

Cameroon

Malaria Knowledge, Attitudes, and Practices

Progress from 2011 to 2012

malaria
NO MORE

Final Report, August 2012

Acknowledgements

Malaria No More's work in Cameroon is carried out in cooperation with the Ministry of Health, National Malaria Control Program (NMCP), WHO, RBM, UNICEF, ACMS, CHAI, IRESO, PLAN, and CCAM. We are grateful for feedback on the Malaria KAP Survey questionnaire and methodology from these partners.

We would like to thank ExxonMobil and COTCO for their generous support of program activities in Cameroon, including the Malaria KAP Survey. We are also grateful to MTN for in-kind and financial program support.

For access to the Malaria KAP Survey data or additional information, please contact:

Hannah Bowen | RESEARCH MANAGER

Malaria No More

432 Park Avenue South, 4th Floor

New York, NY 10016

(o) 646.884.7420

(m) 917.456.7073

Hannah.Bowen@MalariaNoMore.org

Abbreviations

ACMS	Association Camerounaise pour le Marketing Social
ACT	Artemisinin combination therapy
CCAM	Cameroon Coalition Against Malaria
CHAI	Clinton Health Access Initiative
DHS	Demographic and Health Survey
IPTp	Intermittent preventive treatment during pregnancy
ITN	Insecticide treated mosquito net
IRESKO	Institut pour la Recherche, le développement Socio-économique et la Communication
IRS	Indoor residual spraying
KAP	Knowledge, attitudes, and practices
LLIN	Long-lasting insecticidal net
MERG	Monitoring and Evaluation Reference Group (RBM)
MIS	Malaria Indicator Survey
MNM	Malaria No More
NMCP	National Malaria Control Program (also PNLP)
PNLP	Programme Nationale de Lutte Contre le Paludisme (also NMCP)
PSA	Public service announcement
RBM	Roll Back Malaria partnership
RDT	Rapid diagnostic test
SBCC	Social and behavior change communications
WHO	World Health Organization

Contents

Executive Summary	1
Section 1: Background	3
Section 2: Methodology	4
2.1 Overview	4
2.2 Sample.....	4
2.3 Training and Quality Control.....	5
2.4 Fieldwork.....	6
2.5 Data Processing and Analysis.....	6
Section 3: Malaria Control Activities in Cameroon, 2011-2012	8
Section 4: Long-Lasting Insecticidal Nets	9
4.1 Universal Coverage Campaign	9
4.2 Net Usage.....	11
Section 5: Diagnosis and Treatment	15
5.1 Rapid Diagnostic Tests	15
5.2 Seeking Treatment Promptly	16
Section 6: Communication Campaign Effectiveness	17
6.1 Theory of Change	17
6.2 Campaign Activities.....	17
6.3 Campaign Reach.....	19
6.3.1 Recognition of K.O. Palu Spokespeople and Sponsors	20
6.3.2 Effective Communication Channels	20
6.3.3 Target Audiences	21
6.4 Impact on Knowledge	23
6.5 Impact on Attitudes	24
6.6 Impact on Behavior	24
Section 7: Keeping Pace with a Changing Environment	27
Appendix A: Individual Behavior Change Indicators	28
Appendix B: Survey Sample	33
Appendix C: Theories of Behavior Change and Social Mobilization	37

Executive Summary

The 2012 Malaria Knowledge, Attitudes, and Practices (KAP) Survey was conducted between March 22 and April 10, 2012, using interviews with 2,176 randomly selected adults (15-64 years old) representing all regions of Cameroon. A baseline survey with a comparable sample of 2,559 randomly selected adults was conducted in March-April 2011.

The results of the 2012 survey were compared to 2011 baseline indicators in order to track progress over the past year, measure the impact of malaria control interventions, and identify priorities for future malaria communication campaigns.

LLIN Access and Use Have Rapidly Expanded

- **Cameroon's 2011 universal coverage mosquito net distribution was successful, making nets widely – and equitably – available at no cost to families.**
Over 80% of all households have at least one mosquito net – up from 57% in 2011. Still, only around 60% of households have enough nets to cover everyone at night.
- **Thanks to changes in behavior, households with at least one net are using their nets more consistently and to cover more family members.**
In households with at least one mosquito net, 63% of adults (up from 52%) and 74% of their children (up from 63%) slept under a net the night before the survey. Therefore, not only do more people have nets at home, but those who do are using them more consistently.
- **Further behavior change is needed, however, as about 30% of adults (and 25% of their children) still do not sleep under a net nightly when one is available to them.**
Among households where there are enough nets to cover all sleeping spaces (as reported by the respondents themselves), 70% of adults and 77% of children slept under nets. Although more people are using nets more consistently, to reach the country's goal of 80% consistent net use among the whole population, there is still work to be done to convince those who believe a net is too uncomfortable or inconvenient to be worth the trouble or who fail to sleep under an available net for other reasons.

Management of Malaria Cases Remains a Challenge

- **Strong communication efforts will be needed to complement the introduction of rapid diagnostic tests (RDTs) nationally.**
Only one third of Cameroonians know about RDTs, unchanged from 2011, and fewer than 40% said that they were tested the last time they were treated for malaria.
- **Prompt treatment-seeking at the first signs of malaria remains limited.**
Nearly two thirds of respondents said they typically wait, do nothing, or self-diagnose (treating themselves at home or buying medicine at a pharmacy) when they notice the symptoms of malaria.

Malaria Communications Have Wide Reach and Measurable Impact on Net Use

- **Over 60% of all respondents (representing over 6.8 million adults) recalled seeing or hearing malaria communications that used the unified national campaign brand, K.O. Palu.**

Unduplicated recall of any component of the K.O. Palu campaign – radio PSAs, TV PSAs, bed net reminder SMS, the Malaria Anthem, Malaria Anthem music video, or campaign launch event – was 62% of all adults. The single component with the largest reach was the Malaria Anthem, at 46%, while the NightWatch PSAs (on either radio or TV) collectively reached 29% of respondents (approximately 3.2 million adults).

- **The K.O. Palu Malaria Anthem has been particularly effective at reaching youth and putting malaria in the national spotlight.**

The anthem has reached 52% of adults aged 15-30, in part because TV stations were so eager to show the music video as part of their programming, and at no cost to MNM or other health partners.

- **Knowledge about mosquito nets as a malaria prevention tool has increased from 71% in 2011 to 77% in 2012, in part thanks to the K.O. Palu campaign.**

In 2012, Cameroonian adults exposed to the campaign were 21% more likely than those not exposed (81% vs. 67%) to spontaneously mention a mosquito net (or specifically mention a LLIN) as a method of preventing malaria. Even after controlling for other factors, the campaign helps explain the increase in knowledge observed from 2011 to 2012.

- **K.O. Palu communications intensified the impact of the mass net distribution, helping drive a significant increase in mosquito net use from 2011 to 2012 (from 31% to 52% of adults, and from 41% to 65% of children).**

Cameroonians exposed to the K.O. Palu campaign were 13% more likely to sleep under a net (55% vs. 48%), and 24% more likely to have their children sleep under a net (71% vs. 57%).

Implications for Program Strategy

- **In order to close remaining gaps in malaria control behavior, communications need to reach further into rural areas.**

Though great progress has been made in increasing net use among those with access to nets – and closing the urban/rural gap in access itself – the areas where behavior change is still needed are predominantly rural. In particular, results showed net use gaps in the Far North, North, Southwest, and Littoral regions. Interestingly, in Littoral region the use gap was evident not only in rural but also urban areas.

- **Messages will need to evolve, to address the remaining barriers to net use and to support the introduction of RDTs.**

Although nightly bed-net reminder messages will remain relevant, the K.O. Palu campaign and other malaria communications will need to focus on the remaining gaps as well as new opportunities, particularly in diagnosis and treatment.

- **In order to build a strong social movement that makes malaria control a long-term national priority, more men and young adults will need to take malaria seriously.**

In addition to behavior change, malaria communications have helped put the spotlight on malaria in Cameroon. However, men and young adults (15-30) are still less likely to say that they take malaria seriously.

Section 1: Background

In March 2011, Malaria No More (MNM) conducted a Malaria Knowledge, Attitudes, and Practices (KAP) Baseline survey to collect three types of data before launching malaria communication programs in Cameroon:

- A snapshot of the current malaria landscape, including access to tools for malaria prevention, diagnosis and treatment;
- Baseline values for key indicators of awareness, commitment, and action which MNM and other health partners hope to impact through programs implemented in 2011-2; and
- Audience measurements to inform communication strategies.

In developing the Malaria KAP Baseline questionnaire and interpreting the results to design a communication campaign, MNM drew on experience conducting KAP surveys in Senegal and Tanzania from 2009-2011, and consulted with many partners working on malaria in Cameroon, including the National Malaria Control Program (NMCP, or Programme National de Lutte Contre le Paludisme PNL), Institut pour la Recherche, le développement Socio-économique et la Communication (IRESCO), PLAN, Association Camerounaise pour le Marketing Social (ACMS/PSI), and Clinton Health Access Initiative (CHAI). The same questionnaire was used in 2012 with minor revisions and additions.

MNM contracted TNS-RMS, a research agency based in Douala, Cameroon, to carry out the survey fieldwork in both 2011 and 2012. Between March 22 and April 10 2012, interviewers conducted 2176 interviews with adults (15-64 years old) representing both urban and rural areas in all of Cameroon's 10 regions.



Figure 1. Map of Cameroon's 10 Regions

Section 2: Methodology

2.1 Overview

The Malaria KAP Survey consisted of face-to-face pen-and-paper administered interviews with 2,176 randomly selected respondents. The questionnaire was developed by MNM in 2011, drawing on key malaria indicators used by the Roll Back Malaria (RBM) partnership's Monitoring and Evaluation Reference Group (MERG) and standard Malaria Indicator Survey (MIS) and Demographic and Health Survey (DHS) questionnaires. The 2011 Malaria KAP Baseline questionnaire was supplemented with additional questions in 2012 to measure exposure to specific elements of the malaria communication campaign and participation in the 2011 national mosquito net distribution campaign.

2.2 Sample

The sampling universe consisted of the full population of adults over age 15 in Cameroon's 10 regions.

A representative sample was selected using multi-stage random sampling (proportionate to population size). First, interviews were allocated according to the urban and rural population of each region, given in the 2005 national census, and then distributed to sampling points in each region as follows:

- Urban locations were selected purposively; all regional capitals were considered as urban areas and included in the survey. An exception was made in the Southwest region, whereby Buea was replaced by Limbe due to its greater weight in the region's population and its level of development. Douala and Yaoundé were considered as cosmopolitan urban towns.
- Rural areas were randomly selected among villages/towns located at 100-150 KM from the main urban areas selected. Their selection was made in 2011, factoring in accessibility and population criteria. The 2012 study revisited the same rural areas, except for Sackbayeme, Bamesingui, Bafou, Yoke, and Muyuka, which were replaced respectively by Penja, Baham, Foubot, Malende, and Tole. These replacement villages were also randomly selected based on the list of villages within the region. In each area, new sectors in each area were randomly selected in 2012 to avoid revisiting the same households, while maintaining a comparable sample from year to year.
- Within selected urban centers and rural sectors, each sector was broken down into mutually exclusive but exhaustive sampling grids within the low- and high-density segments of the town and a fixed number of interviews allocated. Sectors were drawn via a Simple Random Sampling method. Each selected sector was considered a sampling point, and on average 5-10 interviews were carried out at each sampling point.

At each sampling point, the Team Leader chose a starting point, from which the interviewers began household selection by means of a Random Route Walk method. The interviewer had to make use of the "Day's Code" to randomly select the first dwelling structure for interview. Upon completion of the interview, the interviewer had to skip, in sequence, a number of dwelling structures equal to the sampling interval. When the allocated quota for a particular sector was completed, the whole team of interviewers moved together to another sector.

At selected households, one respondent was selected from among all household members 15 years and above by means of a Kish Grid, using a gender quota to achieve a balanced sample. In cases where the selected respondent was not at home at the time of the first visit, two additional attempts were made before substituting a respondent from the next household.

Table 1. Survey Sample Distribution

Region	Urban Locations	Urban Interviews	Rural Locations	Rural Interviews	Total
Littoral	Douala, Nkongsamba	233	Songmbengue, Penja	72	305
Adamaoua	Ngaoundéré	42	Awak, Dibi	72	114
North	Garoua	90	Langui, Boulahibi, Sorawel, Gashiga, Bockle	138	228
Far North	Maroua	145	Gazawa, Mokong, Meskine, Katoual, Moutourwa	216	361
Centre	Yaoundé, Obala	289	Ngomedzap, Evodoula, Okola	126	415
East	Bertoua	42	Doume, Bonis	72	114
South	Ebolowa	36	Mpouloungoue, Nget	48	84
Southwest	Limbe	60	Malende, Tole, Batoke	90	150
West	Bafoussam	78	Babadjou, Baham, Foubot	124	202
Northwest	Bamenda	77	Babessi, Guzang, Babanki	126	203
Total		1092		1084	2176

Source: Malaria KAP Survey, Mar/Apr 2012. Nationally representative, N=2176 adults 15-64.

2.3 Training and Quality Control

Training of interviewers took place at two levels, central and regional:

- **Central:** Douala, March 20-21, 2012; led by Charline Djiende, Research Executive in charge of the project in both 2011 and 2012. Attended by all regional coordinators, fieldwork staff, and interviewers based in Littoral and South Regions.
- **Regional:** Beginning in Yaoundé March 24-25, 2012 and then in Ngaoundéré, Garoua, Maroua, Bertoua, Limbe, Bafoussam, and Bamenda; led by regional coordinators and fieldwork staff.

The training sessions included an overview of the study background and purpose; methodology and sampling, including household and respondent selection; proper use of survey materials; confidentiality and survey ethics, and a detailed review of questionnaire administration, question-by-question.

The questionnaire was piloted prior to training to check questionnaire coherence, consistency, and translation. Small changes to the questionnaire, such as revising response categories, were made prior to training based on the pilot. After interviewers completed the training sessions, each conducted a practice interview with another trainee as well as a pilot interview with a real respondent (not included in the final dataset) to ensure full understanding of the questionnaire and field procedures. Interviewers

were evaluated based on their performance in the practice and pilot interviews before being approved to participate in fieldwork.

2.4 Fieldwork

Fieldwork was carried out from March 22-April 10, with teams of 5 interviewers travelling together with their supervisors throughout the country by public transportation. Supervisors ensured data quality by accompanying interviewers to 12% of the interviews and back-checking an additional 18% of interviews either by phone or in person. Both the interviewers and their supervisors reviewed 100% of completed questionnaires in the field to ensure completeness and consistency. TNS-RMS field staff deployed to all study locations during fieldwork, paying random and unannounced visits to some sectors in order to carry out spot checks; these spot checks were independent quality assurance checks on interviewers' and supervisors' work. In total, 397 spot checks were conducted. During the course of such visits, questionnaires with inconsistencies were either annulled or the interviewer in question was asked to re-administer the questionnaire. In sectors where inconsistencies were observed, supervisors and field staff back-checked all interviews previously completed in the sector.

Interviewers contacted 4,822 households in the course of fieldwork. Of these, 2,176 were successful interviews; the others were unsuccessful for the following reasons:

- Refusals (respondent or other household member): 535 contacts
- Not available after 3 calls: 81 contacts
- Language barrier: 437 contacts
- Away for more than two days: 234 contacts
- Eligibility (no one aged 15-64 or of gender quota in household): 790 contacts
- Illness: 63 contacts
- Other: 506 contacts

Interviews were conducted in 3 languages, using validated translations of the original English questionnaire into French and Pidgin English. During training, interviewers also discussed local language translations of key terms, to clarify questions for respondents with limited understanding of the three standard questionnaires. Of the 2,176 completed interviews, 81% were conducted primarily in French, 10% in Pidgin, and 7% in English (with 3% in a mixture). Interviews lasted just under 1 hour (55 minutes) on average.

2.5 Data Processing and Analysis

Questionnaires were transported to TNS-RMS' main data processing center in Douala, Cameroon for coding and data entry. Data were entered by experienced data entry clerks, cleaned, and delivered in SPSS format. After comparing key demographic statistics of the achieved sample with the 2011 Malaria KAP Baseline survey and 2005 Census data, it was decided that no weighting of the data would be necessary.

Analysis was conducted in SPSS version 20 on a merged dataset of the 2011 and 2012 data files. Comparisons of key indicators between 2011 and 2012 were performed using independent sample t-

tests of the difference of means. Evaluation of the impact of communication activities was based on independent sample t-tests of the difference of means between individuals exposed to various communication platforms and those not exposed. P-values are reported for all t-tests, as the probability that the two groups (2011 and 2012, exposed and not exposed) have equal means for the indicator. Multivariate linear regressions were also run to test for the effects of other confounding variables, and the direction and significance of regression coefficients are reported where appropriate. However, as this report is designed for a general audience, full regression results are not reported; further impact analysis using regression models will be reported in a separate paper. Population estimates are based on an assumption that, of a total population of 19,406,100 Cameroonians, the survey was representative of 10,940,736 adults over 15.¹ Since in most households, children under 15 are likely also exposed to at least some of the mass media consumed by older members of their households, the population estimates based only on adults over 15 are extremely conservative estimates of the number of individuals truly exposed to malaria communications via mass media.

¹ "Population by age, sex and urban/rural residence, 2010" United Nations Statistics Division, updated 31 Jan 2012, available at http://data.un.org/Data.aspx?q=cameroon+population+by+age&d=POP&f=tableCode:22;countryCode:120&c=2,3,5,7,9,11,13,14,15&s=_countryEnglishNameOrderBy:asc,refYear:desc,areaCode:asc&v=1

Section 3: Malaria Control Activities in Cameroon, 2011-2012

Over the past year, Cameroon made great strides in making life-saving commodities available across the country to improve its malaria control. With funding from the Global Fund to Fight AIDS, Tuberculosis, and Malaria and support from the World Health Organization (WHO) and Roll Back Malaria partnership (RBM), the government procured and distributed over 8 million free long-lasting insecticidal nets (LLINs) to prevent malaria, its first ever Universal Coverage campaign; launched a pilot program to use rapid diagnostic tests (RDTs) in health facilities that will be brought to national scale in the second half of 2012; and introduced first-line treatment with artemisinin-combination therapies (ACTs).

To bolster the use of these life-saving commodities, a coalition of health partners including the Ministry of Health, NMCP, UNICEF, Plan International, IRESCO, CHAI, CCAM, ACMS-PSI, MNM, and private sector partners MTN, COTCO, and ExxonMobil implemented a national malaria communication campaign under a unified brand, the “K.O. Palu” (Knock Out Malaria) campaign. MNM’s activities under the K.O. Palu brand have been an adaptation of MNM’s signature communications platform, NightWatch, to the Cameroonian context. Activities over the past year included a malaria anthem featuring Cameroon’s top musicians, radio and television public service announcements (PSAs), roadside billboards, SMS messages, large public events, and press conferences making critical announcements regarding distribution activities. PSAs have focused on reminding Cameroonians to sleep under a bed net, with reinforcement of two key malaria transmission facts: malaria is transmitted only by mosquito bites, and the mosquitoes that transmit malaria primarily bite at night.

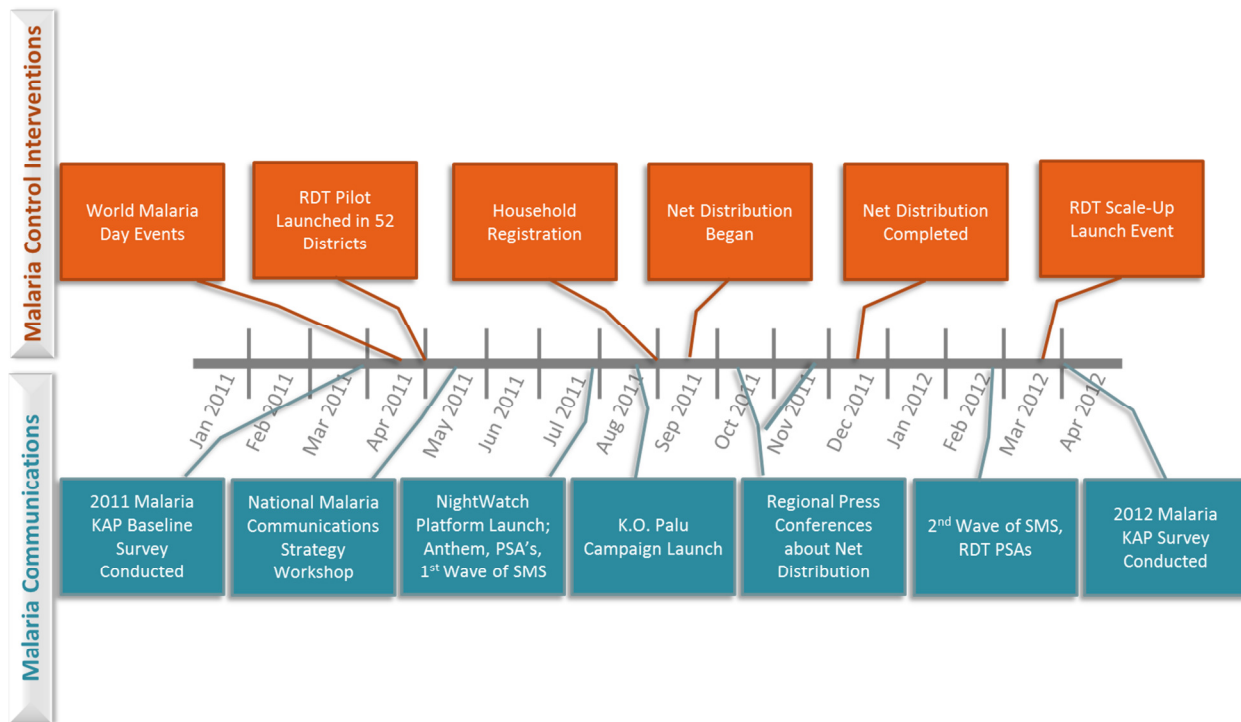


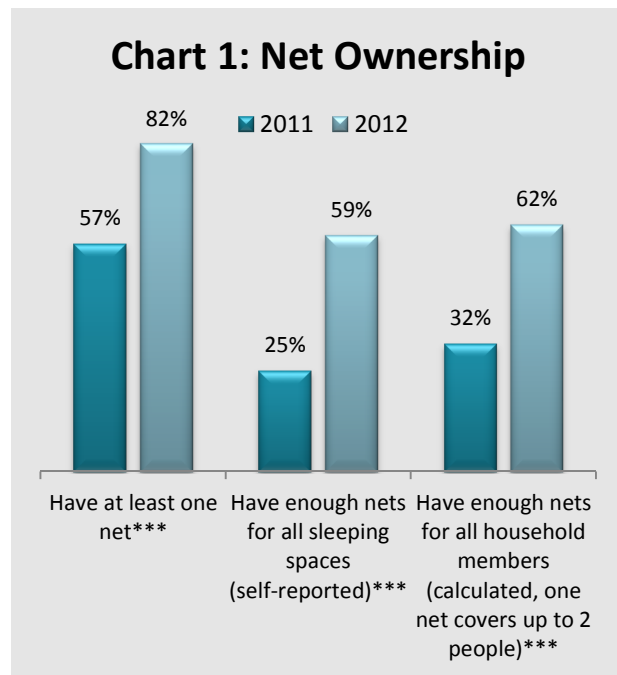
Figure 2. Timeline of malaria control activities, January 2011-April 2012

Section 4: Long-Lasting Insecticidal Nets

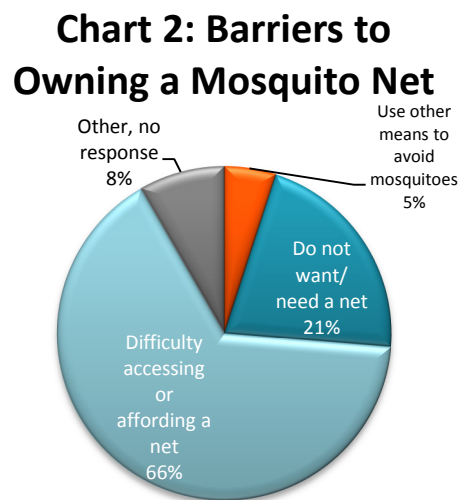
4.1 Universal Coverage Campaign

Cameroon’s first net distribution campaign with a “universal coverage” target aimed to distribute 8,654,731 LLINs (one for every 2.2 Cameroonians) for free by the end of 2011. The NMCP also set a target for 80% of all Cameroonians to sleep under mosquito nets nightly. According to the NMCP’s records from the net distribution, 92% of all households were registered to participate in the distribution, and 86% of those received LLINs from a distribution site, resulting in 73% of households receiving at least one LLIN by the end of 2011.²

The 2012 Malaria KAP Survey found even higher net ownership than that recorded by the NMCP, likely due to existing nets households had received through previous routine distribution, purchased, or received from family or friends (which may not have been counted in the distribution records, but were included in the Malaria KAP Survey). Indeed, 14% of households with at least one net said that they had bought their own nets or were given them by a friend or family member. Similar to the NMCP’s records, the survey found 84% of households recalled registering for the net distribution, and 85% of those (71% of all households) reported receiving at least one net from a distribution site.



Source: Malaria KAP Surveys, Mar/Apr 2011 (n=2566) and Mar/Apr 2012 (n=2176), nationally representative of adults 15-64. Bases: (at left) all respondents; (at right) respondents who do not have any mosquito nets at home. ***=difference between 2011 and 2012 significant at p<0.01. Calculation of one net covering 2 people based on World Malaria Report 2011 methodology.

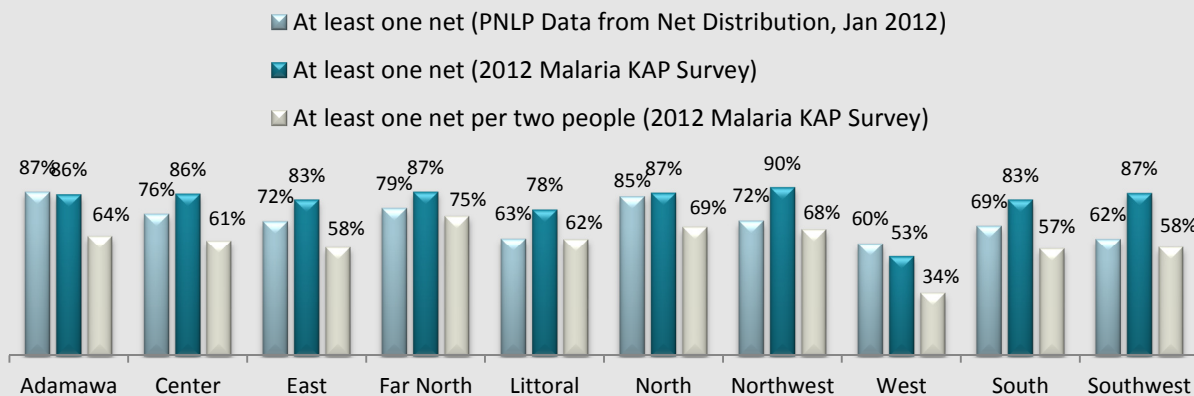


² Ndong, Dr. Prosper. “Cameroon’s Universal Coverage Campaign 2011,” Cameroon NMCP Presentation to the Alliance for Malaria Prevention Partners Meeting, February 2012. Available at: <http://www.allianceformalariaprevention.com/resources/Cameroon%20country%20update%20-%20Prosper%20Ndong.pdf>.

Cameroon Malaria KAP Survey: Measuring Progress from 2011 to 2012

About a fifth of those without nets do not believe that they need one; to reach truly universal coverage, this small group (around 4% of all respondents) would first need to be convinced of the value of nets. However, most of the survey respondents without nets said that the main reason was a lack of access, suggesting that free net distribution is addressing the main barrier to universal net ownership. The survey results suggest that every effort should be made to go the last mile and continue the “mop-up” distribution activities that the NMCP and UNICEF have already committed to, targeting those not already reached by the 2011 distribution campaign. In particular, as noted in the NMCP’s estimates of coverage, the West region lags behind other parts of the country.³

Chart 3: Net Ownership by Region



Sources: Ndong, Prosper. “Cameroon’s Universal Coverage Campaign 2011,” Presentation to the Alliance for Malaria Prevention Partners Meeting, February 2012. Malaria KAP Survey, Mar/Apr 2012 (n=2176), nationally representative of adults 15-64. Base: all respondents in each region.

Although the universal coverage campaign was very successful at reaching households across Cameroon, not all households received enough nets to cover all family members. Whether estimating coverage based on the assumption that two people can fit under each net, or asking individuals if they believe they have enough nets to cover everyone (thereby accounting for a wider range of intra-household dynamics), about two fifths of households still do not have enough nets.

In the 2011 Malaria KAP Baseline survey, prior to the net distribution campaign, urban households were 11% more likely than rural ones to have any mosquito nets and 38% more likely than rural households to have enough



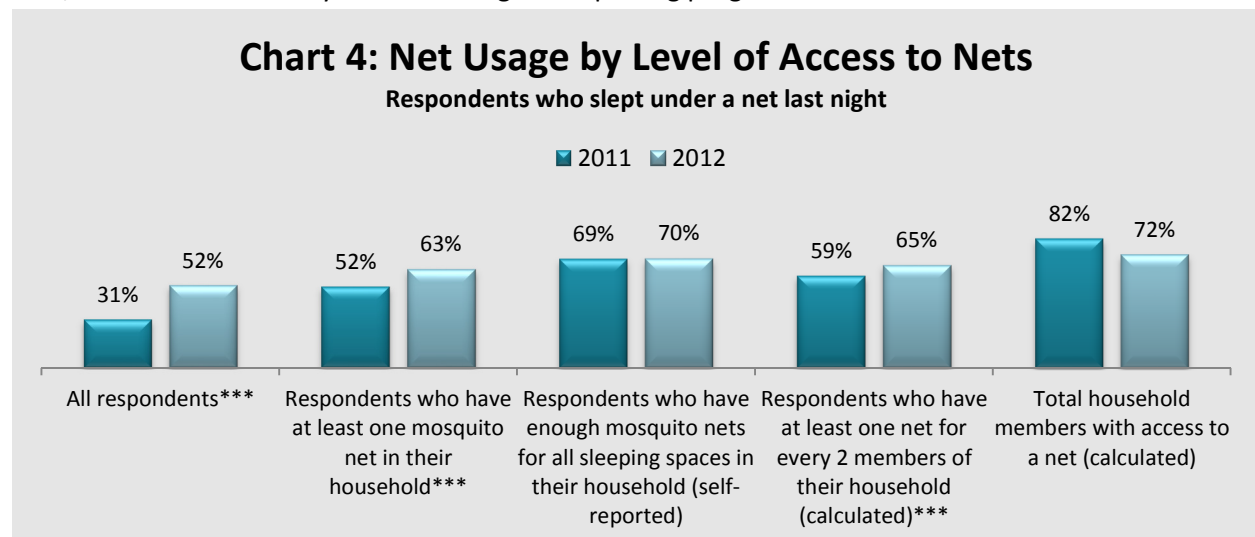
³ Ndong, Dr. Prosper. “Cameroon’s Universal Coverage Campaign 2011,” Cameroon NMCP Presentation to the Alliance for Malaria Prevention Partners Meeting, February 2012. Available at: <http://www.allianceformalariaprevention.com/resources/Cameroon%20country%20update%20-%20Prosper%20Ndong.pdf>. The low coverage may be a result of low initial estimates of population in the region, leading to a smaller allocation of nets. Health partners are aware of the gap and working to improve coverage.

nets for all sleeping spaces (60% vs. 54%, $p < .01^4$ and 29% vs. 21%, $p < .001$). The distribution succeeded in closing these gaps, making net access far more equitable in 2012: 81% of urban households and 84% of rural households had at least one net ($p < .05$), while 58% of urban and 60% of rural households had enough nets for all sleeping spaces (difference not statistically significant).

Another way of measuring Cameroon’s progress toward universal coverage with mosquito nets is to calculate the percentage of individuals with potential access to a net. Using the methodology employed by the World Health Organization (WHO)’s World Malaria Report 2011 to calculate individual access to nets, 76% of all Cameroonians have access to a mosquito net.⁵ By this measure, if supporting programs such as household visits and mass media campaigns were able to convince everyone with access to a net to sleep under it consistently, Cameroon could nearly reach its 80% net usage target without distributing any additional nets.

4.2 Net Usage

The NMCP has set an aggressive target of 80% LLIN usage nationally, based on the level of usage at which malaria transmission is sufficiently disrupted to reduce infection even among those not covered by nets. As the previous section demonstrates, the first major hurdle has already largely been cleared; a prerequisite for net use is net ownership, and net ownership has increased by nearly 50% and is getting closer to universal coverage. However, to be effective, nets must not simply be present in homes – they must be hung properly, used consistently, and cared for. As with measuring ownership of and access to nets, there are several ways of calculating and reporting progress toward consistent net use.



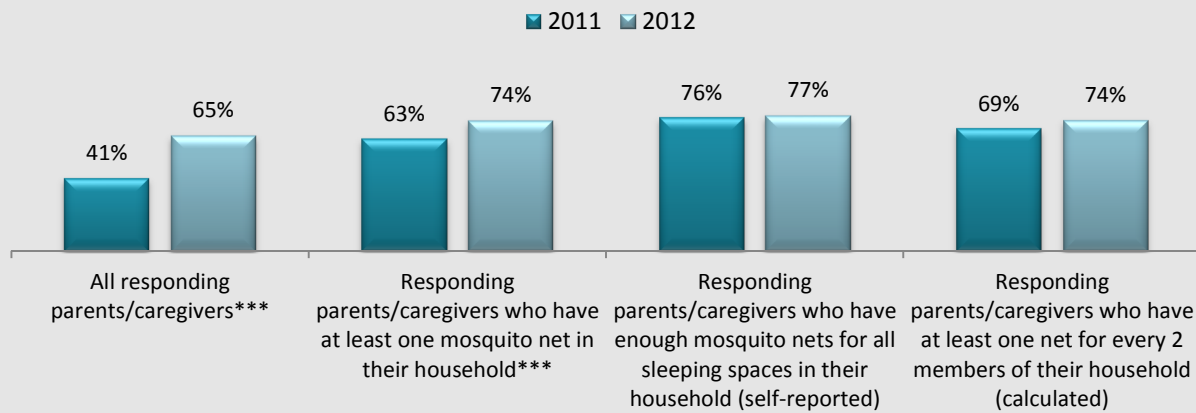
Source: Malaria KAP Surveys, Mar/Apr 2011 (n=2566) and Mar/Apr 2012 (n=2176), nationally representative of adults 15-64. Base: all respondents, respondents with various levels of net access. ***=difference between 2011 and 2012 significant at $p < 0.01$. T-tests not performed on calculated individual-level net access indicator.

⁴ P-value for independent-sample t-test of equality of means. Lower p-value shows stronger statistical significance.

⁵ Calculated by dividing the potential coverage from all nets reported in the survey (5,829 individuals potentially covered, with each net covering up to 2 people but limited by household size) by the number of all household members listed on household rosters (10,685 individuals). Methodology based on indicators reported in “4.1.3: Coverage and use at population level,” *World Malaria Report 2011*, World Health Organization, November 2011. P. 29. Available at http://www.who.int/malaria/world_malaria_report_2011/WMR2011_noprofiles_lowres.pdf

Chart 5: Net Usage by Level of Access to Nets

Respondents whose children slept under a net last night



Source: Malaria KAP Surveys, Mar/Apr 2011 (n=2566) and Mar/Apr 2012 (n=2176), nationally representative of adults 15-64. Base: responding parents/caregivers answering for their children, with various levels of net access. ***=difference between 2011 and 2012 significant at $p < 0.01$.

It is important to note that consistent net use grew at a faster rate over the past year than access did – meaning that behavioral factors have also played a role. In households with at least one net, more individuals (both adults and children) are consistently using their nets. This is impressive progress and suggests that education, outreach, and mass communications have played an important role in making net use more universal, as will be explored in the sections on communication impact below. However, there is still more work to be done: in households with enough nets for all sleeping spaces, a persistent gap remains, at about 30 percent of adults and 25 percent of respondents’ children.

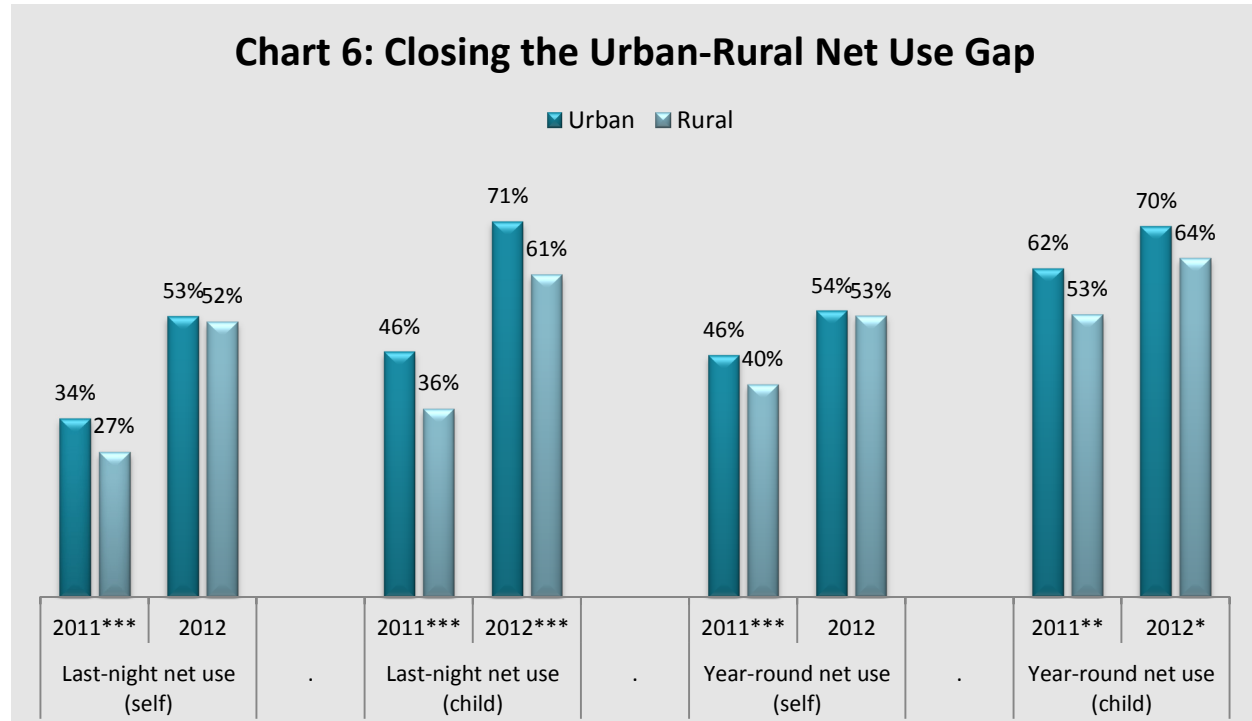
Also important to note is that when net use is measured among all individuals who have access to a net,⁶ consistent use has actually fallen, from 82% to 72%.⁷ This is not surprising, since in 2011 net ownership was limited, and driven by households’ interest in using a net for at least some household members. In 2012, net ownership is more common and more equitable, and therefore the rate of use is more reflective of average commitment to sleeping under a net (rather than the commitment of those who had already made an effort to own nets). This measure provides further evidence of a persistent net use gap of about 30 percent of the population after the access barrier has been removed and communications or other factors have increased use among some household members.

In order to close the gap further, additional determinants of net use must be addressed. The 2011 Malaria KAP Baseline survey identified two factors that seemed to be strong predictors of net use: gender and location. Net use (both “last night” and “year round” use) was lower among rural than urban

⁶ An “individual with access to a net” in this measurement is defined as any individual living in a household where the ratio of nets to people is at least 0.5; based on the assumption that a mosquito net can cover up to two individuals in one sleeping space.

⁷ Net use among individuals with access was calculated by dividing the total number of individuals reported to have slept under a net the night before across all households (4276 individuals in 2011 and 5829 individuals in 2012) by the total number of people with access to a net across all households (5195 individuals in 2011 and 8081 individuals in 2012).

residents, and men were less likely than women to sleep under a net. The urban/rural gap has largely closed for adults, thanks to more equitable access to nets following the universal coverage campaign. However, parents/caregivers in urban areas are still more likely than in rural areas to have their children sleep under a net – even in households with enough nets for all sleeping spaces.



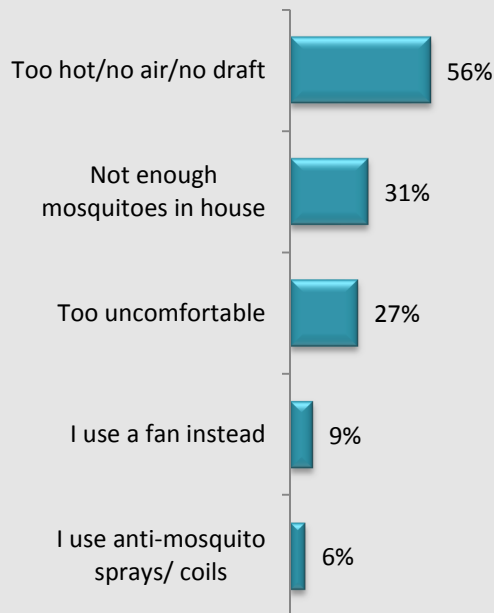
Source: Malaria KAP Surveys, Mar/Apr 2011 (n=2566) and Mar/Apr 2012 (n=2176), nationally representative of adults 15-64. Base: all respondents; responding parents/caregivers answering for their children. *=difference between urban and rural significant at $p<0.1$. **=difference between urban and rural significant at $p<0.05$. ***=difference between urban and rural significant at $p<0.01$.

The gender gap has closed in households where there are enough nets for all sleeping spaces, with men just as likely as women to say they had slept under a net the night before the survey. However, the gap has not closed in resource-constrained households (where there are not enough nets for all sleeping spaces), which is not surprising – since pregnant women and children have been the priority target groups in the past, families are most likely to allocate scarce nets to women and children.

Just as net ownership varies greatly across regions of Cameroon, net usage does as well – even among households that have enough nets for all sleeping spaces: while non-use among respondents with enough nets at home was between 10-25 percent in six regions, over 30% of respondents with enough nets in Littoral and North regions did not sleep under them, 48% in Southwest region, and 63% in the Far North. Communications that reinforce the reasons nets are effective and the value of sleeping under them consistently, every night year-round, can therefore be targeted to these regions. Though knowledge of key malaria facts is slightly lower among non-users in these regions, it is not a strong enough determinant to explain the behavior. Messaging must therefore also address the attitudes that inhibit net use. Among those whose attitudes are a bigger barrier than access to a net, most live in rural areas (57%) and speak either French (73% understand at least some) or Fulfulde (44% understand at least some).

Chart 7: Reasons for Not Sleeping Under a Net

Multiple responses accepted



Source: Malaria KAP Survey, Mar/Apr 2012 (n=2176), nationally representative of adults 15-64. Base: 390 respondents who had enough nets in their household to cover all sleeping spaces and did not sleep under a net last night. Response categories not shown (mentioned by 5% of respondents or fewer): forgot to hang net, mosquito nets are not necessary every night, I don't get malaria, do not have enough nets, mosquito nets do not work, have window screens, nets are harmful to one's health.

The most notable determinant of net use beyond access to a net seems to be how an individual weighs the costs and benefits of sleeping under a net. Among adults in households with enough nets for all sleeping spaces, the main reasons mentioned for not sleeping under a net were the inconvenience or discomfort they associated with sleeping under a net and failing to see enough mosquitoes in the room to need a net. In fact, 82% of non-users with enough nets at home gave one or more of these three reasons. That so much non-use of available nets is related to attitudes suggests a continuing need for behavior change communications, as will be explored in the “Communication Campaign Effectiveness” section below.

Section 5: Diagnosis and Treatment

Unlike malaria prevention tools, which have become much more widely available and more consistently used over the past year, malaria diagnosis and treatment options remain limited in Cameroon. Rapid diagnostic tests (RDTs) came into effective use in 52 of Cameroon’s 181 health districts by the end of 2011, and will be made available to health clinics nationally in 2012. At the time of the survey, the national scale-up had not been completed. Planning meetings and a press conference to announce the use of RDTs at health clinics across the country were held in late



March, 2012. Around the same time, IRESKO began producing case management (diagnosis and treatment) communications under the K.O. Palu brand, but more frequent and consistent messaging about diagnostic and treatment tools may be needed, and communications about RDTs remain limited.

5.1 Rapid Diagnostic Tests

Awareness about RDTs stayed constant over the past year, with about 30% of respondents recognizing this malaria diagnostic tool. Urban residents were 45% more likely than rural residents to have heard about RDTs (38% awareness compared to 26%, $p < .001$). Likely because they are typically described by their English and French names and acronyms (RDTs, or “TDR” for “test diagnostique rapide”), respondents who speak either language were more likely to know about the tests. As RDTs become available nationally, it will be important to ensure that RDTs are referred to in consistent terms in local languages as well.

Not surprisingly, given the low awareness and limited access to RDTs, very few respondents (3%) said that their first reaction upon noticing symptoms of malaria would be to get a malaria test. Testing (either by RDT or microscopy) was also not commonly reported by respondents who had ever taken malaria treatment medication: only 37% said they were tested the last time they were treated. This was not a statistically significant difference from the 2011 KAP Baseline indicator of 39%.

Testing is, however, a key part of Cameroon’s malaria control strategy, because it provides the foundation for the appropriate use of artemisinin-based combination therapies (ACTs). A recent study of case management at healthcare facilities in Cameroon found that only 29% of patients who visited the facilities because of a fever actually had malaria; 70% of the patients with a non-malarial fever, however, were prescribed or given antimalarial medications.⁸

⁸ Mangham, L. J., Cundill, B., Achonduh, O. A., Ambebila, J. N., Lele, A. K., Metoh, T. N., Ndivé, S. N., Ndong, I. C., Nguela, R. L., Nji, A. M., Orang-Ojong, B., Wiseman, V., Pamen-Ngako, J. and Mbacham, W. F. (2012), Malaria prevalence and treatment of febrile patients at health facilities and medicine retailers in Cameroon. *Tropical Medicine & International Health*, 17: 330–342.

Attitudes towards RDTs and the importance of adhering to test results will also need to be considered when crafting communications; only 25% of respondents “strongly agree” that it is necessary to get a blood test to tell if someone has malaria (up from 21% in 2011, $p < .001$) and a majority believe that if an RDT were to turn negative in a person with a fever, that person should be prescribed or take malaria medication anyway.⁹

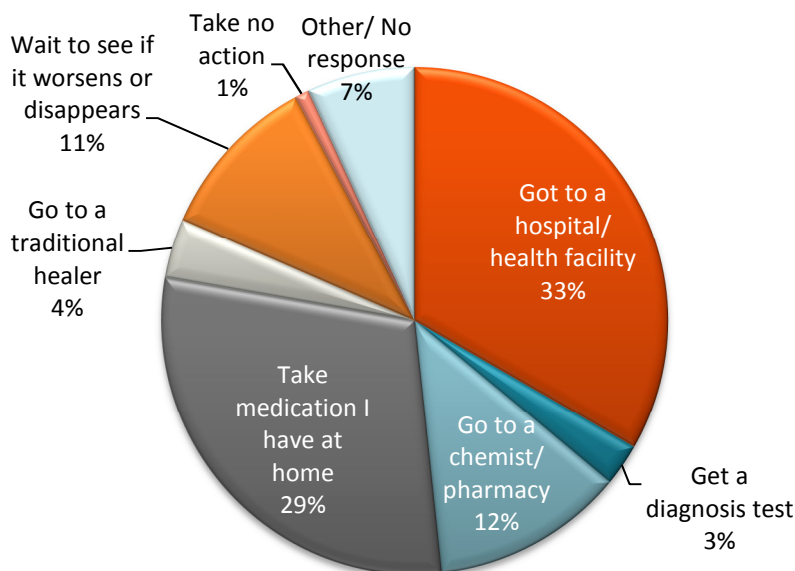
5.2 Seeking Treatment Promptly

*Source: Malaria KAP Survey, Mar/Apr 2012 (n=2176), nationally representative of adults 15-64.
Base: all respondents*

While few respondents mentioned seeking a test/diagnosis, more said they would normally go to a hospital or health facility first when they notice symptoms of malaria. Unfortunately, although a third of adults seek treatment from a health facility, even more self-diagnose (either take medications they already have at home or go directly to a pharmacy, 41%) or take no immediate action (12%).

When it is a child under 5 that is showing signs of malaria, rather than an adult, seeking treatment from a health facility is more common. However, still only 43% of parents/caregivers said that they took their child to a health facility within 24 hours the last time the child had a fever. In order to reach Cameroon’s goal for 80% of all malaria cases to be treated according to national treatment guidelines by 2014, the first step will be to double the rate at which individuals seek treatment from qualified healthcare providers at the first onset of symptoms. Since the rate of prompt treatment-seeking did not improve from 2011 to 2012, it seems that health partners will need to focus on ways to encourage treatment-seeking behavior, including investment in health systems strengthening, expansion and improvement of RDT and ACT supply chains, training of healthcare workers, and incorporating diagnosis and treatment messaging more effectively into national malaria communications.

Chart 8. What do you normally do first when you think you might have malaria?



⁹ A recent study by graduate students at New York University’s Wagner School of Public Service investigated attitudes and understanding about RDTs among healthcare workers and the general public; copies of the report are available from Malaria No More upon request.

Section 6: Communication Campaign Effectiveness

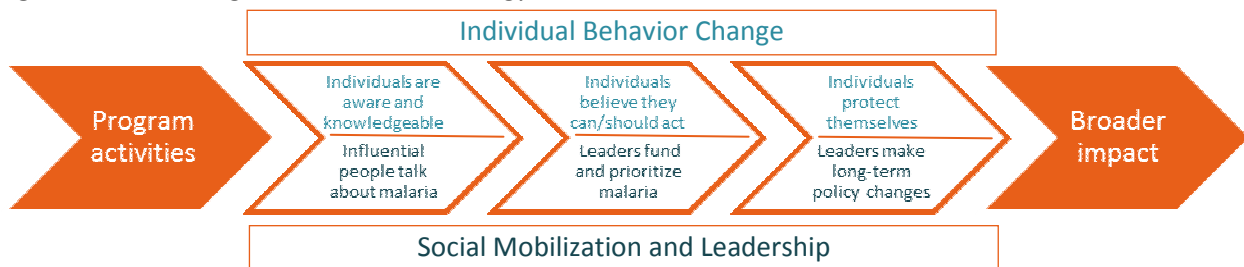
6.1 Theory of Change

MNM’s NightWatch platform is grounded in theories of behavior change and social mobilization that describe how communication feeds into a process of individuals and communities recognizing the importance of malaria control and learning about malaria prevention and treatment, taking action, and thereby reducing malaria deaths (see Appendix C for further information about behavior change theory). **Figure 3.** Process of social and behavior change



The effectiveness of the NightWatch platform, and its adaptation to the Cameroon context as part of the K.O. Palu campaign and brand, can be judged at each stage of the behavior change process. MNM’s monitoring and evaluation strategy corresponds to our theory of change, tracking the reach of program activities and their impact on awareness/knowledge, attitudes, and behavior.

Figure 4. Monitoring and evaluation strategy



6.2 Campaign Activities

With significant program support from ExxonMobil and COTCO, MNM has implemented its signature communications platform, NightWatch, which employs popular, trusted spokespeople to deliver educational and empowering messages about malaria via multiple mass media channels. In Cameroon, these NightWatch activities have been conducted under the umbrella of the country’s unified K.O. Palu brand. NightWatch activities kicked off at a press conference in July 2011, and the full K.O. Palu Campaign was launched in August 2011 with a large public event in Yaoundé, which was also broadcast on national television and radio and covered in the national and international press. The following activities were rolled out in 2011 and early 2012:

- **K.O. Palu Anthem:** an original song and music video featuring educational lyrics about malaria control, performed by popular Cameroonian artists Petit Pays, Sine, Mercellin Ottou, Frederique Ottou, Lady Ponce, and Richard Bona. The anthem was released at the NightWatch press conference in



Cameroon Malaria KAP Survey: Measuring Progress from 2011 to 2012

July 2011 and featured at the August 2011 K.O. Palu Campaign launch event. Distribution went viral immediately, with the song becoming popular on the radio and the music video appearing on local TV and even picked up by the diaspora-facing channel Afrotainment. The music video has also been viewed by over 31,000 people on YouTube (as of June, 2012).

- K.O. Palu NightWatch PSAs:** Four PSAs were released in August 2011 and aired on CRTV, Equinox TV, Canal 2 International, and Spectrum TV, as well as 16 radio stations.¹⁰ The PSAs featured singer Lady Ponce delivering the message *“Bonsoir Cameroun. Saviez-vous que vous ne pouvez obtenir le paludisme qu’à partir d’une piqûre de moustique? Une moustiquaire est l’une des meilleures façons de vous protéger, vous et votre famille contre le paludisme. Dormez tranquille. KO Palu. Tous unis contre le paludisme. Ce message est soutenu par le Ministère de la Santé Publique, COTCO, ExxonMobil et MTN.”* and



NBA star Luc Mbah a Moute delivering the message *“Hello Cameroon. I’m Luc Mbah a Moute. Did you know that the mosquito that transmits malaria only bites at night? A mosquito net is one of the best ways to protect you and your family from malaria. Sleep peacefully. All against malaria. This message is supported by the Ministry of Health, COTCO, ExxonMobil and MTN.”* The first wave of PSAs was on-air at 9pm from July 29-October 29, 2011. Three additional TV PSAs (with messages from Sine in English, Princess Khadizah in Fulfulde, and Xmaleya in French) and 7 additional radio PSAs (with messages from Akon in English, Afo Akom in Pidgin, Frederique Ottou in French, Princess Khadizah in Fulfulde, Sine in English and French, XMaleya in English and French, and a combination message in French and English from XMaleya, Sine, Pit Baccardi, and Afo Akom) were on-air from April 1-July 1, 2012.

- K.O. Palu NightWatch SMS:** In addition to donating media buys to distribute the PSAs, MTN made an in-kind contribution to the campaign in the form of net-use reminders via SMS to MTN subscribers. A first round of SMS reminders began in August 2011, and a second round began in February/March 2012; the SMS featured one of three key messages in either English or French:
 - [English] You can only get malaria from a mosquito bite. Protect you and your family. Use a mosquito net. KO Palu/MTN/Ministry of Public Health.
 [French] Le palu est transmis uniquement à travers la piqure d’un moustique. Protégez-vous et votre famille. Utilisez une moustiquaire imprégnée. KO Palu/MTN/Minsante.
 - [English] The mosquito that transmits malaria primarily bites at night. Protect you and your family. Use a mosquito net. KO Palu/MTN/Ministry of Public Health.
 [French] Les moustiques qui transmettent le palu piquent surtout la nuit. Protégez-vous et votre famille. Utilisez une moustiquaire imprégnée. KO Palu/MTN/Minsante.
 - [English] Protect you and your family from malaria. Remember to sleep under your mosquito nets tonight. KO Palu/MTN/Ministry of Public Health.



¹⁰ CRTV is accessible nationally, whereas many of the radio stations airing K.O. Palu NightWatch PSAs are regional.

Cameroon Malaria KAP Survey: Measuring Progress from 2011 to 2012

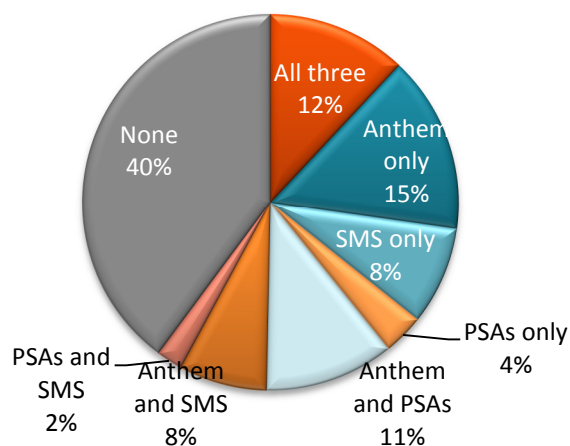
[French] Protégez-vous et votre famille contre le palu. N'oubliez pas de dormir sous vos moustiquaires imprégnées. KO Palu/MTN/Minsante.

- **K.O. Palu Billboards:** Also sponsored by MTN, approximately 100 billboards featuring K.O. Palu Ambassadors were posted around high-traffic areas throughout Cameroon in early 2012.
- **Other Activities:** The K.O. Palu Campaign has also produced hand-out materials such as 2012 calendars, and sponsored events to celebrate World Malaria Day in April 2012.

6.3 Campaign Reach

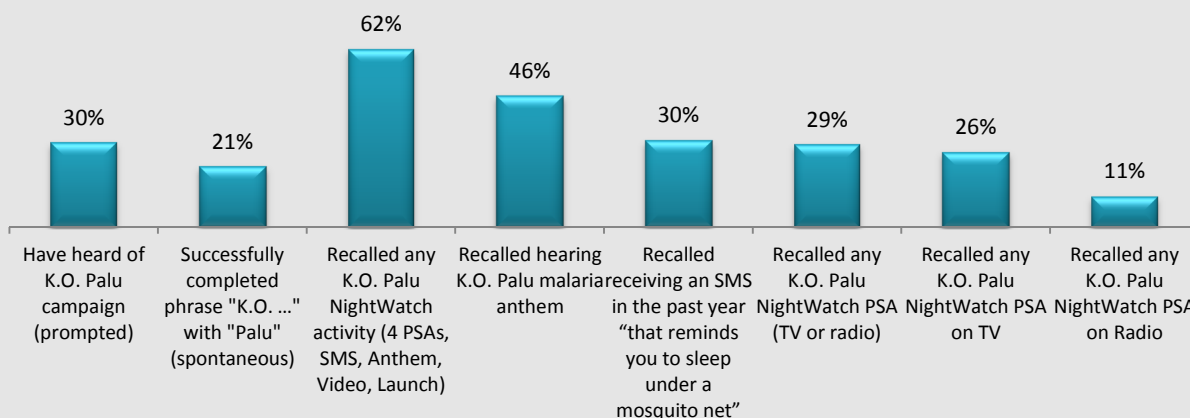
The K.O. Palu NightWatch activities, as intended, have reached Cameroonians from many different directions. Over 60% of all respondents (representing over 6.8 million adults) recalled at least one element of the campaign.¹¹ Not surprisingly, the element that “went viral” and was most consistently present via mass media over the past year, the K.O. Palu Anthem, was the most widely recognized, with 46% of respondents saying they had heard the Anthem. Given their more limited distribution, it is also extremely encouraging that 45% of respondents said they had heard or seen at least one of the bed net reminder components (either a radio PSA, TV PSA, or SMS reminder). It is also important to note that, as intended, many respondents received malaria messages from multiple sources, all reinforcing each other. In other cases, one medium was able to reach people not exposed to other media, broadening the overall audience.

Chart 9. Overlap of Exposure to K.O. Palu Anthem, PSAs, and SMS



Source: Malaria KAP Surveys, Mar/Apr 2011 (n=2559) and Mar/Apr 2012 (n=2176), nationally representative of adults 15-64. Base (both charts): all respondents.

Chart 10. Reach of K.O. Palu NightWatch Platforms



¹¹ Audience estimates based on United Nations Statistics Division estimate of 10,940,736 adults over 15.

The K.O. Palu brand also gained a great deal of traction in its first year, helping to unify malaria communications nationally and lend authority and credence to all activities under the brand. Already, about a third of all adults recognize the K.O. Palu brand name, without any prompting with specific activities or spokespeople, and 21% were able to spontaneously complete the brand slogan with “Palu” when prompted with “K.O. ...” This is impressive brand recognition for a campaign less than one year old.

6.3.1 Recognition of K.O. Palu Spokespeople and Sponsors

The spokespeople MNM recruited to be the faces and voices of K.O. Palu NightWatch communications are among the most popular and trusted celebrities in Cameroon. Their participation has captured the national attention: 40% of respondents (representing 4.4 million adults) spontaneously named at least one K.O. Palu Ambassador when asked which famous people they remembered seeing or hearing in a malaria campaign in the past year. The most widely recognized were singers Petit Pays and Lady Ponce.

The public and private sector partners that have contributed to the K.O. Palu campaign are also widely recognized, although their level of visibility in the campaign is, by design, more as a supporting role and

Table 2. Recognition of Campaign Spokespeople and Sponsors

	Celebrity	% of Survey Respondents	Estimated Audience (adults 15+)
Which famous people have you heard or seen in a campaign about malaria in the past year, if any? (spontaneous)	At least one K.O. Palu Ambassador	40%	4,409,117
	Petit Pays	31%	3,391,628
	Lady Ponce	30%	3,282,221
	Alexandre Song	6%	656,444
	XMaleya and Pit Biccardi	6%	656,444
	Richard Bona	5%	547,037
	Sine	4%	437,629
Which organizations do you think are associated with the K.O. Palu Campaign? (spontaneous)	Ministry of Health or NMCP	28%	3,063,406
	MTN	11%	1,203,481
	COTCO/Exxon Mobil	1%	109,407

Source: Malaria KAP Survey, Mar/Apr 2012. Nationally representative, N=2176 adults 15-64. Audience estimates based on United Nations Statistics Division estimate of 10,940,736 adults over 15.

partnership. Interestingly, all of the respondents who spontaneously mentioned COTCO/ExxonMobil were located in the regions where recognition of the companies’ names and logos may be higher because of the presence of the pipeline and the visibility of the companies’ branding in major urban areas such as Douala and Yaoundé: most were in Littoral and Adamawa, and a handful were in Centre, North, Northwest, and Southwest.

6.3.2 Effective Communication Channels

The most effective campaign channel so far has been the K.O. Palu Anthem, though this is expected to shift as the PSAs and SMS begin reaching their audience consistently over a longer period of time. The anthem has been most popular among young adults, a key demographic group for malaria behavior change communications. The anthem’s success has been a combination of two factors: its intrinsic appeal and its broad distribution on the most popular media platforms. The 2011 Baseline Malaria KAP

survey found television to be the most promising medium for reaching a national audience, and the anthem has reached a large audience in part because television stations were so eager to show the anthem's music video as part of their programming, and at no cost to the NMCP or other health partners. About half of the Cameroonian adults that remembered the anthem had only seen it on TV.

Chart 11. K.O. Palu Anthem: Reach by Age Group

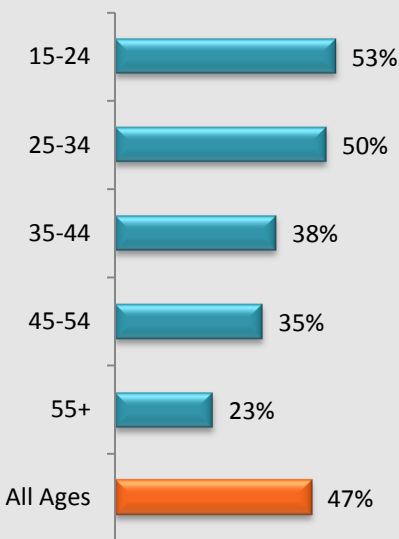
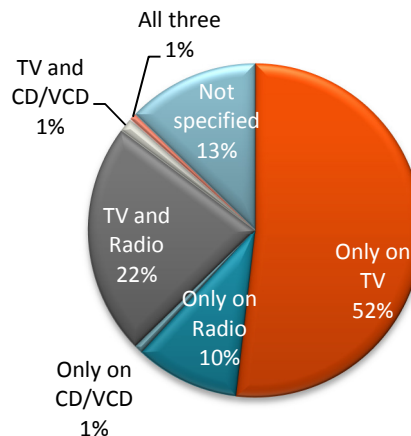


Chart 12. K.O. Palu Anthem Platforms



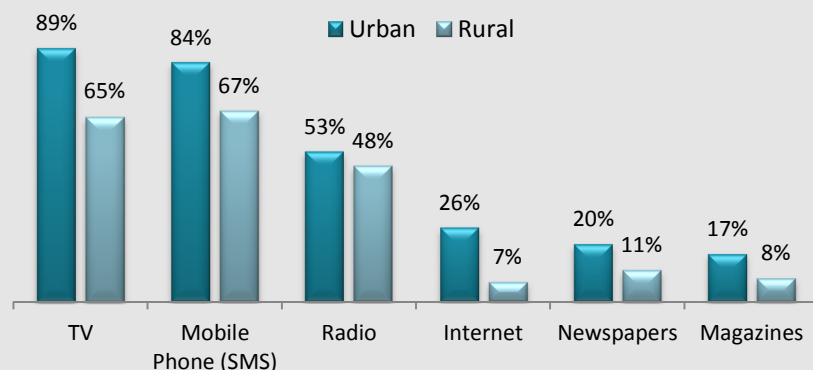
Source: Malaria KAP Survey, Mar/Apr 2012 (n=2176), nationally representative of adults 15-64. Base (at left): all respondents, by age group. Base (at right): n=1082 respondents who recalled hearing or seeing the K.O. Palu Anthem.

As more K.O. Palu NightWatch PSAs air on TV every evening, recall of the PSAs should reach a comparable level. While TV remains one of the best ways to engage a wide audience, the multimedia approach has great value; about 10% of those who remembered the K.O. Palu anthem had only heard it by radio. For the 25-30% of Cameroonians that do not have regular access to a television, being able to hear the anthem or PSAs on local and national radio stations may mean the difference between remembering to sleep under a bed net at night or not.

6.3.3 Target Audiences

As noted above, the multimedia approach to K.O. Palu-branded malaria communications has allowed health partners to reach a wider audience, and also to reinforce the messages to individuals who are exposed to multiple campaign platforms. The K.O. Palu NightWatch distribution strategy is based on the wide reach of both television and mobile phones, along with the recognition that radio remains an important medium, particularly in rural areas where media access is more limited. Community radio stations, in particular, offer an opportunity to expand the reach of NightWatch in media-sparse areas of the country.

Chart 13. Weekly Use of Media



Source: Malaria KAP Survey, Mar/Apr 2012 (n=2176), nationally representative of adults 15-64. Base: n=1092 urban residents and n=1084 rural residents.

Though the goal is broad exposure, MNM and other health partners are also interested in reaching key groups including pregnant women, parents/caregivers of small children, and those in rural areas who are most at

risk from malaria. As the table below shows, the campaign has already reached very large segments of those target audiences. However, although reaching half of all rural adults with malaria messaging is an achievement to be proud of, the even stronger reach in urban areas suggests that it is possible to do more.

Table 3. Reach Among Target Audiences

Campaign Exposure	Urban	Rural	Men	Women	Under 30	Over 30	Pregnant Women	Parents/Caregivers
Any K.O. Palu NightWatch activity	73%	51%	65%	60%	70%	55%	60%	62%
Any K.O. Palu NightWatch PSA	38%	20%	29%	28%	33%	25%	26%	30%
K.O. Palu NightWatch PSA- TV	34%	18%	26%	26%	30%	22%	26%	28%
K.O. Palu NightWatch PSA- Radio	15%	6%	12%	10%	12%	10%	7%	11%
Bed net reminder SMS, whether or not source specified	36%	25%	34%	27%	32%	29%	21%	31%
Bed net reminder SMS, MTN named as source	26%	19%	26%	19%	23%	22%	14%	22%
K.O. Palu Anthem	55%	37%	47%	45%	52%	41%	53%	46%
K.O. Palu Launch Event (heard, saw, attended)	13%	8%	11%	10%	11%	9%	17%	11%

Source: Malaria KAP Survey, Mar/Apr 2012. Nationally representative, N=2176 adults 15-64. Bases: n=1092 urban/1084 rural; n=1089 men/1087 women; n=1175 under 30/909 over 30, n=98 pregnant women, n=833 parents/caregivers.

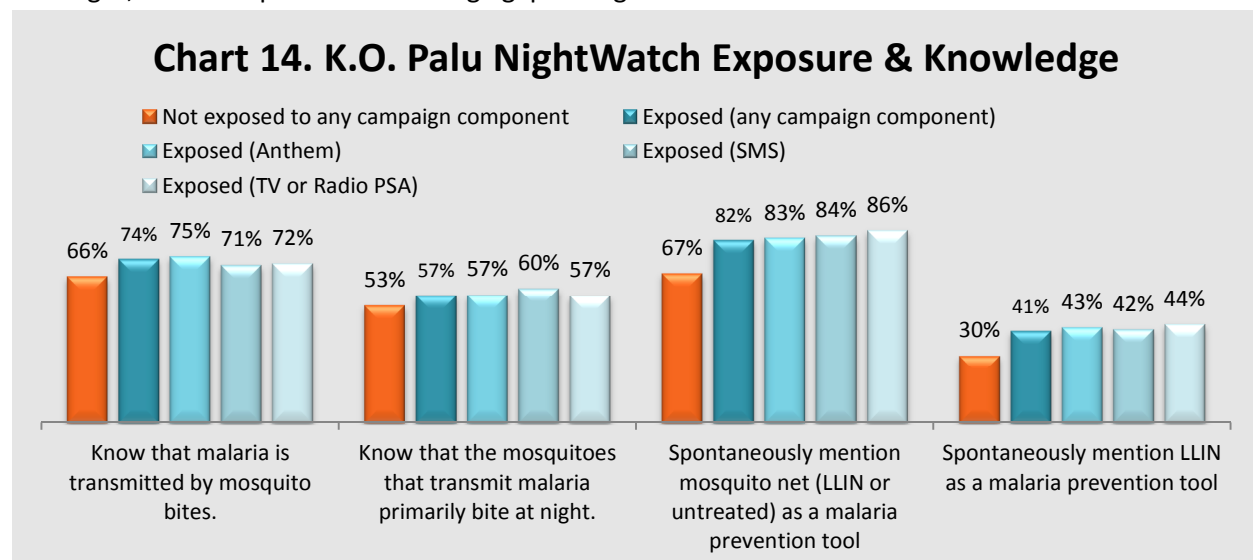
It is also important to note that some platforms are more equitable than others; NightWatch PSAs were as likely to reach women as men, whereas SMS was more likely to find its way to a man than a woman. The K.O. Palu NightWatch communications, with their celebrity spokespeople and engaging style, was very successful in reaching young adults (15-30), a key target group for behavior change since they may have a lower perception of risk from malaria, but are starting families and instilling habits in young children.

6.4 Impact on Knowledge

The K.O. Palu NightWatch PSAs, Anthem, and other activities have focused on key knowledge about how malaria is transmitted, and how it can be prevented. The decision to use messages such as “Did you know that the mosquito that transmits malaria primarily bites at night? A mosquito net is one of the best ways to protect you and your family from malaria.” was based on both the results of the 2011 Malaria KAP Baseline and formative qualitative research. The goal was to increase knowledge about malaria transmission and prevention, so that as the free LLINs became available through the Universal Coverage distribution, Cameroonians would be ready to collect – and use – the nets. In addition, the K.O. Palu NightWatch communications sought to complement the net distribution process by reminding those who already knew key facts why a net is a valuable malaria prevention tool.

Unfortunately, knowledge of key malaria transmission facts did not change significantly from 2011 to 2012. A constant, but fairly high, share of adults (71-72%) know that malaria is transmitted via mosquito bites, and a smaller number (56%) know that the mosquito that transmits malaria primarily bites at night. The most common alternative response for when mosquitoes transmit malaria was, both years, “at any time, night or day” (around 35%). Such a belief could either encourage net use (since a net at least prevents malaria transmission at night), or discourage net use (if individuals feel it is futile to protect themselves from malaria at night, when mosquitoes can simply bite them during the day).

Although there was no significant movement from year to year, there was nonetheless a strong relationship between exposure to K.O. Palu NightWatch communications and knowledge of these two facts. Even after controlling for urban/rural location, gender, education, and media use, those who had seen or heard K.O. Palu-branded communications were more likely to know how malaria is transmitted ($p < .01$). This suggests that while there is still work to be done to reach those segments of the population that do not know key malaria facts, the malaria messages used by the K.O. Palu NightWatch campaign are effective at conveying and reinforcing critical information; with broader distribution of the messages, we can expect the knowledge gap to begin to close.



Source: Malaria KAP Survey, Mar/Apr 2012. Nationally representative, N=2176 adults 15-64. Bases: n=821 not exposed, n=1355 exposed (any component), n=1000 exposed (Anthem), n=659 exposed (SMS), n=628 exposed (TV or Radio PSA).

The emphasis on mosquito nets, and cooperation with the net distribution campaign itself, has had a larger impact: there was a statistically significant increase in knowledge that mosquito nets are one of the best ways to prevent malaria, from 71% of respondents in 2011 to 77% of respondents in 2012 ($p < .01$). More adults are also distinguishing between a net in general and a long-lasting insecticidal net (LLIN), with 37% spontaneously mentioning LLINs as a means of preventing malaria in 2012, compared to 34% in 2011 ($p < .05$).

The 2012 Malaria KAP Survey results suggest that communication efforts played a substantial role in increasing knowledge about nets: respondents exposed to any K.O. Palu NightWatch component were 21% more likely than those not exposed (81% vs. 67%, $p < .001$) to spontaneously mention a mosquito net (or specifically a LLIN) as a method of preventing malaria. Even after controlling for net ownership, level of education, urban/rural location, gender, and media use, exposure to K.O. Palu NightWatch communications had a positive and statistically significant ($p < .001$) effect on knowledge that mosquito nets are one of the best ways to prevent malaria.

6.5 Impact on Attitudes

Another goal of the K.O. Palu campaign, beyond increasing knowledge, is to empower all citizens to fight malaria. The feeling of empowerment – the sense that it is possible and important to take action as individuals and communities – is difficult to measure. However, basic indicators of individuals' attitudes do show improvement from 2011 to 2012, and there is some evidence that the communications campaign has played a role in boosting Cameroonians' confidence in their ability to fight malaria. Multivariate regression results do not show any consistently statistically significant predictors of attitudes, and qualitative research may be necessary to understand more fully how various factors influence feelings of empowerment. However, there is some relationship: those exposed to any K.O. Palu NightWatch component were 22% more likely than someone who was not exposed to say it is "very easy" to protect themselves from malaria and 45% more likely to say it is "very easy" to protect their children (21% vs. 18%, and 13% vs. 9%, respectively, $p < .05$).

The share of Cameroonians who say that they take malaria "very seriously" also increased from 2011 to 2012, from 55% to 62% ($p < .01$). The only factors that have a measurable correlation with taking malaria seriously are gender and age; women and those over 30 were more likely than men and young adults to hold this attitude. The increase from year to year is likely due to the fact that malaria control was put in the spotlight in late 2011 through the net distribution campaign and coordinated communication efforts; however, this effect cannot be linked in the data via either net ownership or exposure to K.O. Palu NightWatch activities.

6.6 Impact on Behavior

The end goal of both the universal coverage net distribution campaign and the K.O. Palu NightWatch communication activities is to ensure that Cameroonians collect the free nets available to them, hang them in their homes, and sleep under them – every night, all year round. As noted in the section on net usage above, the coordinated distribution and communication efforts have been very successful,

increasing nightly net usage from 31% to 52% ($p < .001$) among adults and from 41% to 65% ($p < .001$) among their children under 5.

Net usage depends most heavily on net access, but the communication campaign has had an impact as well. Without controlling for other factors, those exposed to the K.O. Palu NightWatch campaign in any way were 13% more likely to sleep under a net (55% vs. 48%, $p < .01$), and 24% more likely to have their children sleep under a net (71% vs. 57%, $p < .001$). The impact of K.O. Palu NightWatch campaign exposure remains positive and statistically significant ($p < .1$ for adults, $p < .01$ for children) even when controlling for net ownership, level of education, urban/rural location, gender, and media use.

Table 4. Net Use by Level of Exposure to K.O. Palu NightWatch Campaign

Level/Type of Campaign Exposure	Slept Under a Net Last Night		Sleep Under a Net Year-Round ¹²	
	Respondent	Children < 5	Respondent	Children < 5
Not exposed to any campaign component	48%	57%	50%	62%
Any K.O. Palu campaign component	55%	71%	56%	70%
Any 2 K.O. Palu campaign components	56%	72%	58%	71%
Any 3 K.O. Palu campaign components	58%	74%	60%	74%
K.O. Palu Anthem	56%	74%	58%	72%
K.O. Palu NightWatch SMS from MTN	56%	69%	57%	69%
Any K.O. Palu NightWatch PSA	58%	73%	61%	74%
K.O. Palu NightWatch PSA on TV	59%	73%	62%	74%
K.O. Palu NightWatch PSA on Radio	59%	79%	61%	79%
K.O. Palu Launch Event (heard, saw, attended)	65%	76%	86%	80%

Source: Malaria KAP Survey, Mar/Apr 2012. Nationally representative, N=2176 adults 15-64. Bases: n=821 not exposed, n=1355 exposed (any component), n=1077 exposed (2 components), n=692 exposed (3 components), n=1000 exposed (Anthem), n=483 exposed (SMS from MTN), n=628 exposed (NightWatch PSA), n=570 exposed (NightWatch TV), n=232 exposed (NightWatch Radio), n=220 exposed (launch event) and responding parents/caregivers in each category.

Though the launch event is associated with the highest levels of net use, much of this difference is explained by the nature of the audience who heard about the K.O. Palu launch event – particularly that audience’s heavy concentration in urban areas. The impact of the K.O. Palu Anthem on net use, on the other hand, is positive and statistically significant ($p < .05$ for adults, $p < .01$ for children) even when controlling for other factors.

¹² Note that “Sleep under a net year-round” is a self-reported measure based on the question “During which period of the year do you sleep under a mosquito net?” and does not necessarily align with “last-night” net use. Year-round net use captures whether individuals use a net only during certain seasons (often, the rainy season when mosquitoes and malaria cases are more prevalent) or during all seasons. Last-night net use captures consistency during a specific season (when the survey is conducted). It is possible that an individual could, for example, sleep under a mosquito net a few nights a week on average, but during all seasons; conversely, one could sleep under a net every night during the rainy season but never during the dry season. We measure both indicators because for mosquito nets to be most effective in malaria endemic communities, they should ideally be used consistently, every night, year-round.

It is possible that some of the effects measured as impacts of K.O. Palu NightWatch communication activities are actually the result of education or information received as part of the national net distribution itself (for example, while picking up nets at a distribution point). However, communication and materials associated with the distribution were branded with K.O. Palu messaging as well, so those effects can largely be attributed to the coordination of all messaging in a unified campaign.

On the other hand, the impact of K.O. Palu NightWatch messaging may be underestimated if the information and empowerment spread to a secondary audience, beyond those who recall specific components of the campaign. Word-of-mouth has likely spread many messages, as well as the sense that malaria is an important – but preventable and treatable – disease beyond those who remember the K.O. Palu-branded source: for example, 45% of those who collected a net from a distribution point said they discussed sleeping under the net(s) with their family when they returned home, and 10% of all respondents said that most or every time they hear or see malaria communications, they discuss those messages with friends or family (the figure is slightly higher – 14% – for those exposed to K.O. Palu NightWatch communications).

Section 7: Keeping Pace with a Changing Environment

As the malaria control environment changes, communication efforts must keep pace. The 2012 Malaria KAP survey highlights several areas on which the K.O. Palu NightWatch campaign can focus over the next year:

- **Expand reach in rural areas:** some of the most important gaps in malaria control behavior, such as protecting children under 5 with mosquito nets (even in households that have enough nets), are more concentrated in rural areas. In 2012, MNM is partnering with UNICEF to broadcast K.O. Palu NightWatch PSA content on local community radio stations in rural areas of four regions (East, Adamawa, North, and Far North). While this is a first step in addressing the gaps in rural areas, further efforts to reach a rural audience must remain a top priority.
- **Address regional differences in net use:** beyond just the urban/rural divide, net use messages are particularly needed in regions with lower net use among individuals with access to nets – especially the Far North, Southwest, North, and Littoral regions. Messaging in both French and Fulfulde can help address the gaps in these regions. Two of these regions will be reached through the MNM-UNICEF partnership, and health partners can identify opportunities in the Southwest and Littoral regions as well.
- **Focus net messaging on the remaining barriers:** most of the individuals who could sleep under a net (have access to one) but do not use it consistently said that the net is uncomfortable, inconvenient, or not necessary because there are too few mosquitoes at times. Messaging should focus on overcoming these attitudinal determinants of net use.
- **Expand messaging on case management:** building on IRESCO’s K.O. Palu-branded case management PSA’s launched in 2012, more efforts are clearly needed to increase prompt treatment-seeking behaviors. In particular, there is a need to introduce Cameroonians to rapid diagnostic tests: two-thirds of adults have not heard of RDTs, and very few have personal experience with them.
- **Encourage men and young adults to take malaria seriously:** though the K.O. Palu NightWatch campaign has succeeded in bringing malaria to the attention of a broad audience, men and young adults are still less likely than women or adults over 30 to say that they take malaria seriously. Though they may be at lower risk personally, further messaging can emphasize the role men and youth can play in dramatically reducing malaria cases and deaths across Cameroon.
- **Ensure consistency and frequency of communications:** according to the social and behavior change communication (SBCC) theories underlying NightWatch activities, messages are most impactful when they are on the air frequently and consistently over a long period of time. The K.O. Palu Anthem provides evidence in support of this theory; with its entertaining style, the anthem was played all over the Cameroonian airwaves throughout the second half of 2011 and early 2012, and was more widely remembered than other communication activities. As messages evolve along with Cameroon’s malaria control program, it will be important to ensure that the K.O. Palu brand and malaria communications remain in the public eye.

Appendix A: Individual Behavior Change Indicators

Key indicators measured in 2011 and 2012 are listed below. T-tests were used to compare results year-on-year. Where year-to-year differences in means are statistically significant, the level of significance is noted in the KAP 2012 column as follows: *p<0.1; **p<0.05; ***p<0.01.

Individual Behavior Change Indicators					
	Theme	Question	Measurement/ Base	KAP Baseline 2011	KAP 2012
Measures of Awareness	General malaria exposure	Within the last three months, have you heard or seen any communication/advertisement about malaria?	% of all who answer "Yes"	16.5%	49.9%***
		Where have you heard this communication/advertisement about malaria?	% of all who answer "TV"	12.1%	41.7%***
		Where have you heard this communication/advertisement about malaria?	% of all who answer "Radio"	5.7%	13.6%***
		What organizations/companies/groups, if any, have informed you about malaria?	% of all who mention "Ministry of Health"	4.0%	28.5%***
		What organizations/companies/groups, if any, have informed you about malaria?	% of all who mention "COTCO"	0.0%	0.0%
		What organizations/companies/groups, if any, have informed you about malaria?	% of all who mention "MTN"	0.6%	1.9%***
	Knowledge of Malaria	In your opinion, what is the main cause of malaria?	% of all who answer "Mosquito bites"	72.2%	70.8%
		In your opinion, at what time do mosquitoes transmit malaria, if at all?	% of all who answer "Only during the night"	56.4%	55.6%
		Thinking about methods to prevent malaria infection, please tell me which ones you know of?	% of all who answer "mosquito net" or "LLIN" (first mention)	n/a	75.4%
		Thinking about methods to prevent malaria infection, please tell me which ones you know of?	% of all who answer "LLIN" (first mention)	n/a	31.9%
		Thinking about methods to prevent malaria infection, please tell me which ones you know of?	% of all who answer "mosquito net" or "LLIN" (any mention)	70.6%	76.5%***
		Thinking about methods to prevent malaria infection, please tell me which ones you know of?	% of all who answer "LLIN" (any mention)	33.7%	37.0%**
		What are the main symptoms of malaria?	% of all who mention "Fever"	55.0%	55.9%
		In your opinion, is fever and malaria the same thing?	% of all who answer "No"	55.4%	60.0%***
	Seriousness of malaria threat	Have you ever heard of a "rapid diagnostic test" for malaria?	% of all who answer "Yes"	29.5%	32.1%*
Would you say that malaria...		% who answer "...is a disease I take very seriously" (of all)	55.0%	61.9%***	

Cameroon Malaria KAP Survey: Measuring Progress from 2011 to 2012

	Theme	Question	Measurement/ Base	KAP Baseline 2011	KAP 2012
Measures of Commitment	Ability to prevent malaria	Please tell me, on a scale of 1-5, where 1 is "very easy" and 5 is "very difficult," how easy or difficult is it in your opinion to protect yourself from being infected by malaria?	% of all who answer "It is very easy to protect myself from malaria"	14.6%	20.0%***
		Please tell me, on a scale of 1-5, where 1 is "very easy" and 5 is "very difficult," how easy or difficult is it to protect your children under the age of 5 from malaria?	% of parents/caregivers who answer "It is very easy to protect my children under age 5 from malaria"	11.2%	11.5%
		It is possible to eliminate malaria from my community forever	% of all who answer "Strongly agree"	n/a	10.0%
		It is possible to eliminate malaria from Chad	% of all who answer "Strongly agree"	n/a	10.2%
		It is possible, out of one's efforts/actions, to live one's entire life without getting malaria	% of all who answer "Strongly agree"	n/a	7.9%
		Protecting myself from malaria can help protect my community from malaria	% of all who answer "Strongly agree"	9.9%	10.2%
	Importance of seeking prompt diagnosis/ treatment	It is necessary to get a blood test to tell if you have malaria	% of all who answer "Strongly agree"	20.6%	25.0%***
		If tests are available/free, a person should always be tested (with RDT) before any treatment is considered or prescribed.	% of all who answer "Strongly agree"	24.9%	27.3%*
		If a blood test is negative in a person with fever, they should be prescribed or take malaria medications anyway	% of all who answer "Strongly disagree"	10.6%	4.1%***
	Creating norms	When you hear or see communication/advertisements about malaria, how often do you discuss them with other people, like family, friends, or neighbors?	% of all who answer "Most of the times" or "Every time"	n/a	10.0%

Cameroon Malaria KAP Survey: Measuring Progress from 2011 to 2012

	Theme	Question	Measurement/ Base	KAP Baseline 2011	KAP 2012	
Measures of Action	LLIN/bed net ownership and usage	When was the last time you slept under a mosquito net?	% of all who answer "Last night"	30.6%	52.3%***	
		When was the last time your child slept under a mosquito net?	% of all responding parents/caregivers who answer "Last night"	41.1%	65.4%***	
		During which period of the year do you sleep under a mosquito net?	% of all who answer "During the entire year"	31.4%	53.8%***	
		During which period of the year does your child sleep under a mosquito net?	% of all responding parents/caregivers who answer "During the entire year"	58.1%	67.1%***	
		How many mosquito nets do you have in your home that can be used for sleeping?	% of all who answer at least 1	57.2%	82.3%***	
		When was the last time you slept under a mosquito net?	% of all who have at least one mosquito net in their household who answer "Last night"	51.6%	62.6%***	
		When was the last time your child slept under a mosquito net?	% of all responding parents/caregivers who have at least one mosquito net in their household who answer "Last night"	63.4%	74.0%***	
		Do you have mosquito nets for all sleeping spaces in your households?	% of all who answer "yes"	25.4%	59.3%***	
		When was the last time you slept under a mosquito net?	% of all who have enough mosquito nets for all sleeping spaces in their household who answer "Last night"	69.5%	69.8%	
		When was the last time your child slept under a mosquito net?	% of all responding parents/caregivers who have enough mosquito nets for all sleeping spaces in their household who answer "Last night"	75.5%	76.9%	
		Is there at least one net for every two people in the household?	% of households for which # nets/person is greater than or equal to .5	32.2%	62.0%***	
		When was the last time you slept under a mosquito net?	% of all who have at least one net for every 2 members of their household who answer "Last night"	58.7%	65.4%***	
		When was the last time your child slept under a mosquito net?	% of all responding parents/caregivers who have at least one net for every 2 members of their household who answer "Last night"	69.3%	74.0%	
		(Calculated average) household members that were potentially covered by a net in their household (% of all reported household members)		48.0%	75.6%	
		(Calculated average) household members with access to a net that used it "last night" (% of all individuals potentially covered by mosquito nets if a net covers up to 2 people in a single household)		82.3%	72.1%	
		Seeking timely diagnosis/ treatment	Approximately how much time passed between noticing a fever and seeking treatment? (at any location)	% of those who have ever had a fever who answered within 24 hours	40.6%	40.2%
			Approximately how much time passed between noticing a fever and seeking treatment for your child? (at any location)	% of parents/caregivers whose children have ever had a fever who answered within 24 hours	57.1%	61.2%

Cameroon Malaria KAP Survey: Measuring Progress from 2011 to 2012

Approximately how much time passed between noticing a fever and seeking treatment? (from a healthcare facility)	% of those who have ever had a fever who answered within 24 hours	22.2%	23.2%
Approximately how much time passed between noticing a fever and seeking treatment for your child? (from a healthcare facility)	% of parents/caregivers whose children have ever had a fever who answered within 24 hours	38.2%	43.0%*
What would you normally do first when you think you might have malaria?	% of all who answer "Go to hospital/health center for advice or treatment."	38.1%	33.4%***
What would you normally do first when you think you might have malaria?	% of all who answer "Get a malaria test"	2.3%	2.7%
What would you normally do first when you think a child in your household might have malaria?	% of responding parents/caregivers who answer "Go to hospital/health center for advice or treatment."	54.9%	45.4%***
What would you normally do first when you think a child in your household might have malaria?	% of responding parents/caregivers who answer "Get a malaria test."	2.3%	2.2%
When you or your child last had malaria treatment, were you/they first tested for malaria?	% respondents who have ever had malaria treatment who answer "yes"	38.7%	37.0%

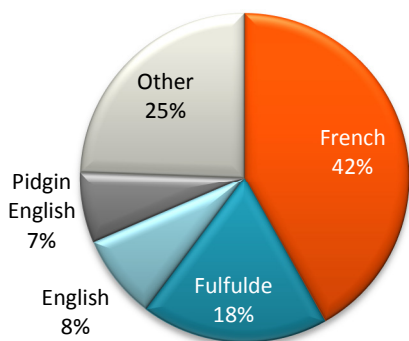
Cameroon Malaria KAP Survey: Measuring Progress from 2011 to 2012

	Theme	Question	Measurement/ Base	KAP Baseline 2011	KAP 2012
Measures of Campaign Effectiveness	KO Palu Campaign exposure	Have you seen/heard a TV/radio advertisement in which... (a KO Palu NightWatch PSA)	% of all who had seen/heard at least one of 4 PSAs mentioned	n/a	28.9%
		Have you seen the KO Palu TV advertisement with Luc Mbah a Moute in English?	% of all who answer "Yes"	n/a	7.8%
		Have you seen the KO Palu TV advertisement with Lady Ponce in French?	% of all who answer "Yes"	n/a	23.1%
		Have you seen the KO Palu radio advertisement with Luc Mbah a Moute in English?	% of all who answer "Yes"	n/a	4.2%
		Have you seen the KO Palu radio advertisement with Lady Ponce in French?	% of all who answer "Yes"	n/a	8.5%
		At what time of day or night have you seen this advertisement on TV (Luc Mbah a Moute in English)?	% of all who saw each PSA on TV who answer "9pm" or "Evening/night"	n/a	55.0%
		At what time of day or night have you seen this advertisement on TV (Lady Ponce in French)?	% of all who heard each PSA on the radio who answer "9pm" or "Evening/night"	n/a	59.8%
		At what time of day or night have you heard this advertisement on the radio (Luc Mbah a Moute in English)?	% of all who heard each PSA on the radio who answer "9pm" or "Evening/night"	n/a	34.8%
		At what time of day or night have you heard this advertisement on the radio (Lady Ponce in French)?	% of all who heard each PSA on the radio who answer "9pm" or "Evening/night"	n/a	n/a
		In the past year, have you received an SMS text message about malaria that reminds you to sleep under a mosquito net?	% of all who answer "Yes"	n/a	30.3%
		Exposure to KO Palu NightWatch on any platform (radio, TV, SMS) unduplicated	% of all who recalled KO Palu PSA or SMS, any platform (unduplicated)	n/a	44.9%
		Can you complete the phrase... K.O. ...	% of all who correctly answer the second half of the slogan	n/a	21.1%
		Have you ever heard about or seen a campaign called, "K.O. Palu?"	% of all who answer "Yes"	n/a	29.5%
		Which famous people have you heard or seen in a campaign about malaria in the past year, if any?	% of all who mention at least one spokesperson	n/a	40.3%
		Which companies or organizations do you think are associated with the "KO Palu" campaign?	% of all who mention "Ministry of Health"	n/a	28.1%
		Which companies or organizations do you think are associated with the "KO Palu" campaign?	% of all who mention "COTCO"	n/a	0.5%
		Which companies or organizations do you think are associated with the "KO Palu" campaign?	% of all who mention "MTN"	n/a	10.5%
		Have you heard the Malaria Anthem sung by Petit Pays, Sine, Mercellin Ottou, Frederique Ottou, Lady Ponce, and Richard Bona?	% of all who answer "Yes"	n/a	46.0%
		Have you seen the Malaria Anthem music video?	% of all who answer "Yes"	n/a	45.2%
		Did you hear about or see a "KO Palu" launch event that took place at the Palais des Sports in Yaounde around the time the net distribution campaign was beginning, in August 2011?	% of all who answer "Yes"	n/a	10.1%
Exposure to KO Palu NightWatch campaign (radio, TV, SMS, anthem, video, launch) unduplicated	% of all who recalled KO Palu NightWatch component, any platform (unduplicated)	n/a	62.3%		

Appendix B: Survey Sample

The achieved sample of 2,176 respondents broadly reflects the population of Cameroon as measured in the 2005 census. The data are also comparable demographically to the 2011 Malaria KAP Baseline. This appendix shows key demographic features of the full sample, as well as a comparison to 2011 demographic indicators.

Primary Language

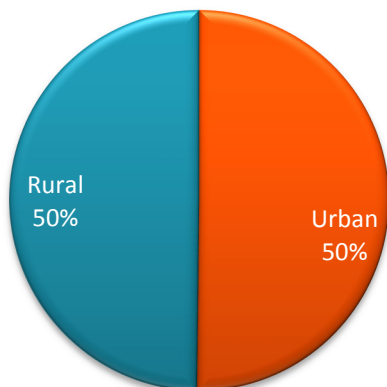


Most respondents (85%) reported that they understand one of the country's official languages, French or English. However, half of respondents said they speak a different language more often than French or English at home. Therefore, though messaging in the two languages of most media content in Cameroon is likely to reach a large audience, local language messaging is still very valuable. Survey respondents were more than three times more likely to say they are literate in French than in English:

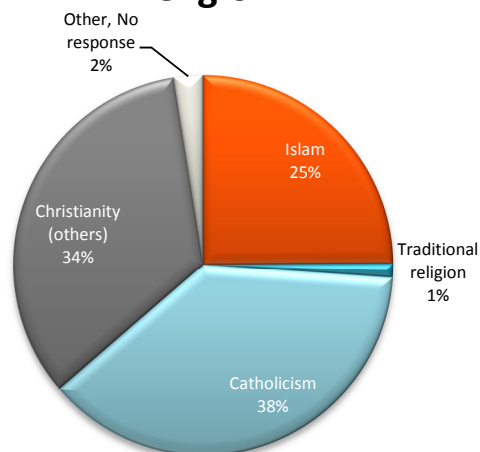
- 75% understand French, and 65% of all respondents said they could read and understand all of a newspaper page in French.
- 19% understand English, and 15% said they could read and understand all of a newspaper page in English.
- In addition, 28% of survey respondents say they understand at least some Fulfulde, even if it is not their first language. Literacy in Fulfulde was not measured in the survey.

By design, the survey was balanced to align with census findings of roughly equal population distribution between urban and rural areas, as well as even balance between men and women. The sample was also representative of the religious and ethnic diversity of Cameroon.

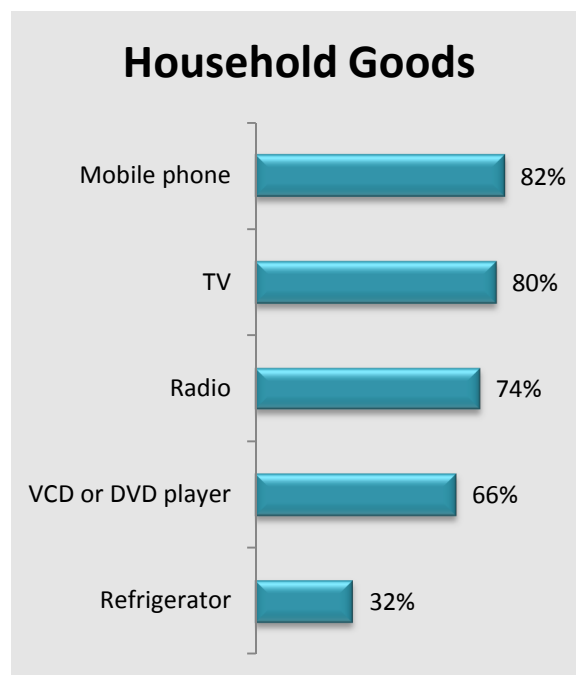
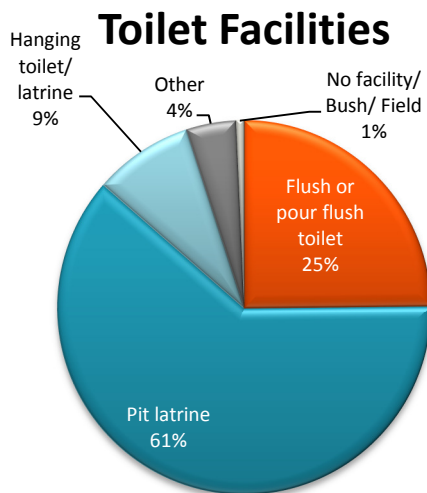
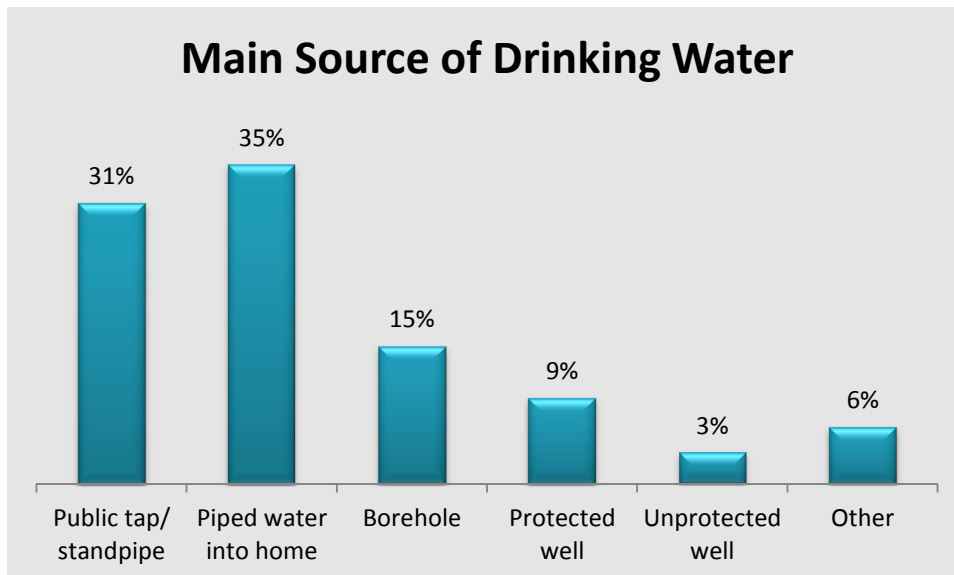
Location



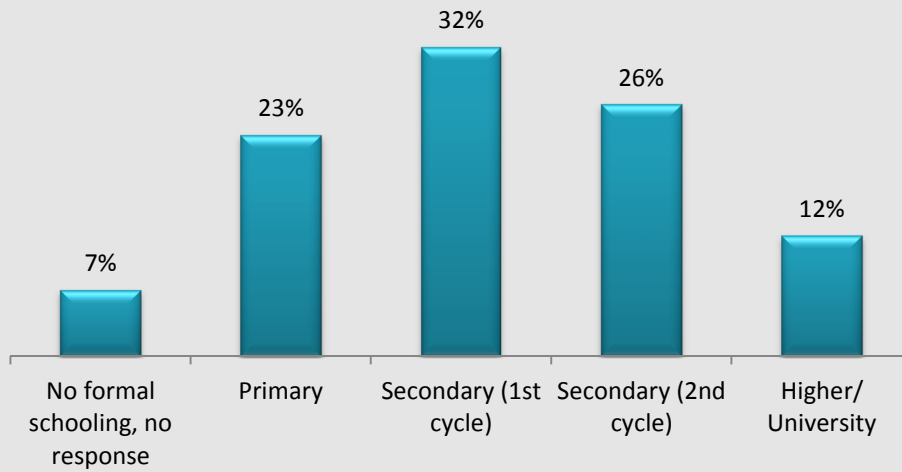
Religion



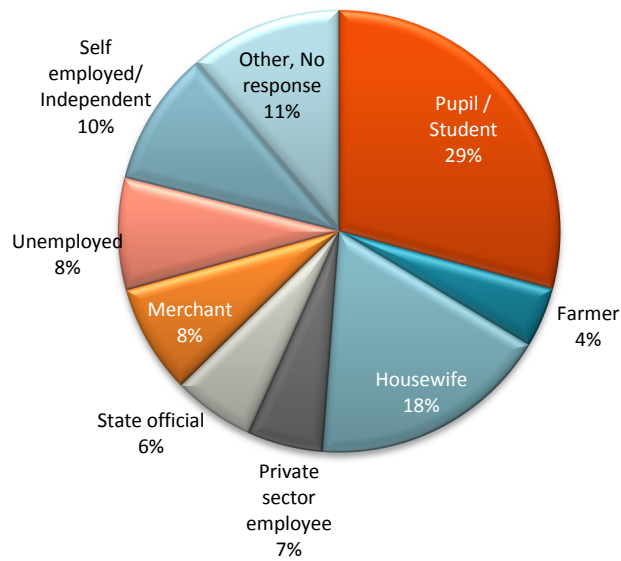
Socioeconomic indicators for the full sample highlight the relatively broad access to media, particularly TV, despite remaining challenges in infrastructure in Cameroon.



Highest Level of Education



Occupation



Cameroon Malaria KAP Survey: Measuring Progress from 2011 to 2012

The samples from the 2011 Malaria KAP Baseline and 2012 Malaria KAP Survey are comparable, making it valid to assume that differences in KAP indicators from one year to the next represent real changes over time rather than differences in the sample.

Key Demographic Indicators	2011	2012
Location		
Urban	51%	50%
Rural	49%	50%
Gender		
Male	49%	50%
Female	51%	50%
Age		
15-29	50%	54%
30+	46%	42%
No answer	4%	4%
Education		
No formal schooling, no response	13%	7%
Primary	20%	23%
Secondary (1st cycle)	30%	32%
Secondary (2nd cycle)	24%	26%
Higher/ University	13%	12%
Religion		
Islam	22%	25%
Traditional religion	1%	1%
Catholicism	38%	38%
Christianity (others)	33%	34%
Other, No response	5%	3%
Household goods		
Mobile phone	77%	82%
TV	78%	80%
Radio	76%	74%
VCD or DVD player	65%	66%
Refrigerator	30%	32%

Source: Malaria KAP Surveys, Mar/Apr 2011 (n=2566) and Mar/Apr 2012 (n=2176), nationally representative of adults 15-64.

Appendix C: Theories of Behavior Change and Social Mobilization

Malaria No More’s communication programs are based on a large body of theory and best practice in using communication tools for behavior change in public health. Key work in this area includes:

Health Belief Model and Social Learning Theory: two related frameworks, which explain health behavior in terms of perceived risks, benefits, and barriers, and describe possible strategies to influence behavior through each set of beliefs. For more information, see: Rosenstock IM, Strecher VJ, Becker MH. **Social Learning Theory and the Health Belief Model.** Health Education Quarterly 1988 Summer; 15(2):175-83.

Social Cognitive Theory: framework for explaining health behavior in the context of environmental and interpersonal influences on individual behavior. For more information, see: Bandura A. **Social Foundations of Thought and Action: A Social Cognitive Theory.** Englewood Cliffs, N.J.: Prentice-Hall, 1986.

Theory-based Communication: different frameworks for understanding health behavior suggest different target audiences and different types of communication activities. For more information, see: National Cancer Institute. **Theory at a Glance: A Guide for Health Promotion Practice (2nd Ed).** National Institutes of Health, U.S. Department of Health and Human Services, 2005.

Mass Media Campaigns for Public Health: mass media campaigns have been used successfully to influence behavior toward a number of health issues (such as smoking, drug use, HIV/AIDS, cancers, cardiovascular disease, and child survival) in various contexts. For more information, see Hornik, RC. **Public Health Communication: Evidence for Behavior Change.** Mahwah, New Jersey: LEA, 2002.

Celebrity Spokespeople and Parasocial Interaction: theory suggests that audiences are more likely to adopt behaviors promoted by celebrities that they identify with. For more information, see: Horton D, Wohl RR. **Mass communication and parasocial interaction: Observations on intimacy at a distance.** Psychiatry 1956, 19:215–229 and Brown W J et al. **The Influence of Famous Athletes on Health Beliefs and Practices: Mark McGwire, Child Abuse Prevention, and Androstenedione.** Journal of Health Communication 2003, 8:41-57.