

Exposure to anti-malaria BCC messages: First RBHS ITN dipstick survey

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Liberia Rebuilding Basic Health Services (RBHS)

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Executive Summary

The Rebuilding Basic Health Services project (RBHS) is supporting the Ministry of Health and Social Welfare (MOHSW) to develop a comprehensive system of high-quality health services for all of Liberia through implementation of the National Health Plan and mobilization of communities. In collaboration with the National Malaria Control Program (NMCP), RBHS launched its first behavior change communication (BCC) campaign on 6 November 2009: "Take Cover" is designed to encourage people all over the country, but especially in RBHS coverage areas, to sleep under insecticide-treated bednets (ITNs). The campaign initially concentrates where bednets have already been distributed: Nimba, Lofa, Bong, and River Gee Counties. The campaign uses a variety of media to get across its message: UNMIL radio, community radio, bulk SMS texting, posters, brochures, stickers, and word of mouth. To maximize the campaign's effectiveness, RBHS needs to quantify how many people are being reached by the message, and through which media.

This "dipstick" survey's primary objective was to measure how well the ITN campaign is reaching its target population through a very short and simple study: To find out what proportion of women with children under five have been exposed to the Take Cover message and through what media. The survey followed a cluster design, interviewing 133 mothers of children under five in 19 randomly selected communities in RBHS catchment districts in Lofa, Bong, and Nimba Counties (seven women per community) during the week 5-9 January 2010. Two teams of four people (two interviewers and two supervisors) conducted the survey using duplicate recording techniques: a standard paper questionnaire and simultaneously an electronic version on Nokia E63 cell phones. Interviewers showed respondents posters, leaflets, and stickers, and also played clips of the Take Cover jingle and one radio spot to test recognition of campaign components.

The results, summarized in the table below, show that women are hearing messages about sleeping under bednets and indeed most are sleeping under nets when one is present in the household. However, despite the study areas having been selected because of recent mass ITN distribution, only about half the households surveyed had a net present.

| Question | n | Freq | % | 95% Lower CL | 95% Upper CL |
|---|-----|------|-----|--------------|--------------|
| ITN in household | 133 | 69 | 52% | 39% | 65% |
| Respondent slept under ITN last night | 69 | 61 | 88% | 79% | 98% |
| Youngest child slept under ITN last night | 69 | 61 | 88% | 79% | 98% |
| Heard any (unprompted) malaria message | 133 | 70 | 53% | 41% | 64% |
| Heard Take Cover jingle or radio spot | 133 | 79 | 59% | 46% | 73% |
| Seen any Take Cover printed material | 133 | 74 | 56% | 36% | 53% |

While over half the respondents reported seeing Take Cover printed material and hearing the Take Cover jingle or radio spot, they also reported having seen not only an old ITN poster, but a fake poster that had never appeared in Liberia. Clearly most respondents had trouble distinguishing among various posters. Interpretation of the results is also complicated by how far the campaign has advanced in different counties. In general, people in Nimba County were far more likely than those in Bong or Lofa to have been exposed to the various messages, although that very difference suggests that Take Cover is making a significant contribution to spreading the ITN message in areas where the campaign is more advanced.

Coming so soon after the start of the campaign, this survey represents more of a baseline than a progress report, but nonetheless gives evidence that already Take Cover is making itself felt in communities.

1 Study context and justification

The Rebuilding Basic Health Services project (RBHS) is supporting the MOHSW to develop a comprehensive system of high-quality health services for all of Liberia through implementation of the National Health Plan and mobilization of communities. RBHS uses a three-pronged strategic approach: 1) strengthening and extending health services to clinics and communities through performance-based contracts to NGO partners; 2) strengthening Liberia's health system in the areas of human resource management, infrastructure, policy development, and monitoring and evaluation; and 3) preventing disease and promoting more healthful behaviors through behavior change communication (BCC) and community mobilization.

Malaria remains the major cause of morbidity and mortality in Liberia. The RBHS approach to improving malaria prevention and control is closely linked to the Operational Plan of the President's Malaria Initiative (PMI) and has been designed following close consultation with the National Malaria Control Program (NMCP). It includes components that address BCC, clinical services at facility and community levels, training, and capacity building and management support of the NMCP. A particular focus is on preventing malaria in children under five and pregnant women, the populations for whom malaria can be most dangerous.

RBHS's first BCC campaign was launched on 6 November 2009: "Take Cover" is designed to encourage people all over the country, but especially in RBHS coverage areas, to sleep under insecticide-treated bednets (ITNs). The campaign initially concentrates where bednets have already been distributed: Nimba, Lofa, Bong, and River Gee Counties. The campaign uses a variety of media to get across its message: UNMIL radio, community radio, bulk SMS texting, posters, brochures, stickers, and word of mouth. To maximize the campaign's effectiveness, RBHS needs to quantify how many people are being reached by the message, and through which media.

2 Objectives

2.1 Main objective

The study's primary objective was to measure how well the ITN campaign is reaching its target population over the coming year.

2.2 Study questions

1. Of mothers with children under five in the study area, what percentage have been exposed to the Take Cover message?
2. Of people who have been exposed to the message, how have they been exposed (by what media)?
3. Of people who have been exposed, what percentage have understood the message?

Answers to the study questions will help RBHS to analyze the success of the campaign and modify activities to improve its effectiveness.

3 Methods

3.1 Study population

The study population includes all mothers of children under 5 living in the catchment areas of RBHS facilities in Lofa, Bong, and Nimba Counties, the total catchment population being 765,000.

3.2 Study design

The dipstick study is a two-stage cluster design, with 19 clusters and 7 samples within each cluster. (See sample size calculation below.) A cluster is an enumeration area (EA) as defined during the 2008 Liberia Census. The study area consists of all districts in Lofa, Bong, and Nimba Counties with

RRBHS-supported facilities. All EAs within that area were listed, with their populations, and in the first stage of the survey, 19 were selected at random proportional to their populations. Out of the total of 1,758 EAs in the study area, the selected 19 represent about 1%.

The household was the primary sampling unit and unit of analysis. In the second stage, within each cluster, seven households were selected, giving a total of $19 \times 7 = 133$ households.

3.3 Sample size calculation

The sample size was calculated using the following formula:

$$n = \frac{EZ^2 p(1-p)}{d^2}$$

where

E = design effect accounting for a cluster survey design,

$Z = 1.96$ (for 95% confidence interval),

p = expected proportion with the characteristic of interest, and

d = half the desired width of the confidence interval ($\pm d$).

Since the proportion of the population is not known ahead of time, p is taken to be 50% (worst case). The desired precision is $\pm 10\%$. The design effect is difficult to estimate in advance, and can vary greatly from survey to survey and even from question to question within the same survey. A general formula is

$$E = 1 + (m - 1)\rho$$

where m is the number of samples per cluster (taken here to be 7) and ρ is the intra-cluster correlation coefficient, which also varies across surveys and questions, but an average value for DHS surveys in rural Liberia is 0.06¹, which gives a value of $E = 1.4$.

Using the above values, the sample size is calculated to be 131, satisfied by the $19 \times 7 (=133)$ design described above.

3.4 Sampling method

As described above, 19 clusters were selected randomly proportional to population. In practice, logistical problems arose reaching some of the clusters. In particular, three bridges were down in Buu Yao District of Nimba County, making the three clusters in Buu Yao inaccessible. The survey team decided to substitute communities judged to be equivalent and nearby, but on the good side of the bridges. Two were also in Buu Yao, while the third was in neighboring Twah River District (also an RBHS-supported district).

Within each cluster, one household was selected at random from 2008 Census listings before field work began, then the other six were selected systematically (every third house encountered by walking in an initial random direction) once in the field. However, all study households had to include a woman with children under five, so each household was first screened for the presence of such women. If no such woman was a member of the household, another household was selected by continuing the random walk.

For households with multiple women having children under five, the sampling scheme included a third stage, in which from a given household a single woman was randomly selected from among those who had children under five. The interviewer wrote the names of all qualifying women on separate scraps of paper, then asked someone else to select one piece of paper without seeing the names. In such a case, the household may still be considered to be the unit of analysis, since there was exactly one woman interviewed per household.

¹ Le, Thanh N. and Vijay K. Verma. *An analysis of sample designs and sampling errors of the Demographic and Health Surveys*. Demographic and Health Surveys analytical reports no. 3. Macro International, 1997.

If a household was visited and no woman with children under five was home, then the closest neighbor was visited and interviewed, substituting for the selected household. (And if no woman at the closest neighbor was home, the next closest neighbor was visited, continuing until the team found someone at home.) In fact, needing to move to the closest neighbor was common; the study period fell during a major farming season, and many women in villages visited during daylight were working in their fields and were not home to be interviewed.

3.5 Study period

Data collection was done during the week 5-9 January 2010. The study questionnaire did not address a specific recall period, with two exceptions: it asked if the respondent or her child slept under an ITN the previous night, and if she had heard any malaria-related message within the past four weeks.

3.6 Data collection

Data were collected by two teams of four trained people each: two interviewers and two supervisors. Each team covered nine or ten clusters, interviewing seven households per community. The four team members visited each community together, with each interviewer-supervisor pair going separately to individual houses.

Interviewers used a structured questionnaire that was pre-tested in a community near Monrovia. Written informed consent to be interviewed was obtained from each respondent before beginning the questions. Data were entered in the field using Nokia E63 cell phones loaded with an EpiSurveyor-based version of the questionnaire; for quality assurance, interviewers also entered answers onto a paper form. The questionnaire was written in simple English, but was verbally translated by the interviewer into the local language if the respondent was not comfortable in English. It was not feasible to make written translations of the questionnaire into all possible local languages, nor can most people read local languages. In a few cases, neither interviewer nor supervisor could speak the local language and the respondent could not speak English; in such cases, local community members who were bilingual facilitated translation, though accuracy of the translation was impossible to verify.

Recall was assessed by first asking for unprompted responses to questions about malaria messages seen or heard. Only after recording answers did interviewers address recognition through use of multimedia supplementary material. For instance, to test recognition of a jingle and radio spot, interviewers played recordings from the cell phone. Interviewers played the jingle first; the much longer radio spot was played only after asking questions about the jingle. The radio spot led off with a few seconds of the jingle. While radio spots are broadcast in 11 different languages, the survey teams played only the English version, for consistency. Similarly, for recognition of the posters, leaflet, and sticker, interviewers showed full-color, A4-size paper copies, including two posters that were not part of the Take Cover campaign. The posters and other material were displayed sequentially, not at the same time, in the following order:

1. Old MOHSW ITN poster (not Take Cover)
2. Take Cover poster (pregnant woman alone under net)
3. ðFakeö ITN poster, used in Ghana, but never in Liberia (not Take Cover)
4. Take Cover poster (couple under net)
5. Take Cover poster (four photos of different net placements)
6. Take Cover leaflet
7. Take Cover sticker

3.7 Data analysis

Data were uploaded from the cell phones into the Web-based Epi-Surveyor and exported into an Excel file to be analyzed using EpiInfo 3.5.1. Random paper questionnaires were cross-checked against the electronic version entered by cell phone. Frequency distributions of all variables were produced to facilitate data cleaning, and then frequencies and confidence intervals were calculated with EpiInfo.

The confidence intervals were adjusted using robust variance estimates to account for the cluster design of the survey.

While extensive bivariate analysis could not be supported by the small sample size, some selected analysis was conducted for key factors such as county of residence. Due to gaps in EpiInfo software and the unavailability of alternative statistical analysis software, p-values could not be adjusted to reflect the cluster design and are therefore likely to be slightly smaller than they should be. However, for the p-values reported herein, the differences are trivial and do not affect any conclusions.

4 Ethical considerations

No experimentation was carried out on human subjects. The questionnaire was brief and took an average of 10-15 minutes to administer to each household, causing a minimum of inconvenience for the respondents. No questions were likely to be emotionally disturbing, and there were no physically invasive examinations.

Respondents did directly benefit from the survey, but the study results will be used to make current project activities more effective, which will benefit the entire study population.

Written informed consent was obtained from each study respondent. Confidentiality of responses will be assured by storing paper questionnaires in a locked file cabinet and by restricting access to the computer database to the two study investigators.

5 Results

In only one household did the identified respondent choose not to answer the survey questions. Since the survey team substituted another household for that one (the next closest household with a woman having children under five), the total number of respondents was exactly the 133 planned. A summary of the survey responses follows; detailed results for each question are shown in Annex 1.

5.1 Respondent characteristics

Due to the intentionally quick and focused nature of this dipstick survey, few questions not related to malaria and ITNs were asked. Those characteristics are summarized in Table 1 below.

Table 1: Respondent characteristics

| Question | n | Freq/ median | % |
|---------------------------------------|-----|-----------------|-----|
| Respondent's age, years (median) | 133 | 28 | |
| Respondent's marital status | 133 | | |
| Single | | 19 | 14% |
| Married | | 76 | 57% |
| Cohabiting | | 35 | 26% |
| Widowed | | 3 | 2% |
| # living children (median) | 133 | 3 | |
| # living children U5 (median) | 133 | 1 | |
| Age of youngest child, years (median) | 133 | 2 | |
| Pregnant now | 133 | 17 | 13% |

5.2 ITN usage and malaria knowledge

As seen from Table 2 below, about half the responding households had at least one ITN; most of the respondents and their youngest child slept under a net if they had one. The survey included only 17 pregnant women, eight of whom had an ITN; all eight of those pregnant women reported sleeping under the net the previous night. Though no question about net distribution was asked during the survey, in a

number of communities respondents and bystanders said either that nets had never been distributed in their community or that the supply had been insufficient and many households had not received a net.

Table 2: ITN usage and malaria knowledge

| Question | n | Freq | % | 95% Lower CL | 95% Upper CL |
|--|-----|------|-----|--------------|--------------|
| ITN in household | 133 | 69 | 52% | 39% | 65% |
| Respondent slept under ITN last night | 69 | 61 | 88% | 79% | 98% |
| Youngest child slept under ITN last night | 69 | 61 | 88% | 79% | 98% |
| Knows what malaria is | 133 | 77 | 58% | 49% | 67% |
| Heard any malaria message on radio in last 4 weeks | 133 | 45 | 34% | 23% | 45% |
| Heard any malaria message from chief | 133 | 23 | 17% | 8% | 27% |
| Heard or seen other messages about malaria in last 4 weeks | 133 | 48 | 36% | 24% | 48% |
| Heard any (unprompted) malaria message | 133 | 70 | 53% | 41% | 64% |

About a third of respondents had heard a message about malaria on the radio in the past four weeks and 42% of those reported (unprompted) having heard a message about using mosquito nets or sleeping under nets at night. While many women told interviewers that they had no radio (not a survey question), they often still heard radios at neighbors' houses. While few respondents had heard a malaria message from a chief, all but two of those reported that the message related to using bednets. Just over a third of respondents had heard a malaria message in the past four weeks other than on the radio or from a chief; the remembered messages were very similar to those reported being heard over the radio.

Combining responses from those three questions shows that just over half of respondents had seen or heard (without being prompted) some malaria message. The messages they reported hearing are shown graphically in Figure 1. Note that the percentages add up to more than 100% because some respondents reported more than one message. (Identical messages from the same respondent ó i.e., for two different questions ó are not counted twice.)

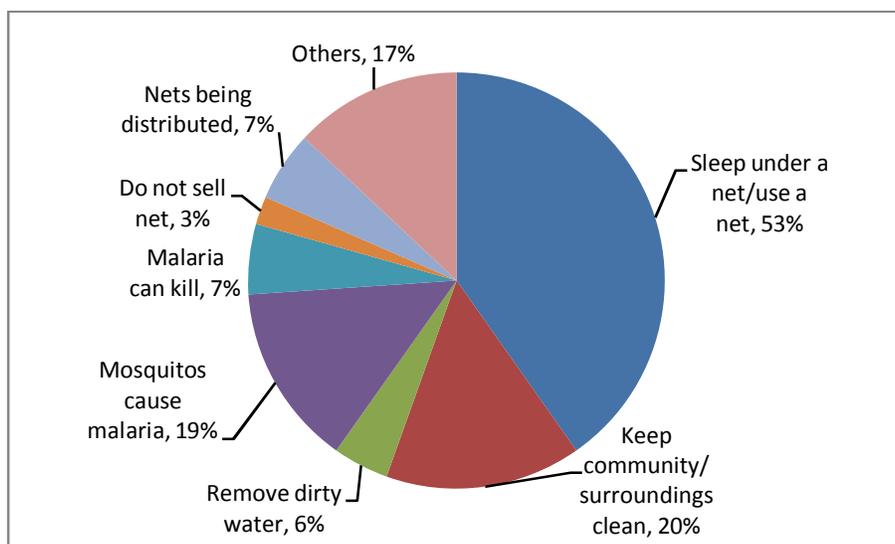


Figure 1
Malaria messages seen or heard

No factors (such as county of residence, pregnancy, number of children) were significantly associated with having a net or not, though the sample size for the survey was too small in general to conclude that no association exists. For instance, Lofa and Nimba Counties had almost the same net ownership ó 56% combined ó which was far greater than ownership in Bong County ó 40% -- but the difference was not statistically significant.

On the other hand, whether people heard a malaria message (unprompted ó not counting responses to specific Take Cover questions) was highly dependent on what county they lived in. Respondents in Nimba County were far more likely to report having heard a malaria message (71%) than those in Bong or Lofa County (32% combined), OR=5.4, p<0.0005.

5.3 Exposure to Take Cover ITN campaign

Table 3 below summarizes exposure to the Take Cover jingle, radio spot, three posters, leaflet, and sticker, as well as the two non-RBHS posters. Almost 60% of respondents reported hearing a Take Cover radio message, with a similar number seeing Take Cover printed material. By far the most common place to have seen printed material was in health facilities. (Percentages add to more than 100% because of multiple responses from some respondents.)

Table 3: Take Cover exposure

| Question | n | Freq | % | 95% Lower CL | 95% Upper CL |
|---------------------------------------|-----|------|-----|--------------|--------------|
| Recognized RBHS ITN jingle | 133 | 38 | 29% | 18% | 39% |
| Recognized RBHS ITN radio spot | 133 | 76 | 57% | 43% | 71% |
| Recognized old poster | 133 | 70 | 53% | 39% | 66% |
| Recognized Take Cover poster #1 | 133 | 58 | 44% | 31% | 56% |
| Recognized fake poster | 133 | 43 | 32% | 22% | 43% |
| Recognized Take Cover poster #2 | 133 | 47 | 35% | 24% | 47% |
| Recognized Take Cover poster #3 | 133 | 30 | 23% | 12% | 33% |
| Recognized leaflet | 133 | 24 | 18% | 10% | 26% |
| Recognized sticker | 133 | 13 | 10% | 5% | 14% |
| Heard Take Cover jingle or radio spot | 133 | 79 | 59% | 46% | 73% |
| Seen any Take Cover printed material | 133 | 74 | 56% | 44% | 68% |
| Where Take Cover material last seen | 74 | | | | |
| Health facility | | 62 | 84% | | |
| School | | 1 | 1% | | |
| CHV | | 3 | 4% | | |
| House/shop | | 15 | 20% | | |
| Palava hut | | 4 | 5% | | |
| Others | | 3 | 4% | | |

Two other aspects of Table 3 deserve notice. First, more than half of respondents reported having seen the old poster, more than any other material, including the Take Cover posters. Moreover, a third of respondents reported having seen the fake poster, which has never been displayed in Liberia. Second, reported recognition decreased nearly monotonically in the order in which the materials were displayed to respondents. See Figure 2.

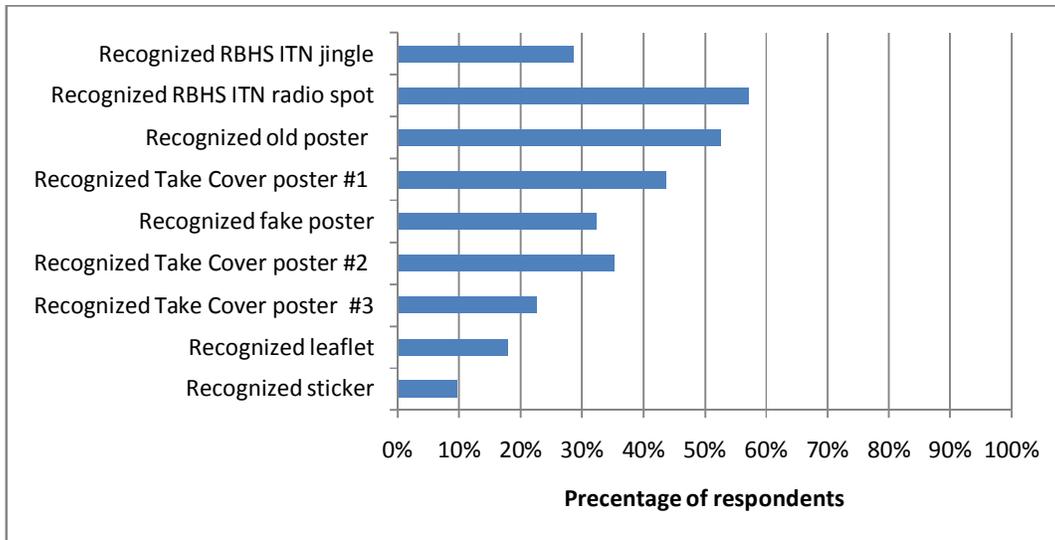


Figure 2
Recognition of Take Cover media (from top to bottom in order of questioning respondents)

Of respondents who heard the Take Cover jingle, and remembered where they had heard it, half (16 of 32) reported hearing it on Radio Nimba (from Sanniquellie). There have been problems with radio transmission from Bong and Lofa Counties, which are reflected in these data: People were much likely to have heard either the jingle or the radio spot in Nimba (77%) than in Bong-Lofa (40%), OR=5.1, $p < 0.0005$.

Similar differences are found for exposure to printed material: While 69% of Nimba respondents reported having seen Take Cover posters, leaflet, or sticker, only 41% of Bong and Lofa respondents had seen them, a statistically significant difference (odds ratio [OR]=3.1, $p = 0.002$); Nimba residents were over three times as likely as people in Bong and Lofa to have been exposed to Take Cover material. The age of the respondent was also associated with exposure to the Take Cover campaign, with younger women (≥ 25 years) over twice as likely as older women to have seen Take Cover material (OR=2.2, $p = 0.028$).

6 Discussion

6.1 Exposure to ITN message

The three counties covered by this survey were selected because mass ITN distribution had been done there within the past year. However, only 52% of respondents reported having a net in the household, which imposes a clear limitation on the potential impact of the Take Cover campaign and ITN messages in general. Nonetheless, it is certainly good news that 88% of respondents and their youngest children and 100% of pregnant women reported having slept under a net the previous night if there was one in the household.

Comparing those usage results with the 2009 Liberia Malaria Indicator Survey² (MIS) reveals some puzzles. The MIS was conducted in late 2008-early 2009, before mass ITN distribution sponsored by DELIVER was done in Lofa, Bong, and Nimba Counties (defined by the MIS as the "North Central" region) in June-July 2009. (All subsequent references to MIS results will be restricted to the North Central region.) The MIS showed that 57% of households had at least one ITN, versus this dipstick figure of 52% (95% confidence interval: 39%-65%). The figures are certainly consistent, although a bit surprising, since the MIS was conducted before mass distribution and the RBHS dipstick was

² *Liberia Malaria Indicator Survey 2009*. 2009. National Malaria Control Program (NMCP) [Liberia], Ministry of Health and Social Welfare, Liberia Institute of Statistics and Geo-Information Services (LISGIS), and ICF Macro. Monrovia, Liberia.

conducted afterwards. However, many communities complained about nets not being delivered in sufficient quantities or at all, which might explain why the dipstick figure isn't higher, though as noted in section 5.2, Lofa and Nimba Counties had virtually the same ITN ownership, and while their difference with Bong was large, it was not statistically significant.

The MIS (again restricted to the North Central region) found that in households with an ITN, 52% of children under five and 65% of women slept under an ITN the previous night, as compared with this dipstick's 88% for both groups. It seems unlikely that the Take Cover campaign could have had that big an effect that quickly (just six weeks after launch). More likely is that the massive publicity associated with the June/July net distribution and the subsequent complaints about shortages sensitized people to the importance of nets, even causing them to be more valued and therefore, perhaps, more used. Regardless of the reason, the 88% represents a dauntingly high baseline for the Take Cover campaign to maintain and improve upon.

The MIS found that 76% of women had seen or heard a message about malaria in the past few months. This dipstick found that only 53% (unprompted) had seen or heard a message (95% confidence interval, 41%-64%), though the dipstick questions specified in the past four weeks; it does not seem likely that a few months versus four weeks would explain such a large difference, especially given the problems respondents had with time as described in section 6.3 below. (The MIS results were limited to women who had heard of malaria, but that was 98%, so would only lower the malaria message figure to 74%.) Among women who had seen or heard a malaria message, 38% had heard the sleep-under-net message as compared with 53% of the dipstick respondents. Notice that both figures are clearly poor reflectors of women's actual understanding, because in both surveys, a much higher proportion of women reported sleeping under a net as opposed to having heard a sleep-under-net message; that is, the message is getting through even if women do not explicitly identify the message as such. The relatively low numbers of women reporting having heard radio messages or messages from chiefs suggests that as the Take Cover campaign advances, much progress can be made.

6.2 Exposure to Take Cover campaign

Because of difficulties discussed below that respondents evidently had in distinguishing among various posters, it is impossible to say with any confidence how many people actually saw a specific poster. More generally, it is hard to pry apart the relative impact of different media. Clearly the sleep-under-net message is getting across, but it is too soon to tell how much of that is due to the Take Cover campaign.

Despite those caveats, there is some reason to think that the campaign has already had an effect, though the evidence is by no means definitive. In particular, the campaign began in Nimba County, with a major event in Sanniquellie on 6 November 2009. Anecdotal evidence suggests that the Nimba County Health Team (CHT) has been more active than the CHTs in Bong or Lofa about distributing posters and mobilizing CHVs and chiefs to spread the message. And while it is impossible to prove cause and effect, people in Nimba County were far more likely than those in Bong or Lofa to have reported seeing Take Cover material (OR=3.1), hearing the Take Cover jingle or radio spot (OR=5.1), or hearing any malaria message (OR=5.4). Since the same is true for people having seen the old (non-Take Cover) poster, it is impossible to draw firm conclusions, but assuming those old posters would be evenly distributed in the three counties, and that when respondents reported seeing a poster it could have been any poster, the collective data are enough to suggest that exposure to the messages is greater in Nimba County, and the primary difference is the faster start at spreading the message in Nimba.

6.3 Study limitations

The primary limitation of this study is the same as that of any study assessing message exposure: People may claim to remember seeing a poster or hearing a radio spot just to satisfy the interviewer or because it indeed seems familiar to them, but they may have it mixed up with a non-RBHS message. To mitigate that problem, the dipstick questionnaire included several questions along the lines of "Have you heard any message and what was it?" before presenting posters and radio jingles, to test what respondents could recall, not just recognize. Moreover, while three Take Cover posters were included, so too were an older non-RBHS poster and a "fake" poster that has never been used in a campaign in Liberia. The fact that a third of respondents reported having seen the fake poster suggests that people

were recognizing posters with ITNs, but were not distinguishing among different posters; in at least one community whose respondents had reported seeing Take Cover posters in the nearby health clinic, interviewers inspected the clinic and found only old ITN posters ó no Take Cover material. The strong correlation between poster recognition and the order in which posters were presented suggests that the first posters to be shown were the most likely to be òrecognizedö regardless of whether respondents truly saw those specific posters.

Logistical problems also disrupted the random nature of cluster and household selection, most importantly the three communities in Nimba County that were inaccessible. However, the three substituted communities were as similar as possible to the original communities, and were only marginally less remote. The fact that many potential respondents were working on their farms and were unavailable for interviews during the day might well introduce a directional bias into the survey, since the women interviewed might be those more likely to be at home during the day and therefore more likely to listen to the radio or take children to health facilities where they might see ITN posters. It is impossible to estimate the extent of that possible bias, but it is not likely to be significant relative to the recognition issues raised above.

Language also proved to be a difficulty. First, playing the English-language radio spot for non-English-speaking women was a considered choice that was probably wrong, though many such women reported having heard the message anyway. It is likely that they would have heard it along with family or friends who knew some English and might have explained the message to them. Any directional bias introduced by playing only the English spots would be in the direction of underestimating the true exposure. Second, though survey teams were equipped with interviewers who spoke local languages, the plethora of local languages required occasional use of local ad hoc translation, for which there was no quality assurance. The key survey questions were sufficiently straightforward that mistranslation was not likely to be a problem, but in any case was certainly unlikely to result in a directional bias.

Annex 1 shows detailed answers to all survey questions, including the questions asking about when a message/poster was last seen/heard and how many times it was seen/heard. These two questions caused problems during field testing, but no solution was found, and the same problems arose during the actual survey: many if not most respondents seemed completely at a loss to answer either question. No matter how many times explanations were made, no matter what language was used, many respondents never understood the notion of òlast timeö nor did they seem able to say how many times they had encountered a message/poster beyond òonceö or òmany timesö. While most women eventually gave answers, they clearly had no confidence in their own answers, and therefore no reliance can be put on any of the resulting statistics, which are reported in the annex but not otherwise analyzed.

Though most people who had seen posters reported having seen them in health facilities, the questionnaire included no question about proximity of health facilities to the respondent's community. If that information had been collected, it might have been possible to infer an association between exposure to the posters and distance to facilities, but as it is proposing such an association is only speculation.

6.4 Conclusions

The dipstick survey was effective in answering questions about people's use of bed nets and exposure to the message to sleep under nets. It was less effective in determining how much of that exposure was specifically to Take Cover messages. Future dipstick surveys will need to take a different approach to teasing out the Take Cover contribution, such as displaying all material simultaneously and asking people if they've seen any of them. Another possibility is to conduct part of the survey in a control area, which has not been exposed to any Take Cover messages. The problems with that approach is that the radio portion of the campaign includes national exposure, it would be difficult to eliminate other differences between the control and intervention areas, and the sample size would need to be increased, defeating the objective and a quick and clean survey. For now the recommendation is to display material simultaneously, but not attempt to establish a control area.

The use of EpiSurveyor and cell phones was a success and will be continued in future surveys.

Annex 1: Detailed responses to survey questions

| Q# | Question | n | Freq/ median | % | 95% Lower CL (%) | 95% Upper CL (%) |
|------|---|-----|-----------------|-----|------------------------|------------------------|
| 1 | Respondent's age (median) | 133 | 28 | | | |
| 2 | Respondent's marital status | 133 | | | | |
| | Single | | 19 | 14% | | |
| | Married | | 76 | 57% | | |
| | Cohabiting | | 35 | 26% | | |
| | Widowed | | 3 | 2% | | |
| 3 | # living children (median) | 133 | 3 | | | |
| 4 | # living children U5 (median) | 133 | 1 | | | |
| 5 | Age of youngest child (median) | 133 | 2 | | | |
| 6 | Pregnant now | 133 | 17 | 13% | 8% | 20% |
| 7 | ITN in household | 133 | 69 | 52% | 39% | 65% |
| 7.1 | Respondent slept under ITN last night | 69 | 61 | 88% | 79% | 98% |
| 7.2 | Youngest child slept under ITN last night | 69 | 61 | 88% | 79% | 98% |
| 8 | Knows what malaria is | 133 | 77 | 58% | 49% | 67% |
| 9 | Heard any malaria message on radio in last four weeks | 133 | 45 | 34% | 23% | 45% |
| 9.1 | Last message heard on radio | 45 | | | | |
| | Sleep under a net/use a net | | 19 | 42% | | |
| | Keep community/surroundings clean | | 8 | 18% | | |
| | Remove dirty water | | 1 | 2% | | |
| | Mosquitoes cause malaria | | 6 | 13% | | |
| | Malaria can kill | | 3 | 7% | | |
| | Can't remember | | 4 | 9% | | |
| | Others | | 7 | 16% | | |
| 9.2 | Last time message heard | 45 | | | | |
| | Less than 1 week ago | | 4 | 9% | | |
| | 7-13 days ago | | 9 | 20% | | |
| | 14-20 days ago | | 5 | 11% | | |
| | 21 days-1 month ago | | 7 | 16% | | |
| | More than 1 month ago | | 6 | 13% | | |
| | Don't know/no answer | | 14 | 31% | | |
| 9.3 | # times message heard | 45 | | | | |
| | Once | | 10 | 22% | | |
| | Twice | | 5 | 11% | | |
| | 3-5 times | | 12 | 27% | | |
| | 6 times or more | | 15 | 33% | | |
| | Don't know/no answer | | 3 | 7% | | |
| 10 | Heard any malaria message from chief | 133 | 23 | 17% | 8% | 27% |
| 10.1 | Last message heard from chief | 23 | | | | |
| | Sleep under a net/use a net | | 16 | 70% | | |
| | Keep community/surroundings clean | | 2 | 9% | | |
| | Nets will be distributed | | 5 | 22% | | |
| | Others | | 1 | 4% | | |
| 11 | Recognized RBHS ITN jingle | 133 | 38 | 29% | 18% | 39% |
| 11.1 | Last time jingle heard | 38 | | | | |

| Q# | Question | n | Freq/ median | % | 95% Lower CL (%) | 95% Upper CL (%) |
|------|--|-----|-----------------|-----|------------------------|------------------------|
| | Less than 1 week ago | | 3 | 8% | | |
| | 7-13 days ago | | 3 | 8% | | |
| | 14-20 days ago | | 7 | 18% | | |
| | 21 days-1 month ago | | 3 | 8% | | |
| | More than 1 month ago | | 11 | 29% | | |
| | Don't know/no answer | | 11 | 29% | | |
| 11.2 | Radio station | 38 | | | | |
| | UNMIL radio | | 3 | 8% | | |
| | Radio Life | | 5 | 13% | | |
| | Nimba | | 16 | 42% | | |
| | Tappita | | 2 | 5% | | |
| | Saclepea | | 3 | 8% | | |
| | Karkieba (Ganta) | | 1 | 3% | | |
| | Kehkema | | 2 | 5% | | |
| | Can't remember or Station Un-identifiable | | 6 | 16% | | |
| | Ring Tone on phone | | 1 | 3% | | |
| | | | | 0% | | |
| 11.3 | # times jingle heard | 38 | | | | |
| | Once | | 5 | 13% | | |
| | Twice | | 6 | 16% | | |
| | 3-5 times | | 10 | 26% | | |
| | 6 times or more | | 14 | 37% | | |
| | Don't know/no answer | | 3 | 8% | | |
| 12 | Recognized RBHS ITN radio spot | 133 | 76 | 57% | 43% | 71% |
| 12.1 | Last time spot heard | 76 | | | | |
| | Less than 1 week ago | | 6 | 8% | | |
| | 7-13 days ago | | 11 | 14% | | |
| | 14-20 days ago | | 7 | 9% | | |
| | 21 days-1 month ago | | 13 | 17% | | |
| | More than 1 month ago | | 17 | 22% | | |
| | Don't know/no answer | | 22 | 29% | | |
| 12.2 | # times spot heard | 76 | | | | |
| | Once | | 21 | 28% | | |
| | Twice | | 13 | 17% | | |
| | 3-5 times | | 20 | 26% | | |
| | 6 times or more | | 19 | 25% | | |
| | Don't know/no answer | | 3 | 4% | | |
| 13 | Heard or seen other malaria messages about malaria in last 4 weeks | 133 | 48 | 36% | 24% | 48% |
| 13.1 | Last message heard or seen | 48 | | | | |
| | Sleep under a net/use a net | | 19 | 40% | | |
| | Keep community/surroundings clean | | 6 | 13% | | |
| | Remove dirty water | | 3 | 6% | | |
| | Mosquitoes cause malaria | | 9 | 19% | | |
| | Malaria can kill | | 4 | 8% | | |
| | Do not sell net | | 2 | 4% | | |
| | Others | | 8 | 17% | | |
| 13.2 | Last time message heard or seen | 48 | | | | |

| Q# | Question | n | Freq/ median | % | 95% Lower CL (%) | 95% Upper CL (%) |
|------|----------------------------------|-----|-----------------|-----|------------------------|------------------------|
| | Less than 1 week ago | | 8 | 17% | | |
| | 7-13 days ago | | 8 | 17% | | |
| | 14-20 days ago | | 5 | 10% | | |
| | 21 days-1 month ago | | 8 | 17% | | |
| | More than 1 month ago | | 13 | 27% | | |
| 13.3 | Where message last seen or heard | 48 | | | | |
| | Health facility | | 33 | 69% | | |
| | School | | 1 | 2% | | |
| | Market | | 1 | 2% | | |
| | gCHV | | 5 | 10% | | |
| | Family/friends | | 6 | 13% | | |
| | House/shop | | 4 | 8% | | |
| | Radio | | 2 | 4% | | |
| | Training / workshop | | 1 | 2% | | |
| | Don't know/no answer | | 2 | 4% | | |
| 14 | Recognized old poster | 133 | 70 | 53% | 39% | 66% |
| 15 | Recognized Take Cover poster #1 | 133 | 58 | 44% | 31% | 56% |
| 15.1 | Last time poster seen | 58 | | | | |
| | Less than 1 week ago | | 17 | 29% | | |
| | 7-13 days ago | | 9 | 16% | | |
| | 14-20 days ago | | 2 | 3% | | |
| | 21 days-1 month ago | | 4 | 7% | | |
| | More than 1 month ago | | 22 | 38% | | |
| | Don't know/no answer | | 4 | 7% | | |
| 15.2 | Where poster last seen | 58 | | | | |
| | Health facility | | 44 | 76% | | |
| | School | | 1 | 2% | | |
| | gCHV | | 2 | 3% | | |
| | House/shop | | 8 | 14% | | |
| | Palava hut | | 4 | 7% | | |
| | Others | | 2 | 3% | | |
| 16 | Recognized fake poster | 133 | 43 | 32% | 22% | 43% |
| 17 | Recognized Take Cover poster #2 | 133 | 47 | 35% | 24% | 47% |
| 17.1 | Last time poster seen | 47 | | | | |
| | Less than 1 week ago | | 22 | 47% | | |
| | 7-13 days ago | | 3 | 6% | | |
| | 14-20 days ago | | 2 | 4% | | |
| | 21 days-1 month ago | | 5 | 11% | | |
| | More than 1 month ago | | 15 | 32% | | |
| 17.2 | Where poster last seen | 47 | | | | |
| | Health facility | | 35 | 74% | | |
| | School | | 1 | 2% | | |
| | gCHV | | 1 | 2% | | |
| | House/shop | | 8 | 17% | | |
| | Palava hut | | 4 | 9% | | |
| | Others | | 1 | 2% | | |
| 18 | Recognized Take Cover poster #3 | 133 | 30 | 23% | 12% | 33% |
| 18.1 | Last time poster seen | 30 | | | | |

| Q# | Question | n | Freq/ median | % | 95% Lower CL (%) | 95% Upper CL (%) |
|------|---|-----|-----------------|-----|------------------------|------------------------|
| | Less than 1 week ago | | 15 | 50% | | |
| | 7-13 days ago | | 1 | 3% | | |
| | 14-20 days ago | | 2 | 7% | | |
| | 21 days-1 month ago | | 15 | 50% | | |
| | More than 1 month ago | | 7 | 23% | | |
| 18.2 | Where poster last seen | 30 | | | | |
| | Health facility | | 21 | 70% | | |
| | School | | 1 | 3% | | |
| | CHV | | 2 | 7% | | |
| | House/shop | | 8 | 27% | | |
| | Palava hut | | 2 | 7% | | |
| | Others | | 1 | 3% | | |
| 19 | Recognized leaflet | 133 | 24 | 18% | 10% | 26% |
| 19.1 | Last time leaflet seen | 24 | | | | |
| | Less than 1 week ago | | 9 | 30% | | |
| | 7-13 days ago | | 1 | 3% | | |
| | 14-20 days ago | | 2 | 7% | | |
| | 21 days-1 month ago | | 4 | 13% | | |
| | More than 1 month ago | | 8 | 27% | | |
| | Don't know/no answer | | | 0% | | |
| 19.2 | Where leaflet last seen | 24 | | | | |
| | Health facility | | 17 | 57% | | |
| | School | | | 0% | | |
| | CHV | | 1 | 3% | | |
| | House/shop | | 5 | 17% | | |
| | Palava hut | | | 0% | | |
| | Friends/Relative | | 1 | 3% | | |
| | Others | | 2 | 7% | | |
| 20 | Recognized sticker | 133 | 13 | 10% | 5% | 14% |
| 20.1 | Last time sticker seen | 13 | | | | |
| | Less than 1 week ago | | 3 | 23% | | |
| | 7-13 days ago | | 1 | 8% | | |
| | 14-20 days ago | | 1 | 8% | | |
| | 21 days-1 month ago | | 4 | 31% | | |
| | More than 1 month ago | | 4 | 31% | | |
| | Don't know/no answer | | | 0% | | |
| 20.2 | Where sticker last seen | 13 | | | | |
| | Health facility | | 10 | 77% | | |
| | School | | | 0% | | |
| | CHV | | 1 | 8% | | |
| | House/shop | | 3 | 23% | | |
| | Palava hut | | | 0% | | |
| | Others | | | 0% | | |
| | Heard any malaria message (unprompted)* | 133 | 70 | 53% | 41% | 64% |
| | Malaria messages heard* | 70 | | | | |
| | Sleep under a net/use a net | | 37 | 53% | | |
| | Keep community/surroundings clean | | 14 | 20% | | |
| | Remove dirty water | | 4 | 6% | | |

| Q# | Question | n | Freq/ median | % | 95% Lower CL (%) | 95% Upper CL (%) |
|----|---------------------------------------|-----|-----------------|-----|------------------------|------------------------|
| | Mosquitoes cause malaria | | 13 | 19% | | |
| | Malaria can kill | | 5 | 7% | | |
| | Do not sell net | | 2 | 3% | | |
| | Nets being distributed | | 5 | 7% | | |
| | Others | | 12 | 17% | | |
| | Heard Take Cover jingle or radio spot | 133 | 79 | 59% | 46% | 73% |
| | Seen any Take Cover printed material | 133 | 74 | 56% | 44% | 68% |
| | Where Take Cover material last seen | 74 | | | | |
| | Health facility | | 62 | 84% | | |
| | School | | 1 | 1% | | |
| | CHV | | 3 | 4% | | |
| | House/shop | | 15 | 20% | | |
| | Palava hut | | 4 | 5% | | |
| | Others | | 3 | 4% | | |

**"Any message" refers to Q 9, 10, 13 combined*

Annex 2: Questionnaire and consent form

[see next pages]

RBHS ITN dipstick survey, form updated January 5, 2010

| | | | |
|--|-----------------|-----------------------------|-------------------------|
| COUNTY | DISTRICT | COMMUNITY/SETTLEMENT | DATE (DD/MM/YY): |
| INTERVIEWER : | | EA Code: | HOUSEHOLD ID# |
| Team Supervisor must sign below to confirm that the questionnaire is satisfactorily completed | | | |
| RESPONDENT INFORMATION | | | |
| NAME | NAME | SIGNATURE | DATE (DD/MM/YY) |

| # | Interview Question | Answers |
|---|--|---|
| 1.0 | How old are you? | _____ years |
| 2.0 | What is your marital status? | 1= Single 2= Married 3= Just cohabitating 4= Separated 5= Widowed 6= Divorced 9= Don't know/No answer |
| 3.0 | How many living children do you have? | |
| 4.0 | How many living children under five do you have ? | 1= One 2= Two 3= Three 4= Four 5= Five or more 9= Don't know/No answer |
| 5.0 | How old is your youngest child? | 1= less than 12 months 2= 12 to 23 months 3= 24 to 35 months 4= 36 to 47 months 5= 48 to 59 months 9= Don't know/No answer |
| 6.0 | Are you pregnant now? | 0= No 1= Yes 9= Don't know/No answer |
| 7.0 | Do you have treated bed nets in this household? | 0= No ⇒ Q#8 1= Yes 9= Don't know/No answer |
| 7.1 | Did you sleep under treated net last night? | 0= No 1= Yes 9= Don't know/No answer |
| 7.2 | Did your youngest child sleep under treated bed net last night? | 0= No 1= Yes 9= Don't know/No answer |
| 8.0 | Do you know what malaria is? | 0= No 1= Yes 9= Don't know/No answer |
| 9.0 | Have you heard any information about malaria on the radio in the past four weeks? | 0= No ⇒ Q#10 1= Yes 9= Don't know/No answer |
| 9.1 | What was the last message? | |
| 9.2 | When was the last time you heard this message? | 1= less than one week ago 2= 7 to 13 days ago 3= 14 to 20 days ago 4= 21 days to 1 month ago 5= more than 1 month 9= Don't know/NA |
| 9.3 | How many times did you hear the message? | 1= One time 2= Two times 3= three to five times 4= Six times or more 9= Don't know/No answer |
| 10.0 | Have you heard any message on malaria or bed nets from a chief? | 0= No ⇒ Q#11 1= Yes 9= Don't know/No answer |
| 10.1 | What was the message? | |
| 10.2 | When was the last time you heard this message? | 1= less than one week ago 2= 7 to 13 days ago 3= 14 to 20 days ago 4= 21 days to 1 month ago 5= more than 1 month 9= Don't know/NA |
| Play jingle, then ask respondent question 11 | | |
| 11.0 | Have you heard this song before? | 0= No ⇒ Q#12 1= Yes 9= Don't know |
| 11.1 | When was the last time you heard this song? | 1= less than one week ago 2= 7 to 13 days ago 3= 14 to 20 days ago 4= 21 days to 1 month ago 5= more than 1 month 9= Don't know/NA |
| 11.2 | On what radio station did you hear this song? | |
| 11.3 | How many times have you heard this song? | 1= One time 2= Two times 3= three to five times 4= Six times or more 9= Don't know/No answer |
| Play radio spot, then ask respondent question 12 | | |
| 12.0 | Have you heard this message before? | 0= No ⇒ Q#13 1= Yes 9= Don't know/No answer |
| 12.1 | When was the last time you heard this message? | 1= less than one week ago 2= 7 to 13 days ago 3= 14 to 20 days ago 4= 21 days to 1 month ago 5= more than 1 month 9= Don't know/NA |
| 12.2 | How many times have you heard this message? | 1= One time 2= Two times 3= three to five times 4= Six times or more 9= Don't know/No answer |
| 13.0 | Have you seen or heard any message about malaria in the last four weeks other than what you've already reported? | 0= No ⇒ Q#14 1= Yes 9= Don't know/No answer |

| | | |
|---|---|--|
| 13.1 | What was the last message? | |
| 13.2 | When was the last time you saw or heard it? | 1= less than one week ago 2= 7 to 13 days ago 3= 14 to 20 days ago 4= 21 days to 1 month ago 5= more than 1 month 9= Don't know/NA |
| 13.3 | Where did you last see or hear it? <i>(multiple responses allowed)</i> | 1= Health facilities 2= Schools 3= Markets 4= Video clubs 5= Text message/phone 6= Posters, fliers, stickers, etc 7= gCHV or TTM 8= Others 9= Don't know/No answer |
| 13.4 | <i>(If Other, write specific response)</i> | |
| For questions 14-18, show specified poster, then ask respondent question | | |
| 14.0 | (Poster 14) Have you seen this poster before? | 0= No 1= Yes 9= Don't know/No answer |
| 15.0 | (Poster 15) Have you seen this poster before? | 0= No ⇒ Q#16 1= Yes 9= Don't know/No answer |
| 15.1 | When last did you see it? | 1= less than one week ago 2= 7 to 13 days ago 3= 14 to 20 days ago 4= 21 days to 1 month ago 5= more than 1 month 9= Don't know/NA |
| 15.2 | Where last did you see it? <i>(multiple responses allowed)</i> | 1= Health facilities 2= Schools 3= Markets 4= Video clubs 7= gCHV or TTM 8= Others 9= Don't know/No answer |
| 15.3 | <i>(If Other, write specific response)</i> | |
| 16.0 | (Poster 16) Have you seen this poster before? | 0= No 1= Yes 9= Don't know/No answer |
| 17.0 | (Poster 17) Have you seen this poster before? | 0= No ⇒ Q#18 1= Yes 9= Don't know/No answer |
| 17.1 | When last did you see it? | 1= less than one week ago 2= 7 to 13 days ago 3= 14 to 20 days ago 4= 21 days to 1 month ago 5= more than 1 month 9= Don't know/NA |
| 17.2 | Where last did you see it? <i>(multiple responses allowed)</i> | 1= Health facilities 2= Schools 3= Markets 4= Video clubs 7= gCHV or TTM 8= Others 9= Don't know/No answer |
| 17.3 | <i>(If Other, write specific response)</i> | |
| 18.0 | (Poster 18) Have you seen this poster before? | 0= No ⇒ Q#19 1= Yes 9= Don't know/No answer |
| 18.1 | When last did you see it? | 1= less than one week ago 2= 7 to 13 days ago 3= 14 to 20 days ago 4= 21 days to 1 month ago 5= more than 1 month 9= Don't know/NA |
| 18.2 | Where last did you see it? <i>(multiple responses allowed)</i> | 1= Health facilities 2= Schools 3= Markets 4= Video clubs 7= gCHV or TTM 8= Others 9= Don't know/No answer |
| 18.3 | <i>(If Other, write specific response)</i> | |
| 19.0 | (Show leaflet) Have you seen this leaflet before? | 0= No ⇒ Q#20 1= Yes 9= Don't know/No answer |
| 19.1 | When last did you see it? | 1= less than one week ago 2= 7 to 13 days ago 3= 14 to 20 days ago 4= 21 days to 1 month ago 5= more than 1 month 9= Don't know/NA |
| 19.2 | Where last did you see it? <i>(multiple responses allowed)</i> | 1= Health facilities 2= Schools 3= Markets 4= Video clubs 7= gCHV or TTM 8= Others 9= Don't know/No answer |
| 19.3 | <i>(If Other, write specific response)</i> | |
| 20.0 | (Show sticker) Have you seen this sticker before? | 0= No ⇒ END 1= Yes 9= Don't know/No answer |
| 20.1 | When last did you see it? | 1= less than one week ago 2= 7 to 13 days ago 3= 14 to 20 days ago 4= 21 days to 1 month ago 5= more than 1 month 9= Don't know/NA |
| 20.2 | Where last did you see it? <i>(multiple responses allowed)</i> | 1= Health facilities 2= Schools 3= Markets 4= Video clubs 7= gCHV or TTM 8= Others 9= Don't know/No answer |
| 20.3 | <i>(If Other, write specific response)</i> | |

Consent form for RBHS dipstick survey

last updated 30 December 2009

Hello, my name is _____. We are here on behalf of a USAID funded project called RBHS to conduct a survey aimed at learning about the health knowledge and status of people in selected communities.

RBHS is an organization working in collaboration with the Ministry of Health and Social Welfare in Liberia to rebuild basic health services.

Data we will collect during the course of this survey will help NGO's, CHTs, and the Government through the Ministry of Health and Social Welfare to plan and implement appropriate health services. It will also help us to increase the effectiveness of some of our activities.

I would like to ask you some questions regarding health messages you may have seen or heard through various media.

If you agree to participate in this survey, it may take us about 15 minutes and whatever answer you give will be kept strictly confidential and only reported when combined with answers from other families.

Participation in this survey is voluntary. Even if you agree to take part in this survey, you may choose to stop answering any or all questions at any time.

However, we hope that you will agree to take part in this survey since, in fact, your views are important.

Would you be willing to take part in this interview?

No Yes

Community/settlement name _____

District _____ County _____

Name of respondent (print) _____

I have read this consent form or someone has explained it to me. I freely agree to be in the survey.

Signature or fingerprint of subject

Interviewer signature

Date ____ / ____ / ____
 dd mm yyyy