Republic of Kenya

2007 Kenya MALARIA Indicator Survey

Division of Malaria Control, Ministry of Public Health and Sanitation

Kenya National Bureau of Statistics

National Coordinating Agency for Population and Development

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March 2009

THIS REPORT SUMMARIZES the findings of the 2007 Kenya Malaria Indicator Survey (KMIS) carried out by the Division of Malaria Control in the Ministry of Public Health and Sanitation in partnership with the Kenya National Bureau of Statistics. The Department for International Development (DFID) through the World Health Organization (WHO) provided financial assistance for the survey. Technical support was provided by WHO and Centers for Disease Control and Prevention (CDC). The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the donor organizations.

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2007 Kenya Malaria Indicator Survey

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Acronyms and Abbreviations

ANC	Antenatal clinic
ACT	Artemesinin combination treatment
CDC	Centers for Disease Control and Prevention
CHW	Community health worker
DFID	Department for International Development
DOMC	Division of Malaria Control
DRH	Division of Reproductive Health
DSO	District Statistical Officer
EPSEM	Equal probability selection method
ERSWEC	Economic Recovery Strategy for Wealth Creation
GDP	Gross domestic product
GIS	Geographical information system
GPS	Geographic positioning system
IPT	Intermittent preventive treatment
IRS	Indoor residual spraying
ITN	Insecticide treated (bed) net
IUGR	Intra-uterine growth retardation
KEMRI	Kenya Medical Research Institute
KMIS	Kenya Malaria Indicator Survey
KNBS	Kenya National Bureau of Statistics
LLITN	Long-lasting insecticide treated (bed) net
MCH	Maternal/child health
NMS	National Malaria Strategy 2001–2010
MOH	Ministry of Health
MSH	Management Sciences for Health
NASSEP	National Sample Survey and Evaluation
NCAPD	National Coordinating Agency for Population and Development
NHSSP	National Health Sector Strategic Plan
NMCP	National Malaria Control Programme
PDA	Personal digital assistant
PPMOS	Probability proportional to measure of size
PMI	Presidential Malaria Initiative
PSI	Population Services International
PPS	Probability proportional to size
RDT	Rapid diagnostic test
SAS	Statistical Analysis System
SP	Sulphadoxine pyrethamine
SPSS	Statistical Package for Social Scientists
TWG	Technical Working Group
VIP	Ventilated improved pit latrine
WHO	World Health Organization
WRP	Walter Reed Project

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Map of Kenya – Provincial Boundaries

Foreword

Malaria is among the diseases of major public health significance. Besides its toll of human suffering and death, malaria saps the work force and drains the economy. Reducing, even eliminating, its adverse impact is therefore of great humanitarian and economic importance. African Heads of State, meeting in Abuja, Nigeria, in April 2000, issued a declaration committing countries including Kenya to achieve significant country targets for malaria control. At the time, malaria accounted for up to 30 per cent of all outpatient attendance in Kenya and 19 per cent of the admissions to health facilities. The Division of Malaria Control (DOMC) is therefore mandated to reduce the level of malaria infection and consequent death in Kenya.

To address the severe burden of malaria in Kenya and to be in harmony with international Roll Back Malaria targets, the Government of Kenya in collaboration with partners developed Kenya's National Malaria Strategy (NMS) 2001–2010, which was launched in April 2001. The NMS articulates the key strategic approaches to malaria control and targets in concert with those established by the Roll Back Malaria movement in Abuja.

The NMS is implemented using four key strategic approaches: to guarantee all people access to quick and effective treatment, to significantly reduce illness and death from malaria, to provide malaria prevention measures and treatment to pregnant women, and to promote the use of insecticide-treated nets by at-risk communities to significantly reduce rates of infection and mitigate against the effects of malaria epidemics.

This document reports the results of the 2007 Kenya Malaria Indicator Survey (KMIS), the first such survey to be undertaken by the country. At the time the survey was done, the NMS had been implemented for six years. The survey intended to evaluate progress the country has made towards the Abuja targets across the interventions implemented by the programme.

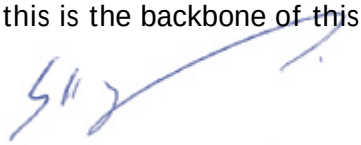
This report details parasitaemia levels in children; access to the first line antimalarial; use of insecticide treated nets by vulnerable

groups; and use of intermittent preventive treatment by pregnant women. The findings of the survey are expected to go a long way in assisting the DOMC to review its policies and strategies for the future. They also highlight some of the challenges in scaling up of interventions.

Like any major survey, the KMIS required the efforts of a variety of partners and stakeholders from national to community levels. We would like to acknowledge the input of our partners that were involved in this survey: the Department for International Development (DFID) for funding the whole process, as well as the World Health Organization (WHO) – both the Kenya country office and the Africa Regional Office – Centers for Disease Control and Prevention (CDC), Population Services International (PSI), Kenya Medical Research Institute (KEMRI)-Wellcome Trust, and the National Coordinating Agency for Population and Development (NCAPD) for their technical input.

Our gratitude also goes to all members of the Malaria Monitoring and Evaluation Technical Working Group. Special thanks go to Kenya National Bureau of Statistics (KNBS) who provided technical support and coordinated the field data collection activities throughout the process. Abercrombie & Kent provided logistics in the form of transport during the field work. We are also grateful to the field teams who worked tirelessly and to all the staff of DOMC.

We also would like to appreciate all the respondents and those who gave blood samples, for this is the backbone of this report.



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Executive Summary

Up to 30 per cent of outpatient attendance and 19 per cent of admissions to health facilities in Kenya are due to malaria. To combat this disease the Ministry of Health through the National Malaria Control Programme (NMCP) developed the National Malaria Strategy (NMS) covering the period 2001 to 2010. The main goal of the NMS was to reduce the level of malaria infection and consequent death by 30 per cent by the year 2006 and to sustain that improved level of control to 2010. During the same period the Government also launched the second National Health Sector Strategic Plan (NHSSP II) 2005–2010. The goal of the strategic plan is to reduce health inequalities and to reverse the downward trend in health-related outcome and impact indicators.

The Kenya Malaria Indicator Survey:
- Collected up-to-date information on coverage of the core malaria interventions included in the National Malaria Strategy 2001–2010.
- Assessed malaria parasite prevalence in children aged 1–59 months.
- Assessed the status of anaemia among children aged 6–59 months.

Furthermore, the Government developed Kenya Vision 2030, whose goal for the health sector is to provide equitable and affordable quality health services to all Kenyans. Vision 2030 also aims at restructuring the health care delivery system to shift the emphasis from curative to promotive and preventive health care.

The Kenya Malaria Indicator Survey (KMIS) was conducted in 2007 with three main objectives: to collect up-to-date information on coverage of the core malaria interventions included in the NMS 2001–2010; to assess malaria parasite prevalence in children aged 1–59 months; and to assess the status of anaemia among children aged 6–59 months.

Summary of Survey Results

The results of this survey indicate that 63 per cent of households own at least one bed net and 34 per cent of households own more than one net. For every 10 households there are 8

The National Malaria Strategy aimed to:
- Guarantee all people access to quick and effective treatment.
- Significantly reduce illness and death from malaria.
- Provide malaria prevention measures and treatment to pregnant women.
- Promote the use of insecticide-treated nets by at-risk communities.

insecticide treated nets (ITNs) or 12 nets of any kind.

The results further show that in endemic areas, 74 per cent of households own at least one net while 39 per cent own more than one. In the same areas 58 per cent of all households own at least one ITN and 28 per cent own more than one ITN. For households in epidemic-prone areas, 59 per cent own at least one net, while 33 per cent own more than one. In the same areas 48 per cent own at least one ITN and 24 per cent own more than one ITN.

The data show that 51 per cent of children under five years of age slept under any net the night preceding the survey, but only 39 per cent slept under an ITN. About 61 per cent of children under five in urban areas used a mosquito net the night preceding the survey, compared with 50 per cent in rural areas. Similarly, 43 per cent of children under five in urban areas slept under an ITN the night before the survey as compared with 39 per cent of rural children.

Endemic areas have the highest use of mosquito nets (58 per cent) and ITNs (46 per cent). Areas in which two mass net distribution campaigns were conducted show a higher ITN usage among children under five than non-campaign ones. That is, in areas where there was no campaign, only 27 per cent of children under five had slept under an ITN the night preceding the survey whereas 44 per cent of those residing in campaign areas had done so.

The survey shows that pregnant women were more likely than all women within the reproductive age to have slept under a mosquito net: About 51 per cent of pregnant women slept under a net the night preceding the survey compared with 45 per cent of all women of reproductive age. Similarly, 40 per cent of pregnant women had slept under an ITN compared with 32 per cent of all women of reproductive age.

One woman in two (50 per cent) in urban areas slept under a net the night preceding the survey, compared with two in five rural women (43 per cent). Similarly, 42 per cent of pregnant women in urban areas slept under an ITN compared with 39 per cent of their rural counterparts.

One child in three (32 per cent) had fever during the fortnight preceding the survey. It was observed that fever prevalence in older children (26 per cent of four-year-olds) was lower than that in younger children (32 per cent of children below one year). Prevalence of fever was highest in malaria endemic areas (40 per cent) and lowest in epidemic and highland areas (25 per cent).

The results further show that 24 per cent of the children with fever took an antimalaria drug and 15 per cent took antimalaria drugs the same/next day. The results also indicate that 70 per cent of children with fever sought treatment from a facility/health provider the same or next day. Endemic areas recorded the lowest percentage of patients who sought treatment within 24 hours following the onset of fever. But children living in epidemic-prone regions are more likely to seek prompt treatment and take an antimalaria medicine for fever. Only 22 per cent of children living in malaria-endemic areas sought treatment for their fever

Government policy presently recommends that all fevers in children under five years of age be presumptively treated as malaria with artemesinin combination treatment (ACT), which is provided free of charge at government and mission facilities. Perhaps surprisingly, the results show that 35 per cent of the children took amodioquine, compared with 29 per cent who took ACT. Eleven per cent of febrile children took SP and 8 per cent took chloroquine,

Of children with fever, 70 per cent of children sought treatment from a facility/health provider the same or next day. Children living in epidemic-prone regions are more likely to seek prompt treatment and take an antimalaria medicine for fever.

which has not been recommended as a first line treatment for malaria for ten years. Unfortunately, chloroquine was mostly used by the youngest children (13 per cent) and those in rural settings (9 per cent against 2 per cent in urban areas).

About 25 per cent of children under one year took ACT drugs, compared with 35 per cent of those aged four years. The survey shows that rural children under five years are more advantaged than their urban counterparts in treatment of malaria: Only 23 per cent of urban children under five took ACT, whereas nearly 30 per cent of rural children did so. Children under five residing in malaria epidemic regions had the lowest use of ACT, at 16 per cent, compared with the other zones at over 29 per cent.

Most patients obtained their medicines from either public or private health facilities, with 47 per cent receiving the medicines from government facilities. It was observed that even in government health facilities, non-recommended therapies are still in use, including chloroquine. The fact that some patients received ACT and quinine from shops is of concern, since these are medicines that are supposed to require a prescription from health workers.

ANC attendance in all zones was much higher than IPT uptake, and women with secondary education were more likely than those with primary education to attend ANC.

The results show that a majority of children (59%) with fever in the two weeks before the survey went to public sector facilities for treatment, compared with only 30 per cent who sought treatment from the private sector. Those living in rural areas (61 per cent) were more likely than urban residents (50 per cent) to seek care from the public sector. Only 28 per cent of rural residents took children with fever to private sector facilities, compared with 43 per cent of urban residents. Use of retail shops as a source of treatment was low at 12 per cent.

Pregnant women are the second major target group for malaria interventions because malaria infection is associated with adverse effects on the outcome of the pregnancy (leading to miscarriage, stillbirth or low birth weight) and maternal morbidity (anaemia or severe illness). Low birth weight (under 2,500 grams) is associated with neonatal and infant mortality. Since malaria infection may either lead to clinical symptoms or be asymptomatic, intermittent preventive treatment for malaria in pregnancy (IPTp) has been policy in Kenya since 1998. The current recommendation is to provide full treatment dosages of sulphadoxine pyrethamine (SP) beginning from quickening and repeat them every four weeks until delivery. This policy is particularly important for areas of high malaria (endemic) transmission in Kenya.

More than half of pregnant women slept under a net the night preceding the survey compared with 45 per cent of all women within the reproductive age.

About 87 per cent of mothers attended antenatal clinic (ANC) during their last pregnancy leading to a live birth in the past two years. More mothers in urban areas (93 per cent) attended ANC than those in rural areas (85 per cent). The survey further shows that low-risk malaria zones reported the highest ANC attendance (92 per cent), while seasonal transmission areas reported the lowest attendance (74 per cent).

The results indicate that 45 per cent of mothers took any antimalaria medicines for prevention during pregnancy. Mothers in urban areas (53 per cent) are more likely than those in rural areas (43 per cent) to have done so. Similarly, mothers from low malaria transmission zones were reported to have the highest use of antimalarials (52 per cent) and mothers from epidemic-prone zones the lowest (34 per cent).

The percentage of women who took any IPTp was higher at 25 per cent than of those who took IPTp2 (13 per cent). One urban mother in three (33 per cent) took any dose of IPTp compared with one in four mothers in rural areas (24 per cent). The data further show that mothers living in low-risk areas had higher use of any dose of IPTp compared with those living in epidemic-prone areas (33 per cent versus 16.7

Current malaria parasite prevalence indicates that all malaria cases should be diagnosed, instead of continuing presumptive treatment for children under five.

per cent, respectively). Similar trends were maintained for IPT2, where low malaria transmission zones had the highest rates of usage at 15 per cent, compared with 7.4 per cent in epidemic-prone zones. ANC attendance in all zones was much higher than IPT uptake (87 per cent versus 25 per cent). Women with secondary education were more likely than those with primary education to attend ANC (95 per cent and 87 per cent, respectively).

In 2006, when the current treatment policy was launched, an intensive nationwide information dissemination campaign was undertaken to increase awareness about ACT. The campaign included mass media, interpersonal communication and printed materials. Results of interviews with women aged 15–49 years show that 39 per cent had heard about ACT. Of these, 61 per cent received information from radio, 27 per cent from health workers and 11 per cent from television.

Summary of Recommendations

- To meet the Abuja targets, explore more free delivery options in order to better reach the poorest wealth quintile more effectively, consider a mass net retreatment campaign, and invest in qualitative research to better understand the drivers of net use and behaviour change outcomes.

- Shift the focus of ITN distribution from vulnerable populations to universal coverage of 100 per cent (a minimum of two nets per household) and usage to 80 per cent.

- Increase access to ACT and SP for IPTp at the community level by increasing its emphasis in the NHSSP Community Strategy, ensure the availability of recommended drugs in all government facilities, and strictly enforce the restrictions on non-recommended antimalarials.

- Continue advocacy and dissemination of targeted messages to promote early treatment-seeking behaviour for fever and IPTp uptake

- In light of the current malaria parasite prevalence, begin diagnosis of all malaria cases instead of continued presumptive treatment for children under five years of age.

- Emphasize joint planning by stakeholders to integrate interventions to prevent malaria in pregnancy.

- Over the long term, maintain the emphasis on girls' education, as the results consistently indicate that better educated mothers are more likely to attend ANC and to use nets.

- Finally, redouble efforts to reach current malaria control targets, not only to reduce current morbidity and mortality, but also because all indications are that global warming induced climate change will increase the incidence of the disease as a result of the expansion of malaria endemic zones into highland regions that are currently reasonably free of the disease.

CHAPTER 1

Introduction

Throughout sub-Saharan Africa malaria is one of the leading causes of morbidity and mortality. Kenya is no exception, and reducing the toll of this disease, especially on small children and pregnant women, is a major public health objective. The Kenya Malaria Indicator Survey (KMIS) was a national sample survey designed to provide up-to-date information on progress towards the achievement of the goals the National Malaria Strategy, which was instituted in 2001. The results of the survey are presented in this report.

The report opens with a brief profile of Kenya, summarizes the objectives of the National Malaria Strategy, and traces the extent of malaria endemicity in Kenya. Following this introduction, the report describes the survey methodology and implementation in detail. It then presents the results of the various aspects of the survey and concludes with a summary of policy recommendations arising from the findings.

Variations in altitude and terrain create contrasts in Kenya's climate, from hot and humid tropical along the coast to temperate in the interior and very dry in the North and North East. All have different implications for the prevalence of malaria.

1.1 Kenya Country Profile

Lying astride the Equator in Eastern Africa, the Republic of Kenya is bordered by Ethiopia to the North, Sudan to the North-west, Somalia to the East, Tanzania to the South and Uganda to the West. A 536-kilometre coastline stretches along the Indian Ocean in the southeast. Kenya lies across latitude 5° North to 5° South and longitude 34° East to 42° East.

Covering an area of 582,646 square kilometres, the land rises from sea level at the Indian Ocean to 5,199 metres at the highest peak of Mount Kenya. About 80 per cent of the land area is arid or semi-arid and only 20 per cent is arable. The land is mostly arid in the north and fertile in the Lake Victoria Basin in the southwest of the country. The Great

Rift Valley bisects the Kenya highlands into east and west. The highlands are cool and agriculturally rich areas in which both large and small holder farming are carried out.

The variations in altitude and terrain create contrasts in the country's climate, which ranges from hot and humid tropical along the coast to temperate in the interior and very dry in the North and North East. There are two rainy seasons, the long rains and the short rains. The long rainy season occurs from April to June and the short rainy season from October to December. The temperature remains high during these months. The hottest period is from February to March and coldest from July to August.

Kenya's geographic position and high percentage of arid and semi-arid lands make the country particularly vulnerable to the impact of global warming and climate change. The effects of this phenomenon are, in fact, already being felt in many areas, through prolonged drought and more intense flooding than have been known in the past. Moreover, over the next few decades the increasing temperatures are expected to extend the areas of malaria endemicity to zones that are presently relatively free of the disease (UNFPA, 2009).

Administratively, Kenya is divided into eight provinces, which in turn are subdivided into 174 districts, each district into divisions, each division into locations and each location into sub-locations. During the 1999 population census, each sub-location was further subdivided into census Enumeration Areas (EAs).

1.1.1 History

Kenya became a British protectorate in 1895 and a colony in 1920. The country attained its independence on 12 December 1963 after an armed struggle by the Mau Mau movement against the colonial government. Politically, a multi-party system was in place until 1982, when the constitution was amended to provide for a one-party state. In 1991, the amendment was repealed and Kenya reverted to multi-party. From 1964 to 2002, the party in power was the Kenya African National Union (KANU). The National Rainbow Coalition (NARC) party governed the country after the 2002 General Election until 2007. In early 2008, following extensive civil unrest occasioned by a disputed election, the current Grand Coalition government of the Party of National Unity (PNU) and the Orange Democratic Movement (ODM) took over the leadership.

The country has great ethnic diversity, with more than 42 tribes. Christianity and Islam are the major religions, but Hinduism is practised by many in the minority Asian community and some Kenyans observe African traditional worship. The official language is English and Kiswahili is the national language.

Kenya's eight provinces are home to peoples of diverse cultures - more than 42 ethnic groups with as many languages. They have in common a dependence on agriculture, which provides the livelihoods of 80 per cent of the population.

1.1.2 Economy

Largely market based, Kenya's economy has agriculture as its backbone. The sector provides livelihood to approximately 80 per cent of the population and is a major share of the gross domestic product (GDP). In 2007 agriculture and forestry contributed about 22.7 per cent to GDP and 17.8 per cent of wage employment. The main agricultural cash crops include tea, coffee and horticultural products (fruits, vegetables and cut flowers). Kenya is the world's leading producer of cut roses.

The country also has a strong industrial sector; manufacturing contributed 9.7 per cent to GDP in 2007. Tourism, a key socio-economic driver, earned the country Ksh65.4 billion and directly employed 10.3 per cent of wage labour in 2007 (*Economic Survey*, 2008).

Independent Kenya's economic growth record has been mixed. In the first decade after independence (1964–1973), the economy grew at impressive rates, with GDP expanding by 6.6 per cent per annum. The first oil crisis of 1973 brought the rapid growth to an abrupt halt and the growth rate decelerated to below 4 per cent for much of the 1970s. The exception was 1976/77, when the unexpected "coffee boom" saw GDP growth rising to 8.2 per cent in 1977. But the collapse of the East African Community in 1977 and the second oil crisis of 1979 contributed to further deceleration in economic performance.

Drought experienced in the early 1980s, world recession and the international debt crisis worsened the domestic situation. In addition, misaligned real exchange rates, the prevailing interest rate regime and poor commodity pricing undermined macroeconomic stability.

To address these economic woes the Government introduced liberalization and deregulation of trade and exchange rate regimes, as well as public and financial sector reforms. The implementation of the reforms led to a resurgence of growth, which averaged 5 per cent during the 1986–1990 period. Decline set in again in the 1990s as a result of inconsistent economic policy, poor weather and deteriorating infrastructure, declining donor support, high inflation owing to massive rent-seeking, insecurity, depressed investments, declining tourism activities, and the poor performance of the manufacturing sector. Overall GDP growth slid further to 2.5 per cent between 1990 and 1995 and to 2 per cent between 1996 and 2000. At this rate, growth was negative in real terms since it was not keeping pace with population growth. Poverty levels rose to encompass about 60 per cent of the population, with both poverty and economic growth negatively affected by the impact of HIV and AIDS, which reached an estimated adult prevalence rate of 14 per cent in 1999 (UNAIDS, 2000), but then declined to about 6.7 per cent (CBS et al., 2004). Nyanza Province, which has the highest HIV prealence, is also a malaria endemic area.

The faltering economic performance was apparent in all sectors of the economy. The decline in GDP growth partly reflects a series of shocks beyond the control of the Government These included *El Nino*-induced floods in late 1997; weak soft commodity prices following the 1997 Asian financial crises; two successive years of severe drought (1999 and 2000); and the worldwide downturn in tourism after the 11 September 2001 terrorist attacks in the United States. All were exacerbated by the economic policy environment. To redress the situation the new NARC government implemented the Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC) beginning in 2002. The economy began to recover, registering growth rates that rose from 2.8 per cent in 2003 to 7.0 per cent in 2007 (*Economic Survey*, various issues).

Kenya's estimated population of 37.2 million is largely youthful – almost 44 per cent are under 15 years and only 4 per cent are aged 65 and older – and increasingly urbanized.

1.1.3 Population

According to the 1999 Kenya Population and Housing Census, the population stood at 28.7 million. Previous census results indicated an annual population growth rate of 2.9 per cent during the 1989–1999 periods, a reduction from 3.4 per cent recorded for both the 1969–1979 and 1979–1989 intercensal periods. Decline in fertility rates and realization of the efforts contained in the National Population Policy for Sustainable Development (NCPD, 2000) were the major contributors to this decline in population growth. On the other hand, mortality rates have increased since the 1980s, largely as a result of increased AIDS-related deaths, decline in health services and pervasive poverty. The 2007 population was projected to be 37.2 million as a result of changing population dynamics (*Statistical Abstract*, 2008)

The Kenya Population and Housing Census of 1979 reported an increase in the crude birth rate of 54 per 1000, but this declined to 48 and 41 per 1,000 in 1989 and 1999, respectively. For a long time the crude death rate has been on the decline, but the period 1989–1999 reported an increase of 12 per 1,000 from 11 per 1,000 of the previous period 1979–1989. Infant mortality rate, as crude death rate, decreased from 119 deaths per 1,000 live births in 1969 to 88 per 1,000 in 1979 and to 68 per 1,000 in 1989, but then increased to 77 per 1,000 in 1999. Kenya is characterized by a youthful population – almost 44 per cent are under 15 years and only 4 per cent are aged 65 and older. This is attributed to the high fertility and declining mortality in the past, and will contribute to continuing population momentum for some years to come.

Kenya's urban population has grown from 3.8 million in 1989 to 9.9 million in 1999, constituting 34 per cent of total population. One result has been the proliferation of urban informal settlements leading to environmental degradation and deteriorating public health standards (KBS, 1989, 1999).

Drought experienced in the early 1980s, world recession and the international debt crisis worsened the domestic situation. In addition, misaligned real exchange rates, the prevailing interest rate regime and poor commodity pricing undermined macroeconomic stability.

To address these economic woes the Government introduced liberalization and deregulation of trade and exchange rate regimes, as well as public and financial sector reforms. The implementation of the reforms led to a resurgence of growth, which averaged 5 per cent during the 1986–1990 period. Decline set in again in the 1990s as a result of inconsistent economic policy, poor weather and deteriorating infrastructure, declining donor support, high inflation owing to massive rent-seeking, insecurity, depressed investments, declining tourism activities, and the poor performance of the manufacturing sector. Overall GDP growth slid further to 2.5 per cent between 1990 and 1995 and to 2 per cent between 1996 and 2000. At this rate, growth was negative in real terms since it was not keeping pace with population growth. Poverty levels rose to encompass about 60 per cent of the population, with both poverty and economic growth negatively affected by the impact of HIV and AIDS, which reached an estimated adult prevalence rate of 14 per cent in 1999 (UNAIDS, 2000), but then declined to about 6.7 per cent (CBS et al., 2004). Nyanza Province, which has the highest HIV prealence, is also a malaria endemic area.

The faltering economic performance was apparent in all sectors of the economy. The decline in GDP growth partly reflects a series of shocks beyond the control of the Government These included *El Nino*-induced floods in late 1997; weak soft commodity prices following the 1997 Asian financial crises; two successive years of severe drought (1999 and 2000); and the worldwide downturn in tourism after the 11 September 2001 terrorist attacks in the United States. All were exacerbated by the economic policy environment. To redress the situation the new NARC government implemented the Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC) beginning in 2002. The economy began to recover, registering growth rates that rose from 2.8 per cent in 2003 to 7.0 per cent in 2007 (*Economic Survey*, various issues).

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1.2 Health Priorities and Programmes

The Kenya Vision 2030 goal for the health sector is to provide equitable and affordable quality health services to all Kenyans. The Vision also aims at restructuring the health care delivery system to shift the emphasis from curative to promotive and preventive health care. In addition, measures are being taken to control environmental threats to health as part of the effort to lower the nation's disease burden. (Kenya Vision 2030 First Medium Term Review, 2008).

The Government of Kenya through the Ministry of Health (MOH) launched the second National Health Sector Strategic Plan (NHSSP II) covering the period 2005–2010. The goal of NHSSP II is to reduce health inequalities and to reverse the downward trend in health-related outcome and impact indicators. The mission of the strategic plan is to promote and participate in the provision of integrated and high quality promotive, preventive, curative and rehabilitative health care services to all Kenyans.

Through the Kenya Essential Package for Health (KEPH) introduced with the strategy, NHSSP II intended to achieve the following objectives:

- Increase equitable access to health services.
- Improve the quality and responsiveness of services in the sector.
- Improve the efficiency and effectiveness of service delivery.
- Enhance the regulatory capacity of MOH.
- Foster partnerships in improving health and delivering services.
- Improve the financing of the health sector.

NHSSP II shifted the focus of health care from the treatment of disease to the promotion of individual health through various stages in the human life cycle and the provision of services at six defined levels of the health care system – with both life stages and care levels defined by KEPH. An important introduction was the focus on the community level, which has a specific strategy for building community participation in the health care system.

In the KEPH approach, health programmes (the malaria programme included) centre on the different phases of human development and thus complement each other, so that synergy and mutual reinforcement among the programmes can be achieved. This is reflected in the vision of NHSSP II, which is to have an efficient and high quality health care system that is accessible, equitable and affordable for every Kenyan.

The targets of the NHSSP II focusing on malaria are:

- 60 per cent of under-fives and pregnant women sleep under long-lasting insecticide treated bed nets or other insecticide treated nets (LLITNs/ITNs).
- 80 per cent of patients admitted with severe malaria receive correct treatment.
- 60 per cent of patients with clinical malaria obtain parasitological diagnosis.
- Malaria case management improved, as reflected in there being no stock outs for the first line antimalaria drug.

1.3 The National Malaria Strategy and Policy Issues 2001–2010

Malaria accounts for up to 30 per cent of outpatient attendance and 19 per cent of admissions to health facilities. To combat this disease the Ministry of Health through the National Malaria Control Programme (NMCP) developed a National Malaria Strategy (NMS) covering the period 2001 to 2010. The main goal of the NMS was to reduce the level of malaria infection and consequent death by 30 per cent by the year 2006 and to sustain that improved level of control to 2010. The strategy's goal can only be attained through partnerships and participation of all stakeholders. The strategy describes four strategic interventions:

1. Clinical management incorporating prompt effective treatment: This involves awareness of client communities, improved case management by service providers and adequate supply of antimalaria drugs by

monitoring drug efficacy. In the recent past the NMCP developed guidelines to guide health workers on the new effective forms of treatment and diagnosis. There was a policy change in 2005 from sulphadoxine pyrethamine (SP) to artemesinin combination treatment (ACT) as the first line antimalarial after it became apparent that SP was no longer effective.

2. Management of malaria and anaemia in pregnancy: This involves provision of SP to antenatal clinics (ANC) so that pregnant women in endemic areas can access intermittent preventive treatment (IPT) during their clinic visits. According to the guidelines, pregnant women are supposed to receive at least two doses of IPT during their gestation after quickening. The strategy also involves the provision of ITNs to pregnant women through the ANCs in endemic areas. This intervention is done in consultation with the Division of Reproductive Health (DRH).

3. Vector control using ITNs and other methods: This is achieved by creating demand for ITNs, reducing taxation on materials used to manufacture ITNs and protecting economically vulnerable groups. Provision of subsidized nets to vulnerable groups is also part of the policy; this is done through maternal/child health services (MCH). Other vector control methods are larviciding and fogging.

4. Epidemic preparedness and response (including indoor residual spraying): This strategy includes empowering the districts defined as epidemic prone to recognize whether there is an epidemic or not. In cooperation with the Division of Disease Surveillance and Response (DDSR), districts are trained and encouraged to set their thresholds. Ways and means of forecasting epidemics are also being looked into. The epidemic districts benefit from annual indoor residual spraying (IRS) campaigns. Buffer stocks of medicines and supplies are also procured and distributed to districts once it has been established that there is an epidemic.

The strategy also describes two support structures that cut across the four interventions:

National Malaria Control Programme
www.nmco.or.ke

- ***Information, education and communication,*** which involves the development and dissemination of messages about the various interventions. The messages are disseminated through the mass media, print materials, school health programmes, and the NMCP website. This support structure is also responsible for planning Kenya's observance of World Malaria Day, celebrated annually on 25 April, in collaboration with the Division of Health Promotion.

- ***Monitoring and evaluation,*** which is done through research measuring target indicators and assessment of the overall impact of the NMS, e.g., KMIS.

The targets of the NMS according to the interventions are included Appendix A.

1.4 Malaria Endemicity in Kenya

Five rather distinct areas or zones of malaria prevalence can be defined in Kenya (see Figure 1.1). The zones illustrated in Figure 1.1 were refined in the KMIS as the following:

Zone 1 depicts the ***arid/seasonal regions*** of the country. These are the North Eastern, North Western and the Southern lowland areas. In these areas malaria is experienced in communities near bodies of water. There is transmission for a few months of the year.

Zone 2 indicates the ***coastal endemic region.*** In this region, transmission and disease risks are similar to that of the lakeside endemic area (zone 4) but exhibit stronger seasonality. The transmission is lower towards the Somali border.

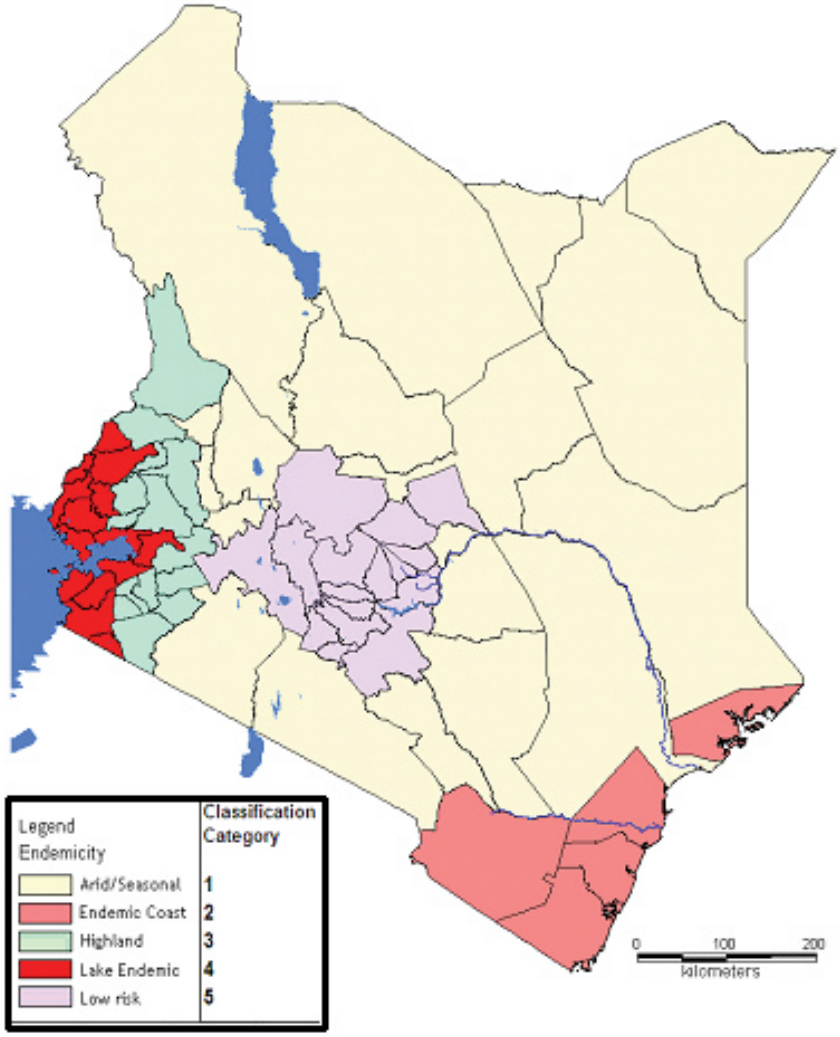
Zone 3 depicts the ***highland epidemic region***: This region has a low disease risk in an average year, but variations in rainfall and temperatures between the years can lead to epidemics affecting all populations in the

region. The population in this region does not have immunity against malaria. In light of the risk of epidemics, IRS is usually done annually to prevent transmission in this region. In the survey these regions were called ***Epidemic***.

Zone 4 near Lake Victoria indicates the ***lakeside endemic zone***. Malaria transmission in this zone is throughout the year. The adult population living here acquires partial immunity, so that the risk of and death from malaria are highly concentrated among children under five years and pregnant women. In the KMIS, the lakeside and coastal regions have been merged because of their similar characteristics and called ***endemic regions***.

Zone 5 depicts the ***low risk regions***: These regions cover the central area of the country. Several parts of these regions experience almost no malaria risk, e.g., Nairobi, Nyeri and Nakuru.

Figure 1.1: Malaria zones in Kenya



CHAPTER 2

Survey Organization and Methodology

The 2007 Kenya Malaria Indicator Survey (KMIS) was the first survey of its kind to be carried out in Kenya. The survey was designed to assess the Abuja Declaration targets, which were adopted in NMS.

The main objective of the KMIS was to measure progress toward achieving the goals and targets set in the NMS 2001–2010. The specific objectives of the KMIS 2007 were:

1. To collect up-to-date information on coverage of the core malaria interventions included in the NMS 2001–2010.
2. To assess malaria parasite prevalence in children 1–59 months.
3. To assess the status of anaemia among children 6–59 months.
4. To build capacity of the DOMC and its partners in the implementation of the KMIS.

The population sample surveyed was expected to provide estimates for most of the indicators in malaria zones at the provincial and urban-rural levels.

2.1 Survey Organization

A number of institutions took part in conducting the 2007 KMIS. The Division of Malaria control (DOMC) in the Ministry of Health coordinated the overall exercise. The sample design, training, data collection and analysis, and report writing were carried out by the Kenya National Bureau of Statistics (KNBS). The Centers for Disease Control and Prevention (CDC) provided technical assistance in the provision and programming of the personal digital assistants (PDAs) used for data collection, training of research assistants, and data analysis. The Kenya Medical Research Institute/Walter Reed Project Centre of Excellence for Diagnostic Microscopy (KEMRI/WRP) assisted in training and the collection and analysis of blood slides. The National Coordinating Agency for Population and Development (NCAPD) assisted in training, fieldwork and report writing. The World Health Organization (WHO) provided technical assistance, while funds were provided by the UK's Department for International Development (DFID).

2.2 Sample Design

Specific targets of the 2007 KMIS were women of reproductive age (15–49 years) and children under the age of five years living in malaria endemic or epidemic-prone areas. The geographical coverage included a total of 63 (out of 69) administrative districts (as at the 1999 Kenya Population and Housing Census). The excluded areas were Nairobi Province; Kiambu, Nyandarua and Nyeri districts in Central Province; Meru Central district in Eastern Province; and Laikipia district in Rift Valley Province.

The KMIS utilized the National Sample Survey and Evaluation Programme (NASSEP IV) sampling frame. The master sample is a national two-stage cluster sampling frame developed by the KNBS after the 1999 Census specifically for household-based sample surveys. The frame was developed using the districts as the first level stratification. The first stage sampling process of the frame involved selection of enumeration areas (EAs) and creation of clusters using the probability proportional to measure of size (PPMOS) method. A total of 1,800 clusters was created, of which 1,260 are rural and 560 urban.

A representative sample of 7,200 households from a total of 200 clusters was selected for KMIS and a uniform sample of 36 households allocated to each cluster. The intention was to provide comparable estimates of key malaria indicators including the prevalence of anaemia in children aged 6 to 59 months. The sample was expected to provide estimates for most of the indicators in malaria zones at the provincial and urban-rural levels.

The allocation of the sample into domains was done to ensure that the lowest domain of the study (North Eastern Province) had a minimum of 21 clusters. The sample was further distributed proportionately into districts within a province. The first stage of sampling of the clusters was done by KNBS prior to commencement of fieldwork and the details loaded into PDAs fitted with a geographic positioning system (GPS). All the selected clusters were mapped using PDAs in a process that involved collecting the basic descriptions of all the households and their geographic coordinates. (See box on facing page.) A simple random sampling of 36 households per cluster was selected with the aid of the PDAs.

Further details on the sample design are provided in Appendix B.

2.3 Training

An initial 122 persons identified to conduct the field work took part in a seven-day training programme prior to commencement of the survey. They comprised 80 research assistants/supervisors and 42 health workers (22 lab technologists and 20 nurses/clinical officers). All were trained on the objectives of KMIS, malaria transmission and the lifecycle of the malaria parasite, interviewing skills, and the use of PDAs. The research assistants/supervisors were further instructed on the identification and mapping of the households.

The health workers were trained on the new treatment policy, the use of hemocues (for measurement of anaemia) and collection of blood smears for malaria parasites (for microscopy examination). This was done in collaboration with KEMRI/WRP.

All the personnel participated in a one-day field test (dry run) to ensure they understood the practical application and to test the instruments.

In addition, all the supervisors were taken through a special session on trouble shooting of PDAs and backing up of the data. They were also briefed on managing field procedures and promoting teamwork.

2.4 Fieldwork

From the 122 trained research assistants/supervisors and health workers, 101 were selected for final data collection. The remaining 21 were retained as a pool of trained KMIS personnel to act as buffers in case of any shortage thereafter. The final personnel consisted of 20 teams, each with one supervisor, two research assistants, one lab technologist and one nurse/clinical officer. Each team was allocated one driver and a vehicle and given specific clusters to cover within a given period

Personal Digital Assistant (PDA)

A personal digital assistant (PDA) is a small handheld computer. It generally has a small screen (approximately 3–4 inches), a long-life battery (allowing more than one full day of field use), a secure data storage card for data backup (like the ones used in digital cameras) and a touch-sensitive screen. A stylus is used with the touch screen for entering data.

PDAs were used for field data collection by the KMIS interviewers. Each of the PDAs had a global positioning system (GPS) installed to allow mapping of households in the surveyed clusters. The system allowed the interviewers to pinpoint the location of every dwelling in a chosen cluster and then choose a random sample, thereby creating an up-to-date sampling frame.

A second software programme guided the interviewers through the data collection process. The programme checked information as it was being entered in the field, not allowing invalid entries (e.g., pregnant males) and verifying suspicious values (are you sure there were 11 bed nets in this house?). The software programme showed the interviewers only questions that were appropriate to the respondent being interviewed at the moment. For example, if an interviewer was speaking to a man, questions about a woman's reproductive history would be automatically skipped. Pictures of various brands of bed nets were included to assist interviewers in proper identification of the bed nets in each household. Also included were training videos on the proper use of the hemocue machines for determining haemoglobin levels and how to properly prepare thin and thick smear slides for assessing parasitaemia.

At the end of the survey, the PDAs were returned to Nairobi, where the data on each were aggregated onto a single database on a laptop computer. This process took only a few hours. After this, report programmes were run to produce preliminary and final analyses. Since the data had already been screened by the data entry programme on the PDA, little data editing was required.

The KMIS was the first national survey in Kenya to use the PDA technology.

of time. Appendix C contains a list of the supervisors, enumerators and others involved in conducting the survey.

A few weeks to the fieldwork, the communities residing in the clusters were mobilized and sensitized on the KMIS. This was necessary because the KMIS involved taking blood samples from under-five children, which is a sensitive issue to many households.

The fieldwork ran from 10 July to 15 August 2007. The teams spent an average of three days in each cluster with the first day dedicated to mapping of the households. Once all the households in each cluster were mapped, the data were consolidated into the supervisor's PDA and used to sample 36 households using a simple random sampling method.

The entire fieldwork was closely supervised by a team of national supervisors who visited the teams in the field and ensured that problems encountered were sorted out. The teams were facilitated in the field by KNBS district staff – District Statistical Officers and Enumerators – who made sure that the sampled areas were accurately identified. Village elders were also instrumental in guiding the teams and mobilizing communities in their respective clusters.

The benefits of participation in the survey included identification and on-the-spot treatment of malaria and anaemia: Any child found to be ill because of low haemoglobin and/or a positive RDT was immediately treated for malaria and referred to the nearest health facility.

2.5 Questionnaires

The KMIS adopted the model questionnaires developed by the MEASURE DHS+ programme and adopted and recommended for use by the Roll Back Malaria Monitoring and Evaluation Reference Group (MERG) Task Force on Household Surveys. The questionnaires were first reviewed by the KMIS Technical Working Group (TWG) and adapted to the Kenyan situation. They were later programmed into PDAs by a team from CDC. The PDA English version of the questionnaire was translated into the Swahili language. All KMIS interviews were done using PDAs; there were no paper forms.

Appendix D contains samples of the questionnaires that guided the survey. They were split into two categories covering household and individual women components:

- ***The household questionnaire:*** The household questionnaire captured information on household membership and socio-economic characteristics and was used as a basis for identifying the eligible women (15–49 years). It also contained information on possession and use of mosquito nets. Haemoglobin measurements for assessing anaemia status were recorded in the household module, along with the results of any rapid diagnostic tests (RDTs) that were needed.

- ***The woman's questionnaire:*** The woman's questionnaire recorded a recent birth history, pregnancy status, use of IPT during pregnancy and access to prompt treatment with antimalarials for children under five with reported fever.

2.6 Response Rates

Household and individual interview response rates are presented in Table 2.1. About 95 per cent of the targeted households were interviewed. The survey yielded response rates of 89 per cent and 87 per cent of eligible women and eligible children, respectively. The response rate for households was higher in rural areas (96 per cent) than urban areas (92 per cent).

Table 2.1: Response rates for the household and individual interviews

Number of households, number of interviews and response rates, according to residence

	Sample	Eligible	Completed	Response rate (per cent)
National				
Households	7,200	7,200	6,854	95.2*
Women (females 15–49)	-	6,893	6,111	88.7
Children (under 5 years)	-	5,840	5,105	87.1
Rural				
Households	5,868	5,868	5,629	95.9*
Women (females 15–49)	-	5,528	4,892	88.5
Children (under 5 years)	-	4,975	4,406	88.6
Urban				
Households	1,332	1,332	1,225	92.0*
Women (females 15–49)	-	1,365	1,219	89.3
Children (under 5 years)	-	865	725	83.8

* The household response rate is computed as the number of completed household interviews divided by the number of eligible households (i.e., sampled households minus households that were vacant, destroyed or where all members were absent).

2.7 Data Processing

As noted, the KMIS data were fully captured using PDAs fitted with GPS. The standard MIS questionnaires were programmed into the PDAs and tested before the actual field work. The data were continuously saved in a central PDA in each team and later transferred into a personal computer for merging and analysis.

The data underwent various cleaning processes before analysis. First, the data were

corrected for any mismatch and wrong coding. The process involved using *ArcGIS* software to plot the coordinates and identify misplaced information. The data were further split and merged into various data sets to ease analysis. The *Statistical Package for Social Scientists* (SPSS) and the *Statistical Analysis System* (SAS) software were used for analysis of the data.

2.8 Ethical Considerations

The KMIS protocol was submitted to the Kenyatta National Hospital/University of Nairobi Scientific and Ethical Committee and the KEMRI Scientific and Ethical Committees for approval. During data collection in the field, informed consent was sought from the head of the household to administer the questionnaires. Consent was also sought from the parents/guardians of children before any pricking for haemoglobin and blood slide was done. Where this was not obtained the interview and/or procedures were not carried out. Strict confidentiality was maintained and all personal identifiers were removed from the data during analysis.

The risks and benefits of participation in the survey were explained to each participant during the process of informed consent. The risk of participation for children under five was minimal, since it was limited mostly to temporary discomfort associated with finger-prick blood collection. The benefits of participation in the survey included identification and on-the-spot treatment of malaria and anaemia. There was minimal risk to women who participated in the interview, other than the possible temporary discomfort during the discussion of sensitive information around reproductive history and child survival.

Nearly all of the targeted households were interviewed, as well as 89 per cent of eligible women and 87 per cent of eligible children.

Any child found to be ill because of low haemoglobin and/or a positive RDT was immediately treated for malaria and referred to a health facility nearest to the place of residence as per the national guidelines.

2.9 Weighting the Sample

The resulting sample was not self-weighted because of the imbalance in allocation among the strata and non-response at household or individual levels. A final weighting adjustment procedure was done to provide comparable estimates for the domains of study.

The weighting procedure used design weights derived during the creation of the NASSEP IV sampling frame together with the response levels of the survey. Weighting was first done using the design selection probabilities and later adjusted to cater for household and individual non-response. Further, post-stratification adjustment was done on the basis of projected provincial estimates of the study areas. Finally, the final aggregate weights were normalized. Details on weighting procedures are presented in Appendix B.

All the results presented in this report, except those on response rates, are based on the weighted data.

CHAPTER 3

Household Population and Housing Characteristics

Basic demographic and socio-economic characteristics of the surveyed household population are summarized in this chapter. The household background characteristics include age, place of residence, sex, educational attainment, household socio-economic status and housing characteristics. The background information assisted in linking the household demographic and socio-economic characteristics to ANC attendance for women aged 15–49 years, health care seeking behaviour of children under five, ownership and use of mosquito nets by children and pregnant women, and the use of antimalaria drugs during pregnancy.

3.1 Household Population

Results of the household population distribution by five-year age groups by place of residence are shown in Table 3.1. The results show that the surveyed population consists of 52 per cent females and 48 per cent males. The results further show that children under five years of age constitute about 20 per cent of the population.

Figure 3.1 presents the population pyramid of the surveyed population. The age-sex structure shows a wide base, indicating that the population is mostly youthful.

Figure 3.1: Population pyramid

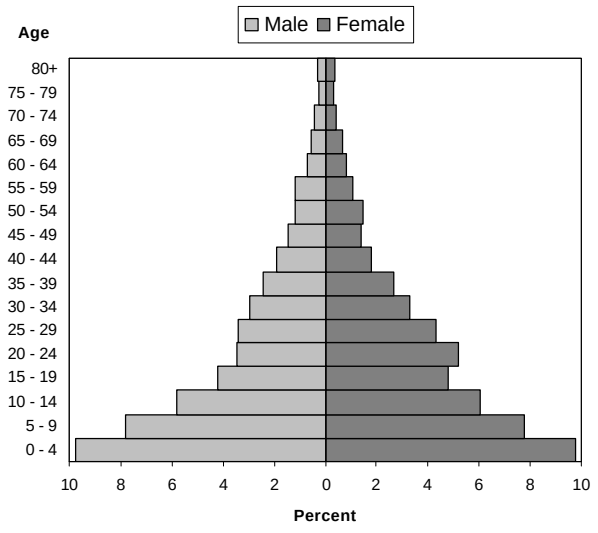


Table 3.1: Household population by age, sex and residence

Percentage distribution of the household population by five-year age groups, according to sex and residence

	Urban			Rural			Total		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
0–4	20.6	18.4	19.4	20.4	18.8	19.6	20.4	18.7	19.5
5–9	12.9	11.8	12.3	16.9	15.4	16.1	16.3	14.9	15.6
10–14	7.1	7.8	7.5	13.0	12.3	12.6	12.2	11.6	11.9
15–19	6.4	10.8	8.8	9.2	8.9	9.0	8.8	9.1	9.0
20–24	9.5	14.6	12.3	6.9	9.1	8.0	7.2	10.0	8.7
25–29	12.6	12.8	12.7	6.3	7.5	6.9	7.2	8.3	7.7
30–34	8.5	7.4	7.9	5.8	6.1	5.9	6.1	6.3	6.2
35–39	8.0	6.2	7.0	4.6	4.9	4.8	5.1	5.1	5.1
40–44	5.3	2.8	4.0	3.7	3.5	3.6	4.0	3.4	3.7
45–49	3.1	2.8	2.9	3.0	2.7	2.9	3.0	2.7	2.9
50–54	2.5	2.0	2.2	2.5	3.0	2.7	2.5	2.8	2.7
55–59	1.6	0.7	1.1	2.6	2.3	2.4	2.4	2.1	2.2
60–64	0.7	0.5	0.6	1.7	1.8	1.7	1.5	1.6	1.6
65–69	0.5	0.5	0.5	1.2	1.5	1.3	1.1	1.3	1.2
70–74	0.2	0.3	0.3	1.1	0.9	1.0	0.9	0.8	0.9
75–79	0.1	0.1	0.1	0.6	0.7	0.6	0.5	0.6	0.6
80 +	0.2	0.4	0.3	0.7	0.7	0.7	0.6	0.7	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	2,233	2,492	4,725	12,323	13,001	25,324	14,556	15,493	30,049

NOTE: Table is based on de jure household members, i.e., usual members. The data are not for Kenya as a whole, but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central) and Rift Valley (Laikipia).

3.2 Household Composition

Mean household size has implications for the pattern of household expenditure. It affects the health care status of the household in terms of nutrition, as well as the affordability and accessibility of health care necessities such as drugs and mosquito nets. Table 3.2 shows the percentage distribution of household size, according to residence and mean size of household. The mean size of a Kenyan household is 4.4 persons. On average, urban households are smaller (3.7 persons) than rural households (4.5).

Table 3.2: Household composition

Percentage distribution of household size, according to residence and mean size of household

Number of usual members	Urban	Rural	Total
1	14.0	9.4	10.2
2	15.9	11.3	12.1
3	21.1	15.5	16.5
4	18.9	16.4	16.8
5	12.2	15.7	15.1
6	9.9	12.2	11.8
7	2.9	8.1	7.2
8	2.8	4.9	4.5
9+	2.3	6.4	5.7
Mean size of household	3.7	4.5	4.4
Total number of households	1,225	5,629	6,854

NOTE: Table is based on de jure household members, i.e., usual members. The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

3.3 Household Headship

Nearly 30 per cent of the households are female headed. Three in four urban households and more than 70 per cent of rural households are male headed. Over 60 per cent of the household heads have not been educated beyond primary level. Heads of household in urban areas are twice as likely as their rural counterparts to have at least secondary school education. Table 3.3 presents the percentage distribution of household heads by sex and education.

Table 3.3: Sex and education of household head

Percentage distribution by sex and education of household head

Characteristic	Residence		
	Urban	Rural	Total
Gender			
Male	74.9	70.1	70.9
Female	25.1	29.9	29.1
Household education			
Nursery/Kindergarten	8	23.6	21
Primary	31.6	51.5	48.1
Post-primary/Vocational	1.7	1.8	1.8
Secondary/ 'A' level	40.5	18.5	22.3
College	12.1	3.8	5.3
University	6.1	0.8	1.7
Total	100	100	100
Total number of households	1,225	5,629	6,854

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

3.4 Demographic Characteristics of Women

Figure 3.2 and Table 3.4 present the distribution of women age 15–49 years by background characteristics. About 40 per cent of the respondents were aged 15–24 years and 32 per cent aged 25–34 years.

Figure 3.2: Women respondents by age

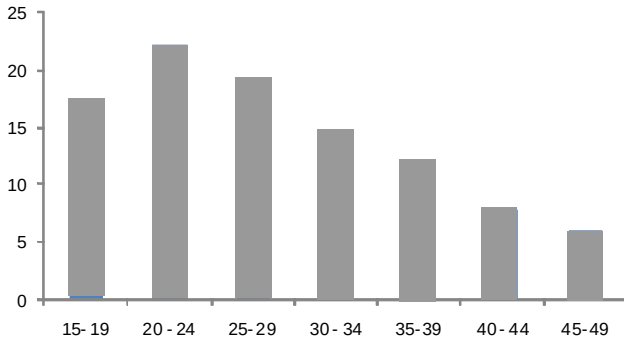


Table 3.4: Demographic characteristics of female respondents

Percentage distribution of women aged 15-49 by background characteristics

Background characteristic	Percentage
Residence	
Urban	19.2
Rural	80.8
Province	
Central	7.5
Coast	10.5
Eastern	17.0
North Eastern	3.3
Nyanza	18.2
Rift Valley	30.1
Western	13.4
School level	
None	23.7
Nursery/Kindergarten	1.0
Primary	50.5
Post-primary/Vocational	1.1
Secondary/ 'A' level	19.5
College (Middle level)	3.3
University	0.8
Religion	
Roman Catholic	22.4
Protestant/Other Christian	63.3
Muslim	8.3
No religion	2.5
Other	3.3
Total	100
Total women	6,111

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

The survey further shows that about half of the of women of reproductive age have attained primary level school of education, but 24 per cent have no education at all. Overall, three in four women (75 per cent) have not gone beyond the primary level of education. Most of the women respondents (85 per cent) are Christians of various denominations; only 8 per cent are Muslims.

3.5 Housing Characteristics

Information on housing characteristic such as access to electricity, source of drinking water, sanitation and flooring materials is key to explaining interrelationships between social and economic conditions of the household and its likely exposure to and prevalence of diseases (2003 Kenya Demographic and Health Survey, CBS et al., 2004). Table 3.5 presents the distribution of households by housing characteristics.

3.5.1 Electricity

Only 10.3 per cent of the households interviewed have access to electricity. There is a significant difference in the supply of electricity between urban and rural residents. Half of urban households in malaria endemic areas are connected to electricity supply, but only 2.2 per cent of rural households.

3.5.2 Cooking fuel

About 78 per cent of households depend on firewood or other biomass as cooking fuel. Whereas urban households mostly use charcoal (50 per cent) or kerosene (26 per cent), rural

The mean size of a Kenyan household is 4.4 persons. On average, urban households are smaller (3.7 persons) than rural households (4.5). Over 60 per cent of household heads have not been educated beyond primary level. Heads of households in urban areas are twice as likely as their rural counterparts to have at least secondary school level of education.

Biomass is the leading cooking fuel for Kenyans in malaria-prone areas. Nine out of ten rural households in these areas depend on firewood or straw and nearly half of urban households use charcoal. Another 26 per cent of urban households use kerosene. Less than 3 per cent of rural folk have access to electricity, against nearly half of urbanites.

households use mostly firewood/straw (91 per cent).

3.5.3 Drinking Water

Almost 28 per cent of households obtain drinking water directly from rivers or streams; nearly 27 per cent use either water piped into the dwelling or plot or a public tap. About three in four urban households (75 per cent) and 17 per cent of those in rural areas have water piped into the dwelling, plot or public tap.

For households in rural areas, the main source of drinking water is a river or stream (33 per cent), followed by a spring (14 per cent) and a covered public well (10 per cent).

3.5.4 Sanitation

Nearly two-thirds of the households interviewed use traditional pit latrines, about 10 per cent use ventilated improved pit latrines (VIPs) and 7 per cent use flush toilets. But 19 per cent have no toilet facilities.

In urban areas, 35 per cent, 44 per cent and 19 per cent of the households have flush toilets, traditional pit latrines and VIPs, respectively. The most commonly used toilets in rural areas are traditional pit latrines (68.6 per cent).

3.5.5 Floor

Over half of the households use earth as their flooring material. The next predominantly used flooring materials are cement (30 per cent) and dung (19 per cent). Among urban households, 84 per cent use cement, while 59 per cent of rural households use earth as their flooring material.

Table 3.5: Housing characteristics

Percentage distribution of households by housing characteristic, according to residence

Housing characteristic	Residence		
	Urban	Rural	Total
Electricity			
Yes	49.8	2.2	10.3
No	50.2	97.8	89.7
Cooking fuel			
Electricity	1.4	0.1	0.3
LPG/natural gas	9.8	0.4	2.0
Biogas	0.1	0.0	0.0
Kerosene	26.3	1.2	5.5
Coal/lignite	0.0		0.0
Charcoal	49.7	6.7	14.1
Firewood/straw	11.6	91.4	77.7
Other	1.1	0.2	0.3
Drinking water			
Piped into dwelling	18.1	1.5	4.3
Piped into yard/plot	17.1	5.3	7.3
Public tap/standpipe	40.1	10.2	15.3
Open well in compound	1.0	2.0	1.8
Open public well	1.9	6.0	5.3
Covered well in compound/plot	2.9	4.2	3.9
Rainwater	2.3	2.6	2.5
Bottled water	2.2	0.1	0.4
Covered public well	7.4	10.4	9.8
Spring	1.6	14.4	12.2
River/stream	2.1	33.2	27.9
Lake/pond	0.0	4.6	3.8
Other	3.2	1.7	2.0
Dam		3.8	3.2
Toilet			
Flush toilet	35.0	0.8	6.6
Traditional pit latrine	44.3	68.6	64.4
Ventilated improved pit latrine (VIP)	18.6	8.2	9.9
No facility/ bush/field	2.1	22.4	18.9
Other	0.1	0.2	0.1
Floor			
Earth/sand	9.8	58.8	50.4
Dung	3.9	21.7	18.7
Wood planks	0.5	0.4	0.4
Palm/bamboo		0.0	0.0
Parquet or polished wood	0.1	0.0	0.0
Ceramic tiles	1.4	0.0	0.2
Cement	84.3	18.9	30.1
Other		0.2	0.1
Total	100.0	100.0	100.0
Total number of households	1,225	5,629	6,854

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

Over a quarter of rural households get their water directly from rivers, streams or springs. The most commonly used toilets in rural areas are traditional pit latrines, but nearly a fifth of rural households have no toilet facilities.

3.6 Household Possessions

Household possessions indicate the socio-economic status of households. Apart from possession of a refrigerator, the KMIS collected information on means of transportation and communication. As shown in Table 3.6, over 70 per cent of the households own a radio, 37 per cent have a cell phone and 33 per cent have a bicycle. Radios are found in 83 per cent of urban households and 68 per cent of rural ones. The survey further shows that 73 per cent of urban households have a cell phone, compared with 30 per cent of rural households. A notable difference in possessions is evidenced by 46 per cent of urban households owning a television against 10 per cent of rural households. More rural households (36 per cent) than urban ones (21 per cent) possess bicycles.

Table 3.6: Household possessions

Percentage distribution of various household possessions by residence

Household possessions	Residence		Total
	Urban	Rural	
Radio	83.3	68.4	71.0
TV	45.9	9.7	15.9
Phone	1.3	0.4	0.5
Cell phone	73.1	29.6	37.1
Refrigerator	10.4	0.4	2.1
Bicycle	20.6	35.7	33.1
Motorcycle	1.2	0.6	0.7
Car	8.0	1.7	2.7
Boat	0.3	0.3	0.3
Donkey	0.4	10.3	8.6
None of the above	7	22.9	20.2
Total number of households	1,225	5,629	6,854

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia.)

CHAPTER 4

Vector Control

Malaria distribution in Kenya is not uniform because of wide geographical differences in altitude, rainfall, temperature and humidity. These factors determine the intensity of malaria transmission as they directly influence malaria vector distribution, vector density, biting intensity and the development of malaria parasites in the vectors. Malaria control efforts are thus targeted to maximize the benefits of the various interventions.

The primary vector control method in Kenya is the use of insecticide treated mosquito nets (ITNs), which have been proven to be effective in preventing malaria. Kenya's NMS set two major targets for ITN use by 2006:

- 60 per cent of children under five sleeping under an ITN.
- 60 per cent of pregnant women sleeping under an ITN.

LLITNs are mosquito nets that are pre-treated in the factory with an insecticide that can withstand many washes without decreasing the efficacy of the insecticide. Treated this way, the nets are very effective against mosquitoes.

4.1 Household Ownership of Mosquito Nets

Several kinds of mosquito nets are found in households in Kenya, but two categories of nets are discussed in this survey: Conventional untreated nets and insecticide treated nets (ITNs). ITNs offer far greater protection against malaria than untreated nets. They include both conventional nets with up-to-date insecticide treatment (treated within the last six months) and long-lasting insecticide treated nets (LLITNs). LLITNs can last 3–5 years (the assumed lifetime of the net) and thus never require retreatment.

4.1.1 Programme Efforts to Increase Net Ownership

In late 2001, a social marketing programme began distributing subsidized conventional nets bundled with an insecticide treatment (deltamethrin) through rural retail shops and other private sector commercial outlets at a price of Ksh100. The number of nets distributed through this programme up to 2007 totals 11,162,204 (PSI/Kenya, 2008).

Starting in 2004, public sector ANCs in malaria endemic and epidemic districts began distributing subsidized ITNs to pregnant women and to children under five years at a price of Ksh50. Then, in 2006, the Kenya Government conducted a mass net distribution campaign that resulted in the distribution of 3.4 million LLITNs in malaria-prone districts. The campaign was conducted in two phases. The first phase was integrated with measles and polio immunization and vitamin A supplementation. The second phase was a stand-alone campaign carried out by the Division of Malaria Control. The two campaigns yielded similar results in terms of net uptake and usage.

All of these initiatives were supported by a range of multi-media messages:

- A behaviour change campaign that attempted to establish ITN use as a social norm, and highlighted vulnerable populations.
- A branded campaign that attempted to remind people that you sleep better under a net because you won't be bothered by mosquitoes.
- A branded campaign promoting a longer-lasting retreatment kit.

These campaigns are considered to have significantly influenced the culture of net ownership and use.

4.1.2 Prevalence of Net Ownership

Overall, 63 per cent of households own at least one net and 34 per cent of households own more than one net (Table 4.1). As mentioned above, ITNs are much more effective than conventional nets, so it's important to isolate ITN use. About 48 per cent of households have at least one ITN and 23 per cent have more

Table 4.1: Ownership of mosquito nets

Percentage distribution of households with at least one and more than one mosquito net (treated or untreated), ever-treated net, ITN and long-lasting insecticide-treated net (LLITN), and average number of nets of each type by household, according to background characteristics

Background characteristics	Percentage of house-holds that have at least one net	Percentage of house-holds that have more than one net	Average number of nets per house hold	Percentage of house-holds that have at least one net	Percentage of house-holds that have more than one ITN	Average number of ITNs per houehold	Number of house-holds
Residence							
Urban	68.7	35.3	1.3	47.7	21.3	0.8	1,225
Rural	61.2	33.4	1.2	47.7	22.8	0.8	5,629
Wealth Index							
Lowest	46.8	21.4	0.8	35.3	14.6	0.6	1,371
Second	61.3	30.4	1.1	49.7	21.5	0.8	1,369
Third	58.1	27.5	1.0	44.4	18.9	0.7	1,372
Fourth	70.3	43.5	1.4	55.3	30.0	1.0	1,372
Highest	72.3	42.6	1.5	50.9	25.6	1.0	1,370
Level of endemicity							
Endemic	73.4	39.3	1.4	57.9	27.6	1.0	2,770
Epidemic	59.0	33.4	1.2	47.9	24.4	0.8	876
Low risk	48.0	22.8	0.8	32.1	12	0.5	1,318
Seasonal Transmission	58.9	33.6	1.2	43.0	20.8	0.8	1,890
Net campaign district							
No campaign	49.0	23.9	0.9	33.4	13.3	0.5	2,226
First campaign	74.0	39.5	1.4	59.2	28.9	1.0	2,148
Second campaign	63.3	36.5	1.3	49.2	24.3	0.9	2,480
Total	62.5	33.7	1.2	47.7	22.5	0.8	6,854

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

than one. The average number of ITNs per household is 0.8, compared with an average of 1.2 nets of any kind per household.

Even though KMIS did not cover all the regions in Kenya, the national averages are important to understand, as they contribute to Abuja targets. They represent a total of all regions, including those areas that have low risk of malaria, and those that have not been beneficiaries of net campaigns and public net initiatives. Far more revealing are the figures from malaria endemic and epidemic areas.

In endemic areas, 73 per cent of households own at least one net and 39 per cent own more than one. Among those owning nets, the average number of nets per household stood at 1.4. In the same areas 58 per cent of all households own at least one ITN and 28 per cent own more than one. On average, households in these areas owned one net.

In epidemic-prone areas, 59 per cent of households own at least one net and 33 per cent own more than one. The average number of nets per household in these areas is 1.2 nets. In the same areas, 48 per cent of all households own at least one ITN and 24 per cent own more than one. The average number of ITNs per household in these areas is 0.8.

Ownership of at least one ITN is consistent across the top four wealth quintiles. It is consistently lowest for the lowest wealth quintile, however, suggesting a need for free distribution of nets to increase coverage for the poor.

Table 4.2: Use of mosquito nets by children

Percentage distribution of children under five years of age who slept under a mosquito net or an ITN the night preceding the survey, by background characteristics

Background characteristics	Percentage of children under five who slept under a mosquito net last night	Percentage of children under five who slept under an ITN last night	Number of children under five years of age
Age in years			
0	54.1	40.6	1,278
1	56.9	42.8	1,076
2	49.5	38.5	1,159
3	47.3	36.5	1,141
4	47.6	37.4	1,186
Sex			
Male	50.7	37.9	2,959
Female	51.6	40.5	2,881
Residence			
Urban	60.6	42.5	865
Rural	49.5	38.6	4,975
Wealth index			
Lowest	39.2	29.1	1,374
Second	47.4	37.3	1,409
Third	50.3	38.6	1,025
Fourth	58.7	46.5	1,199
Highest	61.6	44.5	833
Level of endemicity			
Endemic	58.2	45.8	2,468
Epidemic	45.9	37.9	842
Low risk	42.7	29.7	802
Seasonal transmission	48.7	34.1	1,728
Net campaign district			
No campaign	40.1	26.6	1,854
First campaign	55.3	43.9	2,044
Second campaign	55.4	44.1	1,942
Total	51.1	39.2	5,840

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

4.2 Use of Mosquito Nets by Children under Five Years of Age

Responses revealed that 51 per cent of children under five years of age slept under any net the night preceding the survey, but only 39 per cent slept under an ITN (Table 4.2). The data show that the younger the child the more likely to have slept under any net.

The place of residence plays a major part in use of mosquito nets by children under five. About 61 per cent of children under five in urban areas used a mosquito net the night preceding the survey, compared with 50 per cent in rural areas. For ITNs, the rates were 43 per cent of urban children and 39 per cent of their counterparts in the rural areas.

The survey further shows that the wealthier the household, the more likely it is that children under five will sleep under nets.

The results also show that endemic areas have the highest use of mosquito nets (58 per cent) and ITNs (46 per cent). In epidemic, low risk and seasonal transmission areas, both children and adults are at high risk of malaria because adults may not have developed immunity, unlike those in endemic areas. In all areas, however, ITN use by children under five is below the 60 per cent 2006 Abuja target.

Examination of the potential effect of the mass net distribution campaigns shows that both campaigns yielded higher ITN usage

among children under five compared with the non-campaign districts: In areas where there was no campaign, only 27 per cent of children under five had slept under an ITN the night preceding the survey, compared with 44 per cent of those residing in areas where the second campaign was carried out.

4.3 Use of Nets by Women of Reproductive Age and Pregnant Women

Survey results show that pregnant women are more likely to sleep under a mosquito net than all women within the reproductive age (Table 4.3). About 51 per cent of pregnant women slept under a net the night preceding the survey, compared with 45 per cent of all women of reproductive age. Similarly, 40 per cent of pregnant women slept under an ITN on the night preceding the survey, compared with 32 per cent of all women within the reproductive years.

Women of reproductive age in urban areas are more likely to use mosquito nets than their rural counterparts. The results show that one woman in two (50 per cent) in urban areas slept under a net the night preceding the survey, compared with two out of five women (43 per cent) in rural areas. Similarly, 42 per cent of pregnant women in urban areas slept under an ITN, compared with 39 per cent of their rural counterparts.

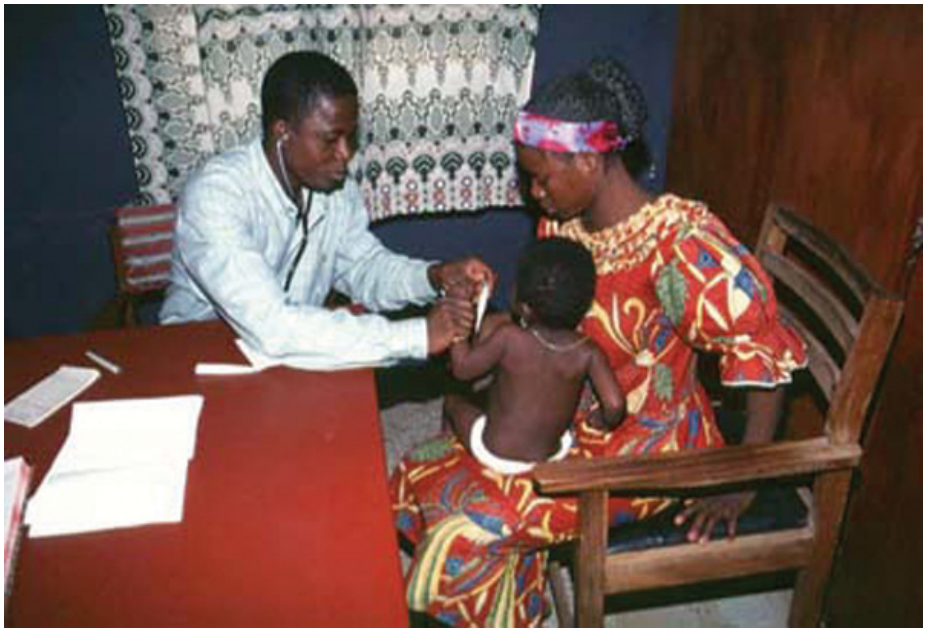
In endemic areas more pregnant women sleep under ITNs than do those in epidemic, low risk and seasonal transmission areas. The epidemic areas recorded the lowest usage of ITNs by pregnant women, yet these areas are targeted for net distribution. There are no major differences in use by women or pregnant women according to wealth index.

Table 4.3: Use of nets by women of reproductive age and pregnant women

Percentage distribution of all women of reproductive age and pregnant women who slept under any mosquito net or an ITN the night preceding the survey, by background characteristics

Background characteristics	Percentage of women who slept under a net last night	Percentage of women who slept under an ITN last night	Number of women	Percentage of pregnant women who slept under a net last night	Percentage of pregnant women who slept under an ITN lastnight	Number of pregnant women
Residence						
Urban	50.1	32.7	1,365	58.3	42.3	85
Rural	43.2	31.4	5,528	49.3	39.4	439
Wealth index						
Lowest	34.7	24.5	1,277	41.2	34.4	132
Second	39.1	28.1	1,450	45.5	34.9	93
Third	45.0	32.5	1,179	51.7	42.9	104
Fourth	49.8	37.4	1,469	60.2	49.1	108
Highest	50.4	33.2	1,518	53.8	35.9	87
Level of endemicity						
Endemic	55.7	40.5	2,721	66.5	57.4	201
Epidemic	36.7	27.8	1,021	34.5	24.9	85
Low risk	34.5	21.6	1,200	47.2	30.6	76
Seasonal transmission	43.6	29.9	1,951	43.9	32.5	162
Total	44.6	31.6	6,893	50.7	39.8	524

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).



CHAPTER 5

Case Management

Prompt, accurate malaria case management is one of the strategic approaches of the National Malaria Strategy. This involves procuring and distributing safe and effective malaria medicine, training health care providers on proper diagnosis and treatment, and encouraging patients to seek early treatment. One of the NMS case management targets to be achieved by 2006 was to have at least 60 per cent of fever cases that are treated at home by family members or caregivers managed appropriately.

The precipitous decline in the efficacy of SP necessitated a change in the policy for the management of uncomplicated malaria. The policy change was effected in 2006. It targeted public and faith-based facilities for the first two years, with the expectation that it would expand to the private sector in the third year of policy implementation.

Existing Government policy recommends that all fevers in children under five years of age should be presumptively treated as malaria with ACT, which is provided free of charge at government and mission facilities.

5.1 Management of Childhood Fevers

According to Ministry of Health Integrated Management of Childhood Illnesses (IMCI) guidelines, all children below five years with fever should be given presumptive malaria treatment within 24 hours of the onset of fever.

5.1.1 Prevalence and Prompt Treatment of Fever

The survey shows that one child in three (32 per cent) had fever during the fortnight preceding the survey (Table 5.1). It was observed that fever prevalence in older children

Children under five residing in malaria epidemic regions had the lowest use of ACT at 16 per cent.

(26 per cent of four-year-olds) was lower that that in younger children (32 per cent of children below one year). Prevalence of fever was highest in malaria endemic areas (40 per cent) and lowest in epidemic and highland areas (25 per cent).

The results further show that 24 per cent of children with fever took an antimalaria drug and 15 per cent took antimalaria drugs the same/next day (Figure 5.1). Nearly 70 per cent of children with fever sought treatment from a facility/health provider on the same/ next day. Endemic areas recorded the lowest percentage of patients who sought treatment in the 24 hours following the onset of fever.

Figure 5.1: Management of children with reported fevers

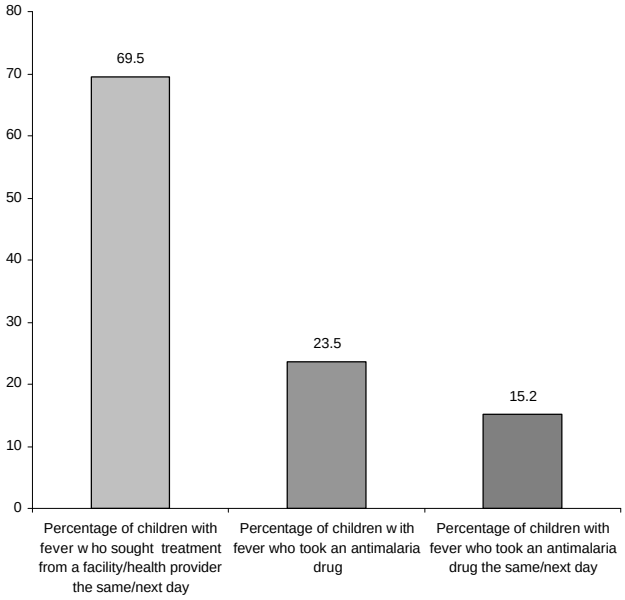


Table 5.1: Prevalence and prompt treatment of fever

Percentage distribution of children under five who reported a fever in the two weeks preceding the survey, and among them, the percentage who took an antimalaria drug the same day, by background characteristics

Background characteristics	Percentage of children with fever in the last two weeks	Number of children under age 5	Percentage of children with fever who took an antimalarial	Percentage of children with fever who took an antimalarial the same/ next day	Percentage of children with fever who sought treatment from a facility/health provider the same/next day	Number of children with fever
Age in years						
0	32.0	1,103	23.3	13.5	68.6	357
1	37.4	929	25.9	18.0	69.0	351
2	33.1	935	22.4	14.8	70.3	300
3	30.0	897	22.1	14.8	68.0	267
4	26.4	882	23.3	14.9	72.6	241
Sex						
Male	34.0	2,386	21.4	13.3	68.4	793
Female	30.0	2,360	25.9	17.4	70.8	723
Residence						
Urban	28.6	720	30.1	15.8	63.3	222
Rural	32.5	4,026	22.6	15.2	70.4	1,294
Wealth index						
Lowest	27.6	1,091	17.3	10.6	74.2	298
Second	32.9	1,131	21.2	13.2	70.1	375
Third	34.0	852	23.8	16.6	64.0	295
Fourth	34.1	974	26.7	15.8	69.7	339
Highest	29.7	698	29.1	21.3	70.6	209
Level of endemicity						
Endemic	39.5	1,930	26.2	16.6	68.5	714
Epidemic	25.2	757	26.7	19.1	72.8	217
Low risk	25.3	714	14.1	8.1	73.6	177
Seasonal transmission	30.4	1,345	19.7	12.7	65.8	408
Total	32.0	4,746	23.5	15.2	69.5	1,516

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

5.1.2 Care Seeking Behaviour for Children with Fever

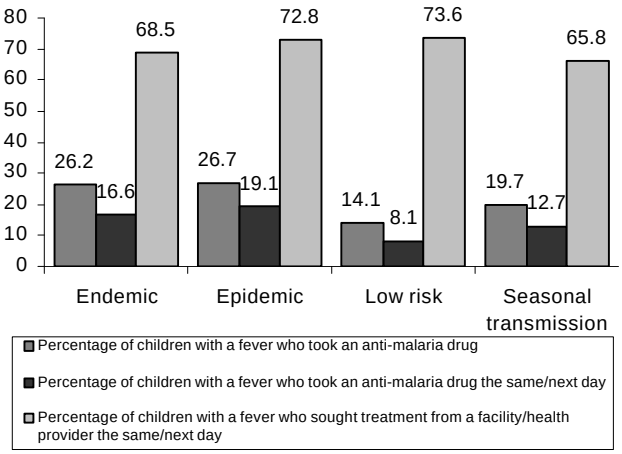
Children living in epidemic-prone regions are more likely to seek prompt treatment and to take an antimalarial for fever (Figure 5.2).

5.1.3 Management of Children with Reported Fevers

Government policy recommends that all fevers in children under five years of age should be presumptively treated as malaria with ACT, which is provided free of charge at government and mission facilities.

Data on the management of children with fever show that 35 per cent of the children took amodioquine, compared with 29 per cent who took ACT (Table 5.2). Eleven per cent of febrile children took SP and 8 per cent took chloroquine, which has not been recommended as a first line treatment for malaria for the last ten years. Unfortunately, chloroquine was mostly used by the youngest children (13 per cent), those in the rural setting (9 per cent

Figure 5.2: Care seeking behaviour for children with fever



* More children received an antimalaria drug than sought treatment because at times antimalaria drugs were given in the home.

Table 5.2: Standard treatment of children with fever

Percentage distribution of children who took first-line drug, second-line drug or other antimalaria drugs, and of those who took a drug the same or next day, by background characteristics

Background characteristics	SP	Chloro-quine	Amodia-quine	Quinine	ACT	Other anti-malarial	Percentage of children who took anti-malarial the same/next day	Number of children with fever and took drug
Age in years								
0	4.8	13.0	39.7	3.2	25.4	13.9	57.8	86
1	13.9	6.2	40.5	3.8	28.3	7.3	69.5	89
2	13.9	3.2	31.1	8.0	24.1	19.7	66.0	64
3	17.1	9.1	29.8		34.2	9.8	66.8	59
4	6.7	4.9	30.0	2.2	34.5	21.7	63.9	52
Sex								
Male	11.5	8.7	32.2	3.6	30.0	14.0	62.3	172
Female	10.9	6.5	38.0	3.7	27.4	13.5	67.0	178
Residence								
Urban	8.4	2.2	25.5	1.5	23.2	39.2	52.6	65
Rural	11.7	8.6	37.1	4.0	29.7	8.8	67.1	285
Wealth index								
Lowest	6.6	13.4	28.4	13.5	38.1		61.4	34
Second	20.6	7.9	35.8	1.0	25.1	9.6	62.3	75
Third	8.5	4.9	39.9	3.1	34.1	9.6	69.8	74
Fourth	8.2	9.6	35.0	2.0	25.3	19.8	59.4	99
Highest	9.2	2.9	33.8	3.8	26.3	23.8	73.0	68
Level of endemicity								
Endemic	6.6	5.4	29.4	3.8	33.4	21.3	63.4	202
Epidemic	15.3	18.6	43.1	3.3	16.3	3.4	71.5	51
Low risk	12.7	1.7	36.1	10.2	28.9	10.4	57.6	33
Seasonal transmission	21.2	2.9	44.6	.	28.5	2.8	64.2	64
Total	11.2	7.5	35.2	3.6	28.7	13.8	64.8	350

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

versus 2 per cent in urban areas) and those in the lowest wealth quintile. Epidemic areas had the highest chloroquine use: In these areas 19 per cent of children who took an antimalaria medicine used chloroquine compared with 2 per cent of those living in low risk areas. According to Table 5.2 it is evident that non-recommended medicines are still being used to manage childhood fevers.

Among febrile children who received anti-malarials, older children were more likely to get ACT than younger children. About 25 per cent of children under one year took ACT drugs, compared with 35 per cent of those aged four years. Rural children under five years are more advantaged than their urban counterparts in the treatment of malaria. Only 23 per cent of the urban children took ACT, compared with 30 per cent of those in rural areas.

Children under five residing in malaria epidemic regions had the lowest use of ACT – only 16 per cent compared with more than 29 per cent in the other zones.

5.1.4 Treatment Options

Table 5.3 shows percentages of children under five reporting a fever in the previous two weeks who sought treatment, and among those who sought treatment the type of services utilized. The results show that a majority of these children (59 per cent) sought treatment from the public sector, compared with only 30 per cent who went to private sector care providers.

Those living in rural areas were more likely to seek care from the public sector (61 per cent) than those in urban areas (50 per cent). Only 28 per cent of rural residents sought care for children with fever from the private sector, compared with 43 per cent of urban residents. Use of retail shops as a source of treatment was low at 12 per cent.

The children in the lowest wealth quintile (32 per cent) are less likely than those in the highest quintile (49 per cent) to seek care from the private sector.

Table 5.3: Treatment options

Percentage of children under five who reported a fever in the previous two weeks who sought treatment, and among those who sought treatment the type of services utilized, by background characteristics

Background characteristics	Percentage of children with a fever who sought treatment	Public sector*	Private sector	CHW/ mobile clinic	Faith-based facilities	Shop	Traditional practitioner	Other
Age in years								
0	29.5	63.5	25.6	4.5	1.7	10.4	2.3	1.3
1	28.0	62.1	28.7	3.8	1.7	6.8	0.8	0.3
2	24.4	55.0	33.5	3.1	1.7	17.5	0.8	.
3	22.1	50.9	36.6	5.5	4.7	12.8	.	1.2
4	25.1	61.3	30.5	3.3	1.7	16.6	.	.
Sex								
Male	27.0	59.5	30.5	4.3	2.4	11.5	1.4	1.1
Female	25.2	58.6	30.3	3.8	1.9	12.9	0.3	.
Residence								
Urban	26.8	60.6	28.4	4.1	2.5	13.5	1.1	0.6
Rural	21.8	49.6	43.4	3.5	0.2	3.6	.	0.6
Wealth index								
Lowest	29.0	45.0	32.0	10.2	9.1	13.6	.	.
Second	25.4	63.4	26.9	3.8	1.4	15.1	1.5	0.8
Third	21.1	69.3	19.8	1.6	0.7	12.1	1.0	0.4
Fourth	26.4	61.0	30.3	2.7	0.7	11.1	1.5	1.0
Highest	30.9	49.6	48.8	3.5	1.2	7.2	.	0.6
Level of endemicity								
Endemic	21.5	58.3	32.2	2.9	0.3	11.0	1.6	1.3
Epidemic	35.5	71.0	24.1	3.0	1.8	8.6	0.9	.
Low risk	25.4	64.6	32.6	1.4	1.1	14.2	.	.
Seasonal transmission	29.8	46.2	31.1	9.1	7.5	16.9	.	.
Total	26.2	59.1	30.4	4.0	2.2	12.2	0.9	0.6

NOTES: *Public sector includes government hospital, health centre, dispensary, mobile clinic or community health worker. Private medical sector includes private pharmacy, hospital, clinic, doctor, mobile clinic, community health worker or other private medical practitioner.The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

5.2 Sources of Malaria Drugs

As reported in Table 5.4, most patients obtained their malaria medicines from either public or private health facilities: 47 per cent from government health facilities. It was observed that in government health facilities, non-recommended therapies are still in use, including chloroquine. The fact that some patients received ACT and quinine from shops is of concern, since these are medicines that require prescription from health workers.

It is of great concern that non-recommended therapies like chloroquine are still in use in government health facilities. That some patients receive ACT and quinine from shops is also a concern, since these are medicines that require prescription from health workers.

5.3 Malaria in Pregnancy

Kenya's National Malaria Strategy intends to reduce the adverse effects of malaria during pregnancy through three strategic approaches:

- All pregnant women attending ANC to receive at least two doses of IPT using SP.
- Provision of ITNs through the ANC.
- Effective treatment of fever cases with the recommended antimalaria medicines.

According to NMS, 60 per cent of pregnant women are expected to take at least two IPTp dosages, starting at the beginning of the second trimester.

Malaria infection during pregnancy may lead to either clinical symptoms or be asymptomatic. Both conditions are associated with adverse effects on the outcome of pregnancy (leading to miscarriage, stillbirth or low birth weight/ intra-uterine growth retardation [IUGR]) and maternal morbidity (anaemia or severe illness). Low birth weight (under 2,500 grams) is associated with neonatal and infant mortality.

IPTp was adopted as a policy on the basis of various research findings showing beneficial effects on birth outcomes (Parise et al., 1998; Shulman, 1999; Shulman et al., 1999; Shultz et al., 1994). Recent observational studies have shown that women get optimum benefit if they receive two or more doses of SP (Filler et al., 2006). It was thought that this policy would be relatively easy to implement, as studies conducted at the same time showed that a high percentage of women visit ANC at least once during pregnancy.

IPTp has been policy in Kenya since 1998 (MOH, 1997). The current recommendation is two full treatment dosages of SP beginning from quickening and repeated at four-week intervals until delivery. This policy is particularly important for areas of high malaria (endemic) transmission in Kenya.

Table 5.5 presents the percentages of mothers who took any antimalaria drugs for prevention during pregnancy, who took one or two or more doses of SP, and who received one or two or more doses of SP during an antenatal care visit for the last pregnancy leading to a live birth in the past two years.

Table 5.4: Sources of malaria drugs

Percentage distribution distribution of antimalaria drugs given to children under five with fever in the two weeks preceding the survey, by source of the drug

Malaria drugs	At home	Government health facility/ worker	Private health facility/ worker	Shop	Other	Number of children who took drug
SP	16.5	31.9	30.5	14.6	6.5	41
Chloroquine	6.1	30.6	30.2	33.1	0.0	24
Amodiaquine	9.3	45.7	21.6	21.6	1.8	124
Quinine	0.0	49.1	25.9	7.9	17.1	14
ACT	11.8	70.7	12.5	4.0	1.0	99
Other antimalarial	6.3	18.9	32.9	41.9	0.0	48
Total	9.8	46.6	22.4	18.9	2.3	350

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

5.3.1 ANC Attendance

As shown in Table 5.5, about 87 per cent of mothers attended ANC at least once during their last pregnancy leading to a live birth in the past two years. More mothers in urban areas (93 per cent) are more likely to attend ANC than those in rural areas (85 per cent). The results show that the attendance increases with increase in wealth status, with the lowest wealth index being 75 per cent and the highest being 93 per cent. The survey further shows that low malaria zones reported the highest ANC attendance (92 per cent) while seasonal transmission areas reported the lowest attendance (74 per cent).

5.3.2 Use of Any Antimalaria Drugs by Pregnant Women

The results indicate that 45 per cent of the mothers took any antimalaria medicines for prevention during pregnancy. Mothers in urban areas (53 per cent) are more likely than those in rural areas (43 per cent) to have taken any antimalarial for prevention during pregnancy. Similarly, mothers from low malaria transmission zones were reported to have the highest use of antimalarials (52 per cent), while mothers from epidemic-prone zones had the lowest use (34 per cent).

5.3.3 Use of Intermittent Preventive Treatment of Malaria in Pregnancy

As illustrated in Figure 5.3, women who took any IPTp (25 per cent) had a higher share than those who took IPTp2 (13 per cent). The data show that one in three mothers in urban areas (33 per cent) took any dose of IPTp, compared with one in four mothers in rural areas (24 per cent). The data further show that mothers living in low risk areas had higher use of any dose of IPTp than those living in the epidemic-prone areas (33 per cent vs. 16.7 per cent, respectively).

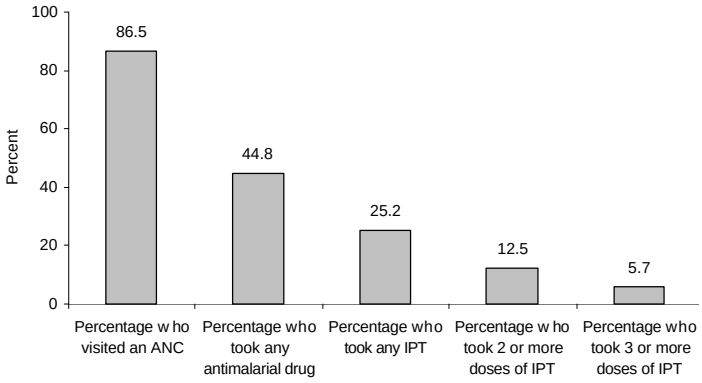
Table 5.5: Use of antimalaria drugs among pregnant women

Percentage distribution of mothers who took any antimalaria drugs for prevention during pregnancy, percentage who took one or two or more doses of SP, and percentage who received one or two or more doses of SP during an antenatal care visit for the last pregnancy leading to a live birth in the past two years, by background characteristics

Background characteristics	Percentage who visited an ANC	Percentage who took any antimalaria drug	Percentage who took any IPT	Percentage who took 2 or more doses of IPT	Percentage who took 3 or more doses of IPT	Number of mothers
Residence						
Rural	85.3	43.1	23.7	12.4	5.6	1,644
Urban	92.8	53.3	32.8	12.8	6.1	328
Wealth index						
Lowest	74.9	26.2	12.5	8.2	5.0	421
Second	84.3	37.3	21.1	11.6	5.4	467
Third	88.3	52.2	26.5	11.8	5.4	366
Fourth	91.5	50.8	30.1	15.4	6.0	397
Highest	93.3	58.5	36.1	15.0	6.8	321
Level of endemicity						
Endemic	89.0	50.6	26.4	13.6	6.7	793
Epidemic	89.3	34.2	16.7	7.4	4.3	321
Highlands	92.0	52.1	33.6	14.9	6.2	316
Arid	74.2	39.9	25.5	14.1	5.0	542
School level						
None	78.8	37.5	19.7	9.7	5.4	611
Nursery/Kindergarten	70.2	23.7	10.8	6.2	.	24
Primary	87.2	44.2	24.6	13.1	5.8	991
Post-primary/vocational	82.6	40.1	23.2	6.0	.	15
Secondary/ 'A' level	94.8	54.7	34.3	15.1	6.2	283
College (middle level)	98.4	73.2	38.7	13.5	8.3	41
University	100.0	30.5	30.5	17.4	.	7
Total	86.5	44.8	25.2	12.5	5.7	1,972

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

Figure 5.3: Use of intermittent preventive treatment of malaria in pregnancy



Total percentage of mothers against each service rendered

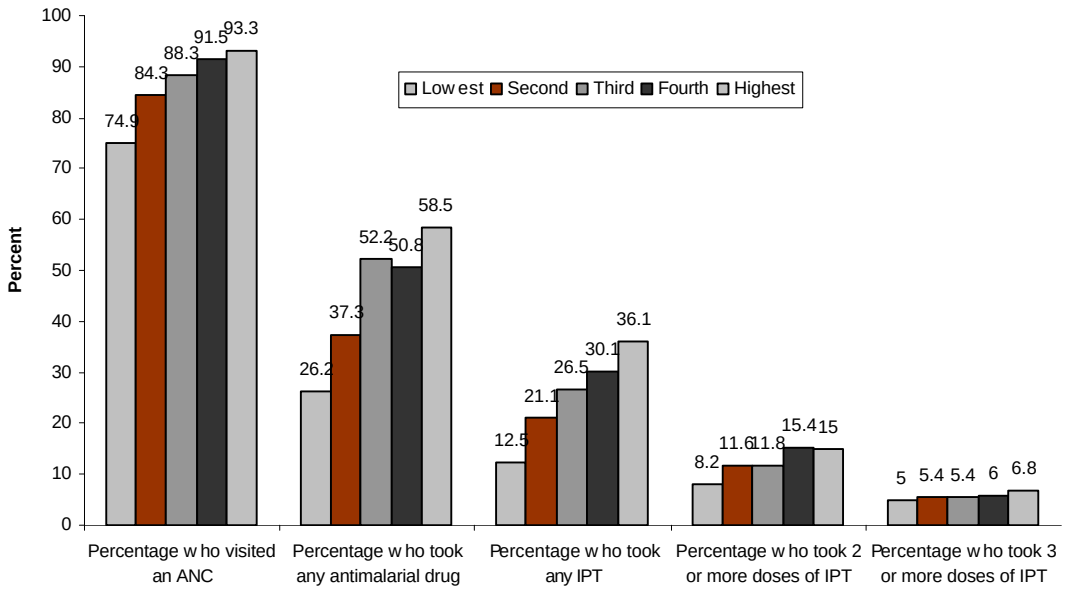
Similar trends were maintained for IPT2: low malaria transmission zones had the highest rate, at 15 per cent, compared with 7.4 per cent in epidemic-prone malaria zones. ANC attendance in all zones was much higher than IPT uptake (87 per cent and 25 per cent). Women with secondary education were more likely than those with primary education to attend ANC (95 per cent vs. 87 per cent).

Moreover, the lowest wealth quintile consistently uses ANC services less than other quintiles, as depicted in Figure 5.4.

5.4 Information, Education and Communication of ACT

In 2006, with the launch of the current treatment policy, an intensive nationwide information dissemination campaign was undertaken to increase public awareness about ACT. The campaign included mass media, interpersonal communication and printed

Figure 5.4: Use of ANC services by wealth quintiles



materials. For the IEC component of the survey only women aged 15–49 years were interviewed. The results in Table 5.6 show that 39 per cent had heard about ACT. Of these, 61 per cent received information from radio, 27 per cent from a health worker and 11 per cent from television. But only 0.6 per cent heard about it at a community *baraza* (chief's meeting).

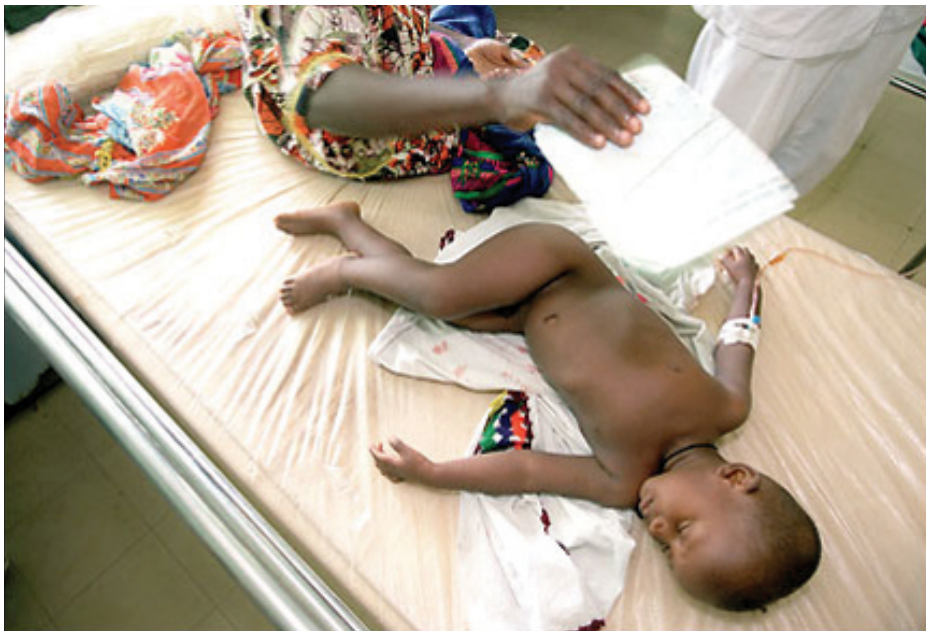
These results provide information on the channels that have the widest reach, but do not give an indication of the effectiveness of the communication.

Table 5.6: Information, education and communication on ACT

Among eligible women aged 15–49, percentage distribution of those who reported having heard of ACT, where they had heard of ACT and where they obtained ACT, by background characteristics

Background characteristics	Percentage who have heard of ACT	Number of women	TV	Radio	Newspaper	Baraza	Relative	Health worker	Community leader/ elder	CHW	Road show	Other source	Women who heard of ACT
Residence													
Urban	46.2	1,205	25.5	56.2	5.4	0.1	8.1	24	0.8	3.4	1.4	7.6	581
Rural	37	4,850	6.5	62.2	0.7	0.7	9	27.7	1.4	3.2	0.7	5.8	1,765
Wealth index													
Lowest	21.2	1,121		45.9		1.3	10.6	42.5	0.9	2.6	1.1	3.1	234
Second	30.7	1,242	0.9	55.3	0.8	0.4	10.3	30.3	2.7	3.4	2.1	6.7	405
Third	39.3	1,054	2	66.2	0.3	0.6	12.3	24.2	1.5	2.7	0.4	3.7	430
Fourth	44.3	1,320	4.8	68.6	1.5	0.7	8.5	25.5	0.7	4.3	0.1	5.1	572
Highest	51.9	1,318	29.5	57.8	4.1	0.3	5.9	23.7	0.8	2.8	1	9.1	705
Level of endemicity													
Endemic	45.4	2,479	10.9	64.5	2.8	0.4	10.2	28.4	0.7	3.1	0.7	5	1,120
Epidemic	32.6	868	11.2	61	0.7	0.4	9.8	16.9	1.4	3.5	1.4	11.3	294
Low risk	39.3	1,061	17.6	62.4	1	0.1	6.2	18.3	1.1	3.8	1.4	8	400
Seasonal	33.2	1,647	5.1	48.4	1.2	1.5	7.2	39	2.7	2.9	0.1	4.3	532
School level													
None	26.5	1,795	3.3	46.5	0.5	0.6	10.3	34.8	1.6	3.6	1.5	8.5	505
Primary	37.7	2,857	5.8	63.7	0.6	0.6	9.3	25.7	1.4	3.3	0.8	5.4	1,074
Post primary	52.5	1,403	23.1	63.5	4.4	0.5	7.3	24.4	0.7	2.9	0.6	6.4	767
Total	38.8	6,055	11.3	60.7	1.9	0.6	8.8	26.8	1.2	3.2	0.8	6.3	2,346

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).



CHAPTER 6

Parasitaemia and Anaemia Prevalence in Children

One of the objectives of KMIS was to assess malaria parasite prevalence in children aged 1–59 months and anaemia in children aged 6–59 months. Parasitaemia is the indicator for exposure to infection by the malaria parasite, while anaemia may be an indicator of manifestation of malaria disease. These indicators are used to assess the impact of malaria control interventions.

6.1 Parasitaemia Prevalence in Children

Current Kenya malaria treatment policy recommends parasitological diagnosis before treatment with ACT except in children less than five years old. The two main methods of parasitological diagnosis are microscopy and malaria rapid diagnostic tests (MRDTs). This survey used both methods to detect infections. The results of the tests are as shown in Table 6.1.

Rural children under five years of age are twice as likely as their urban counterparts to be infected with the malaria parasite.

The survey found a parasite prevalence of 7.6 per cent by RDT and 3.5 per cent by microscopy. There is increase in parasite prevalence with increasing age among children under five years. Children below one year recorded a parasite prevalence of 3 per cent, compared with 12 per cent of those aged four years with positive RDT.

The place of residence determines the prevalence of the malaria parasite. Children under five years of age residing in rural areas (8 per cent) are twice as likely as their urban counterparts (4 per cent) to be infected with the malaria parasite, as detected by RDT, while the microscopy test showed more than three times. The results further showed that the prevalence of the malaria parasite was more pronounced in endemic areas (16 per cent by RDT and 7 per cent by microscopy) compared with other malaria zones.

Table 6.1: Prevalence of malaria parasites in children

Percentage distribution of children aged 1–59 months with malaria parasites, by background characteristics

Background characteristics	Percentage with positive RDT	Percentage with microscopy slide positive for pf	Percentage with microscopy slide positive for pm	Number of children
Age in months				
1– 12	2.9	1.2	.	989
12–23	5.3	1.8	0.18	1,004
24–35	7.8	3.3	.	1,082
36–47	10.9	5.0	.	1,036
48–59	11.5	5.0	.	1,020
Sex				
Male	7.4	3.4	0.07	2,601
Female	7.8	3.2	.	2,530
Residence				
Urban	3.8	1.3	.	725
Rural	8.2	3.6	0.04	4,406
Wealth Index				
Lowest	8.6	3.6	0.19	1,168
Second	10.2	4.3	.	1,265
Third	9.3	4.3	.	924
Fourth	6.4	2.6	.	1,071
Highest	1.4	0.7	.	703
Level of endemicity				
Endemic	16.4	7.4	0.08	2,296
Epidemic	1.0	0.2	.	757
Low risk	0.4	.	.	688
Seasonal transmission	1.4	.	.	1,390
Household ITN ownership				
Yes	7.3	3.3	0.06	3,122
No	8.1	3.2	.	2,009
Use of ITN				
Yes	6.0	3.2	0.09	2,086
No	8.7	3.3	.	3,045
Total	7.6	3.3	0.03	5,131

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

The observed difference in parasite prevalence obtained by microscopy and MRDTs is due to the inability of MRDTs to distinguish current infections from effectively treated infections. This is because certain target antigens persist in the blood for 1–2 weeks after treatment. *P. falciparum* was the predominant species recorded in this survey at 98.2 per cent; *P. malariae* was 1.8 per cent (Table 6.2).

Table 6.2: Predominant malaria parasites

Species	Number of positive slides	Percentage of positive slides
P. falciparum	163	98.2
P. malariae	3	1.8
Total	166	100

6.2 Anaemia Prevalence in Children

Malaria is one of the causes of anaemia especially in children. The survey assessed the level of anaemia in children under five years (Table 6.3). Only 4 per cent of the children had severe anaemia. Children aged 12–23 months had the highest percentage of severe anaemia (6 per cent) and those aged 48–59 months the lowest (2.3 per cent). Severe anaemia was more prevalent in urban (6.9 per cent) than in rural children (4.1 per cent). There was no difference in prevalence of severe anaemia among children under five years using ITNs (4.4 per cent) and those who do not (4.5 per cent).

Table 6.3: Level of anaemia in children aged 6–59 months

Mean haemoglobin values, standard deviation and percentage distribution of children under five with severe anaemia (less than 8 grams/decilitre), by background characteristics

Background characteristics	Mean haemoglobin value	Haemoglobin standard error	Percentage of children under five with severe anaemia	Number of children
Age in months				
6–11	10.7	0.06	5.0	691
12–23	10.8	0.05	6.0	999
24–35	11.1	0.05	5.2	1,078
36–47	11.5	0.05	3.6	1,035
48–59	11.8	0.05	2.3	1,016
Sex				
Male	11.2	0.04	4.9	2,444
Female	11.3	0.03	4.0	2,375
Residence				
Urban	11.1	0.08	6.9	669
Rural	11.2	0.03	4.1	4,150
Wealth index				
Lowest	10.8	0.06	6.9	1,097
Second	11.3	0.04	3.4	1,199
Third	11.3	0.06	3.7	861
Fourth	11.3	0.05	4.1	1,012
Highest	11.4	0.07	4.7	650
Level of endemicity				
Endemic	10.9	0.05	5.4	2,097
Epidemic	11.5	0.06	2.7	701
Low risk	12.0	0.09	2.2	658
Seasonal transmission	10.9	0.11	5.8	1,363
HH ITN ownership				
No	11.2	0.06	5.1	1,885
Yes	11.2	0.04	4.0	2,934
Use of ITN				
No	11.3	0.05	4.5	2,860
Yes	11.1	0.04	4.4	1,959
Total	11.2	0.02	4.4	4,819

NOTE: The data are not for Kenya as a whole but for malaria-prone areas only and exclude Nairobi Province, Central (Kiambu, Nyandarua, Nyeri), Eastern (Meru Central), Rift Valley (Laikipia).

CHAPTER 7

Policy Implications, Conclusions and Recommendations

A number of key policy implications can be derived from the findings of this survey. These are discussed below in terms of the various aspects of net ownership and use, treatment of childhood fevers, malaria in pregnancy, and parasitaemia and anaemia prevalence in children. The section also briefly summarizes the major findings of the survey and draws recommendations for future action.

7.1 Objectives of the Survey

To recap, the main objective of the KMIS was to measure progress toward achieving the goals and targets set in the NMS. The specific objectives were:

- To collect up-to-date information on coverage of the core malaria interventions included in the NMS 2001–2010.
- To assess malaria parasite prevalence in children 1–59 months.
- To assess the status of anaemia among children 6–59 months.

A policy is herein defined as a plan of action to guide decisions, actions and statements on how Government and stakeholders may implement recommendations based on the results.

7.2 Core Malaria Interventions Included in 2001 NMS

Encouragement of widespread usage of bed nets, especially ITNs/LLITNs, was a key plank of the NMS. Critical targets for interventions have been children under the age of five and pregnant mothers. KMIS findings indicate that progress has been mixed.

7.2.1 Net Ownership by Households

Sixty-three per cent of households own at least one net of any kind and 34 per cent own more than one. In comparison, 23 per cent of

households have more than one ITN and about 48 per cent have at least one. Households in endemic areas report that 74 per cent own at least one net and 39 per cent own more than one. In the same areas, 58 per cent of households own at least one ITN and 28 per cent own more than one. In epidemic-prone areas 59 per cent own at least one net, while 33 per cent own more than one. In the same areas 48 per cent of households own at least one ITN and 24 per cent own more than one.

Policy Implication

The results indicate that there is need to redouble efforts to promote the use of ITNs and increase their availability and ownership. Various distribution channels, publicity and advocacy are needed in a multi-pronged effort to convince the majority of the households to obtain and use nets.

7.2.2 Use of Mosquito Nets by Children under Five Years

The data show that one in two (51 per cent) children under five years of age slept under any net the night preceding the survey, but only two in five (39 per cent) slept under an ITN. The results also show that endemic areas have the highest use of both ordinary mosquito nets (58 per cent) and ITNs (46 per cent). This is likely to be a result of the two mass net distribution campaigns, since the survey found higher ITN usage among children under five in campaign districts than elsewhere. In areas where there was no campaign, only 27 per cent of children under five had slept under an ITN the night preceding the survey, compared with 44 per cent of those in areas where the second campaign was carried out. Even so, usage is well below the 60 per cent target set in the NMS.

Policy Implication

These results suggest that the Government and stakeholders need to step up efforts to distribute ITNs through the campaigns as these initiatives seem to have increased the usage of ITNs by children under five years, particularly in endemic areas. Campaigns should be backed up by behaviour change communication.

7.2.3 Use of Nets by Women of Reproductive Age and Pregnant Women

The survey shows that pregnant women were more likely to have slept under a mosquito net than all women within the reproductive years. About 51 per cent of pregnant women slept under a net the night preceding the survey compared with 45 per cent of all women of reproductive age. Similarly, 40 per cent of pregnant women compared with 32 per cent of all women of reproductive age slept under an ITN on the night prior to the survey. In endemic areas, 57 per cent of pregnant women had slept under an ITN the night preceding the survey, a number that is still below the target of 60 per cent set in the NMS.

Policy Implication

The Government and stakeholders need to come up with good strategies for increasing ITN usage by pregnant women to reach the 60 per cent target, particularly in endemic areas.

7.3 Management of Childhood Fevers

According to Ministry of Health IMCI guidelines, all children below five years with fever should be given presumptive malaria treatment within 24 hours of fever onset. Another target relating to case management as set out in the NMS is to have at least 60 per cent of fever cases treated and managed appropriately at home by family members or caregivers.

7.3.1 Prevalence and Prompt Treatment of Fever

One child in three (32 per cent) was reported as having had a fever during the fortnight preceding the survey. Prevalence of fever was highest in malaria endemic areas (40 per cent)

There is need to enforce the policy of use of ACT by children under five as well as to educate communities, especially in endemic and epidemic areas, on the use of ACT.

and lowest in epidemic and highland areas (25 per cent). The results further show that 24 per cent of the children with fever took an antimalaria drug, with only 15 per cent taking the drugs the same/next day. The results also indicate that 70 per cent of children with fever sought treatment from a facility/health provider in the same/next day.

Policy Implication

The results indicate that a significant number of children with fever sought treatment from a health facility/ health provider (70 per cent), but a much lower percentage (15 per cent) took antimalaria drugs the same/next day. This implies that most children presented at the health facility late and therefore there is need to intensify behaviour change campaigns aimed at encouraging mothers to seek treatment within 24 hours of onset of fever.

7.3.2 Management of Children with Reported Fevers

Government policy recommends that all fevers in children under five years of age should be presumptively treated as malaria with ACT, which is provided free of charge at government and mission facilities. The results show that 35 per cent of the children took amodioquine compared with 29 per cent of those who took ACT. Eleven per cent of febrile children took SP and 8 per cent took chloroquine, which has not been recommended as a first line treatment for malaria for the last ten years. Unfortunately, chloroquine was mostly used by infants (13 per cent): Children under five residing in malaria epidemic regions had the lowest use of ACT at 16 per cent, compared with the other zones at over 29 per cent. Nearly a fifth (19 per cent) of children living in epidemic areas and 5 per cent in endemic zones who took an antimalaria medicine used chloroquine, compared with 2 per cent of those living in the low risk areas.

Policy Implication

According to the results, only 29 per cent of patients received the recommended ACT. The results further show that non-recommended medicines (SP, chloroquine, amodiaquine) are still used in management of childhood fevers two years into the new policy. In particular, chloroquine, whose use as a first line treatment was stopped ten years ago, is still used for treatment of children. There is therefore need for the Government to enforce the policy of use of ACT by children under five as well as to educate communities, especially in endemic and epidemic areas, on the use of ACT. Further, the Pharmacy and Poisons Board should make deliberate effort to mop out obsolete therapies.

7.3.3 Sources of Malaria Drugs

Most patients obtained their medicines from either public or private health facilities. Forty-seven per cent of patients received malaria medicines from government health facilities. It was observed that in government health facilities, non-recommended therapies are still in use including chloroquine (31 per cent). The fact that some patients received ACT (4 per cent) and quinine (8 per cent) from shops is also of concern, since these are medicines that require prescription from health workers.

Policy Implication

The results paint a gloomy picture, as non-recommended therapies for malaria such as chloroquine and amodiaquine are still provided and in use at all the sources of malaria drugs. There is therefore need for the Government to enforce the policy of use of ACT by children under five, as well as educating communities, especially those in endemic and

epidemic areas, on the use of ACT. The presence of *prescription only* medicines in shops was alarming and there is therefore need for the inspectorate arm of the Pharmacy and Poisons Board to enforce the registration status of medicines.

7.3.4 Treatment Seeking Areas

The results show that a majority (59 per cent) of children with fever during the two weeks before the survey sought treatment from the public sector, compared with only 30 per cent who sought from the private sector.

Policy Implication

The health treatment seeking behaviour in public and private health facilities among children under five should be encouraged. The ACT policy should also be rolled out in the private sector so that the 30 per cent who seek private care also benefit from it.

7.4 Malaria in Pregnancy

Pregnant women are particularly susceptible to malaria. The NMS policy therefore intends to reduce the adverse effects of malaria during pregnancy through three strategic approaches:

- All pregnant women attending ANC to receive at least two doses of IPT using SP.
- Provision of ITNs through the ANC.
- Effective treatment of fever cases with the recommended antimalaria medicines.

According to NMS, 60 per cent of pregnant women are expected to take at least two intermittent preventive treatments in pregnancy (IPTp) dosages, starting at the beginning of the second trimester. Malaria infection during pregnancy may lead to either clinical symptoms or be asymptomatic. Both conditions are associated with adverse effects on the outcome of pregnancy (leading to miscarriage, stillbirth or low birth weight/IUGR) and maternal morbidity (anaemia or severe illness).

The high ANC attendance rate has failed to translate to high IPTp2 uptake, making it necessary to take measures to increase the incidence of IPTp use by pregnant women.

Low birth weight (under 2,500 grams) is associated with neonatal and infant mortality.

IPTp has been policy in Kenya since 1998. The current recommendation is to provide full treatment dosages of SP beginning from quickening and repeated every four weeks until delivery. This policy is particularly important for areas of high malaria (endemic) transmission in Kenya.

About 87 per cent of mothers attended ANC during their last pregnancy leading to a live birth in the past two years. The survey further shows that 89 per cent of pregnant women in both endemic and epidemic zones attended ANC. Thirteen per cent of pregnant women took two or more doses of IPT. In endemic areas, only 14 per cent of pregnant women took the same doses of IPTp.

Policy Implication

Uptake of both IPTp1 and IPTp2 has remained at 25.2 per cent and 12.5 per cent, respectively. This is far below the projected NMS target of 60 per cent of pregnant women receiving malaria prevention measures (IPTp with SP, bed nets and case management) by the year 2006.

Although the results show that ANC attendance is very high – close to 90 per cent – in high risk areas (endemic and epidemic), the high attendance rate has failed to translate to high IPTp2 uptake. The reason for this failure remains unclear; perhaps SP stock outs, other patient or provider factors, or combinations of these factors are responsible. It is important for the Government to identify the responsible factors so that measures can be taken to redress them and increase the incidence of IPTp use by pregnant women.

7.5 Information, Education and Communication

The results show that 39 per cent of women of reproductive age had heard about ACT medicines. Sixty-one per cent received information from radio, 27 per cent from health workers and 11 per cent from television. In endemic areas, 11 per cent, 65 per cent and 8 per cent got the message from TV, radio and health workers, respectively.

Policy Implication

According to the survey, radio is the major source of information, followed by health workers and TV. Chief's *barazas* are the least likely information source. In addition to augmenting the use of mass media, there is need to strengthen official information channels in the malaria communication strategy, particularly in endemic areas.

7.6 Parasitaemia Prevalence in Children under Five

One of the objectives of the NMS was to assess malaria parasite prevalence in children aged 1–59 months. Parasitaemia is the indicator for exposure to infection by the malaria parasite. Rapid diagnostic test (RDT) results show that in epidemic, low risk and seasonal transmission areas (1.0, 0.4 and 1.4 per cent, respectively), the parasitaemia prevalence. In the endemic areas it is 16.4 per cent

Policy Implication

The low parasitaemia levels show that not all fevers are caused by malaria.

Children aged 12–23 months had the highest percentage of severe anaemia (and those aged 48–59 months the lowest). Severe anaemia was more prevalent in urban than in rural children, but overall only 4 per cent of children under five years had severe anaemia.

This would call for clinicians to confirm their clinical diagnosis with laboratory results before treatment is prescribed.

7.7 Anaemia Prevalence in Children

Another objective of the survey was to assess the prevalence of anaemia in children aged 6–59 months. Anaemia may be an indicator of malaria disease. The results show that 4.4 per cent of children under five years had severe anaemia. Further, the survey indicates that children in endemic areas (5.4 per cent) are twice as likely to suffer from severe anaemia as those in epidemic areas (2.7 per cent).

Policy Implication

There is need for the Government to develop programmes to reduce the impact of severe anaemia in children under five years.

7.8 Conclusions and Recommendations

KMIS findings show very significant areas that need to be addressed urgently. What follows are recommendations on the issues regarded as most more important:

- Recent efforts have had significant impact on both ITN ownership and use. Ownership of nets of any kind is consistently highest in endemic and epidemic areas, which affirms efforts to target interventions.

  To meet the Abuja targets, much more work needs to be done. Kenya should explore more free delivery options in order to reach the poorest wealth quintile more effectively. In addition, the Government should consider a mass net treatment campaign to address the fact that many nets in use are not ITNs. Finally, significant investment in qualitative research focusing on ITN use is recommended to improve understanding of the drivers of net use and behaviour change.

- There is need to shift the focus of ITN distribution from vulnerable populations to universal coverage of 100 per cent (a minimum of two nets per household) and usage to 80 per cent so as to meet revised Abuja targets by 2010. In order to achieve universal coverage, free mass LLITN distribution should be accelerated, while maintaining the levels achieved by other current distribution mechanisms.

- There is need to increase access to ACT and SP for IPTp at the community level by increasing its emphasis in the KEPH Community Strategy, as well as availability in the private sector. Regulations stopping the registration and sale of non-recommended antimalarials should be strictly enforced.

- There is need for continuous advocacy and dissemination of targeted messages to promote early treatment-seeking behaviour for fever and IPTp uptake.

- In light of the current malaria parasite prevalence, there is need for diagnosis of all malaria cases, instead of continued presumptive treatment for children under five years of age.

- There is need for joint planning by stake-holders to integrate the implementation of their interventions to prevent malaria in pregnancy.

- There is need to use other survey methods such as multiple indicator cluster surveys and the KDHS to collect additional data on malaria indicators.

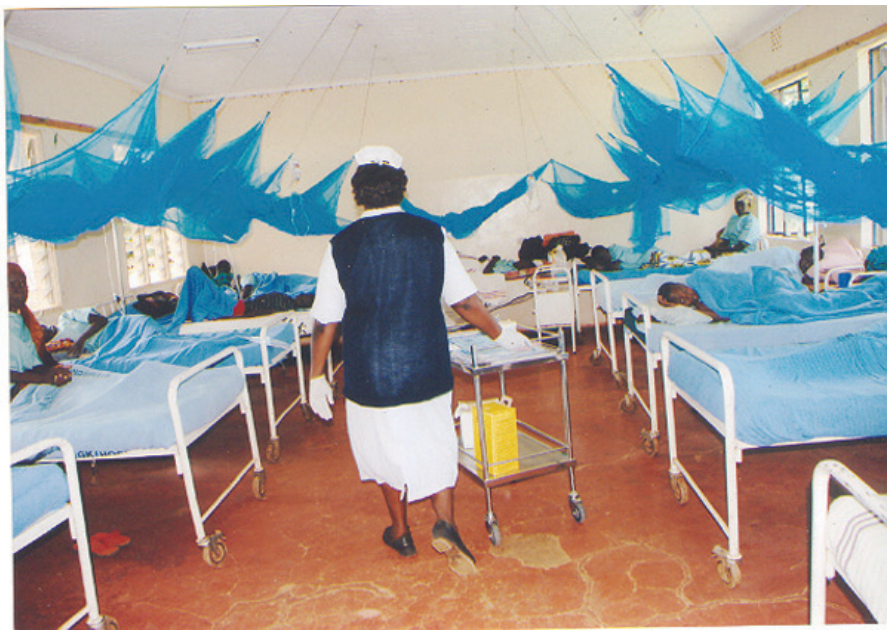
- With less than a third of children with fever using antimalarials, access to antimalaria medicines is still low. Although ACT is provided free by Government, the drugs are not always found in public facilities. There is thus need to ensure that the drugs are readily available. The drug distribution system needs to be improved, particularly in high risk areas.

- Prompt treatment of childhood fevers with effective antimalaria medicines is low (28.7 per cent). Less than a fifth (16 per cent) of children with fever were treated with an antimalarial the same/next day. There is need to improve community level communication avenues to increase the percentage.

- There is need to conduct an MIS every 2–3 years to guide the monitoring and evaluation of malaria projects and programmes.

- Over the long term, it is important to maintain the emphasis on girls' education, as the results consistently indicate that better educated mothers are more likely to attend ANC and to use nets. Other studies have shown that better educated mothers are also more likely to take their children for treatment.

- Finally, it is critical for current malaria control targets to be reached, not only to reduce current morbidity and mortality, but also because all indications are that global warming induced climate change will increase the incidence of the disease as a result of the expansion of malaria endemic zones into highland regions that are currently reasonably free of the disease. Policy makers need to factor the impact of climate change into any long-term strategies for malaria control.



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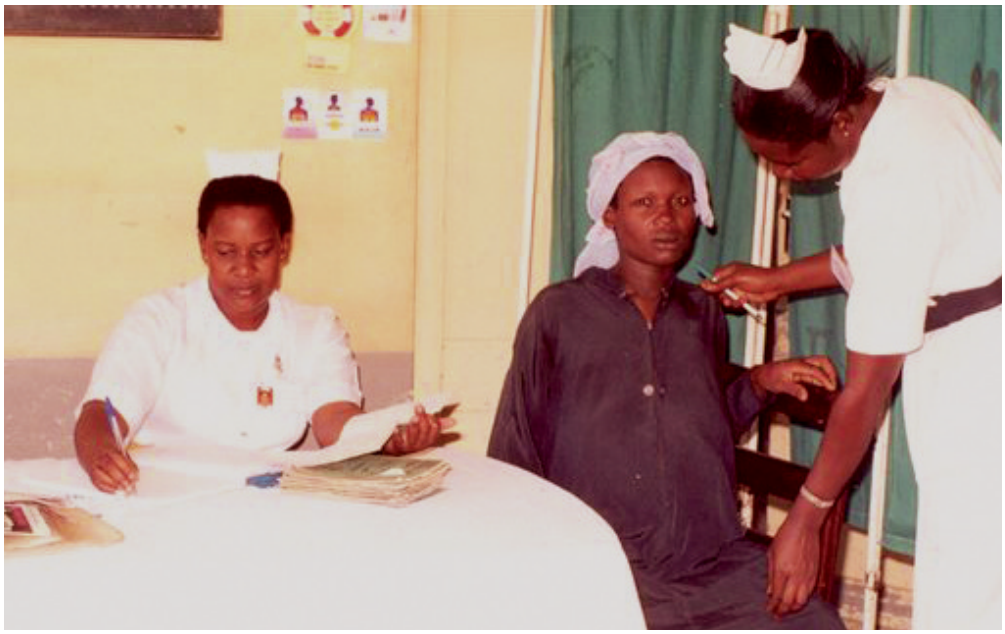

APPENDIX A

National Malaria Strategy 2006 Targets and Goals

NMS page No.	Targets by 2006
P8	**Goal** *To reduce the level of malaria infection and consequent death in Kenya by 30% by the year 2006, and to sustain that improved level of control to 2010*
P21	**Strategic Approach I: Case-Management** 80% of households at risk of malaria will receive targeted IEC 80% of GOK health facilities will have continuous and adequate supplies of drugs essential for the management of malaria 80% of all antimalarials provided through formal and informal sectors will be of internationally acceptable pharmacological standards 60% of fever cases that are treated at home by family members or caretakers will be managed appropriately 80% of all cases of fever treated by CHWs or outpatient facilities will be managed according to national recommendations 80% of first-line therapeutic failures and severe, complicated malaria cases will be correctly managed by health personnel in appropriate health facilities
P26	**Strategic Approach II: Management of malaria and anaemia in pregnancy** 60% of pregnant women will have two IPT of SP in the second and third trimesters 80% of fever or anaemia cases will be appropriately managed at ANC services 60% of pregnant women will sleep under treated nets during their confinement
P28	**Strategic Approach III: Vector control using insecticide-treated nets and other methods** 60% of the at-risk population will sleep under nets - at least 50% of these nets will be regularly treated with insecticides

Continued

NMS page No.	Targets by 2006
P33	**Strategic Approach IV: Epidemic preparedness and response** 80% of epidemic-prone districts will have an early warning and detection system for local malaria epidemics 60% of all districts will respond to reliable warning signals through their DOMT and POMT 60% of confirmed epidemics will be effectively contained through selective interventions including community mobilization, effective case-management, ITNS and/or IRS
P36	**Supporting Structure A: Information, Education and Communications (IEC)** 80% of households nationwide should have received targeted IEC on all key messages from at least one source every six months to support the strategies defined above.

APPENDIX B

Sample Design for 2007 KMIS

1. Introduction

The 2007 KMIS targeted women of reproductive age (15–49 years) and all children under the age of five years living in malaria endemic or epidemic-prone areas. A total of 63 administrative districts (as at 1999 Kenya Population and Housing Census) were covered. The excluded areas were Nairobi Province, Central Province (Kiambu, Nyandarua, and Nyeri districts), Eastern Province (Meru Central district), and Rift Valley Province (Laikipia district).

The major domains for which estimates are computed were:

- All malaria zones in Kenya as a whole.
- Urban and rural malaria areas of Kenya (each as a separate domain).
- Malaria zones in each of seven provinces in Kenya: 1) Central (excluding Kiambu, Nyandarua, and Nyeri districts); 2) Coast; 3) Eastern (excluding Meru Central district); 4) North Eastern ; 5) Nyanza; 6) Rift Valley (excluding Laikipia district); and 7) Western.
- The four malaria epidemiological zones (Endemic, Epidemic, Low risk and Seasonal Transmission), which are collections of areas in different provinces.

2. Sampling Frame

The KMIS utilized the National Sample Survey and Evaluation Programme (NASSEP IV) sampling frame. This a national sampling frame developed by the Kenya National Bureau of Statistics (KNBS) after the 1999 Census specifically for household-based sample surveys.

Kenya is administratively divided into eight provinces that in turn are subdivided into districts, each district into divisions, each division into locations and each location into sub-locations. Further, during the last 1999 population census, each sub-location was subdivided census Enumeration Areas (EAs).

The NASSEP IV frame is composed of a total of 1,800 clusters and follows a two-stage stratified cluster sample format. The frame was developed using the districts as the first

level stratification. The first stage process of the frame involved selection of EAs using the probability proportional to measure of size (PPMOS) method. Clusters were selected with a basis of one measure of size (MOS) defined as the ultimate cluster with an average of 100 households and ranges between 50 and 149 households. Among the total of 1,800 clusters, 1,260 were rural and 560 were urban.

3. Sample Size and Allocation

In calculating sample size the various key indicators were reviewed. Estimates have shown that approximately 25 per cent of pregnant women sleep under ITNs , while about 10 per cent of women received IPT for malaria during their last pregnancies (*Kenya Service Provision Assessment,* NCAPD et al., 2005). Further, it is estimated that about 2 per cent of the population (women age 15–49 years) are pregnant (CBS et al., 2004) and the proportion of women aged 15–49 who had a live birth in the last five years is approximately 11 per cent of the population. Additional information from recent surveys and the 1999 census gave an average household size of 4.7 in all the 63 districts targeted.

In order to achieve approximately 30 children under five years per cluster, a sample of 36 households per cluster was determined. A sample size of 7,200 households was expected to yield 648 pregnant women, assuming a design effect of 2 and confidence interval of 7 per cent. A non-response rate of 10 per cent was assumed.

A final sample size of 7,200 households from a total of 200 clusters was sampled for KMIS with a uniform 36 households allocated to each cluster. The target sample size was allocated in order to give valid estimates for key malaria indicators at varying domain levels.

In the first level of distribution of the sample, a power allocation method was used to allocate the sample into the seven provinces. The method was adopted in order to enable statistically valid estimates in North Eastern Province where the lowest sample of 21 clusters was allocated. Further, a proportional allocation method was used to allocate the sample in the provinces into the various districts and urban/rural sub-domains.

Table B1 shows the final distribution of sample by province and urban-rural residence for the 2007 KMIS. Table B2 summarizes the allocation of the sample.

Table B1: Allocation of the sample by province and urban-rural

Province	Clusters			Households		
	Rural	Urban	Total	Rural	Urban	Total
Central	23	4	27	828	144	972
Coast	15	13	28	540	468	1,008
Eastern	27	3	30	972	108	1,080
North Eastern	17	4	21	612	144	756
Nyanza	27	4	31	972	144	1,116
Rift Valley	28	6	34	1,008	216	1,224
Western	26	3	29	936	108	1,044
Total	163	37	200	5,868	1,332	7,200

Table B2: Allocation of the sample by province, district and urban-rural

Province	District	Sample clusters			Sample households		
		Rural	Urban	Total	Rural	Urban	Total
Central	Kirinyaga	6	1	7	216	36	252
	Murang'a	5	0	5	180	0	180
	Thika	7	3	10	252	108	360
	Maragua	5	0	5	180	0	180
Total		*23*	*4*	*27*	*828*	*144*	*972*
Coast	Kilifi	4	1	5	144	36	180
	Kwale	4	1	5	144	36	180
	Lamu	1	0	1	36	0	36
	Mombasa	0	9	9	0	324	324
	T/Taveta	2	1	3	72	36	108
	T/River	2	0	2	72	0	72
	Malindi	2	1	3	72	36	108
Total		15	13	28	540	468	1,008

Continued

Table B2, continued

Province	District	Sample clusters			Sample households		
		Rural	Urban	Total	Rural	Urban	Total
Eastern	Embu	1	1	2	36	36	72
	Isiolo	1	0	1	36	0	36
	Kitui	3	0	3	108	0	108
	Makueni	4	1	5	144	36	180
	Machakos	6	1	7	216	36	252
	Marsabit	1	0	1	36	0	36
	Mbeere	1	0	1	36	0	36
	Moyale	1	0	1	36	0	36
	Mwingi	2	0	2	72	0	72
	Meru Nort.	4	0	4	144	0	144
	Tharaka	1	0	1	36	0	36
	Meru South (Nithi)	2	0	2	72	0	72
Total		*27*	*3*	*30*	*972*	*108*	*1,080*
North Eastern	Garissa	5	2	7	180	72	252
	Mandera	5	1	6	180	36	216
	Wajir	7	1	8	252	36	288
Total		*17*	*4*	*21*	*612*	*144*	*756*
Nyanza	Gucha	3	0	3	108	0	108
	H/Bay	1	1	2	36	36	72
	Kisii Central	3	0	3	108	0	108
	Kisumu	2	2	4	72	72	144
	Kuria	1	0	1	36	0	36
	Migori	3	1	4	108	36	144
	Nyamira (Kisii North)	3	0	3	108	0	108
	Rachuonyo	2	0	2	72	0	72
	Siaya	4	0	4	144	0	144
	Suba	1	0	1	36	0	36
	Bondo	2	0	2	72	0	72
	Nyando	2	0	2	72	0	72
Total		*27*	*4*	*31*	*972*	*144*	*1,116*
Rift Valley	Baringo	1	0	1	36	0	36
	Bomet	2	0	2	72	0	72
	Keiyo	1	0	1	36	0	36
	Kajiado	1	1	2	36	36	72
	Kericho	2	0	2	72	0	72
	Koibatek	1	0	1	36	0	36
	Marakwet	1	0	1	36	0	36
	Nakuru	4	3	7	144	108	252
	Nandi	3	0	3	108	0	108
	Narok	2	0	2	72	0	72
	Samburu	1	0	1	36	0	36
	Trans Mara	1	0	1	36	0	36
	Trans Nzoia	2	1	3	72	36	108
	Turkana	2	0	2	72	0	72
	Uasin Gishu	2	1	3	72	36	108
	West Pokot	1	0	1	36	0	36
	Buret	1	0	1	36	0	36
Total		*28*	*6*	*34*	*1,008*	*216*	*1,224*
Western	Bungoma	6	1	7	216	36	252
	Busia	3	0	3	108	0	108
	Mt. Elgon	1	0	1	36	0	36
	Kakamega	5	1	6	180	36	216
	Lugari	2	0	2	72	0	72
	Teso	1	0	1	36	0	36
	Vihiga	4	0	4	144	0	144
	Butere	4	1	5	144	36	180
Total		*26*	*3*	*29*	*936*	*108*	*1,044*
Total		**163**	**37**	**200**	**5,868**	**1,332**	**7,200**

4. Selection of the Clusters and Households

The selection of the sample clusters was done systematically using the Equal Probability Selection method (EPSEM). Since NASSEP IV was developed using the PPS method, the resulting sample still retained its properties. The selection was done independently within the districts and the urban/rural sub-strata.

Before selection of the households a listing exercise was done with the aid of personal digital assistants (PDAs) fitted with GPS. The exercise involved mapping all the households within the cluster and collecting the basic descriptions of the households and their geographic coordinates. Once the cluster listing was complete, a simple random sampling of 36 households per cluster was selected using the PDAs.

5. Sampling Weights

Since the 2007 KMIS sample was unbalanced by province and urban-rural area, it required a final weighting adjustment to provide estimates at every other domain of study. Given that the KMIS sample was a two-stage stratified cluster sample, sampling probabilities were calculated separately for each sampling stage and for each cluster. We use the following notations:

P_{1hi}: first stage sampling probability of the i^{th} cluster in stratum h

P_{2hi}: second-stage sampling probability within the i^{th} cluster (households)

P_{hi}: overall sampling probability of any households of the i^{th} cluster in stratum h

Let a_h be the number of clusters selected in stratum h, M_{hi} the number of households according to the sampling frame in the i^{th} cluster, and $\sum M_{hi}$ the total number of households in the stratum h. The probability of selecting the i^{th} cluster in stratum h is calculated as follows:

$$P_{1hi} = \frac{a_h M_{hi}}{\sum M_{hi}}$$

Let b_{hi} be the proportion of households in the selected segment compared with the total number of households in EA i in stratum h if the EA is segmented, otherwise $b_{hi} = 1$. Let L_{hi} be the number of households listed in the household listing operation in cluster i in stratum h, and let g_{hi} be the number of households selected in the cluster. The second stage's selection probability for each household in the cluster is calculated as follows:

$$P_{2hi} = \frac{g_{hi}}{L_{hi}} \times b_{hi}$$

The overall selection probability of each household in cluster i of stratum h is the product of the selection probabilities:

$$P_{hi} = P_{1hi} \times P_{2hi}$$

The sampling weight for each household in cluster i of stratum h is the inverse of its selection probability:

$$W_{hi} = 1/P_{hi}$$

This weight was further adjusted for household non-response. The adjusted weight was then normalized for the whole sample so that the total number of weighted cases was equal to the number of unweighted cases. The normalized household weight is the gross sample weight for individuals living in the households in the same cluster. This weight is further adjusted for individual non-response and then normalized to get the final individual sample weight. It needs to be pointed out that the normalized weights are valid for estimation of proportions and means at any aggregation levels, but not valid for estimation of totals.

APPENDIX C

Persons Involved in the Survey

Administration/Coordinators

Dr. Willis Akhwale – DOMC
Dr. David Okello – WHO
Dr. Rebecca Kiptui – DOMC
Abdulkadir A. Awes – KNBS
Joanne Greenfield – WHO
John Bore – KNBS
Robert C.B. Buluma – KNBS
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Christopher N. Omolo – KNBS
Macdonald George Obudho – KNBS
James Gatungu – KNBS
Kiambo Njagi – DOMC
Julius Kimetei – DOMC
Beatrice Muraguri – DOMC
John Nyamuni – DOMC
Ephantus Murigi – DOMC
Micahel Mbayah – NCAPD
John Moro – DOMC
Beth Rhapuoda (deceased) – DOMC
Ayub Manya – DOMC
Adam Wolkon – CDC/Atlanta
Allen Hightower – KEMRI/CDC
Dr. Augustine Ngindu – WHO
Khoti Gausi – WHO/AFRO
Nathan Bakyaita – WHO/AFRO
Dr. Ayub Manya – DOMC

Data Processing

Samuel Kipruto – KNBS
Paul Waweru – KNBS
Dr. Jimee Hwang – CDC/Atlanta

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2. Paul Mwandembe – Research Assistant
1. Keziah Nzingo Mwachofi – Health Worker
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1. Bioshara Nassir – Health Worker
2. Mohammed A. Hassan – Health Worker

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2. George Ochieng Okuku – Research Assistant
3. Festus Lambi – Research Assistant
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2. Fayo Galgalo – Health Worker

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Philip Makokha – Health Worker

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Grace Ikodo – Health Worker
Emisikho James – Health Worker

Team 20: Kakamega, Vihiga
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Elvis M. Mudanya – Research Assistant
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Loice Shimoli – Health Worker

APPENDIX D
Survey Questionnaires

Household Questionnaire

[KENYA]
[DIVISION OF MALARIA CONTROL]

IDENTIFICATION[1]	
PLACE NAME _____	
NAME OF HOUSEHOLD HEAD _____	
CLUSTER NUMBER	+---+---+---+ ¦ ¦ ¦ ¦ +---+---+---+
HOUSEHOLD NUMBER	¦ ¦ ¦ +---+---+
REGION.....	¦ ¦ ¦ +---+---+
URBAN/RURAL (URBAN=1, RURAL=2).....	¦ ¦ +---+
LARGE CITY/SMALL CITY/TOWN/COUNTRYSIDE[2] ..... (LARGE CITY=1, SMALL CITY=2, TOWN=3, COUNTRYSIDE=4)	¦ ¦ +---+

INTERVIEWER VISITS				
	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR
INTERVIEWER'S NAME				NAME
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NO. OF VISITS
TIME				

*RESULT CODES:
1 COMPLETED
2 NO HOUSEHOLD MEMBER AT HOME OR NO COMPETENT RESPONDENT AT HOME AT TIME OF VISIT
3 ENTIRE HOUSEHOLD ABSENT FOR EXTENDED PERIOD OF TIME
4 POSTPONED
5 REFUSED
6 DWELLING VACANT OR ADDRESS NOT A DWELLING
7 DWELLING DESTROYED
8 DWELLING NOT FOUND
9 OTHER _____ (SPECIFY)

TOTAL PERSONS IN HOUSEHOLD

TOTAL ELIGIBLE WOMEN

LINE NUMBER OF RESPONDENT TO HOUSEHOLD QUESTIONNAIRE

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME _____		
DATE _____		

[1] This section should be adapted for country-specific survey design.

[2] The following guidelines should be used to categorize urban sample points: "Large cities" are national capitals and places with over 1 million population; "small cities" are places with between 50,000 and 1 million population; the remaining urban sample points are "towns."

HOUSEHOLD LISTING

Now we would like some information about the people who usually live in your household or who are staying with you now.

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	ELIGIBLE WOMEN	CURRENTLY PREGNANT?
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.	What is the relationship of (NAME) to the head of the household?*	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)?	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	FOR ELIGIBLE WOMEN, ASK: Is (NAME) currently pregnant?
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			M F	YES NO	YES NO	IN YEARS		YES NO/DK
01			1 2	1 2	1 2		01	1 2
02			1 2	1 2	1 2		02	1 2
03			1 2	1 2	1 2		03	1 2
04			1 2	1 2	1 2		04	1 2
05			1 2	1 2	1 2		05	1 2
06			1 2	1 2	1 2		06	1 2
07			1 2	1 2	1 2		07	1 2
08			1 2	1 2	1 2		08	1 2
09			1 2	1 2	1 2		09	1 2
10			1 2	1 2	1 2		10	1 2

* CODES FOR Q.3 RELATIONSHIP TO HEAD OF HOUSEHOLD:
01 = HEAD
02 = WIFE/HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 = OTHER RELATIVE
10 = ADOPTED/FOSTER/ STEPCHILD
11 = NOT RELATED
98 = DON'T KNOW

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	ELIGIBLE WOMEN	CURRENTLY PREGNANT?
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.	What is the relationship of (NAME) to the head of the household?*	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)?	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	FOR ELIGIBLE WOMEN, ASK: Is (NAME) currently pregnant?
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			M F	YES NO	YES NO	IN YEARS		YES NO/DK
11			1 2	1 2	1 2		11	1 2
12			1 2	1 2	1 2		12	1 2
13			1 2	1 2	1 2		13	1 2
14			1 2	1 2	1 2		14	1 2
15			1 2	1 2	1 2		15	1 2
16			1 2	1 2	1 2		16	1 2
17			1 2	1 2	1 2		17	1 2
18			1 2	1 2	1 2		18	1 2
19			1 2	1 2	1 2		19	1 2
20			1 2	1 2	1 2		20	1 2

TICK HERE IF CONTINUATION SHEET USED +--+ +--+

Just to make sure that I have a complete listing:

1) Are there any other persons such as small children or infants that we have not listed? YES +----> ENTER EACH IN TABLE NO

2) In addition, are there any other people who may not be members of your family, such as domestic servants, lodgers or friends who usually live here? YES +----> ENTER EACH IN TABLE NO

3) Are there any guests or temporary visitors staying here, or anyone else who stayed here last night, who have not been listed? YES +----> ENTER EACH IN TABLE NO

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
10	What is the main source of drinking water for members of your household?[1]	PIPED WATER PIPED INTO DWELLING ..... 11 PIPED INTO YARD/PLOT ..... 12 PUBLIC TAP/STANDPIPE ..... 13 TUBE WELL OR BOREHOLE ..... 21 DUG WELL PROTECTED WELL ..... 31 UNPROTECTED WELL ..... 32 WATER FROM SPRING PROTECTED SPRING ..... 41 UNPROTECTED SPRING ..... 42 RAINWATER ..... 51 TANKER TRUCK ..... 61 CART WITH SMALL TANK ..... 71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL ..... 81 BOTTLED WATER ..... 91 OTHER _____ 96 (SPECIFY)	
11	What kind of toilet facilities does your household use?[1]	FLUSH OR POUR FLUSH TOILET FLUSH TO PIPED SEWER SYSTEM ..... 11 FLUSH TO SEPTIC TANK ..... 12 FLUSH TO PIT LATRINE ..... 13 FLUSH TO SOMEWHERE ELSE . 14 FLUSH, DON'T KNOW WHERE . .... 15 PIT LATRINE VENTILATED IMPROVED PIT LATRINE (VIP) ..... 21 PIT LATRINE WITH SLAB ..... 22 PIT LATRINE WITHOUT SLAB/ OPEN PIT ..... 23 COMPOSTING TOILET ..... 31 BUCKET TOILET ..... 41 HANGING TOILET/HANGING LATRINE ..... 51 NO FACILITY/BUSH/FIELD ..... 61 OTHER _____ 96 (SPECIFY)	
12	Does your household have:[2] Electricity? A radio? A television? A telephone? A refrigerator?	YES NO ELECTRICITY ..... 1 2 RADIO ..... 1 2 TELEVISION ..... 1 2 TELEPHONE ..... 1 2 REFRIGERATOR 1 2	
13	What type of fuel does your household mainly use for cooking?	ELECTRICITY ..... 01 LPG/NATURAL GAS ..... 02 BIOGAS ..... 03 KEROSENE ..... 04 COAL/LIGNITE ..... 05 CHARCOAL ..... 06 FIREWOOD/STRAW ..... 07 DUNG ..... 08 OTHER _____ 96 (SPECIFY)	

[1] Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained.
[2] Additional indicators of socioeconomic status should be added, especially to distinguish among lower socioeconomic classes.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
14	MAIN MATERIAL OF THE FLOOR.[1] RECORD OBSERVATION.	NATURAL FLOOR EARTH/SAND ..... 11 DUNG ..... 12 RUDIMENTARY FLOOR WOOD PLANKS ..... 21 PALM/BAMBOO ..... 22 FINISHED FLOOR PARQUET OR POLISHED WOOD .... 31 VINYL OR ASPHALT STRIPS..... 32 CERAMIC TILES..... 33 CEMENT..... 34 CARPET ..... 35 OTHER _____ 96 (SPECIFY)	
15	Does any member of your household own: A bicycle? A motorcycle or motor scooter? A car or truck?	YES NO BICYCLE..... 1 2 MOTORCYCLE/SCOOTER ..... 1 2 CAR/TRUCK 1 2	
15A	At any time in the past 12 months, has anyone sprayed the interior walls of your dwelling against mosquitoes?[2]	YES.....1 NO.....2 DON'T KNOW.....8	+ - <16
15B	How many months ago was the house sprayed?[2] IF LESS THAN ONE MONTH, RECORD '00' MONTHS AGO.	MONTHS AGO..... +- - - - - + ¦ ¦ ¦ +- - - - - +	
15C	Who sprayed the house?[2]	GOVERNMENT WORKER/PROGRAM.....1 PRIVATE COMPANY…….....2 HOUSEHOLD MEMBER.....3 OTHER _____ 6 (SPECIFY) DON'T KNOW.....8	
16	Does your household have any mosquito nets that can be used while sleeping?	YES.....1 NO.....2	→ 27
17	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS..... +- -+ ¦ ¦ +- -+	

[1] Categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained. In some countries, it may be desirable to ask an additional question on the material of walls or ceilings.

[2] This question should be deleted in countries that do not have an indoor residual spraying program for mosquitoes.

		NET # 1	NET #2	NET #3
18	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. IF MORE THAN THREE NETS, USE ADDITIONAL QUESTIONNAIRE(S).	OBSERVED.....1 NOT OBSERVED..... 2	OBSERVED ..... 1 NOT OBSERVED 2	OBSERVED.....1 NOT OBSERVED..... 2
19	How long ago did your household obtain the mosquito net?	MOS AGO MORE THAN 3 YEARS AGO 95	MOS AGO MORE THAN 3 YEARS AGO..... 95	MOS AGO MORE THAN 3 YEARS AGO……. 95
20	OBSERVE OR ASK THE BRAND OF MOSQUITO NET. IF BRAND IS UNKNOWN, AND YOU CANNOT OBSERVE THE NET, SHOW PICTURES OF TYPICAL NET TYPES/BRANDS TO RESPONDENT.	'PERMANENT' NET[1] BRAND A……11+ BRAND B……12¦ (SKIP TO 24)=-+ 'PRETREATED' NET[2] BRAND C……..21+ BRAND D……..22¦ (SKIP TO 22)=-+ OTHER……31 DON'T KNOW BRAND……98	'PERMANENT' NET[1] BRAND A ..... …11+ BRAND B ..... 12¦ (SKIP TO 24)=-+ 'PRETREATED' NET[2] BRAND C ..... 21+ BRAND D ..... 22¦ (SKIP TO 22)=-+ OTHER .....31 DON'T KNOW BRAND 98	'PERMANENT' NET[1] BRAND A……11+ BRAND B……12¦ (SKIP TO 24)=-+ 'PRETREATED' NET[2] BRAND C……..21+ BRAND D……..22¦ (SKIP TO 22)=-+ OTHER……31 DON'T KNOW BRAND……98
21	When you got the net, was it already factory-treated with an insecticide to kill or repel mosquitoes?	YES.....1 NO.....2 NOT SURE.....8	YES.....1 NO .....2 NOT SURE.....8	YES.....1 NO.....2 NOT SURE.....8
22	Since you got the mosquito net, was it ever soaked or dipped in a liquid to repel mosquitoes or bugs?	YES.....1 NO.....2 (SKIP TO 24) =---¦ NOT SURE.....8	YES.....1 NO .....2 (SKIP TO 24) =---¦ NOT SURE.....8	YES.....1 NO.....2 (SKIP TO 24) =---¦ NOT SURE.....8
23	How long ago was the net last soaked or dipped? IF LESS THAN 1 MONTH AGO, RECORD '00' MONTHS. IF LESS THAN 2 YEARS AGO, RECORD MONTHS AGO. IF '12 MONTHS AGO' OR '1 YEAR AGO,' PROBE FOR EXACT NUMBER OF MONTHS.	MOS AGO MORE THAN 2 YEARS AGO ..... 95 NOT SURE.....98	MOS AGO MORE THAN 2 YEARS AGO.....95 NOT SURE..... 98	MOS AGO MORE THAN 2 YEARS AGO ..... 95 NOT SURE.....98
24	Did anyone sleep under this mosquito net last night?	YES.....1 NO.....2 (SKIP TO 26) =---¦ NOT SURE.....8	YES.....1 NO .....2 (SKIP TO 26) =---¦ NOT SURE.....8	YES.....1 NO.....2 (SKIP TO 26) =---¦ NOT SURE.....8

[1] "Permanent" is a factory treated net that does not require any further treatment.
[2] "Pretreated" is a net that has been pretreated, but requires further treatment after 6-12 months.

		NET # 1	NET #2	NET #3
25	Who slept under this mosquito net last night? RECORD THE RESPECTIVE LINE NUMBER FROM THE HOUSEHOLD SCHEDULE.	NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ]	NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ]	NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ] NAME __________ LINE NO [ ][ ]
26		GO BACK TO 18 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 27.	GO BACK TO 18 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 27.	GO BACK TO 18 IN THE FIRST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE NETS, GO TO 27.

HAEMOGLOBIN MEASUREMENT

CHECK COLUMN (7) OF HOUSEHOLD LISTING: RECORD THE LINE NUMBER, NAME AND AGE OF ALL CHILDREN UNDER AGE 6. THEN ASK THE DATE OF BIRTH.

CHILDREN UNDER AGE 6 YEARS				HAEMOGLOBIN MEASUREMENT OF CHILDREN BORN IN 2000[1] OR LATER			
LINE NUMBER FROM COL. (1)	NAME FROM COL. (2)	AGE FROM COL. (7)	What Is (NAME's) date of birth? COPY MONTH AND YEAR OF BIRTH FROM 215 IN MOTHER'S BIRTH HISTORY AND ASK DAY. FOR CHILDREN NOT INCLUDED IN ANY BIRTH HISTORY, ASK DAY, MONTH AND YEAR.	LINE NUMBER OF PARENT/ADULT RESPONSIBLE FOR THE CHILD RECORD '00' IF NOT LISTED IN HOUSEHOLD SCHEDULE	READ CONSENT STATEMENT TO PARENT/ADULT RESPONSIBLE FOR THE CHILD CIRCLE CODE AND SIGN	HAEMOGLOBIN LEVEL (G/DL)	RESULT 1 MEASURED 2 NOT PRESENT 3 REFUSED 4 OTHER
(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
			DAY MONTH YEAR		GRANTED REFUSED 1 SIGN_____ NEXT LINE ← 2		
					1 SIGN_____ NEXT LINE ← 2		
					1 SIGN_____ NEXT LINE ← 2		
					1 SIGN_____ NEXT LINE ← 2		
					1 SIGN_____ NEXT LINE ← 2		
					1 SIGN_____ NEXT LINE ← 2		

[1] For fieldwork beginning in 2006, 2007 or 2008, the year should be 2001, 2002 or 2003, respectively.

TICK HERE IF CONTINUATION SHEET USED
[ ]

CONSENT STATEMENT: As part of this survey, we are studying anaemia among children. Anaemia is a serious health problem that results from poor nutrition or diseases such as malaria. This survey will assist the government to develop programs to prevent and treat these important health problems.

We request that all children born in 2000[1] or later participate in the anaemia testing part of this survey and give a few drops of blood from a finger. The test uses disposable sterile instruments that are clean and completely safe. The blood will be analysed with new equipment and the results of the test will be given to you right after the blood is taken. The results will be kept confidential.

May I now ask that (NAME OF CHILD[REN]) participate in the anaemia test. However, if you decide not to have him/her/them tested, it is your right and we will respect your decision. Now please tell me if you agree to have the test(s) done.

NOTE:
In countries where some enumeration areas are higher than 1,000 meters, altitude information should be collected in a separate form for each enumeration area higher than 1,000 meters so that the anaemia estimates can be adjusted appropriately.

35	CHECK 33: NUMBER OF CHILDREN WITH HAEMOGLOBIN LEVEL BELOW 7 G/DL ONE OR MORE +--+ ¦ ¦ +--+ ↓ GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HAEMOGLOBIN MEASUREMENT, AND CONTINUE WITH 36.[1] NONE +--+ ¦ ¦ +--+ ↓ GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HAEMOGLOBIN MEASUREMENT AND END THE HOUSEHOLD INTERVIEW.
36	We detected a low level of haemoglobin in the blood of [NAME OF CHILD(REN)]. This indicates that (NAME OF CHILD(REN) has/have developed severe anaemia, which is a serious health problem. We would like to inform the doctor at _____ about the condition of [NAME OF CHILD(REN)]. This will assist you in obtaining appropriate treatment for the condition. Do you agree that the information about the level of haemoglobin in the blood of [NAME OF CHILD(REN)] may be given to the doctor?

NAME OF CHILD WITH HAEMOGLOBIN BELOW 7 G/DL	NAME OF PARENT/RESPONSIBLE ADULT	AGREES TO REFERRAL?
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2
		YES……..1 NO……2

[1]If more than one child is below 7 g/dl, read statement in Q.36 to each parent/adult responsible for a child who is below the cutoff point.

Woman's Questionnaire

[KENYA]
[DIVISION OF MALARIA CONTROL]

IDENTIFICATION[1]	
PLACE NAME _____	
NAME OF HOUSEHOLD HEAD _____	
CLUSTER NUMBER	+---+---+---+
HOUSEHOLD NUMBER	+---+---+---+
REGION	+---+---+---+
URBAN/RURAL (URBAN=1, RURAL=2)	+---+
LARGE CITY/SMALL CITY/TOWN/COUNTRYSIDE[2] ..... (LARGE CITY=1, SMALL CITY=2, TOWN=3, COUNTRYSIDE=4)	+---+---+---+
NAME AND LINE NUMBER OF WOMAN _____	+---+---+---+

INTERVIEWER VISITS				
	1	2	3	FINAL VISIT
DATE	_____	_____	_____	DAY +---+---+ MONTH +---+---+ YEAR +---+---+---+---+
INTERVIEWER'S NAME	_____	_____	_____	NAME +---+---+---+
RESULT*	_____	_____	_____	RESULT +---+
NEXT VISIT: DATE	_____	_____		TOTAL NO. OF VISITS +---+
TIME	_____	_____		

*RESULT CODES:

1	COMPLETED	4	REFUSED	7	OTHER _____ (SPECIFY)
2	NOT AT HOME	5	PARTLY COMPLETED		
		6	INCAPACITATED		
3	POSTPONED				

COUNTRY-SPECIFIC INFORMATION: LANGUAGE OF QUESTIONNAIRE, LANGUAGE OF INTERVIEW, NATIVE LANGUAGE OF RESPONDENT, AND WHETHER TRANSLATOR USED

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME _____ +---+	+---+	+---+
DATE _____ +---+	+---+	+---+

[1] This section should be adapted for country-specific survey design.
[2] The following guidelines should be used to categorize urban sample points: "Large cities" are national capitals and places with over 1 million population; "small cities" are places with between 50,000 and 1 million population; and the remaining urban sample points are "towns".

SECTION 1. RESPONDENT'S BACKGROUND

INTRODUCTION AND CONSENT

INFORMED CONSENT

Hello. My name is _____ and I am working with (NAME OF ORGANIZATION). We are conducting a national survey about malaria. We would very much appreciate your participation in this survey. The information you provide will help the government to plan health services. The survey usually takes between 10 and 20 minutes to complete. Whatever information you provide will be kept strictly confidential and will not be shown to other persons.

Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. However, we hope that you will participate in this survey since your views are important.

At this time, do you want to ask me anything about the survey?
May I begin the interview now?

Signature of interviewer: _____ Date: _____

RESPONDENT AGREES TO BE INTERVIEWED..... RESPONDENT DOES NOT AGREE TO BE INTERVIEWED .... 2 --<E

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOUR ..... +-----+ MINUTES..... +-----+	
102	In what month and year were you born?	MONTH..... +-----+ DON'T KNOW MONTH ..... 98 YEAR..... +----------+ DON'T KNOW YEAR 9998	
103	How old were you at your last birthday? COMPARE AND CORRECT 102 AND/OR 103 IF INCONSISTENT.	AGE IN COMPLETED YEARS +-----+	
104	Have you ever attended school?	YES..... 1 NO 2	-<108
105	What is the highest level of school you attended: primary, secondary, or higher?[1]	PRIMARY..... 1 SECONDARY ..... 2 HIGHER..... 3	
106	What is the highest (grade/form/year) you completed at that level?[1]	GRADE ..... +-----+	
107	CHECK 105: PRIMARY +--+ SECONDARY +--+ +--+ OR HIGHER +---------- ↓		--<109

[1] Revise according to the local education system.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
108	Now I would like you to read this sentence to me. SHOW CARD TO RESPONDENT.[1] IF RESPONDENT CANNOT READ WHOLE SENTENCE, PROBE: Can you read any part of the sentence to me?	CANNOT READ AT ALL.....1 ABLE TO READ ONLY PARTS OF SENTENCE .....2 ABLE TO READ WHOLE SENTENCE .....3 NO CARD WITH REQUIRED LANGUAGE_____ 4 (SPECIFY LANGUAGE) BLIND/VISUALLY IMPAIRED……..5	
109	What is your religion?	ROMAN CATHOLIC……..1 PROTESTANT/OTHER CHRISTIAN……..2 MUSLIM……..3 NO RELIGION……4 OTHER……6 (SPECIFY)	
110	What is your ethnic group/tribe?	EMBU……01 KALENJIN……02 KAMBA……..03 KIKUYU……04 KISII……05 LUHYA……..06 LUO……07 MASAI……08 MERU……09 MJIKENDA/SWAHILI……..10 SOMALI……..11 TAITA/TAVETA……12 OTHER……..96 (SPECIFY)	

[1]Each card should have four simple sentences appropriate to the country (e.g., “Parents love their children”, “Farming is hard work”, “The child is reading a book”, “Children work hard at school”). Cards should be prepared for every language in which respondents are likely to be literate.

Section 2. REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
201	Now I would like to ask about all the births you have had during your life. Have you ever given birth?	YES.....1 NO.....2	-<206
202	Do you have any sons or daughters to whom you have given birth who are now living with you?	YES.....1 NO.....2	-<204
203	How many sons live with you? And how many daughters live with you? IF NONE, RECORD '00'.	SONS AT HOME ..... +-----+ DAUGHTERS AT HOME ..... +-----+	
204	Do you have any sons or daughters to whom you have given birth who are alive but do not live with you?	YES.....1 NO.....2	-<206
205	How many sons are alive but do not live with you? And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	SONS ELSEWHERE ..... +-----+ DAUGHTERS ELSEWHERE .. +-----+	
206	Have you ever given birth to a boy or girl who was born alive but later died? IF NO, PROBE: Any baby who cried or showed signs of life but did not survive?	YES.....1 NO.....2	-<208
207	How many boys have died? And how many girls have died? IF NONE, RECORD '00'.	BOYS DEAD ..... +-----+ GIRLS DEAD..... +-----+	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL.	NONE.....00 TOTAL ..... +-----+	-<345
209	CHECK 208: Just to make sure that I have this right: you have had in TOTAL _____ births during your life. Is that correct? YES → PROBE AND CORRECT AS NECESSARY. NO → 201-208		
210	CHECK 208: ONE BIRTH: Was this child born in the last six years? IF NO, CIRCLE '00.' TWO OR MORE BIRTHS: How many of these children were born in the last six years?	NONE.....00 TOTAL IN LAST SIX YEARS..... +-----+	-<345

211 Now I would like to record the names of all your births in the last six years, whether still alive or not, starting with the most recent one you had.
RECORD NAMES OF ALL BIRTHS IN THE LAST 6 YEARS IN 212. RECORD TWINS AND TRIPLETS ON SEPARATE LINES.

212 What name was given to your (most recent/previous) birth? (NAME)	213 Were any of these births twins?	214 Is (NAME) a boy or a girl?	215 In what month and year was (NAME) born? PROBE: What is his/her birthday?	216 Is (NAME) still alive?	217 IF ALIVE: How old was (NAME) at his/her last birthday? RECORD AGE IN COMPLETED YEARS.	218 IF ALIVE Is (NAME) living with you?	219 IF ALIVE: RECORD HOUSEHOLD LINE NUMBER OF CHILD (RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD).	220 Were there any other live births between (NAME) and (NAME OF BIRTH ON PREVIOUS LINE)?
01	SING... 1 MULT.. 2	BOY .. 1 GIRL.. 2	MONTH +-----+ YEAR +-----------+	YES..... 1 NO ..... 2 (NEXT BIRTH)	AGE IN YEARS +-----+	YES ..... 1 NO 2	LINE NUMBER +-----+ (NEXT BIRTH)	
02	SING... 1 MULT.. 2	BOY .. 1 GIRL.. 2	MONTH +-----+ YEAR +-----------+	YES..... 1 NO ..... 2 (GO TO 220)	AGE IN YEARS +-----+	YES ..... 1 NO 2	LINE NUMBER +-----+	YES ..... 1 NO 2
03	SING... 1 MULT.. 2	BOY .. 1 GIRL.. 2	MONTH +-----+ YEAR +-----------+	YES..... 1 NO ..... 2 (GO TO 220)	AGE IN YEARS +-----+	YES ..... 1 NO 2	LINE NUMBER +-----+	YES ..... 1 NO 2
04	SING... 1 MULT.. 2	BOY .. 1 GIRL.. 2	MONTH +-----+ YEAR +-----------+	YES..... 1 NO ..... 2 (GO TO 220)	AGE IN YEARS +-----+	YES ..... 1 NO 2	LINE NUMBER +-----+	YES ..... 1 NO 2
05	SING... 1 MULT.. 2	BOY .. 1 GIRL.. 2	MONTH +-----+ YEAR +-----------+	YES..... 1 NO ..... 2 (GO TO 220)	AGE IN YEARS +-----+	YES ..... 1 NO 2	LINE NUMBER +-----+	YES ..... 1 NO 2
06	SING... 1 MULT.. 2	BOY .. 1 GIRL.. 2	MONTH +-----+ YEAR +-----------+	YES..... 1 NO ..... 2 (GO TO 220)	AGE IN YEARS +-----+	YES ..... 1 NO 2	LINE NUMBER +-----+	YES ..... 1 NO 2
07	SING... 1 MULT.. 2	BOY .. 1 GIRL.. 2	MONTH +-----+ YEAR +-----------+	YES..... 1 NO ..... 2 (GO TO 220)	AGE IN YEARS +-----+	YES ..... 1 NO 2	LINE NUMBER +-----+	YES ..... 1 NO 2

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
221	Have you had any live births since the birth of (NAME OF MOST RECENT BIRTH)? IF YES, RECORD BIRTH(S) IN BIRTH TABLE.	YES.....1 NO.....2	
222	COMPARE 210 WITH NUMBER OF BIRTHS IN HISTORY ABOVE AND MARK: NUMBERS ARE SAME +--+ NUMBERS ARE DIFFERENT +-----< (PROBE AND RECONCILE) ¦ CHECK: FOR EACH BIRTH: YEAR OF BIRTH IS RECORDED. FOR EACH LIVING CHILD: CURRENT AGE IS RECORDED.		+--+ ¦ ¦ +--¦ ¦ ¦ +--+
223	CHECK 215 AND ENTER THE NUMBER OF BIRTHS IN 2000[1] OR LATER. IF NONE, RECORD '0'.		+--+ ¦ ¦ +--+
224	Are you pregnant now?	YES.....1 NO.....2 UNSURE.....8	+ - <226
225	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS.	MONTHS.....+-----+ ¦ ¦ ¦ +-----+	
226	CHECK 223: ONE OR MORE BIRTHS IN 2000[1] OR LATER +--+ ¦ NO BIRTHS IN 2000 OR LATER +--+		- -<345

[1]For fieldwork beginning in 2006, 2007, or 2008, the year should be 2001, 2002, or 2003, respectively.

Section 3A. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

301	ENTER IN 302 THE NAME AND SURVIVAL STATUS OF THE MOST RECENT BIRTH. Now I would like to ask you some questions about your last pregnancy that ended in a live birth, in the last 6 years.		
302	FROM QUESTIONS 212 AND 216 (LINE 01)	LAST BIRTH NAME _____ LIVING DEAD +--+ +--+ +--+ +--+ ˙ ˙	
303	When you were pregnant with (NAME), did you see anyone for antenatal care?[1] IF YES: Whom did you see? Anyone else? PROBE FOR THE TYPE OF PERSON AND RECORD ALL PERSONS SEEN.	HEALTH PROFESSIONAL DOCTOR ..... A NURSE/MIDWIFE..... B AUXILIARY MIDWIFE..... C OTHER PERSON TRADITIONAL BIRTH ATTENDANT..... D OTHER _____ X (SPECIFY) NO ONE..... Y	
304	During this pregnancy, did you take any drugs in order to prevent you from getting malaria?	YES ..... 1 NO ..... 2 DON'T KNOW..... 8	+ - <310
305	Which drugs did you take to prevent malaria?[2] (probe the respondent whether drug taken was for prevention or treatment) RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	SP/FANSIDAR.....A CHLOROQUINE ..... B OTHER_____ X (SPECIFY) (refer to code book) DON'T KNOW..... Z	
306	CHECK 305: DRUGS TAKEN FOR MALARIA PREVENTION	CODE "A" CODE "A" CIRCLED +--+ +---------- ˙	? 310
307	How many times did you take SP/Fansidar during this pregnancy?	TIMES..... +---------+ ¦ ¦ ¦ +---------+	

[1]Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained. Include all drugs or drug combinations that are commonly given as separate categories.
[2] Add response categories for additional drugs used to prevent malaria during pregnancy, if any. Repeat Questions 306-309 for any other recommended IPT drugs.

		LAST BIRTH NAME _____	
308	CHECK 303: A) ANTENATAL CARE FROM A HEALTH PROFESSIONAL RECEIVED DURING THIS PREGNANCY?	CODE 'A', 'B', OR 'C' CIRCLED +--+ +--+ ˘ OTHER +--+ +-----------	--<310
	B) DID YOU RECEIVE THE ANTENATAL CARE IN A PUBLIC/MISSION FACILITIES OR PRIVATE HEALTH FACILITY? FACILITY NAME……	PUBLIC / MISSION.....A PRIVATE ..... B	
309	Did you get the SP/Fansidar during an antenatal visit, during another visit to a health facility, or from some other source?	ANTENATAL VISIT.....1 ANOTHER FACILITY VISIT.....2 OTHER SOURCE _____ 6 (SPECIFY)	
310	CHECK 215 AND 216: ONE OR MORE LIVING CHILDREN IN 2000[1] OR LATER +--+ +--+ ˘ NO LIVING CHILDREN BORN IN 2000[1] OR LATER +---------- BORN		-<345

[1] For fieldwork beginning in 2006, 2007, or 2008, the year should be 2001, 2002, or 2003, respectively.

SECTION 3B. FEVER IN CHILDREN

311	ENTER IN THE TABLE THE LINE NUMBER AND NAME OF EACH LIVING CHILD BORN IN 2000[1] OR LATER. (IF THERE ARE MORE THAN 2 LIVING CHILDREN BORN IN 2000[1] OR LATER, USE ADDITIONAL QUESTIONNAIRES). Now I would like to ask you some questions about the health of all your children less than 5 years old. (We will talk about each one separately.)		
312	NAME AND LINE NUMBER FROM 212	YOUNGEST CHILD LINE NUMBER ..... +-----+ NAME _____	NEXT-TO-YOUNGEST CHILD LINE NUMBER ..... +-----+ NAME _____
313	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES .....1 NO .....2 (GO TO 313 FOR NEXT CHILD OR, IF NO MORE CHILDREN, SKIP TO 345) =----+ DON'T KNOW 8	YES .....1 NO .....2 (GO BACK TO 313 FOR NEXT CHILD OR, IF NO MORE CHILDREN, SKIP TO 345) =----+ DON'T KNOW 8
314	How many days ago did the fever start? IF LESS THAN ONE DAY, RECORD '00'.	DAYS AGO ..... +---------+ DON'T KNOW……98	DAYS AGO ..... +---------+ DON'T KNOW……98
315	Did you seek advice or treatment for the fever from any source?	YES .....1 NO .....2 (SKIP TO 317) =-----+	YES .....1 NO .....2 (SKIP TO 317) =-----+

316	Where did you seek advice or treatment?[2] Anywhere else? RECORD ALL SOURCES MENTIONED.	PUBLIC SECTOR GOVT. HOSPITAL.....A GOVT. HEALTH CENTER.....B GOVT. DISPENSARY .....C MOBILE CLINIC.....D COMMUNITY HEALTH WORKER.....E OTHER PUBLIC _____ F FAITH-BASED FACILITY……..G (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL / CLINIC.....H PHARMACY.....I PRIVATE DOCTOR.....J MOBILE CLINIC.....K COMMUNITY HEALTH WORKER.....L OTHER PVT. MEDICAL ……M (SPECIFY) OTHER SOURCE SHOP.....N TRAD. PRACTITIONER.....O OTHER _____ X (SPECIFY)	PUBLIC SECTOR GOVT. HOSPITAL.....A GOVT. HEALTH CENTER.....B GOVT. DISPENSARY.....C MOBILE CLINIC.....D COMMUNITY HEALTH WORKER.....E OTHER PUBLIC _____ F FAITH-BASED FACILITY……..G (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC.....H PHARMACY.....I PRIVATE DOCTOR.....J MOBILE CLINIC.....K COMMUNITY HEALTH WORKER.....L OTHER PVT. MEDICAL……M (SPECIFY) OTHER SOURCE SHOP.....N TRAD. PRACTITIONER.....O OTHER _____ X (SPECIFY)
316 A	How many days after the fever began did you first seek treatment for (NAME)? IF THE SAME DAY, RECORD '00'.	DAYS ..... +---+---+ ¦ ¦ ¦ +---+---+	DAYS ..... +---+---+ ¦ ¦ ¦ +---+---+

[1] For fieldwork beginning in 2006, 2007 or 2008, the year should be 2001, 2002 or 2003, respectively.
[2] Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained.

		YOUNGEST CHILD NAME _____	NEXT-TO-YOUNGEST CHILD NAME _____
317	Is (NAME) still sick with a fever?	YES.....1 NO.....2 DON'T KNOW.....8	YES.....1 NO.....2 DON'T KNOW.....8
318	At any time during the illness, did (NAME) take any drugs for the fever?	YES.....1 NO.....2 (SKIP 344) =---¦ DON'T KNOW.....8	YES.....1 NO.....2 (SKIP 344) =---¦ DON'T KNOW.....8
319	What drugs did (NAME) take?[1] Any other drugs? RECORD ALL MENTIONED. ASK TO SEE DRUG(S) IF TYPE OF DRUG IS NOT KNOWN. IF TYPE OF DRUG IS STILL NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	ANTIMALARIAL ACT (specify ACT) ……A SP/FANSIDAR.....B CHLOROQUINE .....C AMODIAQUINE .....D QUININE.....E OTHER ANTIMALARIAL_____ F (SPECIFY) OTHER DRUGS ASPIRIN .....G ACETAMINOPHEN/ PARACETAMOL.....H IBUPROFEN.....I OTHER _____ X (SPECIFY) DON'T KNOW.....Z	ANTIMALARIAL ACT (specify ACT) ……A SP/FANSIDAR.....B CHLOROQUINE .....C AMODIAQUINE .....D QUININE.....E OTHER ANTIMALARIAL_____ F (SPECIFY) OTHER DRUGS ASPIRIN .....G ACETAMINOPHEN/ PARACETAMOL.....H IBUPROFEN.....I OTHER _____ X (SPECIFY) DON'T KNOW .....Z
320	CHECK 319: ANY CODE A-F CIRCLED?	YES +--+ ¦ ˇ NO +--+ ¦ ˇ (GO BACK TO 317 IN NEXT COLUMN; OR IF NO MORE BIRTHS, SKIP TO 344)	YES +--+ ¦ ˇ NO +--+ ¦ ˇ (GO BACK TO 317 IN NEXT COLUMN; OR IF NO MORE BIRTHS, SKIP TO 344)

320A	CHECK 319: ACT ('A') GIVEN?	CODE 'A' CIRCLED CODE 'A' NOT CIRCLED (SKIP TO 324)	CODE 'A' CIRCLED CODE 'A' NOT CIRCLED (SKIP TO 324)
321	How long after the fever started did (NAME) first take ACT?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER ..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER ..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8
		YOUNGEST CHILD NAME _____	NEXT-TO-YOUNGEST CHILD NAME _____
322	For how many days did (NAME) take ACT? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... DON'T KNOW 8	DAYS ..... DON'T KNOW 8
323	Did you have the ACT at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the ACT first?	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER _____ 6 (SPECIFY) DON'T KNOW 8	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER _____ 6 (SPECIFY) DON'T KNOW 8
324	CHECK 319: WHICH MEDICINES?	CODE 'A' CIRCLED CODE 'A' NOT CIRCLED (SKIP TO 324)	CODE 'A' CIRCLED CODE 'A' NOT CIRCLED (SKIP TO 324)
325	How long after the fever started did (NAME) first take SP/Fansidar?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER ..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER ..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8

[1] Revise list of drugs as appropriate; however, the broad categories must be maintained. Include all drugs or drug combinations that are commonly given as separate categories.

		YOUNGEST CHILD NAME _____	NEXT-TO-YOUNGEST CHILD NAME _____
326	For how many days did (NAME) take the SP/Fansidar? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... DON'T KNOW 8	DAYS ..... DON'T KNOW 8
327	Did you have the SP/Fansidar at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the SP/Fansidar first?	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER _____ 6 (SPECIFY) DON'T KNOW 8	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER _____ 6 (SPECIFY) DON'T KNOW 8
328	CHECK 319: WHICH MEDICINES?	CODE 'B' CIRCLED CODE 'B' NOT CIRCLED (SKIP TO 328)	CODE 'B' CIRCLED CODE 'B' NOT CIRCLED (SKIP TO 328)

329	How long after the fever started did (NAME) first take chloroquine?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8
330	For how many days did (NAME) take chloroquine? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... +----+ ¦ ¦ +----+ DON'T KNOW 8	DAYS ..... +----+ ¦ ¦ +----+ DON'T KNOW 8
331	Did you have the chloroquine at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the chloroquine first?	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER_____ 6 (SPECIFY) DON'T KNOW 8	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER_____ 6 (SPECIFY) DON'T KNOW 8
332	CHECK 319: WHICH MEDICINES?	CODE 'C' CIRCLED +--+ +--+ ¦ ˅ CODE 'C' NOT CIRCLED +--+ +--+ ˅ (SKIP TO 332)	CODE 'C' CIRCLED +--+ +--+ ¦ ˅ CODE 'C' NOT CIRCLED +--+ +--+ ˅ (SKIP TO 332)
333	How long after the fever started did (NAME) first take Amodiaquine?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8
		YOUNGEST CHILD NAME _____	NEXT-TO-YOUNGEST CHILD NAME _____
334	For how many days did (NAME) take Amodiaquine? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... +----+ ¦ ¦ +----+ DON'T KNOW 8	DAYS ..... +----+ ¦ ¦ +----+ DON'T KNOW 8
335	Did you have the Amodiaquine at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the Amodiaquine first?	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER_____ 6 (SPECIFY) DON'T KNOW 8	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER_____ 6 (SPECIFY) DON'T KNOW 8
336	CHECK 319: WHICH MEDICINES?	CODE 'D' CIRCLED +--+ +--+ ¦ ˅ CODE 'D' NOT CIRCLED +--+ +--+ ˅ (SKIP TO 336)	CODE 'D' CIRCLED +--+ +--+ ¦ ˅ CODE 'D' NOT CIRCLED +--+ +--+ ˅ (SKIP TO 336)
337	How long after the fever started did (NAME) first take Quinine?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8
338	For how many days did (NAME) take Quinine? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... +----+ ¦ ¦ +----+ DON'T KNOW 8	DAYS ..... +----+ ¦ ¦ +----+ DON'T KNOW 8

338	For how many days did (NAME) take Quinine? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... +-+-+ DON'T KNOW 8	DAYS ..... +-+-+ DON'T KNOW 8
339	Did you have the Quinine at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the Quinine first?	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER_____ 6 (SPECIFY) DON'T KNOW 8	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER_____ 6 (SPECIFY) DON'T KNOW 8
340	CHECK 319: WHICH MEDICINES?	CODE 'F' CIRCLED / CODE 'F' NOT CIRCLED (SKIP TO 344)	CODE 'F' CIRCLED / CODE 'F' NOT CIRCLED (SKIP TO 344)
341	How long after the fever started did (NAME) first take (NAME OF OTHER ANTIMALARIAL)?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER ..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER ..... 2 THREE DAYS AFTER THE FEVER ..3 FOUR OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8
342	For how many days did (NAME) take (NAME OF OTHER ANTIMALARIAL)? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... +-+-+ DON'T KNOW 8	DAYS ..... +-+-+ DON'T KNOW 8
343	Did you have the (NAME OF OTHER ANTIMALARIAL) at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the (NAME OF OTHER ANTIMALARIAL) first?	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER_____ 6 (SPECIFY) DON'T KNOW 8	AT HOME ..... 1 GOVERNMENT HEALTH FACILITY/WORKER ..... 2 PRIVATE HEALTH FACILITY/WORKER ..... 3 SHOP ..... 4 OTHER_____ 6 (SPECIFY) DON'T KNOW 8
344		GO BACK TO 313 IN NEXT COLUMN, OR, IF NO MORE CHILDREN, GO TO 345.	GO BACK TO 313 IN FIRST COLUMN OF NEW QUESTIONNAIRE, OR, IF NO MORE CHILDREN, GO TO 345.

345	RECORD THE TIME.	HOUR ..... +-----+ ¦ ¦ ¦ +--+--¦ MINUTES..... ¦ ¦ ¦ +-----+
27	What is the new anti-malarial drug that is being promoted by the Ministry of Health? (Record Verbatim what the mother says)	1. ACT/AL 2. SP/FANSIDAR 3. CHROLOQUINE 4. AMODIAQUINE 5. OTHER

28.	Have you seen or heard information relating to “ACT” or “AL”?	YES NO	
29.	If, Yes to 28 above What was the source of information?	TV……..1 Radio ……2 Newspaper ……..3 Baraza ……..4 Relative/Friend ……5 Health Worker ……6 Community Leader/elder ……...7 Community Health Worker ……8 Road Show ……..9 Other (specify) _____	
33	Where did you get your “ACT” or “AL”	Shop ……1 Pharmacies / Chemists ……..2 Government Clinics ……3 Other Clinics ……..……4 Other Sources (specify) _____ Do Not Remember ……..5	
34	If you obtained “ACT” or “AL” from a government clinic for this child, how much would you pay (Kshs. Indicate 000 if free)		

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT RESPONDENT:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

NAME OF THE SUPERVISOR:_____ DATE: _____

Division of Malaria Control
Ministry of Public Health and Sanitation
PO Box 19982 KNH
Nairobi 00202, Kenya
head.nmcp@domckenya.or.ke