USAID | DELIVER PROJECT

Long-Lasting Insecticide-Treated Net Market and Data Analysis–2011 Addendum

Updated with Data from August 1, 2010 to August 31, 2011

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CDC

Long-Lasting Insecticide-Treated Net (LLIN) Market and Data Analysis—2011 Addendum

Updated with Data from August 1, 2010 to August 31, 2011

USAID | DELIVER PROJECT, Task Order 3
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Abstract
In 2010 the USAID | DELIVER PROJECT was tasked with providing an analysis of how the LLIN industry has adapted to the rapid scale-up of LLIN procurement since 2007, identify potential trends since 2007 and report if there are any predictable cost drivers for the procurement of LLINs. The result of this analysis was a study titled; LLIN Market and Data Analysis. The purpose of this addendum is to outline where previously identified trends and costs drivers have changed or remained the same when data from procurements carried out by USAID / DELIVER PROJECT between August 2010 and September 2011 are incorporated into the original analysis.

Cover photo: LLIN deliveries in Benin.

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Acronyms

IRS	Indoor Residual Spraying
LLIN	Long-Lasting Insecticide Treated Net
PMI	President Malaria Initiative
RBM	Roll Back Malaria
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
USD	United States Dollars
ITN	Insecticide Treated Net
WHO	World Health Organization
WHOPES	World Health Organization Pesticide Evaluation Scheme

Acknowledgments

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Introduction

Under the Roll Back Malaria (RBM) Partnership and its objective to achieve universal coverage of 80% of people at risk of malaria using locally appropriate vector control methods such as insecticide treated nets (ITNs), the procurement of Long-Lasting Insecticide-Treated Nets (LLINs) has scaled up significantly during the past five years. Large quantities of LLINs have been delivered, particularly to the most vulnerable population groups.

The USAID | DELIVER PROJECT has played a major role in this effort. Within the past five years, the USAID | DELIVER PROJECT has procured, transported and distributed close to 42 million LLINs to 16 countries with a total expenditure of approximately $127 million United States Dollars. Currently, the LLIN commodity represents the highest dollar value of all the commodities procured under the USAID | DELIVER PROJECT.

Further to this rapid growth and as part of a more general set of studies conducted in 2010, related to procurement, freight and logistics analysis, the Presidents Malaria Initiative (PMI) requested the USAID | DELIVER PROJECT to provide further analysis on how the LLIN industry has adapted to this rapid scale-up and identify potential trends over time, and whether there are any predictable cost drivers for the procurement of LLIN. A report titled "LLIN Market and Data Analysis" was produced in 2010. Subsequently the project was asked to update this report based on procurements in 2011.

Background

Long-Lasting Insecticide-Treated Nets

The distribution and correct usage of LLINs is still considered as one of the more effective interventions for malaria control, and needs to be scaled up if countries are to move towards achieving the 'United Nations Millennium Development Goals' by 2015 – WHO Global Malaria Programme (2010).

A Long-Lasting Insecticide-Treated Net (LLIN) is a factory treated mosquito net made with netting material that has insecticide incorporated within, or bound around fibers. From 2007 until the present, USAID | DELIVER PROJECT have procured and distributed two (2) varieties of the LLIN, those being polyester and polyethylene fabric materials.

Previous reports have provided positive analysis on the impact of LLINs on overall childhood mortality and malaria related morbidity. LLINs also have an impact on diseases other than malaria – Leishmaniasis, Japanese encephalitis, Lymphatic filariasis and Chagas Disease – WHO Global Malaria Programme (2011).

Whilst there are varieties of other vector control methods such as Indoor Residual Spraying (IRS), there is no real substitution for LLINs in the market place. Previously reported research has indicated that the use of LLINs are one of the most cost effective interventions against malaria, and have been recommended by WHO (World Health Organization) as a preferred alternative to the conventional Insecticide Treated Nets (ITN), citing that the costs per death averted with LLINs lasting three (3) years, were less than half the comparable costs incurred in using conventional ITNs.

Background of the Original Study

Every LLIN procurement is unique—volumes, delivery locations, specifications---and price has varied considerably over the past five years. Given this, it was difficult to determine both trends over time and whether there were any predictable cost drivers.

The purpose of the LLIN Market and Data Analysis 2010 study was to establish possible market drivers to an unprecedented increase in demand of LLINs between 2007 and 2010 due to Roll Back Malaria's campaign to achieve universal coverage by December 31st, 2010. Despite a significant increase in demand, no significant technological breakthroughs were achieved on the production side and it was not clear if any economies of scale had been gained in productivity. The LLIN Market and Data Analysis included a report on product specificities procurement models, WHO recognized producers and suppliers. The objective of the study was to analyze data on volumes, delivery locations, price variations and lead times, and determines if there had been any trends over time and whether there were any predictable cost drivers.

The Addendum and Format

The purpose of this addendum is to identify previous trends and cost drivers with updated information accumulated between August 2010 and August 2011, and to incorporate this information into the original analysis. Wherever appropriate, these revisions are discussed in this Addendum and, if considered helpful, supplemental information is also provided.

Specific activities include:

- Updating previous analysis with data accumulated between August 2010 and September 2011, and identifies dominant variables.
- Review past LLIN procurements
- Compare Ex-Work prices and lead times based on the following factors:
  - Color
  - Shape
  - Size
  - Volume (size of order)
  - LLIN material (polyester or polyethylene)
  - Denier (density of fibers)
- Add new data to old data, and verify visible trends, if any.
- Identify any significant cost drivers or factors that impact lead time.

The addendum is organized into three parts.

The first part serves to repeat some background information regarding the overview of the of the LLIN industry's characteristics and specificities from the original study and provide a detailed update of the relevant product specificities based on project procurements over time.

In the second part of the addendum data accumulated from the beginning of the USAID | DELIVER PROJECT program (LLIN specific) to August 2010, and all new data from LLIN procurements between then and the 16th September 2011 is analyzed in order to determine potential trends over time, and any other factors which may have an impact on cost and lead times in the procurement of LLIN. Where there are no changes to the analysis from the original study, this is noted.

The third and final part presents a summary of the most significant findings as a result of the inclusion of new data and presents final conclusions.

Product Data Analysis (Long-Lasting Insect-Treated Nets)

August 2010 to August 2011 Highlights

Over the last year, from August 2010 to August 2011, the USAID | DELIVER PROJECT has procured 22,282,496 LLINs for a total spending of United States Dollars 87,662,080.66.

Two main categories of LLINs were procured:

- Rectangular LLINs, quantity 21,922,496 at a cost of USD 85,398,680.66 (an average of USD 3.90 per unit)
- Conical LLINs, quantity 360,000 at a cost of USD 2,223,400.00 (an average of USD 6.18 per unit)
- Average percentage decrease in cost per rectangular unit between August 2010 and August 2011 vs. average cost per rectangular unit between August 2007 and August 2010 was 8.72%
- Average percentage decrease in cost per conical unit between August 2010 and August 2011 vs. average cost per conical unit between August 2007 and August 2010 was 10.2%

The smallest procurement of rectangular LLINs – quantity 80,000 - was for Rwanda for a total cost of United States Dollars 349,104 or an Ex-Works unit price of United States Dollars 4.36 per LLIN

The largest procurement of LLINs – quantity 2,212,500 – was for Kenya for a total cost of United States Dollars 9,602,250.00 or an Ex-Works unit price of United States Dollars 4.34 per LLIN

The USAID | DELIVER PROJECT supplied LLINs to 15 countries in said period, in 9 different sizes, 4 different colors, 2 different materials, 5 different deniers and 2 different shapes.

Long-Lasting Insecticide-Treated Net Specifications

Figure 1. Long-Lasting Insect-Treated Net Types Procured Between 1 Oct 2010 – 16 Sept 2011 under the USAID | DELIVER PROJECT.

Long-Lasting Insecticide-Treated Bed Nets Specifications - 1 Oct 2010 - 16 Sep 2011

Shape	**Rectangular**	**98%**
	Conical	**2%**

Color	**White**	**64%**
	Light Blue	**17%**
	Blue	**11%**
	Green	**8%**

Denier	**150**	**39%**
	75	**28%**
	100	**23%**
	118	**8%**
	115	**2%**

Material	**Polyester**	**51%**
	Polyethylene	**49%**

Size	**190x180x150**	**31%**
	180x190x150	**15%**
	170x180x180	**15%**
	160x180x170	**13%**
	150x190x210	**10.6%**
	160x180x210	**9%**
	160x195x200	**4%**
	1250x65x250	**2%**
	180x190x180	**0.4%**

Most Common Specification	**Quantity**
Polyethylene, Permethrin, 150denier, (190x180x150cm), white, rectangular	3,170,000
Polyester, Deltamethrin 100denier (170X190X180) white rectangular	3,037,150
Polyester, Deltamethrin, 75denier, (160x180x170), white, rectangular	2,760,146

Long-Life Insecticide-treated Net Specification General Observations

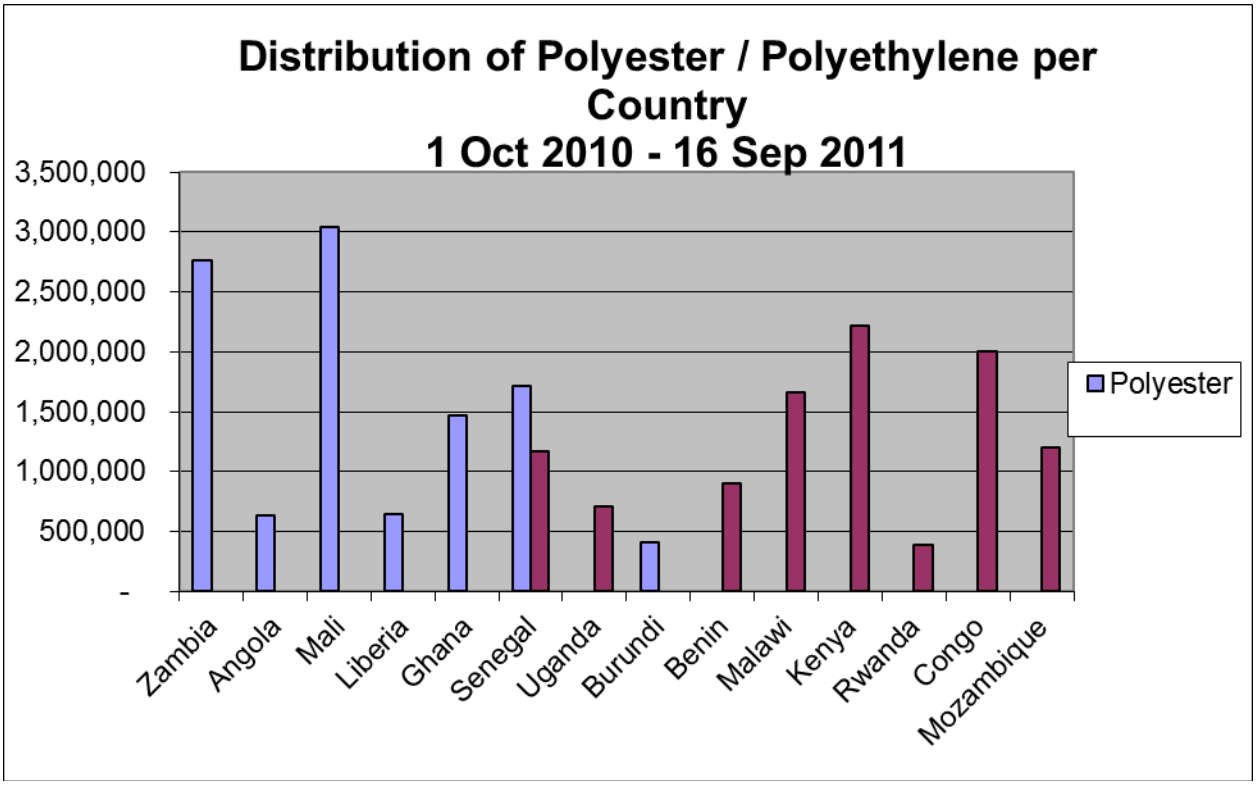
By comparison to data accumulated between 2007 and 2011, on LLIN procurements, the above mentioned statistics reveal the following information:

- The most common specification is still the Polyethylene, Permethrin, 150 denier, 190 x 180 x 150, white rectangular LLINs. By percentage these LLINs made up forty seven (47) percent of all procurements between 2007 and 2010, and in the last twelve (12) months (October 2010 to September 2011), have made up thirty four (34) percent.

- Data captured during the last twelve months reveals an overall increase in polyethylene material structure, by two (2) percent, and polyester LLINs are now slightly less than half of the total.
- Between October 2010, and September 2011, the most common specifications have been a mixture between polyethylene (3,170,000 LLINs) and polyester (5,797,296 LLINs).
- The availability of various colors shapes and sizes are there to accommodate local preferences, and the data captured in 2010 and 2011 reveal no notable change in trends from 2007 to 2010. Distribution by these criteria still appears to be random.

Long-Lasting Insecticide-Treated Net Procurements by Country

Figure 2. Distribution of Polyester / Polyethylene per Country 1 Oct 2010 – 16 Sept 2011



	Zambia	Angola	Mali	Liberia	Ghana	Senegal	Uganda	Burundi	Benin	Malawi	Kenya	Rwanda	Congo	Mozambique
Polyester	2,760,146	630,000	3,037,150	650,000	1,474,000	1,710,000	-	415,000	-	-	-	-	-	-
Polyethylene	-	-	-	-	-	1,170,000	709,000	-	905,000	1,659,700	2,212,500	390,000	2,000,000	1,200,000

Long-Lasting Insecticide-Treated Net Procurements by Country General Observations

By comparison to data accumulated between 2007 and 2010, on LLIN procurements, the above mentioned statistics reveal the following information:

- Senegal is the only country which continued to order both polyester and polyethylene LLINs in the past twelve months. There is no particular reason for this preference.
- Four (4) of the six (6) countries who ordered a combination of the two material types, between 2007 and 2010, have opted to order only polyethylene LLINs in the past twelve (12) months. Contributing factors to that decision can be based on volumes, prices, delivery times and preferences which emanate through 'trial and error'.

Amount of United States Dollars Spent on Long-Lasting Insecticide-Treated Nets by Vendor – 2007 to 2011

Figure 3. Total Amount of United States Dollars Spent on Long-Lasting Insect-Treated Nets by Vendor – 2007 to 2011

Total Amount United States Dollar Expenses by Vendor by Year

Vendor	2007	2008	2009	2010	2011	Total United States Dollars	Market Share in %
Sumitomo	1,505,000	3,619,725	16,506,610	15,866,500	32,254,655	68,247,490	38%
Vestergaard	3,374,888	10,341,111	8,261,876	3,732,300	41,907,826.66	64,243,113.66	36%
BASF		4,735,300	5,053,928	13,387,270		23,176,498	13%
Bestnet	2,403,500		2,549,900	4,829,500	9,858,599	17,237,999	10%
Clarke				3,697,500		3,697,500	2%
Tana				3,186,660		3,186,660	2%
TOTAL	7,283,388	18,696,136	32,372,314	44,699,730	84,021,080.66	179,789,260.66	100%

Long-Lasting Insecticide-Treated Nets by Vendor – 2007 to 2011 General Observations

- LLIN manufacturers must comply with the WHOPES (The World Health Organization Pesticides Evaluation Scheme) requirements. As a result, the market is dominated by a small number of manufacturers: Four large companies (BASF, Sumitomo Chemical Co Ltd, Vestergaard Frandsen and Bestnet Europe Ltd) and three small producers (Clarke, Tana Netting and Yorkool Chemical) manufacture most of the LLIN produced worldwide.
- The project has not initiated any procurement with additional vendors in the past twelve (12) months.
- In 2010, all six (6) identified vendors were used to supply LLINs, and in 2011, only three (3) of the six vendors have supplied LLINs on behalf of USAID / DELIVER PROJECT.
- In 2011 (reference Figure 3) we identify that two (2) of the three suppliers – Sumitomo and Vestergaard-Frandsen; have seventy two (72) percent of the market share for procurement. This is significant, and a strong indicator that they have provided the best prices and lead times.

- Vestergaard Frandsen has moved up from forth (4th) place in 2010 to second (2nd) place in 2011 in terms of the number of LLINs procured. The significance of this statistic is that they have been awarded larger orders based on price, product availability and lead times. It's also an indicator that the supplier is amongst the top two (2) suppliers, and shares market leadership.

Barriers to Entry for New Vendors

- The uncertainty about future demand – for the purpose of this addendum, the author concurs with the opinions expressed in the 2010 Marketing and Data Analysis. There are high levels of uncertainty as to what will happen when LLIN distribution reach global coverage in designated countries.
- In addition to the investment cost requirements for new manufacturers in the industry, it's questionable if there is a need for more manufacturers of LLINs, with the market fairly well covered.
- Net technology was first developed in 1978, and remained in very small circulation until 2001 when WHOPES approved the world's first LLIN, and put it on their recommended list. In order for LLINs to be widely distributed in the required quantities, to the required destinations, global production capacity has increased dramatically. Market leaders in LLIN production are required to have a global presence – World Economic Forum: Committed to Improving the State of the World (2006). Global presence requires strength in the market place as a producer and supplier, significant market share, and large investment. Newcomers to the industry would struggle to gain market share without a global footprint.
- Whilst the LLIN industry remains a competitive business, product differentiation is marginal, based on the WHO standards and recommendations. Each recognized vendor is capable of meeting standard specifications, and contracts are awarded on the basis of price, delivery lead times, and the ability to honor volumetric requirements.

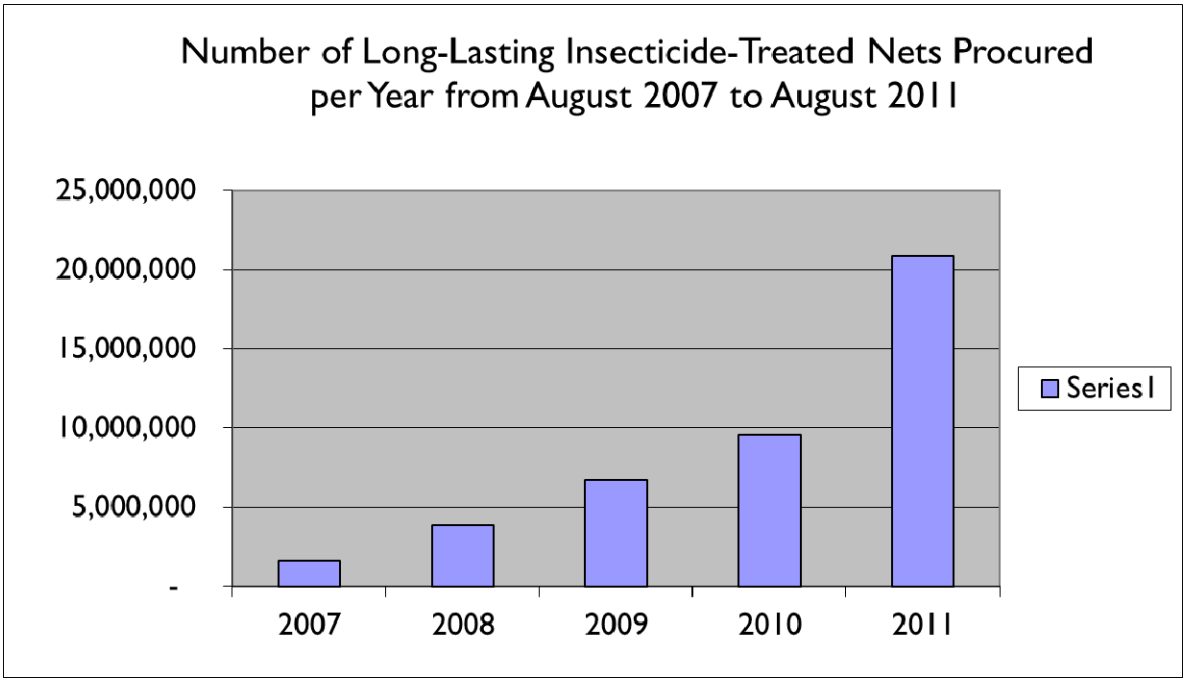
Buyers of Long-Lasting Insecticide-Treated Nets

- Key buyers (global) of LLINs remain the same as those that were identified in the 2010 Marketing and data Analysis – 'the Global Fund, UNICEF, World Bank, PMI, Crown Agents and WHO. Intermediaries play a very important role on the market'.
- USAID | DELIVER PROJECT are unsighted on the global quantity of LLINs procured and it is difficult to get an accurate figure for the annual production of all WHOPES approved LLINs. Global production in the previous year (2009 / 2010) was approximately 150 million LLINs. If we assume that global production has grown to 200 million in the last twelve (12) months (2010 / 2011), we accounted for approximately 10 percent of that figure.
- Increases in production and procurement are not related to new countries or new manufacturers, but rather the increase in funding from PMI for LLINs.

Product Cost Analysis

Quantity

Figure 4. Quantity of Long-Lasting Insecticide-Treated Nets Procured per Year



2007	2008	2009	2010	2011
1,606,115	3,889,235	6,715,200	9,562,000	20,922,496

- In Figure 4, we identify a significant hike in the quantities of LLINs procured in 2011.
- The 2011 increment is more than double the quantity procured in 2010, representing an increase of 12,360,496 LLINs.

Shape and Denier

With additional data captured from August 2010 to August 2011, LLIN unit price variations (United States Dollars) have revealed the following:

- The average unit prices on an ex-works basis per shape and denier of LLINs procured between 2007 and 2011 show that the best averages for conical LLINs were achieved in 2011 at 4.54, with the most expensive prices being reached in 2009 at 7.41. The best averages for rectangular nets were also achieved in 2011 at 4.07, with the most expensive being in 2008 at 4.73.

Figure 5. Avg. Unit Price on Ex-Works Basis per Shape and Denier of Long-Lasting Insecticide-Treated Nets Procured (United States Dollars)

Denier	75	100	115	118	150	Average
Conical						
2007						
2008	6.93					6.93
2009		7.41				7.41
2010	7.25				6.62	6.94
2011 (to 16 Sep)	6.28		2.80			4.54
Rectangular						
2007		4.73	4.37		4.30	4.47
2008	4.48	5.36			4.34	4.73
2009	4.28	4.74	5.10		4.30	4.61
2010	4.49	4.96	4.83		4.60	4.72
2011	3.45	4.24	4.36	4.67	3.96	4.14

Shape and Size

Average unit prices on an ex-works basis per shape and size of LLINs procured between 2007 and 2011; show that the best prices for conical LLINs were achieved in 2011 at 6.35, with the most expensive prices being in 2010 at 7.25. The best averages for rectangular LLINs were achieved in 2011 at 3.35, with the most expensive being in 2008 at 5.60.

Figure 6. Avg. Unit Price on Ex-Works Basis per Shape and Size of Long-Lasting Insecticide-Treated Nets Procured (United States Dollars)

Shape	2007	2008	2009	2010	2011	Average
Conical						
1250x250x65		6.93	7.02	7.25	6.35	6.89
Rectangular						
160x180x150	4.33		4.22	4.56		4.37
160x180x170		4.71	4.52	4.19	3.35	4.19
160x180x210			5.1	5.02	4.27	4.80
160x190x210			5.17	5.17	4.34	4.89
160x195x200					4.56	4.56
170x190x180				5.11	4.24	4.68
180x190x150				4.46	3.54	4.00
180x190x180					4.36	4.36
190x180x150	4.73	4.49	4.15	4.50	3.64	4.30
190x180x170		4.46	4.6			4.53
190x180x180		5.60	5.55			5.58
190x180x200				4.49		4.49
195x160x200				5.19		5.19

Material

Average unit prices on an ex-works basis per material of LLINs procured between 2007 and 2011; show that the best prices for polyester LLINs were achieved in 2011 at 4.33, and the most expensive prices in 2008 at 5.03. The best prices for polyethylene were achieved in 2011 at 4.28, and the most expensive being in 2010 at 4.64.

Figure 7. Average Unit Price on Ex-Works Basis per Material of Long-Lasting Insecticide-Treated Nets Procured (United States Dollars)

Material	2007	2008	2009	2010	2011	Average
Polyester	4.72	5.03	4.65	4.83	4.33	4.71
Polyethylene	4.33	4.35	4.61	4.64	4.31	4.45
Average	4.53	4.69	4.63	4.74	4.32	4.58

Color

- Average unit prices on ex-works basis per color of LLINs procured between 2007 and 2011; show that the best prices achieved were for green LLINs in 2011 at 3.65, and the most expensive in 2008 at 5.75 for the both green and light blue LLINs.

Figure 8. Average Unit Price on Ex-Works Basis per Color of Long-Lasting Insecticide-Treated Nets Procured (United States Dollars)

Colour	2007	2008	2009	2010	2011	Average
Blue	4.37	5.21	4.49	4.94	4.34	4.67
Green	0	5.75	4.75	5.35	3.65	3.90
Light Blue	4.99	5.75	4.57	4.87	4.36	4.91
White	4.59	5.02	4.67	4.53	4.18	4.60
Average	4.65	5.43	4.62	4.92	4.13	4.75

Shape

- Average unit prices on an ex-works basis per shape of LLIN's procured between 2007 and 2011; show that the best prices achieved were 2011 for both rectangular and conical shapes at 4.19 and 6.34 respectively, and the most expensive prices were found to be in 2008 for rectangular LLINs at 4.70 and at 7.25 for the conical LLINs in 2010.

Figure 9. Average Unit Price on Ex-Works Basis per Shape of Long-Lasting Insecticide-Treated Nets Procured (United States Dollars)

Shape	2007	2008	2009	2010	2011	Average
Conical	-	6.93	7.02	7.25	6.34	5.51
Rectangular	4.64	4.70	4.55	4.45	4.16	4.50
Average	**4.64**	**5.81**	**5.78**	**5.85**	**5.25**	**5.47**

Unit Price on Ex-Works Basis

Figure 10. Average Unit Prices on Ex-Works Basis per Shape of Long-Lasting Insecticide-Treated Nets Procured (United States Dollars)

Average Unit Price on Ex-Works Basis per Shape of Long-Lasting Insecticide-Treated Nets Procured (United States Dollars)

SHAPE	2007	2008	2009	2010	2011	Average
Conical	-	6.93	7.02	7.25	6.34	5.51
Rectangular	4.64	4.70	4.55	4.45	4.16	4.50
Average	**4.64**	**5.81**	**5.78**	**5.85**	**5.25**	**5.47**

Average Unit Price Details per Year and Month for Rectangular Long-Lasting Insecticide-Treated Nets (United States Dollars)

2007

Date	Av. Unit Price
Aug 2007	4.93
Oct 2007	4.33
Nov 2007	4.51
Dec 2007	4.76

2008

Date	Av. Unit Price
Mar 2008	4.58
Aug 2008	4.71
Oct 2008	4.49
Nov 2008	4.76
Dec 2008	4.82

2009

Date	Av. Unit Price
Jan 2009	4.83
Feb 2009	4.44
Mar 2009	4.22
Jul 2009	4.05
Aug 2009	6.48
Sep 2009	4.57
Nov 2009	4.27
Dec 2009	4.05

2010

Date	Av. Unit Price
Jan 2010	4.64
Feb 2010	4.52
Mar 2010	4.88
Apr 2010	4.76
May 2010	4.05
Jun 2010	4.49
Jul 2010	4.72
Aug 2010	5.17
Oct 2010	3.74
Nov 2010	3.76
Dec 2010	4.26

2011

Date	Av. Unit Price
Feb 2011	3.95
Mar 2011	4.35
May 2011	4.01
June 2011	3.94
Jul 2011	4.56

Figure 11. Average Unit Price on Ex-works Basis per Shape of Long-Lasting Insecticide-Treated Nets (United States Dollars)

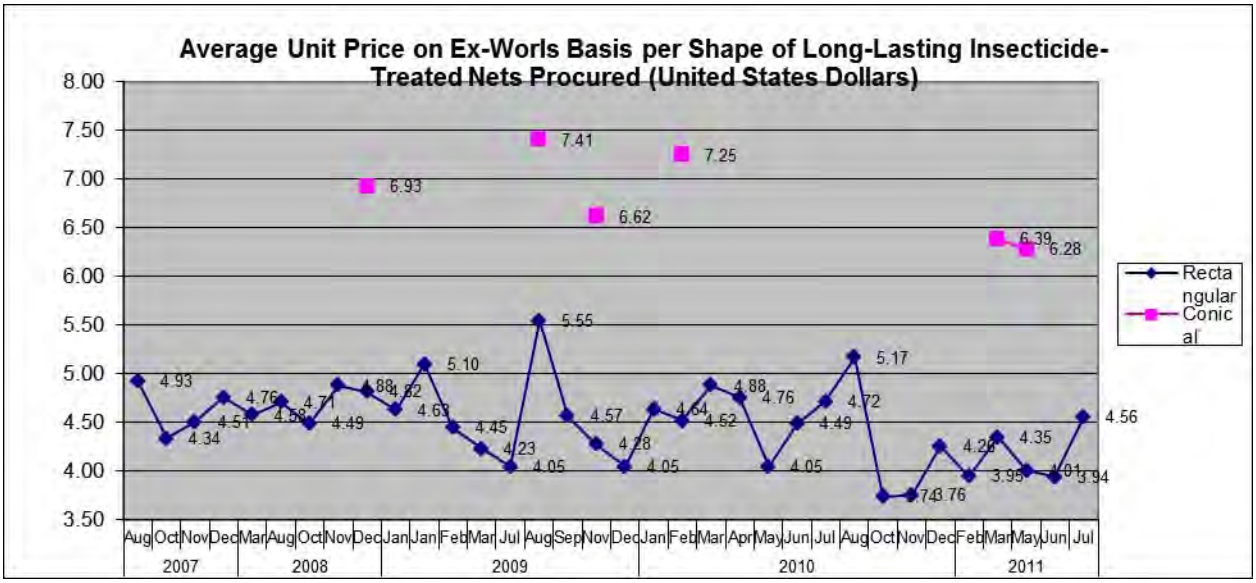


Figure 12. Average Unit Price on Ex-works Basis per Shape of Long-Lasting Insecticide-Treated Nets Procured (United States Dollars)

	2007				2008					2009									2010										2011				
	Aug	Oct	Nov	Dec	Mar	Aug	Oct	Nov	Dec	Jan	Jan	Feb	Mar	Jul	Aug	Sep	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Oct	Nov	Dec	Feb	Mar	May	Jun	Jul
Rectangular	4.93	4.34	4.51	4.76	4.58	4.71	4.49	4.88	4.82	4.63	5.10	4.45	4.23	4.05	5.55	4.57	4.28	4.05	4.64	4.52	4.88	4.76	4.05	4.49	4.72	5.17	3.74	3.76	4.26	3.95	4.35	4.01	3.94	4.56
Conical									6.93						7.41		6.62			7.25											6.39	6.28		

As identified in the LLIN Marketing and Data analysis 2010, there is a general feeling that the larger the volume of LLINs, the better the responses from manufacturers on prices – and it was identified in the study that quantities do not always have a significant impact on pricing. In a manner of speaking, one would make the assumption that if a manufacturer accepts a significantly larger order, then economies of scale should be achieved, and that the overall saving in production, should better the unit cost of the LLIN. However, as we see in Figure 11, there does appear to be a trend in the reduction of unit prices over the last twelve (12) months.

However, there was a significant reduction in prices between August and October 2010, when much larger quantities of LLINs were ordered from manufacturers – refer to Figure 4: Quantities of LLINs Procured per year.

Figure 11: Average Unit Price on Ex-works Basis per Shape of LLINs Procured (United States Dollars), demonstrates a sudden hike in price of rectangular LLINs in July 2011, from United States Dollars 3.94 to United States Dollars 4.56. Whilst there is no definitive reason for this, it is suspected that a factor increasing the manufacturing cost can have something to do with the materials used. Polyethylene (PE), Polypropylene (PP) and Polyester (PET), all have advantages and disadvantages to the final consumer. Polyester multifilament yarn was traditionally the preferred polymer, due to its high strength, low cost and global availability. Polyethylene and Polypropylene have gained popularity in the market with the development of several monofilament yarns that

incorporate insecticide directly into the yarn structure. Polyethylene and polypropylene LLINs also incorporate much higher deniers – Lickfield, D.K. PH.D (2008).

With the unpredictability in demand in 2011 (across the market), prices from manufacturers appeared to be subject to minor fluctuations, and that was evident in July 2011 when purchase orders were placed for large quantities of polyethylene LLINs. Therefore, the slight increase in prices was probably due to 'supply upon demand' factors.

Unit Prices per Quantity Ranges Procured

Figure 13. Unit Price on Ex-Works Basis per Quantity Range of Long-Lasting Insecticide Nets Procured (United States Dollars)

1 Oct 2010 - 16 Sep 2011

Range of Long-Life Insecticide-Treated Nets procured						
Average Ex-Works unit price	**0 - 150,000**	**150,001 - 300,000**	**300,001 -500,000**	**500,001-750,000**	**750,001-1,000,000**	**1,000,001 +**
Sumitomo	4.27	4.27	3.77	3.65		3.97
Vestergaard	6.28	3.54	3.50	3.83	3.98	4.06
BASF						
Bestnet	5.37	5.08	4.56	4.90		
Clarke						
Tana						

Based on quantity range procurements between October 2010 and September 2011, we see a very slight variation or trend, and it appears that better pricing is reached in the 500,001 to 750,000 margin. Prices increase beyond 1,000,000 LLIN orders. This would actually indicate the most cost effective quantities to order in, are between half and three quarter of a million LLINs at a time. This trend is apparent with all three (3) vendors that USAID / DELIVER PROJECT have procured from in the last twelve (12) months.

Lead Time

Figure 14. Average Production Lead Time per Vendor and per Quantity Range of Long-Lasting Insecticide-Treated Nets Procured (Days) October 2010 to September 2011.

	Manufacturer					
Range	**BASF**	**Bestnet**	**Clarke**	**Sumitomo**	**Tana**	**Vestergaard**
0 - 150,000		18		21		49
150,001 - 300,000		23		21		49
300,001 - 500,000		35		41		31
500,001 - 750,000		25		49		40
750,001 - 1,000,000						42
1,000,001 +				28		65

- Based on the current long lead time, it seems that vendors have been operating at close to full capacity. This is a clear indication that manufacturers are receiving large orders from other clients, and appear to have the world market well covered.
- Figure 12 is a representation of data accumulated between the three (3) vendors used for LLIN procurements October 2010 to September 2011.
  - Bestnet – very little variance in lead times regardless of quantity range
  - Sumitomo – no visible trend in lead times versus the quantity ranges, clearly a market related / demand driven statistic, as we can see that when orders are larger by volume, lead times increase. This may be a production / capacity driven variable, however, when we see an order of one million and over, the lead time improves.
  - Vestergarrd-Frandsen – probably the most consistent of the lead time statistics. We can assume from these results that lead time forecasts are relatively predictable with this supplier.
- Lead times have remained much the same as reported in the Marketing and Data Analysis submitted in 2010. There was a significant increase in lead time between 2007 and 2010 because of the increase in market demand, but even though PMI demand doubled in 2011, lead times stayed relatively constant.

Lead Time vs. Price

LLIN emergency orders are rare and our procurement process is based on cost competitiveness rather than on manufacturing lead time. As a result, our past historical data do not allow us to

find any significant relationship between manufacturing lead time and price" (Rebour 2010). No additions to make in this addendum.

Lead Time vs. Quantity

Based on our observations, it also seems that there is no significant correlation between lead time and quantity range. The biggest order of LLIN procured since the beginning of the program, 1.7 million LLINs, was delivered in 2010 with a 10 days turnaround time once the order was concerned" (Rebour 2010). No additions to make in this addendum.

LE Lead Time vs. Color

Historical data did not allow us to establish any specific relationship between lead time and color. That an LLIN be blue, green or white seems to have little to no impact on the manufacturing lead time" (Rebour 2010). No additions to make in this addendum.

Lead Time vs. Manufacturer

Figure 12 above shows the average lead time by manufacturer since the beginning of the program. When evaluating data year to year by manufacturer, it is not possible to predict what manufacturer will have the shorter lead time based on a specific quantity range" (Rebour 2010). No additions to make in this addendum.

Denier vs. Cost

No variance from 2010

Procurement Models

For the purpose of the addendum, there have been no updates. LLIN Market and Data Analysis Rebour (2010; 15).

Market Analysis Summary of Key Findings - Conclusion

With reference to the LLIN Market and Data Analysis report produced in September 2010, the overview of the LLIN industry remains relatively unchanged, with the exception of recent research and development carried out by recognized manufacturers and suppliers - a new generation long lasting insecticidal net (LLIN) has emerged with improved bioefficacy against pyrethroid-resistant malaria vectors.

Production market leaders have been evolving since 2007 and it is apparent that it's having a mild impact on unit LLIN prices by large quantity. These market leaders have the ability to stay abreast of research and development requirements and have a global footprint as their businesses have developed. Their success is notable in the past twelve (12) months as the numbers of vendors who have been awarded contractual orders have been halved.

With reference to LLIN Market and Data Analysis 2010, the following were the most significant findings:

- Quantities supplied from 2007 to 2010 had increased significantly, but in parallel, the unit costs of LLINs had not decreased over that same period of time. With the inclusion of data accumulated in 2010 and 2011 we find that quantities have more than doubled since 2010 and the unit cost of LLINs has decreased slightly. For the purpose of this addendum we concur with the reasoning that unit prices have not decreased as substantially as quantities procured increased, due to the lack of visibility concerning future demands and sustainability.
- The number of specifications available had increased significantly between 2007 and 2010, which created an increase in the variance of the types of LLINs being ordered for that given period of time. With data accumulated between 2010 and 2011, we find that although LLINs as a product have been improved by manufacturers, we identify that the most commonly procured LLINs are that of a polyethylene fabric, white in color and rectangular in shape. We believe that this preference is related to the unit price of the LLINs.
- The lack of on time funding is detrimental to the demand planning on the manufacturer's side. With data accumulated between 2010 and 2011, we believe that the dramatic increase in quantities procured has given evidence of a slight decrease in unit prices which may be providing manufacturers with better insight into the future demand. If this trend continues we should expect a continuation in the same reduction of unit prices.
- Only two parameters seem to impact the cost of an LLIN – the shape (rectangular or conical) and the size (the larger the LLIN the more expensive the unit cost). With data accumulated between 2010 and 2011, the author concurs with this statistic and identifies that conical LLINs are more expensive that rectangular LLINs and that the larger the LLIN the higher the unit cost.

- Procurement strategies have remained the same since 2010, those being the option of long term contracts with one or two vendors and systematic bidding procedures for each new order. The data collected between 2010 and 2011 also shows that a lesser number of vendors have been awarded manufacturing contracts since 2010. These contracts have been awarded on the basis of systematic bidding procedures. This is a clear indication that a limited number of vendors have achieved top quartile status in the LLIN manufacturing industry.
- In addition to the findings in the Market and Data Analysis 2010, we believe that more accurate annual quantity forecasts could create further leverage with manufacturers for improved unit costs. Future demands are relatively unpredictable, but significant ramp up requirements are predicted if countries are to move towards achieving the 'United Nations Millennium Development Goals' by 2015 – WHO Global Malaria Program (2010).
- Supply upon demand does not appear to be an issue, but lead times are market related.
- Cost information is difficult to obtain as key donors do not share pricing information.
- It would be useful, to be able to obtain overall market statistics in order to ascertain where USAID / DELIVER PROJECT fits in as a client to manufacturers. If the project could establish what percentage of market share the project represents in the macro scheme of things, the project could examine potential economies of scale with more accuracy.
- In addition to the finding in the Market and Data Analysis 2010, that barriers to entry are relative to the cost of initial investment, we believe from data accumulated between 2010 and 2011 that the market is dominated by key players who have substantial market share and are well embedded in the industry. It is likely that these manufacturers are in the industry to stay and future cost variables may be determined by improved procurement strategies and negotiation with current vendors.
- The market is characterized by high levels of uncertainty, relative to inconsistent demands and funding availability. For the purpose of this addendum, we concur with the findings submitted in the Market and Data Analysis 2010.
- Lead times appear to increase with quantity ranges.

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