

**Kenya  
Demographic  
and Health  
Survey  
2003**

**Preliminary  
Report**

**Central Bureau of Statistics  
Nairobi, Kenya**

**Ministry of Health  
Nairobi, Kenya**

**Kenya Medical Research Institute  
Nairobi, Kenya**

**Centers for Disease Control and Prevention  
Nairobi, Kenya**

**MEASURE *DHS*+  
ORC Macro  
Calverton, Maryland, USA**

This report summarises the findings of the 2003 Kenya Demographic and Health Survey (KDHS) carried out by Central Bureau of Statistics in partnership with the Ministry of Health. ORC Macro provided financial and technical assistance for the survey through the USAID-funded MEASURE *DHS+* programme, which is designed to assist developing countries to collect data on fertility, family planning, and maternal and child health. Additional funding for the KDHS was received from the United Nations Population Fund (UNFPA), the Department for International Development (DFID/U.K.), the Government of Japan through a fund managed by United Nations Development Programme (UNDP), the United Nations Children's Fund (UNICEF), and the U.S. 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 organisations.

Additional information about the survey may be obtained from Central Bureau of Statistics (CBS), P.O. Box 30266, Nairobi (Telephone: 254.20.340.929; Fax: 254.20.333.030, email: [director@cbs.go.ke](mailto:director@cbs.go.ke))

Additional information about the DHS programme may be obtained from MEASURE *DHS+*, ORC Macro, 11785 Beltsville Drive, Suite 300, Calverton, MD 20705, U.S.A. (Telephone: 301.572.0200; Fax: 301.572.0999; e-mail: [reports@macroint.com](mailto:reports@macroint.com)).

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DEMOGRAPHIC AND HEALTH SURVEY  
2003**

**PRELIMINARY REPORT**

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Ministry of Planning & National Development  
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**December 2003**

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## **1. INTRODUCTION**

The 2003 Kenya Demographic and Health Survey (KDHS) was carried out by Central Bureau of Statistics (CBS) from mid-April to mid-September 2003 using a nationally representative sample of almost 9,000 households. All women aged 15-49 years in these households and all men aged 15-54 years in a sub-sample of one-half of the households were eligible to be individually interviewed. In addition to the data collected through interviews from women and men, blood samples were collected from women aged 15-49 years and men aged 15-54 years in the sub-sample of households selected for the male survey. The blood samples were tested for the Human Immunodeficiency Virus (HIV) at the Kenya Medical Research Institute (KEMRI) laboratory.

The 2003 KDHS was designed to provide data to monitor the population and health situation in Kenya. Thus, most of the information collected in the survey represents updated estimates of basic demographic and health indicators covered in the 1989, 1993 and 1998 KDHS surveys. Specifically, the 2003 KDHS collected information on fertility levels, marriage, sexual activity, fertility preferences, awareness and use of family planning methods, breastfeeding practices, nutritional status of women and young children, childhood and maternal mortality, maternal and child health, awareness and behaviour regarding HIV/AIDS and other sexually transmitted infections. New features of the 2003 KDHS include the collection of information on malaria and use of mosquito nets, domestic violence, and the HIV testing. The survey covered the arid region of North Eastern province and other ASAL districts for the first time.

This preliminary report presents the results of the selected key indicators of the 2003 KDHS. A comprehensive report of the findings of the survey will be published later. While considered provisional, the results presented are not expected to differ significantly from those to be presented in the detailed report.

## **2. SURVEY IMPLEMENTATION**

### **2.1. Sample Design**

The sample for the 2003 KDHS covered the population residing in households in the country. A representative probability sample of almost 10,000 households was selected for the KDHS sample. This sample was constructed to allow for separate estimates for key indicators for each of the eight provinces in Kenya, as well as for urban and rural areas separately. Given the difficulties in traveling and interviewing in the sparsely populated and largely nomadic areas in the North Eastern Province, a smaller number of households was selected in this province. As a result of these differing sample proportions, the KDHS sample is not self-weighting at the national level.

The survey utilised a two-stage sample design. The first stage involved selecting sample points or clusters from a national master sample maintained by CBS (the fourth National Sample Survey and Evaluation Programme or NASSEP IV). The list of enumeration areas (EAs) covered in the 1999 Population Census constituted the frame for the NASSEP IV sample selection, and thus for the KDHS sample as well. A total of 400 clusters comprising 129 urban and 271 rural were selected from the master frame. The second stage of selection involved the systematic sampling of households from a list of all households that had been prepared in 2002. The household listing was updated in May-June 2003 in 50 selected clusters in the largest cities due to the high changes in structures and household occupancy in the urban areas.

All women aged 15-49 years who were either permanent residents of the households in the sample or visitors present in the household on the night before the survey were eligible to be interviewed in the survey. In addition, in every second household selected for the survey, all men aged 15-54 years were eligible to be interviewed if they were either permanent residents or visitors present in the household on the night before the survey. All women and men living in the households selected for the men's survey and eligible for the individual interview were asked to voluntarily give a few drops of blood for HIV testing.

### **2.2. Questionnaires**

Three questionnaires namely; the Household Questionnaire, the Woman's Questionnaire and the Man's Questionnaire were used in the survey. The contents of these questionnaires were based on model questionnaires developed by the MEASURE *DHS+* programme.

In consultation with a broad spectrum of technical institutions, government agencies, and local and international organisations, CBS modified the DHS model questionnaires to reflect relevant issues in population, family planning, HIV/AIDS, and other health issues in Kenya. A number of thematic questionnaire design committees were organised by CBS. Periodic meetings of each of the thematic committees as well as the final meeting were also arranged by CBS. The inputs generated in these meetings were used to finalise survey questionnaires. These questionnaires were then translated from English into Kiswahili as well as eleven other local languages, namely Embu, Kalenjin, Kamba, Kikuyu, Kisii, Luhya, Luo, Maasai, Meru, Mijikenda, and Somali. The questionnaires were further refined after the pretest and training of the field staff.

The household questionnaire was used to list all the usual members and visitors in the selected households. Some basic information was collected on the characteristics of each person listed, including age, sex, education, and relationship to the head of the household. The main purpose of the household questionnaire was to identify women and men who were eligible for the individual

interview. The household questionnaire also collected information on characteristics of the household's dwelling unit, such as the source of water, type of toilet facilities, materials used for the floor and roof of the house, ownership of various durable goods, and ownership and use of mosquito nets. In addition, this questionnaire was also used to record height and weight measurements of women aged 15-49 years and children under the age of 5 years, households eligible for collection of blood samples, and the respondents' consent to volunteer to give blood samples. The HIV testing procedures are described in detail in the next section.

The woman's questionnaire was used to collect information from all women aged 15-49 years and covered the following topics:

- Background characteristics (education, residential history, media exposure, etc.)
- Reproductive history
- Knowledge and use of family planning methods
- Fertility preferences
- Antenatal and delivery care
- Breastfeeding and infant feeding practices
- Vaccinations and childhood illnesses
- Marriage and sexual activity
- Woman's work and husband's background characteristics
- Infant and child feeding practices
- Childhood mortality
- Awareness and behaviour about AIDS and other sexually transmitted diseases (STDs)
- Adult mortality including maternal mortality.

The woman's questionnaire also included a series of questions to obtain information on women's experience of domestic violence. These questions were administered to one woman per household. In households with two or more eligible women, special procedures were followed in order to ensure that there was random selection of the woman to be interviewed.

The man's questionnaire was administered to all men aged 15-54 years living in every second household in the sample. The man's questionnaire collected similar information contained in the woman's questionnaire, but was shorter because it did not contain questions on reproductive history, maternal and child health, nutrition, maternal mortality and domestic violence.

All aspects of the KDHS data collection were pre-tested in November-December 2002. Thirteen teams (one for each language) were formed; each with 1 female interviewer, 1 male interviewer and 1 health worker. The 39 team members were trained for two weeks and then proceeded to conduct interviews in the various districts in which their language was spoken. In total, 260 households were covered in the pretest. The lessons learnt from the pretest were used to finalise the survey instruments and logistical arrangements for the survey. The pretest underscored the need to include Voluntary Counseling and Testing (VCT) for HIV/AIDS as an integral part of the survey, since many respondents during pretest wanted to know their HIV status.

### **2.3. HIV Testing**

In all the households selected for the man's survey, all eligible women and men who were interviewed were asked to voluntarily provide some drops of blood for HIV testing. The protocol for the blood specimen collection and analysis was based on the anonymous linked protocol developed by DHS and approved by ORC Macro's Institutional Review Board. The Kenyan

Protocol for the HIV prevalence of the 2003 KDHS was reviewed and approved by the Scientific and Ethics Committees of the Kenya Medical Research Institute (KEMRI) and also received clearance from the Centers for Disease Control and Prevention (CDC) in Atlanta. The protocol allows for the merging of the HIV results to the socio-demographic data collected in the individual questionnaires, provided that the information that could potentially identify an individual is destroyed before the linking is effected. This requires that identification codes be deleted from the data file and that the back page of the Household Questionnaire that contains the bar code labels and names of respondents be destroyed prior to merging the HIV results with the individual data file.

For the purposes of blood sample collection, a health worker was included in each of the 17 field teams. The health workers were recruited with the assistance of the Ministry of Health. To obtain informed consent for blood taking for HIV testing the health worker explained the procedures, the confidentiality of the data, the fact that test results could not be linked or made available to the subject, and given information about how they could establish their status through VCT services. The health worker then collected a dried blood spot (DBS) sample on a filter paper card from a finger prick using single-use, spring-loaded, sterile lancet. Each DBS sample was given a bar code label, with a duplicate label attached to the Household Questionnaire on the line showing consent for that respondent. A third copy of the same bar code label was affixed to a Blood Sample Transmittal Form in order to track the blood samples from the field to the laboratory. Filter papers were dried overnight in a plastic drying box, after which the health worker packed them in individual Ziploc bags with dessicant and a humidity indicator card and placed them in a larger Ziploc bag for that particular sample point. Blood samples were periodically collected in the field along with the completed questionnaires and transported to CBS headquarters in Nairobi for logging in, after which they were taken to the Centers for Disease Control and Prevention (CDC) laboratory at KEMRI headquarters in Nairobi for HIV testing.

At the laboratory, the DBS samples were each assigned a laboratory number and kept frozen until testing was started in early September. After the samples were allowed to attain room temperature, a circle of at least 6.3mm in diameter was cut out using a pair of scissors. The blots were placed in cryo-vials that contained 200ul of elution buffer and were labeled with the lab number. After centrifuging, the vials were left to elute overnight at 4°C, then spun at 2,500 rpm for 10 minutes. These eluates were then tested with Enzygnost Anti-HIV 1/2 Plus ELISA test kit (DADE-Behring HIV-1/2) for verification purposes. All positive samples and 10 percent of negative samples were then tested with Vironostika HIV-1 MicroELISA System (Organon Teknika). Finally, the few discrepant samples were tested on INN-OLIA HIV confirmation Western blot kit (Innogenetics Biotechnology-Belgium).

The HIV test results were entered into a spreadsheet with the lab number and bar code. Although the plan is to merge this file with the individual records, careful planning for this step will take some time. Consequently, for this preliminary report, a small file of data containing only the age, sex, residence, province, and education of individuals along with their bar code labels was extracted from the individual data file for merging with the HIV results.

#### **2.4. Training**

In February and early March, CBS staff responsible for the survey spent considerable effort in recruiting people with the requisite skills to work as field staff. The majority of those recruited were university graduates, and many had experience either in a previous KDHS or similar surveys such as the Behavioural Surveillance Survey (BSS) or the DHS-type survey that was conducted in



Nairobi slum areas by the African Population and Health Research Centre. CBS then organized a 3-week training course from March 17 to April 5, 2003 at the Izaak Walton Inn in Embu.

A total of 146 people were trained as interviewers, supervisors, health workers and data processing staff. Because of the large number involved, trainees were divided into three groups and trained separately in three halls on the questionnaire administration. They would come together in plenary sessions for special lectures. Four trainers were assigned to each group. The trainers were officers of CBS and National Council for Population and Development (NCPD) and staff from ORC Macro. In addition to the 12 main trainers, guest lecturers made presentations in plenary sessions on (1) Family Planning; (2) Kenya's Program on Integrated Management of Childhood Illnesses; (3) Nutrition and Anthropometric Measurements; (4) HIV/AIDS; and (5) Kenya's Program of Voluntary Counseling and Testing (VCT) for HIV/AIDS.

All participants were trained on interviewing techniques and the contents of the KDHS questionnaires. The training was conducted following the standard DHS training procedures, including class presentations, mock interviews, and four written tests. All of the participants were trained on how to complete the woman's questionnaire and how to collect anthropometric measurements.

Late in the second week of training, the health workers were split off from the other three groups to form a fourth group. Staff from the Kenya Medical Research Institute (KEMRI) and the Centers for Disease Control and Prevention (CDC)/Kenya and ORC Macro trained the health workers on informed consent procedures, taking blood spots for HIV testing and procedures for minimizing risks in handling blood products ("universal precautions"). Meanwhile, the other trainees practiced interviewing in their local languages.

During the final week, the whole group visited households in two sites close to the training center for practical interviews. Towards the end of the course, some trainees were selected as supervisors and field editors. This group was further trained on how to supervise fieldwork and editing of the questionnaires in the field.

## **2.5. Fieldwork**

Seventeen interviewing teams carried out data collection for the survey. Each team consisted of one supervisor, one field editor, four female interviewers, one male interviewer, one health worker and one driver. The Maasai-speaking team and the two Somali-speaking teams had fewer female interviewers. Five senior staff from CBS coordinated and supervised fieldwork activities. ORC Macro participated in field supervision for interviews, weight and height measurements, and blood sample collection. Data collection took place over a five-month period, from 18 April to 15 September 2003.

To ensure that respondents could establish their HIV status, CDC/Kenya in collaboration with KEMRI and the National AIDS Control Programme (NAS COP) organised a parallel team of two VCT counselors to work with each of the data collection teams except in Nairobi (where VCT is accessible through many fixed sites). These mobile VCT teams followed the same protocol applied in fixed VCT sites according to the National Guidelines for Voluntary Counseling and Testing for HIV (MoH, 2001). This includes, discussing the clients' reasons for coming for VCT, their risk factors, and implications of test outcomes, followed by testing with two rapid test kits (Determine and UNI-Gold), with a third test in case the first two are discordant.

In the field, the team supervisors and counselors worked with local officials to locate suitable places within or adjacent to the cluster in which the counselors could set up their operations. The plan was for the two VCT counselors to “leap-frog” each other, with one staying behind for 1-2 days after the interviewing team left the area and the other moving ahead of the team to set up services in advance. In practice, this was not always possible due to transport logistics problems.

CDC/Kenya also printed a brochure on HIV/AIDS and VCT for the team’s health workers to give to all respondents eligible for giving blood samples. Similarly, numbered vouchers were also printed and left with eligible respondents. The vouchers were to be given to the mobile VCT teams or the fixed VCT site when the eligible respondents went for VCT. NASCOP and CDC/Kenya also arranged with the few fixed VCT sites that charge for services so that they would provide free services to KDHS clients and send the vouchers back to CDC for reimbursement. Finally, although the VCT teams were to give priority to clients presenting the KDHS vouchers, they also accepted any other clients from the sampled communities. Over 10,600 clients, both respondents and other community members sought and received VCT services through the KDHS.

## **2.6. Data Processing**

The processing of the KDHS results began shortly after the fieldwork commenced. Completed questionnaires were returned periodically from the field to CBS offices in Nairobi, where they were entered and edited by data processing personnel specially trained for this task. Data were entered using CSPro. All data were entered twice (100 percent verification). The concurrent processing of the data was a distinct advantage for data quality, since CBS was able to advise field teams of errors detected during data entry. The data entry and editing phase of the survey was completed in October 2003.

### 3. RESULTS OF THE SURVEY INTERVIEWS

#### 3.1. Response Rates

Table 1 shows response rates for the 2003 KDHS. A total of 9,865 households were selected in the sample, of which 8,889 were found occupied at the time of the fieldwork. The shortfall is largely due to structures that were found to be vacant or destroyed. Of the 8,889 existing households, 8,561 were successfully interviewed, yielding a household response rate of 96 percent.

In the households interviewed in the survey, a total of 8,717 eligible women were identified out of whom 8,195 were successfully interviewed yielding a response rate of 94 percent. With regard to the male survey results, 4,183 eligible men were identified in the sub-sample of households selected for the male survey, of whom 3,578 were successfully interviewed, yielding a response rate of 86 percent. The response rates are lower in the urban than rural sample, especially for men.

Result	Residence		Total
	Urban	Rural	
<b>Household interviews</b>			
Households selected	3,423	6,442	9,865
Households occupied	3,068	5,821	8,889
Households interviewed	2,893	5,668	8,561
Household response rate	94.3	97.4	96.3
<b>Individual interviews: women</b>			
Number of eligible women	3,019	5,698	8,717
Number of eligible women interviewed	2,751	5,444	8,195
Eligible women response rate	91.1	95.5	94.0
<b>Individual interviews: men</b>			
Number of eligible men	1,466	2,717	4,183
Number of eligible men interviewed	1,150	2,428	3,578
Eligible men response rate	78.4	89.4	85.5

The principal reason for non-response among both eligible men and women was the failure to find individuals at home despite repeated visits to the household. The substantially lower response rate for men reflects the more frequent and longer absence of men from the households.

#### 3.2. Characteristics of Respondents

The distribution of women aged 15-49 years and men aged 15-54 years by background characteristics is shown in Table 2. The proportions of both women and men decline with increasing age reflecting the comparatively young age structure of the Kenyan population.

Sixty percent of women are married or living in an informal union with a man, compared to only 51 percent of men. Because men marry later in life than women, almost half of the surveyed men (45 percent) have never married, compared to just over one-quarter (30 percent) of the women. On the other hand, women are more than twice as likely as men to be widowed, divorced or separated.

The analysis shows that three-quarters of the women and men live in rural areas. Majority of the respondents are in Rift Valley province while the least are in North Eastern Province.

In general, most of the respondents have some formal education with only 7 percent of men and 13 percent of women having never attended school. Among those who have attended school, men tend to be slightly more educated than women.

Background Characteristics	Women			Men		
	Weighted percent	Weighted number	Unweighted number	Weighted percent	Weighted number	Unweighted number
<b>Age</b>						
15-19	22.7	1,861	1,820	23.8	853	829
20-24	20.4	1,668	1,710	18.7	670	674
25-29	16.8	1,376	1,400	14.0	502	514
30-34	13.6	1,117	1,116	11.9	424	421
35-39	10.6	872	859	10.9	392	390
40-44	9.6	789	780	9.0	323	314
45-49	6.2	511	510	5.6	199	206
50-54	-	-	-	6.0	215	230
<b>Marital status</b>						
Never married	29.7	2,437	2,466	44.8	1,602	1,584
Married	54.6	4,474	4,449	50.4	1,804	1,829
Living together	5.7	468	427	0.9	33	26
Divorced/separated	5.7	466	516	3.2	115	116
Widowed	4.3	350	337	0.7	23	23
<b>Residence</b>						
Urban	24.9	2,043	2,751	25.0	895	1,150
Rural	75.1	6,152	5,444	75.0	2,683	2,428
<b>Province</b>						
Nairobi	10.6	867	1,169	11.3	405	493
Central	13.3	1,090	1,314	14.2	506	621
Coast	8.3	676	938	7.3	262	375
Eastern	15.9	1,306	993	16.2	579	468
Nyanza	14.9	1,225	1,025	13.9	497	434
Rift Valley	23.7	1,946	1,328	24.6	881	586
Western	11.0	905	991	10.5	377	435
North Eastern	2.2	181	437	2.0	70	166
<b>Education</b>						
None/preschool	13.2	1,082	1,291	6.8	242	296
Primary incomplete	33.2	2,723	2,409	34.4	1,231	1,110
Primary complete	24.6	2,018	1,939	22.6	808	813
Secondary incomplete	10.8	887	902	10.8	385	392
Secondary complete	12.0	984	1,073	15.4	552	581
Higher	6.1	500	581	10.0	360	386
<b>Religion</b>						
Roman Catholic	25.5	2,092	1,919	26.9	961	913
Protestant/other Christian	64.5	5,284	5,045	59.6	2,134	2,055
Muslim	7.6	621	1,025	6.7	238	381
No religion	1.9	159	167	6.6	237	219
Other	0.3	28	29	0.2	8	9
Missing	0.1	11	10	0.0	1	1
<b>Ethnic group</b>						
Embu	1.4	117	101	1.5	54	46
Kalenjin	11.7	961	643	13.6	487	324
Kamba	12.0	983	786	12.5	447	371
Kikuyu	21.8	1,785	1,977	21.1	755	845
Kisii	6.1	503	454	5.7	205	208
Luhya	14.4	1,177	1,229	13.6	486	520
Luo	11.2	914	853	11.4	409	390
Masai	2.6	216	162	2.8	99	68
Meru	4.9	399	386	4.9	177	172
Mijikenda/Swahili	4.7	387	566	4.0	143	214
Somali	4.0	327	602	3.4	122	223
Taita/Tavate	1.4	113	135	1.2	43	51
Other	1.3	106	133	1.4	49	68
<b>Total</b>	<b>100.0</b>	<b>8,195</b>	<b>8,195</b>	<b>100.0</b>	<b>3,578</b>	<b>3,578</b>

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.

About 65 percent of respondents are Protestants, 26 percent are Catholic and about 7 percent are Muslim. Kikuyus form the largest ethnic group with about 22 percent of respondents, followed by Luhyas, Kambas, Kalenjins, and Luos, each of which accounts for 11-14 percent of women and men.

### 3.3. Fertility

Fertility data were collected in the survey by asking each of the women interviewed for a history of her births. The information obtained on each of the woman's births included the month and year of the birth. These data are used to calculate two of the most widely used measures of current fertility, the total fertility rate (TFR) and its component age-specific fertility rates.

As indicated in Table 3, the total fertility rate is 5.0. This means that on average, a Kenyan woman who is at the beginning of her childbearing years will give birth to 5.0 children by the end of her reproductive period if fertility levels remain constant at the level observed in the three-year period before the survey.

The TFR in rural areas (5.6 births) is considerably higher than the rate in urban areas (3.3 births). The results also show that urban-rural differences in childbearing rates are evident for all age groups. The absolute difference is especially large in the 20-24 age group. The rate among rural women in this age cohort is 280 births per thousand women, compared to an urban rate of 161 births per thousand.

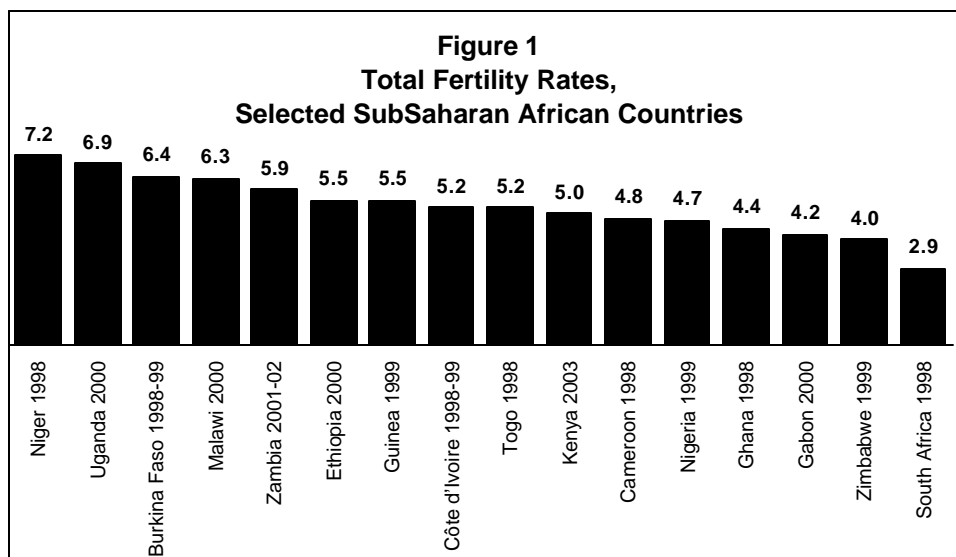
**Table 3 Current fertility**

Age-specific and total fertility rates (TFR) and the crude birth rate (CBR) for the three years preceding the survey, by urban-rural residence, Kenya 2003

Age group	Residence		Total
	Urban	Rural	
15-19	85	123	113
20-24	161	280	245
25-29	171	265	240
30-34	136	220	198
35-39	77	140	126
40-44	19	66	57
45-49	9	17	16
TFR	3.3	5.6	5.0
CBR	35.2	38.6	37.9

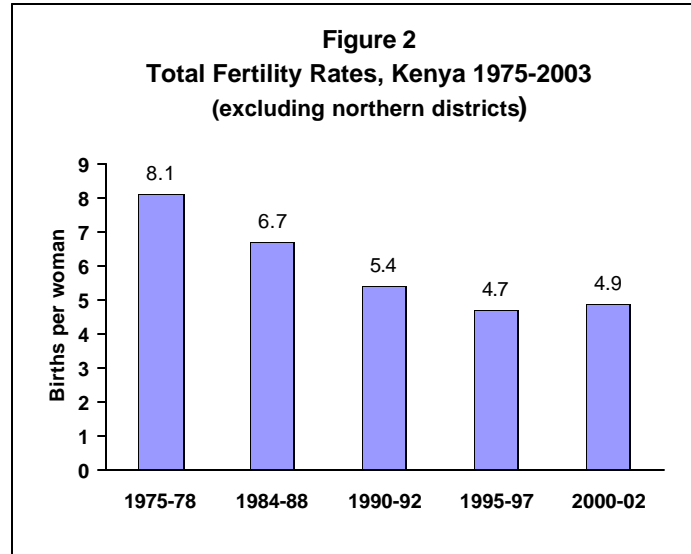
Note: Rates for age group 45-49 may be slightly biased due to truncation.

As the comparison in Figure 1 indicates, Kenya's fertility rate is among the lowest compared to other countries in sub-Saharan Africa region.



Source: DHS StatCompiler

The results indicate that Kenya's fertility decline over the previous two decades has stagnated. Figure 2 shows the decline in the TFR from a high of 8.1 births per woman in the 1977-78 Kenya Fertility Survey, to 6.7 births in the 1989 KDHS, 5.4 in the 1993 KDHS and 4.7 in the 1998 KDHS, followed by a rise to 4.9 in the 2003 KDHS.<sup>1</sup> The TFR has increased equally in both urban and rural areas, though this increase is mostly confined to women aged 25-39 years.



A TFR of 5.0 for the whole country is identical to the figure obtained from a detailed technical analysis of data from the 1999 Population and Housing Census (CBS, 2002:28). A stable or slightly increasing fertility rate is also consistent with the unchanging proportion of women using contraceptives and those in marriage. The patterns of contraceptive use are described in the next section. A more detailed analysis of the fertility data is necessary to explore the reasons for this apparent increase in fertility.

### 3.4. Family Planning

Information about knowledge and use of contraceptive methods was collected from female respondents by asking them to mention any ways or methods by which a couple can delay or avoid a pregnancy. For each method known, the respondent was asked if she had ever used it. Respondents reporting ever use of family planning were asked whether they or their partner was using a method at the time of the survey.

Table 4 shows the level and key differentials in the current use of contraception by method as reported by currently married women. Contraceptive methods are grouped into two types in the

<sup>1</sup> The rate in Figure 2 for the 2003 KDHS differs slightly from that presented in Table 3 due to the exclusion of North Eastern Province, Samburu and Turkana Districts in Rift Valley Province and Isiolo, Moyale and Marsabit Districts in Eastern Province, so as to be comparable to previous KDHS surveys.

table, namely modern and traditional methods. Modern methods include female sterilisation, pill, IUD, injectables, implants, male condom, and female condom. Traditional methods include periodic abstinence (rhythm method), withdrawal, and folk methods.

Table 4 Current use of contraception

Percent distribution of currently married women by contraceptive method currently used, according to background characteristics, Kenya 2003

Background Characteristics	Modern method								Traditional method				Not currently using	Total	Number of women
	Any method	Any modern method	Female sterilisation	Pill	IUD	Injectables	Implants	Condom	Any traditional method	Periodic abstinence	Withdrawal	Folk method			
<b>Age</b>															
15-19	15.2	11.6	0.0	3.1	0.0	5.5	0.4	2.6	3.6	3.1	0.5	0.0	84.8	100.0	333
20-24	27.6	22.2	0.1	6.8	0.6	13.5	0.6	0.6	5.4	4.4	0.5	0.5	72.4	100.0	952
25-29	38.3	30.3	0.5	7.2	1.3	18.2	1.6	1.4	8.0	6.6	0.8	0.7	61.7	100.0	1,056
30-34	43.8	35.8	2.6	10.1	3.0	17.2	1.6	1.2	8.0	6.8	0.6	0.6	56.2	100.0	900
35-39	48.7	38.4	6.8	8.7	4.4	13.4	3.2	1.6	10.4	8.5	1.3	0.6	51.3	100.0	706
40-44	47.3	39.6	12.7	6.8	4.0	12.8	2.2	1.0	7.7	6.4	0.7	0.6	52.7	100.0	617
45-49	38.3	27.0	14.8	2.9	3.5	4.8	0.4	0.6	11.4	8.2	0.4	2.8	61.7	100.0	379
<b>Residence</b>															
Urban	47.3	40.0	4.8	10.5	4.4	15.3	2.5	2.3	7.3	6.2	0.3	0.8	52.7	100.0	1,064
Rural	35.8	27.9	4.2	6.3	1.8	13.5	1.3	0.9	7.9	6.4	0.8	0.7	64.2	100.0	3,878
<b>Province</b>															
Nairobi	51.6	45.6	6.5	13.2	5.0	14.8	2.8	3.3	6.0	5.6	0.2	0.3	48.4	100.0	425
Central	66.8	58.3	6.8	16.5	9.2	21.6	3.5	0.8	8.5	7.5	0.2	0.8	33.2	100.0	602
Coast	23.5	18.8	2.7	4.1	0.7	9.7	1.2	0.3	4.7	3.8	0.5	0.4	76.5	100.0	418
Eastern	49.8	37.0	4.3	9.1	1.6	19.2	1.8	1.0	12.8	11.6	0.4	0.7	50.2	100.0	790
Nyanza	24.3	21.2	5.0	3.5	0.4	11.3	0.7	0.3	3.1	2.7	0.2	0.2	75.7	100.0	774
Rift Valley	32.9	22.9	3.0	4.0	1.7	11.2	1.2	1.6	10.1	7.4	1.7	1.0	67.1	100.0	1,249
Western	32.7	26.2	4.1	6.3	0.1	12.9	1.0	1.8	6.5	4.1	0.7	1.7	67.3	100.0	550
North Eastern	0.3	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	99.7	100.0	135
<b>Education</b>															
None	11.9	7.9	3.1	1.1	0.3	3.2	0.2	0.0	4.0	2.9	0.7	0.4	88.1	100.0	797
Primary incomplete	29.2	22.4	3.3	4.1	0.5	12.9	0.9	0.8	6.8	5.4	0.6	0.8	70.8	100.0	1,618
Primary complete	43.2	34.6	4.3	9.3	1.9	17.1	0.9	1.0	8.6	7.4	0.5	0.8	56.8	100.0	1,268
Secondary incomplete	51.2	42.3	5.5	11.1	2.0	20.8	1.1	1.8	8.8	7.9	0.4	0.5	48.8	100.0	433
Secondary complete	61.8	52.2	5.7	12.6	6.0	20.7	4.8	2.1	9.6	7.7	1.1	0.8	38.2	100.0	547
Higher	78.0	63.2	9.2	16.5	14.7	10.4	6.9	5.5	14.7	11.3	1.9	1.5	22.0	100.0	279
<b>Living children</b>															
0	6.8	3.9	0.0	1.8	0.4	0.8	0.2	0.8	2.8	2.6	0.0	0.2	93.2	100.0	350
1-2	37.5	31.1	0.6	9.6	2.7	14.6	1.7	1.9	6.5	5.1	0.6	0.7	62.5	100.0	1,709
3-4	47.6	39.7	5.3	8.9	3.5	18.7	1.8	1.4	7.9	6.6	0.8	0.5	52.4	100.0	1,475
5+	37.3	26.9	8.8	3.9	1.3	11.1	1.5	0.3	10.4	8.4	0.9	1.1	62.7	100.0	1,407
<b>Total 2003</b>	<b>38.3</b>	<b>30.5</b>	<b>4.3</b>	<b>7.2</b>	<b>2.4</b>	<b>13.8</b>	<b>1.6</b>	<b>1.2</b>	<b>7.8</b>	<b>6.3</b>	<b>0.7</b>	<b>0.7</b>	<b>61.7</b>	<b>100.0</b>	<b>4,942</b>
Total 1998	39.0	31.5	6.2	8.5	2.7	11.8	0.8	1.3	7.5	6.1	0.6	0.8	61.0	100.0	4,834

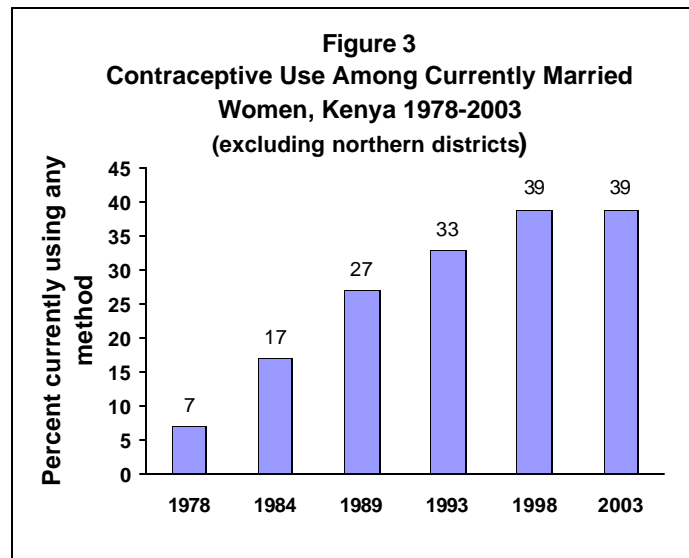
Note: Figures for 1998 exclude North Eastern Province and 5 other northern districts. If more than one method is used, only the most effective method is considered in this tabulation.



Slightly less than four in ten currently married women (38 percent) are currently using some method of contraception. Modern methods of contraception are more commonly used (31 percent) than are traditional methods (8 percent). Of the modern methods, injectables are the most widely used while periodic abstinence is the most popular traditional method.

The data show that contraceptive use among married women has not changed since 1998, when 39 percent of married women were using a method.<sup>2</sup> As shown in Table 4, there have also been no major changes in the mix of methods used, apart from a slight decline in female sterilization, use of IUD and pill; and an increase in use of injectables and implants.

The plateau in contraceptive use is in sharp contrast with previous trends. Since the early 1980s, there had been a steady increase in family planning use among married women as shown in Figure 3. The rate of increase then slowed down between 1993 and 1998, and now appears to have stabilised altogether. Nevertheless, the 2003 KDHS corroborates trends in method mix, namely, a continuing increase in use of injectables and decrease in use of the pill as was the case in earlier KDHS surveys.



Contraceptive prevalence peaks among women in the 35-39 age-group and is lowest for women aged 15-19. A higher percentage of urban women (47 percent) use contraceptives, compared with their rural counterparts (36 percent). Married women in Central Province continue to have the highest contraceptive prevalence rate (67 percent), followed by Nairobi (52 percent) and Eastern Province (50 percent). The lowest level of family planning use is recorded in North Eastern Province (less than one percent).

Contraceptive prevalence increases dramatically with increasing level of education. More than three-quarters of women who have higher education are using a contraceptive method, compared to just over half of women with incomplete secondary education and only 12 percent of those who never attended school. The analysis also shows that the highest proportion of women (48 percent) who use contraception have 3-4 living children.

<sup>2</sup> When North Eastern Province is excluded, the contraceptive prevalence rate among currently married women in 2003 is 39 percent.

### 3.5. Fertility Preferences

Several questions were asked in the survey concerning women’s fertility preferences. These questions included: a) whether the respondent wanted another child and b) if so, when she would like to have the next child. The answers to these questions allow for the estimation of the potential demand for family planning services either to limit or space births.

Figure 4 shows that there is considerable desire among Kenyan women to control the timing and number of births. Among all currently married women, 29 percent would like to wait for two years or more for the next birth, and 48 percent do not want to have another or are sterilised. Sixteen percent of married women would like to have a child soon (within two years). The remaining women are uncertain about their fertility desires or say they are unable to get pregnant (infecund).

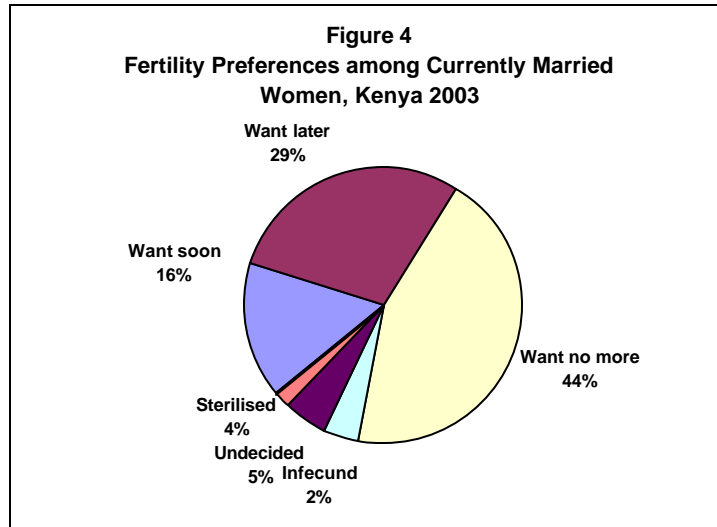


Table 5 shows that fertility preferences are closely related to the number of living children a woman has. The vast majority of currently married women without a child (79 percent) would like to have one soon. Women show greater interest in controlling the pace of childbearing once they have a child. Almost six in ten women with one living child want to delay their next birth. Interest in controlling the number of births grows rapidly as the number of children increases; the proportion wanting no more children or sterilised rises from 9 percent among women with one living child to 79 percent of women with six or more living children.

Analysis of trends is complicated by the fact that the previous KDHS surveys omitted North Eastern Province and several other northern districts. When data for these areas are removed from the 2003 data, the results show a trend towards pronatalist desires, with an increase in the proportion of married women who want to have more children (from 40 to 46 percent) and a subsequent decline in the proportion who want no more children or are sterilised (from 53 to 50 percent).

Table 5 Fertility preferences by number of living children

Percent distribution of currently married women by desire for children, according to number of living children, Kenya 2003

Desire for children	Number of living children <sup>1</sup>							Total
	0	1	2	3	4	5	6+	
Have another soon <sup>2</sup>	78.6	27.5	14.0	12.0	7.7	8.3	5.4	15.6
Have another later <sup>3</sup>	8.9	57.9	45.6	32.5	21.2	10.7	8.3	29.4
Have another, undecided when	2.4	3.4	1.9	1.9	1.0	0.4	1.1	1.7
Undecided	2.3	1.2	4.2	4.0	1.4	2.9	2.5	2.8
Want no more	0.8	8.4	32.6	44.6	60.1	68.5	70.1	44.1
Sterilised <sup>4</sup>	0.0	0.5	0.7	4.1	6.2	7.4	9.2	4.3
Infecund	6.2	1.1	1.0	0.9	2.5	1.6	3.0	1.9
Missing	0.7	0.1	0.1	0.0	0.0	0.2	0.3	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	230	754	940	909	664	511	936	4,942

<sup>1</sup> Includes current pregnancy

<sup>2</sup> Wants next birth within 2 years

<sup>3</sup> Wants to delay next birth for 2 or more years

<sup>4</sup> Includes both male and female sterilisation

### 3.6. Maternity Care

Proper care during pregnancy and delivery are important for the health of both the mother and the baby. In the survey, women who had given birth in the five years preceding the survey were asked a number of questions about maternal and child health care. For the last live birth in that period, mothers were asked whether they had obtained antenatal care during the pregnancy and whether they had received tetanus toxoid injections and/or iron supplements while pregnant. For each birth in the same period, mothers were also asked what type of assistance they received at the time of delivery. Table 6 presents the results of key maternity care indicators.

#### *Antenatal Care*

Almost nine in ten mothers reported seeing a health professional at least once for antenatal care for the most recent birth in the five-year period before the survey. The differentials in antenatal care coverage are generally minor. Coverage is slightly lower for births of sixth and higher order and it is slightly higher in urban areas than in rural areas (93 percent and 87 percent, respectively). Across provinces, the proportion of mothers reporting they received antenatal care from a health professional is markedly lower in North Eastern (25 percent) as compared with a range of 87-95 percent in other provinces. As the mother's educational level rises, so does the likelihood that she will see a health professional for care during pregnancy. The analysis shows that only 67 percent of women with no education received antenatal care from a doctor, nurse or midwife, as compared to 88 percent of women with incomplete primary education and 99 percent of those with higher education.

#### *Tetanus Toxoid and Iron Supplements*

Tetanus toxoid injections are given during pregnancy to prevent neonatal tetanus which is a major cause of infant deaths. Mothers are also given iron supplements during pregnancy to prevent them from maternal anaemia, which is a major cause of both maternal and neonatal mortality.

Table 6 indicates that tetanus toxoid coverage is widespread though not universal among pregnant women in Kenya. Most mothers (86 percent) were given at least one tetanus toxoid injection during pregnancy of their most recent births. Younger and older mothers are somewhat less likely to receive tetanus toxoid injections than mothers aged 20-34 years. Similarly, mothers are less likely to receive tetanus injections for sixth and higher birth orders than for lower birth orders. Urban mothers are slightly more likely than rural mothers to have received a tetanus injection during pregnancy. Differences by province are minimal, except that only about one-third of mothers in North Eastern Province receive tetanus injections, compared with 83-92 percent in other provinces. The likelihood that a mother will receive a tetanus toxoid injection during pregnancy generally increases with her educational level.

According to Table 6, mothers are much less likely to receive iron supplements during pregnancy than a tetanus toxoid injection as less than half of them (46 percent) are receiving iron tablets or syrup during pregnancy. The mother's age, the child's birth order and the place of residence have insignificant effect on the likelihood that the mother will receive iron supplements during pregnancy. Iron supplementation is more common among mothers in Coast and Nyanza Provinces — both of which are malaria endemic areas — and much less common among mothers in North Eastern and Central Provinces. In contrast to the findings regarding antenatal care and tetanus injections, mother's age, level of education, child's birth order and place of residence is largely unrelated to the likelihood that a pregnant woman will receive iron supplements.

## Delivery Care

Proper medical attention and hygienic conditions during delivery could reduce the risk of complications and infections that could cause the death or serious illness of the mother and/or the baby. Table 6 shows that only 4 in 10 births in Kenya are delivered by a health professional. A similar proportion of deliveries takes place in health facilities.

<b>Table 6 Maternity care indicators</b>							
Percentage of women who had a live birth in the five years preceding the survey who received specific maternal health services during pregnancy for the most recent birth, and among all live births in the five years before the survey, percentage delivered by a health professional and percentage delivered in a health facility, by background characteristics, Kenya 2003							
Background Characteristic	Percent with antenatal care from health professional <sup>1</sup>	Percent given at least one tetanus toxoid injection <sup>1</sup>	Percent given iron tablets syrup during pregnancy <sup>1</sup>	Number of women	Percent delivered by a health professional <sup>2</sup>	Percent delivered in a health facility <sup>2</sup>	Number of births
<b>Mother's age at birth</b>							
<20	84.2	80.3	44.8	632	46.5	45.5	1,061
20-34	89.7	87.8	46.6	2,848	41.3	39.9	4,352
35+	83.6	79.5	46.3	582	29.3	28.0	745
<b>Birth order</b>							
1	89.6	85.2	42.1	930	60.1	58.8	1,461
2-3	91.1	89.1	46.3	1,403	42.8	41.1	2,184
4-5	88.5	86.6	47.9	862	33.5	32.5	1,250
6+	80.7	78.7	49.1	868	22.1	20.9	1,262
<b>Residence</b>							
Urban	92.8	89.8	46.8	808	72.6	70.7	1,112
Rural	86.8	84.4	46.2	3,255	33.8	32.5	5,045
<b>Province</b>							
Nairobi	94.7	88.3	43.3	311	78.5	77.2	409
Central	92.7	91.9	29.1	441	68.8	67.6	574
Coast	86.9	83.2	64.8	335	34.7	32.3	507
Eastern	91.1	86.8	32.1	647	35.7	35.0	963
Nyanza	86.6	84.5	62.1	635	40.7	38.2	986
Rift Valley	88.5	85.9	47.4	1,114	36.1	35.1	1,750
Western	90.8	89.9	52.5	470	29.0	28.1	779
North Eastern	25.3	32.6	20.5	110	8.0	7.1	188
<b>Education</b>							
None	66.9	67.0	46.5	599	15.8	14.3	974
Primary incomplete	88.0	84.9	47.8	1,436	30.3	29.6	2,306
Primary complete	91.7	88.5	42.6	1,108	46.9	45.3	1,631
Secondary incomplete	96.4	95.2	49.5	353	59.3	56.1	506
Secondary complete	97.2	95.1	44.7	398	76.4	74.6	516
Higher	99.2	92.8	53.1	170	88.8	87.8	225
<b>Total</b>	<b>88.0</b>	<b>85.5</b>	<b>46.3</b>	<b>4,063</b>	<b>40.8</b>	<b>39.4</b>	<b>6,157</b>
Note: If the respondent mentioned more than one source of antenatal or delivery care, the most qualified person is considered in this table. "Health professional" refers to a doctor, nurse, or midwife. <sup>1</sup> Includes only the most recent birth in the 5-year period preceding the survey. <sup>2</sup> Includes all births in the 5-year period preceding the survey.							

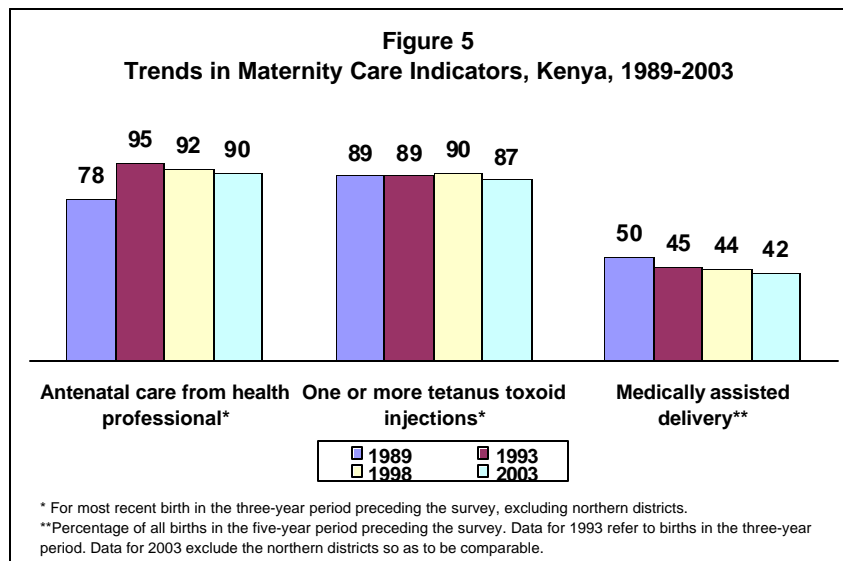
Differentials in delivery care by background characteristics of the mother are generally similar to those for antenatal care. Mother's age at birth and birth order are inversely related to the likelihood of receiving medical assistance during delivery and delivering in a health facility. For example, only one in five births of sixth or higher order is delivered in a health facility, compared with three in five first

births. Rural women and less educated women are less likely than others to receive medical assistance during delivery and to deliver in a health facility. For example, urban mothers (73 percent) are more than twice as likely as rural mothers (34 percent) to have a medically assisted delivery. The likelihood of a medically assisted delivery also increases substantially with the mother's educational level, from 16 percent among mothers with no education to 89 percent among mothers with higher education. Mothers in Nairobi and Central Provinces are more likely to receive medical assistance during delivery and to deliver in health facilities. This contrasts sharply with the fact that only 8 percent of births in North Eastern Province are medically assisted and 7 percent take place in health facilities.

***Trends in Maternity Care Indicators***

As with other comparisons, analysis of trends in maternity care indicators is complicated by the fact that previous surveys omitted the entire northern part of Kenya, due to its relatively small and largely nomadic population. Another obstacle is the fact that the previous KDHS surveys asked questions on antenatal care and tetanus injections for all births in a specified period prior to the survey, whereas the 2003 KDHS confined these questions to only the most recent birth. In the 1998 KDHS, the questions on maternity care and children's health referred to births in the three years preceding the survey while all other KDHS surveys used a five-year reference period.

After adjusting for these differences, Figure 5 shows the trends in key maternity care indicators between the 1989 and 2003 KDHS surveys. Antenatal care from health professionals rose between the 1989 and 1993 surveys and then experienced a decline thereafter. The decrease in antenatal care coverage was modest, as the proportion of mothers reporting they received antenatal care from a health professional dropped by about 5 percentage points from a peak of 95 percent in 1993. Tetanus toxoid coverage has remained more or less constant over time. The percentage of medically assisted deliveries has fallen consistently during the periods between the surveys, from 50 percent of births in 1993 KDHS to 42 percent of births in the 2003 survey.



### 3.7. Child Health and Nutrition

#### Vaccination of Children

According to the World Health Organisation, a child is considered fully vaccinated if he or she has received a BCG vaccination against tuberculosis; three doses of DPT vaccine to prevent diphtheria, pertussis, and tetanus; at least three doses of polio vaccine; and one dose of measles vaccine. These vaccinations should be received during the first year of life. The 2003 KDHS collected information on the coverage for these vaccinations among all children born in the five years preceding the survey.

The information on vaccination coverage was obtained in two ways — from health cards and from mother's verbal reports. All mothers were asked to show the interviewer the health cards used for the child's immunisation. If the card was available, the interviewer copied the dates of each vaccination received. If a vaccination was not recorded on the card as being given, the mother was asked to recall whether that particular vaccination had been given. If the mother was not able to present a card for a child at all, she was further asked to recall whether the child had received BCG, polio, DPT and measles. If she indicated that the child had received the polio or DPT vaccines, she was asked about the number of doses that the child received.

Table 7 presents information on vaccination coverage for children aged 12-23 months, who should be fully vaccinated against the six preventable childhood illnesses. The results are based both on the health card record and information provided by the mother. The table shows that health cards were available for only 6 in 10 of the children covered.

Overall, 52 percent of children aged 12-23 months are fully vaccinated. Only 8 percent of children have not received any vaccines. Looking at coverage for specific vaccines, 87 percent of children have received the BCG vaccination, 89 percent the first DPT dose and 91 percent the first polio dose (Polio 1). Coverage declines for subsequent doses, with only 73 percent of children receiving the recommended three doses of DPT and 67 percent receiving all three doses of polio. The decline in coverage levels reflects dropout rates of 18 percent for DPT and 26 percent for polio. The dropout rate represents the proportion of children who receive the first dose of a vaccine but do not go on to get the third dose. The proportion of children vaccinated against measles is 72 percent.

Differentials in coverage levels show that the proportion of children fully vaccinated falls below 50 percent for children of sixth or higher birth order. Similarly, the proportion of children fully vaccinated in Nyanza, Western, and North Eastern provinces, and those whose mothers have no education or only incomplete primary education also falls below 50 percent. Coverage levels are close to 75 percent for children in Central province and exceed 75 percent for those whose mothers have higher education. The extremely poor immunisation coverage for North Eastern province is worrisome. Only 6 percent of children aged 12-23 months in this Province are fully immunised, while over half have had no vaccinations at all.

To provide an understanding of trends, information on vaccination coverage for all children aged 12-23 months in the 1998 KDHS is included in Table 7. Since this latter survey did not cover North Eastern province, data from the 2003 KDHS excluding this province are also given. Moreover, the 1998 data were adjusted for a likely misinterpretation between the first dose of polio and polio at birth. The adjustment involved checking the total number of polio and DPT doses. For children reported as having received a total of three doses of DPT and polio 0, polio 1, and polio 2, it was assumed that polio 0 was in fact polio 1, polio 1 was polio 2 and polio 2 was polio 3. A similar adjustment was made for KDHS 2003 as presented in Table 7 for comparison purposes.

The data indicate that there has been a decline in vaccination coverage since 1998, from 65 percent in 1998 for fully immunized children to 59 percent in 2003.

**Table 7 Vaccinations by background characteristics**

Percentage of children age 12-23 months who received specific vaccines at any time before the survey (according to a vaccination card or the mother's report), and percentage with a vaccination card seen, by background characteristics, Kenya 2003

Background Characteristic	BCG	DPT 1	DPT 2	DPT 3	Polio 0 <sup>1</sup>	Polio 1	Polio 2	Polio 3	Meas-les	All <sup>2</sup>	No vac-cina-tions	Vac-ci-nation card seen	No. of chil-dren
<b>Sex</b>													
Male	86.2	88.6	83.1	71.8	59.0	90.4	82.8	65.6	72.2	50.7	8.0	58.8	573
Female	87.5	89.8	84.7	73.7	57.5	90.6	83.0	68.1	72.0	52.4	7.5	61.6	572
<b>Birth order</b>													
1	92.0	93.0	90.6	79.3	72.4	93.2	86.9	72.0	81.2	61.2	4.7	64.5	269
2-3	90.8	93.2	86.0	73.7	61.9	93.5	84.3	67.5	76.7	52.5	4.7	63.2	404
4-5	85.7	88.6	85.5	74.4	56.7	89.3	85.9	66.6	70.7	51.4	9.4	59.5	250
6+	74.5	77.9	70.1	61.0	36.1	83.0	72.1	59.6	54.4	38.2	15.2	50.1	221
<b>Residence</b>													
Urban	95.1	93.3	87.3	70.9	71.6	93.5	84.4	63.7	83.8	53.5	3.6	50.5	194
Rural	85.1	88.3	83.2	73.1	55.5	89.9	82.6	67.5	69.7	51.1	8.6	62.1	951
<b>Province</b>													
Nairobi	96.4	96.4	86.8	71.8	72.6	97.6	89.2	64.0	86.8	54.4	1.2	47.7	64
Central	97.5	96.5	95.5	89.4	78.5	96.0	94.0	81.9	92.0	74.2	2.5	66.4	110
Coast	88.5	95.5	89.3	77.8	59.0	95.1	90.0	77.6	80.0	62.8	4.5	69.1	104
Eastern	84.5	96.0	94.7	87.5	62.2	95.1	91.1	77.9	74.1	57.7	4.0	77.7	189
Nyanza	74.6	74.4	65.4	54.9	43.1	80.2	69.9	46.0	48.7	32.4	19.6	40.0	141
Rift Valley	90.7	89.3	85.6	73.2	63.7	90.7	83.0	67.7	74.0	53.2	6.3	61.0	353
Western	90.6	92.3	82.3	65.2	42.0	93.5	81.0	63.3	68.7	41.8	4.9	58.2	155
North Eastern	28.6	33.9	23.7	20.6	17.6	41.0	22.7	17.1	33.4	6.4	52.6	17.5	30
<b>Education</b>													
None	61.6	68.0	59.0	51.2	30.0	72.4	60.2	48.9	50.1	32.8	24.8	45.1	174
Primary incomplete	89.6	91.5	85.1	71.2	54.2	92.6	84.0	65.6	66.3	48.6	5.7	64.6	404
Primary complete	91.8	93.7	89.4	77.4	66.0	93.4	87.9	72.6	81.3	56.3	4.1	63.3	328
Second. incomplete	89.2	89.1	86.5	80.2	65.8	93.2	86.4	70.5	75.4	53.8	6.8	63.1	105
Secondary complete	96.5	98.4	97.6	89.7	81.9	98.4	95.2	73.7	91.2	67.6	1.6	53.9	87
Higher	98.4	98.4	95.2	84.6	82.4	98.4	91.8	82.9	97.0	78.1	1.6	60.3	47
<b>Total 2003</b>	<b>86.8</b>	<b>89.2</b>	<b>83.9</b>	<b>72.7</b>	<b>58.2</b>	<b>90.5</b>	<b>82.9</b>	<b>66.8</b>	<b>72.1</b>	<b>51.5</b>	<b>7.8</b>	<b>60.2</b>	<b>1,145</b>
Total 2003 adjusted <sup>3</sup>	89.1	91.4	86.4	75.1	50.5	92.4	88.0	75.4	74.5	59.2	6.2	61.5	1,081
Total 1998	95.9	95.8	90.0	79.2	-	95.4	90.4	80.8	79.2	65.4	2.7	55.4	1,097

<sup>1</sup> Polio 0 is the polio vaccination given at birth.

<sup>2</sup> BCG, measles and three doses each of DPT and polio vaccine (excluding polio vaccine given at birth)

<sup>3</sup> Excluding the northern districts and adjusted for possible confusion of Polio 0 and Polio 1 (see text)

## Treatment of Childhood Illnesses

Acute respiratory illness, malaria, and dehydration caused by severe diarrhoea are major causes of childhood mortality in Kenya. Prompt medical attention when a child has the symptoms of these illnesses is, therefore, crucial in reducing child deaths. To obtain information on how childhood illnesses are treated, the mothers of each child under five years of age were asked whether the child



had experienced the following symptoms in the two weeks before the survey: cough with short, rapid breathing (symptoms of an acute respiratory infection), fever (symptom of malaria), and diarrhoea.

The results show that less than half of children under age five years whose mothers were interviewed in the survey are reported to have had a cough with short rapid breathing and/or a fever in the two weeks before the survey.<sup>3</sup> Table 8 shows that more than half of these children sought treatment from a health provider. Differences in treatment seeking behaviour by background characteristics are minimal, except for children living in Coast Province who are more likely than their counterparts in other Provinces to be taken to a health provider for treatment. Children whose mothers have higher secondary education have a 70 percent chance of being taken for treatment when they have ARI symptoms and/or fever.

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<sup>3</sup> ARI symptoms were reported for 18 percent of children during the two weeks before the survey, while 40 percent had had a fever.

Table 8 Treatment for acute respiratory infection, fever, and diarrhoea

Among children under five who were sick with a cough accompanied by short, rapid breathing (symptoms of acute respiratory infection-ARI) or fever in the two weeks preceding the survey, percentage for whom treatment was sought from a health facility or provider, and among children under five years who were sick with diarrhoea during the two weeks preceding the survey, percentage for whom treatment was sought from a health facility or provider, percentage given a solution made from oral rehydration salt (ORS) packets, and percentage given any oral rehydration therapy (ORT) by background characteristics, Kenya 2003

Background Characteristics	Children with symptoms of ARI or with fever		Children with diarrhoea			
	Percent for whom treatment was sought from a health facility/ prv.	Number with ARI/ fever	Percent for whom treatment was sought from a health facility/pr.	Percent given solution from ORS packet	Percent given ORT or increased fluids	Number with diarrhoea
<i>Age in months</i>						
<6	45.0	260	20.2	15.7	25.5	90
6-11	53.7	372	32.4	32.2	51.9	185
12-23	48.4	600	33.6	33.3	53.7	289
24-35	48.0	474	25.8	28.9	50.7	178
36-47	39.2	435	34.3	28.6	54.8	90
48-59	38.8	361	27.8	26.7	53.7	71
<i>Sex</i>						
Male	46.0	1,259	27.2	28.1	49.3	495
Female	45.5	1,243	33.6	31.1	51.0	408
<i>Residence</i>						
Urban	53.4	451	33.1	32.4	51.7	175
Rural	44.1	2,051	29.4	28.7	49.6	729
<i>Province</i>						
Nairobi	55.8	165	35.6	40.0	65.7	54
Central	47.6	280	29.7	22.0	56.3	37
Coast	59.4	206	45.6	46.8	63.3	99
Eastern	52.2	293	49.0	37.7	72.2	117
Nyanza	39.3	442	20.9	20.2	34.2	143
Rift Valley	48.7	647	27.7	31.5	48.1	280
Western	33.9	425	19.6	14.8	36.2	153
North Eastern	25.6	44	(10.5)	(30.8)	(47.6)	21
<i>Education</i>						
None/preschool	45.3	328	30.6	38.6	47.9	147
Primary incomplete	47.0	987	28.8	25.2	45.1	406
Primary complete	43.1	671	31.6	31.1	56.1	233
Secondary incomplete	37.3	221	19.5	17.3	38.9	56
Secondary complete	49.3	217	(41.9)	(46.6)	(81.0)	45
Higher	68.8	78	*	*	*	17
Total	45.8	2,502	30.1	29.5	50.0	903

Note: Figures in parentheses are based on 25-49 unweighted cases; an asterisk means a figure is based on fewer than 25 unweighted cases and has been suppressed.

<sup>1</sup>Excludes pharmacy, shop, and traditional practitioner

<sup>2</sup>Includes ORS, recommended home fluid, or increased fluids

Table 8 also looks at the treatment of diarrhoeal illness. The data indicates that less than one-third of the children who were ill with diarrhoea were taken to a health provider. Children under 6 months are among the least likely to receive treatment from a medical provider. The percentage of children taken to a health provider for treatment varies markedly across provinces, from 20 percent in Western Province to 49 percent in Eastern Province.

Oral rehydration therapy (ORT), which involves a prompt increase in the child's intake of fluids, is a simple and effective response to diarrhoeal illness. Mothers reported that half of the children with diarrhoea were treated with some form of oral rehydration therapy (ORT), and 30 percent were given a solution prepared using a packet of oral rehydration salts (ORS). The use of ORT to treat diarrhoea was least common among children in Nyanza and Western provinces and among children under six months of age.

### *Ownership and Use of Insecticide-Treated Mosquito Nets*

One of strongest weapons in the fight against malaria is the use of insecticide-treated mosquito nets (ITNs) while sleeping. In the 2003 KDHS, data were collected from households on ownership and the number of mosquito nets. Finally, respondents were asked to indicate particular household members who had slept under each net the night prior to the interview. Questions were also asked on the treatment of the nets by insecticides and the last time this was done.

More than 20 percent of households report owning at least one mosquito net (Table 9). However, only 6 percent of households have an insecticide-treated net. Although 14 percent of children under five years and 15 percent of women of reproductive age were reported to have slept under a mosquito net the night prior to the interview, less than 5 percent slept under a treated bednet.

**Table 9 Ownership and use of mosquito nets**

Percentage of households with at least one mosquito net (treated or untreated), percentage of households that have at least one insecticide-treated net (ITN) percentage of de facto children under five and de facto women 15-49 who slept under a bednet and who slept under an ITN the night prior to the survey, Kenya 2003

Residence/ Province	Percent of households with at least 1 bednet	Percent of households with at least 1 ITN	Number of house- holds	Percent of children under 5 who slept under a bednet last night	Percent of children under 5 who slept under an ITN last night	Number of children under 5	Percent of women 15-49 who slept under a bednet last night	Percent of women 15-49 who slept under an ITN last night	Number of women 15-49
<i>Residence</i>									
Urban	37.5	10.3	2,110	33.2	10.0	1,023	30.0	9.3	2,182
Rural	15.9	4.1	6,451	10.0	3.1	4,996	10.4	2.9	6,587
<b>Province</b>									
Nairobi	37.2	6.7	862	38.3	8.1	354	30.7	6.7	926
Central	16.4	3.4	1,242	13.9	4.2	574	13.2	3.7	1,161
Coast	33.3	9.5	691	20.8	6.7	489	24.4	7.8	723
Eastern	16.6	4.1	1,312	12.0	3.4	996	12.2	3.5	1,397
Nyanza	31.1	10.6	1,280	16.5	6.7	899	19.6	7.6	1,311
Rift Valley	9.8	2.7	2,014	6.8	2.1	1,750	6.8	1.8	2,087
Western	18.7	6.7	959	11.6	5.0	779	11.8	4.3	969
North Eastern	34.5	3.3	201	26.2	1.3	178	23.1	2.5	196
Total	21.2	5.6	8,561	14.0	4.3	6,019	15.3	4.5	8,769

Ownership and use of mosquito nets is considerably higher in urban than in rural areas. Similarly, ownership and use of ITNs is highest in Nyanza, Coast, and Western Provinces, all of which are malaria-prone areas, as well as Nairobi.

### *Breastfeeding and Supplementation*

Breastfeeding practices and introduction of supplemental foods are important determinants of the nutritional status of children, particularly those under the age of two years. With improved nutritional status, the risk of mortality among children under five years can be reduced and their psycho-motor development enhanced. Breast milk is uncontaminated and contains all the nutrients needed by children in the first four to six months of life. Supplementing breast milk before four months of age is unnecessary and discouraged because of the likelihood of contamination, which may result in the risk of diarrhoeal diseases.

Table 10 Breastfeeding status by age

Percent distribution of youngest children under three years living with the mother by breastfeeding status and percentage of children under three years using a bottle with a nipple, according to age in months, Kenya 2003

Age in Months	Breastfeeding and consuming:							Total	Number of children	Percent using a bottle with a nipple	Number of children
	Not breast-feeding	Exclusively breastfed	Plain water only	Water-based liquids/juice	Other milk	Complementary food					
<2	0.8	29.4	26.9	12.1	15.9	14.8	100.0	173	16.9	175	
2-3	0.0	9.4	13.8	9.8	21.8	45.1	100.0	239	28.6	245	
4-5	0.0	2.8	3.3	5.6	22.5	65.8	100.0	204	32.0	208	
6-7	3.2	1.7	1.7	0.9	11.0	81.5	100.0	208	38.0	212	
8-9	3.2	0.6	3.3	2.5	3.6	86.7	100.0	209	21.2	210	
10-11	3.5	0.7	1.1	1.3	3.1	90.2	100.0	213	26.8	214	
12-15	7.3	0.4	0.8	0.3	2.9	88.3	100.0	405	19.4	417	
16-19	26.5	0.5	0.6	0.4	1.8	70.2	100.0	336	15.0	364	
20-23	43.2	0.0	0.6	0.4	1.3	54.4	100.0	311	10.6	364	
24-27	65.0	0.2	0.0	0.2	0.4	34.2	100.0	266	5.8	353	
28-31	78.5	0.0	0.0	0.0	0.4	21.2	100.0	230	5.2	346	
32-35	89.1	0.0	0.0	0.0	0.1	10.8	100.0	198	5.1	362	
<6	0.2	12.8	14.0	9.1	20.4	43.5	100.0	616	26.5	628	
6-9	3.2	1.2	2.5	1.7	7.3	84.1	100.0	416	29.6	421	

Note: Breastfeeding status refers to a "24-hour" period (yesterday and last night). Children classified as breastfeeding and consuming plain water only consume no supplements. The categories of not breastfeeding, exclusively breastfed, breastfeeding and consuming plain water, water-based liquids/juice, other milk, and complementary foods (solids and semi-solids) are hierarchical and mutually exclusive, and their percentages add to 100 percent. Thus children who receive breast milk and water-based liquids and who do not receive complementary foods are classified in the water-based liquid category even though they may also get plain water. Any children who get complementary food are classified in that category as long as they are breastfeeding as well. <sup>1</sup>Based on all children under three years.

Table 10 shows that the duration of breastfeeding in Kenya is long. The results reveal that 96 percent of children aged between 10 and 11 months are still being breastfed. The proportion of children who are still being breastfed declines with age.

The results in table 10 also indicate that supplementation of breast milk starts early in Kenya. Exclusive breastfeeding (breast milk only) is not common as only 29 percent of children under two months and 9 percent of those under four months of age are exclusively breastfed. Most of the supplements given are plain water, water-based liquids or juice, or other milk. However, 15 percent of babies under two months and 45 percent of those aged 2-3 months of age are given complementary food, presumably mushy or semi-solid food. By age 45 months, two-thirds of children are given complementary foods.

Bottle-feeding among children below three years is widespread. Nearly one in five babies under two months of age are being fed using a bottle with a teat. This proportion rises to about 40 percent of children aged 6-7 months. These rates are slightly higher than those reported in the 1998 KDHS.

### *Child Nutrition*

Malnutrition places children at increased risk of morbidity and mortality and has also been shown to be related to impaired mental development. Anthropometry provides one of the most important indicators of children's nutritional status. Height and weight measurements were obtained for children born in the five years before the survey. The height and weight data are used to compute three summary indices of nutritional status: height-for-age; weight-for-height; and weight-for-age. These three indices are expressed as standardised scores (z-scores) or standard deviation units from the median for the international reference population recommended by the World Health Organisation. Children who fall more than two standard deviations below the reference median are regarded as undernourished, while those who fall more than three standard deviations below the reference median are considered severely undernourished. Table 11 shows the nutritional status among children under five years of age by selected background characteristics.

Children whose height-for-age is below minus two standard deviations from the median of the reference population are considered stunted or short for their age. Stunting is the outcome of failure to receive adequate nutrition over an extended period and is also affected by recurrent or chronic illness. According to the 2003 KDHS findings, 31 percent of Kenyan children are stunted, with 11 percent being severely stunted. Stunting levels increase rapidly with age, peaking at 43 percent among children in the second year of life and remaining at 29-36 percent among older children. Stunting levels are slightly higher for boys than girls and for rural children than for urban children. The prevalence of stunting varies by province from 18 percent in Nairobi to 36 percent in Coast Province. Children of mothers with secondary or higher education are much less likely to be stunted than children whose mothers achieved only the primary level or never attended school. There is little difference in stunting by age of the mother.

Children whose weight-for-height is below minus two standard deviations from the median of the reference population are considered wasted (or thin). Wasting represents the failure to receive adequate nutrition in the period immediately before the survey, and typically is the result of recent illness episodes, especially diarrhoea, or of a rapid deterioration in food supplies. Table 11 shows that 6 percent of Kenyan children are wasted, with just over 1 percent severely wasted. Wasting levels are highest for the ages 10-23 months, the period in which the child is being weaned and, consequently, is more vulnerable to illness. Wasting is markedly higher in North Eastern Province, where 28 percent of children under five years are wasted.

Children whose weight-for-age is below minus two standard deviations (-2 SD) from the median of the reference population are considered underweight. The measure reflects the effects of both acute and chronic malnutrition. One-fifth of Kenyan children are underweight, with 4 percent classified as severely underweight. Peak levels of low weight-for-age are found among children aged 10-35 months, as well as children in North Eastern Province and those whose mothers have no education.

Figure 6 presents trends in the three nutritional indicators as measured in the 1993, 1998, and 2003 KDHSs. The results document a very slight decline in the prevalence of stunting and underweight children since 1998.

Table 11 Nutritional status of children

Percentage of children under five years classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by background characteristics, Kenya 2003

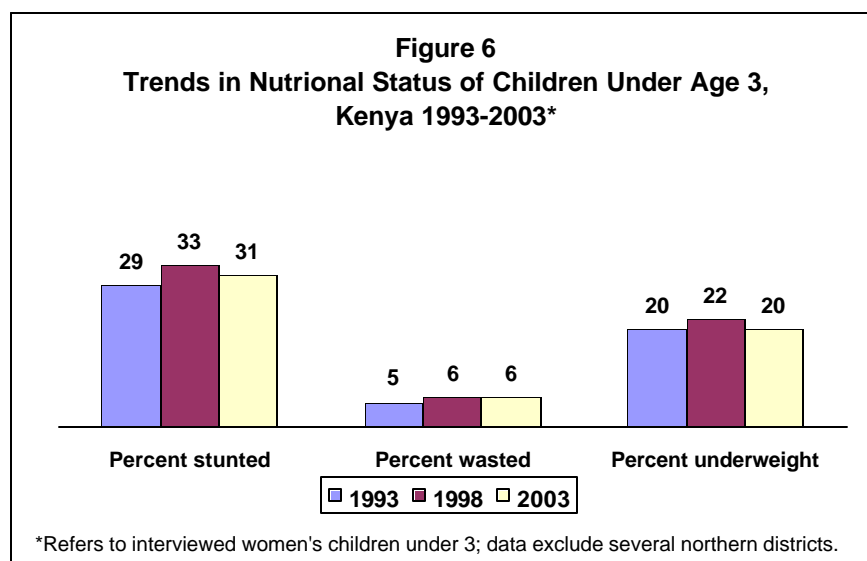
Background characteristic	Height-for-age		Weight-for-height		Weight-for-age		Number of children
	Percentage below -3 SD	Percentage below -2 SD <sup>1</sup>	Percentage below -3 SD	Percentage below -2 SD <sup>1</sup>	Percentage below -3 SD	Percentage below -2 SD <sup>1</sup>	
<i>Age in months</i>							
<6	0.5	7.1	0.7	4.0	0.0	2.2	523
6-9	4.1	13.2	0.6	4.6	2.3	10.5	408
10-11	3.7	20.9	2.8	8.8	4.4	25.6	209
12-23	16.0	42.8	2.2	9.8	8.0	26.4	1,115
24-35	13.7	36.1	1.4	5.6	5.8	26.1	1,049
36-47	13.5	34.7	0.9	4.3	3.2	21.4	1,103
48-59	10.3	28.7	0.6	3.4	3.1	18.2	1,006
<i>Sex</i>							
Male	11.9	33.6	1.3	6.6	4.9	22.3	2,711
Female	10.3	27.8	1.1	4.8	3.7	18.1	2,701
<i>Residence</i>							
Urban	8.3	23.3	1.0	4.3	3.0	12.7	875
Rural	11.6	32.2	1.3	6.0	4.6	21.7	4,537
<i>Province</i>							
Nairobi	5.1	18.4	1.2	4.4	1.9	6.8	312
Central	8.3	26.7	1.0	4.1	2.2	15.0	510
Coast	14.1	35.6	0.0	6.0	6.1	25.9	425
Eastern	13.5	32.9	0.8	4.0	4.6	21.7	914
Nyanza	8.2	30.8	0.0	2.3	2.6	15.4	829
Rift Valley	12.3	32.6	1.7	8.0	5.6	24.4	1,547
Western	11.6	30.3	1.0	4.2	3.9	18.6	742
North Eastern	12.4	24.7	11.9	27.8	10.4	34.4	132
<i>Education</i>							
None	15.8	35.5	3.9	14.9	10.1	32.9	760
Primary incomplete	12.6	35.1	1.1	5.1	4.2	22.4	1,937
Primary complete	10.4	31.3	0.5	2.7	3.1	17.5	1,371
Secondary incomplete	6.0	25.8	0.6	3.7	2.2	14.5	421
Secondary complete	4.9	16.8	0.2	3.1	1.7	9.1	453
Higher	2.5	10.7	0.7	5.0	0.6	7.3	185
<i>Mother's age</i>							
15-19	14.8	34.8	2.0	8.2	7.0	21.9	360
20-24	9.8	31.0	0.8	5.3	3.1	18.3	1,389
25-29	11.1	29.7	1.8	6.2	4.5	21.3	1,536
30-34	9.2	29.0	1.0	4.7	3.2	20.4	1,070
35-49	13.6	32.2	1.0	5.5	6.0	20.4	1,056
<i>Mother's status</i>							
Mother interviewed	10.9	31.0	1.3	5.7	4.3	20.3	5,032
Mother not interviewed, but in household <sup>2</sup>	9.9	22.5	0.0	2.0	5.0	16.6	94
Mother not interviewed, not in household <sup>3</sup>	14.5	27.9	1.0	6.8	5.5	19.5	285
Total	11.1	30.7	1.2	5.7	4.3	20.2	5,412

Note: Table is based on children who stayed in the household the night before the interview. Each of the indices is expressed in standard deviation units (SD) from the median of the NCHS/CDC/WHO International Reference Population. The percentage of children who are more than three or more than two standard deviations below the median of the International Reference Population (3 SD and -2 SD) are shown by background characteristics. Table is based on children who have a valid date of birth (month and year) and valid height and weight measurements.

<sup>1</sup>Includes children who are below -3 SD

<sup>2</sup>For women who were not interviewed, information is taken from the Household Questionnaire. Excludes children whose mothers were not listed in the household schedule

<sup>3</sup>Includes children whose mothers are deceased



### 3.7. Infant and Child Mortality

Information on infant and child mortality is useful in identifying segments of the population that are at high risk so that programmes can be designed to reduce it. Childhood mortality rates are also basic indicators of a country's socio-economic level and quality of life. Caution should be taken in interpreting the mortality information presented in this report because it uses information from the birth history in the Woman's Questionnaire to construct the rates. It is known that in some communities, women are reluctant to discuss their dead children, which could lead to underestimation of the childhood mortality rates.

Table 12 presents infant and under-five mortality rates from the 2003 KDHS and from the three earlier KDHS surveys. The level of under-five mortality was 114 deaths per 1,000 births during the five-year period before the survey, implying that 1 in every 9 children born in Kenya during the period died before reaching their fifth birthday. The infant mortality rate recorded in the survey was 78 deaths per 1,000 live births.

Comparison of mortality rates recorded in 2003 KDHS with the earlier KDHS surveys shows an increase in both infant and under five mortality rates from 1989 to 2003. For example, the infant mortality rate increased by 30 percent from 60 deaths per 1,000 live births in 1989 to 78 in 2003. Similarly, under-five-mortality rate increased by 30 percent between the same period. The trend depicts continued deterioration in the quality of life amongst the Kenyan population over the last 20 years. More precise information on mortality rates by differentials will be presented in the detailed report.

**Table 12 Trends in early childhood mortality rates**

Infant and under-five mortality, Kenya, 1984-2002			
Survey year	Approximate calendar period	Infant mortality (1q0)	Under-five mortality (5q0)
1989	1984-1988	60	89
1993	1988-1992	62	96
1998	1993-1997	74	112
2003	1998-2002	78	114

Note: Data for the 1989, 1993, and 1998 surveys exclude several northern districts.

### 3.8. Domestic Violence

As part of the 2003 KDHS survey, selected women respondents were asked a series of questions concerning domestic violence. Specifically, women who were married or living with a man, separated, or divorced were asked if their current or most recent husband/partner ever physically harmed them, i.e., by pushing, slapping, punching, kicking, or trying to strangle or burn them or threatening them with a weapon. They were also asked if their husband had ever physically forced them to have sexual intercourse or perform other sexual acts when they did not want to. Because of the sensitivity of these questions, if there was more than one eligible woman in the household, the domestic violence section was administered to only one, randomly selected woman. Interviewers were instructed to inform the selected woman that she would be the only one asked these questions in that household. Interviewers were also trained on the importance of ensuring confidentiality of these questions and were instructed not to ask them if the interview was not being conducted in private. Data on the prevalence of domestic violence are given in Table 13.

Background characteristic	Physical or sexual violence		Sexual violence		Total
	Ever	Last year	Ever	Last year	
<i>Age</i>					
15-19	30.4	27.8	13.4	13.0	278
20-29	40.7	31.7	14.7	13.1	1,548
30-39	47.2	28.8	15.8	11.7	1,276
40-49	47.6	25.5	19.5	12.1	765
<i>Residence</i>					
Urban	36.3	21.5	11.4	7.6	844
Rural	45.5	31.4	17.2	13.7	3,023
<i>Region</i>					
Nairobi	32.1	20.3	8.5	6.1	314
Central	40.2	19.1	11.7	6.8	471
Coast	23.3	15.0	7.3	6.0	347
Eastern	36.0	25.1	17.6	14.2	597
Nyanza	56.2	43.4	24.6	21.2	619
Rift Valley	43.0	31.6	15.4	12.3	980
Western	67.3	40.4	22.4	15.9	443
North Eastern	28.9	18.9	0.5	0.5	97
<i>Education</i>					
No education	41.0	26.6	11.1	8.7	625
Incomplete primary	52.4	38.2	20.6	17.1	1,281
Complete primary	40.0	28.7	14.5	12.0	987
Secondary +	36.9	19.8	14.3	9.0	974
<i>Marital status</i>					
Currently married	42.2	30.2	15.1	12.5	3,531
Married once	41.5	29.3	14.7	12.2	3,303
Married more than once	52.0	42.0	20.3	17.2	228
Divorced/separated	57.3	19.5	24.9	10.9	336
Total	43.5	29.2	15.9	12.4	3,867

Forty-four percent of married, divorced or separated women aged 15-49 report that they have ever been physically or sexually violated by their husbands or partners, while 29 percent report that they were victims of such violence in the year preceding the survey. The results show that older women are more likely than younger women to report having ever been beaten or sexually assaulted. There



is, however, little difference in the level of violence in the past year by age of the respondents. Rural women are more likely than urban women to be victims of physical or sexual violence in marriage. The results further indicate that women in Western and Nyanza Provinces appear to have higher risk of violence than women in other provinces. Women with some secondary education are less likely to be victims of physical or sexual violence than less educated women.

About 16 percent of women reported that they have been sexually abused during their lifetime while 12 percent were abused in the past year. Differentials in sexual violence are similar to those for any type of violence.

### 3.9. Circumcision

Circumcision is practiced in many societies in Kenya and often serves as a rite of passage to adulthood. Female circumcision, also referred to as female genital cutting or female genital mutilation, can have negative health implications for women. Male circumcision, on the other hand, has been linked to lower transmission of sexually transmitted infections, including HIV. Prior to the 2003 KDHS survey, data on circumcision was only collected on female genital cutting in the 1998 KDHS. Questions on male circumcision were for the first time included in the 2003 KDHS survey.

Table 14 shows that 34 percent of women and 84 percent of men are circumcised. This represents a decline in prevalence of female genital cutting, from 38 percent in 1998 to 32 percent in 2003, excluding the northern districts.

Among women, the percent circumcised is higher for older women and for women in rural areas. Genital cutting is universal in North Eastern Province (99 percent) and least in Western Province (5 percent). The practice is also strongly related to education, being five times more prevalent among uneducated women than among those with higher educational level. The survey results indicate that majority of Muslim women (54 percent) are circumcised whereas about one-third or more of non-Muslim women are also circumcised. Genital cutting varies by ethnic group, being highest among Somali, Kisii, and Maasai women and lowest among the Luhya and Luo.

Background characteristic	Women		Men	
	Percent	Number	Percent	Number
<i>Age</i>				
15-19	21.8	1,861	71.7	853
20-24	25.9	1,668	89.3	670
25-29	34.8	1,376	87.8	502
30-34	39.7	1,117	89.6	424
35-39	40.7	872	90.0	392
40-44	49.2	789	85.5	323
45-49	50.3	511	84.4	199
50-54	-	-	86.0	215
<i>Residence</i>				
Urban	23.4	2,043	83.5	895
Rural	37.1	6,152	84.4	2,683
<i>Province</i>				
Nairobi	19.4	867	81.5	405
Central	34.2	1,090	91.1	506
Coast	21.6	676	96.4	262
Eastern	36.0	1,306	97.0	579
Nyanza	41.1	1,225	48.1	497
Rift Valley	44.8	1,946	86.7	881
Western	5.5	905	88.5	377
North Eastern	98.9	181	100.0	70
<i>Education</i>				
None	60.2	1,082	85.6	242
Primary incomplete	35.2	2,723	78.0	1,231
Primary complete	32.0	2,018	85.8	808
Secondary incomplete	27.9	887	84.5	385
Secondary complete	20.1	984	90.7	552
Higher	12.1	500	90.4	360
<i>Religion</i>				
Roman Catholic	35.8	2,092	82.8	961
Protestant/other Christian	30.5	5,284	82.9	2,134
Muslim	53.6	621	99.8	238
No religion	37.8	159	87.7	237
<i>Ethnic group</i>				
Embu	42.8	117	97.4	54
Kalenjin	48.6	961	90.9	487
Kamba	26.9	983	99.4	447
Kikuyu	32.6	1,785	94.0	755
Kisii	96.2	503	99.1	205
Luhya	0.9	1,177	93.0	486
Luo	0.7	914	16.7	409
Maasai	93.9	216	79.0	99
Meru	41.2	399	92.8	177
Mijikenda/swahili	5.1	387	99.6	143
Somali	96.8	327	100.0	122
Taita/Tavate	62.1	113	98.1	43
Other	20.8	106	67.9	49
Total	33.7	8,195	84.2	3,578

Differentials in prevalence of male circumcision are narrower than for females. Male circumcision is less common in Nyanza Province and among the Luos than in other provinces and ethnic groups.

### 3.10. HIV/AIDS

Acquired Immune Deficiency Syndrome (AIDS) is one of the most serious public health challenges facing Kenya today. The 2003 KDHS included a series of questions that inquired about respondents' knowledge on AIDS and their awareness of modes of transmission of the Human Immunodeficiency Virus that causes AIDS. In addition, respondents were asked if they knew of behaviours that can prevent the spread of HIV.

#### *HIV/AIDS Awareness*

Table 15 shows that general awareness of AIDS is nearly universal among men and women in the reproductive ages. Eighty six percent of women and 92 percent of men believe that there is a way to avoid the virus causing AIDS. For North Eastern Province, only 30 percent of women and 44 percent of men believe that AIDS can be avoided compared to Nairobi Province where at least 94 percent of the respondents believe that AIDS can be avoided.

Background Characteristic	Women				Men			
	Has heard of AIDS	Knows HIV status <sup>2</sup>	Believes there is a way to avoid HIV/AIDS	Number of women	Has heard of AIDS	Knows HIV status <sup>1</sup>	Believes there is a way to avoid HIV/AIDS	Number of men
<i>Age</i>								
15-19	97.8	6.5	80	1,861	98.7	5.2	84	853
20-24	98.4	17.2	87	1,668	99.7	14.3	96	670
25-29	97.9	16.4	88	1,376	99.4	20.8	94	502
30-39	98.8	15.2	89	1,990	99.8	18.3	96	816
40-49	98.9	8.8	85	1,300	99.1	16.3	94	523
50-54	-	-	-	-	99.1	11.3	88	215
<i>Marital status</i>								
Never married	98.2	9.3	84	2,437	99.1	9.9	89	1,602
Married or living together	98.4	14.2	86	4,942	99.6	17.2	94	1,838
Divorced/separated/widowed	98.7	14.8	87	816	98.4	21.2	90	138
<i>Residence</i>								
Urban	99.2	22.4	90	2,043	99.7	23.6	96	895
Rural	98.1	9.7	84	6,152	99.2	10.9	91	2,683
<i>Province</i>								
Nairobi	99.6	27.7	94	867	99.8	27.5	97	405
Central	99.9	17.7	92	1,090	99.4	15.9	95	506
Coast	99.0	10.6	77	676	99.4	20.1	90	262
Eastern	99.1	9.7	90	1,306	99.7	9.3	87	579
Nyanza	99.8	9.8	87	1,225	99.6	14.8	93	497
Rift Valley	95.1	11.5	81	1,946	99.5	9.9	95	881
Western	99.6	8.4	90	905	99.7	11.2	92	377
North Eastern	94.6	0.4	30	181	85.4	3.0	44	70
<i>Education</i>								
None	92.1	4.3	57	1,082	94.5	7.3	64	242
Primary incomplete	98.8	7.4	84	2,723	99.2	8.8	87	1,231
Primary complete	99.5	13.2	91	2,018	100.0	13.3	96	808
Secondary incomplete	99.7	16.6	94	887	100.0	13.0	99	385
Secondary complete	99.9	22.5	98	984	99.7	18.6	99	552
Higher	100.0	33.6	99	500	100.0	32.5	100	360
<b>Total</b>	<b>98.4</b>	<b>12.8</b>	<b>86</b>	<b>8,195</b>	<b>99.3</b>	<b>14.1</b>	<b>92</b>	<b>3,578</b>

<sup>1</sup> Refers to people who said they were tested for HIV and were informed of the test results.

The table also shows the proportion of respondents who said they had ever been tested for HIV and that they got the results of the test. Thirteen percent of women and 14 percent of men are presumed to know their HIV status (or at least to have known it at some time). The proportions who were tested and received the results are higher among older respondents, those in urban areas, especially Nairobi, and among those with more education. The level is also higher among ever-married respondents than among those who have never married.

### *Use of Condoms*

Condom use, particularly in high-risk sexual relationships, is one of the most important means of preventing the spread of HIV/AIDS. Men and women who reported they were sexually active were asked a number of questions about condom use during the year before the survey. Tables 16.1 and 16.2 present the level of condom use among women and men during their last sexual encounter.

Background characteristic	Spouse or cohabiting partner		Non-cohabiting partner		Any partner	
	Percent	Number	Percent	Number	Percent	Number
<b>Age</b>						
15-19	2.8	349	22.1	293	11.4	627
20-24	1.7	952	27.0	256	6.8	1,192
25-29	1.7	1,035	25.7	153	4.4	1,180
30-39	2.2	1,553	23.0	177	4.2	1,718
40-49	1.5	899	15.7	102	2.8	987
<b>Marital status</b>						
Never married	na	na	26.7	598	26.7	599
Married or living together	1.9	4,661	20.0	101	1.9	4,705
Divorced/separated/widowed	2.9	126	17.7	282	13.0	401
<b>Residence</b>						
Urban	3.7	1,043	32.7	324	10.3	1,355
Rural	1.4	3,745	18.9	657	3.8	4,349
<b>Province</b>						
Nairobi	5.5	416	30.9	151	12.1	564
Central	1.4	609	19.9	122	4.4	727
Coast	1.0	408	31.0	83	5.8	486
Eastern	0.8	795	23.7	171	4.5	954
Nyanza	1.8	772	17.4	190	4.6	942
Rift Valley	2.5	1,121	24.2	173	5.1	1,283
Western	1.5	536	19.7	92	3.7	618
North Eastern	0.0	130	-	0	0.0	130
<b>Education</b>						
None	0.4	681	10.3	72	1.2	747
Primary incomplete	1.2	1,597	15.7	315	3.5	1,882
Primary complete	1.5	1,265	22.5	277	4.8	1,522
Secondary incomplete	2.2	424	21.6	127	6.4	549
Secondary complete	4.3	548	40.3	126	10.8	669
Higher	6.1	273	51.0	64	14.3	335
Total	1.9	4,788	23.4	981	5.3	5,705

na = Not applicable

Men are three times (17 percent) more likely than women (5 percent) to use condoms during sexual encounter with any partner. Both men and women are less likely to use a condom during sexual

encounter with a cohabiting partner (3 percent and 2 percent, respectively) than with a non-cohabiting partner (46 percent and 23 percent, respectively).

Urban women are almost twice as likely as rural women to use a condom during sexual encounter with a non-cohabiting partner. The reported level of condom use during sexual encounters with non-cohabiting partners rises sharply with the woman's educational level, from 10 percent of women with no education to more than half of those with higher education. Urban residence and educational level are also associated with higher condom use among men during their last encounter.

**Table 16.2 Use of condoms by type of partner: men**

Among men who have had sexual intercourse in the past year, percentage who used a condom during last sexual intercourse with spouse or cohabiting partner, with non-cohabiting partner, and with any partner, by background characteristics, Kenya 2003

Background Characteristic	Spouse or cohabiting partner		Non-cohabiting partner		Any partner	
	Percent	Number	Percent	Number	Percent	Number
<b>Age</b>						
15-19	8.7	13	41.8	251	39.9	262
20-24	7.9	121	51.1	358	40.1	457
25-29	4.4	312	50.6	141	16.9	416
30-39	2.7	687	38.6	136	5.9	764
40-49	2.8	472	54.0	43	4.4	490
50-54	2.4	194	20.3	21	4.5	203
<b>Marital status</b>						
Never married	na	na	49.1	685	49.0	686
Married or living together	3.3	1,772	42.7	186	4.0	1,809
Divorced/separated/widowed	13.4	26	29.5	79	25.2	97
<b>Residence</b>						
Urban	6.1	474	59.0	275	23.5	696
Rural	2.5	1,325	41.0	676	14.2	1,896
<b>Province</b>						
Nairobi	8.8	210	62.9	124	26.2	308
Central	1.1	232	36.6	98	10.8	323
Coast	0.7	142	54.4	83	19.3	205
Eastern	3.9	269	39.3	137	15.3	388
Nyanza	1.8	263	34.3	126	10.4	351
Rift Valley	2.8	462	50.1	287	19.5	715
Western	6.5	173	41.4	94	16.8	254
North Eastern	0.0	47	*	0	0.0	47
<b>Education</b>						
None	0.0	155	(34.1)	38	6.9	188
Primary incomplete	2.9	478	35.2	357	16.7	779
Primary complete	2.2	465	45.3	212	14.1	636
Secondary incomplete	4.8	158	56.3	88	21.0	238
Secondary complete	4.6	302	53.9	159	18.6	438
Higher	6.6	241	71.9	96	22.1	314
Total	3.4	1,799	46.2	950	16.7	2,592

Note: Numbers in parentheses are based on 25-49 unweighted cases; an asterisk means that a figure based on fewer than 25 unweighted cases has been suppressed.  
na = Not applicable

#### 4. RESULTS OF HIV TESTING

As mentioned in the introduction, the 2003 KDHS included HIV testing. All women and men who were eligible for individual interview in the one-half of the households selected for the man's Survey were asked if they would consent to give a few drops of blood from a finger prick for HIV testing. Initial findings from this module of the survey are presented below. The summary is limited to eligible men and women in the age group 15-49 to facilitate comparisons between the male and female results. A more detailed analysis of the results will be included in the final report.

An accurate estimation of HIV prevalence is necessary to assess the scope of the AIDS epidemic in Kenya and track trends over time. In Kenya, as in most of sub-Saharan Africa, national HIV prevalence estimates have been derived primarily from sentinel surveillance in pregnant women. Currently, the national sentinel surveillance system consists of 42 clinics in government and mission health facilities selected to represent the different groups, regions, and rural and urban populations in the country. For three months each year since 1990, pregnant women registering their first visit to the Ante-Natal Clinic (ANC) are anonymously tested for HIV and the results analysed by the National AIDS/STD Control Programme (NASCOP).

Earlier population-based HIV prevalence studies have indicated that in generalized HIV epidemics in sub-Saharan Africa, younger women have higher rates of HIV infection than young men, but older men have higher rates of infection than older women. The overall rates in pregnant women were considered to be similar to that of the combined male and female adult population. The WHO Multi-centre study of four cities in sub-Saharan Africa, including Kisumu in Kenya, demonstrated higher risk in women compared to men (Buve, 2001).

The ANC surveillance data have a number of shortcomings, principally related to the fact that pregnant women are not representative of the reproductive age population as a whole (Slutkin et al. 1988). Most obvious in this regard is the fact that HIV prevalence levels typically differ between men and women, and men are not represented in the ANC data. In addition, the HIV infection level among pregnant women is typically expected to be higher than the rate among the female population as a whole because some of the non-pregnant women are not sexually active and hence not exposed to the virus. HIV prevalence levels also vary with age, and women who attend antenatal care clinics have a different age distribution from the female population at large.

With the inclusion of HIV testing in the 2003 KDHS, Kenya is among the first countries in sub-Saharan Africa to conduct a nationally representative, population-based HIV prevalence survey. Demographic and Health surveys in Mali and Zambia (Mali DHS 2001, Zambia DHS 2002), and the Nelson Mandela/HSRC survey in South Africa (Shisana, 2002) included testing for HIV and have demonstrated that it is possible to have plausible estimates from population based surveys. Periodic population-based surveys will therefore help to calibrate the sentinel surveillance data (UNAIDS/WHO Working group on global HIV/AIDS & STI surveillance, 2000) and help to measure progress in achieving national targets for HIV prevalence (Kenya National HIV/AIDS Strategic Plan 2000-2005).

#### 4.1. HIV Testing Response Rates

More than 7 in 10 eligible respondents in the 2003 KDHS provided blood samples for HIV testing (Table 17). Women were more likely to give blood samples for HIV testing than men (76 percent versus 70 percent). Rural respondents were more likely to have been tested than those in urban areas (79 percent versus 62 percent).

Among women respondents, refusal to be tested accounts for about 60 percent of the cases not tested while among men, absence and other factors account for slightly more of the non-response than refusals. Although non-response is higher in urban than rural areas, refusals account for a smaller proportion of the non-response in urban than in rural areas. The main reason for non-response among urban respondents is the inability to find them at home. The fact that one-fifth of the non-response to the HIV testing consists of respondents who were interviewed but were then absent when the team's nurse visited for the blood spot collection underscores the disadvantages of having only one health technician per team. Results were missing for one percent of the respondents eligible for the HIV testing. Some of the missing cases were the result of theft of a bag containing questionnaires for several households from a team's vehicle.

Table 17 Coverage of HIV testing			
Percent distribution of de facto women and men eligible for HIV testing by testing status, according to residence, Kenya 2003			
Sex/ result	Residence		Total
	Urban	Rural	
<b>Women 15-49</b>			
Tested	66.2	81.6	76.3
Not tested	33.8	18.4	23.7
Refused	19.2	11.9	14.4
Absent/other	13.6	5.9	8.6
Interviewed in DHS	7.6	2.9	4.5
Not interviewed in DHS	6.0	3.0	4.1
Result missing	1.0	0.6	0.7
Total	100.0	100.0	100.0
Unweighted number	1,488	2,814	4,302
<b>Men 15-49</b>			
Tested	58.1	76.4	70.0
Not tested	41.9	23.6	30.0
Refused	16.7	11.3	13.2
Absent/other	23.0	11.3	15.4
Interviewed in DHS	6.5	3.7	4.7
Not interviewed in DHS	16.5	7.5	10.7
Result missing	2.2	1.1	1.5
Total	100.0	100.0	100.0
Unweighted number	1,385	2,539	3,924
<b>Both sexes</b>			
Tested	62.3	79.2	73.3
Not tested	37.7	20.8	26.7
Refused	18.0	11.6	13.8
Absent/other	18.1	8.4	11.8
Interviewed in DHS	7.1	3.3	4.6
Not interviewed in DHS	11.1	5.2	7.2
Result missing	1.6	0.8	1.1
Total	100.0	100.0	100.0
Unweighted number	2,873	5,353	8,226



#### 4.2. HIV Prevalence Rates

Table 18 presents the findings from the HIV testing. The table shows that 6.7 percent of the respondents tested were found to be HIV positive. Women are more likely to be HIV positive than men (9 percent versus 5 percent). Among all respondents tested, the proportion of HIV positive rises with age from a level of 2 percent among 15-19 year-olds to 10 percent in the 35-39 age group, before falling to a level of 5 percent among those aged 45-59.

As observed in other studies, there are distinct differences between women and men in the age pattern of HIV infection. Among women, the proportion found to be HIV positive rises rapidly with age, from 4 percent among the 15-19 age group to 12 percent in the 25-29 age group, and then stabilizes among those aged 25-39 years before dropping to 5 percent in the 45-49 age group. Among men, HIV prevalence is below 1 percent among those aged 15-19 years then rises gradually to a peak of 9 percent among those aged 35-44 years and then declines to 6 percent in age group 45-49. The infection rates peak at a later age for men than for women and they are lower for men than women at every age group except the oldest.

HIV prevalence is almost twice as high in urban areas as in rural areas (10 percent and 6 percent, respectively). Provinces with prevalence levels above the national average are Nyanza (14 percent) and Nairobi (9 percent). The lowest levels are found in Eastern, Western, and Rift Valley Provinces. HIV prevalence rates in North Eastern Province are the lowest in the country.

Gender differences were most striking in young people. In the 15-19 age group 3.5 percent of women and only 0.5 percent of men were infected, while in the 20-24 year age group, 8.7 percent of women and 2.4 percent of men were infected.

National HIV prevalence derived from women participating in 2003 sentinel surveillance is estimated at 9.4 percent. These estimates among women from sentinel surveillance data compares well with the prevalence of 8.7 percent among women in the 2003 KDHS. Regional differences in the KDHS are also consistent with sentinel surveillance, with highest rates in Nyanza and Nairobi Provinces, while lowest rates were recorded in North Eastern and Eastern Provinces.

The 2003 KDHS confirms that Kenya has a severe, generalized HIV epidemic and provides useful information on the distribution of HIV in the population. Further analysis in the final report of the KDHS will provide additional information on the links between behaviour, knowledge, and HIV infection in Kenya.

Table 18 HIV prevalence by background characteristics

HIV prevalence rate among women and men age 15-49 by background characteristics, Kenya 2003

Background characteristic	Women 15-49				Men 15-49				Total			
	Per-cent tested	Un-weighted number eligible	Percent HIV positive	Weighted number tested	Per-cent tested	Un-weighted number eligible	Per-cent HIV positive	Weighted number tested	Per-cent tested	Un-weighted number eligible	Per-cent HIV positive	Weighted number tested
<i>Age</i>												
15-19	75.3	975	3.5	725	75.9	928	0.5	740	75.6	1,903	2.0	1,465
20-24	77.7	885	8.7	646	67.5	791	2.4	562	72.9	1,676	5.8	1,208
25-29	76.3	705	12.0	514	64.7	638	6.5	426	70.8	1,343	9.5	940
30-34	76.1	619	11.6	452	70.3	511	6.1	378	73.5	1,130	9.1	830
35-39	79.1	450	11.8	351	69.0	451	8.6	328	74.0	901	10.3	679
40-44	74.2	395	10.3	276	70.6	364	8.6	279	72.5	759	9.4	555
45-49	74.0	273	4.7	188	69.3	241	6.0	165	71.8	514	5.3	354
<b>Residence</b>												
Urban	66.2	1,488	12.3	778	58.1	1,385	7.6	731	62.3	2,873	10.0	1,509
Rural	81.6	2,814	7.5	2,375	76.4	2,539	3.5	2,149	79.2	5,353	5.6	4,524
<b>Province</b>												
Nairobi	54.5	651	11.0	336	49.3	633	7.1	323	51.9	1,284	9.1	659
Central	70.7	738	9.0	433	62.3	690	2.5	398	66.7	1,428	5.9	832
Coast	80.1	488	7.3	249	66.6	410	4.4	211	73.9	898	6.0	460
Eastern	76.1	502	6.2	509	75.1	466	1.7	465	75.6	968	4.1	973
Nyanza	90.8	513	17.0	451	86.8	454	10.6	395	88.9	967	14.0	847
Rift Valley	80.9	702	6.7	763	75.2	654	3.6	727	78.2	1,356	5.2	1,490
Western	88.0	507	6.1	348	82.7	445	3.8	307	85.5	952	5.0	655
North Eastern	75.6	201	0.0	64	73.3	172	0.0	53	74.5	373	0.0	117
<i>Total</i>	76.3	4,302	8.7	3,153	70.0	3,924	4.5	2,879	73.3	8,226	6.7	6,032

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