The USAID | DELIVER PROJECT, Task Order 7, is funded by USAID, implemented by John Snow, Inc., and supports USAID’s implementation of malaria prevention and treatment programs by procuring, managing, and delivering high-quality, safe, and effective malaria commodities; providing on-the-ground logistics capacity, technical assistance, and pharmaceutical management expertise; and offering technical leadership to strengthen the global supply, demand, and financing of malaria commodities.
No Product, No Program

The USAID | DELIVER PROJECT (the project) strengthened global, regional, and in-country supply chains to improve and expand the delivery of public health commodities to the people who need them. Under the Malaria Task Order, with funding from the President’s Malaria Initiative (PMI), the project was responsible for procuring and distributing antimalarial commodities—long-lasting insecticide-treated bed nets (LLINs), rapid diagnostic tests (RDTs), sulfadoxine pyrimethamine (SP), and artemisinin-based combination therapies (ACTs) to PMI-supported country programs. The project worked to improve the global supply and availability of antimalarial commodities, and to bolster in-country supply systems.

The project’s antimalarial commodities contributed to the reduction of morbidity and mortality due to malaria by preventing transmission of malaria, preventing cases among pregnant women, improving diagnosis, and providing treatment. The project worked at all points in the logistics cycle (shown in figure 1) to ensure that malaria products were available when and where needed.

Figure 1. The Logistics Cycle

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1 USAID DELIVER procured LLNs for 24 countries: Angola, Benin, Burkina Faso, Burundi, Burma, Cambodia, Democratic Republic of Congo, Ethiopia, Ghana, Guinea, Laos, Liberia, Kenya, Madagascar, Malawi, Mozambique, Nigeria, Rwanda, South Sudan, Tanzania, Thailand, Uganda, Zambia, and Zimbabwe.
LLINs for vector control and malaria prevention

In 2015, an estimated 212 million cases of malaria occurred across 91 countries and territories worldwide. In the same year, malaria accounted for the deaths of approximately 429,000 people, 92 percent of which occurred in sub-Saharan Africa. Of the total deaths, approximately 303,000 (70 percent of the total), occurred in children under 5 years.²

Between 2000 and 2015, however, malaria prevention and treatment interventions expanded dramatically, contributing to a 60 percent decline in malaria mortality rates globally, helping to avoid an estimated 6.2 million deaths. In the WHO African Region, the estimated malaria mortality rate in children under 5 years of age reduced by 71 percent. During the same period, the global incidence of malaria reduced by 37 percent.⁴

Long-lasting insecticide-treated nets have played a major role in vector control for the prevention of malaria transmission. Across sub-Saharan Africa, where countries have scaled up LLIN distribution efforts to encompass mass campaigns and continuous distributions to meet WHO guidelines of universal coverage, the overall risk of malaria is declining, resulting in impressive declines in malaria-related mortality in children under five.

The proportion of populations who have both access to an LLIN, and who are sleeping under one, has increased notably in the last ten years as well. Based on data from household surveys and reports on LLINs delivered by different manufacturers and distributed by national malaria control programs (NMCPs) and technical partners, an estimated 67 percent of the population at risk for malaria in sub-Saharan Africa had access to an LLIN in 2015, compared to just around 3 percent in 2004. An estimated 82 percent of those in sub-Saharan Africa who had access to a net were sleeping under one in 2015, compared to 2 percent in 2004.⁵ Ensuring access to LLINs is therefore critical to increasing the proportion of the population sleeping under an LLIN.

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The World Health Organization (WHO) recommends that “countries should apply a combination of mass distribution of free LLINs and continuous distributions through multiple channels, in particular antenatal care (ANC) and immunization services.”\(^6\) While countries initially focused on mass distributions through campaigns to rapidly increase LLIN ownership, they are now looking to continuous distribution channels between mass campaigns to maintain high coverage rates over time.

*Figure 3. Proportion of Population Sleeping Under an LLIN, Sub-Saharan Africa*\(^7\)

Continuous distribution through facility-based channels (ANC and the Expanded Program on Immunization (EPI)) is critical, to protect the most vulnerable groups (pregnant women and young children), to offset the effects of net attrition and population growth, to help fill coverage gaps between mass campaigns, and because of the finite lifespan of LLINs (i.e., usually a range of three to five years). Other continuous distribution options include school- and community-based channels. Many countries are in the process of establishing and maintaining logistics systems for these continuous distribution channels. While each distribution channel has its distinct advantages and weaknesses, the project has aided PMI focus countries in not only procuring LLINs for both mass and continuous distribution activities, but also in designing effective systems for continuous distribution, distributing nets down to the last mile,\(^8\) and evaluating these programs for efficiency at serving those most at risk of contracting malaria.

\(^6\) WHO recommendations for achieving universal coverage with long-lasting insecticidal nets in malaria control, March 2014: World Health Organization.

\(^7\) Insecticide-treated mosquito net coverage model: Malaria Atlas Project, 2013 (http://www.map.ox.ac.uk/, accessed on August 12, 2015).

\(^8\) Last mile refers to the final leg of supply chain network, where services are delivered to hard-to-reach clients.
The USAID | DELIVER PROJECT and LLIN distribution

**Strong supply chains provide nets where and when they’re needed most**

Malaria programs rely on strong supply chains to provide adequate quantities of high-quality commodities. In partnership with Ministries of Health (MOH) and NMCPs, and PMI, the project targeted key functions within the logistics cycle to strengthen the supply chain as part of efforts to reduce malaria incidence and mortality. Task Order Malaria (TOM) had a long-term presence in 13 of the PMI-focus countries (Democratic Republic of Congo [DRC], Ethiopia, Ghana, Guinea, Liberia, Madagascar, Malawi, Mozambique, Nigeria, Rwanda, Tanzania, Zambia, and Zimbabwe); the Regional Development Mission Asia (RDMA); and the three USAID malaria non-focus countries (Burkina Faso, Burundi, and South Sudan). In addition, TOM provided technical assistance on LLIN distribution in Angola, Benin, and Mali.

In its first year (2007), the project procured 531,800 LLINs for two countries. The next year, the project procured LLINs for nine countries, and as countries began to operationalize their universal coverage goals, the project procured and distributed more LLINs, mostly for mass campaigns. Over the history of the project, 187.5 million nets were procured. From 2013–2016 alone, the project procured approximately 144,700,000 LLINs, helping malaria-endemic regions dramatically scale up their LLIN activities, and reducing the malaria burden on the most vulnerable.

*Figure 4. LLINS Procured by The Usaid | Deliver Project, Calendar Year 2007–2016*
Throughout the life of the project, LLIN procurement and distribution was a major focus of activities, covering a spectrum of technical and supply chain needs, including:

- Helped develop procedures of LLIN distribution down to household, facility, and designated distribution point level, even hanging the LLINs up in households.
- Developed distribution micro-plans (quantities and locations for each distribution point).
- Developed documentation to support mass campaigns (ensuring visibility of LLINs down to the appropriate level).
- Trained health workers and volunteers on procedures and documentation of LLINs.
- Identified storage and transportation requirements at the various levels of the system.
- Contracted and/or procured warehousing and transportation services down to the necessary level.
- Supported continuous distribution through ANC and EPI clinics, and school-based distribution.
- Reconciled documentation and produced reports on distribution results.
- Found creative solutions for a variety of LLIN-specific considerations and challenges, and wrote reports to share these findings with the global health community. Here is a sample:

The project distributed nearly 104 million LLINs through mass campaigns and continuous distribution; in some cases advising governments and providing logistics expertise and tools to support distribution, while directly distributing nets in others.

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9 The project procured millions of LLINs, and distributed many in-country, sometimes in partnership with Global Fund, UNICEF, and other project partners. In some countries, the project distributed LLINs procured by other partners.
• LLIN Packaging Considerations
• Madagascar LLIN Recycling Pilot Project
• How to Use Mobile Money for Quick, Effective Distribution of LLINs to Last Mile
• Liberia Continuous Distribution of LLINs through Antenatal Care and Institutional Delivery Services

**Highlights from the project’s technical assistance in LLIN distribution.**

**Figure 6. Project LLIN Distribution Coverage**

**Angola**

The project began procuring LLINs for Angola in 2010, and by September 2015, the project has procured over 5 million LLINs for distribution throughout the country, in support of the country’s goal of universal coverage.

**Benin**

Since 2007, the project procured 5.9 million LLINs for Benin, and helped distribute approximately 3.6 million LLINs through continuous distribution channels such as ANC and EPI clinics. Data from the 2012 DHS found that 80 percent of all households owned at least one LLIN, and that 70 percent of children under five years and 75 percent of pregnant women had slept under an LLIN the previous night,\(^{10}\) indicating that significant progress has been made in the country on net ownership and use since 2006.

**Burkina Faso**

In Burkina Faso, the project procured 900,000 LLINs beginning in 2010. The project provided technical and financial support to the NMCP to develop an implementation plan and forms to manage LLINs during the 2013 national LLINs campaign. For the July 2016 mass distribution campaign, the project provided orientation and training on logistics management and the LLIN transportation plan. The project also assisted the NMCP in analyzing household census data and determining the number of LLINs for the distribution.

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Burundi

Beginning in 2010, the project procured and distributed LLINs throughout Burundi. A total of 4.7 million LLINs for distribution through continuous distribution channels and a social marketing program were procured. The project directly distributed 2.6 million LLINs. A noteworthy feature was expansion of the pilot program, in which the project distributed nets to health districts rather than health centers. The districts themselves distributed LLINs to health centers, focusing on building capacity of health districts to manage LLINs and other health commodities. The project’s primary activities in the country also focused on improving supervision at each level of the supply chain through cooperation with the NMCP, and the social marketing of LLINs to increase demand and encourage sustainable market growth.

Ghana

Throughout the life of the project in Ghana, 10.8 million LLINs were procured for the country, and approximately 20.8 million LLINs distributed through mass campaigns, continuous distribution channels like ANC and EPI, and school-based distribution mechanisms. These nets include both PMI-procured LLINs and those procured by other donors (e.g., Global Fund). The project helped Ghana’s NMCP increase LLIN ownership and use.

One of the project’s largest LLIN distribution activities took place from August 2010 to March 2012 as part of Ghana’s strategy to achieve universal ownership and use of LLINs in the population. During this time, the NMCP with support from the USAID | DELIVER PROJECT and other partners conducted a nationwide campaign to distribute approximately 12 million LLINs. Volunteers distributed and
hung nets directly at the sleeping places of beneficiaries to increase use of LLINs, especially by women and children.

With such a large number of nets distributed, campaign organizers were left with a large amount of plastic LLIN storage bags. The project helped evaluate the disposal options for the accumulated plastic waste in line with WHO, Food and Agriculture Organization of the United Nations, USAID environmental standards, and the standards of the Environmental Protection Agency of Ghana. Based on technical recommendations provided by the project, the NMCP and stakeholders selected disposal by recycling the bags into pavement blocks as the best option. The project developed an environmental mitigation and monitoring plan that guided the disposal process.

In 2016, the project transported LLINs from the ports to district educational offices in support of a national school-based distribution. The LLINs were transported directly from the ports to the regions to save cost by eliminating the need for central-level warehousing. In addition, the project supported the distribution of 4.3 million LLINs as part of a mass distribution campaign.

**Liberia**

From 2009 to 2014, the project procured 2.3 million LLINs for distribution in the country. While the majority of procurements were utilized in mass campaigns, in 2014 the project spearheaded the development of the first continuous distribution plan for LLINs through ANC/institutional delivery clinics in the country. In addition to procuring LLINs, 15 ocean shipping containers were procured for the first time in project history to use as temporary storage in counties where there was a significant lack of warehousing space for LLINs. With the arrival of the LLINs in March 2015, the project implemented the first phase of the plan, not only distributing containers to counties and LLINs to facilities throughout the country, but providing orientation for county health team and health facility staff on the LLIN and proper recording and reporting procedures. These skills were put to use during the 2016 distribution of 27,800 LLINs to 149 health facilities, in support of the continuous distribution system.
**Madagascar**

Beginning in 2008, the project procured LLINs for Madagascar nearly every year of the project through 2015. During this time, nearly 16 million LLINs were procured for the country, primarily for distribution through mass campaigns to help reach the island nation’s population of almost 23 million people. Madagascar completed two nationwide mass campaigns to deliver LLINs to targeted populations in 2009–2010 and again in 2012–2013. During the latter, the project contributed to supervision and strategic working sessions of the National Coordination Committee. Two districts were visited, and all team members involved in the campaign were trained and operational before the start of the distribution. Funded by PMI, the campaign distributed 2,578,300 LLINs (corresponding to 6 regions; 28 districts; 1,299,435 households; and 6,107,347 individuals).

**Mali**

The project’s work in Mali began in 2007, procuring LLINs for distribution through mass campaigns. The project procured approximately 13 million LLINs, which were used as part of campaigns to achieve universal coverage for a population of over 15 million people. Since 2011, the project helped distribute approximately 6.4 million LLINs. The 2006 Demographic and Health Survey found that 61.5 percent of households had at least one LLIN; in 2013, this figure was 82.2 percent.

**Mozambique**

In Mozambique, LLIN distribution focused on national mass campaigns. While continuous distribution of LLINs through ANC clinics has been a national policy since 2006, it has not been formalized. The project procured nearly ten million LLINs for Mozambique. The implementation of Mozambique’s rolling mass universal coverage campaigns started in 2010 and was completed in 2015. In 2016, the project stored and transported more than three million LLINs to regional warehouses for further distribution and installed 52 40-foot shipping containers in selected districts throughout the country. The project also trained 121 health workers in 2016 in the management of LLINs for distribution through ANC clinics.
**RDMA (Burma, Cambodia, Laos, Thailand)**

The project came to Burma, Cambodia, Laos, and Thailand in 2012, procuring 2.2 million LLINs for the region to meet national malaria control program goals. While the majority of LLINs procured for the region were rectangular, the project also procured a small number of hammock LLINs. These unique LLINs meet the particular needs of migrant working populations who sleep in open, forested areas while harvesting valuable timber. By procuring these unique LLINs, the project aided especially vulnerable populations in much needed vector control. In Burma, the project arranged for in-country receiving, warehousing, and township-level distribution of PMI-funded LLINs for the NMCP. At the end of March 2016, approximately 390,000 LLINs had been transported to 27 townships across the country. In 2016 in Laos, the project was able to deliver 140,000 LLINs to regional and provincial warehouses.

**Nigeria**

Since 2008 the project procured approximately 32.4 million LLINs for distribution in mass campaigns in 30 states and continuous distribution in 11 PMI focus states throughout the country. The project also assisted with the distribution of 44.4 million LLINs. In December 2013 alone, the project helped deliver 2,490,141 LLINs to 1,020,252 households in Sokoto State. In coordination with in-country distribution partners, and with leadership from the National Malaria Elimination Program (NMEP), the project made LLINs available to end users through continuous mass campaigns and replacement activities. The project managed the development and execution of work orders for the transport of continuous LLINs to service delivery points. This ensured the constant availability of LLINs for different continuous distribution strategies and included distribution of LLINs through antenatal and postnatal clinics, schools, and community-directed distribution. In addition to continuous distribution efforts, the project enabled an emergency LLIN distribution to internally displaced persons in 2015. Overall, household ownership of at least one insecticide-treated net grew from 2.3 percent of households in 2003 (DHS 2003) to 49.5 percent in 2013 (DHS 2013).
Rwanda

Since 2008, the project procured a total of 5.7 million LLINs and helped distribute approximately 4.7 million nets. Rwanda’s national policy and goals for LLIN distribution focuses on both attainment of universal coverage through mass campaigns, as well as identification of target populations and provision of LLINs to these groups. The project conducted a nationwide LLIN distribution in the spring of 2013, distributing 350,000 LLINs to 415 health facilities intended for pregnant women at their first ANC visit, and 60,000 for distribution to households in the region. By using a private-sector company, the project reduced costs to less than half of the previous distribution. In January 2015, the project also assisted the NMCP and Ministry of Health to coordinate and distribute 1.4 million LLINs to the community level. Through media sensitization, augmenting existing structures, and organizing robust logistics and finances, the project accelerated the execution of the process and finished the distribution in 11 working days, distributing 1.35 million LLINs to 13 high-malaria endemic districts and 157 health centers.

Figure 9. Rwanda: Increase in LLIN Ownership and Use

Tanzania

Tanzania’s national policy for LLIN distribution is focused on achieving national universal coverage through mass campaigns and maintaining coverage through continuous distribution channels. Continuous distribution channels include the targeted distribution of vouchers to clients at ANC and EPI clinics through the Tanzania National Voucher Scheme (ended in 2015), as well as a restructured facility-based distribution in ANC and EPI clinics (started in 2016). School-based distribution was tested in three regions in the south of the country in 2014–2015, and scaled up to seven regions in 2016. The project’s involvement in LLIN procurement in Tanzania began in 2013; by completion, it had procured approximately 5.5 million nets for the country.
Zambia

A number of delivery methods were adopted to achieve universal LLIN coverage in Zambia. These included mass distribution of LLINs and continuous distribution to pregnant women and children under-five years of age through ANC and EPI clinics. From 2008 to 2016, the project procured 10.6 million LLINs for the country, including LLINs for a universal coverage campaign in 2014–2015. The project also helped distribute approximately 4.3 million LLINs through targeted, continuous distributions, the last of which concluded in July 2016 with the distribution of 800,000 LLINs. As a result of these efforts, the percentage of homes with at least one LLIN increased from 38 percent in 2006 to 68 percent in 2014.

Zimbabwe

In Zimbabwe, the NMCP increased districts targeted for LLIN distribution from 30 (prior to September 2013) to all 47 malaria-prone rural districts (May 2014) due to the epidemiological shift in the country. As of September 2013, Zimbabwe was targeting 30 of the 62 rural districts for universal coverage of LLINs. Thus far, distribution of LLINs in Zimbabwe has been entirely through mass campaigns. A system for continuous distribution was being developed in 2014 and piloted in four selected districts. The project procured 3.1 million LLINs for Zimbabwe since 2012, and distributed 1.1 million LLINs down to the district level. The percentage of households with at least one LLIN improved from 8.5 percent as reported in the 2006 DHS to 24.7 percent as reported in the 2011 DHS, and up to 48 percent as reported in the 2015 DHS.
Achievements: looking back

Between 2007 and 2016, the project worked consistently to procure high-quality products, and to get those products to those who needed them as efficiently as possible. With funding from PMI, the project contributed to increasing coverage of the most vulnerable populations throughout sub-Saharan Africa, where the majority of the burden still lies. From 2000 to 2012, the percentage of children in Africa sleeping under a treated net increased significantly, in some cases by as much as 50–75 percent.

The USAID | DELIVER PROJECT played an integral role in not only procuring 187.5 million LLINs for free distribution to populations in need, but by strengthening the health delivery systems in countries throughout malaria-endemic regions. This support led to stronger supply chains, greater security measures, and heightened accountability, ensuring that more product reached the right people at the right time.

PMI is a key player in meeting countries’ needs for malaria prevention, diagnosis, and treatment. Improving access to malaria commodities by procuring and delivering quality products and strengthening the in-country supply chains is crucial to meeting these needs. As the NMCPs and Ministries of Health in these countries expand their efforts to improve the health of their populations, continued USAID and PMI investment in procurement of malaria commodities and strengthening national supply chain systems will be essential.

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1 These commodity figures come from the project’s MIS (up to September 2016) and may not completely align with the PMI annual report figures due to differing timeframes, definition of data, and other country specific reasons.