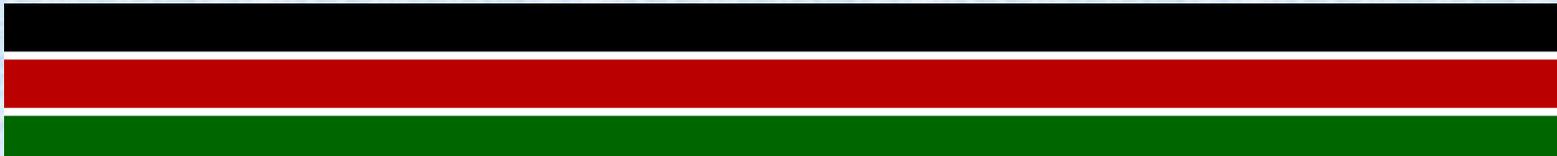




MINISTRY OF HEALTH

KENYA HOUSEHOLD HEALTH EXPENDITURE AND UTILIZATION SURVEY, 2018

JULY 2018





Republic of Kenya

**Kenya Household Health Expenditure and Utilization Survey,
2018**

**Ministry of Health
Nairobi, Kenya**

**Kenya National Bureau of Statistics
Nairobi, Kenya**

July 2018

The 2018 Kenya Household Health Expenditure and Utilization Survey was implemented by the Ministry of Health (MOH) and the Kenya National Bureau of Statistics (KNBS).

The World Bank through the Kenya Health Sector Support Project provided funding for the KHHEUS.

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Foreword

The government of Kenya conducted the fourth study of Kenya Household Health Expenditure and Utilization Survey (KHHEUS) to estimate household utilization of health services and Out of Pocket (OOP) expenditures. The previous surveys were conducted in 2003, 2007 and 2013. The 2013 KHHEUS was the first study conducted after devolution of health services and thus disaggregated data by counties.

This report documents the findings of the 2018 KHHEUS which focused on use of outpatient and inpatient health services, wealth related variations in use of services, out of pocket spending, catastrophic health expenditures, health insurance coverage including willingness to pay for Health Insurance; and trends in health care utilization and expenditure. The data in this study has been disaggregated by counties.

The use of evidence from the 2018 KHHEUS and further analysis of the data will therefore be vital in informing policy makers and other stakeholders in identifying the priority interventions that will seek to inform; uptake rates of health service utilization, quality of health care services and financial protection measures for achieving Universal Health Coverage (UHC). All this will be geared in improving the health status of Kenyans.

Sicily K. Kariuki (Mrs), EGH
Cabinet Secretary

Acknowledgement

The Kenya Household Health Expenditure and Utilization survey, 2018 was an exercise accomplished through the joint efforts of the Ministry of Health, Kenya National Bureau of Statistics (KNBS) and individuals who assisted in a variety of ways in preparation, data collection, processing and analysis and publication of the results.

We would like to therefore thank Mr. Zachary Mwangi, Director General of KNBS and Dr. David Kariuki, Head of Department of Policy Planning and Health Financing, for their efforts in steering the execution of this survey. We also extend our gratitude to KNBS staff for their contribution in the areas of sampling, data collection, data processing and analysis.

We would also like to extend our appreciation to field coordinators, County Statistical Officers, field supervisors, field enumerators and all the members of the households who participated in the survey by willingly providing information analyzed in this reports.

We acknowledge Dr. Valeria Makory (KHSSP Coordinator, MOH), Mr. A. Awes (Senior Manager, KNBS) and Mr. Stephen Kaboro (Economist, MOH), for providing overall coordination for the survey. We are thankful to the Technical Working Group for their support in implementation of the survey.

Finally, special thanks go to World Bank for their financial and technical support towards this survey. We are grateful to the support accorded to the Ministry by Dr. Jane Chuma, the Health Financing Advisor, World Bank, during planning and implementation of this Survey.

Peter Tum Kiplagat, EGH

Ministry of Health

Executive Summary

The 2018 Kenya Household Health Expenditure and Utilization Survey (KHHEUS) is the fourth in a series of similar national surveys undertaken in 2003, 2007 and 2013 that explores the health seeking behavior, utilization of health services, health spending and health insurance penetration amongst the population. The survey will provide necessary information for monitoring progress in achieving the UHC agenda the progress of Universal Health Care (UHC) which is one of the government's big four agenda.

Survey Methodology

The sample for the 2018 KHHEUS was designed to provide estimates for various indicators at National and county levels. The target sample size for the survey was 37,500 households drawn from 1,500 (923 in rural and 577 in urban areas) clusters. A two-stage stratified sampling design was used which involved selection of clusters in the first stage and a systematic sample of 25 households from each sampled cluster in the second stage. The survey utilized the fifth National Sample Survey and Evaluation Program (NASSEP V) household-based master sampling frame which is created and maintained by the Kenya National and Bureau of Statistics (KNBS). Since the sample is not self-weighting, weights were applied on the data during analysis in order to make the sample representative of the target population. The survey used *Computer Aided Personal Interview (CAPI)* for data collection unlike the previous survey which used *Pen and Paper interview*.

Key Findings

Household demographic and social economic characteristics

Information regarding household demographic and social economic characteristics which influences healthcare consumption and expenditures, was collected in the 2018 KHHEUS from 31662 households in the 47 Counties.

In terms of education, the highest level of education completed by most of the population above three years was primary education at 47 percent followed by secondary education at 23 percent. 8 percent of the population had completed college and university education.

Thirty-three percent of the population was engaged in either formal or informal employment, 5 percent were seeking work while 11 percent were homemakers. Students accounted for 40 percent of the population while the rest was distributed between the aged, disabled and children under 5 years (12%).

seventy percent of households in the country have access to improved drinking water sources. The results also show that 64 percent of the households have access to improved methods of human waste

disposal, with the most common method in the country being pit latrine with slab (37.4%).

Household Health Status

Overall, 13 percent of households suffer from chronic conditions, with hypertension, other respiratory disorders and asthma taking the lead at 3 percent and 2 percent and 2 percent respectively. Females (57.9%) are more likely to suffer from chronic conditions than males (42.1%).

The findings of the survey indicate the proportion of individuals reporting sickness during the four weeks preceding the survey in 2018 was 19 percent. Those who were ill and never sought health care increased from 13 percent in 2013 to 28 percent in 2018. More males (30%) compared to females (26.4%) were sick and never sought healthcare. The three major reasons mentioned for not seeking care were “self-medication”, “illness not considered serious enough and high cost of care at 45 percent, 25 percent and 19 percent respectively.

Utilization of outpatient services

Out of the estimated 19 percent of individuals who reported illness during the four weeks preceding the survey, 72% reported they had consulted a health provider. The total number of outpatient visits made in the four weeks preceding the survey has consistently increased over the 15-year period from 4.8 million visits in 2003 to 9.1 million in 2018. However, the annual per capita utilization had dropped from 3.1 in 2013 to 2.5 visits in 2018 with the lowest wealth quintile having 2.2 visits and the highest wealth quintile with 2.8 visits.

Public health facilities were more utilized (59%) than Non- public (42%). Slightly over 70 percent of the persons seeking care attended facilities that were less than 5 kilometers away, the average distance recommended by WHO.

The main reasons for making outpatient healthcare visits were malaria (17%) followed by physical check (17%), Diseases of respiratory system (10 %), dispensing (7%), Injections (6%), Immunization (prevention (4%), Diarrhea (3%) and Pneumonia (3 %).

Utilization of inpatient services

Approximately 1.7 million Kenyans were admitted at least once in the 12 months preceding the survey compared to 1.2 million in 2013. The inpatient admission rate was estimated to be 3.3 percent of the total population in the 12 months preceding the survey, an increase from the previous surveys that recorded 1.5% in 2003, and 2.5% in 2007 and 2013 respectively.

The number of admissions per person per year also indicates a decline in admission rates, from 38 per 1,000 population in 2013 to 35 per 1,000 population in 2018, with an average length of stay (ALOS) of 7.8 days.

The admission rate was higher for females at 44 per 100,000 compared to 26 per 100,000 population for males.

The common causes for inpatient admission were reported to be Malaria/fever (14.1%) of the total admissions, followed by normal delivery at 9%. Others include surgery (7.1%), pneumonia (5.3%) and accidents and injuries (4.8 %).

Government healthcare facilities (National referrals and county hospitals) accounted for 45.6 percent of the total inpatient services, followed by private health facilities at 29.4 percent, mission hospitals 11.1 percent of inpatient services and government health centres were responsible for 6.1 percent.

Expenditure analysis

The total out-of-pocket expenditure in the year 2018 was estimated to be KSh 118.2 Billion, representing a 90% growth from the previous year's OOP of KSh 62.1 Billion. This constituted of KSh 92.9 Billion outpatient expenditures - including routine health expenditure; and KSh 25.3 Billion inpatient expenditure.

The per capita expenditure for the year 2018 was estimated to be KSh 2,470, comprising of KSh 1,941 and KSh 529 outpatient and outpatient per capita expenditures respectively. This represented an increase of 53% from the previous survey's estimated per capita expenditure of KSh 1,609. The mean unweighted OOP expenditure for the period was KSh 1,227 and KSh 21,851 for outpatient and inpatient services respectively.

Health Insurance Coverage and Social Solidarity

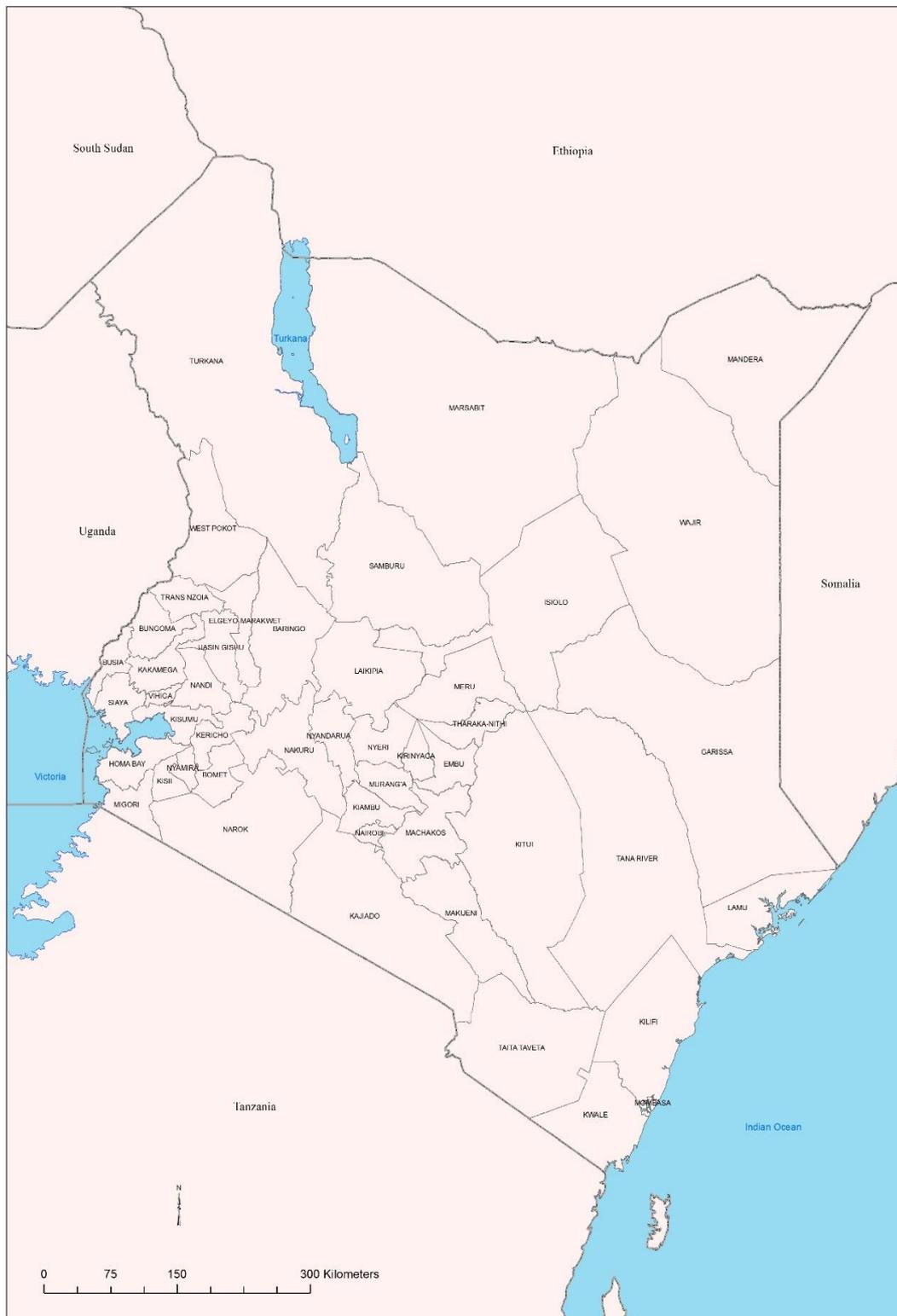
At national level, the proportion of individuals with health insurance coverage increased from 17.1 percent in 2013 to 19.9 per cent in 2018. NHIF recorded the highest coverage at 94 per cent. The data shows that on average an individual contributed KShs 191 for NHIF coverage compared to KShs 10,335 for private health insurance coverage. A majority of those insured were dependents.

Though nearly nine in ten (88.8%) of the respondents indicated willingness to contribute to healthcare for themselves and their families, more than 70% of them are also willing to pay for health insurance in solidarity with the poor, sick and others who are worse off. Half of the respondents disagreed that everyone should only be expected to pay for only their own health care.

Acronyms

ALOS	Average length of Stay
CAPI	Computer-assisted personal interviewing
EA	Enumeration Area
KHHEUS	Kenya Household Health Expenditure and Utilization Survey
KM	Kilometer
KNBS	Kenya National Bureau of Statistics
KSh	Kenya Shilling
MOH	Ministry of Health
NASSEP	National Sample Survey and Evaluation Program
NHA	National Health Accounts
NHIF	National Hospital Insurance Fund
OOP	Out-of-Pocket
PAPI	Paper and Pencil Interview
PPP	Public-Private Partnerships
UHC	Universal Health Coverage
HFS	Health Financing Strategy

Map of Kenya



1. Introduction and Methodology

This chapter explores the rationale for the 2018 Kenya Household Health Expenditure and Utilization Survey (KHHEUS), the methodology used to construct the survey and response rates from fieldwork.

1.1. Background

The Government of Kenya has set a target of attaining Universal Health Coverage (UHC) by the year 2022 as part of the Big Four Government agenda. UHC is based on the principle that all individuals and communities should have access to quality essential health services without suffering any financial hardship. Therefore, the health sector has developed a Health Financing Strategy (HFS) to guide in ensuring the attainment of UHC. The HFS identifies three key priorities for the country namely; increasing access to quality health services; increasing health insurance coverage; and ensuring financial risk protection for Kenyans.

The Kenya Household Health Expenditure and Utilization Survey (KHHEUS) is a national household survey that explores the health seeking behavior, utilization of health services, health spending and health insurance penetration amongst the population. The 2018 KHHEUS is the fourth in a series of similar national surveys undertaken in 2003, 2007 and 2013 and will provide necessary information for monitoring progress in achieving the UHC agenda.

1.2. Objectives of the survey

The goal of the survey is to provide policy makers, development partners and researchers with comprehensive information on the type, frequency and households' out of pocket expenditure on health services used.

The specific objectives of the 2018 KHHEUS are to;

- a. Provide information regarding health care utilization and health seeking behavior.
- b. Determine households' health expenditures.
- c. Estimate penetration and diversity of health insurance in the population.
- d. Quantify extent of catastrophic household health expenditures in the country.
- e. Establish unmet needs for health care and coping mechanisms amongst the population.
- f. Provide information for construction of the National Health Accounts.

1.3. Survey Organization and Methodology

The 2018 KHHEUS was a joint effort of the Ministry of Health (MOH), the Kenya National Bureau of Statistics (KNBS) and the World Bank (WB). The

survey was overseen by the KHHEUS Steering Committee and implemented by the Technical Working Committee comprising of representatives from the Ministry of Health, KNBS and development partners.

Survey planning and execution was carried out by Ministry of Health in collaboration with the Kenya National Bureau of Statistics. This involved development and review of survey tools, recruitment and training of field personnel, data collection, handling of day to day technical and operational matters during training and data collection, report writing and dissemination of survey results. The sample design and selection, data analysis and processing was carried out by KNBS while the World Bank provided technical and financial assistance for the survey.

Sample Design and Selection

The 2018 Kenya Household Health Expenditure and Utilization Survey (2018 KHHEUS) was household-based survey designed to provide estimates for various indicators at the national level, each of the 47 Counties, and residence (rural and urban areas).

The survey used the fifth National Sample Survey and Evaluation Programme (NASSEP V) household sampling frame. This is the frame that the Bureau currently operates to conduct household-based surveys in Kenya. The primary sampling unit for NASSEP V master sampling frame is a cluster, which constitutes one or more EAs, with an average of 100 households per cluster. The frame consists of 5,360 clusters and is stratified into urban and rural areas within each of 47 counties resulting into 92 sampling strata with Nairobi and Mombasa counties being wholly urban.

The sample was designed to have 37,500 households selected from 1,500 clusters (577 in urban and 923 in rural areas) spread across the country. Selection of the sample followed a two-stage stratified cluster sampling design in which 1,500 clusters were sampled from NASSEP V in the first stage. The second stage involved random selection of a uniform sample of 25 households in each cluster from a roster of households in the cluster using systematic random sampling method. Due to the non-proportional allocation of the sample, the survey was not self-weighting. The resulting data has, therefore been weighted to be representative at the national level as well as at county level.

Questionnaires

The questionnaire used in the 2018 KHHEUS was developed by the Technical Working Committee (TWC), pretested, reviewed and improved before training.

Information collected included; identification information, household composition, utilization of outpatient and other health related services, inpatient services and corresponding health expenditure. In addition, information on access to health insurance and social solidarity was

collected. Housing conditions, amenities, assets, household expenditure and consumption information was also included in the last sections of the questionnaire, as shown in table 1.1 below:

Table 1.1: KHHEUS questionnaire sections and unit/s covered, Kenya 2018

No.	Questionnaire Sections	Unit/s Covered
i.	Composition of household & its characteristics	Each household member
ii.	Health status of household members	Each household member
ii.	Utilization of outpatient and other health related services and related health expenditures in the last 4 weeks prior to the survey	Each household member who have been sick in the past 4 weeks prior to the survey and sought health care services
iii.	Routine health expenses in the last 4 weeks prior to the survey	Each household member who in the past 4 weeks prior to the survey had spent on other health related services
iv.	In-patient admission in the last 12 months and the related health expenditures	Each household member who have been admitted in the past 12 months prior to the survey
v.	Access to health insurance	Each household member
vi.	Social solidarity	Each household member above 15 years and present during the time of the interview
vii.	Housing conditions, amenities and assets	Per household
viii.	Water sources and sanitation facilities	Per household
ix.	Household expenditure and consumption	Per household

Training

Training of Trainers (ToTs) was conducted from 13th to 16th March 2018, with 34 trainers drawn from the KNBS and the Ministry of Health. The objective of the training was to equip the survey team with the necessary knowledge and skills to carry out the survey in the areas of; survey design, concepts and definitions, questionnaire content, training techniques and use of CAPI in data collection. The trainers participated in training of survey supervisors and enumerators and later served as fieldwork coordinators.

The training of field survey personnel was conducted for 5 days from 19th to 23rd March 2018 in six regions ie, Kisumu, Eldoret, Nakuru, Machakos, Nyeri and Mombasa. The training of the survey teams comprised of 94 supervisors and 357 interviewers. The survey personnel were trained on concepts and definitions, roles of the survey personnel, field procedures, interviewing techniques, research ethics, questionnaire contents and use of Computer Aided Personal Interview (CAPI). The mode of training included lectures, role-plays and a one day field practice.

Fieldwork

The survey fieldwork took place from April 9th to May 19th, 2018 in all the 47 counties. Each county had two teams thus giving a total of 94 teams. A team comprised of a supervisor, three or four interviewers and a driver. The teams visited the respective County Statistics Offices and thereafter, paid a courtesy call to the County Commissioners to brief them about the survey before proceeding for the fieldwork. The teams were accompanied by a KNBS field personnel to guide them to the assigned clusters and a village elder to locating the households during the data collection. The supervisor assigned the sampled households to a research assistant. Each research assistant recorded the final outcome for all households visited and the individual interviews conducted.

Field data collection was overseen by a team of 34 regional and ICT coordinators drawn from MOH and KNBS. Two regional and one ICT coordinators were assigned five to six counties for which they were responsible for observing and monitoring data collection, solving any administrative issues that arose, ensuring data quality assurance, and replenishing field team materials. ICT Coordinators were providing support on the use of CAPI gadgets and monitoring of data being collected in real time to ensure quality and smooth flow of data from field to the server.

Data Processing

The 2018 KHHEUS data was collected using Computer Aided Personal Interview (CAPI) technique. As opposed to the traditional way of data collection using paper and pen interview (PAPI), the survey used ICT software to convert the questionnaire in a form that was able to run on a mobile phone. The CAPI technique used a data entry program CSEntry application (a CPro software tool for developing CAPI applications). The program was tested against data errors through provision of quality controls and validation checks.

Each Researcher Assistant (RA) and Supervisor was issued with a Techno Camon 9 Smartphone that was installed with the data collection application from a server. The application provided for RA menu to give them interfaces to conduct interviews, view clusters/households coverage and upload final data to the server. Supervisors had a menu facility to monitor the whole cluster coverage and completion status as well as sending RA data to the server.

Programmers and subject-matter specialists ensured data quality by generating outputs from uploaded data. After the survey, the final data was downloaded for cleaning and analysis. Data analysis was done using SPSS and STATA software.

Response Rates

The response rate for the survey was high as shown in Table 1.2. In total, 37,500 households had been selected for the survey out of which 33,286

were occupied at the time of the survey. Out of these occupied households, 31,655 households responded to the questionnaire representing a response rate of 95 percent. There was no variation in response rates between urban and rural households both of which posted similar response rates of 95 percent.

Table 1.2: KHHEUS Response rate, Kenya 2018

Result	Residence		
	Urban	Rural	Total
Household interviews			
Households Selected	14,425	23,075	37,500
Eligible households	12,483	20,803	33,286
Households interviewed	11,800	19,855	31,655
Household response rate	0.95	0.95	0.95

Survey Limitations

Implementation of the 2018 KHHEUS survey was characterized by several limitations during the fieldwork. Some of the selected clusters had not been updated and therefore affected the response rates, mostly in urban areas. In addition, the survey was conducted during a period of heavy rainfall, which rendered some rural clusters inaccessible. In Kenya, some infectious diseases are known to be seasonal. It was not possible to adjust for disease patterns for trend comparability with previous surveys conducted in different months.

Wealth Index construction

Wealth in this study is used to determine the relative economic status of the households surveyed. In order to measure it, a proxy index was created based on the survey responses from each surveyed household. The wealth index assigned to each household was based on a weighted average of 75 variables in the dataset. These variables fall in the following categories:

- a. Ownership of the dwelling
- b. Construction materials of the dwelling
- c. Source of cooking fuel
- d. Source of lighting fuel
- e. Household possessions/goods
- f. Source of water for household consumption
- g. Type of sanitation facility

The wealth index was then generated using the multivariate statistical technique (principal components analysis).

The wealth index has been shown to be consistent with other expenditure and income measures and can provide a useful measure in assessing inequalities in the use of health and other services and in health outcomes (Rutstein and Johnson, 2004). Principal components are weighted averages of the variables used to construct them. Among

all weighted averages, the first principal component is usually the one that has the greatest ability to predict the individual variables that make it up, where prediction is measured by the variance of the index. The wealth index was therefore the first principal component of the 75 variables.

The generated index was then used to categorize the households into five quintiles:

- a. Poorest
- b. Second poorest (Second)
- c. Middle
- d. Second richest (Fourth)
- e. Richest

2. Household characteristics

This chapter presents information on demographic and socio-economic characteristics of the household population including their employment status, wealth status and level of education. Also presented in this chapter is the household living conditions including source of drinking water, type of sanitation facilities.

2.1. Population distribution

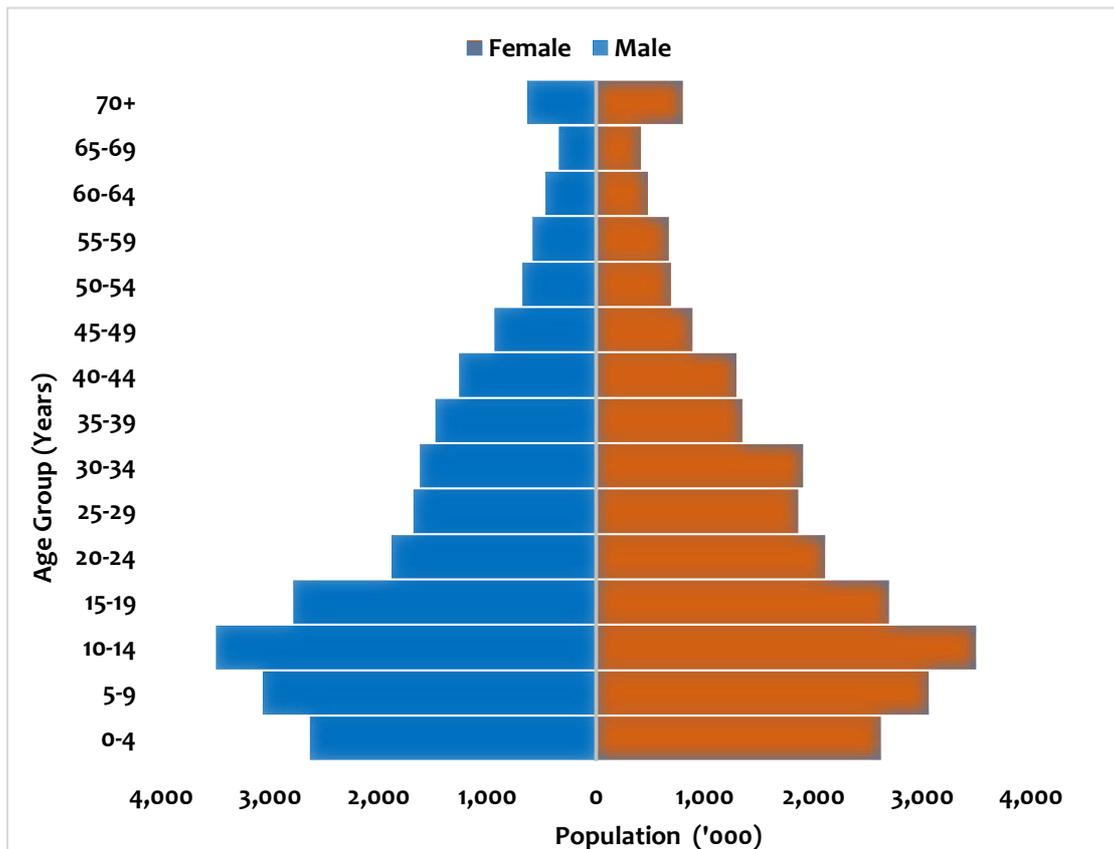
The distribution of the household population in the 2018 KHHEUS is shown in Table 2.1 by 5-year age groups, according to sex and place of residence. Age and sex are important demographic variables in the study of health-seeking behavior and OOP spending by households. The data shows no marked differences between the proportions of male and female by place of residence

Table 2.1: Percent population distribution by residence, sex and age, Kenya 2018

Background characteristics	Residence		Total Population
	Rural	Urban	
Sex			
Male	49.2	49.1	49.2
Female	50.8	50.9	50.8
Age			
0-4 yrs	10.8	11.3	11.0
5-9 yrs	13.6	11.4	12.8
10-14 yrs	16.2	11.8	14.6
15-19 yrs	12.3	10.0	11.5
20-24 yrs	7.6	9.7	8.3
25*29 yrs	5.7	10.3	7.4
30-34 yrs	6.2	9.5	7.4
35-39 yrs	5.0	7.5	5.9
40-44 yrs	5.1	5.7	5.3
45-49 yrs	3.6	4.1	3.8
50-54 yrs	3.0	2.6	2.9
55-59 yrs	2.9	2.2	2.6
60-64 yrs	2.3	1.4	2.0
65-69 yrs	1.9	1.0	1.6
70+ yrs	3.8	1.6	3.0
Total	100.0	100.0	100.0
Population "ooo"	30,523	17,326	47,849

Figure 2.1 shows the population pyramid for Kenya where the survey reveals an age-sex structure characteristic of a society with a youthful population. The decrease in population between age 5-9 and those under 5 for both male and female reflect a fertility decline and an improved dependency ratio in Kenya.

Figure 2.1: Population pyramid



Education Status

Education level of the population is a key determinant in health service utilization. It also serves as a reliable indicator of the socio-economic status of the population. The survey question on the highest level of education completed was asked for all members of the household who were three years of age and older.

The highest level of education completed by most of the population above three years was primary education at 47 percent followed by secondary education at 23 percent. 8 percent of the population had completed college and university education.

Table 2.2: Percent population distribution by education level, sex and residence, Kenya 2018

Background characteristics	Sex		Total
	Male	Female	
Rural			
Pre-primary	6.8	6.2	6.5
Primary	50.9	51.1	51.0
Secondary	20.1	17.8	18.9
College (middle level)	3.4	3.2	3.3
University	1.9	1.0	1.4
Vocational	.6	.4	.5
Informal (e.g. Madrassa)	.5	.4	.4
Don't know	.2	.1	.2
under 5 yrs	15.6	19.8	17.7
Urban			
Pre-primary	5.7	5.6	5.7
Primary	37.6	40.0	38.8
Secondary	29.9	27.9	28.9
College (middle level)	7.5	7.6	7.6
University	6.6	4.2	5.4
Vocational	.5	.5	.5
Informal (e.g. Madrassa)	.3	.2	.3
Don't know	.3	.1	.2
under 5 yrs	11.7	13.8	12.8
National			
Pre-primary	6.4	6.0	6.2
Primary	46.1	47.1	46.6
Secondary	23.6	21.5	22.5
College (middle level)	4.9	4.8	4.8
University	3.6	2.2	2.9
Vocational	.5	.4	.5
Informal (e.g. Madrassa)	.4	.3	.4
Don't know	.2	.1	.2
under 5 yrs	14.2	17.6	15.9
Total	100.0	100.0	100.0
Population ('000)	23,518	24,330	47,849

Employment status

Employment is also a key determinant of how households utilize available health services. Data on employment was collected with a reference period of 12 months and was applicable for those five years and above.

The population engaged in informal and formal employment was 33 percent of the population, 5 percent were seeking work while 11 percent were homemakers. Students accounted for 40 percent of the population while the rest was distributed between the aged, disabled and children under 5 years (12%).

Wealth index

The distribution of population in rural by quintiles is almost even while in urban areas it shows that 54 per cent of the population are in the fifth quintile.

Household composition

The number of members within a household may contribute to strain on household resources, which in turn may affect the general welfare of household members and their access to food, health care, and other items. In cases where women are heads of households, financial resources may be limited. Equally, the size of the household may affect the well being of its members.

Table 2.3 shows the proportion of households by sex of household head, household size and place of residence. The data shows that 68 percent of the Kenyan households are male-headed while women head 32 percent.

Over 42 percent of households comprised of one to three people, while nearly 16 percent households had seven people or more. The overall mean household size is 4.2 persons with the rural areas showing a higher household size of 4.7 persons while urban areas have 3.5 persons.

Table 2.3: Percent distribution of households by Sex of household head, household size and residence, Kenya, 2018

Household distribution	Residence		Total
	Rural	Urban	
Household head			
Male headed	66.2	70.4	68.0
Female headed	33.8	29.6	32.0
Household size			
1 - 3	33.8	53.9	42.4
4 - 6	45.2	37.5	41.9
7+	21.0	8.6	15.7
Total	100.0	100.0	100.0
Mean Size of Household	4.7	3.5	4.2
Number of Households "ooo"	6,542	4,887	11,429

2.2. Household conditions

The survey results show that 70 percent of households have access to improved drinking water sources with 42 percent of the households having piped water to their premises, yard/plot, neighbor or public standpipe. In rural areas, 60 per cent of the households have access to improved sources of drinking water compared to 84 per cent of the households in urban areas.

Households with access to improved human waste disposal methods accounted for 64 percent. More than half of the households (51.2%) in rural areas used improved sanitation compared to 81 percent of those in urban areas. Eight percent of households do not have any toilet facility.

Forty-eight percent of Households use electricity as the main source of lighting, while kerosene and solar was used by 24 percent and 22 percent of households respectively.

3. Health Status and service utilization profiles

This chapter provides an overview of the health status, chronic conditions of those who reported illness in the four weeks preceding the survey, unmet healthcare needs and health utilization of health services of the households.

One of the key priorities for UHC is increasing access to quality healthcare. As such there is a need to provide policy makers with information on health status of the population and how people access health services. Health status was measured through self-assessment. Utilization of health services information was collected to assess the prevalence of illness (four weeks preceding the survey) and hospital admissions (12 months preceding the survey).

3.1. Self-assessment of health status

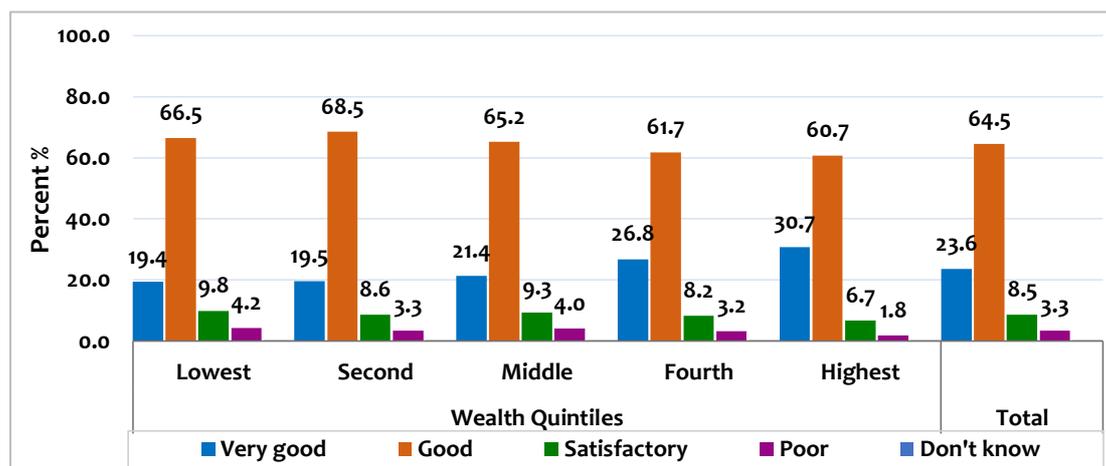
Respondents were asked to assess the general health status of each member of their household, compared with those of their age on a scale of “very good” to “poor”. Households' self-assessment of health status is used to gauge how individuals perceive their health status. Table 3.1 shows that those who rated their health status as “good” increased from 59 percent 2013 to 65 percent in 2018 while those who rated their status as “very good” reduced slightly from 26 percent in 2013 to 24 percent in 2018. There were little variations in the way males and females rated their health status.

Table 3.1: Trend in Household self-assessment health status by sex, Kenya 2018

Health status	Self assessment in health status trend									
	2003		2007		2013			2018		
	Overall (% of the total population)	Male (%)	Female (%)	Overall (% of the total population)	Male (%)	Female (%)	Overall (% of the total population)	Male (%)	Female (%)	Overall (% of the total population)
Very good	22.8	27.2	24.9	26	26.7	24.9	25.8	24.5	22.7	23.6
Good	60.9	58.5	59.1	58.8	59.4	58.8	59.1	64.7	64.3	64.5
Satisfactory	11.5	9.5	10.5	10	10.5	12	11.2	7.9	9.1	8.5
Poor	3.8	2.9	3.6	3.3	3	3.8	3.4	2.8	3.8	3.3
Don't know	1	1.9	1.9	1.9	0.4	0.5	0.5	0.1	0.1	0.1
Total	100	100	100	100	100	100	100	100	100	100

Figure 3.1 shows the distribution of self-assessment of health status by wealth quintiles. Generally, self-reported health status is perceived to be slightly better by households in the highest wealth quintile compared with those in the poorest quintile.

Figure 3.1: Distribution of self-assessment health status by wealth index, Kenya 2018



3.2. Chronic health conditions prevalence

Chronic conditions remain one of the leading causes of morbidity and mortality in Kenya. High costs of managing and treating chronic conditions can push poor households further into poverty. This section provides necessary information that is required to put in place appropriate policies and interventions to address this rising burden.

In order to understand the prevalence of self-reported chronic conditions among the population, the respondents were asked whether they suffer from any chronic health condition such as hypertension, diabetes, cardiac disorder, mental illness, cancer, etc.

Overall, the survey showed that 13 percent of households suffer from chronic conditions with hypertension, other respiratory disorders and asthma taking the lead at 3 percent and 2 percent and 2 percent respectively.

Figure 3.2: Percent distribution of chronic health conditions, Kenya 2018

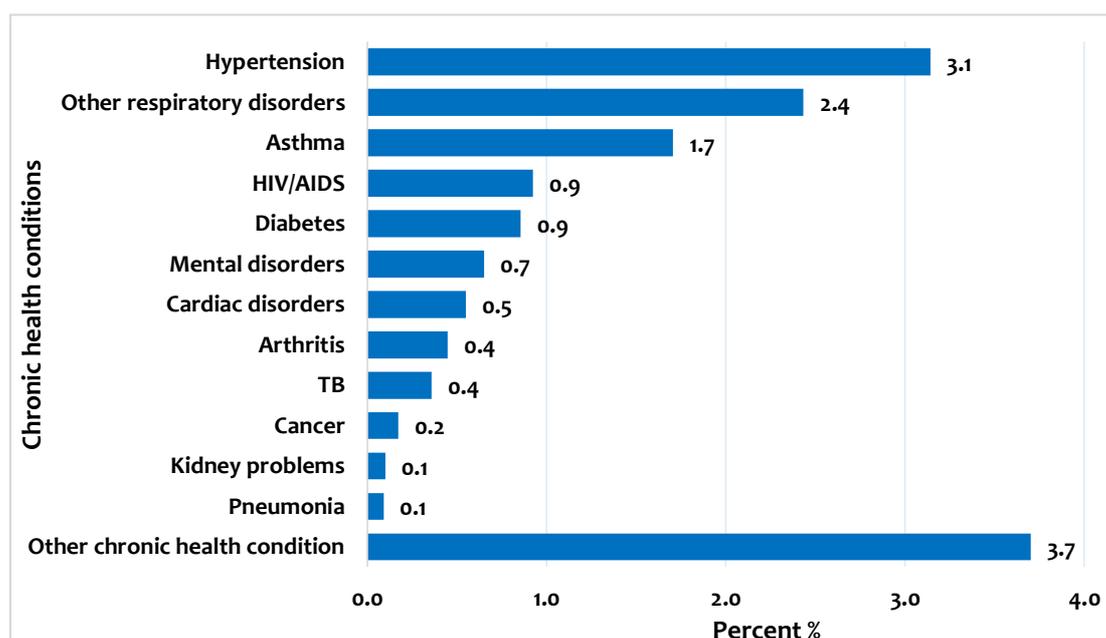


Table 3.2 shows that females (57.9%) are more likely to suffer from chronic conditions than males (42.1%), particularly for conditions such as hypertension, HIV/AIDS and arthritis. Males were more likely to suffer from TB, kidney problems and mental illnesses. Similarly, persons residing in rural areas (63%) were more likely to suffer from chronic conditions compared to those in urban areas (37%).

Hypertension, diabetes, other cardiac disorders, kidney problems, arthritis and cancer were highest amongst the older population of 70+ years. HIV/AIDS (17%) and TB (14%) were highest between the ages of 40 to 44 years.

Table 3.2: Percent distribution of population with chronic health conditions by sex, age, residence and wealth quintile, Kenya 2018

	Hypertension	Other Cardiac disorders	Diabetes	Asthma	TB	Other respiratory disorders	HIV/AIDS	Cancer	Mental disorders	Other chronic health condition	Arthritis	Kidney problems	Other Medical conditions	Pneumonia	No Chronic Condition	Has Chronic Condition	Total	
Sex																		
Male	31	40.1	41.7	42	56.9	49.3	35.8	45.2	56.9	39.1	22.3	56.2	44.7	47.2	50.2	42.1	49.2	
Female	69	59.9	58.3	58	43.1	50.7	64.2	54.8	43.1	60.9	77.7	43.8	55.3	52.8	49.8	57.9	50.8	
Age																		
0-4 yrs	0.5	3.6	0.8	6.2	2.6	8.4	2.1	3.2	2.2	3.9	0.1	0.3	6.6	19.8	11.9	4.4	11	
5-9 yrs	0.3	4.7	1.3	9.9	4.4	9	4.5	5.8	7.8	4.7	0.2	1.8	10.4	10.9	13.8	6	12.8	
10-14 yrs	0.3	6	1.1	9.8	5.6	9.4	4.2	2.9	9.5	8.4	1.3	2.9	15.3	5.3	15.6	7.8	14.6	
15-19 yrs	0.5	5.7	0.5	8.9	3.7	8.8	4.6	5.9	12.9	8.7	0.8	14.1	9.8	4.8	12.1	6.9	11.5	
20-24 yrs	1.5	3.3	1.8	6.5	4.3	8.5	3.4	5	9.7	8.6	0.5	5.6	6.7	0.6	8.7	5.8	8.3	
25-29 yrs	2.5	8.2	1.5	7.6	5.4	6.4	7.6	4	9.5	7.9	0.8	6.5	5.2	9.4	7.6	6	7.4	
30-34 yrs	5.4	6.1	3.5	8.8	13.5	8	9.5	7.6	8.6	10.3	2.9	5.9	5.6	5.7	7.4	7.4	7.4	
35-39 yrs	6.8	7.8	7.1	7.3	11.7	5.9	12.4	6.7	8.3	7.9	3.2	8.7	4.9	6.5	5.7	7.2	5.9	
40-44 yrs	9	7.4	5.7	7.6	14.3	6.4	16.5	3.9	7.8	7.6	4	6.6	5.7	5.9	4.9	7.9	5.3	
45-49 yrs	9.3	5.8	6.9	6.6	6.6	5.9	10	10	5	5.8	5.3	10.9	4.8	8.9	3.4	6.8	3.8	
50-54 yrs	8.7	3.7	6.9	4.1	5.3	5	6.9	5.5	4.4	5.7	10.2	3.4	3.9	2.3	2.4	5.8	2.9	
55-59 yrs	12.3	6	14.7	4.3	5	3.5	7.4	5.4	3.9	6	11.7	2.6	3.5	0.9	2.1	6.4	2.6	
60-64 yrs	10.5	6.2	12.2	3	6	3.9	5.1	3.3	2.8	3.8	11.5	8.4	4.3	5	1.4	5.7	2	
65-69 yrs	9.8	7.7	9.6	3.2	4.1	3.4	3.1	9.2	1.9	3.6	12.7	7.3	3.4	5.6	1.1	4.8	1.6	
70+ yrs	22.5	17.9	26.3	6.2	7.6	7.5	2.6	21.7	5.7	7	34.6	15	9.8	8.3	1.8	11.1	3	
Residence																		
Rural	61.2	59.1	59.7	57.7	66.7	61.2	66.1	60.5	77.3	63.9	70.4	68.6	67.6	55.6	63.9	63.2	63.8	
Urban	38.8	40.9	40.3	42.3	33.3	38.8	33.9	39.5	22.7	36.1	29.6	31.4	32.4	44.4	36.1	36.8	36.2	
Wealth Quintiles																		
Lowest	12	19.6	10.3	17.5	24.2	19.1	23.5	17.9	27	17.3	14.6	26.8	23.5	19.9	20.2	18.4	20	
Second	15.4	20.5	13.4	19.9	25.8	20	21.7	20.2	25.8	20.1	14.2	21.7	20.2	15.9	20.1	19	20	
Middle	23.4	20.2	20.4	19.8	18.9	22.9	22.3	24.1	22.8	24.7	30.4	21.2	24.5	16.4	19.6	22.6	20	
Fourth	27.3	18.7	31.2	19.6	19.4	18.8	24.3	16.2	16.6	19.5	27.6	22.1	18.1	34.5	19.8	21.7	20	
Highest	22	21.1	24.7	23.2	11.8	19.2	8.2	21.6	7.7	18.3	13.1	8.1	13.8	13.3	20.2	18.3	20	
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
National (%)	3.1	0.5	0.9	1.7	0.4	2.4	0.9	0.2	0.7	1.4	0.4	0.1	2.3	0.1	87.2	12.8	100	
Population "000"	1,502	263	409	816	171	1,164	442	83	312	661	214	47	1,106	43	41,711	6,138	47,849	

3.3. Population reporting illnesses

Before examining the utilization of outpatient services, the survey first explored the frequency of reported illness in the four weeks preceding the survey, the unmet healthcare need, and the reasons for not seeking healthcare despite reported episodes of illness.

In order to estimate the population that reported illness in the last four weeks, all member of the household were asked if they experienced any episode of ill-health in the four weeks preceding the survey.

Table 3.3 shows that the proportion of individuals reporting sickness in 2018 was 19 percent, same as what was reported in 2013.

Table 3.3: Proportion of population reporting illnesses four weeks prior to the survey, Kenya 2018

Description	2003	2007	2013	2018
People with some sickness reported (%)	17.4	15.1	19.3	19.3
People with no sickness reported (%)	82.6	84.9	80.7	80.7
Total population (millions)	32.1	37.2	38.6	47.8

Table 3.4 shows that females (21.3%) had higher proportions of reported illness than males (17.3%) in 2018. Higher proportions of illness were reported among people aged 50 years and above. It is also noted that age 0-4 had a higher proportion of illness (23.9%).

Table 3.4: Proportion of population reporting illnesses four weeks prior to the survey by residence, sex, age and wealth quintile, Kenya 2018

Background characteristics	Place of Residence		Total
	Rural	Urban	
Sex			
Male	11.2	6	17.3
Female	13.9	7.4	21.3
Age			
0-4 yrs	14.2	9.7	23.9
5-9 yrs	10.4	5	15.4
10-14 yrs	9.2	3.7	12.9
15-19 yrs	8.9	4	13
20-24 yrs	8.1	6.8	14.9
25-29 yrs	9.1	7.8	16.8
30-34 yrs	10.6	8.3	19
35-39 yrs	11.9	9.8	21.7
40-44 yrs	15.7	7.9	23.6
45-49 yrs	15.5	7.9	23.4
50-54 yrs	20.2	8.4	28.6
55-59 yrs	22	8	29.9
60-64 yrs	26.3	7.5	33.8
65-69 yrs	27.1	8.3	35.5
70+ yrs	33.5	8	41.6
Wealth quintile			
Lowest	17.9	1.7	19.6
Second	17.4	2.1	19.6
Middle	16.6	4	20.5
Fourth	9.4	10	19.4
Highest	1.8	15.8	17.6

3.4. Unmet need for health care

This section looks at the proportion of individuals that were sick and did not seek health care. The survey results indicate that a high proportion of households did not seek health care despite reporting illness episodes in the four weeks preceding the survey. Table 3.5 shows that those who were ill and never sought health care increased from 13 percent in 2013 to 28 percent in 2018.

Table 3.5: Trends in percent of sick people who never sought health care, Kenya 2018

Description	Those who never sought health care trends			
	2003	2007	2013	2018
People with no sickness reported	82.6	82.7	80.7	80.7
People with some sickness reported	17.4	14.7	19.3	19.3
Percent of people with some sickness reported but did not seek health care	22.8	16.7	12.7	28

Table 3.6 shows that more males (30%) compared to females (26.4%) reported illness but never sought care. The proportion of persons that were ill and never sought care in the rural areas were higher than those

in urban areas at 30 percent and 25 percent respectively. Persons aged 60 years and above recorded the highest proportion among those who were sick and never sought care while the lowest proportion was in the age 0-4 at 18 percent. Those in the lowest quintile that were ill and never sought care were at 34 percent compared to 20 percent of those in the highest quintile.

Table 3.6: Percent reporting illness and never sought healthcare by sex, age, wealth quintile, and residence, Kenya 2018

Background characteristics	Did you visit/consult a health provider (hospital/ health centre/ clinic)			Number of persons who were sick
	Yes	No	Don't Know	
Sex				
Male	69.7	30	0.3	4,064,886
Female	73.4	26.4	0.1	5,190,023
Residence				
Rural	69.9	29.9	0.2	6,037,864
Urban	75.3	24.5	0.2	3,217,045
Age groups				
0-4 yrs	82.4	17.5	0.1	1,254,751
5-9 yrs	70.9	29.1	0	942,472
10-14 yrs	68.9	31.1	0	900,846
15-19 yrs	67.4	32.5	0.2	711,274
20-24 yrs	68.9	30.7	0.4	592,860
25-29 yrs	72.1	27.7	0.2	595,855
30-34 yrs	71	28.8	0.2	668,313
35-39 yrs	69.8	30	0.2	613,433
40-44 yrs	71.1	28.5	0.4	600,841
45-49 yrs	70.4	29.3	0.3	426,228
50-54 yrs	72.6	26.9	0.4	392,514
55-59 yrs	73.8	26	0.2	374,754
60-64 yrs	69.3	30.5	0.2	320,016
65-69 yrs	66.7	33.3	0	267,078
70+ yrs	69.7	30.1	0.2	593,676
Wealth quintiles				
Lowest	65.9	34	0.1	1,872,513
Second	67.3	32.4	0.3	1,872,472
Middle	72.9	26.9	0.2	1,965,713
Fourth	74.5	25.3	0.2	1,857,951
Highest	79.1	20.8	0.1	1,686,261
National	71.8	28	0.2	9,254,909

Reasons for not seeking treatment despite reporting illness

Individuals that reported illness and never sought care were asked to give their reasons for not seeking treatment.

Table 3.7 shows the reasons for not seeking treatment despite reporting illness. The three major reasons mentioned were self-medication, illness not considered serious enough and high cost of care at 45 percent, 25 percent and 19 percent respectively.

Table 3.7: Trends in reasons for not seeking treatment despite reporting illness, Kenya 2018

Reasons	Trend analysis			
	2003	2007	2013	2018
Self-medication	34.3	34.4	30.7	45.2
Illness not considered serious enough	7.9	0.1	39.3	24.8
High cost of care	36.3	37.7	21.4	19.4
Long distance to provider	15.1	11.2	1.8	3.0
Religious /cultural reasons	1.1	3.1	0.1	1.6
Fear of discovering serious illness	1.1	0.2	0.0	1.0
Poor quality service	1.6	0.5	0.5	0.8
Other reasons	2.6	12.8	6.2	4.3

There was a high increase in self-medication from 30.7 percent in 2013 to 45.2 percent in 2018. High cost of care reduced from 21.4 percent in 2013 to 19.4 percent in 2018. Illness not considered serious enough also reduced from 39.3 percent in 2013 to 24.8 percent in 2018.

3.5. Utilization of Outpatient Healthcare Services

Outpatient healthcare means medical procedures and services that are done by health facilities and providers of health without requirement for prolonged stay at the point of use. They include diagnosis, observation, consultation, treatment, intervention, rehabilitation and medical procedures that do not require 24-hour admission to the health facility.

The total number of outpatient visits made in the four weeks preceding the survey has consistently increased over the 15-year period from 4.8 million visits in 2003 to 9.1 million in 2018 though similar numbers of visits were recorded in 2013. The Utilizations of outpatient services reported in KHHEUS 2018 was on average 19 percent of individuals who reported illness during the four weeks preceding the survey. This was down from 24 percent reported in 2013 survey. This translates to an average of 19 visits per 100 sick people. Overall, the percentage of people with some sickness reported but did not seek healthcare increased two times more in 2018 at 28 percent from 13 percent reported in 2013.

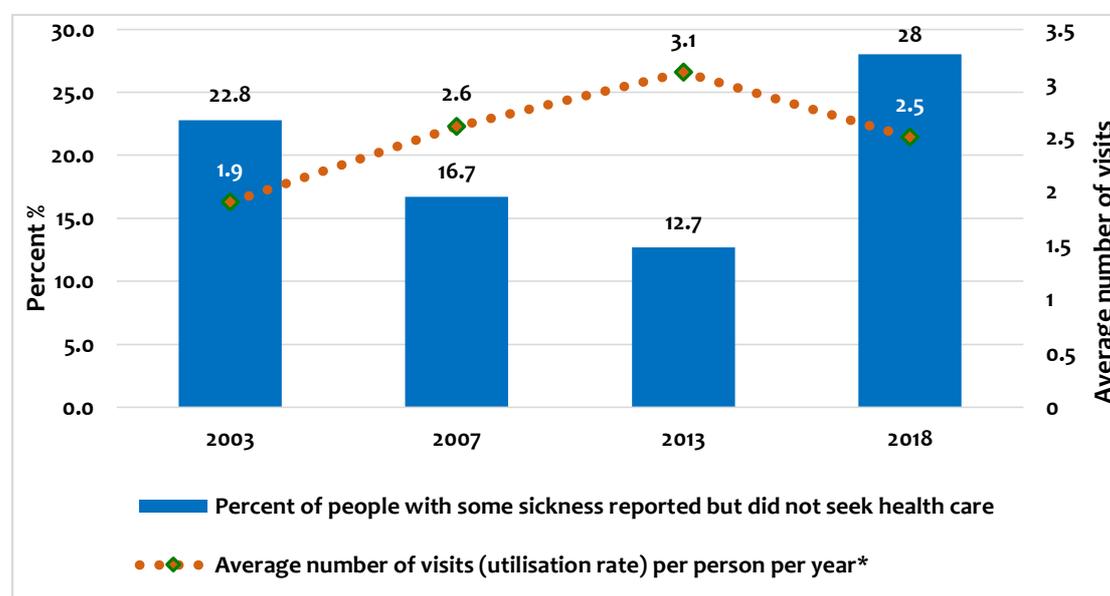
Table 3.8: Trends in proportion and average number of outpatient visits made to the healthcare providers, Kenya 2018

Visits and utilization rates	Trend analysis			
	2003	2007	2013	2018
Percent of people with some sickness reported but did not seek health care (%)	22.8	16.7	12.7	28
Total number of visits made in 4-week recall period to all health care service providers (millions)	4.8	7.4	9.1	9.1
Average number of visits (in 4 weeks) per 100 people	15	20	24	19
Average number of visits (in 4 weeks) per 100 sick people	85	132	122	83
Average number of visits (utilisation rate) per person per year*	1.9	2.6	3.1	2.5

Note: The calculation of this rate is based on the following formula: Annual utilization rate = Number of visits made in the preceding 4 weeks/ Number of people in the sample (weighted) x 52/4. Estimates based on surveys have a margin of error because they are based on samples, rather than on total population

The annual average utilization rate for the population (using 9.1 Million) declined to 2.5 visits per person per year in 2018 from 3.1 visits per person per year in 2013. However, the general trend for the average utilization has shown tremendous increase since 2003 as shown in figure 3.3.

Figure 3.3: Trends in utilizations rates and proportion of people with some sickness who did not seek healthcare, Kenya 2018

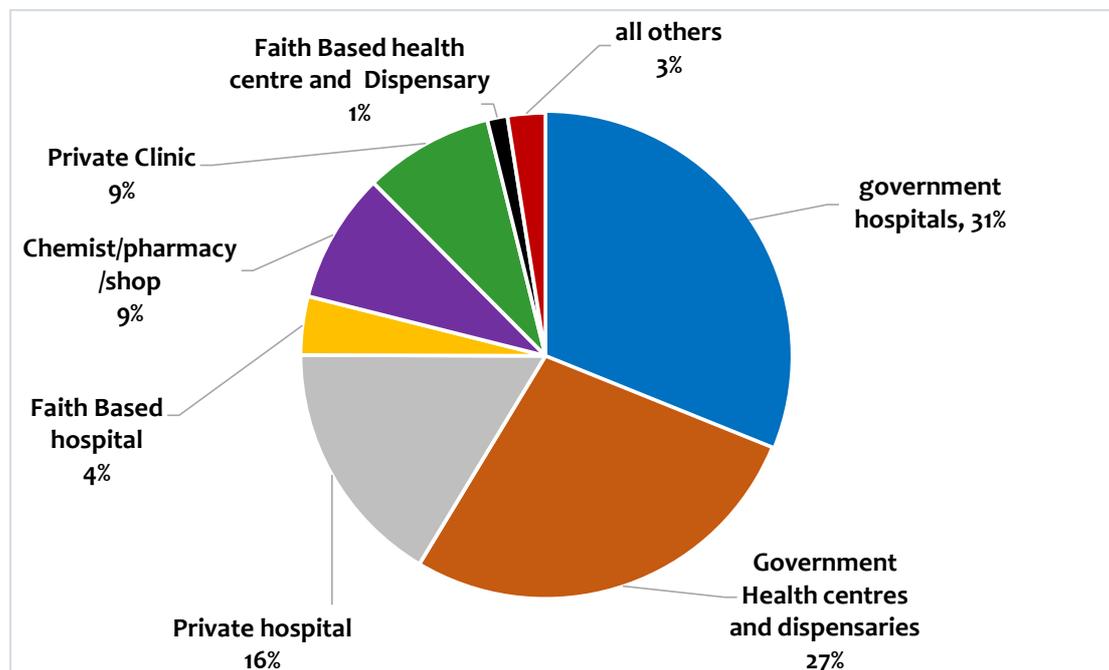


Outpatient visits by health provider type and ownership

The main providers of outpatient services in 2018 were Public health facilities with 59 percent of outpatient visits made. Government Hospitals accounted for 31 percent while Health centers and dispensaries accounted for 28 percent. Private hospitals on the other hand

accounted for 16 percent in 2018, while faith-based hospitals accounted for 4 percent.

Figure 3.4. Main providers of outpatient health services, Kenya 2018



In 2018 the government health centers and dispensaries (primary health care facilities) dropped as key providers of outpatient health services to 28 percent down from 40 percent realized in 2013. This showed that in most outpatient services were provided in hospitals than primary health care facilities.

Figure 3.5: Trends in percent distribution of outpatient visits by provider type, Kenya 2018

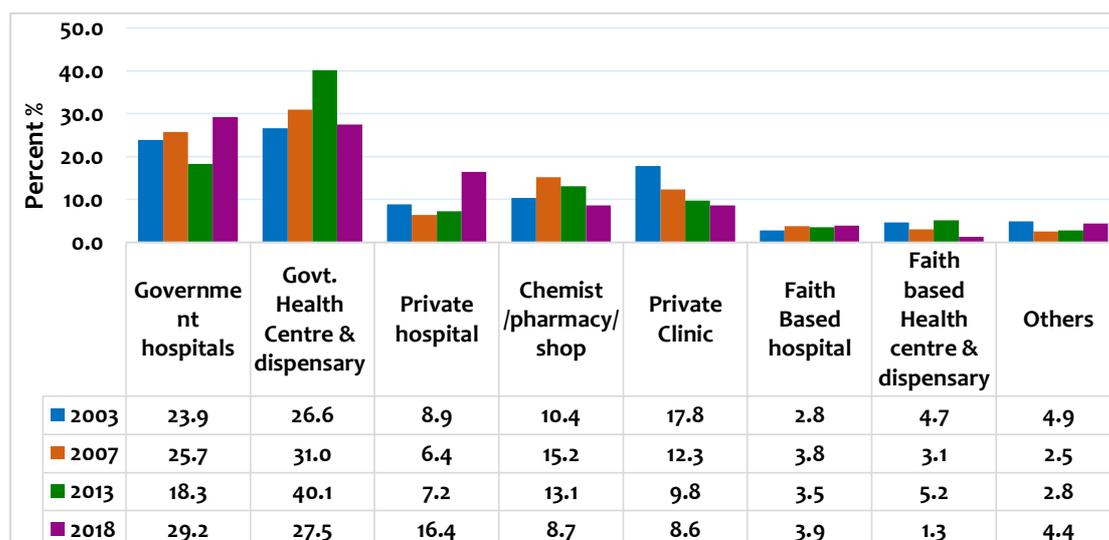
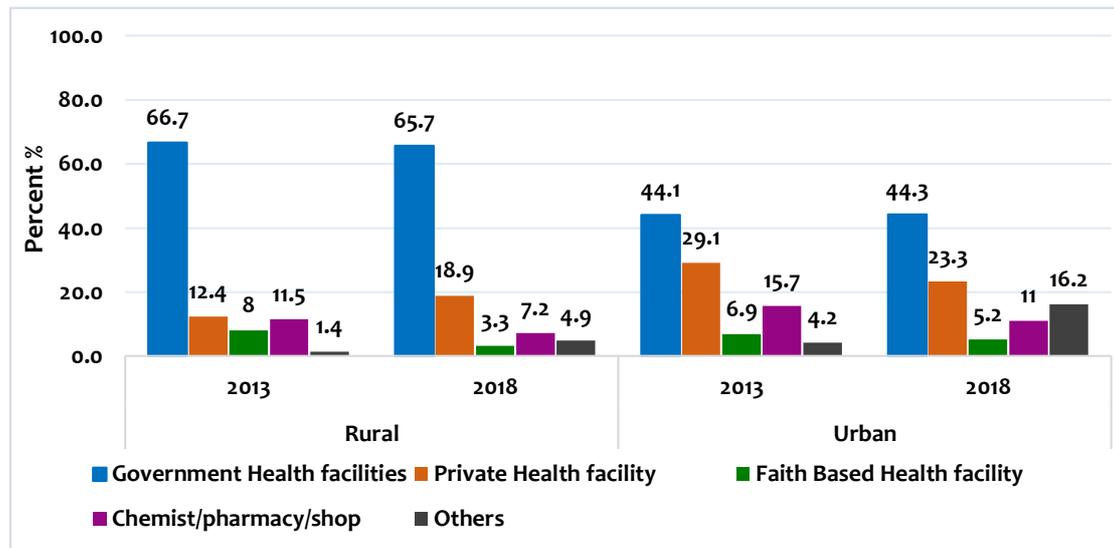


Figure 3.6 shows that the main differences in the use of health facilities was notably in public health facilities accounting for 66 percent in rural

and 43 percent in urban residence in 2018. Dependence on public health facilities for outpatient services is significantly higher among rural populations (65.7%) than urban populations (44.3%). The outpatient health visits dropped from 66 percent to 67 percent of the total outpatient care visits in rural and 44 percent in urban areas in 2013. Private health facilities accounted for 19 percent in rural areas and 23 percent of the total outpatient visits in urban areas; this is an increase from what was reported in 2013. Chemists/Pharmacy/shop has significantly reduced in both Rural and urban by more than 4 percent during the two last surveys.

Figure 3.6: Trends in outpatient healthcare visits/utilization by type of provider and residence, Kenya 2018



Reasons for seeking outpatient care

Figure 3.7 shows that majority of the people who utilized outpatient healthcare visits were due to malaria (17%), physical checkup (16.7%) and diseases of respiratory system (10%), Pneumonia (2.9%) Diarrhea (2.7%) and hypertension (2.4%).

Figure 3.7: Self-reported reasons for seeking outpatient services (curative and preventive care), Kenya 2018

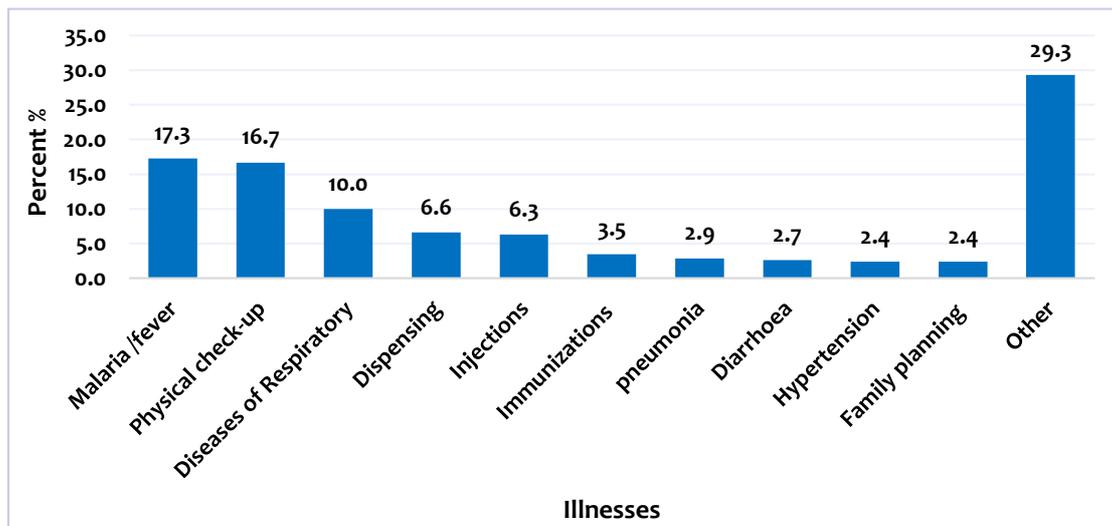
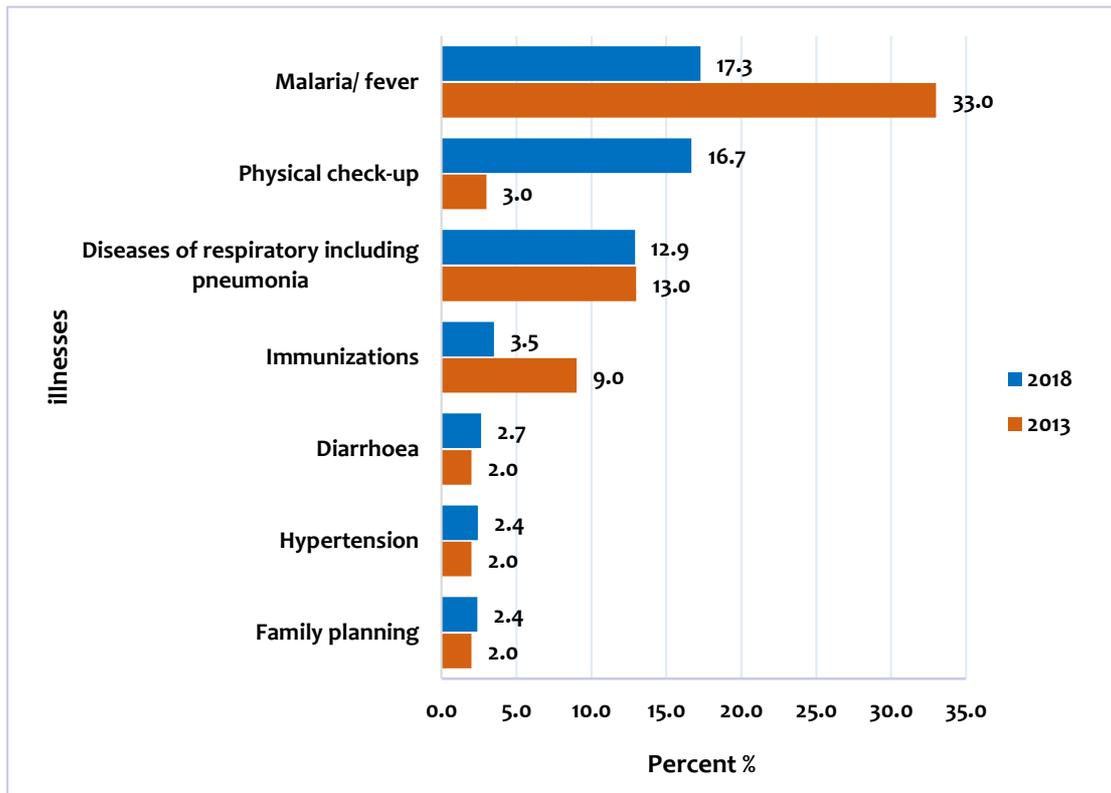


Figure 3.8 shows the trend on self-reported reasons for seeking outpatient services (curative and preventive care), with Malaria/Fever significantly declined by 16 percent to 17 percent from 33 percent experienced in 2013. Physical check-up (prevention) increased five times more to 17 percent from 3 percent reported in 2013 survey. The other main reason was diseases of respiratory that comparatively gone down to 10 Percent of the total reasons for the outpatient visits/ services from 13 percent in 2013. The illnesses that were reported to have slightly gone up were Diarrhea, Hypertension, and pneumonia in 2018.

Figure 3.8: Trends in self-reported reasons for seeking outpatient services (curative and preventive care), Kenya 2018



Outpatient utilization rate by age group

The average number of visits per person per year increased by the progression of age with those reported above 70 years having more visits at 4.8 visits and this was followed by those in age group of 65 – 69 years and children 0- 4 years with four visits per person per year. There is a significant drop between age 5 – 19 years with less than 2 visits per person per year as shown in figure 3.3.

Figure 3.9: Average number of outpatient visits (utilization rate) per person per year by age, Kenya 2018

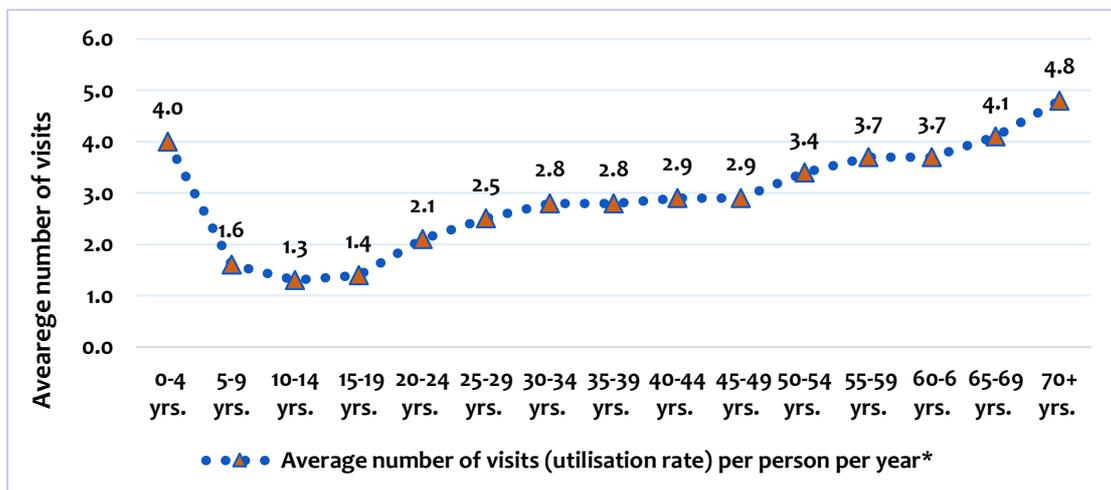
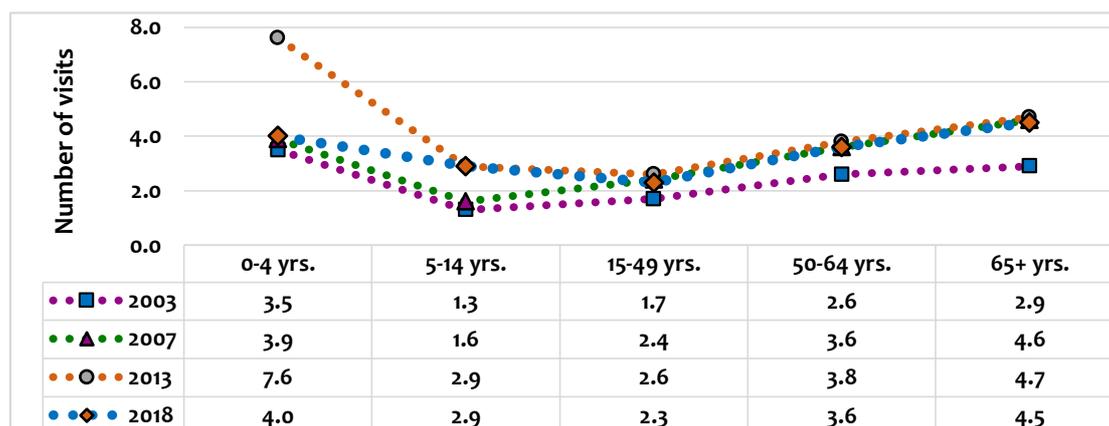


Figure 3.10 shows the annual number of outpatient visits by age in 2003, 2007, 2013 and 2018. Across all the all ages the number of visits dropped from 2013 to 2018. Most of the people visiting the health facilities were in between age 65 and above and zero to 4 years with 4.5 visits and 4 visit on average. There was no much difference in age 5 – 14 years as compared to previous survey in 2013.

Figure 3.10: Trends in average number of outpatient visits (utilization rate) per person per year by age, Kenya 2018



Outpatient utilization rate by age and residence

The overall incidence of reported illness between urban and rural was similar at 19 percent of the populations. The incidence was reported higher in females compared to males at 21 percent and 17 percent respectively. The reported illness rate was noted to increase with age, with the highest reported in population age 65 and above.

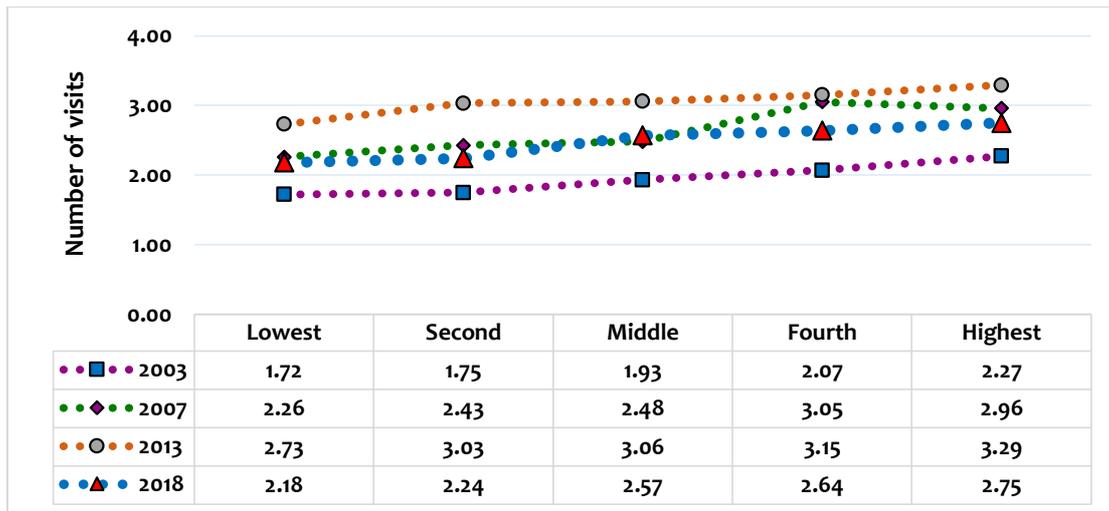
Table 3.9. Trend in proportion of individuals reporting illness by age, sex, residence and wealth quintiles, Kenya 2018

	Residence				National		
	Rural		Urban		2013	2018	
	2013	2018	2013	2018			
Sex							
Male	10.8	11.2	6.2	6	17	17.3	
Female	14.2	13.9	7.3	7.4	21.5	21.3	
Age group							
0-4	17.3	14.2	11.4	9.7	28.7	23.9	
5-14	10.6	9.8	4.9	4.4	15.5	14.1	
15-24	7.5	8.4	5	5.4	12.5	13.9	
25-34	9.1	9.8	7.1	8	16.1	17.7	
35-44	13	13.8	7.8	8.8	20.8	22.2	
45-54	17.1	17.9	7.4	8.2	24.4	26	
55-64	22.5	24.1	7.2	7.8	29.7	31.4	
65+	31	30.4	7.6	8.2	38.6	38.5	
Wealth quintiles							
Lowest	16	17.9	1.3	1.7	17.4	19.6	
Second	16.9	17.4	2.8	2.1	19.6	19.6	
Middle	15.2	16.6	4.3	4	19.5	20.5	
Fourth	10.6	9.4	9.7	10	20.3	19.4	
Highest	2.7	1.8	17	15.8	19.8	17.6	
Total	12.3	12.6	7	6.7	19.3	19.3	

Outpatient visits by wealth index

Figure 3.11 shows that the average outpatient utilization rates per person per year dropped in 2018 with the lowest wealth quintile having 2.2 visits and the highest wealth quintile with 2.8 visits. Overall, in 2003, 2007, 2013 and 2018, the number of average visits increased across all the different wealth.

Figure 3.11: Per capita utilizations rates for outpatient visits by wealth quintile, Kenya 2018



Outpatient utilization by education level

Majority (69%) of the people utilizing outpatient health services have completed primary school and over. About half (41.8%) of the population utilized health services completed primary education level while 20 percent have completed secondary school education and 11 percent never went to school. Thirteen percent (13%) of the children under three years also utilized the outpatient healthcare services as shown in figure 3.12.

Figure 3.12: Percentage distribution of outpatient visits/ utilization by education level, Kenya 2018

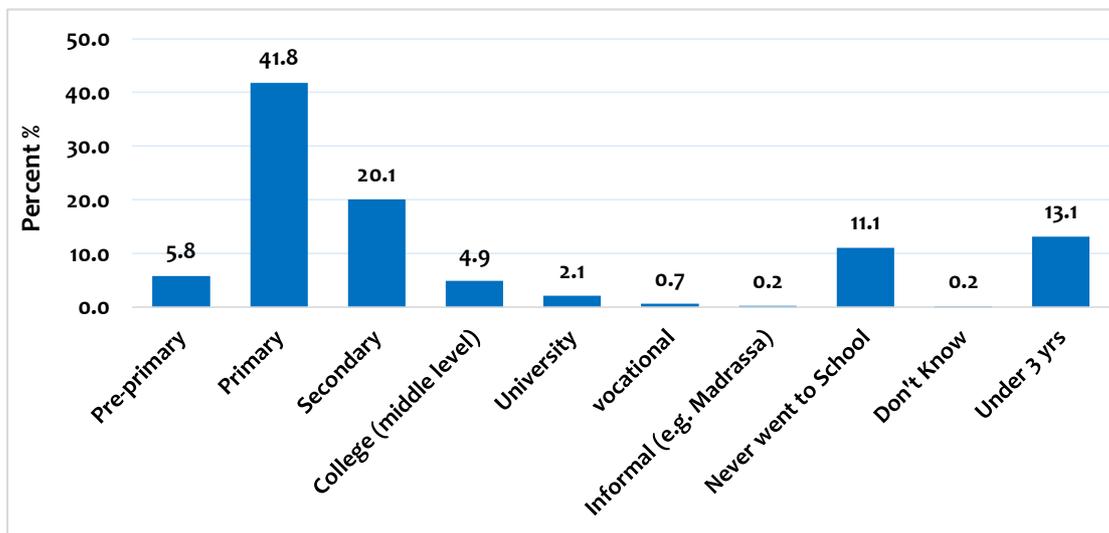
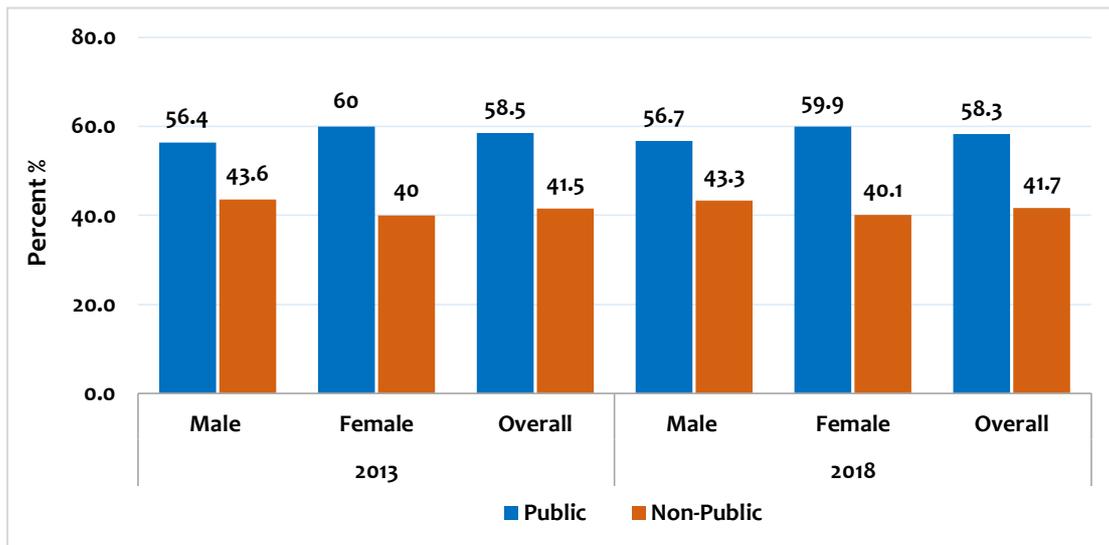


Figure 3.13 shows that overall public health facilities are more utilized with 58 percent of the population while Non- public with about 42 percent. The survey also shows that 58 percent of healthcare services were utilized by females while 42 percent were utilized by male in 2018.

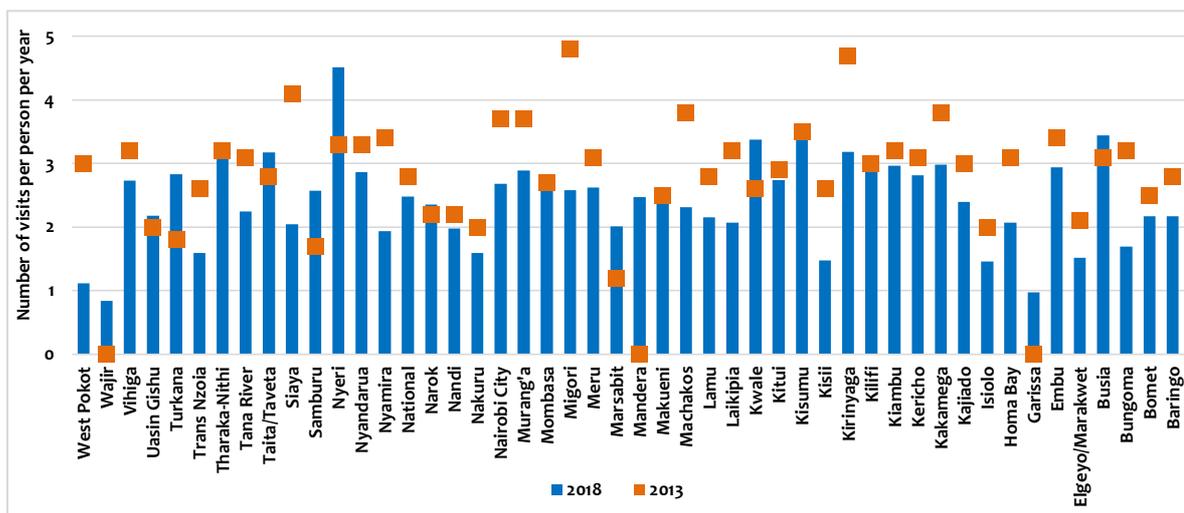
Figure 3.13: Percentage distribution of outpatient visits/ utilization by sex



Inter-county variations in outpatient utilization

Survey findings on the average number of outpatient visits by county are presented in Figure 3.14. Ten (10) out of 47 counties had over 3 visits per person per year. Nyeri residents made the highest number of visits and becoming the only county with over 4 visits per person per year. Other notable high number of outpatient visits was recorded in Tharaka Nithi, Taita Taveta, Kwale, Kisumu, Kirinyaga and Busia where they achieved over 3 visits per capita.. The counties with the least number of visits per person per year were Wajir (0.8), Garissa (1.0), West pokot (1.1) and Isiolo (1.5).

Figure 3.14: Trend in per capita utilization of outpatient services by county, Kenya 2018



Note: the 2013 survey did not cover Garissa, Mandera and Wajir Counties.

Geographical access to outpatient health services

Figure 3.15 below depicts the proportion of the persons who visited health facilities by the distance where they sought care. Over 70 percent of the persons seeking healthcare attended facilities that are less than 5 kilometers, which is the WHO recommended average distance. On average, 19 percent of the people who visited outpatient care services covered over 10 kilometers, which was a slight increase from 13 percent that was reported in 2013 survey.

Figure 3.15: Trend in percent of persons seeking outpatient care by distance to where care was sought, Kenya 2018

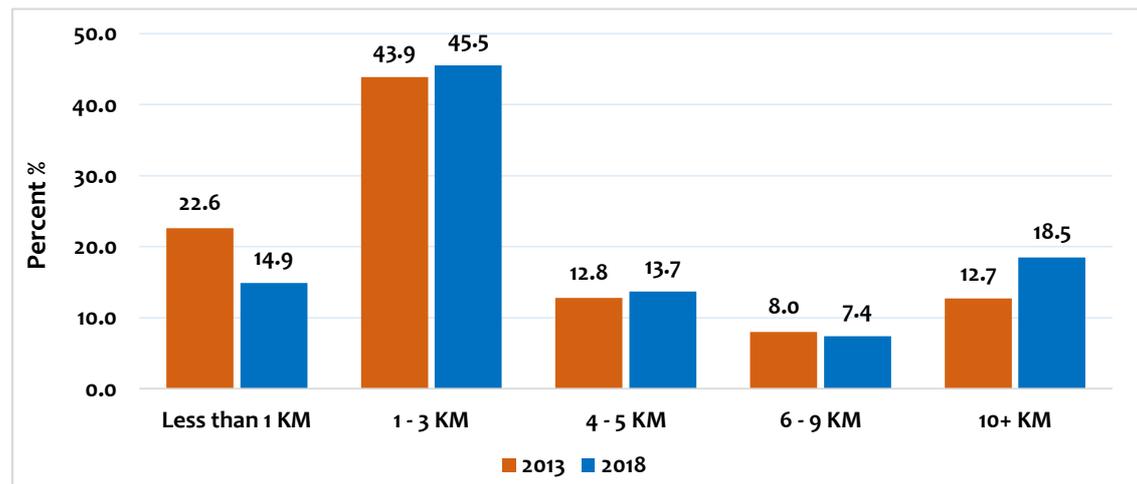


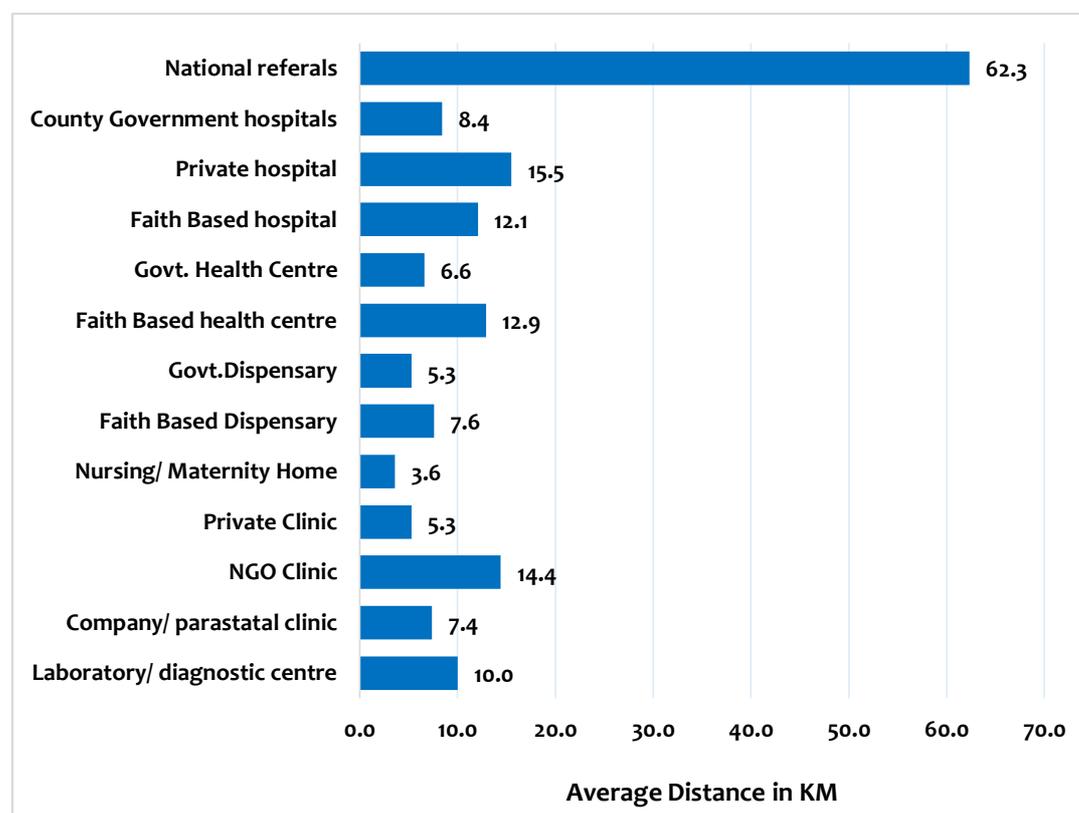
Table 3.10 below presents the proportion of persons seeking health care by distance to the facility where care was sought, place of residence and wealth quintiles. The Table shows that overall, the distance travelled to seek outpatient services was 9.8 kilometers. This should not be confused with the distance to the nearest health facilities since some patients bypassed the nearest facility. Those in rural areas had to travel longer 11.2 Kilometers compared to their counterparts in the urban residence that travelled an average of 7.5 kilometers. The distances covered by patients to health care facilities based on wealth quintiles expressed mixed reactions ranging from a distance of 8.8 kilometers in the second quintile to 10.9 kilometers in the lowest quintile.

Table 3.10: Percent of persons seeking outpatient care by distance, Kenya 2018

Background Characteristics	Distance cohorts in KM					Average distance (KM)
	Less than 1 KM	1-3	4-5	6-9	10+	
Residence						
Rural	10.6	42.5	15.4	9	22.6	11.2
Urban	22.3	50.6	10.8	4.7	11.6	7.5
Wealth quintile						
Lowest	10.5	43.9	15.8	8.9	20.9	10.9
Second	9.6	45.3	15.5	9.7	19.9	8.8
Middle	11.6	45.2	15.1	8.3	19.9	10.6
Fourth	16.4	43.7	14.6	6.4	18.9	10.1
Highest	25.5	49.2	7.8	4	13.5	8.8
National	14.9	45.5	13.7	7.4	18.5	9.8

Figure 3.16 below presents survey findings on the average distances covered by outpatients to health facilities based on the type and ownership of the facility visited. The figure shows that those persons seeking care in national referral hospitals travelled the longest distances (62.3 km) to access health care. Average distance covered by those seeking in County Government hospitals stood at 8.4 Kilometers while distance covered to private hospitals and NGO clinics stood at 15.5 Kilometers, 14.4 kilometers, respectively. Those seeking care in nursing/maternity homes travelled the least distance of 3.6 kilometers.

Figure 3.16: Percent of persons seeking outpatient care by distance, Kenya 2018



Majority (47 %) of the persons seeking healthcare in outpatient travelled for more than 10 kilometers. The longest distances of over 10 kilometers were covered by mostly at 42 percent of those seeking Laboratory/diagnostic services, and 31 percent of those who went to Faith based Health centers. While majority of the people who travelled less than 3 kilometers visited Nursing Homes (81 %), Private Clinics (73 %), Government dispensaries (68%) and Faith based dispensaries (59%).

Table 3.11: Average distance to seek healthcare by type and ownership of the health facility, Kenya 2018

Type and ownership of the health facility type	Distance cohorts in KM					Average distance
	Less than 1 KM	1-3	4-5	6-9	10+	
National referrals	4.5	27.7	12.1	8.7	47.1	62.3
County Government hospitals	10.7	46.1	15.2	7.8	20.1	8.4
Private hospital	16.2	41.3	13.0	7.5	22.0	15.5
Faith Based hospital	18.2	30.9	14.3	8.1	28.5	12.1
Govt. Health Centre	11.9	48.8	12.9	9.2	17.1	6.6
Faith Based health centre	13.5	35.2	11.2	9.6	30.5	12.9
Govt. Dispensary	15.5	53.5	14.2	6.0	10.8	5.3
Faith Based Dispensary	30.4	29.1	13.1	4.9	22.5	7.6
Nursing/Maternity Home	28.1	53.1	2.7	1.7	14.5	3.6
Private Clinic	29.4	44.0	10.3	5.0	11.2	5.3
NGO Clinic	14.2	45.7	12.9	4.4	22.8	14.4
Company/parastatal clinic	2.0	37.8	10.5	25.3	24.4	7.4
Laboratory/diagnostic centre	0.0	57.9	0.0	0.0	42.1	10.0

Reasons for bypassing nearest outpatient healthcare provider

The main reason for bypassing the nearest outpatient health provider remains unavailability of medicines (21%) as shown in figure 3.17. This was closely followed with referral, which went up to 13 percent from 8 percent in 2013. Other reasons for bypassing healthcare provider were perceived unqualified staffs (12%), long waiting time and expensive facilities (10% each).

Of note is that 9% of respondents avoided the nearest facility to avoid paying for services that they would receive in another facility without payments.

Figure 3.17: Percent distribution of the reasons for bypassing the nearest outpatient health provider, Kenya 2018

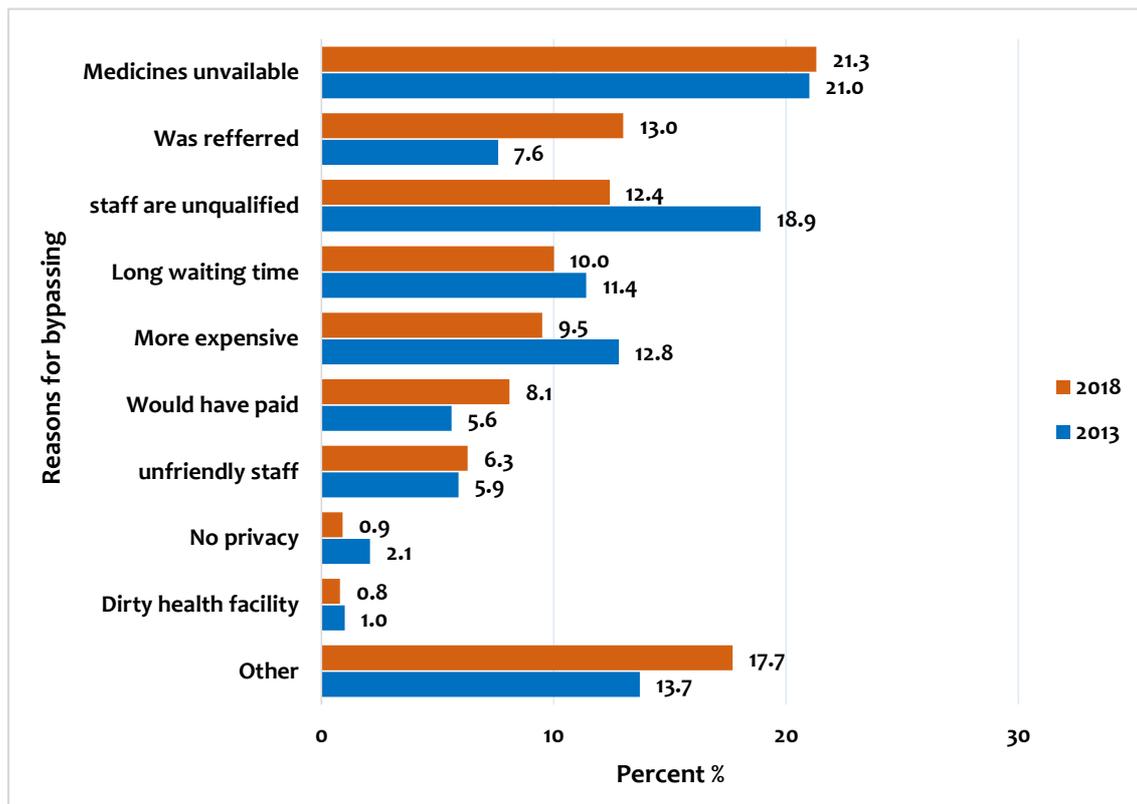


Table 3.12 elaborate the distribution of major reasons why people by pass their nearest outpatient health providers by type and ownership of health provider.

Private (17%) and Faith based (14%) health facilities were perceived to be more expensive hence their bypasses while most referrals were done by NGO and community health facilities (20%).

Table 3.12: Percent distribution of reasons for bypassing nearest outpatient facility by ownership/ type of facility, Kenya 2018

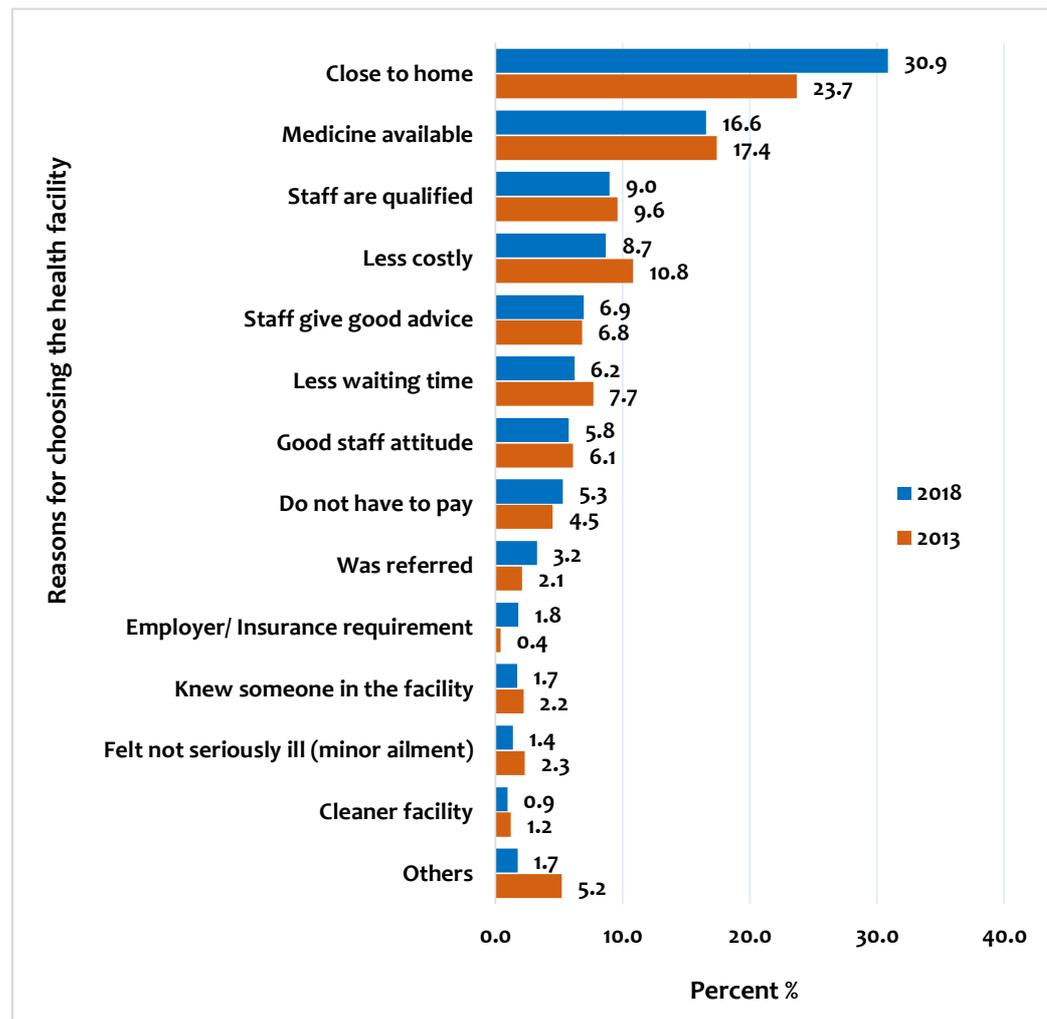
Reasons for bypassing	Ownership / type of health facility						
	Government	Private	Faith Based Organisation	NGO	Community	Others	National
Medicine unavailable	26.5	14.2	18.7	13.1	30.2	9.2	21.3
Was referred	14.3	10.4	17.7	20.1	19.8	18.2	13.0
Staff are unqualified	11.6	13.8	11.1	20.7	20.0	0.0	12.4
Long waiting time	12.0	7.3	9.0	7.5	5.1	4.6	10.0
More expensive services	4.3	16.7	14.1	8.0	7.9	6.7	9.5
Would have been required to pay	4.1	14.2	7.1	5.4	3.8	2.9	8.1
Unfriendly staff	7.3	5.0	6.2	5.7	5.4	2.2	6.3
Unavailability of services	5.7	5.3	2.3	1.3	3.2	0.0	5.3
Insurance prerequisite	1.2	2.8	4.3	5.8	0.0	0.0	1.9
Was away from home/residence	2.0	1.6	2.0	2.7	0.0	17.3	1.9
Unavailable/inadequate of staff	1.5	0.3	1.8	2.9	0.0	0.0	1.1
No privacy	0.9	0.8	0.7	3.2	1.7	0.0	0.9
Dirty facility	0.8	0.9	0.1	0.0	0.0	1.6	0.8
Other	7.8	6.6	4.9	3.8	3.0	37.4	7.3

Reasons for choosing outpatient healthcare provider

Provider choice often depends on a number of individual preferences including distance to the facility, availability of inputs such as medicine and qualified health staff, cost of care, perceived attitude of health workers, facility cleanliness, and waiting time. Figure 3.18 presents the reasons given by individuals for choosing to seek outpatient care from a health service provider.

Distance was the most important determinant in choosing a health facility, with 31 percent of the population indicating that their main reason for choosing care at a particular facility was that it was “close to home”. The other main reason was that “medicine was available” (16.6%), “staff are qualified” (9.0%), “less costly” (8.7%), and “less waiting time” (6.2%).

Figure 3.18: Percent distribution of reasons for choosing the outpatient health provider, Kenya 2018



Time taken to outpatient health facility

Individuals who sought outpatient care were asked about the time they took to reach their chosen health facility. Table 3.13 shows that it took individuals 80.2 minutes to reach an outpatient care facility, which was about two times the time taken in 2013 (46 minutes). Minimal differences in terms of time taken were reported between rural areas and urban areas (80.1 and 80.7 minutes).

Table 3.13: Time taken to health facility where outpatient service was sought, Kenya 2018

Time in hours	Residence				National	
	Rural		Urban		2013	2018
	2013	2018	2013	2018		
< 1 hr	71.2	49.5	74	73.5	72.2	56.9
1-2 hrs	22.6	45.2	19.2	21.9	21.4	38
3-4 hrs	4.7	3.3	5	1.5	4.8	2.8
5+	1.5	2	1.8	3	1.6	2.3
Total	100	100	100	100	100	100
Average time taken (Minutes)	46	80	45	81	46	80

3.6. Utilization of inpatient Healthcare Services

Inpatient healthcare refers to services provided to patients admitted for care, at least for 24 hours, in a facility following a health provider's decision. This section presents an analysis of data collected from households on use of inpatient services in Kenya.

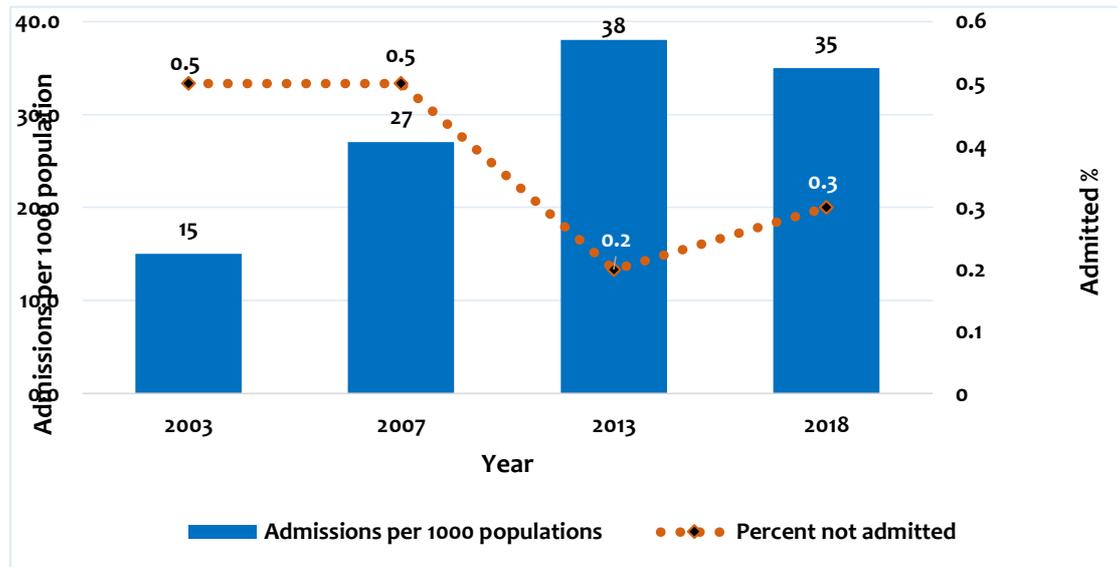
Results from the survey shows that the admission rate was 3.3 percent of the total population in 2018, an increase from the previous surveys that recorded 2.5 percent in 2007 and 2013 as shown in table 3.14. The 2018 KHHEUS shows that approximately 1.7 million Kenyans were admitted at least once in the 12 months preceding the survey compared to 1.2 million in 2013.

Table 3.14: Summary trends on admissions 2003-2018, Kenya 2018

Description	Trend analysis			
	2003	2007	2013	2018
Percent of population requiring admission	2.0	3.0	3.1	3.7
Percent admitted	1.5	2.5	2.5	3.3
Percent not admitted	0.5	0.5	0.5	0.3
Admissions per 1000 populations	15.0	27.0	38.0	35.0
Admissions in rural areas per 1,000 population	14.0	24.0	34.0	31.0
Admissions in urban areas per 1,000 population	20.0	38.0	45.0	42.0
Average length of stay	8.5	6.6	6.7	7.8

The proportion of population who required admission but was not admitted declined to 0.3 from the 0.5 per cent recorded in 2013 as shown in figure 3.19. The number of admissions per person per year indicated a decline from 38 per 1,000 population in 2013 to 35 per 1,000 population in 2018, with an average length of stay (ALOS) of 7.8 days.

Figure 3.19: Admission status and the percentage of people requiring hospitalization but were not admitted, Kenya 2018



Inter-County admission rates

Table 3.15 presents summary statistics on admissions by county. Inpatient admission rate was higher than that of the national (3.3 %) in 18 counties, with the highest being Kisumu (6%), Homabay (5.6%) and Mandera (5.2%) Counties.

The percent of population requiring admissions but were not admitted was highest in Kisumu (4.6%), followed by Mandera (2.7%) and Mombasa (2.3%). However, the ALOS in Kisumu County was lower (6.7 days) compared to the National at 7.3 days.

The lowest ALOS was reported in Mandera County (3.8 days) despite having high admission rates. Kitui county has the highest ALOS (19.1) days, followed by Garissa (17.3 days), Embu (14.3 days) and Kirinyaga (14.1 days) Counties.

Table 3.15: Admissions statistics by county, Kenya 2018

County	population requiring admission %	admitted %	not admitted %	Admissions per 1000 populations	Average length of stay
Mombasa	5.7	3.4	2.3	36.0	5.6
Kwale	3.3	3.2	0.1	33.0	6.0
Kilifi	2.9	2.8	0.1	28.0	6.9
Tana River	1.5	1.4	0.1	15.0	12.6
Lamu	3.0	2.7	0.3	28.0	7.9
Taita/Taveta	2.7	2.6	0.1	30.0	5.8
Garissa	1.3	1.0	0.3	12.0	17.3
Wajir	1.4	1.3	0.1	14.0	12.8
Mandera	8.0	5.2	2.7	55.0	3.8
Marsabit	4.4	3.8	0.6	44.0	8.8
Isiolo	3.2	2.6	0.7	26.0	4.6
Meru	2.6	2.6	0.1	26.0	10.0
Tharaka-Nithi	3.4	3.0	0.4	31.0	8.7
Embu	4.7	4.6	0.1	50.0	14.3
Kitui	2.2	2.2	0.0	22.0	19.1
Machakos	3.6	2.9	0.7	31.0	4.9
Makueni	2.1	2.0	0.0	21.0	7.2
Nyandarua	2.2	2.2	0.0	23.0	13.3
Nyeri	3.7	3.6	0.1	37.0	9.2
Kirinyaga	4.9	4.9	0.0	56.0	14.1
Murang'a	2.4	2.4	0.0	24.0	9.4
Kiambu	3.8	3.7	0.1	37.0	9.0
Turkana	3.2	3.2	0.0	34.0	5.7
West Pokot	2.2	1.9	0.4	19.0	4.7
Samburu	2.9	2.8	0.1	30.0	9.0
Trans Nzoia	2.7	2.3	0.4	25.0	9.3
Uasin Gishu	2.6	2.5	0.1	25.0	7.7
Elgeyo/Marakwet	2.3	2.2	0.1	24.0	10.4
Nandi	2.4	2.3	0.2	24.0	10.8
Baringo	4.0	3.8	0.2	40.0	10.9
Laikipia	2.6	2.6	0.0	29.0	12.7
Nakuru	1.3	1.2	0.1	12.0	6.6
Narok	4.5	4.5	0.0	47.0	4.9
Kajiado	2.7	2.6	0.1	27.0	13.2
Kericho	3.7	3.4	0.3	36.0	7.7
Bomet	2.1	2.1	0.0	22.0	6.2
Kakamega	5.0	4.6	0.4	50.0	5.5
Vihiga	4.3	3.9	0.4	47.0	6.2
Bungoma	2.6	2.6	0.0	27.0	5.4
Busia	5.3	5.2	0.1	56.0	6.8
Siaya	4.2	4.1	0.0	42.0	5.9
Kisumu	10.6	6.0	4.6	64.0	6.7
Migori	4.4	4.1	0.2	43.0	8.0
Homa Bay	5.6	5.6	0.1	58.0	7.0
Kisii	3.1	3.1	0.1	32.0	5.9
Nyamira	3.3	3.3	0.0	34.0	7.8
Nairobi	4.4	4.4	0.0	48.0	7.8

Leading Causes of Hospital admission

Individuals who were admitted for inpatient care in the 12 months preceding the survey were asked to report the main causes for their

inpatient admission. Figure 3.20 shows that malaria still remains the main cause of admission standing at 14 percent of the total admissions, followed by child bearing admissions at 13 percent. Other causes of admission were surgery (7.1%), pneumonia (5.3%) and accidents and injuries (4.8%). Further, a significant proportion of admissions were related to non-communicable diseases including hypertension (4.5%) and diabetes (2.2%).

Figure 3.20: Leading causes of hospital admissions, Kenya 2018

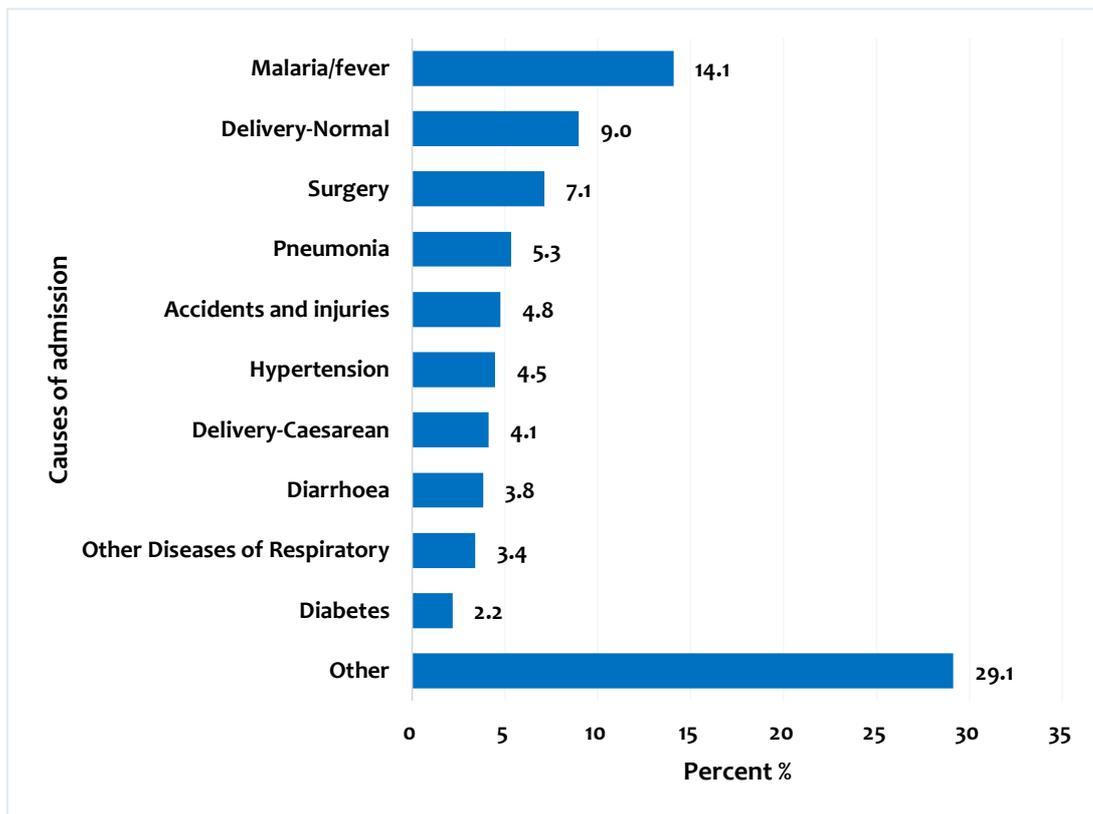
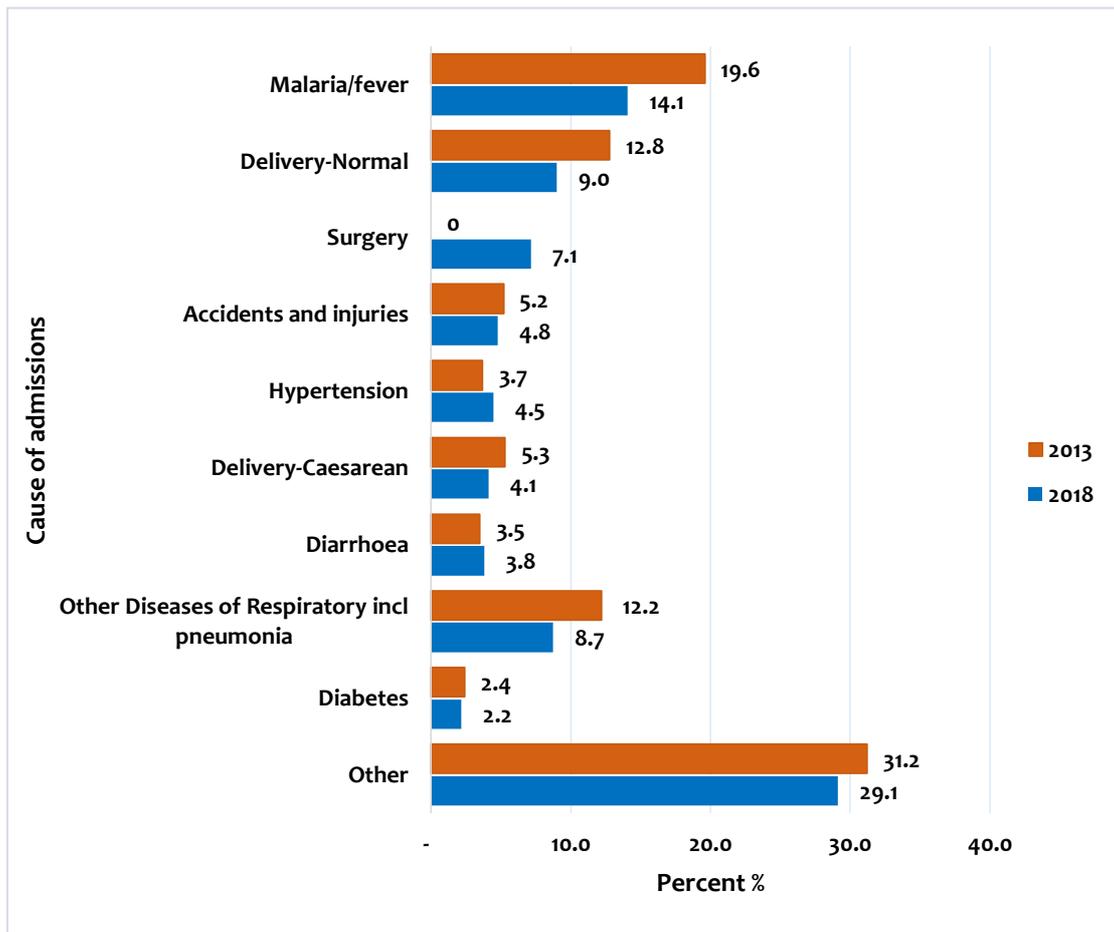


Figure 3.21 represents a trend of leading causes of admissions in 2013 and 2018. Generally, comparing 2013 and 2018, there was a percent reduction in all leading causes of admission except for surgery, hypertension, diarrhea and diabetes. Although malaria was the main reason for admission in both years, it declined from 20 percent in 2013 to 14 percent in 2018 followed by childbearing admissions (18.1% to 13.1%). General surgery procedures increased from 2 percent in 2013 to 7 percent in 2018.

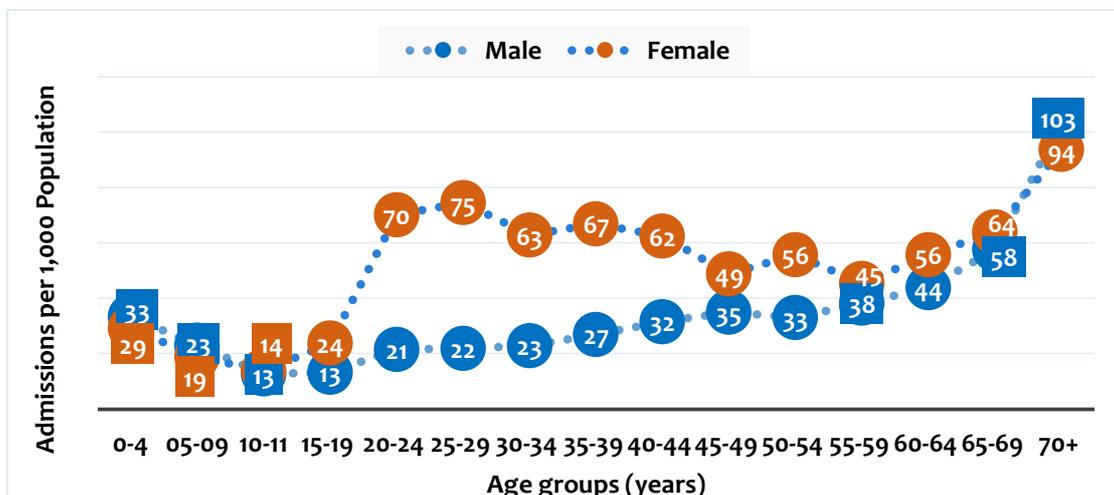
Figure 3.21: Trend in leading causes of hospital admissions, Kenya 2018



Admission rates by age group and sex

On average, the admission rate was higher for females at 44 per 100,000 population compared to 26 per 100,000 population for males. As shown in the figure 3.22, female population had a higher annual admission rate compared to male population for most age groups except for the age 0–4, 5–9 and 70+, where male admissions were higher.

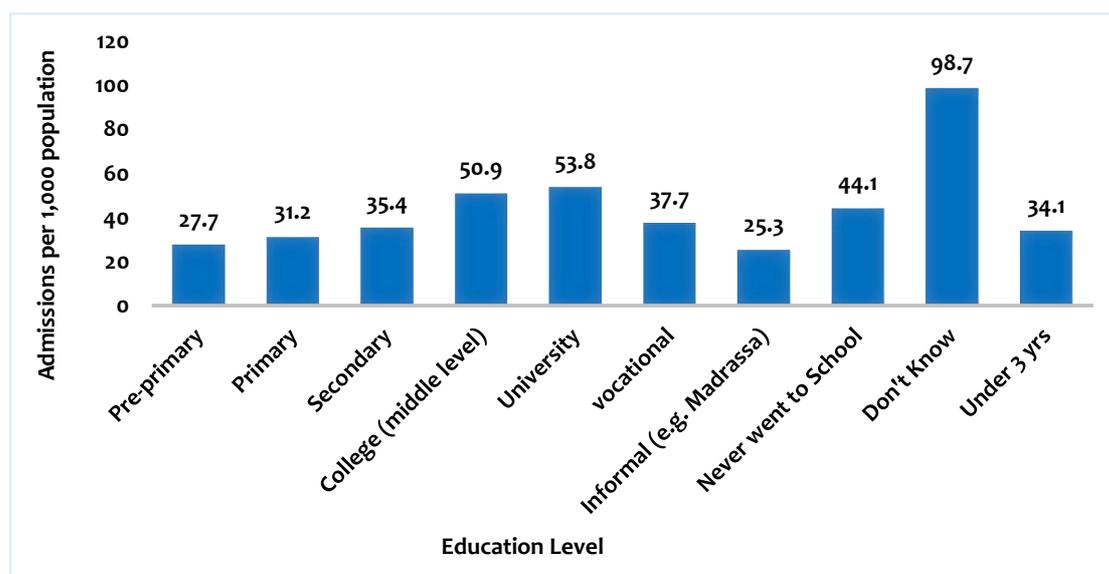
Figure 3.22: Average annual admission rate per 1,000 populations by sex and age group, Kenya 2018



Inpatient utilization by education level

Findings from the 2018 KHHEUS shows that the highest rate of inpatient utilization was reported among persons who did not know their education level: 99 per 1,000 population (Figure 4.22). On the other hand, individuals with informal schooling (e.g. Madrassa) had the lowest inpatient utilization rate (25 per 1,000 population), while those who had attained university education had a utilization rate of 54 per 1,000 populations.

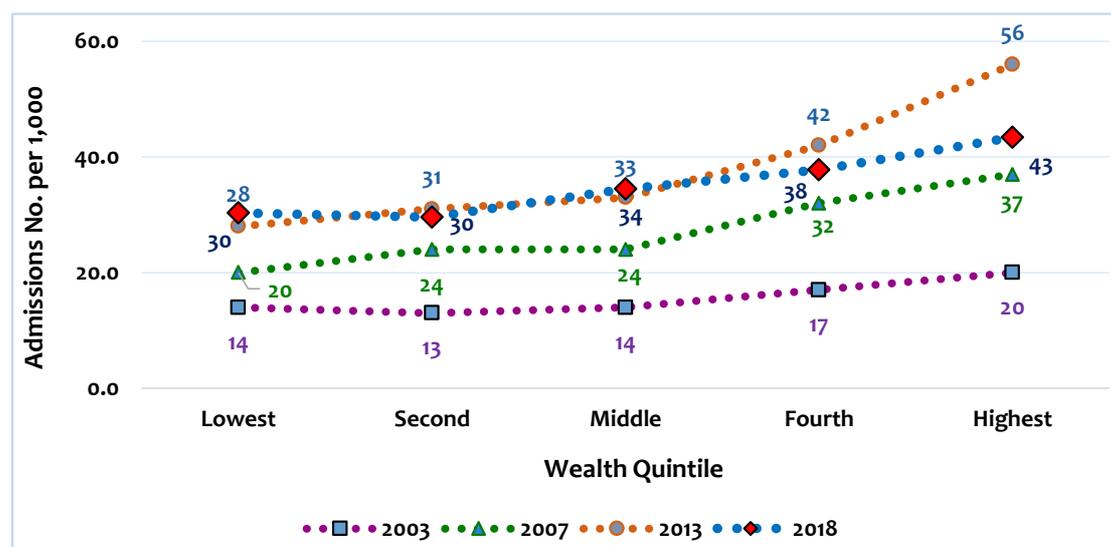
Figure 3.23: Number of admissions per 1,000 population by education levels and county, Kenya 2018



Admission rate by wealth index

The survey result shows that there are distinct differences in admission rates by socioeconomic groups, with those in the highest wealth quintile being more likely to seek admission than other groups. The admission rate per 1,000 population increases with wealth quintiles (Figure 3.24). The highest quintile utilized hospital admission than other groups. However, there is a notable decline among the highest wealth quintile being admitted between the 2013 period and 2018 period.

Figure 3.24: Average annual admission rate per 1,000 population trends by wealth quintile, Kenya 2018



Admissions by wealth index, health provider type and ownership

Table 3.16 shows reliance on public hospitals (National Referral and County Government Hospitals) by the rural population. The urban population was more reliant on both public and private hospitals

Table 3.16: Percent distribution of admissions by type and ownership of facility by residence, Kenya 2018

Health Facility Type/Ownership	Rural (%)	Urban (%)	National (%)
County Government hospitals	41.9	33.9	38.4
Private hospitals	26.1	33.9	29.4
Faith Based Hospital	11.4	10.6	11.1
National referrals	5.4	9.4	7.2
Govt. Health Centre	8	3.7	6.1
Private Health Centre	3.3	4.2	3.7
Faith Based health centre	1.4	2	1.7
Other	1	0.5	0.8
Nursing/Maternity Homes	0.4	1.3	0.8
Don't Know	0.7	0.3	0.5
Other Country (Specify	0.3	0.1	0.2
NS	0.1	0.1	0.1
Traditional healer	0.1	0	0
Total	100	100	100

Further analysis in table 3.17 shows that over half of persons in the lowest and second wealth quintiles use public hospitals (National Referral and County Government Hospitals), and that proportion reduces progressively among the higher wealth quintiles. Conversely, the share

of admissions in private hospitals increases progressively with economic status.

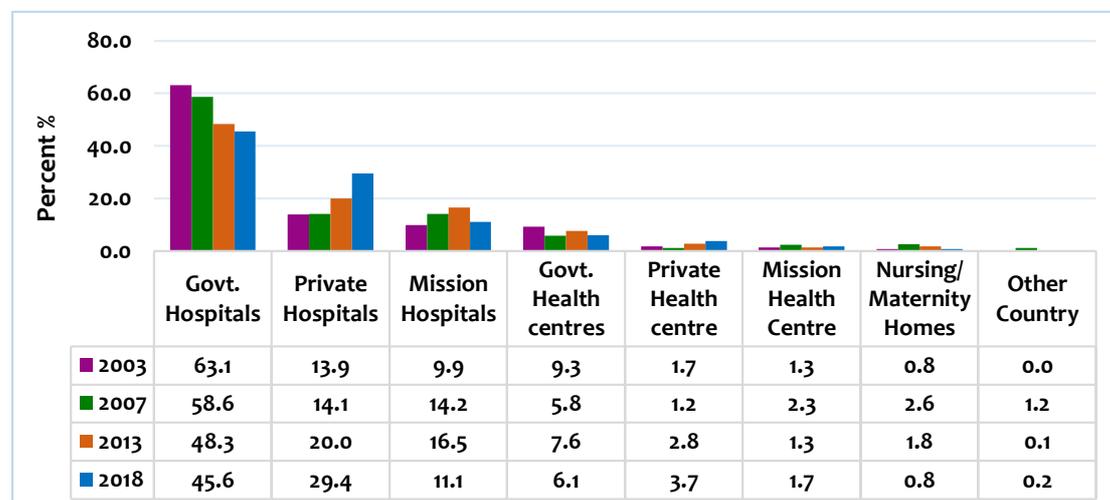
Table 3.17: Percent distribution of admissions by type and ownership of facility by wealth quintile, Kenya 2018

Health Facility Type/ Ownership	Wealth Quintile				
	Lowest	Second	Middle	Fourth	Highest
National referral hospitals	3.9	5.4	5.7	9.4	9.9
County Government Hospitals	48.6	48.4	39.1	38.6	23.9
Private Hospitals	18.6	20.8	28.0	29.1	44.2
Faith Based Hospital	9.1	10.0	12.8	13.4	9.7
Govt. Health Centre	10.5	8.2	7.5	2.9	3.4
Private Health Centre	3.1	3.0	4.1	3.7	4.4
Faith Based Health Centre	2.7	1.3	0.7	1.2	2.4
Nursing/ Maternity Homes	0.0	1.0	0.6	0.8	1.3
Other Country (Specify)	0.6	0.2	0.0	0.3	0.1
Traditional Healer	0.2	0.0	0.0	0.0	0.0
Other (Specify)	2.0	0.6	1.5	0.2	0.1
Don't Know	0.5	1.0	0.1	0.5	0.5
NS	0.1	0.0	0.0	0.1	0.1
Total Number of admissions	289,991	282,886	329,773	361,388	415,481

Most notable is that the proportion of admissions in private hospitals from the lowest wealth quintile has doubled from 9.5% (KHHEUS 2013) to 18.9% (KHHEUS 2018), whereas there has been a marginal increase among the highest wealth quintile from 36.4% (KHHEUS 2013) to 44.2% (KHHEUS 2018).

In as much as this trend is a common finding in most developing countries and represents a shift to higher-quality providers (at least as perceived by users) as affluence increases, the increase among the lowest quintile may be due to the turbulence in the health sector occasioned by numerous industrial action by the health workers in the intervening period forcing the populace to seek care in private institutions.

Figure 3.25 Distribution of admission trends by facility type and ownership, Kenya 2018



Reasons for Choosing the Preferred Inpatient Health Service Providers

Table 4.13 provides the main reasons inpatient service users reported for choosing the inpatient health service providers they visited.

As shown in table 3.18, proximity of the facility to one's home (18.3 %), availability of medicines (17.9%) and qualified staff were the dominant reasons for choosing the facility they visited. Referral services (8.9%), good advice from staff (8.1%) and good staff attitude (7.7%) were the other key reasons reported for choosing inpatient facilities. These six factors accounted for close to 80% of the reasons for choosing an inpatient provider. Cost was ranked seventh on the list where proximity to an inpatient health service provider is dominant.

Table 3.18: Percent distribution of reasons for choosing the preferred inpatient health service provider by residence, Kenya 2018

Reason for preference	Residence		National (%)
	Rural (%)	Urban (%)	
Close to home/residence	17.3	19.6	18.3
Medicine available	20	15.2	17.9
Staff are qualified	13.5	12.5	13.1
Was referred	10.4	7.1	8.9
Staff give good advice	7.6	8.8	8.1
Good staff attitude	7.5	7.9	7.7
Less costly	7.1	7.1	7.1
Less waiting time	4.8	6.1	5.4
Insurance pays	3.7	6.2	4.8
Knew someone in the facility	2.1	2.1	2.1
Cleaner facility	1.1	1.5	1.3
Exemptions	0.6	1.5	1.0
More privacy	0.5	0.6	0.5
Other	3.9	3.7	3.8

Reason for bypassing nearest inpatient Health Service Providers

Table 3.19 presents the reasons that individuals report for bypassing the nearest inpatient health care providers. The main reasons mentioned were referrals (20.2%), unavailability of medicine (16.8%) and unqualified staff (10.7%). In both urban and rural areas, the dominant reason was referral at 17.6 percent and 21.9 percent respectively.

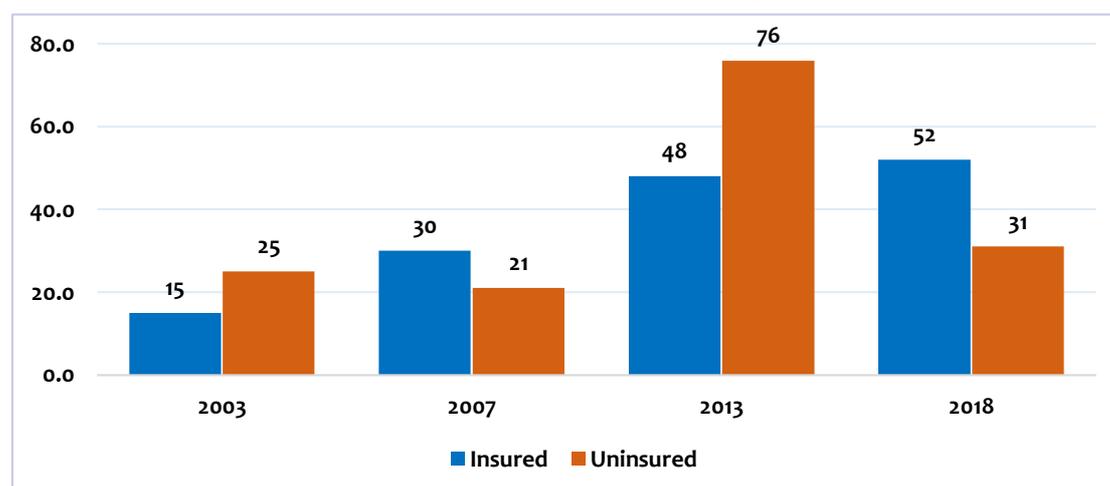
Table 3.19: Percent distribution of reasons for bypassing the nearest healthcare provider by residence, Kenya 2018

Reason for bypassing	Residence		National (%)
	Rural (%)	Urban (%)	
Was referred	21.9	17.6	20.2
Medicine unavailable	19.6	12.8	16.8
Staff are unqualified	11.6	9.4	10.7
Long waiting time	8.5	7	7.9
Beds not available	8.4	5.8	7.3
Services are expensive	4.3	11.3	7.1
Insurance pre-authorization	3.1	7.2	4.8
Unfriendly staff	2.4	6.3	4.0
Staff absent/ on strike	4.1	3.6	3.9
Had to pay	3.1	4.8	3.8
Dirty facility	0.8	2.9	1.7
No privacy	0.6	0.8	0.7
Other	11.7	10.4	11.2

Admission rate by insurance cover

Figure 3.26 shows that the annual hospital admission rates among the insured were significantly higher than that of the uninsured population in 2018. The figure further indicates that there was a sharp decrease of admission rate from 76 percent in 2013 to 31 percent in 2018 for those uninsured.

Figure 3.26 Trends in admission rates by insurance coverage, Kenya 2018



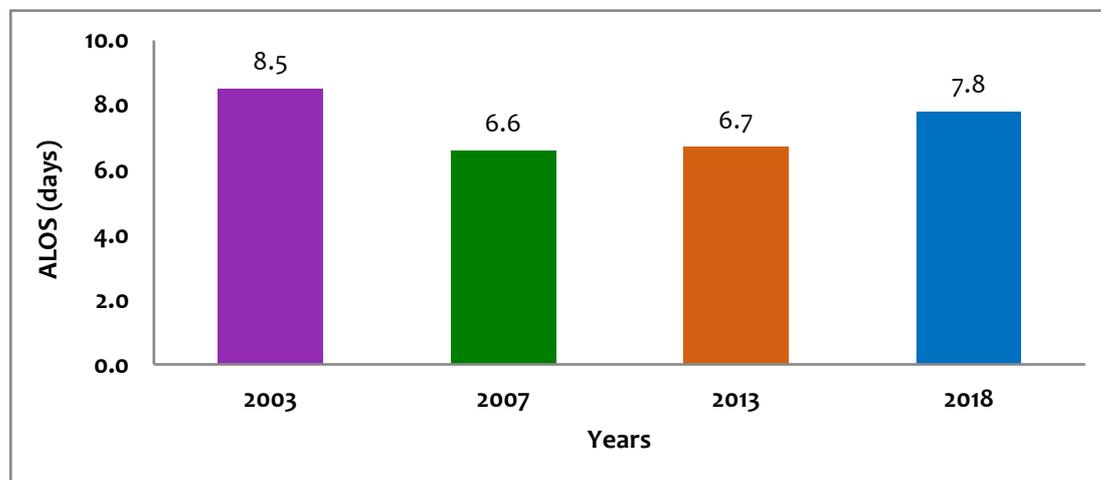
Average length of stay (ALOS)

The Average Length of Stay (ALOS) refers to the average number of days that patients spend in hospital and is often used as an indicator of efficiency at service provision level. It is generally measured by dividing the total number of days stayed by all inpatients during a year by the

number of discharges and deaths. A longer ALOS, assuming all other factors constant, will increase the average cost of each discharge.

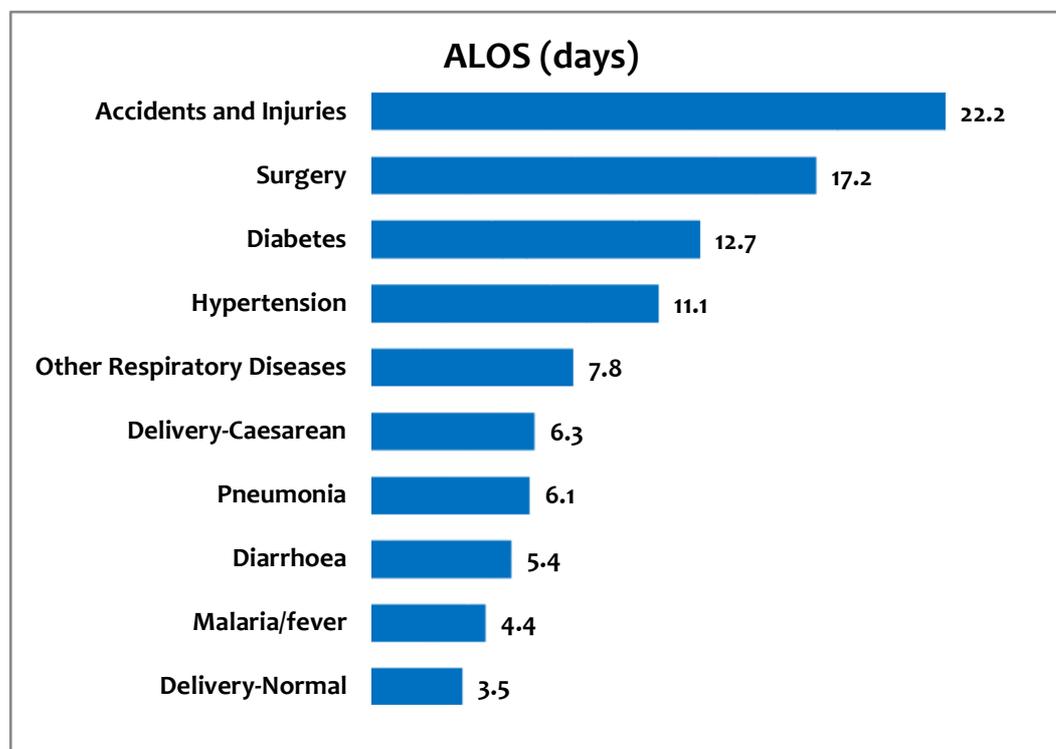
Although there was a decline in ALOS from 8.5 days in 2003 to 6.7 days in 2013, an increase is observed in 2018 (7.8 days).

Figure 3.27 Trend in average length of inpatient stay (days), Kenya 2018



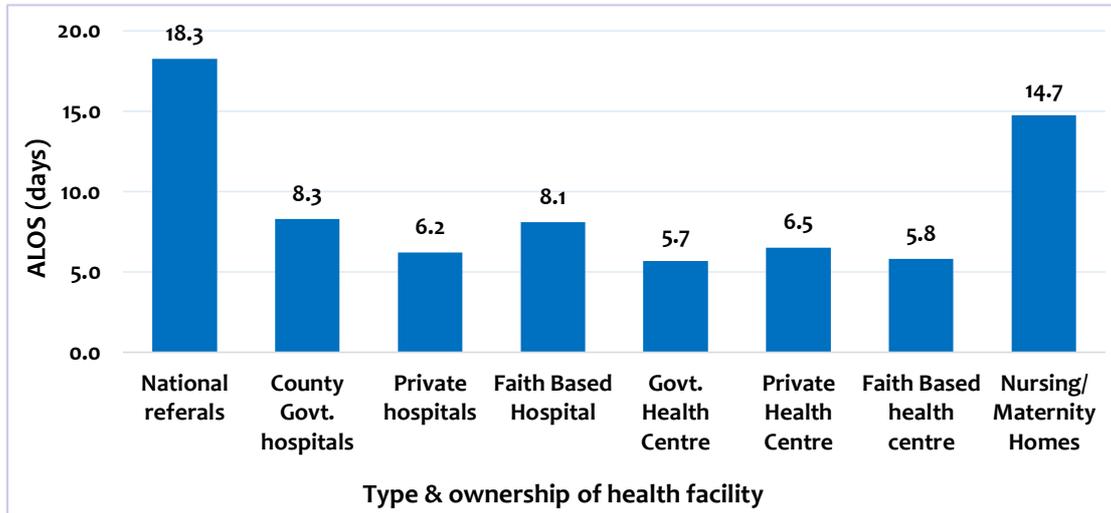
The ALOS for the top ten causes of admissions under this survey ranged from 22.2 days for accidents and injuries and 3.5 days for Normal delivery with no complications as represented in figure 3.28. The leading conditions that account for over 50% of long ALOS were Accidents and Injuries (22.2%), Surgeries (17.2%), Diabetes (12.7%), and Hypertension (11.1%).

Figure 3.28: Average length of stay by illness/condition, Kenya 2018



ALOS for National referral hospitals including Kenyatta National Hospital (KNH), Moi Teaching and Referral Hospital (MTRH), Mathari Hospital and National Spinal Injury Hospital were the highest ALOS of 18.3 days as per the survey. This was followed by nursing and maternity homes at 14.1 days, county government hospitals at 8.3 days and Faith Based Hospitals at 8.1 days

Figure 3.29: Average length of stay by type and ownership of facility, Kenya 2018



4. HOUSEHOLD HEALTH EXPENDITURE ANALYSIS

Household health expenditures are the expenditures incurred by households on health care and includes out of pocket expenditures and prepayments. Out-of-pocket expenditure (OOP) is defined as the direct costs families and individuals make when seeking to improve their health. These costs are only incurred when the families and individuals are at the point of health consumption and does not include prepayments for health care use e.g. health insurance premiums.

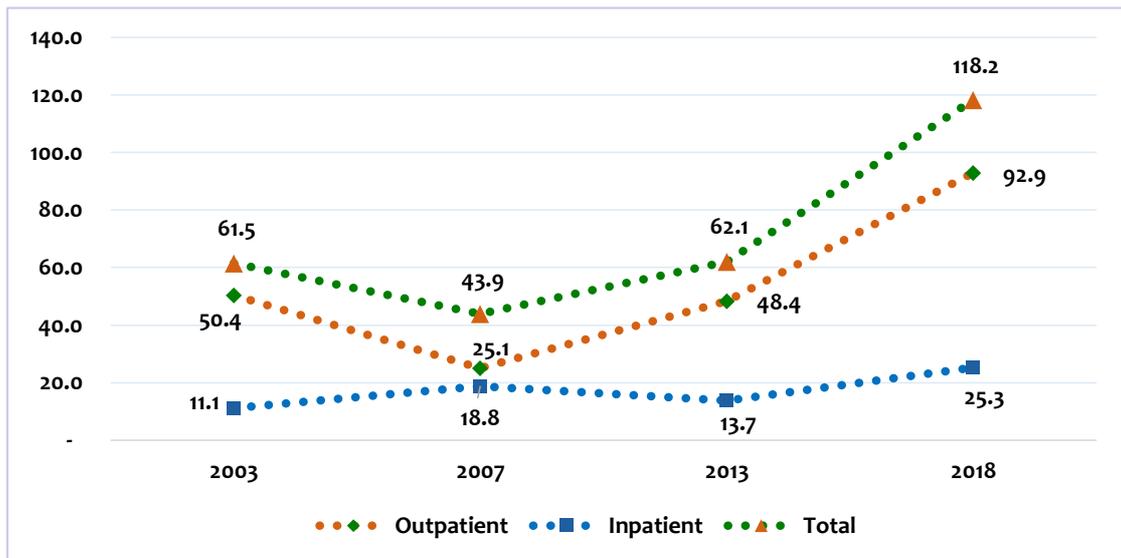
According to the World Health Organization, unregulated direct out-of-pocket often constitutes a major access barrier to needed health care and high OOP payments can reduce financial protection to vulnerable populations in case of ill-health episode.

Total OOP expenditures are reviewed in this chapter and consist of expenditures on outpatient including routine health expenses, and inpatient. To generate the outpatient expenditure, households were requested to report illness visits made to a health provider in the four weeks preceding the survey and the amount of money paid for each visit. A sum of payments was then calculated and annualized to obtain household expenditure on outpatient services. The same methodology was adopted to generate annual expenditures for routine expenses.

In the case of households' inpatient expenditure, information on all admissions in the last 12 months was collected, including the corresponding expenditures for each admission. A sum of expenditures for all admissions was estimated to give the total household expenditure for inpatient services.

The total out-of-pocket expenditure in the year 2018 was estimated to be KSh 118.2 Billion, representing a 90% growth from the estimated 2013 OOP of KSh 62.1 Billion. The 2018 OOP constituted of KSh 92.9 Billion outpatient expenditures - including routine health expenditure; and KSh 25.3 Billion inpatient expenditure.

Figure 4.1: trend in out-of-pocket expenditures, Kenya 2018

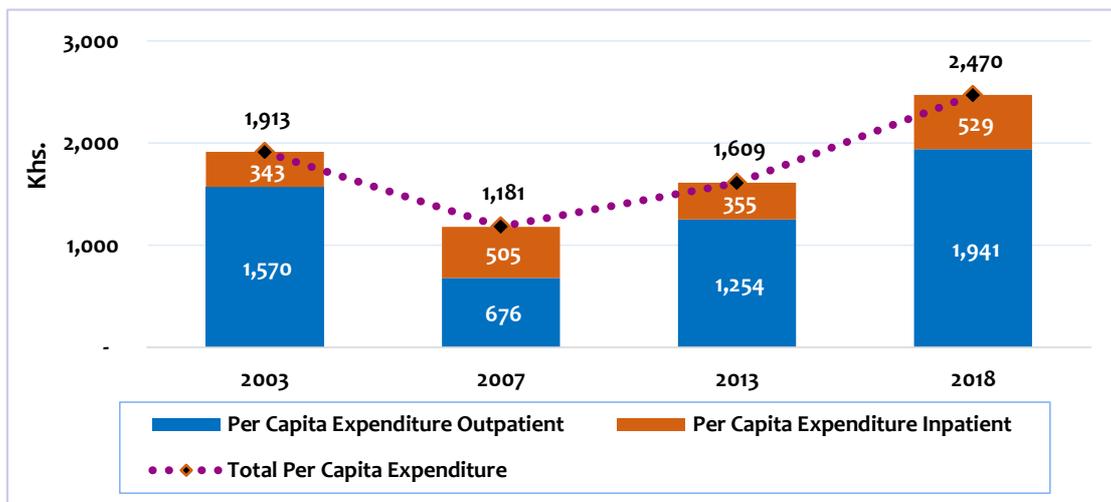


4.1. Per Capita out-of-pocket Expenditure

Per Capita expenditure has shown a gradual increment between the period 2007 and 2013, a reversal from the significant decrease observed between 2003 and 2007 period.

The average annual per capita expenditure for the year 2018 was estimated to be KSh 2,470; comprising of KSh 1,941 and KSh 529 for outpatient and inpatient per capita expenditures. This represented an increase of 53% from the 2013 survey's estimated per capita expenditure of KSh 1,609. The reason for the lower inpatient per capita expenditure as compared to outpatient is the very low incidence of admission compared to the outpatient visits

Figure 4.2: Per capita out-of-pocket health expenditure, Kenya 2018



Inter-County per capita expenditures

The Counties with the highest per capita expenditure recorded were Kiambu and Nyeri with over KSh 4,000, while counties with the lowest per capita expenditures were recorded as West Pokot, Bomet, Turkana and Bungoma with less than KSh 1,400.

Figure 4.3: Per capita out-of-pocket health expenditure by County, Kenya 2018

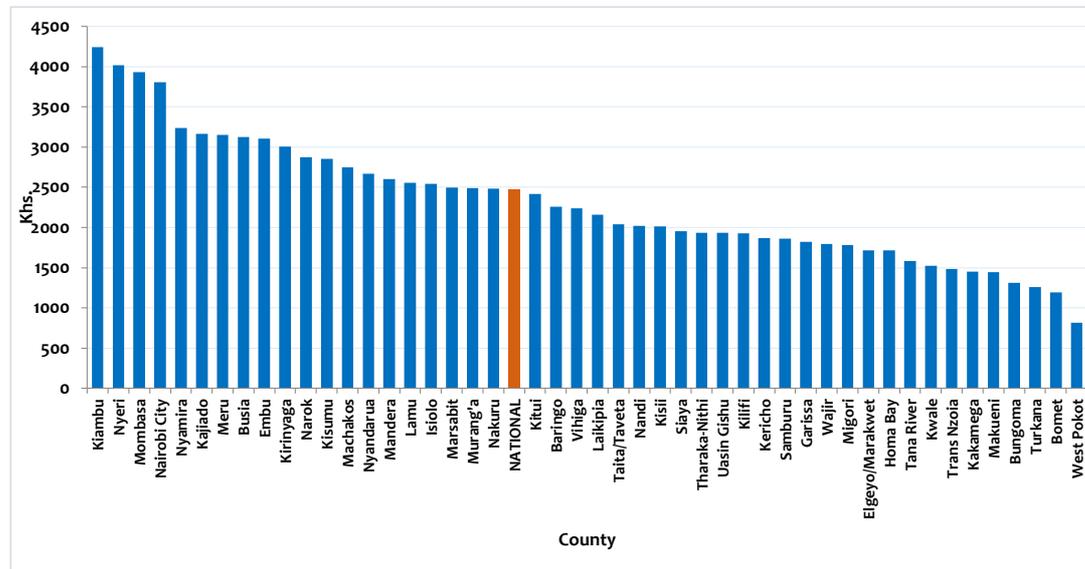
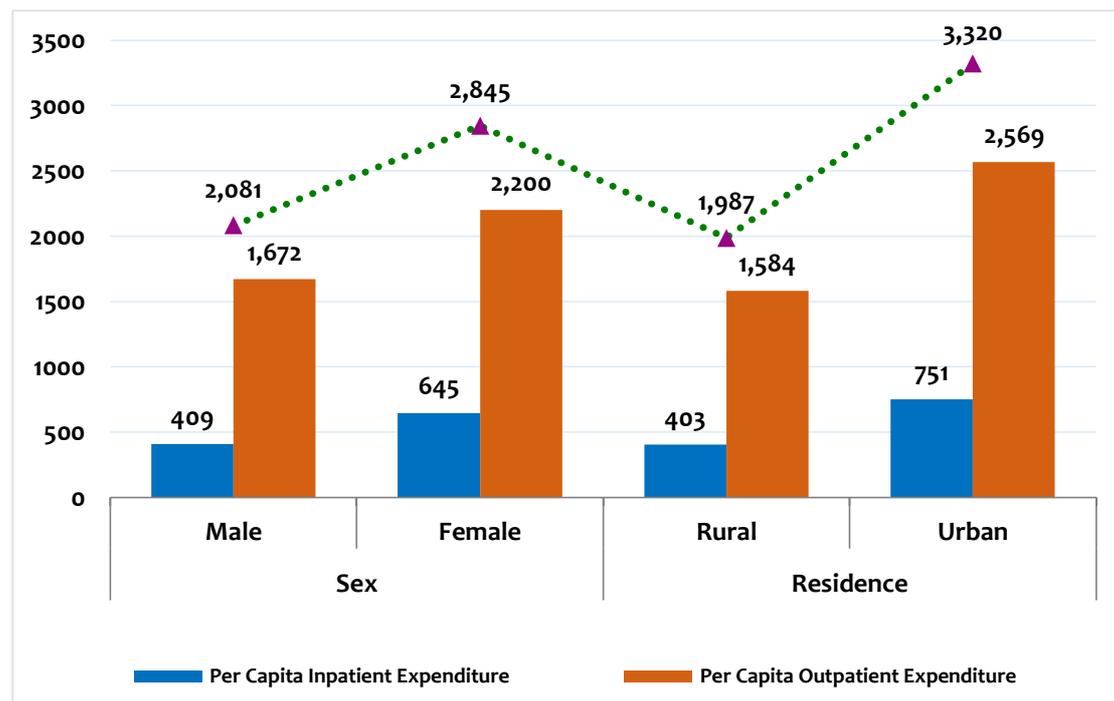


Figure 4.4 shows the annual per capita spending on outpatient care. There is a significant variation among counties with Kiambu, Mombasa and Nyeri with over KSh 3,000 per capita OOP expenditure compared to the National with KSh 1,941. On the other hand, Homabay, Bungoma, Bomet and West Pokot recorded less than KSh 1,000 per capita OOP expenditure.

Expenditure by sex and residence

Females were observed to spend more on health care than males across both inpatient and outpatient, with the overall expenditure by females being 37% more than males.

Figure 4.4: Per capita out-of-pocket health expenditure by sex and residence, Kenya 2018

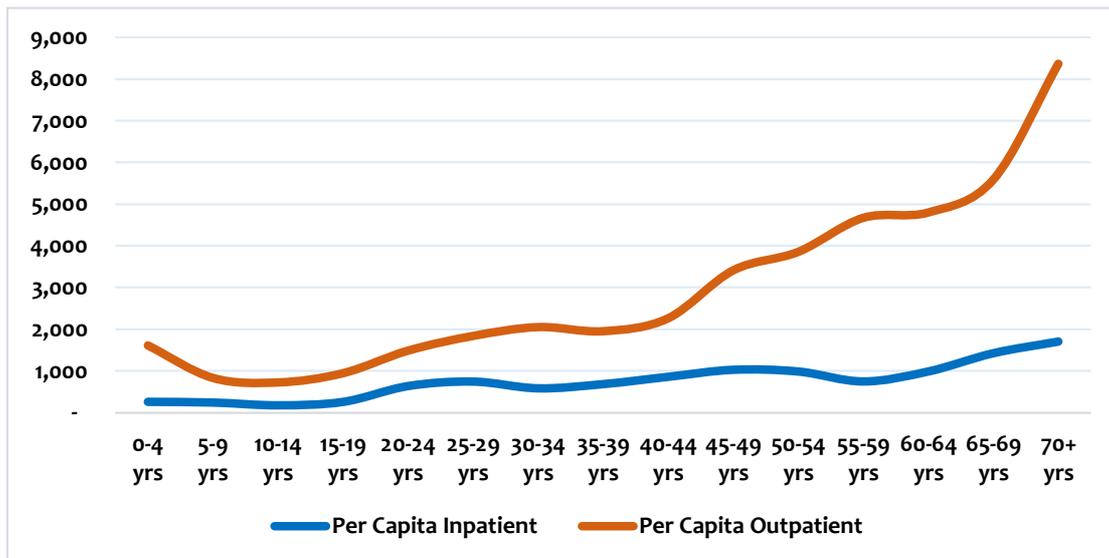


The urban population was observed to spend more on health care than rural population, with the total per capita urban expenditure reported as KSh 3,320 compared to KSh 1,987 per capita expenditure in the rural population.

Per Capita Expenditure by Age

Per capita Out-of-pocket expenditures were observed to increase correlatively with the age of the population, peaking at KSh 8,361 and KSh 1,704 for outpatient and inpatient respectively at the population over 70 years. This indicates that the burden of expenditures related to health care costs increases with age. A point-by-point analysis shows that the highest increase was from the cohort 40yrs-44yrs and cohort 65yrs-69yrs for both inpatient and outpatient health expenditures. The lowest cohort 0-4yrs was also observed to have a relatively high outpatient expenditure compared to immediate subsequent age groups.

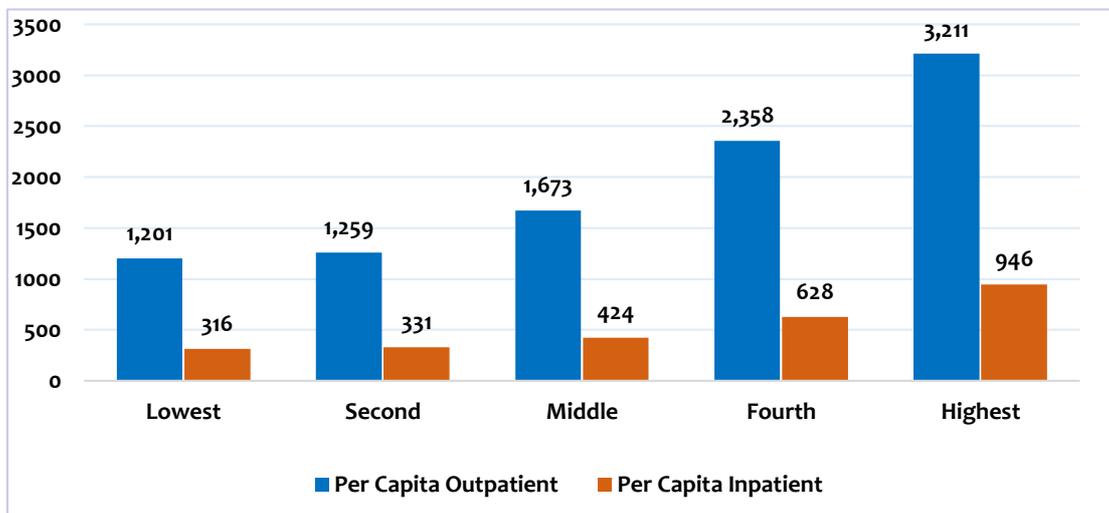
Figure 4.5: Per capita out-of-pocket health expenditure by age, Kenya 2018



Per capita expenditures by Wealth Quintiles

The 2018 KHHEUS showed that per capita expenditure increased relative to the wealth of the population, with the highest wealth quintile spending more (KSh 3,211 for outpatient and KSh 946 for Inpatient) than preceding wealth quintiles for both inpatient and outpatient health expenditures.

Figure 4.6: Per capita out-of-pocket health expenditure by wealth quintile, Kenya 2018



Per capita expenditures by levels of Education and Employment Status

As shown in table 4.1; Per capita Out-of-pocket health expenditure was observed to increase with the education level, with the population with pre-primary education spending the least (KSh 176 and KSh 1,252 inpatient and outpatient respectively), while the population with university level education spending the most (KSh 1,581 and KSh 4,639 inpatient and outpatient respectively).

Persons in the formal sector employment spent more than any other category, with inpatient and outpatient per capita health expenditure recorded as KSh 1,398 and KSh 3,724 respectively.

Table 4.1: Per capita out-of-pocket health expenditure by education and employment status, Kenya 2018

Background Characteristics		Per Capita Expenditure	
		Inpatient	Outpatient
Education level			
	Pre-primary	176	1,252
	Primary	408	1,520
	Secondary	636	2,034
	College (middle level)	1,199	3,015
	University	1,581	4,637
	Vocational	1,630	2,152
	Informal (e.g. Madrassa)	389	3,174
	Never went to School	488	2,780
	Don't Know/No Response	2,601	2,090
	Under 3 yrs	321	1,935
Employment status			
	Working (formal)	1,398	3,724
	Working (informal)	706	2,713
	Seeking work	600	1,294
	Homemakers	971	3,293
	Students/aged/disabled/child under 5	248	2,014

4.2. Coping Mechanism

Coping mechanism are the strategies that households without insurance or readily available cash employ to pay for healthcare costs. The main coping strategy mentioned was money given by family and friends (Outpatient 85.2%, Inpatient 76.8%). This strategy is mostly used by the rural residents as compared to those residing in urban for both outpatient and inpatient services, with incidences increasing with increase in wealth for outpatient services (Table 4.2). The other two key strategies mentioned were borrowing money and harambee contribution.

Table 4.2: Percent distribution of payment coping strategies by residence and wealth quintile, Kenya 2018

Background Characteristic	Source of Payment			
	Was given money	Borrowed money	Harambee contributions	Well wisher
Outpatient				
Residence				
Rural	56.1	56.1	54.7	61.2
Urban	43.9	43.9	45.3	38.8
Wealth quintile				
Lowest	14.7	20.6	18.1	20.6
Second	17.0	23.7	21.3	18.4
Middle	19.9	20.0	18.5	17.5
Fourth	21.1	20.4	22.6	17.9
Highest	27.3	15.3	19.5	25.5
Overall	85.2	10.3	2.4	2.2
Total	1071811	129516	29782	27102
Inpatient				
Residence				
Rural	62.8	61.0	52.9	51.1
Urban	37.2	39.0	47.1	48.9
Wealth quintile				
Lowest	23.3	29.1	21.1	41.7
Second	16.8	20.6	18.1	10.6
Middle	17.9	24.3	13.7	23.2
Fourth	22.4	11.8	39.2	13.7
Highest	19.6	14.2	7.9	10.8
Overall	76.8	14.0	5.9	3.3
Total	290648	53159	22165	12563

4.3. Catastrophic Health Expenditure

The goal of a functional health financing system is to protect the population against financial risks associated with a disease episode. Such risks are associated with pushing the households to poverty in case of ill-health.

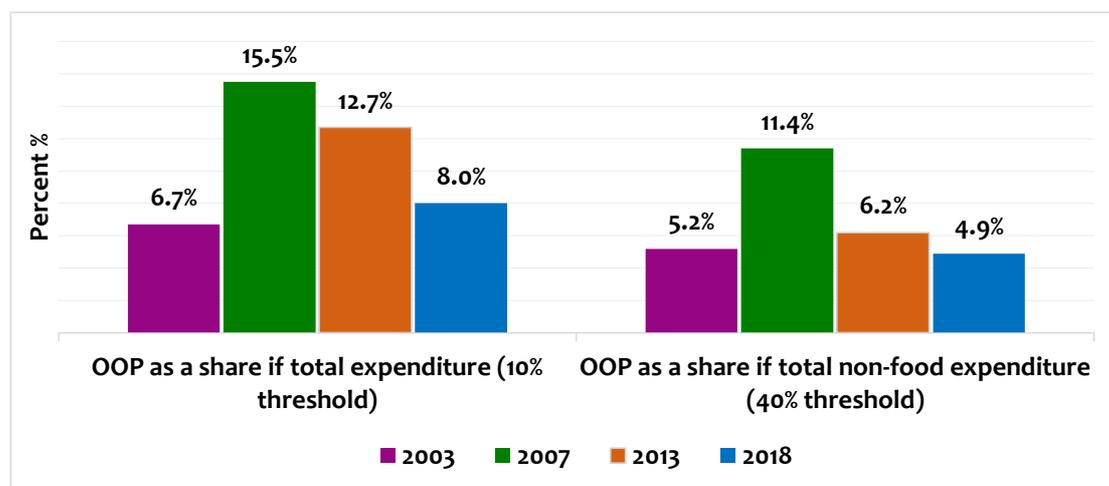
One method of assessing the risk of impoverishment in the population is through catastrophic health expenditure analysis. The World Health Organization defines catastrophic health expenditure as “*out-of-pocket spending for health care that exceeds a certain proportion of a household's income with the consequence that households suffer the burden of disease*”.

Households are said to have incurred catastrophic health expenditure if their total household out-of-pocket spending on health exceeds a certain percentage of their total expenditures. The most commonly used thresholds in Kenya are OOP spending on health exceeding 10% of a households' total expenditure or 40% of their non-food expenditures.

The incidence of catastrophic health expenditure in the study period was estimated to be 4.9% (using 40% threshold) and 8% (using 10%

threshold). This was a significant improvement from the 2013 figure of 6.21% and 12.7% respectively.

Figure 4.7: Trends in incidence of catastrophic health spending, Kenya 2018



4.4. Health Insurance Coverage

This section presents the survey findings on insurance coverage, expenditures on insurance and the socio-economic and demographic characteristics of the insured and uninsured populations.

The other form of payment from households as a source of health care financing is in the form of paying for premiums and to be enrolled in health insurance schemes. Health insurance is a healthcare financing mechanism based on the principle of pooling funds and entrusting management of such funds to a third party that pays for healthcare costs of members who contribute to the pool. The third party can be government, employer, insurance company or a provider (Kraushaar, 1994). The main objective of health insurance is protecting households against impoverishment from out-of-pocket expenditures.

Penetration of health insurance

In Kenya, there are various types of health insurance, including public, private, and community-based insurance schemes. NHIF is the government mandatory insurance scheme, which is compulsory for the formal employment sector and voluntary for the informal sector.

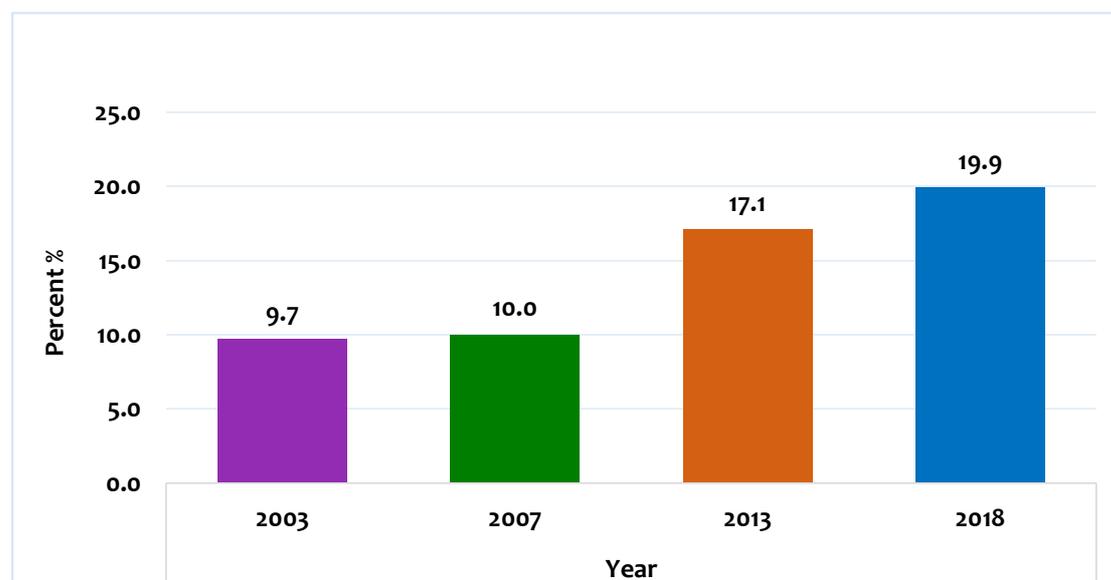
It is important to note that several survey respondents reported having more than one health insurance cover. According to the survey, NHIF covers 89 percent of those Insured, private Insurance 5.1 percent, employer/Institution 3.9 percent, community-based health insurance 0.7 percent county schemes 0.7 percent and other forms of insurance 0.1 percent.

Table 4.3: insurance coverage, Kenya 2018

Insurance Type	Population Covered (%)
NHIF	89.4
Private	5.1
Employer/ Institution	3.9
Community-based health insurance	0.7
County scheme	0.7
Other	0.1

Health insurance coverage trend shows that there has been a significant growth from what was reported in 2003 compared to 2018 as shown in figure 4.8. The 2018 KHHEUS recorded 19.9 percent health insurance coverage, which was a 2.8 percent growth from 17.1 percent recorded in 2013. 19.9 percent national insurance coverage represents 9.5 million Kenyans out of the estimated 47.8 million national population for the year 2018.

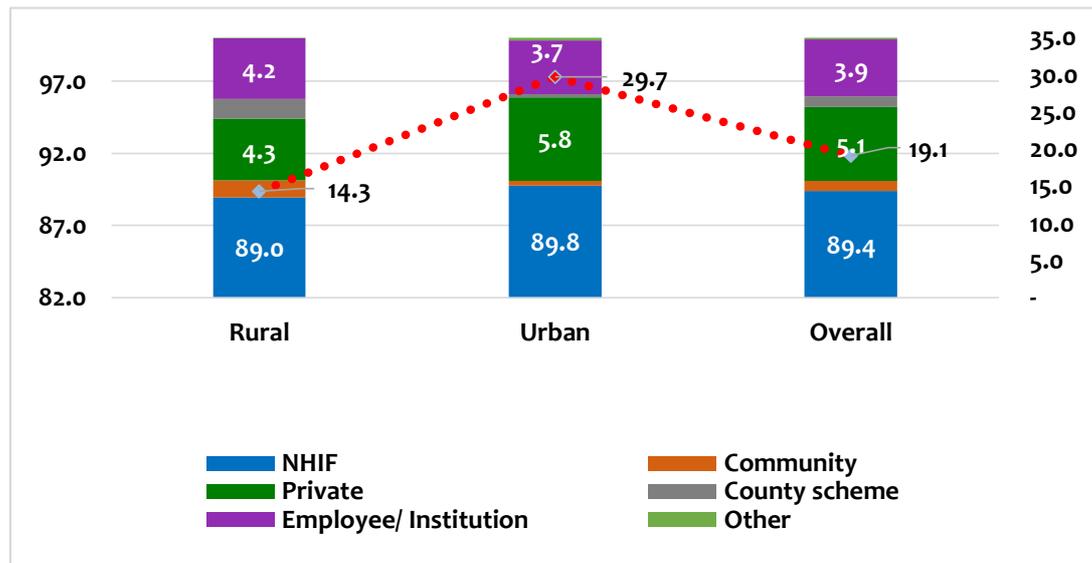
Figure 4.8: Trends in Health Insurance Coverage- 2003,2007,2013,2018, Kenya 2018



Insurance coverage by residence

Figure 4.9 summarizes the health insurance coverage by area of residence. The proportion of urban population with health insurance cover was twice that of the rural areas at 29.7 percent and 14.3 percent respectively. NHIF covers the majority in both rural and urban areas at 89 percent and 90 percent respectively while Private Insurance covers 4.3 percent in rural and 5.8 in urban.

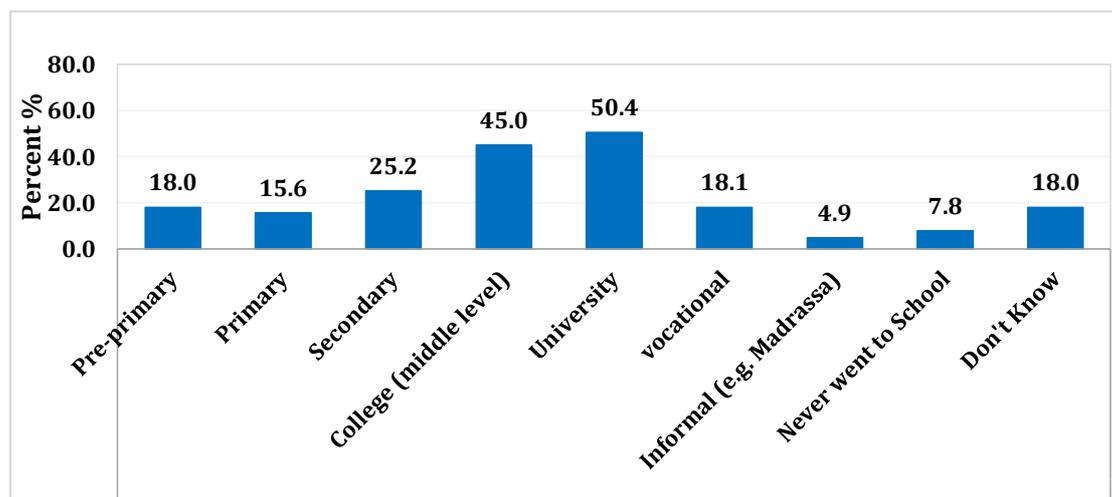
Figure 4.9 Insurance Coverage by Residence, Kenya 2018



Insurance coverage by education level, employment and Health Status

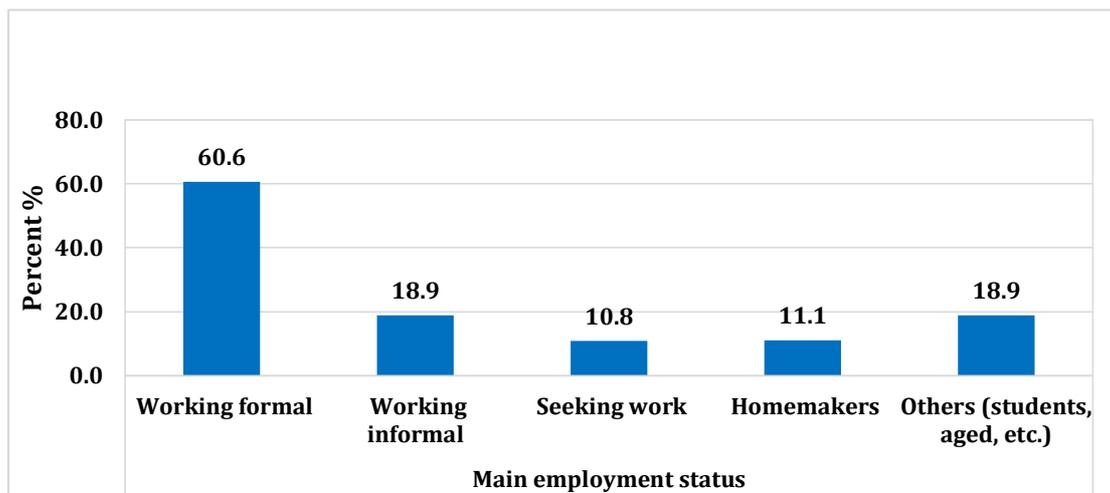
The survey showed that the highest proportion of individuals with some form of health insurance cover either had a university education (50.4%) or college/middle level education (45%). The high insurance coverage among this group could be attributed to their knowledge on the importance of insurance. Those with informal level of education and those with no education recorded the lowest insurance coverage of 4.9 and 7.8 percent respectively (figure 4.10).

Figure 4.10: Insurance coverage by education, Kenya 2018



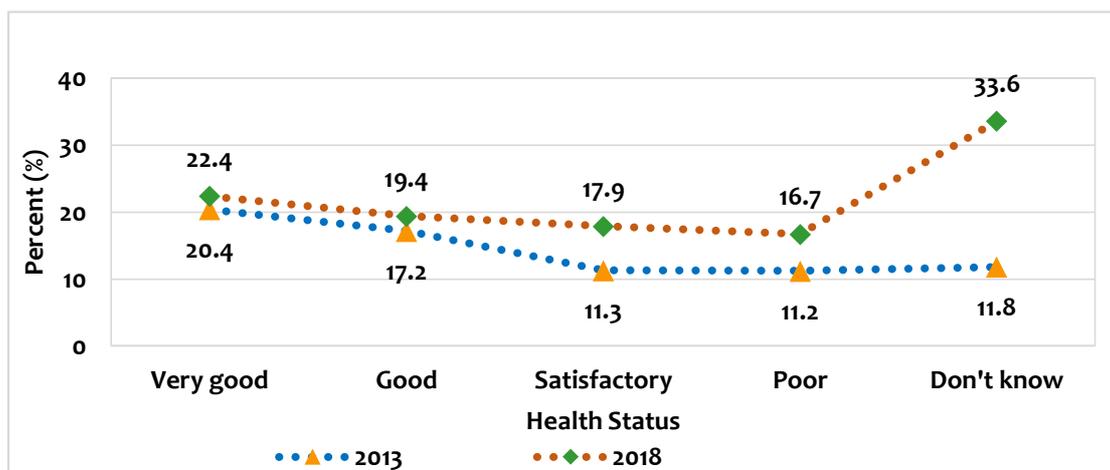
The data indicates that insurance coverage also varied by employment status of individuals. The highest proportion of individuals with some form of health insurance cover was found in the working formal category (60.6%) followed by working informal at 19 percent, as shown in Figure 4.11.

Figure 4.11: Insurance coverage by employment status, Kenya 2018



Insurance coverage was highest amongst respondents who reported their health status as “very good” and “good” at (22.4%) and (19.4%) compared to 2013 (20.4%) and (17.2%). Some individuals could not rate their health status in comparison to that of their peers. Out of these, 34 percent had a health insurance cover.

Figure 4.12: Trends insurance coverage by Self Assessed health status, Kenya 2018

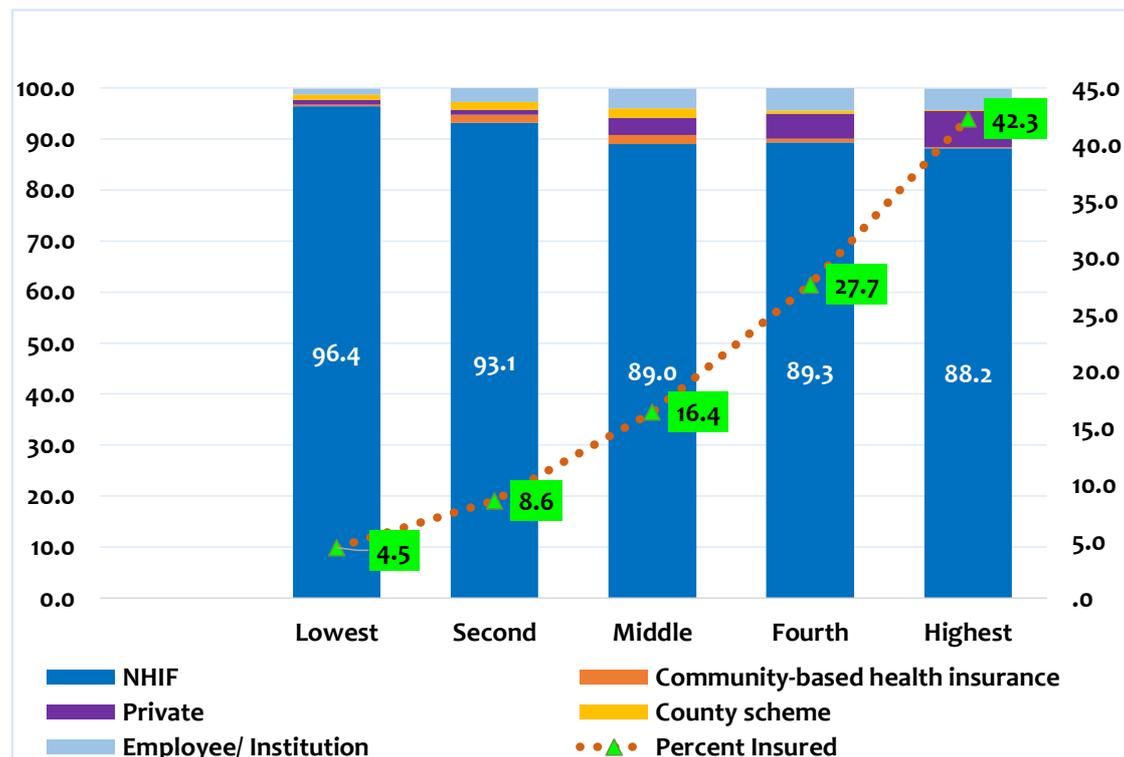


Coverage by Wealth Index

Figure 4.13 highlights the insurance coverage in the country among different income groups and also highlights the depth of coverage by NHIF, private, Employee/Institution, County schemes and community-based insurance. Overall, the middle, fourth and highest quintiles have the highest coverage (16.4%, 27.7% and 42.3% respectively). Coverage for the lowest and second quintiles remained low at 4.5% and 8.6% showing the urgent need for government to achieve UHC.

NHIF covers the majority in all the wealth quintiles, with 96 percent of those in the poorest quintile and 88 percent of those in the highest quintile.

Figure 4.13 Depth of Health Insurance Coverage, Kenya 2018

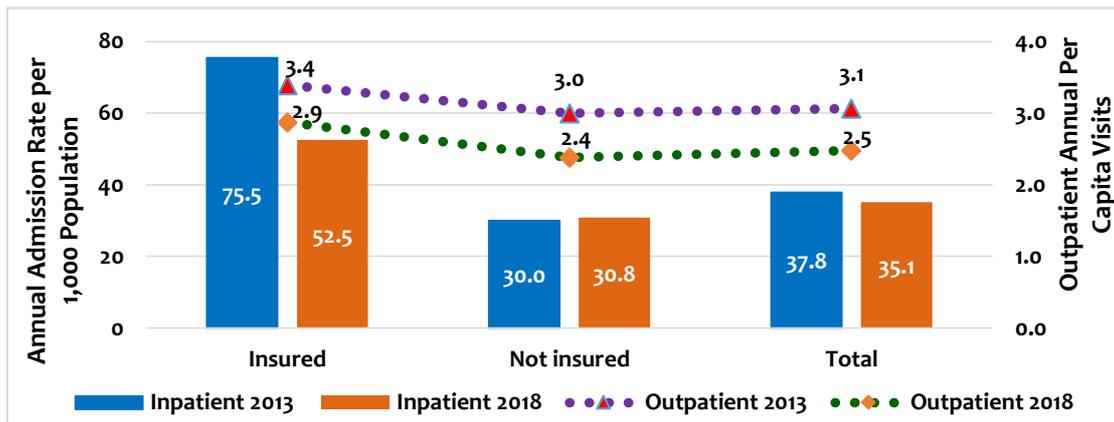


Services utilization by insured cover

The 2018 KHHEUS results showed that there was a decline in outpatient annual per capita visits from 3.1 visits in 2013 to 2.5 visits in 2018. This could be partly attributed to increased uptake of self-medication and prolonged civil strife witnessed in the health sector prior to the survey. The reduced visits were observed for both the insured and uninsured persons.

The annual admission rate per 1,000 insured population declined by over 20 percent from 76 percent in 2013 to 53 percent in 2018 while that of the uninsured population increased marginally. The overall annual admission rate declined slightly to 35 percent in 2018 from 38 percent in 2017. This is as shown in figure 4.14.

Figure 4.14: Services utilization - Insured vs Uninsured, Kenya 2018



Inter-County health insurance coverage

Table 4.4 shows insurance coverage by county. According to the survey, sixteen counties had high insurance coverage compared to the coverage in the whole country of 19.9%. Nyeri had the highest coverage of 42 percent followed closely by Nairobi county 40 percent, Kirinyaga 35 percent and Kiambu with 34 percent.

The counties with the lowest coverage include Lamu (7.0%), Kwale (6.9%), Garrisa (6.6%), West Pokot (4.3%), Wajir (4.0%), Turkana (3.9%), Mandera (2.9%) and Tana River (1.8%).

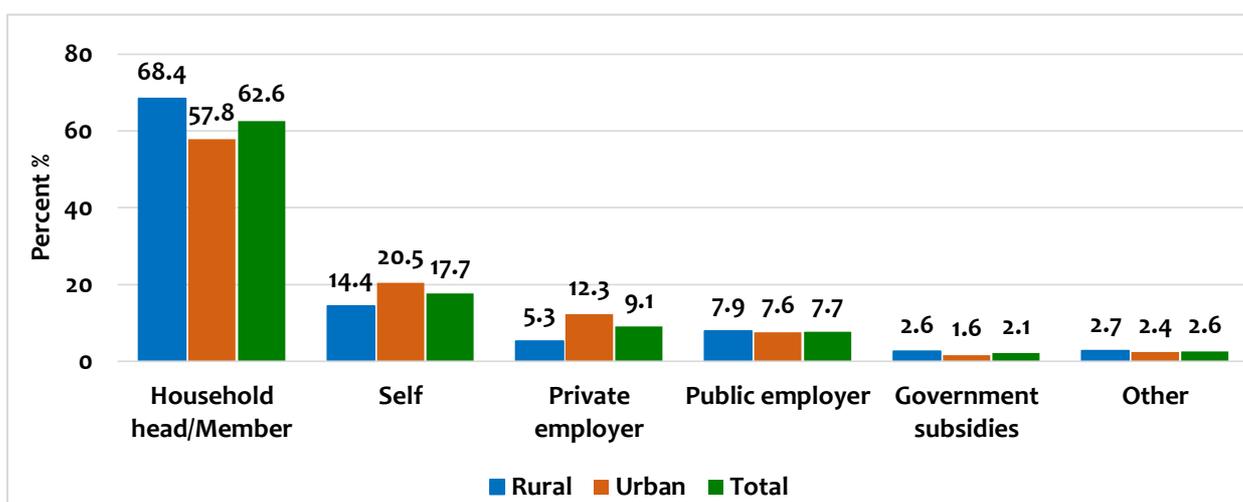
Table 4.4: Individuals with Insurance cover, Kenya 2018

County	Individuals insured	NHIF	Community Based	Private	County	Employer	Other	N
National	19.9	94	0.8	4.8	0.7	4.1	0.9	9,514,412
County								
Mombasa	21	93.1	0.3	12.8	0	3.7	0.5	265,921
Kwale	6.9	92.6	0.6	5.9	0	3.9	0.1	60,050
Kilifi	12.6	93.3	0	7.3	0.3	5.6	1.1	188,859
Tana River	1.8	91.1	0	3.7	0	6.9	9.4	5,896
Lamu	7	96.3	0	6.5	0	4.7	0	9,586
Taita/Taveta	16.4	100	0	4	0.2	1.7	0.5	62,550
Garissa	6.6	84.8	0	8.7	0	9.1	1.1	29,784
Wajir	4	99.3	0	0.7	0	0	0	19,216
Mandera	2.9	96.3	0	1	0	0.5	0	21,323
Marsabit	11	87.8	0	7.7	0.5	3.8	2.6	35,356
Isiolo	11.1	99.7	0	1.9	0	1.5	0.3	17,681
Meru	13.6	93.2	0.7	2.4	2.3	13.7	1.8	204,083
Tharaka-Nithi	16.2	97.1	0.9	1.8	0	4.2	0.5	65,312
Embu	33.3	95.3	2	1	0.3	3	2.5	190,514
Kitui	7.6	99.2	0.3	1.3	0	4.2	0.2	84,919
Machakos	18.9	94	0	1.8	0.2	4.9	2.4	230,226
Makueni	16.5	56.6	13.3	3.2	33.6	0.7	0.5	161,989
Nyandarua	30	98.8	0.7	1.4	0	0.3	0.2	214,477
Nyeri	41.8	89.6	1.2	7.3	0	6	1.5	347,336
Kirinyaga	35	91.8	2.3	4.8	0.1	7.8	0.4	221,438
Murang'a	19.6	84.7	4.3	5.7	0.3	6.4	3.2	221,604
Kiambu	34	93.3	0.2	7.1	0	2.9	0.2	659,953
Turkana	3.9	68.8	0.4	2.8	0.2	31.8	0	44,872
West Pokot	4.3	97.3	0	3.1	0	0.6	2	29,781
Samburu	13.9	92.2	0.2	2.6	1.2	1.8	9.5	42,220
Trans Nzoia	12.5	92.2	1	4.6	0	8.1	0.6	139,340
Uasin Gishu	25.5	91	0.4	6.7	0.2	7.4	0.1	308,965
Elgeyo-Marakwet	16.9	97.6	0.4	0.6	0.2	1	0.2	84,863
Nandi	20.9	89.8	0.1	1.1	0.3	12.6	0.2	213,408
Baringo	20.8	98.5	0	1.3	0	0.8	0.1	157,064
Laikipia	30.2	98.6	0.5	5	0	1.9	0	163,462
Nakuru	25.5	96.3	0.4	4.2	0	2.1	1.3	555,985
Narok	16.2	98.4	0.4	0.2	0	0.8	0.6	187,077
Kajiado	24.5	94.4	0.3	6.6	0	5.1	1.3	228,881
Kericho	28	96	0.4	1.8	0	4.4	0.3	278,494
Bomet	20.6	96.5	0.2	0.5	0	4.3	1.2	198,406
Kakamega	13.7	98.3	0	7.4	0	1.3	0.3	265,062
Vihiga	13.9	91.7	0	8.1	0	2.8	3.2	90,472
Bungoma	10.3	96	1.3	2.9	0.6	8.3	0.1	165,692
Busia	13.4	95.2	1.2	5.4	1	2	0	116,262
Siaya	11.2	96	0	10	0	1.1	0.8	115,364
Kisumu	18.1	97.4	0	5.4	0.2	0.2	5.7	213,481
Migori	10.4	96.9	0.9	2.2	0.4	1.4	0	115,884
Homa Bay	12	97	0	3.9	0.5	1.7	0.8	141,050
Kisii	17.4	95.1	1.4	1.3	0.4	4.1	0	243,982
Nyamira	16.8	91.7	0.5	1.9	0	11.2	0.4	122,403
Nairobi	39.9	96	0.2	5.7	0.1	3	0.5	1,973,866

Health insurance premium contributions

Overall, most of the insurance premium contributions for all types of insurance were made by the household head/member, as shown in Figure 4.15. Rural residents had a higher proportion (68.4%) of their premiums paid by the household head compared to urban residents (57.8%). Overall, about 2 percent had health insurance premiums contributions made through government subsidies. A slightly higher proportion of urban residents made self-contribution (20.5%) compared to rural residents (14.4%). There was no marked difference in the proportion of insurance premiums made by public employer between rural and urban residents.

Figure 4.15: Insurance premium payment by Residence, Kenya 2018



Method of premium payment

Table 4.5 illustrates the proportion of eligible members with health insurance cover by wealth quintile. An eligible member is person who has enrolled as a subscriber or an eligible dependent of a subscriber and for whom the health organization has accepted the responsibility for the provision of health services as may be contracted for while an eligible dependent is usually a spouse or a child of an insured person who is eligible for insurance coverage. Overall, over 71 percent of members were dependents. The level of dependence decreased with the increase in the wealth quintile. About one percent had their premium paid through pension.

Table 4.5: Method of Premium Payment, Kenya 2018

Wealth Quintiles	Method of Payment				No Response
	Pension	Dependent	Cash	Other	
Lowest	0.7	77.3	19.1	2.2	0.7
Second	0.7	78.3	19.6	1.1	0.3
Middle	0.9	75.5	21.8	1.7	0.3
Fourth	1.4	71.7	24.9	1.8	0.3
Highest	0.9	68.4	29.1	1.5	0.1
National	1	71.7	25.5	1.6	0.3

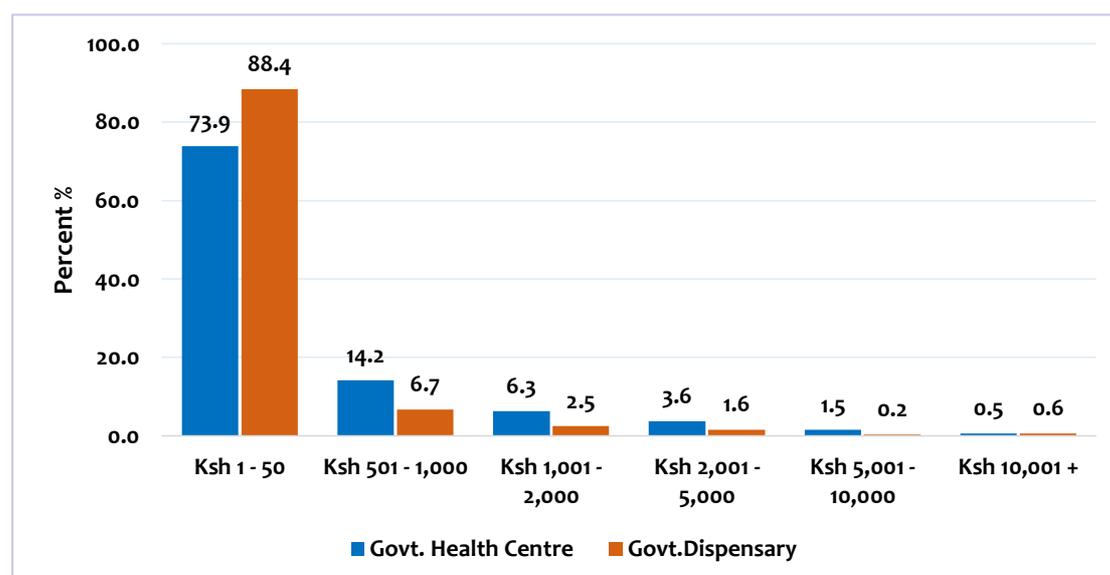
4.5. Strategic Health Interventions

This section explores how strategic government interventions have affected spending in the population when seeking health services. The main policies analyzed in this section are elimination of user fees in public primary health facilities and waiver of maternity service charges in public health facilities.

Expenditure on public health services

From the data collected by the 2018 KHHEUS, majority of the population that utilized primary health services from public health facilities spent less than KSh 100 per visit. However, the data indicated that 11.9 percent and 4.9 percent spent more than KSh 1,000 per visit in accessing primary health services from government health centers and dispensaries respectively.

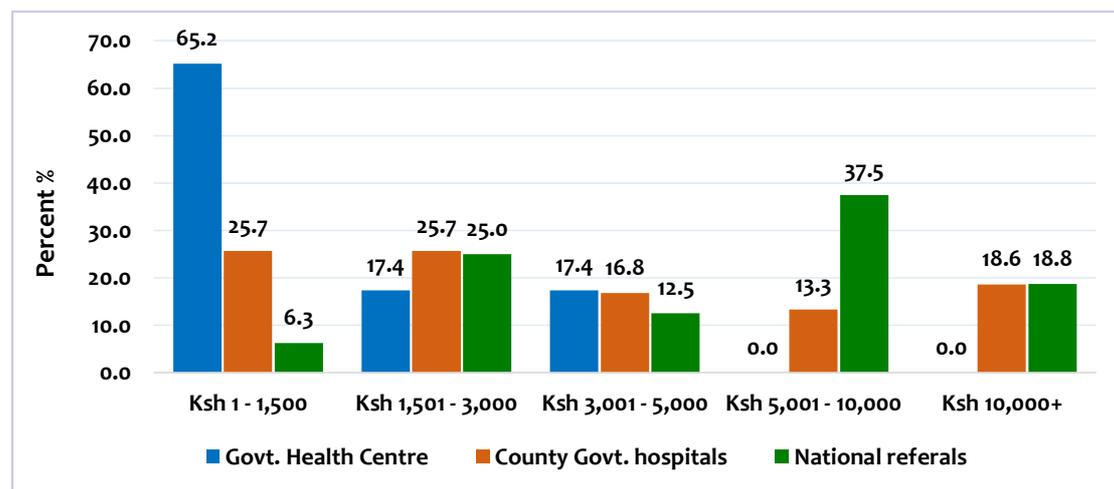
Figure 4.16: Mean expenditure per outpatient PHC services by health facility, Kenya 2018



Maternity Health Services

The proportion of respondents who utilized less than KSh 1,500 for maternity health services in public health facilities increased with the level of care. Most of the survey respondents' expenditure in government health centers spent less KSh 1,500, (65 percent) while most in national referral health facilities spent between KSh 5,000 and KSh 10,000 (38 percent).

Figure 4.17: Proportion of the amount paid for maternity services by facility type, Kenya 2018



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Annexes

Appendix 1 - Sample Design

A.1 Introduction

The 2018 Kenya Households Health Expenditure and Utilization Survey (KHHEUS) was a representative probability sample that utilized a two-stage stratified cluster sampling methodology. It was designed to provide valid estimates at national level, rural and urban areas separately and for each of the 47 counties.

A.2 Sample Size and Allocation

The sample size for the survey had been estimated as 37,500 households. Power allocation method was used to distribute these households first to the counties and then to the rural and urban strata of each county based on the 2009 enumerated census figures. The households were drawn from 1,500 clusters which comprised 923 and 577 rural and urban clusters, respectively. The distribution of the sample is shown in Table A1 below.

Table 1.A1: Sample allocation of clusters and households for 2018 KHHEUS, Kenya 2018

County Name	Allocation of Clusters			Allocation of Households		
	Rural	Urban	Total	Rural	Urban	Total
Nairobi	na	38	38	na	950	950
Nyandarua	21	11	32	525	275	800
Nyeri	20	12	32	500	300	800
Kirinyaga	22	10	32	550	250	800
Muranga	22	10	32	550	250	800
Kiambu	14	19	33	350	475	825
Mombasa	na	33	33	na	825	825
Kwale	21	11	32	525	275	800
Kilifi	18	14	32	450	350	800
Tana River	21	9	30	525	225	750
Lamu	20	10	30	500	250	750
Taita Taveta	21	10	31	525	250	775
Marsabit	20	11	31	500	275	775
Isiolo	16	14	30	400	350	750
Meru	25	8	33	625	200	825
Tharaka	20	11	31	500	275	775
Embu	22	10	32	550	250	800
Kitui	22	10	32	550	250	800
Machakos	15	18	33	375	450	825
Makueni	23	9	32	575	225	800
Garissa	20	11	31	500	275	775
Wajir	22	9	31	550	225	775
Mandera	22	10	32	550	250	800
Siaya	24	8	32	600	200	800
Kisumu	15	17	32	375	425	800
Migori	18	14	32	450	350	800
Homa Bay	22	10	32	550	250	800
Kisii	21	11	32	525	275	800
Nyamira	23	9	32	575	225	800
Turkana	22	10	32	550	250	800
West Pokot	23	8	31	575	200	775
Samburu	20	10	30	500	250	750
Trans-Nzoia	21	11	32	525	275	800
Baringo	22	9	31	550	225	775
Uasin Gishu	16	16	32	400	400	800
Elgeyo Marakwet	22	9	31	550	225	775
Nandi	22	10	32	550	250	800
Laikipia	20	11	31	500	275	775
Nakuru	16	17	33	400	425	825
Narok	24	8	32	600	200	800
Kajiado	16	16	32	400	400	800
Kericho	18	14	32	450	350	800
Bomet	23	9	32	575	225	800
Kakamega	23	10	33	575	250	825
Vihiga	19	13	32	475	325	800
Bungoma	23	10	33	575	250	825
Busia	23	9	32	575	225	800
Kenya	923	577	1,500	23,075	14,425	37,500

Note: Nairobi and Mombasa counties have only urban areas.
na = Not applicable

A.3 Sample Frame

Administratively, Kenya is divided into 47 counties. In turn, each county is subdivided into sub-counties. Prior to the enactment of the current constitution in 2010, the counties and sub-counties had not been created. Instead, the country was divided into provinces which were further divided into districts. Each district was divided into divisions, each division into locations and each location into sub-locations. During 2009 Census cartographic mapping these each of these sub-locations was subdivided into census enumeration areas (EAs) i.e. small geographic units with clearly defined boundaries. Ultimately, a total of approximately 96,000 EAs were developed. This information was used in 2010 to design a master sampling frame known as the fifth National Sample Survey and Evaluation Programme (NASSEP V) with a total of 5,360 selected EAs. This is the frame that was used for the 2018 KHHEUS.

The NASSEP V frame was designed in a multi-tiered structure with four sub-samples (C1, C2, C3 and C4), each consisting of 1,340 EAs that can serve as independent sampling frames. The frame used counties as the first level stratification which were further stratified into rural and urban strata apart from Nairobi and Mombasa counties which have urban areas only, resulting into 92 strata. The sampling of EAs into the frame was done independently within each stratum. Each sampled EA was developed into a cluster through listing and mapping process that standardized them into one measure of size having an average of 100 households (between 50 households and 149 households).

The C3 and C4 sub-samples were primarily used in the 2018 KHHEUS. In situations where a stratum did not have sufficient clusters from the two sub-samples, the other sub-samples were included.

A.4 Sampling of PSUs and Households

The survey sample was selected in two stages. Stage one involved selection of clusters, while the second stage involved selection of households. The sampling was done using the Complex Module of the SPSS software.

The selection of 1,500 clusters for the survey was done using the Equal Probability Selection Method (EPSEM). The clusters were selected systematically from NASSEP V frame independently within each stratum. The process involved ordering the clusters by county, then by urban/rural, and finally by geographic location. The resulting sample retained properties of PPS as used in creation of the frame.

Using the total number of listed households from each sampled cluster, a uniform sample of 25 households per cluster was selected using systematic sampling method. Systematic sampling is a probability sample selection method in which the sample is obtained by selecting every k th element of the population where k , the sampling interval, is an integer greater than 1 and is calculated as;

Where N is the total number of listed households in a cluster and n is the number of households to be selected in the cluster. The first number of the sample must be selected randomly from within the first k elements.

The pre-selected households were given to the teams in advance before they commenced data collection. The survey did not provide for substitution of sampled households and there was strictly no replacement of the preselected households.

A.5 Response Rates

Overall, 95 per cent of the sampled households were successfully interviewed. Uasin Gishu County recorded the highest response rate of 99 per cent while Garissa County had the least (85 per cent). Eleven clusters could not be done; one cluster had all the households demolished while 10 clusters could not be accessed due to heavy rains experienced at the time of the survey.

Table 1.A2: Survey response rates by residence and County, Kenya 2018

	Interview Result									Number of Sampled Households	Eligible Households	Household Response Rate (HRR) ¹	
	Completed (C)	No household member or no competent respondent at home (HP)	Entire household absent for extended period of time (HA)	Postponed (P)	Refused (R)	Dwelling vacant or address not a dwelling (DV)	Dwelling destroyed (DD)	Dwelling not found (DNF)	Others (specify) (O)				
Kenya	84.4	0.4	3.6	0.1	0.6	4.3	1.6	3.2	1.8	100.0	37,500	33,286	0.95
Residence													
Rural	86.0	0.4	3.0	0.1	0.4	3.3	1.5	3.2	2.1	100.0	23,075	20,803	0.95
Urban	81.8	0.5	4.5	0.1	1.0	5.9	1.9	3.1	1.4	100.0	14,425	12,483	0.95
County													
Mombasa	75.6	1.1	9.1	0.1	1.2	9.3	1.0	1.3	1.2	100.0	825	655	0.95
Kwale	84.1	0.1	4.9	0.1	0.1	6.6	2.5	1.5		100.0	800	688	0.98
Kilifi	90.8	0.4	2.8		0.5	1.9	2.0	1.5	0.3	100.0	800	745	0.97
Tana River	82.5		5.9		0.4	3.2	2.1	4.7	1.2	100.0	750	657	0.94
Lamu	80.5	0.5	3.6		1.2	5.5	1.6	2.9	4.1	100.0	750	639	0.95
Taita Taveta	83.0	0.8	4.0		1.2	4.5	0.6	1.7	4.3	100.0	775	671	0.96
Garissa	74.3		4.5	0.3	0.4	2.1	1.3	12.1	5.0	100.0	775	675	0.85
Wajir	92.6	0.4	3.4	0.1	0.3	1.0	3.4	1.5	0.5	100.0	775	736	0.98
Mandera	94.5	0.3	1.0	0.3	0.6	0.8	0.5	1.3	0.9	100.0	800	775	0.98
Marsabit	74.3	0.3	4.9		1.5	5.0	1.5	3.7	10.2	100.0	775	607	0.95
Isiolo	90.8	0.3	2.1	0.1		3.6	0.5	1.5	1.1	100.0	750	695	0.98
Meru	91.0	0.5	0.6	0.1	0.2	4.6	1.5	1.2	0.2	100.0	825	768	0.98
Tharaka-Nithi	90.7		2.7		0.4	3.7	0.6	1.5	0.3	100.0	775	718	0.98
Embu	89.5	0.3	1.8	0.1	0.4	4.1	2.8	0.6	0.5	100.0	800	727	0.98
Kitui	79.6	0.3	1.9		0.6	4.1	1.1	8.3	4.1	100.0	800	710	0.90
Machakos	89.5	0.2	2.4	0.1	0.4	4.6	0.4	1.7	0.7	100.0	825	758	0.97
Makueni	85.3		3.1		0.5	5.9	0.3	3.5	1.5	100.0	800	714	0.96
Nyandarua	86.6	0.3	2.4	0.1	0.6	4.4	0.6	4.9	0.1	100.0	800	740	0.94
Nyeri	92.5	0.3	1.0	0.1	0.4	3.8	0.5	0.8	0.8	100.0	800	752	0.98
Kirinyaga	88.6	0.3	2.0	0.1	0.4	5.9	0.9	1.5	0.4	100.0	800	727	0.98
Murang'a	88.6	0.3	1.1		0.5	4.9	1.0	2.6	1.0	100.0	800	736	0.96
Kiambu	84.8		0.4	0.1	1.0	5.0	1.8	4.2	2.7	100.0	825	744	0.94
Turkana	84.6	0.1	3.4		0.1	1.1	1.6	7.5	1.5	100.0	800	739	0.92
West Pokot	85.7	0.3	4.1			3.7	2.6	3.5	0.1	100.0	775	693	0.96
Samburu	77.7	1.1	5.5		0.7	2.8	4.8	3.6	3.9	100.0	750	623	0.94
Trans-Nzoia	81.0	0.6	4.8	0.3	0.5	6.0	3.6	2.1	1.1	100.0	800	676	0.96
Uasin Gishu	91.9	0.1	1.5		0.1	4.1	1.8	0.5		100.0	800	741	0.99
Elgeyo	86.1	0.3	4.0		0.1	2.8	0.3	2.3	4.1	100.0	775	688	0.97
Marakwet	86.8	0.4	2.0	0.3	0.4	5.3	0.9	1.8	2.4	100.0	800	716	0.97
Nandi	73.0	1.7	7.4		0.9	4.4	3.0	8.6	1.0	100.0	775	653	0.87
Baringo	85.4	0.4	2.5		1.2	5.2	3.0	2.1	0.4	100.0	775	690	0.96
Laikipia	86.2		4.0		0.1	2.9	2.8	3.4	0.6	100.0	825	740	0.96
Nakuru	78.4	0.3	0.9		0.1	3.4	2.5	1.4	13.1	100.0	800	641	0.98
Kajiado	75.3	1.8	5.1	0.1	1.5	5.8	3.4	5.1	2.0	100.0	800	670	0.90
Kericho	81.8	2.4	5.0	0.8	0.6	2.9	2.6	3.3	0.8	100.0	800	710	0.92
Bomet	93.4		1.3	0.4	0.3	2.1	0.5	1.6	0.5	100.0	800	765	0.98
Kakamega	86.8	0.5	2.4		0.5	2.9	0.7	4.2	1.9	100.0	825	759	0.94
Vihiga	92.0	0.1	1.5	0.1	0.5	3.6	0.4	1.1	0.6	100.0	800	751	0.98
Bungoma	85.0	0.2	3.8		0.4	5.5	1.7	3.0	0.5	100.0	825	731	0.96
Busia	89.5	0.3	3.0		0.1	2.1	2.0	2.1	0.9	100.0	800	736	0.97
Siaya	79.6	0.3	7.0		0.1	5.9	2.4	4.6	0.1	100.0	800	677	0.94
Kisumu	72.5	0.6	7.3	0.1	3.4	8.8	2.5	3.6	1.3	100.0	800	642	0.90
Migori	83.5	1.4	4.3		0.9	4.0	1.9	2.9	1.3	100.0	800	709	0.94
Homa Bay	89.0	0.5	3.5		1.0	2.0	0.6	2.9	0.5	100.0	800	747	0.95
Kisii	85.6	0.3	3.4			5.1	1.0	4.1	0.5	100.0	800	720	0.95
Nyamira	81.6	0.8	3.9		1.0	5.4	1.1	5.8	0.5	100.0	800	713	0.92
Nairobi	67.4		9.7		2.8	8.6	6.8	2.8	1.8	100.0	950	719	0.89

¹ Using the number of households falling into specific response categories, the household response rate (HRR) is calculated as: $100 * C / (C + HP + P + R + DNF)$

Data Weighting

Weights for the 2018 KHHEUS were computed and applied during analysis. This is because the survey was not self-weighting since the sample allocation was not proportional to the size of the strata. Additionally, some of the sampled households did not respond to the interviews while others could not be accessed due to various reasons. Accordingly, the sample required weighting adjustments to cater for non-proportional distribution of clusters and non-response, in order to provide estimates that are representative of target population at national and county levels.

The design weights incorporated the probabilities of selection of the clusters from the census EAs database into the NASSEP V sample frame, the probabilities of selection of the KHHEUS clusters from NASSEP V frame and the probabilities of selection of the households from each of the Sampled KHHEUS clusters. These design weights were then adjusted for household and cluster non-response. Non-response was adjusted at stratum level.

We use the following mathematical relation;

$$W_{hi} = D_{hi} \times \frac{S_{hi}}{I_{hi}} \times \frac{C_h}{c_h}$$

where,

W_{hi} = Overall cluster weight for the i-th cluster in the h-th stratum

D_{hi} = Sample cluster design weight obtained from cluster selection probabilities for the i-th cluster in the h-th stratum

S_{hi} = Number of listed households in the i-th cluster in the h-th stratum

I_{hi} = Number of responding households in i-th cluster in the h-th stratum

C_h = Number of clusters in h-th stratum

c_h = Number of selected clusters in the h-th stratum

Eventually, the weights were adjusted to ensure consistency with the projected population figures.

APPENDIX 2: Data Quality Tables

Table 2.A1: Single year age distribution of the household population by sex (weighted), Kenya 2018

Single year age distribution of the household population by sex (weighted)													
Age	Male		Female		Total		Age	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent		Number	Percent	Number	Percent	Number	Percent
0	452,400	1.9	440,704	1.8	893,104	1.9	50	232,166	1.0	221,202	0.9	453,368	0.9
1	445,481	1.9	452,407	1.9	897,889	1.9	51	104,625	0.4	110,634	0.5	215,259	0.4
2	570,254	2.4	560,773	2.3	1,131,027	2.4	52	106,309	0.5	108,427	0.4	214,736	0.4
3	554,545	2.4	591,659	2.4	1,146,204	2.4	53	113,644	0.5	127,762	0.5	241,407	0.5
4	607,993	2.6	576,145	2.4	1,184,138	2.5	54	121,555	0.5	124,785	0.5	246,340	0.5
5	578,551	2.5	606,326	2.5	1,184,877	2.5	55	155,200	0.7	169,511	0.7	324,711	0.7
6	591,767	2.5	602,489	2.5	1,194,255	2.5	56	112,511	0.5	146,625	0.6	259,136	0.5
7	632,284	2.7	619,660	2.5	1,251,944	2.6	57	87,256	0.4	93,377	0.4	180,633	0.4
8	649,961	2.8	665,006	2.7	1,314,966	2.7	58	138,274	0.6	153,609	0.6	291,883	0.6
9	612,913	2.6	568,497	2.3	1,181,410	2.5	59	88,211	0.4	106,799	0.4	195,011	0.4
10	728,651	3.1	730,977	3.0	1,459,628	3.1	60	157,106	0.7	154,008	0.6	311,114	0.7
11	647,719	2.8	634,128	2.6	1,281,846	2.7	61	93,952	0.4	67,682	0.3	161,633	0.3
12	818,240	3.5	867,750	3.6	1,685,990	3.5	62	74,972	0.3	97,218	0.4	172,190	0.4
13	666,537	2.8	645,485	2.7	1,312,022	2.7	63	65,553	0.3	80,574	0.3	146,127	0.3
14	632,412	2.7	617,517	2.5	1,249,928	2.6	64	74,427	0.3	80,407	0.3	154,834	0.3
15	637,504	2.7	629,351	2.6	1,266,855	2.6	65	90,098	0.4	112,567	0.5	202,666	0.4
16	581,156	2.5	548,451	2.3	1,129,607	2.4	66	90,151	0.4	98,325	0.4	188,477	0.4
17	500,538	2.1	493,096	2.0	993,635	2.1	67	39,915	0.2	50,775	0.2	90,690	0.2
18	644,103	2.7	635,044	2.6	1,279,147	2.7	68	74,758	0.3	91,596	0.4	166,354	0.3
19	420,689	1.8	390,089	1.6	810,778	1.7	69	45,758	0.2	58,769	0.2	104,527	0.2
20	487,060	2.1	501,795	2.1	988,855	2.1	70	111,787	0.5	124,113	0.5	235,900	0.5
21	359,422	1.5	401,142	1.6	760,564	1.6	71	46,248	0.2	42,031	0.2	88,279	0.2
22	396,219	1.7	427,275	1.8	823,494	1.7	72	51,369	0.2	55,905	0.2	107,274	0.2
23	341,045	1.5	381,290	1.6	722,334	1.5	73	48,478	0.2	64,201	0.3	112,679	0.2
24	298,455	1.3	395,166	1.6	693,621	1.4	74	22,090	0.1	31,327	0.1	53,417	0.1
25	364,955	1.6	407,715	1.7	772,670	1.6	75	38,938	0.2	58,027	0.2	96,965	0.2
26	334,531	1.4	372,043	1.5	706,574	1.5	76	38,705	0.2	37,490	0.2	76,194	0.2
27	281,590	1.2	336,000	1.4	617,590	1.3	77	22,544	0.1	23,680	0.1	46,223	0.1
28	381,964	1.6	414,280	1.7	796,244	1.7	78	34,659	0.1	53,215	0.2	87,874	0.2
29	313,737	1.3	332,610	1.4	646,346	1.4	79	33,007	0.1	25,917	0.1	58,924	0.1
30	404,477	1.7	445,806	1.8	849,983	1.8	80	29,299	0.1	67,581	0.3	96,879	0.2
31	269,113	1.1	318,973	1.3	588,086	1.2	81	15,354	0.1	13,940	0.1	29,293	0.1
32	357,688	1.5	469,225	1.9	826,913	1.7	82	23,629	0.1	23,583	0.1	47,212	0.1
33	307,363	1.3	323,746	1.3	631,109	1.3	83	20,732	0.1	22,932	0.1	43,663	0.1
34	283,448	1.2	345,415	1.4	628,863	1.3	84	17,020	0.1	12,312	0.1	29,332	0.1
35	399,515	1.7	331,075	1.4	730,591	1.5	85	10,856	0.0	17,613	0.1	28,469	0.1
36	299,687	1.3	269,296	1.1	568,983	1.2	86	8,008	0.0	14,292	0.1	22,300	0.0
37	200,384	0.9	229,602	0.9	429,986	0.9	87	6,091	0.0	10,547	0.0	16,638	0.0
38	356,295	1.5	302,663	1.2	658,957	1.4	88	11,879	0.1	26,220	0.1	38,099	0.1
39	221,327	0.9	216,609	0.9	437,936	0.9	89	3,744	0.0	5,601	0.0	9,345	0.0
40	401,258	1.7	405,997	1.7	807,254	1.7	90	9,120	0.0	12,821	0.1	21,941	0.0
41	164,910	0.7	200,782	0.8	365,692	0.8	91	2,362	0.0	2,363	0.0	4,725	0.0
42	239,605	1.0	260,922	1.1	500,527	1.0	92	2,598	0.0	3,272	0.0	5,869	0.0
43	208,052	0.9	216,451	0.9	424,503	0.9	93	576	0.0	4,220	0.0	4,796	0.0
44	243,461	1.0	207,549	0.9	451,010	0.9	94	3,882	0.0	3,835	0.0	7,717	0.0
45	246,207	1.0	239,585	1.0	485,792	1.0	95	15,142	0.1	36,018	0.1	51,160	0.1
46	191,330	0.8	187,383	0.8	378,713	0.8	96	2,806	0.0	3,191	0.0	5,997	0.0
47	147,019	0.6	110,613	0.5	257,632	0.5	98	198	0.0	923	0.0	1,121	0.0
48	211,523	0.9	205,919	0.8	417,442	0.9		23,518,491	100.0	24,330,344	100.0	47,848,835	100.0
49	135,895	0.6	146,047	0.6	281,943	0.6							

Table 2.A2: Sex ratio for household population (weighted), Kenya 2018

Age	Sex		sex ratio
	Male	Female	
0-4 yrs	2,630,674	2,621,688	1.003
5-9 yrs	3,065,476	3,061,978	1.001
10-14 yrs	3,493,558	3,495,856	0.999
15-19 yrs	2,783,991	2,696,031	1.033
20-24 yrs	1,882,200	2,106,668	0.893
25*29 yrs	1,676,776	1,862,648	0.900
30-34 yrs	1,621,788	1,903,165	0.852
35-39 yrs	1,477,209	1,349,244	1.095
40-44 yrs	1,257,285	1,291,701	0.973
45-49 yrs	931,974	889,547	1.048
50-54 yrs	678,299	692,810	0.979
55-59 yrs	581,453	669,920	0.868
60-64 yrs	466,010	479,888	0.971
65-69 yrs	340,681	412,033	0.827
70+ yrs	631,117	797,168	0.792
Total	23,518,491	24,330,344	0.967

APPENDIX 3: Supplementary tables of survey results

Table 3.1A: Percent Distribution of population with chronic health conditions by sex, age, place of residence and wealth quintile, Kenya 2018

Background characteristics		Hypertension	Other Cardiac disorders	Diabetes	Asthma	TB	Other respiratory disorders	HIV/AIDS	Cancer	Mental disorders	Other chronic health condition	Arthritis	Kidney problems	Other Medical conditions	Pneumonia	No Chronic Condition	Has Chronic Condition	Total
Sex	Male	31	40.1	41.7	42	56.9	49.3	35.8	45.2	56.9	39.1	22.3	56.2	44.7	47.2	50.2	42.1	49.2
	Female	69	59.9	58.3	58	43.1	50.7	64.2	54.8	43.1	60.9	77.7	43.8	55.3	52.8	49.8	57.9	50.8
Age	0-4 yrs	0.5	3.6	0.8	6.2	2.6	8.4	2.1	3.2	2.2	3.9	0.1	0.3	6.6	19.8	11.9	4.4	11
	5-9 yrs	0.3	4.7	1.3	9.9	4.4	9	4.5	5.8	7.8	4.7	0.2	1.8	10.4	10.9	13.8	6	12.8
	10-14 yrs	0.3	6	1.1	9.8	5.6	9.4	4.2	2.9	9.5	8.4	1.3	2.9	15.3	5.3	15.6	7.8	14.6
	15-19 yrs	0.5	5.7	0.5	8.9	3.7	8.8	4.6	5.9	12.9	8.7	0.8	14.1	9.8	4.8	12.1	6.9	11.5
	20-24 yrs	1.5	3.3	1.8	6.5	4.3	8.5	3.4	5	9.7	8.6	0.5	5.6	6.7	0.6	8.7	5.8	8.3
	25-29 yrs	2.5	8.2	1.5	7.6	5.4	6.4	7.6	4	9.5	7.9	0.8	6.5	5.2	9.4	7.6	6	7.4
	30-34 yrs	5.4	6.1	3.5	8.8	13.5	8	9.5	7.6	8.6	10.3	2.9	5.9	5.6	5.7	7.4	7.4	7.4
	35-39 yrs	6.8	7.8	7.1	7.3	11.7	5.9	12.4	6.7	8.3	7.9	3.2	8.7	4.9	6.5	5.7	7.2	5.9
	40-44 yrs	9	7.4	5.7	7.6	14.3	6.4	16.5	3.9	7.8	7.6	4	6.6	5.7	5.9	4.9	7.9	5.3
	45-49 yrs	9.3	5.8	6.9	6.6	6.6	5.9	10	10	5	5.8	5.3	10.9	4.8	8.9	3.4	6.8	3.8
	50-54 yrs	8.7	3.7	6.9	4.1	5.3	5	6.9	5.5	4.4	5.7	10.2	3.4	3.9	2.3	2.4	5.8	2.9
	55-59 yrs	12.3	6	14.7	4.3	5	3.5	7.4	5.4	3.9	6	11.7	2.6	3.5	0.9	2.1	6.4	2.6
	60-64 yrs	10.5	6.2	12.2	3	6	3.9	5.1	3.3	2.8	3.8	11.5	8.4	4.3	5	1.4	5.7	2
	65-69 yrs	9.8	7.7	9.6	3.2	4.1	3.4	3.1	9.2	1.9	3.6	12.7	7.3	3.4	5.6	1.1	4.8	1.6
	70+ yrs	22.5	17.9	26.3	6.2	7.6	7.5	2.6	21.7	5.7	7	34.6	15	9.8	8.3	1.8	11.1	3
Residence	Rural	61.2	59.1	59.7	57.7	66.7	61.2	66.1	60.5	77.3	63.9	70.4	68.6	67.6	55.6	63.9	63.2	63.8
	Urban	38.8	40.9	40.3	42.3	33.3	38.8	33.9	39.5	22.7	36.1	29.6	31.4	32.4	44.4	36.1	36.8	36.2
Wealth Quintiles	Lowest	12	19.6	10.3	17.5	24.2	19.1	23.5	17.9	27	17.3	14.6	26.8	23.5	19.9	20.2	18.4	20
	Second	15.4	20.5	13.4	19.9	25.8	20	21.7	20.2	25.8	20.1	14.2	21.7	20.2	15.9	20.1	19	20
	Middle	23.4	20.2	20.4	19.8	18.9	22.9	22.3	24.1	22.8	24.7	30.4	21.2	24.5	16.4	19.6	22.6	20
	Fourth	27.3	18.7	31.2	19.6	19.4	18.8	24.3	16.2	16.6	19.5	27.6	22.1	18.1	34.5	19.8	21.7	20
	Highest	22	21.1	24.7	23.2	11.8	19.2	8.2	21.6	7.7	18.3	13.1	8.1	13.8	13.3	20.2	18.3	20
Total		3.10%	0.50%	0.90%	1.70%	0.40%	2.40%	0.90%	0.20%	0.70%	1.40%	0.40%	0.10%	2.30%	0.10%	87.20%	12.80%	100.00%
		1502476	262958	409156	816090	170663	1164176	441860	82677	311611	660623	214253	47477	1105790	43350	41710538	6138297	47848835
		100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 3.2A: Proportion of population that paid for services in public health centers and dispensaries by residence and county, Kenya 2018

		National referrals	County Government hospitals	Private hospitals	Faith Based Hospital	Govt. Health Centre	Private Health Centre	Faith Based health centre	Nursing/ Maternity Homes	Others	Don't Know	Total
Residence	Rural	5.3	41.7	26.9	12.1	6.4	4.0	1.6	.5	1.0	.6	100.0
	Urban	9.0	30.2	34.8	12.9	3.6	4.6	2.5	1.8	.4	.2	100.0
Wealth Quintiles	Lowest	3.5	49.6	20.2	9.0	9.0	3.5	3.2	0.0	1.4	.6	100.0
	Second	6.6	47.3	21.2	12.2	5.9	3.6	1.4	1.1	.4	.4	100.0
	Middle	4.9	38.6	29.2	13.3	5.0	4.9	.8	.8	1.5	.1	100.0
	Fourth	8.0	36.1	29.5	15.8	2.6	4.5	1.5	1.1	.4	.5	100.0
	Highest	10.3	18.3	46.4	11.6	3.4	4.5	3.1	2.0	.1	.4	100.0
County	Mombasa	3.8	39.8	41.8	3.8	3.0	7.8	0.0	0.0	.0	0.0	100.0
	Kwale	2.0	41.9	30.5	1.8	17.8	4.5	1.6	0.0	.0	0.0	100.0
	Kilifi	1.0	28.0	32.0	0.0	10.5	23.0	2.6	0.0	2.9	0.0	100.0
	Tana River	3.0	76.6	9.5	0.0	7.1	3.9	0.0	0.0	.0	0.0	100.0
	Lamu	1.7	67.9	23.9	0.0	2.7	3.7	0.0	0.0	.0	0.0	100.0
	Taita/Taveta	11.8	55.7	19.6	0.0	8.4	3.8	.7	0.0	.0	0.0	100.0
	Garissa	5.5	54.8	28.2	9.1	2.5	0.0	0.0	0.0	.0	0.0	100.0
	Wajir	3.1	69.1	16.7	4.1	5.1	0.0	0.0	0.0	2.0	0.0	100.0
	Mandera	5.3	69.5	16.2	0.0	2.6	5.7	0.0	.6	.0	0.0	100.0
	Marsabit	3.2	42.2	22.2	9.1	6.2	1.2	.7	12.2	3.1	0.0	100.0
	Isiolo	7.5	39.8	26.9	17.7	2.3	2.9	0.0	0.0	2.9	0.0	100.0
	Meru	4.0	20.7	14.5	58.7	0.0	1.2	1.0	0.0	.0	0.0	100.0
	Tharaka-Nithi	.7	23.6	17.1	48.3	3.1	3.1	4.1	0.0	.0	0.0	100.0
	Embu	12.4	21.3	29.2	21.9	8.2	0.0	1.9	5.0	.0	0.0	100.0
	Kitui	8.9	30.2	48.1	2.0	1.8	0.0	0.0	0.0	.0	0.0	100.0
	Machakos	31.3	20.1	23.8	16.1	2.5	1.5	4.8	0.0	.0	0.0	100.0
	Makueni	2.9	39.5	43.9	5.1	6.0	0.0	0.0	0.0	.0	2.7	100.0
	Nyandarua	0.0	34.2	42.1	14.9	4.5	3.3	1.0	0.0	.0	0.0	100.0
	Nyeri	7.8	45.0	33.1	7.1	6.0	1.0	0.0	0.0	.0	0.0	100.0
	Kirinyaga	2.3	18.4	63.4	10.3	3.7	1.5	.4	0.0	.0	0.0	100.0
	Murang'a	17.0	34.8	16.4	23.6	4.4	0.0	0.0	0.0	.0	3.7	100.0
	Kiambu	0.0	39.4	38.0	15.6	3.6	0.0	3.4	0.0	.0	0.0	100.0
	Turkana	1.8	47.3	4.6	36.3	1.9	1.0	2.1	0.0	5.0	0.0	100.0
	West Pokot	1.0	60.2	9.7	6.2	10.7	1.2	1.1	0.0	.9	0.0	100.0
	Samburu	0.0	58.4	10.8	23.9	7.0	0.0	0.0	0.0	.0	0.0	100.0
	Trans Nzoia	4.4	60.9	27.6	4.2	2.6	0.0	.3	0.0	.0	0.0	100.0
	Uasin Gishu	44.1	16.6	16.8	13.0	3.9	5.6	0.0	0.0	.0	0.0	100.0
	Elgevo/Marak	17.1	31.6	8.7	20.5	4.0	6.6	1.9	0.0	.0	.6	100.0
	Nandi	10.8	42.8	11.8	10.5	12.5	1.3	0.0	0.0	.0	1.4	100.0
	Baringo	9.6	58.2	9.2	2.1	8.1	6.5	6.3	0.0	.0	0.0	100.0
	Laikipia	15.6	40.4	31.7	10.1	1.2	0.0	1.0	0.0	.0	0.0	100.0
	Nakuru	12.0	50.3	20.5	3.2	0.0	0.0	0.0	0.0	.0	5.0	100.0
	Narok	1.0	46.9	23.0	11.2	4.2	4.5	8.5	0.0	.8	0.0	100.0
	Kajiado	13.3	19.8	47.7	7.7	2.9	1.0	3.9	0.0	3.7	0.0	100.0
	Kericho	0.0	48.4	36.4	6.8	8.5	0.0	0.0	0.0	.0	0.0	100.0
	Bomet	1.0	44.9	17.1	26.8	3.7	6.5	0.0	0.0	.0	0.0	100.0
	Kakamega	1.8	36.4	31.3	16.8	1.4	8.5	0.0	.1	2.6	1.1	100.0
	Vihiga	2.2	40.1	24.8	10.9	9.7	3.2	4.7	.4	3.0	1.0	100.0
	Bungoma	2.4	48.2	25.4	4.6	0.9	6.8	.8	1.9	.0	0.0	100.0
	Busia	4.8	48.2	22.0	10.3	4.3	5.2	2.3	0.0	2.1	.9	100.0
Siaya	2.8	43.6	37.3	5.9	6.7	0.0	.2	0.0	.0	3.6	100.0	
Kisumu	2.8	54.3	30.7	4.4	6.6	.9	0.0	0.0	.0	.3	100.0	
Migori	1.7	32.7	45.0	8.4	6.2	1.6	2.8	0.0	1.6	0.0	100.0	
Homa Bay	2.1	20.5	28.3	14.5	9.5	7.1	1.5	4.9	1.8	.7	100.0	
Kisii	5.3	41.7	25.4	17.0	1.5	4.1	5.0	0.0	.0	0.0	100.0	
Nyamira	3.5	38.6	37.9	9.6	2.5	6.3	1.7	0.0	.0	0.0	100.0	
Nairobi City	14.3	13.7	38.4	15.6	4.0	6.2	3.7	4.1	.0	0.0	100.0	
Total		6.8	36.9	30.2	12.4	5.2	4.2	2.0	1.0	.7	.4	100.0

APPENDIX 4: The 2018 KHHEU Survey Personnel

Table 4.A1: List of KHHEUS 2018 Technical Working Group, Kenya 2018

Name	Institution
Dr. David Kariuki	Ministry of Health
Mr. Elkana Ong'uti	Ministry of Health
Dr. Issabel Maina	Ministry of Health
Dr. Mercy Mwangangi	Ministry of Health
Mr. A.A. Awes	Kenya National Bureau of Statistics
Mr. Stephen Kaboro	Ministry of Health
Mr. Elias Nyaga	Kenya National Bureau of Statistics
Dr. Valeria Makory	Ministry of Health
Dr. Agnes Nakato	Ministry of Health
Mr. David Njuguna	Ministry of Health
Mr. J. Bore	Kenya National Bureau of Statistics

Table 4.A2: List of KHHEUS 2018 trainers and coordinators, Kenya 2018

Region	Counties	Trainers / Coordinators
North- Rift Region	TURKANA	Mr. Stephen Macharia Mr. Robeert Buluma Mr. Vyonne Rono
	WEST POKOT	
	ELGEYO MARAKWET	
	TRANS-NZOIA	
	UASIN GISHU	
	NANDI	
Central Region	NYANDARUA	Dr. Isabel Maina Ms. Terry Watiri Mr. Waweru Paul Mr. Vivian Nyamache
	LAIKIPIA	
	NYERI	
	KIRINYAGA	
	MURANG'A	
	KIAMBU	
North-Eastern Region	GARISSA	Mr. Pepela Wanjala Ms. Sarah Omache Ms. Canabel Oganga
	WAJIR	
	MANDERA	
	MARSABIT	
Upper Eastern	ISIOLO	Mr. Elkana Onguti Mr. David Njuguna Mr. Elias Nyaga
	MERU	
	THARAKA NITHI	
	EMBU	

Western Region	KAKAMEGA	Ms. Mary Mwangangi Mr. Rajab Mbaruku Mr. Buluma Robert
	VIHIGA	
	BUNGOMA	
	BUSIA	
Nyanza Region	KISII	Mr. David Kamau Mr. Godfrey Otieno Mr. Jim Kirimi
	NYAMIRA	
	SIAYA	
	KISUMU	
	HOMA BAY	
Lower Eastern Region	MIGORI	Dr. Mercy Mwangangi Mr. Samuel Kipruto Mr. Paul Samoei Mr. Samuel Ogola
	NAIROBI	
	KAJIADO	
	KITUI	
	MACHAKOS	
Coastal Region	MAKUENI	Dr. Agnes Nakato Mr. A. A. Awes Mr. Kakinyi Mutua
	MOMBASA	
	KILIFI	
	KWALE	
	TAITA TAVETA	
	LAMU	
South-Rift Region	TANA RIVER	Mr. Stephen Kaboro Mr. James Nganga Mr. Ngugi Mwenda
	BARINGO	
	SAMBURU	
	KERICHO	
	BOMET	
	NAKURU	
	NAROK	

Table 4.A3: List of KHHEUS 2018 supervisors and enumerators/ interviewers, Kenya 2018

Name and County	Designation	Name and County	Designation
Nairobi		Kwale	
Job Mose	Supervisor	Alex Munga	Supervisor
Faith Kemunto George	Interviewer	Khadija Khalid Amour	Interviewer
Pauline Mirembo	Interviewer	Lali Hemed Mohamed	Interviewer
Sarah Waka Amwayi	Interviewer	Husna Mwalimu Shee	Interviewer
Immaculate Nyiva Kikuvi	Interviewer	Mwanasiti Bakari Hamisi	Interviewer

Phyllis W. Mwangi Supervisor
Edward Chweya Interviewer
Cindy Nambisia Interviewer
Otieno K. Humphrey Interviewer
Stella Wanjiru Interviewer

Nyandarua

Benson Mwangi Supervisor
Ann Wanjiru Interviewer
Mary Mukuhi Interviewer
Mary Ng'endo Interviewer
Millicent Muthami Interviewer

Benson Wambui Supervisor
Alex Kariuki Ndung'U Interviewer
Anne Kamau Interviewer
Samuel Wahome Interviewer
Helen Gichui Interviewer

Nyeri

Sarah Omache Supervisor
Esther Wamithi Interviewer
Evan Kaburu Kabiru Interviewer
Ian Ngatia Interviewer
Nicholas Mutahi Mureithi Interviewer

Lucy Wanjiku Musili Supervisor
John Kariuki Njoroge Interviewer
Faith Njambi Interviewer
Jane Wambui Interviewer
Susan Nyandia Njoroge Interviewer

Kirinyaga

Ephantus G. Kuria Supervisor
Eunice Gikuni Interviewer
Fridah Jepkirui Koech Interviewer
John Kiarie Interviewer
Paul Mimano Kimunyi Interviewer

Lenata A. Sipulwa Supervisor

Bernard Otieno Supervisor
Phyllis Kisilu Interviewer
Mark Wanje Munga Interviewer
Rashid Juma Hamisi Interviewer
Samson Juma Interviewer

Kilifi

Rodgers Kazungu Supervisor
Chakacha Sidi Purity Interviewer
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