitoring and evaluating mass campaigns, and overall campaign planning.

6 Behavior Change Communication

The behavioral aspects of net use and net longevity cannot be understated. The impact of ITNs on malaria morbidity and mortality relies on correct and consistent use of nets at high rates, above 80%, in order to achieve community protection. The net use gap—defined as the difference between household ownership of at least one net and use of nets the previous night—was perceived to be a failure of BCC. However, this gap ignores the fact that many households may have one net, but not enough for all their family members.

Stories from the field: Nigeria

NetWorks supported ITN distribution, planning and research activities in Nigeria. A three-year, three-state ITN durability study revealed that nets last for very different median lifespans depending on the ecological zone and cultural aspects. Two continuous distribution pilot projects demonstrated that community and school distribution were viable options for maintaining universal coverage, as long as distribution began on time and was well-implemented. In Zamfara, NetWorks supported the State Malaria Elimination Programmes (SMEP) and the Malaria Action Program for States (MAPS) in the design of a community-based ITN distribution approach. Due to community members' low access to health facilities, community-based ITN distribution relied on safe storage sites such as mosques, households of village heads and households of opinion leaders. Community volunteers assessed household ITN needs and community opinion leaders then validated and met them where necessary.

NetWorks conducted a comprehensive assessment of the ITN commercial market in Sokoto State, in partnership with USAID's Targeted States High Impact Project (TSHIP), Sokoto SMEP and other implementing partners. The assessment informed the development of a final continuous distribution strategy for sustaining ITN coverage in Sokoto State to all stakeholders in the state.

NetWorks looked instead at the gap between use of nets the previous night and the proportion of the population that had access to a net within their household – in essence, the use of available nets. Among the 41 Demographic and Health Surveys and Malaria Indicator Surveys data sets analyzed, the project found that, in fact, the use of available nets was above 80% on average, which improved over time and as intra-household access to ITNs improved [16]. This innovative work was a paradigm shift within ITN monitoring and evaluation that is still being felt as countries transition to work with the new universal coverage indicators. Although there are still gaps in household access to ITN, the new indicators now allow program planners to pinpoint the behavioral gap itself, which is in most cases much smaller than previously thought.

6.1 ITN Integrity

NetWorks piloted a net care and repair BCC intervention in Nasarawa State, Nigeria, and in western Uganda, as part of operations research into net longevity. The primary research questions were: can a BCC intervention influence household behaviors and attitudes around net care and repair, and if so, does changing these behaviors and attitudes have any impact on net longevity within the household, as measured by pHI? NetWorks used formative research to establish existing net care and repair beliefs and practices, and to identify the key target audiences, messages and small actions to focus on during the intervention [11;17]. In Uganda and Nigeria, the primary source of messaging was through local radio, along

with health workers, community activities and even school-led repair groups (in Uganda). Song contests about care and repair energized communities, and winning songs received free broadcast time on the local stations. Results from this work are reported in section 7.1.1.

6.2 Capacity Building in Behavior Change Communication

NetWorks focused on building capacity in the monitoring and evaluation of ITN BCC activities. Initially, NetWorks leadership on the AMP BCC working group built capacity through in-person meetings at the annual AMP Partners Meeting, and via conference calls and in-person meetings with members of the group in Washington, D.C. The project developed a package of training tools and resources, including an online training module in five parts: the application of behavioral theory to ITN BCC, the importance of formative research, effective pretesting, how to monitor ITN BCC programs and options for evaluating impact of ITN BCC activities (Table 4). In collaboration with the USAID-funded Health Communication and Capacity Collaborative (HC3) Project, the online training was translated into French. More than 200 participants explored the training courses, with completion rates ranging from 14%-44% for each of the five modules (Table 4, below). Alongside this course, the project produced four key documents: a written [guide to developing an M&E plan](#) for ITN BCC, an [“Indicator Reference Guide for Malaria BCC”](#), a [reporting guide](#) for malaria BCC programs to improve the quality and details of published articles that evaluate BCC, and a draft research agenda for malaria BCC. Working with PMI, M&E experts and other implementing partners, NetWorks led the development and dissemination of these documents under the auspices of the RBM BCC M&E Task Force, which in 2014 was subsumed by the newly reformed [Communication Community of Practice of RBM](#).

Table 4: Enrollment and completion of NetWorks' online training offerings, as of December 31 2014

Online trainings	Launch date	Enrolled	Completed	Completion rate
Monitoring and evaluation for malaria strategic behavior change communication	July 7, 2014			
Module 1: Theory		235	34	14%
Module 2: Formative research		67	26	39%
Module 3: Pretesting		45	20	44%
Module 4: Monitoring		42	16	38%
Module 5: Evaluation		42	17	40%
NetCALC	May 11, 2012	125	12*	10%

* NetCALC training was targeted specifically to NMCP ITN Officers and those responsible for ITN distribution at implementing partner agencies, in addition to serving as reference material for PMI Resident Advisors and headquarters staff. Course completion required completing two modules of 1.5 hours total and a quiz, which may have deterred some trainees from finishing. Registering for online course was, for several months, also the only way to access NetCALC for downloading, which likely exacerbated the low course completion rate.

To showcase innovations in ITN BCC messaging, NetWorks produced a series of [four case studies](#). These short reports described evidence-based BCC campaigns ranging from Ghana’s Aha Ye De campaign, which used humor and research to identify key pressure points for net use despite hot weather, to the global United Against Malaria campaign, which relied on the influence of world-renowned soccer stars to catalyze net use and mobilize communities for malaria control.

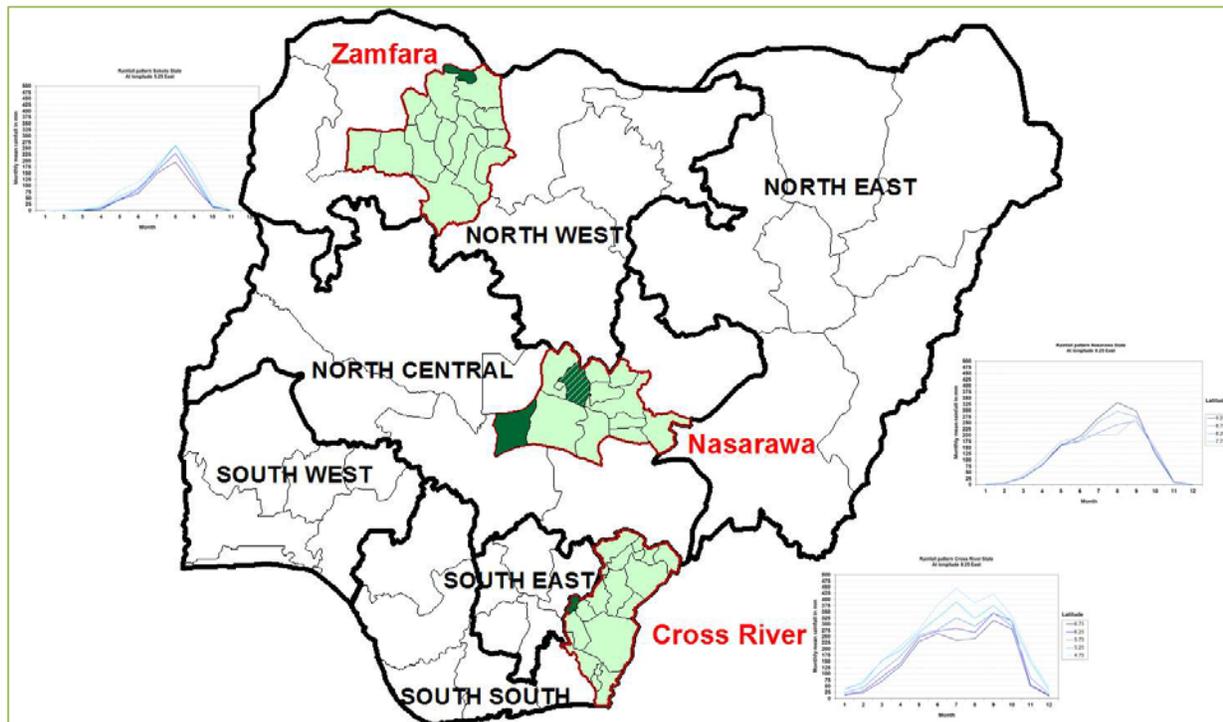
7 Monitoring and Evaluation

During its five-year lifespan, NetWorks produced 28 peer-reviewed articles, 5 operational research studies, 26 separate research studies, and a wealth of ensuing data to inform evidence-based ITN programming. M&E activities took place in 15 countries, ranging from qualitative studies of the culture of net use, to a stepped-wedge-design pilot to test the effectiveness of school-based distribution.

7.1 Operational Research

7.1.1 ITN Durability, Care and Repair

Figure 3: Study sites for Nigeria ITN durability study in three eco-geographical zones.



The results from the care and repair and durability studies showed that the main determinants of net condition differed between three eco-geographical zones in Nigeria [18] and Uganda [Helinski, in review]. In Nigeria, NetWorks selected three sites based on differing rainfall and behavioral patterns and because all sites had distributed 100 denier polyester nets through mass campaigns around the same time, at the end of 2010 (Figure 3). The project conducted three cross-sectional household surveys to measure ITN attrition, the pHI of the remaining campaign nets and median survival. ITN attrition (the number of ITNs discarded or too torn) was similar in the North and the South sites, but was much higher in the Central site. Likewise, the percentage of nets in serviceable condition (pHI <642) was just under 90% after 3.3 years in the North and the South sites, but only 53% in the Central site. Calculating median ITN survival found that nets in the North and the South sites lasted 4 to 5 years on average, compared to 3 years in the Central site. Increasing numbers of children under age five in the household was associated with increased net damage. This was particularly true in the Central site, although children were not associated with damaged nets in the North, possibly due to stricter social customs. Other key determinants included whether the net was observed tied up during the day (associated with improved condition); whether the sleeping space was made from rough materials such as mats, rough frames or on the ground; and the presence of rodents. Nets found not

hanging or stored loose on the ground were much more prone to rodent damage, which was much more common in the Central site. Overall, tears and rips were the most commonly reported types of holes, arising from general wear and tear from handling the net.

Results from the care and repair studies in Nigeria showed a clear association between exposure to the BCC campaign activities and improved attitude scores toward care and repair, and in turn, positive attitude scores were the strongest predictors of net condition at endline [19]. Multivariate regression modeling further reinforced the link between attitudes and net condition, controlling for other key factors including whether the net was tied up, presence of children under five, bed type, etc. Results from Uganda were similar, although the nets were only 18 months old at endline, compared to 3.3 years in Nigeria, and many of the associations between presence of children and net condition, for example, were not present, indicating they may need additional time to be detected.

Care and repair, or just care?

In Uganda and Nigeria, people repaired nets only when they considered them to be in poor condition, indicating that repairs are often late and insufficient to restore them to serviceable condition. However, a close look at the data indicates that in Nigeria, people needed to have a very positive attitude score before they would consider repairing the net. This suggests that repairing nets is a more difficult behavior to change than preventive net care, but that BCC messages can still influence changes in repair behaviors.

The concept of “net care” encompasses many different types of behaviors, from washing to drying to handling to tying up and on through repair. Repair-specific attitudes were a key component of the attitude scores measured during the study. Therefore, the data demonstrates that positive repair *attitudes* contribute to serviceable condition, even if late or insufficient repair *behavior* does not.

7.1.2 Testing Hang-Up Visits

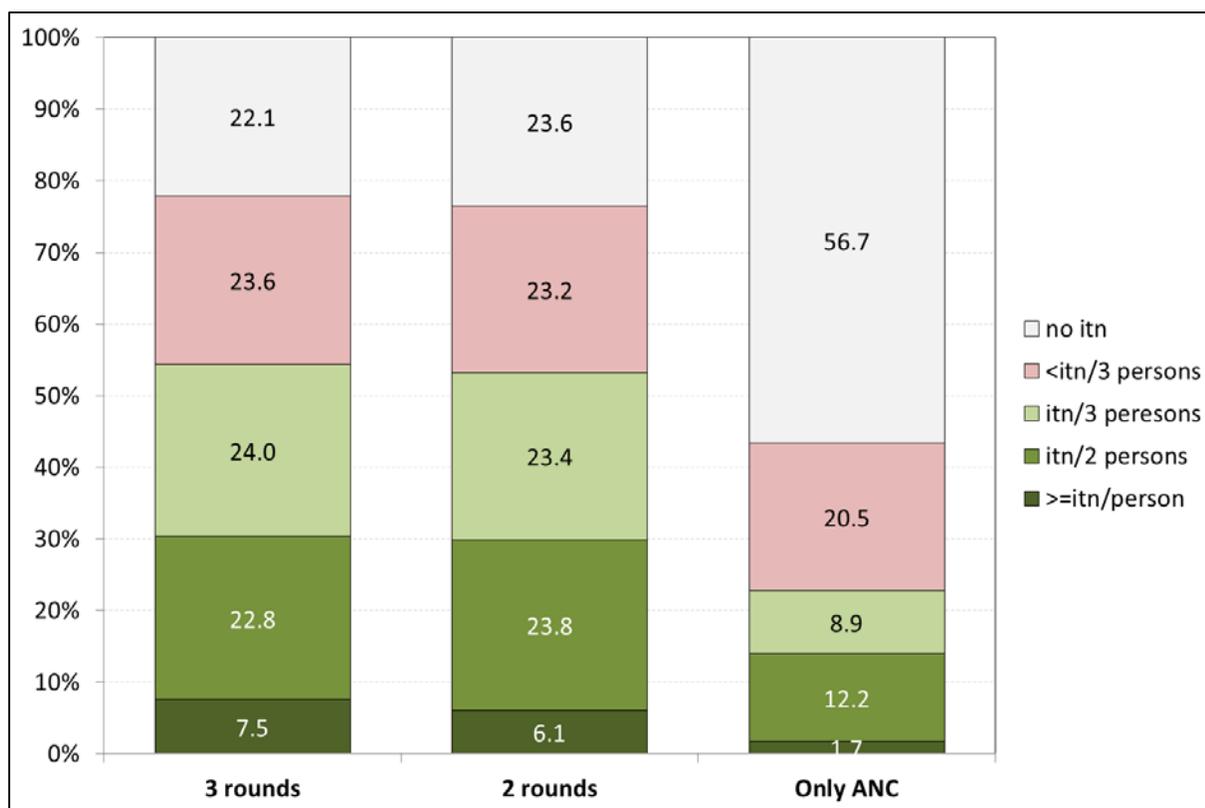
In addition to operational research on net care and repair, NetWorks conducted a cluster-randomized trial of door-to-door hang-up visits in Uganda to assess their impact on improved net use. Designed in collaboration with PMI and AMP, the trial compared three arms—one control arm, an arm receiving one door-to-door visit to hang up nets and deliver BCC messages, and an arm receiving two door-to-door visits to hang up nets and deliver BCC messages. The findings showed that net use increased to a similar degree across all three arms over the course of the study period (8 months), and that there was no effect of the hang-up visits on net use. Indeed, reports from the village health teams showed that the majority of nets were already hung when teams arrived, and even those households that reported difficulty in hanging their nets still managed to get them up [20]. These findings informed PMI policy to not fund door-to-door hang-up visits in areas where net use was already reasonably robust or where previous mass campaigns had taken place.

7.1.3 Continuous Distribution Operational Research

NetWorks conducted two operational research studies to test continuous distribution systems in Nigeria, piloting a school distribution in Cross River State and a community-based distribution in Nasarawa State. For the Cross River pilot, a stepped-wedge design was used, in which activities began shortly after the state’s mass campaign with a baseline survey showing ITN ownership to be 50% in all three study sites, and population access to be around 35%. Collaborating closely with the Cross River State Malaria Control Program, NetWorks conducted two rounds of school distribution in the first arm and three rounds in the

second arm. The first school distributions began about 14 months after the mass campaign, and ANC/EPI distribution was ongoing. Results showed that in the intervention arms, household ownership of any ITN was 77%, compared to 43% in the control arm, and that population access had increased to 54%, compared to a decline to 26% in the control arm. In addition to increasing overall ITN coverage, the school pilot found that the proportion of households that were oversupplied with nets did not significantly increase, but that proportions of households with almost enough (one ITN for three people) or enough (one ITN for two people) nets made gains, compared to the control group, which had a much larger proportion of households with no ITNs or not enough ITNs (less than one ITN for three people) (Figure 4). This demonstrates the channel’s ability to fill gaps in households without oversupplying.

Figure 4: ITN supply for intervention and control households in Cross River State’s school distribution pilot, Nigeria



In the Nasarawa community distribution pilot, delays and stockouts contributed to reduced effectiveness. Implementation of the community-distribution program by the MAPS project did not occur as designed by NetWorks in many of the local government areas, or shifted to new local government areas. Only 32% of households recalled hearing about the community-distribution program, and even among households who benefited from the program, only 64% recalled hearing about it. At baseline, 11 months after the previous mass distribution, ITN ownership was 63% and population access was 42%. At endline, for households that had heard about the program, ownership and access were 55% and 34%, respectively, compared to 28% and 16% in households that had not heard about the program. However, similar to Cross River, households that benefited from the program were able to fill gaps within their households, moving closer to or reaching the target of having one net for every two people. Being informed about the program was a critical first step, and the quality of implementation of continuous distribution channels like this cannot be overstated.

7.2 Monitoring and Evaluation

Apart from the five operational research studies, NetWorks conducted programmatic and other research, fielding ten quantitative and qualitative studies in seven countries described below, along with secondary analyses of existing data.

7.2.1 Continuous Distribution

NetWorks conducted evaluations of programmatic pilots of continuous distribution in Ghana's Eastern Region and Madagascar's Toamasina II District. Both evaluations employed a retrospective calculation of what coverage would have been without the continuous distribution activities by subtracting continuous distribution nets during analysis. In Ghana, ITN ownership was 67% overall at the end of the pilot, but would have been 57% without the continuous distribution activities. In Madagascar, ITN ownership was 96% at the end of the pilot and would have been 75% without the community distribution. Madagascar's population access was 84% and would have been 55% without continuous distribution. Like the Nigeria

Stories from the field: Democratic Republic of the Congo

In 2014 NetWorks conducted a rapid assessment of DRC's ITN distribution channels through antenatal care clinics and Expanded Programme on Immunization in two provinces, Bas-Congo and Katanga. NetWorks made recommendations to improve the distribution systems and identify potential options for additional continuous channels. Recommendations included strengthening and expanding the ITN distribution system through antenatal care clinics and immunization consultations; strengthening the national plan for monitoring and evaluation for ITN distribution; testing a continuous distribution model of ITNs using alternative delivery channels; and strengthening behavior change communication for routine ITN distribution.

operational research studies, continuous distribution activities in Ghana effectively filled gaps without oversupplying. In Madagascar, community redemption of coupons was very effective, in which 80% of those who requested a coupon received a net.

In South Sudan, the project conducted a community distribution pilot, which proved to be very effective even in low-infrastructure settings. Following the area's mass ITN campaign, baseline ITN ownership was 66%, rising to 82% at the end of the pilot. Population access also rose from 40% to 66%, again filling gaps within households. Of those requesting coupons, 93% received a net through the system.

Costing data for the South Sudan and Ghana distributions showed that effective, high-quality implementation can be expensive. Differences in operational costs depend to a very great degree on the volumes of nets distributed. With an average estimated cost

of \$3.50 per net for procurement and delivery to the port, distribution costs, for a program at scale, were estimated to be an additional \$2.50 per net in South Sudan, but ran as high as 16.52 per net during the pilot itself, for a range of \$5.50-\$20.00 depending on the scale of the distribution. In Ghana, the corresponding estimated operational costs, including net procurement, were \$7.97 for ANC and \$9.71 for EPI per net delivered, and \$5.39 per net for schools. Results are preliminary, and additional research to determine both operational and economic costing remain urgently needed from other pilots to inform planning and budgeting.

Finally, in 2014 NetWorks collaborated closely with the RBM MERG to include a question on the source of nets acquired by households into standard Malaria Indicator Survey questionnaires, which will allow programs and donors to track the contributions of various different distribution channels to overall ITN coverage.

7.2.2 Campaigns

NetWorks conducted several post-campaign surveys to evaluate ITN ownership and access following mass distributions. In Senegal, the post-campaign survey found that ITNs covered only 40% of sleeping spaces. However, further analysis revealed that a significant number of those sleeping spaces had not been slept in the previous night, and that ITN coverage for utilized sleeping spaces was more than 70%, one of the highest rates observed in any post-campaign survey. NetWorks conducted post-campaign surveys as baselines for the continuous distribution pilots in Nigeria's Nasarawa and Cross River states and in Ghana's Eastern Region. The project analyzed the above surveys, along with 10 other post-campaign surveys, to identify the key determinants of successful mass campaigns. The analysis showed that initial household registration was the most important step in the campaign process. Registered households were 116 times more likely to receive sufficient nets on the day of distribution compared to unregistered households, even controlling for background factors and campaign characteristics. The analysis also showed that various distribution approaches—such as fixed-point distribution, door-to-door distribution, stand-alone ITN campaigns versus campaigns integrated with polio or measles vaccination campaigns, and fixed numbers of nets per household to a one net for two people allocation strategy—can be successful if they are well implemented [Zegers de Beyl, in press].

Using the OpenMalaria modeling platform, NetWorks produced two peer-reviewed articles that assessed how long after mass campaigns there is reduced transmission of malaria [8], and examined the effects of campaigns versus continuous distribution in combination with widely available antimalarial drugs—artemisinin-based combination therapies (ACT) [9]. Mass campaigns showed a strong effect at reducing malaria transmission for several years after campaigns; however, transmission could sometimes rebound at higher levels than before campaigns, due to lowered immunity in high-transmission areas. Results showed that consistent availability of ACTs for treatment rendered ITNs more cost-effective in the long term, particularly in high-transmission settings.

The project also published articles introducing the new universal coverage indicators, developed in concert with and approved by the RBM Monitoring and Evaluation Reference Group (MERG) in 2011 [23]. NetWorks demonstrated how the new indicators of population access, population use and universal coverage could be used in Nigeria to inform future programming, illustrating the net use gap and reduction in gender and

Stories from the field: South Sudan

The Ministry of Health in South Sudan distributed nets through mass campaigns and routine health services, but unfortunately these efforts had limited results. Coverage declined immediately after the campaign due to wear, tear and loss. In 2011, only 55% of pregnant women received at least one antenatal care visit and less than 20% of children completed their first-year vaccination series, both of which were criteria for receiving a net. In this post-conflict setting, the challenges of net distribution were formidable: inaccurate census data, high logistical constraints and population movements posed major challenges to achieving and maintaining universal coverage. The community-based pilot project distributed 28,696 ITNs for needy households via coupons valid for free nets at health clinics. On-site locked storage containers, holding two bales of ITNs each, enhanced security at some clinics. Storekeepers occasionally delivered nets by bicycle to some remote families. Social mobilizers were important to keep communities aware of the program through megaphones and events at community gatherings and markets. Despite the significant logistics of a post-conflict, low-infrastructure setting, coupon redemption rates averaged 94% during the pilot.

age disparities once households had sufficient nets for all their members [24]. The second seminal article compared population access and population use in 41 data sets, finding that use of available nets is, on average, extremely high [16]. In addition, NetWorks analyzed data from 10 recent Malaria Indicator Surveys and Demographic and Health Surveys to look closely at rates of ITN use for infants and pregnant women. The data showed that these groups—and even non-pregnant women of reproductive age—received priority for ITNs within the household above other family members, indicating that messages about vulnerable groups appear to have been widely internalized [25].

7.2.3 Other Research

Formative research conducted in Senegal, Uganda, Nigeria and Mali demonstrated that care and repair practices prior to BCC interventions were relatively uncommon, but that respondents employed common

Stories from the field: Uganda

In Uganda, NetWorks conducted research activities on the effectiveness of home hang-up visits, net care and repair, and the culture of net use. In the hang-up operations research study, results showed that home visits to help hang up nets were not more effective than the standard package of messaging immediately post-campaign. Although peer review and publication of the results was delayed, PMI applied the findings to programming as soon as they were available, reprogramming hang-up resources into other areas of campaigns. For the net care and repair operational research study, NetWorks implemented a two-phase behavior change intervention to test whether it was possible to extend net condition (see section 7.1.1). For the formative research Culture of Net Use Study, NetWorks conducted three phases: the first phase identified net use motivations, behaviors, and barriers, including care and repair. The second phase produced two articles: one on how the aspects of attending funerals may inhibit ITN use; and an analysis on how families prioritize net allocation hypothetically compared to reality [21;22]. For phase three, the focus turned to pregnant women and their experiences obtaining ITNs at antenatal clinics. Findings showed that women were usually able to obtain a net at ANC; however, their first visit, was often not until the fourth month of pregnancy or later, leaving them unprotected during their first trimester.

sense to make repairs in the absence of specific instructions on washing, care and repair [10;11;17;26;27]. NetWorks published five articles looking closely at care and repair behaviors with a qualitative lens, finding that net damage was common, and caused by daily use behaviors, particularly improper handling by young children or using the net with a rough bed or surface. Nets were often washed more frequently than generally recommended, and sometimes dried in the sun. A desire for cleanliness and aesthetics of the net motivated care and repair behaviors, along with avoiding mosquito bites, protecting one's family, and not being perceived as lazy or unkempt. The consistency of the findings across the five studies indicates that attitudes and practices are likely to be similar elsewhere in sub-Saharan Africa, making message design a more straightforward process for other countries.

NetWorks explored elements of the culture of net use in Senegal, Uganda and Mali, through multi-round prospective qualitative studies, and published six related articles. An in-

depth analysis of barriers to net use in Senegal, ranging from heat to annoyance of the smell of insecticide, found that these barriers did not, in fact, prevent respondents from using their nets [28]. Persistent net use despite inconveniences is one of the markers of a true culture of net use. These studies also explored how respondents perceived nets toward the end of their useful lives, with those in Senegal preferring to replace an old, torn net instead of mending it, as long as a new net is available [10]. Respondents in Senegal also reported transforming rectangular nets into conical shapes to tie them up from a single point, and adding

decorative and protective borders to make nets longer. NetWorks in Senegal documented these practices in two short videos, as well as in the articles, to help improve net transformation practices. In Mali, net use and care practices differed depending on whether there had been a recent mass campaign, making nets more available within households [26].

In Uganda and Ghana, outdoor events such as funerals or other celebrations and gatherings were a key reason for people not to use nets, due to the difficulty of traveling with them, hanging them and using them in front of people who had no nets of their own. NetWorks documented these practices and the difficulties that respondents faced in attempting to use nets during these gatherings [21;29]. The Ghana study also highlighted low use of ITNs and high rates of sleeping outdoors during dry season, potentially contributing to malaria transmission [29]. In Tanzania, a study examining ITN use in areas of recently reduced malaria transmission indicated that persistent net use was a habit that had developed over time, because nets provided numerous benefits—not only protection from malaria but also confidence of getting a good night’s sleep free of mosquito bites and other biting pests, and reduced anxiety of potentially falling ill

[13]. Developing messages to improve on these types of non-malaria reasons for continuing net use will be key in the coming years as more areas experience declines in transmission, and in turn, perceived malaria risk.

The culture of net use studies showed that net use behavior is complex, affected by season, rainfall, perceived risk of malaria and presence of mosquitoes, and factors like being away from home or having recently washed the net.

Secondary analysis of net use data conducted by NetWorks was

integrated into the Results for Development Institute’s [Value for Money in LLIN Specifications Guidance](#) [30]. NetWorks compared use rates of circular and rectangular nets, finding that use of the different nets was largely the same, making it unnecessary to procure more expensive circular nets. Net use rates were also similar for net color and length. Using 14 household surveys from post-campaign evaluations, NetWorks also examined what happens to nets when they leave households, either because people discard them or give them away to family or friends [31]. Out of nearly 30,000 nets among the surveys, respondents reported discarding or giving away nearly 4,000 nets. About two-thirds of nets were discarded versus given away, and the discarded nets were generally much older, with a median age of two years. Nets given away

Stories from the field: Ghana

In only two years, NetWorks activities in Ghana expanded from piloting school and health facility distribution in one region to scaling up both channels nationwide. The successful pilot project in Eastern Region demonstrated that scale-up was a feasible option, maintaining universal coverage post-campaign.

Building on key lessons learned from the continuous distribution pilots, NetWorks and partners took the continuous distribution approach nationwide as a coordinated effort. The government of Ghana played an integral role in strategy development and the implementation process, with coordination at the national, regional, district and circuit levels of the health and education systems. NetWorks supported creative community outreach, mobilization and strategic behavior change communication as integral components of scale-up.

Beyond successes in sustaining coverage of ITNs in Ghana through a mix of continuous distribution channels, NetWorks took a crucial look at net use. In 2014, NetWorks conducted a study to explore outdoor sleeping and other nighttime activities in the northern regions of Ghana, where malaria prevalence is persistently high. The study highlighted unique challenges to net use in this setting and underscored the need for complementary outdoor malaria prevention strategies.

to family or friends were given immediately following the mass campaign. This inter-household redistribution occurred for about 5% of nets, providing a baseline for this behavior in the absence of oversupply of nets and any BCC to encourage the practice. This has important implications for continuous distribution systems, which for school distribution in particular, rely on inter-household redistribution to help ITNs get to households that are not targeted through the distribution channel.

The same study also quantified the rate of ITN misuse and found that less than 1% of respondents reported using the 30,000 nets for another purpose. Along with the high rates of net use among people with access, NetWorks demonstrated that net misuse is quite rare, despite common anecdotes about misuse [31]. NetWorks conducted additional qualitative research on motivations and practices around use of ITNs for fishing in Madagascar to help inform the development of recommendations and potential responses to this problem, which is economically-driven, isolated in fishing communities and requires interagency and inter-ministerial coordination.

NetWorks also used state-of-the-art analytical approaches to assess the contribution of BCC messages to net use in Zambia. Using propensity score matching to create matched “exposed” and “unexposed” groups of women, the project found that exposure to BCC messages was responsible for a 29 percentage-point

Stories from the field: Senegal

NetWorks delivered more than 4 million nets through the universal coverage campaign in Senegal between 2010 and 2013 in six phases, as outlined in Figure 1. An innovative approach to counting usual sleeping spaces helped attain high rates of coverage within households. Specific outreach to nomadic herders, koranic schools, and hard-to-reach areas such as the islands and inlets of Fatick was instrumental in attaining universal coverage for those at risk of malaria. In 2013, planning began for continuous distribution through ANC visits to pregnant women, school distribution for classes CI (1st grade) and CE2 (4th grade) students, and making ITNs available for \$1.00 to anyone visiting a health facility, to maintain high rates of ownership and use post-campaign. The overarching slogan for the ITN distribution activities was *Trois Toutes: Toute la famille, Toute l’annee et Toutes les nuits*. This translates roughly as the “three alls,” encouraging the whole family to sleep under their nets all year round, every night. The slogan united partners and volunteers nationwide in community mobilization and ITN distribution activities. In all, NetWorks helped distribute 6.8 million ITNs in Senegal, contributing to reduction of the malaria burden, and building sustainable systems to reach far into the future.

increase in ITN use for women in households with enough ITNs [12]. This methodology controls for background factors more completely than standard multivariate regression. NetWorks also used mediation analysis to examine data from a 2011 Communication and Malaria Initiative in Tanzania (COMMIT) household survey, finding that exposure to mass media, community agents, or both, significantly contributed to improved net ideation—a composite score of attitudes around ITNs. In turn, improved net ideation increased the odds of the household having enough nets, indicating that household decision making processes influence whether to acquire and maintain sufficient nets for all family members [32].

8 Theory to Practice: Continuous Distribution

At the beginning of the project, it was unknown what other ITN distribution channels were feasible, aside from mass campaigns and ANC/EPI visits. Other types of platforms had been used for mass campaigns—such as using a Title II food distribution system in Niger, conducted by Catholic Relief Services—but no large-scale school or community distributions had been attempted or even conceived. By early 2011, however, the idea of delivering nets through other channels had been incorporated into the continuous distribution consensus statement and tools for quantification were developed as part of the NetCALC modeling software. The idea had yet to be applied, however. Its first chance was in April 2011, when NMCP, GHS, CMS, and DELIVER project staff traveled to Nairobi on a study tour funded by USAID’s Africa Bureau to learn about continuous distribution of ITNs in Kenya. The objective of the study tour was to discuss and learn about ANC/EPI distribution channels, in particular, but also to go through a planning process for other channels. In June 2011, the Tanzania NMCP organized a month-long consultancy funded by Swiss TPH but led by a NetWorks staff member, whose time was supported under the project. The team traveled to four regional stakeholders to meet with representatives from all of Tanzania’s 36 regions. They discussed practicalities of distribution of nets through schools, communities, retail and subsidized sales in addition to modeling (with NetCALC), what expected coverage would be through each channel and modeling various combinations of channels. A health economist estimated costs of running

Stories from the field: Madagascar

NetWorks implemented a pilot project for continuous distribution of ITNs in the Toamasina II District of the Atsinanana Region. Unlike mass campaigns, the distribution employed a community channel, including commune-level and *fokontany*- (village or urban neighborhood organizations) level religious leaders to manage coupons and store and redeem ITNs. In all, NetWork’s partners Catholic Relief Services and a local NGO, Organe de développement du diocèse de Toamasina (ODDIT) trained 582 participants, including 524 religious leaders (public and *fokontany*) and community agents. With technical support from PSI Madagascar, NetWorks also produced two radio spots that were broadcast on local stations for six months. In addition, community agents received a job aid to assist them in identifying and verifying ITN needs at the household level and recording proper documentation. Community agents alerted communities about the ITN distribution, confirmed household needs and provided vouchers for ITNs to households. Household members then went to religious leaders’ households to redeem their vouchers for ITNs. During the project period, NetWorks distributed 43,500 vouchers to beneficiaries, who redeemed them for 43,498 ITNs in 17 municipalities and 169 *fokontany* of Toamasina II District. The experience has shown that the community distribution of ITNs is an effective way to fill gaps at the household level, bring services closer to the population and provide better geographic accessibility.

A household survey at the end of the pilot period showed that ITN ownership had improved to 96% at the end of the pilot, and would have been 75% without the community distribution. Population access at endline was 84%, compared to 55% without continuous distribution. NetWorks also conducted a process evaluation midway through the pilot to identify strengths and weaknesses; its recommendations are being used to inform the scale-up of the pilot. Going forward, the community agents will continue monitoring the use of ITNs and conducting outreach activities. PSI Madagascar is scaling up the pilot in additional districts.

concurrent channels to provide operational cost estimates.

By July 2011, the team completed its report from Tanzania and made recommendations to begin a pilot project to test school distribution in conjunction with the country's existing ANC/EPI subsidized ITN distribution strategy. In November 2011, Ghana followed suit with a three-week assessment of a similar nature, working with stakeholders and planning a pilot project of school and health facility distribution in the Eastern Region. Building on the work in Tanzania, NetWorks developed implementation guidelines for Ghana to enable a quick start. In 2012, Ghana's Eastern Region distributed its first nets through schools and Tanzania's first round of school distribution followed in August 2012. Ghana's first round of nationwide school distribution occurred in March 2013, followed by a second round in 2014. Over the same period, the two operational research pilots in Nigeria (described in section 7.1.3) were also ongoing.

NetWorks conducted a programmatic evaluation for the Eastern Region pilot in Ghana. In Tanzania, a local independent partner evaluated the first round of distribution in schools. Key collaborations took place in January 2013 between the two countries at the AMP meeting, where participants discussed practicalities, challenges and problem-solving strategies, and shared lessons learned between countries. NetWorks facilitated the travel and organized the meeting. The two countries have remained in contact as they have implemented subsequent rounds of school distribution.

Throughout the project, NetWorks wrote 11 case studies from 7 countries, documenting lessons learned to inform future rounds of distribution within each country and to inform planning in other countries considering continuous distribution as an option. In the same way, the report and evaluation from the community distribution pilot in South Sudan informed planning of community distribution in Senegal, Madagascar, Nigeria and Zanzibar. The VCWG continuous distribution work stream provided a crucial dissemination outlet for sharing consistently updated information as data was collected and analyzed, which informed donor decisions, malaria operational plan development and Global Fund concept note development.

9 Next Steps: Recommendations for Future Malaria Work

NetWorks produced a wealth of information and made groundbreaking progress during its five years. This work has shown that continuous distribution can be an effective mechanism for ensuring maintenance of universal coverage, that net care and repair attitudes are important in determining how long ITNs last, and that the universal coverage indicators provide clearer pictures of the realities of ITN distribution and use. At the same time, vector control with ITNs is threatened by a number of serious issues. At the policy level, there is currently low incentive for innovation, a lack of concrete next steps for mitigating insecticide resistance impact, and flat or decreasing resources from donors/governments. For distribution, there is an ever-increasing need for efficiency and cost-effectiveness. For behavior change, there remain significant portions of populations that are reluctant to use ITNs, particularly year-round, and ITN use is not always an appropriate solution for outdoor malaria transmission.

This work, and these looming threats, lead to a series of logical next steps for research and implementation:

Policy

1. Establish clear recommendations on prioritizing net distribution when funding gaps do not permit universal coverage in all at-risk areas.
2. Identify textile tests that will reflect field performance of ITNs such that existing and new ITN products can be procured on the basis of their durability.
3. Clarify guidance on combination of alternative vector control tools with or without ITNs in various niche settings.

ITN Distribution

1. Establish whether specific continuous distribution channels can be effective in the long term.
2. Conduct cost analyses for additional continuous distribution channels in various contexts, to provide budgeting guidelines for countries and for donors.

BCC

3. As countries move toward malaria elimination, test BCC programs that focus on non-malaria benefits of ITN use to maintain high use rates.
4. Investigate subnational rates of ITN access and use them to inform BCC programming, taking into account the survey season.

M&E

1. Further refine and standardize ITN durability monitoring procedures, including standard questionnaires and tools, that also measure how ITNs are repurposed and under what circumstances.
2. Refine the cutoff thresholds for pHI: is there a clear distinction between serviceable and torn nets, can this be more easily assessed in the field, and what is the link to parasitemia or malaria transmission?
3. Investigate outdoor sleeping habits in more depth: how widespread are these practices, and to what extent and under what conditions do they contribute to persistent parasitemia rates?
4. Explore alternative vector control tools to (1) protect niche populations unwilling or unable to use ITNs and (2) have additional impact for reducing transmission and risk of disease.

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11 Annexes:

11.1 Project Monitoring Plan

Indicator	Definition ²	Source	Targets	Actuals
PROJECT OBJECTIVE: Increased ownership and use of LLINs				
IR1: Develop and promote appropriate policies at both the international and national levels to encourage sustained high level coverage of LLINs and related technologies in communities, particularly among the targeted populations				
1. Number of countries where policies advocated by the project to supported increased coverage of LLINs and related technologies were adopted	The number of countries and coordination or international bodies that introduced any NetWorks-advocated policies for the first time, by year.	Review of PMI MOPs	Year 1: 1	0
			Year 2: 3	4
			Year 3: 6	4
			Year 4: 7	7
			Year 5: 7	8
			LOP: 24	22 (At least 19 countries and 3 international bodies)
2. Number of policy-relevant documents developed and disseminated by project	Number of policy documents developed by Networks and disseminated through at least four channels, by year.	Project documents	Year 1: 1	0
			Year 2: 1	1
			Year 3: 5	4
			Year 4: 3	1
			Year 5: 2	3
			LOP: 12	9
IR2: Develop, promote, and support efficient and effective distribution approaches to ensure sustained high level coverage of LLINs and related technologies in communities, particularly among targeted populations				
3. Number of countries where	The number of countries that introduced any Networks-	Review of GFATM proposals and	Campaigns	

² Only deliverables that have been published AND disseminated/promoted count as progress toward achieving targets.

Indicator	Definition ²	Source	Targets	Actuals
project-developed tools or approaches to support more efficient or effective distributions were adopted, by type of distribution.	developed tools or approaches for the first time, disaggregated by type of distribution (campaign or continuous) and year.	PMI MOPs	Year 1: 1	0
			Year 2: 3	1
			Year 3: 6	2
			Year 4: 7	4
			Year 5: 7	1
			LOP: 24	8
			Continuous	
			Year 1: 1	0
			Year 2: 3	5
			Year 3: 6	4
			Year 4: 7	6
			Year 5: 7	4
			LOP: 24	19
			4. Number of RBM fora in which consensus statement on continuous distribution is presented and debated by project staff	Number of meetings supported by Networks or number of meetings where Networks-supported staff present the consensus definition for discussion, by year.
Year 2: 1	2			
Year 3: 2	4			
Year 4: 0	0			
Year 5: 0	0			
LOP: 5	8			
5. Number of tools and approaches promoting more effective and efficient net distribution campaigns developed and disseminated, by type of distribution	Number of publications promoting more effective and efficient net distribution campaigns developed and disseminated through at least four channels by the project, disaggregated by type of distribution and year.	Project records	Campaigns	
			Year 1: 3	0
			Year 2: 3	2
			Year 3: 0	2
			Year 4: 0	2
			Year 5: 1	0
			LOP: 7	6
			Continuous	
			Year 1: 2	0
			Year 2: 3	1
Year 3: 8	9			

Indicator	Definition ²	Source	Targets	Actuals
			Year 4: 10	5
			Year 5: 1	6
			LOP: 24	21
IR3: Increased demand for and use of LLINs and related technologies that contribute towards sustainable high levels of LLIN ownership and use				
6. Number of countries using new BCC indicators	Number of countries including new BCC indicators or MIS surveys, by year.	Review of GFATM performance frameworks, MIS surveys and PMI MOPs	Year 1: 1	0
			Year 2: 3	0
			Year 3: 6	2
			Year 4: 3	1
			Year 5: 0	0
			LOP: 13	5
7. Number of countries incorporating elements of a strategic approach to malaria communication in national plans	Number of countries including strategic approach elements of malaria communication in national plans, by year.	Review of GFATM proposals and PMI MOPs, national communication plans; Key Informant Interviews with NMCP members, and RBM focal points	Year 1: 19	N/A
			Year 2: 14	N/A
			Year 3: 33	28
			Year 4: 0	1
			Year 5: 0	0
			LOP: 33	29
8. Percent of participants in project-supported trainings who report having utilized skills from the training at least once, disaggregated by topic	Numerator: Number of participants who state they use at least one skill, knowledge, material or tool from the training at least once in their course of work. Denominator: Total number of participants reached at 3-month follow-up interviews	Participant follow-up interviews	Year 1: 85%	100%
			Year 2: 85%	100%
			Year 3: 85%	50%
			Year 4: 0	N/A
			Year 5: 0	N/A
			LOP: 85%	95%
9. Number of improved tools and guidelines for increasing demand and use of LLINs and related technologies developed, promoted and adopted, by topic.	Number of publications, tools and guidelines focused on increasing demand and use of LLINs and related technologies developed and disseminated through at least four channels by the project, by year and topic.	Project records	Monitoring and evaluation of BCC	
			Year 1: 2	0
			Year 2: 1	1
			Year 3: 7	4
			Year 4: 4	0

Indicator	Definition ²	Source	Targets	Actuals
			Year 5: 0	6
			LOP: 14	11
			Implementation of BCC programs	
			Year 1: 1	1
			Year 2: 1	0
			Year 3: 2	2
			Year 4: 5	1
			Year 5: 2	5
			LOP: 10	9
			BCC	
			Year 1: 70	66
			Year 2: 32	36
			Year 3: 21	0
			Year 4: 0	0
			Year 5: 84	84
			LOP: 207	186
			NetCALC ToT	
			Year 3: 15	11
			Year 4: 86	7
			Year 5: 106	25
			LOP: 207	LOP: 43
IR4: Design, conduct, and analyze strategic operational research to pilot, document, and scale-up innovative best practices that contribute towards achieving and maintaining high levels of LLINs and related technologies ownership and use				
11. Number of tools and approaches tested by evaluation activities or operations research adapted or discontinued for implementation or policy	Number of approaches tested by Networks-sponsored evaluation activities or operations research that were adapted, continued, discontinued, or scaled up by implementation partners; promoted for inclusion in national and international guidelines, and funded for subsequent evaluation activities.	Review of GFATM proposals and PMI MOPs; Key Informant Interviews with implementation agencies, NMCP members, and RBM focal points	Year 1: 0	0
			Year 2: 3	1
			Year 3: 2	2
			Year 4: 1	1
			Year 5: 2	3
			LOP: 7	7

Indicator	Definition ²	Source	Targets	Actuals
12. Number of reports describing findings from evaluation activities operations research results disseminated.	Number of reports based on evaluation activities or operations research study results disseminated through at least four channels by the project, by topic and year.	Project records	Year 1: 1	0
			Year 2: 7	1
			Year 3: 8	6
			Year 4: 4	4
			Year 5: 9	14
			LOP: 29	25
Global Project Management				
13. Number of USAID country missions that contribute funds to the project	Number of USAID country missions that support NetWorks activities, by year.	Project records	Year 1: 1	2
			Year 2: 3	2
			Year 3: 6	4
			Year 4: 7	8
			Year 5: 7	8
			LOP: 7	12
14. Number of technical assistance visits by project staff	Number of times that project staff provide in-country monitoring and supervision, by year.	Project records	Year 1: 9	9
			Year 2: 16	16
			Year 3: 24	19
			Year 4: 10	8
			Year 5: 3	3
			LOP: 62	55
15. Amount of cost-share funds obtained from non-USG sources	Total amount of cost-share funds contributed to the project by year.	Project records	LOP: \$ 1,507,100	\$ 1,843,604.19
16. Percent of reports submitted on time	Numerator: Number of reports (semi-annual and annual financial and narrative) submitted on time per year Denominator: Total number of reports due per year	Project records	Year 1: 100%	100%
			Year 2: 100%	100%
			Year 3: 100%	100%
			Year 4: 100%	100%
			Year 5: 100%	100%

Indicator	Definition ²	Source	Targets	Actuals
17. Percent of deliverables completed by year's end	Numerator: Number of deliverables completed by year's end Denominator: Total deliverables due per year (These have never included the financial reports and semi-annual reports since they are reflected in indicator 16. When they are included the actuals rise significantly in the early years of the project)	Project records	LOP: 100%	100%
			Year 1:	36%
			Year 2:	28%
			Year 3: 85%	62%
			Year 4: 85%	66%
			Year 5: 100%	92%

11.2 Project Presentations

Bold indicates ASTMH Symposia Title and co-chairs

Year	Date	Meeting	Type	Presentation Title	Presenter
2009	Nov 21	ASTMH	Symposium 128	Net Results: Scaling Up LLIN Use For Malaria Control	Lynch, M White, C
2009	Nov 21	ASTMH	Symposium 128	Examining The Relationship Between Fear Of Malaria And Self-Efficacy On Net Use Among Children Under 5 In Tanzania	Boulay, M
2010	Feb 8-9	WIN-VCWG 5	Oral	How long do LLIN last in the field?	Kilian
2010	Feb 10-11	AMP	Oral	Modeling distribution strategies to ensure universal coverage Strategies to increase net use BCC working group update	Kilian, Koenker
2010	Oct 4	VCWG CD 1	Oral	Distribution Strategies for ITN What best to sustain high coverage? Integrated approach to Universal Coverage - Uganda Adoption, adaptation and diffusion of a new delivery system for ITNs: public and private sector perspectives	Kilian, Lokko, Webster
2010	Nov 6	ASTMH	Symposium 141	Malaria Prevention in Africa - Beyond Mass Campaigns of Long-Lasting Insecticidal Nets (LLIN)	Lynch, M
2010	Nov 6	ASTMH	Symposium 141	Need for continuous distribution systems to sustain successes achieved by campaigns	Kilian, A
2010	Nov 6	ASTMH	Symposium 141	Achieving and Sustaining high levels of net use	Koenker, H
2010	Nov 7	ASTMH	Symposium 179	LLIN durability - concept and methodological approaches	Kilian, A
2010	Nov 4	ASTMH	Poster	Tracking Weekly Net Use In Kongwa, Tanzania	Koenker, H
2011	Feb 7-9	VCWG 6	Oral	LLIN durability	Kilian
2011	Feb 9	VCWG Dur 1	Oral	LLIN durability: Construction and application of a "proportionate Hole Index"	Kilian
2011	Feb 10-11	AMP	Oral	New Universal Coverage indicators Universal coverage in LLIN in Senegal	Kilian, Thior, Koenker

Year	Date	Meeting	Type	Presentation Title	Presenter
				BCC working group update Strategies for Net Use	
2011	Dec 7	ASTMH	Symposium 116	Continuous Distribution Strategy Development: Maintaining Universal Coverage After Scale-Up	Koenker, H
2011	Dec 9	VCWG CD 4	Oral	Review of 2011 Activities and Products Continuous distribution of LLINs: a guide to concepts and strategy A Collation of Global Funding Commitments for Sub-Saharan Africa, 2011-16	Lokko, Kolaczinski, Paintain
2012	Feb 2-3	VCWG Dur 2	Oral	Textile Testing Methods for Nets: Summary of available field data Measurement of Net Durability in the Field: Current recommended methodology	Kilian
2012	Feb 7	VCWG Dur 3	Oral	Textile Testing Methods for Nets: Summary of presentations, discussion and consensus Importance of factors determining the effective lifetime of a mass, long-lasting, insecticidal net distribution: a sensitivity analysis Update on field data from Uganda and Chad	Kilian, Briet, Kilian
2012	Feb 8	VCWG CD 5	Oral	A Collation of Global Funding Commitments for Sub-Saharan Africa, 2011-16 Continuous distribution strategy development – maintaining universal coverage after scale-up Continuous distribution of LLINs: a guide to concepts and strategy	Paintain, Koenker, Kolaczinski
2012	Feb 6-8	VCWG 7	Oral	Continuous LLIN Distribution Systems Update Durability of LLIN in the Field: Update 2011 and plans	De Savigny, Webster, Kilian
2012	Feb 9-10	AMP	Oral	BCC Working Group Update	Koenker
2012	Nov 15	VCWG CD 6	Oral	Update on Rollout of the Electronic Voucher in Tanzania - One Year On Tracking the use of VCWG-CD products (2011/12) Moving forward in LLIN distribution strategy: issues for discussion Sustaining Fragile Gains	Dixon, Lokko, Lynch, Paintain

Year	Date	Meeting	Type	Presentation Title	Presenter
2013	Jan 28-30	VCWG 8	Oral	Budget Update & Website Continuous LLIN Distribution Systems Work Stream Update 2012 and plans Work Stream: Durability of LLIN in the Field: Update 2012 and plans	Boutsika, Webster, Lokko, Kilian
2013	Jan 29	VCWG CD 7	Oral	Senegal Continuous Distribution Overview Sustaining Fragile Gains Optimizing efficiency of LLIN distribution: charting a strategic course LLIN Continuous Distribution	Diouf, Paintain, Lynch, Diouf
2013	Jan 29	VCWG Dur 4	Oral	Update on field studies from Uganda and Nigeria Work Stream on Durability of LLIN in the Field: Update on textile lab study	Kilian
2013	Jan 31- Feb 1	AMP	Oral	BCC Working Group Update	Koenker
2013	Nov 4	APHA	Oral	Households' Role In Mosquito Bed Net Maintenance: Key Behaviors, Barriers And Motivators, And Implications For Malaria Prevention	Scandurra, L
2013	Nov 4	APHA	Poster	Addressing The Gap Between Net Ownership And Use: Lessons From The Culture Of Net Use Study	Loll, D
2013	Nov 14-16	ASTMH	Poster	Schools, Communities And Health Facilities: Ensuring Continued Access To LLINs	Berthe, S
				Recalculating The Net Use Gap: A Multi-Country Comparison Of ITN Use Versus ITN Access	Koenker, H
				Delivery Strategies For Mass Campaigns To Achieve Universal Coverage With Insecticide Treated Nets: Which Works Best? A Multi-Country Comparison	Zegers de Beyl, C
				Impact Of Community Change Agents On LLIN Norms And Use In Tanzania	Ricotta, E
				Ownership And Use Of Insecticide Treated Nets After Mass Distributions	Diouf, M
				Targeting Coverage Of All Sleeping Spaces	
				Does A Torn Long-Lasting Insecticidal Net Fail To Protect Children From Malaria Parasitemia? Data From Two Cross-Sectional Surveys In Western Uganda	Kilian, A
				Reaching And Sustaining High Levels Of ITN Ownership And Use Through A Community-Based, Demand-Driven Approach In Lainya County, South Sudan	Kilian, A
				Continuous Distribution Of LLIN Through Primary Schools And Health	Zegers de Beyl, C

Year	Date	Meeting	Type	Presentation Title	Presenter
				Facilities In Ghana: Process Evaluation Of The Pilot In The Eastern Region	
2013	Nov 15	VCWG Dur 5	Oral	Recent developments regarding methodology to measure LN survival (longevity) in the field	Kilian
2014	Feb 17-18	AMP	Oral	Health facility LLIN distribution in Senegal - Lessons learned School-based distribution Opportunities and challenges for scale up Community-based distribution Opportunities and challenges for scale up ITN access versus use A multicounty analysis The potential power of integration BCC working group update	Diouf, Mandike, Randriamanantenasoa, Koenker, Ricotta, Lynch, Koenker
2014	Feb 19-21	VCWG 9	Oral	Progress on work plan 2013 Budget Update & Information Exchange	Lokko, Webster, Boutsika
2014	Feb 19	VCWG Dur 6	Oral	Overview of last year's developments	Kilian
2014	Feb 20	VCWG CD 9	Oral	Eastern Ghana CD evaluation Role of the private sector Evidence on ANC delivery of LLINs Prioritisation and LLIN delivery MEDA Ghana and Tanzania	Kilian, Webster, Lines, Dixon
2014	Nov 3	ASTMH	Poster	Continuous Distribution Of Long-Lasting Insecticidal Nets Through Schools – Results From A Three Year Evaluation In Cross River State, Nigeria	Kilian, A
	Nov 4	ASTMH	Poster	Impact Of A Behavior Change Intervention On Care And Repair Behaviors For Long-Lasting Insecticidal Nets In Nasarawa State, Nigeria	Koenker, H
	Nov 5	ASTMH	Poster	Potential Implications Of Outdoor-Sleeping Behaviors And Nighttime Activities For Malaria Control In The Upper West And Northern Regions Of Ghana	Monroe, A
	Nov 5	ASTMH	Poster	Durability Of Polyester-Based Long-Lasting Insecticidal Nets In Three Geographical Zones Of Nigeria - A Three Year Follow-Up Of Nets Distributed Through Campaigns	Kilian, A

Year	Date	Meeting	Type	Presentation Title	Presenter
	Nov 4	ASTMH	Poster	Understanding Intra-Household Decision Making For Insecticide-Treated Mosquito Net Allocation In Uganda	Ricotta, E
	Nov 3	ASTMH	Poster	Maintaining Universal Coverage Of Long Lasting Insecticidal Nets: Impact Of Continuous Distribution On Household Ownership In Eastern Region, Ghana	Zegers de Beyl, C
	Nov 4	ASTMH	Poster	Impact Of A Behavior Change Communication Program On Net Durability In Eastern Uganda	Namara, G
2014	Nov 5	VCWG CD 10	Oral	Evidence to policy and practice - what's next for continuous distribution? Prioritizing LLIN distribution mechanisms in resource-constrained environments	Koenker, Lynch

11.3 Complete List of All NetWorks Activities

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Core	5	Core Funded Assessment For ITN Strategy - Senegal	November 17, 2009	https://www.k4health.org/sites/default/files/rapport_final_networks_senegal_needs_assessment.pdf
Core	10	AMP BCC Trainings In French And English	February 21, 2012	http://www.allianceformalariaprevention.com/resources-view.php?categoryID=14
Core	13	Expert Panel Meeting, Evaluation Topics Reviewed And Selected, Year One Evaluation Plan Drafted	September 20, 2010	on file
Core	17	Manual Of Operations	February 21, 2012	on file
Core	19	Project M&E Data Collected, Analyzed	November 12, 2010	on file
Core	22	Project Website Launched	March 5, 2010	www.networksmalaria.org
Core	1, 4, 11, PC.A.3, PC.a.3.2	Background Paper On Universal Coverage Indicators	September 10, 2013	http://www.malariajournal.com/content/12/1/314
Core	12, ME.e, ME.D.4	Uganda Hang Up Study	December 7, 2011	http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0119078
Core	2, PC.A.2, PC.C.3	Advocacy Paper: Accounting For Existing Nets Paper	June 14, 2013	http://www.parasitesandvectors.com/content/6/1/174
Core	3, LD.a	NetCALC Excel-Based Program To Calculate ITN Needs	February 21, 2012	http://trams.jhsph.edu/trams/index.cfm?event=training_launch&trainingID=530
Core	6, LD.g	CRS Report On ITN Distribution Using Title II Food Distribution Platform	July 8, 2011	http://www.crsprogramquality.org/storage/pubs/health/management-and-distribution-of-bed-nets.pdf
Core	7, LD.e, BC.C	AMP Toolkit 2.0	February 8, 2012	http://www.allianceformalariaprevention.com/resources-view.php?categoryID=29

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Core	8, BC.E.1.g, ME.h	Net Use BCC Indicator Guide	February 28, 2014	http://www.rbm.who.int/partnership/wg/wg_communication/docs/Malaria-BCC-Indicators-Reference-Guide.pdf
Core	9, BC.a, BC.A.1	Care & Repair Online Toolkit	April 8, 2013	http://www.k4health.org/toolkits/care-repair-LLIN
Core	BC.B.1	Package Of BCC Materials Used In Continuous Distribution Pilots Posted In Online Toolkit	August 12, 2013	http://k4health.org/toolkits/continuous-distribution-malaria
Core	BC.C.5	Publication Fees For "Trends In Weekly Net Use In Central Tanzania" Article	September 27, 2012	http://www.malariajournal.com/content/11/1/218
Core	BC.D.1	Multi-Country Secondary Analysis Of MIS Data Using Propensity Score Matching To Assess Contribution Of BCC Exposure To ITN Use	August 26, 2014	http://www.malariajournal.com/content/13/1/342
Core	BC.D.2	AMP BCC Working Group Support	March 1, 2012	http://allianceformalariaprevention.com/resources-view.php?categoryID=33
Core	BC.D.3	Global BCC Strategic Framework Support	September 1, 2012	http://rbm.who.int/partnership/wg/wg_communication/docs/Malaria-BCC-Indicators-Reference-Guide.pdf
Core	BC.D.4	Literature Review Of BCC For Malaria Control	September 30, 2012	https://www.k4health.org/toolkits/networks-country-resources/review-literature-malaria-bcc
Core	BC.D.5	Support To RBM Communication Working Group & Global BCC Strategic Framework	September 1, 2012	http://rbm.who.int/partnership/wg/wg_communication/docs/Malaria-BCC-Indicators-Reference-Guide.pdf
Core	BC.D.6, BC.D	Net Use Messaging Case Studies	March 13, 2014	http://networksmalaria.org/networks/behavior-change-communication
Core	BC.E.1.a	Guide To Developing M&E Plans For Malaria BCC Activities	November 7, 2014	https://www.k4health.org/sites/default/files/me_of_malaria_bcc_guide_2014-10-22.docx
Core	BC.E.1.b	Mock TRP Presentation On Malaria BCC	cancelled	cancelled
Core	BC.E.1.c	Sept 2012 BCC M&E Meeting	November 1, 2012	https://www.k4health.org/toolkits/networks-country-resources/malaria-bcc-me-task-force-meeting-reports

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Core	BC.E.1.d	Updating MIS Training Materials To Reflect Addition Of "Exposure To Malaria Messages" Questions	April 7, 2014	http://www.malariasurveys.org/toolkitfiles/03%20Woman's%20Questionnaire.pdf
Core	BC.E.1.e	Round 11 Guidelines	cancelled	cancelled
Core	BC.E.1.f	Sept 2013 BCC M&E Meeting Report	September 30, 2013	https://www.k4health.org/toolkits/networks-country-resources/malaria-bcc-me-task-force-meeting-reports
Core	BC.E.1.h	Reporting Guidelines For BCC Interventions	November 7, 2014	https://www.k4health.org/toolkits/networks-country-resources/reporting-guidelines-bcc-interventions
Core	BC.E.1.i	BCC Editorial - Making The Case For Malaria BCC As We Move Toward Pre-Elimination	January 2, 2014	http://www.malariajournal.com/content/13/1/1
Core	BC.E.1.j	Journal Supplement On Malaria BCC	cancelled	cancelled
Core	BC.E.1.k	Jan 2013 Meeting Of BCC M&E Group	February 2, 2013	https://www.k4health.org/toolkits/networks-country-resources/malaria-bcc-me-task-force-meeting-reports
Core	BC.E.2	Assistance To AMP Trainings	cancelled	cancelled
Core	BC.E.3	Capacity Building For BCC At National Level: F: AMP TA Program, G) AMP Mentor Program	cancelled	cancelled
Core	BC.E.4	Online Training Modules In Malaria BCC M&E	April 10, 2013	http://networksmalaria.org/networks/online-training-series-evidence-based-malaria-social-behavior-change-communication
Core	LD.b	Mali Sikasso Universal Coverage Campaign Process Evaluation	June 29, 2011	https://www.k4health.org/sites/default/files/sikasso_process_evaluation_-_final_report_-_english_6.29.2011.pdf
Core	LD.B.1	Continuous Distribution Assessment And Design - Country Trip Reports And Summary Report Of Common Themes And Recommendations	April 15, 2013	https://www.k4health.org/sites/default/files/ld.b.1_trip_reports_for_netcalc_assessments_and_summary_reports.zip
Core	LD.B.10,	DRC ANC And CD Assessment Report	December 1,	https://www.k4health.org/sites/default/files/final_netwo

Funding Source	Activity #	Deliverable Activity	Date completed	Location
	DRC.1.b		2014	rks_drc_report_2014-12-1.pdf
Core	LD.B.11	Summary Series - 4 Round Ups Of Care/Repair, Continuous Distribution, Culture Of Net Use, And E-Coupon Activities	February 6, 2015	https://www.k4health.org/toolkits/networks-country-resources/summary-series
Core	LD.B.12	Advocacy For Resource Mobilization Toolkit Testing In Sierra Leone	August 21, 2014	http://www.rbm.who.int/docs/2014/ARMGuide.pdf
Core	LD.B.13	LLIN Market Analysis In Southern Ghana	cancelled	cancelled
Core	LD.B.14	Technical Assistance For ITN Distribution In Zimbabwe And Benin	October 28, 2014	https://www.k4health.org/toolkits/networks-country-resources/benin-mass-campaign-technical-assistance-report-2014
Core	LD.B.2	NetCALC Training Workshop And Distance Learning Online Module; Guidance Documentation	2/5/12; 10/24/12; 9/28/12	http://trams.jhsph.edu/trams/index.cfm?event=training.launch&trainingID=530
Core	LD.B.2.a	Report On The Use Of The NetCALC Distance Learning Module By Online-Learners	November 3, 2013	on file
Core	LD.B.2.b	French Translation Of NetCALC And Its Help Files	December 12, 2014	http://trams.jhsph.edu/trams/index.cfm?event=training.launch&trainingID=530
Core	LD.B.2.c	Version 3.0 Of NetCALC	incomplete	incomplete
Core	LD.B.3.a	Case Study Of School-Based Distribution In Cross-Rivers State	November 14, 2012	http://rbm.who.int/partnership/wg/wg_itn/docs/ws3/MalariaLIB6Nigeria.pdf
Core	LD.B.3.b	Case Study Of Community-Based Distribution In South Sudan	May 29, 2013	http://rbm.who.int/partnership/wg/wg_itn/docs/ws3/MalariaLIB8SouthSudan.pdf
Core	LD.B.3.c	Case Study Of Community-Based Distribution In Nasarawa State Nigeria	December 3, 2014	http://rbm.who.int/partnership/wg/wg_itn/docs/ws3/MalariaLIB12NasarawaCDI.pdf
Core	LD.B.3.d	Case Study Of Combination Continuous Distribution In Eastern Region, Ghana	August 12, 2014	http://rbm.who.int/partnership/wg/wg_itn/docs/ws3/MalariaLIB11Ghana.pdf

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Core	LD.B.3.e	Case Study Of Combination Continuous Distribution In Senegal	April 7, 2014	http://rbm.who.int/partnership/wg/wg_itn/docs/ws3/MalariaLIB10Senegal.pdf
Core	LD.B.3.f	Case Study Of School-Based Distribution In Tanzania	March 6, 2014	http://rbm.who.int/partnership/wg/wg_itn/docs/ws3/MalariaLIB9Tanzania.pdf
Core	LD.B.3.h	Videographer For Senegal And Ghana CD Activities	December 23, 2014	http://networksmalaria.org/networks/ghana
Core	LD.B.4	Ghana E-Coupon Pilot Activity In Eastern Region	December 20, 2014	https://www.k4health.org/sites/default/files/networks_summary_e-coupon_pilot_2015-jan.pdf
Core	LD.B.6	Case Study On E-Voucher System In Tanzania	May 29, 2013	http://rbm.who.int/partnership/wg/wg_itn/docs/ws3/MalariaLIB7Tanzania.pdf
Core	LD.B.7, PC.B.5.b.1	5 Trip Reports From The HWG Workshops.	incomplete	https://www.k4health.org/sites/default/files/uganda_net_calc_support_2014.zip
Core	LD.B.8	Ghana E-Coupon Process Evaluation Report	February 7, 2014	https://www.k4health.org/sites/default/files/e-coupon_process_evaluation_final_report.pdf
Core	LD.B.9	School Distribution Guide For Implementation	July 22, 2014	http://rbm.who.int/partnership/wg/wg_itn/docs/ws3/School-Based-Distribution-of-Long-Lasting-Insecticidal-Nets.pdf
Core	LD.c	Design And Preliminary Results Of A Community-Based LLIN Distribution System; Input To USAID/Nigeria Report On Community-Based Continuous Systems	April 17, 2012	https://www.k4health.org/sites/default/files/Design%20document%20CDD%20distribution%20Nasarawa.doc
Core	LD.d	Supply Chain Management Assessment-Senegal	cancelled	cancelled
Core	LD.E.1	Technical Assistance For Selected GFATM R12 Grant-Writing	cancelled	cancelled

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Core	LD.f, PC.C.1	Guidelines And Supervisory Tools For Assessing Quality Of Mass Distribution Campaigns	March 8, 2012	http://www.allianceformalariaprevention.com/resources/Checklist%20for%20Program%20Managers%20and%20Independent%20Observers.pdf
Core	LD.h, PC.C.4	Review Of Operational Aspects Of Urban LLIN Distribution	March 2, 2013	http://www.networksmalaria.org/sites/default/files/Review%20of%20Urban%20LLIN%20Distributions.pdf
Core	ME.A.1	Kinshasa Hole Index And Parasitemia Study	cancelled	cancelled
Core	ME.A.2	Care & Repair Intervention Study Materials	December 1, 2014	https://www.k4health.org/toolkits/care-repair-LLIN
Core	ME.A.2.1.a.i	Formative Paper Nigeria Care Repair	June 26, 2014	http://www.malariajournal.com/content/pdf/1475-2875-13-320.pdf
Core	ME.A.2.1.a.iii	Endline Paper On Nigeria Care Repair	December 21, 2014	http://www.malariajournal.com/content/pdf/s12936-014-0538-6.pdf
Core	ME.A.2.2.a.i	Uganda Care Repair Midline Paper	December 14, 2014	http://www.malariajournal.com/content/pdf/1475-2875-13-504.pdf
Core	ME.A.2.2.a.ii	Endline Uganda Care Repair Paper	incomplete	incomplete
Core	ME.b	Care & Repair Evaluation Design Document	August 15, 2011	https://www.k4health.org/toolkits/care-repair-LLIN
Core	ME.B.1, PC.b.4	Community Redistribution Of LLINs Study - What Happens To Lost Nets Paper	November 18, 2014	http://www.malariajournal.com/content/pdf/1475-2875-13-464.pdf
Core	ME.B.2	Late Breaker Abstracts ASTMH, Final Ppts/Posters	November 20, 2013	https://www.k4health.org/sites/default/files/networks_apha_and_astmh.zip
Core	ME.c	Training Curriculum On How To Count Holes	September 20, 2012	https://www.k4health.org/toolkits/care-repair-LLIN/hole-index-training-materials
Core	ME.C.1	Multi-Country Comparison Of Universal Coverage Campaign Outcomes Publishable Paper	in review	in review

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Core	ME.D.1, ME.a.	Culture Of Net Use Study Protocols, Research Tools, Phase 1 Reports	11/2/12	https://www.k4health.org/sites/default/files/sconu_final_report_phase1b_0.pdf
Core	ME.D.1.a	Publication Of Senegal CONU Papers	9/17/2013, 8/14/14, 9/12/14	http://www.malariajournal.com/content/pdf/1475-2875-12-337.pdf , http://www.malariajournal.com/content/pdf/1475-2875-13-322.pdf , http://www.malariajournal.com/content/pdf/1475-2875-13-357.pdf
Core	ME.D.1.b	Publication Of Uganda CONU Papers	3/6/14, 5/17/14,	http://www.malariajournal.com/content/pdf/1475-2875-13-183.pdf http://www.malariajournal.com/content/pdf/1475-2875-13-82.pdf
Core	ME.D.2, BC.b, ME.i	BCC Impact Evaluation Of Community Change Agents (CCAs) On LLIN Use Tanzania (Cost Shared With COMMIT Project)	December 22, 2014	http://www.malariajournal.com/content/pdf/s12936-014-0531-0.pdf
Core	ME.D.3, BC.c	Low Transmission Messaging Study In Tanzania	June 13, 2013	http://www.malariajournal.com/content/12/1/203
Core	ME.D.5	ITN Use Vs. Access Manuscript	May 21, 2014	http://www.plosone.org/article/fetchObject.action?uri=info:doi/10.1371/journal.pone.0097496&representation=PDF
Core	ME.D.6	Secondary Analysis Of THMIS Dataset For Impact Of BCC On Net Use	cancelled	cancelled
Core	ME.D.7	Publication Fees For Article On ITN Access And Use Among Pregnant Women	April 4, 2014	http://www.ghspjournal.org/content/2/2/165.full.pdf
Core	ME.f	Feasibility Report For Mhealth In ITN Distribution	cancelled	cancelled
Core	ME.F.1.a, ME.d,	Modeling The Influence Of LLIN Coverage On Malaria Transmission	January 13, 2012	http://www.malariajournal.com/content/pdf/1475-2875-11-20.pdf

Funding Source	Activity #	Deliverable Activity	Date completed	Location
	ME.B.3			
Core	ME.F.1.b	Modeling The Influence Of Continuous Distribution On Malaria Transmission	November 4, 2013	http://www.malariajournal.com/content/pdf/1475-2875-12-401.pdf
Core	ME.F.2, ME.g	Senegal Sleeping Spaces Study English Translation	February 28, 2012	https://www.k4health.org/sites/default/files/study_on_the_efficacy_of_the_sleeping-space_registration_strategy_senegal.pdf
Core	PC.A.1	VCWG Durability Workstream Meeting - Lyon	November 6, 2012	http://rbm.who.int/mechanisms/vcwgWorkstream4.html
Core	PC.a.1, PC.C.2	Universal Coverage Quantification Guidance Memo	cancelled	cancelled
Core	PC.A.1.b	Literature Review On Rodent Control And Mitigation Of Rat Damage To LLIN Options.	August 8, 2013	http://www.networksmalaria.org/sites/default/files/Rat%20Paper%20Report%20Format%20Aug82013%20%282%29.pdf
Core	PC.B.1.b	CD Strategy Meeting Held In Washington DC In November 2013 During The ASTMH Meeting	November 18, 2013	http://rbm.who.int/partnership/wg/wg_itn/docs/vcwg6report1.pdf
Core	PC.B.1.c	"Fragile Gains" Article Highlighting Global Fund Investments And Potential Gaps	November 8, 2013	http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0083816
Core	PC.B.1.d	Prioritization Of LLINs In Conditions Of Scarcity: Draft Recommendations Prepared For VCTEG.	December 30, 2014	on file
Core	PC.B.1.f	Incorporating Continuous Distribution Components In Country Strategic Plans For GFATM Funding ; Updating Technical Guidelines; Training HWG Consultants; In-Country Visits To Plan CD	incomplete	incomplete
Core	PC.B.1.g	Attendance At MERG Meetings In FY 2014	June 30, 2014	on file
Core	PC.B.1.h	Support GMP To Hold The VCTEG Meeting	cancelled	cancelled

Funding Source	Activity #	Deliverable Activity	Date completed	Location
		In Time To Reach MPAC		
Core	PC.b.2, PC.B.3.b	Case Studies In Routine Distribution, Experiences And Best Practices Document	March 13, 2012	http://www.rbm.who.int/partnership/wg/wg_itn/docs/ws3/4-LLIN_Keep_Up_Guide.pdf
Core	PC.B.2.a, PC.b.6	Private Sector In Continuous Distribution Background Paper On Barriers To Retailing LLINs	December 30, 2014	on file
Core	PC.b.3	Continuous Distribution Workstream Meetings	February 8, 2011	http://rbm.who.int/partnership/wg/wg_itn/docs/vcwg6report1.pdf
Core	PC.B.3.c, PC.c, PC.B.1	Continuous Distribution Strategy Guide	March 5, 2012	http://rbm.who.int/partnership/wg/wg_itn/docs/ws3/3-Guide_to_continuous_distribution_strategy.pdf
Core	PC.B.3.d	Updated Universal Coverage Indicators Included In MIS Household Survey Guidance	June 1, 2013	http://www.rollbackmalaria.org/toolbox/docs/rbmtoolbox/tool_HouseholdSurveyIndicatorsForMalariaControl.pdf
Core	PC.B.3.e	Review Of Global Fund LLIN Gap Analysis Report	March 1, 2012	http://rbm.who.int/partnership/wg/wg_itn/docs/ws3/2-GF_Routine_Nets_Review.pdf
Core	PC.B.3.f	Case Studies In Routine ITN Distribution	November 15, 2012	http://rbm.who.int/mechanisms/vcwgWorkstream3.html
Core	PC.B.5.a.1	Uganda Phase 3 Culture Of Net Use - Malaria In Pregnancy Topline Report	September 25, 2014	https://www.k4health.org/sites/default/files/uconu_phase_3_malaria_in_pregnancy_topline_report_final.pdf
Core	PC.B.5.a.2	ANC/EPI Assessment Of ITN Availability In 4 Countries	December 22, 2014	https://www.k4health.org/sites/default/files/networks_anc-epi_llin_distribution_reports_final_dec_15_2014.zip
Core	PC.B.5.b.2	Editorial To Ensure ANC/EPI ITN Deliveries Are Not Interrupted During Mass Campaigns	September 9, 2014	http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1001717
Core	PC.B.5.b.2.1	Add A Question On "Source Of Net" To MIS	January 4, 2014	http://www.rollbackmalaria.org/toolbox/docs/rbmtoolbox/tool_HouseholdSurveyIndicatorsForMalariaControl.pdf

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Core	PC.B.5.b.2.2	Add A Question On Whether Pregnant Woman Received A Net At ANC To MIS	cancelled	cancelled
Core	PC.C.5, LD.B.5	Input Into Value For Money In LLIN Specifications Report With R4D	June 1, 2012	http://r4d.org/sites/resultsfordevelopment.org/files/resources/v1_R4D_VFM%20in%20LLIN_0215.pdf
Core	PC.C.6	When To Conduct Urban Distribution Paper	cancelled	cancelled
Core	PC.C.7	Case Study On Using ITNs To Respond To Outbreaks Of Malaria	cancelled	cancelled
Core	PC.D.	Report On Misuse Of ITNs	incomplete	incomplete
Core	PC.d.1	Literature Review Of Net Durability	cancelled	cancelled
Core	PC.e	Net Recycling Presentation	February 28, 2011	conducted by DELIVER
Core	PC.E	Costing Analysis Of CD Channels In Ghana	February 4, 2015	https://www.k4health.org/sites/default/files/ghana_llin_continuous_distribution_cost_analysis_2015-2-4.pdf
Core	PC.f	Leadership In Strategic Health Communication For Malaria Workshop	March 5, 2012	https://www.k4health.org/sites/default/files/francophone_lshc_training_report.zip
Core	PC.g	Input Into Round 11 HWG Guidance Note For BCC Section	February 21, 2012	http://rbm.who.int/mechanisms/hwg.html
Core	PM.F.1	Project Close Out Plans	May 15, 2014	on file
Core	PM.F.2	Core End Of Project Event	September 16, 2014	https://www.k4health.org/sites/default/files/pm.f.2_eop_event_presentations.zip
Africa Bureau	AF.B.1	E Coupon Pilot - Case Study	February 7, 2014	https://www.k4health.org/sites/default/files/networks_summary_e-coupon_pilot_2015-jan.pdf
Africa Bureau	AF.1	South Sudan Pilot Implementation (Report)	February 14, 2014	https://www.k4health.org/sites/default/files/south_sudan_cd_evaluation_report_0.pdf
Burundi	BI.1	Burundi Campaign TA	November 13, 2014	https://www.k4health.org/sites/default/files/rapport_synthese_appui_burundi_vf.docx

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Burundi	BI.2	Burundi CD Intro Workshop	November 13, 2014	https://www.k4health.org/sites/default/files/options_and_implementation_guidelines_for_cd_in_burundi_-_english.pdf
Burundi	BI.3	Burundi National CD Assessment	November 13, 2014	https://www.k4health.org/sites/default/files/options_and_implementation_guidelines_for_cd_in_burundi_-_english.pdf
Burundi	BI.4	Burundi Supply Chain Assessment	November 13, 2014	https://www.k4health.org/sites/default/files/options_and_implementation_guidelines_for_cd_in_burundi_-_english.pdf
Burundi	BI.5	Burundi CD Strategy Document	November 13, 2014	https://www.k4health.org/sites/default/files/options_and_implementation_guidelines_for_cd_in_burundi_-_english.pdf
Burundi	BI.6	Burundi CD Pilot - Canceled	cancelled	Cancelled
DRC	DRC.1.a	DRC Terms Of Reference For ANC Assessment	March 18, 2014	https://www.k4health.org/sites/default/files/final_networks_drc_report_2014-12-1.pdf
DRC	DRC.1.b	DRC ANC Assessment Visit And Report	December 1, 2014	https://www.k4health.org/sites/default/files/final_networks_drc_report_2014-12-1.pdf
Ghana	GH.1	Ghana CD Assessment Trip Report	April 20, 2012	on file
Ghana	GH.2	Ghana CD Assessment Implementation Guidelines	April 20, 2012	https://www.k4health.org/sites/default/files/draft_cd_imp_guidelines_9.pdf
Ghana	GH.BC.1	Strategy Development And Materials Workshop	March 2, 2013	https://www.k4health.org/toolkits/networks-country-resources/behavior-change-communication-0
Ghana	GH.BC.2	BCC Materials In Collaboration With BCS Project	April 8, 2013	https://www.k4health.org/toolkits/networks-country-resources/behavior-change-communication-0
Ghana	GH.BC.3.a	National Community Mobilisation Materials And Reports	September 16, 2014	https://www.k4health.org/toolkits/networks-country-resources/behavior-change-communication-0
Ghana	GH.BC.3.b	National Community Radio Activities	September 16, 2014	https://www.k4health.org/toolkits/networks-country-resources/behavior-change-communication-0

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Ghana	GH.BC.4	Northern Zone Community Mobilisation Materials And Reports	September 16, 2014	on file
Ghana	GH.LD.1	Final Guidelines For CD Strategy	September 16, 2014	https://www.k4health.org/toolkits/networks-country-resources/net-distribution
Ghana	GH.LD.2	Regional Review Meetings	September 16, 2014	on file
Ghana	GH.LD.3	Start Up Stakeholder Meetings	September 16, 2014	on file
Ghana	GH.LD.4.a	Training Manual For Health Facility Staff	August 9, 2014	https://www.k4health.org/sites/default/files/ghana_health_facilities_llin_sopfinal19914.pdf
Ghana	GH.LD.4.b	Intensive And Routine Supervision Reports	September 16, 2014	on file
Ghana	GH.LD.4.c	(DELIVER) - Movement Of ITNs To Health Facilities	September 16, 2014	n/a
Ghana	GH.LD.4.d	Rollout Of HF Distribution	September 16, 2014	n/a
Ghana	GH.LD.5.a	National Level Advocacy For School Distribution	September 16, 2014	on file
Ghana	GH.LD.5.b	Regional Advocacy Meetings For SHEP Etc	September 16, 2014	https://www.k4health.org/toolkits/networks-country-resources/net-distribution
Ghana	GH.LD.5.c	Launch Of School Distribution	March 5, 2013	https://www.k4health.org/toolkits/networks-country-resources/net-distribution
Ghana	GH.LD.5.d	School Distribution And Supervision Reports	September 1, 2014	https://www.k4health.org/sites/default/files/training_manual_-_basic_schools_27_july_2012-all_units.pdf
Ghana	GH.ME.1	Endline Survey Report For Eastern Region	March 15, 2014	https://www.k4health.org/sites/default/files/eastern_region_endline_report_final.pdf
Ghana	GH.ME.2	Eastern Region Process Evaluation Report	May 24, 2013	https://www.k4health.org/sites/default/files/report_-_process_evaluation_of_eastern_region_llin_continuous

Funding Source	Activity #	Deliverable Activity	Date completed	Location
				_distribution_pilot_1.pdf
Ghana	GH.ME.3	Northern Ghana Outdoor Sleeping Study Concept Note, Field Report, Research Report	January 5, 2015	http://www.malariajournal.com/content/pdf/s12936-015-0543-4.pdf
Ghana	GH.ME.4	Monitoring Progress In Net Ownership And Use Reports	September 16, 2014	on file
Ghana	GH.PC.1.1	Stakeholders Meeting	September 16, 2014	on file
Ghana	GH.PC.2	Official CD Launch Event	September 16, 2014	on file
Ghana	GH.PC.3	Support Revision Of Ghana's LLIN Strategy	September 16, 2014	https://www.k4health.org/toolkits/networks-country-resources/net-distribution
Ghana	GH.PC.4.a	Facilitate LLIN Subcommittee Meetings	September 16, 2014	on file
Ghana	GH.PC.4.b	Travel For COP And PM To VCWG/AMP	September 16, 2014	on file
Ghana	GH.PC.4.c	MAVCOC Meetings	September 16, 2014	on file
Ghana	GH.PC.4.d	CD Strategy Meetings	September 16, 2014	on file
Ghana	GH.PC.4.e	Eastern Region Results Dissemination Meeting Presentations	September 16, 2014	https://www.k4health.org/toolkits/networks-country-resources/net-distribution
Ghana	GH.PC.5	Assess Opportunities For Private Sector	incomplete	incomplete
Ghana	GH.PM.1.a	Project Close Out Meeting And Presentations	September 16, 2014	https://www.k4health.org/toolkits/networks-country-resources/net-distribution
Ghana	GH.PM.2	TA And Travel	September 16, 2014	on file
Ghana	GH.PM.3	Peace Corps Placements	incomplete	incomplete

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Ghana	GH.PM.4	Workplan And Reporting	September 16, 2014	on file
Liberia	LI.1	TA For Liberia Campaign	December 30, 2014	on file
Madagascar	MG.1	Madagascar CD Planning Assessment	May 8, 2013	https://www.k4health.org/sites/default/files/madagascar_trip_report_netcalc_workshop_and_cd_options_analysis.doc
Madagascar	MG.2	Madagascar ITN Supply Chain Assessment For CD Strategy Design	May 8, 2013	https://www.k4health.org/sites/default/files/madagascar_trip_report_netcalc_workshop_and_cd_options_analysis.doc
Madagascar	MG.3.a	Madagascar Design Of CD Strategy	May 8, 2013	https://www.k4health.org/toolkits/networks-country-resources/materials-continuous-distribution-pilot
Madagascar	MG.3.b	Madagascar Implementation Of CD Pilot - Strategy Document And Materials	March 5, 2014	https://www.k4health.org/toolkits/networks-country-resources/materials-continuous-distribution-pilot
Madagascar	MG.4.a	Madagascar Midterm CD Process Evaluation Report	March 5, 2014	https://www.k4health.org/sites/default/files/networks_madagascar_evaluation_a_miparcours_du_projet_pilote.pdf
Madagascar	MG.4.b	Madagascar Community-Level Analysis Report	September 30, 2014	https://www.k4health.org/sites/default/files/mada_final_rapport_cd_toamasina_ii_2014-9-30_english.pdf
Madagascar	MG.4.c	Madagascar Final Evaluation Report CD Pilot	September 30, 2014	https://www.k4health.org/sites/default/files/mada_final_rapport_cd_toamasina_ii_2014-9-30_english.pdf
Mali	ML.1	Mali Communication Strategy Update - Cost Shared With HC3	October 22, 2014	https://www.k4health.org/sites/default/files/mali_-_malaria_communication_strategy_-_english_final.pdf
Mali	ML.2	Mali Process Evaluation Of Kayes ITN Campaign	July 15, 2014	https://www.k4health.org/sites/default/files/kayes_process_evaluation_-_final_for_pmi_with_photos.doc
Mali	ML.3	Mali Publication Of Sikasso/Kayes Culture Of Net Use Paper	November 18, 2014	http://www.malariajournal.com/content/pdf/1475-2875-13-435.pdf

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Nigeria	NG.ME.1	Nasarawa Post LLIN Campaign Evaluation Survey/ Community Distribution Endline Evaluation Paper/Report And Presentation	August 11, 2014	https://www.k4health.org/sites/default/files/nasarawa_cd_prelim_results_2014-7-27.pptx
Nigeria	NG.ME.2	Cross River Post LLIN Campaign Evaluation Survey/Evaluation Of School-Based Distribution Paper/Report And Presentation	August 11, 2014	https://www.k4health.org/sites/default/files/school_distribution_pilot_results_of_2nd_in_cross_river_2013_0.pdf
Nigeria	NG.OR.1.a	Nigeria Care Repair Baseline And Two Follow-Up Survey Reports	December 21, 2014	http://www.malariajournal.com/content/pdf/s12936-014-0538-6.pdf
Nigeria	NG.OR.1.b	Nigeria Care Repair Behavior Change Communication Intervention - Materials Posted To Online Toolkit, Final Campaign Report	May 29, 2014	https://www.k4health.org/toolkits/care-repair-LLIN , https://www.k4health.org/sites/default/files/ncr.17_final_netcare_report_pdf.pdf
Nigeria	NG.OR.2	Social Life Of Nets Study	cancelled	Cancelled
Nigeria	NG.P.1	Continuous Distribution By Community Drug Distributors In Nasarawa State (All 13 Lgas) -Monitoring Visit Reports, Case Study	December 17, 2013	https://www.k4health.org/toolkits/continuous-distribution-malaria/community-based-distribution-resources
Nigeria	NG.P.2	School-Based Distribution In Cross River State - Post-Distribution Reports, Job Aids, Tools Posted To Online Toolkit	July 14, 2014	https://www.k4health.org/toolkits/continuous-distribution-malaria/communication-materials
Nigeria	NG.P.3	Community-Based Distribution In Zamfara Monitoring Visit Reports	March 20, 2013	https://www.k4health.org/sites/default/files/zamfara_cd_monitoring_report_june_july_2014.doc
Nigeria	NG.P.4.	Private Sector Assessment Report In Sokoto	January 7, 2014	https://www.k4health.org/sites/default/files/sokoto_assessment_report-for_pmi1.doc
Nigeria	NG.PM.1	Nigeria Close Out Plan, End Of Project Event, And Tools Posted To Online Toolkits	August 11, 2014	https://www.k4health.org/toolkits/networks-country-resources/nigeria

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Nigeria	NG.TA.1	Technical Assistance And Coordination Support To NMCP And PMI/USAID Implementation Partner MAPS For Final SOP For CD, SOP Workshop.	August 11, 2014	https://www.k4health.org/toolkits/networks-country-resources/standard-operating-procedures-continuous-distribution-itns-0
RDMA	RDMA.1.	Behavioural Research To Better Understand Consumer Preferences And Barriers To Use Of LLINs In Burma	December 22, 2014	https://www.k4health.org/toolkits/networks-country-resources/mekong-region
RDMA	RDMA.2	Rapid Coverage Monitoring Of Net Distribution In Burma	December 22, 2014	https://www.k4health.org/toolkits/networks-country-resources/mekong-region
RDMA	RDMA.3	Qualitative Assessment Of Personal Protection Measures And Behaviours Among At Risk Populations Along The Lao PDR, Viet Nam, And Cambodia Borders ("Forest Triangle")	December 22, 2014	https://www.k4health.org/toolkits/networks-country-resources/mekong-region
RDMA	RDMA.4	Cambodia NetCALC Assessment	December 22, 2014	https://www.k4health.org/toolkits/networks-country-resources/mekong-region
Senegal	SN.BC.1	Develop communication plan/strategy/slogan	August 15, 2010	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.BC.1.a	A follow up "post mass distribution" communication strategy for phase in UC districts developed, validated and implemented	August 15, 2010	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.BC.1.a	National, regional and district level BCC strategies planned and implemented	September 29, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.BC.1.b	Umbrella campaign design workshop	October 20, 2014	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.BC.2	"Trois toutes" training materials and	June 17, 2012	https://www.k4health.org/toolkits/networks-country-

Funding Source	Activity #	Deliverable Activity	Date completed	Location
		modules developed for health staff		resources/senegal-0
Senegal	<i>SN.BC.2.a</i>	Development and dissemination of job aids and counseling cards to improve interpersonal communications and standardize messages	October 15, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.BC.2.b</i>	LLIN job aids developed for integration into standard child health home visit package	November 11, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.BC.2.c</i>	Senegal BCC materials uploaded to websites	October 13, 2013	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.BC.3.a</i>	Production and distribution of revised materials and radio spots	August 22, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.BC.3.b</i>	Broadcast of LLIN drama series on 30 community radio stations	April 5, 2014	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.BC.3.c</i>	Professional recording of 5 radio spots in French and Wolof	August 1, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.BC.3.d</i>	Radio/TV spots and programs pretested, produced and broadcast	June 10, 2013	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.BC.4</i>	Develop stories on networks social mobilizations and advocacy initiatives and post to the web	May 9, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.BC.5</i>	Develop and maintain online UC toolkit	April 5, 2014	https://www.k4health.org/toolkits/networks-country-resources/senegal-1
Senegal	<i>SN.BC.6</i>	Poster presentation on the "trois toutes" at the JHUCCP enter-educate conference,	November 17, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0

Funding Source	Activity #	Deliverable Activity	Date completed	Location
		New Delhi		
Senegal	<i>SN.BC.7</i>	Leadership in strategic health communication workshop (advances)	January 31, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.BC.7.a</i>	Leadership in strategic health communication workshop report	March 5, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.1</i>	UC campaign distribution round one: Sedhiou, Kolda/Velingara, Kedougou, Tambacounda - distribution plan; committees formed	May 9, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.1.a</i>	UC campaign distribution round one trainings for regional staff and community volunteers;	March 5, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.1.b</i>	UC campaign distribution round one communications prepared and disseminated;	November 5, 2010	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.1.c</i>	UC campaign distribution round one nets delivered to districts	January 17, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.1.d</i>	Phase iv distribution reports	January 31, 2013	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.1.e</i>	Technical assistance to UC phase vi mass distributions operations in Thies and Dakar	August 31, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.1.f</i>	Tools and technical guidelines updated and disseminated for UC mass	October 11, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0

Funding Source	Activity #	Deliverable Activity	Date completed	Location
		distributions		
Senegal	SN.LD.2	UC campaign – round two: Fatick, Kaolack/Kaffrine, Diourbel, Matam (note: to be confirmed) distribution plan and reports	June 20, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.LD.2.a	Phase v distribution reports	March 12, 2013	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.LD.2.b	Phase vi, Dakar distribution reports	September 24, 2013	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.LD.2.b.1	Omnibus survey to inform design of Dakar urban strategy	October 15, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.LD.3	Routine distribution (strategy workshop held; strategy/policy agreed upon; training materials updated and revised; IEC materials for beneficiaries reviewed for update in fy11; nets procured for routine distribution in fy11)	March 9, 2013	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.LD.3.a	Technical guidelines for ANC validated	October 12, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.LD.3.b	Design and implementation of comprehensive community distribution model in Louga	April 29, 2013	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.LD.4	CD assessment	July 24, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Senegal	<i>SN.LD.4.a</i>	CD assessment report	November 5, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.4.b</i>	Continuous distribution assessment results/dissemination meeting	March 5, 2013	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.4.c</i>	Design of comprehensive community distribution model in Ziguinchor	December 3, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.5</i>	Targeted supportive supervision for facility-based distribution to 8 regions	May 25, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.5.a</i>	Regular supervision reports to the field	n/a	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.6</i>	Transportation and logistics to support the transportation of LLINs for routine distribution through health facilities	October 10, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.LD.7</i>	Monthly "stage reports" prepared by networks and shared with the NCC	n/a	on file
Senegal	<i>SN.LD.7.a</i>	Quarterly reports on district level activities prepared and circulated, including numbers of LLINs distributed and people trained for mass distribution and routine channels	n/a	on file
Senegal	<i>SN.LD.8</i>	Executive summary report (consultant)	January 17, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.1.a</i>	UC phases i-iv - develop tors	n/a	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.1.b</i>	UC phases i-iv mass distribution, process	February 28,	https://www.k4health.org/toolkits/networks-country-resources/senegal-0

Funding Source	Activity #	Deliverable Activity	Date completed	Location
		review implemented	2011	resources/senegal-0
Senegal	<i>SN.ME.1.c</i>	Off-site workshop held with partners to finalize UC phases guidance document	February 3, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.1.d</i>	Document dissemination	March 4, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.2.a</i>	Process evaluation of the Senegal phase ii mass distribution	November 16, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.3.a</i>	Sleeping spaces methodology developed and approved	January 24, 2012	on file
Senegal	<i>SN.ME.3.b</i>	Sleeping spaces evaluation completed and preliminary results shared with the NCC	August 31, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.3.c</i>	Sleeping space study manuscript	cancelled	cancelled
Senegal	<i>SN.ME.4.a</i>	Formative research on factors determining non-use of nets conducted		https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.4.b</i>	Partners meeting to share preliminary findings from formative research	May 14, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.4.c</i>	SCONU evaluation design document; formative research plans	March 23, 2014	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.4.d</i>	SCONU final report on barriers to net use in Senegal; report on the challenges of calculating "net need"	March 23, 2014	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.5.a</i>	Culture of net use study implemented and preliminary findings shared with the NCC	November 1, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.6</i>	Additional questions submitted to	September 8,	https://www.k4health.org/toolkits/networks-country-resources/senegal-0

Funding Source	Activity #	Deliverable Activity	Date completed	Location
		MeasureDHS	2010	resources/senegal-0
Senegal	<i>SN.ME.7</i>	UC monitoring model developed	February 15, 2013	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.ME.8</i>	Manuscript on perceptions and behaviors related to mosquito net damage, care and repair Senegal	February 15, 2014	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.PC.1</i>	Draft national policy for UC in Senegal	July 20, 2010	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.PC.1.a</i>	Universal coverage strategy planned and communicated	August 10, 2010	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.PC.2</i>	First quarter review meetings with the NMCP and PMI	August 15, 2011	on file
Senegal	<i>SN.PC.2.a</i>	Second quarter review meetings with the NMCP and PMI	March 15, 2012	on file
Senegal	<i>SN.PC.3</i>	Routine distribution policy reviewed and updated	December 5, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.PC.4</i>	Terms of reference developed for the LLIN comité de suivi and sub committees based in Dakar and the regions	July 6, 2010	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.PM.1.a</i>	Partners meeting to review challenges and accomplishments from UC operations in fy10	October 9, 2010	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	<i>SN.PM.1.b</i>	Partners meeting to review challenges and accomplishments from UC operations in fy11	October 13, 2011	https://www.k4health.org/toolkits/networks-country-resources/senegal-0

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Senegal	SN.PM.1.c	Partners meeting to review challenges and accomplishments from UC operations in fy12	October 15, 2012	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.PM.2	Networks Senegal website	December 15, 2010	www.networksmalaria.org/networks/senegal
Senegal	SN.PM.3	Networks Senegal legacy document	April 17, 2014	https://www.k4health.org/toolkits/networks-country-resources/senegal-0
Senegal	SN.1	Senegal upload and share BCC materials to websites	October 24, 2014	https://www.k4health.org/toolkits/networks-country-resources/behavior-change-communication
Senegal	SN.2	Senegal travel support to VCWG for two PNLP	February 11, 2013	on file
Senegal	SN.3	Senegal sleeping space study manuscript	cancelled	cancelled
Senegal	SN.4	Senegal translation of videos into local languages for rebroadcast	December 6, 2014	on file
Senegal	SN.5	Senegal umbrella malaria BCC campaign design workshop	incomplete	incomplete
Uganda	UG.LD.B.1	Uganda Technical Assistance To Net Distribution	cancelled	Cancelled
Uganda	UG.ME.A.2.g	Uganda Care Repair Materials Uploaded To Online Toolkit	August 9, 2014	https://www.k4health.org/toolkits/care-repair-LLIN
Uganda	UG.ME.A.2.h	Uganda Care Repair Presentation On Endline Findings	December 8, 2014	https://www.k4health.org/sites/default/files/ccp_brown_bag_-_net_care_and_repair_03feb2015-final.ppt
Uganda	UG.ME.A.2.a	Uganda Care Repair Formative Research Paper	December 17, 2014	http://www.malariajournal.com/content/pdf/1475-2875-13-504.pdf
Uganda	UG.ME.A.2.b	Uganda Care Repair Baseline Survey Report	June 4, 2013	https://www.k4health.org/sites/default/files/uganda_care_and_repair_baseline_survey_report-forpmi_0.pdf

Funding Source	Activity #	Deliverable Activity	Date completed	Location
Uganda	UG.ME.A.2 c-d.	Uganda Develop, Pre-Test And Implement An SBCC Campaign	December 19, 2014	https://www.k4health.org/toolkits/care-repair-LLIN
Uganda	UG.ME.A.2 e-f	Uganda Care Repair Endline Survey Report/Manuscript	incomplete	incomplete
Uganda	UG.ME.D.1 .a	UCONU Phase 1 Research Report	November 13, 2012	https://www.k4health.org/toolkits/networks-country-resources/uganda-culture-mosquito-net-use-study-phase-i
Uganda	UG.ME.D.1 .b	UCONU Phase 2 Research Report or Paper	May 17, 2014	http://www.malariajournal.com/content/13/1/183
Uganda	UG.ME.D.1 .c	UCONU Phase 3 Research Report or Paper	September 25, 2014	https://www.k4health.org/sites/default/files/uconu_phase_3_malaria_in_pregnancy_toplevel_report_final.pdf
Uganda	UG.ME.D.1 .d	UCONU Phase 4 Research Report	cancelled	Cancelled
Uganda	UG.ME.D.1 .e	UCONU Publishable-Quality Paper based on Phase 3 Findings	September 25, 2014	https://www.k4health.org/sites/default/files/uconu_phase_3_malaria_in_pregnancy_toplevel_report_final.pdf
Zambia	ZM.1	Zambia CD Assessment	March 6, 2014	on file
Zambia	ZM.2	Zambia Care & Repair Strategy And Materials Development Workshop	November 26, 2014	on file

11.4 Abstracts for Peer-Reviewed Journal Articles and Reports, 2009–2014

1. [How many mosquito nets are needed to achieve universal coverage? Recommendations for the quantification and allocation of long-lasting insecticidal nets for mass campaigns](#)

Kilian A., Boulay M., Koenker H. and Lynch M.

Malaria Journal 9:330 (2010)

Highly accessed

Background

Long-lasting insecticidal nets are an effective tool for malaria prevention, and "universal coverage" with such nets is increasingly the goal of national malaria control programmes. However, national level campaigns in several countries have run out of nets in the course of distribution, indicating a problem in the method used to estimate the quantity needed.

Presentation of Hypothesis

A major reason for the shortfall in estimation is the mismatch between the quantification factor used to plan procurement and the allocation algorithm used at community level, in particular the effect of needing to add an additional net to households with an odd number of inhabitants. To solve this problem a revised quantification factor is suggested.

Testing Hypothesis

Based on data from a broad range of household surveys across Africa, the effect of odd-numbered households on numbers of nets distributed is estimated via two frequently used allocation methods. The impact of these algorithms on the proportion of households reaching a person to net ratio of 2:1, a frequently used marker of universal coverage is then calculated.

Implications

In order to avoid stock-outs of nets during national coverage campaigns, it is recommended to use a quantification factor of 1.78 people per net, with an additional allocation factor suggested to account for other common problems at the community level resulting in a final recommended ratio of 1.60 people per net. It is also recommended that community level allocation procedures be aligned with procurement estimates to reduce shortages of nets during campaign distributions. These analyses should enable programme managers to make evidence-based decisions and support a more efficient and effective use of LLIN distribution campaign resources.

2. [Trends in weekly reported net use by children during and after rainy season in central Tanzania](#)

Koenker H., Munoz B., Boulay M., Mkocho H., Levens J., West S. K. and Lynch M.

Malaria Journal 11:218 (2012)

Background

The use of long-lasting insecticidal nets (LLINs) is one of the principal interventions to prevent malaria in young children, reducing episodes of malaria by 50% and child deaths by one fifth. Prioritizing young children for net use is important to achieve mortality reductions, particularly during transmission seasons.

Methods

Households were followed up weekly from January through June 2009 to track net use among children under seven under as well as caretakers. Net use rates for children and caretakers in net-owning households were calculated by dividing the number of person-weeks of net use by the number of person-weeks of follow-up. Use was stratified by age of the child or caretaker status. Determinants of ownership and of use were assessed using multivariate models.

Results

Overall, 60.1% of the households reported owning a bed net at least once during the study period. Among net owners, use rates remained high during and after the rainy season. Rates of use per person-week decreased as the age of the child rose from 0 to six years old; at ages 0-

23 months and 24-35 months use rates per person-week were 0.93 and 0.92 respectively during the study period, while for children ages 3 and 4 use rates per person-week were 0.86 and 0.80. For children ages 5-6 person-week ratios dropped to 0.55. This represents an incidence rate ratio of 1.67 for children ages 0-23 months compared to children aged 5-6. Caretakers had use rates similar to those of children age 0-35 months. Having fewer children under age seven in the household also appeared to positively impact net use rates for individual children.

Conclusions

In this area of Tanzania, net use is very high among net-owning households, with no variability either at the beginning or end of the rainy season high transmission period. The youngest children are prioritized for sleeping under the net and caretakers also have high rates of use. Given the high use rates, increasing the number of nets available in the household is likely to boost use rates by older children.

3. [Importance of factors determining the effective lifetime of a mass, long-lasting, insecticidal net distribution: a sensitivity analysis](#)

Briet O. J., Hardy D. and Smith T. A.

Malaria Journal 11(1):20 (2012)

Highly accessed

Background

Long-lasting insecticidal nets (LLINs) reduce malaria transmission by protecting individuals from infectious bites, and by reducing mosquito survival. In recent years, millions of LLINs have been distributed across sub-Saharan Africa (SSA). Over time, LLINs decay physically and chemically and are destroyed, making repeated interventions necessary to prevent a resurgence of malaria. Because its effects on transmission are important (more so than the effects of individual protection), estimates of the lifetime of mass distribution rounds should be based on the effective length of epidemiological protection.

Methods

Simulation models, parameterised using available field data, were used to analyse how the distribution's effective lifetime depends on the transmission setting and on LLIN characteristics. Factors considered were the pre-intervention transmission level, initial coverage, net attrition, and both physical and chemical decay. An ensemble of 14 stochastic individual-based model variants for malaria in humans was used, combined with a deterministic model for malaria in mosquitoes.

Results

The effective lifetime was most sensitive to the pre-intervention transmission level, with a lifetime of almost 10 years at an entomological inoculation rate of two infectious bites per adult per annum (ibpapa), but of little more than 2 years at 256 ibpapa. The LLIN attrition rate and the insecticide decay rate were the next most important parameters. The lifetime was surprisingly insensitive to physical decay parameters, but this could change as physical integrity gains importance with the emergence and spread of pyrethroid resistance.

Conclusions

The strong dependency of the effective lifetime on the pre-intervention transmission level indicated that the required distribution frequency may vary more with the local entomological situation than with LLIN quality or the characteristics of the distribution system. This highlights the need for malaria monitoring both before and during intervention programmes, particularly since there are likely to be strong variations between years and over short distances. The majority of SSA's population falls into exposure categories where the lifetime is relatively long, but because exposure estimates are highly uncertain, it is necessary to consider subsequent interventions before the end of the expected effective lifetime based on an imprecise transmission measure.

4. [Estimating population access to insecticide-treated nets from administrative data: correction factor is needed](#)

Kilian A., Koenker H. and Paintain L.
Malaria Journal 12:259 (2013)

Background

Population access to insecticide-treated nets (ITN) is usually determined from survey data. However, for planning purposes it is necessary to estimate this indicator between surveys. Two different approaches are currently recommended for such estimates from administrative data, multiplying the number of ITN delivered either by 2.0 or 1.8 before dividing by the population. However, the validity of such estimates has not previously been investigated.

Methods

Thirty-five datasets from household surveys in sub-Saharan Africa were selected from ten different countries. The number of ITN and de-facto population from the samples was used as proxy administrative data and estimates of population access to ITN were calculated using the recommended formulae. Administrative estimates were compared to the access indicator from the survey data. Regression analysis was used to further define the relationship between administrative and survey population access. Mean number of ITN users was determined for each data set separately for households with and without enough ITN.

Results

Analysis of users per ITN showed that the assumption of two users per net is valid overall (median 2.00) but that it was consistently lower in households with at least one ITN for every two people (median 1.66). Using the formula number of ITN times 2.0 divided by the population to estimate population access to ITN from administrative data generally overestimated the survey access indicator. This was particularly the case at higher coverage levels, resulting in a 30 percentage-point overestimate at survey access above 80%. Using 1.8 as the multiplier for the number of ITN from administrative data improved the results but still showed a 19 percentage-point overestimate at access coverage above 80%. Regression analysis found that a factor of 1.64 provides the best prediction of the access indicator with slight underestimation at low access levels but good fit at levels above 55%.

Conclusions

A factor of 1.6 rather than 2.0 or 1.8 as the mean number of users per ITN provides a more accurate estimation of population access to ITN from administrative data accounting for discordant ITN-person pairs and a reduced number of ITN users when sufficient ITN are available.

5. [Sustaining fragile gains: the need to maintain coverage with long-lasting insecticidal nets for malaria control and likely implications of not doing so](#)

Paintain L. S., Kolaczinski J., Renshaw M., Filler S., Kilian A., Webster J., Lokko K. and Lynch M.
PLoS One 8(12):e83816 (2013)

Background

Global commitment to malaria control has greatly increased over the last decade. Long-lasting insecticidal nets (LLINs) have become a core intervention of national malaria control strategies and over 450 million nets were distributed in sub-Saharan Africa between 2008 and 2012. Despite the impressive gains made as a result of increased investment in to malaria control, such gains remain fragile.

Methods

Existing funding commitments for LLINs in the pipeline to 2016 were collated for 40 sub-Saharan African countries. The population-based model NetCALC was used to estimate the potential LLIN coverage achievable with these commitments and identify remaining gaps, and

the Lives Saved Tool (LiST) was used to estimate likely consequences for mortality impact if these gaps remain unfilled.

Results

Overall, countries calculated a total need of 806 million LLINs for 2013-16. Current funding commitments meet just over half of this need, leaving approximately 374 million LLINs unfunded, most of which are needed to maintain coverage in 2015 and 2016. An estimated additional 938,500 child lives (uncertainty range: 559,400-1,364,200) could be saved from 2013 through 2016 with existing funding (relative to 2009 LLIN coverage taken as the 'baseline' for this analysis); if the funding gap were closed this would increase to 1,180,500 lives saved (uncertainty range: 707,000-1,718,900).

Conclusions

Overall, the funding gap equates to approximately 242,000 avoidable malaria-attributable deaths amongst under-fives. Substantial additional resources will need to be mobilized to meet the full LLIN need of sub-Saharan countries to maintain universal coverage. Unless these resources are mobilized, the impressive gains made to date will not be sustained and tens of thousands of avoidable child deaths will occur.

6. [A good night's sleep and the habit of net use: perceptions of risk and reasons for bed net use in Bukoba and Zanzibar](#)

Koenker H. M., Loll D., Rweyemamu D. and Ali A. S.

Malaria Journal 12(1):203 (2013)

Highly accessed

Background

Intensive malaria control interventions in the United Republic of Tanzania have contributed to reductions in malaria prevalence. Given that malaria control remains reliant upon continued use of long-lasting insecticidal bed nets (LLINs) even when the threat of malaria has been reduced, this qualitative study sought to understand how changes in perceived risk influence LLIN usage, and to explore in more detail the benefits of net use that are unrelated to malaria.

Methods

Eleven focus group discussions were conducted in Bukoba Rural district and in Zanzibar Urban West district in late 2011. Participants were males aged 18 and over, females between the ages of 18 and 49, and females at least 50 years old.

Results

The perceived risk of malaria had decreased among the respondents, and malaria control interventions were credited for the decline. Participants cited reductions in both the severity of malaria and in their perceived susceptibility to malaria. However, malaria was still considered a significant threat. Participants' conceptualization of risk appeared to be an important consideration for net use. At the same time, comfort and aspects of comfort (getting a good night's sleep, avoiding biting pests) appeared to play a large role in personal decisions to use nets consistently or not. Barriers to comfort (feeling uncomfortable or trapped; perceived difficulty breathing, or itching/rashes) were frequently cited as reasons not to use a net consistently. While it was apparent that participants acknowledged the malaria-prevention benefits of net use, the exploration of the risk and comfort determinants of net use provides a richer understanding of net use behaviours, particularly in a setting where transmission has fallen and yet consistent net use is still crucial to maintaining those gains.

Conclusions

Future behaviour change communication campaigns should capitalize on the non-malaria benefits of net use that provide a long-term rationale for consistent use even when the immediate threat of malaria transmission has been reduced.

7. [Analysing and recommending options for maintaining universal coverage with long-lasting](#)

[insecticidal nets: the case of Tanzania in 2011](#)

Koenker H. M., Yukich J. O., Mkindi A., Mandike R., Brown N., Kilian A. and Lengeler C.
Malaria Journal 12:150 (2013)

Highly accessed

Background

Tanzania achieved universal coverage with long-lasting insecticidal nets (LLINs) in October 2011, after three years of free mass net distribution campaigns and is now faced with the challenge of maintaining high coverage as nets wear out and the population grows. A process of exploring options for a continuous or "Keep-Up" distribution system was initiated in early 2011. This paper presents for the first time a comprehensive national process to review the major considerations, findings and recommendations for the implementation of a new strategy.

Methods

Stakeholder meetings and site visits were conducted in five locations in Tanzania to garner stakeholder input on the proposed distribution systems. Coverage levels for LLINs and their decline over time were modelled using NetCALC software, taking realistic net decay rates, current demographic profiles and other relevant parameters into consideration. Costs of the different distribution systems were estimated using local data.

Results

LLIN delivery was considered via mass campaigns, Antenatal Care-Expanded Programme on Immunization (ANC/EPI), community-based distribution, schools, the commercial sector and different combinations of the above. Most approaches appeared unlikely to maintain universal coverage when used alone. Mass campaigns, even when combined with a continuation of the Tanzania National Voucher Scheme (TNVS), would produce large temporal fluctuations in coverage levels; over 10 years this strategy would require 63.3 million LLINs and a total cost of \$444 million USD. Community mechanisms, while able to deliver the required numbers of LLINs, would require a massive scale-up in monitoring, evaluation and supervision systems to ensure accurate application of identification criteria at the community level. School-based approaches combined with the existing TNVS would reach most Tanzanian households and deliver 65.4 million LLINs over 10 years at a total cost of \$449 million USD and ensure continuous coverage. The cost of each strategy was largely driven by the number of LLINs delivered.

Conclusions

The most cost-efficient strategy to maintain universal coverage is one that best optimizes the numbers of LLINs needed over time. A school-based approach using vouchers targeting all students in Standards 1, 3, 5, 7 and Forms 1 and 2 in combination with the TNVS appears to meet best the criteria of effectiveness, equity and efficiency.

8. [Planning long lasting insecticide treated net campaigns: should households' existing nets be taken into account?](#)

Yukich J., Bennett A., Keating J., Yukich R. K., Lynch M., Eisele T. P. and Kolaczinski K.
Parasites & Vectors 6(1):174 (2013)

Background

Mass distribution of long-lasting insecticide treated bed nets (LLINs) has led to large increases in LLIN coverage in many African countries. As LLIN ownership levels increase, planners of future mass distributions face the challenge of deciding whether to ignore the nets already owned by households or to take these into account and attempt to target individuals or households without nets. Taking existing nets into account would reduce commodity costs but require more sophisticated, and potentially more costly, distribution procedures. The decision may also have implications for the average age of nets in use and therefore on the maintenance of universal LLIN coverage over time.

Methods

A stochastic simulation model based on the NetCALC algorithm was used to determine the scenarios under which it would be cost saving to take existing nets into account, and the potential effects of doing so on the age profile of LLINs owned. The model accounted for variability in timing of distributions, concomitant use of continuous distribution systems, population growth, sampling error in pre-campaign coverage surveys, variable net 'decay' parameters and other factors including the feasibility and accuracy of identifying existing nets in the field.

Results

Results indicate that (i) where pre-campaign coverage is around 40% (of households owning at least 1 LLIN), accounting for existing nets in the campaign will have little effect on the mean age of the net population and (ii) even at pre-campaign coverage levels above 40%, an approach that reduces LLIN distribution requirements by taking existing nets into account may have only a small chance of being cost-saving overall, depending largely on the feasibility of identifying nets in the field. Based on existing literature the epidemiological implications of such a strategy is likely to vary by transmission setting, and the risks of leaving older nets in the field when accounting for existing nets must be considered.

Conclusions

Where pre-campaign coverage levels established by a household survey are below 40% we recommend that planners do not take such LLINs into account and instead plan a blanket mass distribution. At pre-campaign coverage levels above 40%, campaign planners should make explicit consideration of the cost and feasibility of accounting for existing LLINs before planning blanket mass distributions. Planners should also consider restricting the coverage estimates used for this decision to only include nets under two years of age in order to ensure that old and damaged nets do not compose too large a fraction of existing net coverage.

9. [Universal coverage with insecticide-treated nets -- applying the revised indicators for ownership and use to the Nigeria 2010 malaria indicator survey data](#)

Kilian A., Koenker H., Baba E., Onyefunafoa E. O., Selby R. A., Lokko K. and Lynch M.

Malaria Journal 12(1):314 (2013)

Highly accessed

Background

Until recently only two indicators were used to evaluate malaria prevention with insecticide-treated nets (ITN): "proportion of households with any ITN" and "proportion of the population using an ITN last night". This study explores the potential of the expanded set of indicators recommended by the Roll Back Malaria Monitoring and Evaluation Reference Group (MERG) for comprehensive analysis of universal coverage with ITN by applying them to the Nigeria 2010 Malaria Indicator Survey data.

Methods

The two additional indicators of "proportion of households with at least one ITN for every two people" and "proportion of population with access to an ITN within the household" were calculated as recommended by MERG. Based on the estimates for each of the four ITN indicators three gaps were calculated: i) households with no ITN, ii) households with any but not enough ITN, iii) population with access to ITN not using it. In addition, coverage with at least one ITN at community level was explored by applying Lot Quality Assurance Sampling (LQAS) decision rules to the cluster level of the data. All outcomes were analysed by household background characteristics and whether an ITN campaign had recently been done.

Results

While the proportion of households with any ITN was only 42% overall, it was 75% in areas with a recent mass campaign and in these areas 66% of communities had coverage of 80% or better. However, the campaigns left a considerable intra-household ownership gap with 66%

of households with any ITN not having enough for every family member. In contrast, the analysis comparing actual against potential use showed that ITN utilization was good overall with only 19% of people with access not using the ITN, but with a significant difference between the North, where use was excellent (use gap 11%), and the South (use gap 36%) indicating the need for enhanced behaviour change communication.

Conclusions

The expanded ITN indicators to assess universal coverage provide strong tools for a comprehensive system effectiveness analysis that produces clear, actionable evidence of progress as well as the need for specific additional interventions clearly differentiating between gaps in ownership and use.

10. [Repeated mass distributions and continuous distribution of long-lasting insecticidal nets: modelling sustainability of health benefits from mosquito nets, depending on case management](#)

Briët O. J. and Penny M. A.

Malaria Journal 12:401 (2013)

Background

Stagnating funds for malaria control have spurred interest in the question of how to sustain the gains of recent successes with long-lasting insecticidal nets (LLINs) and improved case management (CM). This simulation study examined the malaria transmission and disease dynamics in scenarios with sustained LLINs and CM interventions and tried to determine optimal LLIN distribution rates. The effects of abruptly halting LLIN distribution were also examined.

Methods

Dynamic simulations of malaria in humans and mosquitoes were run on the OpenMalaria platform, using stochastic individual-based simulation models. LLINs were distributed in a range of transmission settings, with varying CM coverage levels.

Results

In the short-term, LLINs were beneficial over the entire transmission spectrum, reducing both transmission and disease burden. In the long-term, repeated distributions sustainably reduced transmission in all settings. However, because of the resulting reduction in acquired immunity in the population, the malaria disease burden, after initially being reduced, gradually increased and eventually stabilized at a new level. This new level was higher than the pre-intervention level in previously high transmission settings, if there is a maximum disease burden in the relationship between transmission and disease burden at intermediate transmission levels. This result could lead one to conclude that sustained LLIN distribution might not be cost-effective in high transmission settings in the long term. However, improved CM rendered LLINs more cost-effective in higher transmission settings than in those without improved CM and the majority of the African population lives in areas where CM and LLINs are sustainably combined. The effects of changes in LLIN distribution rate on cost-effectiveness were relatively small compared to the effects of changes in transmission setting and CM. Abruptly halting LLIN distribution led to temporary morbidity peaks, which were particularly large in low to intermediate transmission settings.

Conclusions

This study reaffirms the importance of context specific intervention planning. Intervention planning must include combinations of malaria vector control and CM, and must consider both the pre-intervention transmission level and the intervention history to account for the loss of immunity and the potential for rebounds in disease burden.

11. [User-determined end of net life in Senegal: a qualitative assessment of decision-making related to the retirement of expired nets](#)

Loll D. K., Berthe S., Faye S. L., Wone I., Koenker H., Arnold B. and Weber R.
Malaria Journal 12(1):337 (2013)

Background

Procurement and distribution of long-lasting insecticidal nets (LLINs) in the African region has decreased from 145 million in 2010 to 66 million nets in 2012. As resources for LLIN distribution appear to stagnate, it is important to understand the users' perception of the life span of a net and at what point and why they stop using it. In order to get the most value out of distributed nets and to ensure that they are used for as long as possible, programmes must communicate to users about how to assess useful net life and how to extend it.

Methods

Data were collected from 114 respondents who participated in 56 in-depth interviews (IDIs) and eight focus group discussions (FGDs) in August 2012 in eight regions in Senegal. Households were eligible for the study if they owned at least one net and had an available household member over the age of 18. Data were coded by a team of four coders in ATLAS.ti using a primarily deductive approach.

Results

Respondents reported assessing useful net life using the following criteria: the age of net, the number and size of holes and the presence of mosquitoes in the net at night. If they had the means to do so, many respondents preferred the acquisition of a new net rather than the continued use of a very torn net. However, respondents would preferentially use newer nets, saving older, but useable nets for the future or sharing them with family or friends. Participants reported observing alternative uses of nets, primarily for nets that were considered expired.

Conclusions

The results indicate that decisions regarding the end of net life vary among community members in Senegal, but are primarily related to net integrity. Additional research is needed into user-determined end of net life as well as care and repair behaviours, which could extend useful net life. The results from this study and from future research on this topic should be used to understand current behaviours and develop communication programmes to prolong the useful life of nets.

12. [Net use, care and repair practices following a universal distribution campaign in Mali](#)

Leonard L., Diop S., Doumbia S., Sadou A., Mihigo J., Koenker H., Berthe S., Monroe A., Bertram K. and Weber R.

Malaria Journal 13(1):435 (2014)

Background

The Government of Mali and the President's Malaria Initiative conducted a long-lasting, insecticidal net (LLIN) distribution campaign in April 2011 in the Sikasso region of Mali, with the aim of universal coverage, defined as one insecticide-treated net for every two persons. This study examines how households in post- and pre-campaign regions value and care for nets.

Methods

The study was conducted in October 2012 in Sikasso and Kayes in the southeast and western regions of Mali, respectively. The regions were purposively selected to allow for comparison between areas that had already had a mass distribution campaign (Sikasso) and areas that had not yet had a mass distribution campaign (Kayes). Study sites and households were randomly selected. Sleeping space questionnaires and structured interviews with household heads were conducted to obtain information on net use, perceived value of free nets in relation to other malaria prevention activities, and net care and repair practices.

Results

The study included 40 households, split evenly across the two regions. Forty interviews were conducted with household heads and 151 sleeping spaces were inventoried using the

sleeping space questionnaire. Nets obtained through the free distribution were reported to be highly valued in comparison to other malaria prevention strategies. Overall, net ownership and use were higher among households in areas that had already experienced a mass distribution. While participants reported using and valuing these nets, care and repair practices varied. CONCLUSION: National net use is high in Mali, and comparatively higher in the region covered by the universal distribution campaign than in the region not yet covered. While the Government of Mali and implementing partners have made strides to ensure high net coverage, some gaps remain related to communication messaging of correct and consistent net use throughout the year, and on improving net care and repair behaviour. By focusing on these areas as well as improved access to nets, coverage and use rates should continue to increase, contributing to improvements in malaria control.

13. ["You need to take care of it like you take care of your soul": perceptions and behaviours related to mosquito net damage, care, and repair in Senegal](#)

Loll D. K., Berthe S., Faye S. L., Wone I., Arnold B., Koenker H., Schubert J., Lo Y., Thwing J., Faye O. and Weber R.

Malaria Journal 13(1):322 (2014)

Background

Net care and repair behaviours are essential for prolonging the durability of long-lasting insecticidal nets. Increased net durability has implications for protection against malaria as well as cost savings from less frequent net distributions. This study investigated behaviours and motivations for net care and repair behaviours in Senegal with the aim of informing social and behaviour change communication (SBCC) programmes, using the Health Belief Model as a framework.

Methods

Data were collected from 114 participants in eight regions of Senegal. Participants were eligible for the study if they were at least 18 years old and if their household owned at least one net. These respondents included 56 in-depth interview respondents and eight focus groups with 58 participants. In addition, the qualitative data were supplemented with observational questionnaire data from a total of 556 sleeping spaces. Of these spaces, 394 had an associated net.

Results

Reported net care and repair behaviours and motivations varied substantially within this sample. Children and improper handling were seen as major sources of net damage and respondents often tried to prevent damage by storing nets when not in use. Washing was seen as an additional method of care, but practices for washing varied and may have been damaging to nets in some cases. Participants mentioned a sense of pride of having a net in good condition and the uncertainty around when they could expect another net distribution as motivations for net care. Net repair appeared to be a less common behaviour and was limited by the perspective that net degradation was inevitable and that repairs themselves could weaken nets.

Conclusions

These findings can be understood using the Health Belief Model framework of perceived severity, perceived susceptibility, perceived barriers, perceived benefits, self-efficacy, and cues to action. This model can guide SBCC messages surrounding net care and repair to promote practices associated with net longevity. Such messages should promote the benefits of intact nets and provide tools for overcoming barriers to care and repair.

14. [Strategic roles for behaviour change communication in a changing malaria landscape](#)

Koenker H., Keating J., Alilio M., Acosta A., Lynch M. and Nafu-Traore F.

Malaria Journal 13:1 (2014)

Highly accessed

Strong evidence suggests that quality strategic behaviour change communication (BCC) can improve malaria prevention and treatment behaviours. As progress is made towards malaria elimination, BCC becomes an even more important tool. BCC can be used 1) to reach populations who remain at risk as transmission dynamics change (e.g. mobile populations), 2) to facilitate identification of people with asymptomatic infections and their compliance with treatment, 3) to inform communities of the optimal timing of malaria control interventions, and 4) to explain changing diagnostic concerns (e.g. increasing false negatives as parasite density and multiplicity of infections fall) and treatment guidelines. The purpose of this commentary is to highlight the benefits and value for money that BCC brings to all aspects of malaria control, and to discuss areas of operations research needed as transmission dynamics change.

15. ["People will say that I am proud": a qualitative study of barriers to bed net use away from home in four Ugandan districts](#)

Monroe A., Harvey S. A., Lam Y., Muhangi D., Loll D., Kabali A. T. and Weber R.

Malaria Journal 13(1):82 (2014)

Background

Despite increased access and ownership, barriers to insecticide-treated bed net (ITN) use persist. While barriers within the home have been well documented, the challenges to net use when sleeping away from home remain relatively unexplored. This study examines common situations in which people sleep away from home and the barriers to ITN use in those situations.

Methods

To explore these issues, a group of researchers conducted 28 in-depth interviews and four focus groups amongst adults from net-owning households in four Ugandan districts.

Results

In addition to sleeping outside during hot season, participants identified social events, livelihood activities, and times of difficulty as circumstances in which large numbers of people sleep away from home. Associated challenges to ITN use included social barriers such as fear of appearing proud, logistical barriers such as not having a place to hang a net, and resource limitations such as not having an extra net with which to travel. Social disapproval emerged as an important barrier to ITN use in public settings.

Conclusions

Unique barriers to ITN use exist when people spend the night away from home. It is essential to identify and address these barriers in order to reduce malaria exposure in such situations. For events like funerals or religious "crusades" where large numbers of people sleep away from home, alternative approaches, such as spatial repellents may be more appropriate than ITNs. Additional research is required to identify the acceptability and feasibility of alternative prevention strategies in situations where ITNs are unlikely to be effective.

16. [What happens to lost nets: a multi-country analysis of reasons for LLIN attrition using 14 household surveys in four countries](#)

Koenker H., Kilian A., Zegers de Beyl C., Onyefunafua E. O., Selby R. A., Abeku T., Fotheringham M. and Lynch M.

Malaria Journal 13:464 (2014)

Highly accessed

Background

While significant focus has been given to net distribution, little is known about what is done with nets that leave a household, either to be used by others or when they are discarded. To

better understand the magnitude of sharing LLIN between households and patterns of discarding LLIN, the present study pools data from 14 post-campaign surveys to draw larger conclusions about the fate of nets that leave households.

Methods

Data from 14 sub-national post-campaign surveys conducted in Ghana, Senegal, Nigeria (10 states), and Uganda between 2009 and 2012 were pooled. Survey design and data collection methods were similar across surveys. The timing of surveys ranged from 2-16 months following their respective mass LLIN distributions.

Results

Among the 14 surveys a total of 14,196 households reported owning 25,447 nets of any kind, of which 23,955 (94%) were LLINs. In addition, a total of 4,102 nets were reported to have left the households in the sample: 63% were discarded, and 34% were given away. Only 255 of the discarded nets were reported used for other purposes, representing less than 1% of the total sample of nets. The majority (62.5%) of nets given away were given to or taken by relatives, while 31.1% were given to non-relatives. Campaign nets were almost six times (OR 5.95, 4.25-8.32, $p < 0.0001$) more likely to be given away than non-campaign nets lost during the same period. Nets were primarily given away within the first few months after distribution. The overall rate of net redistribution was 5% of all nets.

Conclusions

Intra-household re-allocation of nets does occur, but was sensitive to current household net ownership and the time elapsed since mass distribution. These factors can be addressed programmatically to further facilitate reallocation within a given community. Secondly, the overwhelming majority of nets were used for malaria prevention. Of the repurposed nets (<1% overall), the majority were already considered too torn, indicating they had already served out their useful life for malaria prevention. National programmes and donor agencies should remain confident that overall, their investments in LLIN are being appropriately used.

17. [Recalculating the Net Use Gap: A Multi-Country Comparison of ITN Use versus ITN Access](#)

Koenker H. and Kilian A.

PLoS One 9(5):e97496 (2014)

Background

Use of insecticide treated nets is widely recognized as one of the main interventions to prevent malaria and high use rates are a central goal of malaria programs. The gap between household ownership of at least one ITN and population use of ITN has in the past been seen as evidence for failure to achieve appropriate net use. However, past studies compared net use with ownership of at least one net, not access to sufficient nets within households. This study recalculates the net use gap in recent large household surveys using the comparison indicator of 'access to nets within the household' as now recommended by Roll Back Malaria and the World Health Organization.

Methods

Data from 41 Demographic Health Surveys (DHS) and Malaria Indicator Surveys (MIS) (2005-2012) in sub-Saharan Africa were used. For each dataset three indicators were calculated: population access to ITN, population use of ITN, and household ownership of at least one ITN. The ITN use gap was expressed as the difference between one and the ratio of use to access.

Results

The median proportion of users compared to those with access was high, at 82.1%. Even at population access levels below 50%, a median 80.6% used an ITN given they had access, and this rate increased to 91.2% for access rates above 50%. Linear regression of use against access showed that 89.0% of household members with access to nets used them the night before.

Conclusions

These results clearly show that previous interpretations of the net use gap as a failure of behavioral change communication interventions were not justified and that the gap was instead primarily driven by lack of intra-household access. They also demonstrate the usefulness of the newly recommended ITN indicators; access to an ITN within the household provides a much more accurate comparison of ITN use than ownership.

18. ["When I sleep under the net, nothing bothers me; I sleep well and I'm happy": Senegal's culture of net use and how inconveniences to net use do not translate to net abandonment](#)

Berthe S., Loll D., Faye S. L., Wone I., Koenker H., Arnold B. and Weber R.
Malaria Journal 13:357 (2014)

Background

Despite recent advances in the fight against the disease, malaria remains a serious threat to the health and well-being of populations in endemic countries. The use of long-lasting insecticidal nets (LLIN) reduces contact between the vector and humans, thereby reducing transmission of the disease. LLINs have become an essential component of malaria control programmes worldwide.

Methods

The Culture of Net Use study used qualitative and quantitative methods in a longitudinal and iterative design over two phases, in order to capture changes in net use over a year and a half period and covering both dry and rainy seasons. Data were collected from a total of 56 households in eight regions to understand variations due to geographical, cultural, and universal coverage differences. At the time of the data collection, the universal coverage campaign had been completed in six of the eight regions (Dakar and Thies excluded).

Results

Perceived barriers to use were primarily related to the characteristics of the net itself, include shape, insecticide, and a variety of minority responses, such as perceived lack of mosquito density and being unaccustomed to using nets. Insecticide-related complaints found that insecticide did not present a significant barrier to use, but was cited as a nuisance. Feelings of suffocation continued to be the most commonly cited nuisance. Respondents who favoured the use of insecticide on nets appeared to be more aware of the health and malaria prevention benefits of the insecticide than those who perceived it negatively.

Conclusions

Despite prior evidence that barriers such as heat, shape, insecticide and perceived mosquito density contribute to non-use of LLINs in other countries, this study has shown that these factors are considered more as nuisances and that they do not consistently prevent the use of nets among respondents in Senegal. Of those who cited inconveniences with their nets, few were moved to stop using a net. Respondents from this study overcame these barriers and continue to value the importance of nets.

19. ["It is about how the net looks": a qualitative study of perceptions and practices related to mosquito net care and repair in two districts in eastern Uganda](#)

Scandurra L., Acosta A., Koenker H., Kibuuka D. M. and Harvey S.
Malaria Journal 13(1):504 (2014)

Background

Prolonging net durability has important implications for reducing both malaria transmission and the frequency of net replacement. Protective behaviour, such as net care and repair, offers promise for improving net integrity and durability. Given the potential cost-savings and public health benefit associated with extending the useful life of long-lasting insecticidal nets (LLINs), prevention and mitigation of damage will become ever more critical to ensuring adequate net coverage at the population level.

Methods

A qualitative assessment was conducted in two districts in central eastern Uganda in September 2013. Data on household net care and repair behaviour, attitudes and practices were collected from 30 respondents through in-depth interviews (IDIs), observations, photos, and video to gather an in-depth understanding of these behaviours.

Results

Net damage was common and the most cited causes were children and rodents. Responses revealed strong social norms about net cleanliness and aesthetics, and strong expectations that others should care for and repair their own nets. Respondents were receptive and able to repair nets, though longer-term repair methods, such as sewing and patching, were not as commonly reported or observed. Self-reported behaviour was not always consistent with observed or demonstrated behaviour, revealing potential misconceptions and the need for clear and consistent net care and repair messaging.

Conclusions

Respondents considered both aesthetics and malaria protection important when deciding whether, when, and how to care for and repair nets. BCC should continue to emphasize the importance of maintaining net integrity for malaria prevention purposes as well as for maintaining aesthetic appeal. Additional research is needed, particularly surrounding washing, drying, daily storage routines, and gender roles in care and repair, in order to understand the complexity of these behaviours, and refine existing or develop new behaviour change communication (BCC) messages for net care and repair.

20. [Comparing two approaches for estimating the causal effect of behaviour-change communication messages promoting insecticide-treated bed nets: an analysis of the 2010 Zambia malaria indicator survey](#)

Boulay M., Lynch M. and Koenker H.

Malaria Journal 13(1):342 (2014)

Background

Over the past decade, efforts to increase the use of insecticide-treated bed nets (ITNs) have relied primarily on the routine distribution of bed nets to pregnant women attending antenatal services or on the mass distribution of bed nets to households. While these distributions have increased the proportion of households owning ITNs and the proportion of people sleeping under an ITN the night prior to the survey, the role that behaviour-change communication (BCC) plays in the use of ITNs remains unquantified.

Methods

This paper uses two analytic approaches, propensity score matching and treatment effect modelling, to examine the relationship between exposure to the BCC messages and the use of a bed net the previous night, using the 2010 Zambia Malaria Indicator Survey (MIS).

Results

When matched on similar propensity scores, a statistically significant 29.5 percentage point difference in ITN use is observed between exposed and unexposed respondents. Fifty-nine per cent of unexposed respondents reported sleeping under an ITN the previous night, compared to 88% of the exposed respondents. A smaller but similarly significant difference between exposed and unexposed groups, 12.7 percentage points, is observed in the treatment effect model, which also controls for the number of bed nets owned by the household and exposure to malaria information from health workers.

Discussion

Using either approach, a statistically significant effect of exposure to BCC messages on a woman's use of an ITN was found. Propensity score matching has the advantage of using statistically-matched pairs and relying on the assumption that given the measured covariates, outcome is independent of treatment assignment (conditional independence assumption), thereby allowing us to mimic a randomized control trial. Results from propensity score

matching indicate that BCC messages account for a 29-percentage point increase in the use of ITNs among Zambian households that already own at least one ITN.

Conclusions

These analyses serve to illustrate that BCC programmes can contribute to national programmes seeking to increase the use of ITNs inside the home. They also offer a viable approach for evaluating the effectiveness of other BCC programmes promoting behaviour that will reduce malaria transmission or mitigate the consequences of infection.

21. [Decision-making on intra-household allocation of bed nets in Uganda: do households prioritize the most vulnerable members?](#)

Lam Y., Harvey S. A., Monroe A., Muhangi D., Loll D., Kabali A. and Weber R.
Malaria Journal 13(1):183 (2014)

Highly accessed

Background

Access to insecticide-treated bed nets has increased substantially in recent years, but ownership and use remain well below 100% in many malaria endemic areas. Understanding decision-making around net allocation in households with too few nets is essential to ensuring protection of the most vulnerable. This study explores household net allocation preferences and practices across four districts in Uganda.

Methods

Data collection consisted of eight focus group discussions, twelve in-depth interviews, and a structured questionnaire to inventory 107 sleeping spaces in 28 households.

Results

In focus group discussions and in-depth interviews, participants almost unanimously stated that pregnant women, infants, and young children should be prioritized when allocating nets. However, sleeping space surveys reveal that heads of household sometimes receive priority over children less than five years of age when households have too few nets to cover all members.

Conclusions

When asked directly, most net owners highlight the importance of allocating nets to the most biologically vulnerable household members. This is consistent with malaria behaviour change and health education messages. In actual allocation, however, factors other than biological vulnerability may influence who does and does not receive a net.

22. [Prioritizing Pregnant Women for Long-Lasting Insecticide Treated Nets through Antenatal Care Clinics](#)

Hill J., Hoyt J., van Eijk A. M., ter Kuile F. O., Webster J. and Steketee R. W.
PLoS medicine 11(9):e1001717 (2014)

Long-lasting insecticide treated nets (LLINs) are a powerful public health tool and, when used by pregnant women, contribute to improving maternal, neonatal, and infant health, with lasting benefits to the developing child.

Use of LLINs among pregnant women is well below national and international targets; the median use of an insecticide treated net (ITN) the previous night among pregnant women across 37 countries for 2009-2011 was 35.3% (range, 5.2%-75.5%); ITN use was higher in areas with both a high disbursement of funds for malaria control and a lower per-head gross domestic product.

Routine antenatal care (ANC) services constitute an important delivery channel that ensures pregnant women who attend an ANC clinic at least once (77% in sub-Saharan Africa) are covered with a LLIN from their first ANC visit in each pregnancy and plays an important role in maintaining population-level coverage between campaigns, particularly for women who become pregnant between campaigns and for infants born outside of campaign years.

The majority of LLINs delivered from 2010-2012 in sub-Saharan Africa were through mass campaigns as countries sought to reach the 80% coverage target, and some of the LLINs used in these campaigns were re-allocated from routine ANC delivery.

Going forward, national malaria programmes and donors alike will have to make difficult decisions to balance costs with the benefits and impact of investments in LLINs. Where choices must be made, high-risk groups (pregnant women and children under 5 years of age) should be prioritized for the same reason these groups were targeted under the pre-universal coverage WHO strategy.

23. ["We are supposed to take care of it": a qualitative examination of care and repair behaviour of long-lasting, insecticide-treated nets in Nasarawa State, Nigeria](#)

Hunter G. C., Scandurra L., Acosta A., Koenker H., Obi E. and Weber R.

Malaria Journal 13(1):320 (2014)

Background

The longevity of long-lasting insecticidal nets (LLIN) under field conditions has important implications for malaria vector control. The behaviour of bed net users, including net care and repair, may protect or damage bed nets and impact the physical integrity of nets. However, this behaviour, and the motivating and inhibiting factors, is not well understood.

Methods

Qualitative research methods were used to examine behaviour, attitudes and norms around damage, care and repair of LLINs. Eighteen in-depth interviews (IDI) and six focus group discussions (FGD) were conducted with LLIN users in two local government areas of Nasarawa State, Nigeria. A brief background questionnaire with the 73 participants prior to IDIs or FGDs collected additional data on demographics and net use, care and repair behaviour.

Results

Respondents cited that the major causes of damage to bed nets are primarily children, followed by rodents, everyday handling that is not gentle, and characteristics of sleeping spaces. Caring for nets was perceived as both preventing damage by careful handling and keeping the net clean, which may lead to over-washing of LLINs. Repairing a damaged net was considered something that net users should do and the responsibility of adults in the household. Despite this, reported frequency of net repair was low (18%). Motivations for taking care of and repairing nets centred around caring for one's family, avoiding mosquito bites, saving money, and maintaining the positive opinion of others by keeping a clean and intact net. Barriers to net care and repair related to time availability and low perceived value of bed nets or of one's health.

Conclusions

This study provides novel and valuable insights on the perceptions and attitudes of LLIN users in Nasarawa, Nigeria on the durability of bed nets, how to care for and repair nets, and for what reasons. Communication around net care should stress proper daily storage of nets, regular net inspections, prompt repairs, and clarify misconceptions about proper washing frequency and technique. These messages should include compelling motivators, such as local social norms of household hygiene.

24. [Are pregnant women prioritized for bed nets? An assessment using survey data from 10 African countries](#)

Ricotta E., Koenker H., Kilian A. and Lynch, M.

Global Health Science and Practice 2(2)(2014)

Background

Malaria in pregnancy is a major public health concern, contributing to roughly 11% of neonatal deaths and to 25% of all maternal deaths in some parts of the world. The World Health Organization has recommended priority interventions for malaria during pregnancy, including

use of insecticide-treated nets (ITNs), but net distribution has shifted recently to a universal coverage paradigm rather than one targeting vulnerable populations.

Methods

To determine whether and to what extent pregnant women are prioritized within the household for ITN use, we assessed national survey data from 2009-2013 in 10 African countries. Proportion of pregnant women who slept under an ITN the previous night and 95% confidence intervals were calculated and compared between countries. Within-country logistic regression examined whether pregnancy was significantly associated with ITN use the previous night compared with other risk groups, and the predicted probability of net use for each risk group was calculated holding other covariates constant.

Results

A median 58% of households reported owning at least 1 ITN. On average, across all 10 countries, 35% of pregnant women in households with at least 1 ITN used a net. Households with universal coverage (at least 1 ITN per 2 people) had higher levels of net use among all family members; for example, 79% of pregnant women, on average, used a net in such households. In all countries, the predicted probability of ITN use by pregnant women was significantly higher than the probability of net use by most other household members except non-pregnant women of reproductive age.

Conclusions

These findings suggest that both pregnant women and non-pregnant women of reproductive age are being prioritized within the household for net use. However, behavior change communication strategies are needed to achieve ITN use goals for pregnant women.

25. [Impact of a behaviour change intervention on long-lasting insecticidal net care and repair behaviour and net condition in Nasarawa State, Nigeria](#)

Koenker H., Kilian A., Hunter G., Acosta A., Scandurra L., Fagbemi B., Onyefunafoa E. O., Fotheringham M. and Lynch M.
Malaria Journal 14(1):18 (2015)

Background

While some data on net durability have been accumulating in recent years, including formative qualitative research on attitudes towards net care and repair, no data are available on how the durability of a net is influenced by behaviour of net maintenance, care and repair, and whether behavioural change interventions (BCC) could substantially impact on the average useful life of the net.

Methods

The study used an intervention-control design with before-after assessment through repeated cross-sectional household surveys with two-stage cluster sampling following Nasarawa State's December 2010 mass campaign. All campaign nets were 100-denier polyester, long-lasting insecticidal nets (LLIN). Baseline, midline, and endline surveys occurred at one-year intervals, in March 2012, March 2013, and April 2014, respectively. Outcome measures were the proportion of confirmed campaign nets with observed repairs, and the proportion in serviceable condition, measured with proportionate hole index (pHI) and according to WHO guidelines.

Results

For all respondents, exposure to BCC messages was strongly correlated with increased positive attitude towards care and repair, and increases in attitude were positively correlated with observed net repairs, and with the proportion of nets in serviceable condition. In a multivariate regression model, positive care and repair attitude (OR 6.17 $p = 0.001$) and level of exposure (1 source: OR 4.00 $p = 0.000$; 3 sources: OR 9.34 $p = 0.000$) remained the most significant predictors of net condition, controlling for background and environmental factors. Nets that were tied up had 2.70 higher odds of being in serviceable condition ($p = 0.001$), while repairs made to nets were not sufficient to improve their pHI category. Estimated median net lifespan

was approximately one full year longer for nets in households with a positive compared to a negative attitude.

Conclusions

Exposure to multiple channels of a comprehensive BCC intervention was associated with improved attitude scores, and with improved net condition at endline. It is possible for BCC interventions to change both attitudes and behaviours, and to have an important effect on overall median net lifespan. Care and repair messages are easily incorporated into existing malaria BCC platforms, and will help contribute to improved net condition, providing, in principle, more protection from malaria.

26. [Outdoor-sleeping and other night-time activities in northern Ghana: implications for residual transmission and malaria prevention](#)

Monroe A., Asamoah O., Lam Y., Koenker H., Psychas P., Lynch M., Ricotta E., Hornston S., Berman A. and Harvey S. A.

Malaria Journal 14(1):35 (2015)

Background

Despite targeted indoor residual spraying (IRS) over a six-year period and free mass distribution of long-lasting insecticide-treated nets (ITNs), malaria rates in northern Ghana remain high. Outdoor sleeping and other night-time social, cultural and economic activities that increase exposure to infective mosquito bites are possible contributors. This study was designed to document these phenomena through direct observation, and to explore the context in which they occur.

Methods

During the late dry season months of February and March 2014, study team members carried out continuous household observations from dusk to dawn in one village in Ghana's Northern Region and one in Upper West Region. In-depth interviews with health workers and community residents helped supplement observational findings.

Results

Study team members completed observations of 182 individuals across 24 households, 12 households per site. Between the two sites, they interviewed 14 health workers, six community health volunteers and 28 community residents. In early evening, nearly all study participants were observed to be outdoors and active. From 18.00-23.00 hours, socializing, night school, household chores, and small-scale economic activities were common. All-night funerals, held outdoors and attended by large numbers of community members, were commonly reported and observed. Outdoor sleeping was frequently documented at both study sites, with 42% of the study population sleeping outdoors at some time during the night. While interviewees mentioned bed net use as important to malaria prevention, observed use was low for both indoor and outdoor sleeping. Net access within households was 65%, but only 17% of those with access used a net at any time during the night. Participants cited heat as the primary barrier and reported higher net use during the rainy season.

Conclusions

Outdoor sleeping and other night-time activities were extensive, and could significantly increase malaria risk. These findings suggest that indoor-oriented control measures such as ITNs and IRS are insufficient to eliminate malaria in this setting, especially given the low net use observed. Development and evaluation of complementary outdoor control strategies should be prioritized. A research agenda is proposed to quantify the relative risk of outdoor night-time activities and test potential vector control interventions that might reduce that risk.

27. [The use of mediation analysis to assess the effects of a behaviour change communication strategy on bed net ideation and household universal coverage in Tanzania](#)

Ricotta E. E., Boulay M., Ainslie R., Babalola S., Fotheringham M., Koenker H. and Lynch M.

Malaria Journal 14(1):15 (2015)

Background

SBCC campaigns are designed to act on cognitive, social and emotional factors at the individual or community level. The combination of these factors, referred to as 'ideation', play a role in determining behaviour by reinforcing and confirming decisions about a particular health topic. This study introduces ideation theory and mediation analysis as a way to evaluate the impact of a malaria SBCC campaign in Tanzania, to determine whether exposure to a communication programme influenced universal coverage through mediating ideational variables.

Methods

A household survey in three districts where community change agents (CCAs) were active was conducted to collect information on ITN use, number of ITNs in the household, and perceptions about ITN use and ownership. Variables relating to attitudes and beliefs were combined to make 'net ideation'. Using an ideational framework, a mediation analysis was conducted to see the impact exposure to a CCA only, mass media and community (M & C) messaging only, or exposure to both, had on household universal coverage, through the mediating variable net ideation.

Results

All three levels of exposure (CCA, M & C messaging, or exposure to both) were significantly associated with increased net ideation (CCA: 0.283, 95% CI: 0.136-0.429, p-value: <0.001; M & C: 0.128, 95% CI: 0.032-0.334, p-value: 0.018; both: 0.376, 95% CI: 0.170-0.580, p-value: <0.001). Net ideation also significantly increased the odds of having universal coverage (CCAOR: 1.265, 95% CI: 1.118-1.433, p-value: <0.001; M & COR: 1.264, 95% CI: 1.117-1.432, p-value: <0.001, bothOR: 1.260, 95% CI: 1.114-1.428, p-value: <0.001). There were no significant direct effects between any exposure and universal coverage when controlling for net ideation.

Conclusions

The results of this study indicate that mediation analysis is an applicable new tool to assess SBCC campaigns. Ideation as a mediator of the effects of communication exposure on household universal coverage has implications for designing SBCC to support both mass and continuous distribution efforts, since both heavily rely on consumer participation to obtain and maintain ITNs. Such systems can be strengthened by SBCC programming, generating demand through improving social norms about net ownership and use, perceived benefits of nets, and other behavioural constructs.

28. [The Effect of Single or Repeated Home Visits on the Hanging and Use of Insecticide-Treated Mosquito Nets following a Mass Distribution Campaign - A Cluster Randomized, Controlled Trial](#)

Kilian A., Balayo C., Feldman M., Koenker H., Lokko K., Ashton R. A., Bruce J., Lynch M. and Boulay M.

PLoS One 10(3):e0119078 (2015)

Background

Study objective was to evaluate the effectiveness of commonly used post-campaign hang-up visits on the hanging and use of campaign nets.

Methods

A cluster-randomized trial was carried out in Uganda following an ITN distribution campaign. Five clusters (parishes, consisting of ~ 11 villages each) were divided into three study arms with between 7,534 and 9,401 households per arm. Arm 1 received one hang-up visit, while Arm 2 received two visits by volunteers four and seven months after the campaign. Visits consisted of assistance hanging the net and education on net use. The control arm was only exposed to messages during the campaign itself. Three cross-sectional surveys with a two-stage cluster sampling design, representative of the study populations, were

carried out to capture the two key outcome variables of net hanging and ITN use. Sample size was calculated to detect at least a 15 percentage-points change in net use, and was 1811 at endline. The analysis used an intention-to-treat approach.

Findings

Both hanging and use of ITN increased during follow-up in a similar way in all three study arms. The proportion of the population using an ITN the previous night was 64.0% (95% CI 60.8, 67.2), for one additional visit, 68.2% (63.8, 72.2) for two visits and 64.0% (59.4, 68.5) for the control. The proportion of households with all campaign nets hanging increased from 55.7% to 72.5% at endline ($p < 0.0005$ for trend), with no difference between study arms. Financial cost per household visited was estimated as USD 2.33 for the first visit and USD 2.24 for the second.

Conclusions

Behavior change communication provided during the campaign or through other channels was sufficient to induce high levels of net hanging and use and additional "hang-up" activities were not cost-effective.

11.5 Tools Developed by NetWorks

Title	Link
Continuous Distribution	
Summary Series: Continuous Distribution	[English PDF]
Summary Series: E-coupon Distribution	[English PDF]
NetCALC Online Training	[Website]
NetCALC tool download and Documentation	[Website]
Consensus Statement on Continuous Distribution Systems for Insecticide Treated Nets	[English PDF] [French PDF]
Continuous Long-lasting Insecticidal Net Distributions: A Guide to Concepts and Planning	[English PDF] [French PDF]
Country-to-Country Guide for LLIN Keep-up	[English PDF] [French PDF]
LLIN Distribution in Sub-Saharan Africa: A Collation of Global Funding Commitments for 2011-16	[English PDF] [French PDF]
School-Based Distribution of Long-Lasting Insecticidal Nets: A Short Guide Based on Recent Country Experience	[English PDF]
Lessons in Brief Series	
<ul style="list-style-type: none"> No. 1 Making it Work: The Big Picture - Kenya 	[English PDF] [French PDF]
<ul style="list-style-type: none"> No. 2 Making it Work: Integrated Supply and Supervision - Kenya 	[English PDF] [French PDF]
<ul style="list-style-type: none"> No. 3 Accountable Partnership: Singing from the Same Songbook & Knowing the Score - Malawi 	[English PDF] [French PDF]
<ul style="list-style-type: none"> No. 4 Logistics, Logistics, Logistics - Malawi 	[English PDF] [French PDF]
<ul style="list-style-type: none"> No. 5 The Tanzanian National Voucher Scheme (TNVS): Keeping up with 'Keep-up' - Tanzania 	[English PDF] [French PDF]
<ul style="list-style-type: none"> No. 6 School Distribution in Nigeria 	[English PDF] [French PDF]
<ul style="list-style-type: none"> No. 7 Making Targeted Subsidies Fast and Flexible: The TNVS eVoucher 	[English PDF] [French PDF]
<ul style="list-style-type: none"> No. 8 Community-based distribution: "Pulling" it off in South Sudan 	[English PDF] [French PDF]
<ul style="list-style-type: none"> No. 9 Piloting School Net Distribution in Mainland Tanzania 	[English PDF] [French PDF]
<ul style="list-style-type: none"> No. 10 Senegal's Push and Pull Combination Strategy 	[English PDF] [French PDF]
<ul style="list-style-type: none"> No. 11 Ghana's mixed model scores coverage points 	[English PDF] [French PDF]
<ul style="list-style-type: none"> No. 12 Community-based Distribution in Nigeria 	[English PDF] [French PDF]
Continuous Distribution Toolkit	[Website]

Title	Link
<ul style="list-style-type: none"> Health Facility Distribution Tools 	[Website]
<ul style="list-style-type: none"> School distribution tools 	[Website]
<ul style="list-style-type: none"> Community Distribution tools 	[Website]
<ul style="list-style-type: none"> Monitoring and Supervision tools 	[Website]
<ul style="list-style-type: none"> Evaluation tools 	[Website]
Mass Campaigns	
Checklist on LLIN mass distribution for Program Managers and Independent Observers	[English PDF]
Experiences in LLIN Urban Distribution Campaigns Stakeholder Review	[English PDF]
Net Care and Repair	
Summary Series: Net Care and Repair	[English PDF]
Net Care and Repair Toolkit	[Website]
<ul style="list-style-type: none"> Formative Research 	[Website]
<ul style="list-style-type: none"> SBCC Interventions 	[Website]
<ul style="list-style-type: none"> Evaluation Resources and Reports 	[Website]
Measuring Net Integrity Training Materials	
<ul style="list-style-type: none"> Facilitator Guide: LLIN Hole Assessment in Household Surveys 	[English PDF]
<ul style="list-style-type: none"> Training Slides: LLIN Hole Assessment Training for Surveyors 	[English PPT]
<ul style="list-style-type: none"> Net Hole Assessment Training Surveyor Job Aid 	[English PDF]
Rodents as a threat to the durability of mosquito nets for malaria prevention: what is known and what is to be done?	[English PDF]
Behavior Change Communication	
Summary Series: Culture of Net Use Studies	[English PDF]
Online Training Series on Evidence-based Malaria Social and Behavior Change Communication (SBCC)	[Online Training]
Making malaria unacceptable: Harmonizing national messages and partner efforts leads to bigger impact in Tanzania	[English PDF] [French PDF]
Voices and United Against Malaria: An Innovative Partnership to Promote Net Use	[English PDF] [French PDF]
Channeling net use promotion through children as malaria ambassadors – the PataPata Children’s Radio Show	[English PDF] [French PDF]
<i>Aha Ye De</i> Ghana: Keeping net use messages fresh and cool	[English PDF] [French PDF]
Videos	
Senegal: Continuous Distribution Strategies for LLINs	Video (French with English subtitles)
Senegal: Touba – A Net Distribution Success Story	Video (French with English subtitles)

Title	Link
Senegal: Mass Distribution of Mosquito Nets	Video (French)
Senegal: How to care for your mosquito net	Video (French with English subtitles)
Senegal: Demonstration - Modifying a Rectangular Bed Net to a Circular Net	Video (French with English subtitles)
Senegal: Transformed Mosquito Nets: Personalizing a Prevention Method for Increased Use	Video (French with English subtitles)
Senegal: Using your mosquito net	Video (Wolof)
Ghana: School-based Distribution of Long Lasting Insecticidal Nets	Video (English)
Ghana: E-coupon Subsidy Program for Insecticide-Treated Nets	Video (English)
Country-Specific Resources	
NetWorks Country Resources Toolkit	[Website]

12 NetWorks Ghana End of Project Report

12.1 Summary

The NetWorks project operated in Ghana from 2012 to 2014. It made substantial contributions to improve the distribution of insecticide-treated nets (ITNs) by providing support, facilitation, and capacity building services around the concept of continuous distribution (CD). In partnership with the Ghana Health Service (GHS) and the Ghana Education Service (GES), NetWorks facilitated the development of a continuous distribution strategy and tested four CD channels: through antenatal clinics (ANCs), Child Welfare Clinics (CWCs), schools, and subsidized private sector sales. NetWorks played an integral support role in scaling up the CD system at the national level. These efforts were designed to promote continuous coverage and use of ITNs across the 10 regions of Ghana.

Distribution pilot programs began with ANCs, CWCs, and schools in the Eastern Region in 2012 and 2013. Those pilot programs demonstrated the feasibility of using these channels to distribute ITNs and highlighted the value of using a mix of distribution channels to achieve coverage and equity in distribution.



Building on key lessons that had been learned from the CD pilot, NetWorks and its partners took the CD approach nationwide in a coordinated effort. The Government of Ghana played an integral role in developing the strategy and implementing it with coordination at the national, regional, district, and circuit levels of the health and education systems. NetWorks supported creative community outreach, mobilization, and social and behavior change communication (SBCC) as key components of the expansion.

NetWorks carried out the Ghana ITN e-coupon pilot from October 2013 to May 2014 with funding support from USAID's Africa Bureau. The e-coupon was designed to demonstrate that a technological platform could support private sector re-involvement in ITN distribution through a market-based system. The pilot achieved its main objectives, demonstrating that e-coupon issue and redemption could be implemented in Ghana. The pilot successfully demonstrated that various levels of subsidies could be offered to different segments of the population. USAID's investment in this innovative pilot prompted the United Kingdom's Department for International Development to fund the scale up of the e-coupon program in Ghana at 5.5 million GBP (8.8 million USD) over 3 years (2014–2016).

Beyond successes in sustaining ITN coverage in Ghana through a mix of CD channels, NetWorks explored outdoor sleeping habits and other nighttime activities in the Northern Region, where malaria prevalence is persistently high. The study highlighted unique challenges to net use and underscored the need for complementary outdoor malaria prevention strategies.

12.2 Background

Prior to 2010, Ghana's net distribution strategy primarily targeted vulnerable groups (pregnant women and children under the age of five) through routine channels—ANCs and immunization (EPI) clinics—and in a few instances through nongovernmental organizations. From 2010–2012, Ghana's National Malaria Control Program (NMCP) and its partners achieved universal coverage with long-lasting insecticidal nets (LLINs) through a door-to-door distribution and hang-up



campaign. During this time, over 12 million nets were distributed nationwide.

As the national priority shifted towards universal coverage of ITN, the NMCP sought a strategy to sustain the gains achieved through mass distribution. An important part of the process for developing that strategy was a study trip to Nairobi in June 2011, funded by USAID's Africa Bureau, for key stakeholders to learn firsthand about continuous distribution of ITNs in Kenya. NetWorks provided facilitation support during the trip, conducting a two-day workshop on continuous distribution planning tools, including the NetCALC tool. The workshop resulted in a draft continuous distribution strategy for Ghana.

In 2012, NetWorks began collaborating with the Ghana NMCP and its partners to refine, pilot and scale up the CD strategy. This report will highlight activities carried out under the NetWorks project in Ghana from 2012 through 2014, including challenges and successes.

12.3 Continuous Distribution Pilots

Following the 2010–2012 mass campaign of net distribution, the NMCP's objective was to distribute nets through a continuous system via three channels in all 10 regions of Ghana. Before any changes to the national policy could be made, the channels needed to be tested. The Eastern Region was the first to be fully covered by the door-to-door mass ITN campaign, in December 2010, and was therefore well placed to serve as the pilot region for CD activities that NetWorks designed and implemented. The project used health facility and school-based distribution channels in the region at various periods from October 2012 through November 2013. NetWorks carried out the e-coupon pilot in Eastern Region's capital, Koforidua, from October 2013 to May 2014.

Planning for the CD pilot in the Eastern Region required NetWorks to coordinate at the national-level with two main governmental agencies, GHS and NMCP, and the GES School Health Education Program (SHEP), and their regional, districts, circuits/sub-districts and health facility or primary school contacts at the community level. National leadership by NMCP and SHEP personnel unit was critical.

12.3.1 Pilot of school-based ITN distribution

The primary school CD pilot targeted students in Class 2 and Class 6 in Eastern Region and was carried out in October 2012. ITNs were also distributed during the pilot period to students in Class 4 and Class 5 in November 2013 as part of the nationwide school distribution effort. A total of 150,000 ITNs were distributed to 2,682 public and private primary schools in Eastern Region during this time.

ITN distribution through schools involved compilation of school enrollment data for the targeted classes, orientation of 26 district SHEP coordinators and 180 circuit supervisors on how to distribute nets, and how to meet reporting requirements. Calculations of the number of nets needed in each district were made on the basis of aggregated school enrollment data. With these data, ITNs were transported to the district education stores for onward transportation to schools within each circuit.

While the pilot demonstrated the feasibility of ITN distribution through schools, it also revealed challenges associated with reporting timelines. Following the distributions, delays were observed for reports moving from schools up to circuit, district, regional and national levels. Further, copies of reports were often not kept at the schools, making quality checks difficult.

12.3.2 Pilot of health facility-based ITN distribution

The health facility-based CD pilot ran between October 2012 and November 2013. It targeted public and private health facilities that offered antenatal and child welfare/EPI services in all 26 districts in the Eastern Region. Every pregnant woman who visited an ANC for the first time was entitled to receive an LLIN. She was also given information about the effects of malaria in pregnancy and the need for proper use of nets. At EPI clinics, every child aged 18–24 months receiving measles II booster dose was given a net. In summary, 114,000 ITNs were allocated across all health facilities in the 26 districts.

The implementation of health facility based CD included revision of the Maternal Record Book to include LLIN given to the pregnant woman, training of the health workers offering service at the Antenatal Clinic, and the recording in the Antenatal Clinic Register.

Despite the success of the channel in getting nets into households, challenges were observed. Poor coordination among central, regional, and district personnel, supply chain bottlenecks, and poor documentation as evidenced in the District Health Information Management System



were noted when ITNs were distributed to health facilities. These challenges make it difficult to assess exactly what proportion of pregnant women or children received a net at their ANC or CWC visits.

12.3.3 E-coupon pilot

The e-coupon pilot ran between October 2013 and May 2014 in Koforidua, the capital of Eastern Region. The e-coupon system offered discounts to pregnant women, employees of participating businesses, schoolchildren in Koforidua, and the general public when they purchased a net. The pilot adapted the mobile phone-based platform developed by Mennonite Economic Development Associates (MEDA) for the Tanzania National Voucher Scheme. It offered subsidies from multiple donors, variable amounts of subsidy for specific groups of people, and product variety.

The rationale for the e-coupon pilot was to contribute to maintaining universal coverage following mass net distribution campaigns by stimulating a sustainable retail supply chain, placing a subsidy in the hands of consumers, drawing demand into retail shops and allowing inventory to be available to everyone (not just coupon recipients), giving choice to consumers, and stimulating positive competition among ITN brands.



A total of 6,565 coupons were issued during the pilot, with just over half redeemed by beneficiaries. Redemption rates varied by target group and subsidy level. The highest redemption rate was observed among secondary school students, while the lowest redemption rates were for coupons issued to the general public through promotional events.

The pilot demonstrated that e-coupon issue and redemption technology could be implemented in Ghana. The e-coupon pilot was successful in reaching different population groups, including Koforidua residents, employees, and school children. The pilot also demonstrated that it is possible to deliver various levels of subsidy to various segments of the population.

While pilot objectives were achieved, issues were also identified. The pilot did not engage the National Malaria Control Program (NMCP) fully at the beginning of the pilot, and the program would have benefited from additional meetings with key stakeholders to gain local understanding and ownership. This issue was rectified later in the pilot and was identified as a key element necessary for success of the program.

Customers also reported that having to go to two separate locations to receive and redeem a coupon could be cumbersome. Self-issuance was identified as a potential strategy to reduce the need for separate issuers and to make the issuance process more convenient for those receiving e-Coupons, but was not fully rolled out during the pilot. Cell network 'downtimes' also delayed or impeded issuing and redemption of codes in some cases.

Finally, cost effectiveness could not be evaluated due to the small-scale, exploratory nature of the pilot and large sunk costs associated with start-up.

12.3.4 Nationwide scale up

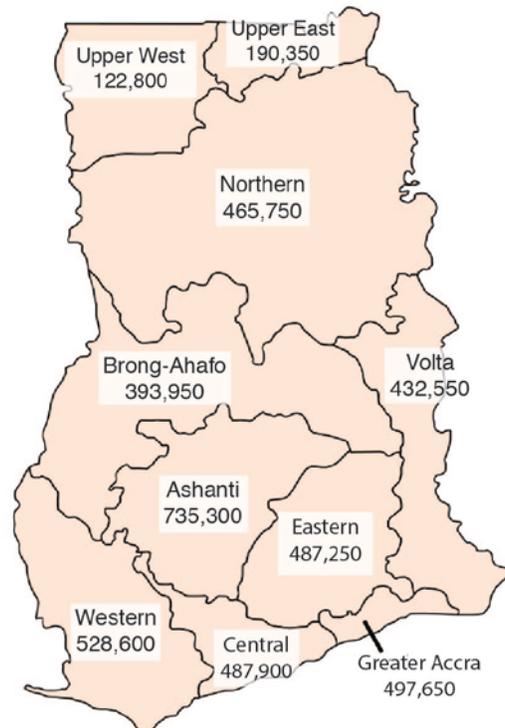
12.3.4.1 Health facility and school-based distribution

Nationwide rollout of CD required establishing mechanisms to coordinate and communicate among implementers. Staff from NetWorks, NMCP, and the USAID/DELIVER project began holding regional meetings in January 2013 to bring together regional health, education, and coordinating council stakeholders to discuss timelines, estimates of ITN numbers, and orientations for ANC and EPI health workers. NetWorks also collaborated with the Focus Region Health Project in the start-up stakeholders' meeting in Central and Western regions.

In addition to collaboration with the NMCP, NetWorks organized CD information meetings approximately quarterly in three to four regions. These meetings brought together regional health services managers to discuss pilot implementation.

Through nationwide scale-up of continuous distribution in 2013-2014, a total of 4,342,100 nets were distributed through health facilities and schools (Figure 5).

Figure 5: Total ITNs distributed in Ghana, by region, for school and health facility distribution



12.3.4.2 Improvements made between pilot and national scale up

In scaling up, steps were taken to address the challenges identified in the Eastern Region pilot. These improvements are outlined in the following section.

Coordination

NetWorks, together with NMCP and regional health education directorates, organized regional and district monitoring and review meetings to complement the planning meetings with stakeholders. Regional review meetings offered a forum for CD implementers to share their experiences and lessons they had learned.

Documentation

NetWorks revised existing record-keeping books and forms. ANC and EPI staff members were trained on site and closer to the time when nets were delivered. Using existing record-keeping forms, modified where needed, gave staff familiar methods to use. A change in the timing and location of training led to better retention of training and adherence to record-keeping.

Supply chain bottlenecks

Health workers and school officers had a clearer understanding of their roles. Stock-outs were minimized because health workers were better aware of minimum and maximum stock levels and re-order requirements. District health and education directorate staff took on leadership roles and found solutions to supply chain issues as they arose.

Logistics management

ITN logistics management was executed primarily by the USAID|DELIVER project with NetWorks playing a critical role in ensuring that the right quantities of ITNs were estimated for each level—national, regional, district, and facility/school.

The charts below show the flow of ITNs from the central level to schools and health facilities for distribution to target beneficiaries.

Figure 6: School distribution: flow of ITN from port to pupils

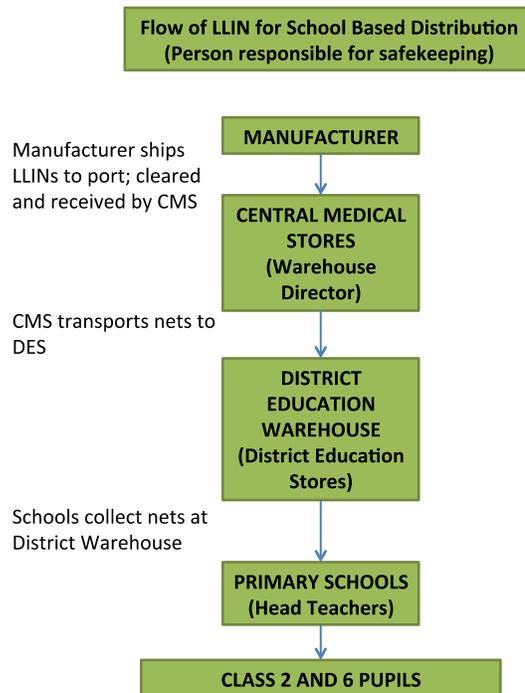
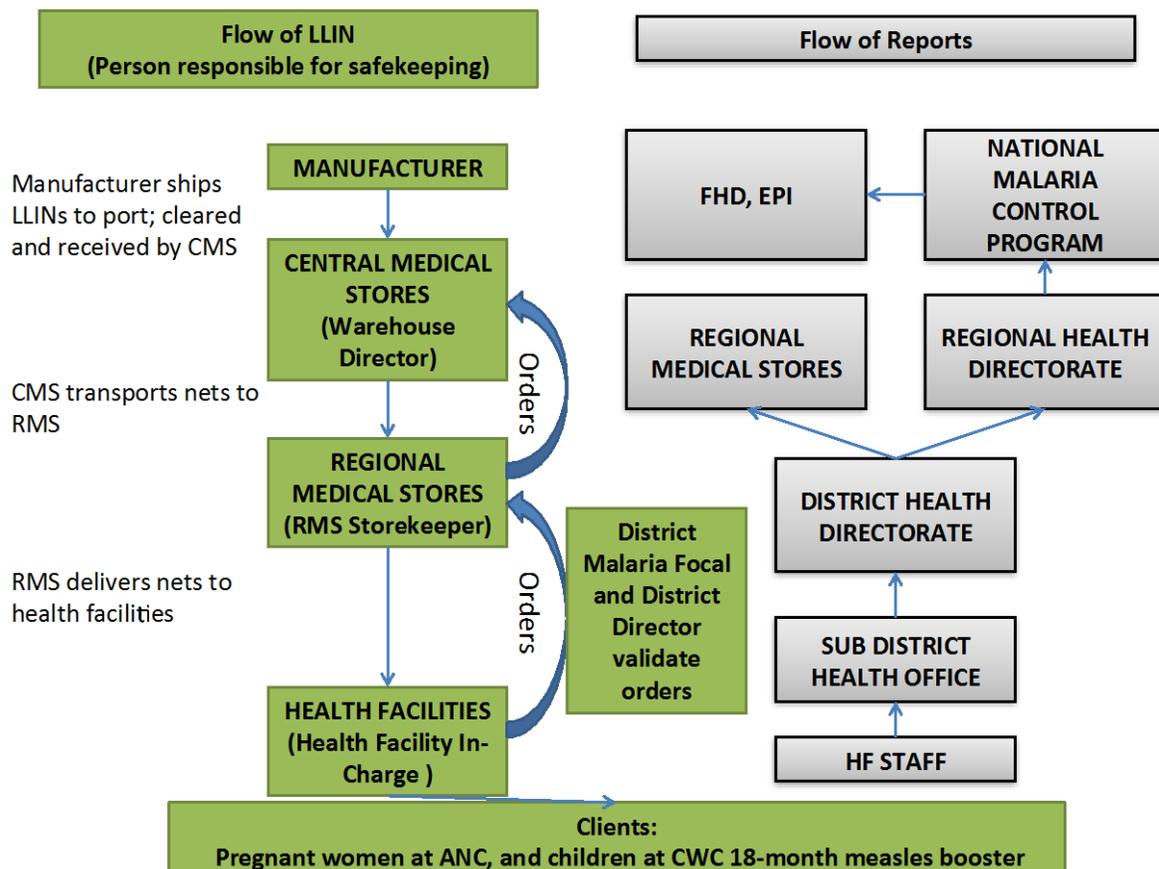


Figure 7: Health facility distribution: flow of ITN from port to clients



Coordination and supervision

Monitoring and coordination involved national, regional, and district officials who made supportive supervision visits to all health facilities one month after nets had been distributed. Subsequent monitoring was carried out by regional and district officers as a step toward ensuring ownership of the CD process. Monitoring reports were discussed on a quarterly basis.

Monitoring the school distribution program was similarly conducted by national, regional, district, and circuit level officers during each round of distribution. The NMCP, with the facilitation support of SHEP, NetWorks, USAID |DELIVER and the regional and district directorates of education and health, actively coordinated the entire process.

Capacity building

Sustaining a CD framework depends on a well-functioning supply chain that guarantees ITN commodity security and the active involvement of all stakeholders. NMCP, SHEP, and health and education regional and district directorates were at the forefront of ITN distribution from its inception, with NetWorks and other USAID projects playing a facilitation role. NetWorks established a set of standard operating procedures in 2014 to facilitate future implementation of the CD framework by NMCP and its implementing partners, regardless of funding source.

12.4 BCC Activities

Community mobilization was important for promoting awareness about how to obtain, use, and care for a net. Existing social support systems were harnessed to promote and ensure the use of ITNs every night, year round.

BCC messages were distributed through ANC visits, CWC visits and primary schools. Health facilities offered information to pregnant women and mothers/caregivers who took their children for a measles booster vaccination. In routine house-to-house visits, community health nurses and community health educators re-emphasized the need to use ITNs consistently. Schools distributed malaria prevention information through drama, music, dance, drum language, poetry, drawings, and paintings. Information, education and communication (IEC) materials that discussed malaria prevention were also distributed at weekly school assemblies, during class lessons, and at PTA meetings.

Community mobilization had four components. First was to encourage stakeholders to accept, support, and promote CD. Next was to ensure that beneficiaries understood the process and how they could obtain an ITN. Third, that beneficiaries, having picked up their nets, used them continuously and consistently. Fourth was to ensure that nets were properly taken care of to achieve their maximum benefit.

12.4.1 School and health facility activities

Using the schools and health facilities as conduits for community mobilization, NetWorks reached out to target groups in Ghana with messages on the CD concept and on ITN use and care. Medical practitioners, clinic staff, school health education coordinators and other regional and district representatives were given orientations on this and were then responsible for disseminating it to their target groups (i.e., pregnant women, caregivers, primary school students, other community members). The campaign to promote awareness of CD and the benefit of net use was carried into more than 24,000 schools and 4,342 health facilities. A total of 20,303 people, split equally between men and women, received training in how to communicate about malaria, malaria prevention, and ITN use and care using materials that included key facts about ITNs, briefs for discussion, and flip charts. Of these twenty thousand people, one fifth were health care workers, while the remaining four fifths were community leaders and community members.

In addition to the activities within schools and health facilities, school outreach activities formed a vital component of the NetWorks community mobilization effort in Ghana. Short drama scripts were developed and distributed to 16,007 primary schools to serve as aids for outreach performances. Twenty regional SHEP/cultural officers received an orientation on the use of drama and other forms of art to promote information on how malaria spreads and how ITNs can prevent it. Those regional officers then trained 374 district officers who in turn trained more than 16,000 school-based SHEP and cultural coordinators. Some schools expanded their performances from the drama scripts and still others developed their own scenarios around malaria prevention and care of ITNs. Other modes of art such as poetry, music, drawing and paintings, were also used in outreach activities. Activities were shared with neighboring schools, market centers, lorry stations, hospitals, churches, mosques, district assemblies, community centers and chiefs' palaces.

12.4.2 Community activities

In the Upper East, Upper West, Northern and Brong Ahafo regions, community opinion leaders and representatives of nongovernmental and faith-based organizations served as vital outreach representatives to create awareness about distribution occurring in health and school facilities. It enabled these groups to appreciate, understand, support and promote CD in their communities.

Participants were told about CD modalities, target groups, and why they were selected. Participants received information on malaria and its transmission, and the benefits of ITNs, including proper hanging and care. Individuals in these groups then further disseminated the information to their communities. Two community durbars on malaria were organized for three communities, targeting chiefs and community members. The events included dramas performed by local primary schools; total of 355 community members participated. In addition, through sensitization sessions, a total of 40,536 community members in 510 communities in 30 districts were sensitized on the use and care of LLINs and malaria. District SHEP Coordinators and Culture Officers were trained in the use of drama and malaria flip charts as tools for increasing knowledge on malaria, LLIN use and care. By the close of the second quarter of the 2014 fiscal year, all districts in Upper East, Upper West, Northern, and Brong Ahafo completed their trainings.

Malaria Prevention Advocacy Session with School Management Committees/Parent Teacher Associations: Sensitization sessions were organized in two districts to educate SMC/PTA members on the CD strategy and basic facts about malaria using the malaria flip chart. A total of 266 parents were reached.

Drama and Quiz Competitions: To generate interest among children in community outreach programs through Information, Education and Communication (IE&C) activities, quiz and drama competitions were organized in 55 districts across Northern, Brong Ahafo, Upper East and Upper West regions. All districts in the Upper East and Upper West regions, 16 districts in Northern region, and 15 districts in Brong Ahafo region participated in the competitions. The competition was opened to three schools in each district, including both public and private schools. Ten children (two for quiz and eight for drama) participated in the activity. A total of 159 public and private schools participated directly in the competition.

Figure 8: Sensitization of community opinion leaders on continuous distribution



12.4.3 Media campaigns

A media campaign formed a vital part of the NetWorks community mobilization effort. The combination of national television and local radio campaigns included radio announcements, jingles, long-play messages, and on-air discussions.

A total of 779 television spots and 2,958 radio spots were broadcast on 17 local community media stations in multiple local languages from January 2013 through December 2014. Two television

spots (Ntomtom Po Soro and Game Plan) were broadcast nationally on eight stations. Two spots focused on the care and use of ITNs and dispelled some of the myths that prevented ITN use were broadcast on two major television stations, one in English and one in a local language. To further bolster the campaign, staff from NMCP participated in radio and television talk and phone-in shows with the general public.

12.5 Challenges in CD Implementation and ITN Distribution in Urban Settings

Implementing CD in urban areas presented some challenges. On-site orientation for ANC and CWC staff was a challenge because they have heavy workloads, and it was difficult to coordinate schedules among training facilitators and clinic staff. Compounding this issue was the amount of time facilitators needed to travel to present orientation sessions.

Implementing the CD framework in schools in urban areas also had challenges. The large number of schools and lack of data on them at the central level made planning a challenge, but the CD project gave managers in GES an incentive to update their database. Some urban schools showed no interest in outreach activities. Teachers attributed their inability to participate for any number of reasons, including a heavy school curriculum, lack of motivation or interest in activities, scheduling conflicts between planned school activities and community mobilization activities, and lack of supervision by SHEP coordinators due to insufficient funds or transportation. Finally, differences in community structure between cities and rural areas made it difficult to effectively organize community outreach to educate community members.

12.6 Research

Research in the form of surveys and studies about project implementation helps ensure that an intervention can be accurately measured for efficacy and provides a baseline for improvement. NetWorks therefore incorporated baseline and follow-up surveys into the design of the project to support an evaluation of the Eastern Region CD pilots, in addition to a process evaluation. NetWorks also used a qualitative study design in northern Ghana to document outdoor sleeping and other outdoor nighttime activities that contribute to potential malaria exposure.

12.6.1 Eastern Region continuous distribution pilots

12.6.1.1 *Methods*

In the Eastern Region, the NMCP and implementing partners supported mass distributions of ITNs between December 2010 and April 2011. CD activities began in October 2012. The outcome was evaluated through cross sectional surveys, conducted at baseline in April 2012, 12-16 months after the campaign, and at endline in December 2013, after one year of CD implementation. For each survey, a representative sample of 900 households was selected using a two-stage cluster sampling design. Household heads were interviewed using a structured questionnaire.

12.6.1.2 *Key findings*

Full results of the pilot are available in the [Final Survey Report for the Eastern Region Continuous Distribution Pilot](#). Overall, household ownership of at least one ITN was maintained at around 90% (91% at baseline and 88% at endline, 18 months later). To assess what ITN ownership would have been without the CD activities, NetWorks calculated ownership by excluding nets obtained through CD channels. Excluding nets received through CD channels, ownership of any ITN would have been 81.0%. The overall proportion of the population with access to an ITN within their household decreased from 74.5% at baseline to 66.5% and would have been 57.4% if one excluded the nets received through the CD channels (Figure 10). Moreover, households tended not to

receive nets from multiple CD channels, but rather through either ANC, EPI, or the school channel. By targeting households at different 'lifecycle' points, oversupplying the same households with nets was avoided. Figure 9: ITN ownership and population access to ITN in Ghana, before and after the CD pilot. While the number of nets distributed was insufficient to boost universal coverage, both ownership and access would have been significantly lower without the contribution of the ITNs from the CD channels. illustrates that households that obtained nets through the CD channels were able to fill gaps in net access - a greater proportion of these households had almost enough (1 ITN / 3 persons) or enough nets (1 ITN / 2 persons) than did households that did not obtain nets through the CD channels.

Three primary conclusions may be drawn from this study. The CD effort made a significant contribution to household ownership, however, the number of ITNs distributed was insufficient to increase universal coverage (one net for every two people in the household). Continuous distribution of ITNs through primary schools and health clinics did not quite achieve universal coverage after one year of implementation due to delays in initiating continuous distribution following the mass campaign. The number of ITN distributed through the CD channels was insufficient to address attrition and loss of ITN that occurred during the nearly two-year gap. These results show, however, that CD implementation can sustain universal coverage if implemented well. Distribution of ITNs through a comprehensive system that uses a mix of channels is the best way to achieve equity in household coverage.

Figure 9: ITN ownership and population access to ITN in Ghana, before and after the CD pilot. While the number of nets distributed was insufficient to boost universal coverage, both ownership and access would have been significantly lower without the contribution of the ITNs from the CD channels.

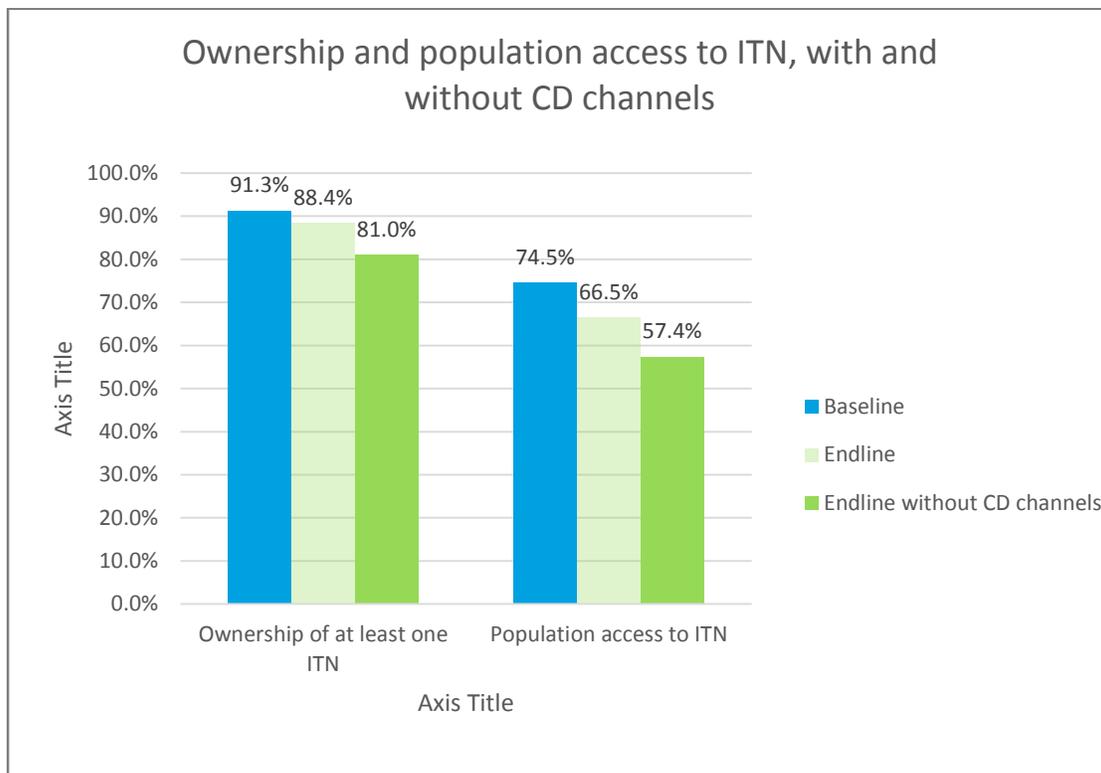
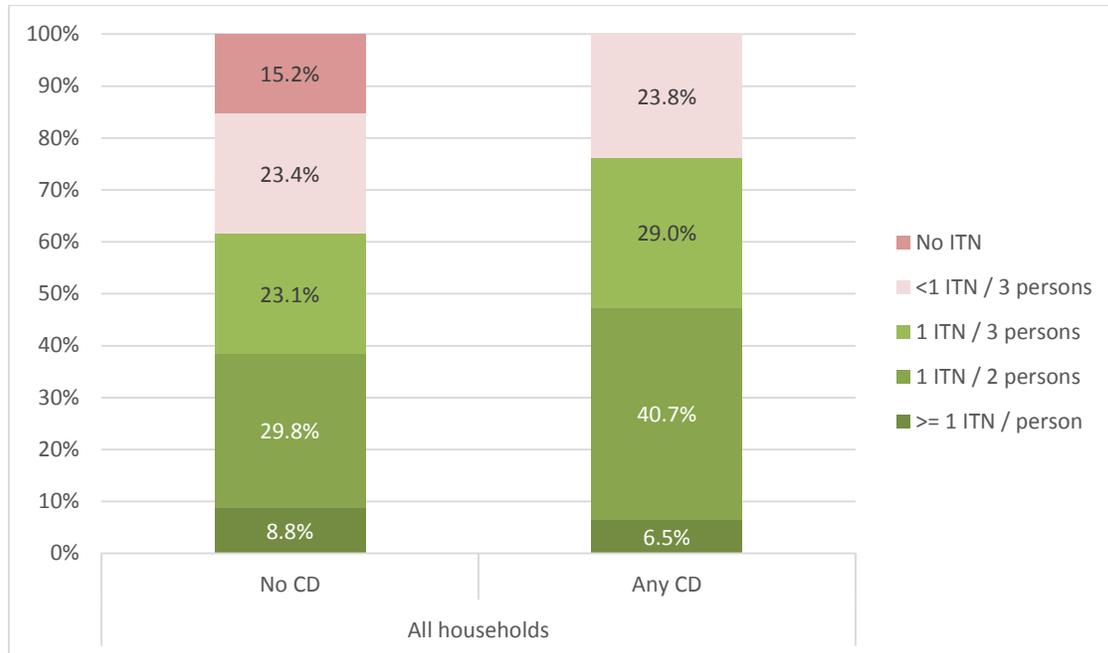


Figure 10: Household ITN supply comparing households that received campaign nets and CD nets. Households filled gaps by obtaining CD nets. At the same time, the proportion of households that had at least 1 ITN per person did not increase (darkest green), indicating CD did not oversupply the same households.



12.6.2 Outdoor sleeping study

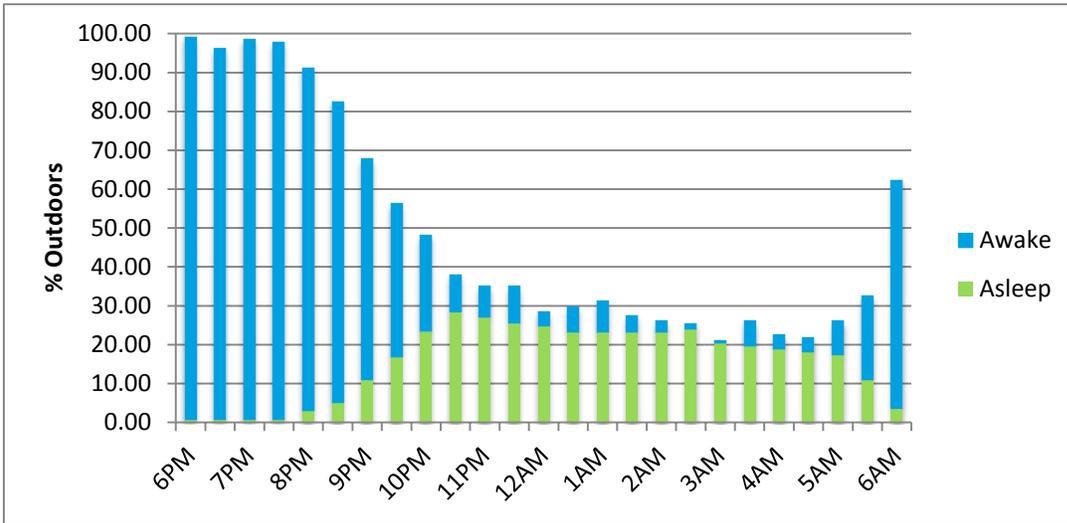
12.6.2.1 Methods

During the late dry-season months of February and March 2014, NetWorks study team members carried out continuous household observations from dusk to dawn in two villages, one in Northern Region and one in Upper West Region. In-depth interviews with health workers and community residents supplemented observational findings. Study team members observed 182 individuals across 24 households, 12 households per site. Between the two sites, they interviewed 14 health workers, 6 community health volunteers and 28 community residents.

12.6.2.2 Key findings

A large percentage of participants were observed to be outdoors throughout the night.

Figure 11: Percentage of observation participants observed outdoors, either awake or asleep, half-hourly



Nighttime activities

In early evening, nearly all study participants were observed to be outdoors and active. From 18:00 to 23:00 hours, socializing, night school, household chores, and small-scale economic activities were common. All-night funerals, held outdoors and attended by large numbers of community members, were commonly reported and observed.

Outdoor sleeping

Outdoor sleeping was frequently documented at both study sites, with 42% of the study population sleeping outdoors at some time during the night.

Figure 12: Household members sleeping in the open-air courtyard of their compound



Net use

In-depth interview participants reported they did not commonly use nets during the dry season, and observed use of nets was low. Nets were observed to be stored, hung over sleeping spaces but not used, used for alternative purposes, or still in packaging material. Net use was low both indoors and outdoors throughout the night, with the highest net use observed between 1:00 and 5:00 am (10%). Although multiple participants noted that they used nets outdoors, outdoor net use was rarely observed.

Net access

Participants reported that not every member of the household had access to a net. Gaps in net coverage and variation in net access was observed across households, with some households not having any nets at all. Among observation participants, approximately two-thirds of observation participants had access to a net at the household level.

Barriers to net use

Reported barriers to net use during the dry season included heat, perceived lower risk of contracting malaria, inconvenience of untying and retying the net when moving from an indoor sleeping space to an outdoor space, difficulty hanging the net outdoors, and outdoor night-time activities.

Next steps

The indicator "slept under a net last night" does not capture the full night's sleeping habits because it is increasingly clear that people may spend only part of the night sleeping under a net, particularly in certain regions. SBCC strategies need to include better messages to promote year-round ITN use and additional malaria prevention strategies when net use is not feasible, in hot weather, and for large-scale, outdoor events such as funerals. These findings suggest that indoor-

oriented control measures such as use of an ITN and indoor residual spraying may be insufficient to eliminate malaria, especially given the observed low use of nets. Development and evaluation of complementary outdoor control strategies should be prioritized.

12.7 Key Contributions, Challenges and Opportunities

Through effective partnerships and collaboration, the NetWorks project demonstrated the effectiveness of four key CD channels in Ghana: ANC clinics, EPI clinics, schools, and the private sector.

A key challenge to demonstrating the effectiveness of CD in sustaining ITN coverage was the large gap in time between the mass campaign and initiation of the CD concept. CD activities began nearly two years after the mass campaign. Moving forward, it will be imperative to initiate CD within 12 months following a mass distribution campaign, or ideally, to perpetually maintain CD channels.

Continued operations research to improve CD and research on the cost-effectiveness of individual channels and combinations of channels are also recommended. Looking forward, it will be important to consider a total market approach for delivering LLINs through the public and private sectors.

School Distributions

In schools, NetWorks helped develop an effective quantification process to ensure the right number of nets was delivered. Opportunities remain for improving the timing of school distribution and the reporting processes. Ideally school distributions will be planned for the middle of the term, rather than at the end, to ensure there is time for reports to be written, duplicated, and submitted before a long break in order to prevent delays. Duplicate forms should also be kept at schools for quality assurance.

Health Facility Distributions

NetWorks improved documentation at the health facility level by updating the ANC and EPI forms and record-books with columns to record net distribution information. Challenges remain throughout the distribution supply chain. Orientation for new health care workers and reorientation of existing health workers is important to improve documentation and reporting. These issues also underscored the need for a national level monitoring team to oversee district-level monitoring teams and to ensure health-facility implementation was being carried out as planned.

Private Sector Distribution

NetWorks demonstrated the potential value of using an e-coupon technology in private sector distribution of ITN. There remains tremendous opportunity to re-establish a viable private-sector market in ITNs in Ghana and beyond. A sustainable private sector market in LLINs provides long-lasting assurance of availability, and thus of households' ability to protect their family members from malaria infection into the future.

Moving forward, all private sector distributor partners should be included in the design of the program scale-up and price setting to ensure that they are fully on-board and willing to participate in program implementation. Demand generation remains an important consideration for private sector distribution. Additional market analysis should be carried out to quantify demand prior to design of specific program activities. Further, e-coupons should be issued in a targeted way that demonstrates value, and requires some action from the redeemer. For that reason, distribution through large, public promotions is not recommended. Finally, the roll-out of the self-issue option

could alleviate some of the burden on the issuers, as customers will be able to request and obtain a coupon through sending an SMS on their mobile phone which they can then take directly to a nearby participating retailer.

ITN Use

It will be important to look beyond distribution to ensuring optimal ITN use. Improved net use through the use of community-based initiatives and peer educators could be of use. An important first step for addressing outdoor transmission will be to measure the risk associated with nighttime outdoor activities. This will provide the opportunity to identify settings and activities representing the greatest risk for malaria transmission in order to better target complimentary outdoor prevention strategies.

12.8 Acknowledgments

This work was made possible by collaboration between the NetWorks project and the Ghanaian government, including GHS, NMCP, GES, and SHEP, as well as partnerships with Malaria Consortium, Mennonite Economic Development Associates, and the USAID |DELIVER project. Funding was provided by the President's Malaria Initiative.

12.9 NetWorks Ghana Performance Monitoring Plan

NetWorks Ghana: Performance Monitoring Plan: Last Updated September 30, 2014

Reporting Period for Year One - 1 October 2012 to 30 September 2013

Reporting Period for Year Two - 1 October 2013 to 30 September 2014

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
Malaria Prevention							
1	Proportion of households with at least one ITN	National: 48.9% Eastern: 78.2% ^m /90.2% ^e ; Volta: 85.4% Northern: 67.2% Ashanti: 39.8% Brong Ahafo: 53.4% Upper East: 51.8% Upper West: 60.7% Central: 32.1% Greater Accra: 25.5% Western: 42.7%	National: 90% Eastern: 90%; Volta: 90% Northern: 90% Ashanti: 90% Brong Ahafo: 90% Upper East: 90% Upper West: 90% Central: 90% Greater Accra: 90% Western: 90%	National: 61.5% Eastern: 55.6%; Volta: 63.7% Northern: 88.7% Ashanti: 42.2% Brong Ahafo: 72% Upper East: 85.7% Upper West: 96.9% Central: 55.9% Greater Accra: 70.6% Western: 33%	National: 90% Eastern: 90%; Volta: 90% Northern: 90% Ashanti: 90% Brong Ahafo: 90% Upper East: 90% Upper West: 90% Central: 90% Greater Accra: 90% Western: 90%	Eastern: 90.1%	Data for the Reporting Period was drawn from the Eastern Region CD Pilot Endline Survey. The National Level DHS 2014 is yet to be conducted.
1.1	Proportion of households with at least one ITN (Urban)	National: 39.1%	National: 85% Eastern: 85%; Volta: 85% Northern: 85%	National 59.1%	National: 90% Eastern: 90%; Volta: 90% Northern: 90%	Eastern: 85.4%	

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
1.2	Proportion of households with at least one ITN (Rural)	National: 60.1%	National: 90% Eastern: 90%; Volta: 90% Northern: 90%	National: 64.4%	National: 90% Eastern: 90%; Volta: 90% Northern: 90% Ashanti: 90% Brong Ahafo: 90% Upper East: 90% Upper West: 90% Central: 90% Greater Accra: 90% Western: 90%	Eastern: 93.9%	
1.3	Proportion of households with at least one ITN (Lowest Wealth Quintile)	National: 65.9%	National: 90% Eastern: 90%; Volta: 95% Northern: 90%	National: 58% Eastern: 46.5%; Volta: 30% Northern: 75%	National: 90% Eastern: 90%; Volta: 90% Northern: 90% Ashanti: 90% Brong Ahafo: 90% Upper East: 90% Upper West: 90% Central: 90% Greater Accra: 90% Western: 90%	Eastern: 91.1%	
1.4	Proportion of households with at least one ITN (Second Wealth Quintile)	National: 58.5%	National: 90% Eastern: 90%; Volta: 90% Northern: 90%	National: 65.4% Eastern: 90%; Volta: 95% Northern: 90%	National: 90% Eastern: 90%; Volta: 90% Northern: 90% Ashanti: 90% Brong Ahafo: 90% Upper East: 90% Upper West: 90% Central: 90% Greater Accra: 90% Western: 90%	Eastern: 89.3%	

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
1.5	Proportion of households with at least one ITN (Middle Wealth Quintile)	National: 52.2%	National: 85% Eastern: 85%; Volta: 85% Northern: 80%	National: 60.4% Eastern: 90%; Volta: 95% Northern: 90%	National: 90% Eastern: 90%; Volta: 90% Northern: 90% Ashanti: 90% Brong Ahafo: 90% Upper East: 90% Upper West: 90% Central: 90% Greater Accra: 90% Western: 90%	Eastern: 91.1%	
1.6	Proportion of households with at least one ITN (Fourth Wealth Quintile)	National: 41.9%	National: 85% Eastern: 85%; Volta: 85% Northern: 80%	National: 58.2% Eastern: 77.3%; Volta: 59.1% Northern: 88.5%	National: 90% Eastern: 90%; Volta: 90% Northern: 90% Ashanti: 90% Brong Ahafo: 90% Upper East: 90% Upper West: 90% Central: 90% Greater Accra: 90% Western: 90%	Eastern: 88.9%	

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
1.7	Proportion of households with at least one ITN (Highest Wealth Quintile)	National: 35.2%	National: 75% Eastern: 75%; Volta: 80% Northern: 70%	National: 73.5% Eastern: **%; Volta: 66.7% Northern: 75%	National: 90% Eastern: 90%; Volta: 90% Northern: 90% Ashanti: 90% Brong Ahafo: 90% Upper East: 90% Upper West: 90% Central: 90% Greater Accra: 90% Western: 90%	Eastern: 90%	
2	Proportion of households with at least one ITN for every two persons	National: 25.5% Eastern: 57.3% ^m /49.8%; Volta: 65.3% Northern: 19.3% Ashanti: 16.4% Brong Ahafo: 22.2% Upper East: 18.0% Upper West: 19.7% Central: 12.8% Greater Accra: 10.4% Western: 21.7%	National: 75% Eastern: 75%; Volta: 75% Northern: 75% Ashanti: 75% Brong Ahafo: 75% Upper East: 75% Upper West: 75% Central: 75% Greater Accra: 75% Western: 75%	National: 45.2% Eastern: 38%; Volta: 46.2% Northern: 61.3% Ashanti: 37.2% Brong Ahafo: 56% Upper East: 73.8% Upper West: 90.6% Central: 41.9% Greater Accra: 47.1% Western: 14%	National: 80% Eastern: 80%; Volta: 80% Northern: 80% Ashanti: 80% Brong Ahafo: 80% Upper East: 80% Upper West: 80% Central: 80% Greater Accra: 80% Western: 80%	Eastern: 40%	
3	Proportion of population of all ages who slept under an ITN the previous night	National 28.6% Eastern: 50.6% ^m /46.8% ^e Volta: 65.6% Northern: 26.9%	National 85% Eastern: 85%; Volta: 85% Northern: 85%	National 38.8% Eastern: 40.7%; Volta: 35% Northern: 41%	National 85% Eastern: 85%; Volta: 85% Northern: 85%	Eastern: 38.2%	

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
3.1	Proportion of population of all ages who slept under an ITN the previous night (Male)	National: 26.9%	National: 85%	National: 34.6%	National: 85%	Eastern: 73.1%	DHS Report did not break down population into male and female
3.2	Proportion of population of all ages who slept under an ITN the previous night (Female)	National: 30.3%	National: 85%	National: 42.8%	National: 85%		
3.3	Proportion of population of all ages who slept under an ITN the previous night (Urban)	National: 19%	National: 83%	National: 34.7%	National: 85%	Eastern: 34%	
3.4	Proportion of population of all ages who slept under an ITN the previous night (Rural)	National: 33.1%	National: 85%	National 43.1%	National: 85%	Eastern: 41.4%	
3.5	Proportion of population of all ages who slept under an ITN the previous night (Lowest Wealth Quintile)	National: 32.8%	National: 85%	National 40.2%	National: 85%	Eastern: 38.5%	
3.6	Proportion of population of all ages who slept under an ITN the previous night	National: 33.3%	National: 85%	National 41.3%	National: 85%	Eastern: 39.2%	

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
	(Second Wealth Quintile)						
3.7	Proportion of population of all ages who slept under an ITN the previous night (Middle Wealth Quintile)	National: 26.1%	National: 85%	National 36.8%	National: 85%	Eastern: 39.1%	
3.8	Proportion of population of all ages who slept under an ITN the previous night (Fourth Wealth Quintile)	National: 20.9%	National: 85%	National 39.2%	National: 85%	Eastern: 37.4%	
3.9	Proportion of population of all ages who slept under an ITN the previous night (Highest Wealth Quintile)	National: 14.5%	National: 85%	National 36%	National: 85%	Eastern: 37%	

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
4	Proportion of children under five years old who slept under an ITN the previous night	National: 39.0% Eastern: 60.2% ^m /49.1% ^e ; Volta: 70.7% Northern:41.8% Ashanti: 31.2% Brong Ahafo: 41.3% Upper East: 45% Upper West: 46.9% Central: 27.7% Greater Accra: 22.1% Western: 32.7%	National: 85% Eastern: 85% Volta: 85% Northern: 85% Ashanti: 85% Brong Ahafo: 85% Upper East: 85% Upper West: 85% Central: 85% Greater Accra: 85% Western: 85%	National 45.6%	National: 85% Eastern: 85% Volta: 85% Northern: 85% Ashanti: 85% Brong Ahafo: 85% Upper East: 85% Upper West: 85% Central: 85% Greater Accra: 85% Western: 85%	Eastern: 45.4%	
4.1	Proportion of children under five years old who slept under an ITN the previous night (Male)	National: 39.3%	National: 85%	National 40.9%	National: 85%	Eastern:	
4.2	Proportion of children under five years old who slept under an ITN the previous night (Female)	National: 38.8%	National: 85%	National 49.4%	National: 85%	Eastern:	
4.3	Proportion of children under five years old who slept under an ITN the previous night (Urban)	National: 30.1%	National: 85%	National: 45.4%	National: 85%	Eastern: 44.4%	
4.4	Proportion of children under five years old who slept under an ITN the	National: 45.9%	National: 85%	National: 45.7%	National: 85%	Eastern: 46%	

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
	previous night (Rural)						
4.5	Proportion of children under five years old who slept under an ITN the previous night (Lowest Wealth Quintile)	National: 49.7%	National: 85%	National: 43.5%	National: 85%	Eastern: 46.6%	
4.6	Proportion of children under five years old who slept under an ITN the previous night (Second Wealth Quintile)	National: 45.5%	National: 85%	National: 38.3%	National: 85%	Eastern: 43.1%	
4.7	Proportion of children under five years old who slept under an ITN the previous night (Middle Wealth Quintile)	National: 41.0%	National: 85%	National: 48.5%	National: 85%	Eastern: 48.3%	
4.8	Proportion of children under five years old who slept under an ITN the previous night (Fourth Wealth Quintile)	National: 31.0%	National: 85%	National: 56.5%	National: 85%	Eastern: 44.7%	

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
4.9	Proportion of children under five years old who slept under an ITN the previous night (Highest Wealth Quintile)	National: 23.6%	National: 85%	National: 30%	National: 85%	Eastern: 44.1%	
5	Proportion of pregnant women who slept under an ITN the previous night.	National: 32.6% Eastern: 62.3% ^m /50% ^e ; Volta: 57.8% Northern: 37.9% Ashanti: 21.3% Brong Ahafo: 36.1% Ahafo: 50.5% Upper East: 41.2% Central: 29.3% Greater Accra: 11.8% Western: 21.5%	National: 85% Eastern: 85% Volta: 85% Northern: 85% Ashanti: 85% Brong Ahafo: 85% Upper East: 85% Upper West: 85% Central: 85% Greater Accra: 85% Western: 85%	National: 54% Eastern: ** Volta: ** Northern: 50% Ashanti: 81% Brong Ahafo: 75% Upper East: 33% Upper West: **% Central: **% Greater Accra: 33% Western: 56%	National: 85% Eastern: 85% Volta: 85% Northern: 85% Ashanti: 85% Brong Ahafo: 85% Upper East: 85% Upper West: 85% Central: 85% Greater Accra: 85% Western: 85%	Eastern: 38.9%	Data for year 2 collected in the dry season (after the rains) where net use is generally low.
5.1	Proportion of pregnant women who slept under an ITN the previous night. (Urban)	National: 18.8%	National: 85%	National 46%	National: 85%	Eastern: 31.3%	
5.2	Proportion of pregnant women who slept under an ITN the previous night.(Rural)	National: 43.6%	National: 85%	National 66%	National: 85%	Eastern: 45%	
5.3	Proportion of pregnant women who slept under an ITN the previous night.(Lowest)	National: 51.4%	National: 85%	National: 87.5%	National: 85%	Eastern: 40%	Survey was conducted at the end of the raining season where net use is generally low.

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
	Wealth Quintile)						
5.4	Proportion of pregnant women who slept under an ITN the previous night.(Second Wealth Quintile)	National: 49.7%	National: 85%	National 35.3%	National: 85%	Eastern: 50%	
5.5	Proportion of pregnant women who slept under an ITN the previous night.(Middle Wealth Quintile)	National: 31.9%	National: 85%	National 61.9%	National: 85%	Eastern: 42.9%	
5.6	Proportion of pregnant women who slept under an ITN the previous night.(Fourth Wealth Quintile)	National: 12.9%	National: 85%	National 30.8%	National: 85%	Eastern: 33.3%	
5.7	Proportion of pregnant women who slept under an ITN the previous night. (Highest Wealth Quintile)	National: 15.8%	National: 80%	National 61.9%	National: 85%	Eastern: - 0	No figure was provided in end line survey
6	Number of ITNs distributed nationally with USG funds	0	1,350,000	1,427,169	3,623,724	1,703,169	The target took into consideration distribution through 3 primary school classes (2, 4, 6) nationwide and health facility distribution. There were delays in the arrival of Nets for the commencement of health facility distribution in 6

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
							Regions. There were also stockouts in 4 Regions due to the late arrival of Nets. For schools, distribution was done through 2 Classes in all 10 Regions. Eastern Region had a top up for two additional classes (Class 4 and 5) This was necessitated by the fact that in year 1, Eastern Region was not served by NetWorks.
6.1	Number of insecticide treated nets (ITNs) purchased with USG funds that were distributed through health facilities	0	150,000	189,969	1,734,124	773,182	The unavailability of Nets in the country and the delay in the arrival of procured nets affected continuous distribution activities through health facilities. Data is for the period 1 October 2013 to 30 September 2014. Data Retrieved on from Ghana health Service District Health Information Management System (DHIMS 2) database
6.2	Number of insecticide treated nets (ITNs) purchased with USG funds that were distributed through health facilities (ANC)	0	tbd	81,009	867,062	294,322	Data Retrieved from the Ghana Health Service District Health Information Management System (DHIMS2 Software for the Period October 1 2013 to September 30 2014
6.3	Number of insecticide treated nets (ITNs) purchased with USG funds that were distributed through health	0	tbd	108,960	867,062	478,860	Data Retrieved from the Ghana Health Service District Health Information Management System (DHIMS2 Software for the Period October 1 2013 to September 30 2014

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
facilities (CWC)							
6.4	Number of insecticide treated nets (ITNs) purchased with USG funds that were distributed through Schools	0	1,200,000	1,237,200	865,876	1,510,100	1,374,100 through school distribution -National (class 2 &6 March - April 2014) 136,000 through Eastern Region schools top up (class 4 &5- November-December 2013). The Central Medical Stores does not disaggregate nets by the purchaser of nets. All Nets are in a pool and used for distribution
6.5	Number of insecticide treated nets (ITNs) purchased by other partners that were distributed with USG funds	0	1,000,000	NA	1,023,724	-	The Central Medical Stores does not disaggregate nets by the purchaser of nets. All Nets are in a pool and used for distribution
7	Number of persons trained in ITN distribution, and/or promotion	0	25,000	23,273	2,684	4,207	Onsite facility based health worker training Upper West - 511, Brong Ahafo 1237 Upper East 353 Ashanti 1926 trained
7.1	Number of persons trained in ITN distribution, and/or promotion (Male)	0	11,250	16,358	389	880	Onsite facility based health worker training Upper West - 187 , Brong Ahafo 279 Upper East 126 Ashanti 288 trained
7.2	Number of persons trained in ITN distribution, and/or promotion (Female)	0	13,750	6,915	953	3,147	Onsite facility based health worker training Upper West - 324 , Brong Ahafo 958 Upper East 227 Ashanti 1638 trained
8	Number of schools implementing	0	18,000	18,846	21,000	19,175	

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
	continuous distribution						
9	Number of pupils receiving ITN through schools	0	1,203,589	1,237,200	1,889,600	1,510,100	Although target took into consideration distribution through 3 streams Class 2, 4 and 6 nets available were enough for only 2 streams. Class 2 and 6 were used. Figure constitutes total nets distributed. 192 out of 216 districts provided information of breakdown by male and female hence breakdown will not tally with total figures.
9.1	Number of pupils receiving ITN through schools (Male)	0	648,000	643,344	969,365	636,139	
9.2	Number of pupils receiving ITN through schools (Female)	0	555,589	593,856	920,235	601,170	
Community Mobilization							
10	Number of Community Radio Stations contracted by NetWorks to broadcast Malaria Prevention Messages	0	25	28	33	22	5 community radio stations - Southern Zone 9 National Stations 8 community Radio Stations in the Northern Zone- CRS
11	Number of radio spots or programs produced	0	9	19	9	14	

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
12	Number of radio spots or programs broadcast	0	10,000	15217	12,000	6772	3807 spots by 5 community radio stations 565 Spots by 9 National Stations 2400 Spots aired by 8 community Radio Stations in the Northern Zone- CRS
13	Number of television spots or programs produced	0	2	2	2	2	
14	Number of television spots or programs Broadcast	0			90	103	Yr 1 results not available
15	% of household respondents who heard or saw a malaria message by specific message (ITN)	National ITN: 23.2% Ashanti ITN;20%; Eastern ITN: 18.7% Northern ITN; 19.2%	National ITN: 80% Ashanti ITN; 80%; Eastern ITN: 80% Northern ITN; 80%	National: 78% Eastern: 94%; Volta: 91% Northern: 55.7% Ashanti: 73% Brong Ahafo: 78% Upper East: 91% Upper West: 94% Central: 47% Greater Accra: 91% Western: 79%	National ITN: 85% Ashanti ITN: 85%; Eastern ITN: 85% Northern ITN; 85%	Eastern ITN: 84.9%	
16	% of household respondents who heard or saw a malaria message by source	Eastern TV: 28.2% Radio: 15.3% Volta TV: 19.5% Radio: 22.6% Northern TV: 33.1% Radio: 15.2%	Eastern TV: 60% Radio: 60% Volta TV: 60% Radio: 60% Northern TV: 60% Radio: 60%	Eastern TV: 24.8% Radio: 45% Volta TV: 32.9% Radio: 23.7% Northern TV: 34.8% Radio: 25.8%	Eastern TV: 80% Radio: 80% Volta TV: 80% Radio: 80% Northern TV: 80% Radio: 80%	Eastern TV: 28.8% Radio: 53%	DHS results for other districts not available during reporting period

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
17	Number of people trained in Community Mobilization for malaria prevention	0	8,000	5139	4,184	16,096	Training of school based teachers in Drama, Malaria flip chart and community outreach activities in 7 Regions
17.1	Number of people trained in Community mobilization for malaria prevention (Male)	0	4,800	2171	2,578	9,530	Training of school based teachers in Drama, Malaria flip chart and community outreach activities in 7 Regions
17.2	Number of people trained in community mobilization for malaria prevention (Female)	0	3,200	2968	1,606	6,566	Training of school based teachers in Drama, Malaria flip chart and community outreach activities in 7 Regions
18	# of Community Based Opinion Leaders Oriented on LLINs for malaria prevention and control	0	1,500	636	1,500	6,190	46 Senior Level Religious Leaders were trained and have oriented 6190 Opinion Leaders and members in the Northern Zone
18.1	# of Community Based Opinion Leaders Oriented on LLINs for malaria prevention and control (Male)	0	900	394	900	4024	Estimated
18.2	# of Community Based Opinion Leaders Oriented on LLINs for malaria prevention and control (Female)	0	600	242	600	2,166	Estimated

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
19	# of organized groups engaged in malaria SM activities	0	150	131	150	131	Old groups for year1 were maintained by CRS
TRAINING							
20	Number of people (medical personnel, health workers, community workers, educational workers etc.) trained with USG funds in malaria treatment or prevention	0	26,500	23,909	4,184	20,303	Shift from classroom training to on-site trainings provided an opportunity for more people to be trained. Additional people were trained on drama scripts for school and community mobilization.
20.1	Number of people (medical personnel, health workers, community workers, etc.) trained with USG funds in malaria treatment or prevention (Male)	0	12,150	16,752	1,213	10,410	
20.2	Number of people (medical personnel, health workers, community workers, etc.) trained with USG funds in malaria treatment or prevention (Female)	0	14,350	7,157	2,971	9,713	

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
20.3	Number of health facility workers trained	0	6,500	2524	2,684	4207	
20.4	Number of community-level workers trained***	0	20,000	21385	1,500	16,096	
New LLIN Indicators for 2014							
21	Percentage of ANC registrants reported as being supplied with LLINs	Eastern: 42.2%; Volta: 29.3% Western: 28.2% Central: 8.95%	NA		National: 80% Eastern: 80%; Volta: 80% Northern: 80% Ashanti: 80% Brong Ahafo: 80% Upper East: 80% Upper Volta: 80% Central: 80% Greater Accra: 80% Western: 80%	National: 32.7% Eastern: 56.3%; Volta: 37.4% Northern: 24.9% Ashanti: 45.1% Brong Ahafo: 38.9% Upper East: 44.0% Upper West: 53.6% Central: 27.1% Greater Accra: 7.1% Western: 28.1%	Data for the month of July 2013 used as a baseline. Baseline Data retrieved from DHIMS on August 27 2013. Data (Results) Retrieved from DHIMS on 27 April 2014. Central, Western Eastern and Volta were affected by stock out of nets between October 2013 and January 2014.

Ind #	Indicator	Baseline	Targets Year 1	Results	Targets Year 2	Results	Comments on Year 2 Results
22	Percentage of children receiving measles 2 dose reported as being supplied with LLIN	Eastern: 79.9%; Volta: 82% Western: 50.3% Central: 30.77%	NA		National: 80% Eastern: 80%; Volta: 80% Northern: 80% Ashanti: 80% Brong Ahafo: 80% Upper East: 80% Upper West: 80% Central: 80% Greater Accra: 80% Western: 80%	National: 57.8% Eastern: 88.2%; Volta: 69.8% Northern: 38.9% Ashanti: 66.5% Brong Ahafo: 52.8% Upper East: 69% Upper West: 68.8% Central: 60.8% Greater Accra: 22.6% Western: 62.1%	Data for the Month of July 2013 used as a baseline. Baseline Data retrieved from DHIMS on August 27 2013.

All baseline data sources for outcome indicators are taken from MICS 2011 except Eastern Region Where ^m = MICS and ^e = Post Campaign Evaluation

***Persons from Educational Institutions are included in the community level trainees

tbd = to be determined.

13 NetWorks Nigeria End of Project Report

13.1 Summary

NetWorks has worked in Nigeria since 2010 by supporting and providing technical assistance to PMI's host country government partners, the National Malaria Elimination Program (NMEP) and the State Malaria Elimination Programs (SMEPs), a to pilot CD strategies and test the effect of BCC interventions in selected states in Nigeria. The resulting CD strategies and BCC designs highlight the wealth and diversity of existing structures (health, education and community facilities and mechanisms) that can be leveraged to improve access to ITNs and also encourage beneficiaries to provide better care of their nets.

NetWorks staff in Nigeria provided technical assistance to its NMEP, SMEP and PMI partners, and also focused on completing and evaluating various pilot projects and interventions in the selected states. Below are the highlights of activities implemented during this period.

Technical assistance and coordination:

- Helped NMEP and its implementing partners finalize standard operating procedures for CD of ITNs in Nigeria
- Facilitated trainings on ITN CD for NMEP personnel
- Supported NMEP to train State Support Teams on the national replacement mass campaign guidelines
- Provided technical support to the Federal Ministry of Health through NMEP and the Neglected Tropical Diseases Unit to train zonal consultants on malaria-lymphatic filariasis co-implementation pilot testing on the national guidelines in Nigeria

Design and implementation of ITN CD and NetCaRe pilots:

- Supported the Malaria Action Programme for States (MAPS) to implement a community-based ITN CD effort in Nasarawa and Zamfara states
- Designed and implemented two phases of a BCC campaign to promote net care and repair in Nasarawa State
- Supported SMEP implementation of three rounds of school-based ITN distribution in Cross River State
- Provided technical assistance to SMEP and the Targeted States High Impact Project (TSHIP) to develop a state-specific strategy for CD of ITNs in Sokoto State

Evaluations of mass campaigns, CD pilots and BCC interventions:

- Data collection, entry, analysis, and production of reports on household surveys to evaluate mass campaigns in Nasarawa, Cross River, and Sokoto States
- Data collection, entry, analysis, and production of reports on evaluation of the school-based ITN CD pilot in Cross River State, and community-based ITN CD pilot in Nasarawa State
- Data collection, entry, analysis, and production of reports on ITN durability survey in Cross River, Nasarawa and Zamfara states, including an assessment of net care and repair in Nasarawa State

National and state-level dissemination of results:

- Evaluation results for school-based and community-based pilots were disseminated in

separate events in Cross River and Nasarawa states, respectively, for state personnel and decision makers. An assessment of the care and repair intervention was also shared in Nasarawa State

- Evaluation results for CD pilots, durability assessments, and BCC interventions were distributed in Abuja for federal and state personnel and decision makers and implementing partners

Further details of the activities listed are provided in the sections below.

13.2 Technical Assistance and Coordination (TA)

NetWorks provided technical assistance to NMEP, MAPS, and TSHIP on all aspects of achieving and sustaining universal coverage with ITNs in Nigeria, using local staff and external consultants where required. This contributed immensely to the knowledge base and to the CD concept in Nigeria.

13.2.1 Technical assistance and coordination support to NMEP and PMI/USAID implementation partners (NG.TA.1)

NetWorks continued to provide technical assistance to the NMEP and the Integrated Vector Control Working Group (IVM committee), especially in introducing malaria-lymphatic filariasis co-implementation guidelines and preparing State Support Teams for the planned mass replacement ITN campaigns in Nigeria. NetWorks also continued to ensure close coordination and collaboration with PMI implementing partners (MAPS, TSHIP and DELIVER) to implement and further identify viable channels for CD of ITNs. NetWorks also provided assistance to MAPS during its annual operational planning and review meeting by strengthening its ability to use various CD methods and to share lessons that had been learned from previous school- and community-based net distribution efforts in Nigeria.



NetWorks also provided technical assistance to TSHIP and Sokoto SMEPs to design a CD strategy that will combine public and private efforts in an effort to sustain net coverage after other recent mass-distribution campaigns.

13.2.2 Design and implementation of continuous distribution pilots

NetWorks began supporting innovative approaches to CD in Nigeria in 2010. In Nasarawa and Zamfara states, the CD strategy included distribution through ANCs and community-based channels. ANCs and school-based channels were used in Cross River. The MAPS project was responsible for community-based distribution in Nasarawa and Zamfara, whereas NetWorks directly managed school-based distribution activities in Cross River.

Community- and school-based distribution channels in these states are intended to complement ongoing net distributions in ANCs to ensure that the total number of nets distributed through these additional channels will result in greater individual access and coverage.

13.2.3 Continuous distribution by Community Drug Distributors in Nasarawa State (all 13 LGAs) (LG.P.1)

In Nasarawa, a network of volunteer community agents already exists as a result of the system of Community-based Drug Distributors (CDDs) that existed to fight onchocerciasis and other neglected tropical diseases, which was started by the Carter Center. In 2013, NetWorks worked with the Nasarawa SMEP and MAPS to design a community-based net distribution effort using CDDs. The USAID | DELIVER project transported the first batch of 48,500 nets to storage sites in wards where the nets were to be distributed, and community-based CD commenced in March 2013 in four selected wards in each of 13 local government areas (LGAs). A second batch of 148,000 nets was delivered to the designated LGA storage sites in September 2013, after being delayed at the state warehouse for several weeks, while waiting for their accompanying forms to be delivered.

NetWorks funded and facilitated two SMEP and Roll Back Malaria (RBM) meetings (in October and November 2013) to address the issue of CDDs having access to households in large wards. These meetings included LGA malaria focal persons and representatives from the Neglected Tropical Diseases branch of the Ministry of Health. NetWorks also funded and supported a joint monitoring visit of community-based CD activities with SMEP and MAPS personnel.

The Nasarawa SMEP and MAPS carried out community-based net CD efforts in Nasarawa using CDDs. Several challenges were encountered:

- Some wards were very large, which meant that CDDs had to travel significant distances to carry out household assessments
- Frequent stock-outs of nets at storage sites (health facilities) and household assessment forms
- Limited household awareness of the CDD program
- Poor data collation at all levels

Community-based CD continued in the wards that had been selected early by the state, even after the endline evaluation that was conducted in April 2014. SMEP and MAPS have been deliberating expanding their CD efforts from four wards to eight wards. In total, 196,500 ITNs were delivered by MAPS and DELIVER to health facilities for the CDD pilot. Planning for a proposed expansion in coverage is occurring.

A [case study of the Nasarawa State community-based ITN CD effort](#) was finalized in late 2014. Results from the endline survey are described below in section 13.3.1.

13.2.4 School-based distribution in Cross River State (NG.P.2)

The use of both schools and health facilities as channels for distributing nets is intended to help sustain the extensive net coverage that was achieved in the last state-wide mass net distribution campaign.

During years 2012 and 2013, NetWorks supported Cross River SMEP and its partners to design, prepare, and implement a school-based distribution program. The first distribution took place in 2012 in Obubra LGA, where 8,444 ITNs were distributed. The second round of distribution took

place in 2013 in both Obubra and Ogoja LGAs, where a total of about 20,545 ITNs were delivered to households through schools.

The third and final round of school-based ITN distribution took place in February 2014). ITNs were again distributed in Obubra and Ogoja LGAs. A total of 21,149 ITNs were distributed based on the registration data from targeted classes in LGA schools. Preparatory activities included micro planning meetings, training workshops for trainers, and training for heads of schools and teachers. These trainings were led by education personnel with technical support from health officials at both state and LGA levels. NetWorks designed and distributed approximately 23,000 job aids for teachers to all schools in Ogoja and Obubra LGAs. These materials were meant to aid classroom teachings and the transfer of knowledge from teacher to pupils and students.

Results from the evaluation are described below in section 14.3.2.

13.2.5 Community-based distribution in Zamfara (NG.P.3)

Zamfara State has very few health facilities and safe storage sites, so NetWorks helped SMEP and MAPS design a community-based approach to net distribution by which nets would be stored in the houses of village and opinion leaders. A household's need for an ITN would be assessed by community volunteers, then validated and met where necessary by a community opinion leader.

The Zamfara distribution strategy was finalized and distributed to all state stakeholders in 2013. MAPS was designated to implement the distribution activities, and NetWorks' role was to help monitor field activities and to provide technical assistance to MAPS and SMEP where needed.

In 2014, NetWorks provided a portion of the refresher training for 35 SMEP, MAPS, and Zamfara State and LGA officials. Distribution commenced in May 2014 in all LGAs. NetWorks funded a statewide monitoring activity in July 2014. NetWorks staff also participated in state RBM monthly meetings when distribution activities were discussed. MAPS distributed 30,058 LLINs from June - Sept 2014, and 11,704 from Oct 2014 - Feb 2015.

13.2.6 Private sector assessment in Sokoto (NG.P.4)

Mass distribution of ITNs was completed in December 2013 in Sokoto State and plans were in place to implement a CD strategy beginning in August 2014. Initial field assessments indicated that Sokoto has a vibrant ITN commercial sector, which can contribute to sustaining ITN coverage in the state.

In 2013, a brief assessment by NetWorks revealed that ITNs were available for sale in Sokoto in numerous retail outlets on the open market. Those nets came from campaigns elsewhere in Nigeria and Ghana, and included possible fake ITNs, and untreated nets-. A secondary analysis of available data showed that ITN coverage in Sokoto State would be higher if campaigns were not the only source of nets in the state, and that an influx of about 350,000 to 600,000 nets per year would have been needed for distribution in the state after the last campaign to maintain coverage. The annual ITN quantification is dependent on identifying the median survival of a net and the range reflects the assumptions of a three year net and a four year net. Based on this information, NetWorks proposed to assess the commercial ITN market and its possible contribution to sustaining ITN coverage in the state.

In 2015, NetWorks assessed the ITN commercial market in Sokoto State, in partnership with TSHIP, Sokoto SMEP and other implementing partners. This private sector assessment was included in a larger feasibility assessment of other continuous distribution channels to sustain ITN coverage in Sokoto State. Draft guidelines for implementing CD in the state, which considers both public and

private distribution of ITNs, was shared with PMI, Sokoto SMEP, TSHIP and other state-level implementing partners. A separate report on the commercial ITN market was also developed and shared with state-level collaborators and PMI. In July 2014, NetWorks disseminated the finalized strategy for sustaining ITN coverage in Sokoto State to all stakeholders.

Beyond the dissemination event, NetWorks worked closely with the Sokoto SMEP, TSHIP and other state-level partners in planning an effective CD system in Sokoto State.

13.3 Evaluations and Operational Research (ME)

The evaluations that NetWorks undertook focused on understanding whether and to what extent the ITN CD strategies piloted in Nasarawa and Cross River states have been successful in sustaining ITN coverage, and the cost of these strategies per net delivered. Current evidence shows that having enough nets for all household members is the strongest determinant of net use. Because continuous distribution seeks to ensure that every member of a household has a net, NetWorks also measured net use in the context of net ownership and access. While a major focus was on household surveys conducted at the beginning and end of the pilot implementation periods, these were also complemented by other data collected over time.

NetWorks also conducted a longitudinal study in Nasarawa, Zamfara and Cross River states to assess the association between ecological zones and net durability, and the potential of net care and repair behaviors (and BCC) to extend the useful life of nets. Improving our understanding of how to extend the useful life of nets may increase the duration of ITN ownership and access (and thus use) within the household, and therefore reduce the costs of net procurement and distribution by reducing the number of replacement nets and the frequency of replacement.

13.3.1 Nasarawa post-ITN campaign evaluation survey/community distribution endline evaluation (NG.ME.1)

In year two, NetWorks completed an evaluation of ITN mass distribution efforts in Nasarawa State, which served as a baseline for the community-based ITN continuous distribution pilot. The evaluation was a state-representative household survey. Preliminary findings were presented to partners in December 2011. [The final report is accessible online.](#)

The design of a community-based ITN distribution system in Nasarawa State began in 2011. Community-based ITN distribution commenced later than planned (in May 2013) because the ITNs were not available. The endline survey was conducted in April 2014 and measured the effect of CD on overall ITN coverage in Nasarawa State after one year, and also analyzed the contribution to net coverage of prevailing ITN distribution channels (i.e., through ANCs, other community-based channels and through the commercial sector).

The endline survey evaluated ITN ownership and access achieved through various distribution activities. The baseline survey results showed that after the 2009 mass campaign, 63% of families owned at least one ITN, and 58% of families owned at least one ITN from the mass campaign. Results from the endline survey showed that by April 2014, ITN ownership had fallen to around 17% for campaign nets, but overall, 37% owned at least one ITN. Households that were aware of the community-based program were significantly more likely to have at least one ITN, and more likely to have enough ITNs than households that were not aware of the program. However, overall rates of access and ownership were below universal coverage targets. Families in middle-wealth quintiles received a new ITN, those in the poorest quintile demonstrated low awareness of the program, and people in the upper quintile tended not to request an ITN even when they knew about the opportunity to obtain one.

In principle, distribution of ITNs through the community-based system has a significant effect on ITN ownership without oversupply. In addition, ITN distribution channels are largely complementary, with very little overlap between ANCs, and community-based and other channels. In practice, these findings indicate that community-based distribution needs to be carefully implemented to maximize the results one desires.

The preliminary results were shared with PMI and stakeholders at both national and state levels at the end of project dissemination meetings. The final results will be written up in 2015.

13.3.2 Cross River post-ITN campaign evaluation survey/evaluation of school-based distribution (NG.ME.2)

In 2013, NetWorks completed an evaluation of ITN mass distribution in Cross River State, which served as a baseline for the school-based CD operational research. The survey was a state-representative household survey. Preliminary findings were presented to state partners in September 2012.

School-based ITN distribution in Cross River State consisted of a stepped-wedge design in which distribution began in additional LGAs in a rolling pattern, and each wedge (additional LGA) was used as a domain in the endline survey with the intent of assessing the presence of a dose-response relationship. Net distribution began in Obubra LGA in 2011, then in both Obubra and Ogoja LGAs in 2012 and 2013. School-based ITN distribution did not occur in Ikom LGA during the pilot and served as a control LGA. ITNs were also being distributed in ANCs in all three LGAs during the three years of pilot implementation. The endline survey was conducted in March 2014, after the third round of school distributions in February 2014.

Results of the baseline survey showed that ownership levels of at least one ITN were very similar in all three LGAs 14 months after the mass ITN campaign. As suggested by the modeling simulated for the pilot, the endline survey showed that three and two rounds of ITN distribution showed a similar increase in ITN coverage in Obubra and Ogoja LGAs, whereas ITN coverage in the control LGA continued to decline beyond the baseline survey (77.4% in Obubra, 76.0% in Ogoja and 43% in Ikom LGA). The survey showed that school-based distribution was the most important source of ITNs for households, and that there was very limited overlap between the ITN distribution channels by schools and ANCs. Although there was overall good equity in ITN distribution, people in the poorest wealth quintile demonstrated slightly lower rates of net ownership via school-based distribution. This is most likely not from inequality in distribution of nets in schools, but either to lower school attendance by poor school children or less recall of the source of nets by members of that group. At baseline, the proportion of household respondents stating they had heard any message about nets and the use of nets was similar in all three LGAs. Household respondents in Obubra LGA reported slightly increased levels of having heard a message about net use after three rounds of school-based distribution. This was the same as it was at baseline in Ogoja LGA after two rounds of school-based distribution, but it decreased in the control LGA of Ikom. This suggests that BCC through schools had a role in maintaining public awareness of nets. Similarly, for all malaria-related messages, recall was best in Obubra, followed by Ogoja and then Ikom LGA.

In summary, results from the school-based evaluation show that adding ITN distribution through schools on to ITN distribution efforts by ANCs not only sustained ITN ownership, but also increased it. However, population access to ITN was still below target. Results also show that BCC efforts disseminated through schools made a significant contribution to net knowledge and intention to use, implying that multiple rounds of school distribution with BCC messages improves net use practices.

The preliminary results were presented to Cross River State education and health personnel during the end of project dissemination event in August 2014, and also at the national end-of-project meeting to key national level decision makers, donors and implementing partners. Final results are expected to be published in 2015.

13.3.3 Durability and care and repair (NG.OR.1)

This study examines the durability of ITNs over time in various field conditions and how durability can be influenced by a BCC intervention that promotes care and repair behaviors. The assessment of ITN durability in the field is important because it can guide replacement behavior and practices, guide the development of better textiles for ITNs and influence the ITN procurement process.

This activity has two components: a baseline and two follow-up surveys, and a BCC intervention.

13.3.3.1 Baseline and two follow-up surveys (NG.OR.1.a)

The objective of these surveys was to assess the physical condition and attrition rates of the ITNs that had been distributed in 2011 through the mass campaigns in Zamfara, Nasarawa and Cross River states. The three states were expected to have different patterns of loss and decay. A sufficient number of ITNs have been collected annually over three years, together with household data on previously lost nets, to allow a detailed assessment of the loss due to wear and tear, fabric integrity of surviving ITN and trends over time.

Data on ITN durability was collected in the three states by NetWorks in 2012 and 2013.. Preliminary findings from the first (baseline) and second rounds (follow-up) of data collection were disseminated to state and national stakeholders in Nigeria and at the Vector Control Working Group meeting in Geneva, Switzerland, in 2013.

NetWorks conducted the third and final round of data collection in 2014 (March and April) in all three states. In Nasarawa, these surveys also serve a dual purpose of assessing how a BCC intervention could prolong the useful life of an ITN. In Nasarawa, the durability of ITNs in an intervention in Kokona LGA was compared with that of a control LGA (Toto) where no BCC interventions were conducted.

Results from the three rounds of the durability surveys showed that mechanical damage was the most important contributing factor to ITN durability, closely followed by rodent damage in all three states. Burns played a lesser role than originally expected. Nets were overall more likely to be in acceptable (serviceable) condition if they were folded or tied up when not in use. Having children in the house and being poor had a significant negative effect on net durability. Of marginal positive effect was the regular use and frequent washing of nets. However, for regular use and frequent washing, the cause and effect is most likely reversed: nets in better condition are more often used and cared for.

These results were disseminated to national-level decision makers, donors, and implementing partners during the end-of-project meeting in August 2014.

13.3.3.2 Behavior change communication intervention (NG.OR.1.b)

The care and repair SBCC intervention in Kokona LGA in Nasarawa State is advancing the understanding of how net users may prevent and repair damage to their nets. The campaign is part of an operations research activity to examine whether communication campaigns can motivate behaviors that can mitigate or repair damage to nets. Implications of this activity include improving our understanding about how net users perceive net longevity and damage, and which attitudes, beliefs and other factors affect a net user's ability to effectively practice net care and

repair. The pilot also provides us with practical information on how to create a supportive and motivating environment and community ownership of net care and repair.

Formative research for the intervention was conducted in February 2012. After a competitive bidding process, the Center for Communication Programs Nigeria (CCPN) was contracted in August 2012 to implement the SBCC intervention. Phase 1 of the intervention ran from October 2012 to March 2013. Activities consisted of a suite of interpersonal communication activities, five radio spots, and a community song contest. After approvals were obtained and contractual procedures were completed in October 2013, NetWorks launched Phase 2 campaign activities, which ran from December 2013 through March 2014 [A full report on the implementation of Phases 1 and 2 is available online.](#)

To implement Phase 2, NetWorks capitalized on lessons that had been learned from Phase 1 and the midline durability assessment results to refine and strengthen BCC activities. In Phase 2, the field team gained much more confidence and had a stronger understanding of the key messages and behaviors, which were new to them before Phase 1.

- To strategize for Phase 2, NetWorks used the results of the midline durability assessment and conducted focus groups to better understand radio listenership patterns in the area and to select the most effective of the five radio spots that were created in Phase 1.
- Following this, a strategy refinement workshop was held with key stakeholders. During the same workshop, fresh radio content was developed using well-liked analogies and characters from Phase 1 to get listeners to continue tuning into the campaign. Including radio airtime funds in CCPN's budget was also advantageous, empowering them to directly negotiate with the radio station.
- Six new settlements were successfully incorporated into the SBCC intervention in Phase 2. This was necessary after the durability study (the evaluation mechanism for this intervention) had to change study sites due to violence in six Kokona communities.
- NetWorks recruited most of the field workers from Phase 1 and held a refresher training with them.
- Interpersonal communication activities were focused on conducting three community dialogues in each of the 20 settlements. The community dialogues were deemed the most effective interpersonal communication activity that carried over from Phase 1. Dialogues included a drama show performed by the field workers themselves who incorporated local idioms and customs to increase the appeal of the drama and add some humor to the presentation.
- Field workers conducted house-to-house visits to follow up with net users on rolling up their nets when not in use and repairing holes.
- The success of the song contest at the end of Phase 1 was used as an entry point for Phase 2. It was a chance for communities to put net care and repair in their own words. It galvanized enthusiasm and participation on behalf of community members and field workers. The winning song was professionally recorded and played during the campaign. In addition, communities that participated in the contest were asked to perform their songs during community dialogues.
- The radio station NBS participated in a more active way during Phase 2. By producing the new radio spots, recording the Royal Father's testimonial and by recording of the Phase 1 song contest winning song, NBS has become entrenched in the campaign and able to comprehend the scope and messages. This has also produced content for their own use, which would improve exposure to the net care and repair campaign.
- Two 60-second radio spots were aired on NBS between January and March 2014.
- During the month of March, NBS also aired a series of 15-minute radio segments that

featured a message from the Royal Father, voices from community members in support of net care and repair, and the professional recording of the song contest winning song.

All field activities were completed by the scheduled end date, prior to the evaluation in April 2014, although contractual delays implied that CCPN started later than anticipated, therefore obtaining an overall intervention time of four months during Phase 2.

A [final report](#) detailing process data and lessons learned was prepared by CCPN. Intervention materials from Phase 2 have been added to the [care and repair toolkit](#). Results from the operational research study were published in early 2015 in *Malaria Journal*: [Impact of a behaviour change intervention on long-lasting insecticidal net care and repair behaviour and net condition in Nasarawa State, Nigeria](#).

13.4 Documentation, Dissemination, and Close-Out

Most NetWorks activities focused on operational research that is meant to help guide future ITN distribution and durability efforts. In 2014 (the last year of the NetWorks project), the project staff completed the durability surveys and the pilots of community- and school-based net CD systems. All implementation processes were documented and the pilots were evaluated for their effect on net coverage and use. The processes, tools and results of the durability surveys and pilots were disseminated. In particular, the project shared results from the longitudinal three-zone durability study and evaluation of the net care and repair BCC intervention, school-based ITN distribution in Cross River State, and community-based ITN distribution in Nasarawa State. State and national level dissemination events were conducted in August 2014.

13.4.1 Real-time dissemination

NetWorks discussed the durability survey and pilot evaluation results and experiences as they were received at meetings with the IVM; monitoring and evaluation; and advocacy, Social Mobilization, and Communication committees and also at state-level RBM meetings. NetWorks disseminated its results to stakeholders and state government officials in Nasarawa and Cross River states, and to national-level policy makers. At the national level, NetWorks held a short, focused discussion with representatives of PMI, the Ministry of Health, NMEP, and other organizations in August 2014 to review and advocate for the key policies/recommendations from the research results.

To further disseminate lessons learned from the ITN continuous distribution pilots in Nigeria, NetWorks will submit manuscripts on the evaluation results to journals such as *Malaria Journal*, *PLoS One*, *PLoS Public Health*, and *BMC Public Health* for peer review and publication.

13.4.2 Documentation: centralizing resources

NetWorks has handed over data and resources to the states, federal government and implementing partners that will allow implementers to build upon the net CD and durability initiatives that the project was able to pioneer. To this end, the project has supported the completion of standard operating procedures, drafted case studies, and compiled results and resources from the pilots. All resources are published online at www.networksmalaria.org and www.k4health.org/toolkits.

14 Senegal End of Project Report

UNIVERSAL COVERAGE

SENEGAL 2010-2013





networksmalaria.org

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A coalition of partners created a comprehensive communications campaign to support UC efforts. Radio journalists, traditional communicators, caravans, kick-off events, home visits, demonstrations and print media encouraged communities to sleep under their new nets year-round.

Urban Settings

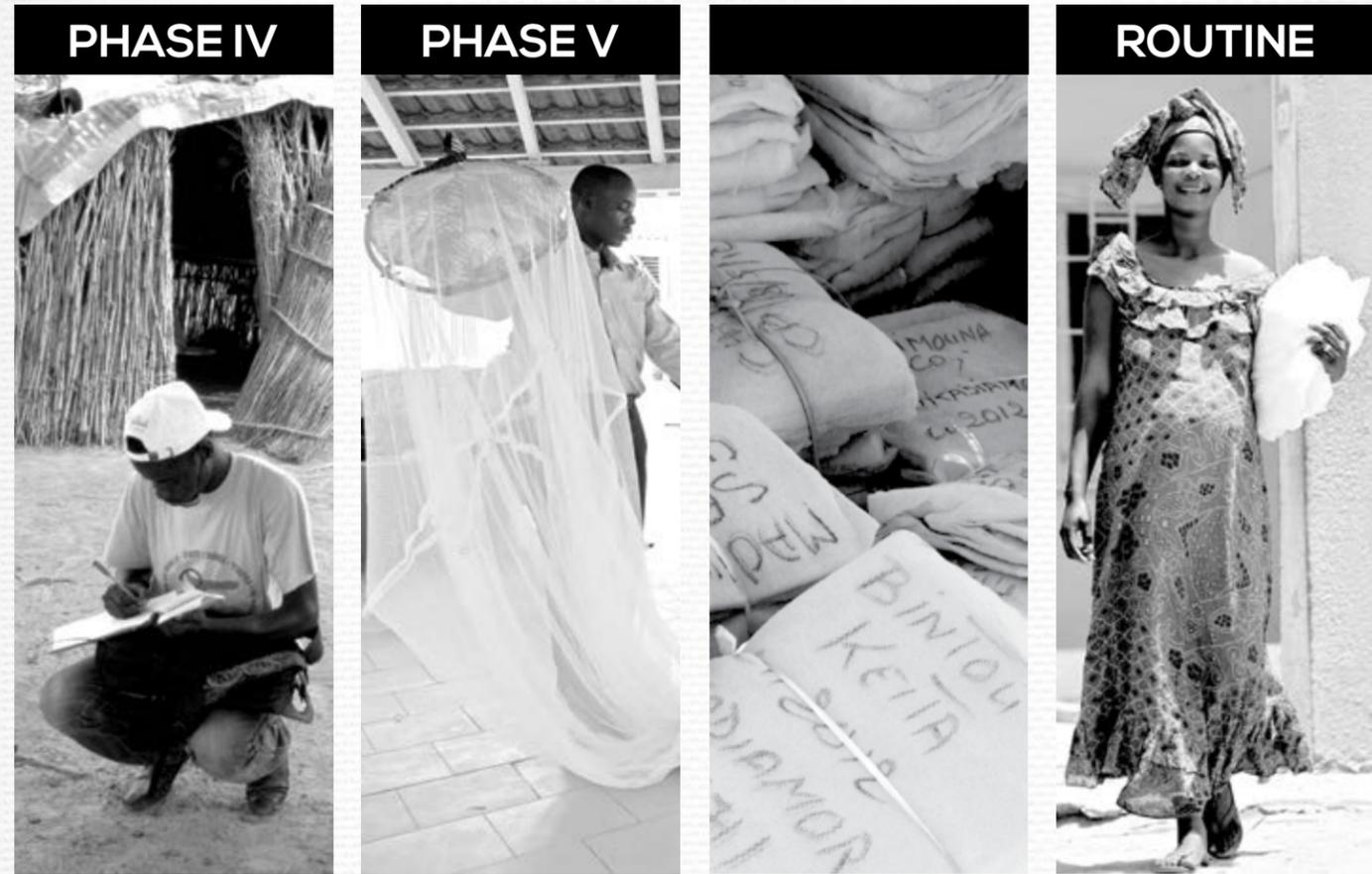
Congested urban areas and isolated fishing communities posed unique challenges for counting sleeping spaces. Working with thousands of traditional religious schools and communities so that nobody was missed was critical to the success of the universal coverage Phase III mass distributions.

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All 14 Regions Covered

IntraHealth completed the final UC mass distributions in Thiès and Dakar with financial support from the Global Fund. By using the same guidelines, tools, and "Trois Toutes" campaign branding that had been successfully used in the rest of the country, the distributions were rapidly planned and executed.

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Mass distributions don't come along every day. What should governments do to ensure that growing populations continue to have access to nets and high levels of net ownership are sustained? Establishing community and health facility-based distribution channels are critical to maintaining good access and use.

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ACRONYMS

CFA	“Communauté Financière Africaine” (currency for francophone Africa)
FAQ	frequently asked questions
IFRC	International Federation of the Red Cross
ITN	Insecticide-Treated Nets
JHU-CCP	Johns Hopkins University-Center for Communication Programs
LLIN	long-lasting insecticide-treated net
NMCP	National Malaria Control Program
PCV	Peace Corps Volunteers
PMI	President’s Malaria Initiative
UC	universal coverage
USAID	U.S. Agency for International Development
WHO	World Health Organization

INTRODUCTION



This report is a compendium of stories about how the rollout of universal coverage (UC) of long-lasting insecticide-treated nets (LLINs) unfolded in Senegal, with each phase presenting a unique set of challenges and opportunities. It was created to ensure that Senegal’s experiences and lessons learned are broadly disseminated within the global community. Senegal’s experience with national mass distribution campaigns is a public health success story about partnerships, local commitment and a common resolve to reduce the country’s malaria burden. We hope that other countries will be inspired to adapt the model to their own particular circumstances and will have equal success in achieving universal coverage.

Background: In 2007, the World Health Organization (WHO) made a bold position statement for malaria prevention which shifted emphasis from safeguarding only the most vulnerable populations to universal coverage, defined by WHO as the use of insecticide-treated nets by all household members.

From 2003 to 2009, the National Malaria Control Program (NMCP) focused net distributions on children under five and pregnant women. Subsidized routine distribution to the general population through community based organizations was also supported between 2006 and 2007, and 791,000 insecticide treated nets (ITN) provided by the Global Fund, UNICEF and the World Bank were distributed. Consistent with changes in global policy and based on a strategy pioneered by the Peace Corps, in 2010 the National Malaria Control Program (NMCP) decided to embark on an ambitious plan that would ensure universal coverage of LLINs in communities throughout the

NetWorks, with financial support from the U.S. Agency for International Development/President’s Malaria Initiative, played a leadership role in guiding the phase-by-phase rollout of the UC campaigns with partners in Senegal.

BACKGROUND

country through a dramatic scale-up of access and ownership of LLINs.

The Malaria Indicator Survey, conducted between 2008 and 2009 in Senegal, found that only 24.4% of the general population had slept under any treated net, 23% under an ITN, and 21.9% under an LLIN the previous night. Use by the general population had increased to 34%, which was still far below the 80% goal for net use set by the NMCP. By early 2013, when distribution had been completed in 12 of the 14 regions, nationally representative survey data showed that household ownership of at least one ITN surpassed 85% in regions where UC had been completed (north: 93%, center: 88%, and south: 86%). Year round use by the general population was 61% in the north, 48% in the center, and 40% in the south, where the UC campaign had been completed almost three years previously. Use by the general population during rainy season surpassed 70% in areas covered by UC.

Organization: An important first step in the UC rollout of LLINs was the creation of coordinating committees at the national, district and local levels, which provided oversight and ensured that all activities were accomplished as planned. Four subcommittees with specific roles were likewise set up: technical and operations, communications and social mobilization, monitoring and evaluation and logistics. Following macro- and microplanning at the national, regional, and district levels, a census was completed by community volunteers, called *relais*, who went from house to house to count the number of regular sleeping spaces, people living in the household, children under the age of 5, and the number of nets in good condition. The head of the household received a coupon indicating the date and location of the local distribution point and later, this coupon was exchanged for the number of nets the household was to receive. This allocation was determined by using the information collected by *relais* and verified by a community

committee. One week following the distribution, *relais* made home visits to ensure that nets were properly hung and also to reinforce messages about proper net care and repair. The *relais* also used this opportunity to stress the importance of net use by the whole family, all year long and every night.

The first mass distributions (UC Phase I) led by NetWorks took place in the southern belt of Senegal, including the regions of Kedougou, Kolda, Sedhiou and Tambacounda, areas known to have the highest levels of malaria transmission. After an assessment period, the phase-by-phase rollout of the mass distributions continued under NetWorks beginning with Kaolack and Kaffrine regions (UC Phase II), followed by Fatick and Diourbel regions (UC Phase III), St. Louis and Matam regions (UC Phase IV) and finally Louga and Ziguinchor regions (UC Phase V). This process took just over 25 months to complete. During this period, 1,175,434 existing nets in good condition were found and 4,070,986 LLINs

were distributed, to 8,880,256 individuals—an average of about one net per 1.69 people, which is in line with WHO guidelines. In 2013, IntraHealth International with support from the Global Fund Round 10 led the Phase VI mass distribution of LLINs in the last two regions of Dakar and Thies.



NetWorks & Peace Corps

*“When spider webs unite they can tie up a lion.”
Traditional West African saying*



Since the beginning of UC rollout in Senegal, NetWorks and Peace Corps have worked side by side. Both organizations rely on personnel who live and work with the communities they serve, and are particularly well placed to translate national policy into local action. NetWorks’ local facilitators, who were based in the regions throughout each UC phase, were key to ensuring that operations were

carried out according to plan and to resolving bottlenecks at the field level. Their presence ensured that day-to-day activities for the distributions and the transfer of skills to the local district staff were consistent and streamlined. Likewise, PCVs working side by side with the local facilitators field-tested communication tools in their communities, drove home key messages via community radio, and carried

out regular home visits with counterparts. Their integration into local communities and language skills helped people to understand and adopt new social norms of regular net use, care and repair.

Field support and supervision trips to resolve problems, answer questions and clarify roles and responsibilities were among the joint activities between NetWorks’ local facilitators

and PCVs. Their ability to work together throughout the process and keep people informed about community distributions, home visits and special communication events made the UC work especially dynamic and fulfilling for everyone involved.

TO COVER A NATION

Universal coverage (UC) is a term used here to describe the process of distributing free long-lasting insecticide-treated nets (LLINs) to the general population. The National Malaria Control Program's (NMCP's) goal of 80 percent LLIN coverage nationwide is an attempt to achieve the critical mass necessary to drastically cut malaria transmission. Though the overall vision of UC has been agreed upon globally, how it is defined can vary from country to country ranging from the use of one net per every two persons, to one net per every two persons within a household, or a flat number of nets per household, such as two nets per household.

Senegal was the first country to define universal coverage as one net for every sleeping space—an approach that generates high levels of ownership. Existing nets were counted as part of the sleeping space census and factored into the number of nets needed for each household. The approach of ensuring one net for every sleeping space was highly successful in Senegal and may help other countries to effectively cover their populations with nets.



THE PILOT

Peace Corps Volunteers were instrumental in getting universal coverage off to a good start in Senegal. The initial experience involved making sure that every sleeping space in one health district had an insecticide treated net. The distribution was later successfully replicated in a second, larger district. This set in motion what would become the universal coverage strategy for the country.

Prior to 2009, few countries in Africa had attempted large scale distribution campaigns aiming to cover 80% of their estimated population, based on the Roll Back Malaria recommendation of coverage. Rwanda, Zambia and Eritrea launched UC campaigns based on average family size calculations and distributed nets according to a minimum number per family, with impressive results. Two pilot campaigns in Senegal proved that not just large scale distribution, but universal coverage, defined as one net per habitual sleeping space, was achievable.

In the fall of 2009, Peace Corps partnered with the local health officials, Net Life, the Against Malaria Foundation, and Malaria No More to conduct the first pilot distribution in Saraya, a hard-to-reach area with a high malaria burden. In preparation for the pilot campaign, Peace Corps Volunteers (PCVs) spearheaded the planning and tried a new strategy, which set the stage for covering the nation with LLINs. They set out to accomplish the impressive goal of covering every sleeping space in a single health district with an insecticide-treated net.

Though it was done in close



collaboration with the local health district staff, the pilot distribution relied heavily on PCVs who collectively provided over 2,000 hours of support to the project. Building on this experience, in late 2009 and into 2010 the Peace Corps, NMCP, Malaria No More, Tostan and World Vision organized a second pilot in the much larger health district of Velingara. They attempted to determine whether the distribution methodology could be effectively managed without intensive PCV support in every community. The role of PCVs was scaled back to one of project leadership, central technical guidance and logistical and communication support in areas that had PCVs. After hearing about the successful distribution, the NMCP coordinator, President's

Malaria Initiative (PMI) adviser and NetWorks' technical adviser traveled to Velingara to learn first-hand about the approach. This event together with the demonstrated rapid coverage and results achieved convinced the NMCP that the approach should be replicated in every district of the country.

The idea for determining a household's net need based on sleeping spaces came about when PCVs decided that rather than estimating the need for nets, which would be inaccurate and lead to insufficient coverage in some areas and oversupply in others, they would conduct a detailed household census. They found that if they counted every habitual sleeping space, their distributions would achieve better coverage. This census

“The first step was to determine what constituted a “sleeping space” and how many there were.... They found that if they counted every habitual sleeping space, their distributions would achieve better coverage.”

was time-consuming and possible only with the explicit support and participation of the communities involved, which was helped by reinforcing the message of malaria prevention. In addition, on the day of distribution, PCVs removed nets from their packaging and wrote on the nets in indelible marker the name of the recipient, the name of the village/neighborhood and the date of distribution. This approach was aimed at enhancing personal pride in net ownership and reducing the prospect of net resale. It was this PCV-driven approach, supported by the community, that influenced the way Senegal came to define UC, drawing the attention of important partners. In 2009, Peace Corps Senegal began advocating for this



“Community involvement makes UC possible.”

new approach of distributing nets based on sleeping spaces with important national and international partners. With the success of the pilots in Saraya and Velingara, the national policy moved to one of UC based on the sleeping space census methodology that Peace Corps and partners had

piloted. Lessons learned from the pilot that would need to be considered during planning for the national scale-up included:

- Net procurement based on population figures is necessary to estimate need: counting every habitual sleeping space assures more even coverage locally.

- Sleeping spaces are the most basic unit of measure in a net distribution. How you define that space matters—whether it is a bed, mattress or a simple mat on the floor.

- Community involvement makes UC possible. Without a strong relationship between the census workers (*relais* or PCVs) and community leaders or health officials, it would be impossible to gather information from every home.

THE RAINS

The NMCP officially decided on Senegal's UC distribution strategy—one net for every sleeping space—in March 2010. From that moment on, there was no time to spare as the rainy season was imminent in the southern belt of the country where malaria prevalence is the highest. Soon many communities would be completely cut off from public services and roads by the swelling rivers, making delivery of the nets impossible. The national coordinating committee, composed of the NMCP and partners, had to create the guidelines and tools for the technical operations, logistics, communications and monitoring and evaluation. UC was a new strategy for the country and very different from previous net distribution campaigns.

It was important that the new strategy and accompanying distribution modalities be very clear for all stakeholders.

Information from the 2009 mass campaign was used to estimate the net need for the first four regions. The NMCP rapidly circulated official letters advising the regions and districts about the UC operations and to prepare appropriate warehousing for the nets. Following a competitive bidding process, a transportation firm was identified and the trucks started rolling out to the regions. Nets purchased by the Islamic Development Bank and the the Senegal River Basin Development Authority were used for the Phase I mass distributions.

Meanwhile, NetWorks and the national coordinating committee were rapidly preparing the overarching plans for the mass distributions including the preparation of detailed budgets, training materials, checklists, a communication strategy and orientation sessions for regional and district level staff. NetWorks engaged four local facilitators who had extensive experience working with communities and nets as regional field agents. They also hired three field accountants to ensure that local funds were appropriately dispersed and accounted for. In late May 2010, the teams joined Peace Corps and partners working in the Kedougou region for the first UC orientations and start-up trainings.



LOGISTICS UC PHASE I

Phase I of Senegal's UC campaign began when the rains had just started. To cover every sleeping space, government officials, civil society and partners public and private, set out to prove they could achieve what many thought was impossible. It often required crossing nearly impassable roads, navigating through flash floods and over submerged bridges, and working outside cell phone range.



NETS READY FOR DELIVERY

Hundreds of thousands of nets just waiting to be delivered



MINING CAMPS

Mining camps and swelling populations



CROSSINGS

The final kilometer to the distribution site



ACCESSIBLE DISTRIBUTION SITES

1,567,821 people were covered during UC phase I



COMMITTED COORDINATION TEAMS

Coordinating teams created at the national, regional, and local levels

Delivery: When the distributions began, certain areas were already being hit hard by the rains. In some regions the health services team called upon the military to help deliver nets to areas where the container trucks had been stopped by deep, muddy rivers and rushing water. In Tambacounda, the military was obliged to cancel a mission to deliver nets to the community of Bohe Balladji after being marooned in the sludge for two days and with no end in sight for the rains. The nets were successfully delivered four months later, once the

rains had subsided and the community became accessible.



Mining Camps: Gold mining is an important industry in Kedougou and although there are large firms working in the area, artisanal mining draws

fortune seekers from numerous countries including Mali, Guinea, Sierra Leone, Burkina Faso, Ghana and The Gambia. Often when a person strikes gold, word travels fast and in a matter of days a community can swell from a couple dozen families to thousands of individuals who may stay in an area from a week to several months and then leave. These populations are referred to as "virtual communities" posing important challenges for the district health teams tasked with the final allocation of bed nets. Without an accurate sleeping space count, it could not be

guaranteed that all sleeping spaces had been covered for the populations residing in these areas.

Supply: Knowing the true number of nets needed to cover all sleeping spaces in the first four regions was a major challenge because the original estimates were based on population data. Because a targeted campaign for children under 5 had taken place the previous year, the presence of these nets was also factored into the regional calculations. What was soon discovered, however, was that many families were

either not declaring these nets or the *relais* were not counting these nets if they were reported by households to have been washed with bleach or dried in the sun, thereby reducing the insecticide. The teams were not adequately prepared to deal with these issues and subsequently net quantities were short in some areas. Different regions addressed the issue of net shortages in various ways. In Sedhiou, for example, the region itself readjusted the number of nets allocated to individual households so that the total number of available nets was shared across

communities. Although almost all households received at least one or more nets, not all sleeping spaces were necessarily covered.

Appreciation: Interviews with people on the street were a common communications approach during the mass distributions.



Reporter: "You have just received (8) nets valued at more than 20,000 CFA. What do you think about that?"

Sedhiou resident: "They are worth at least ten times that much to me. My family will use these nets and we will not get sick this year."

-Personal testimony: Saliou Ndiaye

UNIVERSAL COVERAGE PROCESS CRITICAL STEPS



CROSS-CUTTING ELEMENTS

Logistics:

- Warehousing
- Transportation
- Security

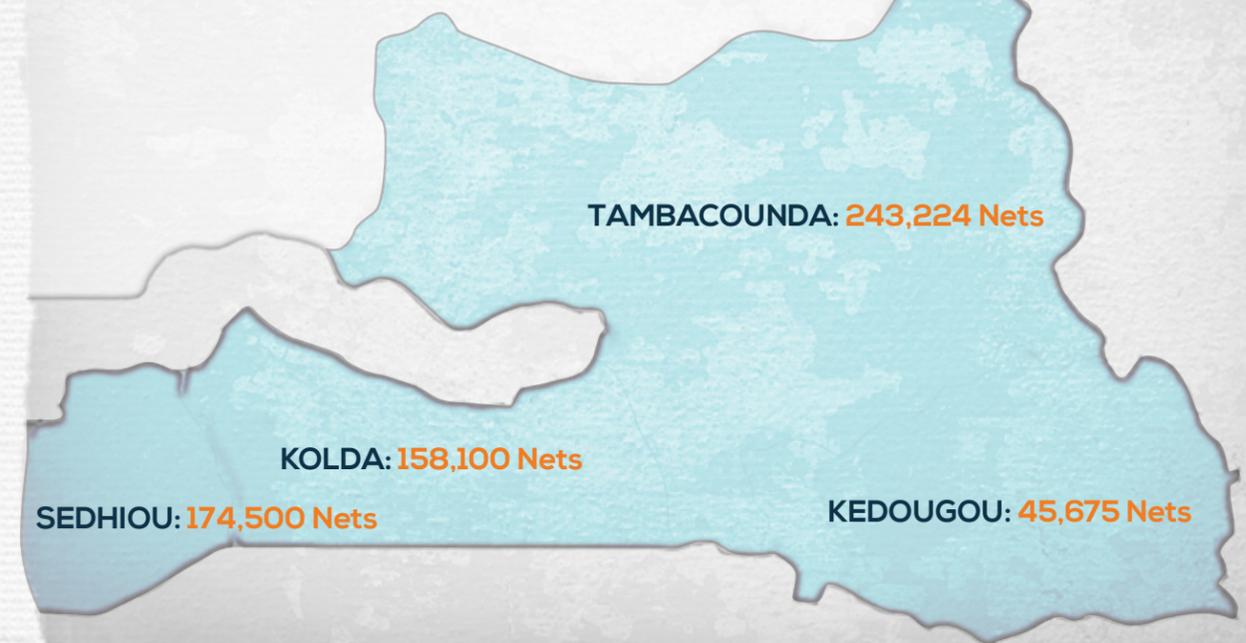
Communication:

- Community radio
- Traditional communicators
- Print media
- Home visits
- Demonstrations
- Parades and launches
- T-shirts and caps
- UC daily journals

Supervision and capacity building:

- Focal points
- Peer supervisions between regions
- National and regional supervision visits
- Terms of reference and check lists
- Reports

Phase I: Regional Coverage
621,481 nets distributed
93.8% sleeping spaces covered



POPULATION: 1,567,821
SLEEPING SPACES: 858,484
NETS DISTRIBUTED: 621,481
NUMBER OF LOCAL ACTORS INVOLVED: 3,651
183,584 EXISTING NETS FOUND IN GOOD CONDITION
OPERATIONAL COST OF DISTRIBUTION: \$430,342 CFA 215,171,046



- NetWorks 70%*
- All Other Partners 30%
 - *IntraHealth
 - *ChildFund
 - Secours Islamique France
 - *Peace Corps
 - Net Life

PARTNER CONTRIBUTIONS AS A PERCENTAGE OF TOTAL OPERATIONAL BUDGET

CFA 500 - \$1US

* Financial support provided by PMI

IMPROVEMENTS UC PHASE II

Unlike UC Phase I, where nearly all operational costs for the mass distributions were assumed by NetWorks, Phase II welcomed the involvement of other partners, including IntraHealth, ChildFund, the Senegal Red Cross, Caritas, Peace Corps and Secours Islamique France. Communities were also more involved than in Phase I, providing financial and in-kind contributions to activities.

COMMUNITY RADIO



Prerecorded radio spots in multiple languages ensured message consistency about net use, care and repair on community radio stations nationwide

Strategy: During the first part of the year, the UC strategy was assessed and improved based on the results of an in-depth process review of Phase I with the Malaria Consortium. One of the most important improvements was the establishment of community coordinating committees that would “validate” local census numbers and calculate household net allocation, thus transferring this responsibility from the *relais* to the community. This helped limit fraud, as committee members had a good idea of how many sleeping spaces and nets their neighbors had and could spot

numbers that didn’t make sense. Once the community committee validated the census, the figures were passed up to the district coordinating committee, who reviewed each health post’s request in relation to the initial estimates and the number of nets available. If serious and legitimate gaps were seen, the district could request more nets from the NMCP, which happened in several cases. In addition a more structured approach for home visits was adopted, including the use of counseling cards and checklists.

Community Participation: Beginning with this phase, community engagement in the planning and rollout of the distributions was improved. Community members contributed personal time to serve on the coordinating committees, provided meals for their *relais* and some hired donkey carts or fishing boats to ensure the timely delivery of the LLINs from the area health post to local distribution sites.

Evaluation: The organization of district-level evaluations was an important new step added to the UC cycle at this point. Evaluations facilitated

PARTICIPATION



Communities actively engaged at every level

the analysis of key results, costs and lessons learned from the distributions in an open community forum organized by the district and attended by stakeholders from multiple levels and sectors. This initiative was consistently well received since it brought closure to an intensive period of work, allowed frank discussions about challenges and achievements and contributed to maintaining an accurate database that was made accessible to everyone involved. It also helped foster local commitment to ensure that nets were used on a regular basis and properly cared for over time.

COUNSELING CARDS & BOOKLETS



Home visits were accompanied by visual aids that facilitated guided conversations about net hanging, care, and use

Supervision: Regular, structured supervisions were likewise implemented starting with Phase II. Partners from the national level, including the PMI team, traveled to the field on a regular basis to supervise key UC steps such as the sleeping space census, validation of the census results, community distributions, home visits and the final district evaluations. This was especially important given the many adjustments and improvements that had been put into place since Phase I.

Communication: Beginning with Phase II, Senegal’s rallying

cry about the importance of using mosquito nets to prevent malaria was a simple slogan and logo. Appearing on T-shirts, caps and smocks, and coming from the mouths of community health workers, volunteers, town mayors, traditional communicators, students, musicians, artists and radio journalists, a single message was spread across the country: Mosquito nets must be used by: “*Toute la famille, Toute l’annee et Toutes les nuits parce que les moustiques sont toujours la!*” (The whole family, all year long and every night because mosquitoes are always there!).

SUPERVISION VISITS



Ongoing supervision was an important feature of Phase II

This saying, called the “*Trois Toutes*,” or the “Three Alls,” reminds people that to end the cycle of malaria transmission, everyone—not only pregnant women and young children—must sleep under a mosquito net every night, all year long. The communication activities conveyed the message that if Senegalese families, given access to nets, adopt this critical behavior, the spread of malaria

in Senegal could be drastically reduced. The challenge was to persuade people to use their mosquito nets consistently and correctly, an objective tackled through community mobilization and locally tailored communication initiatives, hallmarks of the “*Trois Toutes*” national plan. Before, during and after the actual mass distribution, communication sub-committees in each region planned and executed a broad range of activities tailored to their areas. Whether a message was heard on the radio or from their village chief, from a traditional healer or from their school-aged child, the goal was



LOCAL FACILITATORS & DAILY JOURNALS



A special feature of UC Phases I-V was NetWorks' placement of experienced local facilitators at the district level. Local facilitators were individuals who were specially trained to ensure that the distribution operations ran smoothly and who managed and solved complex issues as they arose.

For a period of 45 to 60 days, these facilitators worked closely with the regional and district medical teams on all aspects of the UC field operations, ensuring that activities were carried out according to the national plan. Their essential duties included the oversight and coordination of training and supervision

activities; logistics management for nets, coupons and supplies; communication activities that involved community launches, parades and marches, community radio, home visits and reporting and documentation.

An especially important part of the local facilitators' work was the preparation of daily journals. The journals, which proved to be an invaluable management tool for the UC teams, documented the day-by-day unfolding of the UC mass distribution activities for each district. Compiled by NetWorks and broadly circulated via email on a bi-weekly basis, the journals allowed interested readers around the globe special insight into the rollout of UC in Senegal.

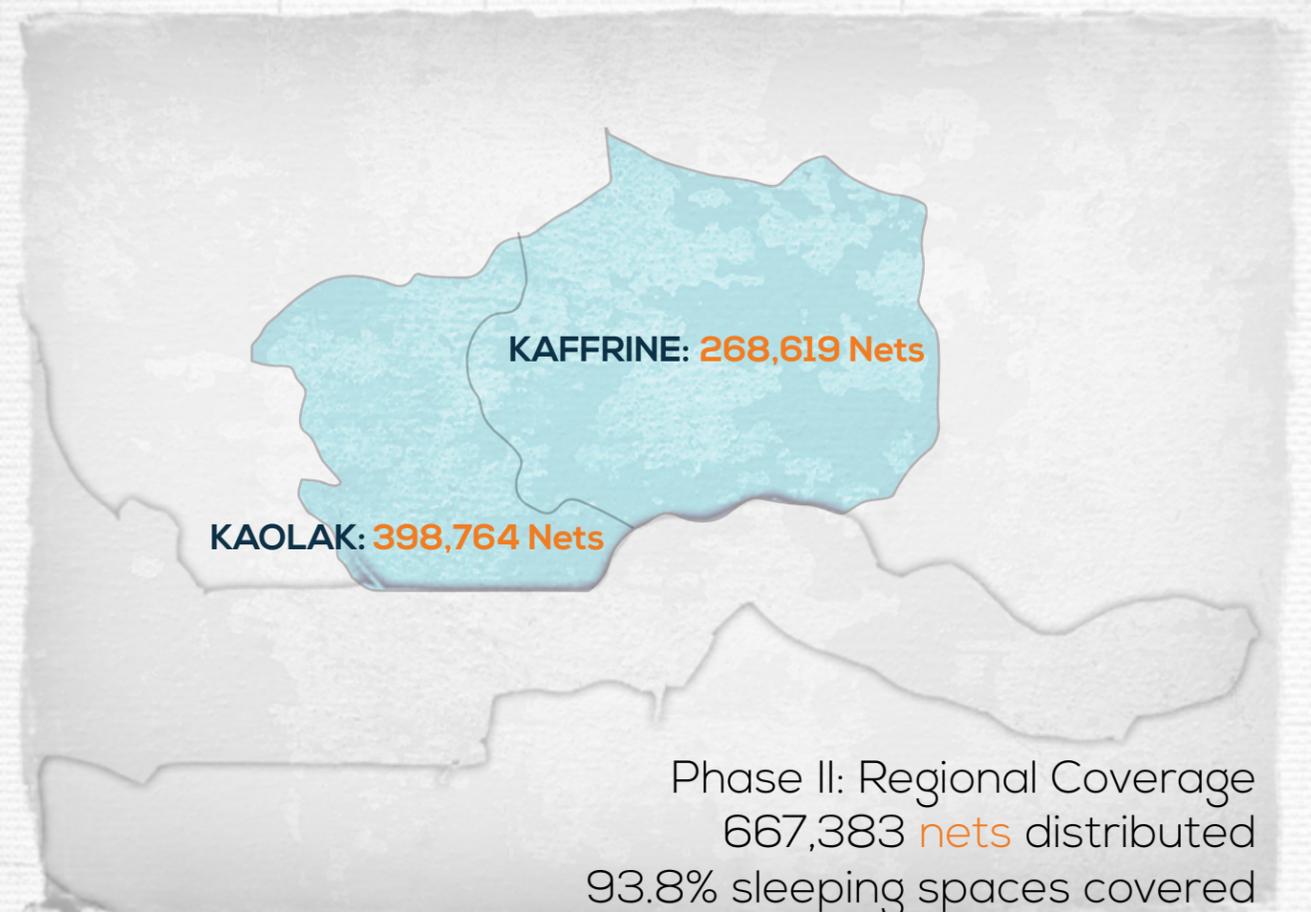
to surround every beneficiary with the "Trois Toutes."

The slogan was at the center of an overarching communications strategy, which featured the NMCP's key messages about net use, care and repair (to ensure consistency) but allowed all the districts to design and carry out locally tailored communication plans, taking into account their specific cultural and environmental contexts. A combination of

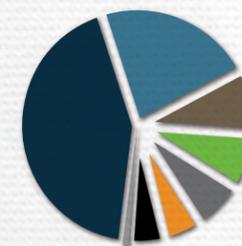
community launches, market and parade events, interactive radio programs and spots, home visits, health talks and demonstrations drove home key messages. *Relais* used newly designed counseling cards during almost 299,000 home visits, and thousands of frequently asked questions (FAQ) booklets were distributed through schools. During a hands-on six-day radio production workshop in 2010, participants representing the

NMCP, the regions and partners created ten radio spots in Wolof and French featuring the "Trois Toutes" and other important messages, which were pretested by participants in communities and recorded. Within weeks after the workshop, four of NetWorks' local facilitators traveled to the regions to work with district health education officers, radio animators and PCVs to translate, pre-test and produce the same radio spots in Pulaar, Bambara, Malinke,

Mandingue and Serere. In 2012 two more materials production workshops were organized on radio and print media and followed by a similar process for building capacity at the district level. Because of the emphasis on training and working closely with the districts and regions, a number of radio stations have continued to broadcast the UC spots free of charge during peak listening hours, thus ensuring optimal listener coverage of key messages.



POPULATION: 1,581,640
SLEEPING SPACES: 893,153
NETS DISTRIBUTED: 667,383
80% HUNG 1 WEEK AFTER DISTRIBUTION
NUMBER OF LOCAL ACTORS INVOLVED: 7,461
170,157 EXISTING NETS FOUND IN GOOD CONDITION
OPERATIONAL COST OF DISTRIBUTION: \$446,247 CFA 223,123,815



- *NetWorks 43.2%
- *Red Cross Senegal 22.1%
- *Caritas 9%
- *ChildFund 7.8%
- *IntraHealth 6.7%
- Community Participation 5.3%
- Secours Islamique France 5%
- *Peace Corps 0.8%

PARTNER CONTRIBUTIONS AS A PERCENTAGE OF TOTAL OPERATIONAL BUDGET

CFA 500 - \$1US

* Financial support provided by PMI

FLEXIBILITY & ADAPTATION UC PHASE III

The number of nets distributed in Senegal's UC Phase III was nearly double that of the first two phases combined. The Diourbel region is home to Touba, whose population is second only to Dakar.



COMMUNITY AUNTIES



KORANIC SCHOOLS



BOATS

Women's groups volunteered to monitor net use and care

Koranic school boarding rooms pose a challenge to counting and covering every sleeping space

Boats made it possible to access island communities

Flexible Phase III required a flexible approach that would accommodate varied communities. Although initially daunting, with its densely populated urban centers in Diourbel and sparsely settled fishing communities in Fatick, these regions turned out to be less complicated than anticipated. Due to the strong influence of religious leaders in Touba, Senegal's largest religious center with over 1

Logistics:

million inhabitants, hundreds of distribution points around the city distributed hundreds of thousands of nets without any major difficulties. In-kind contributions by communities, such as meals and net transportation, demonstrated a strong sense of commitment to make the mass distribution work.

The Fatick region, which is comprised of hundreds of islets and islands, presented program

managers with other logistical challenges. Known for its fishing communities, the challenges encountered by UC operatives were resolved by utilizing their structures, including canoes for transportation.

Two years later, the NetWorks team returned to the area and spoke with a health post official.

"When the responsibility for the UC net distribution was assumed by the local population, who were trained, educated and directly involved in both receiving and distributing the nets, we saw that the results were very encouraging."

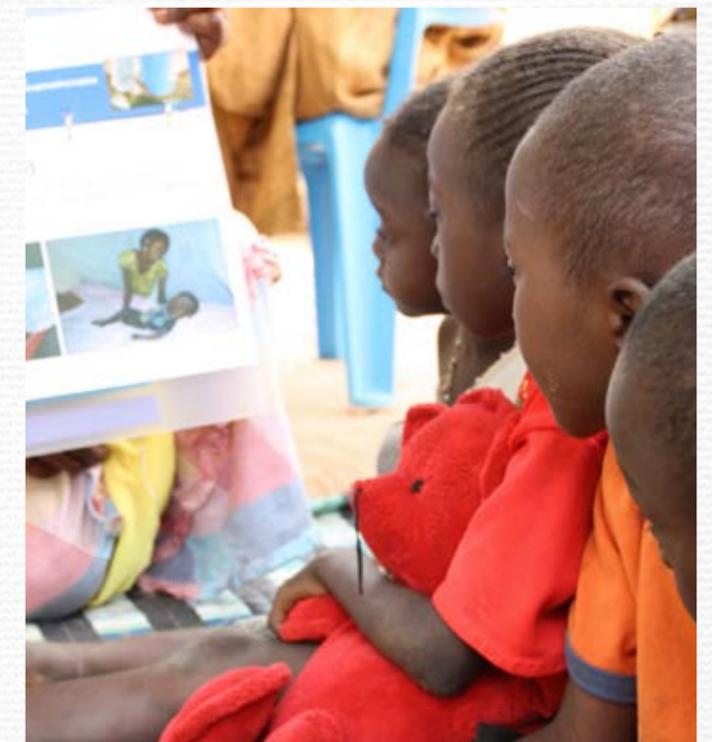
- Abdourahmane Ndiaye, Head of Darou Tanzil Health Post, Touba District

ENGAGED COMMUNITIES AND SOCIAL MOBILIZATION

Specialized training and tools were developed to ensure that messages about optimal net use, care and repair were able to reach diverse audiences.

Touba, in the Diourbel region, was one of the first districts to benefit from "special initiative" funding for communication activities through the NetWorks project. These communications initiatives were conceptualized, implemented and documented by the districts. Teams of *Bajenou Gox* (aunties for healthier communities) were at the core of a special initiative for Touba, which involved training almost 300 women on the basics of net use and care, including washing, drying and repair. With this training they were prepared to work closely with students and instructors from the *daaras* (Koranic boarding schools), so that nets were used regularly and well cared for. Communities contributed soap, thread and meals for the Volunteers.

NetWorks also trained the *daara* instructors on the importance of regular net use as the best way to prevent malaria. The "Trois Toutes" counseling cards featuring key UC messages were translated from French into Wolofol (the Wolof language written in Arabic script), so that messages could be easily incorporated into lessons. Many *daara* leaders noted that this was the first health communication campaign that had specifically addressed their needs and in their "language of work."



Daaras

Koranic Boarding Schools

Despite distributing nets to hundreds of *daaras*, most of the challenges in working with these institutions were found after the distribution. Without the proper follow-up, nets were not always used correctly. Many people needed instruction on care and repair strategies to ensure their nets lasted as long as possible. Follow-up visits were conducted by NetWorks' local facilitators to ensure that both students and teachers understood how to use the nets. The partnership with the *Bajenou Gox* was critical to both educating the students and teachers, but also to ensuring that nets were cared for. By working closely together as a team, religious leaders, health staff, Volunteers and other community members made the intervention at *daaras* a success.



STUDENTS

All these boys slept under a net the previous night



HANGING SOLUTIONS

Finding innovative ways to hang nets



RELIGIOUS INSTRUCTORS

Working with health staff to keep students healthy



COMMUNITY HELPERS

Volunteers work with *daaras* to repair torn nets

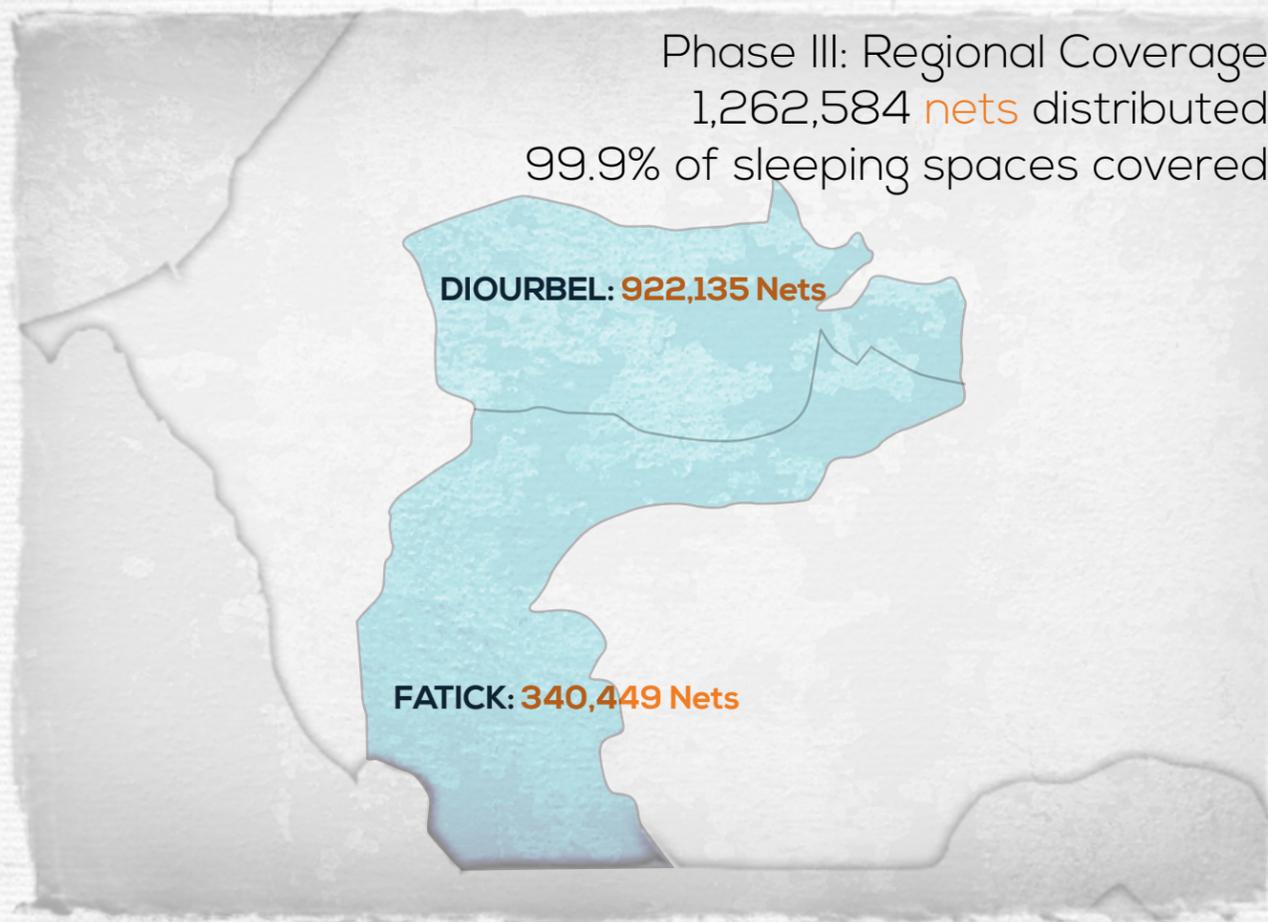


"This is one of the Koranic boarding schools (of 200 boys) where we distributed LLINs. The result was that rather than receiving 10 boys from daaras with malaria every day, we have a maximum of one case weekly. I'm so happy that now, two years later, I come back to the daara and see that children continue to sleep under their nets." -Abdourahmane Ndiaye, Head of Darou Tanzil Health Post, Touba District (top right)



Sometimes the only way to reach communities was with small fishing boats.

Phase III: Regional Coverage
 1,262,584 nets distributed
 99.9% of sleeping spaces covered



POPULATION: 2,467,007
 SLEEPING SPACES: 1,475,276
 NETS DISTRIBUTED: 1,262,584
 86% HUNG 1 WEEK AFTER DISTRIBUTION
 NUMBER OF LOCAL ACTORS INVOLVED: 6,337
 211,852 EXISTING NETS FOUND IN GOOD CONDITION
 OPERATIONAL COST OF DISTRIBUTION: \$668,313 CFA 334,156,776



- *NetWorks 66.8%
- *ChildFund Consortium 10.8%
- Community Contribution 8.6%
- *IntraHealth 5.9%
- *Caritas 5.8%
- Secours Islamique France 1.8%
- *Peace Corps 0.3%

PARTNER CONTRIBUTIONS AS A PERCENTAGE OF TOTAL OPERATIONAL BUDGET

CFA 500 - \$1US

* Financial support provided by PMI

LLIN

CHAMPIONS

GETTING YOUTH EXCITED ABOUT NETS
 AND HOW TO PREVENT MALARIA



In Mbacke, NetWorks engaged students, called “LLIN Champions,” to bring messages about good net use, care and repair back to their homes. The LLIN Champions program involved health and school staff in areas throughout the Diourbel region. Using the UC FAQ

booklets, students learned key information about net use and care and repair, which they were quizzed on during contests organized by each school.

Students who earned the most points became designated LLIN Champions and received

prizes for correct answers. Community members and local health committees were enthusiastic about the program and contributed prizes in the way of pens, notebooks and other school supplies to encourage participation. The program has since become popular in other schools and

regions and has launched the idea of youth Volunteers for health that are tasked with promoting good net use, care and repair behaviors in their communities.

REACHING THE NOMADS

A stone's throw from the edge of Paoskoto village in Senegal's interior, mud huts sit dotted among a field of old peanut plants.

A small gathering of nomadic Fulani have settled here briefly to trade with local farmers and find pasture for their cattle. In this culture, milk and meat are exchanged for grain and mobile phone credit.

Inside their domed huts, metal-frame beds and well-stowed kitchenware give the impression of settlement. But these people are always on the move and thus are some of the hardest to reach in the UC campaigns.

Haji Dia and his wife, Feincoura, have six children, ranging from toddler to teenager. Mr. Dia feels he has been successful in life.

"I have 150 cows now," he says, proudly. But despite his family's success, he admits that malaria has always been a serious problem.

"Before [these nets came] we didn't use any at all and the mosquitoes were really bothering us! Our children were constantly falling ill with malaria. This was very difficult for us."

The Dia family and three other Fulani families travel together.

During the rainy season they stay in their village. When pastures run dry at home, they travel in search of water and food for their livestock.

Mr. Dia says, "We nomads often live out in the open bush where there are many mosquitoes. We have nothing to protect us. The mosquitoes really attack us." According to him, several members of their group have died from malaria in the past few years.

"Often we camp in remote areas, far from hospitals. So by the time it takes to bring someone to a health center, they are almost too far gone to be saved."

He says he first heard about the net distribution campaign over the radio. Aside from his battered mobile phone, his radio is the only other sign of modernity in the camp. NetWorks and Peace Corps use a vast network of community radio stations across the country to make sure they reach the most remote corners of Senegal with the "Trois Toutes" message. Radio is often the best, and sometimes the only, means of communicating with mobile communities like Dia's.

Dr. Mamadou Doucouré, Chief Medical Officer of Niore District, has been very involved in UC activities for nomads living in his area. He says



communication is an essential part of the job. Dr. Doucouré believes that the success of this UC campaign is largely due to the strong partnership between Senegal's Ministry of Health and NetWorks, especially at the local level where communication initiatives reinforce best use and care and repair practices.

Inside Mr. Dia's round hut, three metal-frame beds circle an open sandy space in the center. Each bed has a rectangular white net, its four corners tied to branches poking down from the ceiling, the bulk of the net wrapped neatly over itself.

It seems he got the message. He smiles and hugs his youngest daughter.

"With these nets," he says, "we are much better protected. The mosquitoes cannot get through the nets and neither can the flies. Our children are protected and so are we."

As the sun sets on the camp, a herd of long-horned cows saunter into the clearing from a day's munching.

"As nomads, we are often on the move to find pastures for our cows," says Mr. Dia. "We don't carry many possessions. We can travel far into the bush where there are no houses or huts, where there is nothing, and put our mattresses on the ground to sleep. Now we hang

the mosquito net from a tree and we are protected. For us these nets are very important."

- Story by Fid Thompson

"With these nets," he says, "we are much better protected. The mosquitoes cannot get through the nets and neither can the flies. Our children are protected and so are we."



TRADITION & DIVERSITY PHASE IV

Phase IV was marked by developing creative ways to spread the “Trois Toutes” message with communities that had very different cultures and lifestyles.

LOCAL LEADERS



Chief Medical Officer, Saint Louis

ITINERANT HOUSEHOLDS



All households were visited and sleeping spaces counted

WORD OF MOUTH



Caravan messengers

Lifestyles in the Saint Louis and Matam regions of Senegal are vastly different. From the cool, seaside colonial city of Saint Louis, to the hot, expansive desert plains of Matam, a number of divergent lifestyles exist. Fishing villages, seasonal laborers, university students, military camps, border communities and nomadic populations have varying sleeping preferences.

In 2011, NetWorks worked with local health officials to organize a mass communication caravan in the city of Saint Louis, targeting urban residents. Key information for this population included the “Trois Toutes” core messages as well as tips on how regular net use

could help families to save money through fewer medical expenses. The Saint Louis caravan involved hundreds of individuals including local leaders and health staff, radio DJs, traditional communicators and drummers, *relais*, and rollerblading youth who were all focused on driving home key messages about nets.

During the 2012 mass campaigns, Matam organized surprise evening visits to nomadic communities to see whether nets had been hung. Those with good compliance were “awarded” with prizes such as buckets, soap and T-shirts as well as congratulatory radio announcements making the visits festive and fun.

Health workers in Matam were accustomed to going from hamlet to hamlet to provide basic health services like vaccinations and wanted to do the same with the distribution of the LLINs. NetWorks challenged the region to think differently about how to organize their mass distribution to ensure that operations would be more cost and time efficient. As was done in other regions, following the household census and validation, the population was called to a common distribution point to exchange their coupons for nets rather than the health team going from hamlet to hamlet which would have added important costs to the campaign in terms of fuel, daily allowances and time.

During Phase IV, peer-to-peer supervision visits were introduced whereby senior health staff from bordering regions supervised key mass distribution activities and provide technical support on behalf of the national level. Supervisors were selected based on their successful experience conducting and evaluating LLIN mass distributions in their areas. This work, which was monitored by the NMCP with NetWorks, proved to be very popular as it created camaraderie between regions and promoted local ownership of the program.

URBAN CHALLENGES

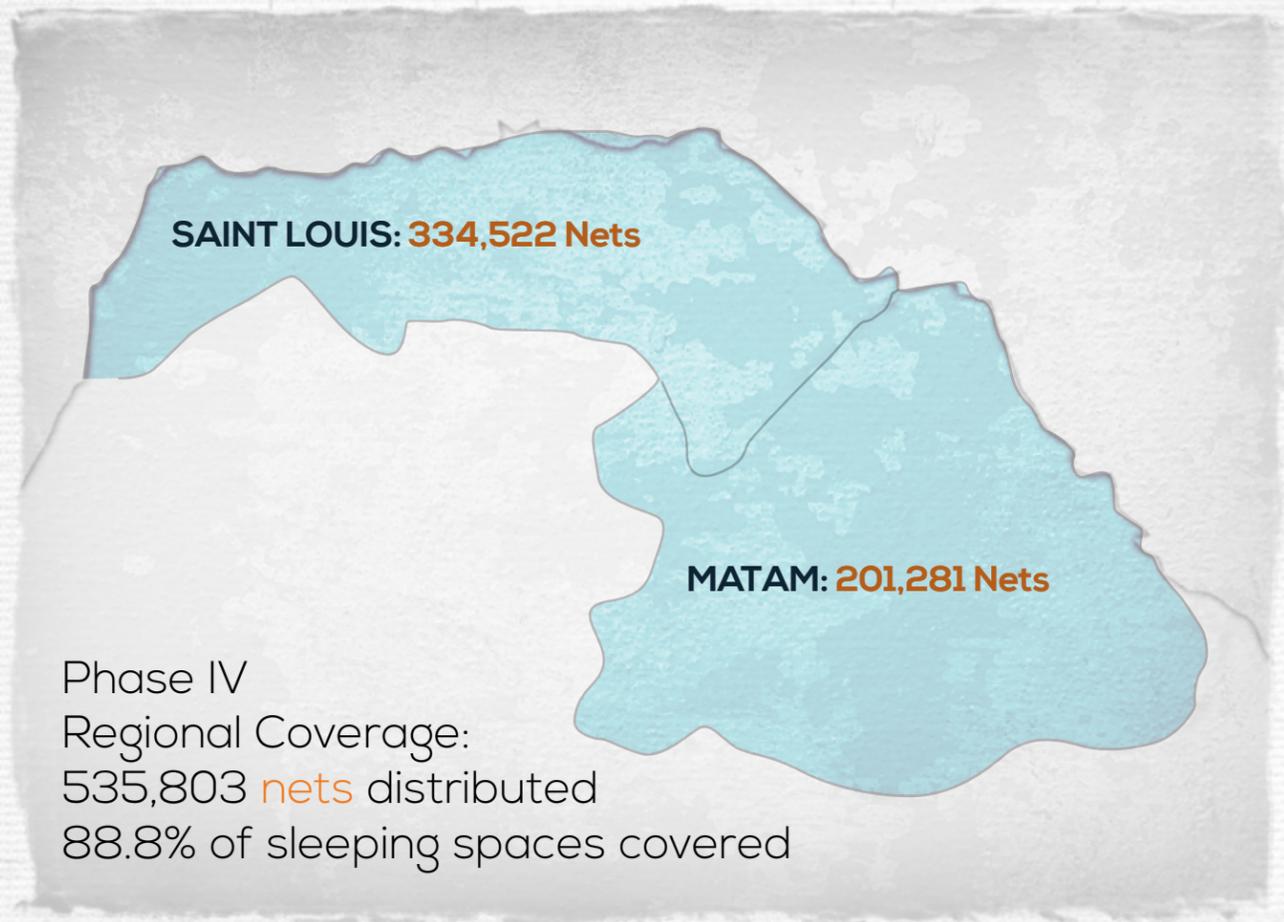
ACCOMODATING CHANGING LIFESTYLES

Conducting mass distributions in urban areas can be a complex process. Critical to its success is solid planning and quality supervision.

Counting people, sleeping spaces, and existing nets in urban households brought up a number of questions: How do you conduct a census if people are away at work when the health workers and *relais* make their rounds? Should tenants or visitors be counted as part of a household? How should busy schedules without keeping them waiting all day? How should boarding schools and military camps be managed? Beyond the challenges of the census and the net tally, there is the additional issue of crowd management at distribution sites: How do you distribute nets to people with busy schedules without keeping them waiting all day? It was quickly discovered that evenings and weekends were the best times to do the census and reach people at home. To minimize crowds, it was recommended that no more than 1,000 nets be given out at a time at any distribution point.



DISTRIBUTION POINT: PHASE IV



POPULATION: 1,620,933
SLEEPING SPACES: 843,045
NETS DISTRIBUTED: 535,803

86% HUNG 1 WEEK AFTER DISTRIBUTION
 NUMBER OF LOCAL ACTORS INVOLVED: 5,802
 213,194 EXISTING NETS FOUND IN GOOD CONDITION
 OPERATIONAL COST OF DISTRIBUTION: \$536,564 CFA 268,282,128



- *NetWorks 73%
- Red Cross Senegal 7%
- MACEPA 8%
- Community Contribution 6%
- UNICEF 5%

PARTNER CONTRIBUTIONS AS A PERCENTAGE OF TOTAL OPERATIONAL BUDGET

CFA 500 - \$1US

* Financial support provided by PMI

SAME NET: DIFFERENT OPTIONS

Several months following the UC mass distributions, NetWorks returned to Saint Louis in order to work with the district health management team to train the *relais* on how to do simple net transformations so that the rectangular nets distributed during the mass distributions could accommodate different needs and preferences.

the mattress was proposed. For those who preferred conical nets, they learned how to reinforce the top so that it could be hung from a central point. Following the trainings, the *relais* conducted hundreds of home visits to promote options for customizing nets to accommodate different style preferences and housing, from large urban homes at the heart of the city to small huts in fishing communities.

For those who liked the rectangular net shape but found it too short, adding fabric to the bottom to make it easier to tuck under



OBSTACLES & SOLUTIONS UC PHASE V

The Louga and Ziguinchor districts were implemented nearly two years after UC began, and once again a sense of urgency was felt. Funding from Global Fund Round 10 had been delayed, and the rains were imminent.



Nomadic populations

Distributions in Louga and Ziguinchor were carried out roughly two years after the original Phase I distributions, and due to the imminent rains, once again there was a sense of urgency. Also, in a major change during planning for UC Phase V, the national coordinating committee made the critical decision to no longer take into account existing nets when determining net allocations per household. Since three years had passed since the 2009 mass distribution, logically those nets were no longer viable and needed to be replaced. Although

Nets for every household

nets had already been stocked and stored in the regions based on population estimates calculated the previous year, this change significantly increased the number of nets required for the Phase V campaigns. Fortunately, sufficient quantities of PMI nets were available in Dakar to accommodate the quantities needed.

Louga is a region characterized by wide plains, deep sand and sparse populations. In recent years, borders for certain zones were redefined to create new health districts and management teams. Some zones, however,

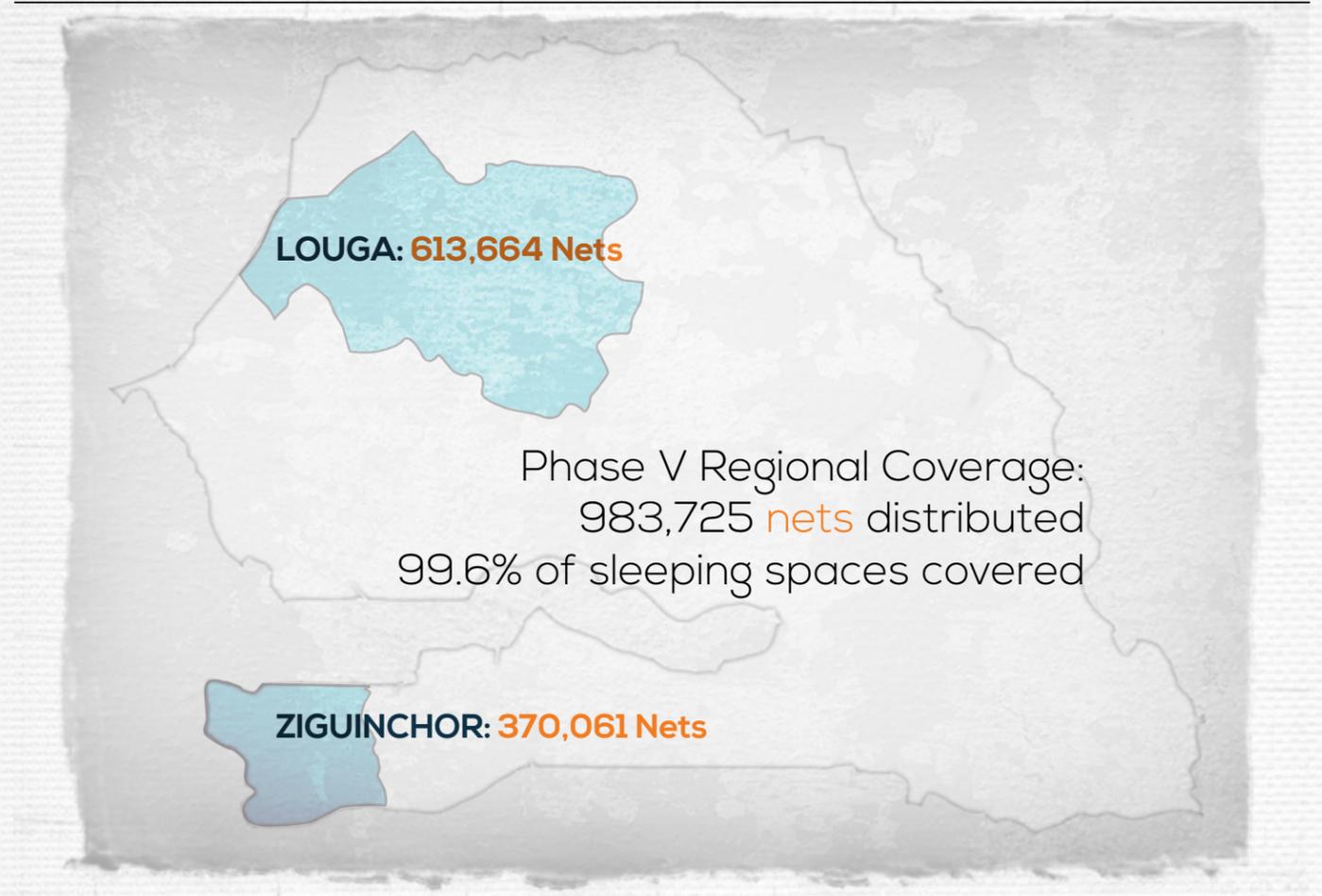
All existing nets replaced

particularly those with a strong union presence and a history of strikes by nurses, were initially reluctant to recognize the new districts, and were therefore preventing UC planning from going forward. Frequent advocacy visits were made by NetWorks and the NMCP in order to discuss problems and find solutions.

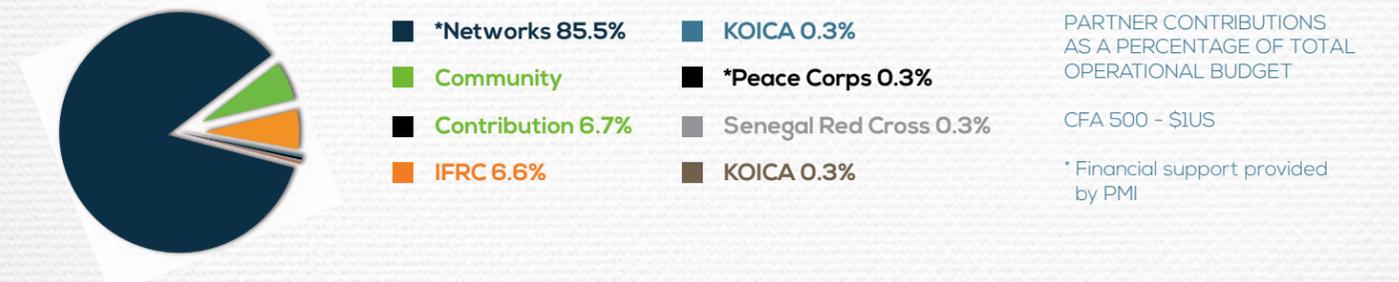
The International Committee of the Red Cross was an important partner in Ziguinchor, a region that has been in varying levels of conflict for more than 20 years. It is known as a neutral entity and has good relationships with

Ensure good communication

all actors in the conflict, and was able to use these relationships to ensure the smooth rollout of activities. Another feature of the UC activities in Ziguinchor was the hiring and training of Diola-speaking facilitators from the region who were able to communicate directly with communities and guide the UC operations for their areas. The local facilitators were trained and supervised by two senior NetWorks staff based in the town of Ziguinchor.



POPULATION: 1,642,855
SLEEPING SPACES: 987,265
NETS DISTRIBUTED: 983,725
87% HUNG 1 WEEK AFTER DISTRIBUTION
NUMBER OF LOCAL ACTORS INVOLVED: 3,902
279,036 EXISTING NETS FOUND AND REPLACED
OPERATIONAL COST OF DISTRIBUTION: \$601,107 CFA 300,553,614



Net Transformation

The following are a series of net transformation possibilities, including using a circular frame, bucket lid or simply adding additional fabric to the bottom of one's net.



CIRCULAR FRAME

Locate the center of a rectangular net and place a circular frame over it.



ATTACH & REINFORCE

Attach the frame using string or heavy thread.



BUCKET LID

The lid to a bucket can be used if no circular frame can be found.



NET SKIRT

Adding fabric to the bottom of the net can add length and reduce the wear and tear caused by tucking.



Dr. Bakary Sambou

IMPRESSIONS OF UNIVERSAL COVERAGE IN SENEGAL

Dr. Bakary Sambou is the Malaria adviser to the World Health Organization in Senegal and a pioneer in the country's fight against malaria.

What do you think of universal coverage and its impact in Senegal?

I recall the huge amount of skepticism and doubt that people had in the beginning about the feasibility and relevance of UC. However, at an important meeting attended by a WHO emissary from Geneva in February 2010, Peace Corps Volunteers described their experiences doing UC campaigns in the south to a large group of stakeholders. Their accounts confirmed that the process was adaptable and feasible.

Since NetWorks took the lead on the UC mass distributions, they have proved that this is the best strategy for distributing nets, as it respects both equity and the real needs of the population. As I have mentioned, in the beginning no one believed in the approach. Even WHO and Roll Back Malaria, who had

written about UC, had not yet explained how it could be done. Before the strategy was introduced, pregnant women and children under 5 were the key targets, as they are the most vulnerable and in most need of protection. However, once it was understood that UC still covered these populations, as well as everyone else, Senegal was encouraged to move forward and try it.

The NMCP, in collaboration with NetWorks and other partners, carried out a spectacular job in the 12 regions where UC was first implemented; this legacy will continue under IntraHealth, who will continue the strategy in Thies and Dakar. Not only will they cover Thies and Dakar, but they will also do follow-up mass distributions in the pioneering regions for UC where the first mass distributions were carried out three years ago.

How can we better share information about universal coverage?

First, it's important to document the process as you go along. Senegal's documentation of the UC rollout is incredibly thorough, and we have seen many successes. Documentation is important to ensure that everyone knows about the strengths and the challenges involved in carrying out such an enormous program.

The next step is to analyze what was done: which of these challenges were real bottlenecks? Based on our knowledge, what can we do in the future so that we do an even better job? This strategy won't stop with a single mass distribution; the UC activities will continue through 2016 and the NMCP needs to reflect on how best to do that, particularly in the regions where the first distributions

were done in 2010, since after three years LLINs need to be replaced. The documentation and recollection of experiences should definitely help in the planning of future distributions, including identifying ways to streamline costs. Preparing ourselves for the future of universal coverage in Senegal is necessary and this documentation is a critical part of that process.

“What people need to understand is what we gained in social and health benefits outweigh the money spent on universal coverage.”

PASSING THE BATON

UC PHASE VI

While NetWorks orchestrated the UC distributions in 12 of the country's 14 regions with the NMCP, IntraHealth led the distributions in Thies and Dakar with Global Fund support. Technical guidelines, tools, and communication materials used for the earlier distributions were employed and once the nets were ready, operations moved full speed ahead.



JOINT PLANNING
Sharing resources to ensure continuity

FIELDWORK
Accounting for almost 684,000 households

DISTRIBUTION
The long awaited nets arrive

PROTECTED
Sleeping soundly under the comfort of the net

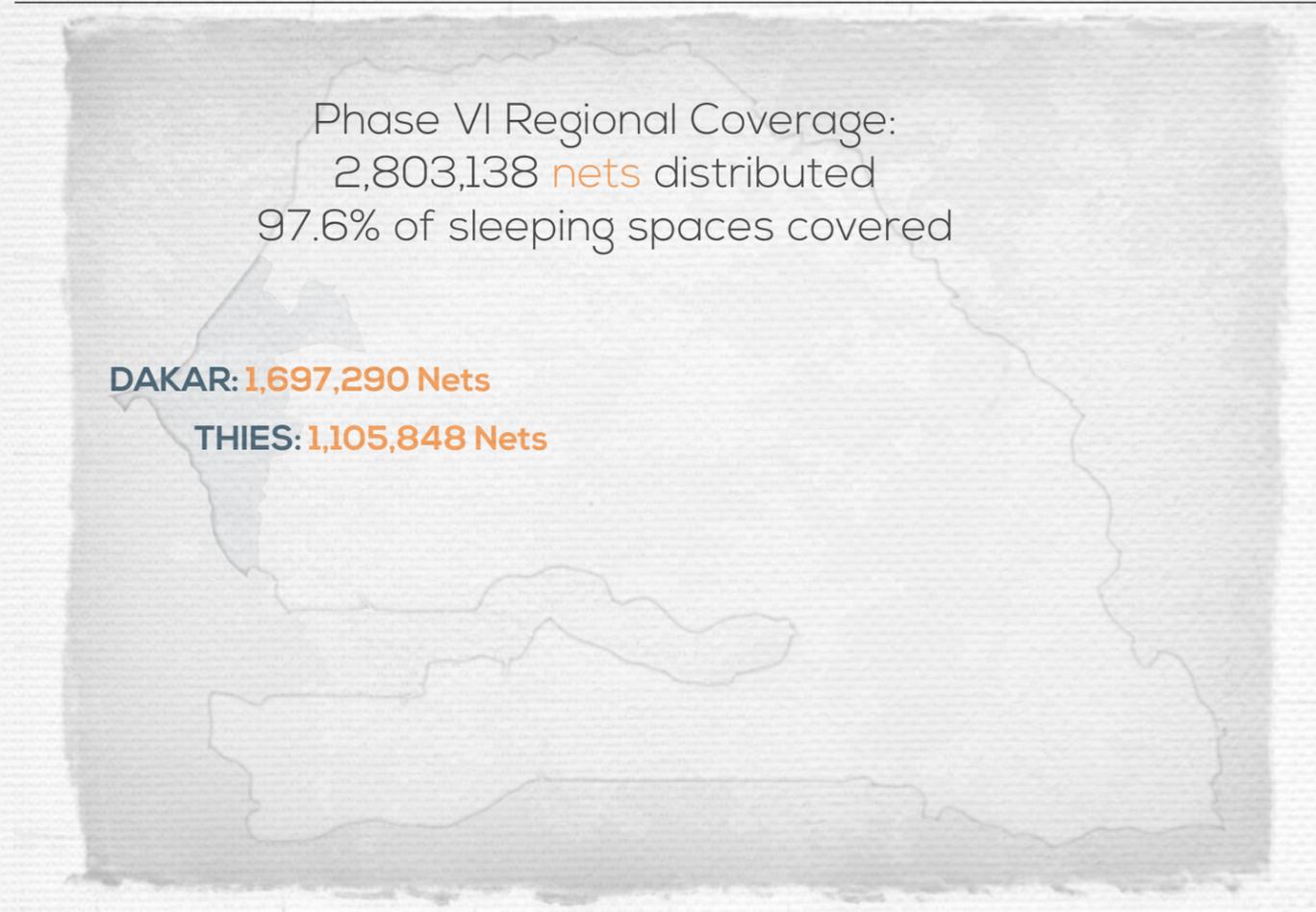
After leading implementation on UC Phases I through V, responsibility for the rollout of Phase VI operations was passed from NetWorks to IntraHealth International. With funding secured through the Global Fund, and working hand in hand with the NMCP, the mass distributions for the regions of Thies and Dakar were successfully completed.

To ensure continuity with the previous phases, NetWorks worked closely with IntraHealth to share resources

and materials, including technical guidelines, checklists, communication materials and templates for the household surveys. Additionally, technical staff from the NetWorks office participated in regional planning sessions for both Thies and Dakar where they were able to share experiences and lessons learned from earlier distributions. Several of the local facilitators who had worked short term for NetWorks in the regions were also hired by IntraHealth to work with the district health management teams due to their

experience and on-the-ground knowledge of the distributions. With the completion of the UC Phase VI campaign in Thies and Dakar, the entire country is now covered with nets. However, the work is not done. Because the first UC campaigns were completed in 2010 before any alternative channels for accessing nets had been put in place, a second round of mass campaigns have been started beginning with Kedougou and Kolda. Support for these mass distributions is coming from the Global Fund and planning

and management of field operations is being ensured by IntraHealth. At the same time, national focus for preserving universal coverage has now evolved to include health facility, community-based, and private sector models so that households have easy and affordable access to nets through a range of continuous distribution channels.



POPULATION: 5,315,027
SLEEPING SPACES: 2,991,270
NETS DISTRIBUTED: 2,803,138
79% HUNG 1 WEEK AFTER DISTRIBUTION
NUMBER OF LOCAL ACTORS INVOLVED: 13,362
117,611 EXISTING NETS FOUND IN GOOD CONDITION
OPERATIONAL COST OF DISTRIBUTION: \$1,375,557 CFA 687,778,989



- *IntraHealth 94.2%
- Health Committees 2.4%
- NGOs 1.2%
- Community Contribution 0.3%

PARTNER CONTRIBUTIONS AS A PERCENTAGE OF TOTAL OPERATIONAL BUDGET

CFA 500 - \$1US

* Financial support provided by Global Fund Round 10

CONTINUOUS DISTRIBUTION

Continuous distribution channels are a way to help maintain universal coverage levels



Births, deaths, marriages, visitors and shifting family dynamics can change the number of household sleeping spaces and subsequently the number of LLINs needed from one year to the next. In addition, even under the best conditions, nets eventually become worn out. While the UC campaigns were successful in getting large numbers of nets into communities over a relatively short period of time, mass distributions are expensive and not intended to be annual events. Because of this, it is

important that nets are available to communities on a continuous basis so that those who want or need new nets have access and to ensure that the high levels of net coverage achieved through the mass distributions are maintained.

Recognizing this reality, the NMCP and NetWorks established a system of continuous net distribution through health facilities in June 2012 which is currently functioning nationwide. Free LLINs are provided to pregnant women during antenatal care

visits and subsidized nets (500 CFA, equal to about \$1US) are available to all others seeking health services.

In addition, community-based and school-based distribution channels were piloted and assessed in two regions, Louga and Ziguinchor, starting in early 2013. Community-based organizations sold subsidized nets for 500 CFA and free distributions were organized in primary schools for students enrolled in first and fourth grade. It is expected that these channels will be

refined and scaled up over the next year by the NMCP. In addition, a social marketing program has been launched to ensure the availability of subsidized nets through the private sector. Together with ongoing communication and community mobilization, continuous distribution channels are expected to expand and evolve in what has clearly become a vibrant culture of net use in Senegal.

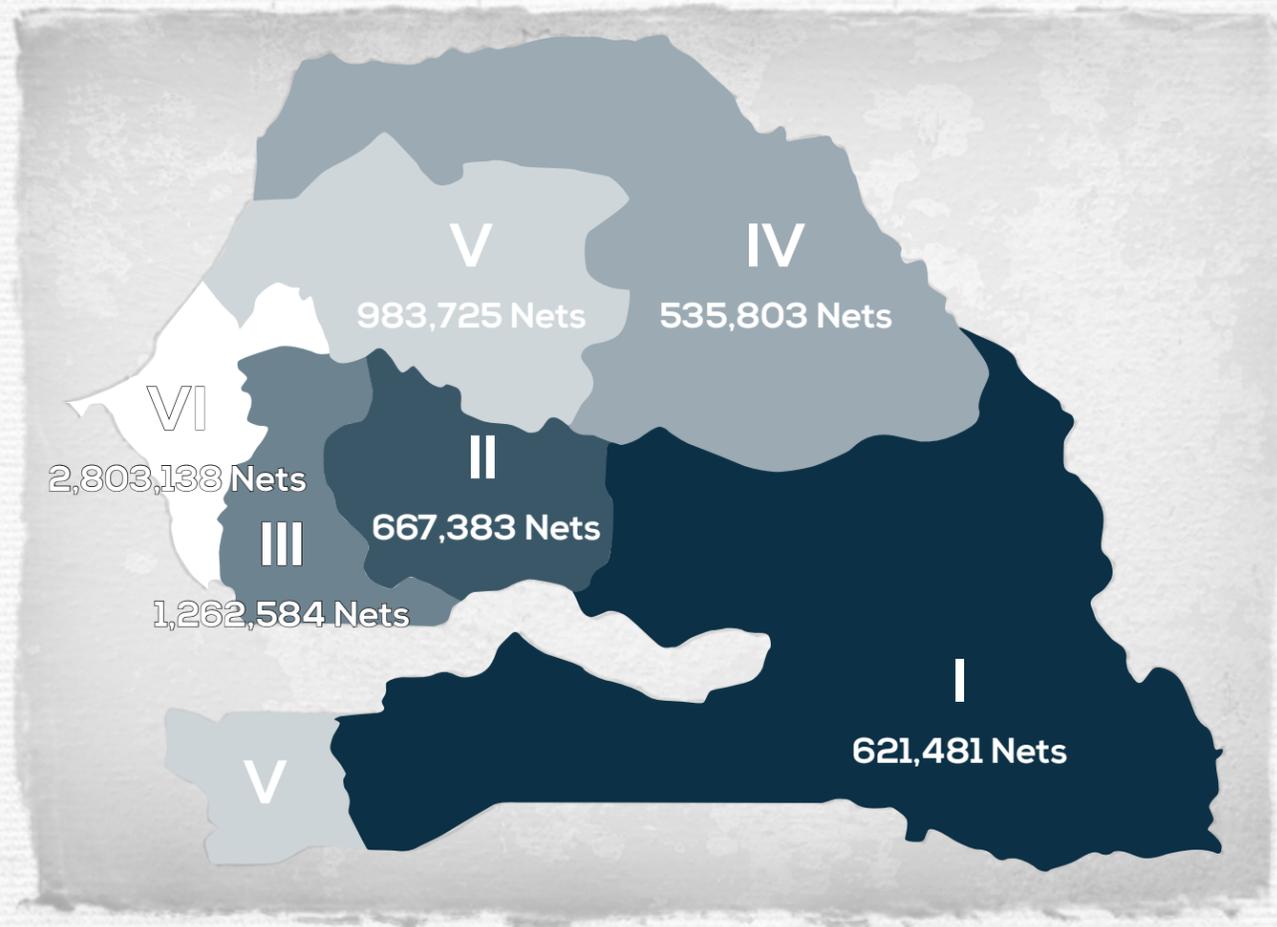
SUMMARY TABLE

Region	Census Population	Sleeping Spaces	Existing Nets in Good Condition	Nets Distributed
Sedhiou	442,380	233,217	48,202	174,500
Kolda	364,268	197,611	28,756	158,100
Kedougou	107,635	69,240	14,432	45,657
Tamba	653,538	358,416	92,194	243,224
Phase I	1,567,821	858,484	183,584	621,481
Kaffrine	604,445	549,236	55,792	268,619
Kaolak	977,195	343,917	114,365	398,764
Phase II	1,581,640	893,153	170,157	667,383
Diourbel	1,715,911	1,045,810	122,835	922,135
Fatick	751,096	429,466	89,017	340,449
Phase III	2,467,007	1,475,276	211,852	1,262,584
Saint Louis	1,002,550	529,234	146,390	334,522
Matam	618,383	313,811	66,804	201,281
Phase IV	1,620,933	843,045	213,194	535,803
Ziguinchor	622,827	371,014	133,121	370,061
Louga	1,020,028	616,251	145,915	613,664
Phase V	1,642,855	987,265	279,036	983,725
Thies	2,084,213	1,153,544	47,309	1,105,848
Dakar	3,234,430	1,837,726	70,302	1,697,290
Phase VI	5,318,643	2,991,270	117,611	2,803,138
Grand Total	14,198,899	8,048,493	1,175,434	6,874,114

PHASES I-VI

6,874,114 nets distributed

5/19/2010 - 6/1/2013



- PHASE I: 5/19/2010-10/13/2010
- PHASE II: 12/6/2010-3/17/2011
- PHASE III: 4/12/2011-7/15/2011

- PHASE IV: 9/7/2011-1/3/2012
- PHASE V: 4/17/2012-6/30/2012
- PHASE VI: 2/1/2013-6/1/2013

ACKNOWLEDGMENTS

Tens of thousands of people across the country were actively involved in the design, planning, implementation and evaluation of the universal coverage mass campaigns in Senegal. Because of their hard work and determination, nets are now hanging and being used in homes throughout the country.

Special recognition is given to the PMI Senegal team. Without their technical wisdom, financial support and flexibility, Senegal would never have been able to successfully complete the mass campaigns and launch continuous distribution.

Additionally, the NMCP was an impressive leader and ally throughout the design and rollout of the UC mass distributions. WHO provided ongoing encouragement and motivation to the UC teams based both in Dakar and the field.

The National Medical Store (*Pharmacie Nationale d'Approvisionnement* or PNA) is acknowledged for the important services they provided by warehousing hundreds of thousands of nets in Thies, Tivaouane and Bambeby.

Partners that made important contributions to the UC campaign at the national and district levels include the Islamic Development Bank, Africare, Caritas Senegal, Catholic Relief Services, ChildFund, IFRC, IntraHealth International, Malaria Control and Evaluation Partnership in Africa, the Senegal River Basin Development Authority, Red Cross Senegal, *Secours Islamique France*, Speak Up Africa, Tostan, World Vision and United Nations Children's Fund.

A special tribute goes out to the regional and district health management teams from Kedougou, Sedhiou, Kolda, Tambacounda, Kaffrine, Kaolack, Fatick, Diourbel, Matam, St. Louis, Louga, Ziguinchor, Dakar, Thies and the hundreds of community coordination committees, *relais* and supervisors who put in long and tireless hours throughout the mass distributions

and who continue to encourage people to use their nets regularly and care for them.

And finally, this work could not have been completed without the tireless work of all the Peace Corps Volunteers and NetWorks' technical, administrative and financial staff for their dedication and help in making universal coverage a reality for Senegal.

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UNIVERSAL COVERAGE SENEGAL 2010-2013



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