



**Awareness, Ownership, and Use  
of Mosquito Nets  
in Nigeria, Senegal, Zambia,  
Ghana, and Ethiopia**

**Cross-country results  
from the 2004 NetMark surveys**

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**NetMark** is an eight-year project funded by the United States Agency for International Development (USAID) to prevent malaria by increasing access to and use of ITNs in sub-Saharan Africa. NetMark began in 1999 and addresses all three components of the Roll Back Malaria Strategic Framework for Scaling-up of ITNs: commercial expansion, short-term targeted subsidies or market priming activities, and long-term targeted subsidies to vulnerable groups in order to achieve equity. NetMark aims both to develop a sustainable commercial market and to ensure that vulnerable groups have access to affordable ITNs. In addition to increasing the proportion of households that own ITNs, the project also seeks to increase nightly use of treated nets, especially by pregnant women and children under five years of age; and to increase the proportion of net owners who, if not using a long-lasting ITN, regularly treat their nets with insecticide.

NetMark is managed by the Academy for Educational Development (AED). Its partners include over 40 national and international insecticide and net manufacturers, product distributors, and advertising companies. NetMark has programs in Cameroon, Ethiopia, Ghana, Mali, Nigeria, Senegal, Uganda, and Zambia.

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## CREDITS

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Dr. Carol Baume was responsible for the household survey research in all NetMark countries, from the baselines in 2000 (Mozambique, Nigeria, Senegal, Uganda, Zambia, plus Mali in 2003) through the present series of 2004 surveys (Ethiopia, Ghana, Nigeria, Senegal, and Zambia).

Ms. Celeste Marin conducted the data analysis for all of the NetMark surveys for 2004.

Ms. Lonna Shafritz provided technical assistance throughout, including questionnaire revision and pre-testing, training in Zambia, and contributions to writing the reports.

Ms. Sheila Somashekhar and Ms. Roshelle Payes provided support for data analysis and report-writing and managed report production.

Mr. Pramod Amatya assisted with proofreading and report production.

The report benefited from review and input from Dr. Martin Alilio.

Research International (RI) of South Africa was contracted to implement the fieldwork in all five countries using their local affiliates, and to enter the data. Mr. Joe Boniaszczuk and Mr. Manas Misra were key personnel for those activities.

## LIST OF ACRONYMS

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|       |  |
|-------|--|
| AED   | Academy for Educational Development                |
| ITNs  | Insecticide treated nets                           |
| RI    | Research International (South Africa)              |
| RBM   | Roll Back Malaria                                  |
| SES   | Socio-economic status                              |
| USAID | United States Agency for International Development |

## KEY CONCLUSIONS

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### Nigeria

Since the baseline survey in 2000 in Nigeria, there have been significant increases in awareness of ITNs, in net and ITN ownership, equity of net/ITN ownership across socio-economic segments and between urban and rural areas, and in the number of nets/ITNs per net-owning household. A tremendous increase in the proportion of nets that have been treated has occurred since 2000. Within net-owning households, the youngest children are given preference for sleeping under a net.

Although there has been a great increase in awareness of ITNs – from 7% in 2000 to 60% in 2004 – the level of awareness is still rather low. Nigeria is lower than all other countries surveyed except Ethiopia (47%), where ITN promotion has only recently begun on a large scale. The same is true for the percent of households owning nets/ITNs; although there have been great increases since 2000, Nigeria (along with Ethiopia) has the lowest proportion of households that own nets and ITNs. Among countries surveyed, Nigeria has by far the lowest proportion of nets that have ever been treated. Nigeria also has some of the greatest variation among sites (i.e. within the country) in terms of net/ITN coverage and use.

Further, within net-owning households, pregnant women were not much more likely than other women of reproductive age to sleep under a net/ITN.

There is also a special problem in Nigeria with nets owned not being used: only 56% of nets owned had been used the night prior to the survey. This is particularly concerning since the percent of nets that were used in 2000 was 91%, and the reason for the large drop needs to be explored and understood. The large percentage of unused nets means that in spite of large increases in net/ITN ownership since 2000, there was not a commensurate increase in the proportion of children under five sleeping under hanging nets since 2000.

### Senegal

There is a “net culture”, and now an “ITN culture,” in much of Senegal. Almost everyone has now heard of ITNs, compared with less than three-fourths who had in 2000. There have been dramatic increases in net and ITN ownership, and in the number of nets/ITNs per net-owning household. Since 2000 there has also been a tremendous increase in the proportion of nets that have been treated. Among the five countries surveyed, Senegal has the highest net ownership, highest ITN ownership, greatest number of nets per household, and, along with Zambia, the highest percentage of nets owned that are currently treated. Furthermore, net and ITN ownership across socio-economic segments has remained equitable or has improved. Net and ITN ownership increased across all SES groups, and in urban and rural households.

Additionally, since 2000, the proportion of children and pregnant women who slept under a net or ITN the prior night increased significantly. Within net-owning households, the youngest children and pregnant women are given preference for sleeping under a net. Among the five countries surveyed, Senegal also had the largest proportion of children under five and pregnant women sleeping under a net/ITN.

Senegal also had the highest proportion by far of nets owned that had been used (had someone sleeping under them) the prior night: 91%. However, the average number of months per year that a household uses its nets is 6.3 – lower than in Zambia (7.1) and Ghana (7.2).

## **Zambia**

A large majority of people in Zambia have heard of ITNs, compared with about half who had in 2000. Since the baseline in 2000, there have been very substantial increases in net and ITN ownership, and in the number of nets/ITNs per net-owning household. Of the five countries surveyed, Zambia has the highest proportion of nets owned that are treated. Net/ITN ownership is, however, much higher in urban than rural areas, and is very strongly related to socio-economic status; the higher the SES segment, the more likely that a household owns a net.

Within net-owning households, the youngest children and pregnant women are given preference for sleeping under a net, and the proportion of children and pregnant women who slept under a net or ITN the prior night has increased significantly since 2000.

Households are now using their nets for more months of the year than in 2000 – longer than other countries surveyed. However, the proportion of nets owned that are used is among the lowest, although part of the reason may be that the data were collected before rather than during the rainy season, unlike in the other countries.

## **Ghana**

Although NetMark was not able to conduct a survey in 2000, other studies indicate that there were low levels of net and ITN ownership at that time. The 2004 data show that there is now the beginning of a “net culture” in parts of Ghana. The vast majority of people have heard of ITNs, and a good portion of households own nets, although there is much variation in ownership within the country (i.e., by site). In comparison with the other countries surveyed, net/ITN ownership falls in the mid-range. Nets are owned fairly equitably across SES groups, and in urban and rural households. The proportion of nets that have been treated is somewhat low – much lower than Senegal and Zambia but the same as Ethiopia and higher than Nigeria.

Within net-owning households, the youngest children are given preference for sleeping under a net. However, pregnant women are not much more likely than other women of reproductive age to sleep under a net. The great majority of nets owned are put into use, and families use their nets more months of the year than in the other countries surveyed.

## **Ethiopia**

There has not been a tradition of net use in Ethiopia, and efforts to introduce ITNs on a wide scale have been initiated only within the past few years. A substantial minority of people have not even heard of nets, much less treated nets. The percent of households owning a net is lowest among the countries surveyed (although it is similar to Nigeria), as is the number of nets owned per household. There is great variation in ownership by site, reflecting where recent projects have worked. Further, net/ITN ownership is highly skewed to better-off households and to urban families.

Within net-owning households, the youngest children are given preference for sleeping under a net/ITN, but pregnant women are not.

The number of months per year that families use their net as well as the percent of nets used the prior night is among the lowest of the countries surveyed.

# NETMARK HOUSEHOLD SURVEY SUMMARY TABLE

|   | NIGERIA |      | SENEGAL |      | ZAMBIA |      | GHANA | ETHIOPIA |
|---|---------|------|---------|------|--------|------|-------|----------|
|   | 2000    | 2004 | 2000    | 2004 | 2000   | 2004 | 2004  | 2004     |
| % respondents aware of treated nets                                 | 7.3     | 60.3 | 70.0    | 97.3 | 50.7   | 88.3 | 91.4  | 46.6     |
| % HH owning a net   | 12.0    | 26.7 | 33.6    | 56.1 | 26.5   | 50.0 | 38.1  | 25.3     |
| % HH owning ever-treated net  | 0.0     | 9.8  | 11.0    | 42.8 | 9.5    | 40.3 | 21.0  | 14.1     |
| % HH owning currently-treated net (ITN)                             | 0.0     | 8.9  | 8.2     | 38.7 | 5.5    | 34.6 | 19.0  | 10.7     |
| % HH owning a baby net (non-hanging)                                | *       | 39.9 | *       | 9.5  | *      | 1.4  | 24.5  | 6.1      |
| Mean number nets per HH   | 1.3     | 1.7  | 2.1     | 2.8  | 1.4    | 1.8  | 1.5   | 1.3      |
| Mean number ever-treated nets per HH                                | 1.0     | 1.3  | 1.8     | 2.2  | 1.4    | 1.7  | 1.2   | 1.4      |
| Mean number currently-treated nets (ITNs)                           | 0       | 1.3  | 1.9     | 2.2  | 1.4    | 1.7  | 1.1   | 1.3      |
| % nets ever treated   | 0.6     | 30.5 | 30.2    | 72.9 | 35.8   | 80.3 | 45.0  | 56.9     |
| % nets currently treated (12 mo.)                                   | 0.0     | 27.1 | 23.4    | 65.0 | 21.5   | 65.6 | 40.0  | 41.1     |
| % nets bought pretreated  | 0.6     | 19.8 | 18.4    | 64.7 | 28.3   | 62.1 | 38.1  | 43.7     |
| % nets treated since acquired ("post-treated")                      | 0.0     | 18.4 | 15.1    | 26.4 | 16.3   | 41.6 | 19.3  | 27.0     |
| % children < five in ALL HH sleeping under a net                    | 8.8     | 10.3 | 17.7    | 35.4 | 11.9   | 24.6 | 25.3  | 12.9     |
| % children < five in ALL HH sleeping under a net or baby net        | *       | 17.9 | *       | 37.6 | *      | 24.7 | 30.1  | 16.1     |
| % children < five in ALL HH sleeping under an ITN                   | 0.0     | 3.3  | 4.6     | 23.9 | 2.4    | 16.9 | 10.3  | 5.8      |
| % children < five in NET-OWNING HH sleeping under a net             | 73.4    | 35.8 | 52.5    | 60.1 | 47.7   | 50.1 | 68.1  | 49.5     |
| % children < five in NET-OWNING HH sleeping under a net or baby net | *       | 45.5 | *       | 61.9 | *      |      | 70.9  | 57.3     |
| % pregnant women in ALL HH sleeping under a net                     | 7.3     | 14.1 | 21.7    | 41.7 | 3.9    | 21.5 | 21.0  | 8.6      |
| % pregnant women in ALL HH sleeping under an ITN                    | 0       | 4.4  | 5.0     | 31.0 | 0      | 13.5 | 7.6   | 6.2      |
| % pregnant women in NET-OWNING HH sleeping under a net              | **      | 46.1 | 59.1    | 66.1 | **     | 50.5 | 68.8  | 31.8     |
| Mean number of months HH uses its net(s)                            | 7.6     | 5.9  | 5.6     | 6.3  | 6.4    | 7.1  | 7.2   | 5.8      |
| % of nets used the prior night                                      | 90.6    | 55.8 | 90.4    | 91.1 | 66.7   | 61.6 | 77.4  | 60.7     |

\* Data not collected

\*\* Denominator too small to permit meaningful calculation

For denominators and for individual country breakdowns by site, urban-rural, and socio-economic status, see report.

## SECTION 1

### INTRODUCTION

---

#### 1.1 SURVEY COUNTRIES AND TIMING

This report presents findings on key ITN-related topics included in surveys conducted by NetMark in 2004 in Nigeria, Senegal, Zambia, Ghana, and Ethiopia. The report compares results among the five countries surveyed in 2004, and reports on changes over time in the three countries (Zambia, Senegal, and Nigeria) where both 2000 and 2004 data were collected.

During the life of the project, NetMark has conducted household surveys in the following countries and years:

**Country and year of survey administration**

| Country    | 2000 | 2003 | 2004 |
|------------|------|------|------|
| Mozambique | X    |      |      |
| Uganda     | X    |      |      |
| Mali       |      | X    |      |
| Nigeria    | X    |      | X    |
| Senegal    | X    |      | X    |
| Zambia     | X    |      | X    |
| Ghana      |      |      | X    |
| Ethiopia   |      |      | X    |

#### 1.2 REPORT TOPICS

The full survey covers a range of ITN topics of interest to both the public health community and the commercial sector as it seeks to develop a sustainable supply of nets. Results on the full set of topics are found in the individual country reports. A list of topics from the full reports is found in Annex A. This report focuses on key public health variables, comparing results across countries and across time on:

- *Awareness of treated nets*
- *Household ownership of nets and treated nets, and baby nets*
- *Net treatment status*: Percent of nets never treated, ever treated, and currently treated
- *Use of nets and treated nets by vulnerable groups*: children under five and pregnant women
- *Intra-household net use*
- *Regularity of net use*

Full reports, summary reports, and questionnaires for all countries surveyed are available from NetMark or on the web at [www.netmarkafrica.org/research](http://www.netmarkafrica.org/research).

### 1.3 SAMPLE

This survey was conducted among women of reproductive age (15-49) who were mothers or guardians of children under five years of age. The total sample size varied by country and year, as depicted in the following table.

**Sample size by country and year**

| Country  | 2000 | 2004              |
|--|------|-------------------|
| <b>Nigeria:</b> Lagos, Ibadan, Kano, Maiduguri, Nsukka         | 1000 | 2000 <sup>1</sup> |
| <b>Senegal:</b> Dakar, Thies, St. Louis, Kaolack, Tambacounda  | 1000 | 2000              |
| <b>Zambia:</b> Lusaka, Choma, Kaoma, Kitwe Mansa               | 1000 | 2000              |
| <b>Ghana:</b> Accra, Keta, Kumasi, Wa, Tamale                  |      | 1500              |
| <b>Ethiopia:</b> Bahir Dar, Nazreth, Dire Dawa, Dessie, Awassa |      | 1000              |

In each country, the sample was drawn from five primary sites, listed above. The sites were selected in malarious areas that reflected the geo-ethnic diversity of the country. In each site, 40% of households were from the city and 60% were located from up to 200 kilometers from the city. The 40:60 ratio approximates the actual urban-rural distribution in most of the countries surveyed.

For technical, budgetary, and logistical reasons, the sampling approach used was two-stage sampling with quotas by urban-rural rather than a national random sampling. Because for countries surveyed in both 2000 and 2004 the same sites and the same sample sampling procedure within sites was used, the comparison of data at both points is a valid means of measuring change over time.

Details regarding the sampling plan are found in Annex B. Annex B also explains how this sample may differ from nationally random samples. Annex C gives the characteristics of the sample in each country.

### 1.4 IMPLEMENTATION

In all countries except Zambia, the data were collected during the rainy season. In the three countries where there were two rounds of data collection, the fieldwork was conducted at the same time of year. The specific dates of fieldwork were:

|          |  |
|----------|--|
| Nigeria  | 2000 October 1 – October 23<br>2004 September 25 – November 12 |
| Senegal  | 2000 October 10 – October 29<br>2004 September 21 – October 11 |
| Zambia   | 2000 October 7 – November 3<br>2004 October 11 – November 20   |
| Ghana    | 2004 August 3 – 19   |
| Ethiopia | 2004 August 20 – September 8                                   |

<sup>1</sup> In Nigeria, data were collected in nine sites, for a total of 3590 respondents. However, we have limited reporting to the same five sites in the baseline, in the interest of comparability of data. Data on all nine sites are found on the web at [www.netmarkafrica.org/research](http://www.netmarkafrica.org/research).

The research was designed and carried out by NetMark. NetMark contracted with Research International South Africa to organize and manage the fieldwork, and to enter the data and produce preliminary tables. NetMark staff conducted further analyses and wrote the reports.

## 1.5 PRESENTATION OF DATA

For each key topic, main trends are noted, and a summary graph and table giving total results across countries and over time is presented. The summary tables are set up as follows:

**ALL COUNTRIES: Percent of**  
Among...[description of denominator]

|      | NIGERIA |      | SENEGAL |      | ZAMBIA |      | GHANA | ETHIOPIA |
|------|---------|------|---------|------|--------|------|-------|----------|
|      | 2000    | 2004 | 2000    | 2004 | 2000   | 2004 | 2004  | 2004     |
|      |         |      |         |      |        |      |       |          |
|      |         |      |         |      |        |      |       |          |
| BASE |         |      |         |      |        |      |       |          |

For some topics, a set of individual country tables follows, with the following breakdowns:

- By **site**: the five primary sampling areas, *each of which includes both urban and rural areas*
- By **urban-rural**: all urban respondents across sites compared with all rural respondents across sites
- By **capital** or other major city (except in Ethiopia, where malaria is not a major problem in Addis Ababa)
- By **socio-economic status (SES)**: a scale broken into quintiles

These breakdowns are combined in one table, set up as follows:

**COUNTRY: Percent of...**  
Among...[description of denominator]

|      | TOTAL | Site (city plus surrounding rural areas) |  |  |  |  | Urban<br>[main<br>city] only | Urban/Rural  |              | Socio-economic status |   |   |   |        |
|------|-------|--|--|--|--|--|------------------------------|--------------|--------------|-----------------------|---|---|---|--------|
|      |       |  |  |  |  |  |                              | All<br>Urban | All<br>Rural | 1 Low                 | 2 | 3 | 4 | 5 High |
|      |       |  |  |  |  |  |                              |              |              |                       |   |   |   |        |
|      |       |  |  |  |  |  |                              |              |              |                       |   |   |   |        |
| BASE |       |  |  |  |  |  |                              |              |              |                       |   |   |   |        |

The text summarizing results refers to 2004 data unless otherwise specified.

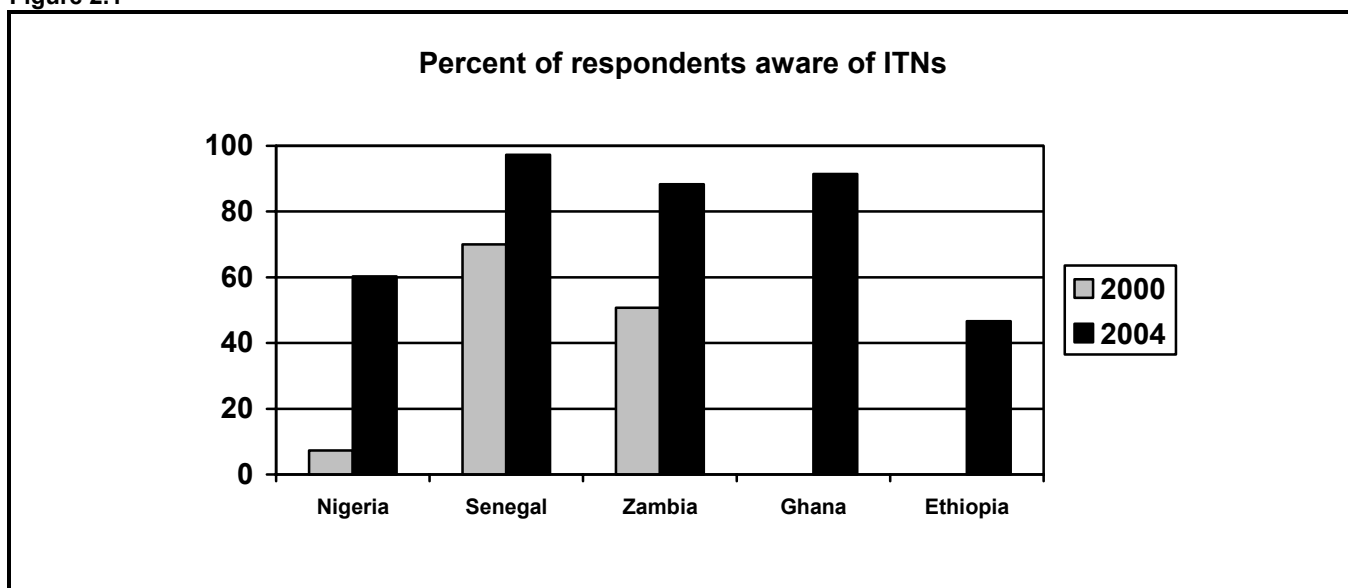
## SECTION 2

### AWARENESS OF INSECTICIDE-TREATED NETS

*Awareness of insecticide-treated nets is a pre-requisite for ownership and use. Respondents were asked if they had heard of nets treated with an insecticide. The percent of respondents who had heard of insecticide-treated nets varied widely by country, and by site within country. In all three countries where 2000 data were collected, there were very large increases in ITN awareness.*

- The percent of respondents aware of ITNs varied from a low of 47% in Ethiopia to a high of 97% in Senegal. In fact, in Ethiopia 30% of respondents had never even heard of mosquito nets, much less *treated* nets (data not shown).
- There was much variation in awareness of ITNs by site within Nigeria and Ethiopia, with less variation in Zambia, and very little in Senegal and Ghana. In all countries, awareness tended to rise with socio-economic status (SES) and be higher in urban than rural areas.
- In the three countries where both 2000 and 2004 data were collected, there were large increases in ITN awareness. Nigeria made the biggest jump—from 7% to 60%—but awareness remained low compared with all countries except Ethiopia. In Senegal, awareness is now virtually universal, having risen from 70% to 97%.

**Figure 2.1**



**Table 2.1: ALL COUNTRIES: Percent of respondents aware of insecticide-treated nets**  
Among all respondents

|      | NIGERIA |      | SENEGAL |      | ZAMBIA |      | GHANA | ETHIOPIA |
|------|---------|------|---------|------|--------|------|-------|----------|
|      | 2000    | 2004 | 2000    | 2004 | 2000   | 2004 | 2004  | 2004     |
| Yes  | 7.3     | 60.3 | 70.0    | 97.3 | 50.7   | 88.3 | 91.4  | 46.6     |
| No   | 92.7    | 39.7 | 30.0    | 2.7  | 49.3   | 11.7 | 8.6   | 53.4     |
| BASE | 999     | 2000 | 1000    | 2000 | 1000   | 2000 | 1500  | 1000     |

## INDIVIDUAL COUNTRIES: Percent of respondents aware of insecticide-treated nets

**Table 2.1a: NIGERIA — 2000 and 2004**

|      | TOTAL | Site (city plus surrounding rural areas) |        |      |           |        | Urban<br>Lagos<br>only | Urban/Rural |           | Socio-Economic Status |      |      |      |        |
|------|-------|--|--------|------|-----------|--------|------------------------|-------------|-----------|-----------------------|------|------|------|--------|
|      |       | Lagos                                    | Ibadan | Kano | Maiduguri | Nsukka |                        | All Urban   | All Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| 2000 | 7.3   | 5.5                                      | 2.0    | 8.0  | 14.0      | 7.0    | 8.8                    | 11.0        | 4.8       | 5.6                   | 3.4  | 5.5  | 9.0  | 13.1   |
| BASE | 999   | 200                                      | 200    | 199  | 200       | 200    | 80                     | 399         | 600       | 195                   | 204  | 201  | 200  | 199    |
| 2004 | 60.3  | 55.8                                     | 35.5   | 81.3 | 50.0      | 79.0   | 62.5                   | 63.0        | 58.5      | 59.1                  | 59.2 | 58.4 | 56.3 | 68.5   |
| BASE | 2000  | 400                                      | 400    | 400  | 400       | 400    | 160                    | 800         | 1200      | 399                   | 402  | 399  | 400  | 400    |

**Table 2.1b: SENEGAL — 2000 and 2004**

|      | TOTAL | Site (city plus surrounding rural areas) |       |          |         |                  | Urban<br>Dakar<br>only | Urban/Rural |           | Socio-Economic Status |      |      |      |        |
|------|-------|--|-------|----------|---------|------------------|------------------------|-------------|-----------|-----------------------|------|------|------|--------|
|      |       | Dakar                                    | Thies | St Louis | Kaolack | Tamba-<br>counda |                        | All Urban   | All Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| 2000 | 70.0  | 60.5                                     | 67.3  | 89.1     | 73.7    | 59.4             | 69.4                   | 76.3        | 65.8      | 53.0                  | 71.0 | 66.5 | 77.5 | 82.0   |
| BASE | 1000  | 205                                      | 199   | 201      | 198     | 197              | 85                     | 400         | 600       | 200                   | 200  | 200  | 200  | 200    |
| 2004 | 97.3  | 99.0                                     | 96.0  | 99.5     | 92.8    | 99.0             | 99.4                   | 99.6        | 95.7      | 92.8                  | 94.5 | 99.2 | 99.8 | 100.0  |
| BASE | 2000  | 399                                      | 401   | 400      | 400     | 400              | 159                    | 800         | 1200      | 400                   | 401  | 399  | 400  | 400    |

**Table 2.1c: ZAMBIA — 2000 and 2004**

|      | TOTAL | Site (city plus surrounding rural areas) |       |       |       |       | Urban<br>Lusaka<br>only | Urban/Rural |           | Socio-Economic Status |      |      |      |        |
|------|-------|--|-------|-------|-------|-------|-------------------------|-------------|-----------|-----------------------|------|------|------|--------|
|      |       | Lusaka                                   | Choma | Mansa | Kitwe | Kaoma |                         | All Urban   | All Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| 2000 | 50.7  | 42.7                                     | 26.5  | 77.5  | 62.5  | 45.9  | 43.3                    | 50.0        | 51.2      | 41.5                  | 51.5 | 54.4 | 41.5 | 64.5   |
| BASE | 1000  | 211                                      | 200   | 200   | 184   | 205   | 90                      | 404         | 596       | 200                   | 196  | 204  | 200  | 200    |
| 2004 | 88.3  | 96.5                                     | 81.8  | 86.5  | 96.3  | 80.5  | 96.9                    | 96.3        | 83.0      | 71.8                  | 81.9 | 92.4 | 96.7 | 98.3   |
| BASE | 2000  | 400                                      | 400   | 400   | 400   | 400   | 160                     | 800         | 1200      | 390                   | 403  | 408  | 398  | 401    |

**Table 2.1d: GHANA — 2004**

|      | Total | Sites (city plus surrounding rural areas) |      |        |      |        | Urban<br>Accra<br>Only | Urban/Rural |           | Socio-Economic Status |      |      |      |        |
|------|-------|---|------|--------|------|--------|------------------------|-------------|-----------|-----------------------|------|------|------|--------|
|      |       | Accra                                     | Keta | Kumasi | Wa   | Tamale |                        | All Urban   | All Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| 2004 | 91.4  | 94.4                                      | 93.4 | 88.7   | 87.3 | 93.3   | 96.7                   | 92.0        | 91.0      | 84.8                  | 90.2 | 91.1 | 94.3 | 96.7   |
| BASE | 1500  | 301                                       | 301  | 300    | 299  | 299    | 120                    | 599         | 901       | 302                   | 296  | 302  | 300  | 300    |

**Table 2.1e: ETHIOPIA — 2004**

|                        | TOTAL | Site (city plus surrounding rural areas) |        |           |        |        | Urban/Rural |           | Socio-Economic Status |      |      |      |        |
|------------------------|-------|--|--------|-----------|--------|--------|-------------|-----------|-----------------------|------|------|------|--------|
|                        |       | Bahir Dar                                | Nazret | Dire Dawa | Dessie | Awassa | All Urban   | All Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| Aware of mosquito nets | 70.2  | 71.6                                     | 78.2   | 86.4      | 49.7   | 65.0   | 89.5        | 57.3      | 35.0                  | 54.5 | 76.5 | 89.0 | 96.0   |
| Aware of treated nets  | 46.6  | 58.2                                     | 51.5   | 58.1      | 25.6   | 39.5   | 66.0        | 33.7      | 12.5                  | 28.0 | 53.5 | 58.5 | 80.5   |
| BASE                   | 1000  | 201                                      | 202    | 198       | 199    | 200    | 400         | 600       | 200                   | 200  | 200  | 200  | 200    |

## SECTION 3

### OWNERSHIP OF NETS AND TREATED NETS, AND BABY NETS

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*There were wide variations from country to country in the percent of households owning at least one net or ITN, as well as differing patterns of net and ITN ownership by site, urban-rural location, and socioeconomic status (SES). In all three countries where 2000 data were available, the 2004 data show very large increases in household net and ITN ownership, as well as increases in the number of nets owned per household.*

The tables in this first section show the proportion of *households* owning nets of different treatment status. If a household owned more than one net, the household was categorized according to the most recently treated net. The tables in the next section show the proportion of *nets* falling into each treatment category.

#### 3.1 HOUSEHOLD OWNERSHIP OF NETS

- In 2004, the percent of households *owning at least one net* ranged from lows of 25% in Ethiopia and 27% in Nigeria, to highs of 50% in Zambia and 56% in Senegal. Ghana was in the middle, at 38%.
- Within all countries there was variation in net ownership by site. Zambia had the least variation (ranging from 20% to 38%) and Nigeria the most (ranging from 10% to 51%).
- There was little difference in net ownership by urban-rural or SES in Nigeria, Senegal, and Ghana. In contrast, in Zambia and Ethiopia, net ownership was much higher in urban than in rural areas, and the percent of households owning a net sharply increased with SES.
- In the three countries where both 2000 and 2004 data were collected, there were large increases in the percent of households owning a net. Ownership approximately doubled in Nigeria (from 12% to 27%) and in Zambia (from 27% to 50%), and showed a large increase (from 34% to 56%) in Senegal.
- Among net-owning households, the average number of nets per household ranged from 1.3 in Ethiopia to 2.8 in Senegal. A comparison of 2000 and 2004 data show that that number of nets per household has increased in all three countries: from 1.3 to 1.7 in Nigeria; from 2.1 to 2.8 in Senegal; and from 1.4 to 1.8 in Zambia.

#### DEFINITIONS

**Net:** any hanging net for use while sleeping regardless of whether it has ever been treated; excludes baby nets but includes cot nets which are hung or draped over a crib.

**Ever-treated net:** a net that has ever been treated, either when acquired (pre-treated) or since acquired, regardless of when the treatment was put on the net

**ITN or currently-treated net:** a net that is a long-lasting insecticide-treated net (a LLIN, or “permanently treated”), or is pre-treated and has been purchased within the last 12 months, or has had insecticide put on it up to and including the last 12 months. This is equivalent to the Roll Back Malaria (RBM) definition of an ITN.

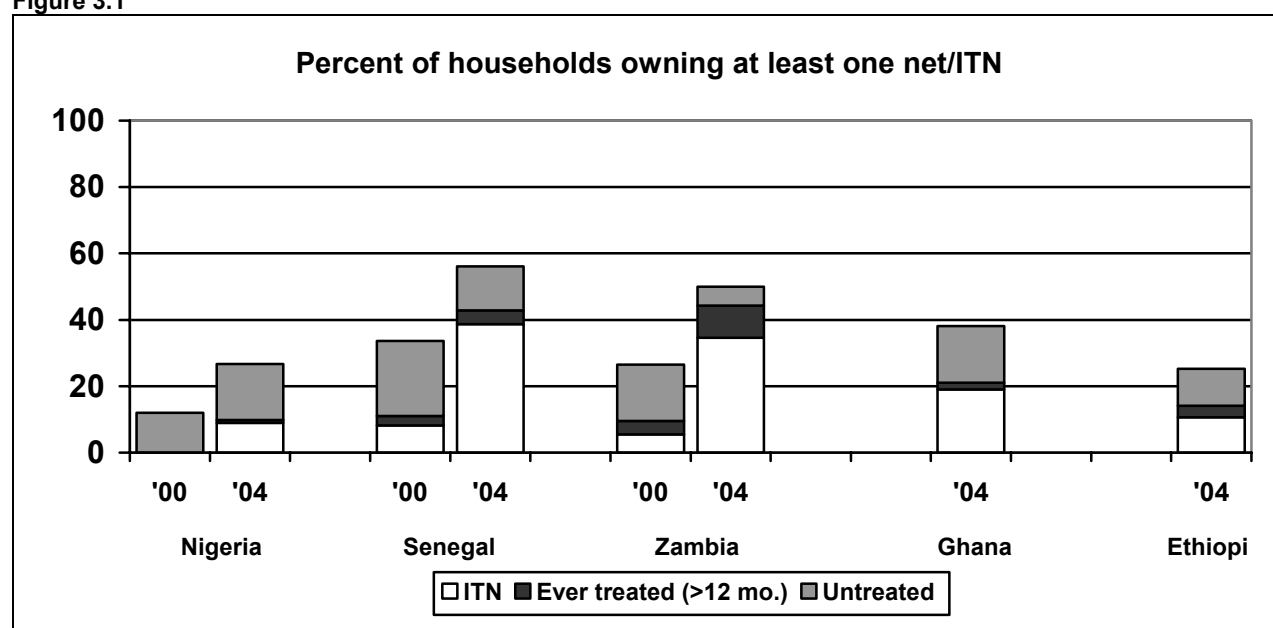
**Baby net:** a small net with a built-in frame that is not hung but is placed over an infant. It is often used to keep flies off a sleeping infant during the day, but can also be used at night. Baby nets are rarely treated, and the umbrella frame precludes dipping the netting in an insecticide solution. Baby nets are not counted in these net coverage figures, but are reported here separately.

#### 3.2 HOUSEHOLD OWNERSHIP OF EVER-TREATED AND CURRENTLY-TREATED NETS

- There was a large range in the percent of households *owning an ever-treated net*—from lows of 10% in Nigeria and 14% in Ethiopia, to a high of 43% in Senegal. Similarly, there was a large range in the percent of households *owning a currently-treated net (an ITN)*—from lows of 9% in Nigeria and 11% in Ethiopia, to highs of 35% in Zambia and 39% in Senegal. Ghana was mid-range, with 19% of households owning an ITN.

- There was much variation by site in ownership of ever-treated and currently-treated nets in all countries except Zambia, where there was little difference by site. As with nets in general, ownership of treated nets was fairly equitable by urban-rural and SES in Nigeria, Senegal, and Ghana. However, in Zambia and Ethiopia, there were large disparities in ownership of treated nets by urban-rural and SES, with a much higher proportion of urban than rural households, and upper than lower SES households, owning treated nets.
- A comparison of 2000 and 2004 data documents very large increases in the percent of households owning ever-treated and currently treated nets (ITNs). The percent of households owning an ever-treated net increased from 0% to 10% in Nigeria; from 11% to 43% in Senegal; and from 10% to 40% in Zambia. The percent owning a currently-treated net (ITN) increased from 0% to 9% in Nigeria; from 8% to 39% in Senegal; and from 6% to 35% in Zambia.
- Among ITN-owning households, the average number of ITNs owned ranged from 1.1 in Ghana to 2.2 in Senegal. The average number of ITNs owned increased between 2000 and 2004: from 0 to 1.3 in Nigeria; from 1.9 to 2.2 in Senegal, and from 1.4 to 1.7 in Zambia.

**Figure 3.1**



**Table 3.1: ALL COUNTRIES: Percent of households owning nets and insecticide-treated nets**

Among all households

|                                   | NIGERIA |      | SENEGAL |      | ZAMBIA |      | GHANA | ETHIOPIA |
|-----------------------------------|---------|------|---------|------|--------|------|-------|----------|
|                                   | 2000    | 2004 | 2000    | 2004 | 2000   | 2004 | 2004  | 2004     |
| Owens a net                       | 12.0    | 26.7 | 33.6    | 56.1 | 26.5   | 50.0 | 38.1  | 25.3     |
| Owens ever-treated net            | 0.0     | 9.8  | 11.0    | 42.8 | 9.5    | 40.3 | 21.0  | 14.1     |
| Owens currently-treated net (ITN) | 0.0     | 8.9  | 8.2     | 38.7 | 5.5    | 34.6 | 19.0  | 10.7     |
| BASE                              | 999     | 2000 | 1000    | 2000 | 1000   | 2000 | 1500  | 1000     |

**INDIVIDUAL COUNTRIES: Percent of households owning nets and insecticide-treated nets**
**Table 3.1a: NIGERIA – 2000 and 2004**

|                       |      | TOTAL | Sites (city plus surrounding rural areas) |        |      |                |        | Urban<br>Lagos<br>only | Urban/Rural |       | Socio economic status |      |      |      |        |
|-----------------------|------|-------|---|--------|------|----------------|--------|------------------------|-------------|-------|-----------------------|------|------|------|--------|
|                       |      |       | Lagos                                     | Ibadan | Kano | Maidu-<br>guri | Nsukka |                        | Urban       | Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| Owns a net            | 2000 | 12.0  | 14.0                                      | 1.5    | 12.6 | 13.5           | 18.5   | 7.5                    | 13.3        | 11.2  | 11.3                  | 6.4  | 13.9 | 10   | 18.6   |
|                       | 2004 | 26.7  | 19.8                                      | 9.5    | 16.5 | 50.8           | 36.8   | 13.8                   | 23.4        | 28.8  | 31.6                  | 31.3 | 24.1 | 20.5 | 25.8   |
| Owns ever-treated net | 2000 | 0.0   | 0.0                                       | 0.0    | 0.0  | 0.0            | 0.0    | 0.0                    | 0.0         | 0.0   | 0.0                   | 0.0  | 0.0  | 0.0  | 0.0    |
|                       | 2004 | 9.8   | 6.3                                       | 5.5    | 7.8  | 9.8            | 19.8   | 6.9                    | 8.8         | 10.5  | 8.5                   | 11.7 | 9.3  | 8.5  | 11.0   |
| Owns ITN (12 mo.)     | 2000 | 0.0   | 0.0                                       | 0.0    | 0.0  | 0.0            | 0.0    | 0.0                    | 0.0         | 0.0   | 0.0                   | 0.0  | 0.0  | 0.0  | 0.0    |
|                       | 2004 | 8.9   | 6.0                                       | 5.3    | 7.5  | 8.3            | 17.5   | 6.9                    | 8.0         | 9.5   | 7.0                   | 11.2 | 8.3  | 7.5  | 10.5   |
| BASE                  | 2000 | 999   | 200                                       | 200    | 199  | 200            | 200    | 80                     | 399         | 600   | 195                   | 204  | 201  | 200  | 199    |
|                       | 2004 | 2000  | 400                                       | 400    | 400  | 400            | 400    | 160                    | 800         | 1200  | 399                   | 402  | 399  | 400  | 400    |

**Table 3.1b: SENEGAL – 2000 and 2004**

|                       |      | TOTAL | Sites (city plus surrounding rural areas) |       |          |         |                  | Urban<br>Dakar<br>only | Urban/Rural |       | Socio economic status |      |      |      |        |
|-----------------------|------|-------|---|-------|----------|---------|------------------|------------------------|-------------|-------|-----------------------|------|------|------|--------|
|                       |      |       | Dakar                                     | Thies | St Louis | Kaolack | Tamba-<br>counda |                        | Urban       | Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| Owns a net            | 2000 | 33.6  | 18.0                                      | 20.6  | 55.2     | 25.3    | 49.2             | 18.8                   | 28.8        | 36.8  | 36.5                  | 42.0 | 32.0 | 27.5 | 30     |
|                       | 2004 | 56.1  | 30.6                                      | 45.4  | 69.8     | 52.3    | 82.5             | 22.0                   | 53.3        | 58.0  | 52.0                  | 57.4 | 55.6 | 58.3 | 57.3   |
| Owns ever-treated net | 2000 | 11.0  | 2.9                                       | 9.0   | 24.9     | 11.6    | 6.6              | 4.7                    | 10.0        | 11.7  | 9.0                   | 15.5 | 9.5  | 9.0  | 12.0   |
|                       | 2004 | 42.8  | 22.6                                      | 31.7  | 46.8     | 40.8    | 72.0             | 18.9                   | 45.0        | 41.3  | 36.8                  | 43.9 | 40.1 | 45.0 | 48.0   |
| Owns ITN (12 mo.)     | 2000 | 8.2   | 2.0                                       | 6.0   | 17.9     | 9.6     | 5.6              | 2.4                    | 7.3         | 8.8   | 6.0                   | 12.5 | 8.0  | 5.0  | 9.5    |
|                       | 2004 | 38.7  | 20.3                                      | 27.4  | 39.3     | 37.5    | 69.0             | 18.9                   | 40.9        | 37.3  | 35.3                  | 38.7 | 35.3 | 40.8 | 43.3   |
| BASE                  | 2000 | 1000  | 205                                       | 199   | 201      | 198     | 197              | 85                     | 400         | 600   | 200                   | 200  | 200  | 200  | 200    |
|                       | 2004 | 2000  | 399                                       | 401   | 400      | 400     | 400              | 159                    | 800         | 1200  | 400                   | 401  | 399  | 400  | 400    |

**Table 3.1c: ZAMBIA – 2000 and 2004**

|                       |      | TOTAL | Sites (city plus surrounding rural areas) |       |       |       |       | Urban<br>Lusaka<br>only | Urban/Rural |       | Socio economic status |      |      |      |        |
|-----------------------|------|-------|---|-------|-------|-------|-------|-------------------------|-------------|-------|-----------------------|------|------|------|--------|
|                       |      |       | Lusaka                                    | Choma | Mansa | Kitwe | Kaoma |                         | Urban       | Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| Owns a net            | 2000 | 26.5  | 24.6                                      | 20.0  | 29.0  | 38.0  | 22.0  | 27.8                    | 34.9        | 20.8  | 11.5                  | 18.4 | 25.5 | 29.5 | 47.5   |
|                       | 2004 | 50.0  | 47.8                                      | 44.3  | 50.8  | 59.0  | 48.0  | 61.3                    | 68.8        | 37.4  | 21.5                  | 31.0 | 47.5 | 66.6 | 82.5   |
| Owns ever-treated net | 2000 | 9.5   | 7.1                                       | 6.5   | 14.5  | 17.4  | 2.9   | 2.2                     | 9.7         | 9.4   | 6.0                   | 10.2 | 10.8 | 7.5  | 13.0   |
|                       | 2004 | 40.3  | 38.5                                      | 34.5  | 43.3  | 46.0  | 39.0  | 48.1                    | 56.3        | 29.6  | 17.2                  | 23.6 | 35.3 | 54.3 | 70.6   |
| Owns ITN (12 mo.)     | 2000 | 5.5   | 4.3                                       | 3.5   | 10.0  | 8.2   | 2.0   | 1.1                     | 5.9         | 5.2   | 3.0                   | 4.6  | 6.9  | 4.0  | 9.0    |
|                       | 2004 | 34.6  | 33.3                                      | 31.3  | 36.3  | 41.0  | 31.0  | 41.3                    | 48.8        | 25.1  | 14.6                  | 20.1 | 29.4 | 46.5 | 61.8   |
| BASE                  | 2000 | 1000  | 211                                       | 200   | 200   | 184   | 205   | 90                      | 404         | 596   | 200                   | 196  | 204  | 200  | 200    |
|                       | 2004 | 2000  | 400                                       | 400   | 400   | 400   | 400   | 160                     | 800         | 1200  | 390                   | 403  | 408  | 398  | 401    |

**Table 3.1d: GHANA – 2004**

|                      |  | TOTAL | Sites (city plus surrounding rural areas) |      |        |      |        | Urban<br>Accra<br>only | Urban/Rural  |              | Socio-Economic Status |      |      |      |        |
|----------------------|--|-------|---|------|--------|------|--------|------------------------|--------------|--------------|-----------------------|------|------|------|--------|
|                      |  |       | Accra                                     | Keta | Kumasi | Wa   | Tamale |                        | All<br>Urban | All<br>Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| Own net              |  | 38.1  | 17.3                                      | 63.8 | 18.7   | 44.8 | 46.2   | 20.0                   | 39.1         | 37.5         | 42.7                  | 37.8 | 34.1 | 36.7 | 39.3   |
| Own ever-treated net |  | 21.0  | 10.3                                      | 19.6 | 10.0   | 29.4 | 35.8   | 13.3                   | 19.2         | 22.2         | 20.9                  | 21.6 | 14.2 | 20.0 | 28.3   |
| Own ITN (12 mo.)     |  | 19.0  | 8.6                                       | 18.3 | 9.3    | 24.7 | 34.1   | 13.3                   | 16.9         | 20.4         | 19.5                  | 19.9 | 12.3 | 17.7 | 25.7   |
| BASE                 |  | 1500  | 301                                       | 301  | 300    | 299  | 299    | 120                    | 599          | 901          | 302                   | 296  | 302  | 300  | 300    |

**Table 3.1e: ETHIOPIA – 2004**

|                      | TOTAL | Sites     |          |           |        |        | Urban/Rural |       | Socio-Economic Status |     |      |      |        |
|----------------------|-------|-----------|----------|-----------|--------|--------|-------------|-------|-----------------------|-----|------|------|--------|
|                      |       | Bahir Dar | Nazareth | Dire Dawa | Dessie | Awassa | Urban       | Rural | 1 Low                 | 2   | 3    | 4    | 5 High |
| Own a net            | 25.3  | 40.3      | 23.8     | 24.2      | 13.1   | 25.0   | 40.3        | 15.3  | 3.0                   | 8.5 | 22.5 | 37.5 | 55.0   |
| Own ever treated net | 14.1  | 30.8      | 11.4     | 11.6      | 6.0    | 10.5   | 21.8        | 9.0   | 2.5                   | 4.5 | 15.5 | 18.5 | 29.5   |
| Own ITN (12 mo.)     | 10.7  | 23.9      | 8.9      | 8.6       | 3.5    | 8.5    | 17.3        | 6.3   | 2.0                   | 2.0 | 10.0 | 15.5 | 24.0   |
| BASE                 | 1000  | 201       | 202      | 198       | 199    | 200    | 400         | 600   | 200                   | 200 | 200  | 200  | 200    |

**Table 3.2: ALL COUNTRIES: Average number of nets and insecticide-treated nets owned**

Among net-owning households

|                              | NIGERIA |      | SENEGAL |      | ZAMBIA |      | GHANA | ETHIOPIA |
|------------------------------|---------|------|---------|------|--------|------|-------|----------|
|                              | 2000    | 2004 | 2000    | 2004 | 2000   | 2004 | 2004  | 2004     |
| Nets                         | 1.3     | 1.7  | 2.1     | 2.8  | 1.4    | 1.8  | 1.5   | 1.3      |
| BASE                         | 120     | 533  | 336     | 1122 | 265    | 999  | 572   | 253      |
| Ever-treated nets            | 1.0     | 1.3  | 1.8     | 2.2  | 1.4    | 1.7  | 1.2   | 1.4      |
| BASE                         | 1       | 196  | 110     | 855  | 93     | 797  | 315   | 141      |
| Currently-treated nets (ITN) | 0       | 1.3  | 1.9     | 2.2  | 1.4    | 1.7  | 1.1   | 1.3      |
| BASE                         | 0       | 178  | 82      | 773  | 42     | 673  | 285   | 107      |

### 3.3 PROPORTION OF NETS THAT HAVE BEEN TREATED

*In 2004, there was wide variation among and within countries in the proportion of nets that had been treated. Since 2000, there have been extremely large increases the proportion of nets that have ever been treated, and even greater increases in the proportion of nets that are ITNs, or currently treated.*

The prior section reported on the percent of *households* owning nets, ever-treated nets, and currently-treated nets. Another way of measuring treated nets is to look at the proportion of *nets* owned that have ever been treated and, among them, the proportion that is currently treated (i.e. an ITN).

Among nets ever treated, some had treatment on them when acquired (i.e., were “pre-treated”), some had been treated since acquired (were “post-treated”), and some were both pre-treated and post-treated.

#### *Percent of nets ever treated*

- The proportion of nets owned that had ever been treated ranged from a low of 31% in Nigeria to a high of 80% in Zambia.
- In the three countries where 2000 data were collected, there was a tremendous increase in the proportion of ever-treated nets: from 1% to 31% in Nigeria; from 30% to 73% in Senegal; and from 36% to 80% in Zambia.
- There was not a large disparity in the proportion of ever-treated nets by SES in Senegal and Zambia. However, in Nigeria and Ghana, there were greater proportions of ever-treated nets in higher SES groups than in lower ones. In contrast, in Ethiopia, there were greater proportions of ever-treated nets in the lower SES groups. There was little difference by urban-rural in Nigeria, Zambia, and Ethiopia; however in Senegal there was a greater proportion of ever-treated nets in urban areas and in Ghana a greater proportion in rural areas.

### *Percent of nets currently treated (ITNs)*

- As with ever-treated nets, there was considerable range in the proportion of nets that were currently treated—i.e., that were ITNs: ranging from a low of 27% in Nigeria to highs of 65% in Senegal and 66% in Zambia.
- The data also show dramatic increases from 2000 to 2004: from 0% to 27% in Nigeria; from 23% to 65% in Senegal, and 22% to 66% in Zambia. The same patterns by SES and urban-rural held for ITNs as for ever-treated nets.

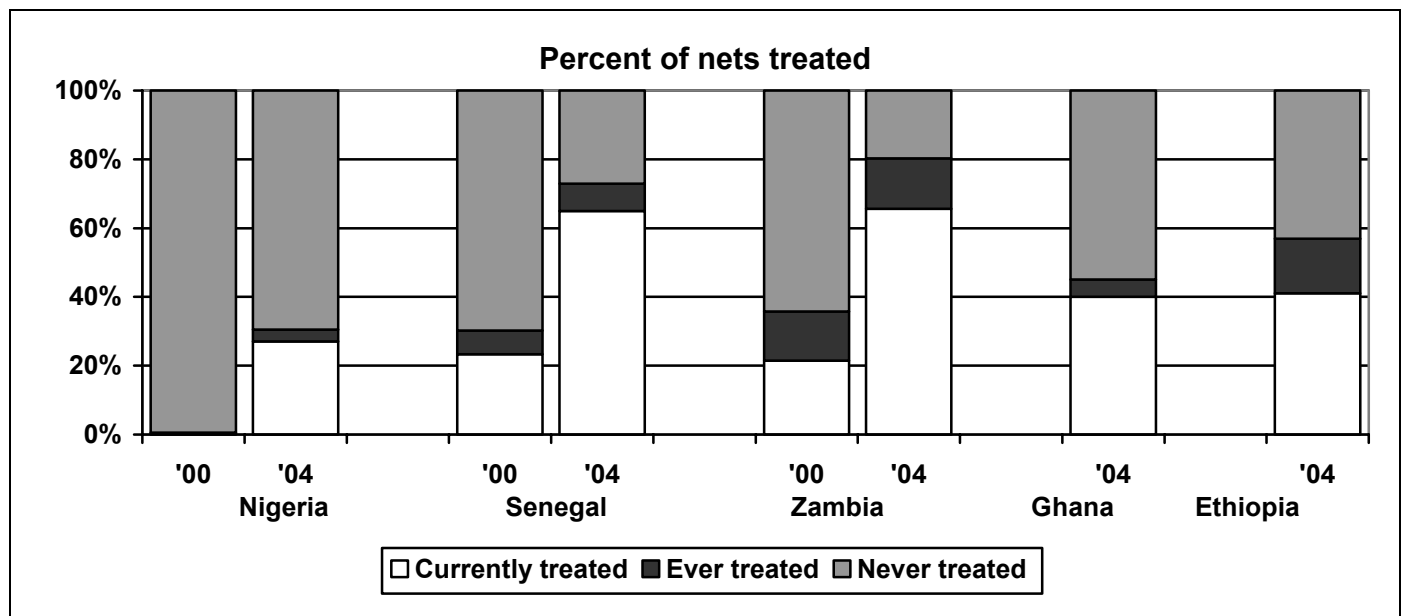
### *Percent of nets bought pre-treated*

- The percent of nets bought pre-treated ranged from 20% in Nigeria to 62% in Zambia and 65% in Senegal.
- Between 2000 and 2004, the percent of nets bought already treated has greatly increased: from 1% to 20% in Nigeria; from 18% to 65% in Senegal, and from 28% to 62% in Zambia.

### *Percent of nets post-treated*

- The percent of nets treated since acquired ranged from 18% in Nigeria and 19% in Ghana, to 42% in Zambia.
- Between 2000 and 2004, the percent of nets treated since acquired increased substantially: from 0% to 18% in Nigeria; from 15% to 26% in Senegal, and from 16% in 2000 to 42% in Zambia.

**Figure 3.3**



**Table 3.3: ALL COUNTRIES: Treatment status of nets owned**

Among all nets owned

|  | NIGERIA |      | SENEGAL |      | ZAMBIA |      | GHANA | ETHIOPIA |
|--|---------|------|---------|------|--------|------|-------|----------|
|  | 2000    | 2004 | 2000    | 2004 | 2000   | 2004 | 2004  | 2004     |
| Ever treated*                              | 0.6     | 30.5 | 30.2    | 72.9 | 35.8   | 80.3 | 45.0  | 56.9     |
| Currently treated<br>(12 mo.)              | 0.0     | 27.1 | 23.4    | 65.0 | 21.5   | 65.6 | 40.0  | 41.1     |
| Bought pretreated<br>("pre-treated")       | 0.6     | 19.8 | 18.4    | 64.7 | 28.3   | 62.1 | 38.1  | 43.7     |
| Treated since acquired<br>("post-treated") | 0.0     | 18.4 | 15.1    | 26.4 | 16.3   | 41.6 | 19.3  | 27.0     |
| <b>BASE</b>                                | 159     | 856  | 649     | 2579 | 363    | 1734 | 808   | 341      |

\*Bought pretreated and/or treated since purchase

**INDIVIDUAL COUNTRIES: Treatment status of nets owned**

Among all nets owned

**Table 3.3a: NIGERIA – 2000 AND 2004**

|  |      | TOTAL | Site (city plus surrounding rural areas) |        |      |           |        | Urban<br>Lagos<br>Only | Urban/Rural  |              | Socio-Economic Status |      |      |      |        |
|--|------|-------|--|--------|------|-----------|--------|------------------------|--------------|--------------|-----------------------|------|------|------|--------|
|  |      |       | Lagos                                    | Ibadan | Kano | Maiduguri | Nsukka |                        | All<br>Urban | All<br>Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| Ever treated                                   | 2000 | 0.6   | 0.0                                      | 0.0    | 3.8  | 0.0       | 0.0    | 0.0                    | 1.4          | 0.0          | 0.0                   | 0.0  | 0.0  | 0.0  | 2.5    |
|  | 2004 | 30.5  | 34.1                                     | 57.4   | 43.5 | 14.2      | 46.2   | 50.0                   | 33.1         | 29.2         | 16.2                  | 30.9 | 32.4 | 34.6 | 42.1   |
| Currently treated<br>(12 mo.)                  | 2000 | 0.0   | 0.0                                      | 0.0    | 0.0  | 0.0       | 0.0    | 0.0                    | 0.0          | 0.0          | 0.0                   | 0.0  | 0.0  | 0.0  | 0.0    |
|  | 2004 | 27.1  | 32.5                                     | 51.1   | 41.7 | 11.0      | 41.1   | 50.0                   | 30.0         | 25.7         | 13.3                  | 29.8 | 28.8 | 27.1 | 38.8   |
| Bought pretreated<br>("pre-treated")           | 2000 | 0.6   | 0.0                                      | 0.0    | 3.8  | 0.0       | 0.0    | 0.0                    | 1.4          | 0.0          | 0.0                   | 0.0  | 0.0  | 0.0  | 2.5    |
|  | 2004 | 19.8  | 28.1                                     | 51.1   | 30.8 | 14.2      | 11.7   | 39.3                   | 20.7         | 19.3         | 6.3                   | 16.0 | 24.3 | 24.2 | 33.0   |
| Treated since<br>acquired ("post-<br>treated") | 2000 | 0.0   | 0.0                                      | 0.0    | 0.0  | 0.0       | 0.0    | 0.0                    | 0.0          | 0.0          | 0.0                   | 0.0  | 0.0  | 0.0  | 0.0    |
|  | 2004 | 18.4  | 23.1                                     | 25.5   | 24.3 | 1.9       | 42.1   | 33.3                   | 23.9         | 15.7         | 12.1                  | 21.6 | 14.1 | 14.6 | 28.3   |
| <b>BASE</b>                                    | 2000 | 159   | 34                                       | 4      | 26   | 43        | 52     | 6                      | 73           | 86           | 33                    | 18   | 33   | 35   | 40     |
|  | 2004 | 856   | 123                                      | 47     | 108  | 381       | 197    | 30                     | 287          | 569          | 210                   | 191  | 139  | 133  | 183    |

**Table 3.3b: SENEGAL – 2000 AND 2004**

|   |      | TOTAL<br>2004 | Site  |       |          |         |                  | Urban<br>Dakar<br>only | Urban/Rural  |              | Socio economic status |      |      |      |        |
|---|------|---------------|-------|-------|----------|---------|------------------|------------------------|--------------|--------------|-----------------------|------|------|------|--------|
|   |      |               | Dakar | Thies | St Louis | Kaolack | Tamba-<br>counda |                        | All<br>Urban | All<br>Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| Ever treated                                  | 2000 | 30.2          | 22.6  | 30.8  | 38.1     | 448.8   | 12.9             | 29.2                   | 34.6         | 28.2         | 23.6                  | 31.3 | 28.5 | 28.0 | 40.9   |
|   | 2004 | 72.9          | 71.4  | 64.4  | 59.0     | 74.0    | 88.2             | 84.6                   | 82.8         | 67.4         | 73.3                  | 70.4 | 69.2 | 73.1 | 78.6   |
| Currently treated<br>(12 mo.)                 | 2000 | 23.4          | 18.9  | 21.5  | 27.5     | 42.5    | 11.3             | 20.8                   | 26.3         | 22.1         | 17.4                  | 25.0 | 25.2 | 15.9 | 33.9   |
|   | 2004 | 65.0          | 63.2  | 55.4  | 48.4     | 65.4    | 83.3             | 82.7                   | 72.6         | 60.7         | 70.9                  | 61.9 | 58.6 | 65.0 | 69.2   |
| Bought pretreated<br>("pre-treated")          | 2000 | 18.4          | 24.5  | 21.9  | 18.1     | 39.2    | 6.6              | 30.4                   | 27.9         | 13.9         | 7.8                   | 15.8 | 17.5 | 24.0 | 30.6   |
|   | 2004 | 64.7          | 70.3  | 63.9  | 50.6     | 72.9    | 71.4             | 84.6                   | 78.5         | 56.7         | 51.3                  | 61.2 | 61.9 | 72.1 | 75.0   |
| Treated since<br>acquired<br>("post-treated") | 2000 | 15.1          | 2.0   | 9.2   | 23.2     | 16.5    | 8.7              | 4.8                    | 13.4         | 15.9         | 16.9                  | 19.4 | 13.2 | 6.6  | 17.0   |
|   | 2004 | 26.4          | 15.6  | 11.8  | 17.4     | 15.2    | 48.3             | 21.2                   | 25.7         | 26.8         | 46.4                  | 25.0 | 22.0 | 21.3 | 19.9   |
| <b>BASE</b>                                   | 2000 | 649           | 53    | 65    | 265      | 80      | 186              | 24                     | 205          | 444          | 144                   | 160  | 123  | 107  | 115    |
|   | 2004 | 2579          | 185   | 334   | 746      | 457     | 857              | 52                     | 931          | 1648         | 461                   | 540  | 517  | 532  | 529    |

**Table 3.3c: ZAMBIA – 2000 AND 2004**

|  |      | TOTAL<br>2004 | Site (city plus surrounding rural areas) |       |       |       |       | Urban<br>Lusaka<br>only | Urban/Rural  |           | Socio-Economic Status (SES) |      |      |      |        |
|--|------|---------------|--|-------|-------|-------|-------|-------------------------|--------------|-----------|-----------------------------|------|------|------|--------|
|  |      |               | Lusaka                                   | Choma | Mansa | Kitwe | Kaoma |                         | All<br>Urban | All Rural | 1 Low                       | 2    | 3    | 4    | 5 High |
| Ever treated                               | 2000 | 35.8          | 25.4                                     | 43.1  | 43.2  | 47.3  | 14.1  | 8.8                     | 29.6         | 43.8      | 51.7                        | 47.6 | 45.6 | 26.3 | 29.9   |
|  | 2004 | 80.3          | 79.7                                     | 77.8  | 82.3  | 80.8  | 80.3  | 78.2                    | 80.0         | 80.7      | 82.3                        | 76.0 | 75.3 | 80.2 | 82.5   |
| Currently treated<br>(12 mo.)              | 2000 | 21.5          | 14.9                                     | 22.4  | 29.6  | 26.9  | 9.4   | 5.9                     | 17.7         | 26.3      | 24.1                        | 21.4 | 29.4 | 16.3 | 20.1   |
|  | 2004 | 65.6          | 68.8                                     | 64.4  | 66.9  | 67.7  | 59.9  | 65.5                    | 65.6         | 65.8      | 67.7                        | 59.1 | 61.8 | 64.5 | 68.5   |
| Bought pretreated<br>("pre-treated")       | 2000 | 28.3          | 24.2                                     | 23.6  | 35.8  | 40.4  | 8.5   | 8.8                     | 20.1         | 39.1      | 50.0                        | 45.9 | 43.9 | 11.8 | 21.0   |
|  | 2004 | 62.1          | 66.5                                     | 51.5  | 70.9  | 51.6  | 72.0  | 67.5                    | 60.5         | 65.1      | 76.9                        | 71.8 | 61.4 | 57.4 | 61.4   |
| Treated since acquired<br>("post-treated") | 2000 | 16.3          | 1.5                                      | 24.1  | 22.2  | 23.7  | 6.3   | 0.0                     | 14.3         | 18.8      | 13.8                        | 14.3 | 23.5 | 16.3 | 13.9   |
|  | 2004 | 41.6          | 35.1                                     | 42.1  | 37.2  | 56.4  | 34.4  | 31.6                    | 42.4         | 40.4      | 27.1                        | 29.2 | 37.3 | 43.3 | 46.6   |
| BASE                                       | 2000 | 363           | 67                                       | 58    | 81    | 93    | 64    | 34                      | 203          | 160       | 29                          | 42   | 68   | 80   | 144    |
|  | 2004 | 1734          | 295                                      | 334   | 384   | 402   | 319   | 165                     | 1112         | 622       | 96                          | 154  | 259  | 440  | 785    |

**Table 3.3d: GHANA — 2004**

|  | Total | Sites (city plus surrounding rural areas) |      |        |      |        | Urban<br>Accra<br>Only | Urban/Rural  |           | Socio-Economic Status |      |      |      |        |
|--|-------|---|------|--------|------|--------|------------------------|--------------|-----------|-----------------------|------|------|------|--------|
|  |       | Accra                                     | Keta | Kumasi | Wa   | Tamale |                        | All<br>Urban | All Rural | 1 Low                 | 2    | 3    | 4    | 5 High |
| Ever treated                               | 45.0  | 56.9                                      | 23.2 | 49.4   | 60.1 | 73.5   | 63.3                   | 38.1         | 51.3      | 40.1                  | 46.5 | 30.4 | 44.9 | 61.6   |
| Currently treated<br>(12 mo.)              | 40.0  | 43.1                                      | 20.4 | 46.8   | 50.3 | 70.3   | 60.0                   | 32.6         | 46.6      | 37.7                  | 41.9 | 25.3 | 39.7 | 53.7   |
| Bought pretreated<br>("pre-treated")       | 38.1  | 55.4                                      | 17.7 | 40.3   | 52.4 | 64.6   | 63.3                   | 33.5         | 42.3      | 33.8                  | 38.5 | 27.9 | 36.1 | 52.3   |
| Treated since acquired<br>("post-treated") | 19.3  | 9.2                                       | 10.7 | 19.5   | 29.6 | 33.3   | 10.0                   | 15.9         | 22.4      | 18.5                  | 17.5 | 11.4 | 22.2 | 26.1   |
| BASE                                       | 808   | 65  | 358  | 77     | 153  | 155    | 30                     | 383          | 425       | 162                   | 155  | 158  | 156  | 177    |

**Table 3.3e: ETHIOPIA — 2004**

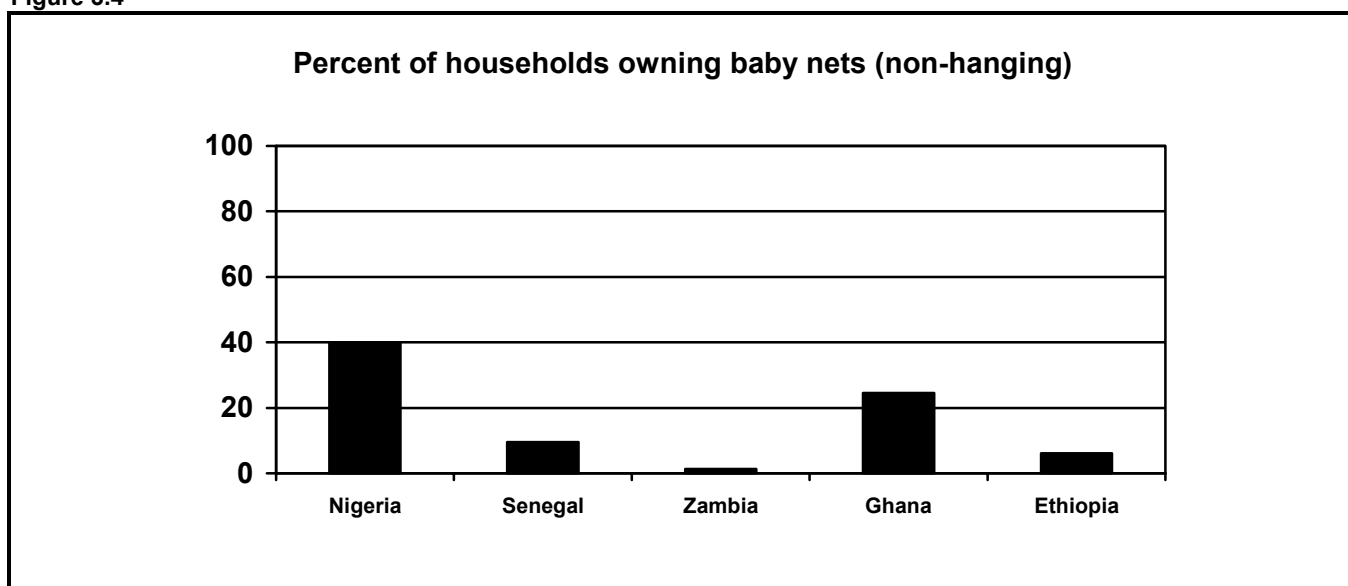
|  | Total | Site (city plus surrounding rural areas) |        |           |        |        | Urban/Rural |           | Socio-economic Status |      |      |        |
|--|-------|--|--------|-----------|--------|--------|-------------|-----------|-----------------------|------|------|--------|
|  |       | Bahir Dar                                | Nazret | Dire Dawa | Dessie | Awassa | All Urban   | All Rural | 1 & 2 Low             | 3    | 4    | 5 High |
| Ever treated                               | 56.9  | 80.7                                     | 44.6   | 48.2      | 46.9   | 39.1   | 55.7        | 59.0      | 62.5                  | 71.4 | 47.7 | 56.1   |
| Currently treated<br>(12 mo.)              | 41.1  | 59.7                                     | 33.8   | 33.9      | 21.9   | 30.4   | 43.4        | 36.9      | 33.3                  | 42.9 | 39.8 | 42.2   |
| Bought pretreated<br>("pre-treated")       | 43.7  | 63.0                                     | 30.8   | 42.9      | 46.9   | 21.7   | 41.6        | 47.5      | 45.8                  | 64.3 | 38.6 | 39.3   |
| Treated since acquired<br>("post-treated") | 27.0  | 45.4                                     | 23.8   | 5.5       | 10.3   | 22.4   | 32.2        | 17.6      | 20.8                  | 21.8 | 19.8 | 33.3   |
| BASE                                       | 341   | 119                                      | 65     | 56        | 32     | 69     | 219         | 122       | 24                    | 56   | 88   | 173    |

### 3.4 BABY NET OWNERSHIP

The data on baby nets are from 2004 only.<sup>2</sup> Baby nets were not asked about in the 2000 survey.

- Baby nets are most popular in Nigeria, where 40% of households sampled owned one. They are also common in Ghana (25%). Baby nets are least common in Ethiopia (6%) and Zambia (1%). (Baby nets are *not* included in household net ownership rates above.)
- In all countries, baby net ownership is concentrated in the highest SES households. (Data is not shown here. See individual country reports.)

**Figure 3.4**



**Table 3.4: ALL COUNTRIES: Percent of households owning a baby net (non-hanging)**

Among all households

|      | NIGERIA |      | SENEGAL |      | ZAMBIA |      | GHANA | ETHIOPIA |
|------|---------|------|---------|------|--------|------|-------|----------|
|      | 2000    | 2004 | 2000    | 2004 | 2000   | 2004 | 2004  | 2004     |
| Yes  | *       | 39.9 | *       | 9.5  | *      | 1.4  | 24.5  | 6.1      |
| No   | *       | 60.1 | *       | 90.5 | *      | 98.6 | 75.5  | 93.9     |
| BASE | *       | 2000 | *       | 2000 | *      | 2000 | 1500  | 1000     |

\* data on baby nets not collected in 2000

<sup>2</sup>NetMark is monitoring baby net ownership and use because baby net ownership may affect decisions to buy hanging nets. NetMark is not necessarily encouraging use of baby nets, since the resources used to buy a baby net could be used for a larger hanging net that would serve the child for a longer period than infancy, would allow other family members to sleep under it, and could be treated. A treated hanging net would also afford some protection to family members not sleeping under the net.

## SECTION 4

### NET AND ITN USE

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Although it is beneficial for any household member to sleep under a net, it is particularly important for those vulnerable to severe malaria — children under five (and especially children under one) and pregnant women — to do so. This section reports the proportion of vulnerable groups sleeping under nets and ITNs—in *all households* as well as *in net-owning households*. The proportion in all households shows the status of the sample with regard to Abuja targets<sup>3</sup>; and the proportion within net-owning households shows who uses the net when nets are present in the household. Note that the proportions under a net/ITN in all households are highly affected by net ownership rates, whereas the proportions under a net in net-owning households are not affected at all by ownership rates.

Net use is likely to be highest in mid-end rainy season, when mosquito density and malaria transmission is highest. In all countries except Zambia, the data were collected at the onset or middle of the rainy season. In Zambia the data were collected before the rainy season began, so net use figures are likely to be lower in Zambia than they would be if data were taken during the rainy season.

#### 4.1 USE BY CHILDREN UNDER AGE FIVE

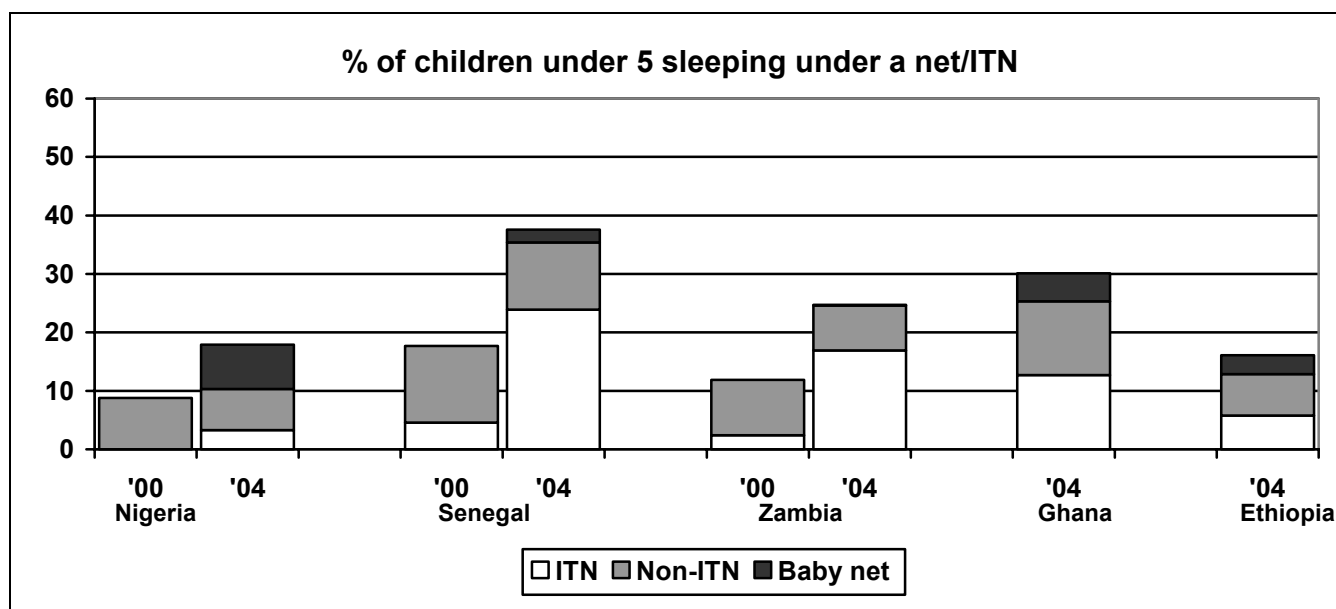
*Household ownership of nets varied considerably by country, and therefore the proportion of children under five sleeping under a net in each country tended to vary accordingly. Since 2000, there was a 100% increase in the percent of children under five sleeping under a net in Senegal and Zambia, but in Nigeria the increase was very small.*

- Among all households, the percent of children under five who slept under *a net* (a hanging net, whether treated or untreated) the prior night in 2004 varied from a low of 10% in Nigeria and 13% in Ethiopia to a high of 35% in Senegal. When baby nets are included, the figures ranged from 16% in Ethiopia and 18% in Nigeria to 38% in Senegal.
- Within countries, there was much variation by site in the proportion of under-fives under a net in all countries except Zambia, where the variation by site was modest. There was little difference by SES or urban-rural in Nigeria, Senegal, and Ghana; however in Ethiopia and Zambia the percent under a net rose sharply with SES and favored urban over rural children.
- Among all households, the percent of children under five who slept under *an ITN* the prior night in 2004 varied from a low of 3% in Nigeria and 6% in Ethiopia to a high of 24% in Senegal. The pattern by site, SES and urban-rural was the same for ITNs as for nets.

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<sup>3</sup> The African Summit on Roll Back Malaria held in Abuja, Nigeria on April 25, 2000, set the target of having at least 60% of children under five years of age and pregnant women use insecticide treated mosquito nets.

Figure 4.1



**Table 4.1: ALL COUNTRIES: Percent of children under five sleeping under a net and ITN**  
Among children under five in all households

|                                  | NIGERIA |      | SENEGAL |      | ZAMBIA |      | GHANA | ETHIOPIA |
|----------------------------------|---------|------|---------|------|--------|------|-------|----------|
|                                  | 2000    | 2004 | 2000    | 2004 | 2000   | 2004 |       |          |
| Sleeping under a net             | 8.8     | 10.3 | 17.7    | 35.4 | 11.9   | 24.6 | 25.3  | 12.9     |
| Sleeping under a net or baby net | *       | 17.9 | *       | 37.6 | *      | 24.7 | 30.1  | 16.1     |
| Sleeping under an ITN            | 0.0     | 3.3  | 4.6     | 23.9 | 2.4    | 16.9 | 10.3  | 5.8      |
| BASE                             | 1402    | 3054 | 1811    | 4116 | 1470   | 2862 | 2008  | 1127     |

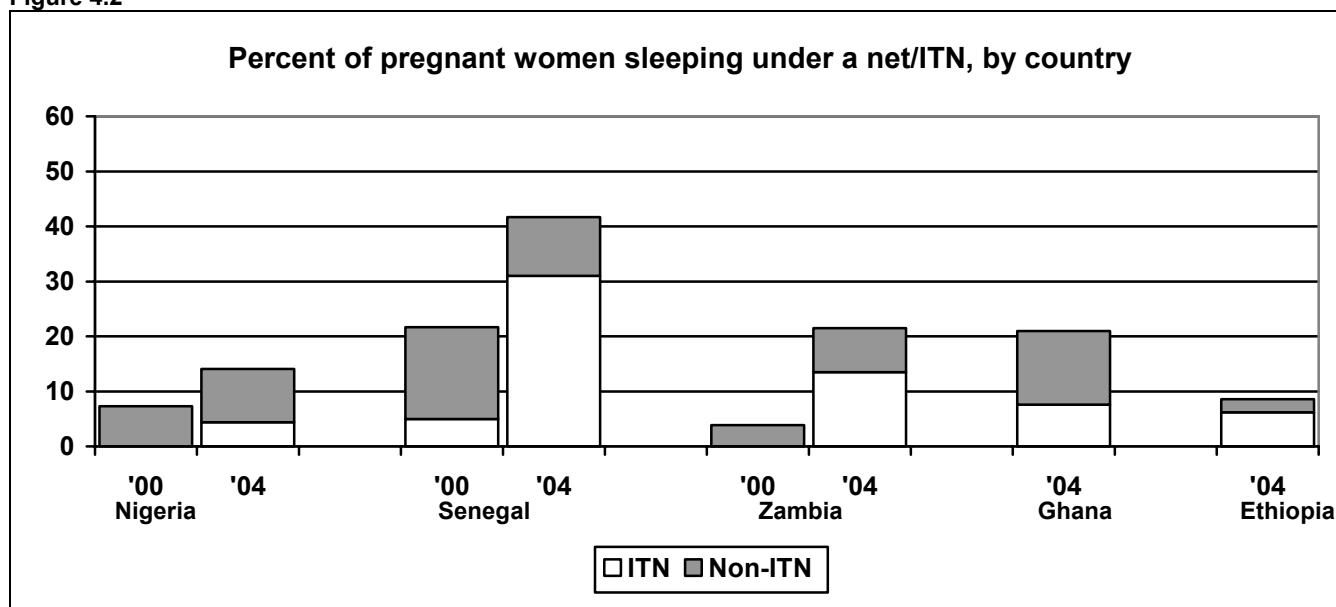
\* Data on baby nets not collected in 2000

## 4.2 USE BY PREGNANT WOMEN

*The proportion of pregnant women sleeping under a net among and within countries tended to vary with the percent of households owning a net or ITN. A comparison of 2000 and 2004 data show very substantial increases in the percent of pregnant women sleeping under nets and ITNs in all countries.*

- There was a very wide range in the percent of pregnant women sleeping under a net (treated or untreated): from a low of 9% in Ethiopia to a high of 42% in Senegal. The percent sleeping under a net the prior night rose from 7% to 14% in Nigeria; from 22% to 42% in Senegal, and from 4% to 22% in Zambia.
- There was wide variation in the percent of pregnant women sleeping under an ITN, ranging from a low of 4% in Nigeria to a high of 31% in Senegal. In the three countries where 2000 and 2004 data were collected, the percent of pregnant women sleeping under an ITN rose from 0% to 4% in Nigeria, 5% to 31% in Senegal, and 0% to 14% in Zambia.

Figure 4.2



**Table 4.2: ALL COUNTRIES: Percent of pregnant women sleeping under a net and ITN**  
Among pregnant women in all households

|                       | NIGERIA |      | SENEGAL |      | ZAMBIA |      | GHANA | ETHIOPIA |
|-----------------------|---------|------|---------|------|--------|------|-------|----------|
|                       | 2000    | 2004 | 2000    | 2004 | 2000   | 2004 |       |          |
| Sleeping under a net  | 7.3     | 14.1 | 21.7    | 41.7 | 3.9    | 21.5 | 21.0  | 8.6      |
| Sleeping under an ITN | 0       | 4.4  | 5.0     | 31.0 | 0      | 13.5 | 7.6   | 6.2      |
| BASE                  | 96      | 249  | 120     | 290  | 76     | 237  | 110   | 81       |

### 4.3 INTRA-HOUSEHOLD NET USE

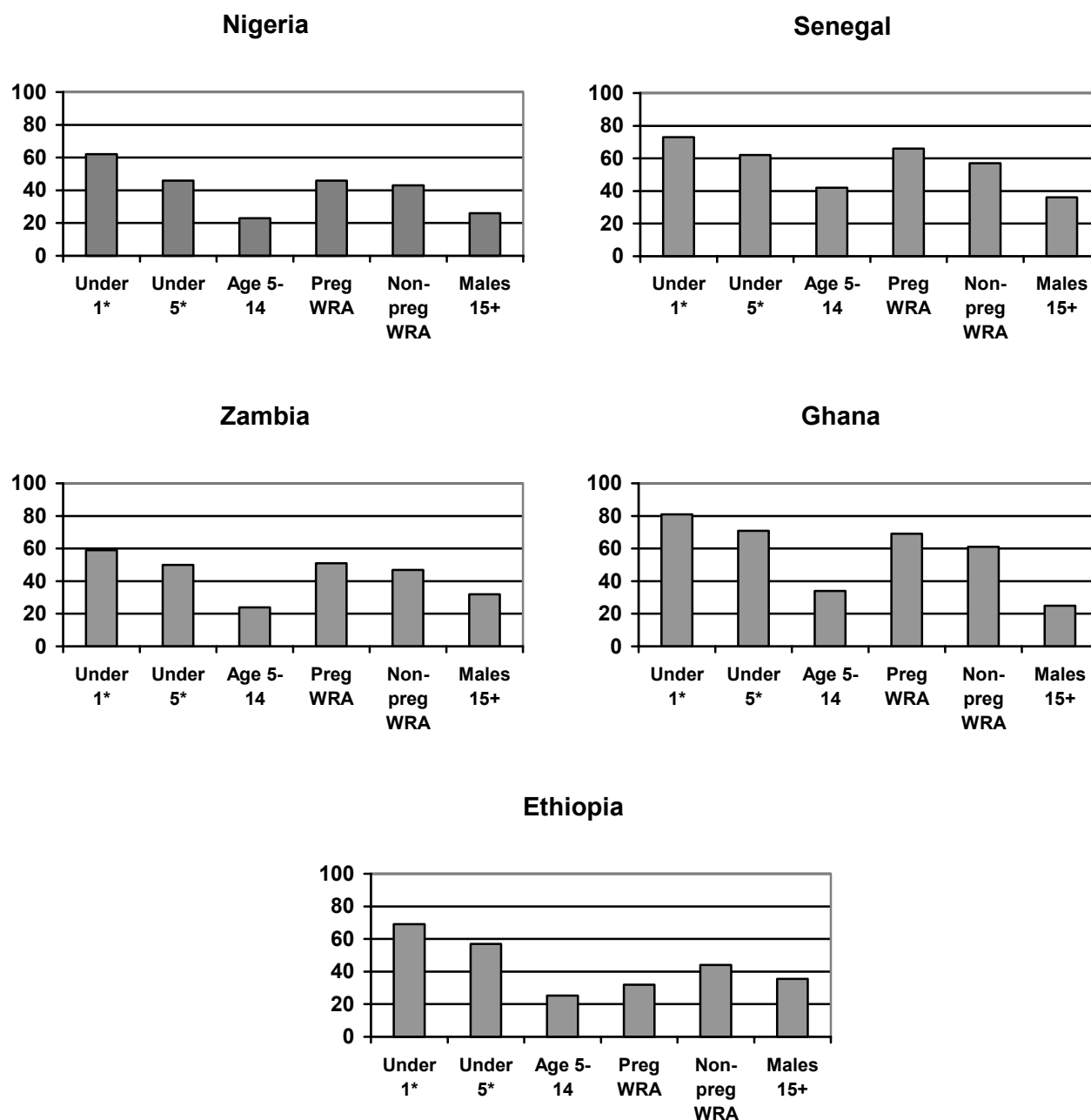
*Within net-owning households, vulnerable groups in most countries were given priority for net use: the household members most likely to sleep under a net were children under five (and especially children under two) and pregnant women. The exception is Ethiopia, where it appears that pregnant women were not as likely as children under five or other adults to use the net.<sup>4</sup>*

- Younger under-fives are more likely to sleep under a net than older under-fives. Generally the percent of young children under a net drops off after age two.
- In all countries except Ethiopia, pregnant women are more likely than non-pregnant women of reproductive age to sleep under a net.
- There was no gender bias in childhood net use; male and female under-fives were equally likely to be placed under the net.

<sup>4</sup> The full data tables on household members other than children under five and pregnant women are not included in this report, but are in the individual country reports. In this report, the data on other household members is shown only in the graphs.

- Children aged 5-14 and adult males (aged 15 and older) were the least likely to sleep under the net.
- Adult females, whether pregnant or not, are much more likely to sleep under a net than adult males, although the difference is least pronounced in Ethiopia.

**Figure 4.2 Intra-household net allocation**—% of family members under a net, among net-owning households



\*Including baby nets

**Table 4.3a: Percent of vulnerable groups who slept under a net and ITN last night – 2000 & 2004**

**NIGERIA**

Among **ALL** households

|                           |      | Total | Site (city plus surrounding rural areas) |        |      |                |        | Urban<br>Lagos<br>only | Urban/Rural  |              | Socio-Economic Status |      |      |      |        |
|---------------------------|------|-------|--|--------|------|----------------|--------|------------------------|--------------|--------------|-----------------------|------|------|------|--------|
|                           |      |       | Lagos                                    | Ibadan | Kano | Maidu-<br>guri | Nsukka |                        | All<br>Urban | All<br>Rural | 1 low                 | 2    | 3    | 4    | 5 high |
| <b>Children &lt;5</b>     |      |       |  |        |      |                |        |                        |              |              |                       |      |      |      |        |
|                           |      |       |  |        |      |                |        |                        |              |              |                       |      |      |      |        |
| Hanging net               | 2000 | 8.8   | 11.2                                     | 0.8    | 8.9  | 11.4           | 11.2   | 5.6                    | 9.9          | 8.2          | 7.9                   | 4.7  | 10.4 | 7.3  | 14.4   |
|                           | 2004 | 10.3  | 10.4                                     | 2.7    | 5.2  | 17.2           | 13.8   | 5.4                    | 6.6          | 12.6         | 14.6                  | 14.6 | 7.6  | 7.8  | 6.2    |
| Hanging or baby<br>net    | 2000 | *     | *  | *      | *    | *              | *      | *                      | *            | *            | *                     | *    | *    | *    | *      |
|                           | 2004 | 17.9  | 18.8                                     | 8.2    | 9.0  | 30.3           | 20.0   | 16.1                   | 16.6         | 18.8         | 18.7                  | 21.6 | 14.7 | 15.2 | 19.4   |
| ITN <sup>1</sup> (12 mo.) | 2000 | 0.0   | 0.0                                      | 0.0    | 0.0  | 0.0            | 0.0    | 0.0                    | 0.0          | 0.0          | 0.0                   | 0.0  | 0.0  | 0.0  | 0.0    |
|                           | 2004 | 3.3   | 1.9                                      | 2.2    | 2.1  | 1.2            | 9.6    | 1.8                    | 2.9          | 3.6          | 3.3                   | 5.1  | 2.8  | 3.8  | 1.5    |
| BASE                      | 2000 | 1402  | 294                                      | 264    | 269  | 299            | 276    | 107                    | 536          | 866          | 266                   | 298  | 278  | 289  | 271    |
|                           | 2004 | 3054  | 536                                      | 546    | 631  | 745            | 596    | 223                    | 1178         | 1876         | 643                   | 631  | 607  | 580  | 593    |
| <b>Pregnant women</b>     |      |       |  |        |      |                |        |                        |              |              |                       |      |      |      |        |
|                           |      |       |  |        |      |                |        |                        |              |              |                       |      |      |      |        |
| Any net                   | 2000 | 7.3   | 12.5                                     | 6.3    | 0.0  | 0.0            | 16.7   | 0.0                    | 9.1          | 6.3          | 6.5                   | 9.5  | 23.1 | 0.0  | 0.0    |
|                           | 2004 | 14.1  | 17.4                                     | 0.0    | 5.8  | 32.3           | 10.2   | **                     | 8.9          | 17.0         | 13.3                  | 17.9 | 12.7 | 12.8 | 12.8   |
| ITN (12 mo.)              | 2000 | 0.0   | 0.0                                      | 0.0    | 0.0  | 0.0            | 0.0    | 0.0                    | 0.0          | 0.0          | 0.0                   | 0.0  | 0.0  | 0.0  | 0.0    |
|                           | 2004 | 4.4   | 0.0                                      | 0.0    | 4.7  | 4.6            | 8.2    | **                     | 4.4          | 4.4          | .0                    | 8.9  | 1.8  | 10.3 | 2.6    |
| BASE                      | 2000 | 96    | 16                                       | 16     | 12   | 28             | 24     | 7                      | 33           | 63           | 31                    | 21   | 13   | 15   | 16     |
|                           | 2004 | 249   | 23                                       | 26     | 86   | 65             | 49     | 9                      | 90           | 159          | 60                    | 56   | 55   | 39   | 39     |

1 The figures for ITN use in this table differ from those in the Nigeria 2000 baseline report. In the 2000 baseline report, an ITN was defined as a net that had ever been treated with insecticide. We now distinguish between ever-treated and currently treated nets, and use ITN to refer only to currently-treated nets. The definition of a currently treated net (ITN) we use is the RBM definition: a long-lasting insecticide treated net or one bought pre-treated and/or treated within and including the prior 12 months. The 2000 data have been recomputed to conform to that definition and to be comparable to the 2004 data.

Within **NET-OWNING** households

|                        |      | Total | Site (city plus surrounding rural areas) |        |      |                |        | Urban<br>Lagos<br>only | Urban/Rural  |              | Socio-Economic Status |      |      |      |        |
|------------------------|------|-------|--|--------|------|----------------|--------|------------------------|--------------|--------------|-----------------------|------|------|------|--------|
|                        |      |       | Lagos                                    | Ibadan | Kano | Maidu-<br>guri | Nsukka |                        | All<br>Urban | All<br>Rural | 1 low                 | 2    | 3    | 4    | 5 high |
| <b>Children &lt;5</b>  |      |       |  |        |      |                |        |                        |              |              |                       |      |      |      |        |
|                        |      |       |  |        |      |                |        |                        |              |              |                       |      |      |      |        |
| Hanging net            | 2000 | 73.4  | 84.6                                     | **     | 68.6 | 85.0           | 59.6   | **                     | 73.6         | 73.2         | 67.7                  | 73.7 | 76.3 | 75.0 | 73.6   |
|                        | 2004 | 35.8  | 50.0                                     | 28.8   | 31.7 | 32.4           | 38.5   | 40.0                   | 26.7         | 40.4         | 43.5                  | 45.3 | 28.4 | 33.8 | 22.8   |
| Hanging or baby<br>net | 2000 | *     | *  | *      | *    | *              | *      | *                      | *            | *            | *                     | *    | *    | *    | *      |
|                        | 2004 | 45.5  | 59.8                                     | 34.6   | 36.5 | 46.1           | 44.1   | 56.7                   | 39.7         | 48.5         | 49.5                  | 57.6 | 35.2 | 41.4 | 38.9   |
| BASE                   | 2000 | 169   | 39                                       | 3      | 35   | 40             | 52     | 9                      | 72           | 97           | 31                    | 19   | 38   | 28   | 53     |
|                        | 2004 | 876   | 112                                      | 52     | 104  | 395            | 213    | 30                     | 292          | 584          | 216                   | 203  | 162  | 133  | 162    |
| <b>Pregnant women</b>  |      |       |  |        |      |                |        |                        |              |              |                       |      |      |      |        |
|                        |      |       |  |        |      |                |        |                        |              |              |                       |      |      |      |        |
| Any net                | 2000 | **    | **                                       | **     | **   | **             | **     | **                     | **           | **           | **                    | **   | **   | **   | **     |
|                        | 2004 | 46.1  | **                                       | **     | **   | 58.3           | 33.3   | **                     | 36.4         | 50.0         | 50.0                  | 52.6 | 36.8 | **   | **     |
| BASE                   | 2000 | 12    | 2  | 2      | 0    | 2              | 6      | 0                      | 5            | 7            | 2                     | 2    | 4    | 2    | 2      |
|                        | 2004 | 76    | 6  | 5      | 14   | 36             | 15     | 2                      | 22           | 54           | 16                    | 19   | 19   | 11   | 11     |

\* Data on baby nets not collected in 2000

\*\* Denominator too small to permit meaningful calculations

**Table 4.3b: Percent of vulnerable groups who slept under a net and under ITN last night – 2000 and 2004**

**SENEGAL**

Among **ALL** households

| Among ALL households      |      |       |  |       |          |         |                  |                        |              |              |                       |      |      |      |        |
|---------------------------|------|-------|--|-------|----------|---------|------------------|------------------------|--------------|--------------|-----------------------|------|------|------|--------|
|                           | Year | TOTAL | Site (city plus surrounding rural areas) |       |          |         |                  | Urban<br>Dakar<br>only | Location     |              | Socio-Economic Status |      |      |      |        |
|                           |      |       | Dakar                                    | Thies | St Louis | Kaolack | Tamba-<br>counda |                        | All<br>Urban | All<br>Rural | 1 low                 | 2    | 3    | 4    | 5 high |
| Children <5               |      |       |  |       |          |         |                  |                        |              |              |                       |      |      |      |        |
|                           |      |       |  |       |          |         |                  |                        |              |              |                       |      |      |      |        |
| Hanging net               | 2000 | 17.7  | 5.2                                      | 8.3   | 36.7     | 11.0    | 30.0             | 5.4                    | 13.7         | 19.9         | 18.9                  | 25.4 | 13.2 | 14.4 | 16.4   |
|                           | 2004 | 35.4  | 15.0                                     | 18.0  | 52.4     | 31.1    | 56.9             | 15.7                   | 33.2         | 36.6         | 34.2                  | 34.9 | 35.4 | 36.6 | 36.7   |
| Hanging or baby<br>net    | 2000 | *     | *  | *     | *        | *       | *                | *                      | *            | *            | *                     | *    | *    | *    | *      |
|                           | 2004 | 37.6  | 17.9                                     | 20.6  | 53.2     | 34.0    | 58.6             | 18.6                   | 35.6         | 38.7         | 35.4                  | 36.3 | 37.7 | 39.7 | 40.0   |
| ITN <sup>1</sup> (12 mo.) | 2000 | 4.6   | 1.2                                      | 1.8   | 10.8     | 5.4     | 4.3              | .0                     | 3.9          | 5.0          | 2.8                   | 6.6  | 4.7  | 2.9  | 6.2    |
|                           | 2004 | 23.9  | 9.2                                      | 10.5  | 27.0     | 21.1    | 47.2             | 13.3                   | 25.1         | 23.3         | 24.9                  | 23.9 | 21.1 | 24.4 | 25.3   |
| BASE                      | 2000 | 1811  | 345                                      | 397   | 332      | 390     | 347              | 130                    | 648          | 1163         | 392                   | 362  | 386  | 347  | 324    |
|                           | 2004 | 4116  | 708                                      | 868   | 782      | 824     | 934              | 210                    | 1428         | 2688         | 948                   | 908  | 828  | 795  | 637    |
| Pregnant women            |      |       |  |       |          |         |                  |                        |              |              |                       |      |      |      |        |
| Any net                   | 2000 | 21.7  | 5.6                                      | 6.9   | 34.5     | 17.4    | 42.9             | **                     | 18.2         | 23.7         | 26.1                  | 15.0 | 20.7 | 31.8 | 15.4   |
|                           | 2004 | 41.7  | 26.7                                     | 32.1  | 50.0     | 45.9    | 53.2             | **                     | 41.2         | 42.0         | 36.8                  | 41.8 | 45.5 | 36.8 | 53.1   |
| ITN <sup>1</sup> (12 mo.) | 2000 | 5.0   | .0                                       | .0    | 10.3     | 8.7     | 4.8              | **                     | 6.8          | 3.9          | 4.3                   | .0   | 6.9  | 4.5  | 7.7    |
|                           | 2004 | 31.0  | 15.6                                     | 19.8  | 34.0     | 32.4    | 49.4             | **                     | 33.0         | 30.1         | 31.6                  | 28.4 | 34.8 | 25.0 | 40.6   |
| BASE                      | 2000 | 120   | 18                                       | 29    | 29       | 23      | 21               | 6                      | 44           | 76           | 23                    | 20   | 29   | 22   | 26     |
|                           | 2004 | 290   | 45                                       | 81    | 50       | 37      | 77               | 9                      | 97           | 193          | 57                    | 67   | 66   | 68   | 32     |

1 The figures for ITN use in this table differ from those in the Senegal 2000 baseline report. In the 2000 baseline report, an ITN was defined as a net that had ever been treated with insecticide. We now distinguish between ever-treated and currently treated nets, and use ITN to refer only to currently-treated nets. The definition of a currently treated net (ITN) we use is the RBM definition: a long-lasting insecticide treated net or one bought pre-treated and/or treated within and including the prior 12 months. The 2000 data have been recomputed to conform to that definition and to be comparable to the 2004 data.

Within **NET-OWNING** households

|                        | Year | TOTAL | Site (city plus surrounding rural areas) |       |          |         |                  | Urban<br>Dakar<br>only | Location     |           | Socio-Economic Status |      |      |      |        |
|------------------------|------|-------|--|-------|----------|---------|------------------|------------------------|--------------|-----------|-----------------------|------|------|------|--------|
|                        |      |       | Dakar                                    | Thies | St Louis | Kaolack | Tamba-<br>counda |                        | All<br>Urban | All Rural | 1 low                 | 2    | 3    | 4    | 5 high |
| Children <5            |      |       |  |       |          |         |                  |                        |              |           |                       |      |      |      |        |
| Hanging net            | 2000 | 52.5  | 26.9                                     | 39.3  | 68.9     | 43.0    | 57.1             | 24.1                   | 46.1         | 55.4      | 57.4                  | 60.9 | 38.3 | 54.3 | 50.5   |
|                        | 2004 | 60.1  | 45.3                                     | 38.5  | 70.7     | 57.7    | 69.5             | 67.3                   | 59.9         | 60.2      | 58.9                  | 62.4 | 61.2 | 57.5 | 60.9   |
| Hanging or baby<br>net | 2000 | *     | *  | *     | *        | *       | *                | *                      | *            | *         | *                     | *    | *    | *    | *      |
|                        | 2004 | 61.9  | 47.4                                     | 40.5  | 71.0     | 61.0    | 71.3             | 71.4                   | 62.6         | 61.6      | 59.6                  | 63.6 | 63.5 | 60.1 | 63.5   |
| BASE                   | 2000 | 610   | 67                                       | 84    | 177      | 100     | 182              | 29                     | 193          | 417       | 129                   | 151  | 133  | 92   | 105    |
|                        | 2004 | 2427  | 234                                      | 405   | 580      | 444     | 764              | 49                     | 791          | 1636      | 550                   | 508  | 479  | 506  | 384    |
| Pregnant women         |      |       |  |       |          |         |                  |                        |              |           |                       |      |      |      |        |
| Any net                | 2000 | 59.1  | **                                       | **    | **       | **      | **               | **                     | 42.1         | 72.0      | **                    | **   | **   | **   | **     |
|                        | 2004 | 66.1  | 52.2                                     | 60.5  | 69.4     | 85.0    | 67.2             | **                     | 65.6         | 66.4      | 60.0                  | 75.7 | 75.0 | 51.0 | 77.3   |
| BASE                   | 2000 | 44    | 3  | 6     | 14       | 7       | 14               | 2                      | 19           | 25        | 8                     | 7    | 9    | 9    | 11     |
|                        | 2004 | 183   | 23                                       | 43    | 36       | 20      | 61               | 2                      | 61           | 122       | 35                    | 37   | 40   | 49   | 22     |

\* Data on baby nets not collected in 2000

\*\* Denominator too small to permit meaningful calculations

**Table 4.3c: Percent of vulnerable groups who slept under a net and under ITN last night - 2000 & 2004**

**ZAMBIA**

Among **ALL** households

among ALL households

|                     |      | Total | Site (city plus surrounding rural areas) |       |       |       |       | Urban<br>Lusaka<br>only | Location<br>All Urban    All Rural |      | Socio-Economic Status |      |      |      |        |
|---------------------|------|-------|--|-------|-------|-------|-------|-------------------------|------------------------------------|------|-----------------------|------|------|------|--------|
|                     |      |       | Lusaka                                   | Choma | Mansa | Kitwe | Kaoma |                         |                                    |      | 1 low                 | 2    | 3    | 4    | 5 high |
| Children <5         |      |       |  |       |       |       |       |                         |                                    |      |                       |      |      |      |        |
| Hanging net         | 2000 | 11.9  | 7.8                                      | 9.6   | 16.5  | 17.1  | 9.3   | 11.5                    | 19.3                               | 7.2  | 3.2                   | 6.3  | 9.1  | 13.4 | 28.6   |
|                     | 2004 | 24.6  | 19.0                                     | 19.8  | 26.9  | 31.5  | 25.2  | 31.2                    | 42.2                               | 13.0 | 6.8                   | 10.4 | 19.5 | 33.3 | 55.0   |
| Hanging or baby net | 2000 | *     | *  | *     | *     | *     | *     | *                       | *                                  | *    | *                     | *    | *    | *    | *      |
|                     | 2004 | 24.7  | 19.4                                     | 19.8  | 27.2  | 31.7  | 25.2  | 31.7                    | 42.6                               | 13.0 | 6.8                   | 10.4 | 19.5 | 33.7 | 55.6   |
| ITN (12 mo.)        | 2000 | 2.4   | 1.0                                      | 1.0   | 5.6   | 4.3   | 0.6   | 0.9                     | 3.3                                | 1.9  | 0.7                   | 1.0  | 2.8  | 1.3  | 6.6    |
|                     | 2004 | 16.9  | 12.9                                     | 14.7  | 17.7  | 22.8  | 16.3  | 19.8                    | 28.6                               | 9.3  | 4.7                   | 7.8  | 12.4 | 21.8 | 39.8   |
| BASE                | 2000 | 1470  | 306                                      | 291   | 303   | 258   | 312   | 113                     | 575                                | 895  | 282                   | 300  | 317  | 298  | 273    |
|                     | 2004 | 2862  | 520                                      | 597   | 610   | 575   | 560   | 202                     | 1134                               | 1728 | 559                   | 587  | 591  | 600  | 525    |
| Pregnant women      |      |       |  |       |       |       |       |                         |                                    |      |                       |      |      |      |        |
| Any net             | 2000 | 3.9   | 0.0                                      | 0.0   | 5.9   | 15.4  | 0.0   | 0.0                     | 7.7                                | 2.0  | 0.0                   | 5.0  | 0.0  | 8.3  | 7.7    |
|                     | 2004 | 21.5  | 18.2                                     | 7.8   | 30.8  | 23.1  | 25.8  | 21.4                    | 35.1                               | 15.0 | 11.3                  | 14.8 | 22.2 | 35.9 | 35.7   |
| ITN (12 mo.)        | 2000 | 0.0   | 0.0                                      | 0.0   | 0.0   | 0.0   | 0.0   | 0.0                     | 0.0                                | 0.0  | 0.0                   | 0.0  | 0.0  | 0.0  | 0.0    |
|                     | 2004 | 13.5  | 6.1                                      | 5.9   | 15.4  | 17.9  | 19.4  | 7.1                     | 19.5                               | 10.6 | 8.1                   | 11.1 | 14.8 | 20.5 | 17.9   |
| BASE                | 2000 | 76    | 14                                       | 13    | 17    | 13    | 18    | 4                       | 26                                 | 49   | 16                    | 20   | 14   | 12   | 13     |
|                     | 2004 | 237   | 33                                       | 51    | 52    | 39    | 62    | 14                      | 77                                 | 160  | 62                    | 54   | 54   | 39   | 28     |

1 The figures for ITN use in this table differ from those in the Zambia 2000 baseline report. In the 2000 baseline report, an ITN was defined as a net that had ever been treated with insecticide. We now distinguish between ever-treated and currently treated nets, and use ITN to refer only to currently-treated nets. The definition of a currently treated net (ITN) we use is the RBM definition: a long-lasting insecticide treated net or one bought pre-treated and/or treated within and including the prior 12 months. The 2000 data have been recomputed to conform to that definition and to be comparable to the 2004 data.

Within **NET-OWNING** households

|                       |      | Total | Sites (city plus surrounding rural areas) |       |       |       |       | Urban<br>Lusaka<br>only | Location     |              | Socio-Economic Status |      |      |      |        |
|-----------------------|------|-------|---|-------|-------|-------|-------|-------------------------|--------------|--------------|-----------------------|------|------|------|--------|
|                       |      |       | Lusaka                                    | Choma | Mansa | Kitwe | Kaoma |                         | All<br>Urban | All<br>Rural | 1 low                 | 2    | 3    | 4    | 5 high |
| <b>Children &lt;5</b> |      |       |   |       |       |       |       |                         |              |              |                       |      |      |      |        |
| Hanging net           | 2000 | 47.7  | 35.8                                      | 49.1  | 54.3  | 47.3  | 50.0  | 41.9                    | 56.1         | 37.9         | 31.0                  | 38.8 | 42.0 | 46.5 | 58.2   |
|                       | 2004 | 50.1  | 39.0                                      | 46.8  | 56.2  | 55.5  | 50.7  | 48.8                    | 62.7         | 35.1         | 30.4                  | 34.9 | 41.8 | 51.2 | 66.3   |
| Hanging or baby net   | 2000 | *     | *   | *     | *     | *     | *     | *                       | *            | *            | *                     | *    | *    | *    | *      |
|                       | 2004 | 50.4  | 39.4                                      | 46.8  | 56.8  | 55.5  | 50.7  | 49.6                    | 63.1         | 35.1         | 30.4                  | 34.9 | 41.8 | 51.2 | 67.0   |
| BASE                  | 2000 | 367   | 67  | 57    | 92    | 93    | 58    | 31                      | 198          | 169          | 29                    | 49   | 69   | 86   | 134    |
|                       | 2004 | 1402  | 254                                       | 252   | 292   | 326   | 278   | 129                     | 764          | 638          | 125                   | 175  | 275  | 391  | 436    |
| <b>Pregnant women</b> |      |       |   |       |       |       |       |                         |              |              |                       |      |      |      |        |
| Any net               | 2000 | 17.6  | **  | **    | **    | **    | **    | **                      | **           | **           | **                    | **   | **   | **   | **     |
|                       | 2004 | 50.5  | 33.3                                      | 21.1  | 80.0  | 50.0  | 61.5  | 30.0                    | 58.7         | 43.6         | 46.7                  | 40.0 | 57.1 | 60.9 | 45.5   |
| BASE                  | 2000 | 17    | 3   | 2     | 5     | 5     | 2     | 0                       | 8            | 9            | 1                     | 8    | 2    | 1    | 5      |
|                       | 2004 | 101   | 18  | 19    | 20    | 18    | 26    | 10                      | 46           | 55           | 15                    | 20   | 21   | 23   | 22     |

\* Data on baby nets not collected in 2000

\*\* Denominator too small to permit meaningful calculations

**Table 4.3d: Percent of vulnerable groups who slept under a net and under ITN last night – 2004**

**GHANA**

Among **ALL** households

|                       | Total | Site  |      |        |      |        | Urban<br>Accra<br>only | Urban/Rural    |                | Socio-Economic Status |      |      |      |        |
|-----------------------|-------|-------|------|--------|------|--------|------------------------|----------------|----------------|-----------------------|------|------|------|--------|
|                       |       | Accra | Keta | Kumasi | Wa   | Tamale |                        | Total<br>Urban | Total<br>Rural | 1 low                 | 2    | 3    | 4    | 5 high |
| <b>Children &lt;5</b> |       |       |      |        |      |        |                        |                |                |                       |      |      |      |        |
| Hanging net           | 25.3  | 9.8   | 46.9 | 12.3   | 27.8 | 32.6   | 11.4                   | 26.3           | 24.7           | 29.0                  | 26.3 | 19.8 | 26.8 | 24.3   |
| Hanging or baby net   | 30.1  | 17.0  | 50.4 | 20.4   | 30.4 | 34.5   | 19.8                   | 30.9           | 29.6           | 30.8                  | 30.1 | 23.3 | 33.6 | 33.1   |
| ITN (12 mo.)          | 12.7  | 4.5   | 13.7 | 6.3    | 15.3 | 24.3   | 7.2                    | 10.5           | 14.0           | 13.0                  | 14.0 | 5.9  | 14.8 | 15.7   |
| BASE                  | 2008  | 400   | 373  | 446    | 378  | 411    | 167                    | 753            | 1255           | 445                   | 418  | 404  | 366  | 375    |
| <b>Pregnant women</b> |       |       |      |        |      |        |                        |                |                |                       |      |      |      |        |
| Any net               | 21.0  | 14.3  | 29.4 | 13.0   | 20.0 | 29.2   | .0                     | 22.2           | 20.0           | 25.0                  | 37.5 | 11.1 | 13.0 | 26.3   |
| ITN (12 mo.)          | 7.6   | 4.8   | 5.9  | 8.7    | 0.0  | 16.7   | 0.0                    | 4.4            | 10.0           | 10.0                  | 25.0 | 0.0  | 0.0  | 10.5   |
| ITN (6 mo.)           | 5.7   | 4.8   | 5.9  | 8.7    | 0.0  | 8.3    | 0.0                    | 4.4            | 6.7            | 5.0                   | 18.8 | 0.0  | 0.0  | 10.5   |
| BASE                  | 105   | 21    | 17   | 23     | 20   | 24     | 9                      | 45             | 60             | 20                    | 16   | 27   | 23   | 19     |

Within **NET-OWNING** households

|                       | Total | Site  |      |        |      |        | Urban<br>Accra<br>only | Urban/Rural    |                | Socio-Economic Status |      |      |      |        |
|-----------------------|-------|-------|------|--------|------|--------|------------------------|----------------|----------------|-----------------------|------|------|------|--------|
|                       |       | Accra | Keta | Kumasi | Wa   | Tamale |                        | Total<br>Urban | Total<br>Rural | 1 low                 | 2    | 3    | 4    | 5 high |
| <b>Children &lt;5</b> |       |       |      |        |      |        |                        |                |                |                       |      |      |      |        |
| Hanging net           | 68.1  | 56.5  | 76.4 | 66.3   | 60.7 | 69.8   | 55.9                   | 70.2           | 66.8           | 67.9                  | 73.3 | 62.0 | 72.1 | 64.5   |
| Hanging or baby net   | 70.9  | 62.3  | 78.6 | 68.7   | 63.6 | 72.4   | 61.8                   | 73.0           | 69.6           | 68.9                  | 74.7 | 64.3 | 76.5 | 70.2   |
| BASE                  | 746   | 69    | 229  | 83     | 173  | 192    | 34                     | 282            | 464            | 190                   | 150  | 129  | 136  | 141    |
| <b>Pregnant women</b> |       |       |      |        |      |        |                        |                |                |                       |      |      |      |        |
| Any net               | 68.8  | *     | *    | *      | *    | *      | *                      | *              | 63.2           | *                     | *    | *    | *    | *      |
| BASE                  | 32    | 5     | 9    | 3      | 8    | 7      | 2                      | 13             | 19             | 7                     | 6    | 6    | 5    | 8      |

\* Denominator too small to permit meaningful calculations

**Table 4.3e: Percent of vulnerable groups who slept under a net and under ITN last night – 2004**

**ETHIOPIA**

Among **ALL** households

|                       | TOTAL | Site (city plus surrounding rural areas) |        |              |        |        | Urban/Rural |           | Socio-Economic Status |     |      |      |        |
|-----------------------|-------|--|--------|--------------|--------|--------|-------------|-----------|-----------------------|-----|------|------|--------|
|                       |       | Bahir Dar                                | Nazret | Dire<br>Dawa | Dessie | Awassa | All Urban   | All Rural | 1 low                 | 2   | 3    | 4    | 5 high |
| <b>Children &lt;5</b> |       |  |        |              |        |        |             |           |                       |     |      |      |        |
| Hanging net           | 12.9  | 30.8                                     | 9.9    | 5.8          | 6.1    | 12.8   | 20.6        | 7.9       | 0.8                   | 3.6 | 14.2 | 19.5 | 26.9   |
| Hanging or baby net   | 16.1  | 33.7                                     | 13.0   | 12.1         | 7.0    | 15.7   | 26.5        | 9.3       | 0.8                   | 3.6 | 14.2 | 22.5 | 40.1   |
| ITN (12 mo.)          | 5.8   | 17.6                                     | 2.7    | 3.6          | 0.4    | 5.4    | 9.7         | 3.2       | 0.4                   | 1.4 | 6.2  | 8.0  | 13.2   |
| BASE                  | 1127  | 211                                      | 223    | 223          | 229    | 242    | 442         | 685       | 237                   | 219 | 225  | 226  | 219    |
| <b>Pregnant women</b> |       |  |        |              |        |        |             |           |                       |     |      |      |        |
| Any net               | 8.6   | 34.9                                     | 0.0    | 3.0          | 0.0    | 14.9   | 17.8        | 2.1       | 0.0                   | 0.0 | 13.4 | 7.1  | 24.9   |
| ITN (12 mo.)          | 6.2   | 23.3                                     | 0.0    | 3.0          | 0.0    | 9.9    | 14.8        | 0.0       | 0.0                   | 0.0 | 6.7  | 7.1  | 18.6   |
| BASE                  | 81    | 9  | 17     | 33           | 2      | 20     | 34          | 47        | 18                    | 18  | 15   | 14   | 16     |

Within **NET-OWNING** households

|                       | TOTAL | Site (city plus surrounding rural areas) |        |              |        |        | Urban/Rural |           | Socio-Economic Status |      |      |      |        |
|-----------------------|-------|--|--------|--------------|--------|--------|-------------|-----------|-----------------------|------|------|------|--------|
|                       |       | Bahir Dar                                | Nazret | Dire<br>Dawa | Dessie | Awassa | All Urban   | All Rural | 1 low                 | 2    | 3    | 4    | 5 high |
| <b>Children &lt;5</b> |       |  |        |              |        |        |             |           |                       |      |      |      |        |
| Hanging net           | 49.5  | 74.7                                     | 38.6   | 23.6         | 40.0   | 52.5   | 49.2        | 50.0      | 33.3                  | 47.1 | 61.5 | 47.8 | 46.8   |
| Hanging or baby net   | 57.3  | 79.3                                     | 47.4   | 38.2         | 42.9   | 61.0   | 58.4        | 55.6      | 33.3                  | 47.1 | 61.5 | 52.2 | 61.9   |
| BASE                  | 293   | 87                                       | 57     | 55           | 35     | 59     | 185         | 108       | 6                     | 17   | 52   | 92   | 126    |
| <b>Pregnant women</b> |       |  |        |              |        |        |             |           |                       |      |      |      |        |
| Any net               | 31.8  | *  | *      | *            | *      | *      | *           | *         | *                     | *    | *    | *    | *      |
| BASE                  | 22    | 3  | 3      | 10           | 0      | 6      | 16          | 6         | 0                     | 1    | 4    | 7    | 10     |

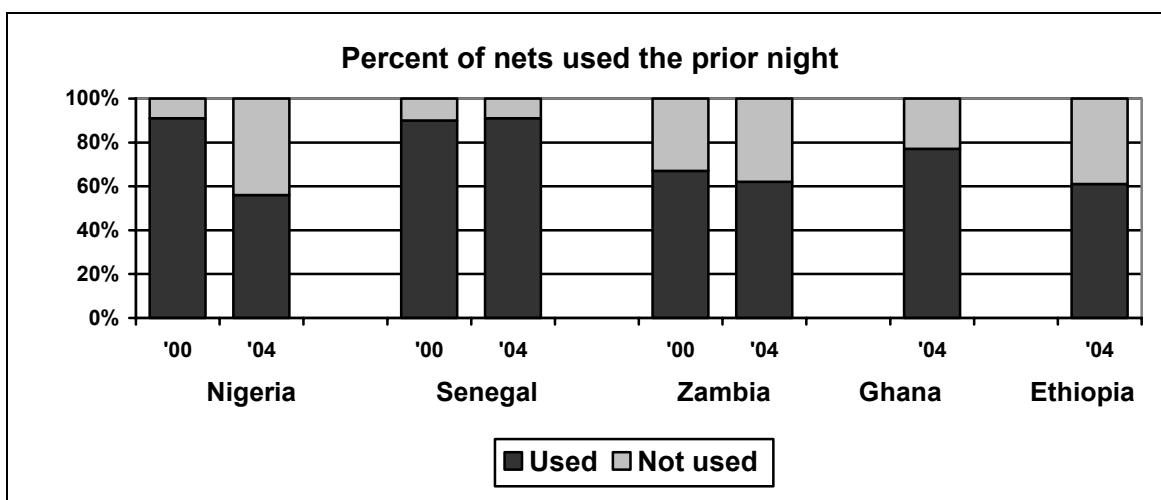
\*Denominator too small to permit meaningful calculations

#### 4.4 REGULARITY OF NET USE

*Ideally, nets should be used throughout the year to afford maximum malaria protection. The average number of months per year a household used its net(s) varied by country, and since 2000 increased in some countries and decreased in others. The proportion of nets that had been used the prior night also varied very widely by country, and since 2000 remained the same in some and declined in others. These are the only net ownership and use indicators that have not improved overall since 2000.*

- The average number of months during the year that nets were used ranged from lows of 5.8 in Ethiopia and 5.9 in Nigeria, to highs of 7.1 in Zambia and 7.2 in Ghana.
- In all countries except Senegal, a sizeable proportion of nets went unused the prior night.<sup>5</sup> In Senegal 91% of nets were used, but in Nigeria only 56% were used; in Ethiopia 61% were used; and in Zambia 62% were used. [Note that the Zambia data were collected in the dry season, but in all other countries the data were collected during the rainy season. The percent of nets used would likely be higher during the rainy season.] Ghana was fairly high at 77%.

**Figure 4.3**

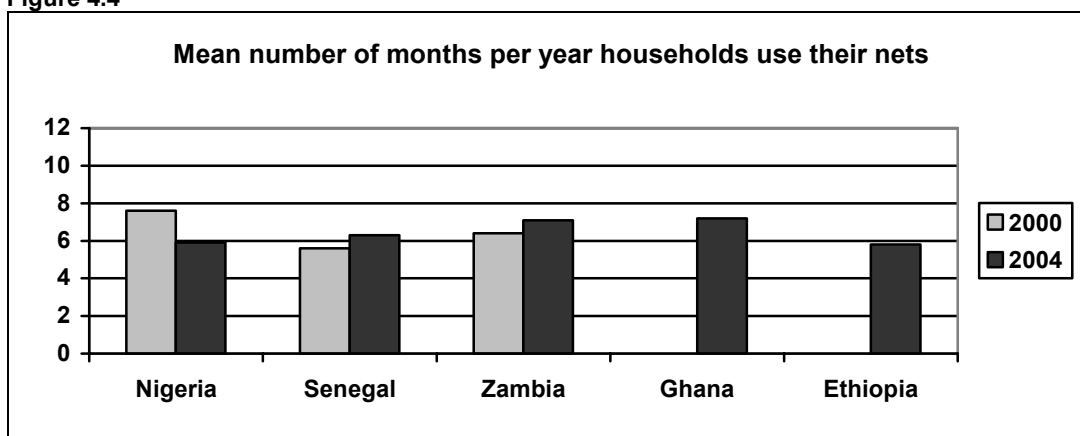


**Table 4.4: ALL COUNTRIES: Percent of nets used (had someone sleeping under) the prior night**  
Among all nets owned

|                      | NIGERIA |      | SENEGAL |      | ZAMBIA |      | GHANA | ETHIOPIA |
|----------------------|---------|------|---------|------|--------|------|-------|----------|
|                      | 2000    | 2004 | 2000    | 2004 | 2000   | 2004 | 2004  | 2004     |
| Percent of nets used | 90.6    | 55.8 | 90.4    | 91.1 | 66.7   | 61.6 | 77.4  | 60.7     |
| BASE                 | 159     | 856  | 649     | 2579 | 363    | 1734 | 808   | 341      |

<sup>5</sup> Further analyses are being conducted to look at the factors associated with non-use of nets, and will be reported in a separate paper.

**Figure 4.4**



**Table 4.5: ALL COUNTRIES: Mean number of months per year household uses their nets**

Among net-owning households

|                       | NIGERIA |      | SENEGAL |      | ZAMBIA |      | GHANA | ETHIOPIA |
|-----------------------|---------|------|---------|------|--------|------|-------|----------|
|                       | 2000    | 2004 | 2000    | 2004 | 2000   | 2004 | 2004  | 2004     |
| Mean number of months | 7.6     | 5.9  | 5.6     | 6.3  | 6.4    | 7.1  | 7.2   | 5.8      |
| BASE                  | 120     | 533  | 336     | 1122 | 265    | 999  | 572   | 250      |

## **ANNEX A: LIST OF TOPICS IN THE FULL REPORTS**

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### **SECTION 1: INTRODUCTION**

- 1.1 Background
- 1.2 Survey objectives, sample and sites, and implementation
- 1.3 Organization of report and tables

### **SECTION 2: NET AND ITN OWNERSHIP AND USE**

- 2.1 Ownership of nets and treated nets
- 2.2 Net and ITN use by vulnerable and other household members
- 2.3 Regularity of net use

### **SECTION 3: MOSQUITO NET TREATMENT AND WASHING PATTERNS**

- 3.1 Percent of nets treated
- 3.2 Net treatment practices
- 3.3 Net washing patterns

### **SECTION 4: CHARACTERISTICS OF NETS OWNED**

- 4.1 Age of nets
- 4.2 Source of nets
- 4.3 Factory-made vs. tailor-made nets
- 4.4 Brand of nets owned
- 4.5 Cost of nets
- 4.6 Size, shape, and color of nets owned
- 4.7 Who obtained the net/ITN

### **SECTION 5: KNOWLEDGE, BELIEFS AND SOURCES OF INFORMATION ABOUT MALARIA AND NETS**

- 5.1 Recognition of the term “malaria”
- 5.2 Perceived symptoms and causes of malaria
- 5.3 Knowledge of vulnerable groups
- 5.4 Awareness of insecticide treated nets
- 5.5 Perceived advantages and disadvantages of net and itn use by vulnerable groups
- 5.6 Reasons for non-ownership
- 5.7 Exposure to information on ITNs

### **SECTION 6: OTHER CONSUMER PREFERENCES AND PERCEPTIONS**

- 6.1 Preferred net size, shape, and color
- 6.2 Awareness and perceptions of mosquito net brands
- 6.3 Awareness and use of other mosquito control products
- 6.4 Association of attributes with nets, ITNs, and other mosquito control products

### **SECTION 7: PROGRAM AND PRODUCT IMPLICATIONS**

## ANNEX B: SAMPLING PLAN AND PROCEDURE

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The following is a description of the sampling plan as well as a comparison of these samples with national random samples.

### PLAN AND PROCEDURE

In the interest of comparability, the same procedure was used in all countries surveyed. A multistage sampling procedure was used to select respondents, as follows.

*1- Selection of primary sampling units:* Purposive sampling was used to select five sites that reflected the geo-ethnic diversity in the country. Further criteria included the potential for NetMark to be active in product distribution and/or programs to provide targeted subsidies for women who were pregnant or who had a child under five. In every country except Ethiopia, the capital was included as a site. (Malaria is not a significant problem in Addis Ababa.)

*2- Selection of sampling points:* The sampling points (villages or urban neighborhoods) were randomly selected from electoral or other suitable lists using quota sampling to attain 40% of households from the city and 60% located from up to 200 kilometers from the city. The 40:60 ratio approximates the actual urban-rural distribution in most of the countries surveyed. At each of the sampling points, 10 households were interviewed.

This stratification scheme was designed to meet the purposes of the evaluation. Since a key objective of NetMark is to increase ownership of ITNs across the socio-economic spectrum, it was essential to include urban centers with the potential to be reached by product distribution systems, as well as include households located at varying distances from the urban center where lower socio-economic status (SES) individuals typically reside.

The number of sampling points depended on the total sample size in each country. Ten households were selected at each sampling point. The specific number of sampling points in each country is as follows:

In Ethiopia: Within each of the sites, 20 sampling points (villages or urban neighborhoods) were randomly selected from electoral or other suitable lists using quota sampling: 8 from within the city (“urban”); 6 up to approximately 50 kilometer radius from the city (“near rural”); and 6 from a 50 to 150 kilometer radius from the city (“far rural”). In each of the sampling points, 10 households were interviewed

In Ghana: Within each of the sites, 30 sampling points (villages or urban neighborhoods) were randomly selected from electoral or other suitable lists using quota sampling: 12 from within the city (“urban”); 9 up to approximately 50 kilometer radius from the city (“near rural”); and 9 from a 50 to 150 kilometer radius from the city (“far rural”). In each of the sampling points, 10 households were interviewed

In Nigeria, Senegal, and Zambia: Within each of the sites, 40 sampling points (villages or urban neighborhoods) were randomly selected from electoral or other suitable lists using quota sampling: 12 from within the city (“urban”); 16 from within 100 kilometer radius from the city (“near rural”); and 16 from within a 100-200 kilometer radius from the city (“far rural”). In each of the sampling points, 10 households were interviewed.

*3- Selection of households:* Ten interviews were conducted per sampling point, each in a different household. For each sampling point, a starting point (a fixed landmark or address) and the direction from which to start the data collection were chosen. Interviewers were instructed to go to the starting point and walk in the chosen direction until they located a residence with a qualified respondent. After a successful interview, interviewers were instructed to skip five residences (or less if residences were far apart) and seek another qualified respondent.

*4- Selection of eligible respondents:* An eligible respondent for the evaluation was a female 15-49 years old who was the parent or guardian of a child under five years, i.e., aged 0-4. Females aged 15-49 were selected to maximize the sample size for calculating the proportion of females of reproductive age sleeping under a net. Similarly, only those women who had a child under five were included, to maximize the sample size for calculating the proportion of children under five sleeping under a net.

## **HOW THE SAMPLE MAY DIFFER FROM NATIONALLY RANDOM SAMPLES**

This sampling procedure was designed to meet the purposes of this study. This procedure may result in findings that would differ from those obtained from a true national random sample, which was neither desirable nor feasible for this study:

- a) Only households with children under five were included in the sample, and households with young children are more likely than others to own a net.
- b) The sample was drawn only from areas where malaria is a problem. Net ownership will be much higher in areas where malaria is a problem than in other areas.
- c) Various organizations have had net/ITN promotional activities in areas included in the study. Because there are five primary sites rather than a randomly selected sample, if a site is unusually high or low in coverage, it will have a disproportionate impact on the overall ownership and use figures. For example, if a donor or project were particularly active in a site and coverage is very high, that high coverage will count as 20% of the entire sample, even though the site does not account for 20% of the population nationally.
- d) When net ownership in a large and densely populated site such as a capital is lower than in other areas, the levels of ownership and use in this study will be higher than a random sample because this sample included the same number of respondents per site, even though proportionally the capital has more people than other sites.
- e) Only women of reproductive age were selected as respondents. Responses from men or from older women may differ from those of women of reproductive age.

## ANNEX C: CHARACTERISTICS OF RESPONDENTS AND HOUSEHOLDS, AND SES SCALE

This Annex provides descriptive information on respondents and households in the sample, as well as a description of how these variables were combined to construct a socio-economic status (SES) scale.

### CHARACTERISTICS OF RESPONDENTS

**Table C-1:**

|                  | NIGERIA | SENEGAL | ZAMBIA | GHANA | ETHIOPIA |
|------------------|---------|---------|--------|-------|----------|
| <b>AGE GROUP</b> |         |         |        |       |          |
| 15-19 years      | 4.4     | 7.6     | 11.1   | 3.6   | 8.4      |
| 20-29 years      | 48.7    | 46.3    | 52.3   | 45.3  | 50.0     |
| 30+ years        | 47.0    | 46.2    | 36.6   | 51.1  | 41.6     |
| Mean             | 29      | 29      | 28     | 30    | 29       |
| <b>EDUCATION</b> |         |         |        |       |          |
| None             | 22.0    | 53.8    | 11.2   | 36.3  | 35.9     |
| 1-6 years        | 4.1*    | 30.6    | 27.4   | 17.7  | 19.4     |
| 7-12 years       | 63.3**  | 12.7    | 56.3   | 40.8  | 40.4     |
| 13+ years        | 10.6    | 3.0     | 5.3    | 5.1   | 4.3      |
| BASE             | 2000    | 2000    | 2000   | 1500  | 1000     |

\* 1-5 years \*\* 6-12 years

(In each country, the specific breakdown for years of education corresponded to years of primary and secondary school in that country)

### CHARACTERISTICS OF HOUSEHOLDS

**Table C-2: Household distribution and composition**

|  | NIGERIA | SENEGAL | ZAMBIA | GHANA | ETHIOPIA |
|--|---------|---------|--------|-------|----------|
| Number of households in sample               | 2000    | 2000    | 2000   | 1500  | 702*     |
| Average number of people in HH               | 5.4     | 8.7     | 5.8    | 5.2   | 4.8      |
| Average # of women of reproductive age in HH | 1.3     | 2.1     | 1.5    | 1.4   | 1.5      |
| Average number of children under 5 in HH     | 1.5     | 2.1     | 1.4    | 1.3   | 1.1      |

\*Number of households with complete family enumeration data

**Table C-3: Age distribution of household members**

|                | NIGERIA | SENEGAL | ZAMBIA | GHANA | ETHIOPIA |
|----------------|---------|---------|--------|-------|----------|
| 0 years        | 6.4     | 5.1     | 5.4    | 5.7   | 3.3      |
| 1 years        | 4.5     | 3.9     | 4.5    | 4.4   | 3.8      |
| 2 years        | 5.7     | 4.7     | 4.9    | 4.6   | 5.2      |
| 3 years        | 5.8     | 4.9     | 4.6    | 5.1   | 5.0      |
| 4 years        | 6.0     | 5.0     | 5.3    | 5.9   | 5.8      |
| 5-14 years     | 25.9    | 27.0    | 26.8   | 24.8  | 25.2     |
| 15-49 years    | 40.1    | 38.7    | 43.5   | 43.0  | 49.0     |
| 50 and older   | 2.4     | 5.7     | 2.4    | 5.3   | 2.8      |
| Don't know age | 3.2     | 5.0     | 2.6    | 1.2   |          |
| BASE           | 10791   | 17432   | 11608  | 7824  | 4894     |

## SOCIOECONOMIC CHARACTERISTICS

**Table C-4:**

|                                      | NIGERIA | SENEGAL | ZAMBIA | GHANA | ETHIOPIA |
|--------------------------------------|---------|---------|--------|-------|----------|
| <b>HEAD OF HOUSEHOLD</b>             |         |         |        |       |          |
| Self                                 | 2.8     | 3.8     | 16.8   | 14.3  | 20.2     |
| Husband                              | 92.7    | 67.4    | 67.0   | 68.9  | 71.6     |
| Father                               | 2.4     | 8.4     | 5.0    | 6.4   | 2.6      |
| Brother                              | .6      | 4.1     | 2.2    | .8    | .5       |
| Mother                               | .8      | 4.8     | 4.7    | 6.0   | 3.8      |
| Sister                               | .2      | .5      | 1.5    | .8    | .6       |
| Other                                | .8      | 11.1    | 3.0    | 2.9   | .7       |
| <b>INCOME REGULARITY</b>             |         |         |        |       |          |
| Regular                              | 38.0    | 30.3    | 30.1   | 24.8  | 34.7     |
| Occasional                           | 53.6    | 55.8    | 33.6   | 35.7  | 42.5     |
| Seasonal                             | 7.4     | 13.1    | 35.4   | 39.0  | 22.6     |
| Don't Know                           | 1.0     | .8      | 1.0    | .5    | .2       |
| <b>None</b>                          |         |         | 8.1    |       |          |
| <b>HEAD OF HOUSEHOLD'S EDUCATION</b> |         |         |        |       |          |
| None                                 | 14.8    | 63.7    | 8.1    | 4.1   | 9.8      |
| 1 - 6 years                          | 1.4*    | 13.1    | 12.3   | 4.1   | 16.3     |
| 7-12 years                           | 54.1**  | 11.5    | 63.4   | 47.5  | 42.6     |
| 13 years or more                     | 14.8    | 63.7    | 8.1    | 4.1   | 9.8      |
| Don't know                           |         |         |        | 31.4  | 18.5     |
| <b>HOUSEHOLD ASSETS</b>              |         |         |        |       |          |
| Electricity                          | 86.0    | 62.1    | 25.7   | 59.6  | 84.4     |
| Working radio                        | 89.1    | 91.7    | 54.6   | 78.1  | 80.9     |
| Working TV                           | 65.3    | 57.4    | 28.7   | 34.9  | 35.1     |
| Working telephone                    | 27.3    | 50.8    | 14.6   | 13.6  | 22.3     |
| Working refrigerator                 | 35.6    | 32.4    | 17.5   | 25.5  | 14.1     |
| Working bicycle                      | 21.3    | 23.6    | 31.9   | 37.9  | 12.4     |
| Working motorcycle                   | 21.0    | 10.3    | 2.0    | 9.1   | 1.0      |
| Working automobile                   | 19.3    | 12.6    | 5.1    | 6.7   | 4.0      |
| Cart                                 | 1.3     | 26.4    | 2.8    | 1.3   | 4.2      |
| Plough                               | 2.5     | 20.2    | 6.9    | 1.9   | 15.4     |
| Window/ door screens                 | 40.2    | 13.9    | 6.1    | 45.4  | 4.0      |
| None of the above                    | 3.4     | 1.9     | 29.4   | 8.5   |          |
| <b>SANITARY FACILITIES</b>           |         |         |        |       |          |
| Flush toilet                         | 14.7    | 15.0    | 17.6   | 5.3   | 6.0      |
| Shared flush toilet                  | 12.7    | 5.1     | 1.2    | 4.8   | 2.2      |
| Traditional pit latrine              | 52.9    | 38.7    | 63.8   | 16.5  | 64.9     |
| Ventilated pit latrine               | 10.7    | 31.6    | 5.7    | 20.3  | 9.2      |
| Other                                | .3      | 5.1     | .4     | 52.9  | .2       |
| None                                 | 8.8     | 4.7     | 11.5   | .3    | 17.5     |

|                                  | NIGERIA | SENEGAL | ZAMBIA | GHANA | ETHIOPIA |
|----------------------------------|---------|---------|--------|-------|----------|
| <b>SOURCE OF DRINKING WATER</b>  |         |         |        |       |          |
| Piped into home                  | 13.5    | 55.6    | 24.4   | 15.9  | 31.5     |
| Public tap                       | 21.1    | 20.6    | 10.6   | 37.4  | 49.4     |
| Well into residence              | 10.5    | 6.6     | 12.2   | 2.8   | 1.4      |
| Public well                      | 10.2    | 14.0    | 18.3   | 6.0   | 2.3      |
| Public bore hole                 | 18.6    | 1.8     | 24.8   | 24.6  | 3.7      |
| Spring                           | 2.2     | .0      | .0     | .8    | 3.6      |
| River                            | 4.4     | .7      | 7.9    | 9.2   | 6.7      |
| Pond/lake                        | .2      | .4      | .2     | .9    | .7       |
| Tanker truck                     | 13.3    | .0      | .0     | 1.1   | .5       |
| Rainwater                        | 3.5     | .1      | .0     | 1.0   | .0       |
| Bottled water                    | 2.8     | .0      | .1     | .1    | .0       |
| Other                            | .0      | .5      | 1.9    | .1    | .2       |
| <b>ENERGY SOURCE FOR COOKING</b> |         |         |        |       |          |
| Electricity                      | .9      | .1      | 17.8   | .3    | .7       |
| LPG                              | 2.7     | 42.9    | .0     | 9.8   | 12.2     |
| Biogas                           | .3      | .7      | .0     | .1    | .5       |
| Kerosene                         | 45.7    | .3      | .4     | 1.1   | 11.1     |
| Coal                             | .0      | .0      | .0     | .0    | .0       |
| Charcoal                         | 1.1     | 16.6    | 32.5   | 39.0  | 19.0     |
| Firewood                         | 49.2    | 39.4    | 48.3   | 49.7  | 53.0     |
| Dung                             | .3      | .1      | .0     | .0    | 3.2      |
| Other                            | .2      | .0      | .1     | .0    | .3       |
| <b>MAIN FLOORING</b>             |         |         |        |       |          |
| Earth                            | 9.1     | 13.3    | 52.2   | 11.6  | 35.1     |
| Dung                             | .0      | .0      | 3.0    | .1    | 23.8     |
| Wood planks                      | .1      | .0      | .1     | .1    | 2.1      |
| Palm                             | .2      | .0      | .1     | .0    | .7       |
| Parquet                          | .1      | .2      | .1     | .1    | .1       |
| Vinyl                            | 19.9    | .7      | .6     | 3.9   | 4.3      |
| Ceramic                          | 1.7     | 11.4    | 2.2    | 1.3   | 1.4      |
| Cement                           | 63.3    | 50.4    | 40.9   | 79.6  | 30.5     |
| Carpet                           | 5.7     | 24.3    | .9     | 3.3   | 2.0      |
| Other                            | .1      | .0      | .2     | .0    | .0       |
| BASE                             | 2000    | 2000    | 2000   | 1500  | 1000     |

\* 1-5 years \*\* 6-12 years

(In each country, the specific breakdown for years of education corresponded to years of primary and secondary school in that country)