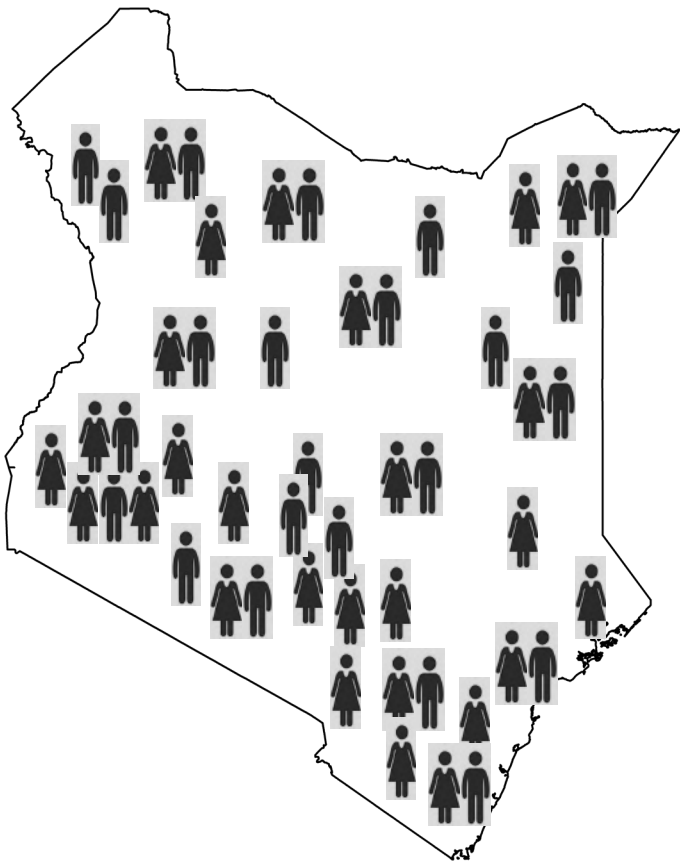


2019 Kenya Population and Housing Census

Analytical Report on Information and Communication Technology

Volume XX



April, 2022



2019 Kenya Population and Housing Census

“Counting Our People for Sustainable Development and
Devolution of Services”

Analytical Report on Information and Communication Technology

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Abbreviations

AfDB	African Development Bank
AICS	Italian Agency for Development Cooperation
AM	Amplitude Modulation
ASAL	Arid and Semi-Arid Land
CDMA	Code-Division Multiple Access
CSPro	Census and Survey Processing System
DSL	Digital Subscriber Line
EA	Enumeration Area
FM	Frequency Modulation
FttH	Fibre to the Home
GPS	Global Positioning System
ICT	Information and Communication Technology
ICTs	Information and Communication Technologies
ILO	International Labour Organization
IP TV	Internet Protocol Television Set
ISCE-93	International Classification of Status in Employment-93
ISDN	Integrated Services Digital Network
ISIC	Industrial Classification of all Economic Activities
ITU	International Telecommunication Union
KNBS	Kenya National Bureau of Statistics
KPHC	Kenya Population and Housing Census
LAN	Local Area Network
LW	Long wave
MTP	Medium Term Plan
ONS- UK	Office of National Statistics, United Kingdom
PWDs	Persons Living with Disabilities
SDGs	Sustainable Development Goals
SIM	Subscriber Identification Module
SPSS	Statistical Package for Social Sciences
STI	Science, Technology, and Innovation
SW	Short Wave
TV	Television Set
TVET	Technical and Vocational Education and Training
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNRCO	United Nations Resident Coordinator's Office
UNSD	United Nations Statistical Division
USB	Universal Serial Bus

VSAT	Very-Small-Aperture Terminal
WCAG 2.0	Web Content Accessibility Guidelines 2.0
WIFI	Wireless Fidelity
WIMAX	Worldwide Interoperability for Microwave Access
WHO	World Health Organization

Foreword

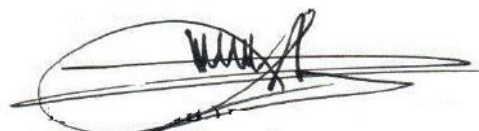
The 2019 Kenya Population and Housing Census (KPHC) was conducted from the night of 24th/25th to 31st August 2019 and followed the United Nations principles and recommendations for conducting the 2020 round of censuses. The theme of the Census was “Counting Our People for Sustainable Development and Devolution of Services”. This resonated very well with Kenya’s development agenda -*Vision 2030* and the Big Four, as well as other regional and international development initiatives such as the Sustainable Development Goals (SDGs) and the African Union Agenda 2063. The main objective was to provide the Government and other stakeholders with essential information for evaluating policies and easing planning and budgeting processes.

The first set of the census reports (basic volumes I-IV) were released in a record 6 months after enumeration. The second set of the census reports covers the thematic areas of: Fertility and Nuptiality; Mortality; Migration; Education and Training; Youth and Adolescents; Information and Communication Technology; Housing Conditions, Amenities and Household Assets; Gender Dimensions; Older and Vulnerable Population; Urbanization; Disability; Household and Family Dynamics; Labour Force Dynamics; Agriculture; Population Dynamics and Population Projections.

This monograph presents data on the use and ownership of Information and Communication Technology (ICT) equipment. The results show that mobile phones are the most used device at 47.3 per cent with most users being in the urban areas. Usage of the internet stood at 22.7 per cent with most users being men. Usage of computers is significantly low at 10.7 per cent with most users being in the urban areas. The data on e-commerce showed that users stood at 4.3 per cent and majority were those with university-level of education.

The information in this monograph provides valuable programmatic evidence to policymakers for use in the formulation of policies and plans explicitly intended to achieve SDG targets. The report not only adds knowledge but also serves as a foundation for assessment, reporting and eventually monitoring achievement of SDGs by 2030, *Vision 2030*, formulation of MTP IV, County Integrated Development Plans, and other sector-specific plans. Specifically, the evidence is expected to contribute immensely towards measuring and monitoring SDGs numbers 5, 9 and 17.

On behalf of the Government, I wish to thank the staff, management and Board of Directors of the Kenya National Bureau of Statistics as well as the authors for their contribution towards the preparation of this report. I further wish to extend special thanks to our development partners, especially UNFPA, UNICEF, UN-Women, WHO and UNDP under the coordination of UN Resident Coordinators’ Office and all the other stakeholders who were involved in the process for their technical and financial support.



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Acknowledgment

The 2019 Kenya Population and Housing Census (KPHC) was implemented under the provisions of the Constitution of Kenya, 2010 and the Statistics Act, 2006. The census was the sixth to be conducted in Kenya since independence and the first that was fully digitized, where the latest technology was embraced. This monograph is among the set of 16 such reports, addressing various topical areas regarding the demographic, social, and economic profiles of the Kenyan population.

The 2019 KPHC implementation process was accomplished through a concerted effort of various government ministries, departments, agencies, International and local organizations and individuals who assisted during preparation, collection, compilation, processing, analyzing and publishing the results. Kenya National Bureau of Statistics (KNBS), on behalf of the Government, takes this opportunity to sincerely thank all those who participated in the preparation of this report.

The Bureau is indebted to all the organs of government, the private sector, and the general public for the overwhelming support and participation that led to the successful implementation of the 2019 Census. Special gratitude goes to United Nations Population Fund (UNFPA); United Nations Entity for Gender Equality and the Empowerment of Women (UN Women); United Nations Children's Fund (UNICEF); United Nations Economic Commission for Africa (UNECA); World Health Organization (WHO); and United Nations Development Programme (UNDP) under the coordination of UN Resident Coordinators' Office (UNRCO); African Development Bank (AfDB); Statistics Sweden; Office of National Statistics, United Kingdom (ONS-UK) and Italian Agency for Development Cooperation (AICS) for their immense support. I also recognize the census personnel (coordinators, content and ICT supervisors, enumerators, village elders and security) for the role they played in the overall success of the 2019 KPHC.



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Executive Summary

The Information and Communication Technology (ICT) module administered during the 2019 Kenya Population and Housing Census comprised questions at individual and household levels. Individual-level questions sought information on ownership and use of mobile phones, use of the Internet, and use of computers/laptops by individuals aged 3 years and above in the 3 months preceding the Census. E-commerce questions targeted individuals aged 15 years and above and sought information on engagement in online buying of goods and services 3 months preceding the Census. Information sought at the household level comprised ownership of ICT assets/equipment such as standalone radio, television set, computer/laptop, and Internet connection.

The analysis and results of the ICT monograph are presented in 8 chapters. Chapter 1 presents the general background information of the census, objectives, the methodology of data analysis, assessment of data quality, and definition of key concepts and terms. Chapter 2 provides the rationale for the ICT monograph. Chapter 3 gives an overview of the ownership and use of mobile phones. Chapter 4 examines internet usage at the individual level. Chapter 5 looks at computer usage at the individual level. Chapter 6 provides an outlook on e-commerce and potential e-commerce users. Chapter 7 gives an overview of household ownership of ICT equipment. Finally, chapter 8 gives the summary, conclusion, and recommendations.

The results show that mobile phones are the most used device at 47.3 percent by population 3 years and above, with males at 47.6 percent and females at 47.0 percent. Mobile usage in the country stood at 55.2 percent with the majority being in urban areas at 71.1 percent compared to rural areas at 48.1 percent. Notably, 14.9 percent of the targeted population use a mobile phone without owning- they borrow a mobile phone for their use instead of owning one. This has a significant impact as these individuals are limited in enjoying the maximum benefits of a mobile phone as well as accessing government services, which ride on mobile phone infrastructure. Most of the population who share mobile phones are females at 15.4 percent and males at 14.3 percent.

Internet use is quite low; therefore, more is needed to reach the unconnected in order to bridge the digital divide. Analysis shows that 22.7 percent of the targeted population used the Internet with 25.2 percent being males and 20.2 percent being females. Most Internet users were found in urban areas at 22.6 percent while those in rural areas were 12.7 percent. Data from the population that reported to be in school show that all students that were currently enrolled in the universities used the Internet, whilst those in pre-primary, primary, and adult basic education were the lowest users of the Internet at 2.3, 4.0, and 7.6 percent, respectively.

The 2019 census shows that the use of computers in the country is significantly low. About 10.7 percent of the targeted population used a computer in the 3 months preceding the census with 12.0 percent being male while 9.4 percent were female. Similarly, the majority of computer users were found in urban areas at 22.1 percent while those in rural areas were 13.8 percent. For the population enrolled in school, all university students used a computer while the least users were those in madrasa at 2.1 percent followed by those in pre-primary at 2.4 percent.

The 2019 KPHC collected data on the buying component of e-commerce only and not the online selling component. The data shows that online buyers also referred to as e-commerce users, stood at 4.3 percent for the targeted population with a majority from the urban areas at 9.6 percent and those from rural areas were 1.7 percent. More males (5.0 percent) than females (3.7 percent) engaged in e-commerce. The analysis also shows those who searched and bought elsewhere; and those who searched only. These are regarded as potential e-commerce users as they are likely to buy goods or services eventually. They also exhibit skills required to carry on e-commerce. About 1.1 percent searched and bought elsewhere while 4.4 percent searched for the goods and/or services without buying.

The level of education is key in the use of ICTs. The census highlighted education levels and the use of ICTs on population age 3 years and above. The majority of those that used ICTs had completed university. Specifically, mobile ownership among those who completed university was 98.3 percent. All persons who had completed university used a mobile phone and as expected, they were the least to be mobile sharers. Persons with pre- primary and primary as their highest form of education were the majority in sharing a mobile phone at 10.7 percent. Once more, use of Internet and computer was high among those with university education at 95.4 percent and 82.4 percent, respectively.

The use of ICTs should be embraced by everyone in the society due to its fundamental benefits. The data highlights the use of ICTs by persons living with disabilities (PWDs) age 5 years and above. About 49.4 percent of PWDs owned a mobile phone with females taking a lead at 51.6 percent, followed by males at 46.4 percent. Similarly, 55.7 percent used a mobile phone, with females at 57.9 percent and males at 52.7 percent. Nevertheless, PWDs who did not own a mobile phone but borrowed to use were 14.9 percent with females being 15.4 percent and males at 14.3 percent. The use of the Internet, computer, and e-commerce remained low as only 11.4, 4.7, and 1.5 percent of PWDs used these ICTs, respectively.

Analysis by marital status and the use of ICTs for the population age 12 years and above show that the highest uptake of mobile phone ownership and mobile usage was among the married monogamous, at 81.4 percent and 84.8 percent respectively, while those who shared a mobile phone were highest among those who reported having never married at 10.7 percent. Further, the majority of those who used a computer were never married at 15.4 percent, while a majority of those who used the Internet were married monogamously. Lastly, of those who engaged in e-commerce, the majority were never married at 4.9 percent.

An in-depth analysis using ICTs by religious affiliation was captured for the population age 3 years and above. The data shows that Hindu affiliations were the majority to own a mobile phone, use a mobile phone, computer, Internet, and e-commerce at 80.7, 86.0, 52.8, 77.3, and 22.4 percent respectively. Notably, they were the least to share a mobile phone at 3.8 percent. Particularly, evangelical followers were the highest in sharing a mobile phone at 9.0 percent. In addition, traditionists were the least to use all the ICTs captured in the census.

In terms of ownership of ICTs at the household level, stand-alone radio was the most popular device (57.0 percent) in most households in Kenya with those in the rural areas taking the lead at 58.5 percent followed by urban areas at 54.5 percent. Households with a functional television were 38.8 percent with

the majority being from urban areas at 60.6 percent followed by those in the rural areas at 25.1 percent. Out of the households with a functional television, 23.9 percent had a set top box, 21.6 percent had a pay TV decoder while 2.1 percent had an IPTV. Households that were left with analogue televisions after the digital migration and are yet to convert their sets to receive digital signals or buy new digital television were 1.9 percent. Furthermore, households with Internet connection were 18.0 percent with a majority having the mobile broadband at 16.9 percent, followed by fixed broadband at 3.5 percent. Lastly, 8.8 percent of households owned a computer.

Kenya at a Glance

Table A: Summary of Key ICT Indicators at Individual Level

			National			Rural			Urban		
Core ITU-ICT Indicators	Useful for Related SDG targets/ MTP	Key Indicators at individual level	Total	Male	Female	Total	Male	Female	Total	Male	Female
HH18	1.4, 2.3, 2.c, 3.8, 5.b, 8.5, 8.10, 10.c, 16.10	Proportion of population age 3 years & above Owning a Mobile phone	47.3	47.6	47	40.5	40.7	40.3	62.6	63.2	62
HH10		Proportion of population age 3 years & using a Mobile	55.2	55.1	55.2	48.1	47.9	48.2	71.1	71.4	70.7
		Proportion of population age 3 years & above using a Mobile phone use without owning it	14.9	14.3	15.4	12.7	12.1	13.2	22.6	22.3	22.8
HH7	1.4, 2.3,4.5, 5.b, 8.5, 9.c, 12.8,16.10, 17.8	Proportion of population age 3 years and above Use of Internet	22.7	25.2	20.2	13.8	16.2	11.4	42.6	45.4	39.9
HH5		Proportion of population age 3 years and above Use of Computer	10.7	12	9.4	5.6	6.5	4.7	22.1	24.4	19.9
HH20		Proportion of population age 15 years and above Searched and bought online (E- commerce Users)	4.3	5	3.7	1.7	2.1	1.3	9.6	10.6	8.6
		Proportion of population age 15 years and above Searched and bought elsewhere (Potential E-commerce Users)	1.1	1.2	1	0.9	1	0.8	1.5	1.6	1.4
		Proportion of population age 15 years and above Searched only (Potential E-commerce Users)	4.4	4.9	3.9	2.7	3.2	2.2	7.6	8.1	7.2

Table B: Summary of Key ICT Indicators at Household Level

Core ITU- ICT Indicators	MTP indicators	Key Indicators at Household level	National	Rural	Urban
HH1		Proportion of households with Standalone Radio	57	58.5	54.5
HH2		Proportion of households with any type of functional TV ^[1]	38.8	25.1	60.6
HH13	Proxy for MTP A2	Proportion of households with TV with Free to Air Set-top-box/inbuilt digital television	23.9	16.6	35.6
		Proportion of households with TV with Pay TV Decoder	21.6	11.8	37.2
		Proportion of households with Internet protocol TV (IP TV)	2.1	0.7	4.3
		Proportion of households with Analogue TV ^[2]	1.9	1.8	2
HH6	1.4, 9.1	Proportion of households with any type of Internet ^[3]	18	6.9	35.4
H11	Proxy for MTP A2	Proportion of households with Internet through mobile phone/Modem	16.9	6.6	33.2
		Proportion of households with Fixed Internet at home e.g Fiber Satellite dish LAN Wi-Fi	3.5	0.8	7.9
HH4		Proportion of households with Computer/Laptop/Tablet	8.8	3	18

[1] Includes all households with free to air set top box and/or inbuilt digital television and/or pay tv decode and/or IPTV

[2] Excludes houses that may have analogue televisions and any of the mentioned functional television as mentioned in note 1. Only includes households with analogue television only

[3] Includes households with any type of Internet that is fixed broadband and/or mobile broadband

Table C: Key Indicators at Individual Level for Persons with Disability (PWDs) Age 5 years and above

Ownership	National			Rural			Urban		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Owning a Mobile phone	49.4	46.4	51.6	46.2	43.2	48.4	62.4	59.4	64.7
Using a Mobile phone	55.7	52.7	57.9	52.5	49.4	54.8	68.6	66.1	70.5
Using a Mobile phone without owning it (Mobile Sharers)	14.9	14.3	15.4	12.7	12.1	13.2	22.6	22.3	22.8
Using Internet	11.4	13.5	9.8	7.6	9.5	6.2	27.1	29.6	25.1
Using a computer	4.7	5.9	3.8	2.7	3.5	2	12.9	15.4	11
Searched and bought online (E- commerce Users)	1.5	1.8	1.2	0.6	0.9	0.4	4.8	5.6	4.3
Searched and bought elsewhere (Potential E-commerce Users)	0.5	0.7	0.5	0.5	0.6	0.4	0.8	1	0.7
Searched only (Potential E-commerce Users)	1.5	1.9	1.3	1	1.3	0.7	3.8	4.3	3.4

Table D: Key Indicators at Individual Level by Age Group

Key Indicators at individual level by Age groups												
	Owning a Mobile Phone			Using a Mobile Phone			Using a Mobile Phone without owning			Using a Computer		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
3 - 4	1.9	1.9	1.9	10.8	10.8	10.8	9.1	9.1	9.1	1.9	1.9	1.9
5 - 9	2.3	2.3	2.3	13.8	13.8	13.8	11.7	11.7	11.8	3.4	3.4	3.3
10 - 14	4.1	4.2	3.9	18.5	18.5	18.6	15.1	14.9	15.3	4.1	4.2	4
15 - 24	48.7	49.3	48.2	59	58.7	59.2	20.1	18.7	21.4	16.1	17.1	15.2
25 - 34	83.9	85.1	82.8	87	87.6	86.3	19	17.2	20.4	18.7	22.3	15.4
35 - 44	85	85.1	85	87.7	87.6	87.8	17.9	17	18.8	14	15.9	11.9
45 - 54	84.5	84.9	84.1	87.1	87.3	86.9	17.1	16.2	17.9	11.7	14.3	9
55 - 64	79.7	81.9	77.6	82.9	84.7	81.3	16	15.4	16.5	7.6	10.3	5.1
65 - 74	68.5	73.3	64.3	72.7	76.9	69	13.2	13.6	13	3.3	4.9	1.9
75+	45.8	54.3	40.1	50.8	58.9	45.5	9.3	10	9	1.4	2.1	0.9
	Using Internet			Searched and bought online by age group			Searched and bought elsewhere			Searched only		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
3 - 4	2.1	2.1	2.1	..	..	..	..	..	..	..	..	..
5 - 9	2.7	2.8	2.7	..	..	..	..	..	..	..	..	..
10 - 14	4	4.2	3.8	..	..	..	..	..	..	..	..	..
15 - 24	32.3	34.7	29.9	3.3	3.6	3	1.2	1.3	1.1	5	5.4	4.7
25 - 34	44.5	50.6	39.1	7	8.2	6	1.4	1.6	1.3	5.9	6.8	5.1
35 - 44	35.4	39.3	31.3	5.1	5.7	4.5	1.1	1.2	1	4.1	4.5	3.6
45 - 54	27.6	32.4	22.7	3.7	4.4	3	0.8	1	0.7	2.9	3.5	2.4
55 - 64	18.3	23.5	13.4	2.1	2.8	1.4	0.6	0.7	0.4	1.7	2.3	1.2
65 - 74	9.3	12.7	6.3	0.8	1.2	0.4	0.4	0.4	0.3	0.7	1	0.5
75+	4.2	5.8	3.1	0.3	0.4	0.2	0.3	0.3	0.3	0.3	0.5	0.3

.. No data for those below 15 years since e-commerce questions were asked to those 15 years and above

Table E: Key Indicators at Individual Level by Age Cohorts

Key Indicators at individual level by Age groups												
	Owning a Mobile Phone			Using a Mobile Phone			Using a Mobile Phone without owning/ Mobile sharers			Using a Computer		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
3-14	3.0	3.1	2.9	15.3	15.3	15.3	12.7	12.6	12.8	3.4	3.5	3.3
15-24	48.7	49.3	48.2	59.0	58.7	59.2	20.1	18.7	21.4	16.1	17.1	15.2
25-74	82.9	84.0	81.8	85.8	86.6	85.1	17.4	16.4	18.2	14.1	16.8	11.5
75+	45.8	54.3	40.1	50.8	58.9	45.5	9.3	10.0	9.0	1.4	2.1	0.9
	Using Internet			Searched and bought online by age group			Searched and bought elsewhere			Searched only		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
3-14	3.2	3.3	3.0	..	..	..	..	..	..	..	..	..
15-24	32.3	34.7	29.9	3.3	3.6	3.0	1.2	1.3	1.1	5.0	5.4	4.7
25-74	34.3	39.2	29.6	5.0	5.9	4.3	1.1	1.2	1.0	4.1	4.8	3.6
75+	4.2	5.8	3.1	0.3	0.4	0.2	0.3	0.3	0.3	0.3	0.5	0.3

.. No data for those below 15 years since e-commerce questions were asked to those 15 years and above.

Table F: Key Indicators at Individual Level by Highest Completed Level of Education

Key Indicators at individual level for population 3 years and above by highest level completed/attained												
	Owning a mobile phone			Using a mobile phone			Using a Mobile Phone without owning/ Mobile sharers			Using a computer		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
None/Never Attended	21.5	18.8	23.9	27.5	24.7	30	3.5	3.8	3.3	1.8	2	1.7
Pre-Primary	18.9	17.9	20	29.6	28.5	30.6	10.7	10.7	10.7	3	3.1	2.8
Primary	40.7	40	41.3	51.4	50.5	52.2	10.7	10.5	10.9	3.7	4.1	3.2
Secondary	75.7	78.1	73.3	82.4	83.8	80.8	6.6	5.7	7.6	16.5	18.6	14.3
Middle Level/TVET	96.8	96.5	97.1	97.9	97.7	98.2	1.1	1.2	1	47.8	50.2	45.5
University (Undergraduate/Masters/ PhD)	98.3	98.2	98.6	100	100	100	1.6	1.8	1.4	82.4	82.9	81.7
Adult Education	46.8	44	49.7	51.4	48.6	54.4	4.6	4.5	4.7	4.1	4.3	3.8
Madrassa/Duksis	38.3	38.2	38.3	42.5	41.5	43.9	4.2	3.3	5.5	6.3	6.4	6.1
Vocational Training	82.8	83.1	82.5	86.6	86.5	86.9	3.8	3.4	4.4	11.4	12	10.6

	Using internet			Searched and bought online			Searched and bought elsewhere			Searched only		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
None/Never Attended	4.6	4.9	4.3	0.4	0.5	0.3	0.8	1	0.7	0.9	1.1	0.8
Pre-Primary	4.9	5.4	4.4	0.4	0.5	0.3	0.4	0.4	0.3	0.9	1.1	0.8
Primary	11.4	13.2	9.7	0.7	0.8	0.5	0.4	0.5	0.4	1.5	1.8	1.2
Secondary	44.3	48.8	39.7	4	4.6	3.3	1.2	1.3	1	6	6.7	5.3
Middle Level/TVET	79.4	79.5	79.2	14.4	15.1	13.8	2.8	2.9	2.8	12.5	12.5	12.6
University (Undergraduate/Masters/ PhD)	95.4	94.8	96.3	33.9	33.1	34.9	4.2	4.2	4.2	14.5	14.2	14.8
Adult Education	13.8	14.4	13	1	1.1	0.9	1.2	1.2	1.2	1.7	1.8	1.6
Madrassa/Duksis	18.9	18.1	20	2.9	3	2.7	1.5	1.6	1.3	2.2	2.7	1.6
Vocational Training	38.2	40	35.2	3.4	3.7	2.9	1	1	1.1	5	5.7	3.9

Table G: Key Indicators at Individual Level by Current Attendance Level of Education

Key Indicators at individual level for population 3 years and above currently at school												
	Owning a mobile phone			Using a mobile phone			Using a Mobile Phone without owning/ Mobile sharers			Using a computer		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Pre-primary	1.8	1.8	1.8	12.9	12.9	12.9	11.1	11.2	11.1	2.4	2.4	2.3
Primary	4.7	5	4.4	19.7	19.9	19.4	14.9	14.9	15	4	4.1	3.8
Secondary	30.7	37.1	24.3	48.8	53.2	44.3	18	16.1	20	12	13.3	10.7
Tertiary	93.7	93.2	94.1	95.5	95	95.9	1.8	1.9	1.8	73.6	75.2	72.2
University	97.3	97	97.6	100	100	100	2.7	3	2.4	100	100	100
Vocational Training	52.8	57.3	45.2	61.8	65.9	55	9	8.5	9.8	9.1	9.8	7.9
Adult Basic	46.1	42.8	49.6	50.9	47.4	54.4	4.7	4.7	4.8	4	4.4	3.5
Madrasa/Duksi	13.2	13.4	13	18.5	18.6	18.4	5.3	5.2	5.4	2.1	2.1	2.2

	Using internet			Searched and bought online			Searched and bought elsewhere			Searched only		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Pre-primary	2.3	2.3	2.3	..	..	..	..	..	..	..	..	..
Primary	4	4.3	3.7	0.2	0.2	0.2	0.6	0.6	0.6	0.9	1	0.8
Secondary	23.9	28.8	19	1.4	1.6	1.1	0.7	0.8	0.6	3.7	4.4	3.1
Tertiary	88.7	89.4	88.1	11.2	12.5	10	3.2	3.3	3.1	15.3	15.5	15.2
University	100	100	100	26.8	27.1	26.4	5	5	5	18.1	18	18.3
Vocational Training	14.4	15	13.9	1.3	1.3	1.2	0.6	0.7	0.5	3.7	3.9	3.2
Adult Basic	7.6	7.3	7.8	1.1	1.3	1	1.1	1.1	1.1	1.8	1.9	1.7
Madrasa/Duksi	27.1	30.4	21.5	1.1	1.2	1.1	0.9	1	0.8	2.3	1.7	3

.. No data for those below 15 years since e-commerce questions were asked to those 15 years and above.

Table H: Key Indicators at Individual Level by Main Job Status

Key Indicators at individual level for population 3 years and above by main job status												
	Owning a mobile phone			Using a mobile phone			Using a mobile phone without owning/ Mobile Sharers			Using a computer		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Not Working/ No Work Available ¹	70.2	69.9	70.6	73	72.8	73.4	2.8	2.9	2.8	13.2	13.3	13
Persons outside the Labour Force ²	19.6	17.1	21.8	32.4	30.2	34.5	12.8	13	12.7	9.3	9.7	8.9
Paid Employees ³	81	82.1	79.4	84	84.8	82.8	7.7	5.5	10.9	18.2	19	17
Self Employed ⁴	74.6	75.4	73.9	78.6	78.7	78.6	2.9	3.7	2.4	8.4	11.3	6.3
Apprentice/Intern/Volunteer ⁵	74.3	75.8	72.3	77.2	78.4	75.4	2.8	2.6	3.1	21.4	21.9	20.6
Other	58.4	56	60.1	62.6	59.6	64.9	4.2	3.6	4.8	3.4	4.1	2.8

	Using internet			Searched and bought online			Searched and bought elsewhere			Searched only		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Not Working/ No Work Available ¹	35.6	35.3	35.9	4.1	3.9	4.3	1.4	1.4	1.5	5	4.9	5
Persons outside the Labour Force ²	13.8	13.7	13.9	3.3	3.5	3.1	1.1	1.2	1.1	4.6	4.9	4.3
Paid Employees ³	40.2	43.1	36.1	6.9	7	6.6	1.3	1.4	1.3	5.4	5.7	5
Self Employed ⁴	25.9	31.4	22	3.1	4.2	2.4	0.8	1	0.7	3.2	3.9	2.6
Apprentice/Intern/Volunteer ⁵	40	42.5	36.5	6.8	6.8	6.7	1.7	1.7	1.6	6.7	7	6.3
Other	13	15.1	11.4	0.8	1.1	0.7	0.6	0.7	0.5	1.6	1.9	1.3

¹Not Working/ No Work Available: refers to those who are future starters seeking work-action taken, seeking work-action not taken, no work available

²Persons outside the Labour Force include those that are retired, too old to work, homemakers, full-time students, incapacitated, too young to work.

³Paid Employee includes paid employees outside household; paid employees within a household

⁴Self-employed refers to those working on own/family business; family agricultural holding.

⁵Apprentice/Intern/Volunteer includes both paid and non-paid

Table I: Key Indicators at Individual Level by Marital Status

Key Indicators at individual level for population 12 years and above by Marital Status												
	Owning a mobile phone			Using a mobile phone			Using a mobile phone without owning/ Mobile Sharers			Using a computer		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Never Married	40.8	41.9	39.5	51.5	51.9	51	10.7	10.1	11.5	15.4	15.6	15.2
Married Monogamous	81.4	85.3	77.9	84.8	87.7	82.2	3.4	2.4	4.3	12.8	15.7	10.2
Married Polygamous	71.1	78.2	64.6	75.1	80.9	69.7	4	2.7	5.1	5.7	8.3	3.3
Widowed	67.8	66.3	68	71.8	70.5	72	4.1	4.2	4	3.5	5.4	3.3
Divorced	77.2	68.8	81.8	80.7	73.7	84.5	3.5	4.9	2.8	8.5	8.9	8.3
Separated	80.2	70.9	86.5	84.3	76.6	89.4	4	5.7	2.9	8.8	7.8	9.6

	Using internet			Searched and bought online			Searched and bought elsewhere			Searched only		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Never Married	28.3	29.2	27.2	4.9	4.9	5	1.4	1.4	1.3	5.7	5.7	5.6
Married Monogamous	33	38.7	27.7	4.4	5.4	3.5	1	1.2	0.9	3.9	4.5	3.4
Married Polygamous	17.4	23.6	11.6	1.7	2.6	1	0.7	0.8	0.5	1.7	2.3	1.2
Widowed	11.2	14.1	10.7	1	1.6	0.9	0.4	0.5	0.4	1	1.4	1
Divorced	27	24.7	28.3	3.4	3.4	3.4	0.8	0.8	0.8	2.8	2.8	2.8
Separated	28.9	23.2	32.7	3.2	2.6	3.6	0.8	0.7	0.9	3.6	2.9	4

Table J: Key Indicators at Individual Level by Religion

Key Indicators at individual level for population 3 years and above by Religion												
	Owning a mobile phone			Using a mobile phone			Using a mobile phone without owning/ Mobile Sharers			Using a computer		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Catholic	49.8	50.7	49	57.6	58.1	57	7.7	7.4	8	12.2	13.6	10.8
Protestant	49.4	49	49.8	57.9	57.4	58.4	8.5	8.4	8.7	12.9	14.6	11.4
Evangelical Churches	46.4	45.1	47.5	55.4	53.9	56.6	9	8.8	9.2	9.4	10.9	8.1
African Instituted Churches	45.9	45.4	46.4	54.3	53.5	55.1	8.4	8.1	8.7	6.9	8.3	5.7
Orthodox	47.7	48.3	47.1	55.6	55.8	55.3	7.9	7.5	8.3	8.6	10.1	7.2
Other Christian	55.3	59.6	49.1	61.6	65.5	55.9	6.3	6	6.8	10.9	12	9.4
Islam	36.2	37	35.3	40.8	41.3	40.2	4.6	4.3	4.9	6.6	7.5	5.6
Hindu	80.7	82.6	78.6	86	87.5	84.2	5.2	4.9	5.6	52.8	59.4	45.3
Traditionists	26	29.4	21.8	29.9	33	26	3.8	3.6	4.1	1.8	2.3	1.1
Other Religion	48.6	52.4	43.5	54.1	57.6	49.5	5.6	5.2	6	8.3	9.4	6.8
No religion /Atheists	52.1	57.4	38.3	57.8	62.7	44.8	5.7	5.4	6.6	6.2	6.8	4.6

	Using internet			Searched and bought online			Searched and bought elsewhere			Searched only		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Catholic	25	27.5	22.5	4.9	5.5	4.3	1.2	1.3	1.1	4.7	5.2	4.3
Protestant	25.3	27.9	22.8	5.3	6.1	4.5	1.2	1.4	1.1	5	5.7	4.4
Evangelical Churches	21.1	23.8	18.8	3.6	4.5	3	1	1.2	0.9	4.3	5.1	3.7
African Instituted Churches	17.7	20.7	15	2.5	3.3	1.9	0.8	1	0.7	3.4	4.2	2.8
Orthodox	20.4	23.4	17.5	3.3	3.9	2.6	1	1.1	0.8	3.8	4.5	3.2
Other Christian	26.3	29.4	21.9	4.6	4.8	4.2	1	1	0.9	4.3	4.7	3.7
Islam	16.5	18.1	14.8	2.9	3.2	2.6	1.2	1.2	1.1	2.9	3.2	2.5
Hindu	77.3	80.7	73.4	22.4	25.6	18.8	1.2	1.3	1.1	6	6.1	5.9
Traditionists	5.6	7	3.9	0.7	0.9	0.4	0.5	0.5	0.5	1	1.3	0.7
Other Religion	19.9	23.1	15.7	3.6	4	3	0.8	0.9	0.7	3.1	3.5	2.5
No religion /Atheists	18.2	20.7	11.6	2.7	2.7	2.7	0.6	0.6	0.5	2.2	2.4	1.5

Chapter 1: Introduction

1.1 Background Information

A population census is the total process of collecting, compiling, evaluating, analysing, and publishing or otherwise disseminating demographic, economic, and social data pertaining, at a specified time, to all persons in a country or in a well-delimited part of a country. It is vital for effective national development planning because it provides detailed benchmark data on all population characteristics.

The first known population census in Kenya was conducted in 1897 and was a headcount. This was followed by the 1948 census that focused on non-natives. A complete census that enumerated 8.6 million persons was conducted in 1962 and was used to set up political and administrative structures. The first post-independence census was undertaken in 1969 and enumerated 10.9 million persons. Since then, the country has conducted decennial population and housing censuses on a de facto basis with the midnight of 24th/25th August as the reference point. The censuses have been implemented in accordance with the United Nations (UN) Principles and Recommendations for conducting population and housing censuses. Table 1.1 presents census results since 1897.

Table 1. 1: Summary of Census Counts in Kenya, 1897-2019

Year	Population (millions)
1897	2.5
1948	5.4
1962	8.6
1969	10.9
1979	15.3
1989	21.4
1999	28.5
2009	37.7
2019	47.6

The 2019 Kenya Population and Housing Census was conducted under the provisions of the Constitution of Kenya, 2010 (Fourth Schedule Part 1 Item 11), the Statistics (Amendment) Act, 2019 and the Statistics (Census of Population) Order, 2018 - Legal Notice No. 205 and the Cabinet Memorandum of May 2017 on the implementation of the 2019 population and housing census process. The theme for the census was “*Counting Our People for Sustainable Development and Devolution of Services.*”

1.2 Objectives of the 2019 Census

The main objective of the 2019 KPHC was to collect information on the size, composition, distribution, and socio-economic characteristics of the population. The specific objectives were to ascertain:

- Population size, composition, and spatial distribution.

- Levels of fertility, mortality, and migration.
- Educational attainment.
- Household composition.
- Rate and pattern of urbanization.
- Size and deployment of labour force.
- Uptake of ICTs.
- Distribution of persons with disability.
- Housing conditions and availability of household amenities; and
- Agricultural indicators to inform the creation of an agriculture sampling frame.

This information will be used in planning, budgeting, and programming for important services; future policy formulation, resource allocation; creation of administrative and political units; monitoring and evaluation of programmes and projects; research; development of a master household sampling frame; development of a geospatial database; and benchmark for ICT surveys.

1.3 Overview

The 2019 KPHC captured information on the use and ownership of ICT equipment at both individual and household levels. ICT questions at an individual level were asked of individuals age 3 years and above for those who own a mobile phone, use and share a mobile phone, use the Internet and computer. E-commerce questions were asked to individuals aged 15 years and above. All questions were referenced in the last 3 months.

E-commerce entails the buying and selling of goods and/or services online regardless of the mode of payment and delivery. The census however, captured the buying aspect only. E-commerce was categorized in three aspects. Searched and bought (1) refers to those who successfully ordered their goods and/or services online. Searched and bought elsewhere (2) refers to those who browsed for the items they wanted online but opted to buy the goods in physical retail. Searched only (3) refers to those who browsed for items online but did not buy them online or in a physical shop. Searched and bought elsewhere and searched only are also referred to as potential e-commerce users as they are regarded to have the necessary skills in using e-commerce and may successfully buy the goods online in the future.

Information on ICTs was also captured at the household level. Ownership of a stand-alone radio which excludes integrated radio devices such as cars, television, computers, etc, was captured. Households with functional television which includes those with pay TV decoder, or in-built digital television was captured. The census also captured those with analogue television which refers to those that have never purchased or migrated to a digital television capable of receiving digital signals. In other words, these are households that were negatively affected by the digital migration that occurred in 2015. The report also entails households who own a computer/laptop/tablet. Lastly, the census captured households with an Internet connection by type, that is, mobile broadband which refers to a network through a mobile handset, card or a USB modem; and/or fixed broadband which refers to technologies at advertised download speeds of at least 256 Kbit/s, such as Digital Subscriber Line

(DSL), cable modem, high speed leased lines, fibre-to-the-home/building, powerline, and other fixed broadband.

1.4 General Trends

The population and housing census conducted in 2009 included questions on ICT at both individual and household levels. At the individual level, the 2009 census captured the access of ICTs for individuals aged 3 years and above who used them in the last one month while the 2019 census captured the use and ownership of ICTs age 3 years and above with the reference period of the last 3 months. With this, it is not possible, therefore, to compare the two censuses for ICT indicators at the individual level. The indicators captured in the 2009 census included the use of stand-alone radio, television, mobile phone, fixed telephone, and computer. It also captured the frequency of use of the Internet and location. It is worth noting that the definition for television in the 2009 census did not have the digital aspect as digital migration had not occurred, and tablet was also not included in the computer as they were not yet in the market. The results for access to ICTs in the 2009 census are shown in Table 1.2.

Table 1.2 Proportion of Individuals 3 years and above Accessing ICTs- 2009 Census

Proportion of Individuals with access to:	
a. Mobile phone	51.4
b. Computer*	5.9
c. Internet	5.5
d. Fixed telephone	2.3
e. Radio	76.6
f. Television	35.2

*Classification of computers does not include tablets.

At the household level, the 2009 census included indicators such as ownership of Radio, Television, Mobile phone, and Landline. The results are shown in Table 1.3.

Table 1.3: Proportion of Households owning ICTs at the household level, 2009 & 2019 Census

Proportion of HHs owning a:	2009 Census			2019 Census		
	Kenya	Rural	Urban	Kenya	Rural	Urban
Stand-alone Radio	74	71.3	78.4	57	58.5	54.5
Television	28	15.8	47.8	38.8	25.1	60.6
Mobile Phone	63.2	52.7	80.2	N/A	N/A	N/A
Fixed telephone	1.2	0.04	2.6	N/A	N/A	N/A
Computer*	3.6	0.9	7.9	8.8	3	18

*Classification of computers does not include tablets to allow for comparison between 2009 and 2019 Census

N/A data not available

The definitions for the stand-alone radio in the 2009 and 2019 census are the same. However, a comparison between the two censuses shows that in the just-concluded census, radio ownership has decreased compared to the 2009 census. It is worth noting that, the use of integrated radio- integrated with another device, such as an alarm clock, an audio player, a mobile telephone, a car, or a computer

has gained more popularity than the stand-alone radio. The 2019 census shows stand-alone radio only without the integrated radio.

Ownership of television in the 2009 census captured television as one which is functional. Since the digital migration had not occurred then, this indicator can be compared with functional television captured in the 2019 census with the notion that the latter receives the digital signal. Indicators on ownership of mobile phones and fixed telephones were not captured in the 2019 census. This is because fixed telephone has become obsolete especially at the household level while mobile phone ownership was captured at the individual level in the 2019 census. Indicators on ownership of computers in the 2009 census did not include the tablet mainly because they were not in the Kenyan market then. It is important to note that the uptake of the computer has slightly increased over the last decade.

In conclusion, ICT indicators both at individual and household levels demonstrate an upward trend, except among those accessing the stand-alone radio. This is because of new ways of listening to a radio have emerged such as listening through integrated devices. Furthermore, the fixed telephone is considered obsolete and hence depicts a downward trend.

1.5 Methodology

1.5.1 Use of Technology

Kenya adopted the use of mobile technology to collect data during the 2019 Census as recommended by the UN for the 2020 round of censuses. This was the first census in Kenya's history to use mobile technology in the capture and transmission of data for both cartographic mapping and enumeration. During mapping, the GPS coordinates for homesteads, households and other points of interests within the locality were collected using the mobile devices with an accuracy of plus or minus 5 Meters. The enumeration area (EA) maps were developed using Arc GIS Software on a background of aerial photographs and satellite imageries that were not more than six months old from the date of the field cartographic data collection. The EA maps were then uploaded into the tablets assembled by two local universities to facilitate the 2019 Census enumeration exercise.

1.5.2 Recruitment and Training

Recruitment of census personnel comprising content supervisors, supervisors, and enumerators was undertaken by the County and Sub-County Census Committees through a competitive process. The training of these personnel was conducted in a cascaded manner from the training of trainers to the training of enumerators. The training for various cadres was conducted for seven days for each cadre. These trainings were sequentially conducted between 14th July and 20th August 2019.

1.5.3 Enumeration

Census enumeration was preceded by enumeration area (EA) boundary identification and pre-enumeration listing of households in each EA for two days before the census night. The pre-enumeration listing exercise helped in gauging the expected workload during the seven days of

enumeration and also in monitoring the level of coverage as enumeration progressed. The actual enumeration took place from the night of 24th/25th August 2019 and ended on 31st August 2019. A mop-up exercise was conducted on 1st and 2nd September 2019. Special populations were strictly enumerated on the night of 24th/25th August 2019. The 2019 Census adopted the *de facto* approach where all persons within the boundaries of Kenya were enumerated depending on where they spent (or were found) on the census night. The canvasser method of enumeration, where information for each individual or household is collected and recorded by a trained census official designated to perform the tasks in the assigned area, was used.

1.5.4 Data Transmission and Storage

Data collected by enumerators using mobile devices (tablets) were then transmitted to a central server. The data were encrypted prior to transmission and backed up in off-site locations.

1.5.5 Data Processing

Editing of the census data was guided by the United Nations Handbook on Population and Housing Census Editing. The data were processed using CPro, Stata, and SPSS software's. In addition, validation checks were undertaken to ensure all EAs, aligned to administrative boundaries, were accounted for in the dataset. Outputs were generated based on administrative and geopolitical units.

1.5.6 Quality Assurance

Quality assurance was integrated into all phases of the census process. Comprehensive guidelines were developed and shared with census personnel. Field supervision followed a three-tier structure to ensure adequate support, real-time response to emerging issues, and feedback during data collection. In addition, enumeration reporting schedules and control forms were used to facilitate the monitoring of activities. Field monitoring teams oversaw technical, logistical, and administrative aspects of enumeration in each region. Further, independent observers, drawn from the international community and national statistics offices across Africa, monitored and observed the 2019 census enumeration process.

1.5.7 Data Quality

Evaluation or appraisal of data is a critical step in census undertaking to ensure quality. Evaluation techniques are often necessary to figure out whether the data collection was correctly done and whether the data are of acceptable quality. Owing to the massive data collection involving thousands of field interviewers, errors may creep in at any stage of data collection and processing. An evaluation of census data is desirable to assess the quality of the data. Evaluative studies probe into the qualitative and the quantitative aspects of the data.

1.5.8 Objectives of Evaluation:

- a) To find the types and sources of errors or biases to know which groups, items, or methodology produce errors.

- b) To measure the accuracy of the data and where possible.
- c) To adjust the data by considering the varieties and number of errors present.

1.5.9 Sources and Types of Errors

Two main types of errors occur in census data: coverage and content errors. Statistics classified by age groups may be affected both by errors in the reporting of ages and by variations in the completeness of enumeration.

a. Coverage Errors

There are two types of coverage errors. (1) Population under-coverage refers to the error of excluding someone who should have been counted. (2) Population over-coverage refers to the error of either counting someone more than once or including someone who should not have been enumerated. The latter error is considered negligible. Under-coverage is more common than over-coverage. Coverage errors are one of the most important types of error since they affect not only the accuracy of the counts of the various census universes but also the accuracy of all of the census data describing the characteristics of these universes.

Coverage errors may occur in various forms, namely: omitting a unit that should have been included; including a unit more than once; or including a unit that should not have been included. Although a massive effort is made to provide comprehensive training and up-to-date cartographic maps to field staff, as well as introducing checks and controls throughout the fieldwork, such errors still occur. Consequently, any census data should always be checked for any inconsistencies as a result of such errors. Various techniques have been developed for checking such inconsistencies

b. Content errors

These types of errors occur when an attribute of an enumerated individual is misreported or not reported at all. One common content error occurs in reporting the age of an individual. Age is one of the basic and vital information provided during a population census.

Population data in developing countries are often subject to age misreporting. Irregularities in the age distribution may be a result of a respondent's incorrect age declaration or the interviewer who estimates the age of a respondent who does not know his or her age. It is, therefore, important to evaluate the accuracy of the age distribution and correct for deficiencies wherever necessary.

1.6 Concepts and Definitions

Analogue TV	Refers to a television set that is not connected to either a free to air set-top box or a pay tv decoder thus not able to receive digital signals.
Computer use	Refers to individuals who use “a desktop computer, a laptop computer or a tablet or similar handheld computer in the last three months. It does not include equipment with some embedded computing abilities, such as smart TV sets, and devices with telephony as a main function, such as mobile or smartphones.”
Fixed Internet at home e.g Fiber to the home/building, Satellite dish, LAN, Wifi	Refers to fixed connection in the house including Fibre to the Home (FttH), cable modem, Integrated Services Digital Network (ISDN), Digital Subscriber Line (DSL), Worldwide Interoperability for Microwave Access (WIMAX), fixed Code Division Multiple Access (CDMA) and satellite which passes through the radio waves and Very Small Aperture Terminal (VSAT) dish antenna with a transceiver normally located at the subscriber’s premises, etc.
Functional Television	A functional television (TV) is a TV device capable of receiving broadcast television signals, using popular access means such as over-the-air, cable, and satellite. A television set is typically a stand-alone device. For this report, a functional Tv must either have a set-top box/ built-in digital television, pay tv decoder or be an IPTV.
Internet Protocol TV (IPTV)	This is a type of TV that receives multimedia services over an IP based network managed to support the required level of high quality
Internet through mobile phone/Modem	Refers to Internet through a portable modem, mobile phone, Universal Serial Bus (USB) wireless modem, tablet, etc.
Internet Use	These are individuals who used the Internet from any location and any device in the last three months.
Mobile phone ownership	An individual owns a mobile cellular telephone if they have a mobile cellular phone device with at least one active SIM card for personal use. It includes mobile cellular phones supplied by employers that can be used for personal reasons (to make personal calls, access the Internet, etc.) and those who have a

	mobile phone for personal use that is not registered under his/her name. It excludes individuals who have only active SIM card(s) and not a mobile phone device. The reference period observed is the last three months.
Mobile phone use	These are individuals who used a mobile telephone in the last three months regardless of whether they own it or not.
Mobile phone use without owning/ mobile sharers	These are individuals who used a mobile phone in the last three months, but they do not own one hence they borrow a handset and use it. Also includes those who own sim cards but borrow a handset to use mobile services.
Searched and bought elsewhere (Potential E-commerce Users)	Refers to individuals who searched for goods and services online but did not purchase or order the product or service through the Internet but in physical stores. They are referred to as potential e-commerce users as there is more likelihood of these individuals purchasing via online in the future.
Searched and bought online (E-commerce Users)	Refers to individuals who successfully bought goods and services online in the last three months.
Searched only (Potential E-commerce users)	These are individuals who searched for products or services but never ordered or purchased them. Includes individuals who ordered the goods or services and cancelled it at some point. They are referred to as potential e-commerce users as there is more likelihood of these individuals purchasing online in future.
Stand-alone radio	Defined as a device capable of receiving broadcast radio signals, using common frequencies, such as FM, AM, LW, and SW. Excludes radio integrated with other devices such as TV, Phone, laptop, car, etc
TV booster/ Free to air set top box/ Built in Digital TV	This is a device that allows a digital signal to be received, decoded, and displayed on television to enable the channels to be displayed on your analog TV set.
TV with Pay TV Decoder	Maybe similar to the set-top box though it offers several channels that one has to pay a monthly fee to be able to view the programs

Chapter 2: Rationale for the ICT Monograph

The availability of information and communication technology (ICT) infrastructure and the uptake of its use continues to grow. The Internet is transforming society, with a growing amount of information and a large number of tools available. These advances, together with the recognition that ICTs are a driver of social and economic development, have resulted in the need for reliable, comprehensive, and comparable statistics to support government and industry policy decisions. The impressive growth in digital infrastructure and uptake over the past decade has led to increasing demand for accurate and comparable ICT data and statistics.

The ICT monograph presents key indicators used to measure the use and ownership of ICTs. ICT statistics collected during the 2019 KPHC are key in measuring achievements, milestones, and progress towards international, regional, and national development agenda and targets. This information is vital for monitoring the implementation of Kenya's national development agenda Vision 2030, SDGs, Africa's Agenda 2063, and other international and national targets and goals. Further, analysis in the monograph will be useful in generating indicators such as the digital readiness index and ICT development index. The information presented in the monograph will be useful in informing policymakers, investors, academicians, and the public on the uptake of Information and Communication Technology (ICT) in the country.

The ICT indicators compiled during the Census meet the set definitions and guidelines aligned by the International Telecommunication Union (ITU) and hence are comparable with other countries in the World (ITU, 2020).

2.1 ICT related International, Regional and National Strategies and Policies

In September 2015, the 2030 Agenda for Sustainable Development was agreed upon at the United Nations Sustainable Development Summit. This new framework for international cooperation to promote sustainable development between 2015 and 2030 is composed of 17 Sustainable Development Goals (SDGs), 169 targets, and some 232 indicators. While none of the goals is specifically about ICTs, several targets refer to digital technology. The 2030 Agenda for Sustainable Development also recognizes that "The spread of information and communications technology and global interconnectedness has immense potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies." Sustainable Development Goal 9, which concerns industrialization, innovation, and infrastructure, recognizes the importance of ICTs, and establishes Target 9.c, to "significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in the least developed countries by 2020." Measuring ICT access and use by households and individuals is key to checking the progress of countries towards becoming information societies.

Agenda 2063 is Africa's blueprint and master plan for transforming Africa into the global powerhouse of the future. The plan refocuses and reprioritizes Africa's agenda from the struggle against apartheid and the attainment of political independence for the continent to inclusive social and economic development, continental and regional integration, democratic governance, and peace and security, amongst other issues aimed at repositioning Africa to becoming a dominant player in the global arena. The blueprint recognizes the importance of science, technology, and innovation in driving the development agenda for Africa. This is outlined in goals 2, 4, and 10 of the agenda, envisioning a well-educated citizens and skills revolution underpinned by Science, Technology, and Innovation (STI), transformed economies with STI driven manufacturing and industrialization and value addition and world-class infrastructure crisscrossing the continent with communication and infrastructure connectivity as a priority area (Agenda 2063).

The Kenya Vision 2030 identified ICTs as a key enabler to the attainment of its goals and aspirations. In the Vision, the ICT sector is envisaged to transform Kenya into a knowledge and information-based economy by enabling access to quality, affordable and reliable ICT services which play an important catalytic role in the economic and social development of the country. ICT further enables a more efficient public administration, provision of better services through innovation and e-government thus improving responsiveness to demands and enhancing transparency and accountability.

The ICT monograph contributes to computing indicators that measure the progress in achieving the Kenya MTP III of Vision 2030, SDG, Africa Agenda 2063, and other ICT policies both directly and indirectly. The ICT monograph contributes to MTP III indicators such as those for universal access to information which includes: Proportion of the population with Internet connectivity; Proportion of households with digital TVs; Proportion of households with Radio etc.

Furthermore, the Sustainable Development Goals (SDGs) for 2015-2030 aimed at creating a healthy, prosperous, and just world – one that eliminates poverty, provides dignity for all people, and protects the planet for future generations. Some of the SDG indicators that the ICT monograph contributes to include:

1. 5.b.1: Proportion of individuals who own a mobile telephone, by sex which is also related to target 1.4, 2.c, 12.8, 16.10, and 17.8;
2. 17.8.1: Proportion of individuals using the Internet, which is also related to target 1.4, 2.c, 5.b, 9.c, 10.3, 12.8, 16.10, and 17.6.

This monograph also contributes to measuring the progress of Agenda 2063 in indicators such as (i) Aspiration 1, goal 1: (a) Indicator 7: Percentage of population with access to the Internet (b) Indicator 8: Percentage of population using the Internet; (ii) Aspiration 2, goal 10: (a) Indicator 38: Proportion of population using mobile phones

The ICT individual indicators are disaggregated and cross-classified by sex, age, disability, geographic location, education level and economic/labour status, marital status, and religion.

Household ICT indicators are disaggregated and cross-classified by geographic location, household headship, household composition, agricultural activities, tenure-ship, wealth quintiles, and mains of lighting.

2.2 Objective

The ICT monograph is expected to:

- Provide information for monitoring the implementation of Kenya’s national development agenda Vision 2030, SDGs, and other related indices such as the digital readiness index and ICT development index.
- Provide opportunities on areas of investment for local and international private investors in the ICT sector. The data shows where ICT adoption and pockets of exclusion are at the county level which would lead to the development of policies and initiatives to mitigate this.
- Provide a database that is required to enhance basic services through the amplification of ICTs coverage and use in health, education, government services etc.

2.3 ICT Indicators at Individual Level

This section captures ICT indicators at the individual level from Chapter 3 to chapter 6.

The key indicators captured under this section meet the quality and standards required for use locally and comparable at the international level. The key indicators are as follows:

- a. The proportion of individuals owning a mobile phone.
- b. The proportion of individuals using a mobile phone.
- c. The proportion of individuals sharing a mobile phone.
- d. The proportion of individuals using the Internet.
- e. The proportion of individuals using a computer.
- f. The proportion of individuals using e-commerce who purchased goods and/or services.

Further, these ICT indicators have been disaggregated into more categories to produce more information that is useful for analytical purposes. The section below classifies the cross classifications used for the individual ICT indicators.

2.4 Individual characteristics

Data granularity is of more interest to policymakers as it is best for decision-making. The need for detailed data on subpopulations has been clearly stated in the 2030 Agenda for Sustainable Development, by coining the expression “leave no one behind”. In addition, disaggregating the data by various socio-economic and demographic profiles enriches the data for policymakers to understand not only the effectiveness of existing policies but also to point out gaps and hindrances. To facilitate policymaking, ICTs have been disaggregated by demographic profiles and socio-economic status such as age, sex, marital status, religion, area of residence, disability status, labour

force status, and education levels. Classifications for these categories are based on international standards and are described below:

2.4.1 Sex:

The sex (male or female)¹ of every individual was collected in the 2019 census as sex disaggregation of data is a fundamental requirement for social statistics and the analysis of the gender gap in the use of ICT. This disaggregation informs SDG 5 (‘Achieve gender equality and empower all women and girls’). All ICT indicators are broken down by sex to maximize information on any digital gender gap. The target population for this classification is 3 years and above.

2.4.2 Age

Age is a strong determinant of ICT use. In this report the age group ranges are 3-4; 5-9; 10-14; 15-24; 25-34; 35-44; 45-54; 55-64; 65-74; and 75 and above. It is important to collect data on children’s use of ICTs to provide information on the use of ICTs by children.

2.4.3 Area of Residence

This acts as a strong determinant in measuring the digital divide. Categorized as urban and rural areas, this breakdown plays a key role in establishing where ICTs are not in use and guides policymakers on the areas to focus on. The target population for this classification is 3 years and above.

2.4.4 Counties

The report disaggregates ICT indicators in the top and bottom counties giving a snapshot of how the counties are performing in terms of the uptake of the ICTs. In addition, a map showing proportion of the uptake of ICTs by county is depicted in the report. The target population for this classification is 3 years and above.

2.4.5 Current Education Level/ Education Attendance Level

Education levels influence the type of activity in which users engage in with implications for their gains. Use of the Internet by those currently in school, for instance, is likely to be for pedagogical purposes. Furthermore, those in school and not using the Internet and/ or computer is an indication they are missing out on the benefits that come with using such ICTs. Therefore, it is important to disaggregate this information by this classification for ease of identifying the existing gaps with the exact school level attended. The target population for this classification is 3 years and above.

2.4.6 Highest Education Level Attained

Education level attained has a great influence on the use of ICTs and the type of activity to be undertaken. For instance, those with lower levels of education make very limited use of mobile

¹ The 2019 Census collected data on Males, Female, and Intersex. This monograph, however, only shows data for male and female data on Intersex was excluded as it was too small. However, absolute numbers are shown in the annexes.

applications and/ or Internet, hence unable to exploit its full potential. The target population for this classification is 3 years and above.

2.4.7 Main Job Status

Categories for labour force status used to break down ICT indicators at the individual level are based on the International Labour Organization (ILO) international classification of status in employment (ISCE-93) and categorized as follows:

- a) Paid employee which includes: paid employee- outside household; paid employee- within a household;
- b) Self-employed: includes those working on own/family business; family agricultural holding.
- c) Apprentice/Intern/Volunteer: Includes those paid and non-paid.
- d) Not working/ no work available: refers to those who are future starters seeking work-action taken, seeking work-action not taken, no work available.
- e) Persons outside the labour force include those that are retired, too old to work, homemakers, full-time students, incapacitated, too young to work.

This category targets the population aged 5 years and above and is in accordance with the 18th International Conference of labour, resolution II, which states that the target population for measuring child labour comprises all persons within the age group 5 to 17 years.

2.4.8 Economic Activity

This category uses the broad category of international standard industrial classification of all economic activities (ISIC), revision 4, from section A to U. It is important to disaggregate the ICT data in the economic activities to capture where the digital divide exists. This category targets populations 5 years and above.

2.4.9 Disability

Persons living with disabilities (PWDs) face difficulties in everyday life including the use of ICTs. The importance of ICT in disability lies in its ability to serve as enablers for PWDs to realize their full potential by providing opportunities for participation and inclusion in the various aspects of life. ICTs offer new possibilities for PWDs, such as accessing online training, using voice-recognition software to manage a computer, etc. The data of PWDs was collected using the statistical standards proposed by the Washington Group in Disability Statistics. The Washington Group short set was designed as a core set of questions for self-reporting of functional limitations at the individual level. This category targets populations aged 5 years and above.

2.4.10 Religious Affiliation

The ICT data is disaggregated by the religious affiliation for the purpose of finding whether some beliefs may hinder the use of ICTs. In addition, this characteristic is used to bring out the digital divide

that may be caused by religious practices. The target group for this indicator is individuals aged 3 years and above.

2.4.11 Marital Status

The ICT data is disaggregated by marital status as part of socio-demographic/cultural characteristics classifications to bring out the existing digital divide among such categories. Advancement and proliferation of ICTs matters on family setup and distinct categories of marital status, may encourage, or deter the use of ICTs. The target population for this characteristic is 12 years and above.

Chapter 3: Ownership and Use of Mobile Phones

3.1 Mobile phone ownership

Mobile cellular networks have spread rapidly over the last decade. The number of mobile-cellular subscriptions has outnumbered the number of people. This is mainly because one individual can subscribe to several mobile networks or have several gadgets, hence leading to a high number of subscriptions. However, not every person uses or owns a mobile-cellular telephone and this is confirmed through household surveys or censuses.

Mobile phone ownership is considered a key indicator not only for measuring the progress of the uptake of technology but also its use. Mobile phones have provided an arena of opportunities over and above the usual calls and texts. Such opportunities range from digital payments and Internet access to a device one can use to monitor other devices. Several innovations with social impact are now accessible through a mobile phone and have facilitated key services such as financial services, health, agriculture, digital identity, energy, water, sanitation, disaster resilience, and gender equality, among others.

Mobile phone ownership is one of the SDGs indicators for tracking gender equality and the digital divide while working towards leaving no one behind. This indicator highlights the importance of mobile phone ownership to track and to improve gender equality and the digital divide. Monitoring this indicator will inform the design of targeted policies to address the inequalities.

The 2019 KPHC used the international definition of mobile phone ownership which refers to an individual who has an active mobile phone with at least one active sim card for personal use regardless of how it was acquired. The target population was those aged 3 years and above.

Figure 3.1 shows population distribution age 3 years and above who owned a mobile phone by sex and area of residence. The results show that overall, 47.3 percent of the targeted population owned a mobile phone of which 47.6 percent were males and 47.0 percent of females owned a mobile phone². This indicator responds to SDGs indicator 5.b.1. Results show that by area of residence, the majority of those who owned a mobile phone were in urban areas at 62.6 percent while those in rural areas were at 40.5 percent.

² Mobile ownership derived from mobile owners divided by total population age 3 years and above. Similarly, by sex, males/females who owned a mobile phone divided by total males/females age 3 years and above multiplied by 100

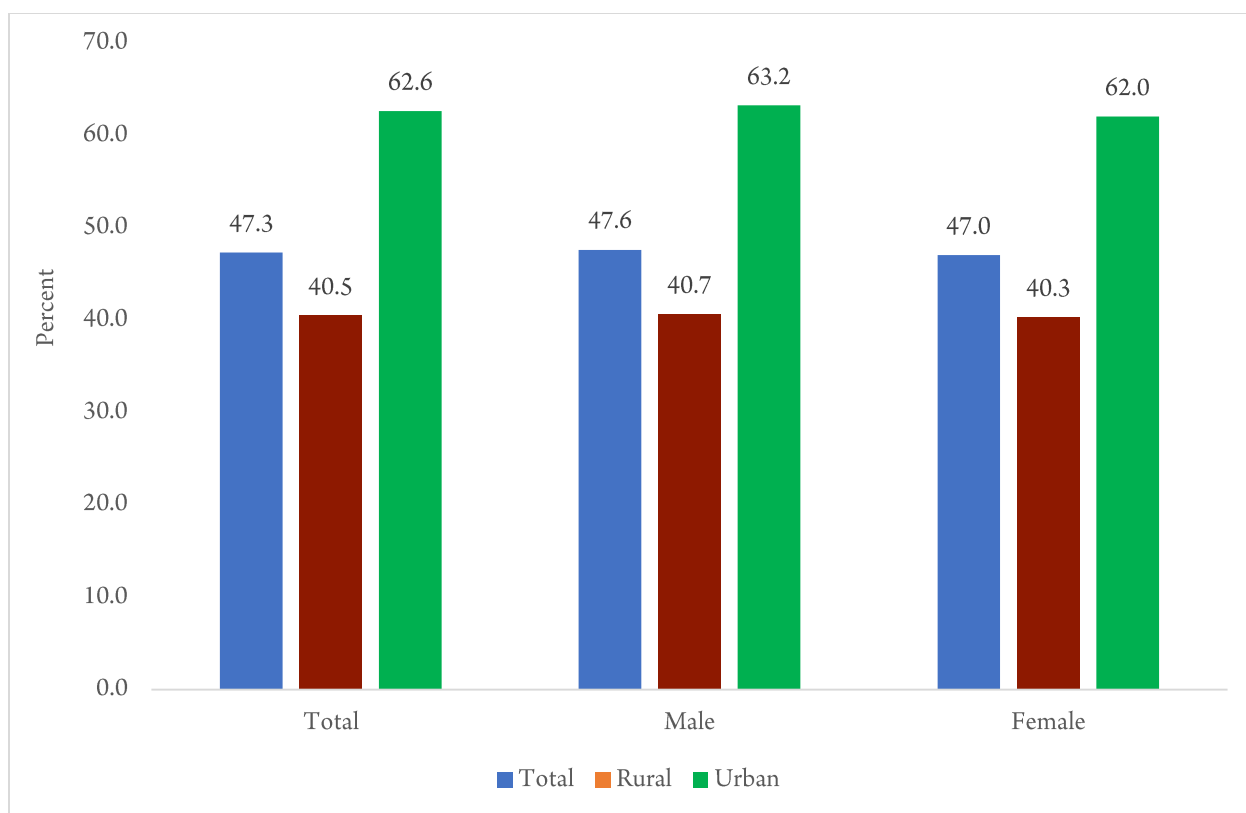


Figure 3.1: Population Distribution of Age 3 years & above of Persons owning a Mobile Phone by Sex & Area of Residence

Figure 3.2 presents the proportion of the population owning a mobile phone by age group and sex out of the population age 3 years and above. The highest proportion of individuals owning a mobile phone are within the 35-44 age group at 85.0 percent followed by those in the 45-54 years age group at 84.5 percent. Notably, there is a huge disparity (14.2 percentage points difference) between males and females aged 75 years and above, with males at 54.3 percent and females at 40.1 percent.

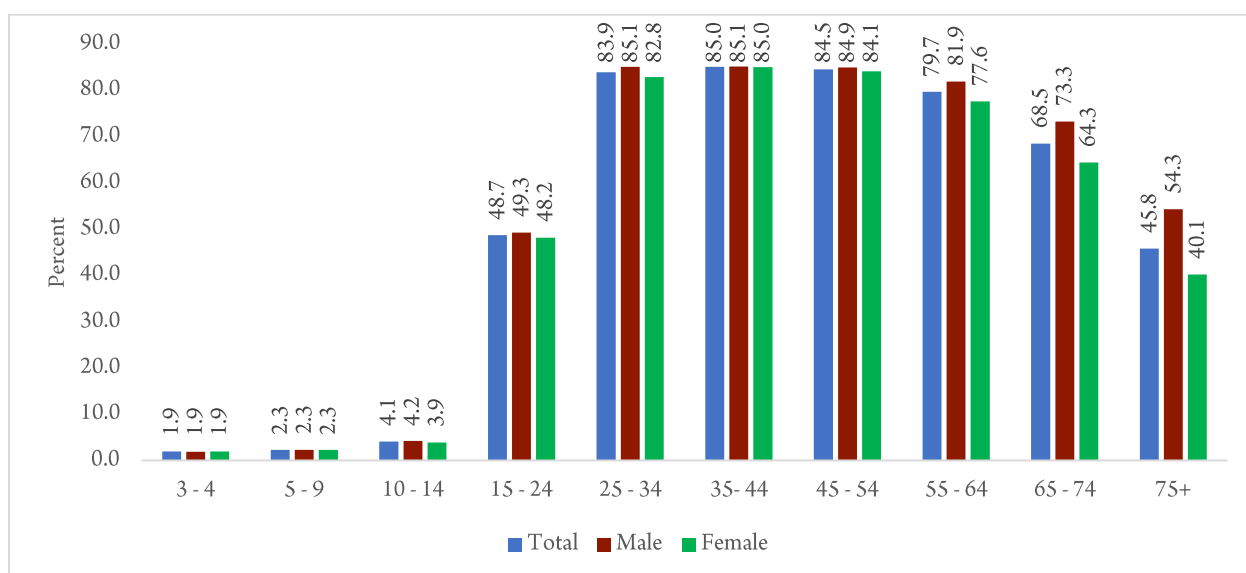


Figure 3.2: Proportion of Population Age 3 years and above who Owned a Mobile phone by Age group and Sex

Figure 3.3 shows counties with the highest and lowest proportion of males and females owning a mobile phone. Nairobi City County and Turkana counties had the highest and lowest proportion, respectively, of both males and females owning a mobile phone. Figure 3.4 shows the distribution of mobile phone ownership by county.

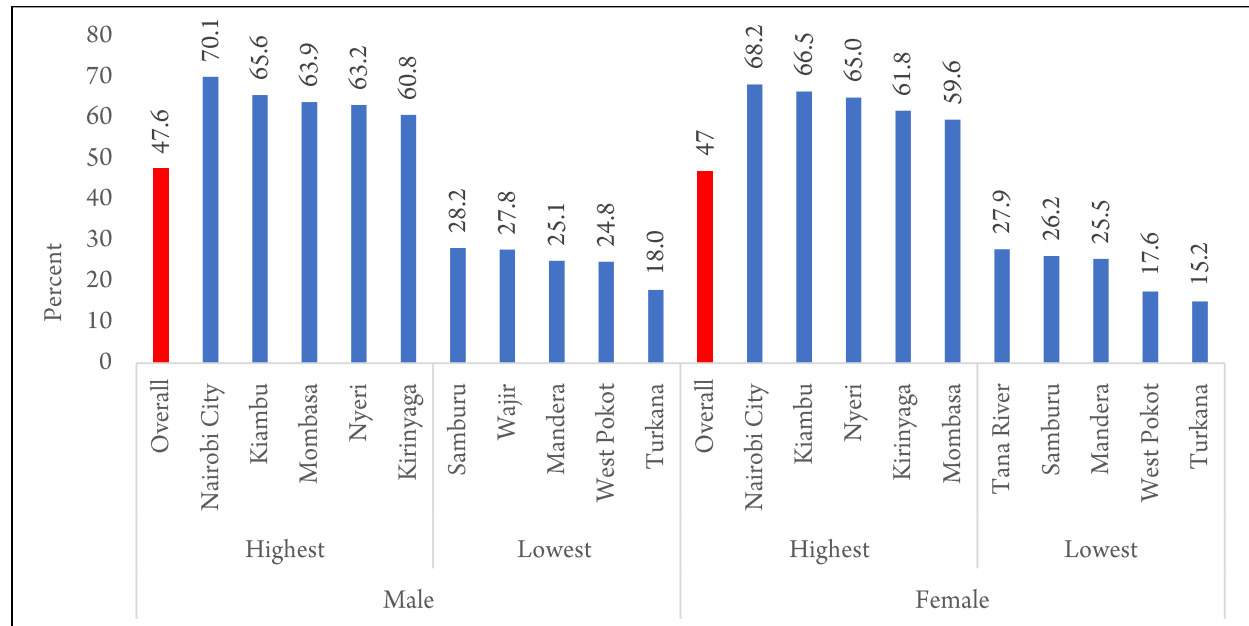


Figure 3.3: Counties with Highest and Lowest Proportion of Males & Females Owning a Mobile Phone.

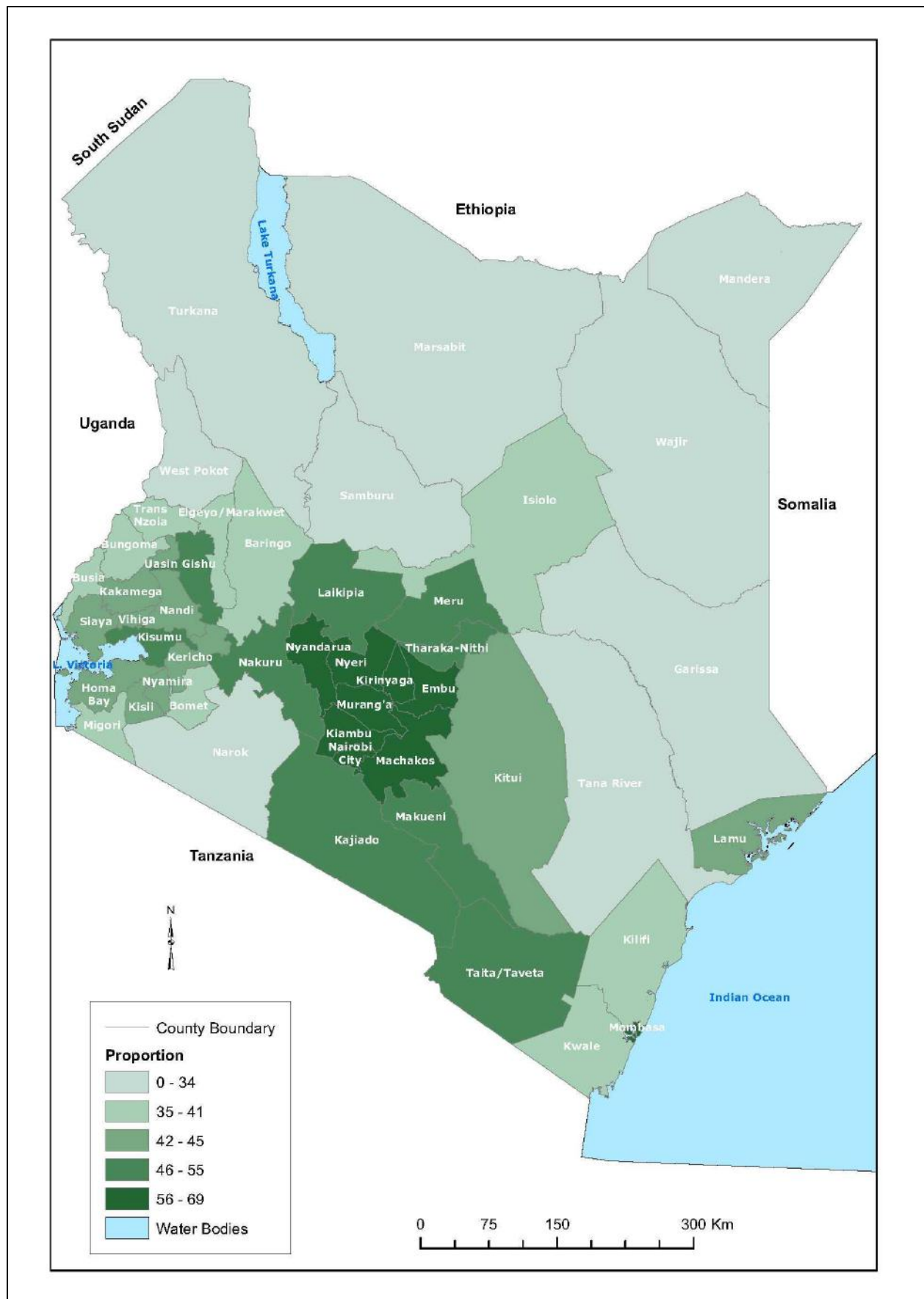


Figure 3.4: Mobile Phone Ownership by County

3.1.1 Mobile Phone Ownership and Education Attendance Level

Figure 3.5 presents the percentage distribution of population age 3 years and above who owned a mobile phone by education attendance level and area of residence. The data shows that overall, urban areas had more people owning a mobile phone while still in school, with the majority being in university at 98.2 percent followed by those in middle-level colleges at 96.0 percent.

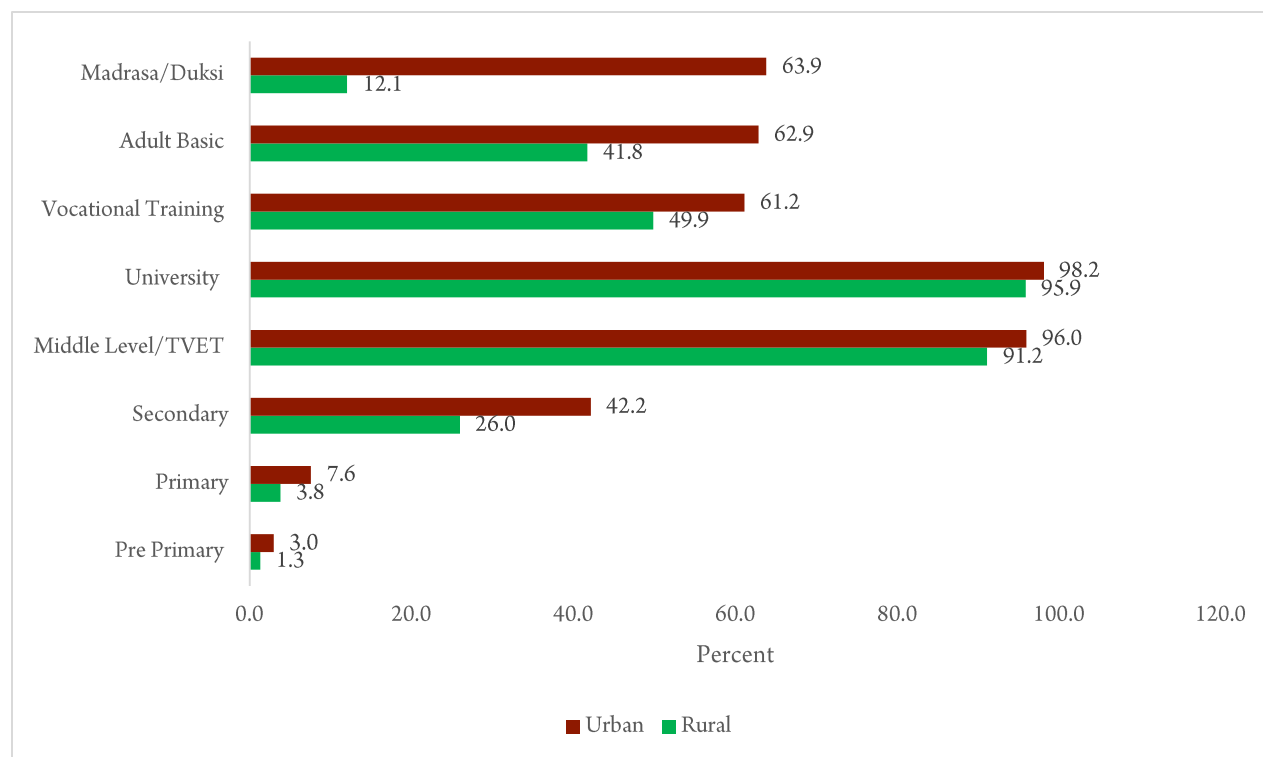


Figure 3.5: Percentage Distribution of Population Age 3 Years and above who Owned a Mobile Phone by Education Attendance Level and Area of Residence.

Figure 3.6 shows the percentage distribution of population age 3 years and above who owned a mobile phone by education level attendance and sex. Overall, ownership of mobile phones was higher among females than males in tertiary, university, and adult basic education.

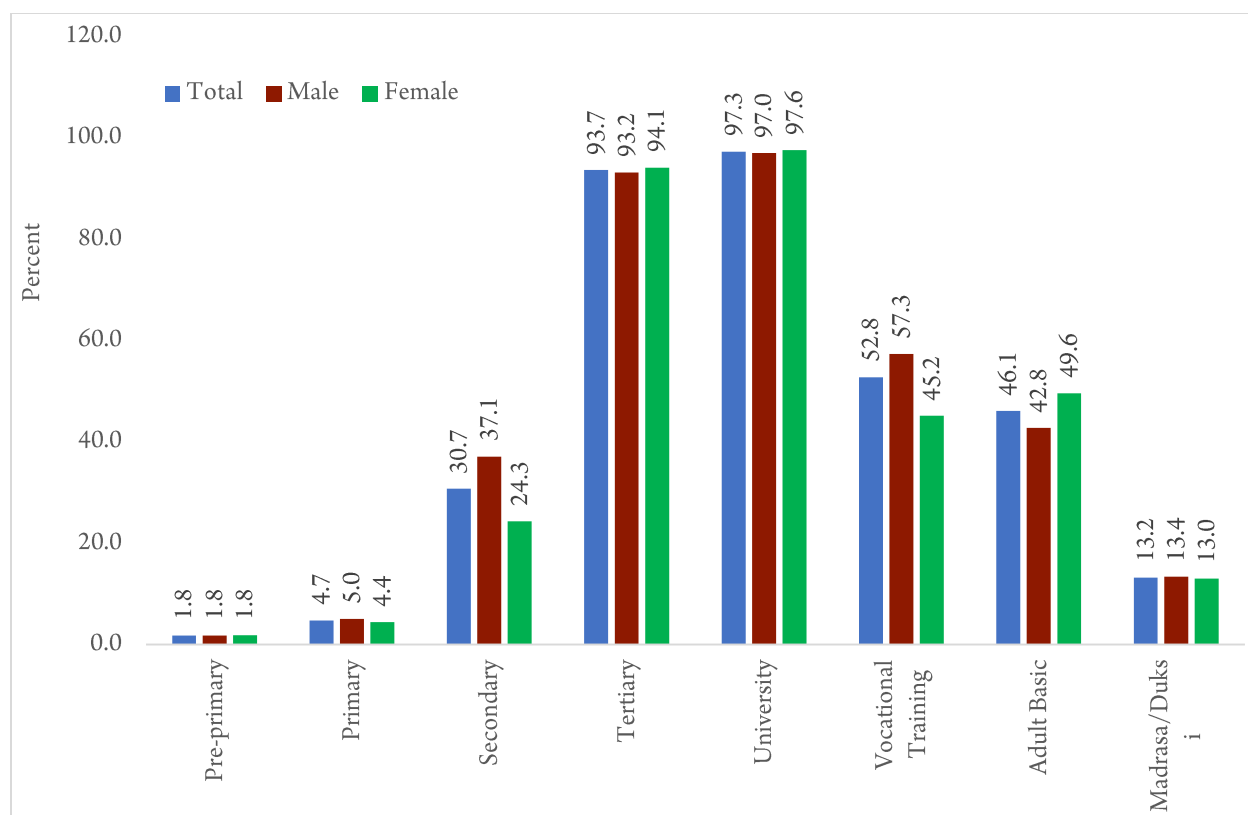


Figure 3.6: Percentage Distribution of Population Age 3 years and above who Owned a Mobile Phone by Education Level Attendance and Sex

3.1.2 Mobile ownership by Highest Education Level Completed

Figure 3.7 shows the population distribution of population age 3 years and above who owned a mobile phone by highest education level completed and residence. The ownership of mobile phones was highest among those from urban areas and had completed university education, at 98.9 percent while the least are those from rural areas who completed pre-primary levels, at 18.7 percent³.

³ Derived from those owning a mobile phone in urban/rural with respective highest education level divided by total population age 3 years and above by respective total highest level of education completed in either in rural or urban multiplied by 100

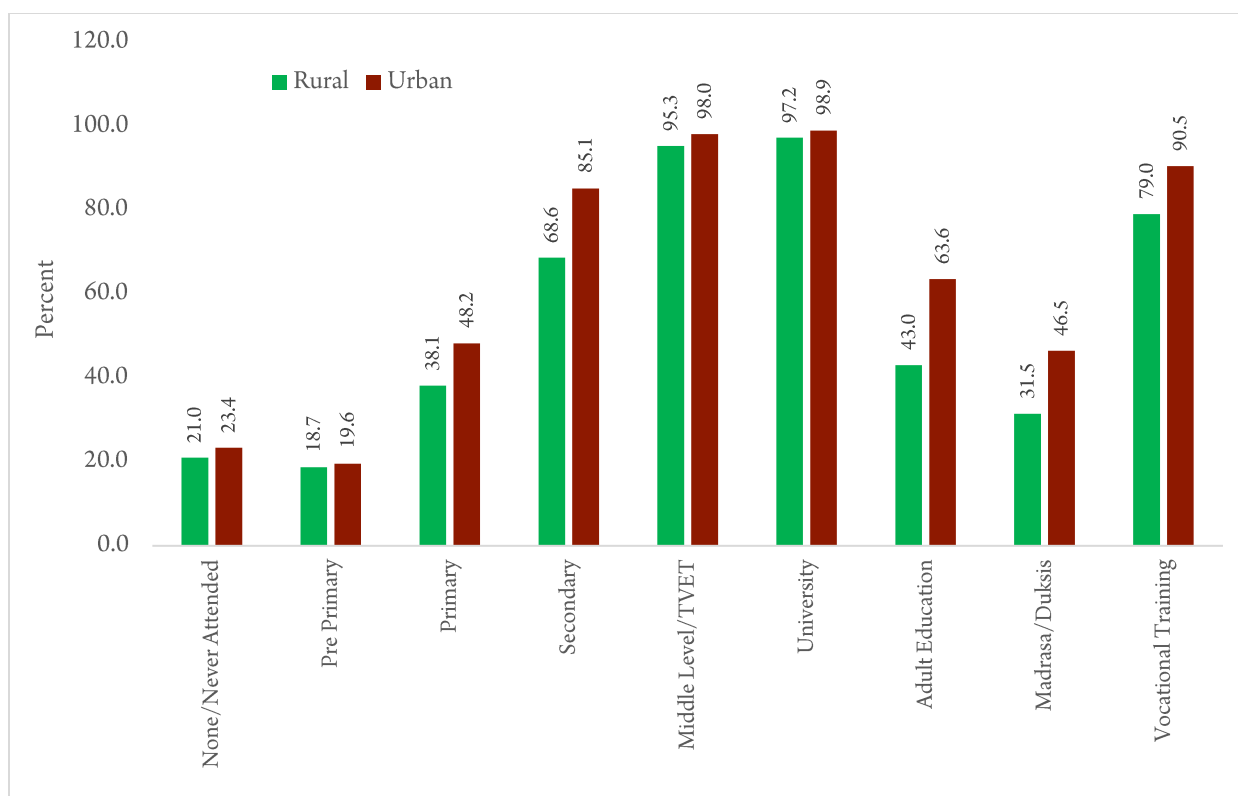


Figure 3.7: Population Distribution of Population Age 3 Years and above who Owned a Mobile Phone by Highest Education Level Completed and Area of Residence

Figure 3.8 presents the percentage distribution of the population aged 3 years and above owning a mobile phone, by highest education level completed and sex. For those who reported having completed university, females who owned a mobile phone were slightly more at 98.6 percent compared to males at 98.2 percent⁴. The least were males who had pre-primary as their highest education level at 17.9 compared to females at 20.0 percent. Overall, those who attained pre-primary were the least to own a mobile phone at 18.9 percent compared to those who never attended school at 21.5 percent.

⁴ Derived from those owning a mobile phone either female/male with respect to highest level of education divided by total population age 3 years and above by respective total highest level of education completed in either in female/male multiplied by 100

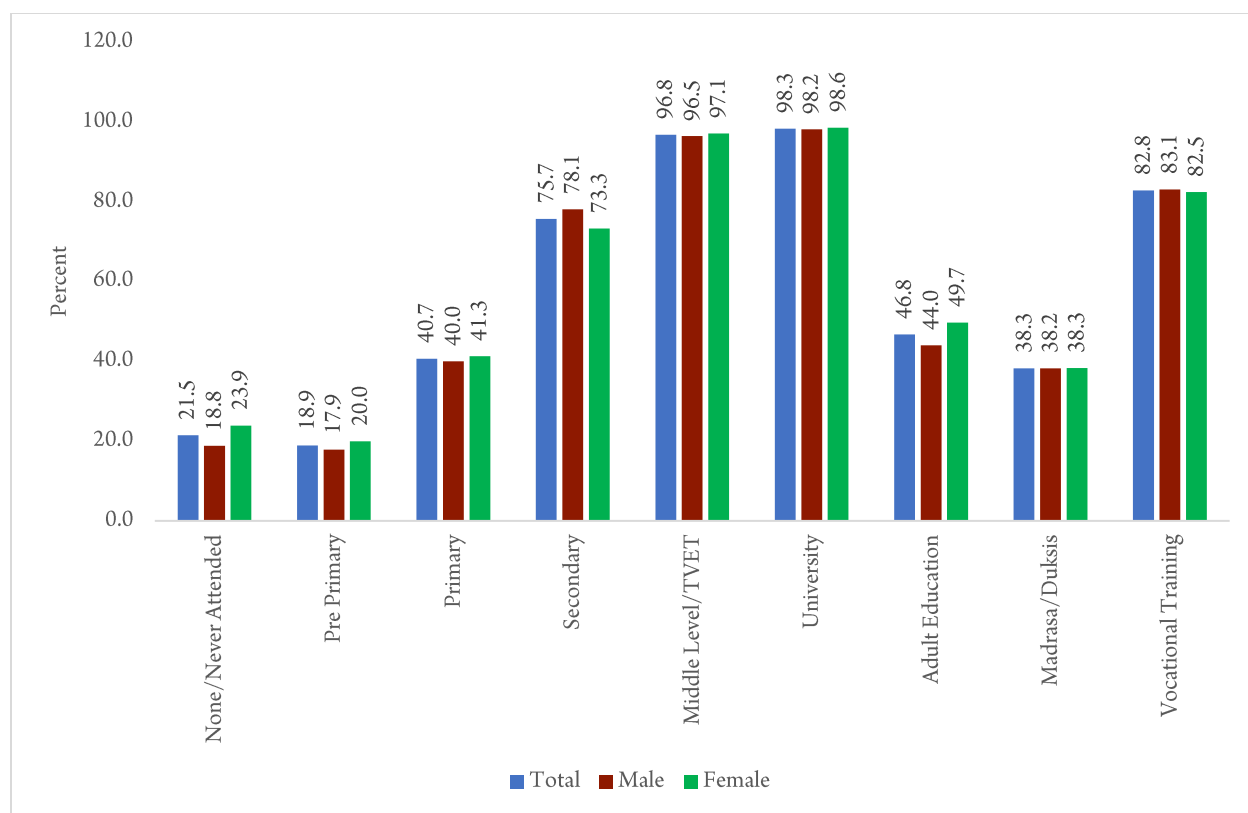


Figure 3.8: Percentage Distribution of Population of Age 3 years who Owned a Mobile Phone by Highest Education Level Completed and Sex

3.1.3 Mobile phone Ownership by Main Job Status

Availability of source of income allows one to be able to own a phone and pay for services rendered through the mobile phone such as texts, calls, and data. Lack of source of income may prevent one from owning a phone hence unable to enjoy the benefits associated with mobile phones. In some cases, some individuals may be forced to rely on their relatives who either give them funds to buy airtime or borrow their phones to use. Therefore, the source of income is a key factor in driving mobile penetration in the country.

The questions on main job status and economic activity were administered to individuals aged 5 years and above. This is in accordance with the 18th International Conference of labour, resolution II, which resonates that the target population for measuring child labour comprises of all persons age group 5 to 17 years. Therefore, the Census captured data on job status and economic activity from the population aged 5 years and above.

The results show that by considering the main job status, the highest proportion of those who owned a mobile phone are paid employees (81.0 percent) and self-employed (74.6 percent), while the least were persons outside the labor force at 19.6 percent as presented in Figure 3.9⁵.

⁵ Derived from those owning a mobile phone within a particular main job status category divided by total population age 3 years and above with respect to the total main job status category multiplied by 100

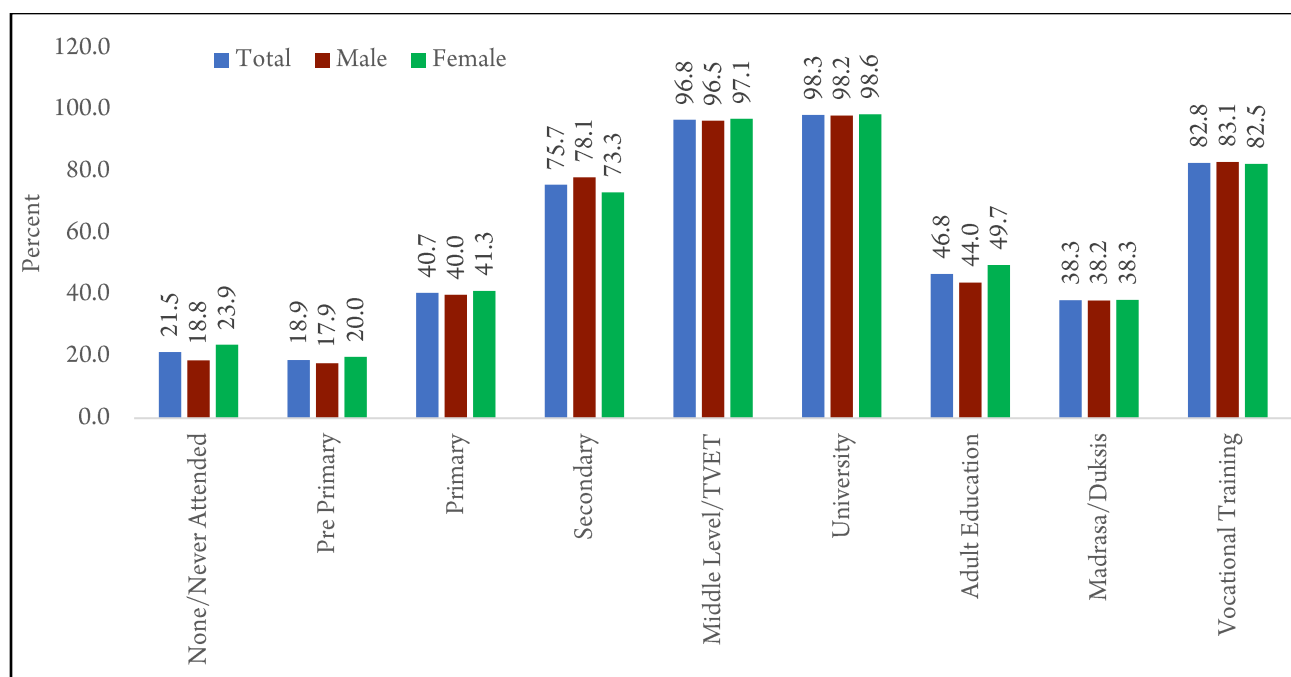


Figure 3.9: Distribution of Population Age 5 Years and above who owned a Mobile Phone by Main Job Status

Figure 3.10 illustrates the population above 5 years that owned a mobile phone by job status category and sex. Out of those who were not working, persons outside the labour force, and others, there were slightly more females owning a mobile phone compared to males. Those who were working (paid employee, self-employed, and apprentice) had slightly more males than females owning a mobile phone.

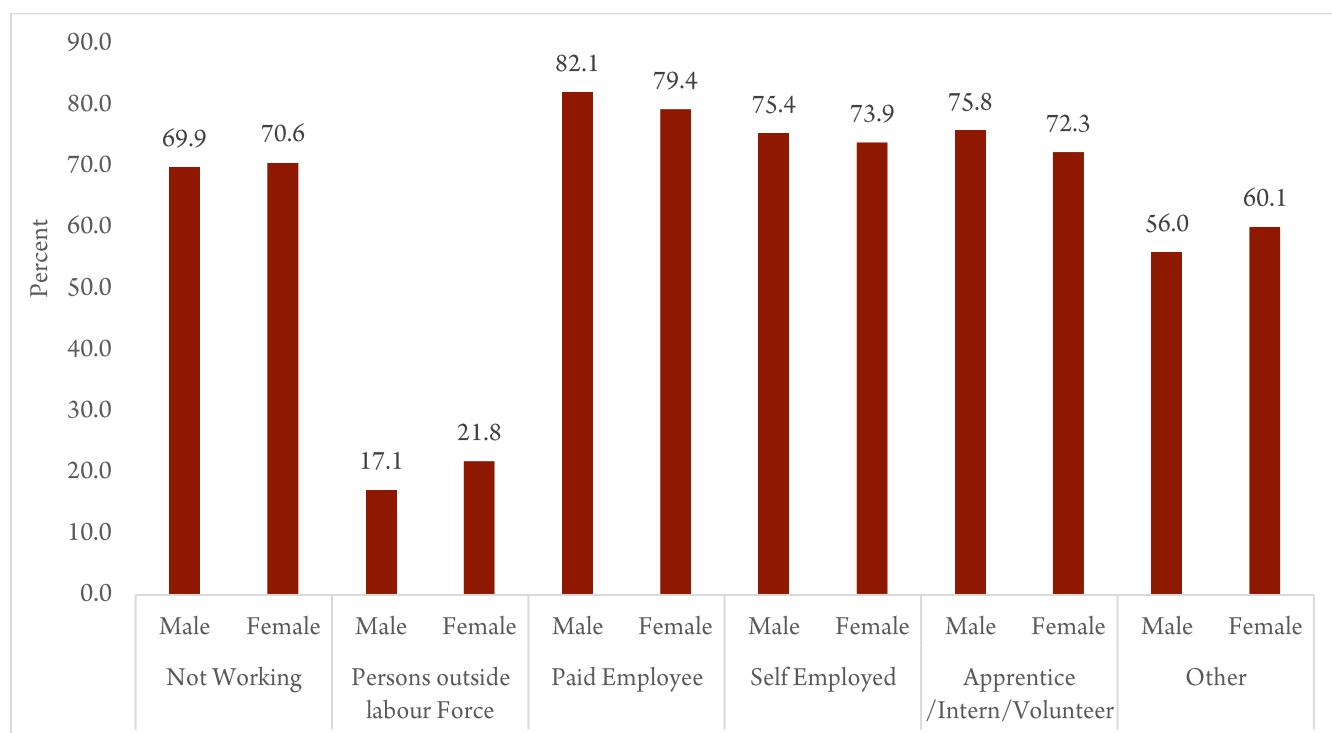


Figure 3.10: Distribution of Population Age 5 Years and above who Owned a Mobile Phone by Main Job Status and Sex

Figure 3.11 shows the distribution of those who owned a mobile phone by main job status and area of residence. Out of those in all job categories, the majority were in urban areas. The least that owned a mobile phone were from the rural areas and were outside the labour force at 13.3 percent.

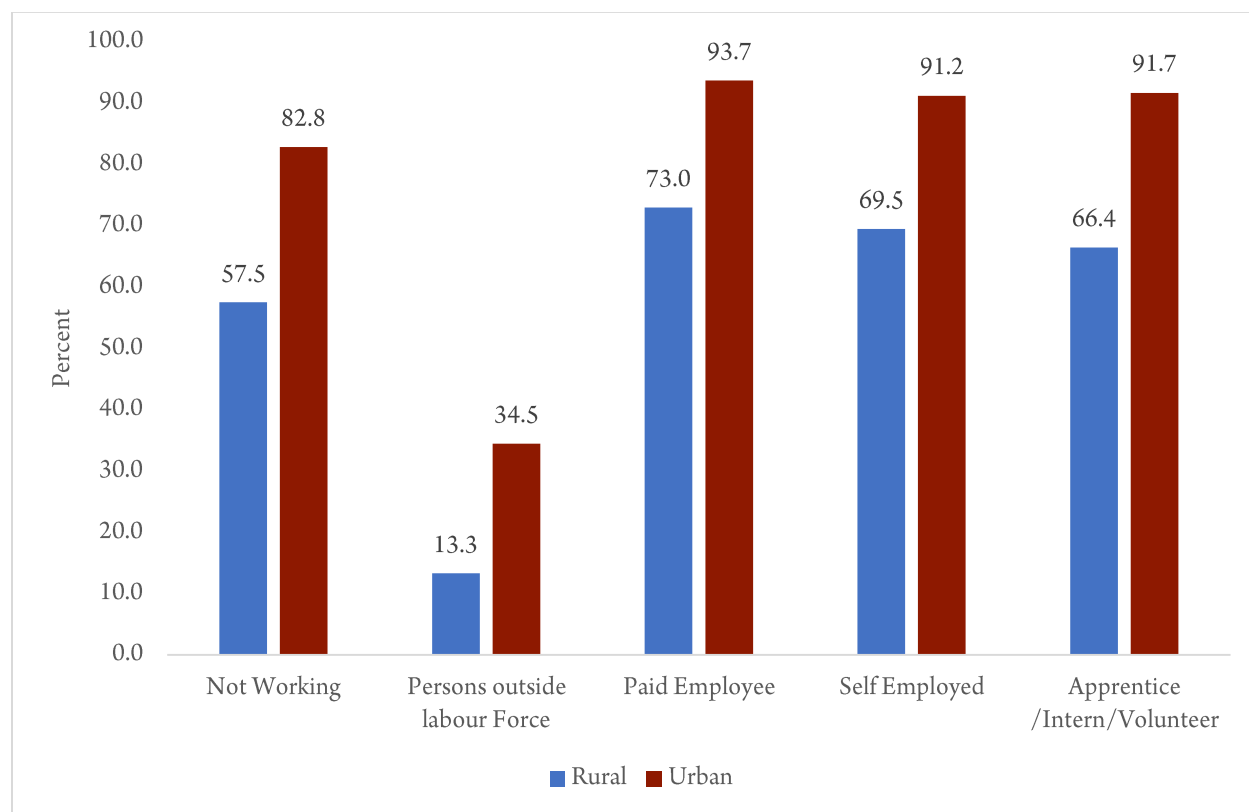


Figure 3.11: Distribution of Population Age 5 Years and above who Owned a Mobile Phone by Main Job Status and Area of Residence

3.1.4 Mobile phone Ownership by Economic Activity

Table 3.1 presents an analysis of the percentage distribution of the population aged 5 years and above who own mobile phones by type of economic activity engaged, for those who reported to be working. A higher proportion of those reported to be working and owning a mobile phone were engaged in information and communication at 98.5 percent with 98.6 percent being males and 98.2 percent being females⁶. In most of the economic activities, ownership of mobile phones is above 90 percent. The least proportion of population owning a mobile phone were engaged in agriculture at 66.2 percent with females (67.1 percent) being slightly more than males (65.1 %).

⁶ Derived from those who own a mobile phone age 5 years and above with respective economic category divided by the population within the specific economic activity multiplied by 100

Table 3.1: Percentage Distribution of Population Age 5 Years and above who owned a Mobile Phone by type of Economic Activity Engaged and Sex

Type of Economic Activity	Total	Male	Female
Agriculture	66.2	65.1	67.1
Mining and quarrying	80	80.7	75.8
Manufacturing	94.1	94.5	93.3
Electricity gas steam and air conditioning supply	97.2	97.3	96.9
Water supply; sewerage waste management and remediation activities	93.5	93.8	92.6
Construction	91.1	91	92
Wholesale and retail trade; repair of motor vehicles and motorcycles	94.4	94.7	94.1
Transportation and storage	95.2	95.3	94.5
Accommodation and food service activities	93.4	94.2	92.9
Information and communication	98.5	98.6	98.2
Financial and insurance activities	98.2	98.6	97.9
Real estate activities	92.3	93.3	90.6
Professional scientific and technical activities	97.5	97.6	97.4
Administrative and support service activities	97.4	97.2	97.5
Public administration and defence; compulsory social security	96.9	96.8	97.6
Education	97.3	97.4	97.1
Human health and social work activities	97.4	97.5	97.4
Arts entertainment and recreation	94.9	95.2	94.5
Other service activities	91.5	91.3	91.9
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	87.4	84.4	89.4
Activities of extraterritorial organizations and bodies	94.3	94.6	93.8

3.1.5 Mobile phone Ownership by Disability

The sustainable development goals aim at “leaving no one behind.” As technology spreads in every part of the country, digital discrimination should be eliminated so that everyone can use and access the ICTs. It is with this notion that this section shows mobile phone ownership by people living with a disability. ICTs have a tremendous potential to enable people living with disabilities to connect to the information society thereby ensuring inclusion. In the absence of access to ICTs such as owning a mobile phone, persons with disabilities are in danger of being excluded from essential services, social interaction, payments, and key information delivered through mobile phones. With the understanding of how important it is for PWDs to own ICT devices, the Census collected information on mobile phone ownership by PWDs. The questions on disability were administered to the population age 5 years and above⁷. Overall, 49.4 percent of PWDs owned a mobile phone with the majority being women at 51.6 percent as seen in Figure 3.12⁸.

⁷ The total population with disability is as follows: males= 393,451; females=523,184; Intersex= 57; total 916,692

⁸ Derived from PWDs who own a mobile phone divided by the total PWDs age 5 years and above divided by 100

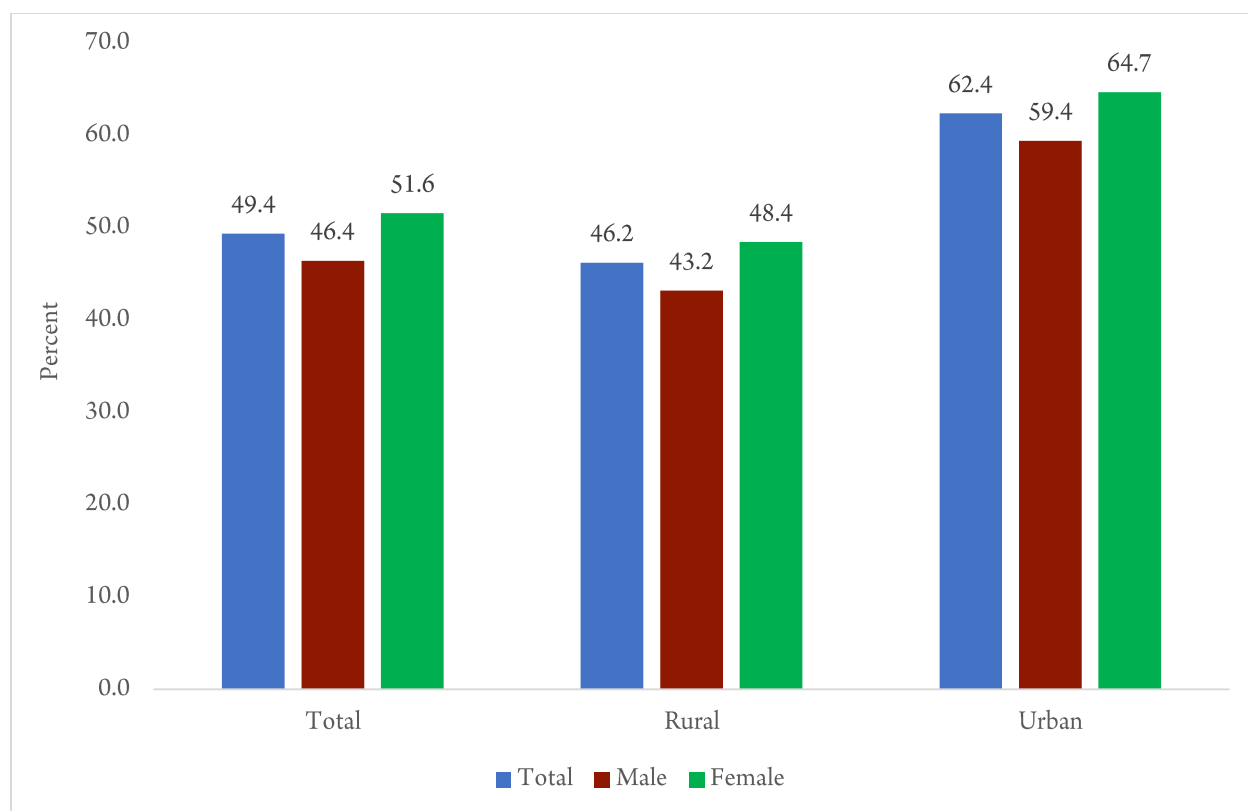


Figure 3.12: Distribution of Population Age 5 Years and above who Owned a Mobile Phone by Persons Living with Disability and Area of residence

Table 3.2 presents the proportion of the population aged 5 years and above who own a mobile phone by type of disability and residence. The results show that the highest ownership of mobile phones by disability domain was recorded for those with visual difficulties at 57.1 percent followed by those with mobility difficulties at 54.6 percent. Mobile phone ownership was lowest among persons with difficulties in communication at 13.4 percent. Generally, ownership was higher in urban areas compared with rural areas for all disability domains.

Table 3.2: Proportion of Population Age 5 Years and above who owned a Mobile Phone by type of Disability and Area of Residence

Country/ Area of Residence	Visual	Mobility	Hearing	Cognitive	Self-care	Communication
Kenya	57.1	54.6	34	32.4	20.9	13.4
Rural	52.9	52.2	31.5	31.3	19.2	11.7
Urban	71.6	66.2	47.9	38.5	28.5	20.3

Figure 3.13 shows the proportion of the population aged 5 years and above who owned a mobile phone by type of disability and sex. The analysis shows that more than 50 percent of both males or females with visual or mobility disabilities own a mobile phone. Notably, a higher proportion of females than males owned a mobile phone for the majority of disability domains except hearing and communication.

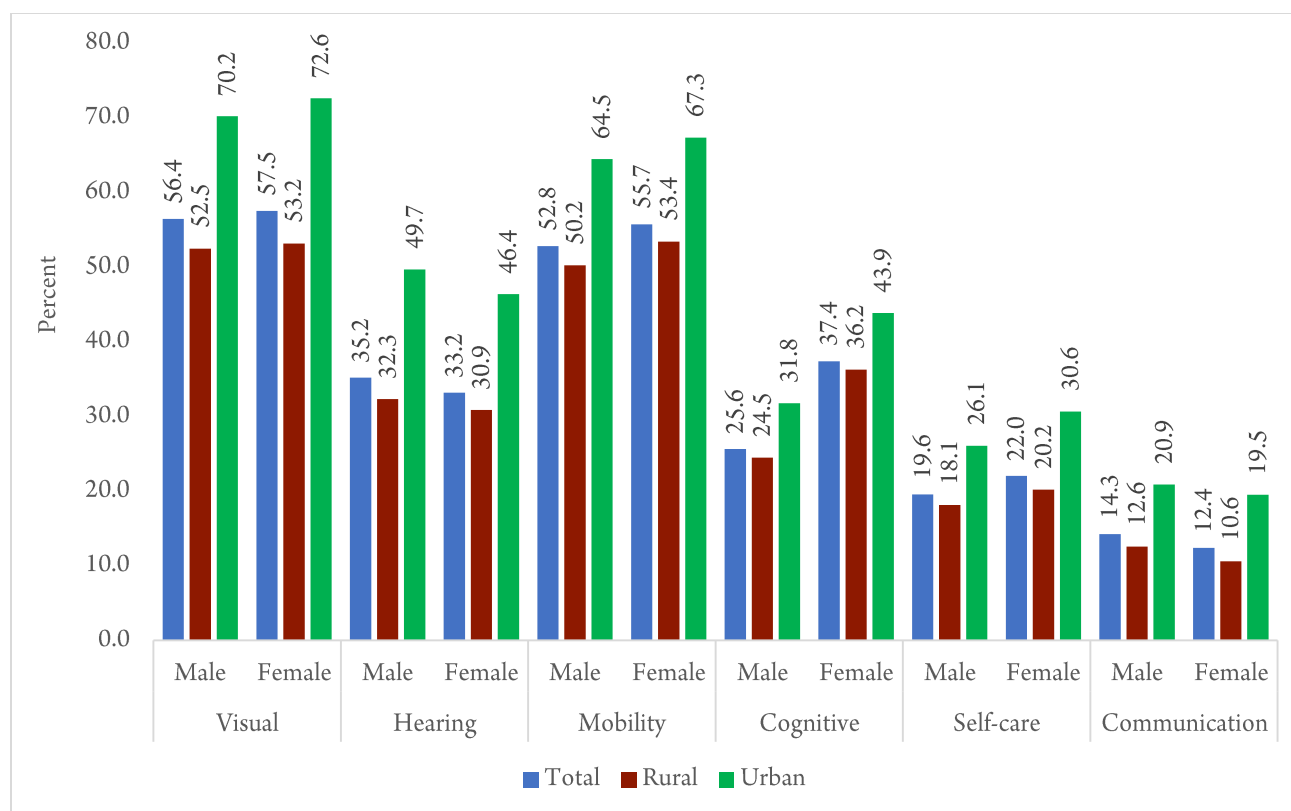


Figure 3.13: Distribution of Population Age 5 Years and above who Owned a Mobile Phone by type of Disability and Sex

3.1.6 Mobile phone Ownership by Religious Affiliation

Religion affiliation is one of the socio-economic characteristics that are useful in giving insights and understanding on whether there is discrimination or a barrier to mobile phone ownership. Figure 3.14 presents the percentage distribution of population age 3 years and above that own a mobile phone by type of religion. The highest proportion of the population owning a mobile phone are those affiliated to Hindu religion at 80.7 percent followed by other Christians and Atheists at 55.3 and 52.1 percent, respectively⁹.

⁹ Derived from individuals owning a mobile phone by specific religion divided by the total specific religion affiliation for population age 3 years and above

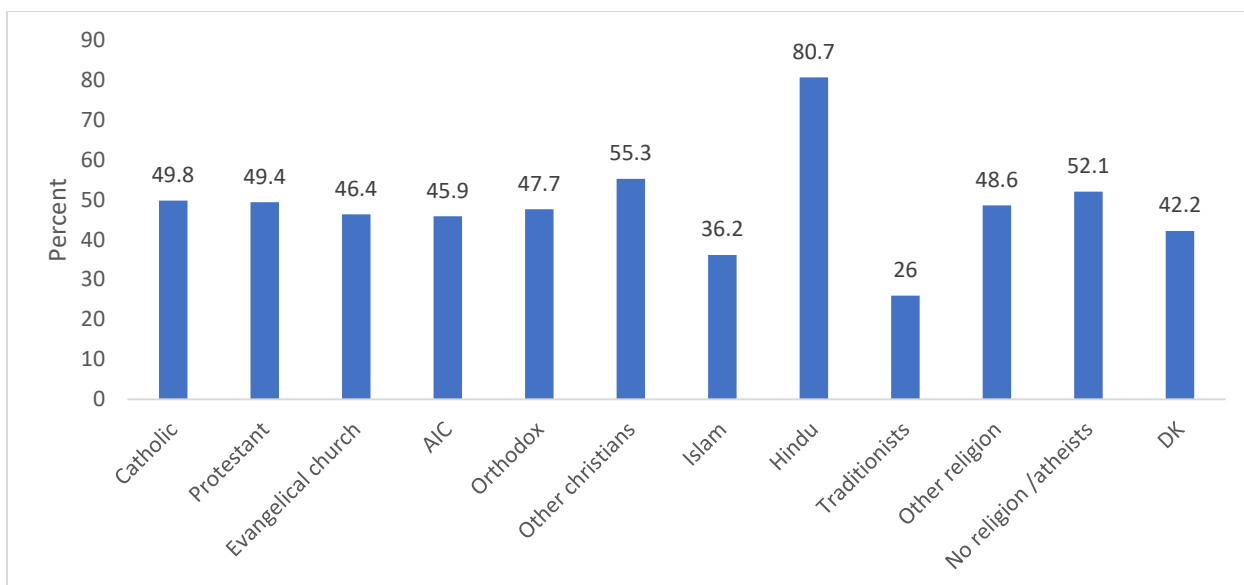


Figure 3.14: Percentage Distribution of Population Age 3 years and above Owning a Mobile Phone by type of Religion

Figure 3.15 presents the percentage distribution of the population aged 3 years and above that own a mobile phone by type of religion and area of residence. The highest proportion of individuals owning a mobile phone are those affiliated with the Hindu religion and live-in urban areas (83.1%). Generally, a higher proportion of individuals living in urban areas compared to rural areas regardless of their religion, own a mobile phone.

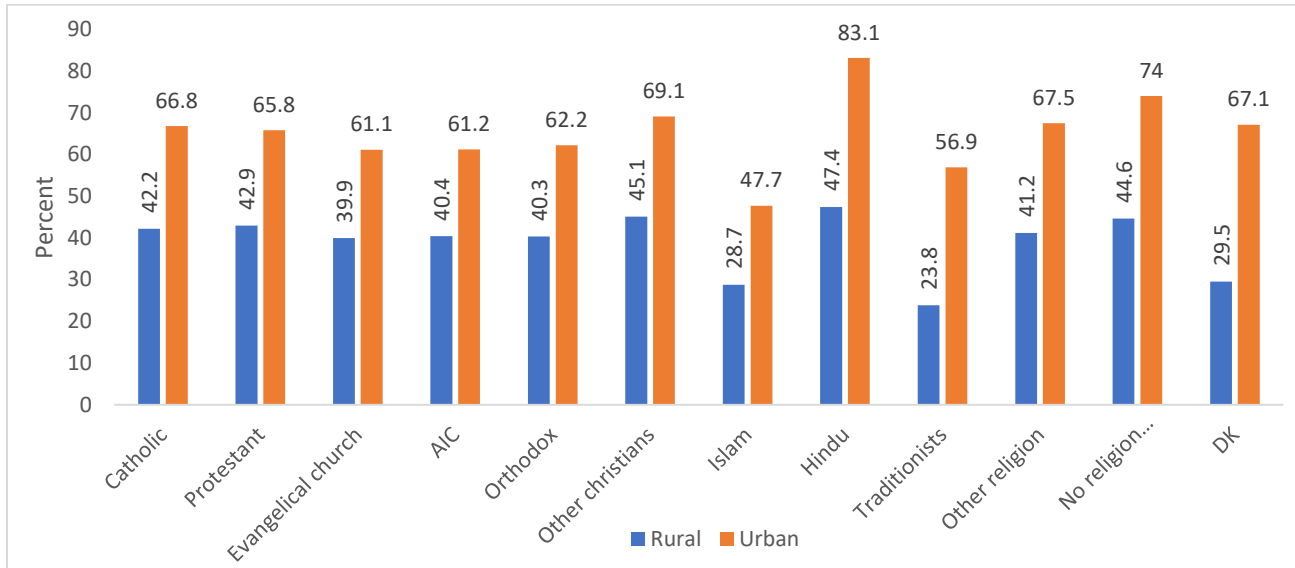


Figure 3.15 Percentage distribution of population Age 3 years and above owning a Mobile Phone by type of Religion and Area of Residence

Figure 3.16 depicts the percentage distribution of population age 3 years and above who owned a mobile phone by religious affiliation and sex. The ownership of mobile phones was higher in females than males among Protestants, Evangelical churches, and African instituted churches. In contrast, a higher proportion of males compared to females affiliated to Islam, Hindu, Catholic, and other Christians owned a mobile phone.

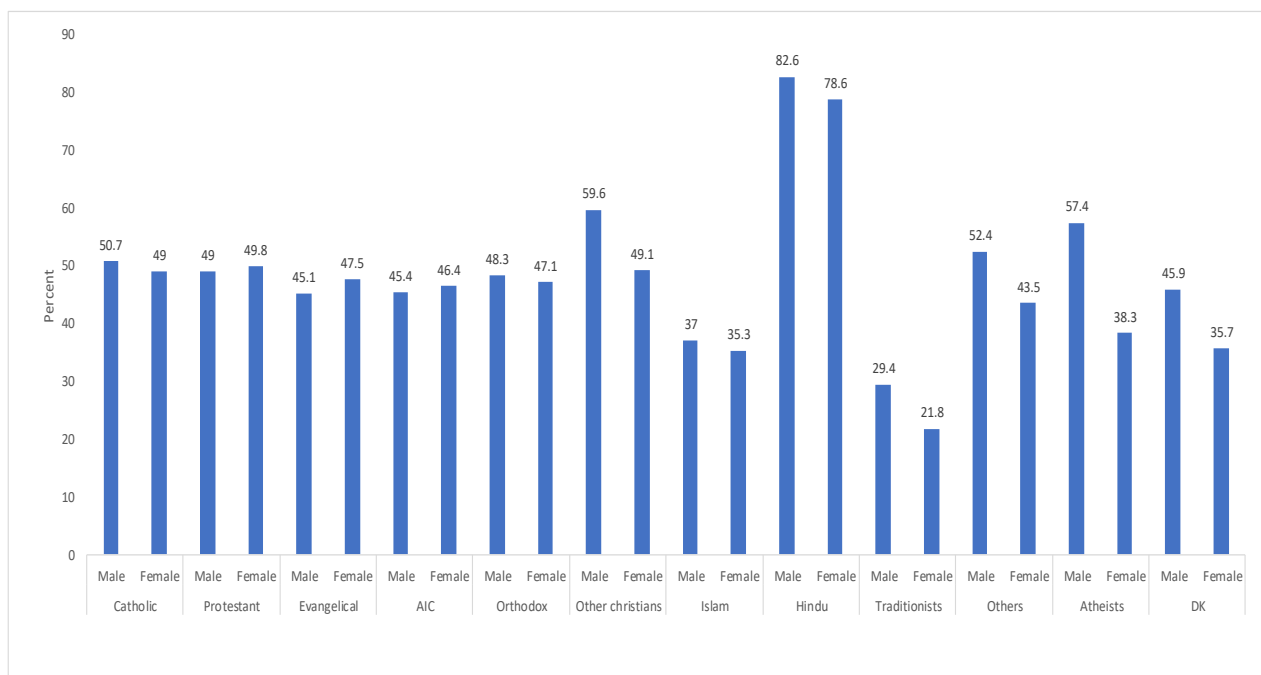


Figure 3.16 Percentage distribution of population Age 3 years and above Owning a Mobile Phone by type of Religion and Sex

3.1.7 Mobile phone Ownership by Marital Status

Marital status acts as a key factor in understanding the penetration of mobile phone ownership in a country. It gives more analysis to the digital divide, especially where women are not allowed to own a mobile phone due to their marital status. In some cases, marital status together with cultural practices may hinder the uptake of mobile phones. It is with this notion that analysis of mobile phone uptake by marital status was done. Information on marital status was sought for populations aged 12 years and above. The majority of those who owned a phone were married monogamous at 81.4 percent (with the majority being from urban areas at 92.2 percent) followed by those who had separated from their spouses at 80.2 percent¹⁰. Those who never married were the least to own a mobile phone at 40.8 percent as seen in Figure 3.17.

¹⁰ Derived from individuals owning a mobile phone with respect to their marital status divided by total specific marital status of individuals 12 years and above

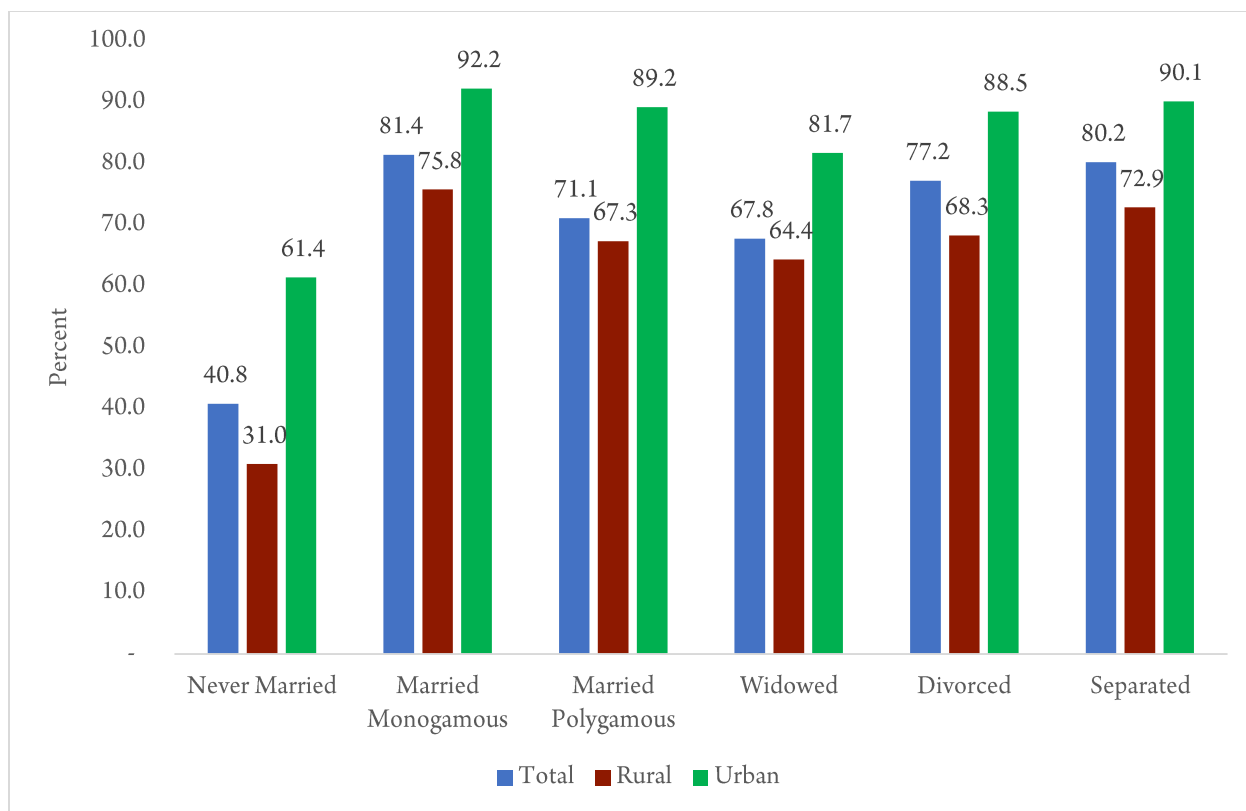


Figure 3.17: Percentage Distribution of Population age 12 years and above Owning a Mobile Phone by Marital Status

Figure 3.18 presents the percentage distribution of population age 12 years and above owning a mobile phone by marital status, area of residence, and sex. Mobile phone ownership among the divorced (81.8 percent) and separated (86.5 percent) females was higher than that of males. The majority of males who owned a mobile phone were married monogamous (85.3 percent) and residing in urban areas (94.4 percent). In addition, females who owned a mobile phone, never married, and resided in the rural areas had the least proportion of 27.9 percent.

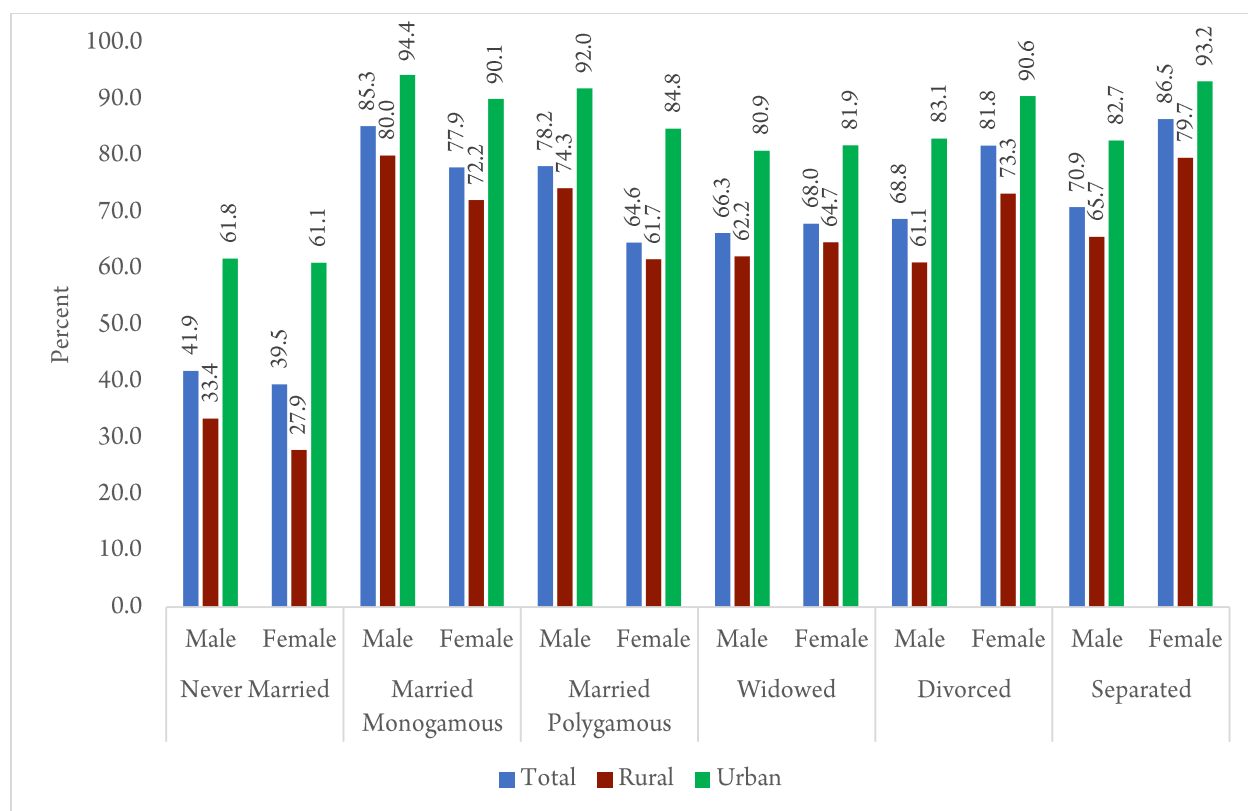


Figure 3.18: Percentage Distribution of Population Age 12 years and above who Owned a Mobile Phone by Marital status, Area of Residence and Sex.

3.2 Mobile phone usage

The use of mobile phone has increased significantly and has become one of the most dominant influences on society. Mobile phone technology has brought the world closer. It provides great convenience in communication among people by way of either calling or texting. In addition, mobile phone also offer a variety of features like Internet access, payment mode, entertainment, reading, among others.

The proportion of individuals who use a mobile telephone is an important indicator to measure the uptake of mobile cellular technology. The uptake of mobile services has continued to grow in the country due to growing technological innovations and increasing demand for cellular services. This indicator targeted the population age three years and above. The indicator includes both those who own a mobile phone and mobile sharers.

The 2019 KPHC results show that more than half (55.2 %) of the population aged three years and above reported having used a mobile phone in the reference period¹¹. Urban areas had the highest proportion of the population who had used a mobile phone at 71.1 percent compared with 48.1 percent in rural areas as seen in Figure 3.19.

¹¹ Derived as mobile phone users divided by the total population aged 3 years and above multiplied by 100

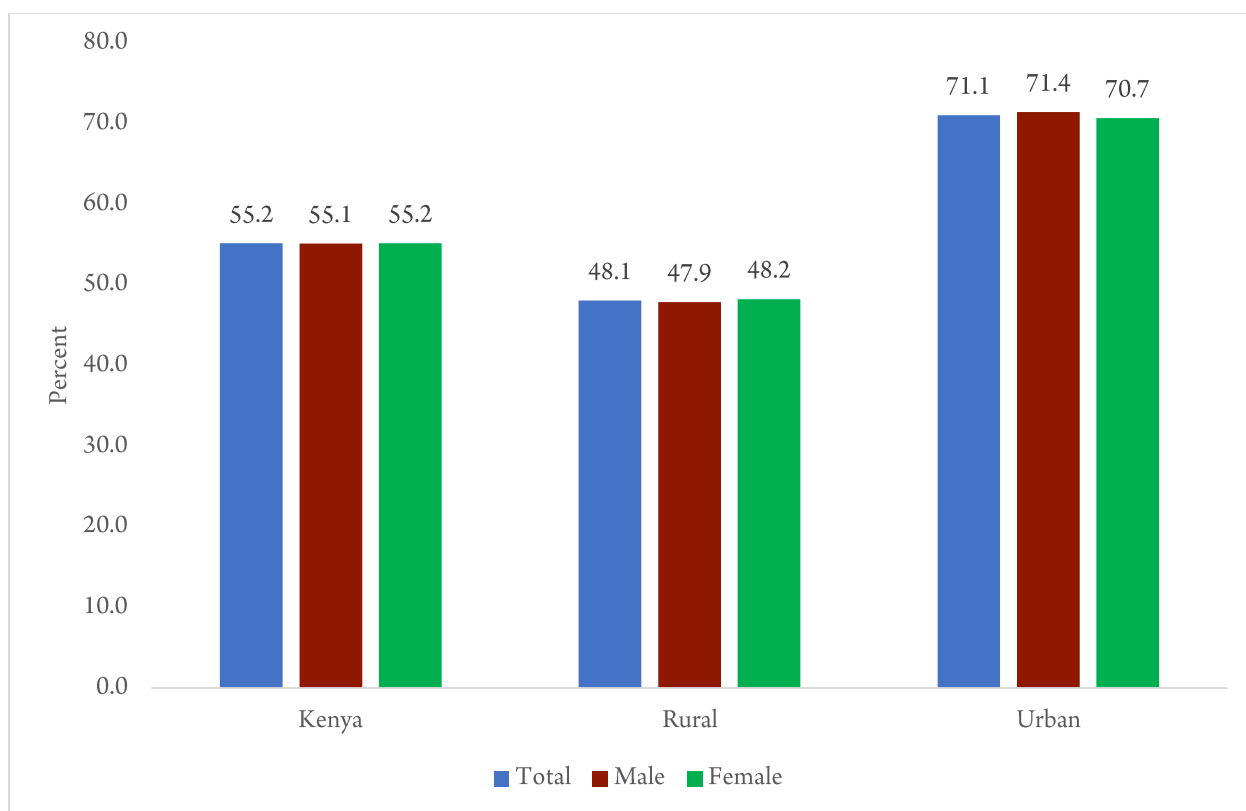


Figure 3.19: Proportion of Population Age 3 years and above using a Mobile Phone by Sex and Area of Residence

Table 3.3 shows the percentage distribution of population age 3 years and above who used a mobile phone by age group and sex. The analysis shows that over 80 percent of persons in the 25-64 years age group reported having used a mobile phone in the reference period. On average, persons in the 35-44 years age group reported the highest usage at 87.7 percent. Further, the results indicate that the use of mobile phones increases with age and peaks at the 35-44 years age group after which mobile phone usage declines with age from the age of 65 years and above.

Table 3.3: Proportion of population Age 3 years and above who used a mobile phone by age group and sex

Age Group	Proportion population using a mobile phone		
	National	Male	Female
3 - 4	10.8	10.8	10.8
5 - 9	13.8	13.8	13.8
10 - 14	18.5	18.5	18.6
15 - 24	59.0	58.7	59.2
25 - 34	87.0	87.6	86.3
35 - 44	87.7	87.6	87.8
45 - 54	87.1	87.3	86.9
55 - 64	82.9	84.7	81.3
65 - 74	72.7	76.9	69.0
75 - 84	57.3	64.3	52.3
85 +	36.0	44.6	31.1

Figure 3.20 shows the top five counties with the highest and lowest proportion of population using a mobile phone. Nairobi City County (78.3 percent) had the highest proportion of population aged 3 years and above using a mobile phone followed by Kiambu County at 75.5 percent. On the other hand, Turkana County registered the lowest proportion of the population using a mobile phone at 18.4 percent. Map 2 shows the mobile phone users at the County level.

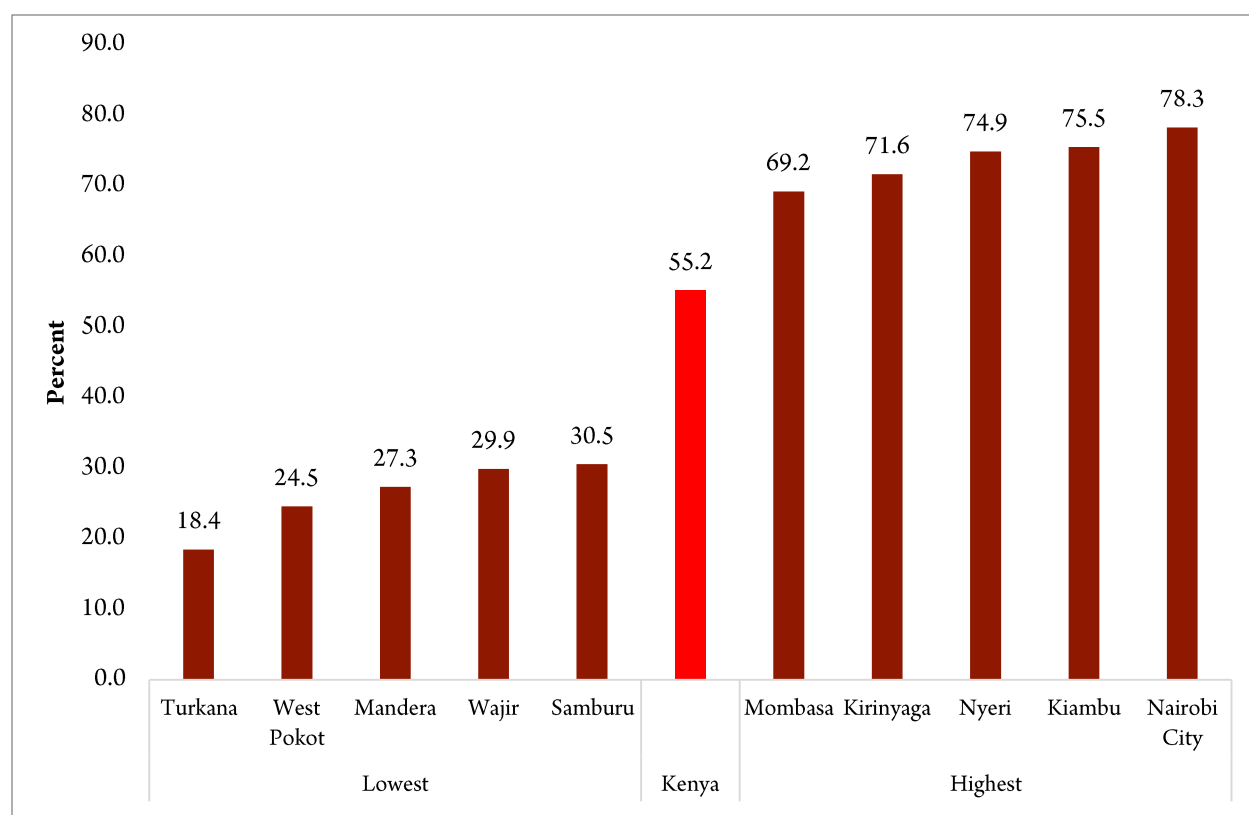


Figure 3.20: Top 5 Counties with the Highest and Lowest Proportion of Population that used a Mobile Phone

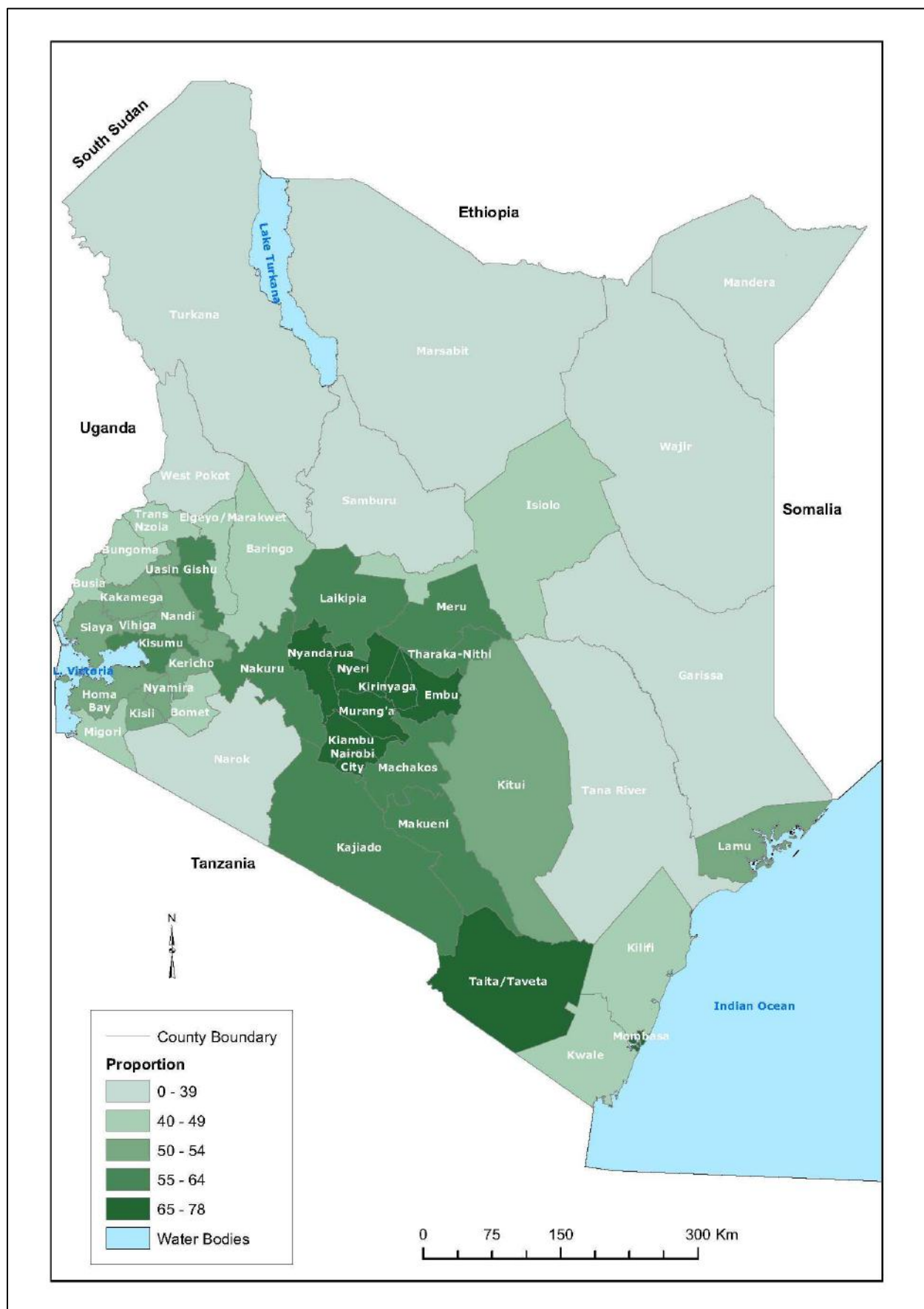


Figure 3.21: Mobile Phone Users by Counties

3.2.1 Use of Mobile phone by Education Attendance level

Education is a major influence in increasing the use of mobile phones. An individual who has a higher level of education navigates and uses a wide range of mobile applications compared to those with lower education levels. Cell Phones enable communication between teachers and students. Mobile phones can be connected to the Internet at any time and at any place which is advantageous to students to browse anything through it related to their studies. Not only students but teachers also use the mobile Internet to manage the grades, attendance, and upload materials.

Figure 3.22 shows the distribution of population age 3 years and above, who used a mobile phone by education attendance level and area of residence. Out of those who attended school and used a mobile phone, the proportion was higher in urban areas for all education levels, apart from those in adult education levels where the majority were in rural areas at 46.5 percent¹².

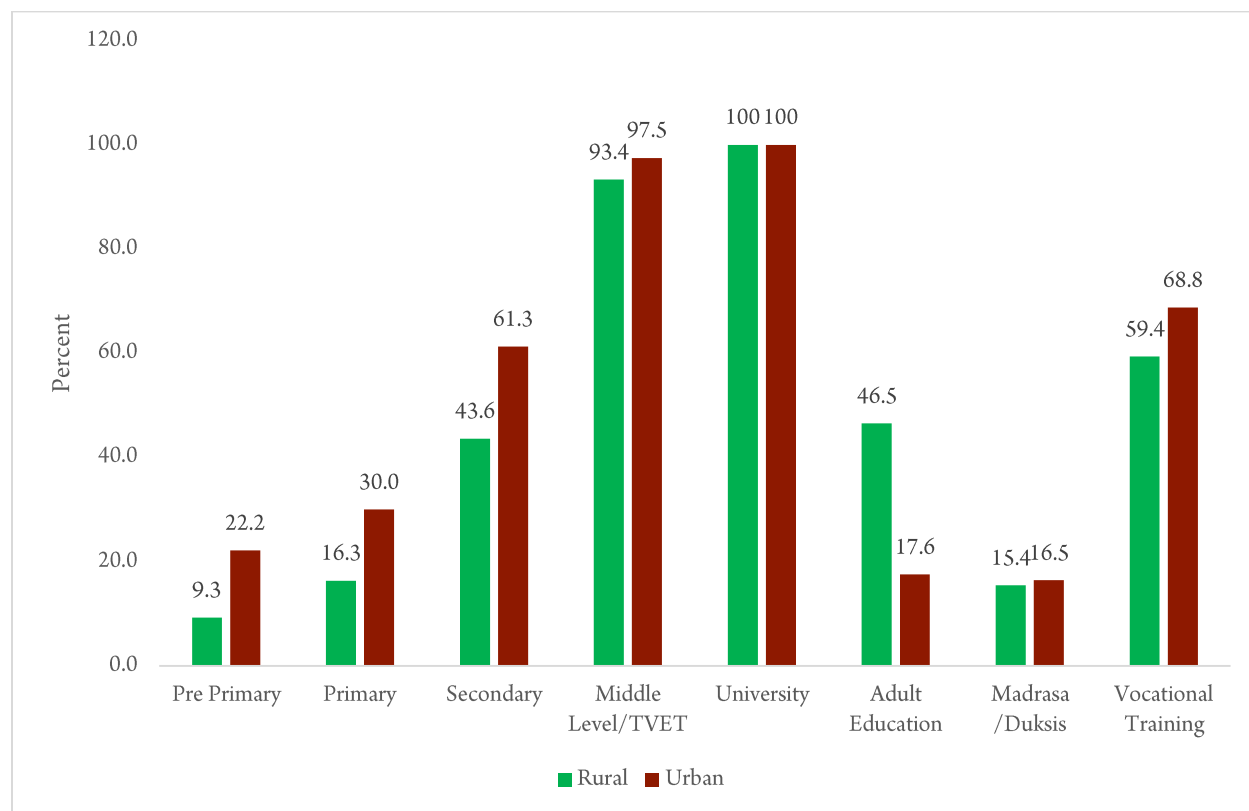


Figure 3.22 Percentage Distribution of Population Age 3 Years and above who used a Mobile Phone by Education Attendance Level and Area of Residence

Figure 3.23 illustrates the percentage distribution of population age 3 years and above who used a mobile phone by school attendance level and sex. The analysis showed that there was not much

¹² Derived from those who used a mobile phone with respect to the education category divided by the total respective education category multiplied by 100

difference between males and females in most categories apart from the vocational training that had an enormous difference of 10.9 percentage points.

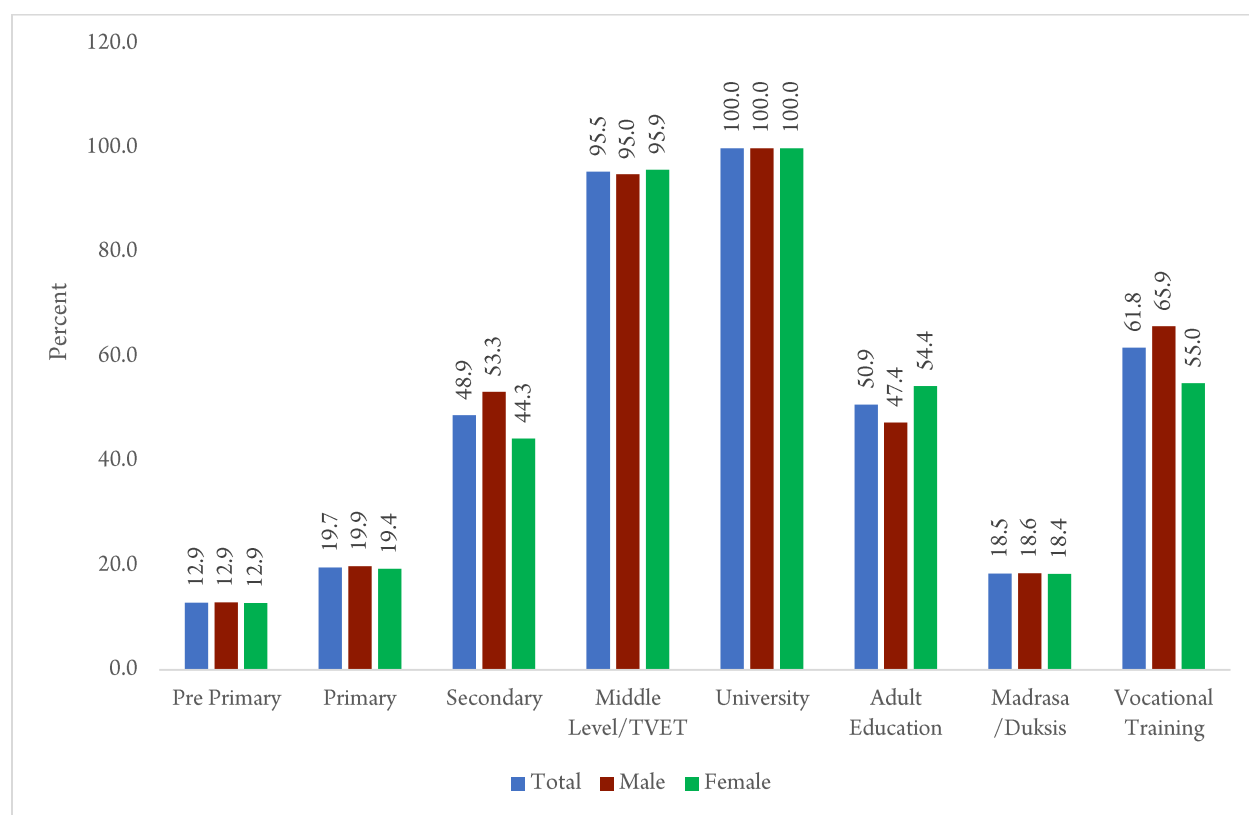


Figure 3.23: Percentage Distribution of Population Age 3 Years and above who used a Mobile Phone by Education Attendance Level and Sex

3.2.2 Use of Mobile phone by Highest Education Level Completed

The population aged 3 years and above that reported to have used a mobile phone in the reference period was disaggregated by the highest education level completed. The importance of this disaggregation is to understand the basic skills the individuals have as this drives the use of a mobile phone. Notably, the majority of those who used a mobile phone had university and tertiary education as their highest education completed, whether residing in rural or urban areas. There was a big difference in those residing in urban areas and had adult education (92.9 percent) as their highest completed, compared to those from the rural areas (47.8 percent) as shown in Figure 3.24.

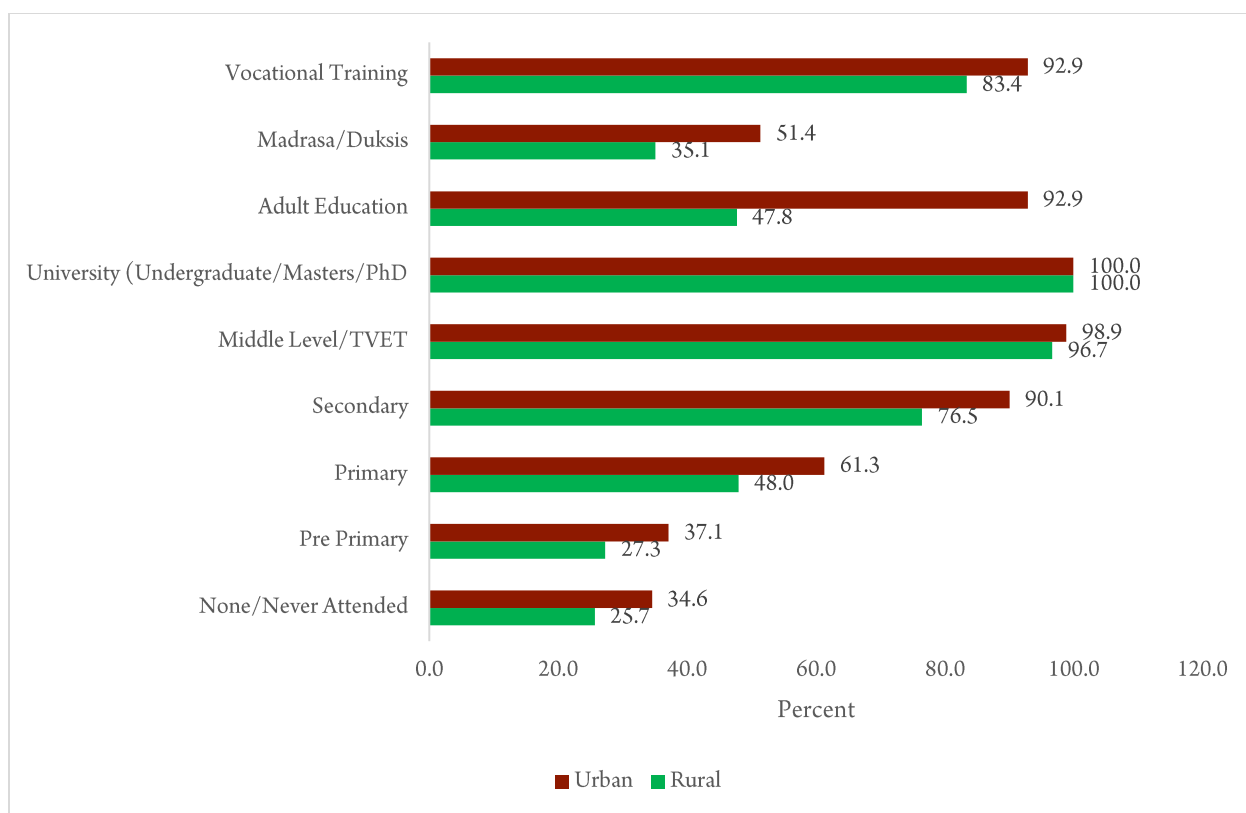


Figure 3.24: Percentage Distribution of Population Age 3 Years and above who used a Mobile Phone by Highest Education Level Completed and Area of Residence

Analysis of the use of mobile phones by highest education level completed and sex show that a slightly higher proportion of females than males with primary school level of education used a mobile phone in the reference period. The analysis shows that all students who had gone to the university used a mobile phone followed by those in tertiary schools. Those who never attended school and those in pre-primary were the least to use a mobile phone at 27.5 percent and 29.6 percent, respectively as shown in Figure 3.25.

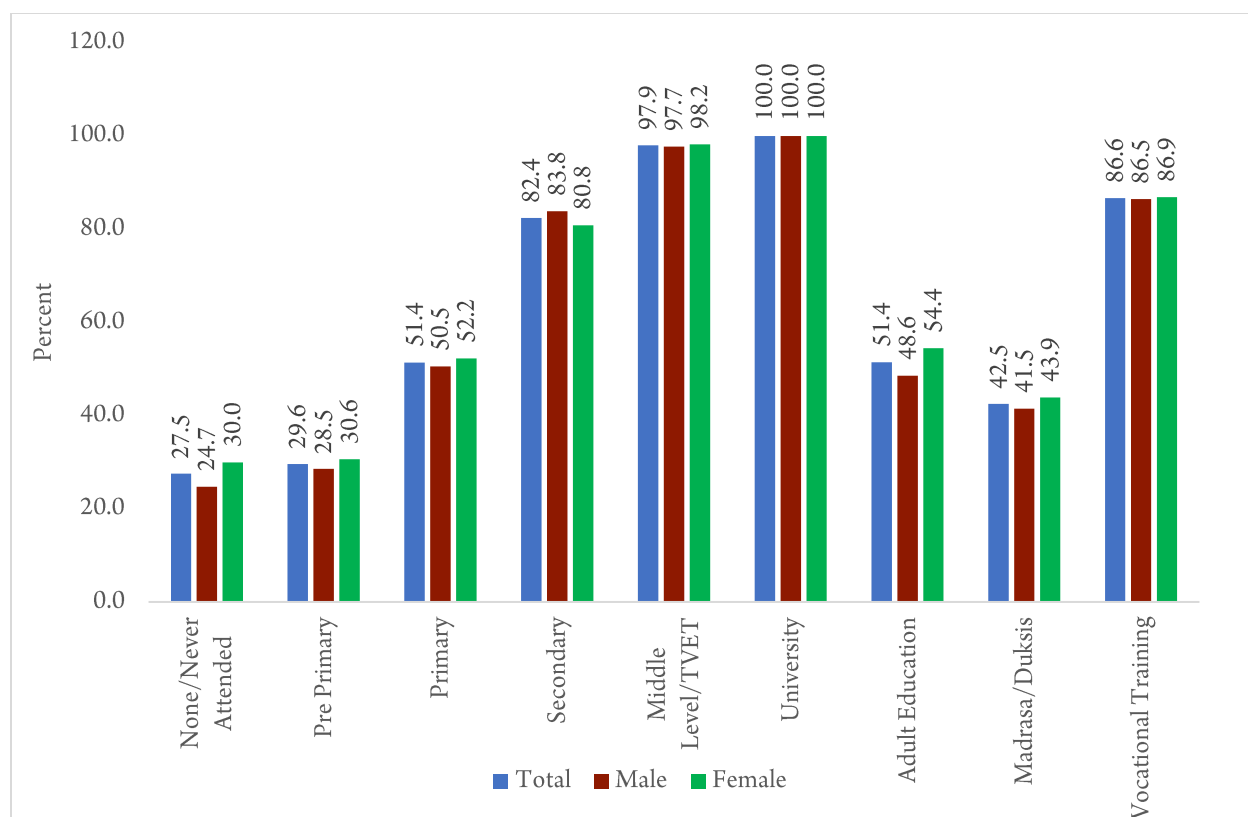


Figure 3.25: Percentage Distribution of Population Age 3 years and above using a Mobile Phone by Highest Education Level Completed and Sex

3.2.3 Use of Mobile phone by Main Job Status

The KPHC 2019 data collected information on individuals aged 5 years and above who used a mobile phone by their main job status. Individual job status influences the use of mobile phones when one has a source of income that enables one to pay for mobile services. However, individuals who may have no source of income are likely to rely on others such as parents, friends, relatives, etc in financing mobile services such as calling, use of data, texts. Individuals who have no way of financing mobile phone services are more likely not to use these services. According to the 2019 Census, a majority of those who used a phone were paid employees at 31.7 percent followed by those who were self-employed at 30.5 percent as shown in Figure 3.26¹³. Persons outside the labour force composed of students, retired people, stood at 25.7 percent.

¹³ Derived from individuals using a mobile phone with respect to the job status divided by the total specific job status multiplied by 100

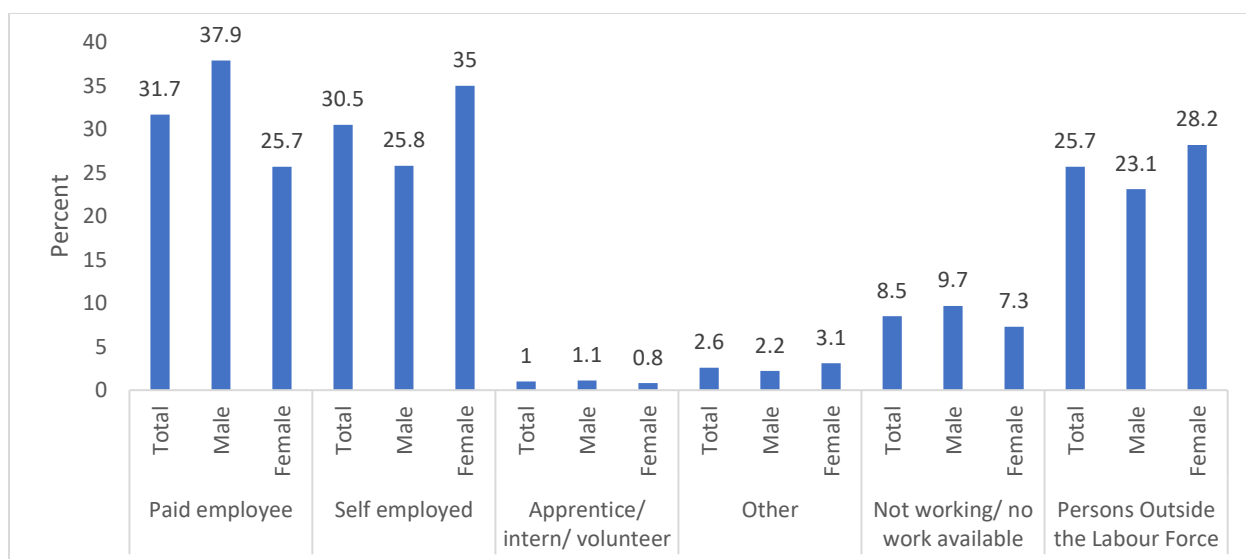


Figure 3.26: Percentage Distribution of Population Age 5 Years and above using a Mobile Phone by Main Job Status and Sex

Out of the population aged 5 years and above that used a phone, the majority were both male and female paid employees at 84.8 percent and 82.8 percent, respectively with the lead from urban areas, (male 95.3 percent; female 95.1 percent). The least mobile users were males residing in rural areas and outside the labour force at 24.7 percent as seen in Figure 3.27.

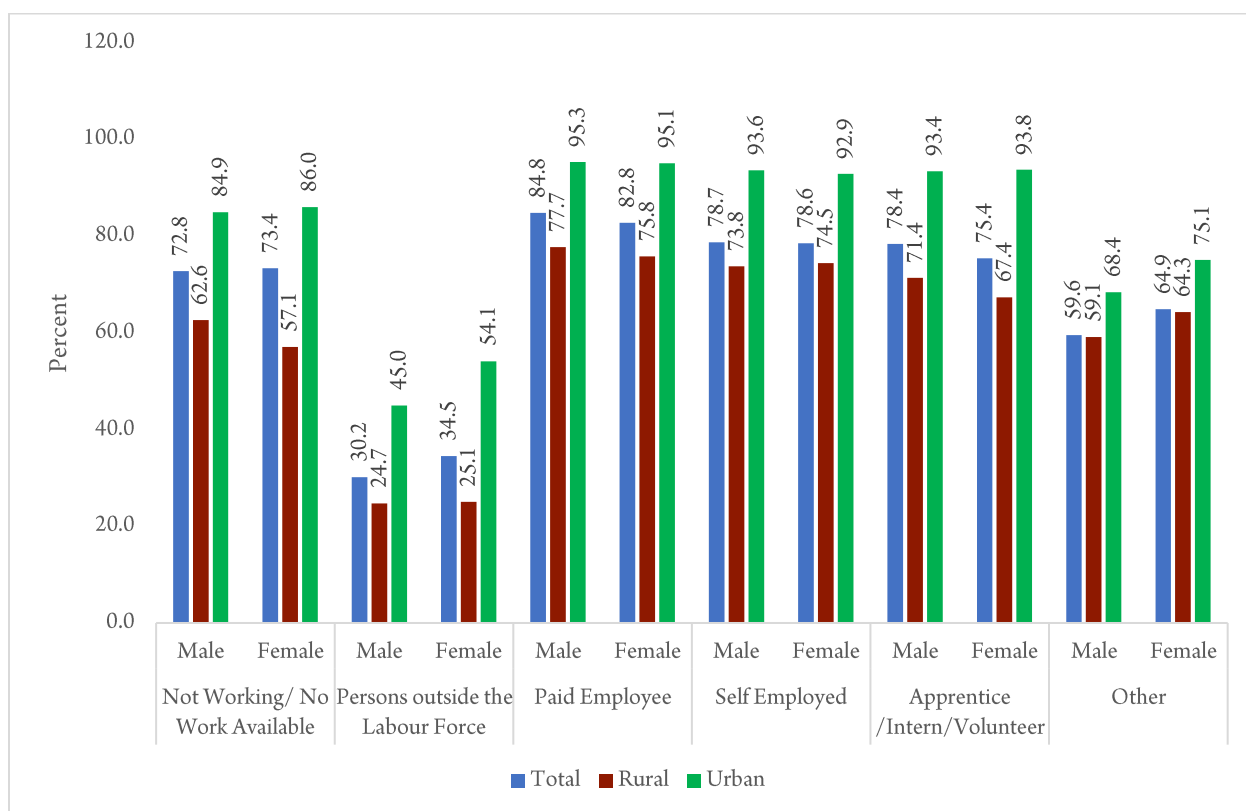


Figure 3.27: Percentage Distribution of Population Age 5 Years and above using a Mobile Phone by Main Job Status and Area of Residence

3.2.4 Use of Mobile phone by Economic Activity

Table 3.4 presents an analysis of the percentage distribution of the population aged 5 years and above who own mobile phones by type of economic activity engaged, for those who reported to be working. A higher proportion of those reported to be working and owning a mobile phone were engaged in information and communication at 99.1 percent with the least being engaged in agriculture at 70.9 percent. Analysis by sex indicates that a higher proportion of males (69.1 percent) than females (72.2 percent) engaged in agriculture used a mobile phone.

Table 3.4: Percentage Distribution of Population Age 5 Years and above who used a mobile phone by type of economic activity engaged and Sex

Type of Economic Activity	Total	Male	Female
Agriculture	70.9	69.1	72.2
Mining and quarrying	85.3	85.8	82.5
Manufacturing	95.8	96	95.2
Electricity gas steam and air conditioning supply	98.1	98.2	97.8
Water supply; sewerage waste management and remediation activities	95.4	95.6	94.6
Construction	93.8	93.8	94
Wholesale and retail trade; repair of motor vehicles and motorcycles	96.1	96.3	96
Transportation and storage	96.7	96.8	95.9
Accommodation and food service activities	95.6	96.1	95.3
Information and communication	99.1	99.2	98.9
Financial and insurance activities	98.9	99.2	98.6
Real estate activities	94	94.8	92.7
Professional scientific and technical activities	98.5	98.5	98.4
Administrative and support service activities	98.2	98.1	98.3
Public administration and defense; compulsory social security	97.6	97.4	98.2
Education	98.1	98.3	98
Human health and social work activities	98.3	98.3	98.2
Arts entertainment and recreation	96.6	96.8	96.3
Other service activities	93.7	93.4	94.2
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	91	88.3	92.8
Activities of extraterritorial organizations and bodies	95.8	96	95.3

3.2.5 Use of Mobile phone by Disability

The uptake of mobile phones by persons living with disabilities is vital in ensuring the inclusion of everyone and in the spirit of leaving no one behind. Overall, 55.7 percent of people living with disabilities used a mobile phone with the majority residing in urban areas at 68.6 percent. Slightly more females (57.9 percent) than males (52.7 percent) living with disabilities used mobile phones as shown in Figure 3.28.

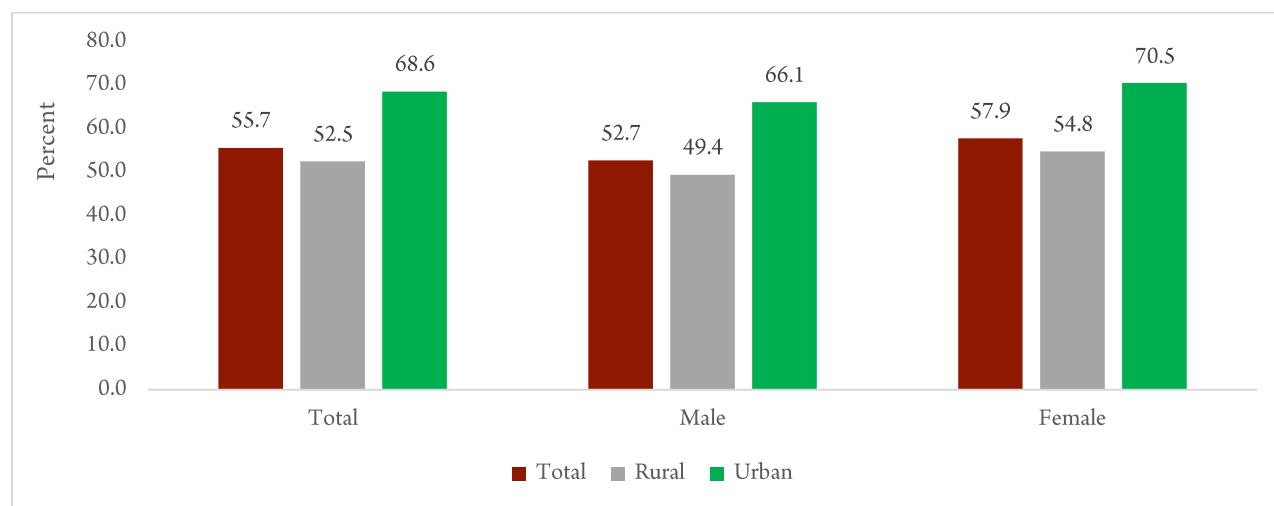


Figure 3.28 Percentage Distribution of Population Living with Disability Age 5 years and above using Mobile Phone by Sex and Area of Residence

The highest proportion of PWDs using mobile phones are in Nairobi City County (75.0 %) while the lowest are in Turkana County (18.4%) as shown in Figure 3.29.

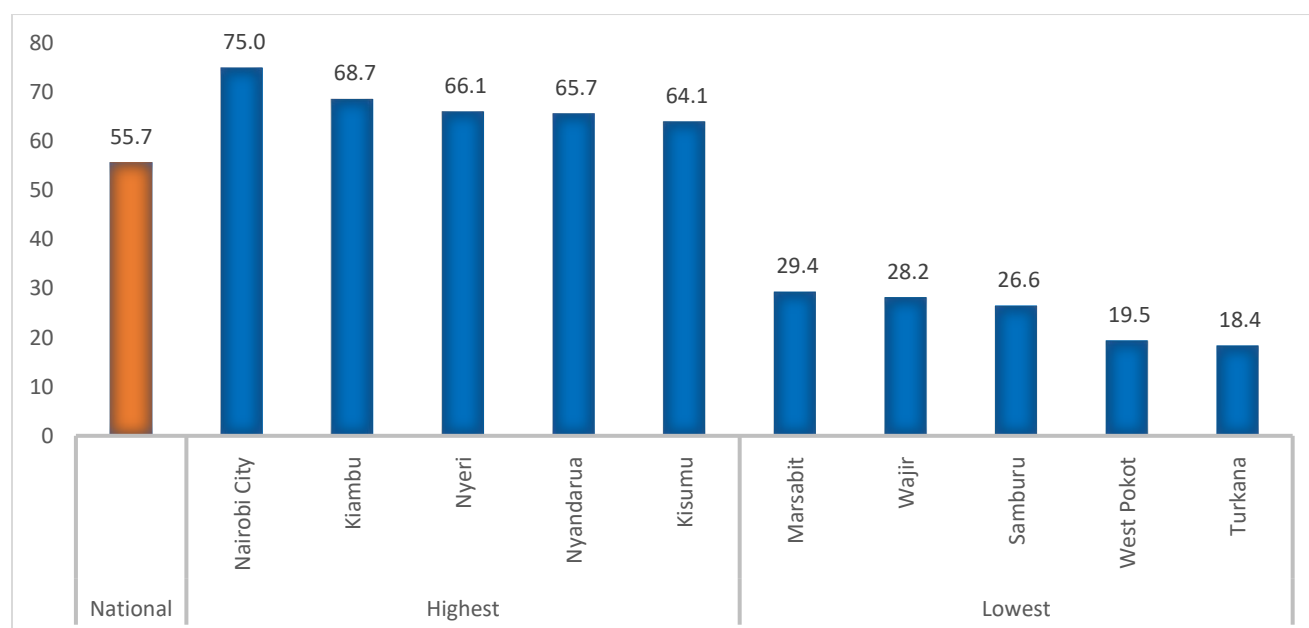


Figure 3.29 Counties with the Highest and Lowest Proportion of Population aged 5 years and Living with Disability and using Mobile phone

Figure 3.30 presents the distribution of the population living with a disability using mobile phones by disability domain and sex. The lowest proportion of PWDs using mobile phones were those with communication difficulties at 17.8 percent followed by those with self-care difficulties at 25.4 percent. The use of mobile phones by the population with communication difficulties is normally limited to text-based usage, and this may explain the lower proportion. On the other hand, a higher proportion of females (64.2%) than males (63.4%) with visual difficulties used a mobile phone in the reference period. Among the population living with disabilities, over half of those with visual and mobility difficulties used a mobile phone.

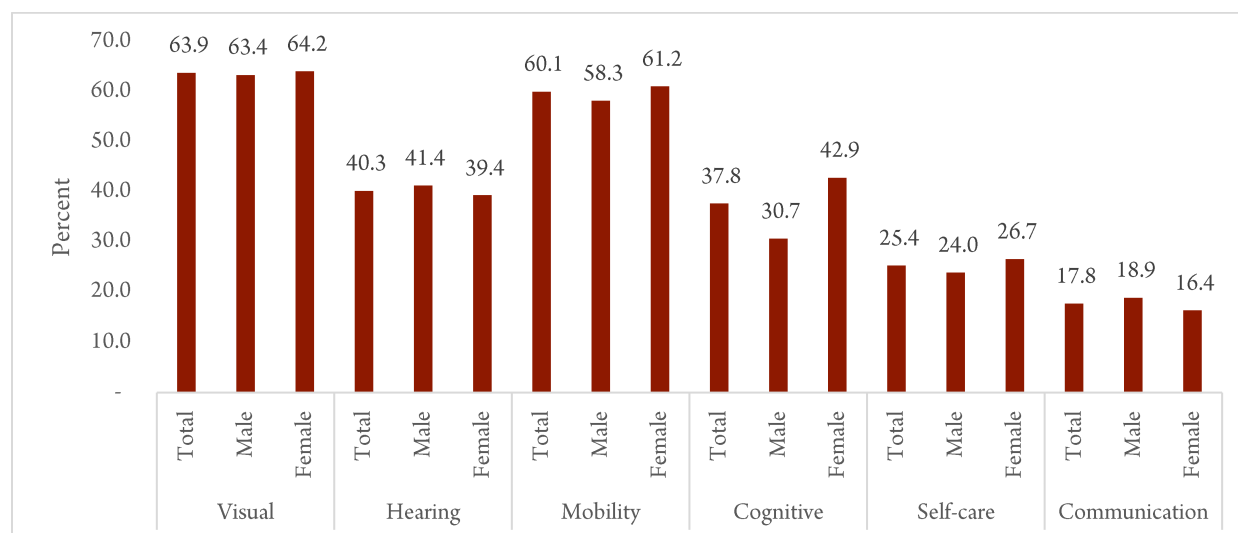


Figure 3.30: Distribution of Population Age 5 Years and above who used a Mobile Phone by Type of Disability and Sex

The distribution of population age 5 years and above by type of disability show that majority of those with visual difficulties who used a mobile phone were from the urban areas at 77.9 percent while the least had communication difficulties and were from rural areas at 15.3 percent as seen in Figure 3.31. Overall, mobile phone usage was low among PWDs in rural areas compared to those in urban areas irrespective of disability domain.

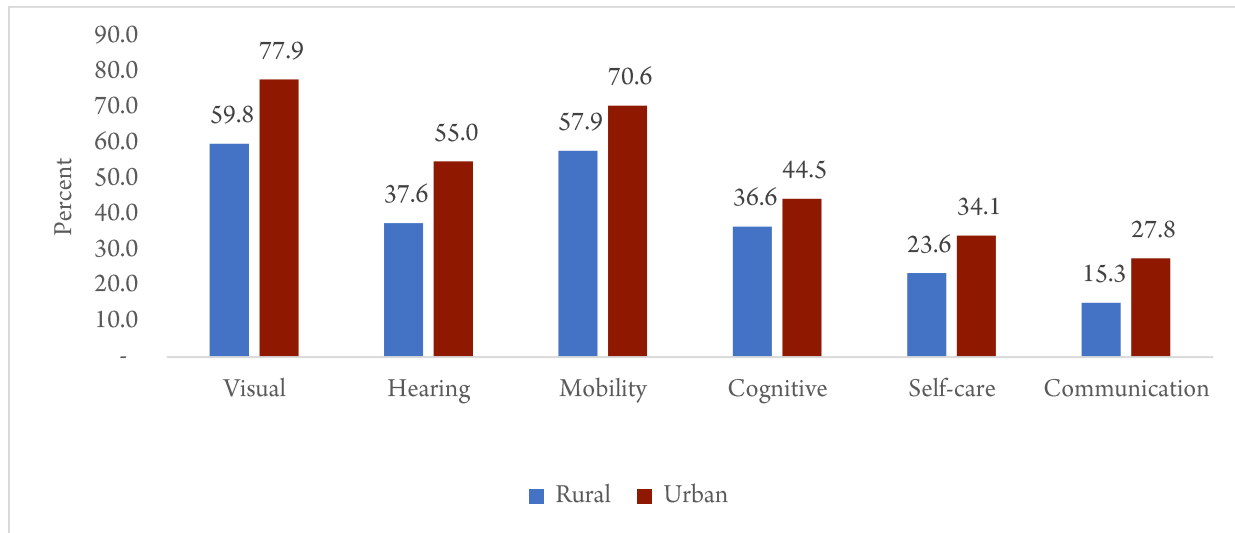


Figure 3.31: Distribution of Population Age 5 Years and above who used a Mobile Phone by Type of Disability and Area of Residence

3.2.6 Use of Mobile phone by Religious Affiliation

The distribution of population age 3 years and above by religious affiliation is shown in Figure 3.32. From the analysis, over 50 percent of individuals affiliated to all religions used a mobile phone except those professing Islam and Traditional religion at 40.8 percent and 29.9 percent, respectively. Mobile phone usage is highest among those in the Hindu religion at 86 percent.

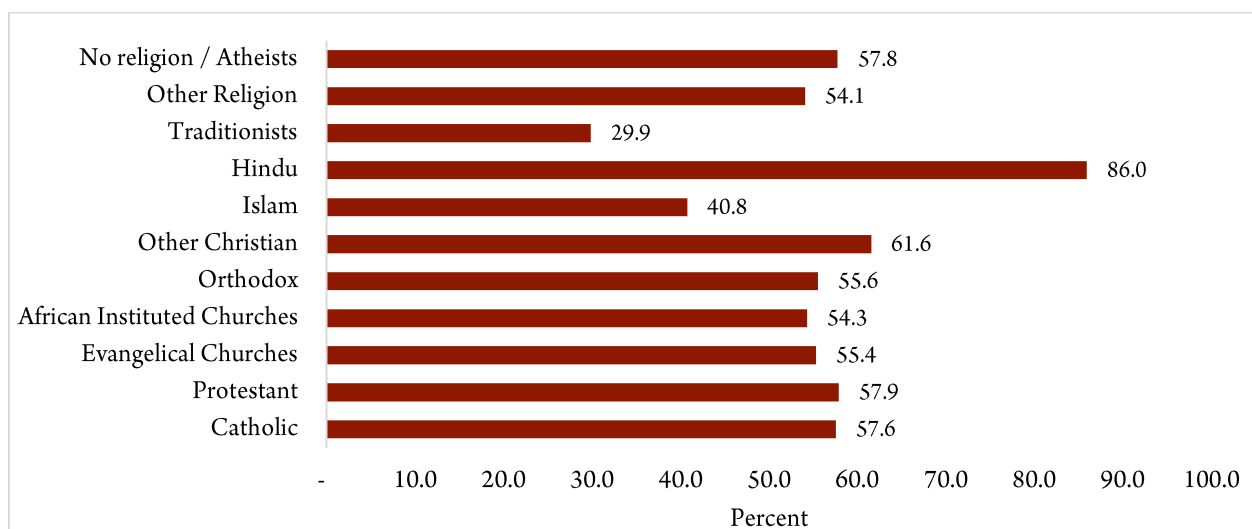


Figure 3.32: Distribution of Population Age 3 Years and above who used a Mobile Phone by Type of Religion

Distribution of population using mobile phone by religion and area of residence shows that majority of those that used a mobile phone were in urban areas with the highest proportion being the Hindu religion at 88.4 percent as shown in Figure 3.33.

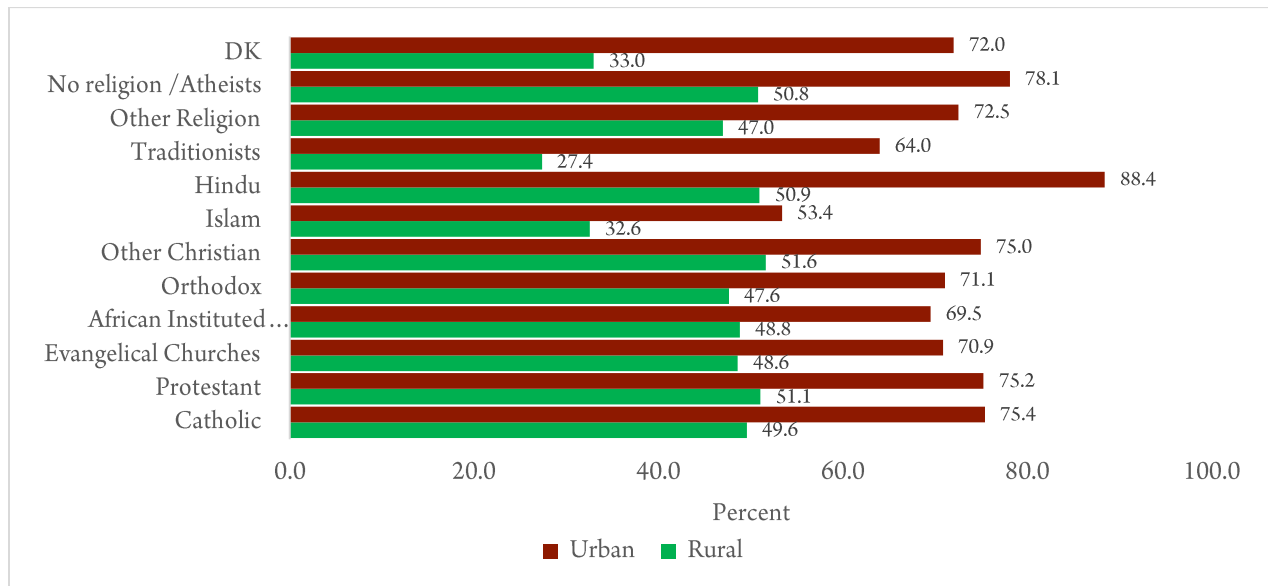


Figure 3.33: Distribution of Population Age 3 Years and above who used a Mobile Phone by Type of Religion and Area of Residence

Analysis of mobile phone usage by religious affiliation and sex indicate that majority of males from the Hindu religion used a mobile phone at 87.5 percent with the female traditionists being the least at 26.0 percent as shown in Figure 3.34. There was a marginal gender difference in mobile phone usage among Catholic, Protestant, and Orthodox religions.

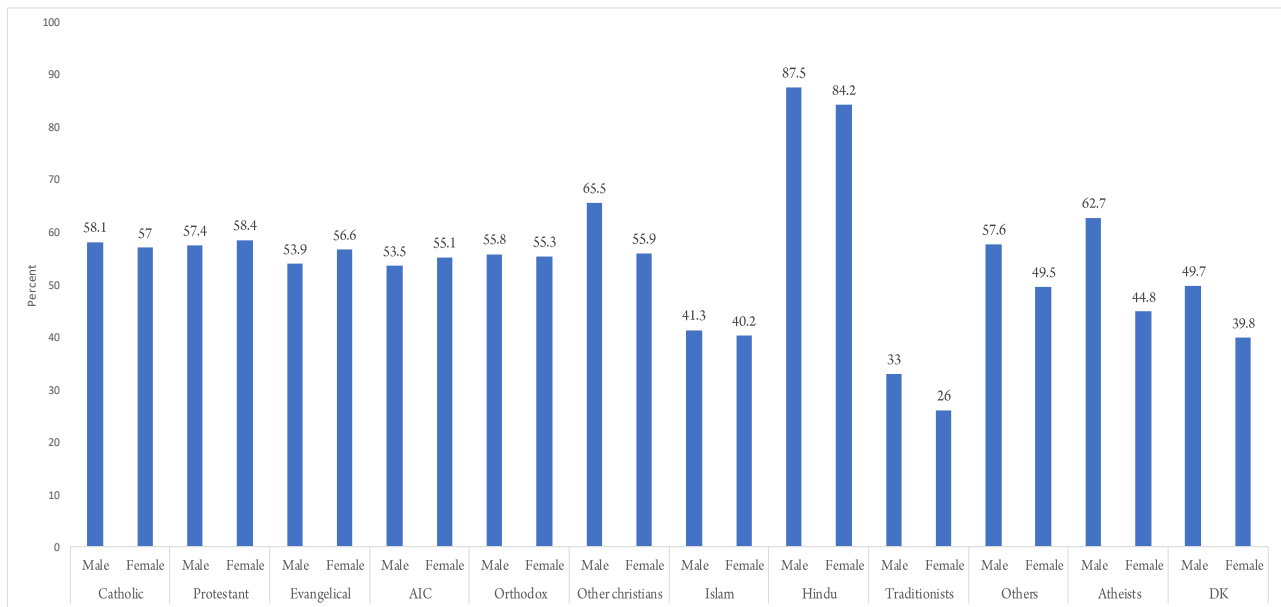
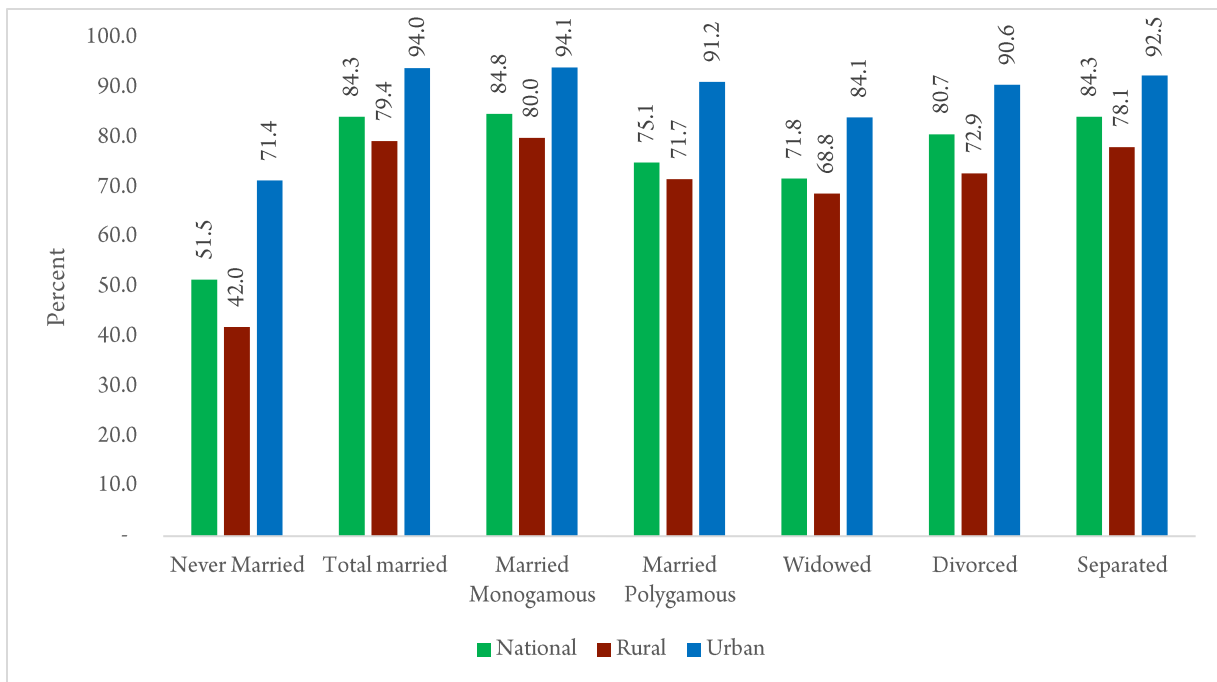


Figure 3.34: Distribution of Population Age 3 Years and above who used a Mobile Phone by Type of Religious Affiliation and Sex

3.2.7 Use of Mobile phone by Marital Status

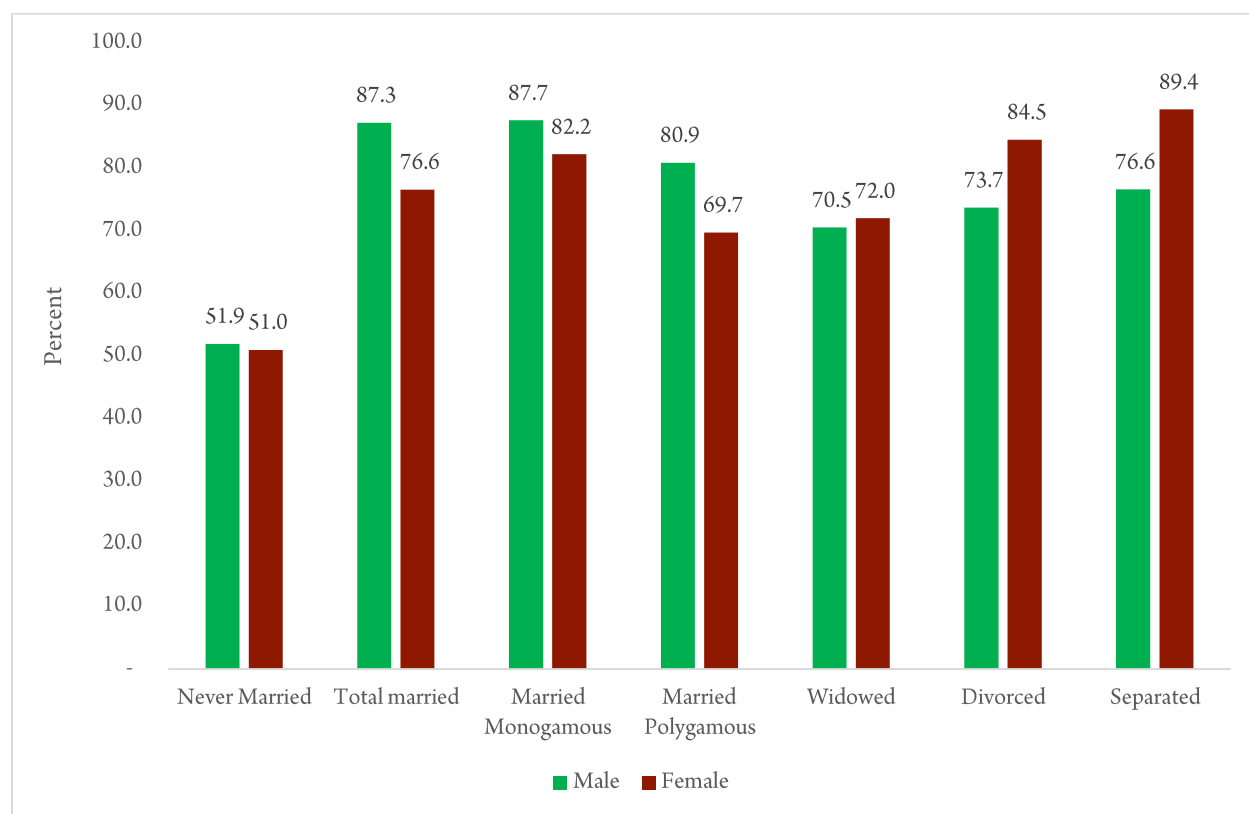
Figure 3.35 shows the proportion of the population aged 12 years and above using a mobile phone by marital status and residence. Out of the population 12 years and above by type of marital status, a majority of those who used a mobile phone were married at 84.3 percent (monogamous 84.8 percent and polygamous at 75.1 percent) and separated at 84.3 percent.



Note: Total Married is a combination of married monogamous and married polygamous

Figure 3.35: Percentage Distribution of population Age 12 years and above using a Mobile Phone by Marital Status and Area of Residence

The percentage distribution of population age 12 years and above using a mobile phone by marital status and sex is presented in Figure 3.36. Notably, the usage of mobile phones was highest in females that were separated at 89.4 percent followed by married monogamous males at 87.7 percent. While there was no marked difference in mobile phone usage among the never married, the male had a higher proportion among the married category (married monogamous and married polygamous), while females had a higher proportion among the widowed, divorced, and separated category.



Note: Total Married is a combination of married monogamous and married polygamous

Figure 3.36: Percentage Distribution of population Age 12 years and above using a Mobile Phone by Marital Status and sex

3.3 Mobile Sharers (Mobile phone users who do not own the phone)

Mobile sharers also referred to as those who use a mobile phone without owning it, must be considered in the formulation of ICT policies. This may include the removal of taxes on phones, reduction of mobile tariffs, enhancing network coverage, and building skills on ICTs where necessary, among others, so that majority can afford to own mobile phones. The importance of owning a mobile phone cannot be over-emphasized. A mobile phone gives a variety of benefits and for one to enjoy privacy, access to mobile services, among others, is recommended that one owns a mobile phone. However, some people still use mobile services but do not own one. This is by borrowing from friends, relatives, guardians, and so on. This, however, increases reliance on others and limits one to enjoy the

full benefits a mobile phone comes with. The 2019 Census collected data from the population that use a phone but do not own one. According to the results, those who were age 3 years and above and did not own a mobile phone but shared a mobile phone were 14.9 percent with the majority being female at 15.4 percent, as shown in Figure 3.37. The majority of those who shared a phone were from urban areas at 22.6 percent and rural at 12.7 percent. Figure 3.38 shows mobile sharers by counties.

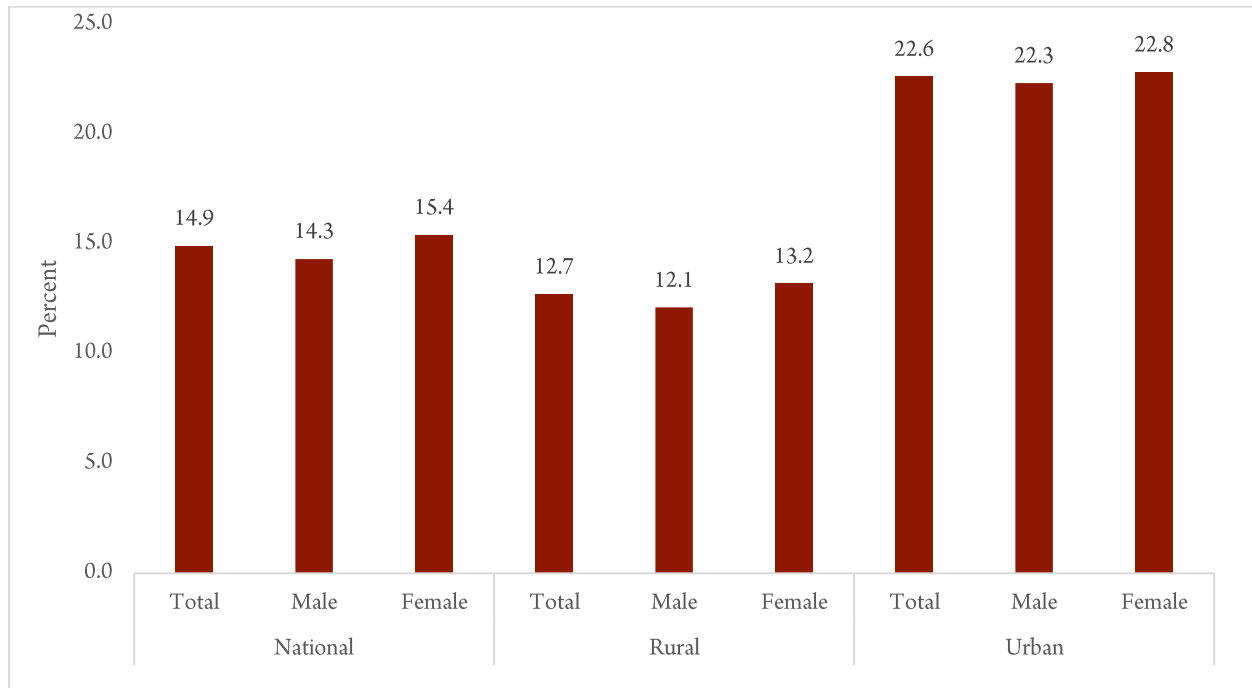


Figure 3.37: Percentage Distribution of Population Age 3 years and above sharing a Mobile Phone by Sex and Area of Residence

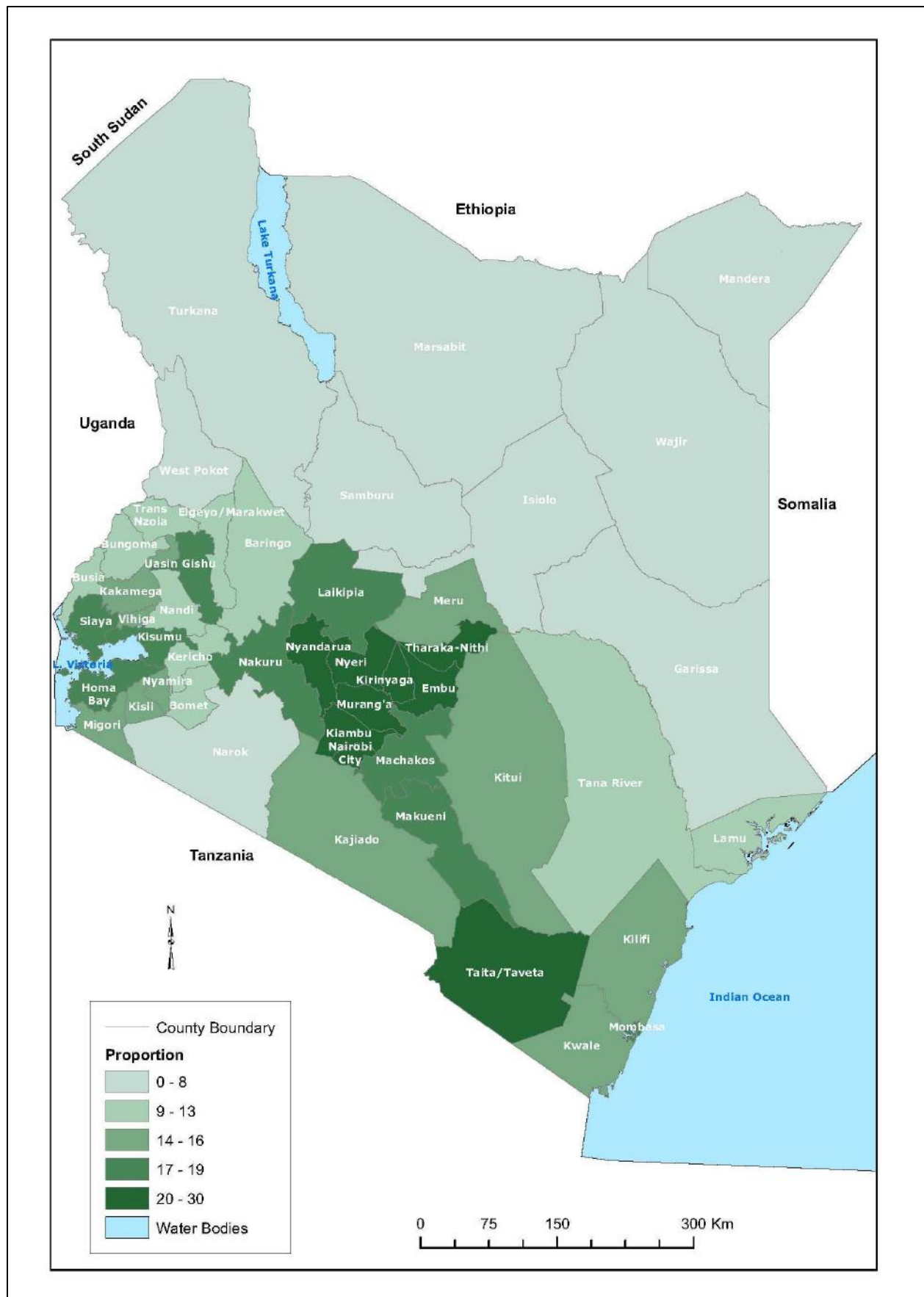


Figure 3.38: Mobile Phone Sharers by Counties

3.3.1 Mobile Phone Sharers by Age group

It is key to identify the age groups that are sharing a mobile phone. Technically, it is expected to have young children sharing a mobile phone with their guardians, parents, siblings, and so on. However, young adults who share a mobile phone may be limited in accruing the benefits that come with owning a mobile phone. The limitation of the young adults not owning a mobile could be due to parental restrictions, lack of money to buy their phones, among other reasons. The results from the 2019 Census show that about 21.4 percent of females in the age of 15-24 shared a mobile phone compared to 18.7 percent of males in the same age group as seen in Figure 3.39. Males above 65 years surpassed females in mobile sharing.

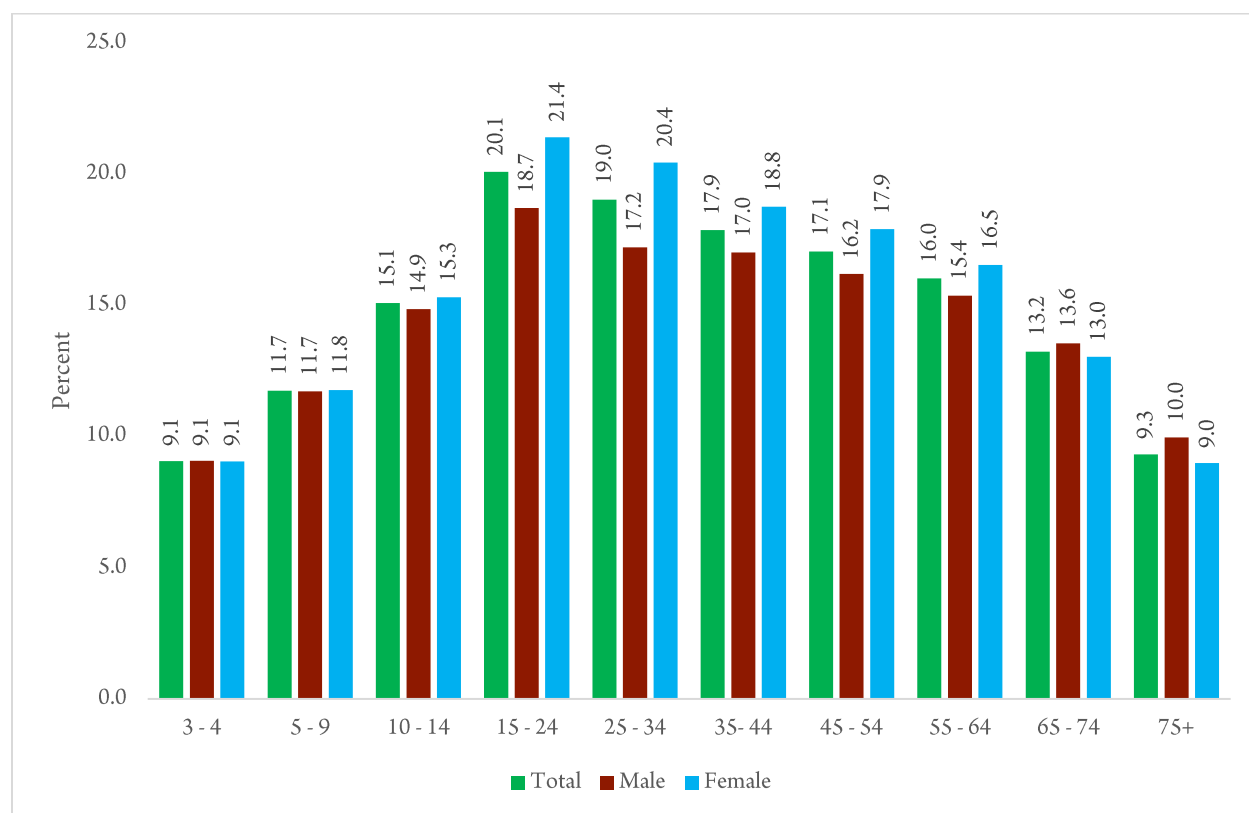


Figure 3.39: Percentage Distribution of Population Age 3 years and above sharing a Mobile Phone by Sex and Age Groups

3.3.2 Mobile Phone Sharers by Education Attendance Level

The population that shared a mobile phone (used a mobile without owning it) and were in school at the time when the census was undertaken, is presented in Figure 3.40. The results show that majority of those that shared a mobile phone, were in secondary school at 18.0 percent with the majority being female at 20.0 percent. The least were those in the middle technical at 1.8 percent and university at 2.7 percent.

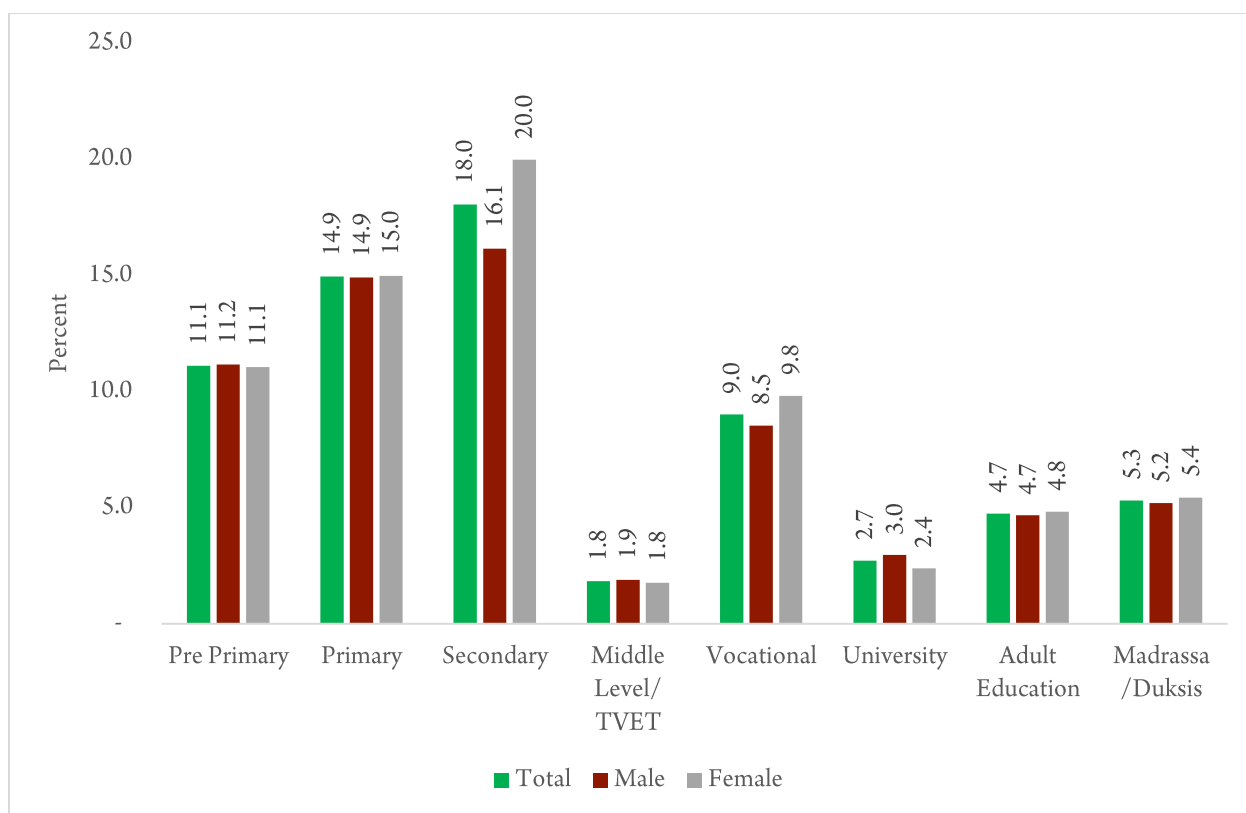


Figure 3.40: Percentage Distribution of Population Age 3 years and above sharing a Mobile Phone by Education Attendance Level and Sex

3.3.3 Mobile Phone Sharers by Highest Education Level Completed

It is expected that those with high education also have basic ICT skills. It is therefore notable that those with high education would then own their mobile phone. Similarly, those with low skills may shy away from owning a mobile as many do not see its importance or its need. The 2019 Census shows that those who use a mobile phone without owning it had pre-primary and primary levels as their highest education levels at 10.7 percent, a proportion that is higher than those who never attended any form of education (3.5 percent) as seen in Figure 3.41. The least population that used a mobile without owning it had tertiary (1.1 percent) and university (1.6 percent) as their highest attained education level.

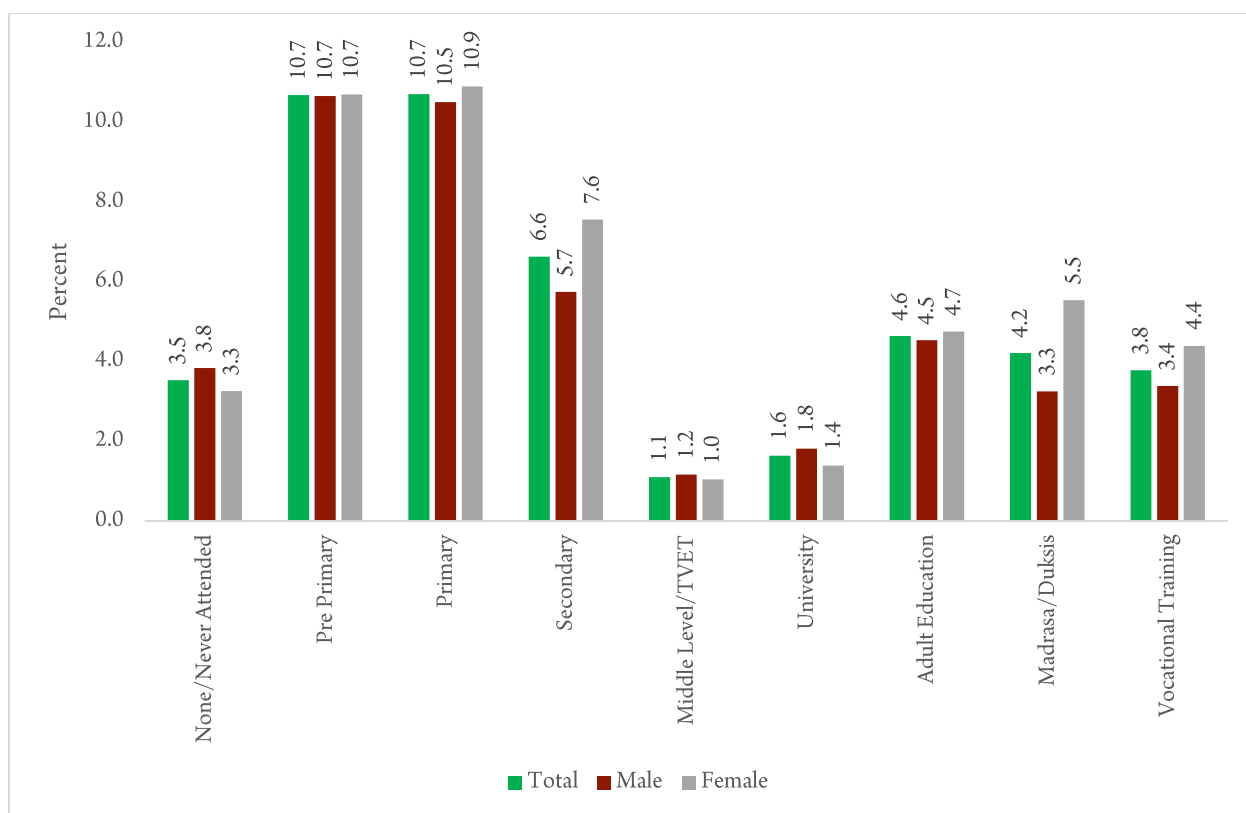


Figure 3.41: Percentage Distribution of Population Age 3 years and above Sharing a Mobile Phone by Highest Education Completed and Sex

3.3.4 Mobile phone sharers by Main Job Status

Job status determines abilities to own a mobile phone. Income status also plays a key role in mobile phone ownership. For instance, those who are low-income earners may not afford a mobile phone and the services it comes with. The analysis shows the main job status of persons who do not own but use a mobile phone. However, the Census did not capture details on an individual's income, hence in-depth research on this may be required. The Census results show that majority of those who shared a mobile phone were persons outside the labour force. This includes full-time students, retired, too old to work, homemakers, incapacitated, and too young to work. From those who were paid employees, the majority were females at 10.9 percent while males were 5.5 percent as seen in Figure 3.42.

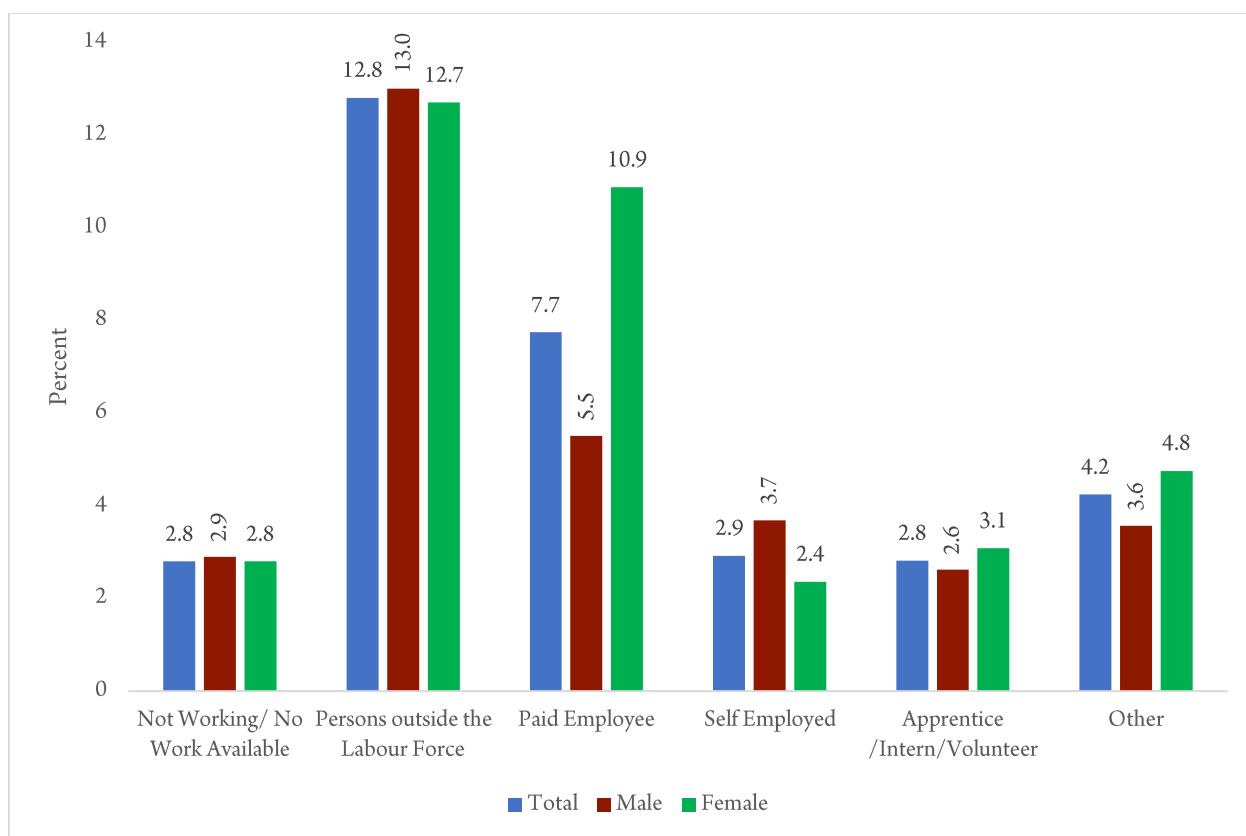


Figure 3.42: Percentage Distribution of Population Age 5 years and above Sharing a Mobile Phone by Main Job Status and Sex

3.3.5 Mobile Phone Sharers by Economic Activity

The analysis shows that majority of those who shared a mobile phone or used a mobile phone without owning it, engaged in Mining and Quarrying at 5.3 percent with females at 6.8 percent and males at 5.0 percent as shown in Table 3.5. Those engaged in Information and Communication were the least to share a mobile phone at 0.6 percent.

Table 3.5: Percentage Distribution of Population Age 5 Years and above who share a Mobile Phone by type of Economic Activity engaged and Sex

Type of Economic Activity	Total	Male	Female
Agriculture	4.6	4	5.1
Mining and quarrying	5.3	5	6.8
Manufacturing	1.7	1.6	1.9
Electricity gas steam and air conditioning supply	1	1	0.9
Water supply; sewerage waste management and remediation activities	1.9	1.8	2.1
Construction	2.7	2.7	2.1
Wholesale and retail trade; repair of motor vehicles and motorcycles	1.8	1.6	2
Transportation and storage	1.5	1.5	1.5
Accommodation and food service activities	2.2	1.8	2.4
Information and communication	0.6	0.6	0.7
Financial and insurance activities	0.7	0.6	0.7
Real estate activities	1.7	1.5	2.1
Professional scientific and technical activities	0.9	0.9	0.9
Administrative and support service activities	0.9	1	0.8
Public administration and defense; compulsory social security	0.7	0.7	0.7
Education	0.9	0.9	0.9
Human health and social work activities	0.8	0.8	0.9
Arts entertainment and recreation	1.7	1.7	1.8
Other service activities	2.2	2.1	2.3
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	3.6	3.9	3.4
Activities of extraterritorial organizations and bodies	1.5	1.4	1.6

3.3.6 Mobile Phone Sharers by Persons Living with Disability.

Persons living with disabilities should have the same benefits as others and be able to access, own and use ICTs. PWDs who use a mobile phone without owning it do not enjoy fully the benefits of a mobile phone. It is with this that the Census data captured the use of mobile phones without owning it by PWDs. The analysis shows that nationally, 6.3 percent of PWDs used a mobile without owning it nationally as shown in Figure 3.43. In the rural areas, the majority of female PWDs (6.4 percent) shared a mobile phone while in the urban areas, the majority were male PWDs at 6.7 percent.

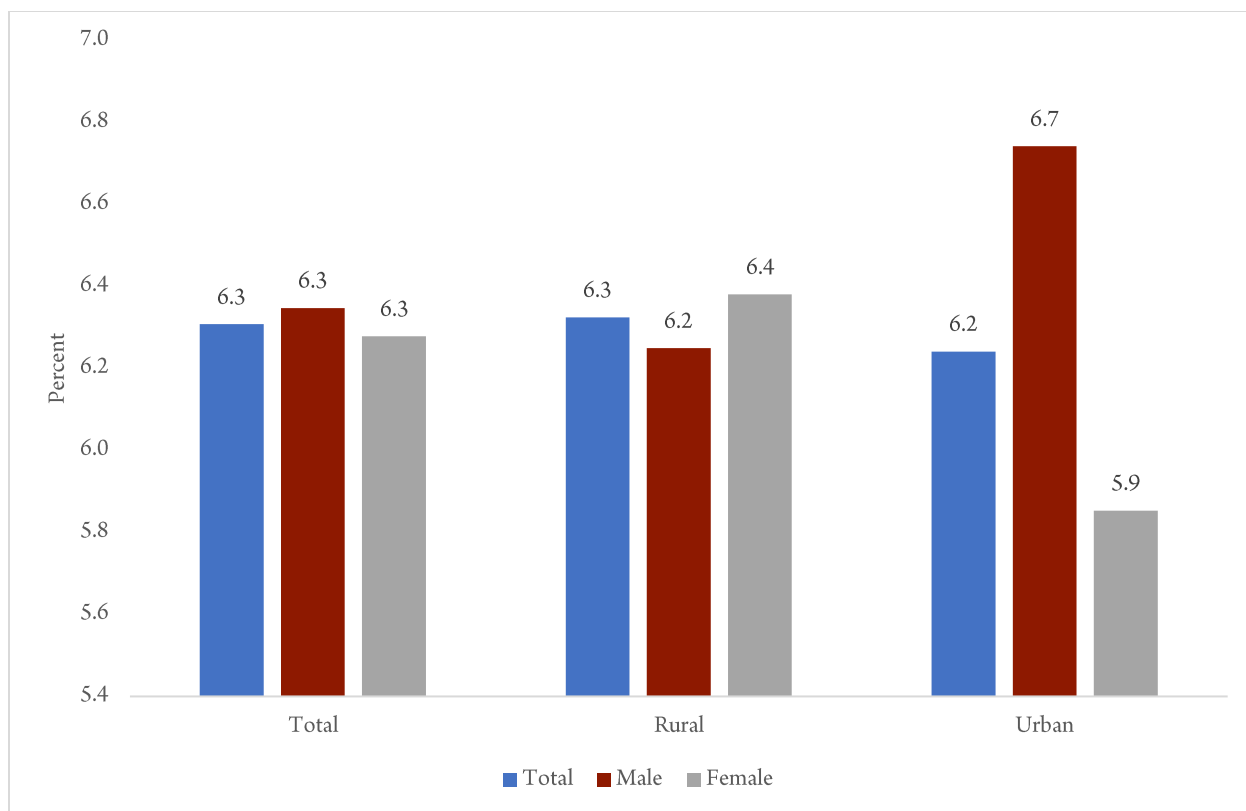


Figure 3.43: Percentage Distribution of Population Age 5 years and above Sharing a Mobile Phone by Persons Living with Disability.

3.3.7 Mobile phone sharers by Marital Status

The purpose of analyzing those who share mobile and their marital status and is to see whether marital status plays a role in inhibiting one to own a mobile phone. For instance, some cultures advocate for married women not to own a phone and hence share it with their husbands. The 2019 census report show that majority of those who shared a phone were never married at 10.7 percent with females being the majority at 11.5 percent as seen in Figure 3.44. Interestingly, a majority of males who shared a mobile were those that were separated (5.7 percent), divorced (4.9 percent), and widowed (4.2 percent) while women were more in married monogamous (4.3 percent) and polygamous (5.1 percent) marital status.

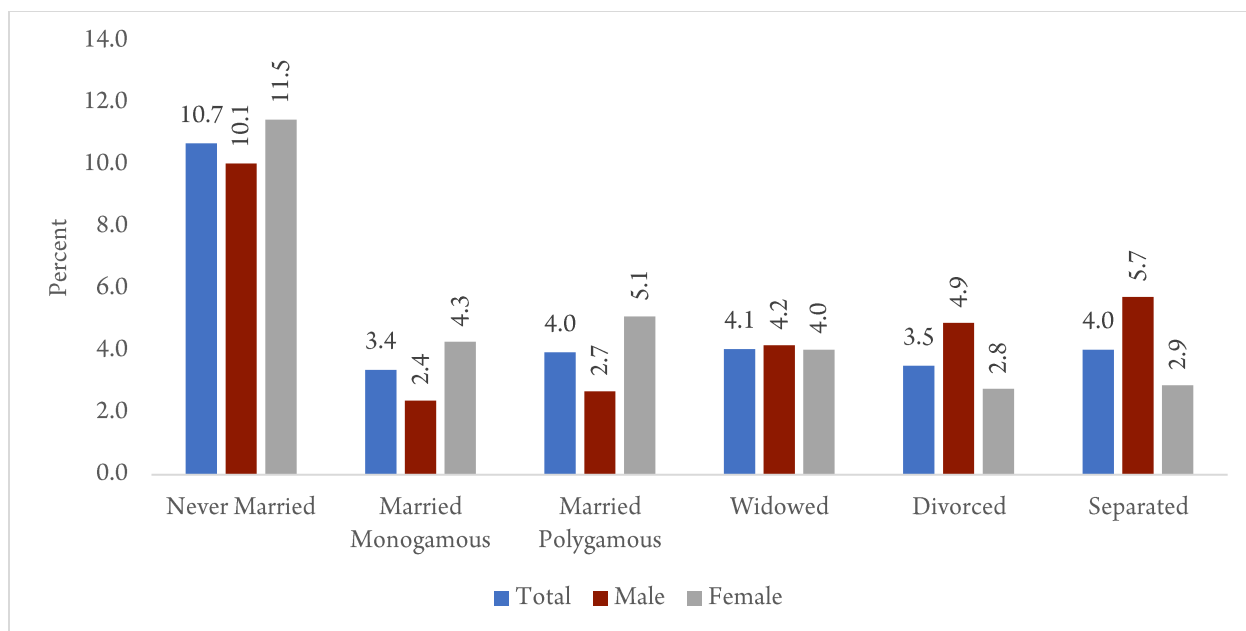


Figure 3.44: Percentage Distribution of population Age 12 years and above Sharing a Mobile Phone by Marital Status and Sex

3.3.8 Mobile Phone Sharers by Religious Affiliation

Religion plays a key social impact on many individuals in the World. Different types of religious affiliation may influence how people handle and use ICTs. The 2019 census collected information on religion and the mobile sharers as seen in Figure 3.45. The analysis shows that majority who shared a mobile phone were from evangelical churches at 9.0 percent, followed by protestants at 8.5 percent. The least mobile sharers were traditionists at 3.8 percent and Islam at 4.6 percent. Though it is worth noting that traditionists and Islam followers were the least population in owning a mobile phone, therefore, a large population of these followers, neither own a mobile phone nor share a mobile phone.

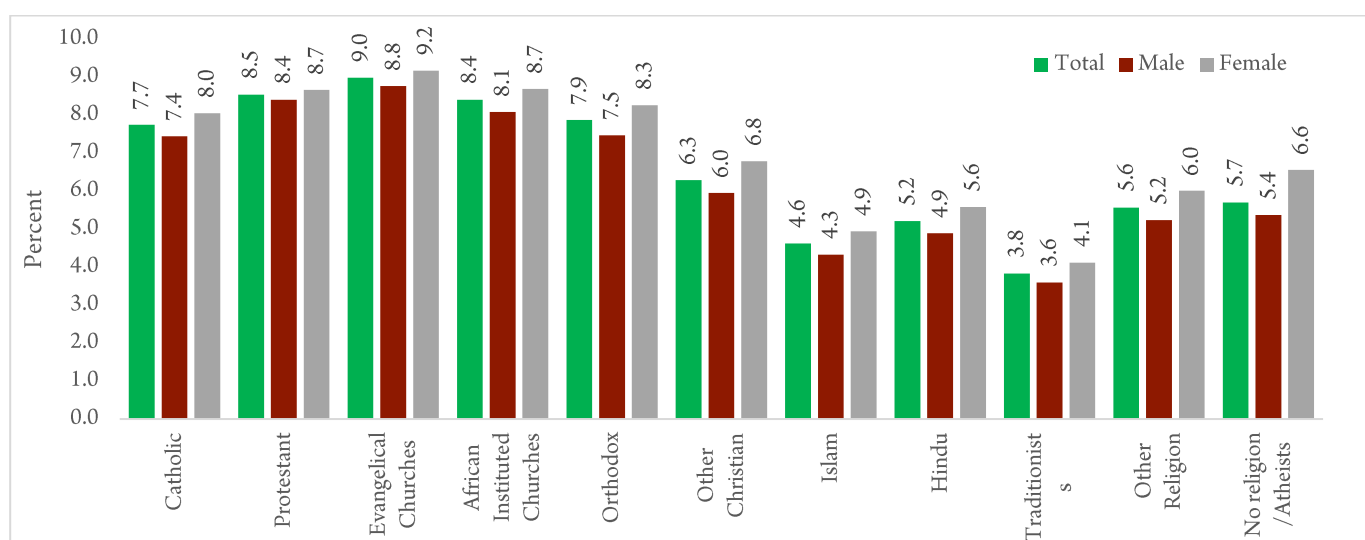


Figure 3.45 Percentage Distribution of Population Age 3 years and above Sharing a Mobile Phone by Religious Affiliations and Sex

Chapter 4: Internet Usage at Individual Level

The Internet has become an increasingly important tool to access public information, communicate, work and facilitate business. The Government has continued to facilitate the deployment of infrastructure for universal, always-on, high speed, wireless data connectivity for all. Internet uptake is a key indicator for measuring the development of the information society and the growth of Internet content, including user-generated content which provides access to information and services. The Internet also plays a fundamental role in the provision of access to information resources to academic institutions and learners. It offers potential for increased access and exposure to quality information.

4.1 Use of Internet

Figure 4.1 presents the proportion of the population age 3 years and above that used the Internet by sex and residence. Nationally, 22.7 percent of the population aged 3 years and above used the Internet. The proportion of the population in urban areas using Internet was 42.6 percent compared with 13.8 percent in rural areas. A higher proportion of males (25.2%) than females (20.2%) reported having used the Internet in the reference period.

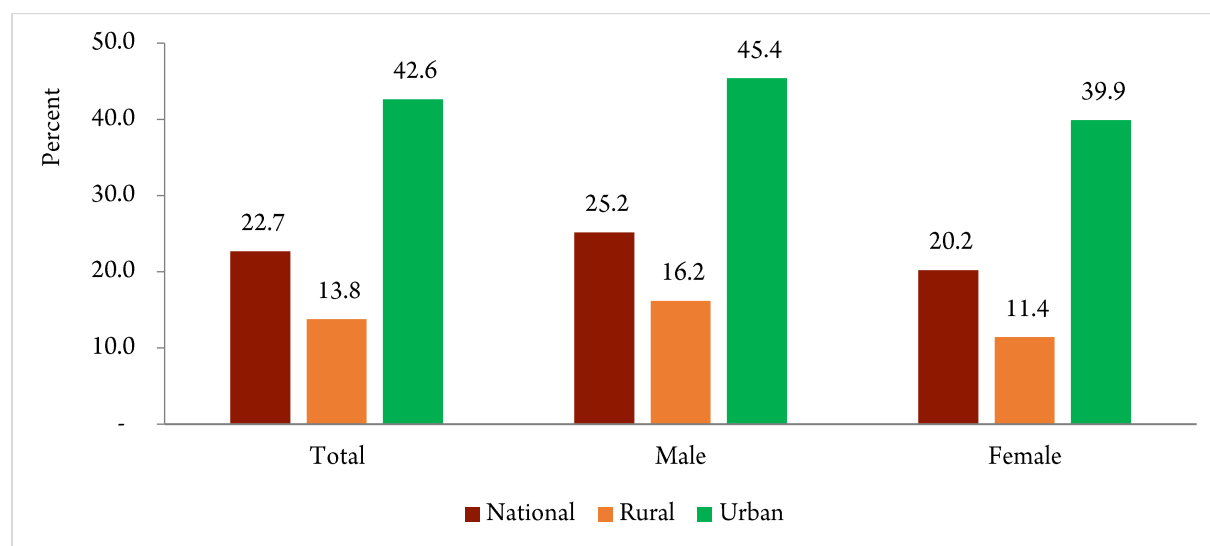


Figure 4.1: Distribution of Population Age 3 Years and above using the Internet by Sex and Residence

Figure 4.2 presents the counties with the highest and lowest proportion of the population using the Internet. Nairobi City County had the highest proportion of the population (52.5 %) using the Internet, which is more than twice the national average, while Turkana County registered the lowest usage at 7.0 percent. Among the top five counties in terms of Internet use are Nairobi City, Kiambu, Mombasa, Kajiado, and Nyeri. Figure 4.3 shows internet users by Counties.

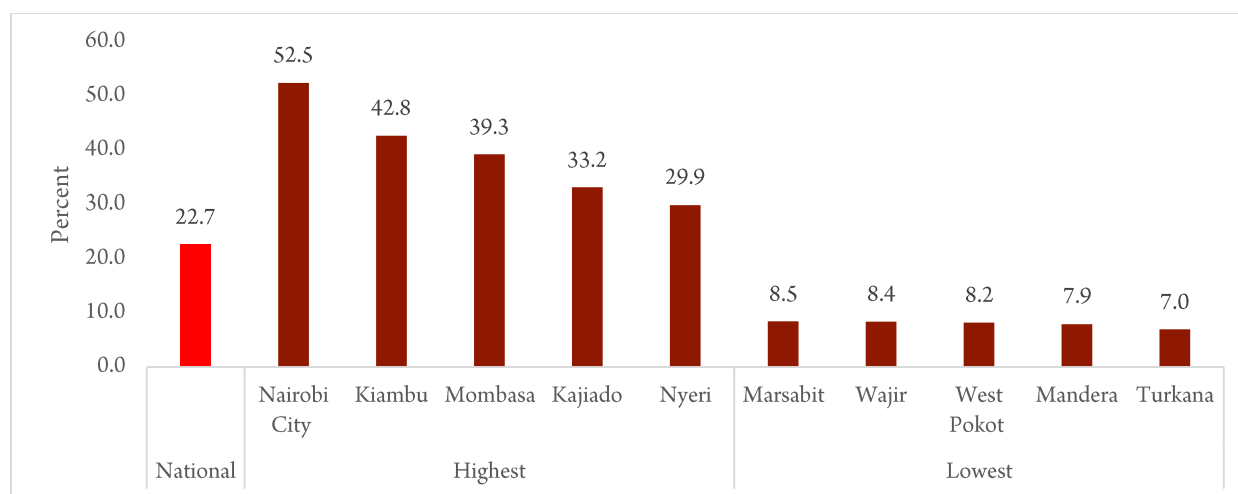


Figure 4.2: Counties with the Highest and Lowest Proportion of Population using Internet.

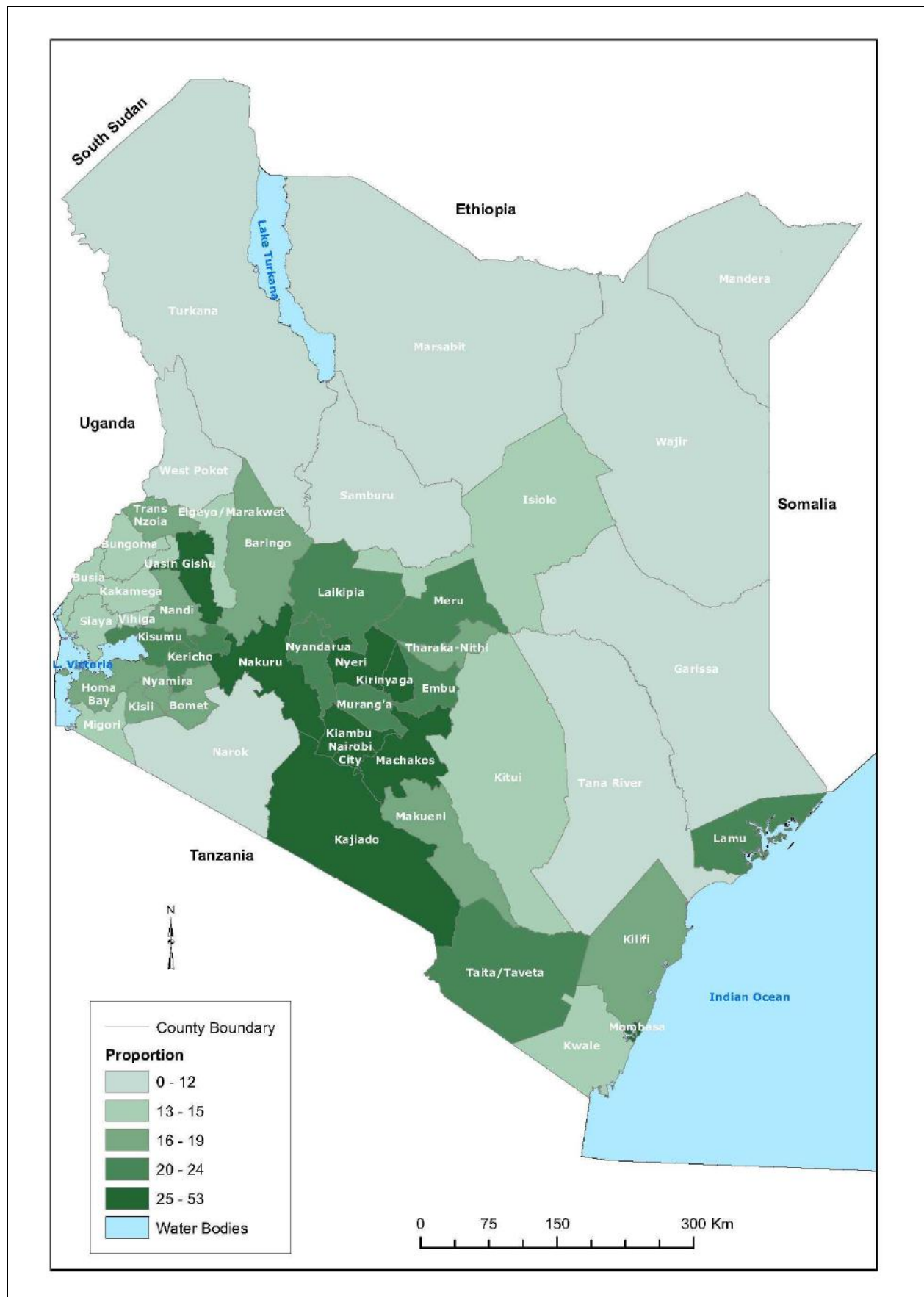


Figure 4.3: Internet Users by Counties

4.2 Use of Internet and Age Distribution

Age is one of the biggest influencers in Internet use. Internet usage among primary school-going age levels of between age 5-14 is low compared to that of secondary school and tertiary school age of between 15-24 years. This is mainly because Internet use is not part of pedagogy in primary schools. The data on the distribution of the population age 3 years and above show that Internet use peaks at age 25-34 years and starts deteriorating from 35 years as shown in Figure 4.4. The use of the Internet was dominated by males at all age ranges. The Internet use in the 25-74 years age cohort was at 34.3 percent, slightly above those in the 15-24 years cohort at 32.3 percent as shown in Figure 4.5.

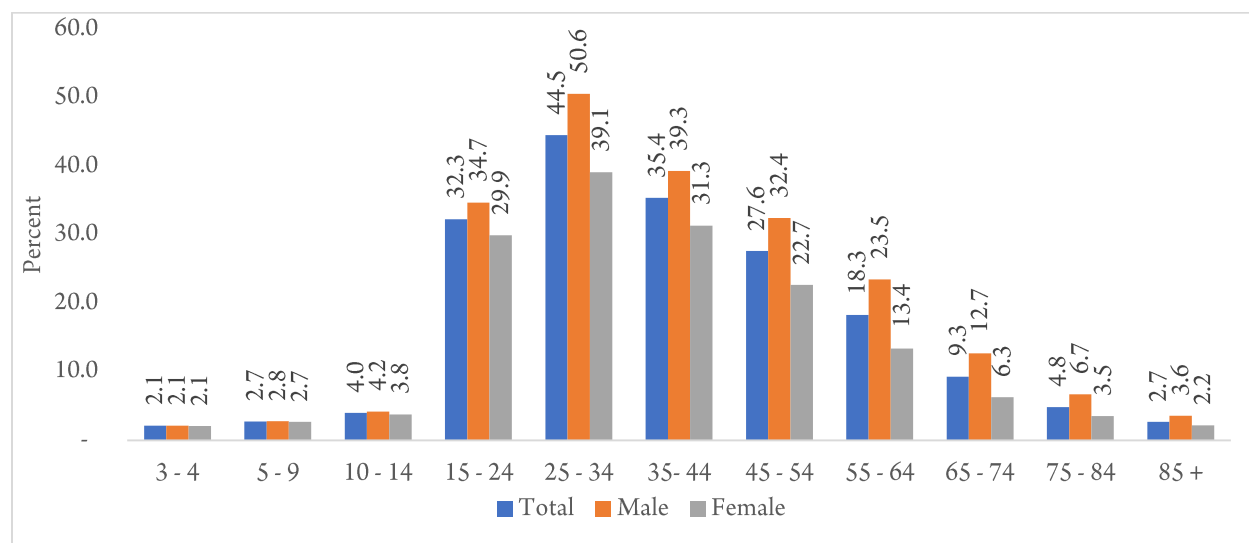


Figure 4.4: Proportion of Population Age 3 years and above that used Internet by Age group and Sex

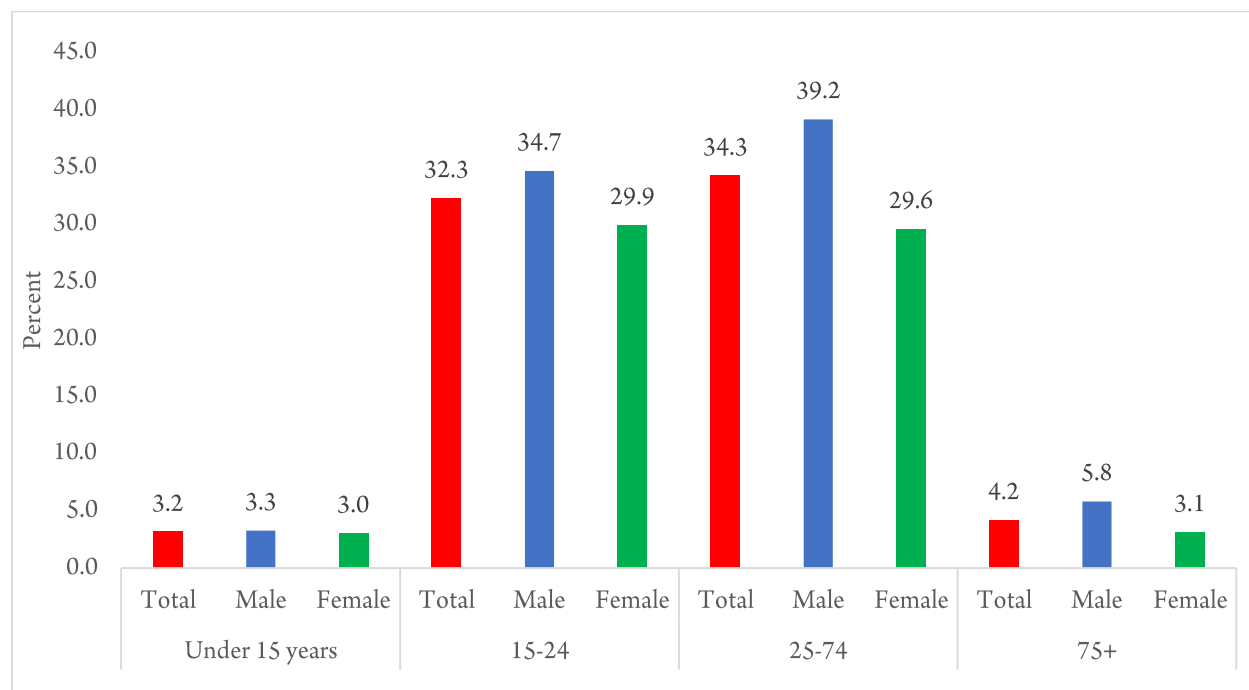


Figure 4.5: Proportion of Population Age 3 years and above that used Internet by Age Cohort and Sex

4.3 Use of the Internet by Current Education Level

Figure 4.6 presents the percentage distribution of population age 3 years and above using the Internet by current school/ learning institutions level and sex. In general, the use of the Internet is likely to increase with education level. Analysis on the usage of Internet by education level shows that all students in the university used Internet followed by those in tertiary at 88.7 percent. The lowest Internet users were in pre-primary at 2.3 percent followed by primary at 4.0 percent. Analysis by sex shows that there was no major difference in the use of the Internet between males and females in school though in most cases males led minimally.

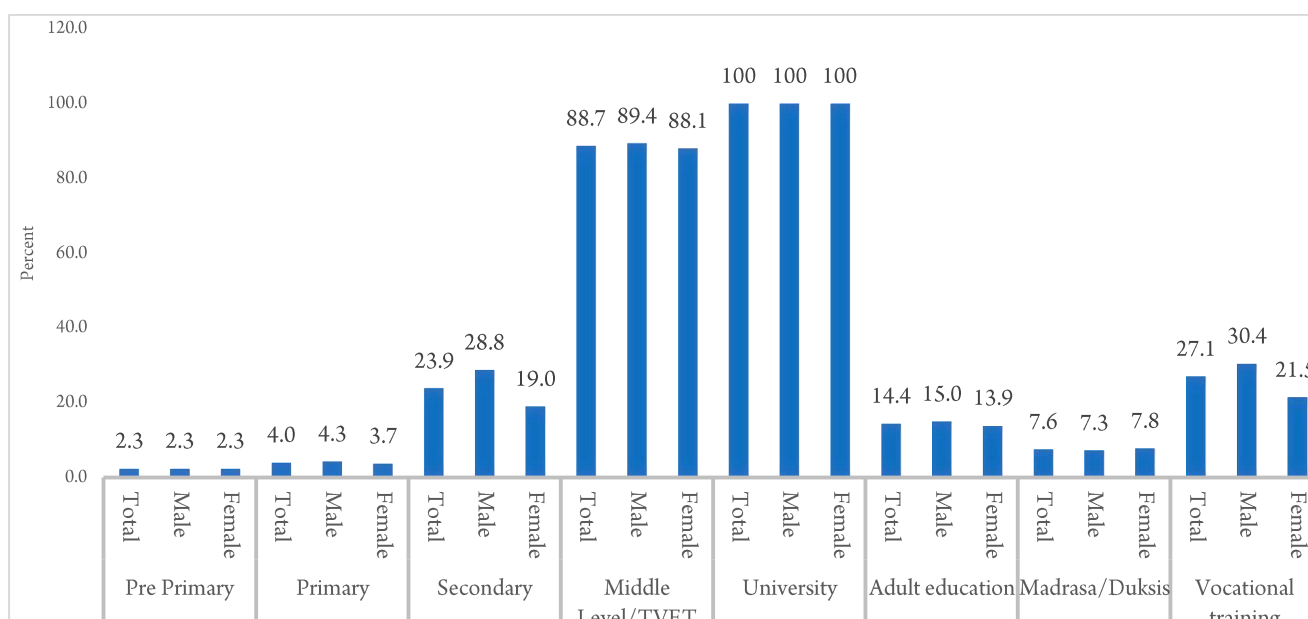


Figure 4.6: Percentage Distribution of Population Age 3 Years and above using the Internet by Current Education Level and Sex.

Figure 4.7 presents the percentage distribution of population age 3 years and above using the Internet by current education level and area of residence. The highest usage of Internet by school level was reported by those in university both in rural and urban areas. Overall, proportions were higher for those in urban areas in most education categories.

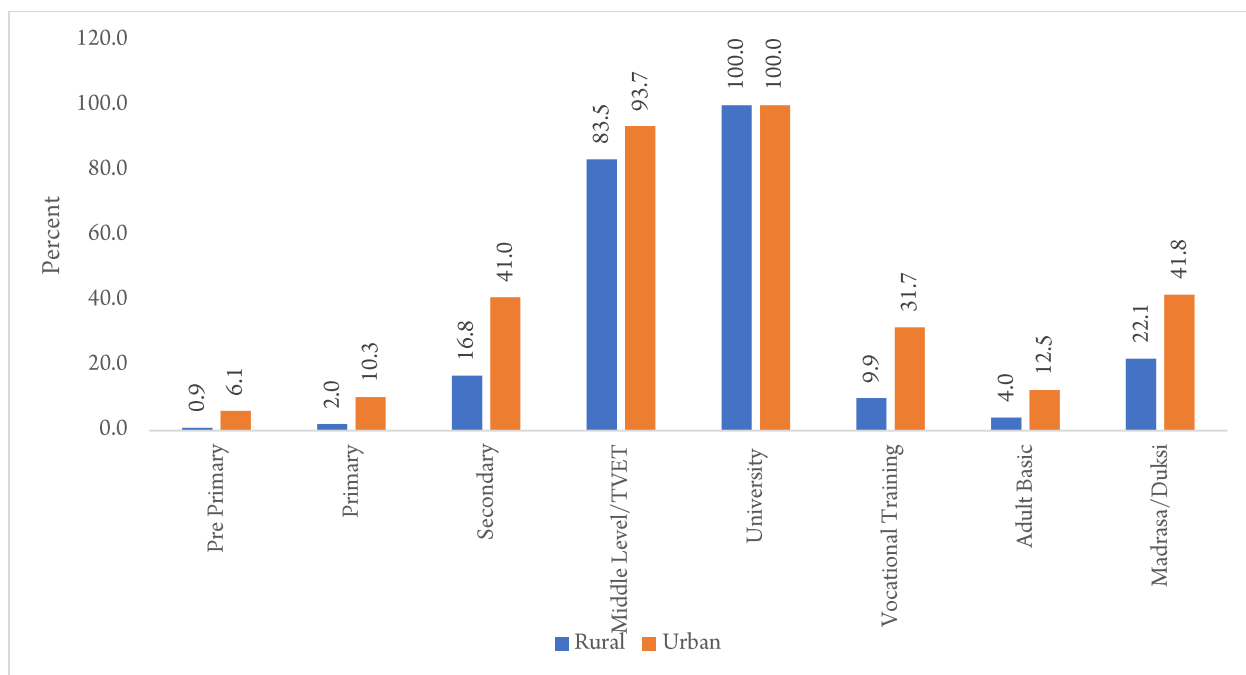


Figure 4.7: Proportion of Population Age 3 years above using Internet by Current Education level and Area of Residence

4.4 Use of the Internet by Highest Education level Completed

The fundamental purpose of education is to gain knowledge, instill appropriate behavior, skills and acquire technical proficiency. Education contributes to human capacity development and is, therefore, key in the effective use of ICT. Students who attend schools that use the Internet for pedagogical purposes have a round of knowledge in digital skills. The KPHC 2019 collected data on the individuals who used the Internet by highest education completed.

Figure 4.8 presents the percentage distribution of population age 3 years and above using the Internet by the highest level of education completed and area of residence. The results reveal that Internet usage among individuals was higher in urban areas for all education levels, with the highest being those in the university at 97.1 percent followed by those in tertiary at 87.1 percent. A major difference of those in Internet usage between the urban and rural areas is among those with the secondary school as their highest education levels, with the rural at 32.5 percent and urban at 59.9.

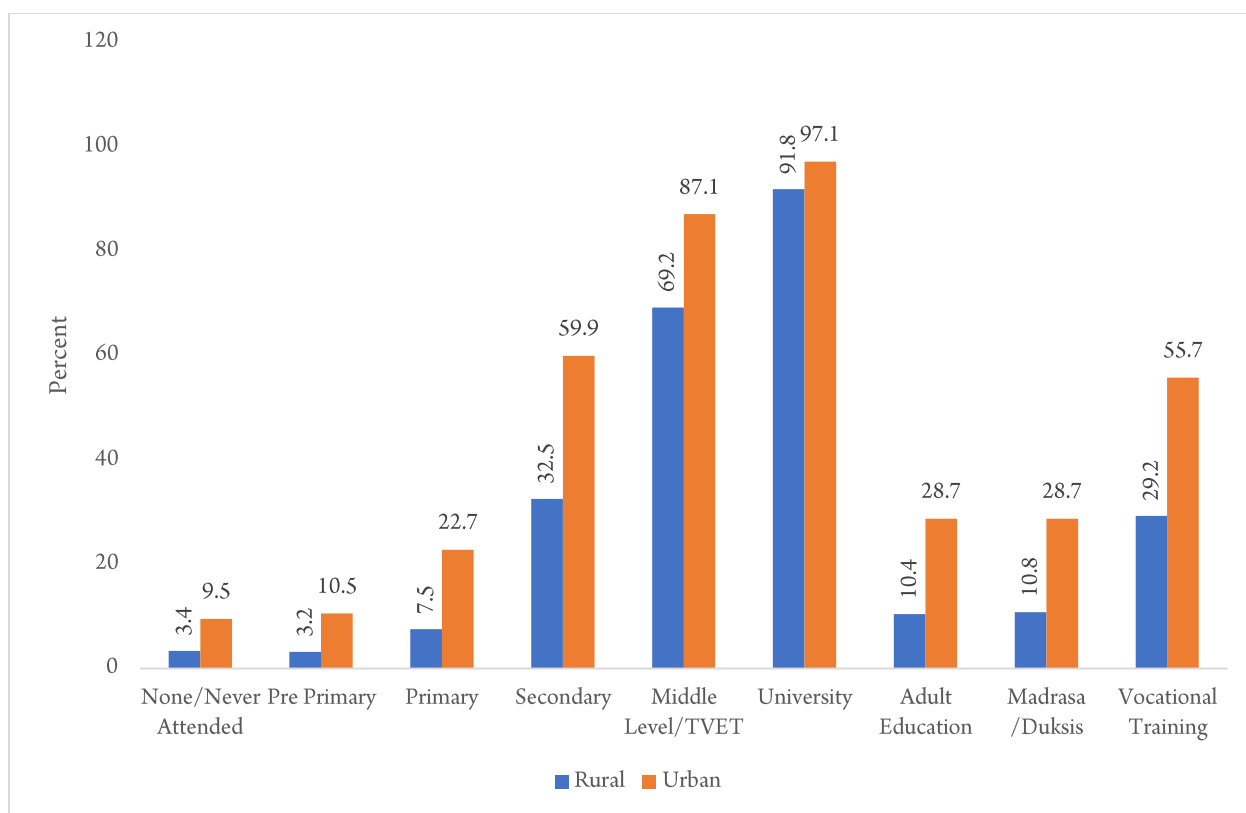


Figure 4.8: Proportion of Population Age 3 Years and above using the Internet by Highest Education Level Completed and Area of Residence

Figure 4.9 depicts the proportion of population age 3 years and above using the Internet by highest education completed and sex. Overall, usage of the Internet was higher for males than females for all education levels completed except for university and madrasa categories.

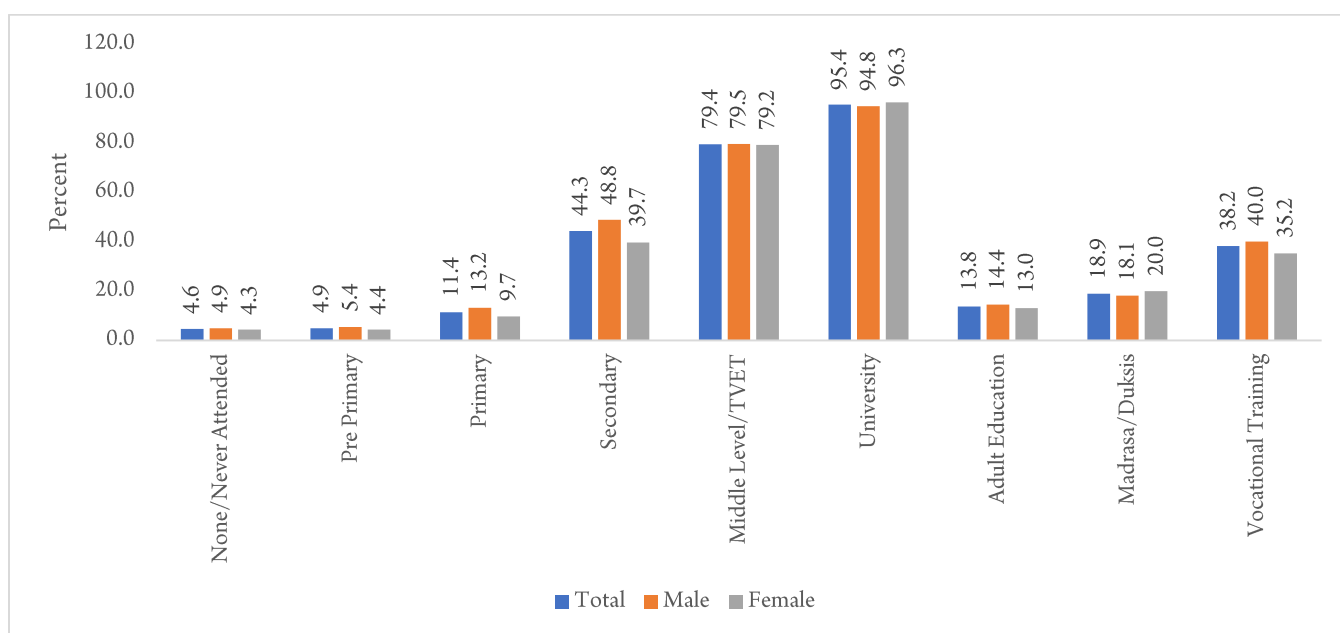


Figure 4.9: Proportion of Population Age 3 years and above using the Internet by Highest Level of Education Completed

4.5 Use of the Internet by Main Job Status

The distribution of population using the Internet by the main job held is shown in Figure 4.10. The target population for those who used the Internet by main job status were 5 years and above. The majority of those who used the Internet were paid employees at 40.2 percent followed by apprentices at 40.0 percent. In addition, there was a notable difference between males (31.4 percent) and females (22.0 percent) who were self-employed using the Internet.

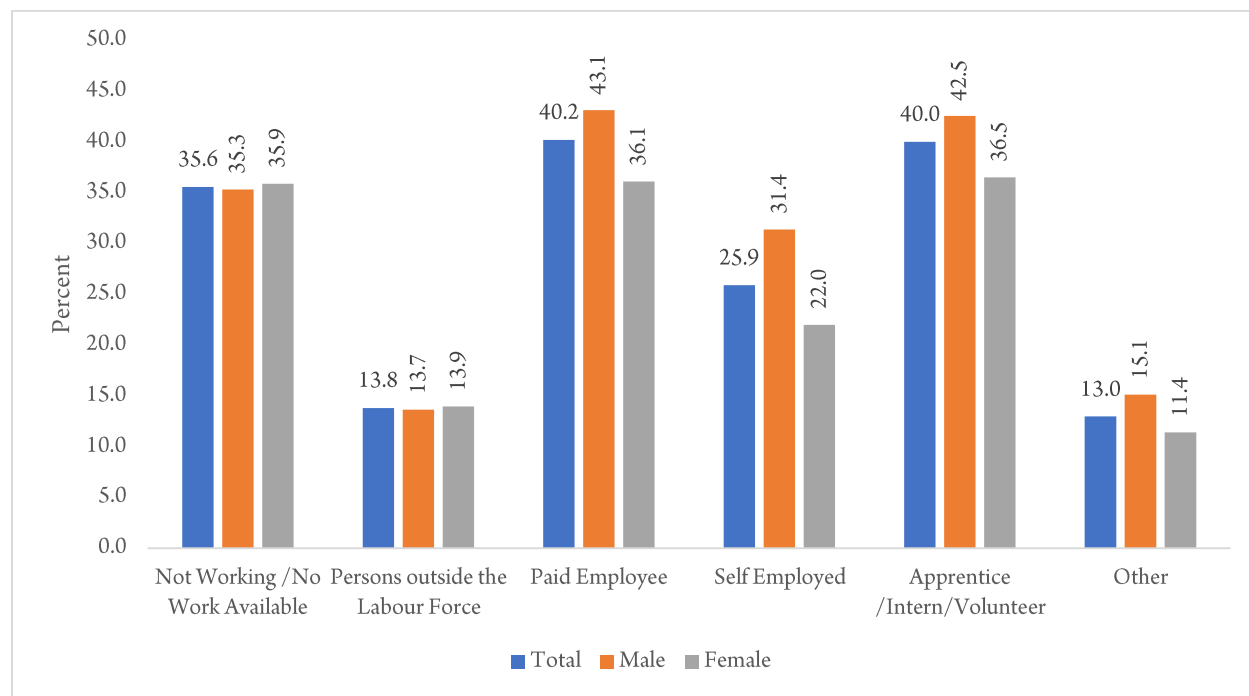


Figure 4.10: Proportion of Population Age 5 years and above using the Internet by Main Job Status and Sex

The majority of those who used the Internet were apprentice/ interns and volunteers residing in the urban areas at 68.3 percent followed by those who were paid employees at 63.6 percent as shown in Figure 4.11.

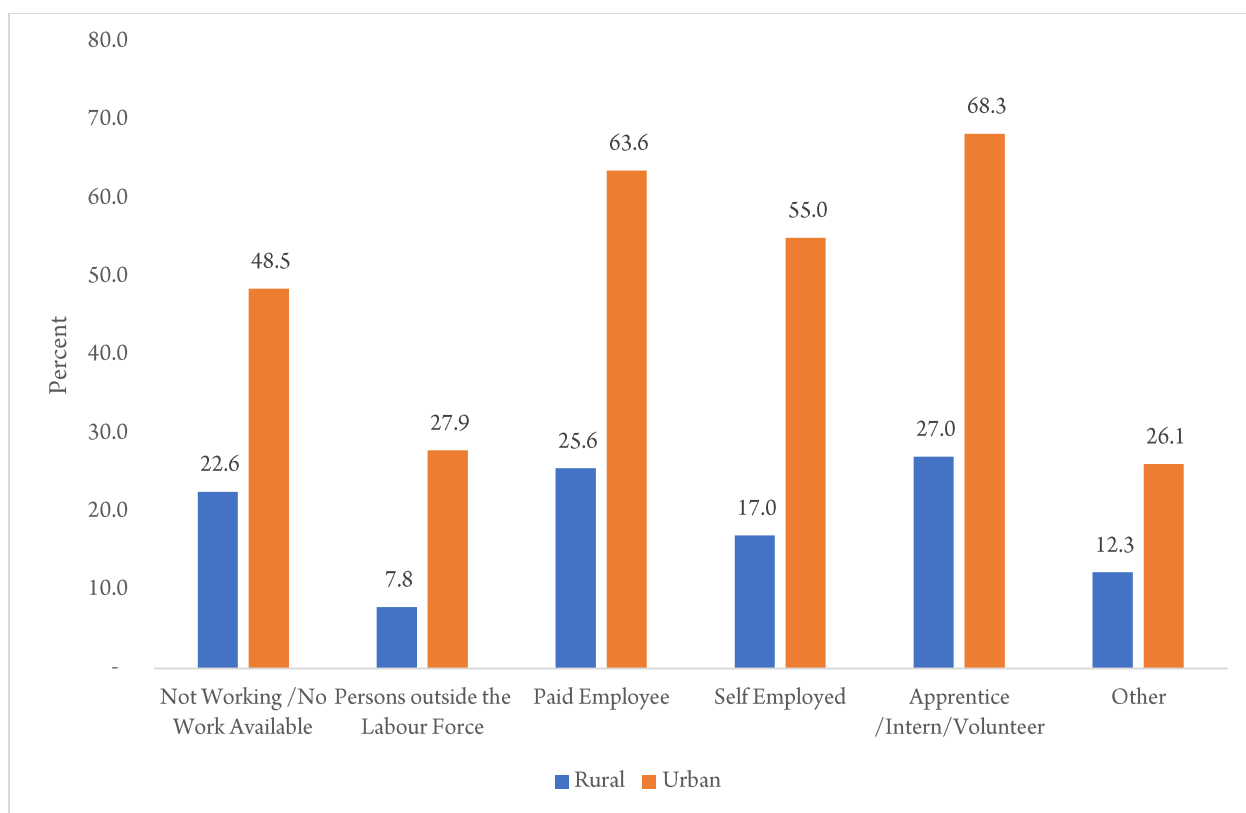


Figure 4.11: Proportion of Population Age 5 years and above using the Internet by Main Job Status and Area of Residence

4.6 Use of the Internet by Type of Economic Activity

The use of the Internet has significantly changed the processes of engaging in the labour force. It has offered a means of accessing new employment opportunities through the development of new products, services, and markets.

Table 4.1 shows the percentage distribution of population age 5 years and above using the Internet by type of economic activity engaged in. The highest proportion of those who had used the Internet were engaged in Information and Communication at 92.0 percent with males at 93.1 percent and females at 90.1 percent. The least was in Agriculture at 16.4 percent with males at 19.8 percent and females at 13.9 percent.

Table 4.1: Percentage distribution of population age 5 years and above using Internet by Type of Economic Activity Engaged In

Type of Economic Activity	Total	Male	Female
Agriculture	16.4	19.8	13.9
Mining and quarrying	26.8	28.1	19.2
Manufacturing	56.6	58.9	51.6
Electricity gas steam and air conditioning supply	76.1	75.5	81
Water supply; sewerage waste management and remediation activities	58.5	58.4	58.8
Construction	42.9	42.3	56.8
Wholesale and retail trade; repair of motor vehicles and motorcycles	54.9	59.2	50.6
Transportation and storage	53.8	53	72.1
Accommodation and food service activities	53.7	60	49.7
Information and communication	92	93.1	90.1
Financial and insurance activities	90.4	91.8	88.9
Real estate activities	60.1	61.6	57.5
Professional scientific and technical activities	80.9	81.3	80.2
Administrative and support service activities	76	72.1	81.6
Public administration and defense; compulsory social security	78.1	76.6	85.1
Education	79.2	81.4	77.5
Human health and social work activities	81.9	83.2	81
Arts entertainment and recreation	68.8	72.3	64.4
Other service activities	49.8	50.9	48.5
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	36.4	34.4	37.8
Activities of extraterritorial organizations and bodies	65.2	64	67.3

4.7 Use of the Internet by Disability

Persons living with disabilities are increasingly adopting the Internet to access information. This enables them to actively participate in the daily activities of life and in broadening their relationships with the public. Persons living with disabilities face different challenges in accessing and using the Internet. Barriers to access and usage of the Internet vary by type and extent of disability. Although the barriers faced by persons with disabilities in the online environment are extensive, technologies have been developed and deployed to facilitate the inclusion of such persons. The use of the Internet by persons living with a disability is important as it ensures digital inclusivity.

The KPHC 2019, collected data on disability for individuals aged 5 years and above. The analysis shows that 11.4 percent of PWDs used the Internet and the majority of them were in urban areas at 27.1 percent as shown in Figure 4.12. In addition, slightly, more male (13.5%) than female (9.8%) PWDs used the Internet.

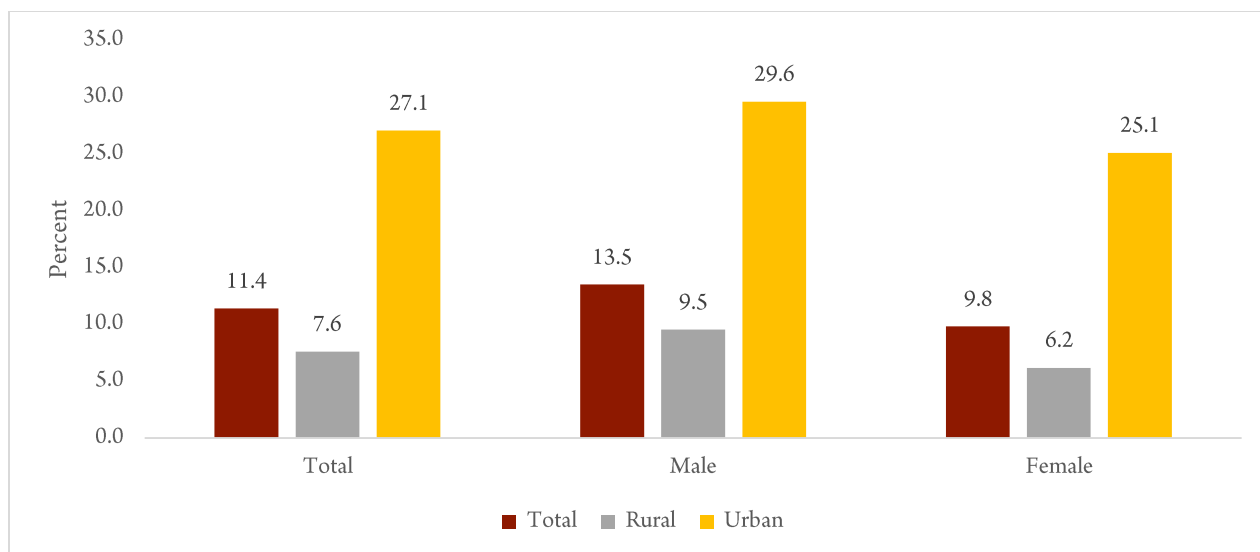


Figure 4.12: Proportion of Population Age 5 years and above using the Internet by People Living with Disability, Area of Residence and Sex

Figure 4.13 shows the top 5 counties that have the highest and the lowest proportion of PWDs using the Internet. Nairobi City has the majority at 36.8 percent while West Pokot has the lowest at 4.4 percent.

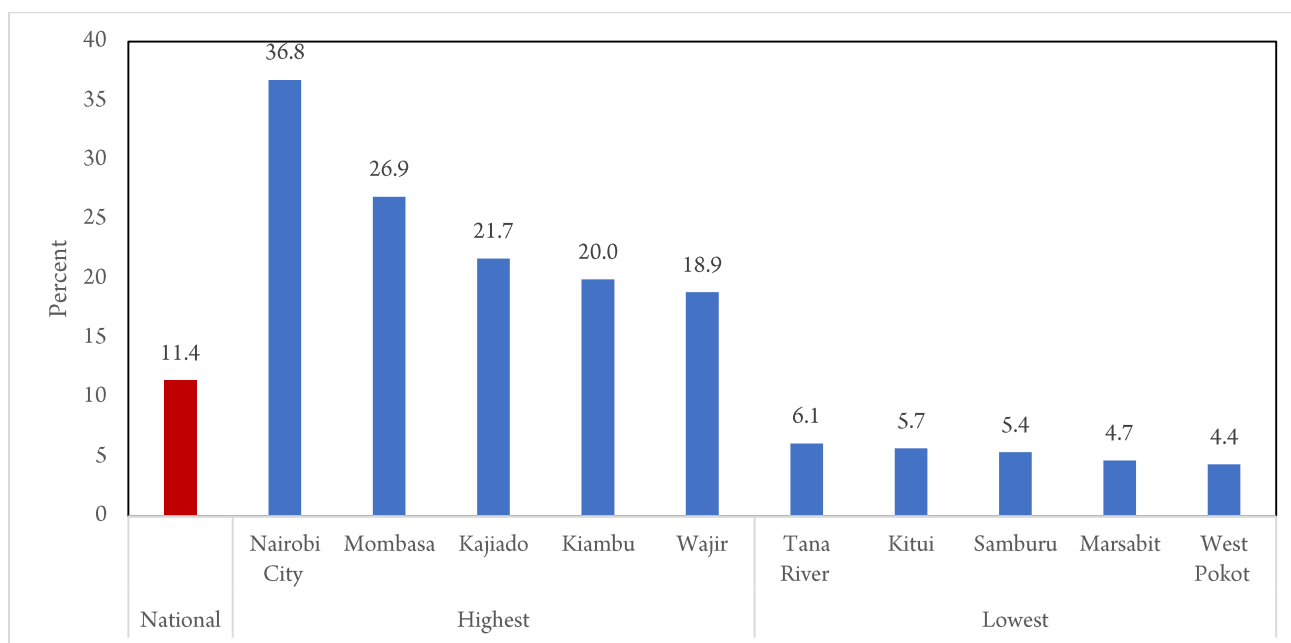


Figure 4.13 Counties with the Highest and Lowest Proportion of Population aged 5 Years and Living with Disability and using Internet

Figure 4.14 shows the proportion of the population using the Internet by type of disability and sex. The usage of the Internet was highest among persons with visual difficulties at 15.4 percent while those with communication difficulties reported the lowest usage at 5.7 percent. In all disability domains, males reported the highest usage of the Internet compared to their female counterparts.

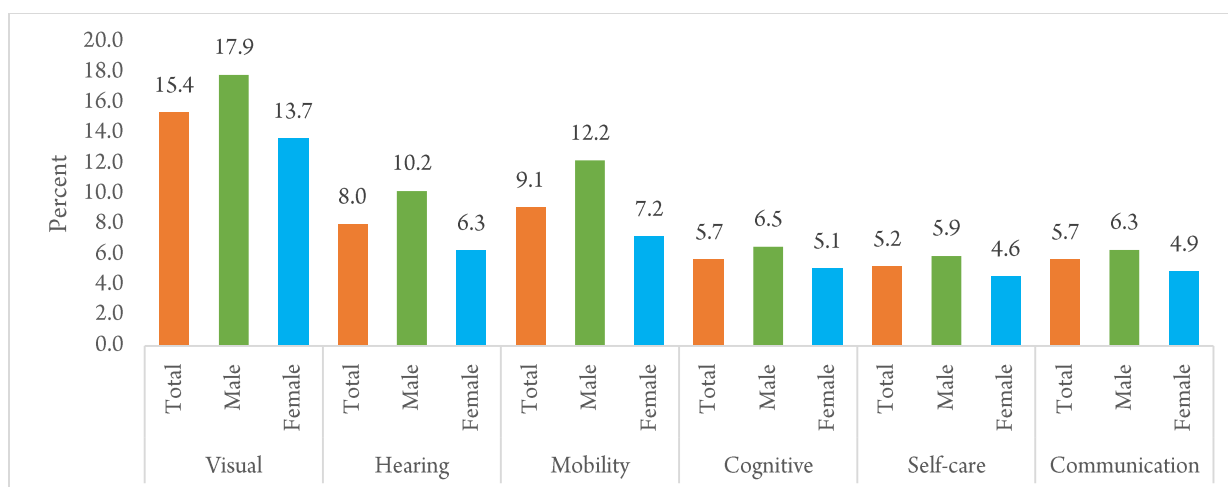


Figure 4.14: Proportion of Population Age 5 years and above using the Internet by Type of Disability and Sex

Figure 4.15 shows the distribution of population age 5 years and above by type of disability and area of residence. For all disability domains, Internet usage was higher in urban than in rural areas.

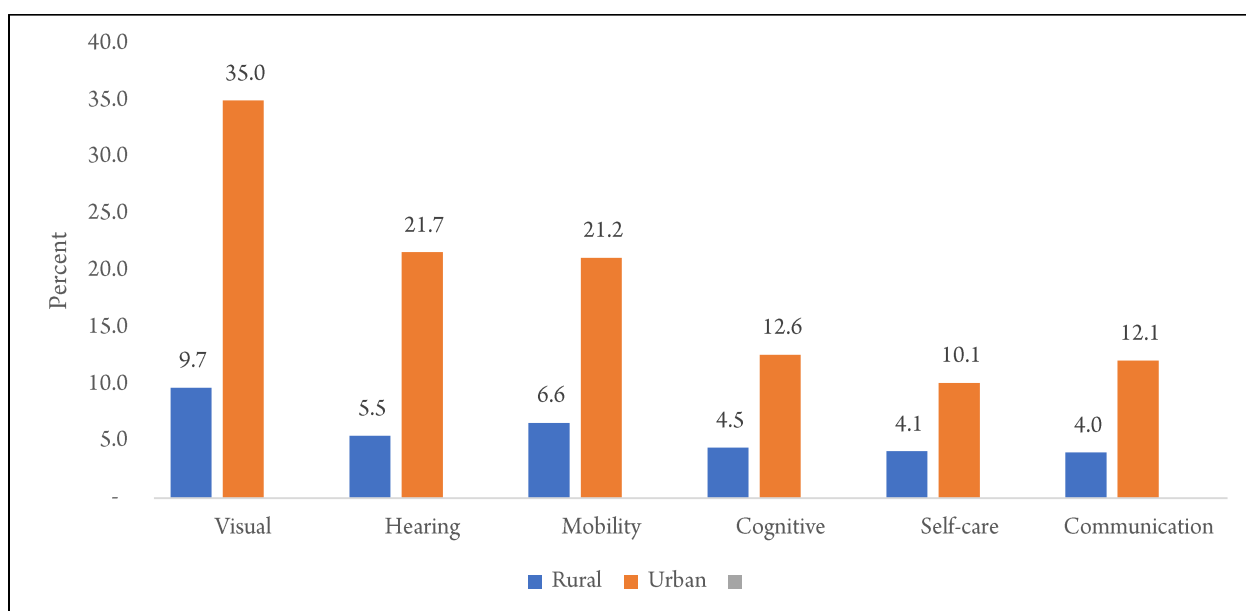


Figure 4.15: Proportion of Population Age 5 years & above using the Internet by Type of Disability Area of Residence

4.8 Use of the Internet by Religious Affiliation

Cultural and religious beliefs shape our perception of the world and numerous aspects of human life. Analysis of the use of the Internet in relation to religious affiliation and belief systems are therefore useful in determining barriers to the use of the Internet among the population. Religious institutions play a key role in shaping the ethics and conduct of people and how they relate with one another. Likewise, the use of ICT influences how people relate to each other and can contribute to breaking barriers to access among excluded segments of society. Religious affiliations have adopted the use of ICTs like TV, radio, and the Internet as a medium of reaching people and achieving religious goals.

Figure 4.16 presents the proportion of the population age 3 years and above using the Internet by religious affiliation and area of residence. Nationally, the highest proportion of individuals who

reported to be using the Internet and belonged to a religious affiliation were Hindu at 77.3 percent followed by other Christians at 26.3 percent.

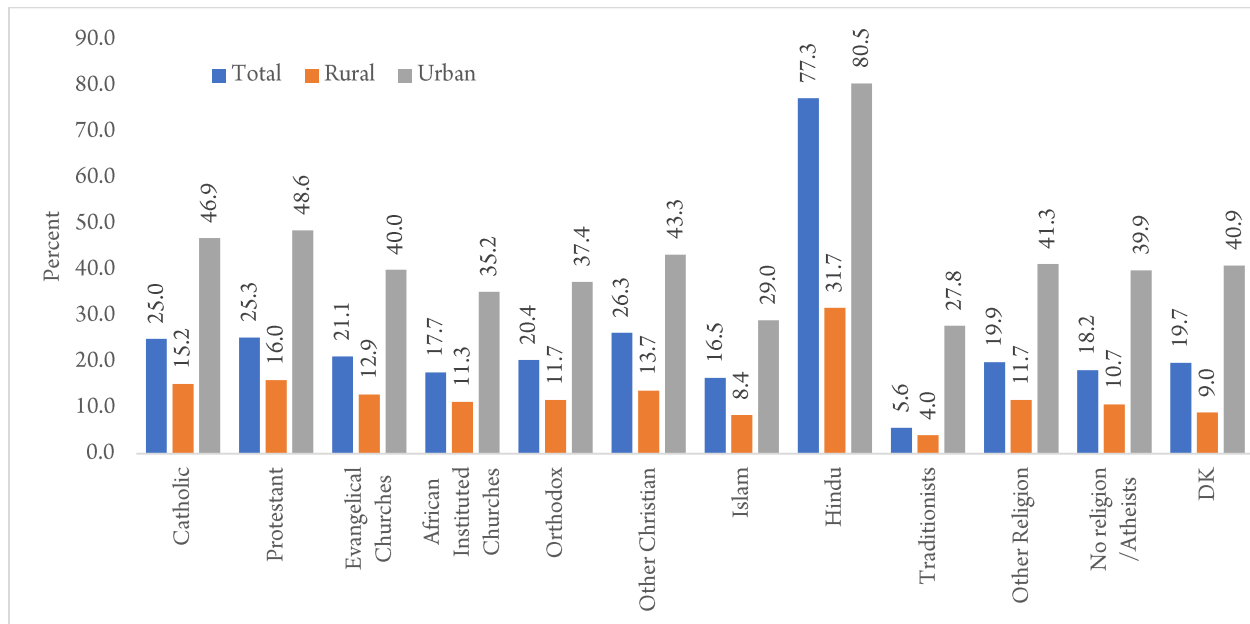


Figure 4.16: Percentage Distribution of Population Age 3 years and above who used Internet by Religious Affiliation and Area of Residence

Figure 4.17 shows the distribution of population 3 years and above who are using the Internet by religious affiliation and sex. Males from Hindu affiliation had the highest proportion of those using the Internet at 80.7 percent. The lowest use of the Internet lies among the Traditionists irrespective of sex.

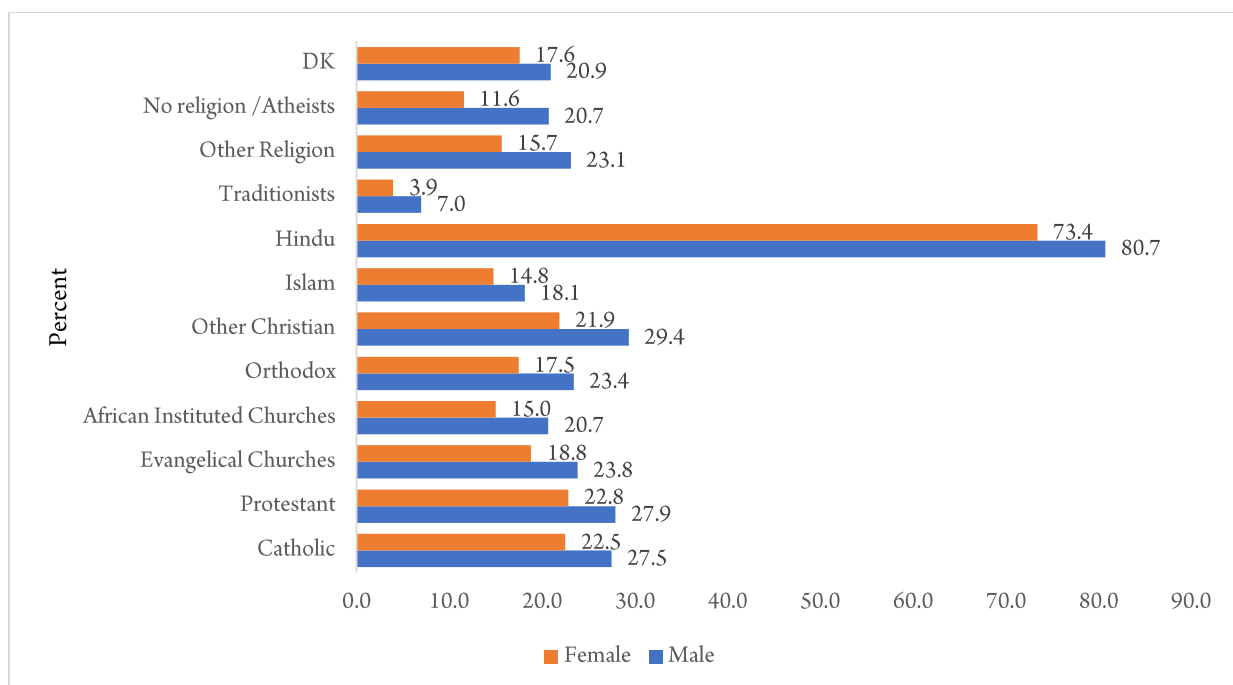


Figure 4.17: Proportion of Population Age 3 years and above using Internet by Religious Affiliation and Sex

4.9 Use of the Internet by Marital Status

Figure 4.18 presents the percentage distribution of population age 12 years and above by marital status. The highest proportion of those who reported using the Internet were married (both monogamous and polygamous) at 32.1 percent with monogamous being the highest at 33.0 percent and polygamous at 17.4 percent. Similarly, those who were married had the highest proportion of individuals using the Internet in both the rural and urban areas. Irrespective of marital status, use of the Internet was higher for those in urban areas compared to those in rural areas.

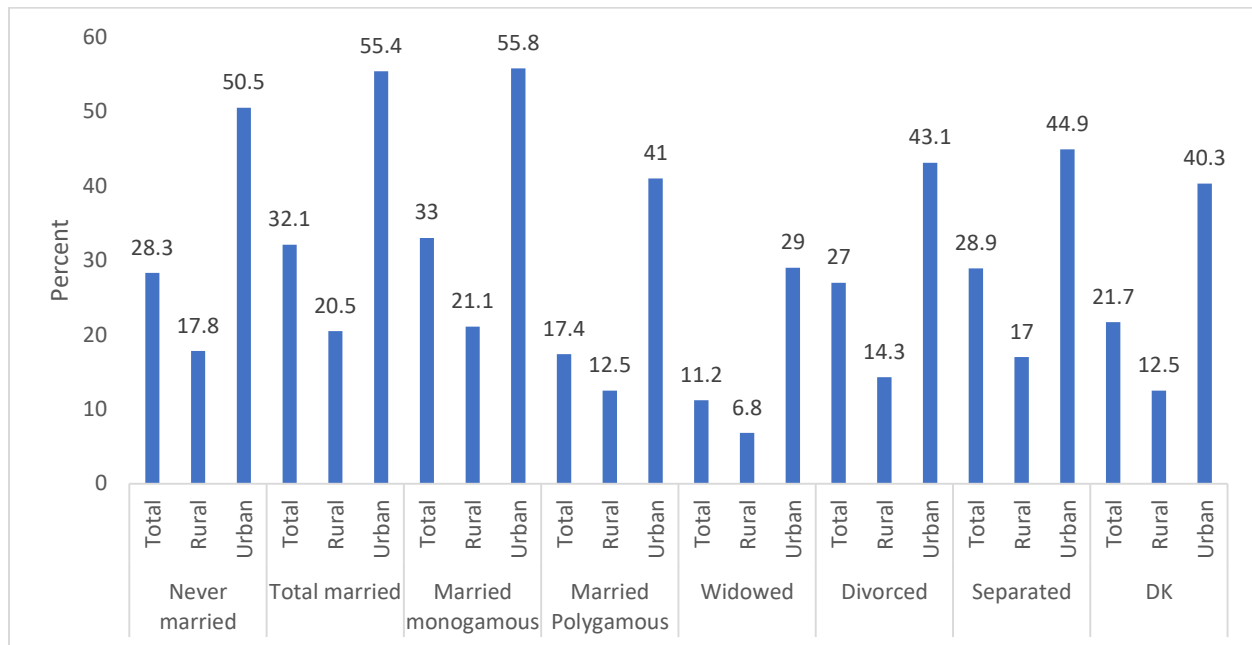


Figure 4.18: Percentage distribution of population Age 12 years and above using Internet by Marital Status and Area of Residence

Majority of males who were never married, married and widowed, used the Internet as compared to their counterparts whilst the majority of females who were divorced and separated, had high proportions using the Internet as shown in Figure 4.19.

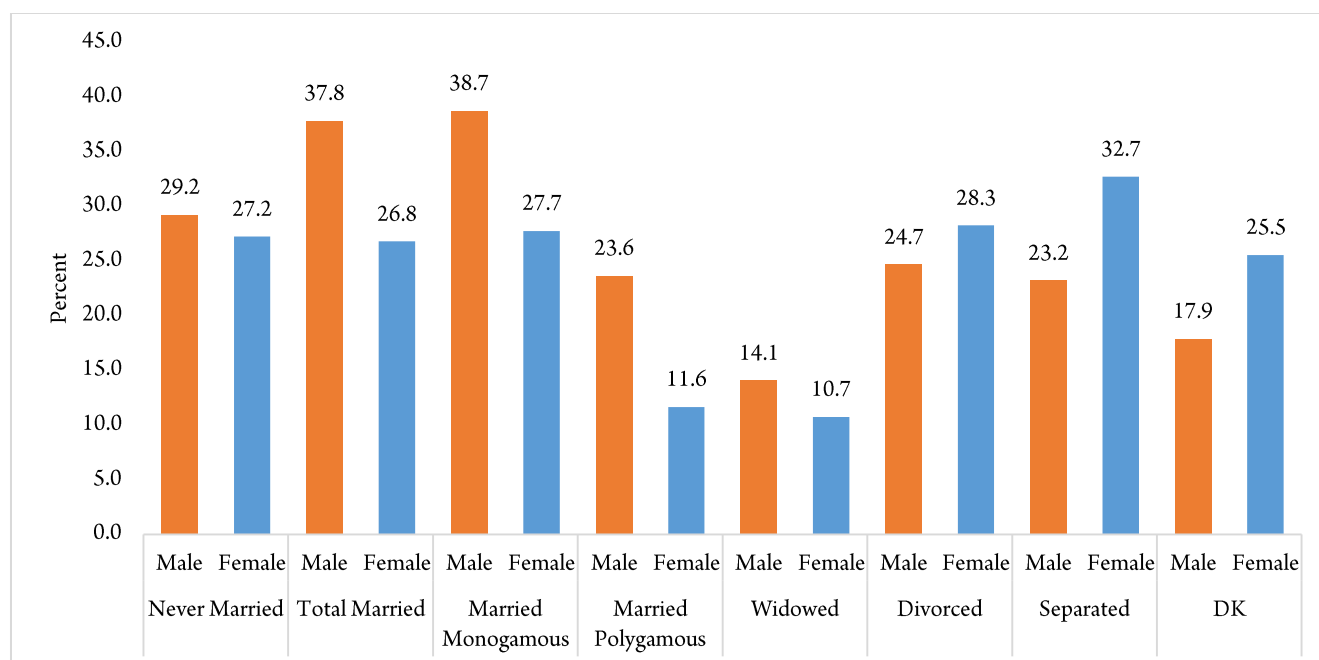


Figure 4.19 Percentage Distribution of Population Age 12 years & above using Internet by Marital Status & Sex

Chapter 5: Computer Usage at Individual Level

The importance of computer uses, and its related technology has continued to foster research and improve service delivery in various sectors. Its benefits are so massive such as reduction in paperwork, saving labour as computer-controlled devices are used, communication speeds amplified as the use of postage and telephone reduce, due to the use of emails and other means through the computer among other benefits. All these benefits impact a country positively such as reducing the cutting down of trees to make paper.

Today, using a computer is an increasingly essential life skill as it allows people to conduct basic computing tasks, store, and process information. The government has adopted various initiatives geared towards enhancing digital literacy and computing skills among its citizens. This section looks at computer usage by age, area of residence, and sex; disaggregate the data further by looking at those who are currently in school, highest completed education level, disability, religious affiliation, and marital status.

5.1 Use of Computer

Information on the proportion of population aged 3 years and above using computer/laptop/tablet by sex and residence is presented in Figure 5.1. In this report, computers refer to either desktop computers, laptops, or tablets. Overall, the proportion of the population age 3 years and above who reported having used a computer was 10.7 percent. Computer usage was higher in urban areas (22.1%) than in rural areas (5.6 %). Comparison by sex revealed that a higher proportion of males (12.0 %) than females (9.4 %) had used a computer in the reference period.

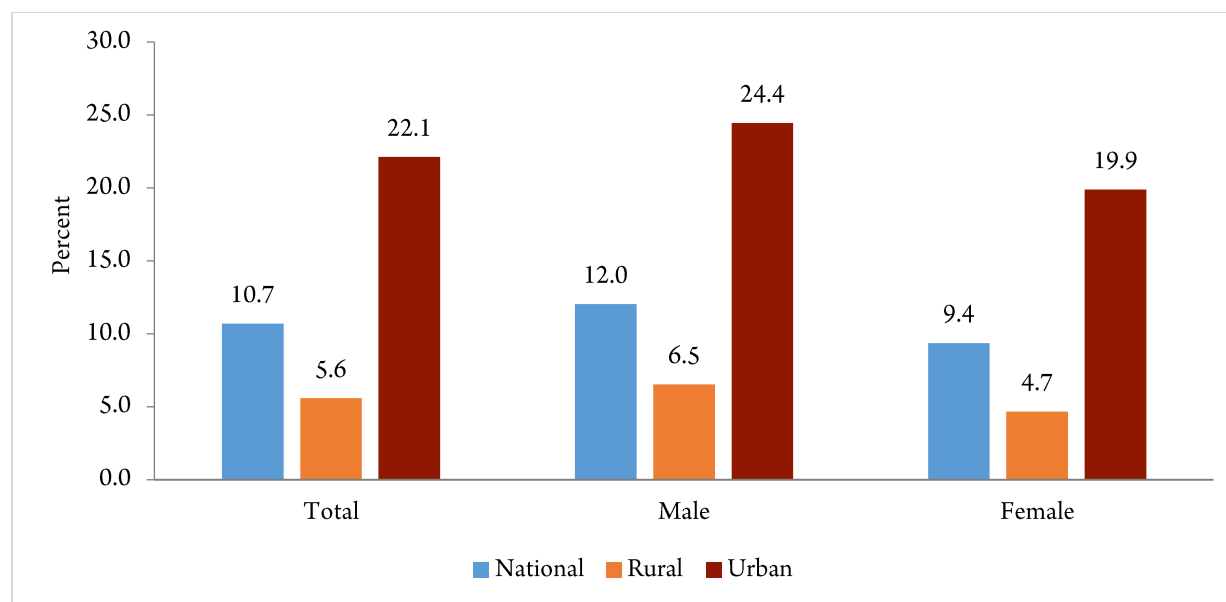


Figure 5.1: Proportion of Population Age 3 years and above who used Computer by Sex and Area of Residence

Figure 5.2 shows counties with the highest and lowest proportion of the population using a computer. Nairobi City County recorded the highest proportion of population age 3 years and above using a computer at 28.6 percent followed by Kiambu at 22.3 percent and Mombasa County at 17.2 percent. Turkana County recorded the lowest proportion at 2.6 percent. Figure 5.3 shows the computer usage by all counties.

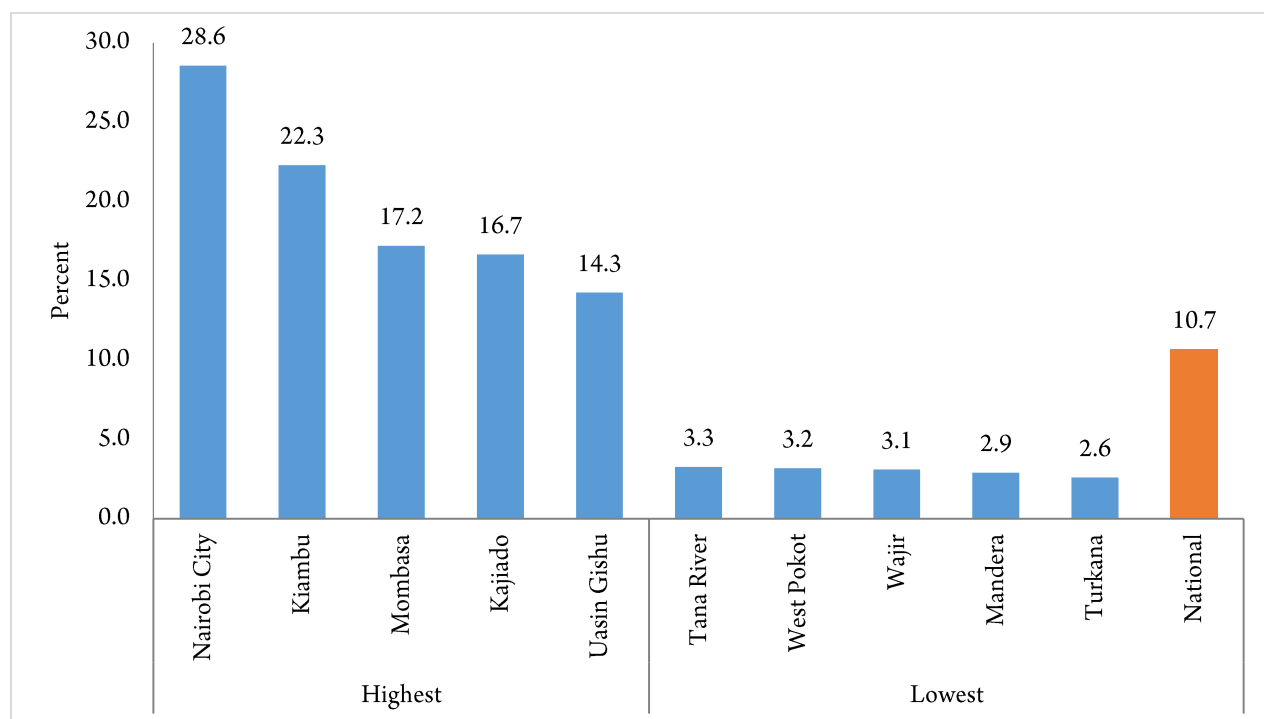


Figure 5.2: Counties with the Highest and Lowest Proportion of Population using Computer

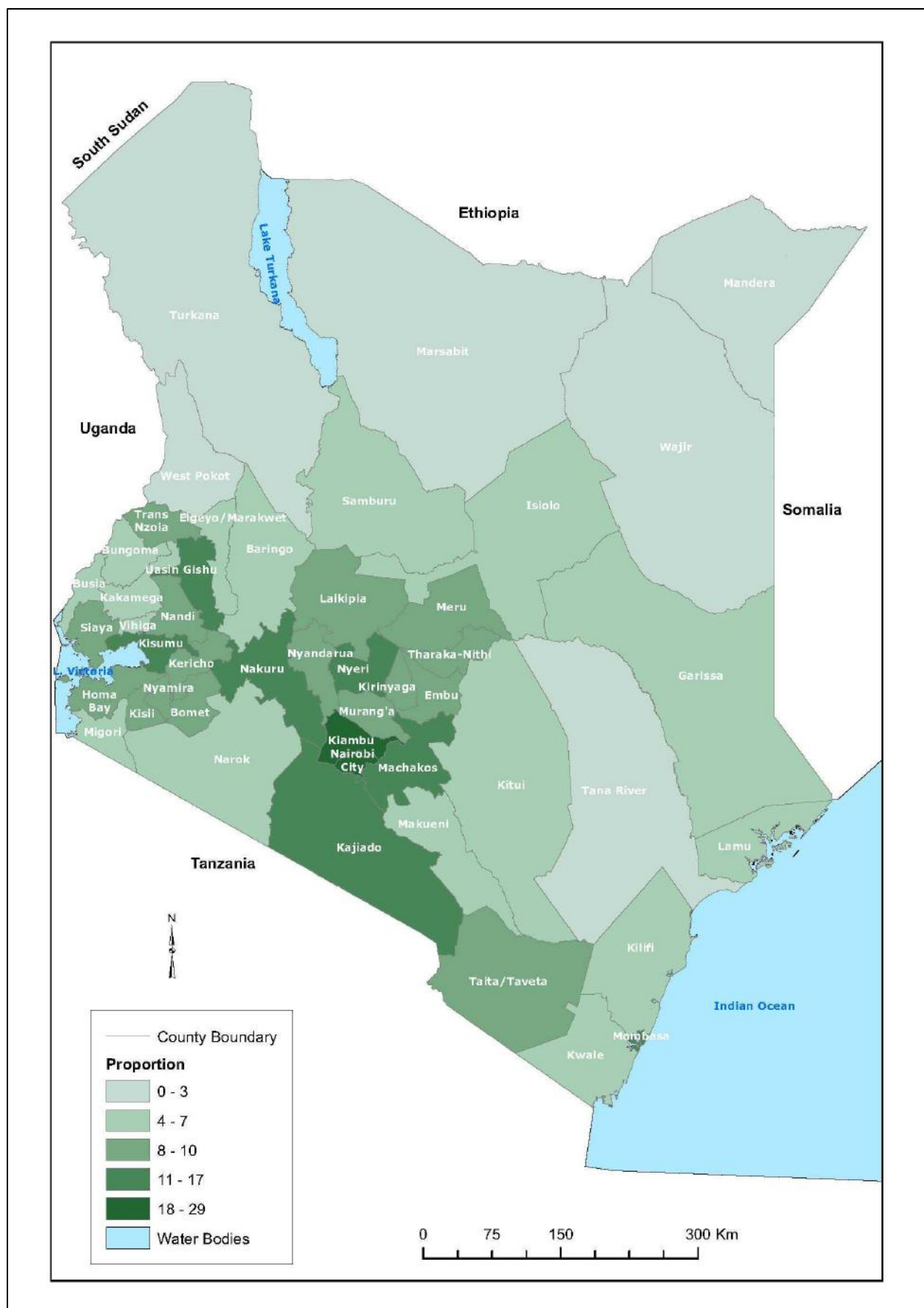


Figure 5.3: Computer Use by Counties

5.2 Use of Computer and Age Distribution

The use of a computer depends on its availability and the skills that are needed to operate a computer. With this, age plays a major factor as the youngest and older people tend not to use the computer probably due to lack of need to use them and/or lack of skills. The use of computers starts to pick at the age of 15 years, which is a similar scenario with the use of the Internet as highlighted in Chapter 4. As shown in Figure 5.4, males in the 15-24 years cohort (17.1%) had the highest proportion of those using a computer compared to their female (15.2%) counterparts in the same age group.

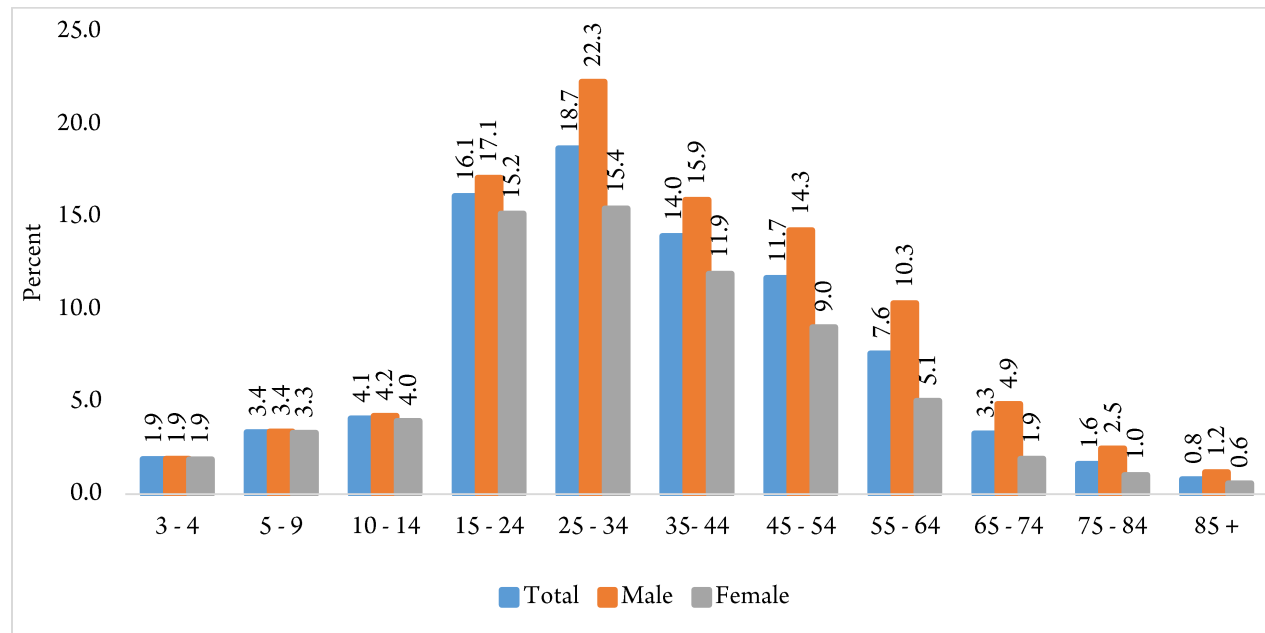


Figure 5.4: Proportion of Population age 3 years and above who Used a Computer by Age Group

Analysis of computer usage by age shows that individuals in the 15-24 years cohort had the highest proportions at 16.1 percent followed by those between 25-74 years at 14.1 percent as shown in Figure 5.5.

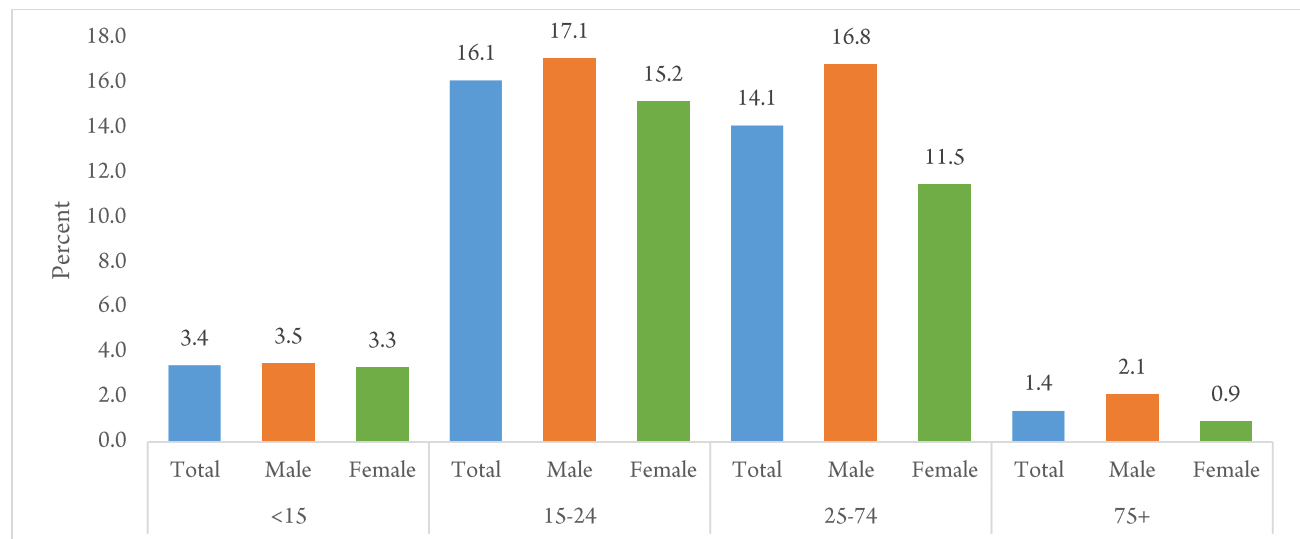


Figure 5.5: Proportion of Population Age 3 years and above that used a Computer by Age Cohort & Sex

5.3 Use of Computer by Education Attendance Level

According to 2019 census results, all students in the university both in rural and urban areas, used a computer as seen in Figure 5.6. Apart from those in the university, those in other education levels in the rural areas were the least to use a computer across the board.

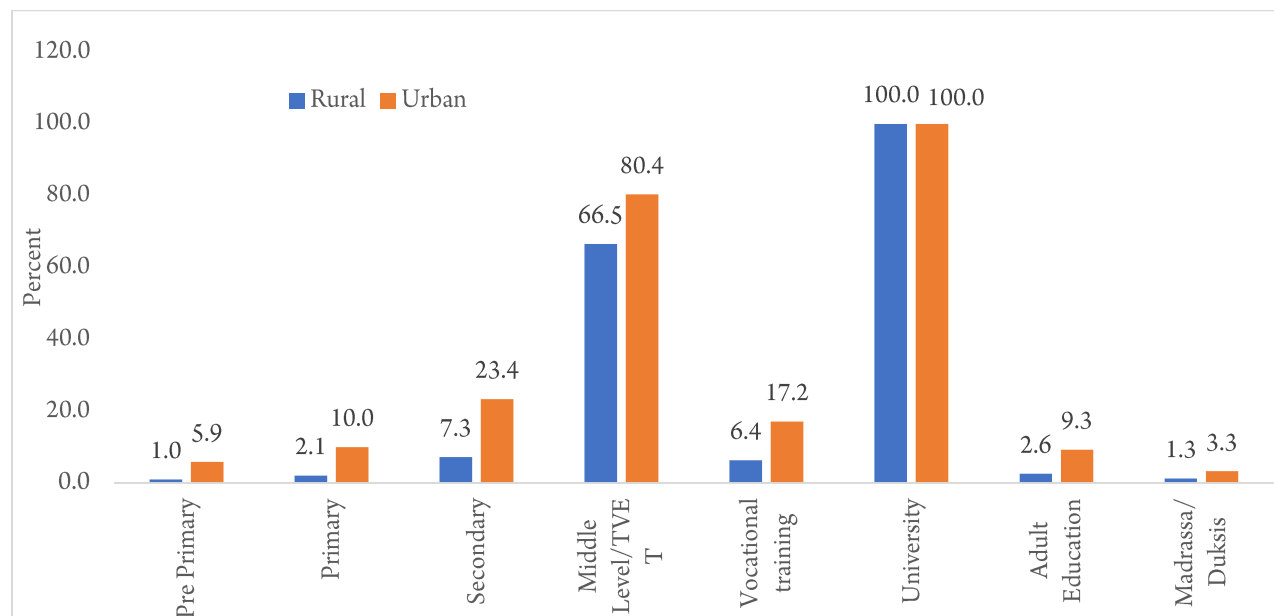


Figure 5.6: Percentage Distribution of Population Age 3 Years and above who used Computer by Education Attendance level and Area of Residence

Figure 5.7 shows the percentage distribution of population age 3 years and above who reported having used a computer while currently attending school by education level and sex. Nationally, all university students currently in school (both male and female), used a computer, followed by those in the middle-level institutions.

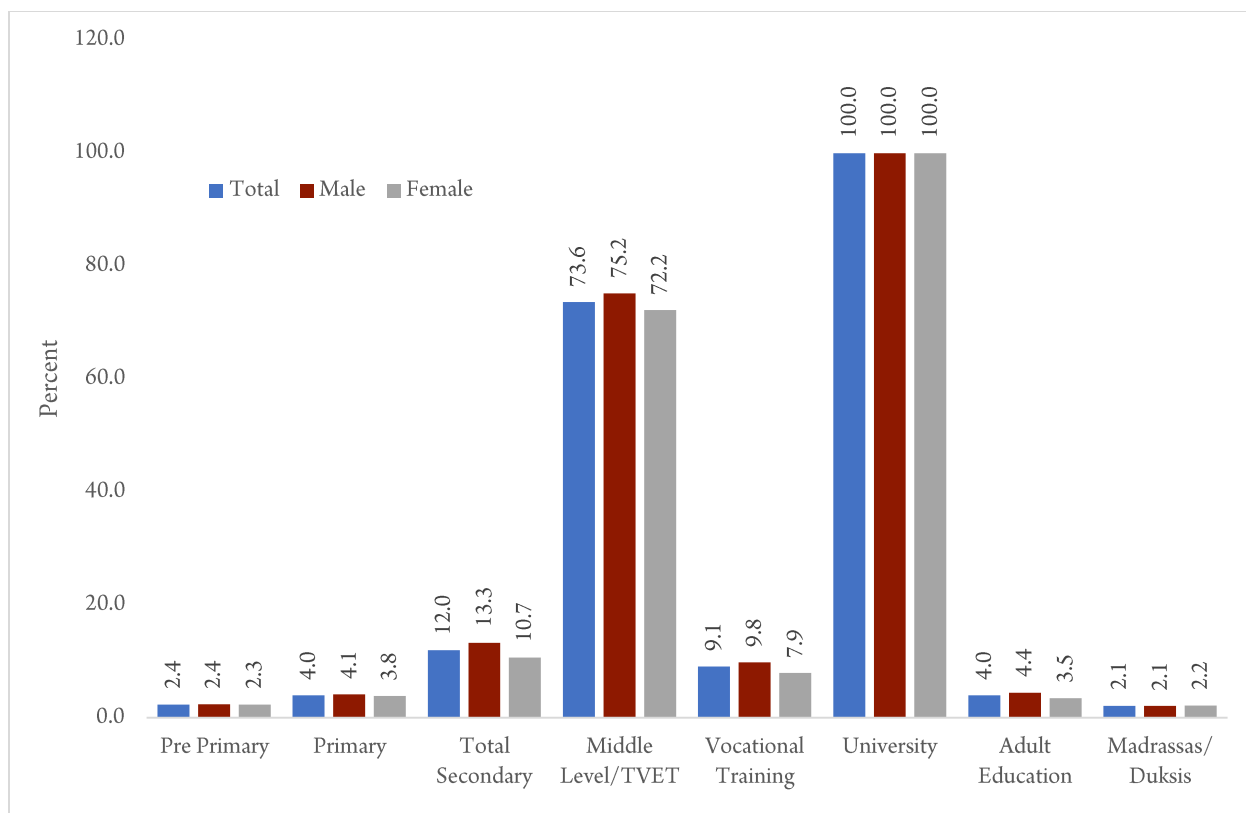


Figure 5.7: Percentage Distribution of Population who used Computer by Education Attendance level and Sex

5.4 Use of Computer by Highest Level of Education Completed

Figure 5.8 presents the percentage distribution of population age three years and above using a computer by highest level completed and residence. The analysis shows that the usage of computers was highest for individuals who had completed university and were in urban areas at 86.4 percent followed by 74.1 percent in the rural areas.

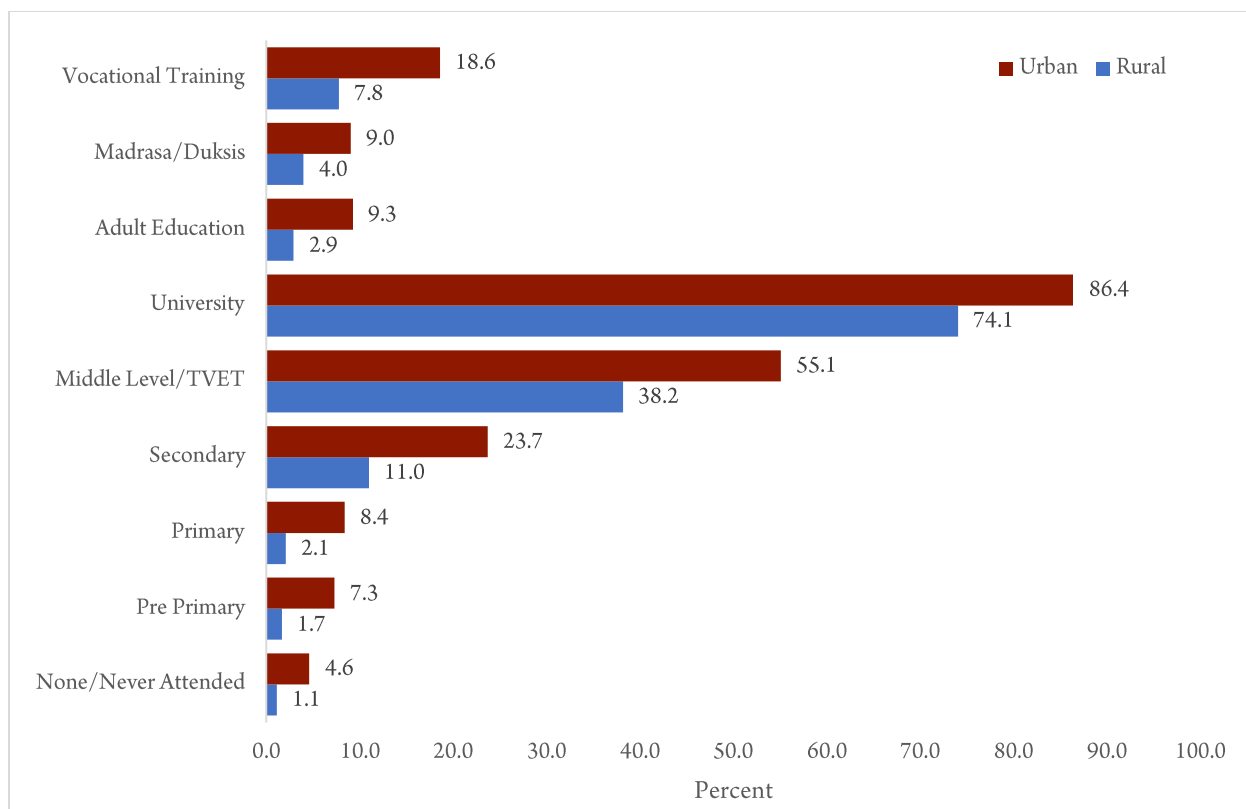


Figure 5.8: Distribution of Population Age 3 Years and Above using Computer by Highest Level completed and Area of Residence

Figure 5.9 shows the percentage distribution of population age three years and above using a computer by highest education level completed and sex. The analysis shows that overall, in the country, the highest proportion of individuals using a computer were those that had completed university at 82.4 percent with males being slightly higher than females at 82.9 percent and 81.7 percent, respectively.

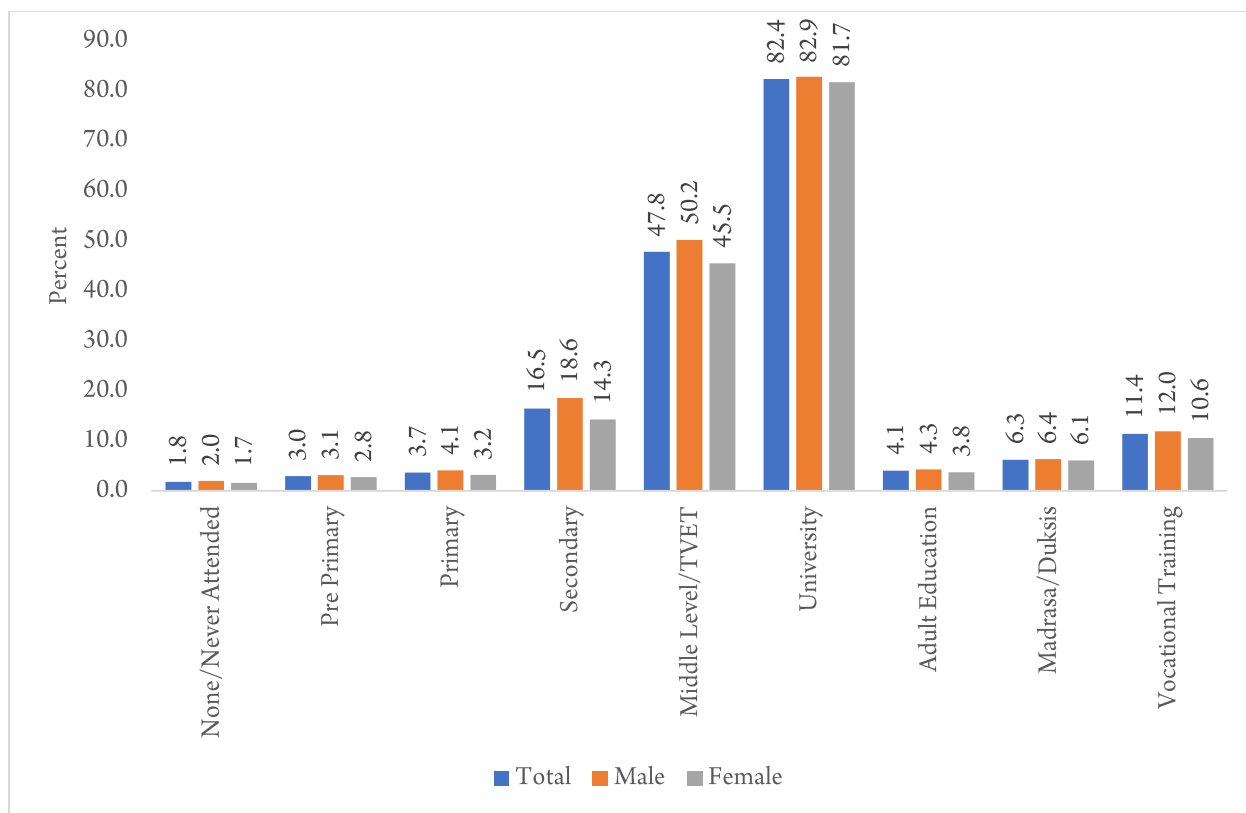


Figure 5.9: Percentage Distribution of Population Age 3 years and above using Computer by Level of Education Completed and Sex

5.5 Use of computer by Main Job Status

The main job status of individuals determines whether they need to use a computer in their daily routine. The distribution of those who use a computer by their main job status is shown in Figure 5.10. The majority of those who used the computer were persons in apprentice/interns/ volunteers in the urban areas at 43.3 percent followed by paid employees at 32.2 percent.

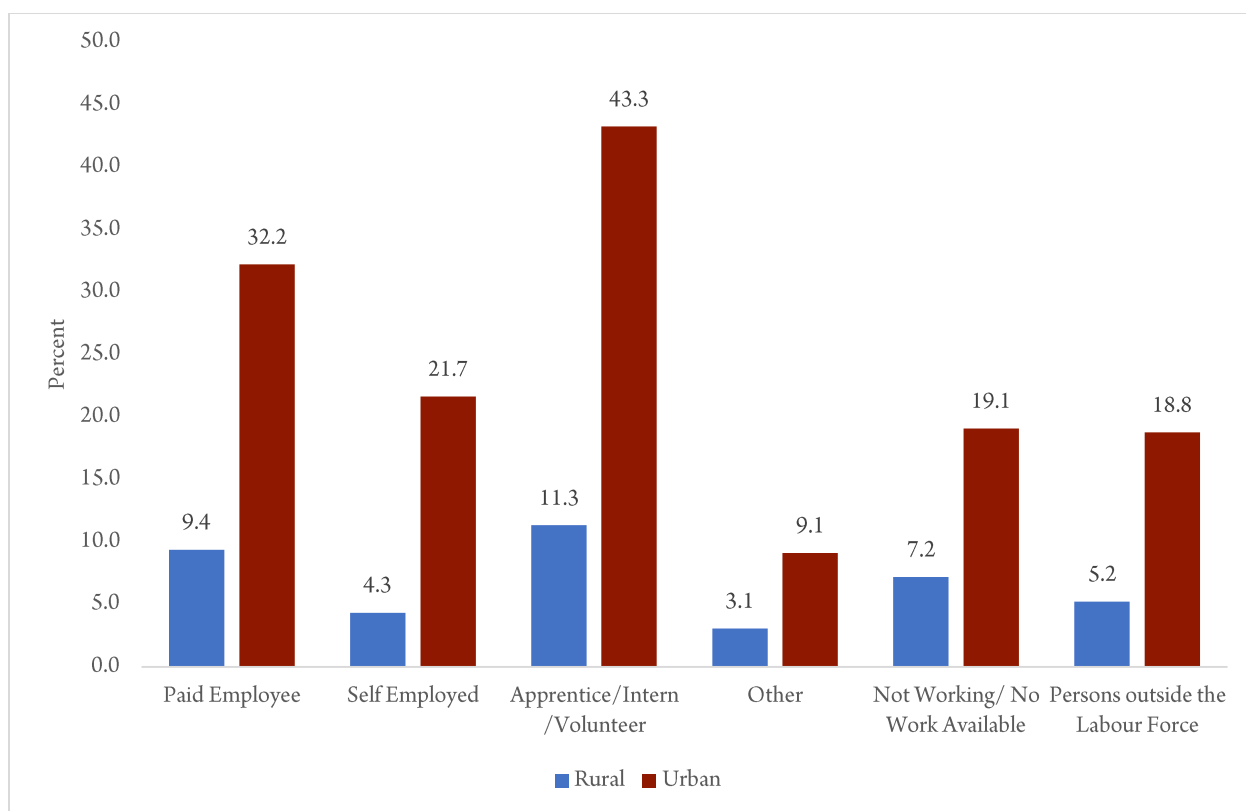


Figure 5.10: Percentage Distribution of Population Age 5 years and above using computer Main Job Status and Area of Residence

Similarly, those that used a computer, were apprentice/intern/volunteer at 21.4 percent with 21.9 percent being male and 20.6 percent being female as shown in Figure 5.11. There was a stark difference between men and women who used a computer and were self-employed at 11.3 percent and 6.3 percent, respectively.

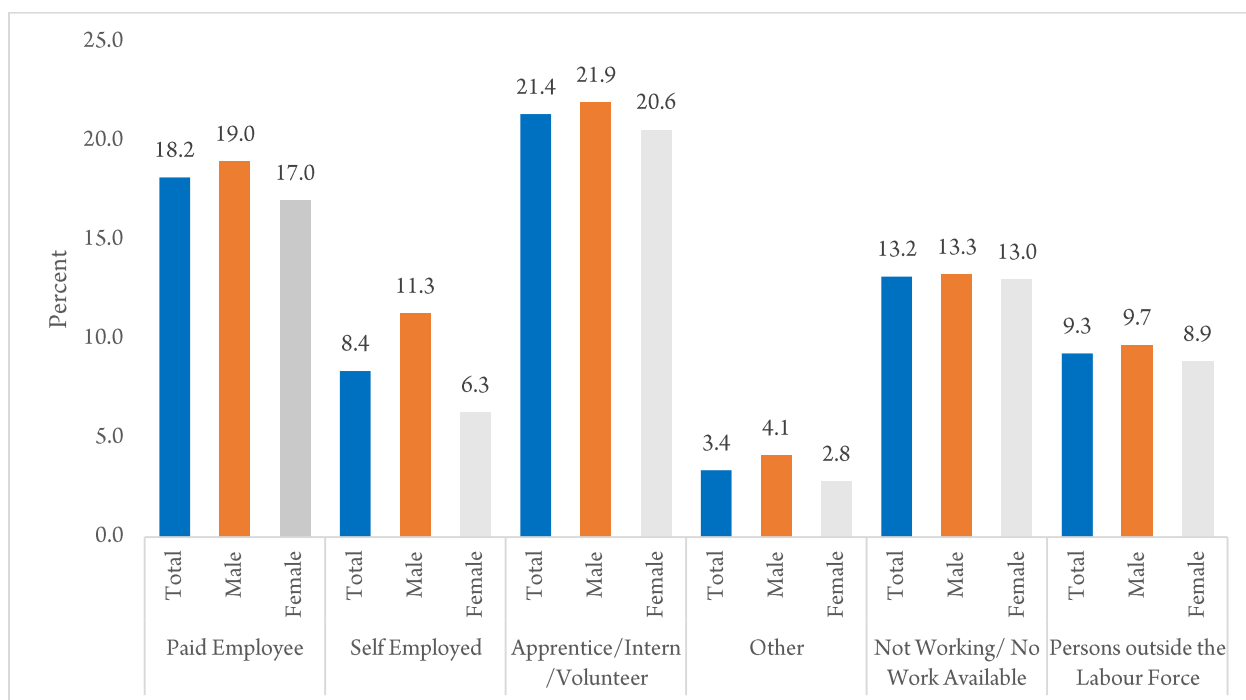


Figure 5.11: Percentage Distribution of Population Age 5 years and above using Computer by Main Job Status and Sex

Table 5.1 presents the distribution of population age 5 years and above that are working and using computers, by type of economic activity engaged in. The majority of those using computers are in Information and Communication at 78.7 percent, followed by those in Financial and Insurance activities at 73.9 percent. The lowest category to use the computer were in Agriculture activity at 4.7 percent.

Table 5.1: Proportion of Population Age 5 Years and above using Computer by Type of Economic Activity Engaged in and Sex

Type of Economic Activity	Total	Male	Female
Agriculture	4.7	6	3.7
Mining and quarrying	7.2	7.2	7.1
Manufacturing	21.9	23.2	19.2
Electricity gas steam and air conditioning supply	40.7	39.6	50.1
Water supply; sewerage waste management and remediation activities	28	26.8	31.3
Construction	13.9	13.2	30.8
Wholesale and retail trade; repair of motor vehicles and motorcycles	19.5	22.3	16.7
Transportation and storage	17.7	16.5	44.2
Accommodation and food service activities	19.5	23.9	16.7
Information and communication	78.7	82.1	73.1
Financial and insurance activities	73.9	78	69.4
Real estate activities	34.1	34.5	33.3
Professional scientific and technical activities	56.3	58.2	53.4
Administrative and support service activities	50.5	44.6	59
Public administration and defense; compulsory social security	41.8	39.6	51.8
Education	49.6	55.3	44.9
Human health and social work activities	57.4	61.7	54.3
Arts entertainment and recreation	36.9	44.1	27.8
Other service activities	18.8	20	17.3
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	9.3	9.3	9.3
Activities of extraterritorial organizations and bodies	37.8	36	41.1

5.6 Use of Computer by Type of Disability.

It is important to measure the use of a computer by persons living with a disability. This ensures that the spirit of “leaving no one behind” is executed by ensuring computers are accessible and available to the special population. Analysis of the KPHC 2019 data shows the use of computers was generally low among persons living with a disability. Figure 5.12 shows that only 4.7 percent of PWDs used a computer with the majority being male at 5.9 percent. In addition, more males (15.4 percent) than females (11.0 percent) PWDs used a computer in the urban areas.

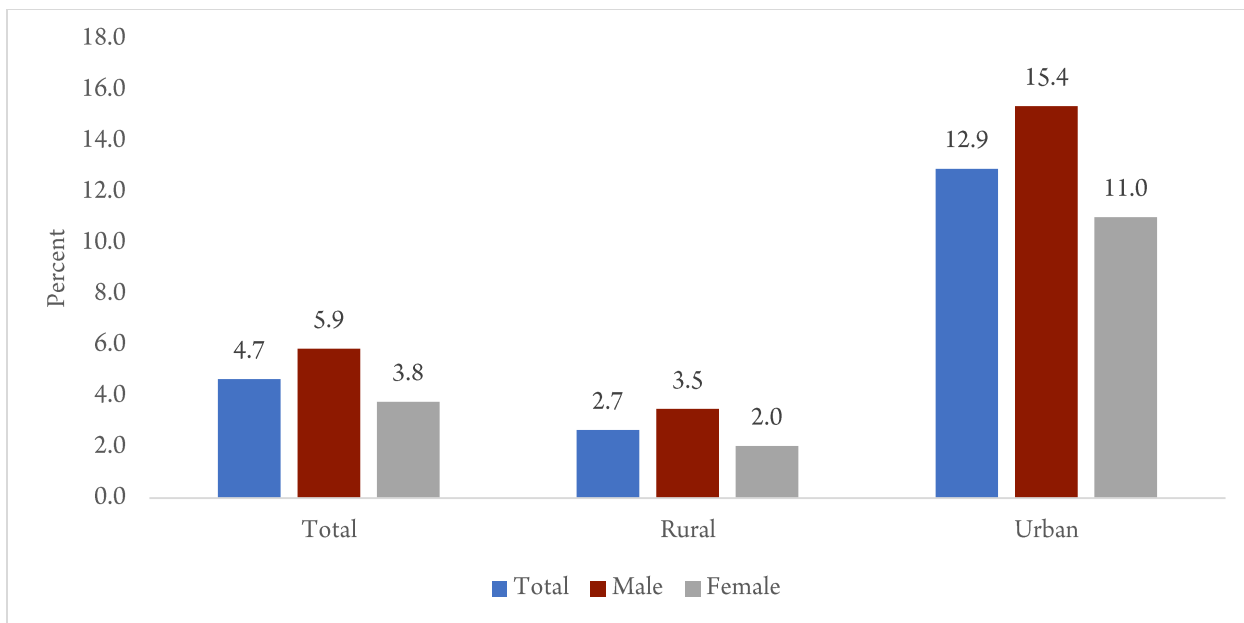


Figure 5.12: Percentage Distribution of Population Age 5 years and above that are PWDs using Computer by Sex and Area of Residence

Figure 5.13 presents the distribution of population age 5 and above living with disabilities and using a computer, by disability domain and residence. The usage of computers by persons living with disabilities was highest for persons living with visual impairment at 7.0 percent with the majority being from the urban areas at 18.2 percent. Notably, computer usage was highest in urban compared to rural areas for all disability domains.

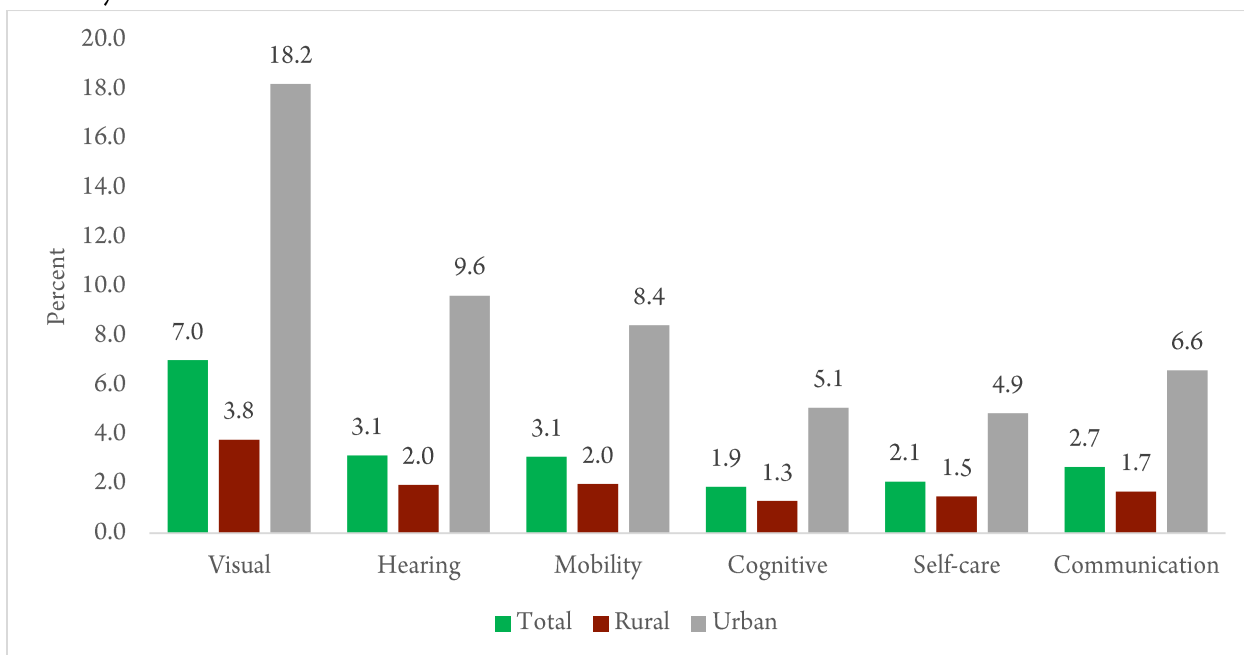


Figure 5.13: Percentage distribution of population age 5 and above living with disabilities and using a computer by type of disability and residence

Analysis by sex shows that computer usage was higher for males than females in all disability domains as depicted in Figure 5.14. Males with visual impairment were the majority at 8.6 percent with the least being female had cognitive as a form of disability at 1.4 percent.

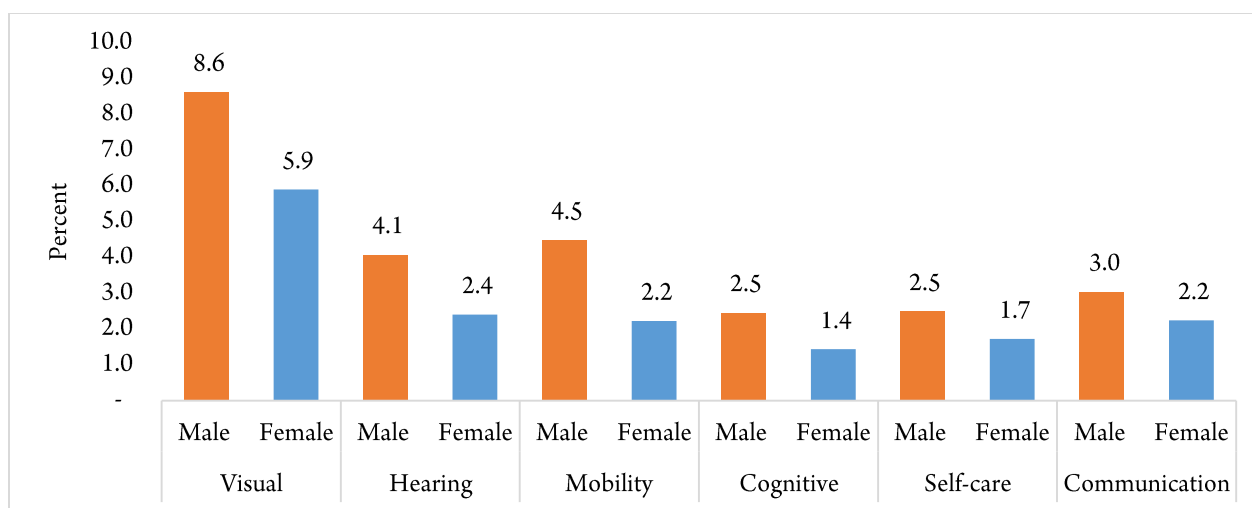


Figure 5.14: Proportion of Population Age 5 years and above using a computer by type of disability and sex

5.7 Use of Computer by Religious Affiliation

The use of a computer by religious affiliation and area of residence is displayed in Figure 5.15. A higher proportion of individuals affiliated to Hindu religion used a computer compared to those affiliated with mainstream religions such as Catholics and Protestants. Traditionists, however, had the least proportion of those using a computer at 1.8 percent.

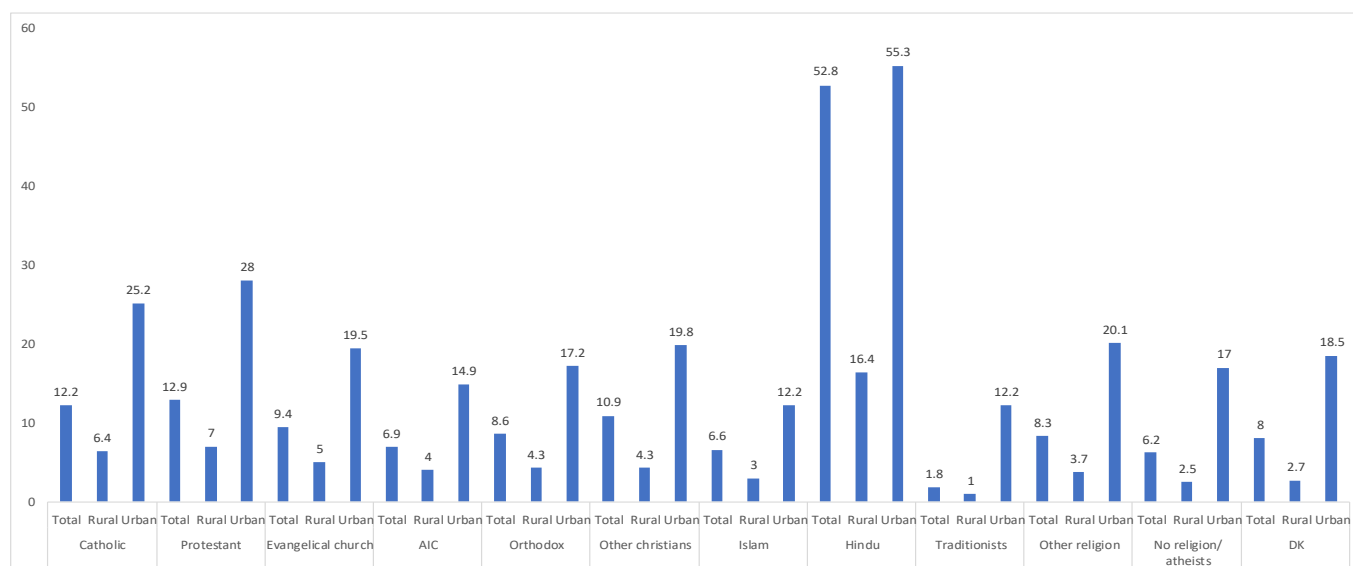


Figure 5.15: Proportion of Population Age 3 years and above using a Computer by Type of Religion and Area of Residence

Analysis of the use of a computer by religious affiliation and sex is shown in Figure 5.16. Overall, the highest proportion of individuals using a computer were males affiliated to the Hindu religion, at 59.4 percent. Notably, a higher proportion of males than females used computers regardless of religion.

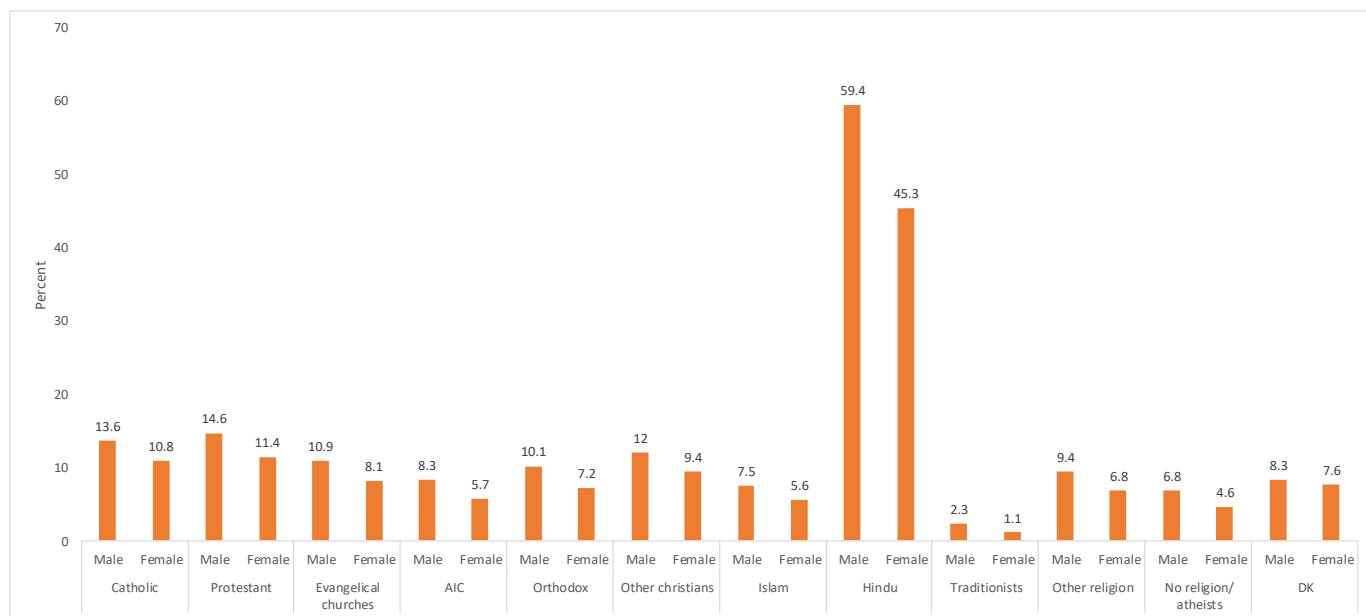


Figure 5.16: Proportion of Population Age 3 years and above using a Computer by Type of Religion and Sex

5.8 Use of Computer by Marital Status

Figure 5.17 shows the proportion of the population using a computer by marital status and area of residence. Out of the total population aged 12 years and above, the majority of those who used a computer were never married at 15.4 percent, with the majority being from urban areas at 29.8 percent. The least segment of the population using a computer is the widowed at 3.5 percent, with those from rural being the least at 1.8 percent. Overall, most of those that used a computer were living in urban areas.

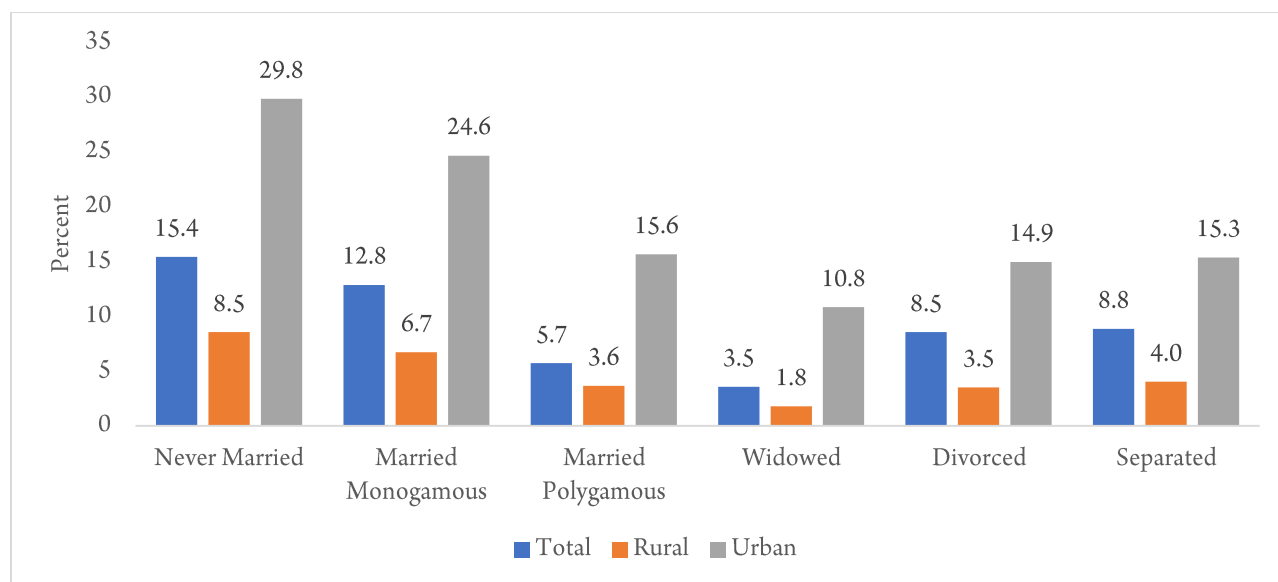


Figure 5.17: Proportion of Population Age 12 years and above using Computer by Marital Status and Area of residence

Figure 5.18 presents the proportion of the population using a computer by marital status and sex. The use of computers was higher for males than females in all marital status apart from those that were separated, where the use of computers was higher among females than males. Those who were widowed were the least users of a computer with males at 5.4 percent and females at 3.3 percent.

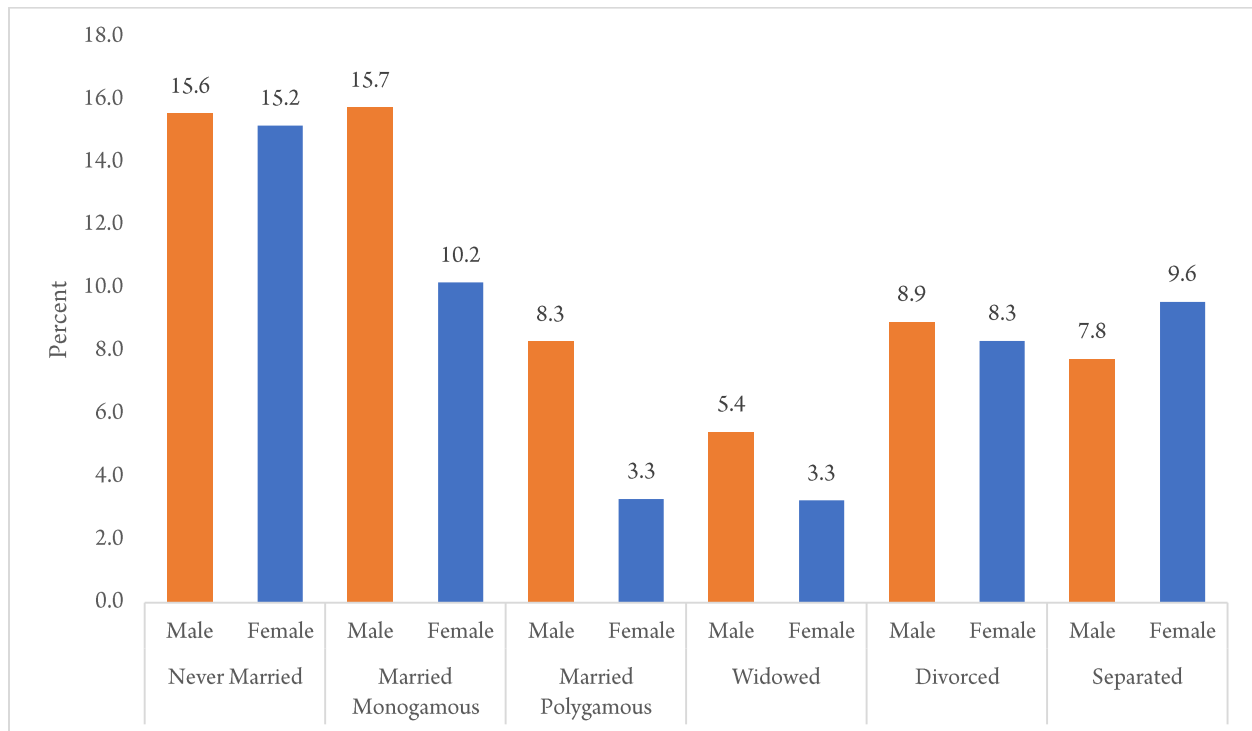


Figure 5.18: Proportion of Population Age 12 years and above using Computer by Marital Status & Sex

Chapter 6: E-commerce and Potential E-commerce Users

6.1 Use of E-commerce and Potential E-commerce Users

The rise of Internet usage has given online users an opportunity for several activities such as buying goods and services online. E-commerce entails the buying and selling of goods and/or services online. However, for the purposes of the Census, only one category of e-commerce was covered, that is, buying goods and services online. E-commerce questions targeted individuals aged 15 years and above.

This analysis shows the population distribution of the total population age 15 years and above, for individuals who used e-commerce or are potential e-commerce users.

The analysis is divided into three categories:

- Searched and bought online: These are the e-commerce users. These are individuals who ordered/bought goods online regardless of the mode of delivery and payment methods.
- Searched and bought elsewhere: These are potential e-commerce users. These are individuals who were looking for information on a particular product but did not order the goods online instead they bought the items at a physical shop/place. They are considered potential e-commerce users as they are likely to successfully buy goods online in the future and they also prove they have the skills and the desire to carry out e-commerce.
- Searched only: Also considered as the potential e-commerce users. These are individuals who searched for the items but did not buy them online or in a physical place.

Out of the population age 15 years and above, only 4.3 percent bought goods/services online (e-commerce users). Potential e-commerce users, those that searched only and those that searched and bought elsewhere, were 4.4 percent and 1.1 percent, respectively, as shown in Figure 6.1.

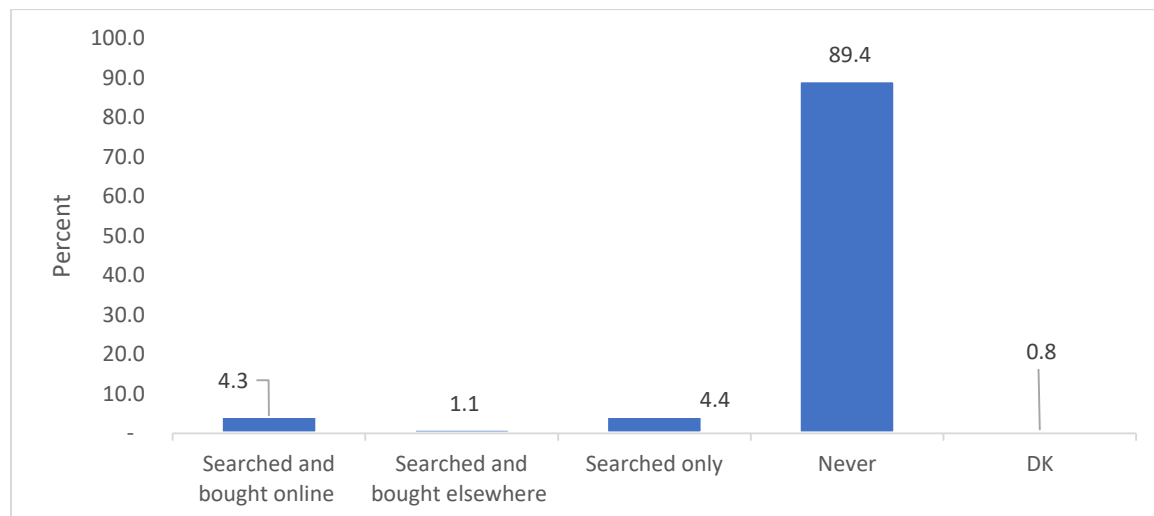


Figure 6.1: Percentage Distribution of Population age 15 years & above who Engaged in E-commerce by Category

Figure 6.2 shows the percentage distribution of the population age 15 years and above who engaged in e-commerce activity by category and area of residence. The data shows that more e-commerce users were

from urban areas at 9.6 percent while most of those who never engaged in e-commerce were from the rural areas at 94.1 percent.

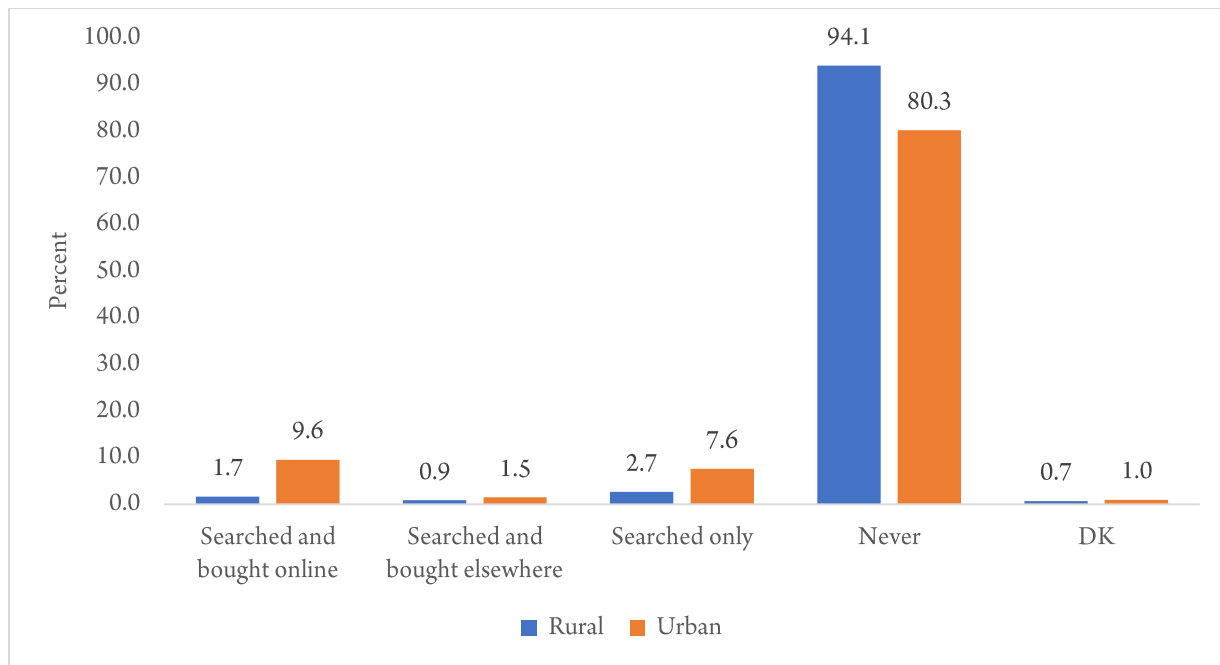


Figure 6.2 Percentage Distribution of Population age 15 years and above who engaged in E-commerce by Category and Area of Residence

Figure 6.3 presents the Counties with the highest and lowest proportion of the population using e-commerce. The data shows that Nairobi City County had the highest proportion of the population at 14.0 percent using e-commerce, while Marsabit and West Pokot counties registered the lowest usage at 0.8 percent. Figure 6.4 shows the E-commerce users by Counties.

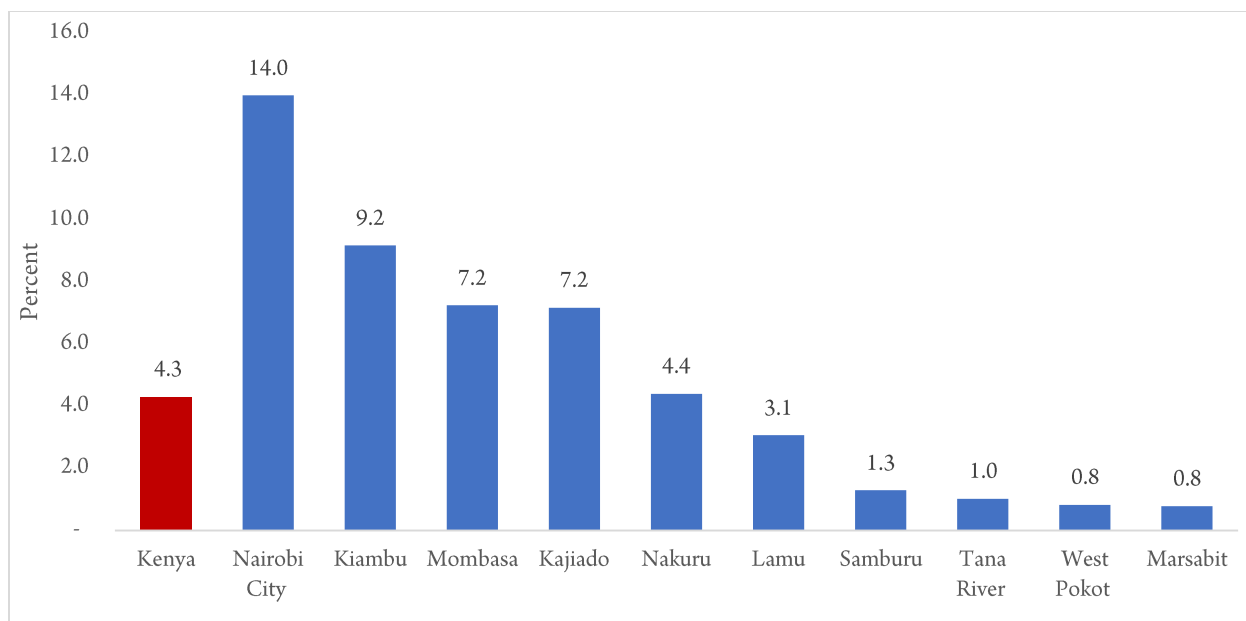


Figure 6.3: Counties with the Highest and Lowest Proportion of Population aged 15 years and above using E-commerce

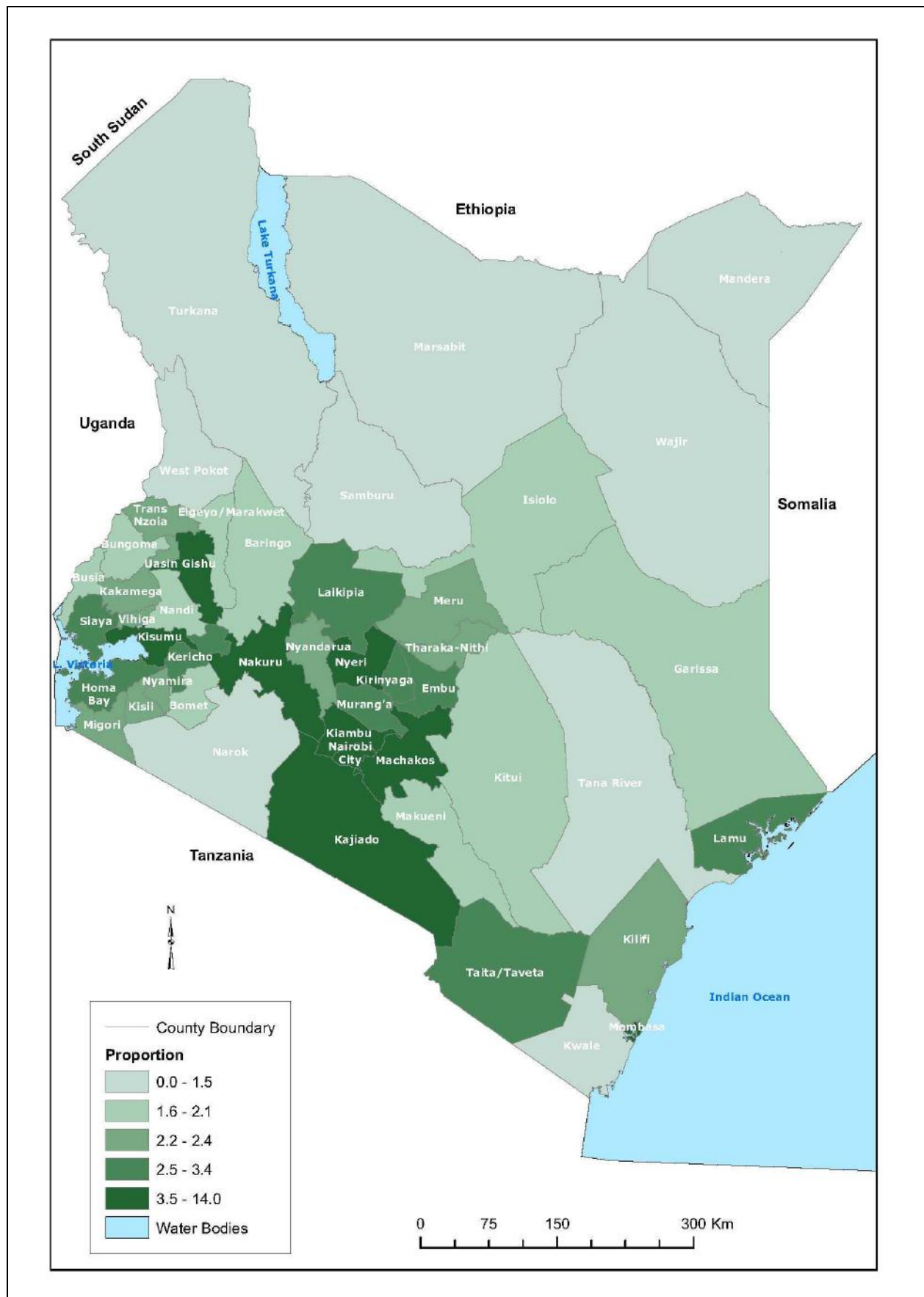


Figure 6.4: E-commerce Use by Counties

Counties with the highest proportion of potential e-commerce users are Nairobi and Kiambu. Those who searched and bought elsewhere in Nairobi stood at 1.7 percent while those who searched only, the majority were in Samburu at 1.1 percent, respectively as shown in Figure 6.5.

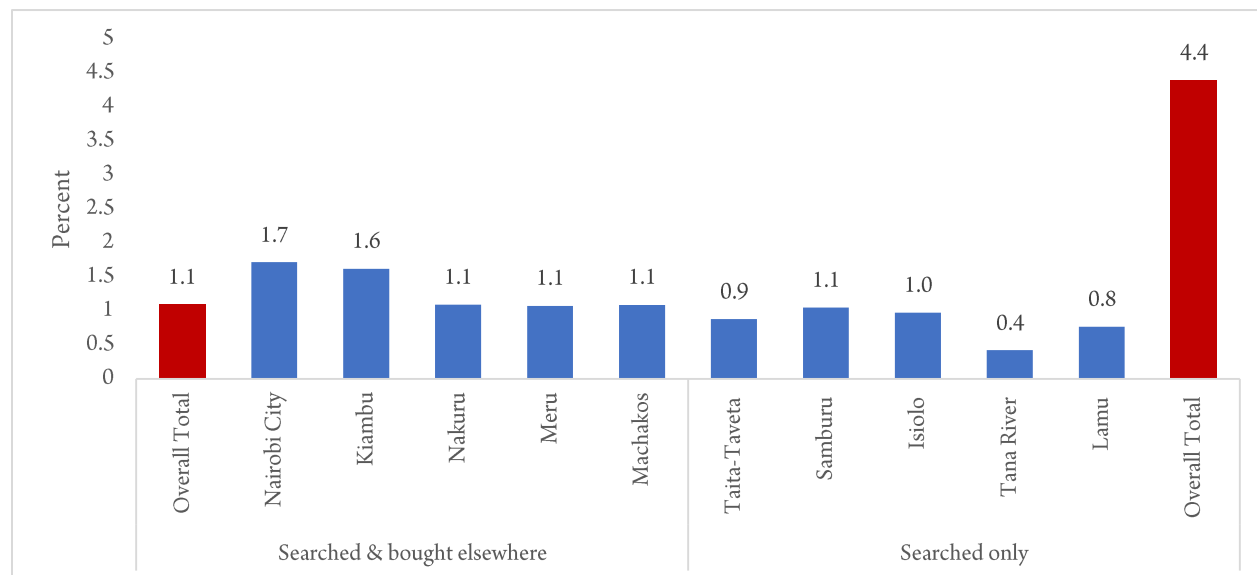


Figure 6.5: Counties with the Highest and Lowest Proportion of Population aged 15 years and above who are Potential E-Commerce Users

The uptake of e-commerce by gender distribution shows a higher proportion of males than females in all e-commerce categories as shown in Figure 6.6. Males had a higher proportion in using e-commerce (5.0%), searching, and buying elsewhere (1.2%), and searching only (4.9 %) compared to the females.

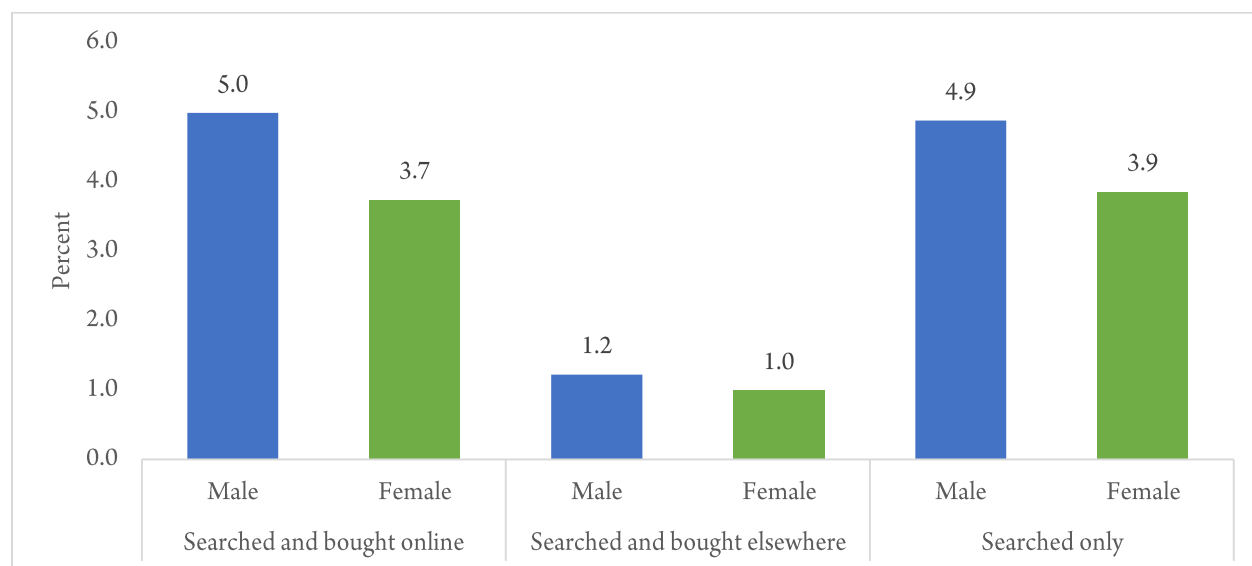


Figure 6.6 Percentage distribution of population age 15 years and above who Engaged in E-commerce by Category and Sex

6.2 Use of the Internet by E-commerce and Potential E-commerce Users

The use of the Internet drives the uptake of several online activities such as e-commerce. Information from the 2019 KPHC shows that 22.7 percent of the population age 3 years and above use the Internet. This analysis shows the proportion of those who used e-commerce services *vis a vis* those that used the Internet

and therefore not the total population of 15 years and above. Therefore, care should be taken when these analyses are used and should be quoted accordingly.

Out of internet users in the population aged 15 years and above, who stood at 32.9 percent, 13.2 percent engaged in e-commerce, 3.4 percent searched and bought elsewhere, and 13.2 percent searched only.

About 32.9 percent of Internet users aged 15 years and above, (32.9 percent), while those who searched and bought online, and searched online were 13.2 percent while those who searched and bought elsewhere were 3.4 percent as seen in Table 6.1.

Table 6.1 Percentage Distribution of Population Age 15 Years and above using Internet and E-commerce.

Age	Internet Users (15 years & above)	E-commerce category		
		Searched & bought online- E-commerce Users	Searched & bought elsewhere	Searched only
15 years & above	32.9	13.2	3.4	13.2
15 - 24	32.3	10.3	3.7	15.6
25 - 34	44.5	15.8	3.3	13.2
35 - 44	35.4	14.4	3	11.5
45 - 54	27.6	13.4	3.1	10.6
55 - 64	18.3	11.4	3.2	9.4
65 - 74	9.3	8.4	4.1	8.1
75 - 120	4.2	6	7.6	8.4

6.3 Use of E-commerce and Potential E-commerce users by Age Distribution

The use of e-commerce is driven by several factors including the age of Internet users. The younger population tends to use Internet services more than the older population. E-commerce, one of the activities carried online, is mostly preferred by young people. Figure 6.7 shows that a higher proportion of the population that used e-commerce, those that searched and bought online, were in the 25-34 years age group while less than 1.0 percent of the population aged 65 years and above engaged in e-commerce.

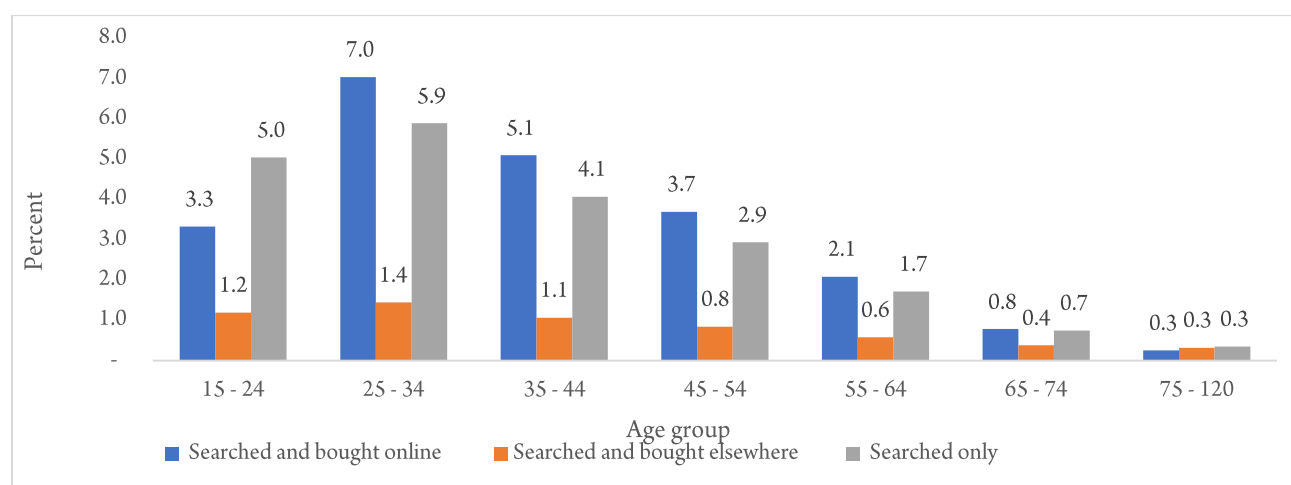


Figure 6.7: Proportion of population Age 15 years and above by E-commerce category and Age group

Figure 6.8 shows the distribution of the population by age group using e-commerce and area of residence. Majority of the population that engaged in e-commerce (12.7 percent) and those who searched only (8.7 percent) aged 25-34 years were from urban areas. The least e-commerce and potential users were those aged 65 years and above, mostly from rural areas.

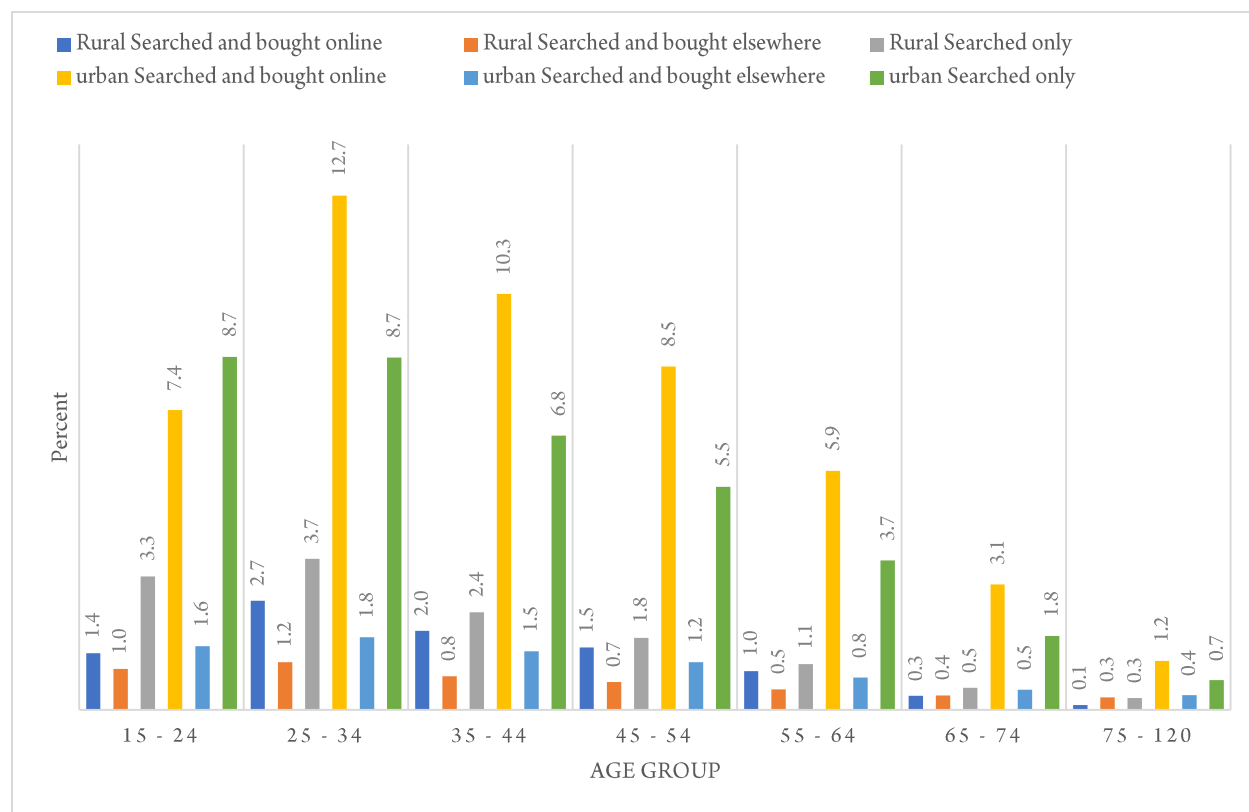


Figure 6.8: Proportion of Population aged 15 years and above using E-commerce by Type of category by Age Groups and Area of Residence

6.4 Use of E-commerce by Current Education Level

6.4.1 E-commerce users by Area of Residence

Figure 6.9 shows the percentage distribution of the population aged 15 years and above who engaged in e-commerce and are currently in school. Overall, those attending university used e-commerce more than those in other education levels at 26.8 percent with the majority being in urban areas at 33.2 percent; followed by those in the middle level at 11.2 percent with the majority residing in urban areas.

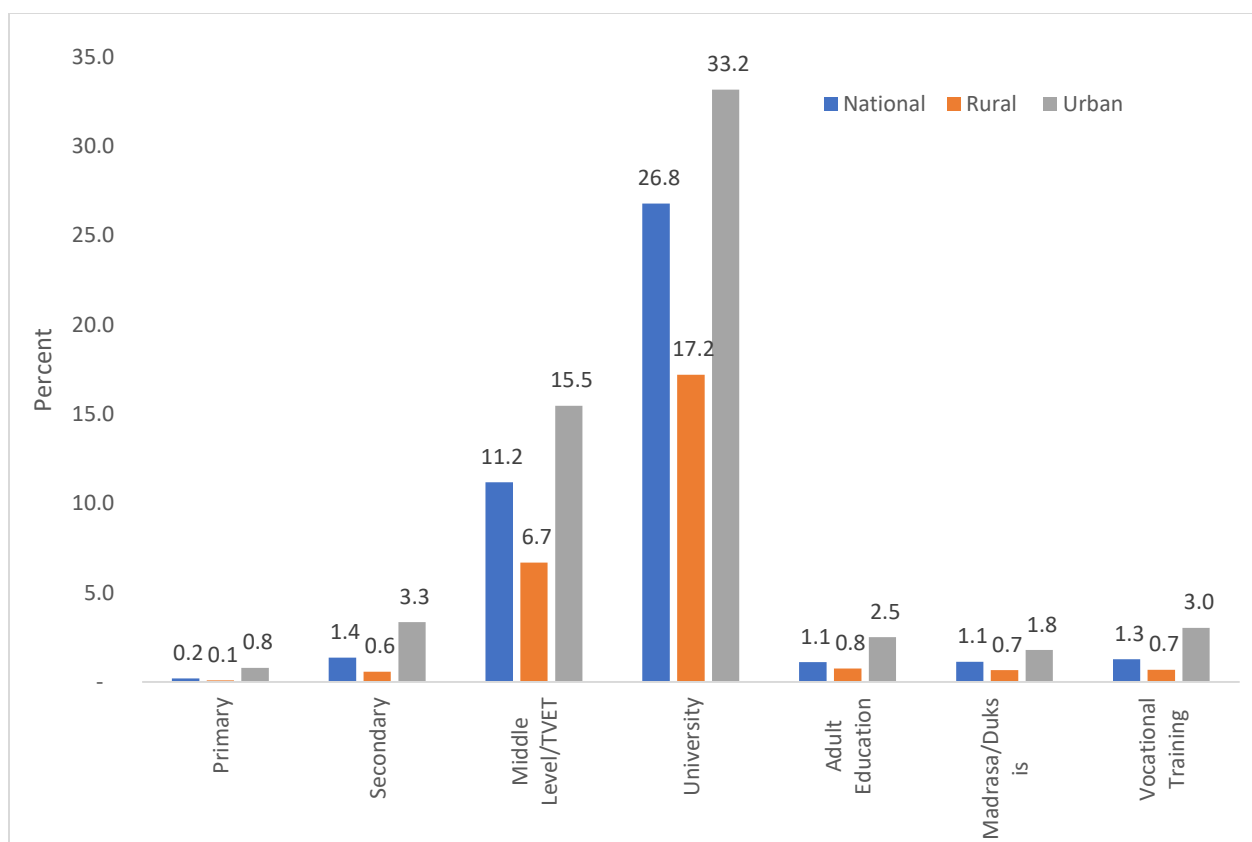


Figure 6.9: Percentage Distribution of population age 15 years and above who used E-commerce and are Currently in School by Sex and Area of Residence

6.4.2 Potential E-commerce users by Area of Residence

6.4.2.1 Searched and bought elsewhere

The distribution of population age 15 years and above currently in school, who searched and bought elsewhere, were in university at 5.0 percent, with the majority being from the rural areas at 6.5 percent as seen in Figure 6.10. Among those in middle level/TVET, a higher proportion of those who searched and bought elsewhere were those in rural areas at 3.3 percent. In other education categories, those in urban areas had higher proportions.

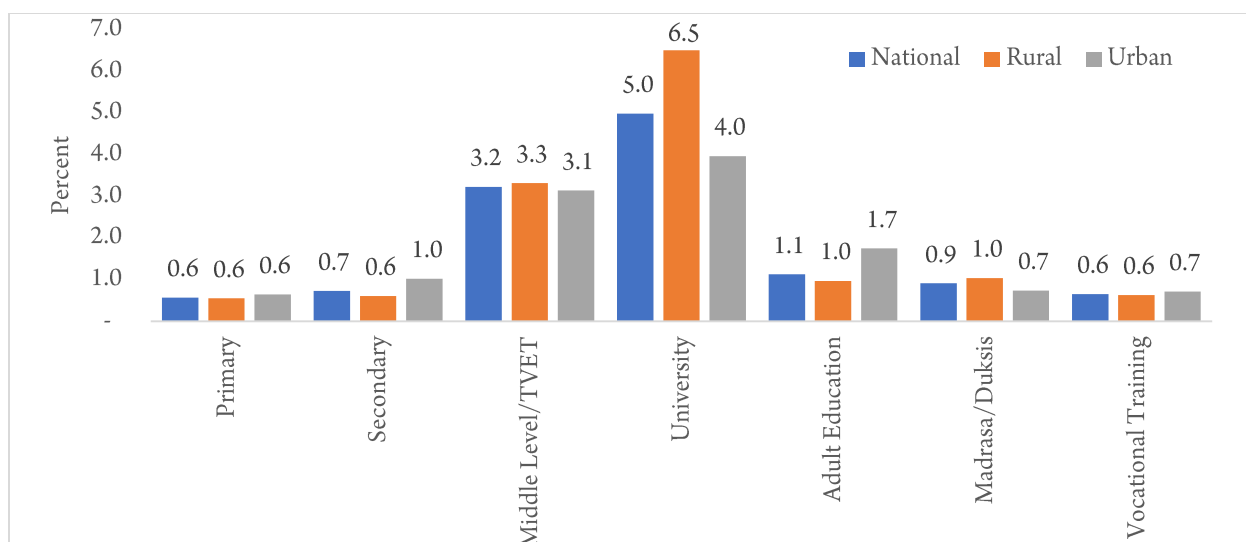


Figure 6.10: Percentage Distribution of Population Age 15 years and above currently in school who Searched and bought elsewhere by Area of Residence

6.4.2.2 Searched only

The majority of the population who were currently in school and searched only were majorly in university at 18.1 percent and mostly from rural areas at 19.5 percent as shown in Figure 6.11.

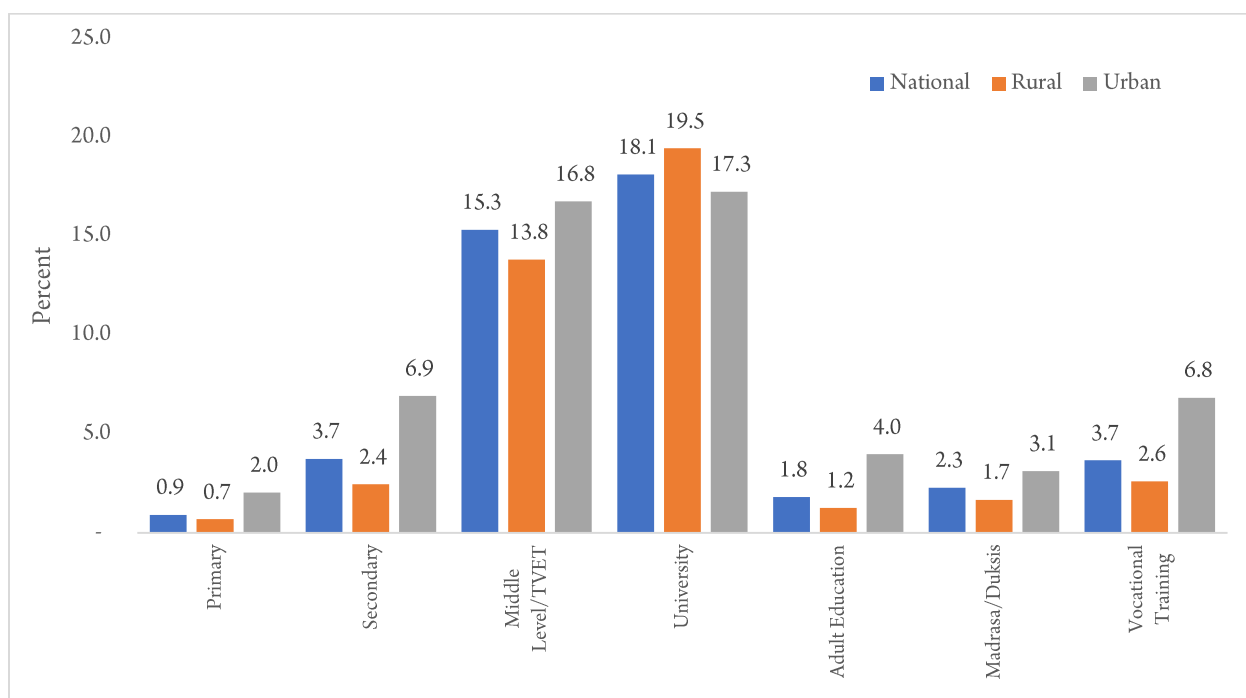


Figure 6.11: Percentage Distribution of Population Age 15 years and above currently in school who Searched only by Area of Residence

6.4.3 E-commerce and Potential e-commerce users by Sex

Figure 6.12 shows individuals who are currently in school who used e-commerce and those that are potential e-commerce users. The data shows that majority of those who searched and bought goods (e-

commerce users) were male who were in university at 27.1 percent followed by females at 26.4 percent. Overall, the leading users of e-commerce were those in university and middle level/TVET.

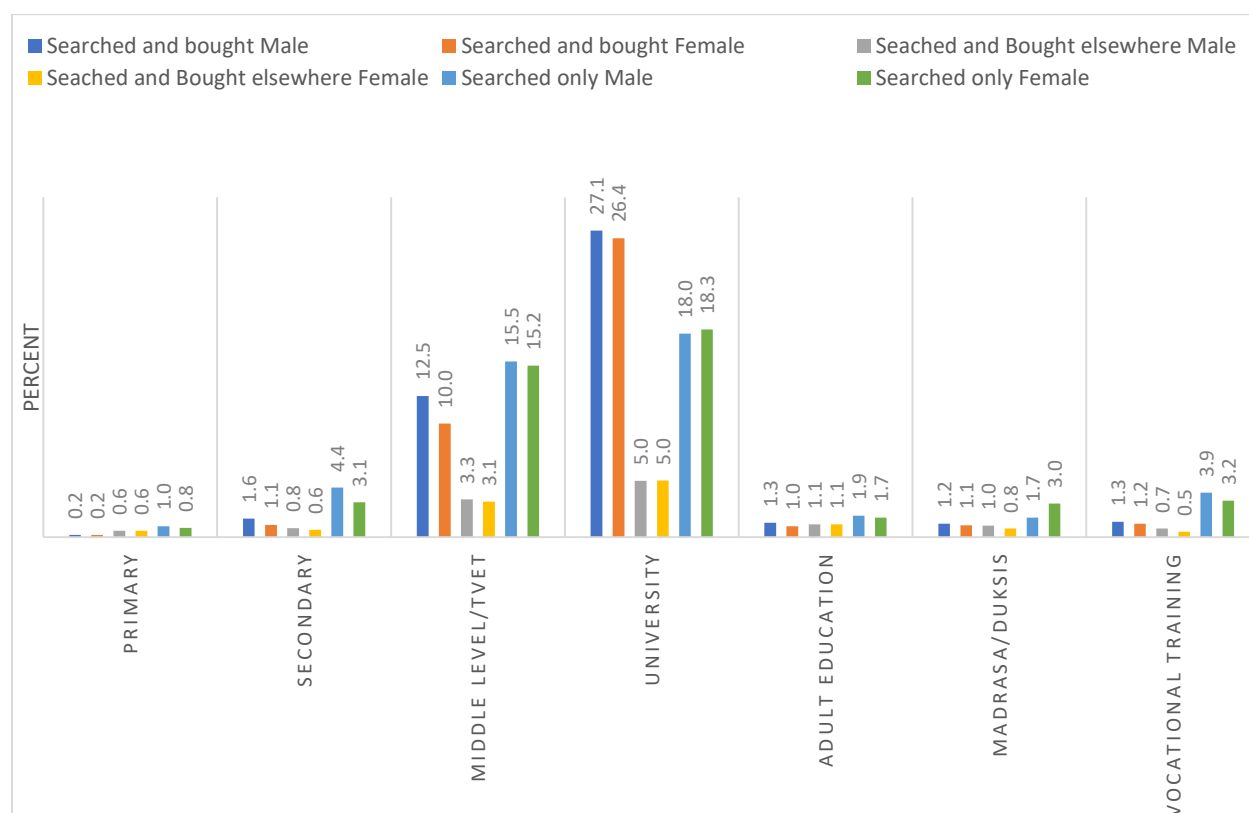


Figure 6.12: Percentage Distribution of Population Age 15 years and above who used E-commerce and are Currently in school by Level and Sex

6.5 Use of E-commerce and Potential E-commerce users by Highest Education Level Completed

6.5.1 E-commerce by Area of Residence

Education has a big impact on the uptake of e-commerce. Any level of education incorporated with digital skills improves digital literacy and the uptake of the ICTs. Whereas e-commerce applications are available in both computer and Internet-enabled mobile devices, most people can be able to buy goods online if they have skills. More so, the more learned one is, the more likely one is to engage in e-commerce. The results show the highest proportion of those who engage in e-commerce (39.6 percent) had university as their highest level of education and were in urban areas followed by those in rural areas at 21.7 percent, as seen in Figure 6.13.

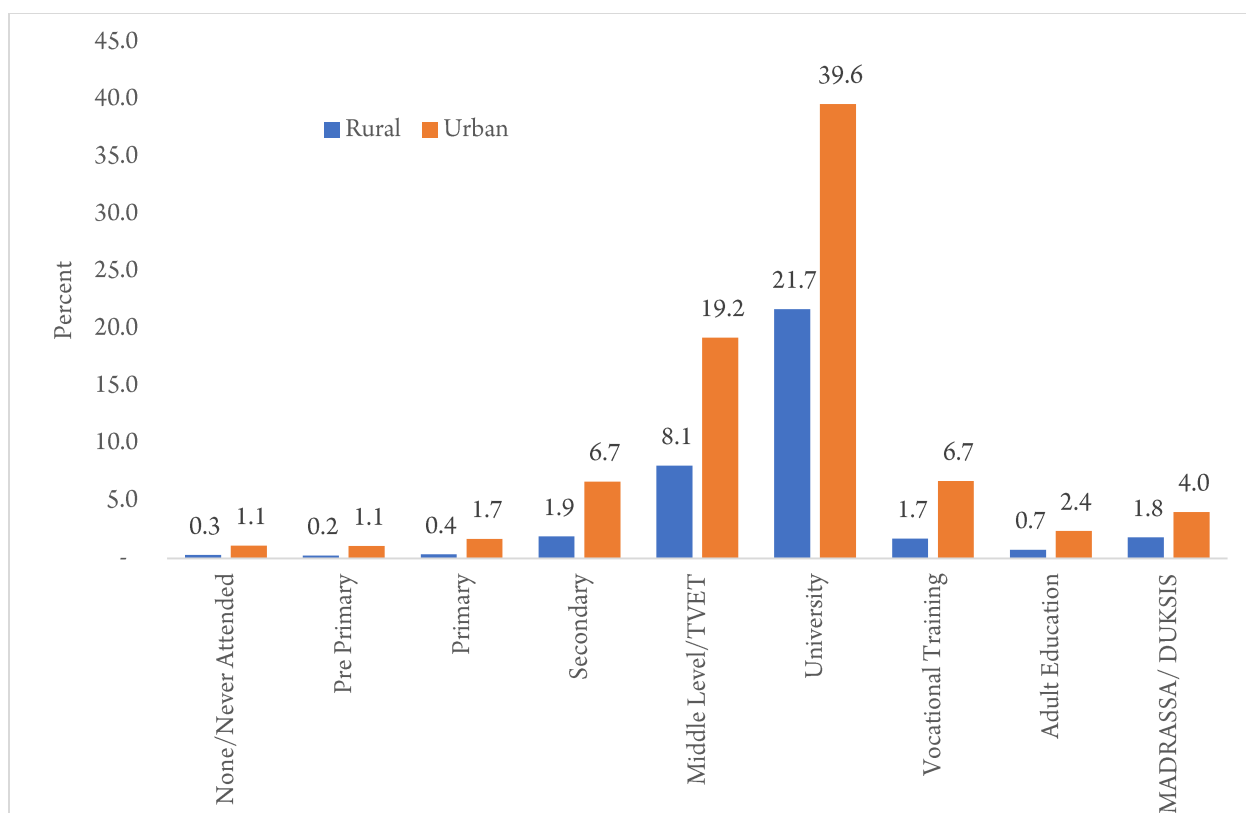


Figure 6.13: Proportion of Population Age 15 Years and above using E-commerce by Highest Education level Completed and Area of Residence

6.5.2 E-commerce by Sex

Figure 6.14 shows the proportion of the population aged 15 years and above by highest education and sex. The results show that majority of e-commerce users had university education as their highest education level at 33.9 percent with males at 33.1 percent and females at 34.9 percent.

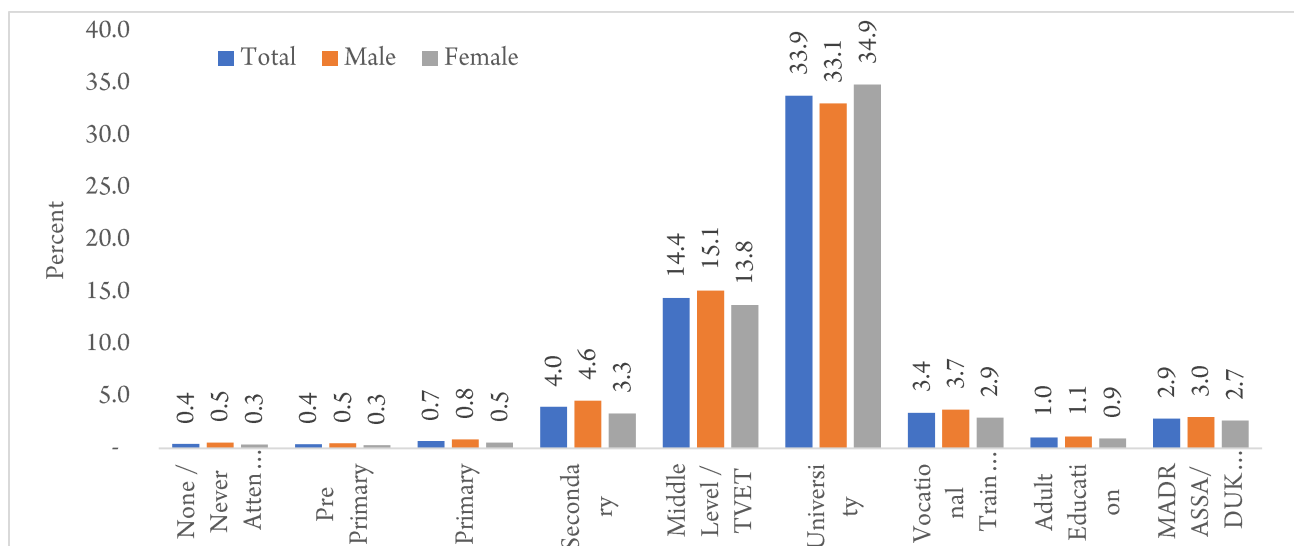


Figure 6.14: Percentage Distribution of Population Age 15 Years and above who Engaged in E-commerce by Highest Education Level Completed and Sex

6.5.3 Potential E-commerce Users by Sex

6.5.3.1 Searched and bought elsewhere

Individuals who searched and bought goods and/or services elsewhere were mainly in the university at 4.2 percent followed by those in middle/TVET at 2.8 percent. There was no major difference between males and females across all categories as shown in Figure 6.15.

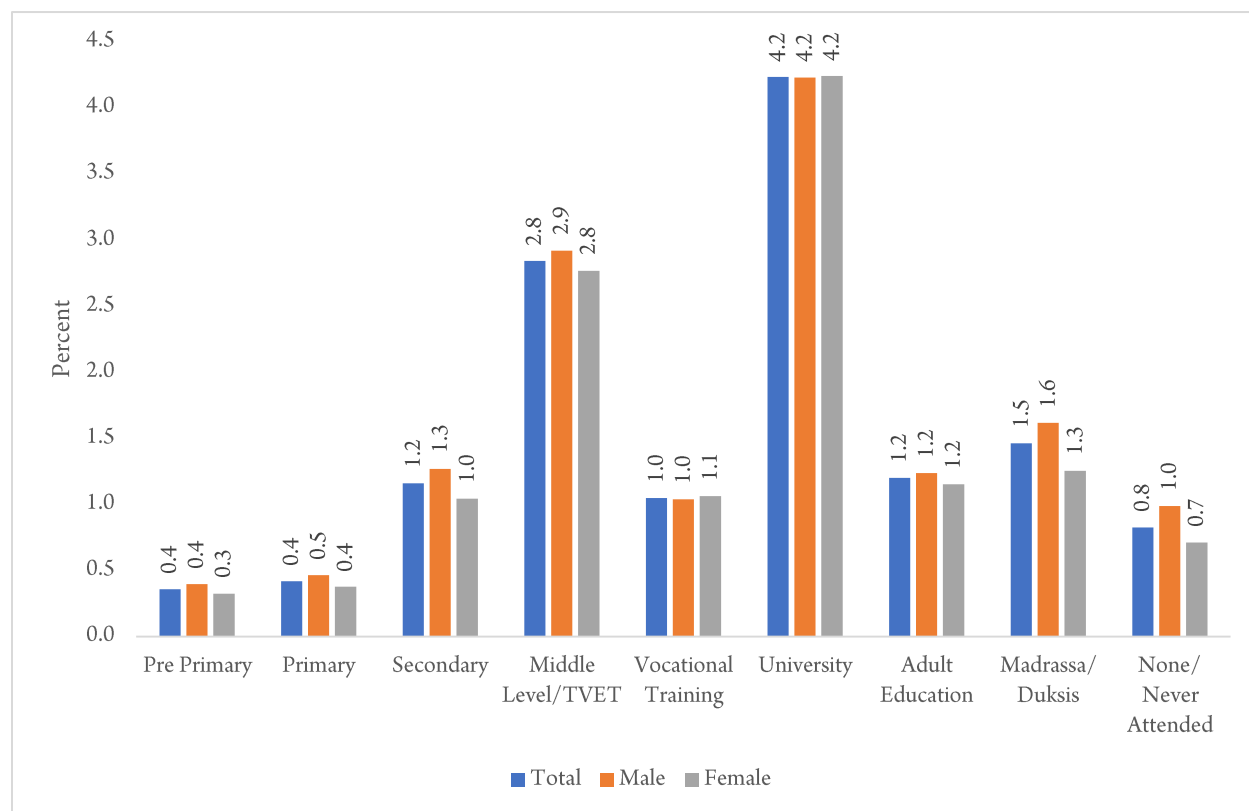


Figure 6.15: Proportion of Population Age 15 Years and above who Searched and Bought elsewhere by Highest Education Level Completed and Sex

6.5.3.2 Searched only

A similar trend was seen on those who searched only having university as their highest level of education at 14.5 percent with the least being those who never attended and those in pre-primary at 0.9 percent as shown in Figure 6.16.

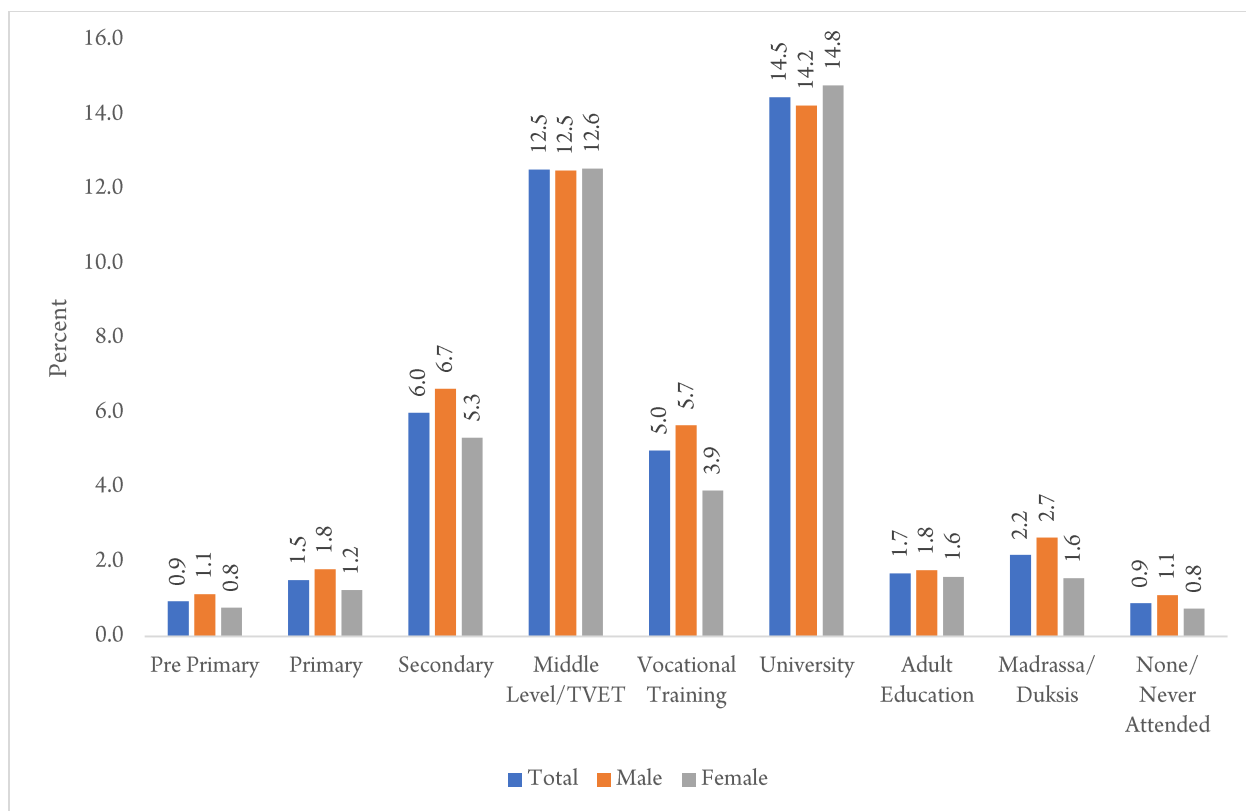


Figure 6.16: Proportion of Population Age 15 Years and above who Searched Only by Highest Education Level Completed and Sex

6.6 Use of E-commerce and potential e-commerce users by Disability

6.6.1 Use of E-commerce by Persons Living with Disability by Area of Residence

The use of e-commerce has grown in the past few years mainly due to the exponential increase in Internet accessibility in the country. As one of the activities carried online, e-commerce is available for use to everyone including persons living with a disability. However, most e-commerce applications and websites have accessibility challenges for persons living with a disability. There is a need to adopt web accessibility such as the Web Content Accessibility Guidelines (WCAG 2.0) to increase the consumer's satisfaction for all persons including those with disabilities.

Since e-commerce data targeted only individuals 15 years and above, the analysis for disability while comparing the use of e-commerce, also considered this age. Figure 6.17 presents the distribution of population age 15 years and above living with disabilities that engaged in e-commerce by category and residence. The highest proportion of the population living with a disability that engaged in e-commerce were those that searched and bought online and were residing in urban areas at 4.8 percent.

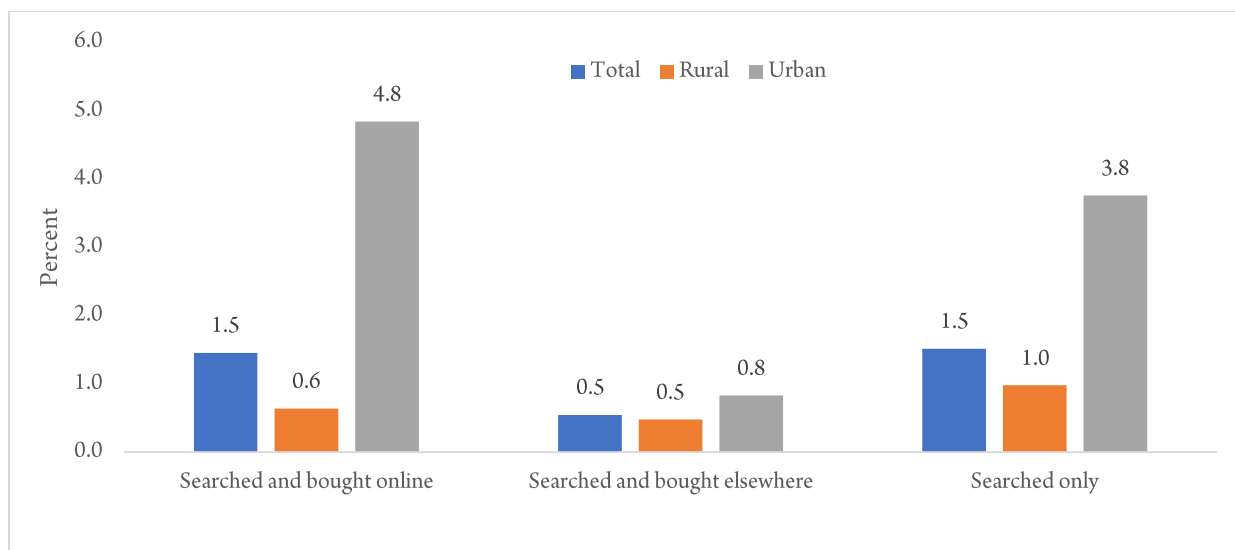


Figure 6.17: Proportion of Population living with disability Age 15 years and Above Using E-commerce by category and area of residence

6.6.2 Use of E-commerce by Persons Living with Disability by Highest and Lowest County

As illustrated in Figure 6.18, counties with the highest proportion of the population living with disability aged 15 years and above who engaged in e-commerce were from Nairobi City County at 8.1 percent, while the least were from West Pokot County at 0.3 percent.

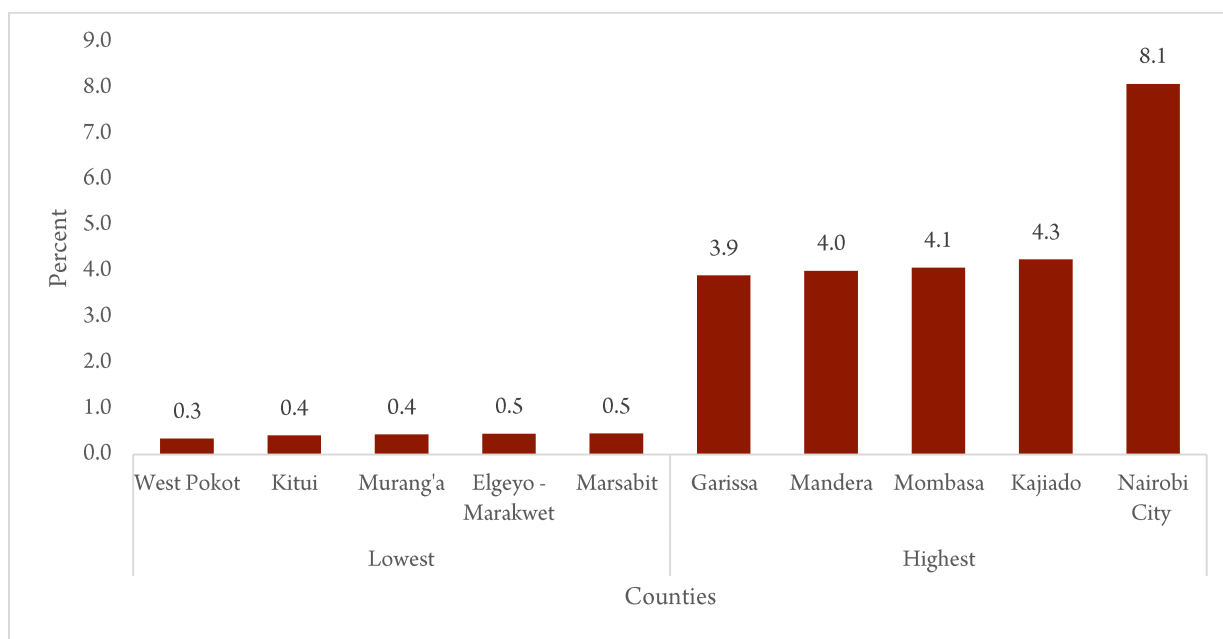


Figure 6.18: Counties with the Highest and Lowest Proportion of Population aged 15 Years and Living with Disability by e-commerce users

6.6.3 Potential E-commerce users by Lowest and Highest County

6.6.3.1 Searched and bought goods elsewhere

Figure 6.19 shows PWDs who searched and bought goods elsewhere by highest and lowest counties. The results show that Wajir at 7.4 percent had the majority of PWDs that searched and bought goods elsewhere with the least being from Murang'a county.

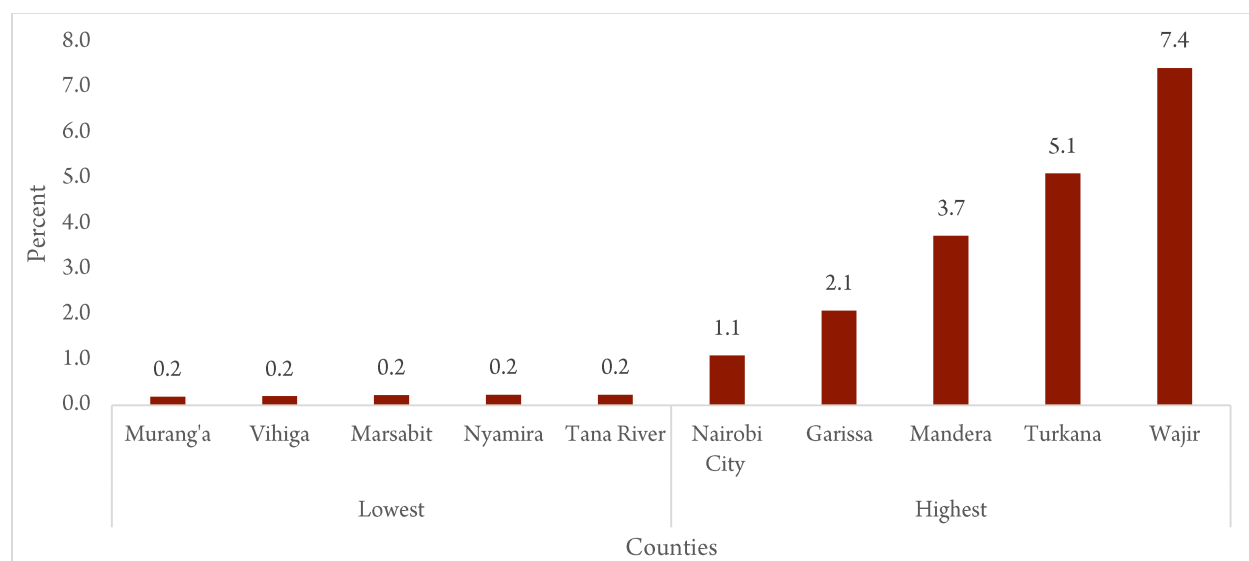


Figure 6.19: Counties with the Highest and Lowest Proportion of Population aged 15 Years and Living with Disability who searched and bought goods elsewhere

6.6.3.2 Searched only

Figure 6.20 shows PWDs that only searched goods online only by highest and lowest counties. The analyses show that majority of PWDs who searched only were in Wajir county at 5.6 percent while the least were in Tana River at 0.5 percent.

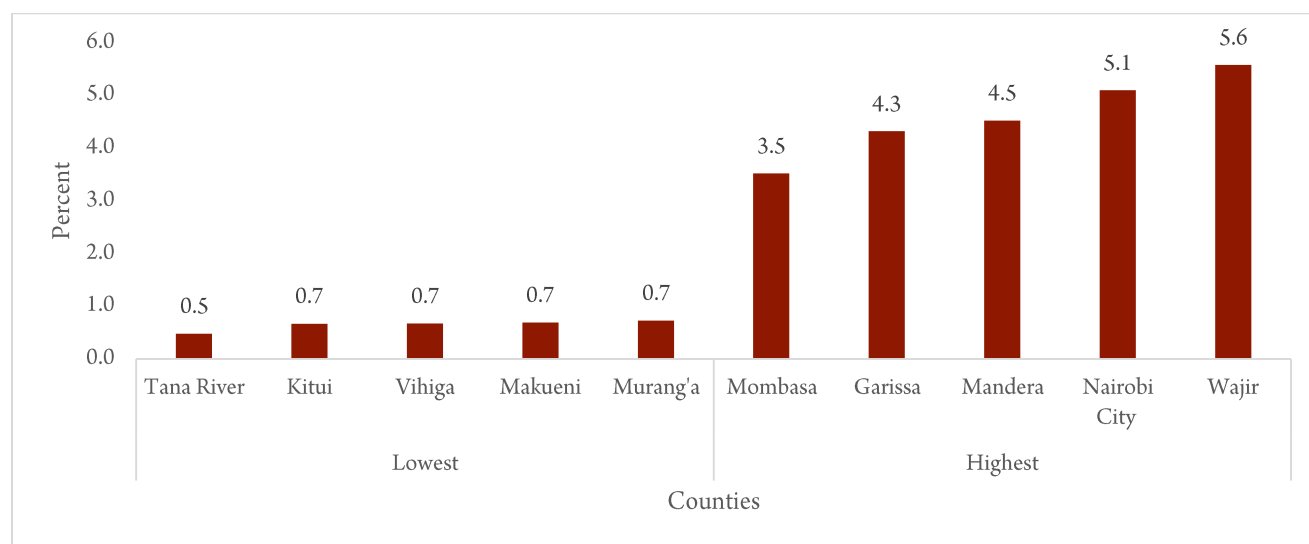


Figure 6.20: Counties with the Highest and Lowest Proportion of Population aged 15 Years and Living with Disability who searched and bought goods elsewhere.

6.6.4 Use of E-commerce and potential e-commerce users by Type of Disability

The KPHC 2019 shows that the highest proportion of persons living with a disability that engaged in e-commerce were those with visual difficulties at 2.3 percent followed by those with mobility difficulties at 0.9 percent as seen in Figure 6.21. Notably, those with visual difficulties also searched only at 2.1 percent. The least PWDs that engaged in e-commerce were those with cognitive disability at 0.5 percent.

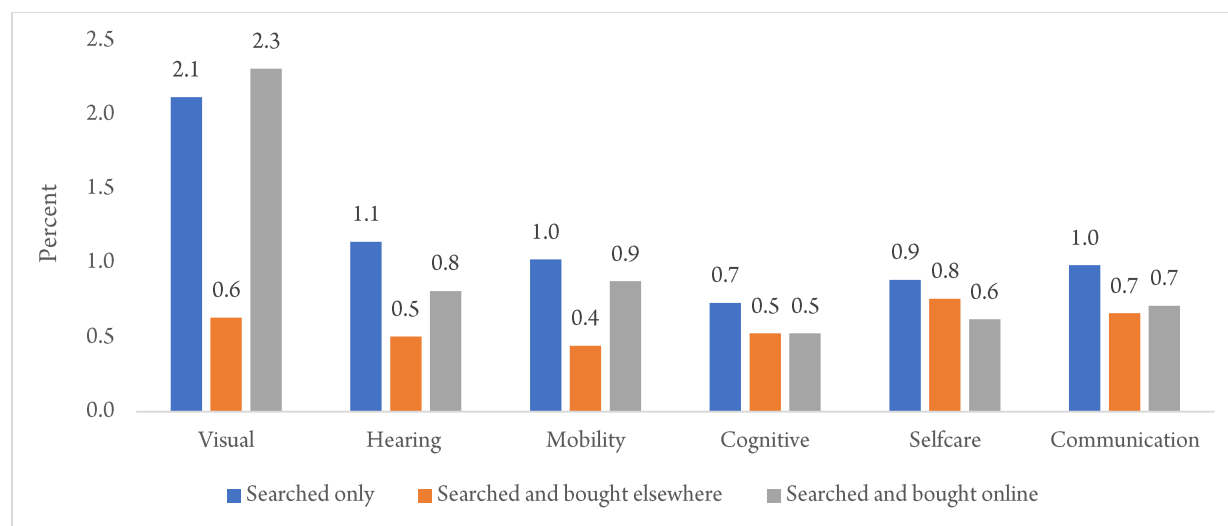


Figure 6.21: Percentage Distribution of Population Age 15 Years by type of disability and type of e-commerce category

6.6.5 Use of E-commerce by Type of Disability and Sex

Figure 6.22 shows the proportion of the population aged 15 years and above using e-commerce by type of disability and sex. Out of the population living with disabilities, the usage of e-commerce was high among persons with visual difficulties at 2.3 percent followed by those with mobility difficulties at 0.9 percent. Overall, the use of e-commerce by persons with difficulties is higher in males than females in all the disability domains.

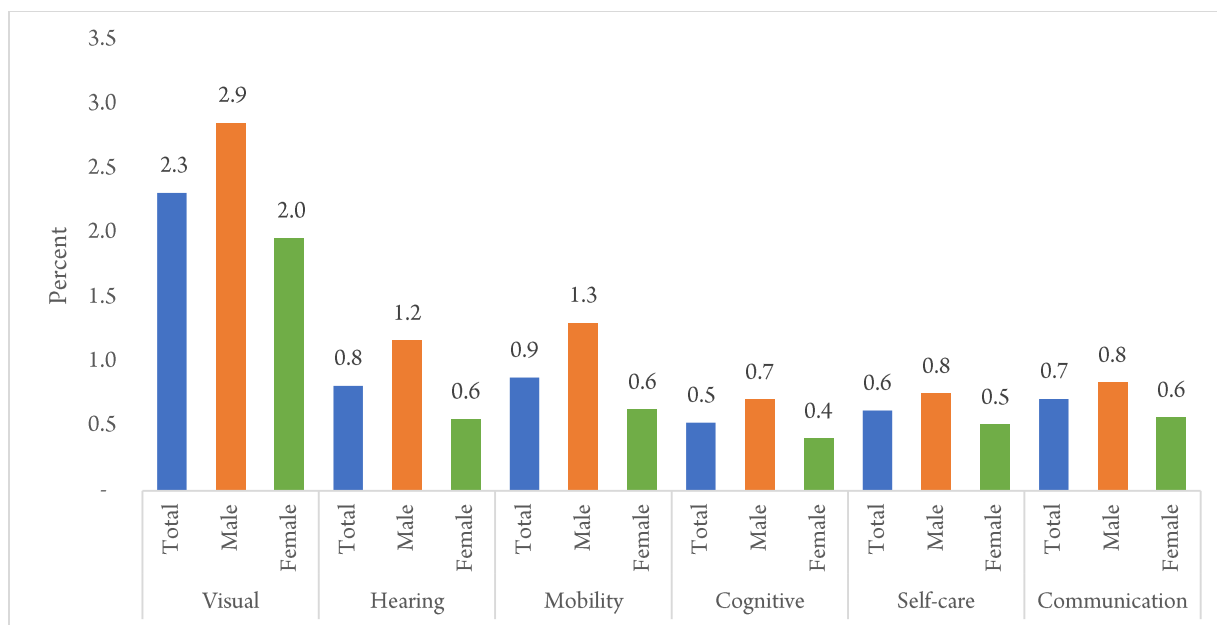


Figure 6.22: Percentage Distribution of Population Age 15 Years & above using E-commerce by Type of Disability & Sex

6.7 Use of Ecommerce by Main Job Status

Engagement in income-generating activity has a huge influence on the uptake of e-commerce. Together with other crucial factors such as age and digital skills, engagement in income-generating activities increases the uptake of e-commerce.

Figure 6.23 illustrates the distribution of population age 15 years and above using e-commerce by main job status. According to the 2019 KPHC, 6.9 percent were paid employees followed by apprentice/intern/ volunteer at 6.8 percent. Males from all domains of job status took the lead with the highest difference being those who were self-employed at 4.2 percent while females were 2.4 percent in the same category.

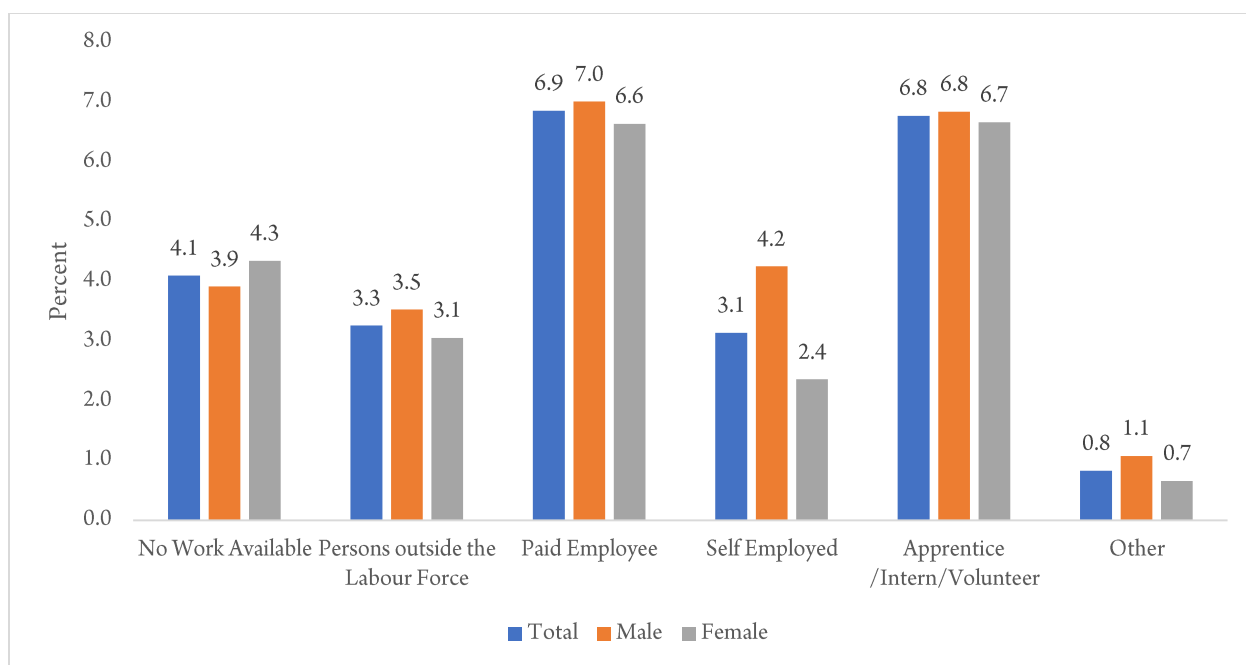


Figure 6.23: Proportion of Population Age 15 Years and above using e-commerce by Main Job Status

6.8 Use of E-commerce by Economic Activity

Table 6.2 shows the population age 15 years and above who engaged in e-commerce by type of economic activity. The results show that majority of those who engaged in e-commerce undertook Information and Communication activities at 39.8 percent with males at 41.9 percent and females at 36.2 percent, followed by those in Financial and Insurance activities at 33.7 percent.

Table 6.2 Percentage Distribution of Population Age 15 Years and above who engaged in e-commerce by type of economic activity engaged and Sex

Type of Economic Activity	Total	Male	Female
Agriculture	1.2	1.6	0.9
Mining and quarrying	2.7	2.6	3.2
Manufacturing	8.6	8.8	8.1
Electricity gas steam and air conditioning supply	15.5	14.7	22.6
Water supply; sewerage waste management and remediation activities	9.9	9.2	12
Construction	5.2	4.8	15.1
Wholesale and retail trade; repair of motor vehicles and motorcycles	8	8.8	7.1
Transportation and storage	7	6.3	22.1
Accommodation and food service activities	7.8	9.1	6.9
Information and communication	39.8	41.9	36.2
Financial and insurance activities	33.7	34.7	32.7
Real estate activities	15.5	14.9	16.6
Professional scientific and technical activities	23.2	23.7	22.4
Administrative and support service activities	19	16.1	23.2
Public administration and defense; compulsory social security	15.6	14.3	21.6
Education	14.9	16.4	13.6
Human health and social work activities	22.8	24.1	21.8
Arts entertainment and recreation	16.3	18.2	13.8
Other service activities	7.3	7.4	7.1
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	3.2	3.1	3.2
Activities of extraterritorial organizations and bodies	15.9	14.5	18.7

6.9 Use of E-commerce and potential e-commerce users by Religious Affiliation

Religion is an important part of life for many people all over the world. Religious values influence the consumption patterns of individuals in terms of what to consume, how, and when to consume goods and services. Religious values delineate what consumption behaviors are allowed and what is forbidden. With this, the use of the Internet has not been spared. The uptake of certain online activities may partly be influenced by the religious values held by an individual. It is with this notion that online activities such as e-commerce must meet different religious values for their uptake to increase. An e-commerce site, for example, selling pork and non-halal foods and alcohol among others will not attract consumers affiliated to the Islamic religion.

According to the KPHC 2019, overall, the top three religions in Kenya are Protestants, Catholics, and Evangelical churches. The uptake of e-commerce, however, is more for the Hindu at 22.4 percent followed by Protestants at 5.3 percent. The use of e-commerce was highest in urban than rural areas for all religious categories as seen in Table 6.3.

Table 6.3: Percentage Distribution of Population Age 15 years and above who used E-commerce by Religious Affiliation, and Area of Residence

Religion	Total	Rural	Urban
Catholic	4.9	1.9	10.8
Protestant	5.3	2.1	12.2
Evangelical Churches	3.6	1.4	8
African Instituted Churches	2.5	1.1	6
Orthodox	3.3	1.1	6.9
Other Christian	4.6	1.3	8.5
Islam	2.9	1	5.4
Hindu	22.4	6.4	23.4
Traditionists	0.7	0.2	6.1
Other Religion	3.6	1.1	9.3
No religion /Atheists	2.7	0.7	8
DK	3.1	0.7	7.1

Table 6.4 shows that for all religious affiliations, most people searched only compared to those who searched and bought online with the majority being in urban areas.

Table 6.4: Percentage Distribution of Population Age 15 years and above who are Potential E-commerce Users by Religious Affiliation and Area of residence

Religion		Searched & bought online			Searched Only		
		Total	Rural	Urban	Total	Rural	Urban
Catholic	Total	1.2	1	1.6	4.7	2.9	8.3
	Male	1.3	1.1	1.7	5.2	3.4	8.6
	Female	1.1	0.8	1.6	4.3	2.4	8
Protestant	Total	1.2	1	1.8	5	3.2	9
	Male	1.4	1.2	1.9	5.7	3.9	9.6
	Female	1.1	0.8	1.7	4.4	2.6	8.4
Evangelical	Total	1	0.8	1.4	4.3	2.6	7.8
	Male	1.2	0.9	1.6	5.1	3.3	8.7
	Female	0.9	0.6	1.3	3.7	2	7.1
African Instituted Churches	Total	0.8	0.6	1.2	3.4	2.1	6.4
	Male	1	0.8	1.4	4.2	2.8	7.3
	Female	0.7	0.5	1	2.8	1.6	5.6
Orthodox	Total	1	0.7	1.3	3.8	2.1	6.8
	Male	1.1	0.9	1.4	4.5	2.7	7.6
	Female	0.8	0.6	1.3	3.2	1.6	6
Other Christian	Total	1	0.7	1.3	4.3	2.2	6.8
	Male	1	0.7	1.3	4.7	2.6	7.3
	Female	0.9	0.7	1.1	3.7	1.6	6
Islam	Total	1.2	1.1	1.2	2.9	1.6	4.5
	Male	1.2	1.2	1.3	3.2	1.9	5
	Female	1.1	1	1.2	2.5	1.3	4
Hindu	Total	1.2	2.1	1.2	6	2.2	6.3
	Male	1.3	1.7	1.3	6.1	2.4	6.4
	Female	1.1	2.9	1	5.9	1.9	6.1
Traditionists	Total	0.5	0.5	1.1	1	0.7	5
	Male	0.5	0.5	1.3	1.3	0.9	5.8
	Female	0.5	0.5	0.8	0.7	0.5	3.8
Other religion	Total	0.8	0.7	1.2	3.1	1.8	5.9
	Male	0.9	0.7	1.3	3.5	2.1	6.4
	Female	0.7	0.6	1.1	2.5	1.3	5.2
No religion/ Atheists	Total	0.6	0.4	0.9	2.2	1.3	4.5
	Male	0.6	0.5	0.9	2.4	1.5	4.7
	Female	0.5	0.4	0.8	1.5	0.7	3.8
DK	Total	0.8	0.7	0.9	2.5	1.4	4.3
	Male	0.7	0.6	0.9	2.4	1.5	4.2
	Female	0.8	0.8	0.9	2.6	1.4	4.6

6.10 Use of E-commerce and Potential E-commerce users by Marital Status

Marital status is one of the demographic profiles that play an important role in influencing consumer behavior in general. Results from the 2019 KPHC shows that for the population age 15 years and above who used e-commerce, 4.9 percent were never married followed by the married monogamous at 4.4 percent as seen in Figure 6.24. The least e-commerce and potential e-commerce users were those widowed at 1.0 percent for e-commerce and searched only, and 0.4 percent for searched and bought elsewhere.

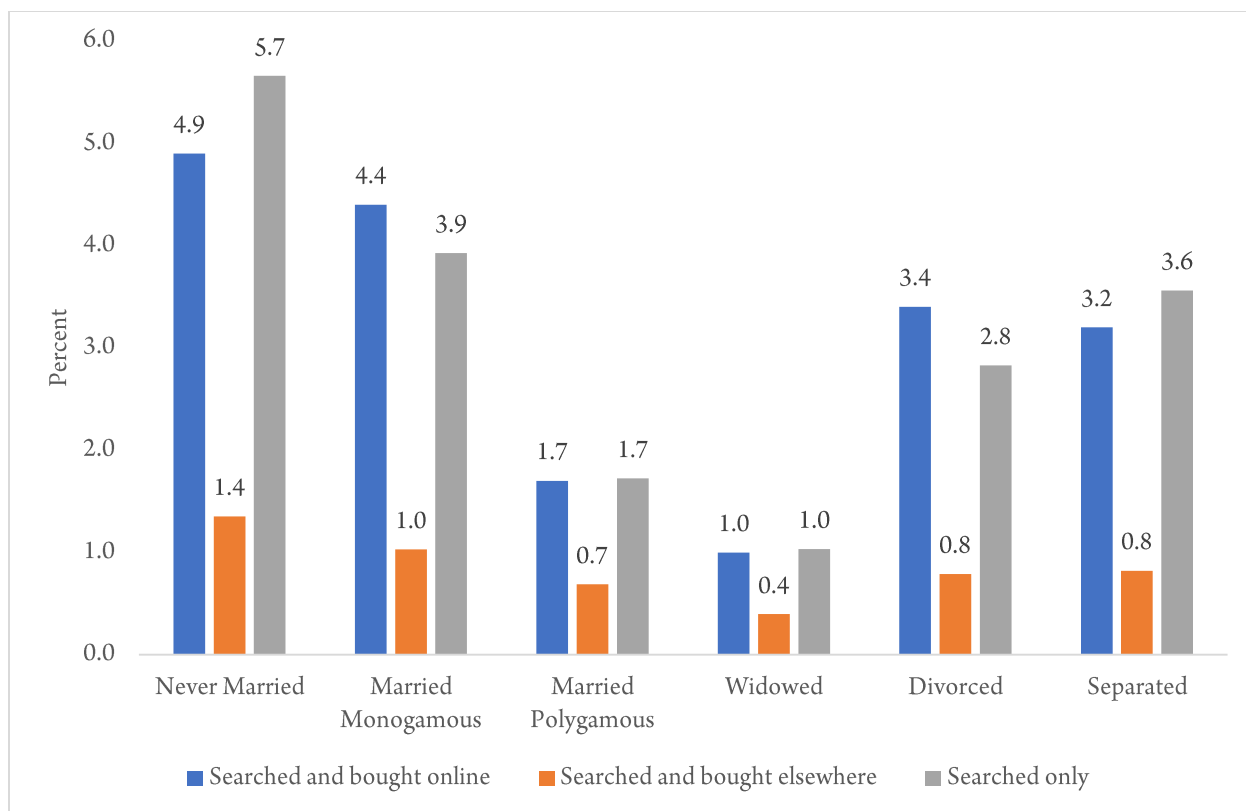


Figure 6.24: Proportion of Population aged 15 years and above using E-commerce by Marital Status

Majority of those who used e-commerce and were married monogamous were males at 5.4 percent as seen in Figure 6.25. Males who used e-commerce dominated in all categories apart from those who were never married and divorced. In addition, females who were separated were more than their male counterparts in searching only at 4.0 percent.

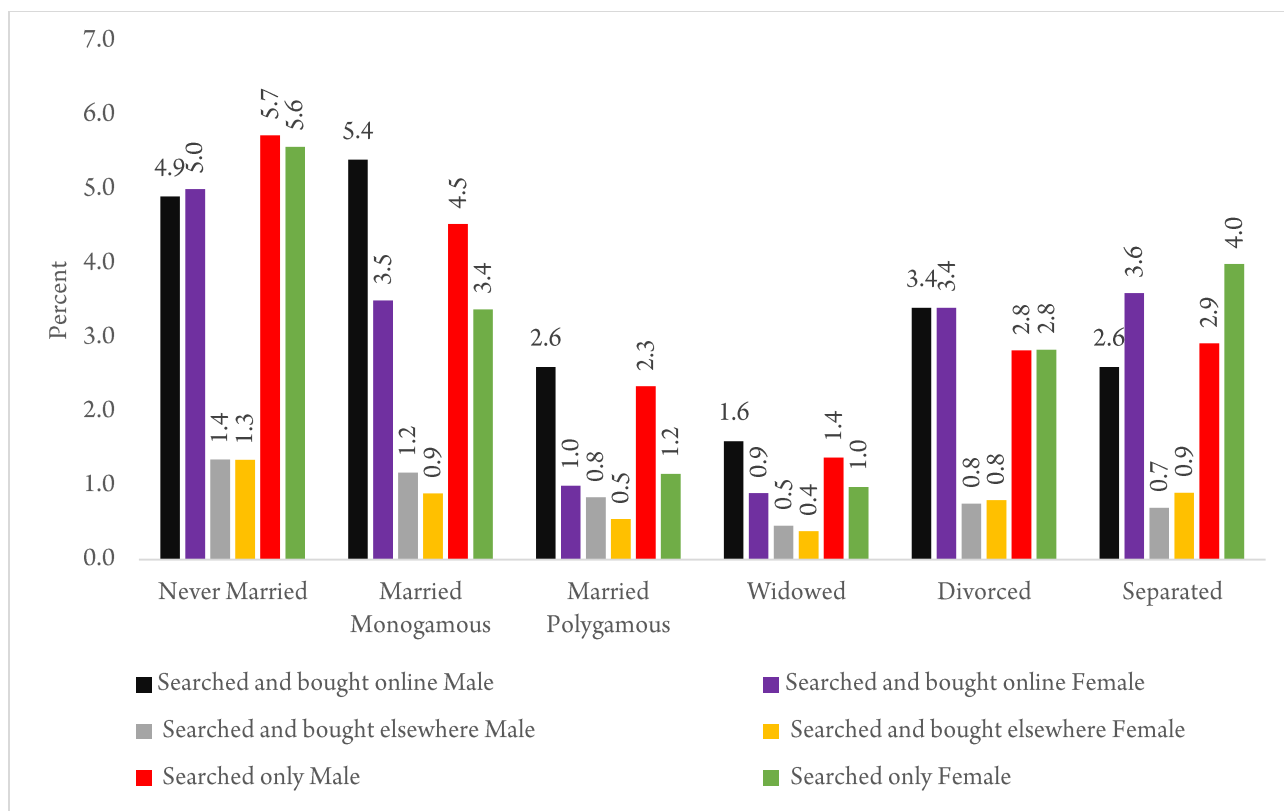


Figure 6.25: Proportion of Population aged 15 years & above using E-commerce by Marital Status & Sex

Chapter 7: Household Ownership of ICT Equipment

7.1.1 Introduction

This section gives a brief on ICT indicators at the household level. The core ICT household indicators covered include those that are concerned with ICT infrastructure, access, and use of ICT by households. The key indicators that are captured in this chapter are as follows:

- a. The proportion of households with a stand-alone radio
- b. The proportion of households with a television
- c. The proportion of households with a computer
- d. The proportion of households with Internet, by type
- e. The proportion of households with multichannel television, by type

Further, ICT indicators at the household level were disaggregated into distinct characteristics as discussed below:

7.1.2 Household

Is a person or a group of persons who reside in the same homestead or compound but not necessarily in the same dwelling unit. They have the same cooking arrangement and are answerable to the same household head. For purpose of 2019 KPHC, households were categorized into conventional and non-conventional. Conventional were the ordinary households while non-conventional households referred to people live together but cannot be said to belong to “ordinary” households. Examples were students in boarding schools and colleges, hospital in-patients, people in police cells, guests in hotels, or prison inmates, outdoor sleepers, nuns, brothers in a monastery and other religious organizations with some institution-like living arrangements.

7.1.3 Rural and Urban Areas

This is characterized by a concentration of economic activity and infrastructure, in addition to having a vastly higher population density than its surrounding areas. It might be seen as a built-up and compact human settlement with a population of at least 2,000 people. An urban center may be classified as a market center, town, municipality or city. Urban centers are also service centers that supply goods and services to both the resident and surrounding population. As such, an urban center may form some trading centers with less than 2,000 people.

Rural areas are a large and isolated part of an open or agricultural part of the country, including trading, market, and service centers with low population concentrations of less than 2,000 people.

7.1.4 Households with Agricultural Activity

Cross-classification of ICT indicators with households with agricultural activities such as fishing, crop farming, livestock farming, and aquaculture was included. The use of ICTs by households with agricultural activities are likely to access information such as explore new markets online, access a wide range of information from radio, television, Internet, etc.

7.1.5 Household Composition

This is relevant to measuring the digital divide in households with children who are digital natives.

7.1.6 Household by type of Headship

Data is cross classified with households by either male or female headship for purposes of bringing out the digital divide that may exist.

7.1.7 Counties

ICT at the household level is disaggregated for top and bottom county giving a snapshot of how the counties are performing in terms of the uptake of the ICTs. In addition, a map showing the proportion of uptake of ICTs by county is depicted in this report.

7.1.8 Household by types of Human Waste Disposal

The type of human waste disposal that a household has is likely to influence the type of ICT assets a household can own. Cross classification between these two also informs the policymakers on which policies are working and how fast. For instance, sanitation policies have been in existence way before ICTs but the adoption of ICTs may be adopted faster than proper sanitation facilities.

7.1.9 Households by type of Tenure ship for the Dwelling Unit

Cross classification between ICT assets and the type of tenure ship is generally related to the geographical location and gives more information on how the households are living i.e, whether renting, purchased, constructed on inherited the dwelling unit. Gives further insights on the digital divide based on the tenure ship of the dwelling unit.

7.1.10 Households by type of Lighting

Cross classification between ICT assets and the type of lighting influences ownership of most ICT assets.

7.1.11 Wealth Quintiles

The ownership of ICTs and wealth quintiles bring out the digital divide among the poorest to the richest household.

7.2 Household asset ownership

This following section presents an analysis of household ownership of stand-alone radio, Television set Internet connection, and computer/laptop at rural, urban, and County levels. It is also cross-referenced with tenure ship, agricultural activities, household composition, headship type, waste disposal, and lighting.

7.2.1 Ownership of stand-alone radio

The radio has for a long time been the most widespread ICT in the world. Radios are important affordable and the most accessible mass medium for rural and marginalized urban communities. Radios can overcome literacy and language barriers and therefore the medium that reaches the widest

audience worldwide. Radios are accessible, cheap, and quite simple to use ICT equipment at home, and can carry any message to any place at any time even without electricity. Where Internet access is not available or affordable, radio plays a particularly significant role in delivering education or services in the areas of agriculture and health among others. The ownership of stand-alone radio indicators is important for country projects that rely on the availability of radios in households.

Nationally, 57.0 percent of households own a stand-alone radio as shown in Figure 7.1. A higher proportion of households in rural areas (58.5 %) compared with urban areas (54.5 %) own a stand-alone radio.

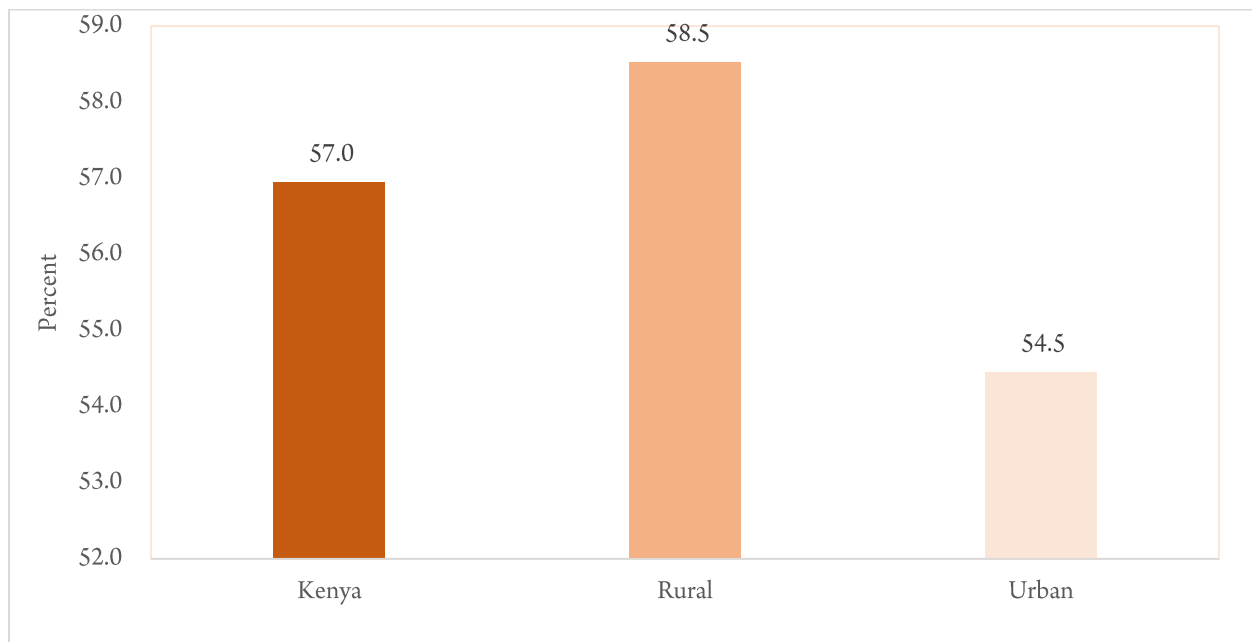


Figure 7.1: Proportion of Households with Stand-Alone Radio

Figure 7.2 presents counties with the highest and lowest proportion of households owning a stand-alone radio. Counties with the highest proportion of households owning stand-alone radio include Nyeri (74.3%), Nyandarua (72.4%), and Muranga (70.7%) while those with the lowest proportion of households owning a stand-alone radio include Turkana (12.1%), Marsabit (27.8 %), Tana River (28.4%) and Samburu (29.4%). Figure 7.3 shows ownership of the stand-alone radio by county.

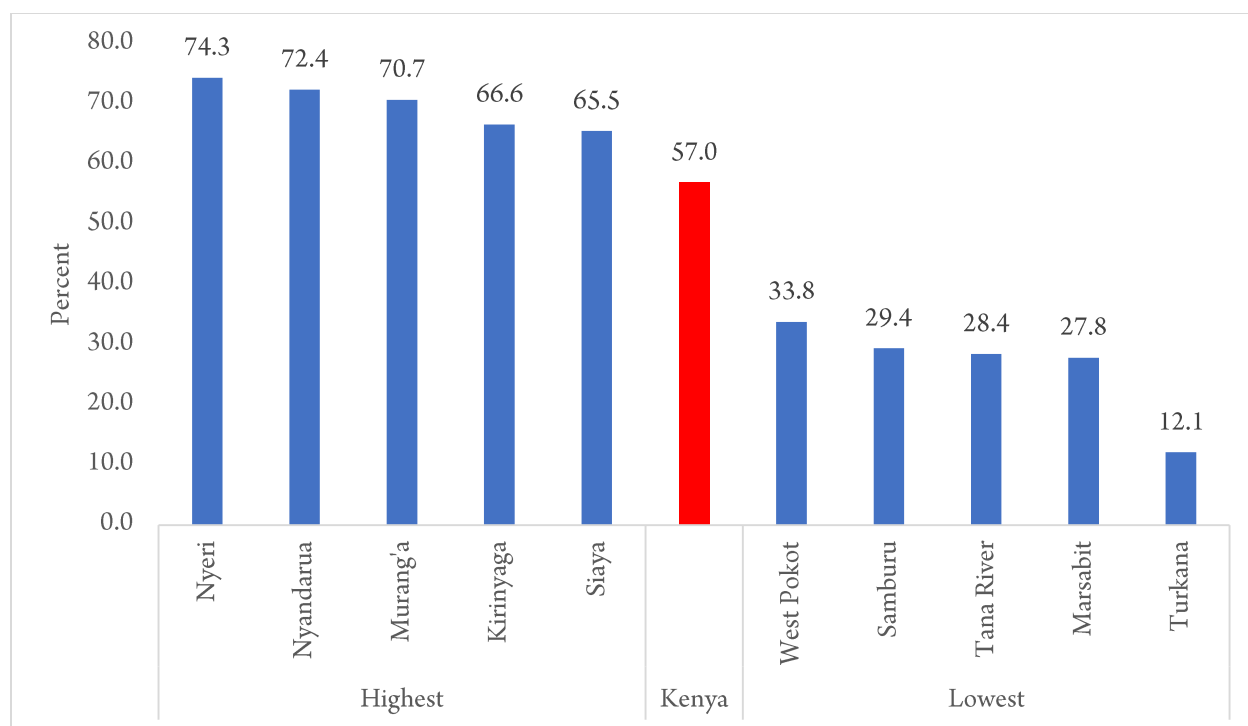


Figure 7.2: Counties with the highest and lowest proportion of households owning stand-alone radio

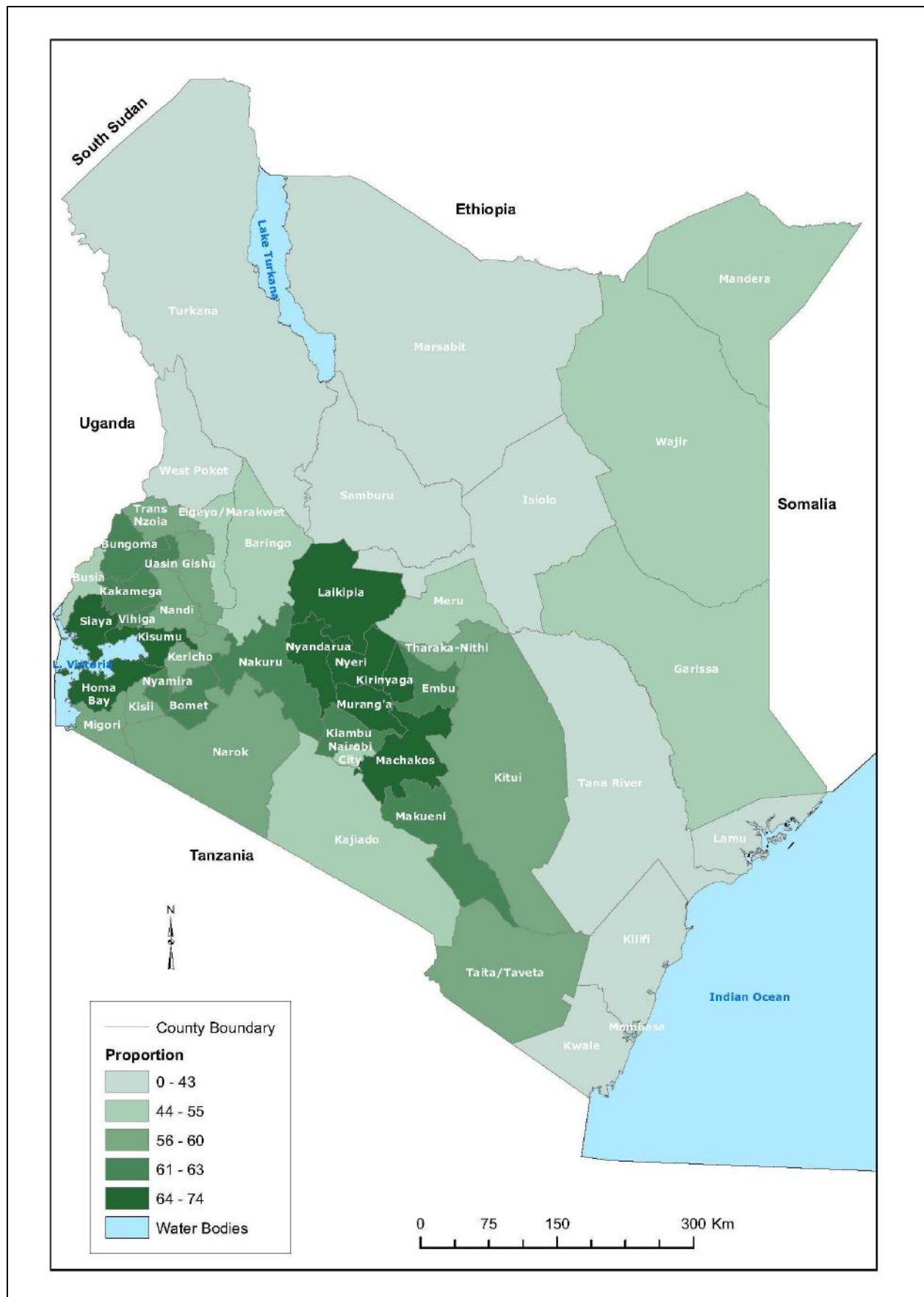


Figure 7.3: Ownership of Stand-Alone radio by County

7.2.2 Ownership of Television set

A television set is an important source of information and a means of expressing national identity. Television is an important medium of mass communication and can be harnessed for communicating a variety of information including education, health, civic education, and many other messages. Television sets are widely available globally and are universally prevalent. Ownership of a television set requires access to electricity to function properly and is an expense for household budgets in getting the equipment/service and/or for any subscription charges. It is also a measure of household wealth/welfare.

The 2019 Census collected information on households that have a functional television. This implies that the television has capabilities of receiving digital signals and is therefore functional. It is worthy to note that since the digital migration in 2015, several households are yet to get new TV sets or signal devices that can enable analog televisions to function. Therefore, households that were yet to acquire digital signals or devices and have analog televisions are counted under analog television.

Therefore, this section is divided into two:

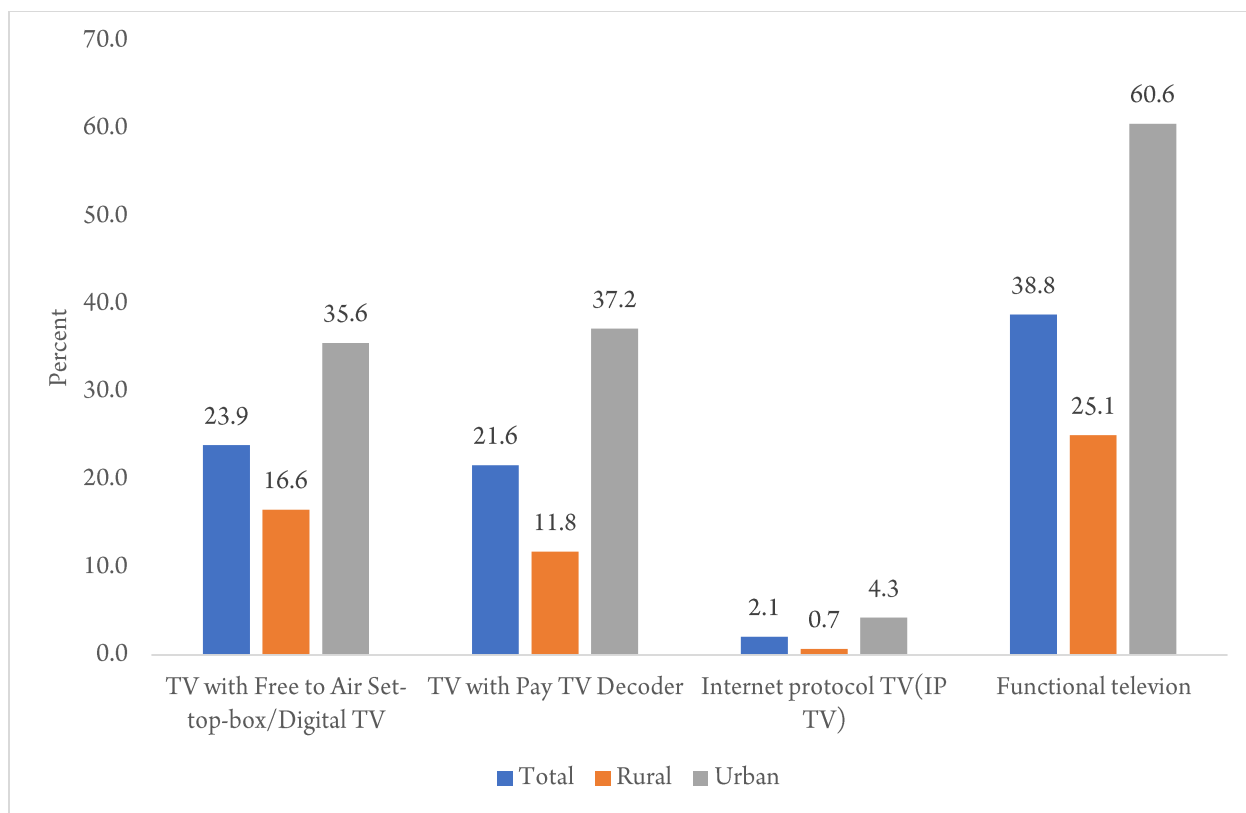
- 1) Households with functional television
- 2) Households with analog television

7.2.2.1 Households with functional television

Functional television entails households who responded to have a free-to-air/ inbuilt digital television, pay TV, and/or Internet protocol television.

Nationally, 38.8 percent own a functional television¹⁴ set as shown in Figure 7.4. There is a wide variation in TV ownership by place of residence with urban areas at 60.6 percent and rural at 25.1 percent. The highest proportion of households own Free to air set-top box television sets at (23.9%) followed by households owning TVs with pay-TV decoders at 21.6 percent. Internet protocol TVs are the least owned type of television sets at 2.1 percent.

¹⁴ A functional television entails either a pay TV, free to air/set top box, or IPTV.



Note: A functional Television entails either or all a pay-tv, free to air/set-top box, and IPTV..

Figure 7.4: Proportion of households owning TVs by type and Residence

Kiambu (68.5 %), Nairobi City (66.8 %), Nyeri (57.3 %), have the highest proportion of households owning TVs as shown in Figure 7.5. Wajir (6.1%), and Turkana (7.0 %), counties have the lowest proportion of households with Television. Figure 7.6 presents ownership of functional television by counties.

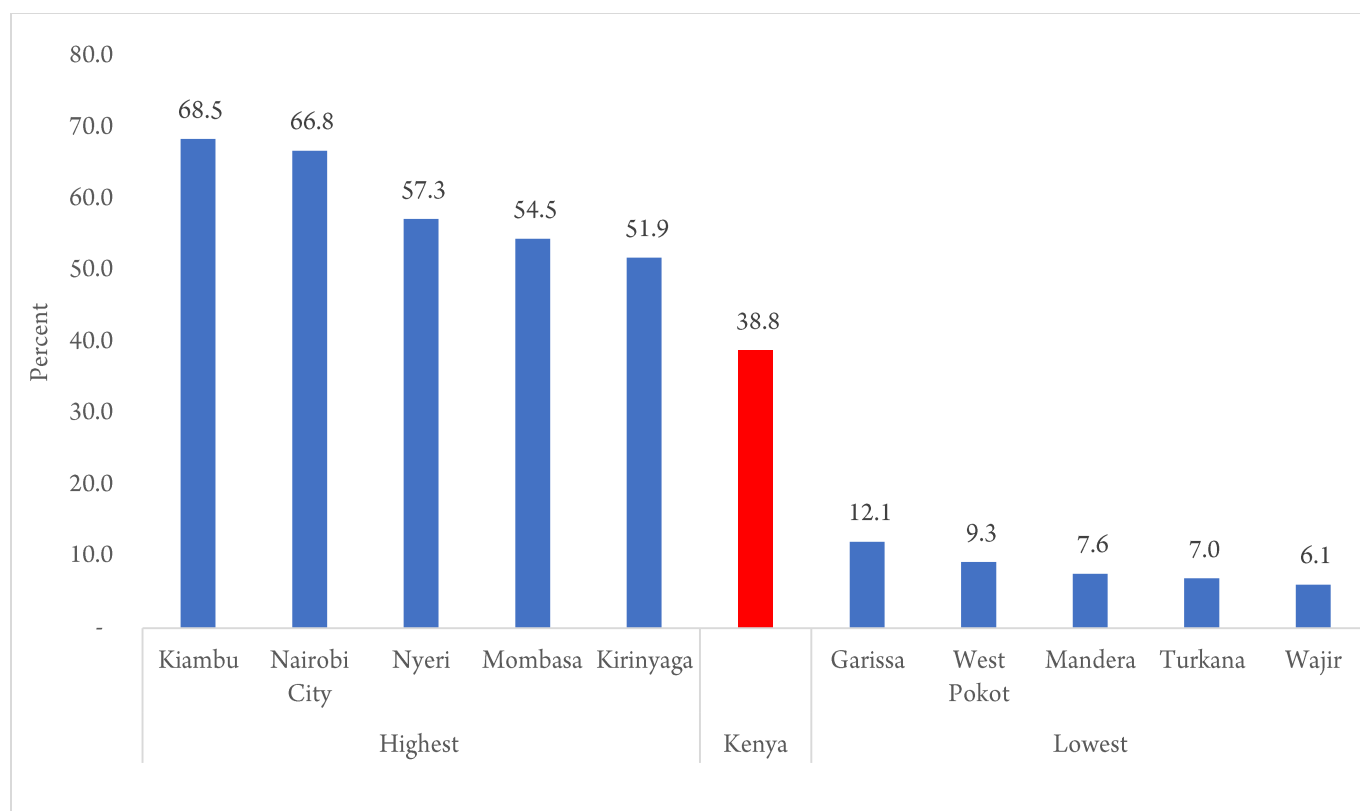


Figure 7.5: Counties with the highest & lowest proportion of households owning a Functional Television

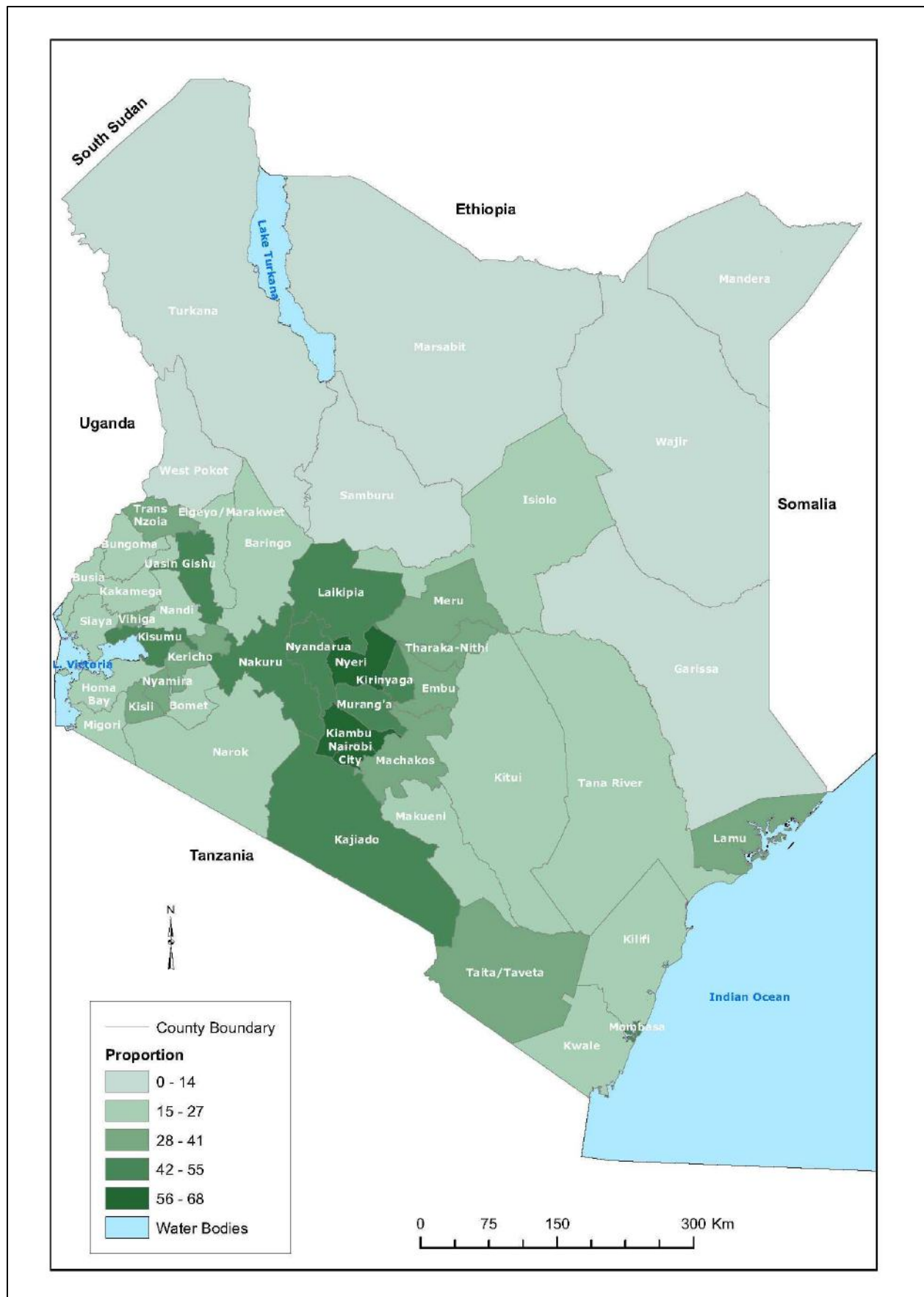


Figure 7.6: Ownership of Functional Television by Counties

7.2.2.2 Households with Analogue Television

Households with analogue televisions are those that have a television but cannot receive digital signals due to the digital migration that was implemented in 2015. These households cannot access information broadcasted on television hence are left out. The 2019 Census shows that households with analogue televisions were 1.9 percent with the majority being from urban areas at 2.0 percent as shown in Figure 7.7. In other words, this is the population of households that are yet to digitally migrate. To note is that this indicator excludes households that may have analogue televisions and the inbuilt digital televisions/ set-top boxes/ IPTV or the pay-tv decoder.

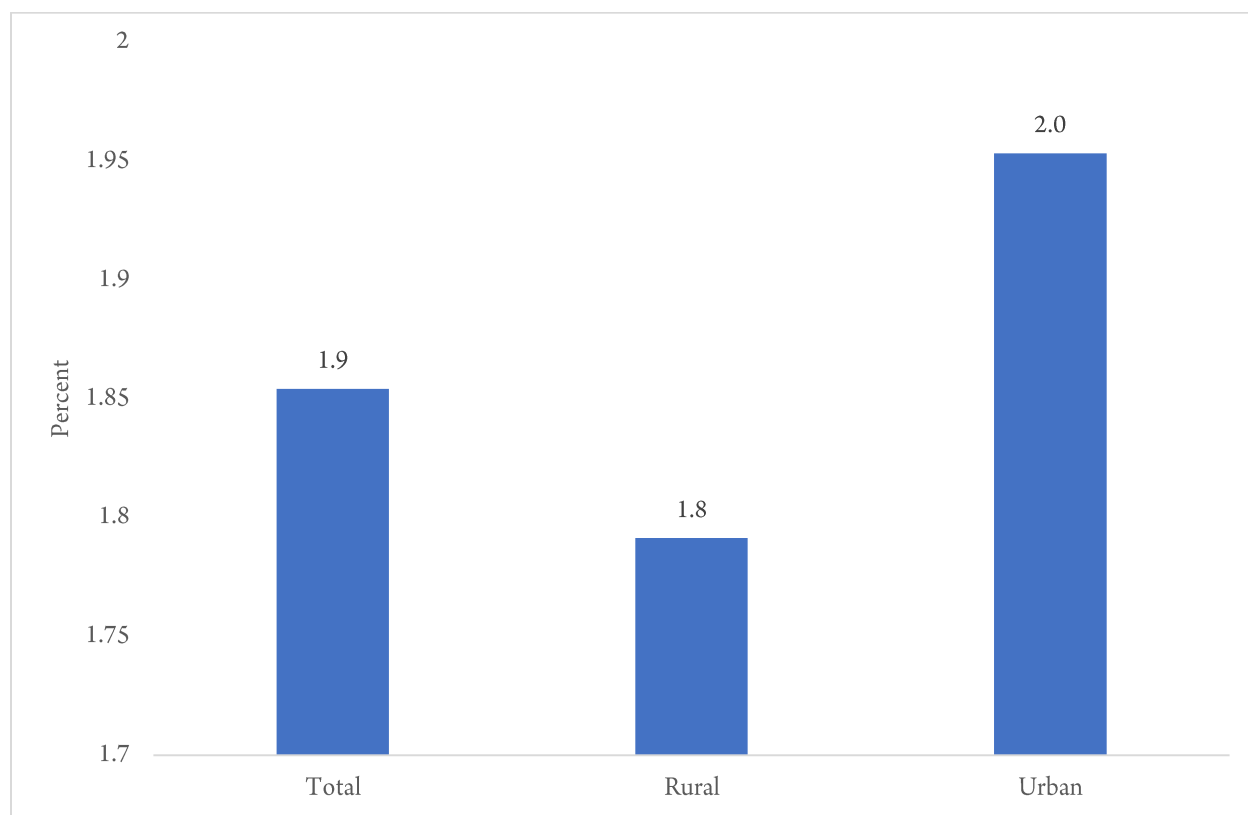


Figure 7.7: Proportion of Households with Analogue Televisions

In terms of analysis by counties, Turkana (0.4 %) had the least households with analog television as shown in Figure 7.8. Mombasa had the highest number of households with analog televisions at 2.7 percent. Figure 7.9 shows households owning analog television by counties.

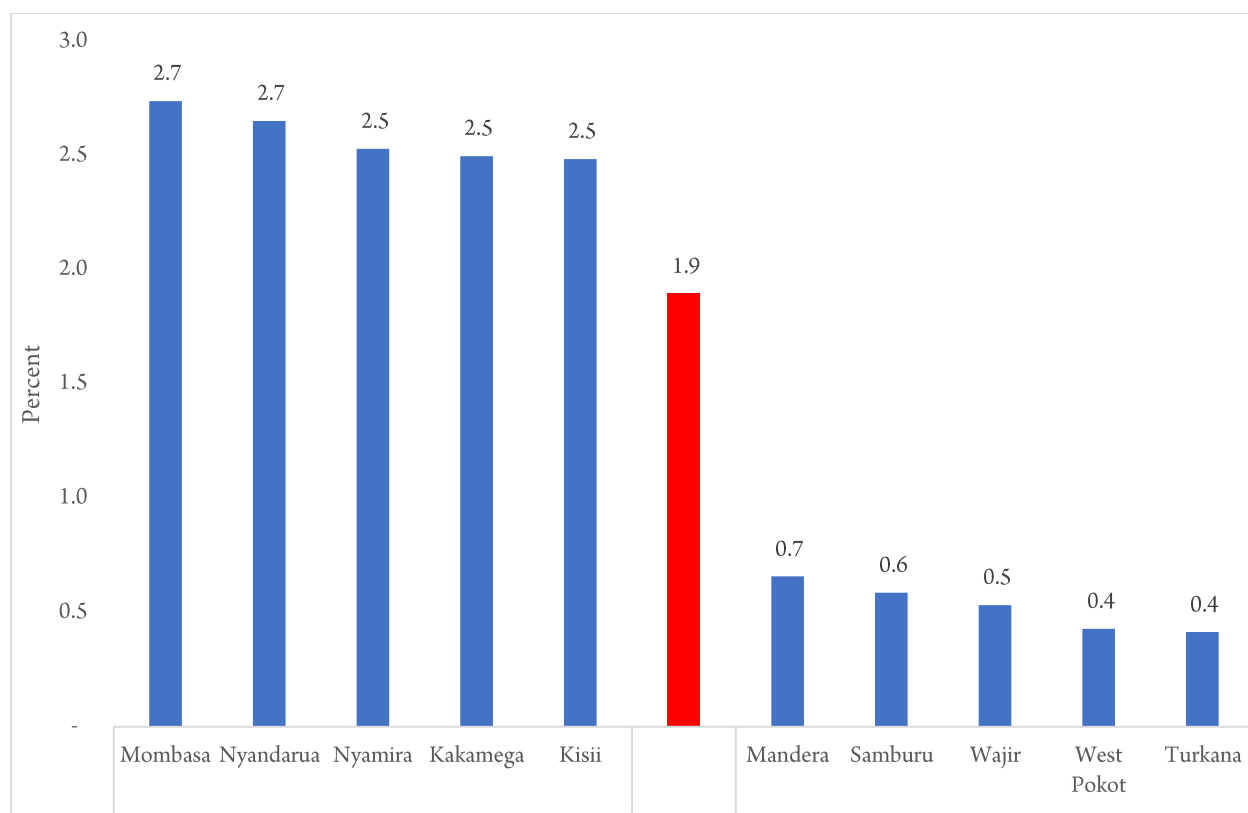


Figure 7.8: Proportion of Counties with Households having Highest & Lowest Number of Analogue Televisions

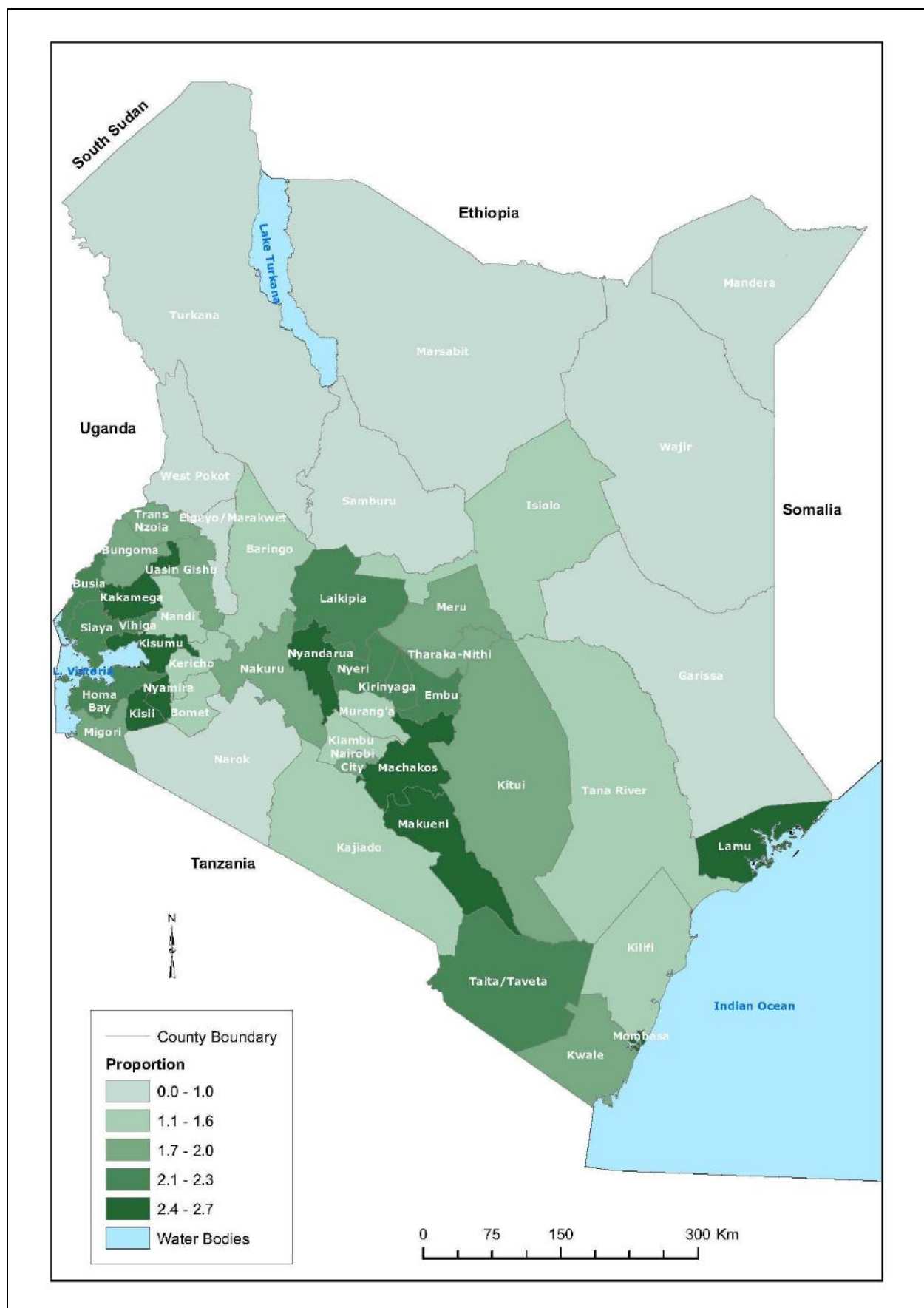


Figure 7.9: Households with Analogue Television by County

7.3 Internet Connection at Home

The availability of Internet connection at home is a key indicator of information society progress because internet access at home allows citizens to benefit from the availability of ICT services and applications in the privacy and security of their homes. It is critical to know whether citizens have internet access at home for the delivery of e-government services, among other services. Information on the type of internet access that households use enables monitoring of the uptake of broadband internet access. It is also important in tracking the transition from fixed Internet access to wireless access. The breakdown by technology allows policymakers to evaluate the speed and the quality of internet connection, as each technology has different characteristics and offers different speeds. Disaggregation of information on internet connection by type also allows for an evaluation of the differences in the potential of these technologies and what type of activities can be carried out over the internet.

Nationally, 18.0 percent of households are connected to the Internet (any type) at home as shown in Figure 7.10. About two in five households (35.4%) in urban areas are connected to the Internet compared with seven in a hundred households in rural areas (6.9%). Connection to the Internet is mainly through mobile/modem at 16.9 percent with 3.5 percent of households accessing it via a fixed connection at home.

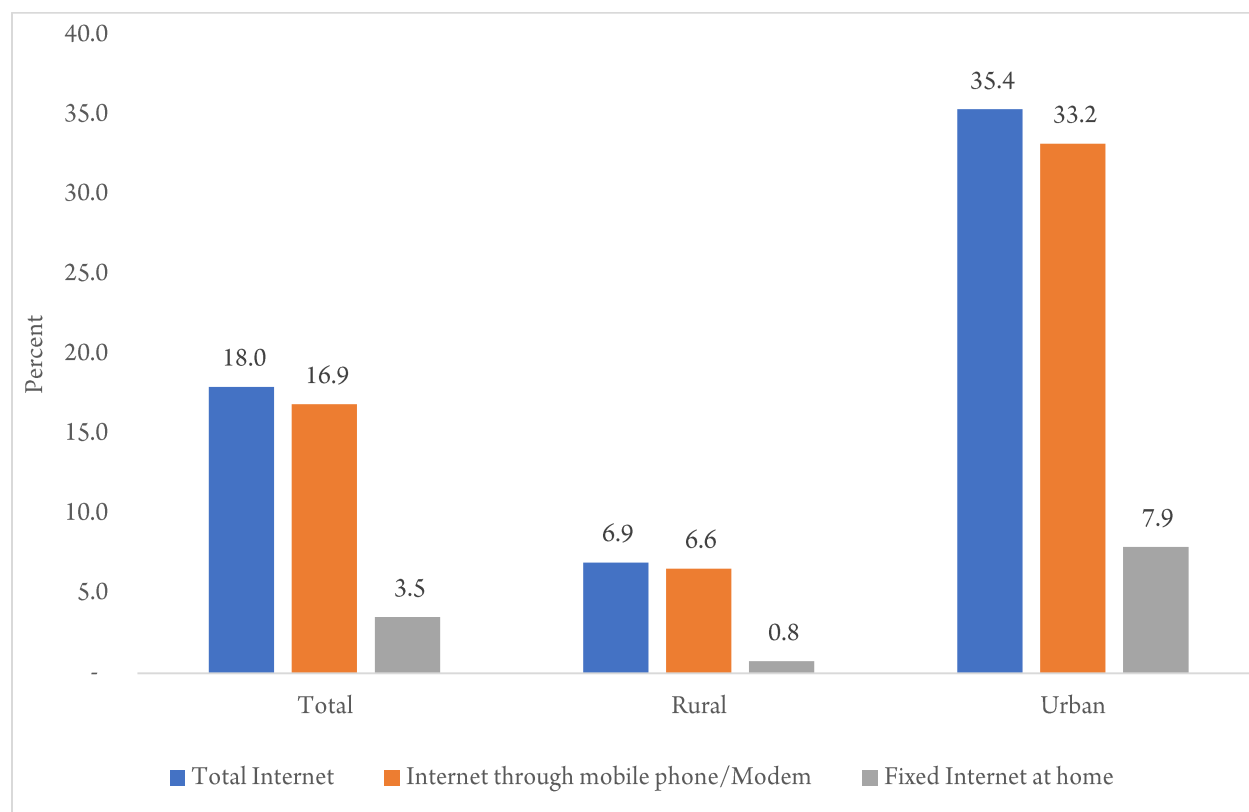


Figure 7.10: Proportion of Households Connected to Internet by type and Area of Residence

Figure 7.11 presents counties with the highest and lowest proportion of households connected to an Internet at home. Overall, the counties with the highest proportion of households with an Internet connection at home are Nairobi City at 42.1 percent followed by Kiambu at 39.2 percent.

Those with the lowest proportion of households with an Internet connection at home are Wajir, Mandera, and West Pokot, at 3.5 percent.

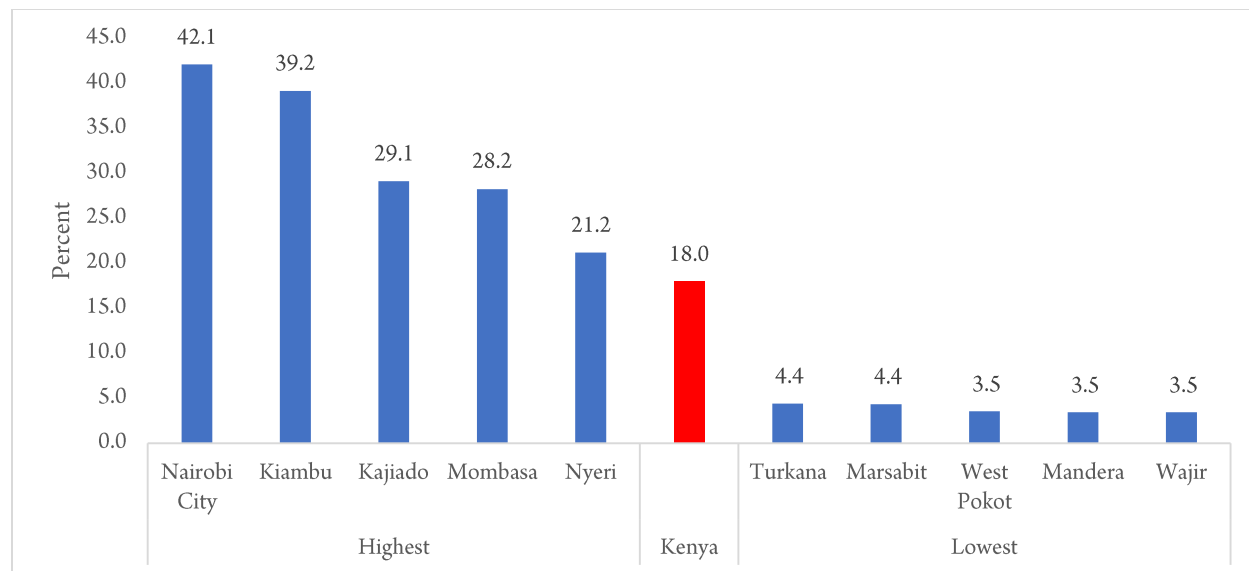


Figure 7.11: Counties with the Highest and Lowest Proportion of Households connected to the Internet at Home

Figure 7.12a shows counties with the highest and lowest proportion of households connected to mobile broadband. Nairobi City had the highest proportion of households with mobile broadband at 38.5 percent while the least was Mandera County at 3.0 percent.

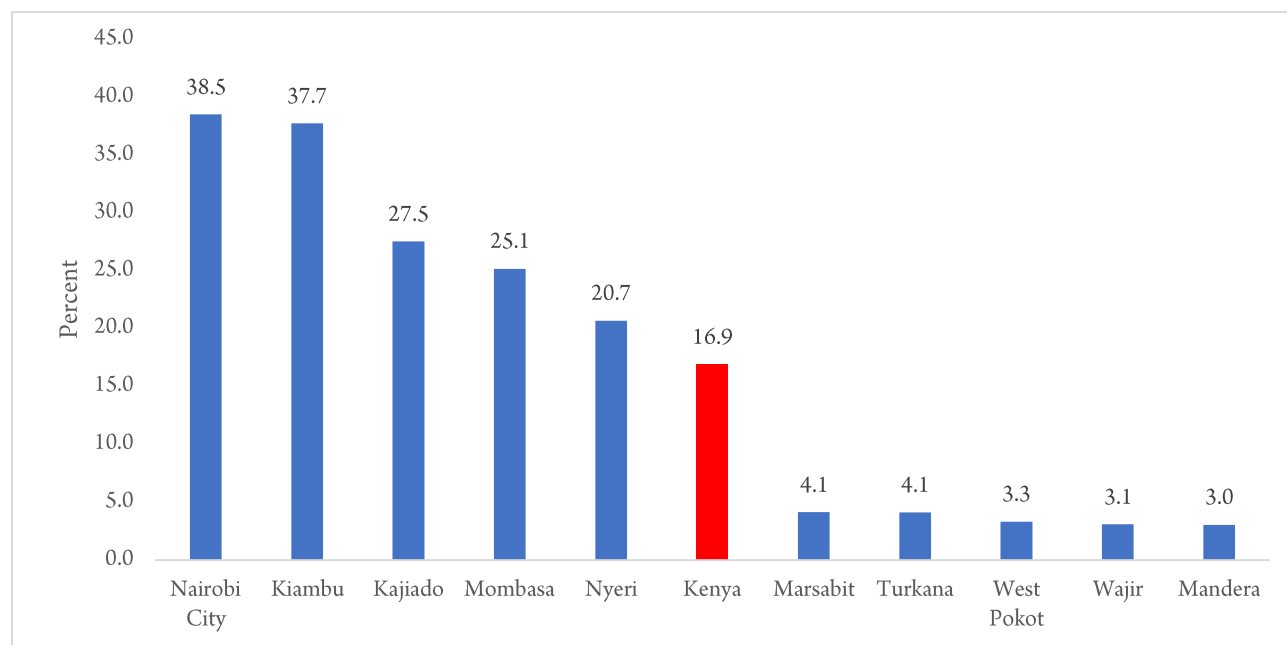


Figure 7.12a: Counties with the Highest and Lowest Proportion of Households connected to Mobile Broadband

Figure 7.12b shows counties with the highest and lowest proportion of households connected to fixed broadband. Nairobi city had the highest proportion of households with fixed broadband at 13.6 percent while the least was West Pokot County at 0.5 percent. Figure 7.13 shows households owning Internet by county across the country.

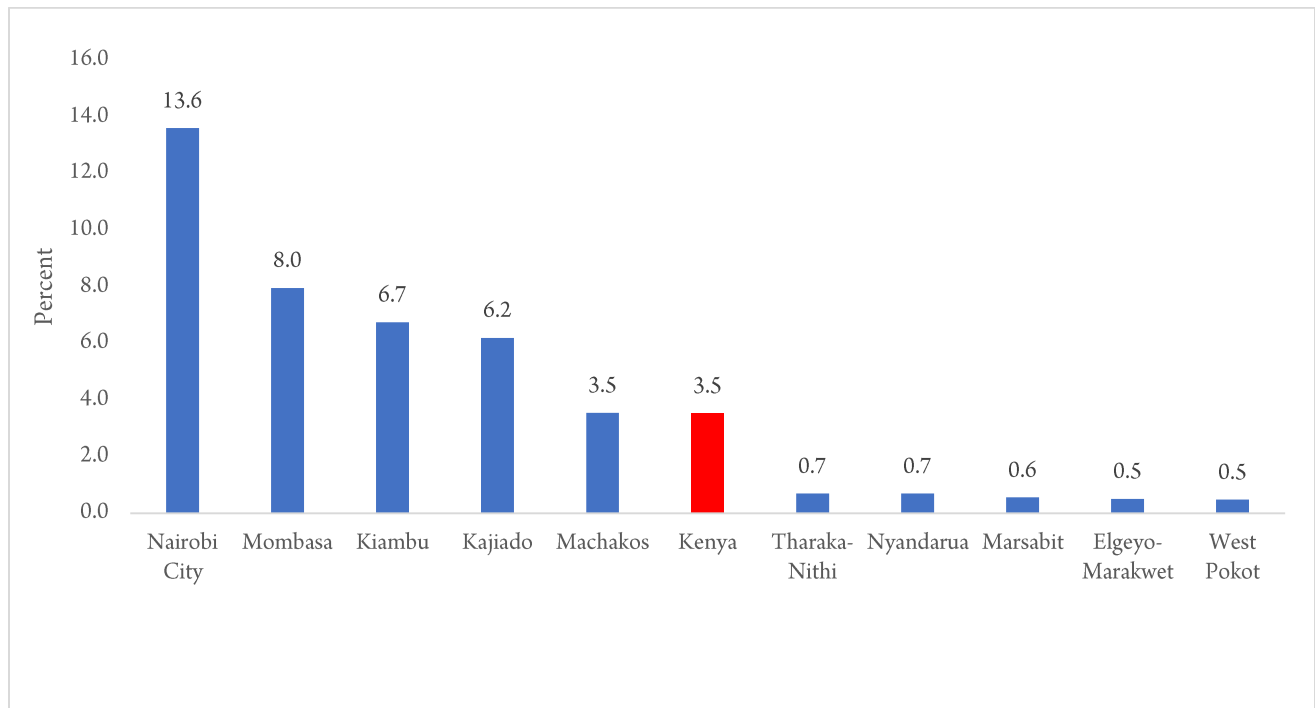
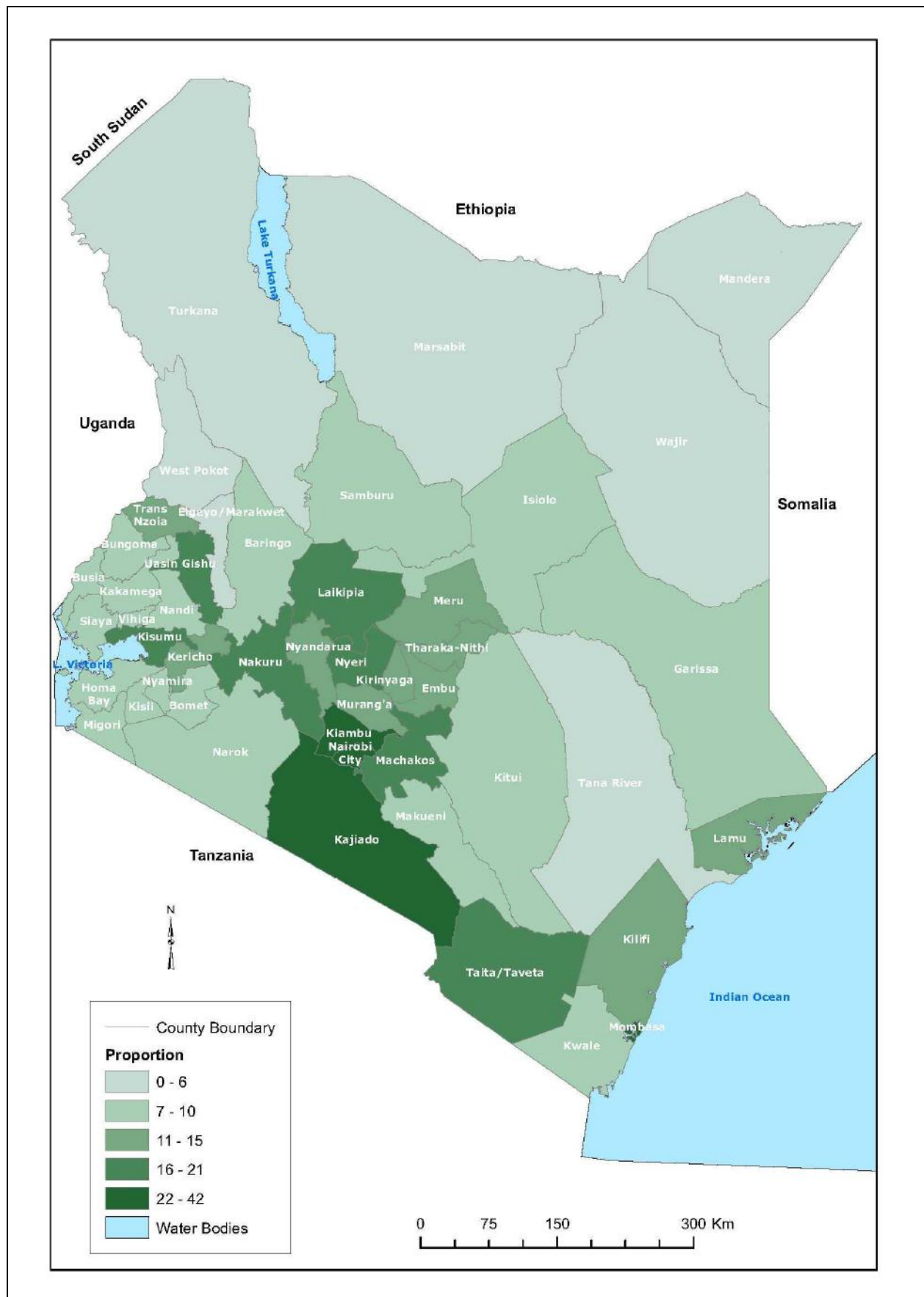


Figure 7.12b: Counties with the Highest and Lowest Proportion of Households connected to Fixed Broadband



7.4 Ownership of computer

The availability of a computer at home allows people to carry out basic computing tasks, store and process information, including word processing. The availability of a computer at home is also important for household members to improve their ICT skills. A computer is also an important device to access and use the Internet, in particular advanced applications and services, which are usually more difficult to use on a smartphone. Information on the proportion of households with a computer is critical in informing various policies.

Nationally, 8.8 percent of households own a computer/laptop as shown in Figure 7.14. About one-fifth (18.0%) of households in urban areas compared to 3.0 percent in rural areas, own a computer.

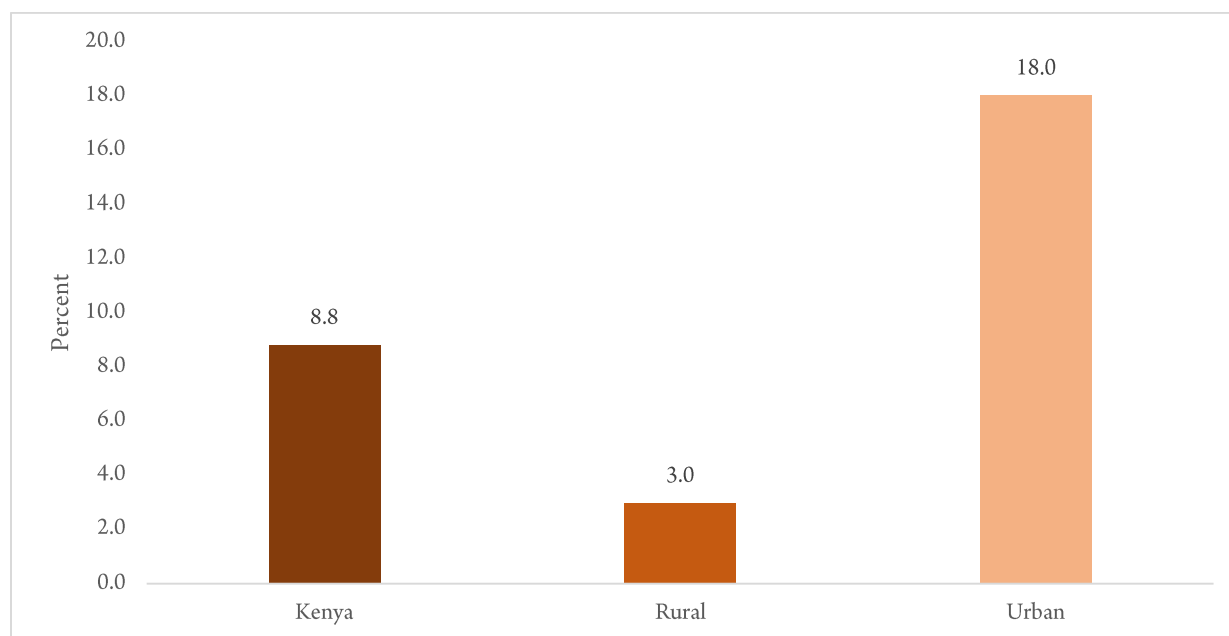


Figure 7.14: Proportion of Households Owning a Computer/Laptop/Tablet

Nairobi City County has the highest proportion of households with computer/laptop/tablets at home at 22.7 percent followed by Kiambu at 19.6 percent as shown in Figure 7.15. Wajir and West Pokot were the lowest proportion of households to own a computer at 1.4 percent. Figure 7.16 presents the distribution of households owning a computer by counties in the country.

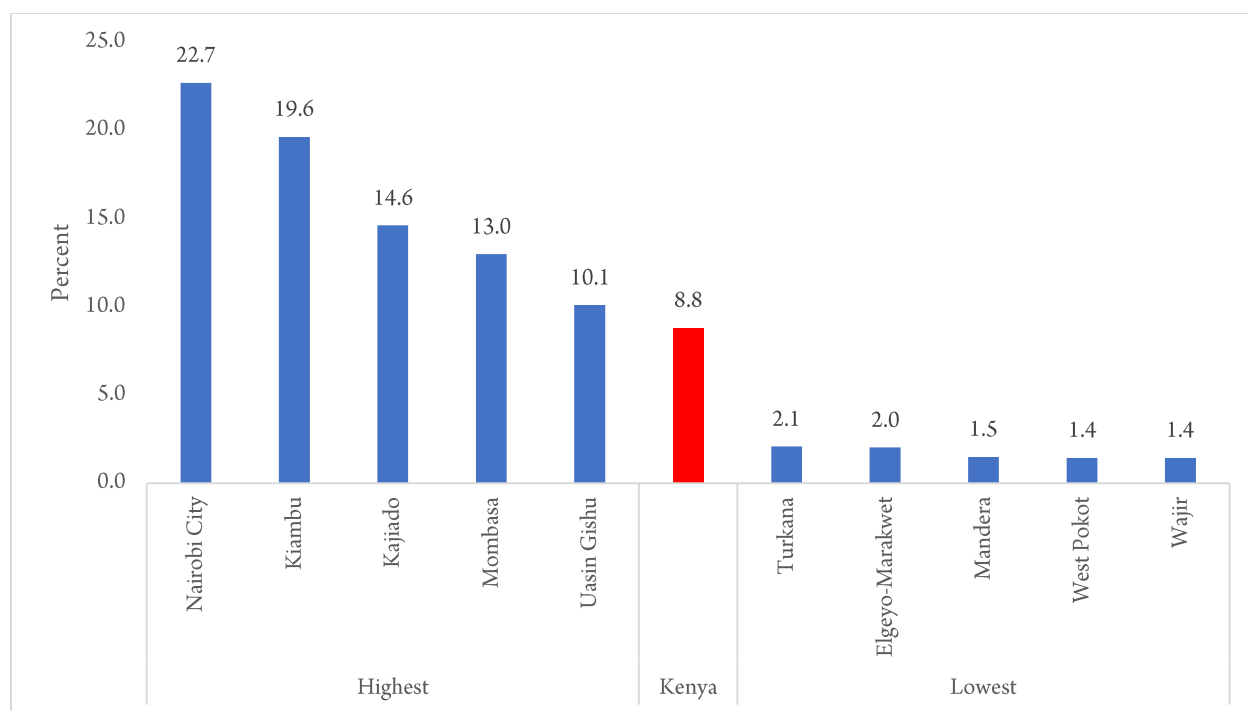


Figure 7.15: Counties with the Highest and Lowest Proportion of Households Owning a Computer/Laptop/Tablet

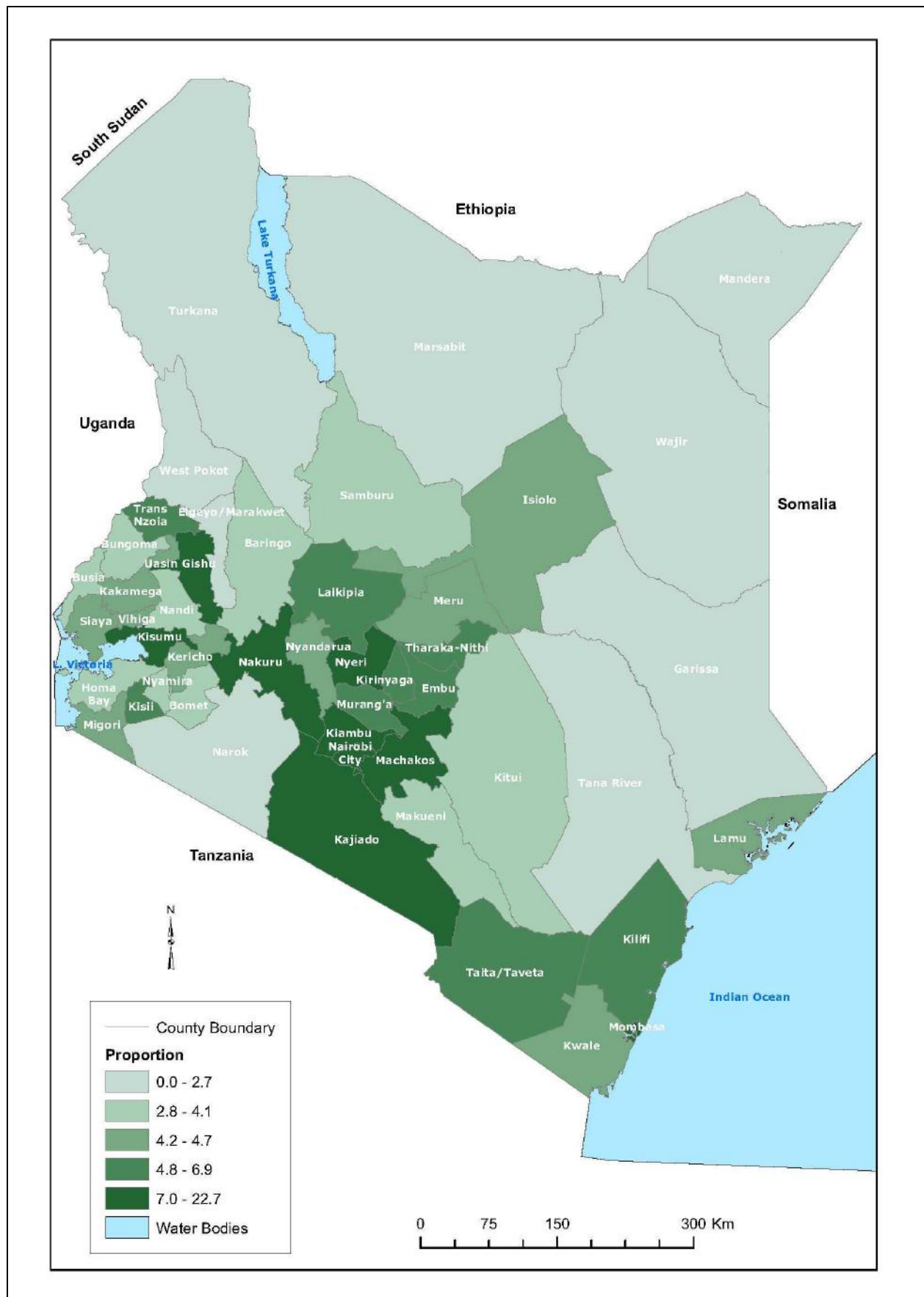


Figure 7.16: Computer Ownership by County

7.5 Ownership of ICT Assets in Relation to Agriculture

Agriculture is increasingly becoming knowledge-intensive with millions of small-scale farmers around the world being confronted by constraints such as poor access to markets and financial services, low levels of human and physical capital, poor access to education and weak information flows. The information needs of farmers in both developing and developed countries will only increase as they have to make more and more complex decisions on how to use their land, what crops to produce and how in which markets to buy inputs and sell their products. The large adoption and integration of ICTs are expected to reduce information and transaction costs, improve service delivery, create new jobs, generate new revenue streams, and save resources.

In agriculture and food sectors across the world, suppliers of farm inputs and large machinery manufacturers provide a number of services to farmers through ICTs, including extension advice. Downstream, supermarkets and agricultural product buyers also engage in the food value chain through ICTs, where the technology is also used by farmers' cooperatives, international organizations, civil society, and governments to effectively provide information on many aspects of farming, including regulation. ICTs have transformed how businesses, people, and governments work. They reduce transaction costs and facilitate communication. ICTs, and specifically mobile phones, increase access to both information and capacity-building opportunities for rural populations in developing countries. Farmers can achieve higher crop and livestock yields, as they gain access to timely and better-quality information on products and inputs, as well as environmental and market conditions through ICTs.

7.5.1 Household ownership of ICT equipment and crop farming

ICTs are increasingly finding use in agriculture throughout the commodity value chain. Typically, farmers are faced with information gaps at all stages of the crop cycle; on inputs, planting, weather, harvesting, storage, transportation, and marketing. Farmers can apply ICT to increase farm productivity, by matching cropping practices to climatic trends, using inputs and resources optimally, and ensuring good farming practices through improved soil, nutrient, and land management. ICT can also be used for weather forecasting and as a tool for the early warning system.

Nationally, about two-thirds (64.3%) of households engaged in crop farming own a stand-alone radio, while three in ten households own a TV as shown in Figure 7.17. Household ownership of a computer is fairly low at 4.1 percent. Only 8.6 percent of households engaged in crop farming are connected to the Internet at home. Wide variations in ownership of ICT equipment between rural and urban households engaged in crop farming is observed for Internet, television, and computer, with a higher proportion of households in urban compared to rural areas reporting ownership.

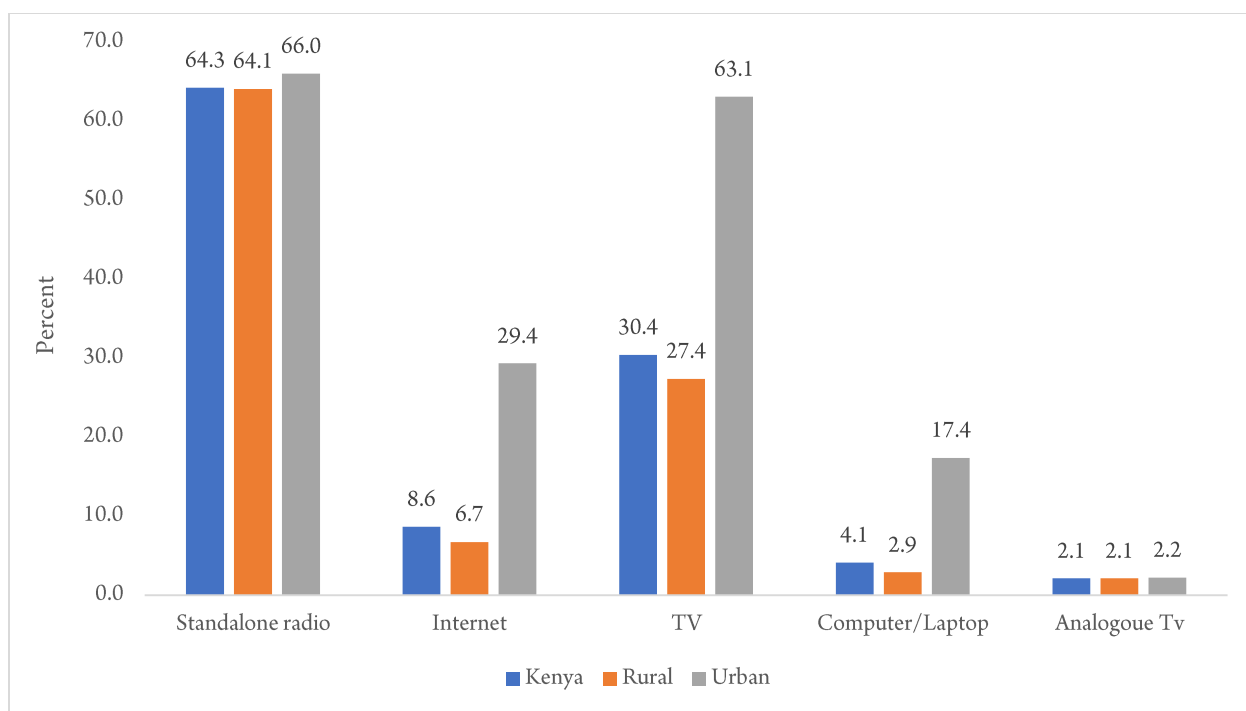


Figure 7.17: Proportion of Households engaged in Crop Farming by type of ICT equipment owned and Area of Residence

7.5.2 Household Ownership of ICT equipment and Livestock Farming

The use of ICTs in livestock farming is gaining importance. Radio frequency identification system is applied to prevent and treat cattle diseases. The mobile phone can also be an effective tool for strengthening livestock farming extension services. Farmers organizations that use ICTs function more efficiently to attract and retain a wider membership, generate more funds, and provide better services to their members. The benefits of ICTs to such cooperatives include improved connections to members, better accounting and administration, and a stronger collective voice. Lack of ownership of ICTs among livestock farmers limits them from getting real-time information and other benefits.

About 64.7 percent of households engaged in livestock farming own a stand-alone radio while nearly a third (31.3%) of them own a TV as shown in Figure 7.18. Ownership of Internet and computer by households practicing livestock farming is relatively low at 9.0 and 4.3 percent, respectively. Rural-urban differentials are notably high for all other ICTs, apart from the ownership of radio and analog television among households engaged in livestock farming.

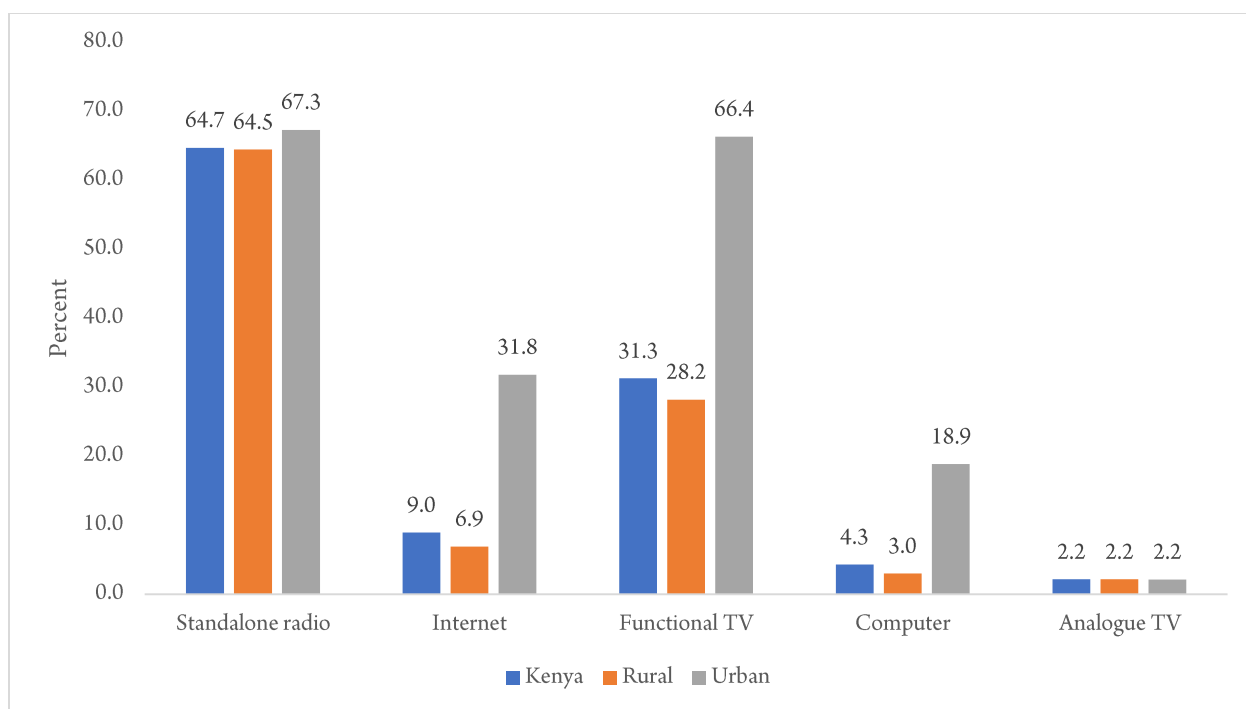


Figure 7.18: Proportion of Households Engaged in Livestock Farming by type of ICT equipment owned and Area of Residence

7.5.3 Household Ownership of ICT equipment and Aquaculture Farming

In aquaculture, ICTs have been applied for various functions, ranging from pond management to monitoring fish feeding, growth and water quality and in fish marketing. ICTs can be used to report on fish market and price trends. ICT applications can make a significant contribution to meet future global food needs by collecting and sharing timely and accurate information on weather, inputs, markets, and prices; feeding information into research and development initiatives; disseminating knowledge to farmers; connecting producers and consumers, and through many other avenues.

Figure 7.19 presents the proportion of households engaged in aquaculture by type of ICT equipment owned. Stand-alone radio is the most owned ICT equipment reported by nearly 70 percent of households engaged in aquaculture followed by TV at 42.6 percent. About 1 in 5 households (18.6%) are connected to an Internet at home. There is a wide variation in the ownership of ICT equipment apart from the stand-alone radio and analog television between rural and urban households practicing aquaculture.

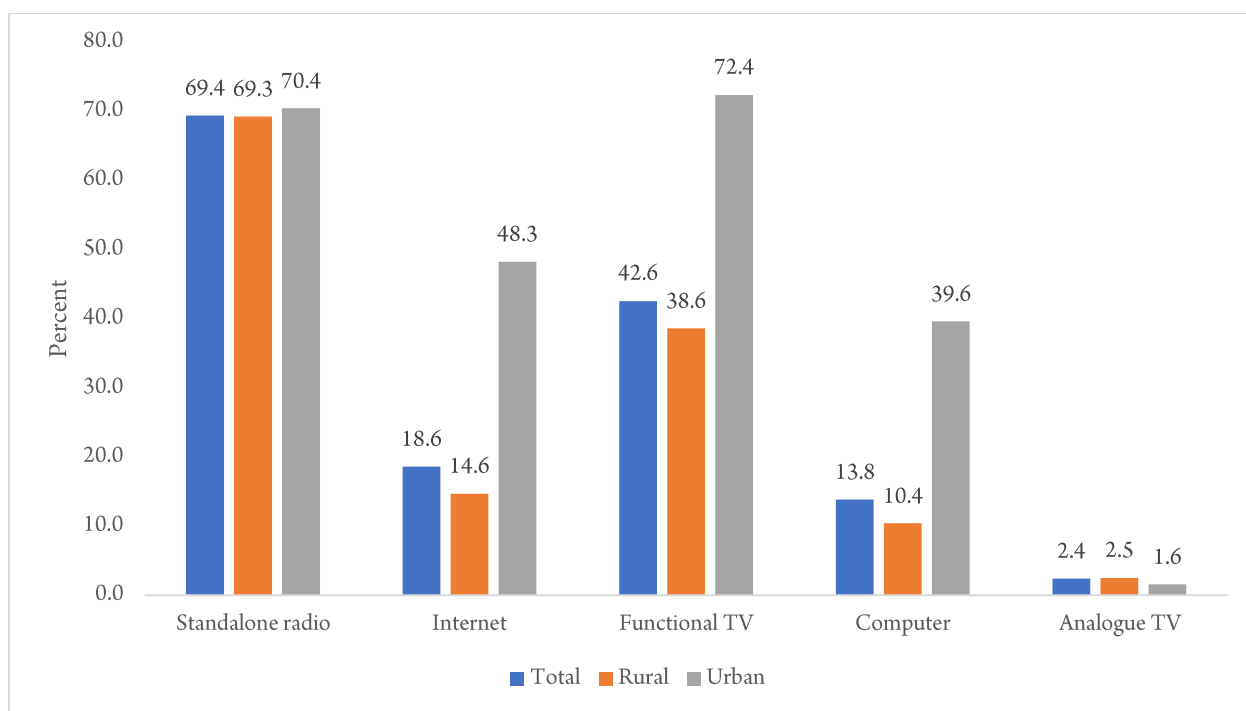


Figure 7.19: Proportion of Households engaged in Aquaculture by type of ICT equipment owned and Area of Residence

7.5.4 Household Ownership of ICT equipment and Fishing

Digital and other electronic technologies are transforming economies, societies, and people's lives. In fisheries, new ICTs are being used across the sector, from resource assessment to processing and commercialization. Some of the ICTs are specialist applications such as sonar for locating fish, while others are general purpose applications such as Global Positioning Systems (GPS) used for navigation and location finding, mobile phones for trading, information exchange and emergencies, radio programming with fishing communities and Web-based information and networking resources. At a global level, there has been a wide range of applications of ICT in fisheries, right from fish harvesting and throughout the fish value chain and adopting various levels of technological sophistication.

Stand-alone radio is the dominant ICT equipment owned by households engaged in fishing at 57.4 percent followed by TV at 24.8 percent as shown in Figure 7.20. About one in ten households (8.9%) engaged in fishing are connected to the Internet while 4.0 percent have a computer at home. Only 2.2 percent of households are unconnected to the digital signals, therefore, having the analog television. A significant variation is noted for ICT equipment ownership between rural and urban households engaged in fishing, with a higher proportion of households in urban areas owning TV and computer, while rural households are doing better in stand-alone radio ownership.

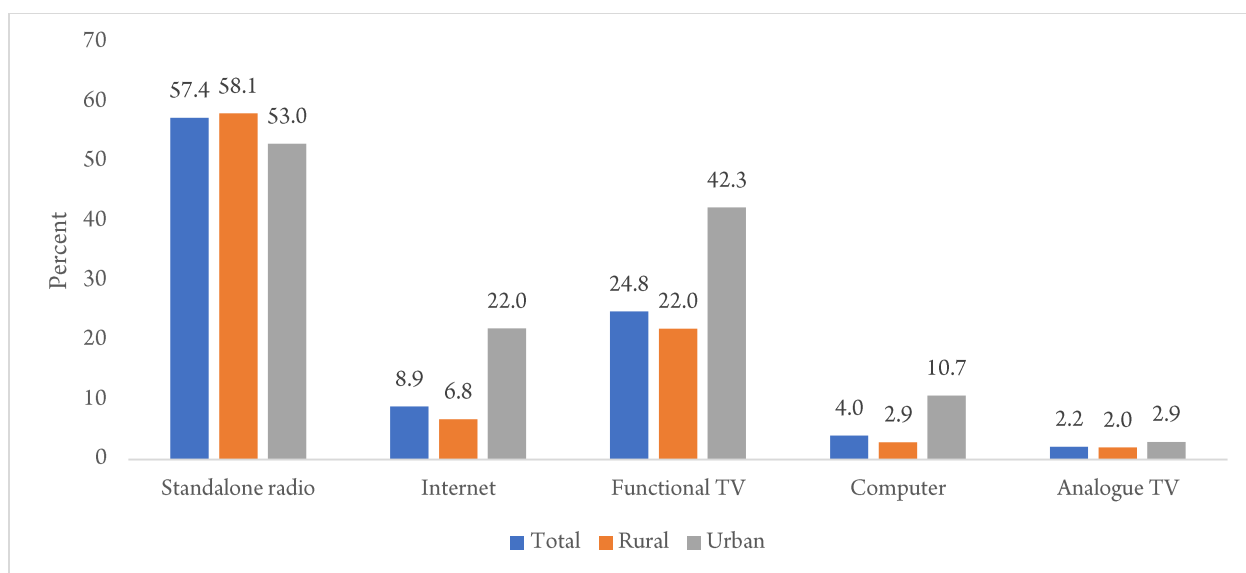


Figure 7.20: Proportion of Households engaged in Fishing by type of ICT equipment owned and Area of Residence

7.6 Household Ownership of ICT equipment in relation to Housing Tenure-ship

This section presents the findings on household ownership of ICT equipment in relation to housing tenure ship. This gives detailed information on households owning ICTs and could give more insights to policymakers regarding the uptake of ICTs. For instance, ICT policymakers can come up with incentives for those constructing houses to consider connecting these homes with home fiber. This cross-referencing also gives more details on the digital divide from a household perspective.

7.6.1 Ownership of Stand-alone Radio by Tenure of Main Dwelling unit

Figure 7.21 presents the proportion of households owning a stand-alone radio by the tenure of main dwelling unit. Nationally, the highest proportion of households owning a stand-alone radio, live in constructed dwelling units at 59.9 percent, followed by those living in purchased dwelling units at 57.7 percent. About 55.1 percent of households living in inherited dwelling units own a stand-alone radio.

In rural areas, the highest proportion of households that own a stand-alone radio live in constructed dwelling units followed by those living in purchased dwelling units at 56.1 percent. In urban areas, a similar trend is observed with the highest proportion of households owning a stand-alone radio living in constructed dwelling units followed by those living in purchased dwellings at 59.3 percent. Households that rented houses were the least to own a stand-alone radio across all categories.

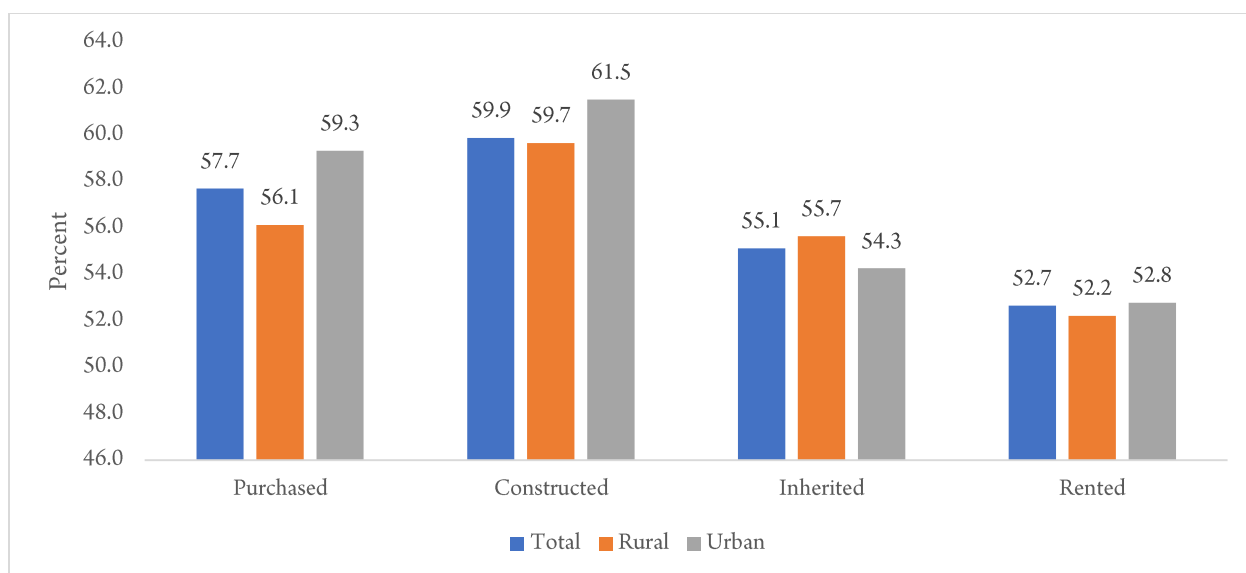


Figure 7.21: Proportion of Households owning Stand-Alone Radio by Tenure of Main Dwelling unit

7.6.2 Ownership of Functional Television by Tenure of Main Dwelling unit

Figure 7.22 presents the proportion of households owning a TV by the tenure of the main dwelling unit. Nationally, slightly above half of the households living in rented households (52.9%) own a TV with the least being those who have constructed their houses, at 29.1 percent. Television ownership in rural areas is low regardless of tenure. In urban areas, the highest proportion of households owning a TV occupy purchased dwelling units (76.4 %), with the least being those who have inherited and rented at 59.4 percent.

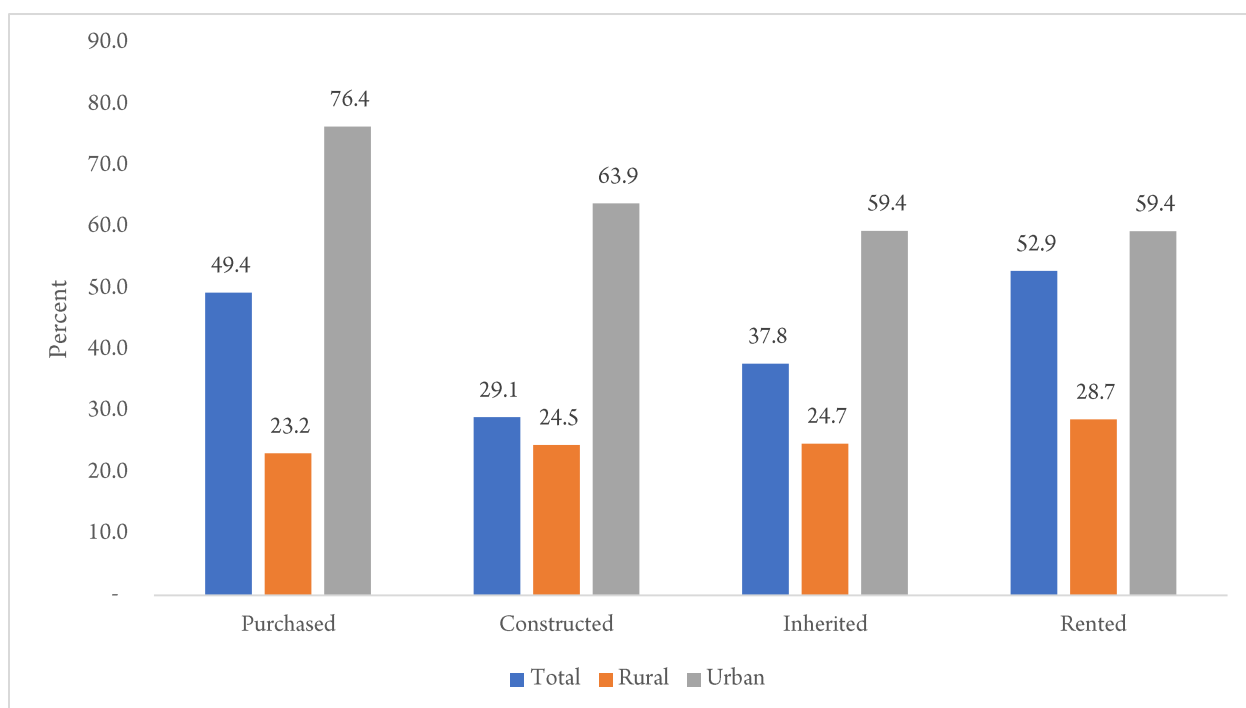


Figure 7.22: Proportion of households owning TV by tenure of dwelling unit

7.6.3 Ownership of Analogue Television by Tenure of Main Dwelling unit

Households that have analog television indicating they have no access to digital signals hence unable to view television, by type of tenure ship is shown in Figure 7.23. The highest proportion of households who owned an analog television were those that inherited houses at 2.1 percent while the least were households who purchased the houses at 1.5 percent.

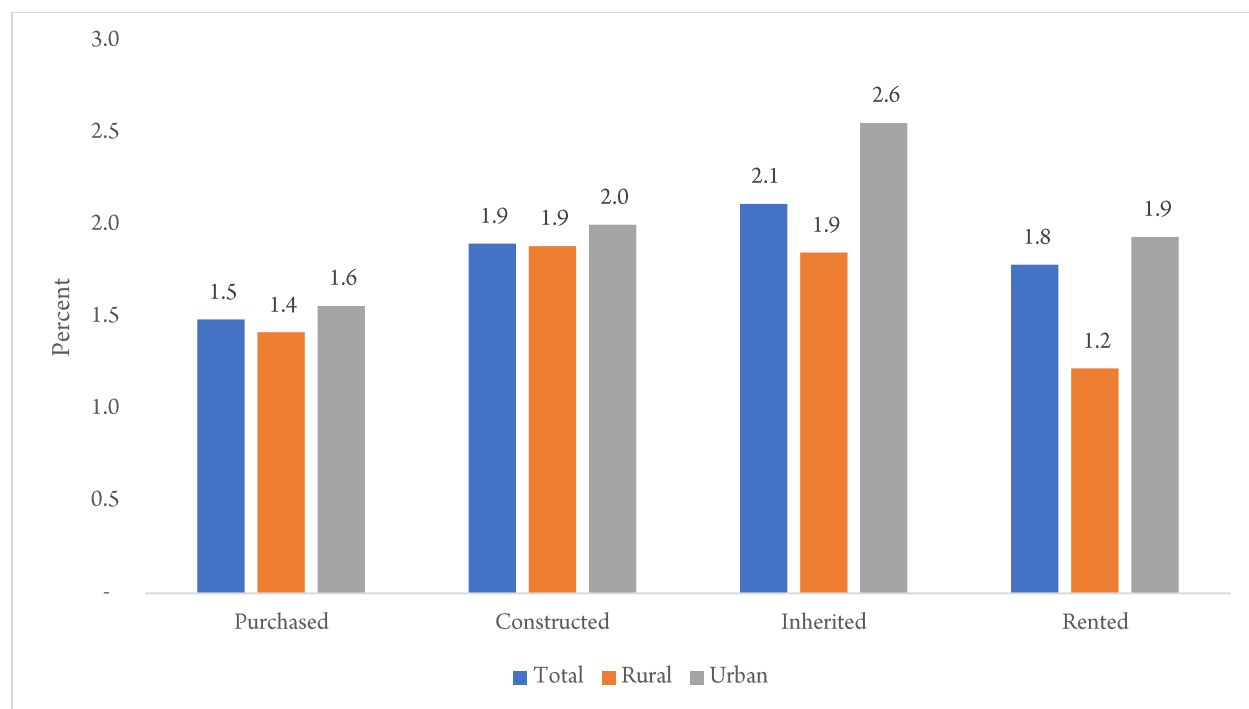


Figure 7.23: Proportion of households analog TV by the tenure of dwelling unit

7.6.4 Internet Connection by Tenure of Main Dwelling unit

Figure 7.24 presents the proportion of households connected to the Internet at home by the tenure of the dwelling unit. Overall, 31.6 percent of households living in rented dwelling units are connected to the Internet at home, with the least being constructed houses at 8.5 percent. In rural areas, the highest proportion of households with an Internet connection at home live in rented dwelling units at 13.4 percent. In addition, urban areas with the highest proportion of households with an Internet connection at home are those living in purchased dwelling units at 53.5 percent.

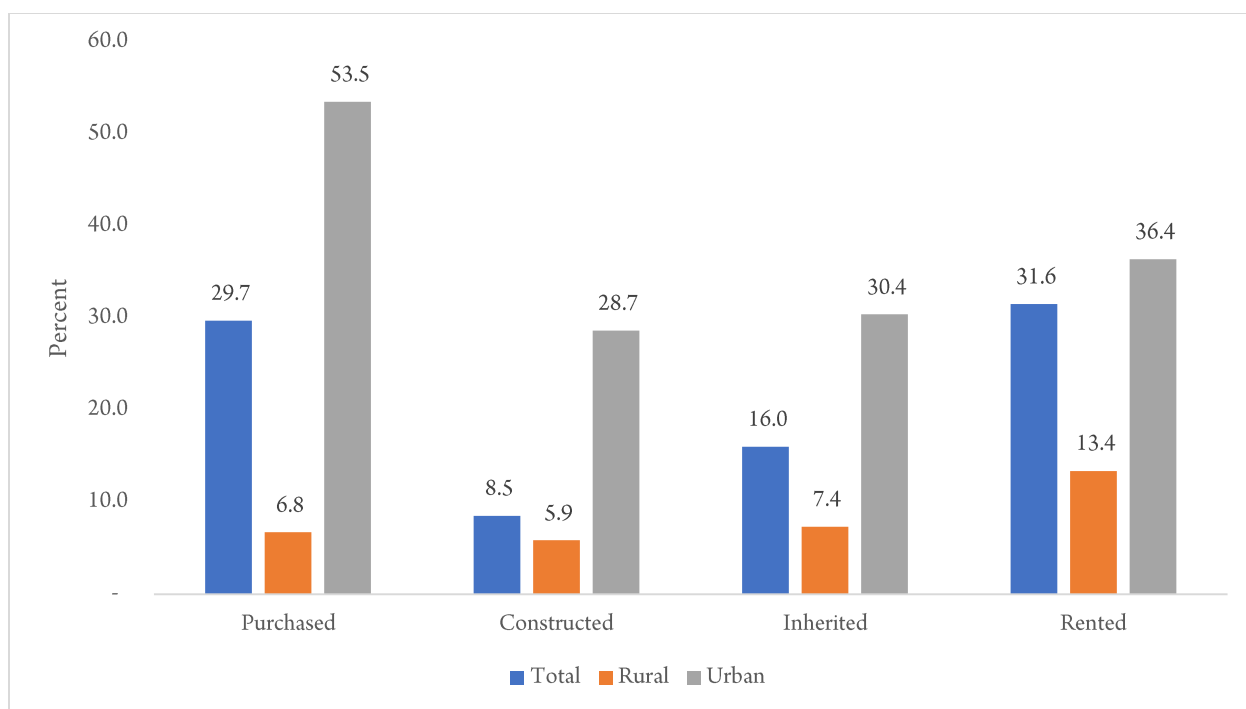


Figure 7.24: Proportion of Households Connected to the Internet at home by Tenure of Dwelling unit

Figure 7.24a shows households with mobile broadband (modem or through a mobile phone) by type of tenure. Analysis shows that majority of those in urban areas and purchased their dwelling unit owns a mobile broadband, while the least are those who constructed the dwelling unit at 26.9 percent. Further, households that rented their dwelling unit in rural areas had the highest proportion of having mobile broadband.

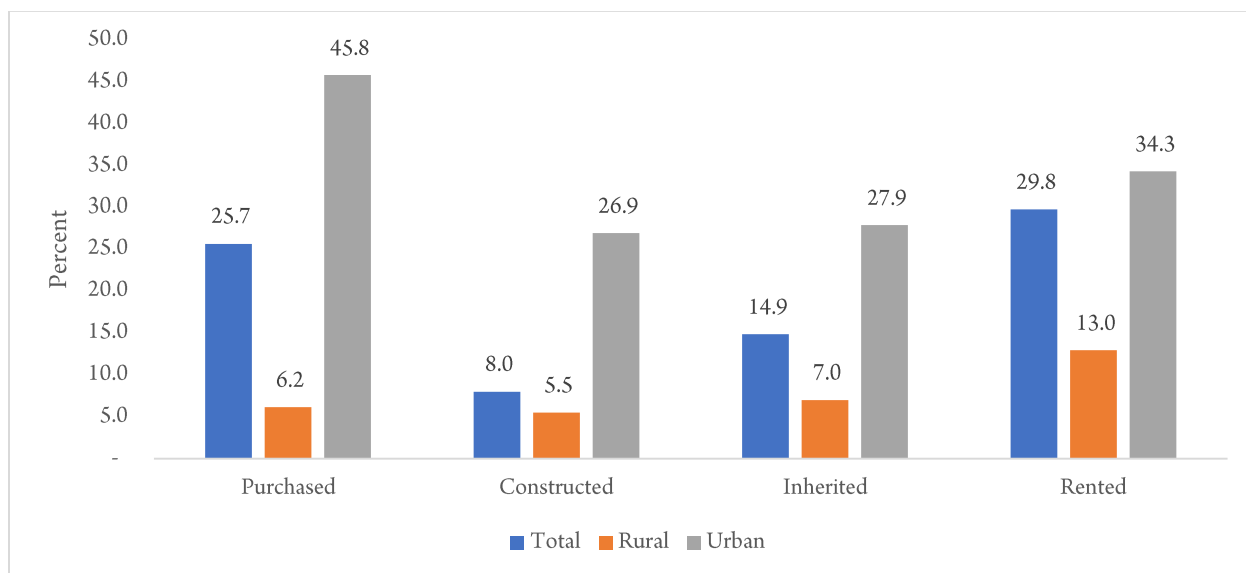


Figure 7.24a: Proportion of Households Connected to Mobile Broadband at Home by Tenure of Dwelling unit

Figure 7.24b shows households with fixed broadband by type of tenure. Analysis shows that majority of those in urban areas and purchased their dwelling unit own fixed broadband at 33.7 percent, while the least are those who constructed the dwelling unit at 6.2 percent. Similarly, households that purchased their dwelling unit in rural areas had the highest proportion at 1.6 percent.

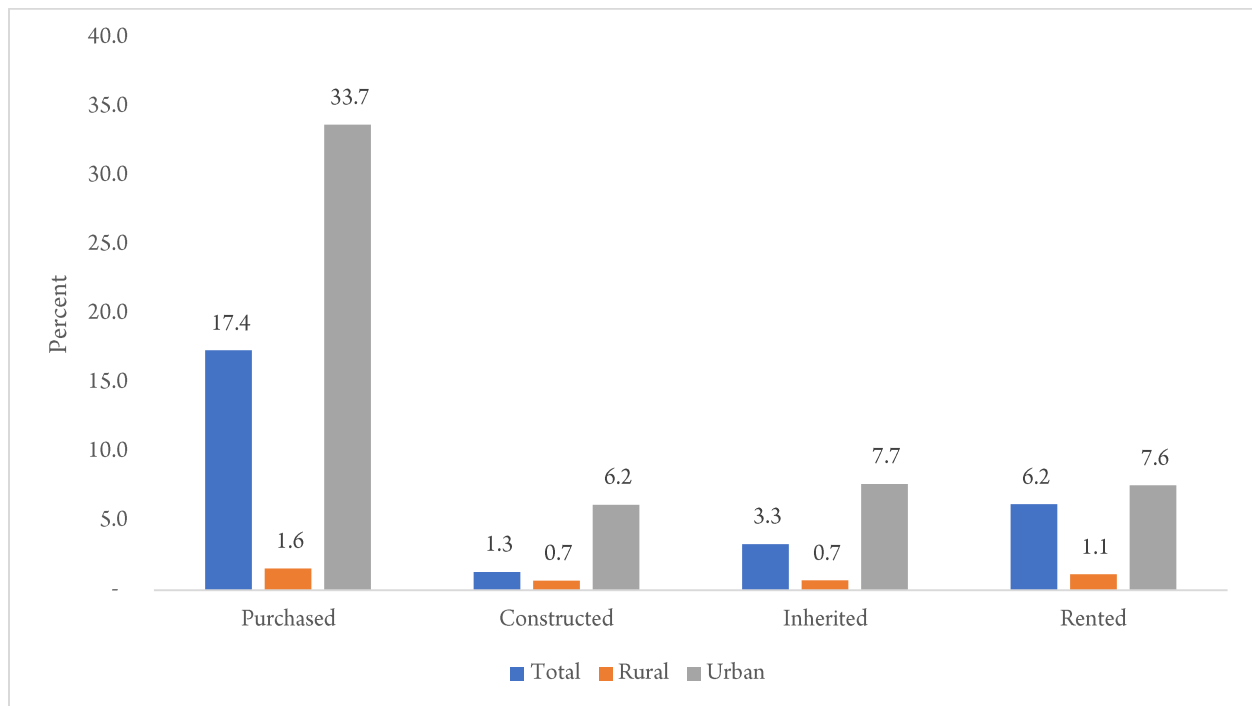


Figure 7.24b: Proportion of households connected to Fixed broadband at home by tenure of dwelling unit

7.6.5 Ownership of Computer/Laptop by Tenure of Main Dwelling unit

Figure 7.25 presents the proportion of households owning a computer/laptop by the tenure of the main dwelling unit. Overall, the highest proportion of households owning a computer/laptop are those living in purchased dwelling units at 23.2 percent followed by those who rented at 14.7 percent. In urban areas, the highest proportion of households owning a computer/laptop live in purchased dwelling units at 43.3 percent followed by those in constructed dwelling units at 18.6 percent. In rural areas, the highest proportion of households owning a computer/laptop are those living in rented dwelling units at 5.3 percent.

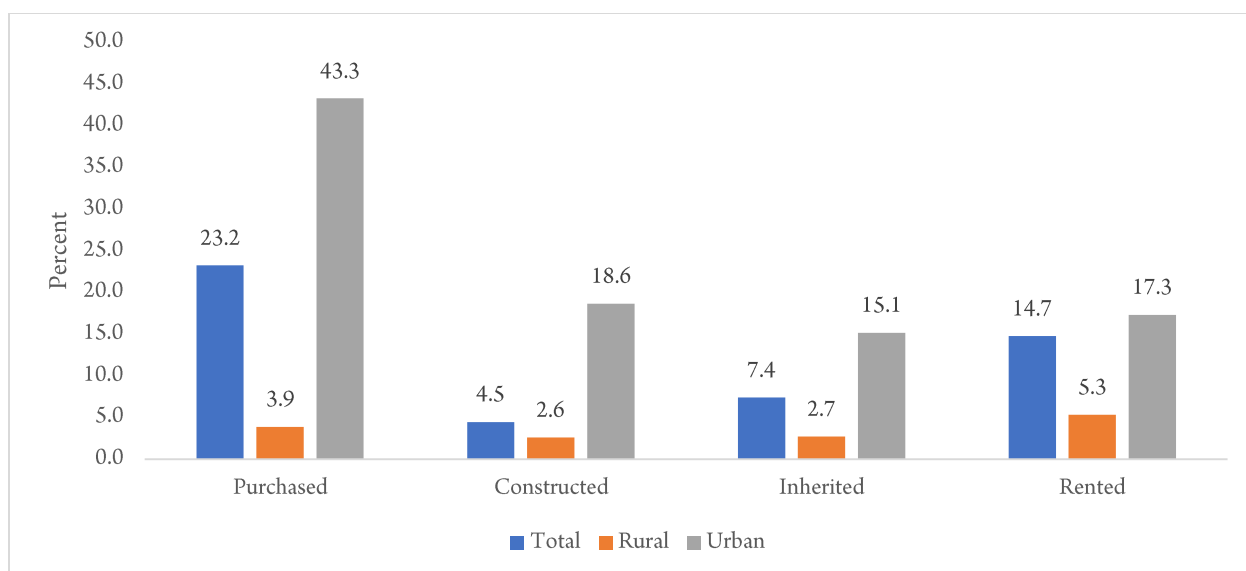


Figure 7.25: Proportion of Households owning a Computer/Laptop/Tablet by Tenure of Main Dwelling unit

7.7 Household ownership of ICT equipment and main type of Lighting

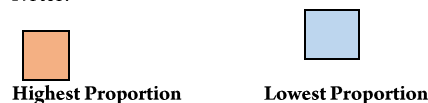
Table 7.1 presents the proportion of households by ICT equipment owned and the main type of lighting. Availability of electricity in a household influences ownership of ICTs and without it, the majority of households may deter from owning them. Clean energy is also advocated for and therefore, it is imperative to measure its use by household's vis a vis ownership of ICTs.

The highest proportion of households owning a stand-alone radio use solar as the main source of lighting (69.6 %) with the lowest using wood at 23.6 percent. About 31.6 percent of households connected to the Internet (mobile or fixed broadband) at home use electricity mains as the main source of lighting, with the lowest being those who use wood at 1.4 percent. A similar trend is observed for functional TV ownership with 65.3 percent of households using electricity mains, with the least being those who use torch/spotlight dry cells at 1.5 percent.

Households with main electricity as their main source of electricity took the lead in owning a computer (16.3 %) while 3.3 percent of households using the battery(car/charged) as their main source of lighting had analog television.

Table 7.1: Proportion of Households by ICT equipment owned and main type of Lighting

Type of Lighting	Standalone radio	Internet	Functional TV	Computer	Analogue TV
Mains Electricity	60.6	31.6	65.3	16.3	2.0
Paraffin Pressure lamp	48.9	4.9	9.6	1.6	1.4
Paraffin Lantern	50.1	3.5	4.9	0.7	1.6
Paraffin Tin lamp	40.6	2.2	2.9	0.4	1.0
Gas Lamp	48.6	5.6	10.1	2.7	1.1
Wood	23.6	1.4	2.3	0.5	0.3
Solar	69.6	5.9	23.1	1.9	2.5
Torch/Spotlight-Solar Charged	54.2	3.8	8.5	0.9	1.4
Torch/Spot light-Dry cells	34.9	1.7	1.5	0.4	0.4
Candle	30.1	6.3	5.5	1.0	1.2
Battery(Car/Charged)	66.3	6.0	19.8	1.4	3.3
Generator (Diesel/Petrol)	35.1	13.4	22.1	5.7	2.2
Biogas	38.9	10.5	24.2	5.9	1.5

Notes:

7.8 Household ownership of ICT equipment and main mode of human waste disposal

Figure 7.26, presents the distribution of households by ICT equipment owned and the main mode of human waste disposal. The intent of this cross-referencing is to bring out the usage of different types of human waste disposal vis a vis owning ICTs. Human waste disposal methods of low quality are likely to influence lack of owning the ICTs as it highlights a sense of income/ wealth levels.

The highest proportion of households that have a stand-alone radio use VIP pit latrine at 63.0 percent with the lowest being households using the bush at 32.0 percent. The highest proportion of households with a functional television use the septic tank at 73.2 percent with the least being those who use the bush at 3.2 percent. The highest proportion of households with the Internet at home and computer use bio-septic tank/ bio-digester at 50.9 percent and 39.0 percent, respectively followed by those who have septic tank at 49.6 percent and 31.5 percent. All households with different modes of human waste disposal had minimal proportions of having an analog television.

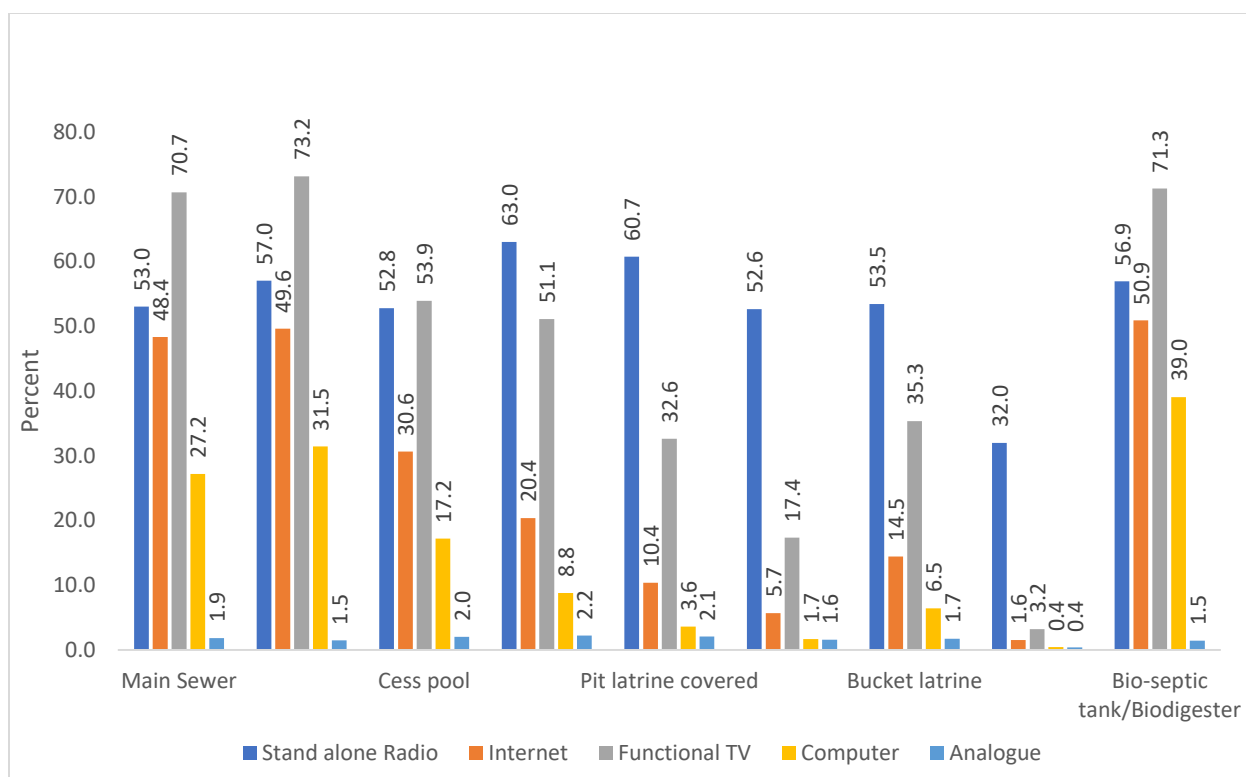


Figure 7.26: Proportion of households by ICT equipment owned & main mode of human waste disposal

7.9 Household Headship and Ownership of ICT Equipment

Analysis by household headship provides information about ownership of ICTs by comparing female-headed, male-headed, and intersex-headed households. Statistical evidence of disparities between female-headed households could lead to policy and programmes that ease female headed-households access to ICT, also likely increasing access and use by girls.

Overall, a higher proportion of male-headed households' own ICT equipment compared with female-headed households as shown in Figure 7.27. Two-thirds of male-headed households (61.3%) own a stand-alone radio, compared to half of the female-headed households (49.9%). Internet connection at home is slightly higher for male-headed households (19.2 %) followed by intersex-headed households at 16.6 percent. About 40.7 percent of male-headed households compared to 35.8 percent of female-headed households own a functional TV. Similarly, computer ownership is higher for male-headed households at 9.9 percent compared to female-headed households at 7.1 percent. Slightly more female-headed households had analog TV (2.8%) compared to male and intersex-headed households at 1.9 percent and 1.2 percent, respectively.

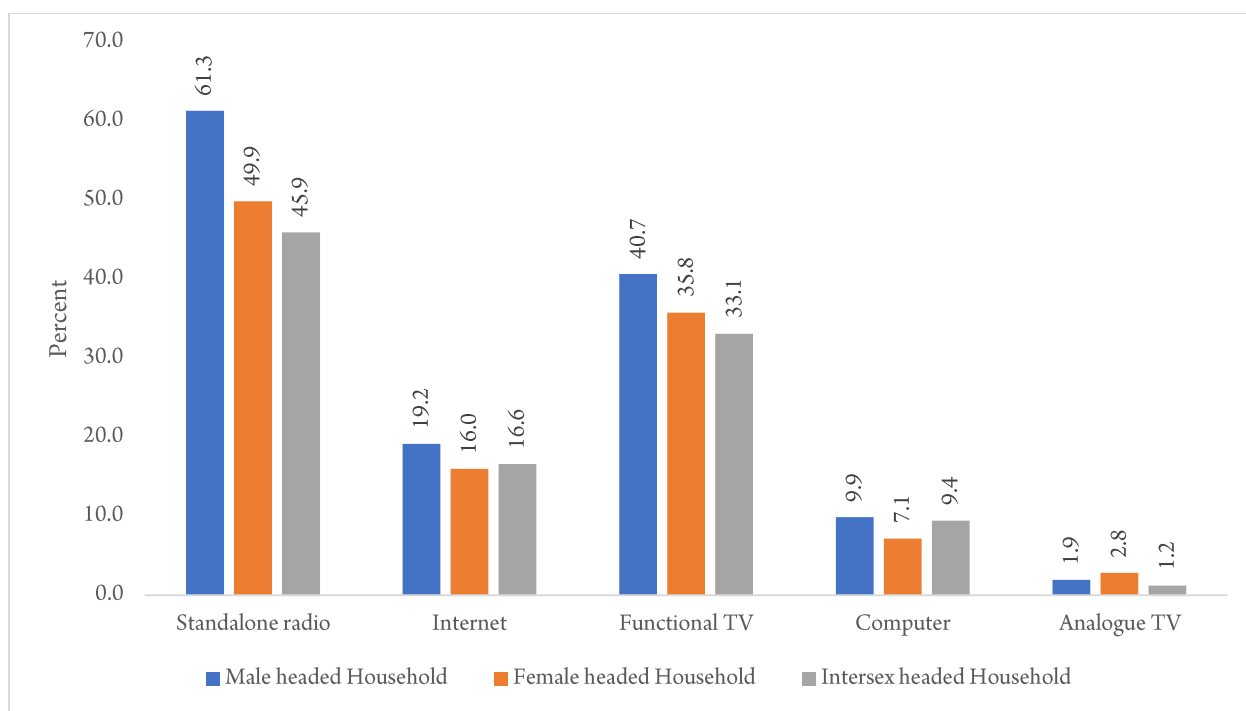


Figure 7.27: Proportion of households by ICT equipment owned by type of household headship

7.10 Wealth and ICT equipment ownership

Figure 7.28 presents the distribution of households by ICT equipment owned and wealth quintile. Analysis of ownership of standalone radio is highest for all wealth quintiles except for the richest, with those in the middle having the highest proportion at 62.2 percent. The richest have the largest proportion in owning a functional television at 81.9 percent which is way higher than the national ownership level of 38.8 percent. Furthermore, the richest have the highest proportion of households with Internet and computer at 58.5 percent and 35.2 percent, respectively. The poorest quintile has the lowest proportion in owning analog television at 0.8 percent.

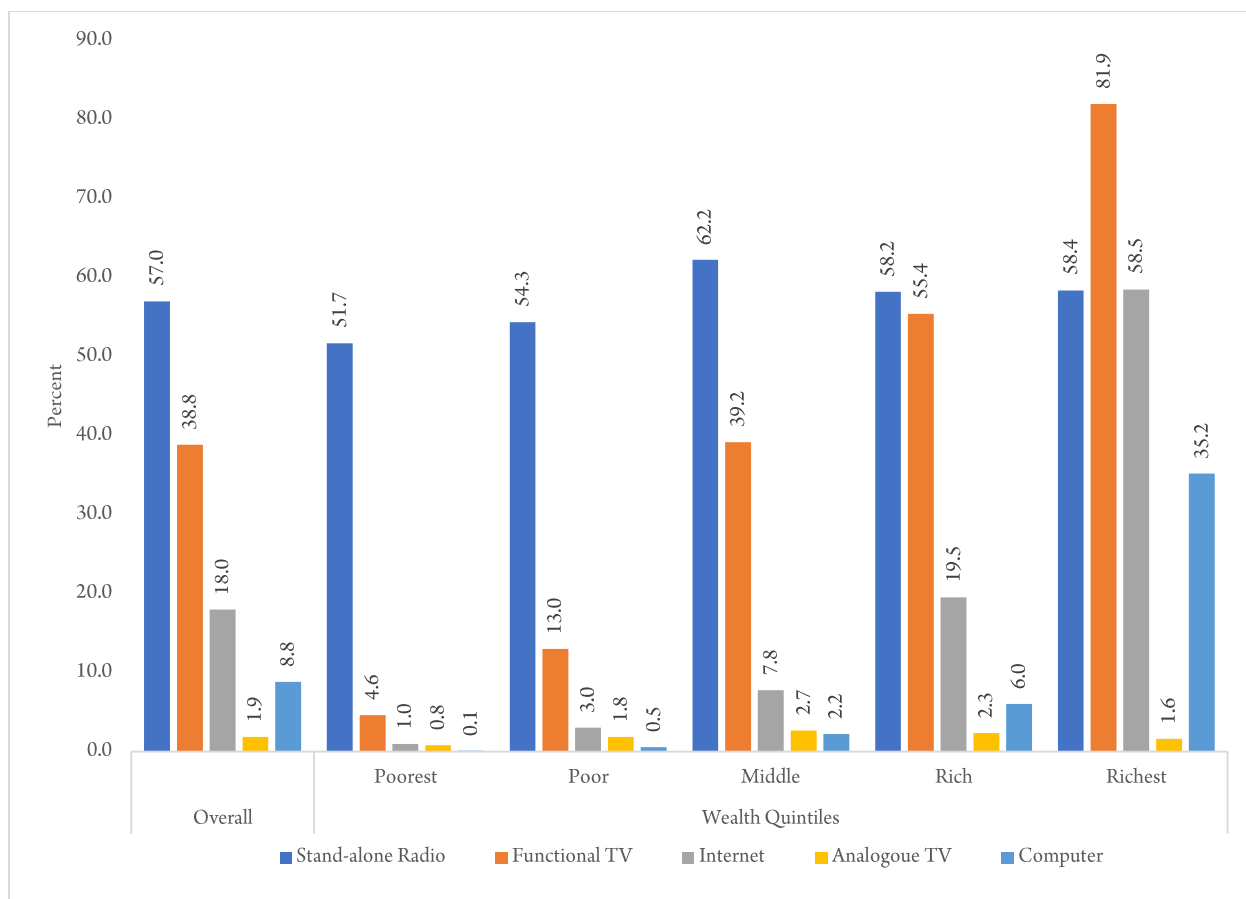


Figure 7.28: Distribution of Households by ICT Assets owned and Wealth Quintile

Figure 7.29 shows the proportion of households owning a functional television by type that is, free to air set-top box/ digital television, pay-tv decoder, Internet protocol television; and type of Internet that is: mobile broadband and fixed broadband. Analysis shows that through all the quintiles, the richest rank first while the poorest rank last, in that order, for the proportion of ownership for all the categories of functional television and Internet.

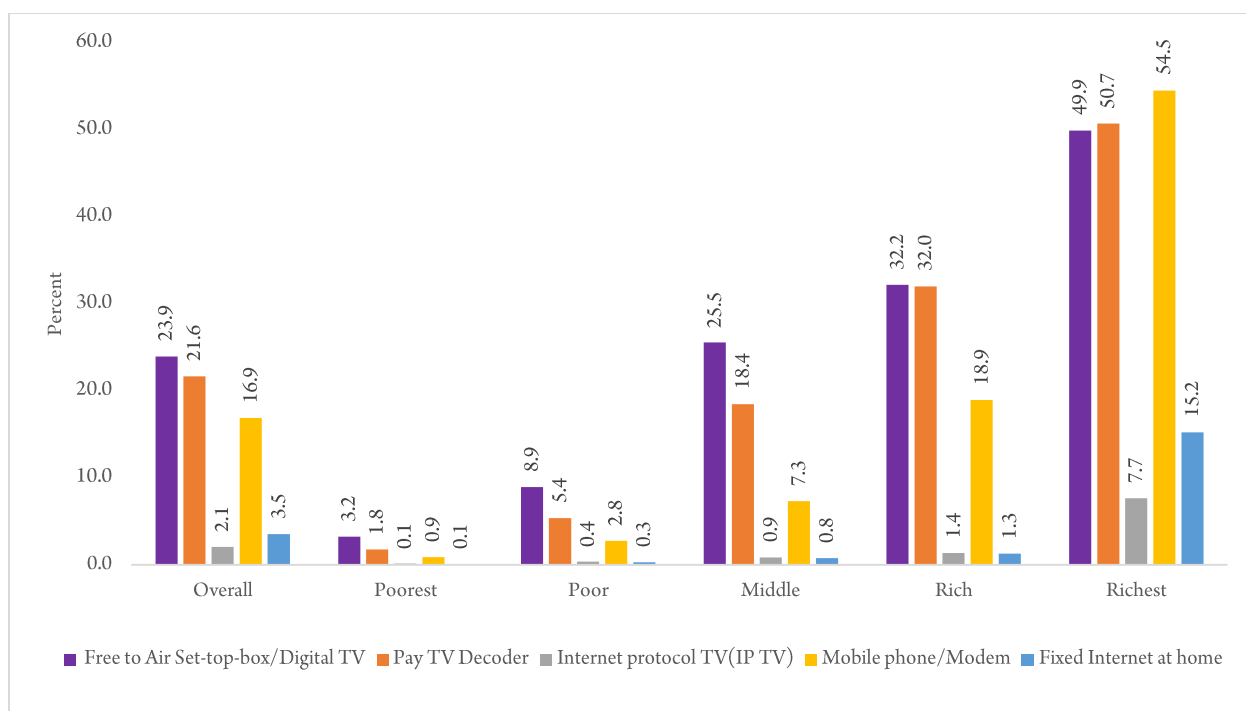


Figure 7.29: Distribution of Households by Type of Functional Television and Internet

7.11 Household Composition

Household composition is critical in measuring the digital divide among households with children below 15 years and those without. Statistical evidence of disparities between households with children below 15 years and other households could lead to policy and programmes that ease young ones to incorporate ICTs at an earlier age such as at school. Figure 7.30 shows that most households with children under 15 years own standalone radio, functional television, free-to-air set-top box/digital television, and pay-tv decoder. Further, most households without children below 15 years own any type of Internet connection at 21.9 percent while those with children below 15 stands at 15.6 percent.

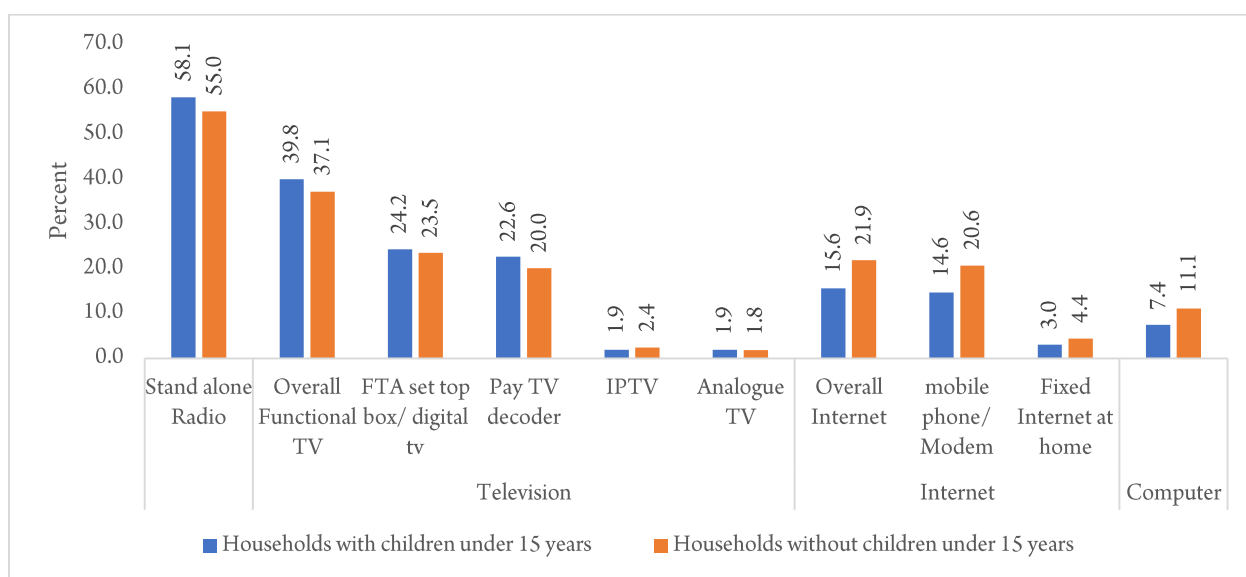


Figure 7.30: Proportion of Households owning ICT Assets by type of Household Composition

Chapter 8: Conclusion and Recommendation

8.1 Conclusion

The results from the 2019 Census on ICTs show that only 47.3 percent of the population 3 years and above own a mobile phone. This also implies that more than 50 percent of the targeted population do not own a mobile phone. In addition, the total mobile users in the country account for 55.2 percent while noting that mobile sharers (14.9 %) are included. Further, the results show that even though women are at parity when it comes to owning a mobile phone, they are still the majority in the mobile sharers category. The use of a computer (10.7 %) and the internet (22.7 %) is low in the country with the majority of users being men. This is similar to the use of e-commerce which stands at 4.3 percent for individuals aged 15 years and above and where men are more than women when it comes to online shopping.

The use of ICTs among those with the highest completed level of education is high among those with university degrees followed by those in tertiary, with the least users being those who never attended school, apart from mobile ownership where those who never attended school (21.5%) were slightly more to own a mobile phone than those who reached pre-primary (18.9%). Furthermore, results for individuals who were currently in school and use of ICTs show that all of those who were in university used a mobile phone, a computer and the Internet.

The use of ICTs by the PWDs shows a similar trend at the national level, where mobile phone ownership (49.4%), mobile usage (55.7%), Internet use (11.4%), computer use (4.7%), e-commerce (1.5%) with the majority of the users being in urban areas.

Analysis by use of ICTs by marital status shows that the majority of computer users (15.4%) and e-commerce users (4.9%) were never married while those who owned a mobile phone (81.4%) and used the Internet (33.0%) majority were married monogamously. Additionally, analysis by religious affiliation shows those least users of ICTs were traditionalists.

In conclusion, the above results, however, only show the pre-Covid 19 pandemic situation, and therefore when referenced, this should be noted.

8.2 Recommendations

The following are some recommendations:

- a) Promotion of mobile Internet usage could also amplify the use of the Internet in the country. This could include educating individuals especially those in rural areas on how to use the Internet and how they can benefit from these services. Further, the availability of affordable networks in the country should be amplified so that more people can use the Internet through their mobile phones.

- b) The use of the internet especially by those who were attending Madrasa (27.1%) is higher than those in vocational training (14.4%). In-depth analysis backed by more studies should be carried out to explain this result.
- c) The use of computers and the internet for pedagogical purposes if promoted early in schools such as pre-primary, primary, and secondary could intensify the use of these ICTs.
- d) Programmes targeting ASAL counties in the use of ICTs should be developed as these areas lag compared to other counties in the country when it comes to the uptake of ICTs.
- e) There is a need for an updated ICT household survey to capture among other variables, the impact of the Covid-19 pandemic which has created new demand in the use of ICTs such as e-commerce; barriers to use of ICTs; activities related to cybercrimes, and online bullying, and activities carried out when using ICTs.

References

(n.d.). *Agenda 2063*.

ITU. (2020). *Manual for measuring ICT access and use by households and individuals 2020 edition*.

Appendix 1: 2019 KPHC Questionnaires

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Republic of Kenya

POPULATION AND HOUSING CENSUS 24TH/25TH AUGUST 2019



Statistics Act 2006

STRICTLY CONFIDENTIAL

HOTEL/LODGE RESIDENTS, HOSPITAL IN-PATIENTS, PRISON/POLICE CELLS AND SCHOOLS/CHILDREN HOMES

County=	Sub-County=	Division=	Location=	Sub-Location=	E.A. Number
E.A. Type=	E.A. Status=	Constituency=	Ward=	Males =	Females =
Total Population =			Other =		
Type of Institution: Hotel/Lodge Residents ☐			Prison/Police Cells ☐		
Name of Institution:			Schools/learning institution ☐		

Line Number (SQ01)	Name (SQ02)	Sex (SQ03)	Age (SQ04)	County/ Country of Birth (SQ05)	Nationality/ Ethnicity (SQ07)
Illustration	What are the names of all persons who spent the night of 24th/25th August, 2019 in this institution? (Record two names for each person.) <i>An illustration of how to write the names is shown below.</i>	What is <NAME>'s sex? 1= Male 2= Female 3= Other	How old is <NAME>? (Record age in completed years using two digits. If under 1 year, record "00"; If 95 years and above, code "95".)	What is <NAME>'s country/ county of birth?	What is <NAME>'s Nationality/ Ethnicity?
0 1	JOHN MOGAKA				
0 1					
0 2					
0 3					
0 4					
0 5					
0 6					
0 7					
0 8					
0 9					
1 0					



REPUBLIC OF KENYA



CONFIDENTIAL

REPUBLIC OF KENYA

POPULATION AND HOUSING CENSUS 24th /25th AUGUST 2019 SHORT QUESTIONNAIRE FOR EMIGRANTS

E-01: Serial No.	E-01(a): Line No. of Respondent	E-02: Name of Emigrant Please give me the name(s) of the emigrant(s)?	E-03: Sex What is <NAME>'s Sex? Male=1 Female=2	E-04: Age How old was <NAME> at the time of his/her departure?	E-05: Level of Education What was the highest level of education that <NAME> had completed at the time of his/her departure?	E-06: Professional training What professional training had <NAME> acquired before departure from Kenya? (Applicable to persons age 15 years & above)	E-07: Country of first Destination What was <NAME>'s country of first destination during his/her departure?	E-08: Year of Departure When did <NAME> depart from Kenya?	E-09: Main reason for Departure What was the main reason for <NAME> departing from Kenya?	E-10: Country of current residence What is the current country of residence of <NAME>?	E-10a: Select the Name of the Emigrant if currently in Kenya.	E-11: Remittances Did <NAME> remit money to any member of this household while outside Kenya in the last 12 months? Yes= 1 No= 2 DK= 9	E-12: Utilization of funds How was the money utilized? (Allow for maximum of 3 responses)
1													
2													
3													
4													
5													
6													
7													
8													



POPULATION AND HOUSING CENSUS 24TH/25TH AUGUST 2019



Republic of Kenya

TRAVELLERS AND PERSONS ON TRANSIT

[illegible]



REPUBLIC OF KENYA



CONFIDENTIAL

POPULATION AND HOUSING CENSUS 24th /25th AUGUST 2019

SHORT QUESTIONNAIRE FOR STREET PERSONS/OUTDOOR SLEEPERS/VAGRANTS

County Sub-county Division

Location Sub-Location EA Number

Constituency Ward

Name of the street.....Code.....

Line /NO	Name (List at least two names)	SEX 1. Male 2. Female Stated	3. Other 4. Not	AGE in Completed years	COUNTRY/ COUNTRY OF BIRTH	ETHNICITY/ NATIONALITY <i>What is <NAME>'s Nationality/Ethnicity?</i>
1						
2						
3						
4						
5						
6						
7						
8						

TOTAL: MALES _____ FEMALES _____ OTHER _____ UNSPECIFIED SEX _____ TOTAL _____

Appendix 2: Contributors to the 2019 Kenya Population and Housing Census Monographs

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