The Second Malaria Indicator Survey in the Islamic Republic of Afghanistan, 2011

Ministry of Public Health
General Directorate of Preventive medicine
Communicable Disease Control Directorate
National Malaria and Leishmaniasis Control Program

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Contents

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World Health Organization
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Abbreviations

API	Annnual Parasite Index
AS	Artesunate
BHC	Basic Health Center
BPHS	Basic Package of Health Services
CHC	Comprehensive Health Centre
CHW	Community Health Worker
COMBI	Communication for Behavioural Impact
ELISA	Enzyme-Linked Immunosorbent Assay
EMRO	Eastern Mediterranian Regional Office
EPHS	Essential Package of Hospital Services
EPR	Epidemic Preparedness and Response
EU	European Union
GFATM	Global Fund to fight AIDS, Tubeculosis and Malaria
GFMU	Global Fund Managemnet Unit
HMIS	Health Management Information System
HMM	Home based management of Malaria
HNI	HealthNet International
IEC	Information Education and Communications
IMPD	Institute of Malaria and Parasitic Diseases
IPT	Intermittent Preventive Treatment
ITNs	Insecticide Treated Nets
IVM	Integrated Vector Management
LLINs	Long Lasting Insecticidal Mosquito Nets
M&E	Monitoring and Evaluation
MoPH	Ministry of Public Health
MSH	Management Sciences for Health
NGOs	Non Governmental Organisations
NIML	National Institute for Malaria and Leishmaniasis
NMLCP	National Malaria and Leishmaniasis Control Programme
NMSP	National Malaria Strategic Plan
NTCC	National Technical Coordination Committee
PCR	Polymerase Chain Reaction
PMLCP	Provincial Malaria and Leishmaniasis Control Programme
PSI	Population Services International
RBM	Roll Back Malaria
REACH	Rural Expansion for Afghanistan Community Health
SP	Sulfadoxine-Pyrimethamine
TB	Tuberculosis
TBA	Traditional Birth Attendant
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WB	World Bank
WHO	World Health Organization

EXECUTIVE SUMMARY

The Afghanistan malaria indicator survey (MIS) of 2011 was undertaken in October 2011. The aim of the survey was to track the progress in key malaria interventions and changes in malaria prevalence. Progress in these indicators was to be assessed within the framework of the targets set in the national malaria strategic plan of 2008 – 2013 and as compared to the baseline data obtained during the MIS of 2008. The key indicators that the survey aimed to track were those in relation to malaria vector control, case management, information-education-communication and the prevalence of infections. The targets outlined in the national malaria strategy were:

- By the end of 2013, 85% of households in the targeted populations will have at least one LLIN for each 2-3 members
- By the end of 2013, at least 85% of targeted population will be protected by LLINs through scaling-up of effective implementation strategies
- By the end of 2010, 14 million people living in the targeted Provinces will be stimulated through COMBI strategy to acquire and regularly use LLINs throughout the transmission season.
- By the end of 2013, 9 million long-lasting insecticidal nets (LLINs) will be distributed in targeted Provinces

The aim of the survey was to provide precise estimates of the key indicators at the national level, between urban and rural areas, malaria strata and where possible by province. To achieve this, it was estimated a national sample of 3240 households was required using '*the proportion of children under the age of five years sleeping under an insecticide treated net (ITN)*' as the sampling indicator allowing for a design effect of 1.5 and non-response rate of 10%. By taking 20 households per cluster, it was estimated that 165 clusters were required. In distributing this sample across the country, a major challenge has been the lack access to several districts due to security problems. In the end 153 districts were available for sample selection and of these 77 were selected for survey. The 165 clusters were subsequently redistributed among these clusters based on probability proportion to size.

During the fieldwork for the MIS 2011 3040 households in 172 clusters spread across 21 provinces were successfully covered. These households had a total of 19641 members of whom 49.1% were female. A total of 4199 were unavailable during the day of survey and on follow up. Of the remaining population, response rate to various sections of the survey varied but was generally very high, over90%, except for malaria testing where response was about 88%. In the rest of this summary, main results of the key indicators observed during MIS 2011 and their comparison to the MIS 2008 are presented.

Coverage of mosquito bed nets

During the MIS survey of 2011 approximately 23%, 21% and 20% of the 3040 households owned at least one net, ITN and LLIN respectively. Ownership of at least two nets/ITNs/LLINs was 20%, 19% and 18% respectively. These results indicate that majority of nets in the households were ITNs and subsequent summaries are therefore presented only for ITNs and LLINs. Average number of ITNs and LLINs per households was 0.6 and 0.5 respectively. The proportion of households with full coverage of ITNs (2 persons per ITN) was 10%. Better coverage with ITNs and LLINs were generally observed in urban areas, households headed by a man, in the wealthiest households. Importantly, over 99% of households that reported to own at least one ITN in the households were observed in the highest malaria risk areas.

Utilization of these nets, as measured by the percentage that slept under them the night before survey, was overall less than 16%. Approximately 15% and 14% of the household members slept under an ITN and LLIN respectively the night before the survey. Utilization was higher in urban areas and among children under the age of five years (21% ITN, 20% LLIN). Percentage of persons in the highest malaria risk stratum (stratum 1) was 31% ITN and 29% LLIN. Utilization was substantially higher among persons from the least poor households compared to the most poor.

When analysis was restricted to individuals to utilization of nets among persons in households with at least one net, about 61%, 58% and 54% of the sampled population slept under a net, ITN and LLIN the night before survey. Among children under the age of five years, 64% and 60% slept under an ITN and LLIN the night before survey respectively. Overall, about 20% of women who were pregnant slept under an ITN or LLIN including about 35% and 34% in the highest risk stratum.

The main source of nets was the mass campaign (60%), followed by NGO (15%) and private shop (13%). Majority of nets in the households either had no holes (41%) or were in fair condition (38%). Nets in the provinces of Jawzjan, Laghman, Paktya and Saripul were in the worst condition with over 40% of the nets either poor or unsafe for use. 75% of nets in Baghlan province were remained unused. Almost 89% of nets were obtained within the last three years. However, ove r40% of nets in the provinces of Balkh, Jawzjan, Kabul, Parwan and Saripul were older than 3 years.

Comparison of coverage of mosquito nets reported during the MIS 2011 to those of the MIS 2008 must be interpreted with some caveats. Although the numbers of clusters sampled in both surveys were similar, the MIS 2008 covered 10 provinces while the MIS 2011 was undertaken in 21 provinces. These differences in sampling distribution are likely to result in differences that are a function of sampling variations and not necessarily actual change in the indicators even if the comparison was restricted to the same provinces surveyed in 2008. Nonetheless, it is hoped these sampling effects will be minimal and comparisons of main indicators of vector control between the two surveys is provided in Table 1 of this summary.

Table 1 Vector control indicators: comparison of MIS 2008 and MIS 2011

Indicator	MIS 2008	MIS 2011
% Households with at least one:		
Net	26.7	22.7
ITN	20.6	21.1
LLIN	9.9	19.8
LLIN in stratum 1	-	43.4
% Households with at least two:		
Nets	19.1	20
ITNs	-	19.1
LLINs	-	18
LLIN in stratum 1	-	38.7
Average number per household of:		
Nets	0.3	1.6
ITNs	0.2	1.4
LLINs	0.1	1.2
% Households with at least one ITN per 2 persons:		
Overall	-	10.3
Stratum 1	-	16.7
% Persons who slept under:		
Net	4.2	15.5
ITN	3.4	15.0
LLIN	1.9	14.0
% Persons in stratum 1 who slept under:		
Net	-	31.7
ITN	-	30.6
LLIN	-	28.6
Main source of bed nets		
Health clinic	47.9	59.8
Private shop	45.5	13.1
NGO	2.8	14.9
EPI	1.3	0.2
Duration since nets were purchased		
0 – 6 months	27.0	56.1
7 – 12 months	14.4	21.5
13- 36 months	58.6	10.8

>36 months		10.4

Comparison of the bed net coverage data show that significant improvements have been made in net ownership with substantially higher mean number of nets per households and increase in use of these nets before survey. Fewer nets are also been purchased from private sources with the campaigns being the main source of nets which are supplied for free. Almost 90% were also acquired within the last three years and with majority with no holes or in fair condition. Equity in ownership of LLINs between the wealthiest and poorest households has almost been achieved. 43% of households in stratum 1 have at least 1 LLIN. The changes in these indicators are likely to be even greater if comparison was restricted to provinces surveyed in both the MIS 2008 and that of 2011. Challenges, however, remain as coverage remains well below the target for 2013 and households with full coverage of ITNs (2 persons per 1 ITN) is 10% overall and 17% in stratum 1.

Recommendation 1

Large scale-up of LLINs are still required, particularly in stratum 1, to achieve the targets for 2013. The 3.4 million LLINs distributed since 2008 remain well short of the 9 million targeted by 2013.

Recommendation 2

Utilization of LLIN especially in rural area remains low and there is need for more effort to increase the knowledge and practice for usage of mosquito bed nets

Case-management

Prevalence of reported fever in the two weeks prior to survey was 2.1% and was higher in the highest risk malaria strata. 3.3% reported to have fever on the day of survey. Average duration of fever was about 5 days. Treatment seeking information was recorded only for the 327 (2.1%) persons who had fever the two weeks prior to survey. About 77% of these took action to treat the fever. Among those who took action, 33% did so within 24 hours and an additional 26% within 48 hours. Overall treatment seeking was generally higher among children under the age of five years, in the least poor households, among rural areas and in the highest malaria risk strata.

Majority of fevers were first treated at public health facilities (44%) and by private clinics (29%). The next most popular sources of treatment were drug stores (11.5%) and mullahs (11%). In the highest risk stratum, similar proportion of patients was treated at public health facilities (30%) compared to private health facilities (34%). Self-medication, while almost non-existent among individuals with fever in the stratum 2, was the third most popular treatment action (26%) in stratum 1.

The first-line treatment for *P. vivax* malaria in Afghanistan is chloroquine while for *P. falciparum* is AS+SP. Among individuals who sought treatment, about 25% were treated with antipyretics and 29% were treated with antimalarials. Use of antimalarials was marginally higher among patients in stratum 1 compared to stratum 2. Approximately 74% of fevers that were treated with antimalarials were prescribed chloroquine and included 78% of all fevers from stratum1. AS+SP was prescribed to about 4% of fevers treated with antimalarials and all were from stratum 1. All fevers that were treated with SP were from stratum 2 and all were from Daykondi province. The high usage if chloroquine may be related to the high prevalence of vivax in stratum 1. Almost 70% of children under the age five years were treated with chloroquine and about 23% with SP. BY the day of survey. 83% of fevers had already resolved.

The most common reasons given by respondents who had fever in the last two weeks but did not seek treatment was that fever was mild (78%); health facilities were far (37.5%), shortage of drugs at health facilities (34.1%), poor care at the health facility (34%), long wait at health facilities (33%) and cost of treatment (33.0%). Overall, travel time to the nearest public health facility, private clinic or drug-store was

about an hour and a quarter while waiting times were approximately an hour. Both travel and waiting times were considerably lower in stratum 1 compared to stratum 2. The average cost of antimalarials was about 81 Afghanis while cost of blood test and consultation was around 8 Afghanis. In stratum 1, the cost of antimalarials was 65 Afghanis.

The prevalence of blood testing among fever cases was about 53% with 60% of those who reported receiving a blood test reporting a malaria positive result. Testing rates did not appear different when children under the age five years were compared to older age groups. Testing rates were over 60% in stratum 1 and about 44% in stratum 2.

Table 2 Case management indicators: comparison of MIS 2008 and MIS 2011

Indicator	MIS 2008	MIS 2011
% persons with reported fever on the day of survey	6.5	3.3
% persons with reported fever in the last two weeks	3.4	2.1
% children under the age of 5 years with fever in the last two weeks	-	3.8
Average duration (days) of fever	-	5.2
% of persons with fever in the last two weeks who took action	59.8	76.8
% of persons with fever in the last two weeks who took action within 24 hours	42.4	32.9
% of children under 5 years with fever in the last two weeks who took action within 24 hours	xx	31
% of persons with fever in the last two weeks who were treated for malaria and took nationally recommended antimalarial	83.3 CQ	74.0 CQ AS+SP 4.1
% of children under five years with fever in the last two weeks who were treated with nationally recommended antimalarial	- -	69.2 CQ 0.0 AS+SP
% of persons with fever in the last two weeks who had a blood test done	23.3	52.9
% of persons with fever in the last two weeks who had a blood test done who reported positive for malaria	55	60.3
% of children under five years with fever in the last two weeks who had a blood test done	50.9	66.7
Average travel time (mins) to nearest health facility	41.1	76.6
Average waiting time (mins) at a health facility	41.6	67.3

Recommendation 3

Although progress has been in malaria case-management over the last 4 years, treatment seeking with 24 hours remains low while several malaria cases have reportedly been treated with SP. High chloroquine treatments have been reported, although it is likely that this is due to the high prevalence of vivax for which this drug is first line but additional information is required to understand of chloroquine is being used for the treatment of falciparum. Further scale up of parasitological diagnosis of malaria is also required although significant improvements have been achieved in the last three years.

Malaria knowledge, attitudes and practices

Central to the COMBI strategy is that target populations will be aware of the causes, symptoms, prevention and treatment of malaria. To this extent, household members 12 years of age and above were asked questions on why they used nets, their knowledge of the risks of malaria they were exposed to, the cause of malaria, its treatment transmission, people's perceptions of the malaria risk they were exposed to and their previous exposure to malaria infections.

In households without bed nets, the biggest reason for not having a net was the poor availability (52.6%) followed by the price of nets (30%). About 20% of households reported that the reason they did not have nets was there were no mosquitoes in their area. On the responses that suggest lack of proper knowledge of the

benefits of mosquitoes the most common was it did not stop insect bites (14%) or doesn't reduce the risk of malaria (12.2%). About 10% of the households thought that insecticides were dangerous to their health.

In households with nets, the reasons for using a net most commonly given by households is that they prevented mosquito bites (86.4%) and malaria (72.6%). There were minimal differences in responses by gender, residence and household wealth. Among similar households, the most common disadvantage of using mosquito nets was they were too hot sleep under (34%), presented difficulties when getting up at night (24%) or took time to hang (22%).

About 47% of all households reported that at least one household member has ever had malaria and 29% reported that a household member had malaria within the last two months. 2.7% reported a person in the households ever dying of malaria. These responses were substantially higher in malaria stratum 1. When responses by individual household members were analyzed, incidence of malaria in the past three months was reported by 22% of respondents and around 31% mentioned that they knew someone in their household who had malaria in the last 3 months. About 3% reported a malaria death in the household in the past.

Regarding whether respondents knew there was malaria risk in their area, about 39% responded that they didn't know; 42% said they had high risk and 16% low risk. The percentage of people who did not know the malaria risk of their area was lowest in stratum 1 at 28%. About 38% of respondents did not know the symptoms associated with malaria while 46% responded fever as the main symptom and body pain by 14%. In malaria stratum 1, 66% reported fever as the main symptom of malaria while 59% mentioned cold and chills. About 44% of individuals did not know the cause of malaria transmission while 47% mentioned the bit of the mosquito. Regarding the best approaches to preventing malaria, 44% of household members said they didn't know of one, about 30% mentioned use of mosquito nets and 20% though having clean surrounding prevented malaria. Exposure to formal IEC was low with about 72% of respondents said that they did not receive any malaria education, information or communication. Health facilities and radios were the main source of IEC.

Compared to the MIS 2008, important progress has been in malaria case-management. Fever prevalence is lower, treatment seeking has is higher and the proportion of person been tested for malaria has more than doubled. Access to treatment within 24 hours, however, appears to have reduced and these may a function of factors including distances to services which is considerably higher in the MIS of 2011 compared to 2008.

Table 3 Malaria knowledge, attitude and practices: comparison of MIS 2008 and MIS 2011

Indicator	MIS 2008	MIS 2011
Main reason for not having nets		
Never heard of nets	11.6	42.4
Nets not available	31.2	52.6
Net price	74.5	30
Main reason for using net among those who slept under a net		
To prevent mosquito bites and malaria	66.0	49.5
Main disadvantages of using nets among those who slept under a net		
Too hot	11.3	34
Difficult to hang	7	22.1
Difficult when getting up at night	6.2	23.9
Self-reported malaria		
% of households where there has ever been a case of malaria	43.8	47
% of household where there has been a malaria case in the last 3 months		29.3
% of household where there has been a reported malaria death	4.6	2.7
Household knowledge of cause of malaria transmission		
Mosquito bite	60.8	47.2
Don't know the cause	25.2	43.7
Household knowledge of malaria symptoms		
Fever	47	47
Cold/chills	28.8	45.5
Don't know the symptoms	20.1	38.3

Household knowledge of malaria prevention		
Mosquito nets	46	29.5
Clean surrounding	19	20.2
Don't know	23.8	44.2
Household exposure to IEC		
Received IEC	43.1	26.8
Did not receive IE	56.9	71.8

Progress in knowledge, attitude and practices appeared somewhat limited compared to the results of the MIS 2008. This may be because the MIS 2011 covered more provinces than that of 2008 but this is a factor that affects all indicators and not limited to those on KAP. It appears, however, that knowledge of malaria symptoms have improved while the price of nets is no longer seen as the most important impediment to acquiring nets.

Recommendation 4

It seems that indicators of KAP are better in stratum 1 compared to other strata although generally low. Assessment of the reach and acceptability of current IEC strategies require urgent attention. Messages should also be tailored to target the specific epidemiology of malaria across the country.

Malaria infection prevalence

Malaria testing was done using rapid diagnostic tests (RDT) and blood smears analysed using light microscopy. A total of 13,443 (87.5% of respondents) were tested for malaria using First Response pan-species RDT. Of these 174 (0.6%) were positive for malaria using RDT. About 79% of all those who were positive for malaria were infected with *Plasmodium vivax,* 15% with *Plasmodium falciparum* and 6% mixed infections. Overall, infection rates did not vary by residence, age, and gender but were higher among the least poor and those who had fever on the day of survey. Overall, infection rates did not vary by residence, age, gender but were higher among the least poor and those who had fever on the day of survey. The relationship between fever on the day of survey and infection was stronger for individuals infected with falciparum. Percentage of malaria positive cases appeared to be higher among individuals who travelled in Afghanistan compared to those who did not, although the sample of those who travelled was too small to make any concrete assertion about the relationship of travel to infection.

Blood slides were taken from a total 13272 persons. Of these, there were 95 positive cases implying a national malaria prevalence of 0.3% according to microscopist 1 (Table 6.2). Microscopist 2 observed 133 positive slides resulting in malaria prevalence of 0.6% nationally. The proportion of Pv in the first and second readings were 82.2% and 85.9% respectively while Pf cases were similar. However, microscopist 1 had slightly higher mixed positive cases than microscopist 2. Vivax cases were higher in urban areas and in stratum 2. All Pf cases were from rural areas and stratum 1.

The overall rates of infection prevalence in 2011 are similar to those estimated during the MIS 2008 which nationally was 0.4% using microscopy. The difference, however, is that the proportion of infections that were falciparum reduced from 33% to around 13% while the proportion of vivax registered a corresponding increase from 66.7% to 81.4%.

Recommendation 5

Due to the very low prevalence rates observed using both RDT and microscopy, there is need to analyse the filter papers using PCR to detect low level infections and ELISA to determine exposure to infections. Whether to include malaria testing in subsequent MIS must also be reviewed as the national estimates, and in fact estimates across all strata, of parasite prevalence are below 2% which is the threshold below which malariometric surveys are not recommended as a source of data for tracking changes in disease burden. Instead a combination of passive and active case detection should be used.

Table 4 Malaria prevalence and self-reported incidence

Indicator	MIS 2008	MIS 2011
% persons who were tested using RDT and were positive for malaria		
All	-	0.6
Pf (of those positive)	-	15.2
Pv (of those positive)	-	79.0
Mixed (of those positive)	-	5.8
% persons who were tested using blood smears and were positive for malaria*		
All	0.4	0.6
Pf (of those positive)	33.3	12.6
Pv (of those positive)	66.7	81.4
Mixed (of those positive)	-	5.9
Relationship of fever in the last two weeks and RDT positivity		
Fever in last two weeks and RDT positive	-	9.4
No Fever in the last two weeks and RDT positive	-	0.7
Relationship of travel in the last two months within Afghanistan and RDT positivity		
Travelled in last two months and RDT positive	-	2.4
Travelled in the last two months and RDT negative	-	1.3

*Results presented here are those of expert microscopist 1

CHAPTER ONE: BACKGROUND AND SURVEY

1.1 Background

The Islamic Republic of Afghanistan is a landlocked country that covers an area of 647500 km^2. It is bordered by Pakistan to the south and east, Turkmenistan, Uzbekistan and Tajikistan to the North, Iran to the West and China to the northeast. Following the Anglo-Afghan war and the signing of the Treaty of Rawalpindi, the country gained independence on 19th August 1919 [The World Factbook 2010]. Since the 1970s, the country has however experienced extended periods of conflict, which have affected adversely the socio-economic and health status of the population [WHO 2010a; Kolaczinski et al 2005]. Efforts to extend health services to the population and control diseases, such as malaria, have had to face enormous difficulties during this period.

In 2009, for a population of 28.2 million, the average GDP in Afghanistan was 900 USD and average expenditure on health on 50 US dollars [WHO 2010a]. In general health indicators in Afghanistan remain among the poorest globally. Life expectancy was 48 years overall, well short of the 68 years globally. Adult and child mortality were 399 and 199 per 1000 respectively [WHO 2010a]. Malaria is an important contributor to the disease burden in Afghanistan [WHO 2010b] contributing the second highest number of morbidity cases among the countries in the WHO-EMRO region [Safi et al 2009a]. In the 1970s, malaria risk was significantly reduced to levels where it was not a major public health problem [Kolaczinski et al 2005] but the decades following have seen a dramatic upsurge of disease burden due to the interruption of disease control and general health care provision by the civil wars.

Following the launch of the Roll Back Malaria Initiative in 2000 [RBM 2000] and the establishment of the National Malaria and Leishmeniasis Control Program (NMLCP), however, substantial efforts have been made to bring malaria back under control [Safi et al 2009a]. Between the years 2000-2010, expenditure on malaria increased from less than a million to 8.5 million US dollars with funding and technical support from GFATM, UNICEF, USAID, WHO and other partners. Consequently, significant reductions in the malaria burden have been reported in the last decade from over 600,000 cases in 2002 to about 482748 cases in 2011 cases in 2011 [unpublished data]. Expansion of malaria control measures such as insecticide treated mosquito nets (ITNs) and indoor residual spraying (IRS) of households, improved diagnosis and treatment with effective drugs, training of health workers, expansion of health services to the lowest tier health facilities and establishment of home-based management have been some of the major program activities. All these activities have historically been guided by evidence from operational research undertaken by the NMCP and partners [Safi et al 2009a].

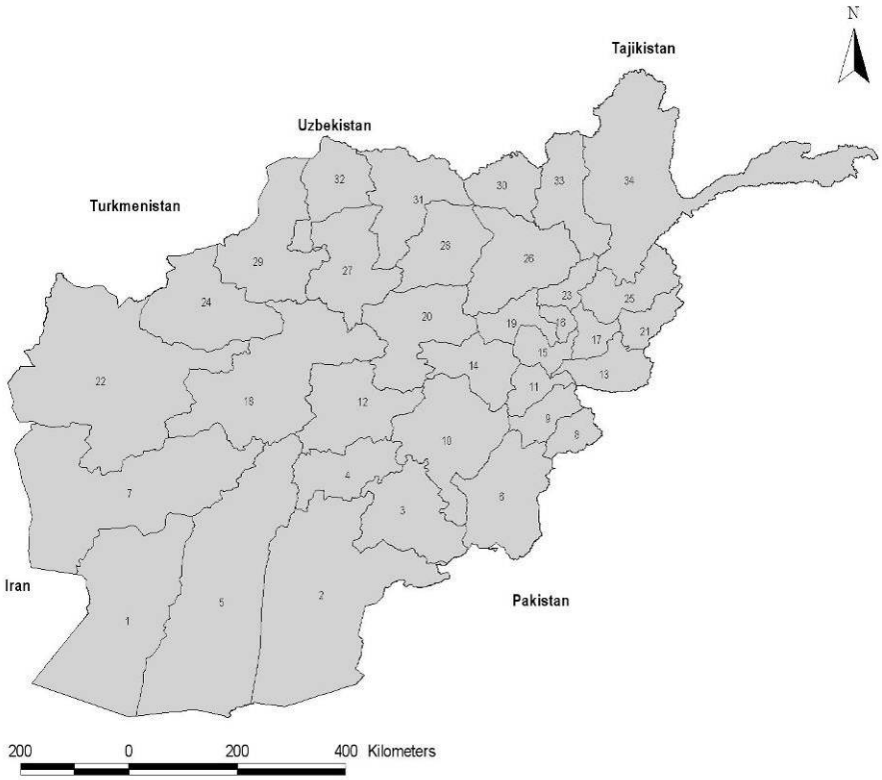
To monitor the progress of these control activities and evaluate their impact in terms of coverage and effect on disease, the Afghanistan government implemented its baseline national malaria indicator survey (MIS) in 2008 [MoPH 2009]. This document outlines a proposal to implement a second MIS in September 2011 to compare with results of the MIS of 2008 and inform the NMCP on progress, gaps and needs for the next two years.

1.2 Geography and climate of Afghanistan

The geography and climate in Afghanistan are highly variable and are generally characterized by rugged topography, patchy rainfall and extreme aridity in large parts of the country [Dupree 1973]. Almost half of the countries land surface lies above altitudes of more than 2000 m [http://countrystudies.us/afghanistan/31.htm]. In the northeast, the country is dominated by the Hindu Kush mountain range which is prone to earthquakes and comprises the Wakhan Corridor-Pamir Knot, Badakhshan, Central Mountains, Eastern Mountains, Northern Mountains and Foothills, Southern Mountains and Foothills [Dupree 1973]. The Turkistan Plains, Herat-Farah Lowlands, Sistan Basin-Helmand Valley, Western Stony Desert, and Southwestern Sandy Desert surround the Mountains in the north, west and southwest.

During the winter, temperatures in the central highlands of the country, the area around Nuristan and the Wakhan corridor, drop to below -15 °C while in the summer in July the low-lying areas of the Sistan Basin of the southwest, the Jalalabad basin in the east, and the Turkistan plains along the Amu River in the north temperatures average over 35 °C. The Sistan Basin is one of the driest areas in the world while much of the south and southwest has desert climate. Average rainfall in the country is approximately 210 mm per year with the main rainy season from December to April, although some areas in the south-east receive monsoonal summer rain. The country drainage system is dominated by four main rivers: Amu (Oxus) to the north, the Hari Rud to the west, the Helmand River in the south and the Kabul River in the east. Forests, found mainly in the eastern provinces of Nuristan and Paktiya, cover barely 2.9% of the country's area although these are diminishing [http://countrystudies.us/afghanistan/31.htm]. In the eastern and northeastern provinces, irrigated rice cultivation is widely practiced and is a major contributor to anopheles breeding [Safi et al 2009a].

Figure 1.1 Administrative map of Afghanistan showing provincial boundaries



ID	Province
1	Nimruz
2	Kandahar
3	Zabol (Zabul)
4	Oruzgan (Uruzgan)
5	Helmand
6	Paktika
7	Farah
8	Khowst
9	Paktia
10	Ghazni
11	Lowgar
12	Daykondi
13	Nangarhar
14	Vardak (Wardag)
15	Kabol (Kabul)
16	Kapisa
17	Laghman
18	Ghowr
19	Parvan (Parwan)
20	Bamian
21	Konar (Kunar)
22	Herat
23	Panjshir
24	Badghis
25	Nurestan
26	Baghlan
27	Sar-e Pol
28	Samangan
29	Faryab
30	Kondoz (Kunduz)
31	Balkh
32	Jowzjan
33	Takhar
34	Badakhshan

1.3 Malaria epidemiology and control in Afghanistan

1.3.1 Epidemiology

The natural extent of malaria transmission in Afghanistan is limited by the combination of high altitude and the consequent reduced temperatures and aridity which affect both development of the anopheles mosquito and parasite sporogony [Safi et al 2010]. Figure 2a is a map of altitude thresholds in Afghanistan showing areas ≥2000m and those below. In a recent analysis of the temperature suitability to support parasite sporogony, an index ranging from 0 (not suitable) to 1 (most suitable) [Gething et al 2011] showed that the majority of the temperature-suitable areas were coincidenr with altitude of ≥2000m (Figure 2a and 2b). An analysis of aridity derived from enhanced vegetation index (EVI) constructed from remotely-sensed satellite imagery shows that large areas are under mean annual EVI of <0.1, a threshold of vegetation mass considered indicative of aridity (Figure 2c) [Guerra et al 2007]. Using a combination of case reporting; malariometric surveys and topographic

information, provinces in Afghanistan are classified into three main malaria relative risk areas: medium to high risks; low risk; and very low or potentially malaria free areas (Figure 3) [Safi et al 2010].

Figure 1.2 a) Altitude limits

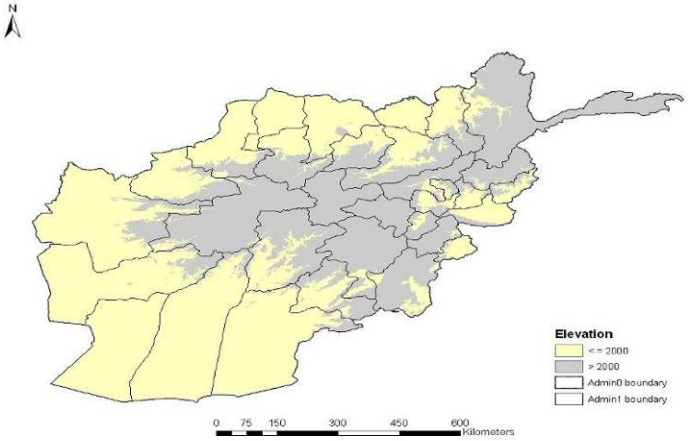


Figure 1.2b Temperature suitability Index for parasite sporogony

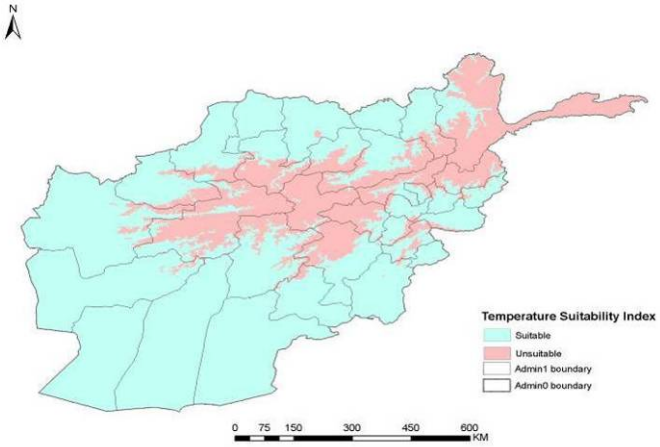


Figure 1.2 c) Average Annual Enhance Vegetation Index (EVI). Index <0.1 is an indicator of aridity

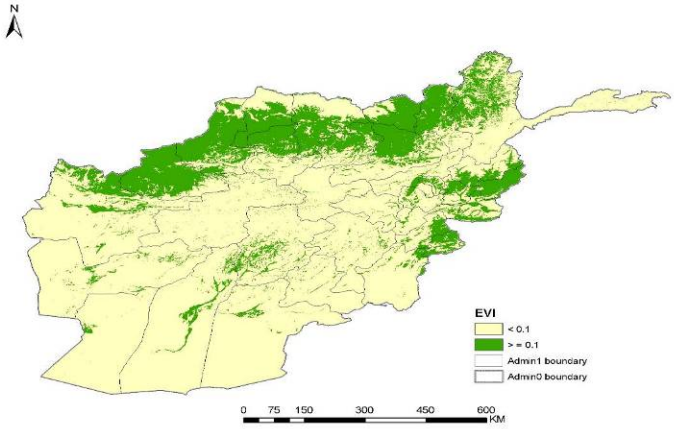


Figure 1.3 Malaria risk stratification of provinces in Afghanistan

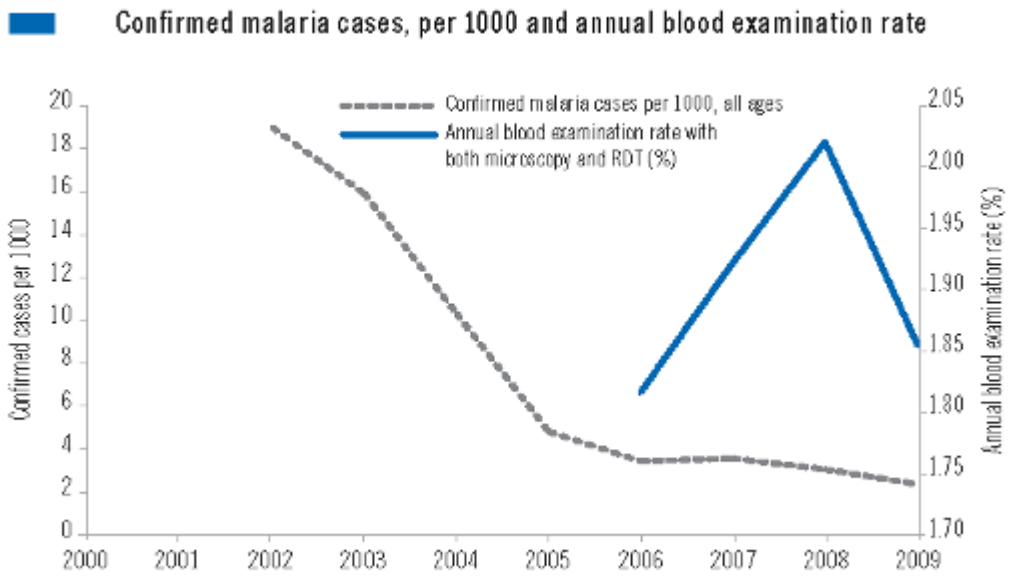
Malaria risk	Province
Medium to high risk	Badakhshan, Badghes, Baghlan, Balkh, Faryab, Herat, Helmand, Kandahar, Khost, Kunar, Kunduz, Laghman, Nangarhar and Takhar
Low risk	Daikundi, Farah, Jauzjan, Kabul, Kapisa, Logar, Nimruz, Oruzgan, Paktia, Paktika, Parwan, Samangan, Sar-epul, Wardak and Zabul
Very low risk or malaria free	Bamyan, Ghazni, Ghor, Panjsheer and Nuristan

Of the estimated 28.2 million people in 2009 in Afghanistan, 12.1 million (43%) live in areas of medium to high risk; 11.2 million (39.7%) in low risk conditions and 4.9 million (17.4%) in areas of very low or potentially no risk.

Anopheles superpictus, *An. culicifacies*, *An. stephensi*, *An. hycranus*, *An. pulcherimus* and *An. fluviatilis* are the main vectors of malaria in Afghanistan [Eshgy & Nushin 1978; Rowland et al 2002; Safi et al 2009a]. *Plasmodium vivax* and *P. falciparum* are the commonest parasites [Rowland et al 2002; MoPH 2008a]. Malaria transmission is unstable and seasonal peaking during the months of June to November, with negligible transmission occurring between December and April. *P.vivax* infections however relapse during the spring season and this may give rise to a *vivax* peak around July. The *P. falciparum* peak is in October, a few months after the summer peak of *P.vivax*. Due to the seasonality and relative low prevalence of malaria results in a population with low functional immunity to malaria. *P.falciparum* is particularly unstable in this region, at the edge of its range, and can fluctuate markedly from year to year depending on climatic variation and, in recent years, drought.

In the last decade, the malaria case burden has decreased dramatically from over 18 cases per 1000 blood examinations to less 2 cases per 1000 blood examinations in 2009 as shown in Figure 4 [WHO 2010b].

Figure 1.4 Trend in malaria morbidity in Afghanistan (Soure: WHO 2010)



1.3.2 Malaria control program

Since 2001, when the current transitional government came to power, malaria control activities have been informed by the national malaria strategy plan (NMSP) of 2006-2010 [MoPH 2006] and the NMSP of 2008-2013 [MoPH 2008a] developed within the context of changing global and regional malaria targets and the overall evolution of health care provision in Afghanistan. The NMSP 2006-2010 was developed to support a malaria control agenda with an overall goal of contributing *'……..to the improvement of the health status in Afghanistan through reduction of morbidity and mortality associated with malaria'* with the objectives of reducing malaria morbidity and mortality by 50% and 80% respectively by 2010 [MoPH 2006]. In line with the overall elimination agenda of the WHO-EMRO region, the NMSP 2008-2013, however, outlined its overarching vision and mission as a malaria free Afghanistan in which the NMLCP is the technical arm of the MoPH tasked with leading 'm*alaria and lesihmaniasis prevention, development of evidence-based national policies, quality control and timely detection and treatment of patients in integrated system at the point of service delivery, with the purpose of reducing the burden of malaria and leishmaniasis as a public health problem in Afghanistan'* [MoPH 2008]. The objectives of this strategic plan are: a) to reduce malaria morbidity by 60% by the year 2013 (baseline 19 cases per 1000 population, 2007 data); b) to reduce malaria mortality by 90% by the year 2013; c) to reduce the incidence of *P. falciparum* malaria to sporadic cases by the end of 2013 with a vision to interrupt transmission of *P. falciparum.*

The strategic approaches adopted by Afghanistan follow largely those advocated as part of global RBM initiatives including vector control with insecticide treated nets (ITN), Indoor Residual Spraying (IRS) and other measures, effective prompt case-management, management of malaria in pregnancy, home-base management of malaria, epidemic detection and containment and supporting communications and behavioral change initiatives. These packages of interventions have been driven as part of the BPHS and EPHS and/or in collaboration with stakeholders, modified depending upon resources, partners and objectives.

1.3.3 Monitoring and Evaluation

Within the MoPH of Afghanistan, the Department of Monitoring and Evaluation (DME) is responsible for the coordination, guidance and harmonization of monitoring and evaluation activities among various departments within the Ministry, Provincial Public Health Directorates and NGOs. The DME is advised by a consultative

group, the Monitoring and Evaluation Advisory Board (MEAB), which is comprised of representatives from the MoPH, international technical agencies and donor agencies, in the development of guidelines, monitoring tools and related procedures [MoPH 2008a]. Within the NMLCP, there is also a department of Monitoring and Evaluation for the Malaria Control Programme which is embedded and works within the existing MoPH systems.

Although a significant amount of information on malaria control and burden is provided by the Health Management and Information Systems (HMIS) of the MoPH, several output, outcome and impact indicators important to efficient malaria control planning can only be captured through household surveys. These indicators include those listed in Table 1. The RBM-MERG identified national cluster randomized household surveys as the main source of such information [http://www.rollbackmalaria.org/mechanisms/merg.html#MIS]. This stand-alone household surveys, known as malaria indicator surveys (MIS) are aimed at collecting data at the national and regional levels from a representative sample of respondents to support national malaria control programs and international health organizations to make evidence based decisions in malaria control. The MIS addresses a number of topics including household ownership of insecticide-treated mosquito nets and their use by household members; intermittent preventive treatment against malaria during pregnancy; and the type and timing of treatment of high fever in children under five years of age or in rare cases among all ages; indoor residual spraying of insecticide to kill mosquitoes; and the prevalence of malaria infection. It is recommended that MIS surveys are done during the high malaria transmission season to provide programmatically relevant information on the key indicators.

In November 2008, the NMLCP with support from stakeholders and funding from the GFATM implemented the first MIS in Afghanistan [MoPH 2009]. This survey was undertaken 10 medium to high risk provinces covering 1559 household, 11307 individuals including 2811 women 15-49 years of age of whom 269 were pregnant. A total of 45 individuals out of 10736 who sampled for parasitaemia found positive for either *P falciparum* or *P vivax* using microscopy [MoPH 2009].

Although the MIS 2008 provided important baseline information, there were a number of limitations. First, owing to financial constraints, the survey covered a smaller sample size than was required with a limited spatial distribution covering only 10 provinces. Second for the malaria parasitaemia data to be used to improve the precision existing malaria stratification in the country, the geographic spread of the survey sample must be extended.

Table 1.1 Monitoring and Evaluation indicators that are normally assembled through household surveys

Indicator	Category	Estimates from MIS 2008
Period prevalence of fevers	Impact	3.4%
Prevalence of *P. falciparum* parasitaemia	Impact	0.4% (33.3)
Prevalence of *P. vivax* parasitaemia	Impact	0.4% (66.7)
Percentage of fevers that seek treatment in the public health sector	Case Management	36%
Percentage of fevers that are tested at facilities that should have diagnostics	Case Management	60%
Percentage of malaria patients (with or without test) receiving treatment according to national therapeutic guidelines	Case Management	60%
Percentage getting free malaria treatment (consultation, diagnosis, drugs) from the public health sector	Case Management	85%
Percentage of households owning at least one ITN/LLIN	Vector Control	19.5%
Percentage of households owning at least one ITN for each 2 members	Vector Control	26.7%

Percentage children under five using ITN/LLIN the night before survey	Vector Control	4.3%
Percentage pregnant women using ITN/LLIN the night before survey	Vector Control	5.2%
Percentage all ages using ITN/LLIN the night before survey	Vector Control	3.4%
Percentage of mothers/ caretakers able to recognize the treatment for uncomplicated malaria	Information, Education and Communication	
Percentage of mothers/ caretakers able to recognize at least two methods of malaria prevention	Information, Education and Communication	No recorded

1.3.4 Vector control

Since the formation of the NMLCP, the main approaches to vector control remain protection with ITNs and LLINs and IRS of households. These approaches are implemented within the framework of the Eastern Mediterranean Region Regional Strategic Framework for Integrated Vector Management (IVM) for the implementation of vector control. ITNs have been shown to have significant impact on malaria morbidity and all-cause mortality among individuals using them [Lengeler et al 2004] and has the collateral of reducing vector density and protecting even those individuals who are not using in communities where their use is relatively common the herd effect [Killeen et al 2009].

Within the last decade and despite financial, logistical and security challenges, the MoPH and Partners have made very progress in creating demand for and scaling up of ITNs – including LLINs. The two main approaches to scaling up ITNs in Afghanistan have been through social marketing and normal purchase from the retail sector. Within the current NMSP 2008-2013, however, free distribution of LLINs is recommended. A phased implementation through special mass campaigns has been implemented to provide LLINs through ANC and EPI health facilities. IRS has been targeted for *P. falciparum* malaria elimination in areas where the parasite is most prevalent using evidence from entomological and clinical assessment. The Vector-Borne Disease Control Task Force has the responsibility to coordinate and oversee the implementation of the programme. The taskforce is chaired by the MoPH, with representation from RBM Partners i.e., WHO, UNICEF, BPHS implementing NGOs and perhaps major donors. Provincial Malaria Task Forces are mandated to implement the operational aspects of the ITN strategy. The targets for IVM interventions coverage within the NMSP 2008-2013 are:

- By the end of 2013, 85% of households in the targeted populations will have at least one LLIN for each 2-3 members
- By the end of 2013, at least 85% of targeted population will be protected by LLINs through scaling-up of effective implementation strategies
- By the end of 2010, 14 million people living in the targeted Provinces will be stimulated through COMBI strategy to acquire and regularly use LLINs throughout the transmission season.
- By the en of 2013, 09 million LLINs will be distributed in targeted Provinces

A summary of /LLINs distributed from 2000 to 2011 is provided in Table 1.2.

Table 1.2 summary of ITNs/LLINs distributed and target areas in Afghanistan from 2005 to 2011

Year	ITNs or LLINs distributed	Target Provinces or Malaria Strata
2001	30880	Laghman,Kunar,Nangahar,Kandahar, Helmand and Khost
2002	52905	Laghman,Kunar,Nangahar,Kandahar, Helmand and Khost
2003	48151	Laghman,Kunar,Nangahar,Kandahar, Helmand and Khost
2004	46403	Laghman,Kunar,Nangahar,Kandahar, Helmand and Khost
2005	202,366	Laghman,Kunar,Nangahar,Kandahar, Helmand and Khost
2006	40,000	Laghman,Kunar,Nangahar,Kunduz, Takhar,Badakhsan, Balkh,Baghlan and Khost

2007	345,245	Laghman,Kunar,Nangahar,Kunduz, Takhar,Badakhsan, Balkh,Baghlan
2008	916,723	Laghman,Kunar,Nangahar,Kunduz, Takhar,Badakhsan, Balkh,Baghlan
2009	317,631	Laghman,Kunar,Nangahar,Kunduz, Takhar,Badakhsan, Balkh,Baghlan, and Khost
2010	922956	Laghman,Kunar,Nangahar,Kunduz,Takhar,Badakhsan, Balkh,Baghlan,Hirat, Helmand, Kandahar, Badghies and khost
January to August 2011	1268292	Laghman,Kunar,Nangahar,Kunduz,Takhar,Badakhsan,Faryab Balkh,Baghlan,Hirat, Helmand, Kandahar, Badghies and Khost

1.3.5 Case management

In Afghanistan, malaria case management is integrated into the BPHS and EPHS. The guidelines for malaria case-management have changed over time in the country following development of drug resistance [MoPH 2008a] and to address the complexity of dealing with the management of both *P. vivax* and *P. falciparum* malaria [MoPH 2008a; MoPH 2010]. *P. falciparum* chlororquine and amodiaquine resistance in Afghanistan was first detected in 1989 and overall failure rate is now as high as 60% and 90% in Jalalabad [Delfini 1989; Safi et al 2009c]. However, chloroquine remains fully effective against *P. vivax*, and sulphadoxine-pyrimethamine (SP) remains effective against *P. falciparum* (10-15% of cases fail to cure) [Rowland et al 1997]. The AS+SP combination gives 100% cure rate in Afghanistan [MoPH 2008a; Safi et al 2009c]. The presence of glucose-6-phosphate dehydrogenase (G6PD) deficiency in a minority of the population complicates the *P. vivax* radical treatment with the 14-day primaquine regimen [Rowland et al 1999; Leslie et al 2008].

Within the framework of the BPHS, malaria case management is provided at five primary levels: the health posts; health sub-centres; mobile health teams; basic health centres; and comprehensive health centres.

The national malaria treatment protocol, as outlined in the revised national malaria treatment guidelines [MoPH 2010] is as follows

- First-line treatment for laboratory confirmed *P. falciparum* cases: AS+SP
- Second-line treatment for laboratory confirmed *P. falciparum* cases: Quinine
- Clinically diagnosed cases: CQ
- Confirmed *P. vivax* malaria: CQ+PQ
- Pre-referral treatment of complicated and/or severe malaria at health facility level: Artemether IM
- Treatment of complicated and/or severe cases at Hospital level: Quinine IV
- Premaquine for radical treatment of vivax

For uncomplicated malaria, the household survey measurable targets of the NMSP 2008-2013 are as follows:

- By the end of 2013, 90% of uncomplicated malaria cases will be managed according to national diagnosis and treatment guidelines
- By the end of 2013, 95% of severe and complicated malaria cases will be managed according to national diagnosis and treatment guidelines
- By the end of 2013, all CHCs and 90% of targeted BHCs in priority areas, will provide high quality laboratory diagnosis for malaria, TB and leishmaniasis
- By the end of 2013, 60% of targeted Health Posts will be able to diagnose malaria by RDTs

1.3.6 Information, Education and Communication (IEC)

Within the framework of the Communication for Behavioural Impact (COMBI) strategic plan for 2008-2013, the NMLCP and partners plan to increase knowledge of malaria prevention and treatment by increasing people knowledge and awareness around vector control, disease management, malaria prevention and treatment

during pregnancy and malaria epidemic prevention and control [MoPH 2008b]. So far, the NMLCP has distributed over 200,000 malaria notebooks to schools and a similar number of posters and brochures to 14 medium to high risk provinces [Safi et al 2009a]. The overall objectives of the COMBI strategy are:

- To prompt 80% of all suspected malaria sufferers from each of the 14 high risk provinces to seek early diagnosis and treatment, at public and private health clinics, which adhere to the national diagnosis and treatment guidelines.
- To encourage 80% of all individuals from each of the 14 high risk provinces to own and sleep under a LLIN every night throughout the malaria transmission season, especially those experiencing fevers, pregnant women and children under five.

To achieve these objectives, approaches that have been adopted include the use of Malaria Prevention and Treatment Assistants (MPTA) to visit household to raise awareness around the importance of early diagnosis and treatment and use of bed nets; community mobilization activities set out to gain community acceptance, support and action for interventions channelled through schools, local NGOs and women groups, community health workers, religious leaders and other channels; mobilization of government administrative and political machineries for advocacy and public relations; advertising through print, audio and visual media; and point of service communication [MoHP 2008b]. The MIS 2011 aims to evaluate the progress toward meeting the objectives of the COMBI and CBMM strategies.

1.4 Objectives of the Malaria Indicator Survey of 2011

To collect data to monitor progress and to provide evidence for further investment and implementation of national malaria strategy by collecting information on the coverage of malaria indicators and the prevalence of malaria infection measuring-ring the difference between this MIS and the MIS 2008.

1.4.1 Specific objectives:

1. To examine the status of (ITN, ACT and IEC) coverage and use among households and household members of all ages in Afghanistan
2. To assess the treatment seeking patterns for fever/malaria treatment in Afghanistan
3. To measure the prevalence of malaria parasite (*P. falciparum and P. vivax*) in all age groups using rapid diagnostic tests (RDTs) and microscopy.
4. To measure the prevalence of malaria parasite infections and antibodies using Polymerase Chain Reaction (PCR) and Enzyme-Linked Immunosorbent Assay (ELISA) respectively using blood sample collected among a sub-sample of the population.
5. To build capacity of the NMLCP and its partners in the implementation of MIS.
6. To use the infection or serological prevalence data to improve the precision of malaria stratification in the country
7. To assess Knowledge Attitude and Practice (KAP) related to Malaria
8. To examine the differences in key indicators between the 2008 and 2011 survey to assess progress
9. To provide strategic orientation of malaria control programmes using the results of the MIS.

1.5 Methodology

The survey covered 21 provinces in all malaria risk strata in Afghanistan from which a nationally representative sample of households was drawn to provide precise estimates of core malaria control indicators at the national and state levels and for urban and rural populations.

1.5.1 Sample size estimation and sample selection

Districts were classified by security level and the survey sample was drawn from those that were deemed secure. Of the 391 districts in 28 provinces in the country, 153 were considered secure. Of these 153 districts,

about half (n=77) were selected. To estimate the actual number of survey households and clusters (villages) to be visited, recent information on prevalence of key indicators and population distribution was required. The selected key indicator for sampling was the '*proportion of children below the age of five years who slept under an ITN the night before survey*' was used. The estimate for this indicator was considered double that of the MIS 2008. Population distribution data, particularly the proportion of the population who were under the age of five years and the mean household size were obtained from the MIS survey.

1.5.1.1 Multi-stage probability sampling

A traditional multi-stage cluster sample survey design (Macro International, 1996) proceeds by an initial random selection of population clusters (weighted by population where appropriate) and the subsequent random selection of households within each sampled cluster. Decisions on the sample size (the number of clusters, and households within each cluster, to sample) are generally based on a desired level of precision in indicator summary estimates, generally at a prescribed level of spatial aggregation defined by administrative units. Stratifications, such as between urban and rural areas, can also be introduced to ensure areas with known distinct characteristics are captured.

The sampling approach for the Afghanistan MIS 2011 will have two stages. In the first stage, the traditional household cluster sample design (equation 1) will be used to define the overall sample size as follows:

$n = [4 (r) (1 - r) (f) (1.1)] / [(e*r)^2 (p) (n_h)]$……equation 1

where

n= the required sample size for the KEY indicator,
4= a factor to achieve the 95 percent level of confidence,
r= the predicted or anticipated prevalence (coverage rate) for the key indicator, in this case the proportion of children sleeping under ITN the night before survey which was estimated at 8.6%, almost double what was observed during the MIS 2008.
1.1 = the factor necessary to raise the sample size by 10 percent for non-response,
f = the design effect *(deff)*, 1.5 was selected for the purposes of this survey
e = the margin of error to be tolerated (0.12 as advised in the MIS sampling manual)
p = the proportion of the total population that the smallest group comprises (18% of the population were children under the age of five years from the MIS 2008)
n_h = the average household size (this was 7 from the MIS 2008)

Based on this sampling approach, a total of 3,280 households was required to provide reliable estimates of the key indicator at the national and state levels and for urban and rural populations. At an average of 20 households per cluster, therefore, 164 clusters were selected for the 2011 MIS. These clusters were then allocated into urban and rural categories proportionately within each district. Within each selected district, a cluster was selected also using probability proportional to size method. An additional cluster was added to Parwan province (Chahariakr district) because only one cluster was randomly assigned to this province in the original design. A total 165 clusters were therefore selected for the MIS 2011.

1.5.2 Survey planning

The period June to August 2011 was used to prepare for survey. Activities that were scheduled during this period include the drafting of the survey protocol and meetings by the NMLCP and partners to harness focus towards survey activities; development of tools; identification of field workers and budgeting.

1.5.2.1 Questionnaires

Two survey questionnaires was developed first in English and then translated to Dari and Pashto, using the templates developed during the MIS 2008 as the basis. These were the household questionnaire and the household member's questionnaire. The household questionnaire was used to list all usual members and

visitors of the selected households. For each household member the following data will be collected: age, sex, education, and relationship to the head of the household. The household questionnaire also collected data on household head's education level and household assets to assess household socio-economic status. Information on the household ownership of mosquito nets and their use by household members was also be recorded. Data on household exposure to indoor insecticide spraying (IRS) and information-education-communication (IEC) activities will be collected.

The household members' questionnaire recorded information on all consenting household members including whether individual had fever in the last 14 days and whether they sought treatment for the fever in that time; sources of treatment and drugs used (Annex 2B). Exposure to IEC through the COMBI strategy was also recorded for all individuals 12 years or more. All individuals had temperatures measured to ascertain fever at the time of interview. This was followed by a section detailing recent travel history and net use while travelling and the final section captured information on malaria infection status for each assenting individual were examined for parasitaemia first using RDTs; thick and thin blood smears. Individuals who tested positive for parasite infection using the RDT test were treated with nationally recommended antimalarial drugs. Likely severe malaria cases or individuals assessed by health worker to need additional medical attention were referred to the nearest health facility.

1.5.3 Training and Pre-test activities

Survey teams were selected in each province from the provincial malaria control program department. Interviewers were selected based on their ability to speak in both Pashto and Dari languages. Training of trainers (TOT) of NMLCP at provincial level was conducted in August at NMLCP, Kabul. Training was also organized for delegates from the central level selected to assist program managers at provincial level. The ToTs then trained surveyors and laboratory technicians in their respective province. Methods of training included interactive lectures, discussion, role-play as well as practice. Questionnaires were pre-tested and necessary adjustment made before using them in the study. Training was undertaken on general interviewing skills, administration of consent forms, filling of questionnaires, collection of blood samples and the appropriate treatment of individuals found positive for malaria. The trainers evaluated completed questionnaires again and correction of mistakes made during pre-testing and any necessary adjustments to the survey tools resulting from the pre-test was undertaken.

1.5.4 Composition of survey management and field team

Overall, the survey management team was composed of a national consultant; two national coordinators; 21 provincial coordinators and 23 field team supervisors.

The national consultant worked closely with international consultant to achieve the aforementioned tasks; ensure of overall successful implementation of survey; participate in data analysis and report writing. The national coordinators were drawn primarily from the NMLCP to assist the consultants in all aspects of survey preparation and management; were in charge of the actual survey implementation; management of survey budget; hiring of survey teams; procurement of survey materials; storage of survey questionnaires and samples; management of data entry; will participate in the data analysis and report writing. The national coordinators were primarily responsible for the dissemination of survey results. The provincial coordinators acted trainers of the survey field teams and were in-charge of day-to-day management of the survey. They were also acted as the bridge between the field teams and the national level management team. They were responsible for daily checking of questionnaires and proper storage of survey materials; briefing of survey teams each day prior to start of survey and to ensure appropriate inventory and registration of survey questionnaires; RDTs and slides before they handed over to the relevant teams for analysis and provide daily feedback to survey team.

Each field team will consist of 3 persons comprising 1 interviewer; 1 laboratory technician and 1 team supervisor. Survey teams visited a selected cluster a day and completed interviews of sampled households. The team supervisor role was to ensure that all survey procedures are followed and field teams conducted household interviews appropriately. The supervisor also checked that all questionnaires have been correctly coded and filled before departing the cluster. The supervisor ensured that all call-backs were attended to.

1.5.5 Parasite prevalence

All consenting individuals were tested first using RDT ((First Response Malaria Ag (pLDH/HRP2) COMBO, Premier Medical Corporation Ltd)). All RDT positive cases detected during the household survey were given a referral note to the nearest health facility. Using the same finger prick, a thick and thin blood smear was prepared. The smears were stained in 4% Giemsa solution for 30 minutes and labelled slides transported to each state headquarters. Thick blood films were used under a light microscope with x 100 oil-immersion lens and x 10 eyepiece. One hundred high power fields were examined before a slide was considered negative. For all positive blood slides, the asexual stage of Plasmodium parasites was counted against 200 leukocytes and expressed as parasites/µl of blood by multiplying this number by a factor of 40 assuming a mean white blood cell count of 8000 cells/µl. Two independent microscopists read slides and any discrepancies were further reviewed by a third independent expert parasitologist. Blood samples were also collected on filter paper for further analysis of infections and exposure.

1.5.6 Field work and quality control

The survey was undertaken from 1st to 30th October 2011. Each survey team visited a cluster per day. At the end of each survey day, all questionnaires, RDTs, blood slides and filter papers were submitted to the provincial coordinators or their representative for review and storage. The provincial coordinators reviewed the survey team's daily submissions and suggest corrections where necessary. The NMLCP national coordinators also regularly visited the provinces and observe each survey team as they perform interviews for a few selected households and advise on appropriate corrections. At the end of every week, the provincial coordinators submitted completed questionnaires to the NMLCP office in Kabul where a central data entry system was established. The slides were retained at the provincial for initial analysis and submitted to the national level for a second reading and general quality control.

To minimize the inconvenience and pain caused during the collection blood samples, only a single finger prick was used for the collection of the different blood samples during malaria testing. The first drop was wiped off from the finger using a swab dipped in methylated spirit, the second drop was applied to the RDT; the third sets of drops were used to prepare a thick and thin blood films and the fourth set will be collected on filter papers. All leftover materials used for the collection of blood samples, such as lancets and swabs were carried from the household in a special biohazard box and appropriately disposed of at the end of the survey day.

1.5.7 Data entry and analysis

Trained data entry personnel were used to capture information from the survey questionnaires using customized data entry screens developed in Microsoft Access 2007. Double entry of the data was undertaken in a central place at the NMLCP offices in Kabul. Once entered data was checked for consistencies by the data manager and necessary corrections were made. The results of the blood slides and filter papers were recorded in customized forms with members ID. Analysis of the survey data and writing of the report was undertaken by the international consultant.

1.5.8 Ethical considerations & ethical review

The survey protocol was first reviewed and approved by Institutional Review Board of the Afghan Ministry of Public Health. At the initial phase formal approval was obtained from the Institutional Review Board (IRB) of the Afghan Public Health Institute. Administrative approval was sought from local authority in each province. Finally, the purpose of the study was explained to potential study participants and written informed consent

was obtained from them. Strict aseptic precautions were followed to collect blood specimen to obviate the risk of infection to both participants and laboratory technicians. Confidentiality of the collected information was maintained through all phases of the study. All specimens were labelled with a unique identifier to match the databases following sample analysis but no names or other identifiers. All malaria positive cases were referred to nearest health facility. Pregnant women with fever (axillary temperature ≥ 99.5^{o}F) and clinical signs suggestive of malaria were referred to the district hospital for confirmation of diagnosis and treatment. Cases of fever among which malaria was not observed were referred to the nearest health facility for further investigation and management. All referred cases were given a “referral note” stating the reason for referral.

CHAPTER TWO: CHARACTERISTICS OF SURVEY SAMPLE

A household was defined as a person or group of persons, related or not, living together in the same dwelling unit, under one household head, sharing a common source of food. The household questionnaire collected basic demographic and socio-economic characteristics for each person who spent the night preceding the survey in the sampled household, including usual residents and visitors, as well as information on their household characteristics. This chapter describes the demographic characteristics of household populations and distribution of household assets that have been used in defining household socio-economic status in subsequent chapters. The survey enumerated all de jure (persons usually resident in the selected households) and de facto (populations' resident on the night prior to survey). The difference between these two populations is small and unless otherwise specified all tables in this chapter refer to the de facto population.

Table 2.1 Household population by age, sex and residence

Percent distribution of de jure household population by age, sex and residence, Afghanistan MIS 2011

	Rural			Urban			Total		
Age (years)	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
0-4	16.5	15.1	15.9	16.3	13.7	15.0	16.6	15.0	15.8
5-9	18.6	16.7	17.7	20.3	20.0	20.2	18.7	17.0	17.9
10-14	14.2	13.6	13.9	15.1	15.0	15.0	14.2	13.6	13.9
15-19	10.3	10.3	10.3	9.1	9.9	9.5	10.1	10.4	10.3
20-24	6.6	8.5	7.5	7.4	6.0	6.7	6.6	8.2	7.4
25-29	6.2	7.8	7.0	4.1	9.5	6.8	6.0	7.9	6.9
30-34	5.3	7.3	6.3	5.7	7.3	6.4	5.3	7.3	6.3
35-39	4.4	5.4	4.9	4.2	5.4	4.8	4.4	5.4	4.9
40-44	4.7	4.6	4.7	4.6	4.9	4.7	4.8	4.6	4.7
45-49	3.1	3.3	3.2	3.1	2.8	2.9	3.1	3.2	3.2
50-54	3.7	3.0	3.4	2.9	2.7	2.8	3.6	3.0	3.3
55-59	1.4	1.1	1.3	1.9	0.8	1.3	1.5	1.1	1.3
60-64	2.1	1.5	1.8	2.8	0.9	1.9	2.2	1.5	1.8
65-69	0.9	0.5	0.7	0.9	0.4	0.6	0.9	0.5	0.7
70-74	1.2	0.8	1.0	1.1	0.5	0.8	1.2	0.7	1.0
75-79	0.3	0.1	0.2	0.1	0.0	0.1	0.3	0.1	0.2
80+	0.5	0.2	0.4	0.4	0.2	0.3	0.5	0.2	0.4
Don't know/missing	0	0	0	0	0.1	0.2	0	0.3	0
Total	51.0	49.0	100.0	49.7	50.3	100.0	50.9	49.1	100.0
Number	8,932	8544	17476	848	855	1708	9999	9641	19641

Of the 19641 individuals who were enumerated during the survey, children under the age of five years comprised 15.8% while about 72% were under the age of 30 years. The percentage of population male was 50.9% compared to 49.1% female.

Of the 3,040 households that were surveyed, 91% were rural. Almost 80% of households were headed by a man (Table 2.2) and average household size was about 6.5 with minimal difference between urban and rural areas. Almost 90% of households had, on average, four or more persons.

Table 2.2 Household composition

Percent distribution of household by head and de jure household population by residence and mean household size, Afghanistan MIS 2011

	Urban	Rural	Total
Gender of household head			
Male	77.2	80.1	79.8
Female	22.8	20.0	20.2
Number of usual members			
1	0	0.4	0.4
2	0.8	2.9	2.7
3	5.7	8.3	8.0
4	10.3	13.0	12.8
5	18.3	17.5	17.6
6	21.7	14.9	15.5
7	17.1	14.2	14.4
8	9.9	10.9	10.8
9+	16.2	17.9	17.8
Number of households	263	2777	3040

Table 2.3 Household drinking water

Percent distribution of households by source of drinking water and sanitation, according to urban-rural residence, Afghanistan MIS 2011

	Urban	Rural	Total
Household drinking water			
Piped water into dwelling	3.0	6.6	6.3
Piped nearby	17.1	11	11.5
Well	67.6	68.7	68.6
Rainwater	3.0	2.2	2.3
Tanker Truck	6.5	2.5	2.9
Pond	12.6	21	20.2
Bottled water	0.0	0.6	0.5
Other	0.8	1.9	1.8
Household sanitation			
Flush	1.1	1.7	1.8
pit latrine	15.6	10	10.4
Bucket toilet	77.1	73.6	74
No toilet/use bushes	22.4	33.6	32.7
Other	0	0.4	0.3

Interestingly the percentage of households with piped water (into dwelling or nearby) was similar (20.1 urban vs. 17.7 rural) (Table 2.3). The predominant source of water in both urban and rural areas was a well. Bucket toilet was the means of sanitation used in Afghanistan accounting for about 74% of toilets with minimal difference between urban and rural areas. 32.7% of the households had no access to a toilet or latrine.

Ownership of radio, telephones, refrigerators, cars and bicycles was similar between urban and rural populations. Substantially more households in urban areas owned a TV (Table 2.4).

Table 2.4 Household durable goods and means of transportation

Percent distribution of households by type of durable goods and means of transportation according to urban-rural residence, Afghanistan MIS 2011

	Urban	Rural	Total
Household effects			
Radio	58.8	59.8	59.9
Television	42.2	26.9	28.1
Telephone	64.6	66.8	66.6
Refrigerator	4.2	3.6	3.7
Air con	1.5	0.6	0.7
Fan	16.4	9.9	10.5
Means of transport			
Bicycle	20.2	19.8	19.8
Motorcycle	18	23.1	22.7
Car/Truck	9.6	10.1	10.1

About 51% of the female population was between the ages 15 to 49 years (Table 2.5). This population group were main respondents to all pregnancy related questions.

Table 2.5 Characteristics of women respondents

Percent distribution of women aged 15-49 by age, residence and education, Afghanistan MIS 2011

	Percent	Number
Age (years		
15 - 19	19.0	967
20 - 24	15.2	775
25 - 29	14.6	745
30 - 34	13.5	687
35 - 39	9.9	506
40+	27.8	1415
Residence		
Urban	8.6	438
Rural	91.4	4657
Total	**51.1**	**5095**

Education level of the household head and household assets were used in a Principal Component Analysis to construct a wealth index for each household which has been used to assess variation by wealth of key malaria control indicators in subsequent chapters.

Questions on household members' travel history in the two months prior to survey were documented to examine whether this was a risk factor for malaria infection. Only 307 persons reported to have travelled within the country in the past two months and even fewer (n=100) travelled outside the country (Table 2.6).

Table 2.6 Travel within the last two months by household members, Afghanistan MIS 2011				
	%	Number of persons who travelled	%	Number of persons who travelled
Residence				
Urban	2.0	29	0.5	8
Rural	2.0	278	0.7	92
Malaria strata				
High risk	2.0	206	0.7	68
Low risk	2.2	100	0.7	31
No risk	0.0	1	0.2	1
Total	**1.9**	**307**	**0.7**	**100**

CHAPTER THREE: COVERAGE OF KEY MALARIA INTERVENTIONS

Table 3.1 Household ownership of any nets; insecticide-treated nets (ITN); and long lasting insecticidal nets (LLINs), Afghanistan MIS 2011.

	Any type of mosquito net			ITN			LLIN				
	%with at least one net	%with more than one net	Average number of nets per household	%with at least one net	%with more than one net	Average number of nets per household	%with at least one net	%with more than one net	Average number of nets per household	Percentage of households with at least one ITN for every 2 persons	Number of Households surveyed
Residence											
Urban	45.0	41.4	1.5	44.7	41.1	1.3	44.7	41.1	1.2	11.4	263
Rural	21.0	18.4	0.6	19.4	17.4	0.5	18.0	16.3	0.5	10.2	2777
Region											
Kabul	3.0	1.1	0.04	1.6	0.8	0.02	1.6	0.8	0.02	0.0	232
Kapisa	27.9	12.8	0.5	22.5	12.8	0.4	5.1	3.4	0.1	2.8	71
Parwan	6.7	6.7	0.2	2.2	0	0.02	2.2	0	0.02	0.0	49
Wardak	0	0	0	0	0	0	0	0	0	0.0	40
Logar	2.9	2.9	0.1	1.4	1.4	0.03	1.4	1.4	0.03	0.0	69
Patkya	2.1	1.4	0.03	0	0	0	0	0	0	0.0	160
Khost	86.3	85.3	2.6	67.2	67.2	1.9	3.3	3.3	0.1	47.3	74
Nagharhar	46.8	40.0	1.2	42.4	36.4	1.1	36.6	32.0	0.9	13.6	375
Kunar	97.1	93.3	3.7	95.5	91.7	3.6	93.7	88.2	3.0	10.3	116
Laghman	93.6	92.7	3.8	92.3	91.8	2.8	92.7	91.8	2.7	29.1	110
Baghlan	46.7	45.6	1.7	46.6	45.5	1.6	46.7	45.6	1.6	13.1	198
Badakhshan	35.4	31.7	0.9	35.1	31.3	0.9	35.1	31.3	0.9	6.6	290
Takhar	23.1	12.4	0.4	21.5	11.6	0.4	21.2	11.3	0.4	2.7	188
Kunduz	46.5	42.2	1.3	45.1	41.7	1.3	45.1	41.7	1.3	36.5	233
Samangan	0	0	0	0	0	0	0	0	0	0.0	59
Balkh	59.7	26.2	1.0	29.1	13.4	0.5	4.9	0.2	0.1	13.5	156
Jawzjan	57.1	24.2	0.9	13.2	6.5	0.2	8.1	4.8	0.2	3.3	61
Saripul	2.2	1.1	0.03	0	0	0	0	0	0	0.0	182
Baghdis	90.3	71.0	2.1	89.2	68.9	2.0	86.8	67.5	1.9	20.7	116
Bamyan	0	0	0	0	0	0	0	0	0	0.0	125
Daykondi	0	0	0	0	0	0	0	0	0	0.0	136
Household head											
Male	23.8	21.1	0.7	22.2	20.1	0.6	20.7	18.9	0.5	10.7	2426
Female	18.6	16.4	0.5	17.6	15.6	0.5	17.0	15.1	0.4	8.8	614
Malaria strata											
High risk	54.0	46.4	1.6	49.9	43.8	1.4	43.4	38.7	1.2	16.7	1856
Low risk	6.8	3.3	0.1	2.6	1.4	0.05	1.1	0.7	0.02	0.4	1059
No risk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	125
Household Wealth											
Most Poor	19.3	16.8	0.5	18.5	16.3	0.4	18.1	16.1	0.4	13.2	608
Very Poor	20.5	18.7	0.6	19.4	17.9	0.5	18.8	17.5	0.5	7.1	608
Poor	30.0	26.9	1.0	28.4	26.2	0.8	26.5	24.4	0.8	11.7	608
Less Poor	19.8	18.1	0.6	18.2	16.9	0.5	16.8	15.6	0.5	8.2	608
Least Poor	26.7	22.0	0.8	23.5	20.3	0.7	20.8	18.2	0.6	11.5	608
Total	**22.7**	**20.0**	**0.7**	**21.1**	**19.1**	**0.6**	**19.8**	**18.0**	**0.5**	**10.3**	**3040**

Table 3.1 shows that overall, household ownership of one net of any type, ITNs or LLINs were 22.7%, 21.1% and 19.8% respectively. Ownership of more than one net, ITN and LLIN were 20.0%; 19.1% and 18% respectively. Mean number of any net, ITN and LLIN were 0.7, 0.6 and 0.5 per household respectively. Urban

households headed by men had higher net ownership than those headed by women. Although households in the least poor wealth quintile had the highest ownership of any net, the difference diminished in the ownership of ITN and LLIN. The highest LLIN ownership was in the provinces of Baghdis (86.8%); Laghman (92.7%) and Kunar (93.7%). Moderate LLIN ownership (30% to 50%) was reported in Nangharhar, Baghlan, Badashkan and Kunduz provinces. In Khost province, 67.2% of households reported to own at least one ITN but only 3.3% had at least one LLIN.

Table 3.2 Percentage sleeping under any net; insecticide-treated nets (ITN); and long lasting insecticidal nets (LLINs) the night prior to the survey, Afghanistan MIS 2011.

	Slept under a net last night	Slept under ITN last night	Slept under LLIN last night	Number of persons
Member				
Male	15	14.2	13.1	7142
Female	16.2	15.6	14.7	8228
Residence				
Urban	23.2	23	22.8	1478
Rural	15	14.3	13.2	13892
Province				
Kabul	0	0	0	2026
Kapisa	0	0	0	588
Parwan	0.4	0	0	1429
Wardak	0	0	0	649
Logar	1.3	0	0	469
Paktya	0	0	0	502
Khost	81.5	63.1	2.6	370
Nangarhar	40.3	37	31.1	947
Kunar	49.4	49.3	47.8	302
Laghman	90.1	89.5	89.5	394
Baghlan	2.4	2.4	2.4	984
Badakhshan	21.8	21.7	21.4	602
Takhar	0.4	0.4	0.3	616
Kunduz	25.3	24.8	24.6	397
Samangan	0	0	0	2012
Balkh	5.6	1.4	0	702
Jawzjan	4	0	0	259
Saripul	8	0	0	315
Baghdis	4.2	4.2	0.4	926
Bamyan	0	0	0	657
Daykondi	0	0	0	224
Malaria strata				
High risk	31.7	30.6	28.6	10272
Low risk	0.3	0	0	4701
No risk	0	0	0	469
Age category				
0 - 4	21.5	20.7	19.4	2716
5-9	16.7	15.9	15	2907
10-14	14.7	14.1	13.4	2091
15 - 19	16.7	16	14.9	1396
20 - 44	13.8	13.3	12.2	4446
>44	12.2	11.7	10.8	1814
Household Wealth				
Most Poor	8.6	8.3	8.2	3392
Very Poor	11.8	11.4	11.1	3479
Poor	32.3	31.9	29.7	3164
Less Poor	15.5	14.1	11.4	2350
Least Poor	21.6	20.2	18.7	2985
Total	**15.5**	**15**	**14**	**15370**

In malaria risk stratum 1 (highest risk areas) approximately 54%, 50% and 43% of sampled households owned at least on net, ITN or LLIN respectively. Overall, 10% of all households or 17% of those in stratum 1 had complete coverage with ITNs (i.e. 1 ITN per 2 persons). Sampled households in Bamyan, Daykondi, Samangan and Wardak reported zero ownership of nets.

Table 3.3 Percentage sleeping under any net; insecticide-treated nets (ITN); and long lasting insecticidal nets (LLINs) the night prior to the survey in households with at least one net, Afghanistan MIS 2011.

	Slept under a net last night	Slept under ITN last night	Slept under LLIN last night	Number of persons
Member				
Male	58.8	55.8	51.4	2685
Female	62.3	60.2	56.7	3130
Residence				
Urban	49.8	49.3	48.9	658
Rural	62.6	59.8	52.3	5134
Province				
Kabul	5			22
Kapisa	38.5			104
Parwan				20
Logar	98.9	76.6	3.1	13
Paktya	89.3	81.8	68.8	17
Khost	51	50.9	49.3	300
Nangarhar	97.2	96.5	96.5	864
Kunar	5.1	5.1	5.1	945
Laghman	59	58.7	58	571
Baghlan	2.8	2.8	2	629
Badakhshan	57.2	55.8	55.4	809
Takhar	10.1	2.5		72
Kunduz	7.6			312
Balkh	34.8			402
Jawzjan	0.5	0.5	0.5	198
Saripul				21
Baghdis				493
Malaria strata				
High risk	62.5	60.4	56.3	5397
Low risk	12.7	0	0	418
No risk	0	0	0	0
Age category				
0 - 4	66.1	63.9	59.6	1101
5-9	61.5	58.7	55.1	1103
10-14	57.9	55.7	52.9	797
15 - 19	62.4	60	55.9	552
20 - 44	60.1	57.6	53.2	1596
>44	54.1	51.7	47.8	666
Household Wealth				
Most Poor	54.2	52.2	52.1	1095
Very Poor	51.9	50.3	48.9	1045
Poor	68.5	67.6	63.1	1487
Less Poor	64.8	58.8	47.8	892
Least Poor	63.2	59.2	54.7	1273
Total	**60.8**	**58.3**	**54.4**	**5815**

When usage (sleeping under a net the night before survey) of nets was analysed percentage of persons sleeping under a net, ITN or LLIN was between 15.5%, 15% and 14% respectively (Table 3.2) with minimal difference by gender and higher among urban compared to rural residents. Use of mosquito bed nets was highest among children under the age of five years and persons from the wealthiest households. Approximately more that 50% of persons in Kunar, Khost and Laghman provinces slept under an ITN the night before survey. In stratum 1, use of nets, ITNs and LLINs was 32%, 31% and 29% respectively. Among children under the age of five years, use of nets, ITNs and LLINs were 2%, 21% and 19% respectively.

When analysis was restricted to only household with at least one net, overall proportion of children sleeping under net, ITN and LLINs rose to 61%, 58% and 54% respectively indicating that majority of individuals who had access to nets used them. These patterns were influence largely by the trends in stratum 1 where usage by individuals in households with nets mirrored the national average (Table 3.3). These trends appeared similar by gender and higher in rural areas compared to urban.

However, among households that owned at least one net, the usage of any net, ITN and LLIN was 60.8%, 58.3% and 54.4%, significantly higher than the national survey averages (Table 3.3). Among the provinces where ITN and LLIN usage was reported, all reported usages of 49% to 97% except in Khost, Baghlan and Takhar. LLIN use was similar in between male and female and higher among urban residents, children under the age of five years. LLIN use didn't vary much by wealth quintile.

Table 3.4 Percentage of children under the age of five years sleeping under any net; insecticide-treated nets (ITN); and long lasting insecticidal nets (LLINs) the night prior to the survey, Afghanistan MIS 2011.

	Slept under net last night	Slept under ITN last night	Slept under LLIN last night	Number of persons
Residence				
Urban	28.4	27.9	27.9	266
Rural	20.7	20.0	18.4	2450
Malaria strata				
High risk	35.4	34.5	32.2	1885
Low risk	0.5			764
No risk				81
Total	**21.5**	**20.7**	**19.4**	**2730**

Further analysis of usage patterns by children under the age of five years by residence and malaria strata showed that utilisation of nets/ITN/LLINs were higher in urban areas compared to rural and was above 30% in stratum 1 (Table 3.4). A similar analysis of pregnant women (Table 3.5) showed that 35% and 34% slept under ITNs/LLINs respectively, all of them in stratum 1.

Table 3.5 Percentage of pregnant women sleeping under any net; insecticide-treated nets (ITN); and long lasting insecticidal nets (LLINs) the night prior to the survey, Afghanistan MIS 2011.

	Slept under net last night	Slept under ITN last night	Slept under LLIN last night	Number of persons
Residence				
Urban	14.0	13.6	12.7	37
Rural	20.4	20.0	19.2	290
Malaria strata				
High risk	35.7	35.1	33.7	228
Low risk	0.0	0.0	0.0	92
Nor risk	0.0	0.0	0.0	8
Total	**20.4**	**20.0**	**19.2**	**328**

Overall, 75% of all nets owned by households during the survey were LLINs and 12% ITNs (Table 3.6). The remainder were either untreated nets of the local traditional nets. The percentage of nets that were LLIN were higher in urban areas compared to rural and reverse was true for ownership of ITN and local nets. About 41% of nets observed during survey had no holes, 38% were in fair condition 13% were unused while the remainder were either in poor or unsafe conditions (Table 3.7). Saripul, Parwan, Paktya, Jawzjan and laghman all had 20% or more of their nets in either poor or unsafe conditions. Net condition was defined as follows: Fair= no holes larger that fit a normal torch battery; Poor= 1 to 4 holes that fit a torch battery; Unsafe =>5 holes that fit a torch battery; Unused= net still in package. The main source of nets was through campaigns (60%), followed by

NGOs (15%), private clinic (15%), private shop (13%) and public clinic (9%) (Table 3.8). About 88% of nets were obtained within the last three years: 56.1% 0 to 6 months; 21.5% 7 to 12 months; and 10.8% 13 to 36 months (Table 3.9). However, in the provinces of Balkh, Jawzjan, Kabul, Parwan and Saripul between 40% to 75% of nets were older than three years.

Table 3.6 The type, number and percentage of owned by households, Afghanistan MIS 2011.

	Total untreated nets	% Total untreated nets	Total ITN	% Total ITN	Total LLIN	% Total LLIN	Total local nets	% Total local nets	Total nets
Residence									
Urban	27	8.2	12	3.7	288	87.8	1	0.3	328
Rural	233	8.7	358	13.3	1981	73.6	121	4.5	2693
Province									
Badakhshan	3	1.0	8	2.7	278	94.9	4	1.4	293
Badghis	4	1.6	5	2.1	229	94.2	5	2.1	243
Baghlan	0	0.0	0	0.0	297	97.1	9	2.9	306
Balkh	9	5.1	115	65.7	12	6.9	39	22.3	175
Bamyan	0		0		0		0		0
Daykondi	0		0		0		0		0
Jawzjan	0	0.0	4	7.7	10	19.2	38	73.1	52
Kabul	1	14.3	0	0.0	3	42.9	3	42.9	7
Kapisa	6	17.1	22	62.9	7	20.0	0	0.0	35
Khost	73	37.6	111	57.2	10	5.2	0	0.0	194
Kunar	2	0.5	61	14.4	360	85.1	0	0.0	423
Kunduz	5	1.4	0	0.0	353	98.1	2	0.6	360
Laghman	113	26.9	1	0.2	303	72.1	3	0.7	420
Logar	2	50.0	0	0.0	2	50.0	0	0.0	4
Nangarhar	28	6.5	37	8.6	353	81.9	13	3.0	431
Paktya	5	62.5	3	37.5	0	0.0	0	0.0	8
Parwan	0	0.0	0	0.0	1	14.3	6	85.7	7
Samangan	0		0		0		0		0
Saripul	6	100.0	0	0.0	0	0.0	0	0.0	6
Takhar	3	5.3	3	5.3	51	89.5	0	0.0	57
Wardak	0		0		0		0		0
Total	**260**	**8.6**	**370**	**12.2**	**2269**	**75.1**	**122**	**4.0**	**3021**

Table 3.7 The condition of nets owned by households, Afghanistan MIS 2011.

	No holes	Fair	Poor	Unsafe	Unused
Badakhshan	21.2	58.0	3.3	5.6	11.9
Badghis	1.2	85.3	4.1	0.8	8.6
Baghlan	15.3	9.4	0.0	0.0	75.3
Balkh	49.1	48.0	2.9	0.0	0.0
Jawzjan	7.8	45.1	23.5	23.5	0.0
Kabul	57.1	28.6	14.3	0.0	0.0
Kapisa	39.4	42.4	9.1	6.1	3.0
Khost	78.4	16.2	5.4	0.0	0.0
Kunar	70.6	19.4	1.7	0.0	8.4
Kunduz	30.6	66.2	0.9	0.3	2.0
Laghman	54.4	7.4	5.0	20.6	12.5
Logar	0.0	100.0	0.0	0.0	0.0
Nangarhar	47.8	40.2	6.7	2.8	2.5
Paktya	62.5	12.5	25.0	0.0	0.0
Parwan	100.0	0.0	0.0	0.0	0.0
Saripul	0.0	75.0	25.0	0.0	0.0
Takhar	16.9	71.2	11.9	0.0	0.0
Total	**41.1**	**37.6**	**4.1**	**4.4**	**12.8**

Table 3.8 The source of nets owned by households, Afghanistan MIS 2011.

	Don't know	Private shop	Public Clinic	NGO	EPI	ANC	Campaign	Other
Badakhshan	0.0	0.4	1.1	4.8	0.0	3.0	90.7	0.0
Badghis	0.0	2.5	0.4	96.7	0.0	0.0	0.0	0.4
Baghlan	0.0	0.3	0.0	0.0	0.0	0.3	99.3	0.0
Balkh	1.1	20.1	43.7	29.3	0.0	0.0	1.1	4.6
Jawzjan	0.0	94.1	0.0	0.0	0.0	0.0	2.0	3.9
Kabul	0.0	71.4	28.6	0.0	0.0	0.0	0.0	0.0
Kapisa	3.0	6.1	57.6	0.0	3.0	9.1	0.0	21.2
Khost	0.0	37.0	1.1	60.3	0.0	0.0	1.6	0.0
Kunar	0.0	12.9	1.4	1.0	0.0	1.0	83.7	0.0
Kunduz	1.4	0.6	0.3	0.3	0.3	1.7	95.4	0.0
Laghman	0.0	20.1	7.4	0.5	0.0	3.6	68.3	0.0
Logar	0.0	50.0	0.0	0.0	0.0	0.0	50.0	0.0
Nangarhar	1.2	13.1	18.9	3.5	0.7	3.7	59.0	0.0
Paktya	0.0	62.5	0.0	37.5	0.0	0.0	0.0	0.0
Parwan	0.0	85.7	0.0	0.0	0.0	14.3	0.0	0.0
Saripul	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Takhar	0.0	8.5	69.5	6.8	0.0	0.0	3.4	11.9
Total	**0.4**	**13.1**	**9.0**	**14.9**	**0.2**	**1.8**	**59.8**	**0.9**

Table 3.9 The age of nets owned by households Afghanistan MIS 2011.

	0-6 months	7-12 months	13-36 months	>36 months	Don't know
Badakhshan	25.7	66.4	4.5	3.0	0.4
Badghis	63.6	33.5	0.8	1.2	0.8
Baghlan	99.7	0.3	0.0	0.0	0.0
Balkh	13.1	2.3	4.0	64.6	16.0
Jawzjan	39.2	5.9	13.7	41.2	0.0
Kabul	0.0	0.0	28.6	71.4	0.0
Kapisa	42.4	24.2	21.2	12.1	0.0
Khost	69.2	24.9	3.2	2.7	0.0
Kunar	51.0	29.8	17.3	1.7	0.2
Kunduz	99.1	0.6	0.0	0.0	0.3
Laghman	23.9	34.2	22.7	19.0	0.2
Logar	100.0	0.0	0.0	0.0	0.0
Nangarhar	68.2	7.0	11.9	12.4	0.5
Paktya	0.0	50.0	50.0	0.0	0.0
Parwan	42.9	14.3	0.0	42.9	0.0
Saripul	0.0	25.0	0.0	75.0	0.0
Takhar	0.0	8.5	89.8	1.7	0.0
Total	**56.1**	**21.5**	**10.8**	**10.4**	**1.2**

CHAPTER FOUR: TREATMENT SEEKING FOR FEVER

Table 4.1 described the prevalence of fever. A total 734 individuals comprising a weighted percentage of 3.3% out of 15,370 individuals who were interviewed had fever on the day of survey.

Table 4.1 The prevalence and duration of fever among all ages, Afghanistan MIS 2011.

	Fever on the day of survey (%)	Fever 2 weeks prior to the survey (%)	Average Fever duration	Number of persons examined
Member				
Male	3.1	1.9	7.8	7142
Female	3.5	2.0	8.4	8228
Residence				
Urban	3.4	1.2	14.3	1478
Rural	3.3	2.1	7.9	13892
Province				
Kabul	0.2	0.3	1.9	2026
Kapisa	1	0.0		588
Parwan	0	0.7	1.5	1429
Wardak	10.3	1.7	12.8	649
Logar	0	0.0		469
Paktya	4.8	0.7	5.3	502
Khost	0.4	0.5	4.4	370
Nangarhar	13.5	6.6	2.5	947
Kunar	9.1	8.7	9.8	302
Laghman	1.1	1.8	14.2	394
Baghlan	0.2	0.4	28	984
Badakhshan	10.7	1.0	4.4	602
Takhar	1.2	0.6		616
Kunduz	1.7	0.6	6.4	397
Samangan	0.9	0.0		2012
Balkh	0.4	2.4	5.7	702
Jawzjan	0.3	1.4	8.0	259
Saripul	1.3	1.0	8.0	315
Baghdis	1.2	1.9	9.7	926
Bamyan	0.2	0.0		657
Daykondi	0.4	3.6	10.5	224
Malaria strata				
High risk	6.0	1.9	5.8	10272
Low risk	1.0	2.4	10.1	4629
No risk	0.2	0	0.0	469
Age category				
0 - 4	3.8	1.7	5.5	2716
5 - 9	3.9	1.7	5.1	2907
10 - 14	3.1	1.5	9.3	2091
15 - 19	2.5	2.4	10.5	1396
20 - 44	3.2	1.9	8.4	4446
>44	3.1	3.4	10.0	1814
Household Wealth				
Most Poor	1.0	1.4	10.1	3392
Very Poor	1.4	1.8	8.7	3479
Poor	9.1	2.3	4.3	3164
Less Poor	2	3.2	9.3	2350
Least Poor	8	2.1	6.5	2985
Total	**3.3**	**2.1**	**5.2**	**15370**

Prevalence of fever in the two weeks prior to survey was 2.1% and did not vary much by gender or age but was higher in rural communities and those in the highest risk malaria strata. Only the provinces of Kunar and Nangarhar reported two-week fever prevalence of >5%. Average duration of fever was about 5 days and was higher among respondents who were female, those in urban areas, in stratum 2 (low risk) and among the poorest quintile.

Over 90% of persons who had fever within the two weeks prior to the survey reported at least one additional symptom. About 37% reported fever accompanied by headache, 44% sweating and most commonly about 59% reported fever with muscle ache. Only 4.8% reported fever with convulsions, which among other things is an indicator of severe malaria (Table 4.1). Running nose, pain in the throat and cough which are associated with upper respiratory infections were reported by 39%, 48% and 39% respectively.

Table 4.2 The symptoms accompanying fevers among those who had fever in the last two weeks, Afghanistan MIS 2011.

Symptom	Percentage (n=327)
Any symptoms	92.0
Headache	37.2
Sweating	43.9
Muscle ache	59.7
Nausea	44.6
Diarrhea	34.4
Abdominal pain	37.2
Running nose	39.2
Pain in the throat	48.0
Cough	39.3
Difficulty breathing	22.2
Convulsion	4.8

Actions taken for fever were reported for only the 327 individuals who had fever the two weeks prior to survey., of which 77% too action to treat the fever. Among those who took action, 33% did so within 24 hours and an additional 26% within 48 hours. Almost 41% of fevers who took action did so 48 hours or more after the start of the fever. Overall treatment seeking was generally higher among children under the age of five years, in the least poor households, among rural areas and in the highest malaria risk strata. Treatment seeking within 24 hours followed a similar (Table 4.2). Almost 80% of all fevers were reported in the provinces of Nangarhar, Kunar and Badakshan.

Majority of fevers were first treated at public health facilities (44%) followed by private clinics (29%). The next most popular sources of treatment were drug stores (11.5%) and mullahs (11%) (Table 4.3). In the highest risk stratum, similar proportion of patients was treated at public health facilities (30%) compared to private health facilities (34%). Self-medication, while almost non-existent among individuals with fever in the stratum 2, was the third most popular treatment action (26%) in stratum 1.

Among individuals who sought treatment about 30% did not know the type of treatments they received (Table 4.4). About 25% were treated with antipyretics and 29 % were treated with antimalarials. About 2% did not receive any medication. Use of antimalarials was higher among female respondents, urban residents and those in the poorest households. It was also marginally higher among patients in stratum 1 compared to stratum 1.

Approximately 74% of fevers that were treated with antimalarials were prescribed Chloroquine and included 78% of all fevers from stratum1 (Tabel 4.5). AS+SP was prescribed to about 4% of fevers treated with antimalarials and all were from stratum 1. All fevers that were treated with SP were from stratum 2 reported and all were from Daykondi province. All urban fevers and 72% of rural fevers treated for malaria received chloroquine. Halofantrine was the next most commonly used antimalarial and predominantly in the highest

risk stratum. The high usage if chloroquine may be related to the high prevalence of vivax in stratum 1. Almost 70% of children under the age five years were treated with chloroquine and about 23% with SP.

Table 4.3 Action taken to treat fever among those who had fever in the two weeks prior to survey, Afghanistan MIS 2011.

	Action	<24 hrs	24-<48 hrs	48 – 72 hrs	> 72 hrs	Number of fevers
Member						
Male	71.8	36.7	35.4	12.9	14.8	39
Female	80.6	30.4	20.2	33.2	16.3	34
Residence						
Urban	75	51.0	37.0	0.0	12.0	4
Rural	76.9	32.1	25.8	26.2	15.9	69
Age category						
0 - 4	91.9	31.0	62.1	6.9	0.0	10
5 - 9	70.6	39.2	50.9	9.0	0.9	17
10 - 14	95.8	22.5	16.2	33.9	27.4	11
15 - 19	68	23.4	23.6	47.8	5.1	9
20 - 44	73.7	43.0	13.3	32.8	10.9	18
>44	71.4	27.4	7.8	21.6	43.2	8
Malaria strata						
High risk	83.9	47.8	30.3	13.2	8.7	67
Low risk	70.5	17.3	22.2	37.4	23.1	6
No risk	0.0					
Household Wealth						
Most Poor	80.7	14.0	24.1	43.7	18.2	13
Very Poor	83.2	24.7	17.4	20.1	37.8	26
Poor	73.4	42.7	32.7	18.5	6.1	16
Less Poor	63.4	43.0	34.8	22.3	0.0	3
Least Poor	91.3	54.4	24.9	10.8	9.8	15
Total	**76.8**	**32.9**	**26.4**	**25.0**	**15.7**	**73**

The prevalence of testing among fever cases was about 53% with 60% of those who reported receiving a blood test reporting a malaria positive result (Table 4.6). Testing rates did not appear different when children under the age five years were compared to older age groups. Tesiting rates wree over 60% in stratum 1 and substantially higher than stratum 2 (44%).

Table 4.7 shows that majority of prescriptions across the whole health sector was chloroquine comprising 75% in the public health sector, 52% in the private health sector and almost 97% in the drug strores. Among individuals who reported a negative blood test, 67% were treated with SP and 33% with chloroquine. 75% of test positive cases were treated with chloroquine and 13% with halofantrin. Among those who were not tested, 67% were treated with chloroquine and 17% with SP.

The most common reason given by respondents who had fever in the last two weeks but did not seek treatment was that fever was mild (78%). This was followed by long distances to health facilities (37.5%), shortage of drugs at health facilities (34.1%), poor care at the health facility (34%), long wait at health facilities (33%) and cost of treatment (33.0%) (Table 4.8). At the time of survey, about 83% of fevers had already resolved (Table 4.9). Rural households and individuals in the stratum 1 reported higher percentage of resolved fevers compared to those in urban areas or in stratum 2 respectively.

The average cost of antimalarials overall was 80.6 Afghanis while that of blood test and consultations were 7.2 and 7.8 Afghanis respectively (Table 4.10). In stratum 1, the average costs of antimalarials, blood test and consultation were 65, 7 and 9 Afghanis respectively. Table 4.11 shows the average travel and waiting times in minutes to the nearest public health facility, private clinic or drug store. Overall, travel time to the nearest was about an hour and a quarter while waiting times were approximately an hour. Travel times were also higher for female respondents and children under the age of five years. Waiting times were higher for female respondents, rural residents, and poorest households. Both travel and waiting times were considerably lower in stratum 1 compared to stratum 2.

Table 4.4 Source of treatment for fever patients who took action, Afghanistan MIS 2011.

	First action						Second action						Third action			
		Self medication	Private clinic	Traditional healer	Drug sore	Public health facility	Mullah	Self medication	Private clinic	Traditional healer	Drug sore	Public health facility	Mullah	Self medication	Private clinic	Traditional healer
Member																
Male	15.5	1.9	25.9	3.4	11.3	42	5.3	0	20.6	20.3	11.2	42.6	0	66.8	33.2	0
Female	8.1	1.6	30.5	2.9	11.6	45.3	0.7	4.7	23.2	22.4	35.1	13.9	10.3	0	70	19.7
Residence																
Urban	48.2	0	29.2	12	4.4	6.2	0	50	0	0	0	0	0	0	0	0
Rural	9.3	1.8	28.6	2.7	11.8	45.8	1.4	2.7	23.6	22.8	33	16.7	9.5	5	67.2	18.2
Malaria strata																
High risk	12.9	25.7	33.6	5.9	14.9	30.1	4.3	17.8	14.5	14.6	19.7	29.2	30.9	16.4	8.1	44.6
Low risk	9.1	0.8	23.4	0.2	7.9	58.6	0.4	0	23.6	23.4	35.6	14.2	0	0	93.6	6.5
No risk																
Age category																
0 - 4	6.3	0	19.6	0.8	35.2	38.1	0	0	96.3	0	0	3.7	0	0	0	0
5 – 9	34.5	0.9	17.7	0	17.4	29.5	10.5	34.6	25.5	0	84.9	29.4	0	0	0	0
10 - 14	4.3	0	16.5	3.3	11	65	0	3.3	4.6	0	0	7.2	26.9	0	100	0
15 - 19	17.7	21.5	15.4	3.1	4.1	57.5	0	11.2	68.9	19.9	40.4	0	0	14.3	7.1	51.7
20 - 44	10.4	43.2	33.4	7.9	4.7	39.3	3	3.4	6.5	32.4	31	14.2	0	0	0	0
>44	0.6	0.8	51.6	0	2.3	44.5	0	0	2.1	30.3		36.6	0	0	0	0
Household Wealth																
Most Poor	19.7	0	13.2	1	1.8	64.3	0	5.9	39.3	0	84.9	15.3	7.2	0	92.8	0
Very Poor	3.8	3.7	58.7	2.3	5.8	25.7	3.2	0	6.3	2.9	19.7	2.6	0	41.9	20.8	37.3
Poor	8.7	4.2	22.6	5.4	24.2	35	0	26.6	13.7	26.9	3.2	13.1	0	0	0	100
Less Poor	8.3	0	18.6	2.6	19.2	51.3	1.5	0	24.6	46.1	18.4	24.6	100	0	0	0
Least Poor	14.5	1.2	29.9	6.2	11.4	36.9	0	0	16.3	15.4		49.9	0	0	0	0
Total	**11.1**	**1.7**	**28.6**	**3.1**	**11.5**	**43.9**	**1.3**	**4.1**	**2.3**	**2.2**	**3.2**	**1.8**	**9.5**	**5**	**6.7**	**1.8**

Table 4.5 Type of medications used for the treatment of fever, Afghanistan MIS 2011.						
	None	Herbs/Traditional medicine	Antipyretics	Antibiotics	Anti-malarial	Don't Know
Member						
Male	1.1	0.3	22	11.2	26.3	39
Female	2.1	0.6	27.4	14	31.7	24.1
Residence						
Urban	12	0	20.12	4.5	40.6	22.7
Rural	1.1	0.5	25.4	13.3	29.9	30.6
Malaria strata						
High risk	2.6	1.0	32.7	16.9	30.2	16.6
Low risk	0.7	0.0	17.5	8.7	28.4	44.7
No risk						
Household Wealth						
Most Poor	2.6	0	19.1	4.1	48.3	25.9
Very Poor	1	1.1	21.6	8.2	20.2	47.7
Poor	3.2	0	33.1	22.3	26.6	14.8
Less Poor	0.5	0	28.6	18.8	17.1	35
Least Poor	0.6	1.9	27.3	16	32.8	21.3
Age category						
0 - 4	0.9	0	19.5	34.3	9.9	35.4
5 -9	6.9	0	28.3	9.5	18.8	36.5
10 -14	0	0	17.1	5.5	64.1	13.4
15 - 19	2.4	0	68.2	4.2	20.7	4.5
20 - 44	0.8	1.9	16.2	15	33.1	33.1
>44	0.4	0	24.3	4.8	28.8	41.7
Total	**1.7**	**0.5**	**25.3**	**12.9**	**29.3**	**30.3**

Table 4.6 Type of antimalarials used for the treatment of fever, Afghanistan MIS 2011.							
	AS+SP	SP/Fansidar	Chloroquine	Halofantrin	Quinine	Don't know	Number who received antimalarials
Member							
Male	5.1	2.6	77.0	10.3	0	5.1	39
Female	3.0	8.8	70.6	11.8	3.0	1.7	34
Residence							
Urban	0	0	100	0	0	0	4
Rural	4.4	5.9	72.1	12.0	1.5	4.4	69
Malaria strata							
High risk	4.5	0.0	77.6	12.0	1.5	4.4	67
Low risk	0.0	80.0	20.0	0.0	0.0	0.0	6
No risk							
Age category							
0 - 4	0.0	23.1	69.2	0.0	0.0	7.7	10
5 - 9	11.5	0.0	53.8	30.8	3.8	0.0	17
10 -14	0.0	0.0	93.8	0.0	0.0	6.3	11
15 - 19	0.0	50.0	50.0	0.0	0.0	0.0	9
20 - 44	0.0	0.0	93.3	0.0	0.0	6.7	18
>44	0.0	0.0	100.0	0.0	0.0	0.0	8
Household Wealth							
Most Poor	0.0	23.1	69.2	0	7.7	0	13
Very Poor	11.5	0.0	54.0	30.8	4.0	11.7	26
Poor	0.0	0.0	93.8	0.0	0.0	6.2	16
Less Poor	0	50.0	50.0	0	0	0	3
Least Poor	0	0	100.0	0	6.7	7.1	15
Total	**4.1**	**5.5**	**74.0**	**11.0**	**1.4**	**4.1**	**73**

Table 4.7 Prevalence of blood tests among those who took action to treat a fever within the last two weeks prior to survey, Afghanistan MIS 2011.

	Percentage reporting having a blood test	Percentage reporting a positive blood test	Number of persons
Age			
0 - 4	50.9	66.7	53
5+	53.4	58.8	223
Malaria strata			
High risk	60.3	64.4	242
Low risk	43.8	21.4	34
No risk			
Total	52.9	60.3	

Table 4.8 Type of antimalarials used for the treatment of fever by source and treatment with antimalarial by reported result of blood test among those who took action to treat a fever within the last two weeks prior to survey, Afghanistan MIS 2011.

	AS+SP	SP/Fansidar	Chloroquine	Halofantrin	Quinine	Don't know
Source						
Public health facility	8.3	0	75	0	8.3	8.3
Private health facility	3.2	12.9	51.6	25.9	0	6.5
Drug store	3.3	0	96.6	0	0	0
Blood test done						
No	0.0	16.7	66.7	0.0	0.0	16.7
Negative	0.0	66.7	33.3	0.0	0.0	0.0
Positive	5.0	1.7	75.0	13.3	1.7	3.3
Total	**4.1**	**5.5**	**74.0**	**11.0**	**1.4**	**4.1**

Table 4.9 Reasons for not taking action among those who did not take action for a fever in the last two weeks, Afghanistan MIS 2011.

	Mild fever	Fever will resolve	Not malaria	Cannot afford	Facility is far	Long wait	Poor care	Drugs shortage	inefficient	Bad behaviour	No workers
Member											
Male	80.5	4.1	15.4	60.6	53.3	43.7	47.7	47.7	42	16.1	16.1
Female	76.1	15.9	15.1	10.9	20	20.7	17.7	17.8	2.7	0	6.3
Residence											
Urban	84.4	0	0	84.4	0	84.4	84.4	84.4	84.4	84.4	84.4
Rural	77.8	11	15.9	30.9	39.3	30.4	31.7	31.8	21.3	5.3	8.3
Malaria strata											
High risk	27.2	32.7	54.5	42.2	43.8	18.7	26.0	23.9	3.9	14.9	23.2
Low risk	96.3	3.0	1.8	29.5	34.6	39.5	38.3	39.5	34.8	5.6	5.6
No risk											
Household Wealth											
Most Poor	94.7	2.2	0	15.5	15.5	15.5	26.8	26.8	0	13.4	13.4
Very Poor	75.1	49.8	0	28.9	57.9	57.9	28.9	57.9	28.9	0	0
Poor	23.3	25.2	74.8	40.6	43.9	3.2	3.2	3.2	6.4	6.5	6.5
Less Poor	98.4	0.9	0	37.7	46.6	55.7	54.4	54.4	53.4	9.1	10.4
Least Poor	28.3	48.6	23	34.7	29.2	34.7	41.6	23	0	0	37

Total	**78.0**	**10.6**	**15.3**	**33.0**	**37.5**	**32.8**	**34**	**34.1**	**24.1**	**8.8**	**11.7**

Table 4.10 The percentage of fevers in the last week that had resolved by the day of survey, Afghanistan MIS 2011.

Residence	
Urban	68.8
Rural	83.6
Age (years)	
0 - 4	91.7
5 - 9	87.7
10 - 14	93.0
15 - 19	60.6
20 -44	77.5
>= 44	81.6
Malaria strata	
High risk	84.5
Low risk	73.5
No risk	
Household wealth	
Most poor	75.5
Very poor	78.7
Less poor	85.1
Poor	90.3
Least poor	86.3
Total	**82.9**

Table 4.11 Average cost of blood test, antimalarials and consultation paid by those who took action for a fever in the last two weeks, Afghanistan MIS 2011.

	Facility type	Cost of blood test	Cost of antimalarial	Cost of consultation
Overall	Health post	0.00		0.00
	Comprehensive health care	0.83	0.00	2.04
	District hospital	7.89	126.88	0.00
	Provincial hospital	0.00		0.00
	Regional hospital	0.00	133.33	0.00
	Private clinic	6.25	40.00	12.50
	Private hospital	14.50	73.68	17.56
	Drug store	0.36	250.00	0.00
	Total	**6.7**	**64.8**	**8.9**
High risk	Health post	6.70	64.83	8.94
	Comprehensive health care	0.00		0.00
	District hospital	0.87	0.00	2.17
	Provincial hospital	0.00	2.50	0.00
	Health post	0.00		0.00
	Private clinic	0.00	0.00	0.00
	Private hospital	6.25	40.00	12.50
	Drug store	15.10	75.91	18.67
	Total	**10.7**	**76.0**	**0.00**
Low risk				
	Health post	0.00		0.00
	Comprehensive health care	0.00	0.00	0.00
	District hospital	27.27	500.00	0.00
	Provincial hospital	0.00		0.00
	Regional hospital	0.00	400.00	0.00
	Private hospital	0.00		0.00
	Drug store	0.00	0.00	0.00
	Total	**0.00**	**0.00**	**0.00**
No risk				
	Health post	0.00		0.00
	Private hospital	25.00	0.00	0.00
Total		**7.21**	**80.63**	**7.80**

Table 4.12 Travel time to and waiting time at the nearest public health facility, private clinic or drug store, Afghanistan MIS 2011.		
	Average travel time (mins)	Average waiting time (mins)
Member		
Male	68.6	46
Female	81.4	80
Residence		
Urban	69.1	36.3
Rural	75.8	67.9
Malaria strata		
High risk	58.5	43.5
No risk	93.8	90.0
Household Wealth		
Most Poor	49.8	84.7
Very Poor	72.5	53.9
Poor	57.3	52.8
Less Poor	129.2	91.5
Least Poor	68	37.6
Age category		
0 - 4	104.5	77.4
5 - 9	48.3	36.9
10 -14	52.5	69.9
15 - 19	64.3	108.7
20 - 44	86	67.5
>44	77.4	54
Total	**76.6**	**67.3**

In households without bed nets, the biggest reason for not having a net was the poor availability (52.6) followed by the price of nets (30) (Table 5.1). Interestingly although net availability was more of a problem in rural and most poor households, net price was as a reason for not having nets was more common in urban and least poor households. About 20 of households reported that the reason they did not have nets was there were no mosquitoes in their area. On the responses that suggest lack of proper knowledge of the benefits of mosquitoes the most common was it did not stop insect bites (14) or doesn't reduce the risk of malaria (12.2). About 10 of the households thought that insecticides were dangerous to their health.

Table 5.1 Reasons for not having mosquito nets among households without nets, Afghanistan MIS 2011.

	Not heard of nets	Net Price	Net not Available	There are no mosquitoes	There is no malaria	Doesn't stop bites	Doesn't reduce risk	Not practical to use	Mosquitoes still bite	No Space	Insecticide is dangerous
Household head											
Male	42.2	29.7	57	19.1	18.5	13.4	11.9	13	8.9	9.7	9.6
Female	42.9	31	38.8	22.7	13.5	16.9	13.3	14.8	11.1	9.7	10
Residence											
Urban	35.8	43.8	54.1	39.2	36.1	26.6	19.9	25.5	20.4	24.4	16.3
Rural	42.7	29.3	52.6	19	16.4	13.3	11.9	12.8	8.9	8.9	9.4
Province											
Kabul	8.5	49.5	8.9	15.3	14.6			6.3		2	
Kapisa	15.2	45.8	47.3	7.7	14.8	7.5	5	15.2	3	2.9	3.9
Parwan	24.5	16.5	61.5	11.6	23.7	9.1	6.6	22	6.6	7	4.6
Wardak	42.5	37.5	47.5	27.5	15	20	30	32.5	25	20	15
Logar	25.4	58.7	68.3	27	27	41.3	28.6	34.9	30.6	33.3	30.2
Paktya	43.8	38.3	39.3		1.4	6.7	11.4	27.9	14.7	17.5	26.6
Khost	9.1	27.3	9.1	9.1	18.2	18.2	9.1	9.1	9.1	9.1	9.1
Nangarhar	17.5	55.8	21.6	12.2	11.3	9.9	10.6	9.2	9.1	89.6	10.8
Kunar		100									
Laghman		57.1	71.4								
Baghlan	88.5	82.3	73.9	57.2	66	54.5	55	64.3	48.8	57	43.2
Badakhshan	37.3	38.5	72.9	33.8	36.1	34.1	33	29.7	30	33.2	31.8
Takhar	54.1	57.6	83.8	40.8	29.7	25.8	21.3	15.1	12.1	9.4	5.9
Kunduz	51.4	56.9	68.8	41.3	38.5	22	15.6	21.1	13.8	18.3	13.8
Samangan	30.7	43.3	27.1	19.9	53.1	10.8	21.7	23.5	14.4	25.3	27.1
Balkh	39.9	49.6	27.9	35.8	18.2	22	20.6	27.3	15.4	24	23.1
Jawzjan	18.6	64.7	96.3			4.1					3.7
Saripul	15.1	34.5	50.7	24.4	11.2	3.7	1.7	8.1	2	2.6	0.9
Baghdis	100	100	100	78.2	78.2	78.2	78.2	91.3	78.2	91.4	91.4
Bamyan	19	10.7	37.2	3.3	9.9	1.7		0.8			
Daykondi	57.8	15.6	54.1	15.6	9.6	11.2	9.6	8.1	5.2	3	5.2
Household Wealth											
Most Poor	55.8	23.8	59.3	20.5	15.1	13	9.5	12.6	7.8	7.7	1
Very Poor	35.7	31.1	50.1	12.6	17.8	11.9	7.1	11.4	8.5	9.8	7.8
Poor	34	34.4	45.3	21.3	18.6	13.2	16.6	12.6	11.8	11.9	10.4
Less Poor	40.9	29.8	53.7	18	15.1	14.4	14	16.3	9	9.4	6.9
Least Poor	34.7	36.3	48.7	28.4	23.1	18.3	16.5	13.8	12.1	11.6	14.7
Total	**42.4**	**30**	**52.6**	**19.9**	**17.3**	**13.9**	**12.2**	**8.9**	**9.5**	**9.7**	**9.7**

In households with nets, the reason for using a net most commonly given by households is that they both prevent mosquito bites and malaria (Table 5.2). The most commonly mentioned advantage of mosquito nets was also that they prevented mosquito bites (86.4) while 72.6 of households said they prevented malaria. There were minimal differences in responses by gender, residence and household wealth.

Table 5.2 Perceived advantages of using mosquito bed nets among households that own nets, Afghanistan MIS 2011.							
	Reason for using a net				Advantages of nets		
	Prevent mosquito bites	Prevent malaria	Both	Others	Avoid mosquito bites	Minimize risk of malaria	Sleep better when under a net
Household head							
Male	28.9	17.5	53.2	0.4	87.5	76.6	54.2
Female	48.1	18.6	33.4		81.8	55.1	41.7
Residence							
Urban	34.9	12.7	52.4		87.8	69.52	38.8
Rural	32.1	18.5	49	0.3	86.2	73.1	53.9
Province							
Kabul	10.5		89.5		100	89.5	52.7
Kapisa	24	35.3	40.7		82.7	48.2	15.9
Parwan	66.7	33.3			100		33.3
Logar			100				
Paktya	66.7	33.3			100	100	33.3
Khost	4.4	1.1	94.5		100	98.9	84.9
Nangarhar	32.3	21	46.8		77.2	63.8	38.8
Kunar	60.2	32.8	7		88.2	73.1	24.5
Laghman	22.3	9.7	68		89.3	74.8	30.1
Baghlan	28	23.2	46.4	2.4	94.1	85.1	60.8
Badakhshan	61	16.3	22.7		85.4	64.8	54.2
Takhar	78.7	3.6	17.7		90.2	22.4	18
Kunduz	16.3	30.8	52.9		82.7	83.8	78.5
Balkh	57.6	13.3	24.1	5	77.4	44	41.2
Jawzjan	51	8.3	40.6		88.3	29.2	47.7
Saripul	50	12.6	37.4		87.4	37.4	
Baghdis	8.9	3.1	88		95.8	95	91.1
Household Wealth							
Most Poor	23	26.2	50.3	0.5	82.9	73.6	61.7
Very Poor	38.5	20.6	40.7	0.3	77.1	63.8	43
Poor	37.7	10.6	51.3	0.5	86.8	76.2	48.2
Less Poor	39.4	12.4	48.1	0.1	91.5	73.8	53.6
Least Poor	26.9	18.2	54.8	0.2	93	72.9	49.1

Among similar households, the most common disadvantage of using mosquito nets was they were too hot sleep under (34), presented difficulties when getting up at night (24) or took time to hang (22). About 16 of household lack of enough air to breathe as a disadvantage of using bed nets. There were minimal variations in these responses by gender of household head, residence or household wealth.

Table 5.3 Perceived disadvantages of using mosquito bed nets among households that owned nets, Afghanistan MIS 2011.					
	Too Hot	**Not enough air**	**Mosquito still bites**	**Takes time to hang**	**Difficult when getting up at night**
Household head					
Male	34.9	16	7.1	22.3	24.2
Female	29.9	14.9	10.6	21.4	22.5
Residence					
Urban	38.9	10.3	5	26.4	22.7
Rural	33.2	16.7	8.2	21.4	24.1
Province					
Kabul	10.5				
Kapisa				15.3	12.2
Parwan					
Logar					
Paktya					
Khost	3	1.9	1.9	2	1.9
Nangarhar	28.7	15	1.7	8.1	6.3
Kunar	28.8	18	3.9	4.1	1.6
Laghman	63.1	17.5		35.9	37.9
Baghlan	45.2	29.4	11.7	28.1	25
Badakhshan	17.1	9.3	9.6	27	39.2
Takhar	8.7				
Kunduz	13.2	0.4	0.7	1.5	1.9
Balkh	38.5	31.7	7.8	3.1	8
Jawzjan	43.7				
Saripul		25.3		74.7	
Baghdis	88.8	91.3	88.8	90	90.7
Household Wealth					
Most Poor	29.4	13.3	7.8	15.9	19.4
Very Poor	39.5	21.7	8.1	27.2	25.6
Poor	41.8	17.1	5.5	25.7	30
Less Poor	26.2	12.9	9.6	22.7	30
Least Poor	33.5	15.2	8.1	20.7	15.1
Total	**34**	**15.8**	**7.7**	**22.1**	**23.9**

About 47 of all households reported that at least one household member has ever had malaria (Table 5.4) and 29 reported that a household member had malaria within the last two months. Only 2.7 reported a person in the households ever dying of malaria. Responses to these questions were significantly higher in female headed households. Except in Kabul, Kapisa, Khost,Baghlan, Saripul and Bamyan more thant 20 of households in other provinces reported someone ever having malaria in their households. Within the last three months, however, reported incidents of malaria of greater than 10 was observed in Logar, Paktya, Nangarhar, Kunar, Laghman, Badakhshan, Takhar, Kunduz and Jawzjan provinces.

Table 5.4 Self-reported malaria cases and deaths as reported by head of household, Afghanistan MIS 2011.			
	A household has ever had malaria	**A household has had malaria in the last 3 months**	**A household has ever died of malaria**
Household head			
Male	43.4	24.8	1.7
Female	59	45	6.1
Residence			
Urban	45.1	31.1	1.4
Rural	47.1	29.2	2.8
Province			
Kabul	12.7	0.3	0.1
Kapisa	11.1	3.8	
Parwan	26.1	2.3	
Wardak	47.5		
Logar	30.8	15.4	1.5
Paktya	93.6	78.5	20.7
Khost	5.6	3	
Nangarhar	94.3	72.5	0.2
Kunar	97.4	84.2	1
Laghman	99.1	87.3	1.8
Baghlan	10.1	0.6	0.6
Badakhshan	53.3	21.1	2.8
Takhar	88.7	30.6	1.8
Kunduz	77.2	13.7	2.1
Samangan	25.3		
Balkh	21.6	5.7	4.6
Jawzjan	57.5	15.2	
Saripul	4.8	1.4	0.3
Baghdis	52.1	8.9	1.8
Bamyan	0.8		
Daykondi	42.2	40.7	4.4
Household Wealth			
Most Poor	47.7	31.6	3.1
Very Poor	42.3	24.8	0.3
Poor	44.9	27.8	3.4
Less Poor	43.2	25.8	3.7
Least Poor	55.2	36.3	2.4
Total	**47**	**29.3**	**2.7**

Household members 12 years of age and above were asked a series of questions on malaria knowledge, attitudes and practices. Regarding whether respondents knew there was malaria risk in their area, about 39 responded that they didn't know; 42 said they had high risk and 16 low risk (Table 5.5). Lack of knowledge of risk was higher among women, rural residents and those in the most poor households. Variations also existed by province with more than 50 of respondents in 9 provinces indicating that they didn't know the level of malaria risk of their area. About 38 of respondents the symptoms associated with malaria while 46 responded fever as the main symptom and body pain by 14 (Table 5.5).

Table 5.5 Household members knowledge and perception of malaria risk in their area and symptoms, Afghanistan MIS 2011.										
	Malaria risk in your area				Malaria symptoms					
	Don't Know	No Risk	Low Risk	High Risk	Don't Know	Fever	Colds/Chills	Sweating	Diarrhea	Body Pain
Member										
Male	32.2	3.8	13.6	50.4	32.6	52.2	51.8	12.9	3.4	15.5
Female	42.8	4.3	17.1	35.8	42	43.5	41.7	9.7	1.6	13
Residence										
Urban	26.7	2.6	22.3	48.4	25.4	64.9	61.6	11.6	1.4	12
Rural	39.5	4.2	15.2	41.1	39.3	45.6	44.2	11	2.4	14.1
Province										
Kabul	59.5	1.1	8.4	31	56.7	36.9	31	2.2	0.2	12.4
Kapisa	52.4	6.2	34.1	7.3	47.6	34.3	35.7	9	15.6	14.2
Parwan	53.7	1.6	16.5	28.2	55.2	35.3	32.1	5.4		1.5
Wardak	52.1	22.9	22.2	2.8	45.8	23.6	33.3	6.3	11.1	4.2
Logar	25.7	0.6	3.4	70.3	26.3	65.7	61.1	60.6	30.3	16
Paktya	9.4		11.8	78.8	4.6	76.3	56.5	20.4	0.4	22.5
Khost	4.1		0.6	95.3	6.3	87.8	72.6	81.6	8.4	16.5
Nangarhar	18.1	3.1	17.2	61.6	16.2	68.5	66.8	16.1	0.9	33.8
Kunar	5.8	0.8	16.9	76.4	3.6	78.1	64	0.9	0.4	33.1
Laghman	9.6		7.8	82.6	2.1	73.7	73	16		36.2
Baghlan	66.9	1.3	7.1	24.8	67.6	30	25.5	2	0.4	2.9
Badakhshan	36.3	4.2	16.9	42.6	34.2	61.9	55.6	16	1.4	17.4
Takhar	6.4	1.7	8.6	83.3	21.1	67.8	59.2	9.8	1.6	35.6
Kunduz	9.3	3.2	29.6	57.9	4.2	87.7	76.1	27.1	6.2	41.8
Samangan	54.6	1	7.1	37.4	52.1	39.2	25.1			0.8
Balkh	33	0.9	7.7	58.4	33.1	58.2	53.2	4.4	1	7
Jawzjan	20.2	1.9	20.8	57.1	15.6	58.7	79.1	5.4		24
Saripul	23	5	11	61	25.5	62	45.5	14.8	1.3	8.3
Baghdis	67.9	0.3	0.4	31.4	23.7	71.8	71.6	2.3	0.8	2.7
Bamyan	32.4	12.6	37.9	17.1	55.3	40.3	21.8	5.5	0.3	4.4
Daykondi	58.2	4.4	13.2	24.2	56.6	16.5	30.2	1.6	1.7	2.2
Malaria strata										
High risk	28.3	2.5	15.2	54.0	25.2	65.8	59.3	15.9	2.0	23.9
Low risk	50.3	4.3	12.6	32.7	49.0	28.6	35.0	6.9	3.1	5.2
No risk	32.4	12.6	37.9	17.1	55.3	40.3	21.8	5.5	0.3	44.3
Household Wealth										
Most Poor	50.2	3.2	11.5	35.1	48.8	35.5	37	8.3	2.8	12
Very Poor	27.5	7.3	23.6	41.6	29.8	55.7	48.3	10.7	1.9	16.8
Poor	38.3	1.8	6.2	53.6	33.4	57.6	52.8	13.8	1.8	18.9
Less Poor	31.8	4.7	22.2	41.3	33.3	45.3	49.7	14.7	1.6	11
Least poor	30.1	2.8	17.7	49.4	31.7	58	54.2	12.6	3.3	12.5
Total	**38.6**	**4.1**	**15.7**	**41.6**	**38.3**	**47**	**45.5**	**11**	**0.2**	**14**

Table 5.6 summarises information on knowledge of the causes of malaria transmission. 44 of individuals did not know the cause of malaria transmission while 47 mention the mosquito bite. Regarding the best approaches to preventing malaria, 44 of household members said they didn't know of one, about 30 mentioned use of mosquito nets and 20 though having clean surrounding prevented malaria. About 5 mentioned mosquito repellents and 4 screens (Table 5.7). Regarding exposure to IEC, about 72 of respondents said that they did not receive any malaria education, information or communication. Lack of IEC was highest among female respondents, those in rural areas or from the poorest households. Health facilities and radios were the main source of IEC (Table 5.8). About 17 received information on methods of malaria transmission and a similar percentage on malaria prevention (Table 5.9). About 5 of respondents received information on malaria treatment.

Incidence of malaria in the past was reported by 22 of respondents and around 31 mentioned that they new someone in their household who had malaria in the last 3 months. About 3 reported a malaria death in the household in the past (Table 5.10).

Table 5.6 Household members knowledge and perception of causes of malaria transmission in their area, Afghanistan MIS 2011.

	Don't Know	Contaminated food or drink	Human contact	Mosquito bite	Other insect Bite	Airborne	Birds
Member							
Male	37.3	6.1	2.7	54.4	3.1	0.9	0.4
Female	48.0	5.2	3.2	42.5	3.8	0.7	0.4
Residence							
Urban	30.8	5.8	3.7	58.4	3.3	1.8	0.8
Rural	44.7	5.5	2.9	46.3	3.5	0.7	0.4
Province							
Kabul	63.5		0.2	34.3	0.2	0.9	
Kapisa	53.0	1.3	5.6	39.4	0.7		
Parwan	70.6	9.7	3.0	17.2		0.8	
Wardak	50.7	2.8	8.3	36.8		0.7	1.4
Logar	28.6			68.6	1.1	0.6	
Paktya	61.7	1.4	1.8	31.8	0.3	0.4	
Khost	5.0	0.8	0.3	93.8			
Nangarhar	20.9	1.9	5.0	66.6	3.7	0.4	1.2
Kunar	17.7	0.3	0.4	80.8		0.4	
Laghman	5.8	3.4	2.7	86.7	0.7		
Baghlan	73.7	1.3	2.3	21.1	0.4	0.5	0.3
Badakhshan	41.1	5.9	1.5	49.3	1.	0.4	0.8
Takhar	19.0	5.7	17.3	70.5	13.1	9.2	1.9
Kunduz	6.8	2.3	1.6	71.0	22.0	0.9	0.5
Samangan	45.9	2.9	0.5	51.2	0.5		
Balkh	38.0	0.5	1.7	58.4	0.1		0.5
Jawzjan	18.2	7.0	6.8	63.2		4.8	
Saripul	26.9	1.5	1.7	69.0	1.5	0.3	
Baghdis	66.1	4.7	0.9	27.9	1.2	0.3	0.4
Bamyan	62.5	0.7	5.1	30.0	1.0		
Daykondi	59.9	11.5	3.3	30.8	2.8	0.8	0.3
Malaria strata							
High risk	30.9	3.7	2.8	58.7	5.1	0.9	0.6
Low risk	54.0	8.3	2.9	38.0	2.1	0.7	0.2
No risk	62.5	0.7	5.1	30.0	1.0		
Household Wealth						1.2	
Most Poor	53.7	7.3	2.8	35.3	5.9	0.6	0.4
Very Poor	37.0	4.0	4.0	56.0	3.0	0.2	0.5
Poor	39.1	4.1	2.3	53.4	0.6	0.3	0.5
Less Poor	37.9	6.7	2.8	52.5	2.3	0.7	0.1
Least poor	36.6	2.8	2.7	55.5	1.2		0.5
Total	**43.7**	**0.5**	**3.0**	**47.2**	**3.5**	**0.8**	**0.4**

Table 5.7 Household members knowledge of malaria prevention, Afghanistan MIS 2011.

	Don't Know	Clean Surrounding	Mosquito Nets	Mosquito Repellents	Use Coils	Screens	Insecticides	Taking antimalarials	Filling Puddles
Member									
Male	37.0	21.7	33.9	0.7	1.3	4.7	6.3	1.1	0.8
Female	48.9	19.3	26.6	0.6	0.9	4.0	4.7	1.0	0.4
Residence									
Urban	38.6	18.7	37.7	0.9	0.5	6.5	3.9	0.4	0.9
Rural	44.6	20.4	28.9	0.7	1.2	4.1	5.4	1.1	0.5
Province									
Kabul	57.8	10.3	23.4	0.2		7.2	0.7	0.2	
Kapisa	53.8	20.4	5.9			3.3	19.0		
Parwan	62.0	18.5	16.8			3.5	4.8	0.7	1.4
Wardak	45.8	4.2	28.5	0.7	1.4	5.6	15.3		
Logar	30.9	9.7	8.0	2.9	1.7	6.9	53.1	2.9	5.1
Paktya	5.2	2.7	60.8	0.3		8.1	0.4	17.6	1.1
Khost	7.2	43.0	26.6	5.7	2.3	3.3	70.1	3.1	1.7
Nangarhar	21.5	9.2	62.3	0.4	1.0	6.0	2.2	1.9	0.8
Kunar	14.5	18.7	81.3	1.5	0.2	3.3	6.0	3.1	10.0
Laghman	2.7	11.6	69.6	0.7	0.7	4.4	9.6		0.3
Baghlan	73.6	9.9	12.4	0.6		3.6	0.1	0.1	0.1
Badakhshan	50.0	20.3	20.6	0.2	0.4	3.4	4.7	0.3	0.1
Takhar	20.5	24.3	60.1	2.8	0.7	24.0	23.5	7.1	0.5
Kunduz	4.4	23.8	74.4	0.4	1.4	4.7	2.9	3.4	0.8
Samangan	47.3	14.0	43.7	1.0		2.8	0.5		1.5
Balkh	33.2	4.4	58.2	0.5		2.4	1.0		
Jawzjan	19.1	37.3	34.7			1.0	8.4	0.4	
Saripul	27.1	35.6	40.6	3.3	0.2	1.1	0.5		
Baghdis	24.8	6.9	16.1			2.9	48.8	1.4	
Bamyan	50.8	35.5	9.6			3.8			
Daykondi	65.4	20.6	11.8	0.3	2.5	3.3	0.8	0.2	0.3
Malaria strata									
High risk	32.0	17.5	43.7	0.7	0.6	5.0	7.6	1.4	0.7
Low risk	55.7	20.6	18.0	0.8	1.8	3.6	3.8	0.8	0.5
No risk	51.0	35.5	9.6	0.0	0.0	3.8	0.0	0.0	0.0
Household Wealth									
Most Poor	54.8	19.0	25.4	0.3	1.0	2.7	2.6	0.9	0.3
Very Poor	33.5	24.2	31.9	1.1	2.5	6.7	6.6	1.5	1.1
Poor	37.9	16.7	31.7	0.8	0.5	4.2	9.1	0.7	0.3
Less Poor	42.3	26.5	28.2	0.8	0.3	3.6	6.0	0.9	0.7
Least poor	39.4	11.6	38.9	1.1	0.7	6.0	6.7	1.4	0.4
Total	**44.2**	**20.2**	**29.5**	**0.7**	**1.1**	**4.3**	**5.3**	**1.1**	**0.6**

Table 5.8 Household members exposure to and source of malaria information, education and communication, Afghanistan MIS 2011.

	Received IEC	Did not receive IEC	Radio	Newspapers	Health Facility	Work Place	School	Mosque	Educational Materials
Member									
Male	32.4	66.3	12.8	3.3	15.0	3.7	6.7	3.1	4.7
Female	23.1	75.4	8.8	1.8	11.1	0.5	3.4	0.5	2.1
Residence									
Urban	33.5	65.0	11.0	3.2	17.0	1.5	4.9	1.5	4.7
Rural	26.2	72.2	10.4	2.3	12.3	1.8	4.7	1.5	2.9
Province									
Kabul	20.4	77.3	3.7	0.8	4.9	0.4	6.5	1.5	3.8
Kapisa	25.1	75.2	7.1	0.4	6.7	4.4	8.5		2.1
Parwan	16.0	79.1	16.4	3.4	5.2		1.5		1.3
Wardak	4.2	95.1	4.2						0.6
Logar	20.0	79.5	17.7	4.6	15.4		0.6		
Paktya	22.4	50.4	1.5	0.2	9.9	0.4	13.2	0.2	1.0
Khost	91.9	6.6	85.6	2.2	73.3	1.0	32.1	0.5	0.5
Nangarhar	63.3	35.4	33.9	4.7	53.2	1.8	7.0	10.0	3.4
Kunar	40.2	61.4	15.8	0.7	4.6		2.4	0.1	4.2
Laghman	48.3	50.8	0.3	0.7	15.4	0.3	2.4	0.3	18.8
Baghlan	12.5	87.3	9.2	3.8	6.7	0.1	1.8	0.4	0.6
Badakhshan	26.5	72.4	20.4	3.8	2.5	1.7	5.7	1.5	6.3
Takhar	58.5	39.2	11.4	1.8	26.3	0.4	17.4	10.3	1.2
Kunduz	67.6	31.9	14.9	1.8	64.6	5.0	4.0	3.7	5.4
Samangan	16.0	80.9	7.5	0.5	8.4	3.9	3.3		
Balkh	6.9	92.6	0.7	0.2	4.4	0.2	2.2	0.5	0.2
Jawzjan	66.5	32.9	21.7	1.4	38.8	2.5	10.5	13.3	13.5
Saripul	46.0	52.0	7.3	1.1	20.4	10.9	14.3	0.8	2.3
Baghdis	8.6	90.1	1.6	0.8	3.5		2.7	1.4	1.8
Bamyan	4.8	93.2	2.4	0.7			0.7		0.3
Daykondi	9.9	89.0	3.8	2.7	0.5	0.8	2.2	0.3	
Malaria strata									
High risk	40.0	60.0	16.7	2.7	22.3	1.8	5.6	2.8	5.8
Low risk	16.7	83.3	5.2	2.3	4.8	2.1	4.3	0.5	0.7
No risk	4.8	95.2	2.4	0.7			0.7		0.3
Household Wealth									
Most Poor	20.7	78.3	5.9	1.0	13.4	1.8	2.5	1.2	2.1
Very Poor	29.5	68.2	13.4	5.6	7.8	2.0	4.7	1.0	2.3
Poor	33.4	65.4	13.1	2.0	13.8	1.1	5.5	3.8	7.2
Less Poor	25.9	72.0	10.4	1.1	12.2	1.6	7.2	1.0	3.0
Least poor	35.4	63.5	17.1	3.1	19.9	2.4	8.1	1.3	3.1
Total	**26.8**	**71.8**	**10.4**	**2.4**	**12.7**	**1.8**	**4.7**	**1.5**	**3.1**

Table 5.9 Type of malaria information, education and communication received by households members, Afghanistan MIS 2011.				
	No IEC received	IEC was on transmission methods	IEC was on prevention Methods	IEC was on treatment Methods
Member				
Male	66.7	19.7	21.1	3.3
Female	76.0	14.3	14.4	6.7
Residence				
Urban	66.0	23.7	18.4	4.5
Rural	72.8	15.9	17.0	6.5
Province				
Kabul	81.3	16.2	1.1	0.1
Kapisa	76.4	11.0	19.6	6.1
Parwan	82.2	9.6	9.6	3.0
Wardak	65.1	3.4	1.3	
Logar	80.0	17.1	16.0	0.6
Paktya	51.1	0.5	16.3	1.4
Khost	6.6	33.7	90.6	69.8
Nangarhar	36.6	49.1	41.2	21.2
Kunar	60.9	19.9	24.3	0.1
Laghman	50.9	44.0	36.9	2.0
Baghlan	87.6	10.8	6.9	4.8
Badakhshan	73.3	17.4	17.8	6.2
Takhar	47.4	21.6	41.8	9.7
Kunduz	32.8	40.3	40.4	6.9
Samangan	80.9	12.9	3.6	1.0
Balkh	91.9	4.3	3.6	0.2
Jawzjan	33.5	25.1	56.5	0.5
Saripul	52.3	29.1	21.3	9.6
Baghdis	91.0	3.8	6.6	2.2
Bamyan	91.8	3.1	1.7	
Daykondi	89.0	3.3	6.9	0.8
Household Wealth				
Most Poor	79.2	11.6	12.9	2.4
Very Poor	68.0	18.1	20.1	3.4
Poor	66.8	24.4	22.1	7.3
Less Poor	72.2	14.9	16.5	6.3
Least poor	63.8	22.6	19.5	9.7
Total	**72.3**	**16.5**	**17.0**	**4.7**

Table 5.10 Household members responses to whether they have had malaria before or knew someone who died of malaria, Afghanistan MIS 2011.

	Have you ever had malaria yourself	Hs another household member ever had malaria	Someone ever died of malaria	Number of persons interviewed
Member				
Male	21.8	29.6	3.0	3639
Female	22.0	31.0	3.1	5157
Residence				
Urban	30.0	36.4	5.0	792
Rural	21.3	30.0	2.9	8004
Province				
Kabul	2.9	3.2	0.1	591
Kapisa	0.4	4.7		152
Parwan	10.4	20.6	0.8	136
Wardak	19.4	48.6	2.1	144
Logar	0.5	0.6		175
Paktya	80.2	84.1	9.6	310
Khost	2.7			253
Nangarhar	79.7	93.3	1.7	984
Kunar	97.8	99.0	1.5	509
Laghman	84.9	94.5	15.8	293
Baghlan	3.9	4.7	0.8	843
Badakhshan	13.5	24.4	3.6	1245
Takhar	82.0	94.2	5.1	403
Kunduz	39.1	62.3	2.3	481
Samangan	10.0			210
Balkh	5.2	22.6	2.7	417
Jawzjan	20.9	43.3	2.5	202
Saripul	1.2	3.7	0.4	485
Baghdis	32.1	36.9	1.4	306
Bamyan	0.3	1.0		293
Daykondi	9.6	17.9	3.0	364
Malaria strata				
High risk	37.0	48.2	4.1	5944
Low risk	9.8	17.0	2.4	2559
No risk	0.3	0.3	0.0	293
Household Wealth				
Most Poor	16.0	27.7	2.4	2093
Very Poor	22.0	26.1	1.1	1900
Poor	36.2	43.4	5.8	1771
Less Poor	18.0	27.6	6.3	1388
Least poor	29.7	35.5	1.2	1644
Total	**21.9**	**30.5**	**3.0**	**8796**

CHAPTER SIX: MALARIA INFECTION PREVALENCE

Of the 15,370 individuals who were enumerated, a total of 13,443 (87.5) were tested for malaria using Care start rapid diagnostic test (RDT). Of these 174 (0.6%) were positive for malaria six of whom were in urban areas. 79 of all those who were positive for malaria were infected with *Plasmodium vivax,* 15 with *Plasmodium falciparum* and 6 mixed infections (Table 6.1). Positive cases came from the provinces of Badakhshan (14); Baghlan (1), Balkh (4), Kabul (4), Kapisa (2), Kunar (50), Laghman (2), Logar (1), Nangarhar (67), Paktya (23), Samangan (4), Takhar (1), Wardak (1). All falciparum infections were in rural areas.

Table 6.1 The prevalence of malaria infection measure using RDT, Afghanistan MIS 2011.

			Positive for malaria			
	RDT positive	Number tested for malaria	Pf positive	Pv positive	Mixed	Number positive for malaria
Residence						
Urban	0.6	1283	0	100	0	6
Rural	0.6	12094	16.7	77	6.3	168
Age category (years)						
<5	0.5	2196	13.2	80.4	6.4	28
5 to 9	0.8	2514	15.9	74.2	19	39
10 to 14	0.6	1861	19.8	80.2	0	25
15 to 19	0.7	1222	7.2	89.3	3.6	14
20 to 44	0.5	4006	15.6	82.1	2.3	48
>44	0.7	1644	17	70.1	12.8	20
Sex						
Male	0.6	6114	17	76.3	6.9	71
Female	0.6	7329	14.1	80.8	5.1	103
Fever last two weeks						
No	0.3	12487	8	85.5	6.5	84
Yes	0.5	956	23.1	72	4.8	90
Fever today						
No	0.4	12730	12.3	81.3	6.5	96
Yes	0.7	713	19.4	75.8	5	78
Slept under ITN						
No	0.5	11039	12.6	81.7	5.7	115
Yes	1.1	2404	21.1	72.9	5.9	59
Malaria strata						
High risk	1.5	9350	18.5	78.0	3.3	142
Low risk	0.8	3678	0.0	83.4	16.6	32
No risk	0.0	349	0.0	0.0	0.0	0
Travel in the last two months inside Afghanistan						
No	1.3	13156	97.4	94.9	100.0	167
Yes	2.4	287	2.6	5.1	0.0	7
Travel in the last two months outside Afghanistan						
No	1.3	13346	97.4	100.0	100.0	173
Yes	1.0	97	2.6	0.0	0.0	1
Household Wealth						
Most Poor	0.2	2871	6	9.9	3	18
Very Poor	0.7	2920	36.5	55.9	7.6	54
Poor	0.9	2858	2.3	92.3	5.4	46
Less Poor	0.3	1993	0	100	0	11
Least Poor	1.4	2735	16.2	76.5	7.3	45
Total	**0.6**	**13443**	**15.2**	**79**	**5.8**	**174**

Overall, infection rates did not vary by residence, age, gender but were higher among the least poor and those who had fever on the day of survey. The relationship between fever on the day of survey and infection was stronger for individuals infected with falciparum. Percentage of malaria positive cases appeared to be higher among individuals who travelled in Afghanistan compared to those who did not, although the sample of those who travelled was too small to make any concrete assertion about the relationship of travel to infection.

Blood slides were taken from a total 13272 persons. Of these, there were 95 positive cases implying a national malaria prevalence of 0.3% according to microscopist 1 (Table 6.2). Microscopist 2 observed 133 positive slides resulting in malaria prevalence of 0.6% nationally. The proportion of Pv in the first and second readings were 81.4% and 85.9% respectively while Pf cases were similar. However, microscopist 1 had slightly higher mixed positive cases than microscopist 2. Vivax cases were higher in urban areas and in stratum 2. All Pf cases were from rural areas and stratum 1.

Table 6.2 The prevalence of malaria infection measure using microscopy, Afghanistan MIS 2011.

				Positive for malaria		
	% positive	**Number positive**	**Number of people tested**	**% Pv**	**% Pf**	**% Mixed**
Microscopy reading 1						
Residence						
Urban	0.04	1	1271	100	0.0	0.0
Rural	0.32	94	11942	81.3	12.7	5.9
Malaria strata						
High risk	0.40	67	9253	75.9	18.6	5.4
Low risk	0.20	28	3633	93.0	0.0	6.9
No risk	0.00		327			
Total	**0.30**	**95**	**13272**	**81.4**	**12.6**	**5.3**
Microscopy reading 2						
Residence						
Urban	0.2	2	1271	100	0.0	0.0
Rural	0.6	131	11942	85.5	13.3	1.2
Malaria strata						
High risk	0.9	102	9253	83.0	17.0	0.0
Low risk	0.3	30	3633	94.5	0.0	5.5
No risk	0.3	1	327	100	0.0	0.0
Total	**0.6**	**133**	**13272**	**85.9**	**12.9**	**1.1**

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9.0 ANNEX: Questionnaire

1

THE SECOND MALARIA INDICATORS SURVEY – AFGHANISTAN, 2011

HOUSEHOLD QUESTIONNAIRE (FORM – H)

---

1. HOUSEHOLD UNIQUE ID = |___|___| |___|___| |___|___| |___|___|___|**

This form is to collect information on household members, household characteristics and bed nets

Survey team and field supervisor Date of interview |___|___| |___|___|

Name of interviewers 1. |_____| 2. |_____|
Name of Lab. technicians 1. |_____| 2. |_____|
Name of supervisor 1. |_____| 2. |_____|

Name(s) of person who revised the questionnaire 1. |_____| 2. |_____|
Name(s) of the person who coded the format 1. |_____| 2. |_____|
Name(s) of the person who revised the coding 1. |_____| 2. |_____|
Name(s) of the person who entered the data 1. |_____| 2. |_____|

Important notes **

1. Make sure to write the unique ID (no.1) as instructed (Province code /village code/ household number)
2. While collecting data, don't write in the box in front of each question
3. All questions bear one possible answer except those marked with **

Number of slides returned |_____|_____|

Members who refused blood testing |_____||_____||_____||_____||_____||_____|

Members who were not present at time of survey |_____||_____||_____||_____||_____||_____|

[ ] 2. Province |_____|

[ ] 3. District |_____|

[ ] 4. Village |_____|

[ ] 4.1 (1)Urban (2) Rural

[ ] 5. Household number |___|___|___|

[ ] 6. Number of permanent and visiting residents of the household |___|___|

[ ] 7. Number of residents who spent the previous night in the household. |___|___|

[ ] 8. Latitude |_____||_____||_____|.|_____||_____||_____||_____||_____|

[ ] 9. Longitude |_____||_____||_____|.|_____||_____||_____||_____||_____|

Ask about household members. Provide information on all permanent residents/visitors of this household

2	A	B	C	D	E	F	G	H	I	J
No. of household member	Name	Father's name	Visitor No.....1 Yes 2	Age in (years) (0 if <1)	Age in months if <1 year (0 if >1)	Sex Male.1 Female ...2	**If female 15-49 years**, ask if Pregnant the time of survey No.....1 Yes .....2 Don't know....3	Sleep in household last night No .....1 Yes 2	**If Yes to G,** Did you Sleep under bed net last night No.....1 Untreated.....2 ITN.....3 LLIN.....4	Present in household at the time of survey No .....1 Yes 2
01										
02										
03										
04										
05										
06										
07										
08										
09										
10										

Member of the household providing the information (specify number) |___|___|

	A	B	C	D	E	F	G	H	I	J
No. of household member	Name	Father's name	Visitor No.....1 Yes 2	Age in (years) (0 if <1)	Age in months if <1 year (0 if >1)	Sex Male .....1 Female .2	**If female 15-49 years**, ask if Pregnant the time of survey No.....1 Yes .....2 Don't know....3	Sleep in household last night No .....1 Yes 2	**If Yes to G,** Did you Sleep under bed net last night No.....1 Untreated.....2 ITN.....3 LLIN.....4	Present in household at the time of survey No .....1 Yes 2
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Member of the household providing the information (specify number) |___|___|

Information about the head of the household and the house

	10. Sex of the head of the household	(1) Man (2) Woman
	11. Is the head of the household able to	(1) Read & Write (2) Read only (3)Neither
	12. Education attainment of the head of the household (completed)	
	(0) Never been to school (1) Madrasa /Religious education (2) <6 years (3) Primary - 6 years	
	(4) Middle school -9 years (5) High school-12 years (6) University or higher	
	13.Household construction type	(1) Mud (2) Bricks (3) Cement (4) Stone
	14. Which type of window have your HH	(1)Window with glasses (2) Window with screen
		(3) Window with curtain (4)Window without glass
	15. The number of rooms or quarters in the household	|____|____|
	16. How many sleeping rooms in the household	|____|____|
	17. What is the source of water in the household ** *(tick all that apply)*	
	(1) Piped Inside Dwelling (2) Piped to a Nearby Spot (3) Well/Spring (4) Rain Water/Dam	
	(5) Tanker Truck (6) Pond/River (7) Bottled Water (8) Others mention |_____|	
	18. What is the type of toilet in the household ** *(check all what apply)*	
	(1) Flush (2) Pit Latrine (3) Trench/Bucket (4) Bush; (5) Others mention |_____|	

Does the household have

	19. Electricity	(1) No	(2) Yes
	20. Radio	(1) No	(2) Yes
	21. Television	(1) No	(2) Yes
	22. Telephone /mobile telephone	(1) No	(2) Yes
	23. Refrigerator	(1) No	(2) Yes
	24. Fan	(1) No	(2) Yes
	25. Air Conditioner	(1) No	(2) Yes

Does any member of your household have

	26. Bicycle	(1) No	(2) Yes
	27. Motorcycle or motor scooter	(1) No	(2) Yes
	28. Car or truck	(1) No	(2) Yes

Livestock possessed by family

	29. Does the family possess any livestock	(1) no (2) yes	
	30. Goats (specify the number of heads)	|____|____|____|____|	(-1) don't have livestock
	31. Sheep (specify the number of heads	|____|____|____|____|	(-1) don't have livestock
	32. Cows (specify the number of heads)	|____|____|____|____|	(-1) don't have livestock
	33. Donkeys (specify the number of head)	|____|____|____|____|	(-1) don't have livestock

Preventive measures around the household

	34. Does the family possess bed nets	(1) no (2) yes	
	If Q yes proceed	**if no ask question &**	
	35. How many mosquito nets does the household have	|___|___|	(999) don't have net
	36. Number of untreated nets	|___|	(999) don't have net
	37. Number of ITN	|___|	(999) don't have net
	38. Number of LLITN	|___|	(999) don't have net
	39. Number of locally made nets	|___|	(999) don't have net

Please provide information about the bed nets available for household members

	Net number	Net 1	Net 2	Net 3	Net 4	Net 5	Net 6	Net 7
40 Net 1- 7	Ask to see the net available	Not observed ....1 Observed 2	Not observed ....1 Observed 2	Not observed ....1 Observed 2	Not observed ....1 Observed 2	Not observed ....1 Observed 2	Not observed ....1 Observed 2	Not observed ....1 Observed 2
41 Net 1- 7	Net condition* ***See coding details at the end of table***	1-No holes 2-Fair 3-Poor 4-Unsafe 5-Unused	1-No holes 2-Fair 3-Poor 4-Unsafe 5-Unused	1-No holes 2-Fair 3-Poor 4-Unsafe 5-Unused	1-No holes 2-Fair 3-Poor 4-Unsafe 5-Unused	1-No holes 2-Fair 3-Poor 4-Unsafe 5-Unused	1-No holes 2-Fair 3-Poor 4-Unsafe 5-Unused	1-No holes 2-Fair 3-Poor 4-Unsafe 5-Unused
42 Net 1- 7	Source of net	Don't know .....0 Private shop .....1 Clinic .....2 NGO .....3 EPI.....4 ANC.....5 Campaign.....6 Others .....7. |_____|	Don't know .....0 Private shop .....1 Clinic .....2 NGO .....3 EPI.....4 ANC.....5 Campaign.....6 Others .....7 |_____|	Don't know .....0 Private shop .....1 Clinic .....2 NGO .....3 EPI.....4 ANC.....5 Campaign.....6 Others .....7 |_____|	Don't know .....0 Private shop .....1 Clinic .....2 NGO .....3 EPI.....4 ANC.....5 Campaign.....6 Others .....7 |_____|	Don't know .....0 Private shop .....1 Clinic .....2 NGO .....3 EPI.....4 ANC.....5 Campaign.....6 Others .....7 |_____|	Don't know .....0 Private shop .....1 Clinic .....2 NGO .....3 EPI.....4 ANC.....5 Campaign.....7 Others .....6 |_____|	Don't know .....0 Private shop .....1 Clinic .....2 NGO .....3 EPI.....4 ANC.....5 Campaign.....7 Others .....6 |_____|
43 Net 1- 7	Since how long do you have this bed net	Don't know .....0 0-6 months [__] 7-12 months [__] -36 months[__] >36 months [__]	Don't know .....0 0-6 months [__] 7-12 months [__] -36 months[__] >36 months [__]	Don't know .....0 0-6 months [__] 7-12 months [__] 12-36 months[__] >36 months [__]	Don't know .....0 0-6 months [__] 7-12 months [__] 12-36 months[__] >36 months [__]	Don't know .....0 0-6 months [__] 7-12 months [__] 12-36 months[__] >36 months [__]	Don't know .....0 0-6 months [__] 7-12 months [__] 12-36 months[__] >36 months [__]	Don't know .....0 0-6 months [__] 7-12 months [__] 12-36 months[__] >36 months [__]
44 Net 1- 7	Type of the bed net available	Non-treated .....1 ITN .....2 LLIN .....3 Locally made.....4	Non-treated .....1 ITN .....2 LLIN .....3 Locally made.....4	Non-treated .....1 ITN .....2 LLIN .....3 Locally made.....4	Non-treated .....1 ITN .....2 LLIN .....3 Locally made.....4	Non-treated .....1 ITN .....2 LLIN .....3 Locally made.....4	Non-treated .....1 ITN .....2 LLIN .....3 Locally made.....4	Non-treated .....1 ITN .....2 LLIN .....3 Locally made.....4
45 Net 1- 7	No. of those who slept under the net last night	None.....0 Member 1 ID|__| Member 2 ID|__| Member 3 ID|__|	None.....0 Member 1 ID|__| Member 2 ID|__| Member 3 ID|__|	None.....0 Member 1 ID|__| Member 2 ID|__| Member 3 ID|__|	None.....0 Member 1 ID|__| Member 2 ID|__| Member 3 ID|__|	None.....0 Member 1 ID|__| Member 2 ID|__| Member 3 ID|__|	None.....0 Member 1 ID|__| Member 2 ID|__| Member 3 ID|__|	None.....0 Member 1 ID|__| Member 2 ID|__| Member 3 ID|__|

***Fair=** no holes larger that fit a normal torch battery; **Poor=** 1 to 4 holes that fit a torch battery; **Unsafe** =>5 holes that fit a torch battery; **Unused=** net still in package

Skip questions & then Complete question on bed nets by asking question to 5

BED NETS – KNOWLEDGE, ATTITUDES AND PRACTICES

IF NO BED NETS ARE AVAILABLE IN HOUSEHOLD ASK Q. 46 & 47

46. What is the reason for not having a net in the household

	46.1. Never heard of bed nets	(1) Not mentioned	(2) mentioned
	46.2. Price of bed net is not affordable	(1) Not mentioned	(2) mentioned
	46.3. No one is selling bed nets in the area	(1) Not mentioned	(2) mentioned
	46.4. Mosquito is not a problem in the area	(1) Not mentioned	(2) mentioned
	46.5. Malaria is not a problem in the area	(1) Not mentioned	(2) mentioned
	46.6. Nets don't reduce or eliminate the risk of mosquito bite	(1) Not mentioned	(2) mentioned
	46.7. Nets don't reduce or eliminate the risk of malaria	(1) Not mentioned	(2) mentioned
	46.8. Not practical to sleep under bed net	(1) Not mentioned	(2) mentioned
	46.9. Mosquito still bite even when sleeping under net	(1) Not mentioned	(2) mentioned
	46.10. Not enough space to hang the net	(1) Not mentioned	(2) mentioned
	46.11. Insecticide included is dangerous for health	(1) Not mentioned	(2) mentioned
	46.12. Others |_____|	(1) Not mentioned	(2) mentioned
	46.13. Others |_____|	(1) Not mentioned	(2) mentioned

47. If a bed net is provided will you use it

	(1) No at all	(2) Yes some nights	(3) Yes every night

IF BED NETS ARE AVAILABLE IN THE HOUSEHOLD ASK Q 48 TO 50

48. What is the main reason for using bed net

	(1) Protection from mosquito/insect bite	(2) Preventing malaria	(3) Both
	(4) others (specify) |_____|		

49. Advantages of sleeping under bed net		**(0) Has no advantage**	
	49.1. Avoid the painful bite of mosquito/other insects	(1) Not mentioned	(2) mentioned
	49.2. Minimize/eliminate the risk of Malaria	(1) Not mentioned	(2) mentioned
	49.3. Sleep better when sleeping under net	(1) Not mentioned	(2) mentioned
	49.4. Others |_____|	(1) Not mentioned	(2) mentioned
	49.5. Others |_____|	(1) Not mentioned	(2) mentioned

50. Disadvantages of sleeping under bed net		**(0) Has no disadvantage**	
	50.1. Sleeping place get too warm /hot	(1) Not mentioned	(2) mentioned
	50.2. Feel that there is no enough air	(1) Not mentioned	(2) mentioned
	50.3. Mosquito still bite	(1) Not mentioned	(2) mentioned
	50.4. Takes time to tuck it in every night	(1) Not mentioned	(2) mentioned
	50.5. Difficult when getting up in the might	(1) Not mentioned	(2) mentioned
	50.6. Others |_____|	(1) Not mentioned	(2) mentioned
	50.7. Others |_____|	(1) Not mentioned	(2) mentioned

51. Malaria in the household (for all participants)

	51.1. Any member of the household ever had malaria	(1)No	(2) Yes
	51.2. Any member of household had malaria in last 3 months	(1)No	(2) Yes
	51.3. Any member of the household died from malaria	(1)No	(2) Yes

END HOUSEHOLD INTERVIEW AND PROCEED WITH INDIVIDUAL INTERVIEW

THE SECOND MALARIA INDICATORS SURVEY – AFGHANISTAN, 2011

INDIVIDUAL QUESTIONNAIRE (FORM – I)

1. **Member unique ID** |___|___| |___|___| |___|___| |___|___|___| |___|___|
2. **Member Name** _____

Information on malaria morbidity and health seeking behavior among ALL AGES

3. **Blood Film** (1) REFUSE BLOOD TEST (2) TEST DONE
4. **RDT** (1) REFUSE BLOOD TEST (2) TEST DONE
5. **Filter Paper** (1) REFUSED BLOOD TEST (2) TEST DONE

6.1 Age |__|__| Years completed [0] if < 1 year

6.1 Age |__|__| Months completed [0] if ≥ 1 year

7. Sex (1) male (2) female [if male skip to Q 9]

8. Total number of previous pregnancies |___|___| (0) None

9. Pregnancy at the time of interview (1) No (2) Yes

10. Are you able to read and write
(1) read (2) read & write (0) neither (-1) Below education age [under 6 year]

11. Educational attainment (completed)
(0) Never been to school (1) Madrasa/ Religious education (2) <6 years (3) Primary - 6 years
(4) Middle school-9 years (5) High school-12 years (6) University or higher (-1) Below education age

12. Are you still studying (1) No (2) Yes (0) Never been to school (-1) Below education age

13. Are you employed or in a self-employed job (1) No (2) Yes

14. Type of job (mention) |_____|
(1) Professional (2) Semi-Professional (3) Skilled (4) Semiskilled (5) business owner
(6) Farmer (7) Driver (0) not employed

15. Employed for (1) Cash (2) Food (0) not employed

Sleeping under bed net (this question can also be a check for net roster table)

16. Did you sleep under a bed net every night last month
(1) No (2) Yes (0) Don't have a net

17. Did you sleep under bed net last night (0) don't have bed net (1) No (2) yes

18. If yes; which type of bed net (1) Untreated (2) ITN (3) LLIN (4) Locally made

Fever at the time of the survey

19. Do you have fever now (1) No (2) Yes

20. Recorded temperature [___|___|.[___| ^{0}C (0) Refused taking temperature

Fever in the two weeks prior to the survey

21. Did you have fever in the 2 weeks prior to the survey
(1) No **If [NO] _____ GO TO QUESTION 44**
(2) Yes **If [YES] _____ PROCEED TO QUESTION 22**

	22. When did the fever start (day/month)? |___|___|.|___|___|
	23. Has the fever been resolved? (1) No (2) Yes
	24. When the fever was resolved (day/month)? |___|___|.|___|___|

Please - Recheck with participant and provide a summary of fever in the previous two weeks

Summary of fever in the two weeks prior to the survey

	25. Fever in the previous two weeks (1) Had a fever and resolved (2) Had a fever and still continuous
	26. Duration of the fever (Even if not resolved) |___|___| Days (write 01 if the fever resolved in the same day)

	27. Was the fever associated with other symptoms? (1) No (2) Yes

28. **If YES to 27**, what were these symptoms

	28.1. Headache & malaise	(1) No	(2) yes
	28.2. Sweating and /or chills	(1) No	(2) yes
	28.3. Muscle/body/joints aches	(1) No	(2) yes
	28.4. Nausea/vomiting	(1) No	(2) yes
	28.5. Diarrhea / loose stool	(1) No	(2) yes
	28.6. Abdominal pain	(1) No	(2) yes
	28.7. Running nose	(1) No	(2) yes
	28.8. Sore throat	(1) No	(2) yes
	28.9. Cough	(1) No	(2) yes
	28.10. Difficulty breathing	(1) No	(2) yes
	28.11. Convulsions	(1) No	(2) yes
	28.12. Others (mention)	(1) No	(2) yes |_____|

	29. Did you take any action to treat the **FEVER?**

(1) No **If [NO] _____ go to Q 43 & ask why no action was taken**
(2) Yes **If [YES] _____ proceed to Q 30**

Health seeking behaviour for fever

	30. What did you do to treat the fever **(select all actions taken to treat the fever and indicate whether first action, second, third etc)

Source	**Order of visit,** i.e. First, Second etc...
(1) Consulted a Mullah	_____
(2) Decided self management	_____
(3) Private Clinic	_____
(4) Consulted traditional healer	_____
(5) Visited a drug store	_____
(6) Visited public health care facility	_____
(7) Others, specify |_____|	_____

If drug store or health facility were visited complete Q. 34 to 42

31. Time of the action taken
(1) < 24 hrs (2) 24 –< 48 hrs
(3) 48 – 72 hrs (4) > 72 hrs

32. Medications received
(9) Don't know (3) Antipyretics
(1) None (4) Antibiotics
(2) Herbs/traditional medicine (5) **Anti-malarial**
(6) Others mention |_____|

If anti-malaria drugs were received complete Q. 38 to 42

33. Outcome of treatment
(1) Cure (2) Improvement
(3) No improvement (4) Worsen

Information on health facility **(-1) Health facility or drug store not visited**

34. Type of health facility
Public sector (1) Health post (2)health sub center (3) Basic health care
(4) Comprehensive health care (5) District hospital (6) Provincial hospital
(7) Regional hospital
Private sector (8) Private clinic (9) Private hospital (10) Drug store

35. Travel time from home to facility |__|__|__| minutes
36. Waiting time at facility |__|__|__| minutes
37. Blood tested for malaria (1) No ; Yes and results were (2) Negative (3) Positive (9) Don't know
38. Cost of medical consultation (not including medications) |__|__|__| AFG
39. Cost of blood test (999) not tested |__|__|__| AFG

Information on anti-malaria drugs **(-1) Anti-malaria drugs not received**

40. Type of antimalarial drugs	**41. Source**
(1) AS + SP (ACT)	1) public health facility; 2)Private Clinic; 3) Drug store; 4) Home
(2) SP/Fansidar	1) public health facility; 2)Private Clinic; 3) Drug store; 4) Home
(3) Chloroquine	1) public health facility; 2)Private Clinic; 3) Drug store; 4) Home
(4) Halofantrin	1) public health facility; 2)Private Clinic; 3) Drug store; 4) Home
(5) Amodiaquine	1) public health facility; 2)Private Clinic; 3) Drug store; 4) Home
(6) Primaquine	1) public health facility; 2)Private Clinic; 3) Drug store; 4) Home
(7) Quinine	1) public health facility; 2)Private Clinic; 3) Drug store; 4) Home
(8) Others mention	
(9) Don't Know	

42. Cost of antimalarial drugs |__|__|__| AFG

ASK WHY: **If participant had a fever in the two weeks prior to the survey**

Did not take any action **or** **Did not visit a health facility or drug store**

(0) Action taken & health facility sought in first action

43. A. Disease related reasons

43A (1) Fever was mild	(1) Not mentioned	(2) Mentioned
43A (2) Fever will resolve spontaneously	(1) Not mentioned	(2) Mentioned
43A (3) Fever was not attributed to malaria	(1) Not mentioned	(2) Mentioned

43 B. Cost of care

43B (1) Cannot afford the cost of consultation/medications	(1) Not mentioned	(2) Mentioned

43C. Health facility

43C (1) Health facility is far (long travel distance)	(1) Not mentioned	(2) Mentioned
43C (2) long waiting time at the facility	(1) Not mentioned	(2) Mentioned

43 D. Quality of health service

43 D (1) Care at the health facility is poor/inadequate	(1) Not mentioned	(2) Mentioned
43 D (2) Shortage of diagnostic and drugs at the health facility	(1) Not mentioned	(2) Mentioned
43 D (3) Workers at the health facility are not efficient	(1) Not mentioned	(2) Mentioned
43 D (4) Workers behavior at the health facility was not good	(1) Not mentioned	(2) Mentioned
43 D (5) Workers at the health facility are not available	(1) Not mentioned	(2) Mentioned

43 E. Other mention |_____|

MALARIA RELATED HEALTH KNOWLEDGE **(Unprompted then prompted)**
Applicable to household members aged 12 years and above **(-1) Below the age of 12 years**

44. Is malaria a risk in your area? (0) Don't know (1) No risk at all (2) Low risk (3) High risk

45. Malaria is manifested by** (0) Don't know (1) Fever (2) feeling cold/chills (3) Sweating (4) Diarrhea (5) body pain (6) Others |_____|

46. Malaria is transmitted by (0) Don't know (1) contaminated food and drinks (2) contact with infected person (3) Mosquito bite (4) bite of other insects other than mosquito (5) air borne and droplet from infected persons (6) Contact with birds

47. Best measure to prevent malaria is (0) Don't know ( ) Keep the surroundings clean
( ) Use of mosquito nets ( ) use of mosquito repellant
( ) Use of coils ( ) screening windows
( ) spraying insecticides indoor & outdoor
( ) Taking anti-malaria drugs in the transmission season
(8) Filling up water puddles

48. Have you ever been exposed to health education about malaria (1) No (2) Yes

49. Source of education message was** (0) Did not receive education about malaria
(1) Radio /Television (2) newspapers
(3) Health facility (4) work place (5) school
(6) mosque (7) Family/friends
(8) educational materials (posters/notice)

50. Education messages addressed ** (0) Did not receive education about malaria
(1) transmission methods (2) Prevention
(3) Treatment

51. Have you ever had malaria yourself (1) No (2) Yes

52. A household member had malaria in the past (1) No (2) Yes

53. Do you know someone who died from malaria (1) No (2) Yes

TRAVEL HISTORY SECTION

54. Have you travelled inside or outside the country in the last two months? (1) No (2) Yes

55. If inside the country where did you travel? .....
.....
.....

56. When did you travel (mm/yy)? |__|__|/|__||__|

57. How long did you stay (night spent) ☐☐☐

57a. Did you a mosquito bed net while you were away? (1) No (2) Yes

58. If outside the country where did you travel? .....
.....
.....

59. When did you travel (mm/yy)? |__|__|/|__||__|

60. How long did you stay (nights spent)? ☐☐☐

60a. Did you a mosquito bed net while you were away? (1) No (2) Yes

RDT RESULTS

61. What was the result of the RDT? 1. Positive; 2. Negative; 3. Invalid; 4. Not Done

62. If Positive which parasite specie? 1. Falciparum; 2. Vivax; 3. Mixed

ON THE FIRST PAGE OF THE INDIVIDUAL QUESTIONNAIRE INDICATE WHETHER BLOOD FILMS AND FILTER PAPER WERE DONE FOR THIS INDIVIDUAL

THANK YOU FOR PARTICIPATION IN THIS SURVEY