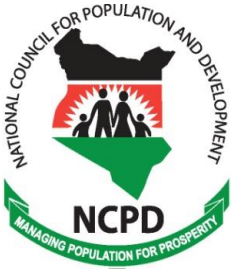
THE STATE OF KENYA POPULATION 2017



"The Population factor in Transformative change in Development in Kenya"

NATIONAL COUNCIL FOR POPULATION AND DEVELOPMENT

JUNE 2018

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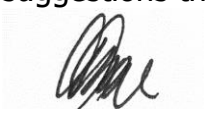
FOREWORD

This report explores how the government development strategy of the "Big Four Plan" can enhance the prospects for achievement of the goals outlined in the Demographic Dividend roadmap for Kenya. Data sources for the report include literature review, in-depth interviews with key informant interviews with subject matter experts, policy makers and program implementers. The overarching theme for Kenya Population report 2017 - "The Population factor in Transformative change in Development in Kenya" is informed by fact that since the ICPD 1994 and the 29th Special Session of the UN General Assembly; the rationale for development is "to raise the quality of life for all people through population and development policies and programmes that seek to eradicate poverty, sustain economic growth in the context of sustainable development". To achieve these goals implies the need to integrate population issues in all development planning at all levels and in relevant sectors within the population and development framework.

The policy thrust for Kenya development strategy is anchored on "The Big Four" strategic areas namely: raise the share of manufacturing sector to 15 percent of GDP; ensure that all citizens enjoy food security and improved nutrition by 2022; achieve universal health coverage; and deliver at least five hundred thousand (500,000) affordable housing units (Republic of Kenya, 2018). It is envisaged that these policy objectives will be achieved through sustaining economic growth, macroeconomic stability and implementing reforms aimed at providing an enabling environment for all stakeholders to play their role towards achieving the "The Big Four" Plan (Republic of Kenya, 2018).
All the key components in "The Big Four" agenda are intrinsically linked to the population and development framework. First, rapid population growth can magnify development challenges since the increase in the number of people require; more jobs, water, food and energy, clothing, housing and infrastructure, health and education. Kenya is still struggling to meet the needs of rapidly growing populations amid huge disparities between the rich and the poor coupled with the fact that more people are vulnerable to food insecurity, water shortages, and weather-related disasters which undermine their welfare. These challenges on population dynamics need to be addressed through policies that shape demographic trends through their determinants such as health, education, empowerment, employment, social protection and through planning for demographic changes that will unfold over the next few years.

Finally, National Council for Population and Development appreciates all the sources of data used for making the compilation of this report possible and welcomes any suggestions that will improve future editions of the report.



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Director General
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June, 2018

ACKNOWLEDGEMENTS

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The Council renders special recognition to the internal and external reviewers of the report for the valuable professional support provided during the process. To all who contributed in one way or another to the development of the SKPR, 2017, we say thank you. This report will serve as a key reference document to policy makers and programmes across the country.

Special thanks to the NCPD Management for initiating the process and for finding time to deliberate on the state of Kenya Population Report 2017 and providing very useful and constructive comments for its development. The facilitation and guidance by the NCPD Task force for this particular activity lead by Mr. Nzomo Mulatya, Deputy Director, Programme Coordination, Monitoring and Evaluation Division is highly appreciated. The enormous contribution from officers involved in the preparation of the 2017 Kenya State of Population Report is also highly appreciated.

Since it is not possible to list the names of each and every one who participated in enriching this document, we appreciate your effort and recognize that without your inputs; this document will not have been realized.

Finally we thank the Population Studies and Research Institute, University of Nairobi Technical team lead by Dr. Anne Khasakhala, Professor, Kimani Murungaru, Professor, Alfred Agwanda and Mr. Ben Jarabi for their technical assistance in development of this report.

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Contents

ACRONYMS & ABBREVIATIONS

AIDS	-	Acquired Immune Deficiency Syndrome
GoK	-	Government of Kenya
HIV	-	Human Immunodeficiency Virus
KDHS	-	Kenya Demographic and Health Survey
KEPHIS	-	Kenya Plant Health Inspectorate Service
MDGs	-	Millennium Development Goals
NBA	-	National Biosafety Authority
PEV	–	Political Ethnic Violence
PRB	-	Population Reference Bureau
UN	-	United Nations
UNAIDS	-	United Nations Programme on HIV/AIDS
UNFPA-	United Nations Population Fund	
WAHEF	–	Water, Agriculture, Health, Energy and Forests
WHO	-	World Health Organization

Overview of the Role of Population Factors In Sustainable Development

1.1 Introduction

The priority for the population sub-sector during the Medium Term Plans for the realization of Kenya's Vision 2030(MTPII (2013-2017) and MTP III (2018-2022)) period is the implementation of the Sessional Paper No. 3 of 2012 on Population Policy for National Development. This implementation is carried out through the development, publication and launch of the State of Kenya Population reports which forms a flagship project for the Population sub-sector. The State of Kenya Population report 2016 focused on "Repositioning the Population Agenda in Kenya to Harness the Demographic Divided"**.** The State of Kenya Population report 2017 is anchored on the fact that the structure and dynamics of population in any country have several implications on development. The overarching theme for Kenya Population report 2017 - "The Population factor in Transformative change in Development in Kenya" is informed by fact that since the ICPD 1994 and the 29th Special Session of the UN General Assembly; the rationale for development is **"**to raise the quality of life for all people through population and development policies and programmes that seek to eradicate poverty, sustain economic growth in the context of sustainable development". To achieve these goals implies the need to integrate population issues in all development planning at all levels and in relevant sectors within the population and development framework described in the next section.

1.2 Framework for Population and development

The findings and conclusions of the operational review (ICPD Beyond 2014) suggested a new framework for Population and Development Beyond 2014 built on five thematic pillars, namely: dignity and human rights; health; place and mobility; governance and accountability; and sustainability. The document recognized that any development agenda that aims at individual and collective well-being and sustainability has to guarantee dignity and human rights to all persons (Figure 1). Further, motivations for development are generated by human aspirations for dignity and human rights, for good health, and for both security of place and mobility.

The proposition of the framework contents that dignity and human rights[1] which is inextricably linked to development is fundamentally geared to expansion of human opportunity and freedom[2]. Dignity of the individual is therefore fundamental for all nations and people and for all segments of society. Dignity requires that individuals be provided access to opportunities to build and renew their capabilities across the life course to participate fully in society and enjoy well-being[3]. In line with Agenda

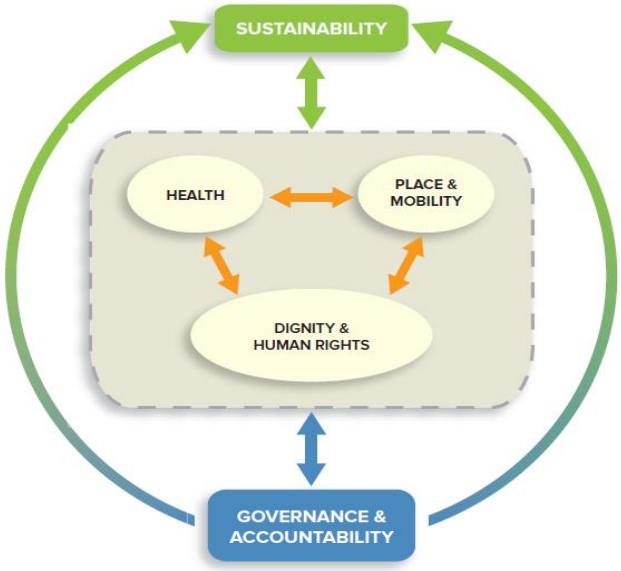
[1] United Nations Economic and Social Council 2014. Commission on Population and Development Forty-seventh session 7-11 April 2014. Framework of Actions for the follow-up to the Programme of Action of the International Conference on Population and Development (ICPD) Beyond 2014. Report of the Secretary-General

[2] United Nations Economic and Social Council 2014. Commission on Population and Development Forty-seventh session 7-11 April 2014. Framework of Actions for the follow-up to the Programme of Action of the International Conference on Population and Development (ICPD) Beyond 2014. Report of the Secretary-General

[3] United Nations Economic and Social Council 2014. Commission on Population and Development Forty-seventh session 7-11 April 2014. Framework of Actions for the follow-up to the Programme of Action of the International Conference on Population and Development (ICPD) Beyond 2014. Report of the Secretary-General

2030 for Agenda for Sustainable Development[4], future actions on sustainable development should be based on the fulfillment of human rights, individual dignity, equality and non-discrimination.

FIGURE 1
Thematic pillars of population and development



In the framework, any development agenda that aims at individual and collective well-being needs to recognize that all persons have the right to the highest attainable standard of health. It also emphasizes intersectoral action in the promotion and prevention of ill health, the need to end poverty and boost shared prosperity including inclusive economic growth all of which are anchored on investments in health, education, and social protection for all their citizens. To free the world from extreme poverty by 2030, countries must ensure that all their citizens have access to quality, affordable health services because health yields economic dividends. However, good health is a complex state and achieving it requires much more than just one or two simple interventions, but an integrated range of preventive strategies; environmental changes; therapies and technology to diagnose and treat ill health; and provision of opportunities for those who need health care to access it. It is as a result of this complexity that a number of countries [5](including Kenya), at all levels of development, are embracing the goal of Universal health coverage (UHC). The goal of UHC makes it a critical component of the Sustainable Development Goals (SDGs) which include a specific health goal: "ensure healthy lives and promote wellbeing for all at all ages'. Thus, supporting the right to health and ending extreme poverty can both be pursued through universal health coverage.

The third component of the framework is place and mobility which is fundamental in enhancing spatial interaction and flows of people, goods and services in space and time. Places are the areas of spatial concentration of population, production and

[4] United Nations General Assembly Resolution 70/1. Transforming our world: the 2030 Agenda for Sustainable Development. 25th September 2015.

[5] Sixty-seventh session of the United Nations General Assembly 2012A/67/L.3 A/67/L.36. Global health and foreign policy. The United Nations General Assembly resolution calling for governments "to accelerate the transition towards universal access to affordable and quality health care services" confirmed not only the breadth of consensus regarding the urgency of action on UHC, but also the level of concern about the state of the world's health systems.

consumption. They do not only have a location, territorial domain, and natural environment, but are also social constructs shaped by human behavior and interactions. As such, the physical, social, political, institutional, economic and environmental characteristics of a place determine not only spatial interaction but may also explain population mobility and change over time, regional disparities and inequalities, livability and quality of life, and economic growth and development. Therefore a secure place is essential for human development just as human security (freedom from hunger, fear, violence and discrimination) is a precondition for the development and well-being of all persons[6]. The core international human rights instruments protects both rights related to human security, through the "right of everyone to an adequate standard of living … including adequate food, clothing and housing, and to the continuous improvement of living conditions," and those rights related to mobility, including a person's "right to liberty of movement and freedom to choose his residence" and the freedom to "leave any country".

1.3 Calls to Action

The 1992 Rio Declaration at the United Nations Conference on Sustainable Development (UNCSD) and the ICPD-PoA (1994) place humans at the centre of development and therefore the need to promote human well-being and higher living standards must be done in harmony with nature. Studies indicate that unsustainable patterns of consumption and production often erode essential and irreplaceable natural resources which will ultimately undermine the very basis for economic growth and wellbeing. The environmental impact of human activity is attributable to three principal determinants, namely economic growth, technological progress in production and distribution processes and population growth. Population dynamics, including the structure by age and the spatial distribution of populations have also considerable implications for sustainable development. However, despite the recognition of these determinants, past policies and the current debate have not yet adequately addressed these determinants and their inter-linkages.

The ICPD PoA specifically anchored this process by calling on governments to address the issue of integration of population issues into national and sector development frameworks[7] and explicitly to raise the quality of life for all people through population and development policies and programmes that seek to eradicate poverty, sustain economic growth in the context of sustainable development, achieve sustainable patterns of consumption and production, develop human resources and guarantee all human rights, including the right to development."The fiftieth session on *Commission on Population and Development* held on 3-7 April 2017[8] further reaffirmed the ICPD PoA call by urging Governments to integrate

[6] United Nations Economic and Social Council 2014. Commission on Population and Development Forty-seventh session 7-11 April 2014. Framework of Actions for the follow-up to the Programme of Action of the International Conference on Population and Development (ICPD) Beyond 2014. Report of the Secretary-General

[7] *"Governments… should work to increase awareness of population and development issues and formulate, implement and evaluate national strategies, policies, plans, programmes and projects that address population and development issues, including migration, as integral parts of their sectoral, intersectoral and overall development planning and implementation process(ICPD Programme of Action, Para 13.5).*

[8] *Commission on Population and Development Fiftieth session 3-7 April 2017: E/CN.9/2017/3;*

population dynamics into the planning and implementation of development initiatives within all sectors, at both national and sub-national levels, creating or strengthening institutions for this purpose if necessary.

It is important to note that population dynamics challenges are also central to any future development agenda (Royal Society, 2012; World Bank, 2016). First, as population grows so does the demand for resources. Rapid population growth results in increased social expenditures such as education and health thereby diminishing investment in other critical development sectors such as agriculture, technology and infrastructure. Secondly, population dynamics are inseparably linked with a wide range of social and economic challenges (health, education, gender equality, women's empowerment, employment and social protection) but under the right circumstances, changes in population dynamics, structure and spatial distribution also provide important opportunities for sustainable development (World Bank, 2016). Previous studies (Republic of Kenya 2013; Muriithi, et al., 2014) have shown that a fall in fertility levels and slower population growth in Kenya can enable it to reap the demographic dividend resulting from demographic transitions in order to jumpstart economic transformation. Similarly, internal migration can be an important enabler of social and economic transformation through integrated rural–urban planning and strengthening of urban–rural linkages (World Bank 2009).

An important link between population dynamics and economic and social development (UNFPA, 2010) is the labour market. The potential demographic bonus can only be seized if the country can create sufficient and sufficiently productive and remunerative employment opportunities for its labour force (World Bank, 2016). The challenge lies in policy responses that: i) promote employment-oriented economic growth; and ii) strengthen the employability of people, which requires human capital investments and enhancement of social protections systems, particularly for youth.
A key social transformation occurring in many developing countries such as Kenya is the onset of demographic transition. Urbanization which is inevitable is one important component but managing its trends and patterns constitute a major challenge as well as opportunity. The challenge is that urban population is growing very fast while the economic growth and development transformations necessary to support it and enhance quality of life are not occurring at the same rate(Bocquier et al 2009). Despite this fact, studies also show that if cities are well managed then they can offer important opportunities for economic and social development since cities have always been centres for economic development and innovation (World Bank 2009). The high population density in urban areas can enable governments to easily deliver essential infrastructure and services at relatively low cost per capita. Therefore planning and managing urban growth as part of national development planning, can enable the country to address the challenges and harness opportunities linked to efficiency in provision of needs and lowering of resource scarcity threats associated with high population growth rate. For example the urban settlements will progressively absorb the population growth and therefore, the country will witness increasing population concentration in urban areas, as opposed to the wide dispersion pattern that was prevalent in the past.

1.4 Population Factors and the Transformative Agenda for Kenya's Development

The policy thrust for Kenya development strategy is anchored on "The Big Four" strategic areas namely: raise the share of manufacturing sector to 15 percent of GDP; ensure that all citizens enjoy food security and improved nutrition by 2022; achieve universal health coverage; and deliver at least five hundred thousand (500,000) affordable housing units (Republic of Kenya, 2018). It is envisaged that these policy objectives will be achieved through sustaining economic growth, macroeconomic stability and implementing reforms aimed at providing an enabling environment for all stakeholders to play their role towards achieving the "The Big Four" Plan (Republic of Kenya, 2018).

All the key components in "The Big Four" agenda are intrinsically linked to the population and development framework. First, rapid population growth can magnify development challenges since the increase in the number of people require; more jobs, water, food and energy, clothing, housing and infrastructure, health and education. Policy responses aimed at promoting sustainable development need to consider the challenges associated with this demographic phenomenon (UNDESA, 2012). It simply raises the debate on the extent to which a larger population is good or bad for human development and welfare (Birdsall and Sinding, 2001; Kelley, 2001). Secondly, how does population growth respond to changing economic conditions (Kremer, 1993, Wang et al., 1994) since in the process of demographic transition, different challenges and opportunities do exist. For example, the changing age distribution in the process of demographic transition is equally important as population growth itself because each age group in a population behaves differently with distinct economic consequences (UNFPA 2012). Kenya is still struggling to meet the needs of rapidly growing populations amid huge disparities between the rich and the poor (Zuberi and Thomas 2012) coupled with the fact that more people are vulnerable to food insecurity, water shortages, and weather-related disasters which undermine their welfare.

The population and development framework (Figure 1) and the development agenda suggest that policy actions need to be viewed from the perspective of three fundamental elements. First, the investments in individual human rights, capabilities and dignity, across multiple sectors and through the life course are a necessity in order to achieve the development agenda. Secondly, policy responses aimed at promoting sustainable development need to consider the challenges associated with a country's demographic phenomenon. Thirdly, changes in population dynamics, structure and spatial distribution provide important opportunities for sustainable development which is in line with the increasing global call to address population dynamics and their components in designing new development strategies, policies and programmes (World Bank, 2016; UNECA, 2013; UNDESA, 2012). It simply asks the question: "what are the population dynamics issues and how can social policies be tailored to achieve the best outcome for human development in order to reap from opportunities that arise from these dynamics"? This question rests on the hypothesis that the challenges on population dynamics need to be addressed

through policies that shape demographic trends through their determinants such as health, education, empowerment, employment, social protection and through planning for demographic changes that will unfold over the next few years (Herrmann, 2014). These arguments form the foundation of this report and the subsequent chapters of this report is organized as follows:

1. Chapter 2 presents an overview of population dynamics and their implications on Kenya's development agenda. It provides an update on the status of population and its dynamics and analysis of the interactions between population dynamics – growth, composition and momentum – and the changing nature of socio-economic transformation.

2. Chapter 3 focuses on population factors and infrastructure development since infrastructure is both an explicit goal and as well as an implicit means to implement and achieve other SDGs. Infrastructure is core to quality life and directly explicit about welfare of the population. SDG 9 in which the expectation is to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation is important for all the pillars of "The Big Four" Plan. SDG 6 which seeks to ensure availability and sustainable management of water and sanitation for all targets availability, access, and sustainable water management, all of which require carefully planned infrastructure projects, especially in health and agriculture. SDG 7 which seeks to ensure access to affordable, reliable, sustainable and modern energy for all and emphasizes the need for the universality in access. The economic aspects of infrastructure are addressed in Goal 9 while SDG 11 of making cities and human settlements inclusive, safe, resilient and sustainable relate to infrastructure planning including issues such as; waste management, transportation, climate change mitigation and adaptation, and resource-efficient.

3. Chapter 4 presents the implications of population factors in the attainment of universal health coverage because health is one of the key pillars of population and development framework and a key goal in the SDG framework for development. The aim of UHC is to provide health care and financial protection to all people with three related objectives: equity in access (everyone who needs health services should get them, and not simply those who can pay for them); quality of health services (good enough to improve the health of those receiving the services); and financial-risk protection (ensuring that the cost of health care does not put people at risk of financial hardship).

4. Chapter 5 focuses on the inter-linkages between population factors and food security - a continuation of what was covered in the State of Kenya Population report of 2016. This is anchored on the fact that there is need to regularly monitor the progress towards achieving the food security and nutrition targets set by the 2030 Agenda. The ambition to end hunger and prevent all forms of

malnutrition by 2030 can only be fulfilled if agriculture and food systems become sustainable. Agriculture is the main source of livelihood for majority of the population in Kenya, in terms of basic nutritional needs, income generating activities, and social organization and is one of the most critical sectors in economies as it provides employment and accounts for a large share of GDP.

5. The last chapter also act as a continuation of the State of Kenya Population report 2016 on repositioning the population agenda to harness the demographic divided. The focus of this chapter will be to enhance understanding on how the "Big Four Plan" can enhance the prospects that are outlined in the Demographic Dividend roadmap for Kenya. The main aim is to review the status of how different actors can contribute to leveraging the potential for a demographic dividend through more effective tools and a systematic, comprehensive and integrated approach to population and development issues.

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Chapter 2: Population Dynamics

2.1 Introduction

Population dynamics, including changes in the size, structure and spatial distribution, have direct and indirect implications for development. The size, growth rate, age-sex structure, and location of the population have an impact, through a variety of mechanisms on fundamental aggregate economic parameters such as investment, savings, consumption, and productivity and therefore up-to-date information in the relationships is relevant for public policies and decisions (UNFPA, 2010). In order to improve welfare of the people, trends in aggregate characteristics determine the evolution of the target age groups of the main social sectors such as education, health, social security, housing, sanitation, among others. The profiles by age, sex, and location, are of key importance for estimating sectoral requirements and their geographical location. The chapter examines trends in population size and growth, distribution and its implications on selected social and economic transformation.

2. 2 Population Size and Distribution

The population of Kenya is estimated at 45.8 million in 2017, with an inter-censual population growth rate of 2.9 per cent and is expected to reach 52 million in 2020 and about 65 million by 2030(UNDESA, 2017). As a result of present and past population growth rates, the population is dominated by young people. Approximately 70 per cent of the population is below 24 years of age, and 28 per cent are youth age 15-24. The elderly (age 60 and above) constitute about 5 per cent of the total population.

Nearly all of Kenya's population is concentrated in the 20 percent of the arable land mostly in Central, Rift Valley, Nyanza and Western parts of the country (see Figure 4.1). The projected increase in the population is expected to increase average population density to 831 persons per square kilometer by 2050 from 348 in 2014. However substantial spatial variations in the distribution of populations exist. Some of the rural counties with high population densities include: Vihiga (1,045 persons per square Kilometre), Kisii (875), Nyamira (665), Busia (656) in western Kenya and Kiambu (638) in central region respectively. Marsabit County had the lowest density of 4 persons per square kilometer followed by Isiolo and Tana River with six. Analysis of the patterns of the spatial distribution shows that they remained unchanged between 1999 and 2009 (NCPD, 2017).

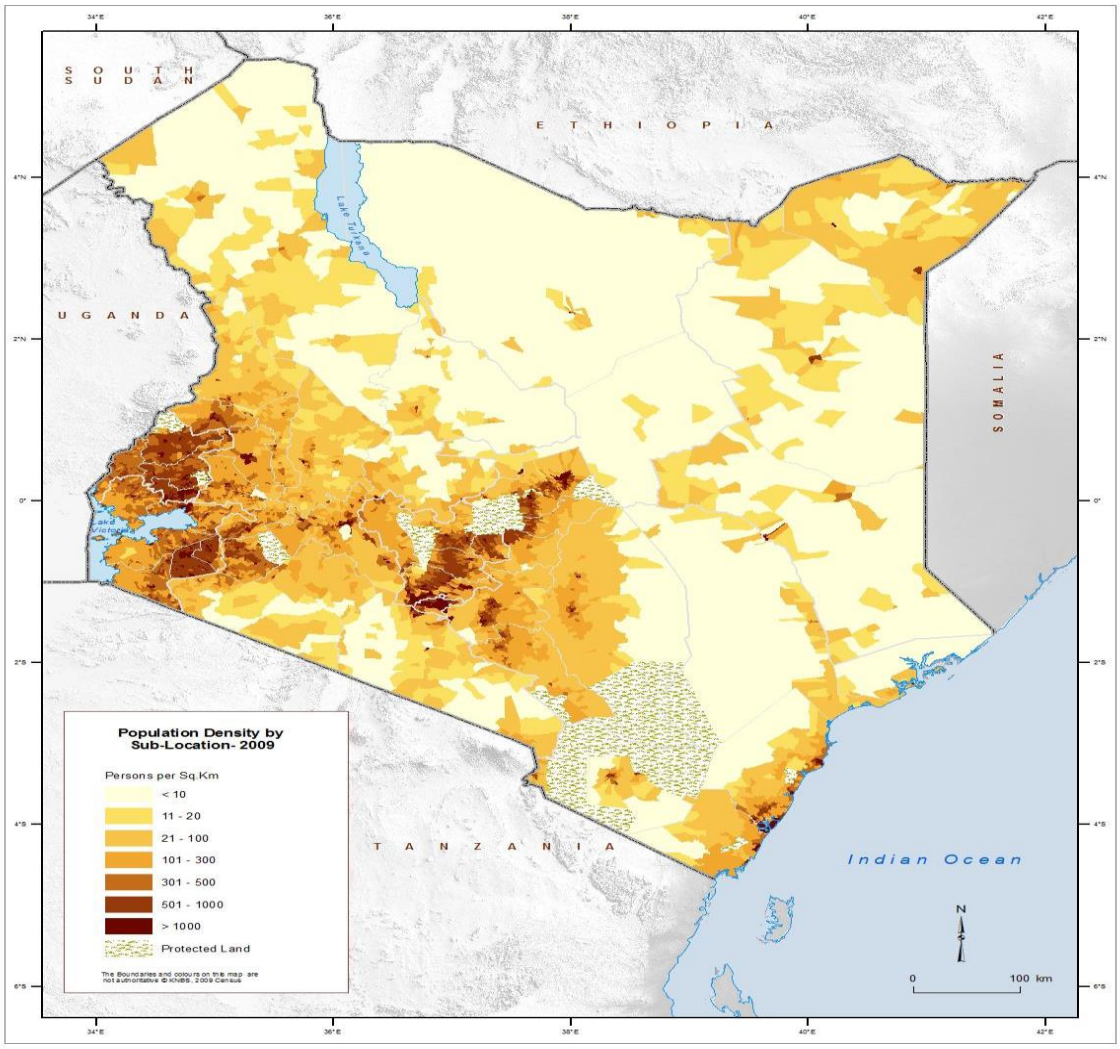

Figure 4.1 Population Densities in Kenya by Sub Location
Source: KNBS 2012

An important dimension in the distribution of the population is the urbanization process which leads to an increase in the proportion of the population residing in urban areas. Urbanization is an on-going global phenomenon and is inevitable. In 2016 fifty five percent of the world population lived in urban areas and is projected to increase to 60 percent. There are five sources of urban population growth in Kenya, namely: rural-to-urban migration; natural urban increase; increase in the number of urban centres over space and time expansion of urban boundaries or reclassification of urban centres; and daily commuters. Daily commuters, is hardly captured in population censuses but they increase the daytime population of urban areas.

Analysis of urbanization trends in Kenya presented in the State of the Kenya population report 2016 show that 12 million or slightly over 31 percent of the total population was living in urban areas (Figure 2.1). This reflects a substantial increase from the 5.3 percent representing 285,000 people in 1948. The proportion of the urban population is projected to reach nearly 46 percent by 2030.

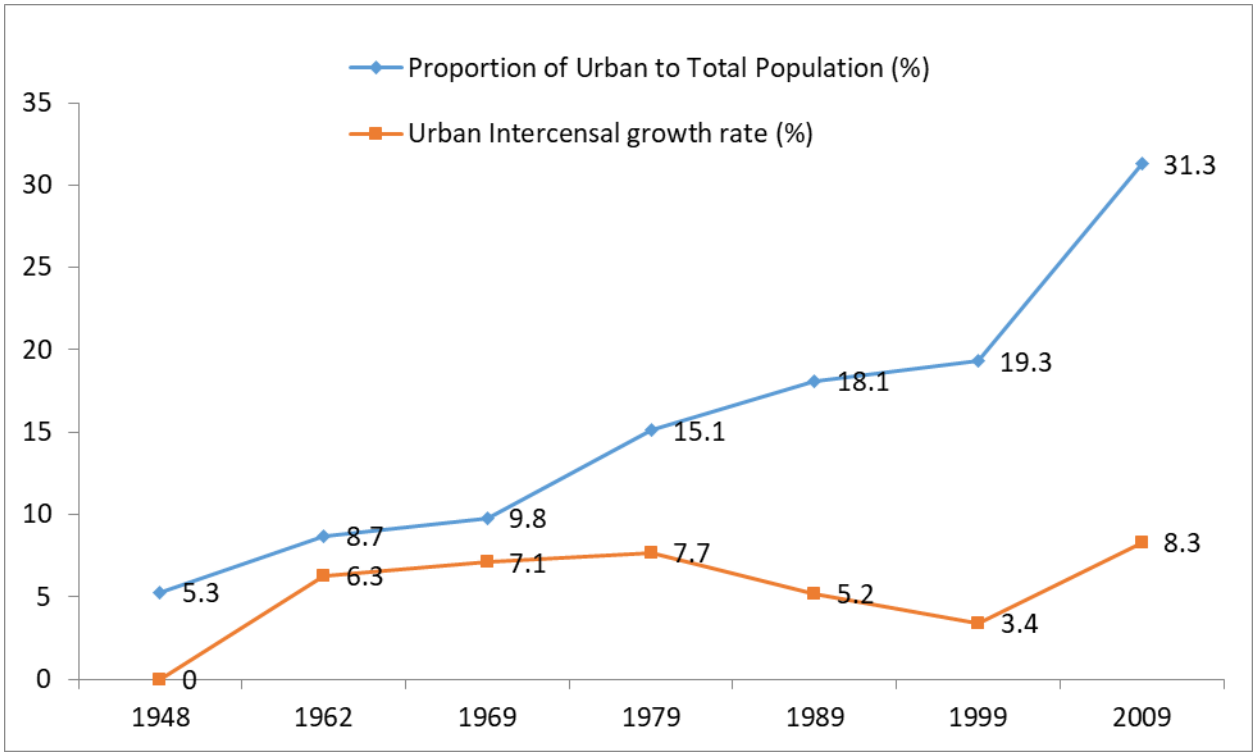

Figure 2.1: Trends in indicators of urbanization from census data

The increase in urban population is also reflected in the increase in the number of urban centers which increased from 17 in 1948 to 230 in 2009. The number of urban centers with a population of at least 100,000 also increased from 2 (Nairobi and Mombasa) in 1962 to 22 in 2009. Slightly over half of the urban population lives informal settlements which are characterized by inadequate access to safe water, sanitation and other infrastructure, poor quality of housing, overcrowding and insecure residential status (Table 2.1).

Table 2.1: Trends in urban population living informal settlements 1990-2014

	1990	1995	2000	2005	2010	2014
Proportion of urban population living in slum area	54.9	54.8	54.8	54.8	54.7	56.0
Urban slum Population at mid- year ('000)	2,343	2,859	3,400	4,069	4,762	6,427

Source: NCPD 2017

2. 3 Components of Population growth

Population growth is determined by changing birth rates, deaths rates and the balance between immigration and emigration. The trajectory of population change in Kenya is largely driven by declining fertility and mortality. After a rapid rise in fertility levels in the early 1970s that reached one of the highest rates in fertility levels, the country has experienced substantial decline in fertility reaching a TFR of 3.7 in 2015(Table 2.2). Between 1989 and 2014, the total fertility rate (TFR) declined by 45 percent indicating that fertility transition is on course in Kenya. Fertility decline in Kenya has occurred on account of the reduction of higher order births to older

women but the peak age at childbearing still occur in age group 20-24 indicating considerable momentum in population growth rate.

Table 2.2: Trends in Age specific fertility rates and Total fertility rates (TFR)

	Age specific fertility rates (births per 1000 women of age)							TFR
Year of survey	15-19	20-24	24-29	30-34	35-39	40-44	45-49	
1988/9 DHS	153	324	301	243	184	99	29	6.7
1993 DHS	110	257	241	197	154	70	50	5.4
1998 DHS	111	248	218	188	109	51	16	4.7
2003 DHS	114	243	231	196	123	55	15	4.9
2008/09 DHS	103	238	216	175	118	50	12	4.6
2014 DHS	96	206	183	148	100	38	9	3.9
2015 MIS	96	201	177	151	83	33	8	3.7

Source: http://www.statcompiler.com

Despite the impressive decline, data disaggregated by sub groups show wide differentials by geographic regions. The TFR ranges between 2.3 births per woman in Kirinyaga to 7.8 births per woman in Wajir. About half of the 47 counties have their TFR ranging from 3.5 to 5.1 compared with a range of 4.1 to 4.8 according to 2009 population and housing census. Data from the 2014 KDHS suggests increased disparity in fertility rates by counties compared to the census data in 2009. Fertility appears to be constant or increasing in counties in arid and semi-arid regions of Kenya (Table2.3). This has implications on poverty levels in the counties where fertility may be increasing or constant.

Table 2.3: summary of county variations in fertility trends, 2009 and 2014

	2009 Census		KDHS 2014	
Rank	County	TFR	County	TFR
Counties with highest fertility levels	Mandera	7.3	Wajir	7.8
	West Pokot	6.7	West Pokot	7.2
	Wajir	6.5	Turkana	6.9
	Tana River	6.4	Samburu	6.3
	Garissa	6.4	Garissa	6.1
Counties with Lowest fertility level	Kirinyaga	2.7	Kirinyaga	2.3
	Nyeri	2.9	Kiambu	2.7
	Murang'a	3.0	Nyeri	2.7
	Nairobi	3.0	Nairobi	2.7
	Kiambu	3.1	Murang'a	3.0

Sources: http://www.statcompiler.com; KNBS 2012. Source: Republic of Kenya 2012

The rapid decline in fertility has been associated with rapid rise in contraceptive use and increased levels of education especially among women.

Other than fertility, the other key determinant of population change Kenya is mortality levels. The likelihood of dying during a given time period is linked to many factors; such as age, sex, race or ethnicity, occupation, and social class. The incidence of death also reveals much about a population's standard of living and quality of health care.

Kenya experienced rapid declines in mortality rates in the 1970s and 1980s followed by an upsurge in mortality at all age in the 1990s. The life expectancy at birth declined from 58 years to 54 years for males and 61 years to 57 years for females in the last decade but this has so far increased to 58 for males and 61 for females according to the last census. The average life expectancy at birth for both sexes was estimated at 62.6 years in 2013, increasing to 63.4 years in 2015. Currently, female life expectancy at birth is estimated at 65.8 years, compared to 61.1 years for men. The estimates suggest that since the year 2000, life expectancy has increased at a rate of 0.8 years per year (about 1.3% annual increase). The increase in life expectancy has been attributed to recent declines in both child and adult mortality.

Trends on indictors of childhood mortality are shown in Figure 2.2. Between 2003 and 2014, IMR and U5M substantially declined but the level of neonatal mortality only changed marginally. The neonatal mortality rate was estimated at 31 per 1,000 live births in 2008 and 33 per 1,000 live births in 2003 declined to about 22 per 1000 births in 2014. The proportion of neonatal deaths to U5M increased to about 45 percent in 2014 indicating that majority of childhood deaths occur in the first month of life.

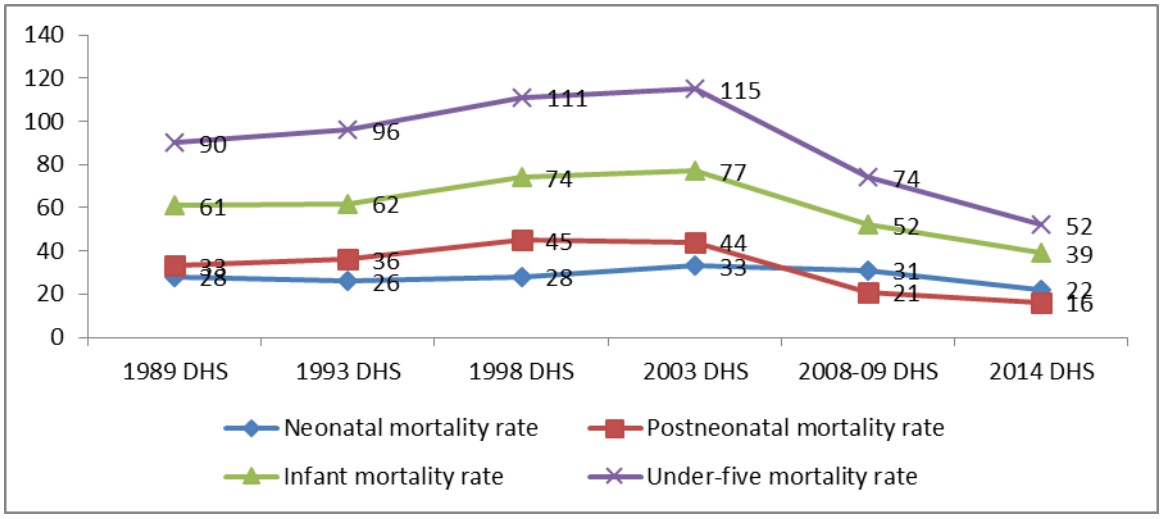

Figure 2.2: Trends in childhood mortality 1989-2014
Source: http://www.statcompiler.com

The unchanging pattern of neonatal death is closely related to the perinatal mortality. At national level, there appears to be no change. Perinatal mortality is considered as a major marker to assess the quality of health care delivery[9].

[9] The PMR is a key outcome indicator for newborn care and directly reflects prenatal, intrapartum, and newborn care

The disease burden among adults - the most economically productive age span – is rapidly increasing in developing countries due to increased number of older persons and health transitions. Therefore, the level of adult mortality is becoming an important indicator for the comprehensive assessment of the mortality pattern in a population[10] . Adult mortality is also highly correlated with the level of development, just as infant mortality. A commonly used measure for adult mortality rate is the probability of dying between the ages of 15 and 60--that is, the probability of a 15-year-old dying before the age of 60[11] (denoted by ${}_{45}q_{15}$). The most recent estimates of ${}_{45}q_{15}$ for Kenya are 0.309 for males and 0.271 for females (UN, 2017) indicating that for every 1000 young adults reaching age 15, 309 males and 271 females die before reaching their 60th birthday respectively. Men are 14 per cent more likely to die before reaching age 60 having reached age 15 compared to women. Table 2.4 shows adult mortality death rates obtained from various demographic and health surveys for Kenya. Adult mortality between ages 15-49 have declined in the last five years. A comparison of the change in adult mortality rates between 1998 and 2014 shows that females have had a higher gain in survival between ages 15 and 35 compared to men. This might reflect gains made from reductions in HIV related causes of death which affect women more than men and or reduced death rates due to pregnancy. In all the periods it appears that there was much higher female mortality at prime age of childbearing (ages 20 to 34).

Table 2.4: Trends in age specific death rates (per 1000 population) by sex

	1998 DHS		2003 DHS		2008-09 DHS		2014 DHS	
	Females	Males	Females	Males	Females	Males	Females	Males
15-19	2.13	2.29	2.76	1.83	1.68	2.48	1.67	2.05
20-24	4.26	3.13	4.67	3.71	3.32	3.09	2.1	2.36
25-29	4.85	3.72	6.56	4.48	5.9	4.13	2.66	3.62
30-34	6.47	5.25	9.11	8.45	6.99	7.16	4.73	5.23
35-39	4.89	6.34	9.02	9.26	8.97	8.4	6.78	7.11
40-44	7.21	10.07	10.94	13.01	11.08	12.28	6.83	9.71
45-49	7.28	9.77	10.34	14.08	10.26	14.85	5.00	10.39

Source: http://www.statcompiler.com

2. 3 Implications of Population dynamics and distribution

Implications of Changing age structure- demographic dividend and dependency ratio

One of the major consequences of the demographic transition is the transformation of the age structure. NCPD (2017) show that the youthful structure of the population aged less than 15 years has been declining while that of the working population

[10] http://www.who.int/gho/mortality_burden_disease/mortality_adult/situation_trends_text/en/.

[11] Adult mortality rate represents the probability that a 15 year old person will die before reaching his/her 60th birthday, if subject to age-specific mortality rates between those ages for the specified year.

aged 15-59 has been increasing. Between 1969 and 2016 the proportion of the population aged less than 15 years declined from 46.3 percent to 41 percent while that for the proportion in the working age groups 15-59 increased from 46.3 percent to 53 percent. The population aged less than 15 years is projected to decline further by 2050 to 27.5 percent while the working age population will increase to 61 percent. This transformation progresses in stages starting with a reduction in the proportion of the children aged less than 15 years accompanied by an increase in the proportion of the youth aged 15 to 24 eventually resulting in the increase in the proportion of the working age population (15-64 years) and a reduction in the dependency burden. Such a structure is considered potentially advantageous to economic development and is referred to as 'demographic dividend' or 'demographic window of opportunity'. Table 2.5 summarizes key aspects of age structure based on the Kenya Household and Budget survey 2015/16 and indicators of the dependency ratio.

Table 2.5: Summary of Population by Broad Age groups 2015/16

	Number in thousands	Percent of total
Population by broad Age groups		
Child population age 0-14	18,636.50	41
Child population 0-19	23,652.30	52
Working age population 15-64	24,135.70	53
Working age population 20-59	19,119.90	42
Adult population 65+	1737.8	4
Adult population 60+	2557.5	6
Total population	45,329.70	
Derived measures of age structure		
Dependency ratio 1 (child pop <15 and adult pop 65+)/ pop 15-64		84
Dependency ratio 2 (child pop <20 and pop 60+) /pop 20-59		137

Source KNBS 2018. Kenya Household and Budget Survey 2015/16

The ratio of the working-age population relative to the non-working-age population is called the age-dependency ratio. The ratio is expressed as the number of dependents per 100 people of working age. The dependency ratio summarizes the effect of changes in age distribution and can be used as a proxy indicator of the economic burden and responsibility borne by the working-age population. Age-dependency ratios of 100 and above are undesirable. The traditional measure of dependency ratio 1 which considers child population to be under 15 while the elderly population to be age 65 and above. Dependency ratio 2 considers child population to be 0-19 and elderly to be age 60 and above. The second measure considers that with increased schooling among children and tendency to enter into the job market to be later together with retirement at age 60 increases the number of dependents to the working population. Thus the dependency ratio 1 declined from 94 per 100 working persons in 2009 to about 84 in 2016. But consideration of the dependency ratio 2 shows that the burden to the working population is still very high.

Both dependency ratio 1 and 2 are only potential but do not take into account the persons unemployed in the working age group. Using the household budget survey,

there were 20,374,300 persons in age group 15-64 but only 17, 875,800 reported to be employed indicating that 1,435,800 were unemployed within the same age group. Taking into account the persons unemployed in the working age, the dependency ratio becomes 122 per 100 working persons which is much higher that the computed potential of 84 per 100.

Changing mortality rates and health

Not only are more people surviving to age 60, but are also living longer into old age as well. This has created structural changes in disease patterns that are concomitant with the transformation in the age pattern of morbidity and mortality. Figure 2.3 shows the changes in life expectancy at age 60 for males and females separately. The life expectancy for males have increased by 2.2 years while that for females by 2.5 years since the turn of the century. The increased longevity for males and females has been associated with the growing influence of non communicable diseases in disease burden. The increasing disease burdens from NCDs in Kenya, even as the country grapples with continued burdens of infectious, maternal, perinatal and nutritional causes of illness and death, presents challenges in priority setting, resource allocation for health and the provision of universal health coverage.

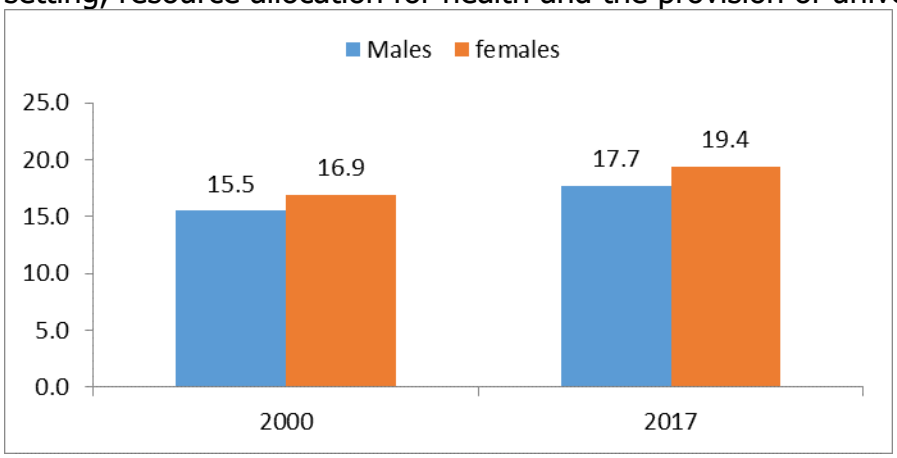

Figure 2.3: Trends in life expectancy at age 60 by sex

Household size, composition and living arrangements and implications on social protection

Another effect of population dynamics and changing distribution is in the household size, composition and living arrangements. According to UNDESA (2017a), the average household size now stands and 3.9 persons at 2014, having declined from an average of 5.3 in 1969. The average number of children per household among households with children is 2.6. The proportion of households with children under age 15 is 66 percent; however the proportion of households with an adult member age 60 and above is only 19 percent. About 11 percent of households have both children under age 15 as well as adults age 60 and above. The proportion of persons age 60 and above living alone has increased from 7 percent in 1969 to about 13 percent in 2014 while those who are over 80 increased from 10 to 17 over the same period (UNDESA, 2017b). About 16 percent of women and 10 percent of males age 60 and above are more likely to be living alone. The living arrangements have implications for social protection especially health, access to adequate food and nutrition and self care for elderly persons.

Changing Land holding and implications

The rapid increase of the population has led to the fragmentation of the land to smaller land holdings and over exploitation of land and other natural resources as the population density in these areas continues to increase (AFIDEP and PAI, 2012). This has led to very high land inequality in Kenya with a Gini coefficient of 0.55. The intergenerational subdivision of land also constrains the options of rural youth entering the labor force. Yamano et al., (2009) indicated that roughly a quarter of young men and women born in rural areas start their families without inheriting any land from their parents, forcing them to either commit themselves to off-farm employment including migration or to renting land. Oyvat and Mwangi wa Gĩthĩnji, (2017) have shown that higher land inequality in rural household leads to increase the probability of rural to rural migration and to rural to urban migration especially smaller cities or towns and four largest urban areas - specifically Mombasa, Kisumu, Nakuru, Eldoret and suburban Nairobi.

Urbanization and socio economic transformation

The process of urbanization is one of the most significant global social trends of the twenty-first century. Urbanization is part of demographic transition and the structural transformation of a society –which is a major determinant of sustainable development. However, Kenya remains under-urbanized at present trends (World Bank 2017) but is rapidly urbanizing with new urban configurations. Large and small cities are expanding and merging to create urban settlements in the form of city urban corridors. Examples include; the Nairobi Metropolitan corridor (Thika, Juja, Ruiru, Nairobi, Athi River, Kitengela, Ongata Rongai and Tala) and Mombasa-Mtwapa-Kilifi corridor. These new configurations are spatially connected and are functionally bound by their economic and environmental linkages. The other aspect is the continued suburbanization, peri-urbanization, or urban sprawl. The reality of urbanization in Kenya is the urban expansion and dispersal spurred not only by individual preferences for a suburban lifestyle, but also due to: poor land management and lack of sound regulatory control over peri-urban areas; new land subdivisions accommodating highway and automobile expansion; and enhanced ease of mobility due to improved commuting technologies in some areas. With cities growing beyond their administrative and physical boundaries, conventional governing structures and institutions become outdated and challenging.

There are however, two schools of thought with regard to urbanization in Kenya. One school of thought contends that new forms of urban developments are results of poor land management, automobile-driven and uncontrolled growth while the other proponents view it as a choice to move outside the congested urban core where land is less expensive to suburbs where land and housing are cheaper, with low-density living often resulting in better quality of life and improved access to amenities.

The opportunity lies in the fact that the country can still leverage the benefits of urbanization for improving economic opportunities and living conditions. The Report of the Global Thematic Consultation on Population Dynamics in 2013 outlined the following as the major urbanization opportunities.

- If well managed, cities offer important opportunities for economic and social development;
- Cities have always been centres for economic development, innovation, and the arts;
- Due to higher population density in urban areas enables governments to more easily deliver essential infrastructure and services at relatively low cost per capita;
- If adjusted for income, people in urban areas tend to consume less energy per capita than in rural areas and energy savings are particularly large in the housing and transportation sector.

Policy and intervention responses

While the challenges of rapid population growth have been acknowledged, Lam (2011) noted increasing well-being despite rapid population growth worldwide and which he attributed to the combined effect of three economic and three demographic factors (cf. Kohler and Behrman, 2014).

These include:

- Market responses, such as enabling farmers to grow more food in response to higher food prices, or individuals finding substitutes for scarce resources whose prices increase in response to population pressure.
- Innovation, where population growth increases the incentives and abilities to develop new technologies and knowledge – for example the green revolution that use available resources more efficiently.
- Globalization and transnational migration net works, harnessing increased economic integration of countries through international flows of goods and capital that improves efficiency of both production and distribution.
- Urbanization, in which cities absorb significant proportion of the population growth, thereby contributing to innovation, economic growth and improvements in efficiency that helped to achieve increases in living standards despite growing populations.
- Accelerating fertility decline, causing birth rates, with some lag, to follow declining mortality rates and reducing rates of population growth.
- Investments in children and child health, that contributes to reduced fertility, improved health, increased productivity and economic growth.

Kohler and Behrman, 2014 therefore indicate that under the right circumstances, changes in population dynamics, structure and spatial distribution also provide important opportunities for sustainable development to which policy responses need to take into consideration.

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Chapter 3: Population Factors and Infrastructure Development

3.1 Introduction

A well-functioning infrastructure is essential for economic development and to quality of life across the globe[12]. Within the sustainable development goals (SDG) perspective, infrastructure appears both as an explicit goal and as an implicit means to implement and achieve other SDGs. While the importance of infrastructure for achieving rapid rates of economic growth is well recognized literature[13] other essential life course needs are not. More importantly, infrastructural investments are not only critical inputs that are used by enterprises in the production process such as transport, port facilities, electricity, and information and communications technology (ICT) but also to produce services for household consumption such as water, sanitation, social service infrastructure, telecommunications, electricity.

Several studies suggest that infrastructure is critical input to human development (Fay et al 2003; Foster and Briceño-Garmendia 2010). For example, safe water's effect on health is well documented and in developing countries like Kenya where communicable disease are still common with high intake of unsafe water, infectious diarrhea are the leading causes of infant mortality (Fink et al 2011). Waterborne illnesses can be a substantial economic burden, affecting both adult productivity and children's overall health and education. Moreover, better water and sanitation service is associated with less malnutrition and stunting (Fink, et al 2011). Improved provision of electricity has important benefits for health because vaccines and medications can be safely stored in hospitals and food can be preserved at home (Jimenez and Olson 1998). Provision of electricity to schools and homes improves literacy and primary school completion rates because students can read and study after sundown (Barnes 1988; Venkataraman 1990). Similarly, improved access to electricity lowers costs for businesses and increases investment, driving economic growth (Reinikka and Svenson 1999). Improved transportation networks enable isolated rural communities to move into commercial agriculture, thereby increasing their income, and to use health and education services some distance away (World Bank 1996). By reducing the time and money it takes to move goods, better transportation improves competitiveness, helping create more jobs and boost incomes (World Bank 2000, 2001).

According to The World Bank's *World Development Report 2009* infrastructure may be categorized as follows (Heller, 2010):

- Spatially universal infrastructure - includes services such as housing, water, sanitation, and basic social services such as education and health;
- Economically productive infrastructure, - includes energy, ICT, irrigation, ports, and transport (roads and railways), which can complement the work

[12] Global Infrastructure Outlook - Infrastructure investment needs 50 countries, 7 sectors to 2040

[13] National Infrastructure Commission, *Economic growth and demand for infrastructure services* (London, 2017). Cited in Global Infrastructure Outlook

force in manufacturing and services and facilitate employment growth in urban areas; and

- Spatially connective infrastructure, - include transport modes that connect regions within a country, or that facilitate international trade (either cross-border within a region or with global markets).

There other ways of examining the infrastructure[14] needs, but the overarching point is that a major expansion of investment in modern, clean, and efficient infrastructure will be essential to attaining the growth and sustainable development objectives. Therefore, investments in infrastructure such as transport, irrigation, energy and information and communication technology are crucial to achieving sustainable development and empowering communities. In addition, growth in productivity and income, as well as improvements in health and education outcomes require investment in infrastructure.

[14] SDG 9—Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation—is the most direct call for increased investment in sustainable infrastructure.
Implicitly, infrastructure development will also play an important role in many other SDGs:

1. SDG 1—*end poverty in all its forms everywhere*—the targets relate to access to basic services, building resilience and reducing vulnerability to climate-related extreme events, and other economic, social and environmental shocks. Good infrastructure is needed to provide this resilience, as well as for public service delivery, such as education, healthcare or access to water and energy.
2. SDG 2—*end hunger, achieve food security and improved nutrition and promote sustainable agriculture*—the targets refer to an increase in investment for rural infrastructure, which illustrates the importance of infrastructure investment, not only in urban but also in rural areas.
3. SDG 3—*ensure healthy lives and promote well-being for all at all ages*—target 3.8 focuses on access to quality essential health-care services for which the development of health centers and hospitals in urban and rural areas will be essential.
4. SDG 4—*ensure inclusive and equitable quality education and promote lifelong learning opportunities*—target 4.a demands the construction and upgrading of learning facilities.
5. SDG 5—*achieve gender equality and empower all women and girls*—target 5.4 points at the need for provision of public services and infrastructure for social protection of unpaid care and domestic work.
6. SDG 6—*ensure availability and sustainable management of water and sanitation for all*—this goal and the underlying targets focus on availability, access, and sustainable water management, all which require carefully planned infrastructure projects.
7. SDG 7—*ensure access to affordable, reliable, sustainable and modern energy for all*—targets 7a and 7b refer explicitly to the promotion of investment in and expansion of energy infrastructure.
8. SDG 11—*make cities and human settlements inclusive, safe, resilient and sustainable*—targets relating to infrastructure planning or issues such as waste management, transportation, climate change mitigation and adaptation, and resource-efficiency, require sustainable infrastructure development to reach this goal.
9. SDG 12—*ensure sustainable consumption and production patterns*—target 12.7 refers to the implementation of sustainable procurement practices and policies that will have to be reflected in the procurement of infrastructure projects as well.
10. SDG 13—*take urgent action to combat climate change and its impacts*—this goal implies that infrastructure projects have to be structured in a way that helps on the mitigation and adaptation front, as well as being explicitly developed to protect the poor and vulnerable groups of the effects of climate change.
11. SDG 17—*the means of implementation* of the SDGs and post-2015 agenda—the targets refer among others to multi-stakeholder partnerships. Public-private partnerships (PPPs) will become increasingly important as a way of delivering infrastructure.

Source: Amar Bhattacharya, Jeremy Oppenheim and Nicholas Stern 2015.

Nevertheless, with ever increasing population and other threats such as climate change requires; purposeful, smartly-designed and properly maintained infrastructure which is critical to expanding society's access to public goods, as well as productive assets and innovations that progress individual and community capacity, wellbeing, and overall national economic growth. On the other hand, failing to address infrastructure needs will not only weaken economic growth but also potentially reverse some of the positive gains previous development goals as well as compromising future SDG targets. Infrastructure underpins economic and human development, which can also have major impacts on the climate and biodiversity.

3.2 How do demographics affect infrastructure?

Heller (2010) indicates that policy makers and academic researchers have for considerable period of time neglected the importance demographic factors in shaping the agenda for infrastructure investments yet a number of demographic factors affect infrastructure investments at all levels. Population size is the most obvious factor particularly for spatially universal infrastructure. The larger the population size, the greater the need for a capacity to provide clean water and sanitation services, as well as medical care. The number of households in a population also independently influences the demand for many essential services such as water, sanitation, power, and telecommunications. The 2009 population and housing census showed that growth of households in rural areas showed massive decline(1.5 % per annum) while there was a dramatic rise in the growth rate of households in urban centers(10.8 % per annum) this creates a shortfall for housing in urban centres.

The age structure of a population also influences the demand for specific types of infrastructure. A young population implies, *ceteris paribus*, a greater demand for infrastructure related to the provision of education services (Heller, 2010). Conversely, the greater the share of those of working age, the greater the demands for infrastructure that can help facilitate the creation of jobs, including infrastructure that complements and enhances the productivity of private sector capital investments(Heller, 2010). Similarly a large elderly population calls for infrastructure conducive to their needs, such as the availability of long-term care facilities, elderly-friendly transport, and housing structures.
People's demand for infrastructure services therefore not only depends on population growth but also other demographic factors such as age structure, density and spatial distribution. Infrastructure service demand varies across the country depending on where people choose to live and where businesses are located (Heller, 2010). Some studies have also indicated that demand for most infrastructure services tends to increase with higher incomes and to reduce with higher prices (IMF, cited in Heller 2010).

Box 3.1: Age structural Changes and Infrastructure needs

High-fertility countries will feel tremendous popular pressure for new schools at all levels of the educational system. However, as the youth bulge increases due to previous high population growth rates, such countries face the prospect of continued growth in the number of potential entrants to the labor force, intensifying the pressure on governments to create an environment for the private sector conducive to job creation, including the provision of critical economic infrastructure.

As a country moves through the demographic transition—as population growth slows and people age-- the relative need for education facilities will drop and the need for infrastructure that facilitates job creation will increase. Similarly, in the later stages of the demographic transition, particularly for countries where the fertility rate has dropped significantly below replacement levels, one will observe an absolute decline in the population (particularly among the young), accompanied by a sharp decline in the share of the population in rural areas and smaller urban centers.

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ward.

Two characteristics of urbanization are particularly relevant in influencing the nature of the demand for infrastructure and the technological possibilities for satisfying that demand: the size of a city and the density of its settlement. As stated in the new Urban Agenda: "*Urbanization has helped millions escape poverty through higher levels of productivity, employment opportunities; improved quality of life via better education and health; large-scale public investment and access to improved infrastructure and services (*UN Habitat, 2016, pg 35)."

Urbanization is often associated with a shift towards manufacturing and services production, which calls for greater provision of economically productive infrastructure in addition to universal services (such as ITC, transport links, electricity). The larger the urban agglomeration, the greater the possibility for economies of scale in the provision of many kinds of infrastructure, significantly reducing the unit cost of provision, particularly relative to rural areas. Higher (or lower) densities significantly augment (or constrain) the options for more efficient infrastructure networks that embody economies of scale, particularly for infrastructure of higher quality (Foster and Briceño-Garmendia, 2010). There are several other ways in which urbanization and density affect the demand for infrastructure. Urban populations shift the consumption locus for both the domestic agricultural sector and imports, spurring demand for storage, distribution, transport and port infrastructure associated with distant agricultural production.

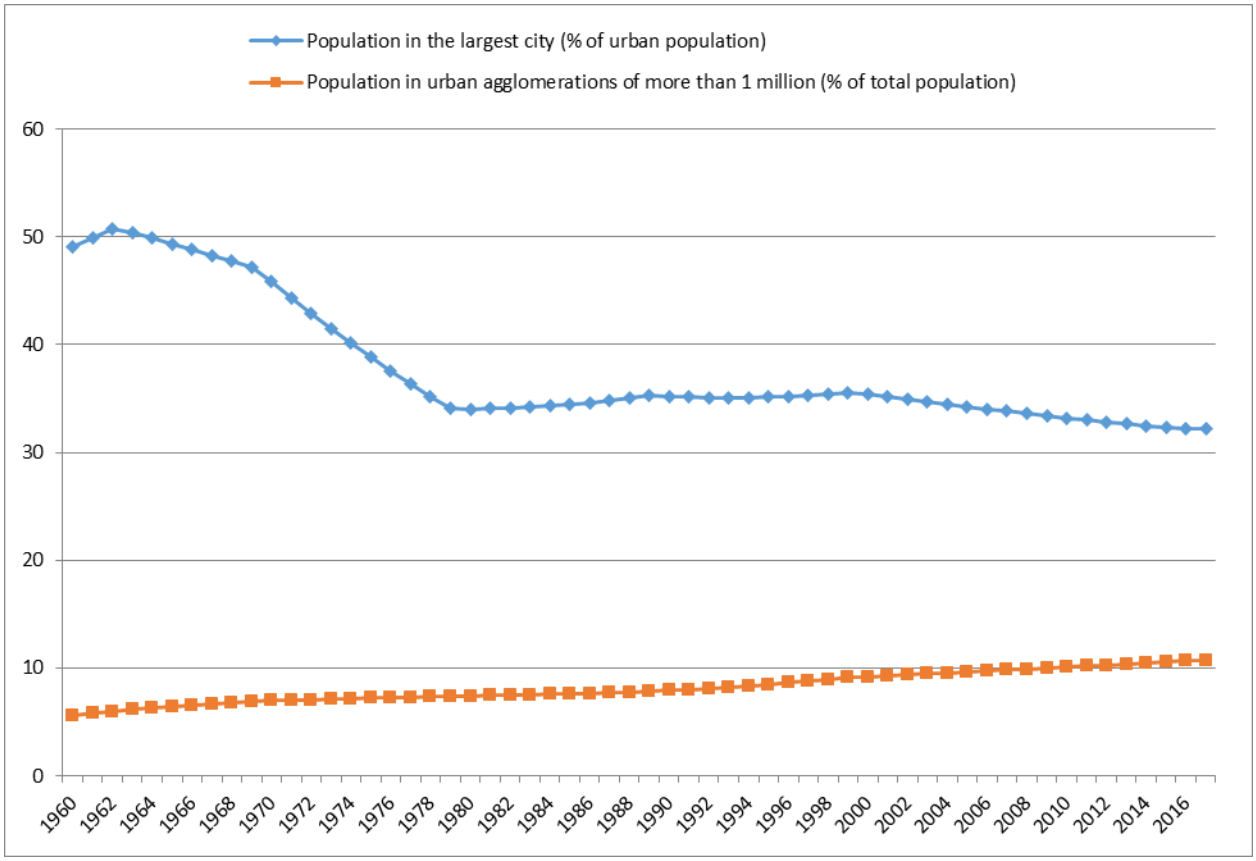

Figure 3.1: Trends in share of the population in Nairobi (largest city) to total urban population and share of population in urban agglomerations of more than 1 million to total population

Cities and urban centres are not static and their growth may imply that existing infrastructure may become inadequate and may need to be upgraded or replaced. The changing densities in urban areas as economies mature, per capita incomes rise, and land values become more expensive also influence the demand. Higher densities allow for the substitution of networked infrastructure, enabling both higher quality as well as lower unit costs.

Closely related to urbanization are migration patterns since significant migration might derive from movements from rural to urban areas. But substantial migration in or out of a country also influences population size, the number of households, and the age structure, and may positively or negatively the need for infrastructure. The connection between urbanization and migration is connected to Kuznets hypothesis who in his Nobel Prize lecture summarized the structural changes that accompany economic growth, emphasizing "*the shift away from agriculture to nonagricultural pursuits and, recently, away from industry to services*". It simply means that the idle rural population must shift from working in the agriculture to manufacturing and services sectors through increased rural to urban migration. However, one consequence of the high rate of urban population growth due rural to urban migration is the rise of unplanned settlements (squatters/slums) characterized by pressure on available basic services including housing and secure tenure, safe and

reliable water supply, sanitation, access roads, drainage and waste collection management.

Due to higher population density in urban areas, governments can easily deliver essential infrastructure and services at relatively low cost per capita. If adjusted for income, people in urban areas tend to consume less energy per capita than in rural areas and energy savings are particularly large in the housing and transportation sector the report says. No country has developed without the growth of its cities. As countries become richer, economic activity becomes more densely packed into towns, cities, and metropolises (World Bank, 2009).

3.3 How does infrastructure influence demographics?

The direction of causation between population and infrastructure demand is not necessarily one-way. It is known that the development of clean water and sewerage were significant causes of increased life expectancy. For developing countries, Fink et. al., (2011) using DHS data from over 70 countries, show that access to improved sanitation was associated with lower mortality, a lower risk of child diarorhea, and a lower risk of mild or severe stunting. Access to improved water was associated with a lower risk of diarrhea, a lower risk of mild or severe stunting. Fertility rates tend to be lower in urban areas while the availability of infrastructure might not only influence migration but ultimately influences fertility rates indirectly.

Put differently, the absence of infrastructure—adequate roads, primary health clinics, primary schools and so forth—may be an important factor underlying higher morbidity and mortality rates or lower primary school enrollment rates. Similarly, an adequate transport infrastructure, particularly in the rural areas, might facilitate access by isolated populations to both education and health facilities. There is one final dimension to the demography-infrastructure connection that is worth exploring, and this is whether the availability of infrastructure might be an independent factor influencing demographic developments. A number of relations might be posited. Does the availability of higher quality infrastructure influence migration decisions, say from rural to urban areas or even from low-income to high-income countries? Some countries, notably China, have actively sought to develop cities, with the expectation that the availability of jobs would induce rural to urban migration.

Future infrastructure provision and usage is unlikely to have such significant effects on the overall population level, nor the age distribution, but it has potentially more significant effects on location decisions. Because, people's location choices are affected by a range of factors, especially access to jobs and housing prices and availability. Other important factors include access to amenities and facilities in addition to the fact that people's location choices change with age (effect of changing age distributions).

Implications of changing fertility, age structure and spatial distribution

Figure 3.2 shows trends in the number of primary and secondary schools since 2008. The growth in number of primary schools typically reflect the past rapid population growth fueled by high birth rates. Since 2008, growth of both primary and secondary

schools show linear increase for every year increase. Trends in the growth of secondary schools reflect the fact that optimal enrollment in secondary schools has not been met and only about 50 percent of secondary school going population actually enroll.

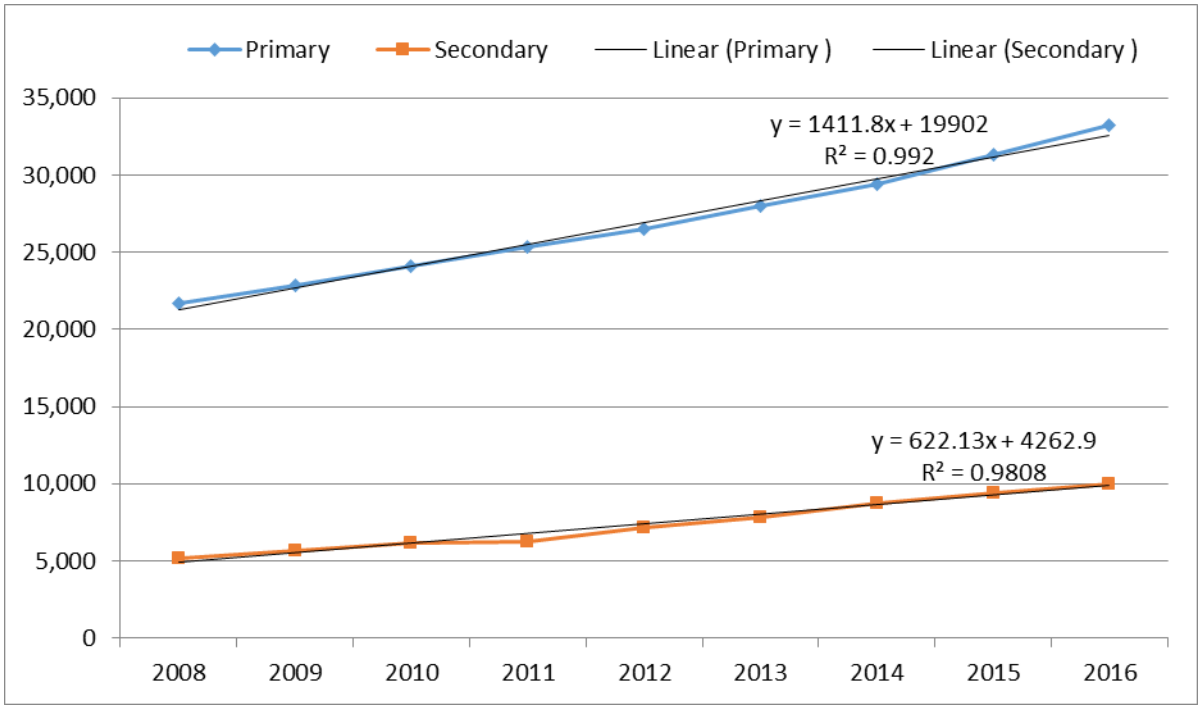

Figure 3.2: Trends in growth in the number of primary and secondary schools 2008-2016

The trends in average primary and secondary school sizes are presented in Figure 3.3. Primary school sizes have been linearly declining but the change in average secondary school sizes has been erratic. There remains the challenge of providing infrastructure to meet the needs of a rapidly growing population. The trend data may reflect current demographic trends - there will be need for more secondary schools while for primary schools may need for not only improvements in the current schools but also infrastructure that provide quality education and basic services such as water sanitation and electricity.

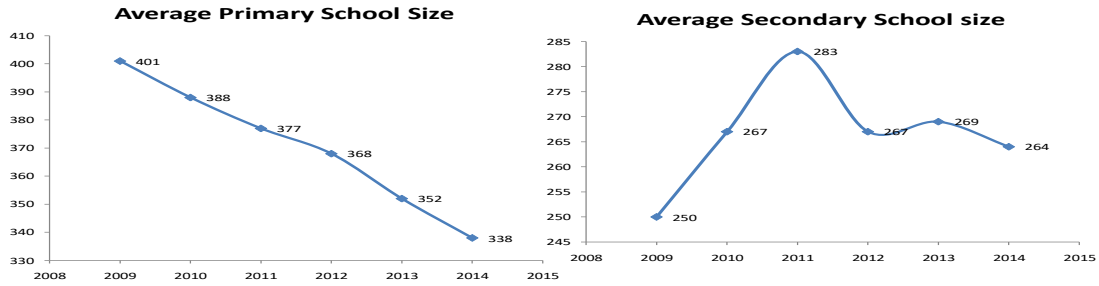

Figure 3.3: Trends in average primary and secondary school sizes

Access to electricity and clean fuels and technologies for cooking

The SDG goal relevant for lighting and fuel within homes is SDG 7.1: "ensure access to affordable, reliable, sustainable and modern energy for all. At the current levels (see Figure 3.4) the progress towards universal access is still very low and requires massive investments associated with of installing generating capacity and associated transmission and distribution infrastructure. Previous studies into the cost of providing universal electricity access have identified a minimum level of electricity usage per person or per household, although there is no commonly agreed minimum level for the universal access condition to be met. The Oxford Group estimates that the total electricity investment need for Kenya for 2016 to 2030 will increase from 1.4 percent to 6.8 percent of GDP.

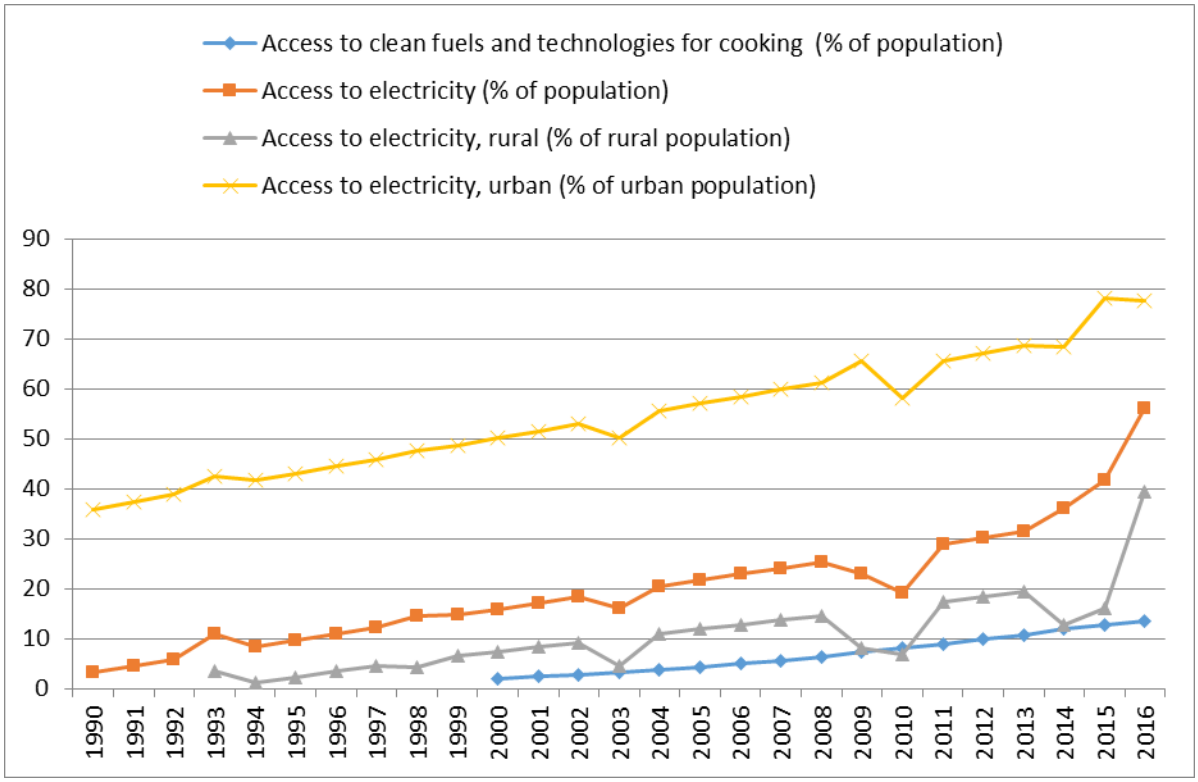

Figure 3.4: Trends in proportion of the population with access to electricity, clean fuels and technologies for cooking

Access to clean fuels and technologies is still very low. More than 75 percent of the Kenyan population lives in the rural areas, with agriculture as their main occupation. Fuel wood is the principal farm-based source of energy but is often in short supply and 90 percent of the rural population is dependent on firewood, followed by petroleum with 22 percent, electricity 9 percent and others with 1 percent. Rural households consume on average 11.77 kg wood per day or 4.3 tons per year. Urban households predominantly cook on charcoal and use 742 kg of it per year. This scenario therefore calls to development of alternative sources such as use of biogas in rural areas.

Water and Sanitation

Among the SDG targets on water and sanitation, two targets are most directly linked to investment in infrastructure. First, SDG 6.1 which states that: "By 2030, achieve universal and equitable access to safe and affordable drinking water for all" measured by the "proportion of population using safely managed drinking water services". Secondly, SDG 6.2 which states that: "By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations" measured by the "proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water".

Figures 3.5 to 3.7 show trends in the proportion of the population with access to water and sanitation services. Since 1990, there has been little change in the share of the population with access to flush toilets or piped water. The proportion of the

population with access to basic drinking water services in urban Kenya has been declining since 2000 but a slight increase for those living in the rural areas.

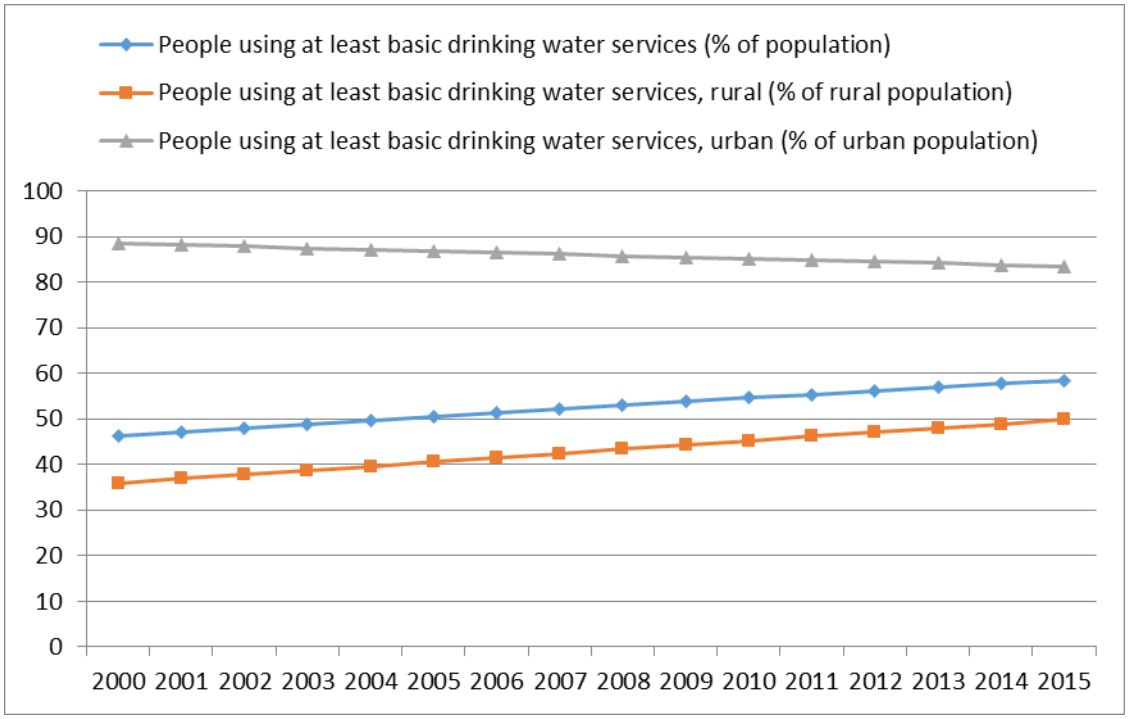

Figure 3.5: Trends in Proportion of the population with access to basic water services

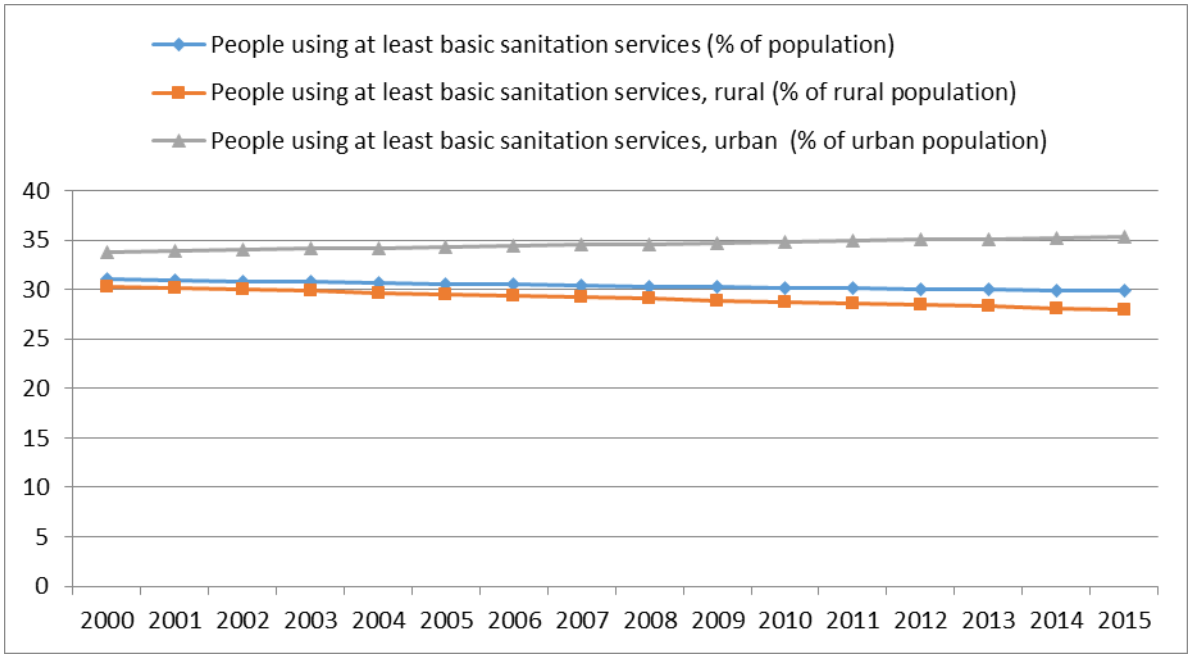

Figure 3.6: Trends in Proportion of the population with access to basic sanitation services

Access to basic sanitation whether in rural or urban areas has remained low and stagnated since 2000. The implication is that given rapid growth in the urban areas, demand for sanitation services need to be rapidly improved in order to ascertain better health care for the population. The shortfall is also shown to be declining

proportion of the population using safely managed drinking water services in the urban areas.

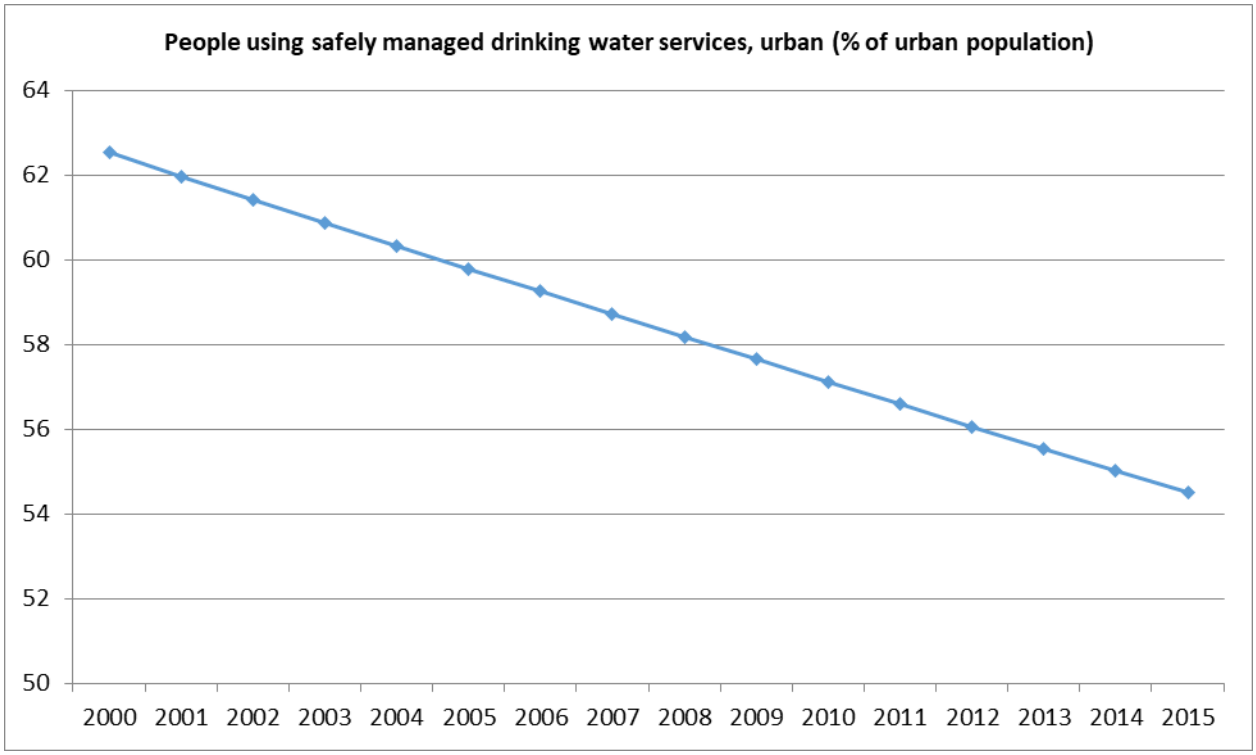

Figure 3.7: Trends in proportion of the population using safely managed water services in urban centres

The population covered by improved water supply has not expanded in recent years. Indeed, it has declined in urban areas (see figure 3.7). Rural populations continue to rely on surface water, while boreholes are the principal improved source but access to piped water and standposts is very low. One important infrastructure requirement not explicitly estimated in the investment costs is water storage capacity, which is required to reach water security.

Role of urbanization in infrastructure needs

Kenya will begin to experience significant urbanization, and with the bulk of the urban population likely to be dominated by those of working age. Figure 3.8 shows growth in population in urban agglomerations with 1 million and above population. Trend data suggest that population in these spatial areas will grow by almost 8.3 per 1000 relative to total population. This suggests the relatively greater importance of providing economic infrastructure—power, telecommunication, and transport— to facilitate increased private investments in services and manufacturing, rather than responding to the need for spatially universal services infrastructure.

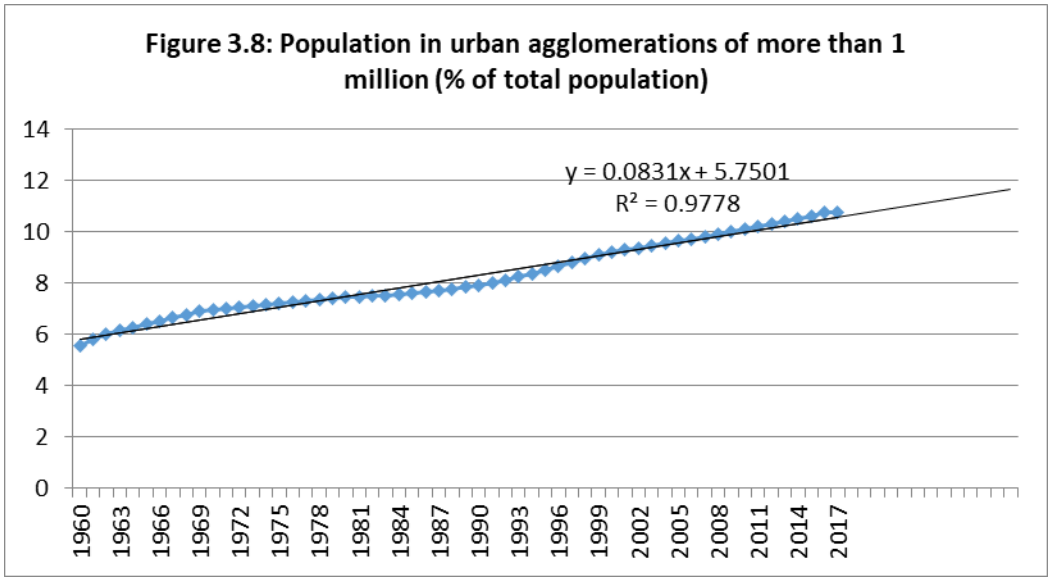

Figure 3.8: Trends in Population in urban agglomerations of more than 1 million (% of total population)

The Kenyan urban centers are not currently able to meet the rapidly growing demands for infrastructure and services due to poor management and limited investment (World Bank 2017)**.** Rapid urbanization has left Kenyan cities with huge unmet demand for critical infrastructure and basic services, which has constrained the productivity of businesses and negatively impacted the quality of life of residents (World Bank 2017). The quality of urban infrastructure is very critical to the relationship between urban concentration and economic growth. It has been suggested that large agglomerations in developing countries today, might face Malthusian *trap.* This implies that if population growth in these agglomerations exceeds the supply of resources including urban infrastructure then this may lead to congestion costs exceeding the benefits from agglomeration. It therefore implies that for large agglomerations, investments in urban infrastructure are fundamental (Jedwab et al. 2014). The improved access to basic services is not just desirable per se in terms of quality of life for urban residents but also in terms of capital accumulation as well as in terms of economic efficiency at national level. Guaranteeing adequate urban infrastructure in these large cities to keep pace with their rapid increase in population not only improves living conditions but can also induce a transition away from Malthusian dynamics (Castells-Quintana 2015). The higher urbanization rate may entail higher per capita infrastructure costs, mostly reflecting the demand for higher quality offsetting the savings from economies of scale associated with higher-density settlements.

Implications for rural infrastructure

Figure 3.9 shows trends in rural population growth, indicating substantial expected change. The growth rate suggests need for not only universal services infrastructure (such as water and sanitation) but also spatially connective transport infrastructure. Rural infrastructure will be needed both to address dramatic existing deficiencies as well as to respond to the growth in the absolute size of the rural population. For the rapidly growing population, connective transport infrastructure will be important in

order to allow rural areas to export their agricultural produce to urban centers at low cost.

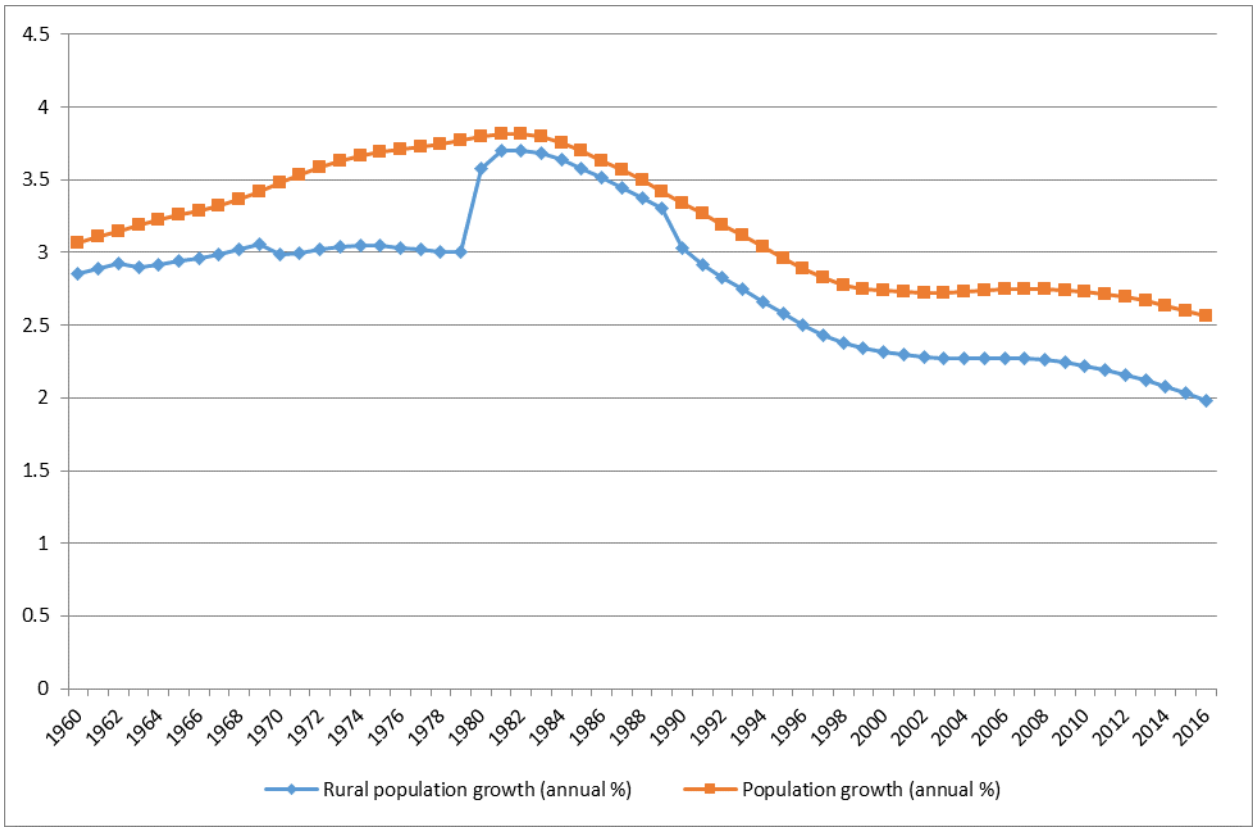

Figure 3.9 Trends in rural population and national population growth rates.

3.4 Policy implications

The role of infrastructure in human development is critical for success on development interventions and in addition to the fact that provision of infrastructure services is an expensive undertaking it is important for policy makers to think of what answers to provide for the following questions:

- What infrastructure is needed for a country to become competitive or to maintain competitiveness?
- What infrastructure is required to restructure modes of energy generation or to adjust to higher future carbon prices?
- How should water infrastructure needs be prioritized, particularly in view of the impact of climate change on general water availability?
- What policies are needed to render infrastructure both affordable and profitable in the context of still sizeable low-income populations?

Answers to these questions would require not only economic responses but also responding to the issue of demographic factors especially on the need to provide basic infrastructural services. The population dynamics in Kenya have implications for infrastructure. It requires considerations on fertility transition, the changing age

distributions and the associated events such as increased urbanization. The continued youth bulge necessitates finding resources that might go into investments that could spur growth amidst continued need for spatially universal infrastructure. Similarly there is need for policy scenarios to be sensitive to the precise nature of the rural-urban migration process. Does it largely reflect movements from rural to small cities, rather than simply a more direct migration to the capital city? Movements to small cities may imply the need to provide new infrastructure for small cities, rather than to expand existing infrastructure networks. At the same time, the provision of urban infrastructure and the greater availability of urban amenities might itself induce further large scale in-migration to urban areas. The Urban Areas and Cities Act (UACA) (2011, amended in (2016) only partially addresses this urban governance deficit. The National Urban Development Policy (NUDP) approved by the Cabinet in 2016, intends to contribute towards the realization of the broader development goals articulated in Vision 2030 by addressing the key challenge of urban development. This requires greater consideration of population factors in the planning and articulating the desired infrastructure needs.

3.5 Conclusion

Population dynamics including age structure and spatial distribution matter in the provision of infrastructure because the SDG as well as the population and development framework are enshrined as a minimum set of welfare targets. With pace of growth of population size, the country must be prepared to provide a basic network of water, sanitation and social services. The pace of urbanization implies the need to accommodate this population movement and provide such services in places where they have hitherto not been provided. It will also require investments to fill the outstanding backlog of infrastructure facilities. This chapter of the report has also argued that beyond universal services infrastructure, the shifting age structure of the population, particularly the rising number of working age people, will require the country to provide economic infrastructure that can attract private sector investments and facilitate the creation of jobs. Urbanization will not only require the creation of jobs in urban centers but also necessitate the availability of infrastructure to exploit the production potential of rural areas in the agricultural and forestry sectors.

Using demographic projections, Heller (2010) recommends that policymakers need to consider population trends as they make choices about infrastructure investment. As demographic conditions continue to change, so too will infrastructure needs, necessitating careful monitoring of the connection between the two in order to achieve maximum benefits from their investments. In doing so, there will be need to leverage technology and data analytics. Information technologies and data analytics should not only be used to operate cities more efficiently and sustainably, but also to help advance master planning. Designs for climate resilience, for example, can take into account projections for rainfall, tides, temperature and population in order to prepare for changing needs, vulnerabilities and opportunities.

A general weakness of most quantitative models of infrastructure demand tends to treat the population as a purely external driver of demand. This seems a reasonable assumption for the total population and its age structure in future, although historically infrastructure played a significant role in increases in life expectancy. However, location decisions are potentially more complex. Transport infrastructure in particular is a determinant of where people choose to live, with people generally preferring to live near to transport hubs.

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Chapter 4: Implications of population factors in the attainment of Universal Health Coverage

4.1 Introduction

Health is a key driver of poverty reduction and vice versa and the systems put in place to deal with illness, determine health outcomes. Good health in turn is a complex state and achieving it requires an integrated range of preventive strategies. In response to 67th session of the United Nations General Assembly[15], Kenya embraced the goal of universal health coverage (UHC) whose aim is to provide health care and financial protection to all people. This goal of UHC makes it a critical component of the Sustainable Development Goals (SDGs) which include a specific health goal: "ensure healthy lives and promote wellbeing for all at all ages'. Available evidence indicates that supporting the right to health and ending extreme poverty can both be pursued through universal health coverage. The government of Kenya in line with Article 43 of the Kenya constitution currently pursues universal health coverage in order to reduce disparities in service utilization and access across socioeconomic classes by 2022.

4.4 Health Situation

Worldwide many countries are experiencing the structural changes in disease patterns that are concomitant with the transformation in the age pattern of morbidity and mortality. Despite these global trends, there is considerable diversity within countries both in levels of life expectancy and in the trajectories of mortality at different ages. Globalization of unhealthy lifestales has changed disease burden in a number of countries which had predominatly comunicable infectious diseases such as Kenya. These diseases are related to new life styles that are a reflection of modern life, as well as deaths and disabilities caused by violence. Aggregate improvements mask growing inequalities within countries, with far too many countries including Kenya exhibiting progress among households in the upper wealth quintiles, while progress is flat or marginal among poor households, and also falls short for marginalized and disadvantaged groups.

Disease burden

Although the global health burden shifted towards non-communicable diseases and injuries but in Kenya, communicable, maternal, nutritional and neonatal conditions have persisted. According to the Institute for health metrics and evaluation (2016), the leading causes of premature deaths in Kenya are communicable diseases. HIV/AIDS currently causes most premature deaths and disability combined closely followed by; diarrheal diseases, lower respiratory infections, neonatal disorders, tuberculosis and malaria. The leading cause of facility-based morbidity in 2016 according to Kenya Economic Survey (2017) were the diseases of the respiratory system including pneumonia (42.2%), malaria (16%), diseases of the skin (8.6%)

[15] United Nations General Assembly 2012A/67/L.3 A/67/L.36

and diarrheal (5.7%). Figures 4.1 and 4.2 highlight the main causes of death among children and adults respectively.

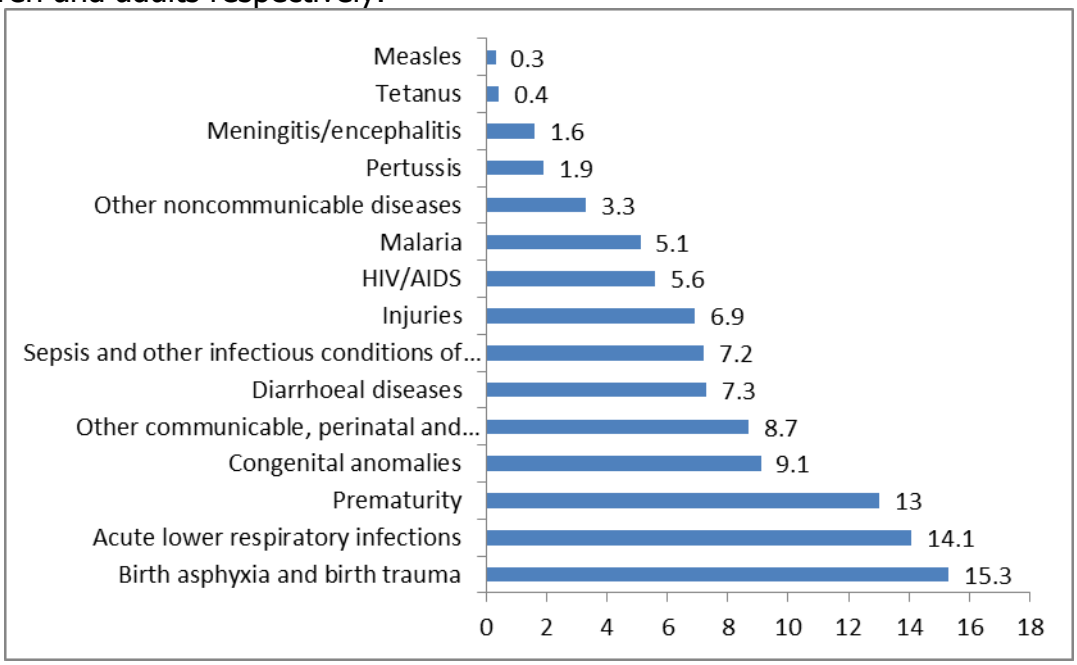

Figure 4.1: Leading causes of death in children under age 5 years
Source: http://www.who.int/gho/mortality_burden_disease/en/index.html

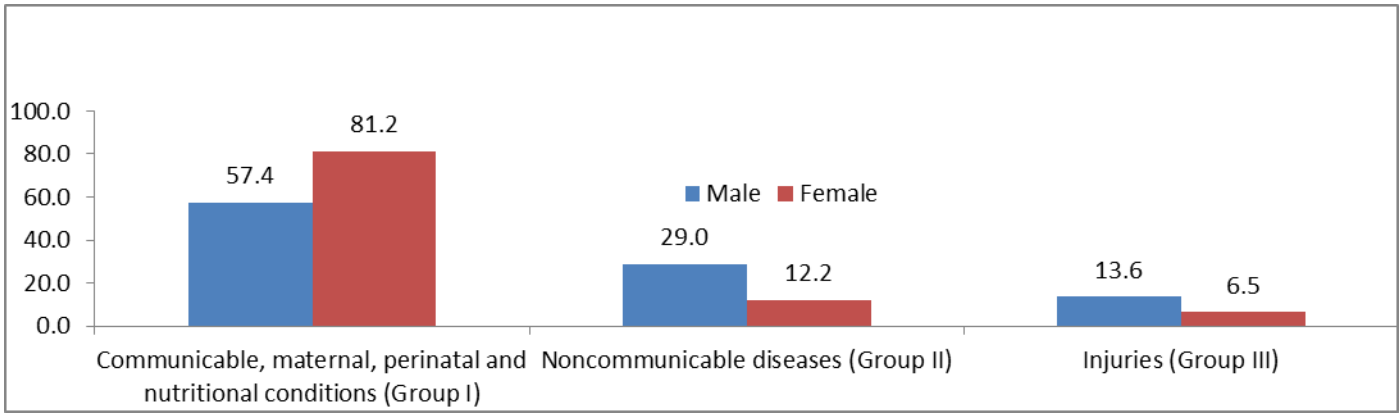

Figure 4.2: Contribution to DALYS by broad causes of premature death and disability
Source: http://www.who.int/gho/mortality_burden_disease/en/index.html

The data from the STEPS 2015 show high prevalence of overweight and obesity reaching epidemic proportions especially among women. Currently, 38 percent of the women age 15-69 in Kenya are either overweight or obese compared to 18 percent among men in same age group. The geographic differentials are wide with nearly 45 percent of women in counties in the central region and cities overweight or obese compared to 15 percent in counties in the arid regions. The survey further reveals that raised blood pressure (>=140/90 mm Hg) affects almost a quarter (23%) of the adults in Kenya but just under 20 percent had been diagnosed. Further, the proportion of the population with hypertension that has been identified and put on antihypertensive treatment and whose blood pressure was controlled was only 4 percent. Among adults age 18-69 years, 22.7 percent either had raised blood pressure (systole>140 mm Hg or diastole>90 mm Hg) or were already on

treatment for hypertension. Prevalence of diabetes among adults 15-69 years was 1.9 percent but only 41 percent had been diagnosed. Effective treatment coverage for diabetes, defined as the proportion of the population that had diabetes mellitus and that were diagnosed and put on diabetes treatment and whose diabetes was controlled was 7 percent. Cervical cancer screening rates are low throughout Kenya with only 14.2 percent women 25-49 years (ever) screened. Only Nairobi and Central Province had cervical cancer screening coverage higher than 20 percent.

Health service utilization

According to Kenya household health expenditure and utilisation survey (2013), public health facilities accounted for 66.7 percent and 44.1 percent of total outpatient care visits in rural and urban areas respectively, as compared to Faith based health facilities at 12.4 percent and 29.1 percent of the total outpatient visits in urban and rural areas, respectively(Ministry of Health, 2014). Private hospitals accounted for 13.0 percent of outpatient visits in urban areas and only 3.5 percent in rural areas.

Based on self-reported illness, at any given time, about twenty percent (19.3%) of the Kenya population is with some sickness and therefore require health services. These requirements vary by sex and age (Table 4.1). The reported illness rate reveals a high incidence of illness for the 0–4 age group, 55 years and older, and among females. However, according to Kenya Integrated Household Budget Survey of 2015/2016, only 55.5 percent of ailing population visits health worker for diagnosis. Reasons for not seeking treatment despite feeling unwell vary but self medication and high cost of care feature prominently (Table 4.2).

Table 4.1: The Population Distribution and individuals reporting illness by Age and Sex, 2013

		Population Distribution (%)	Individuals Reporting Illness (%)	Annual Number of Visits Per Capita by Age Group
Sex	Male	49.5	17.0	N/a
	Female	50.5	21.5	N/A
Age	0–4	13.5	28.7	7.6
	5–14	28.2	15.5	2.9
	15–24	19.6	12.5	2.6
	25–34	14.9	16.1	2.6
	35–44	10.0	20.8	2.6
	45–54	6.3	24.4	2.6
	55–64	3.7	29.7	3.6
	65+	3.7	38.6	4.6
	Total	100	19.3	
	Number	38,620,391	38,620,391	

Source: Ministry of Health, Kenya Household Health Expenditure and Utilisation Survey (2013)

Table 4.2: Reasons for Not Seeking Treatment despite Reporting Illness Reasons

Reason	2003 (%)	2007 (%)	2013 (%)
Illness not considered serious enough	0	0	39.3
Self-medication	37.2	34.5	30.7
High cost of care	39.4	37.7	21.4
Long distance to provider	16.4	11.2	1.8
Poor quality service	1.7	0.5	0.5
Religious/cultural reasons	1.2	3.1	0.1
Fear of discovering serious illness	1.2	0.2	0
Other reasons	3	12.8	6.2
Total	100	100	100

Source: Ministry of Health, Kenya Household Health Expenditure and Utilisation Survey (2013)

Health financing

Health services in Kenya are financed by government (public), the national and private health insurances, employer schemes, community based health financing (CBHF) schemes, households (out of pocket expenses), development partners and non-governmental Organizations (NGOs). Table 4.3 shows current health care spending (about 187 U$ per capita) which has increased by about 2 percent per annum since 1995. Government contribution has been about 31 percent of the national budget. Out-of-pocket (measure of potential inequities in health financing) average 30 percent, while spending from development assistance is about 26 percent and Health insurance 13 percent. The government contribution has been far below the commitment under the Abuja declaration (2001) to spend 15 percent of national budget.

Table 4.3: Health spending in Kenya

Indicator	value
Total health spending per capita(US dollars)	187 US dollars
Total health spending as a share of gross domestic product (%)	5.8 %
Government health spending as a share of total health spending (%)	30.6%
Prepaid private spending as a share of total health spending (%)	12.9 %
Out-of-pocket spending as a share of total health spending (%)	30.0%
Development assistance for health as a share of total health spending (%)	26.4 %
Annualised rate of change in total health spending per capita, 1995–2015 (%)	2.1%

Source: Global Burden of Disease Health Financing Collaborator Network 2018. Lancet 391: 1799–829

Healthcare insurance coverage in Kenya remains low but improving. In 2017 it was 19 percent compared to 17.1 percent in 2013 and 10 percent in 2003, and vary with wealth status. The population in the richest wealth quintile at 41.5 percent coverage compared to 2.9 percent in the poorest quintile (Ministry of Health, 2014). Health insurance coverage is mainly through the government mandatory insurance scheme; the National Hospital Insurance Fund (NHIF) which is compulsory for the formal employment sector and voluntary for the informal sector. In 2013, NHIF covered 88.4 percent of those insured while private insurance covered 9.4 percent and community-based insurance 1.3 percent.

Health insurance enhances access to healthcare. Ministry of Health (2014) survey found a higher utilisation of inpatient services (76 admissions per 1,000 population) for the insured compared with the uninsured (30 admissions per 1,000 population). In the absence of adequate insurance coverage therefore, illness will both reduce the well-being of individuals and increase the risk of financial hardship and impoverishment due to high healthcare costs. Other studies have also found inverse association between the income level and the use of hospitalization (Schifano *et al.*, 2009).

4.5 Universal health Coverage (UHC)

Defining UHC

Broadly, UHC means all people receiving the health services they need, including health initiatives designed to promote better health, prevent illness and to provide treatment, rehabilitation, and palliative care of sufficient quality to be effective while at the same time ensuring that the use of these services does not expose the user to financial hardship (WHO 2010). There are two main components of
UHC: quality, essential health service coverage and financial coverage – both extended to the whole population. These two components are often presented in three dimensions; namely effective health services, finance, and population and typically represented in what has come to be known as the coverage cube (Figure 4.3).

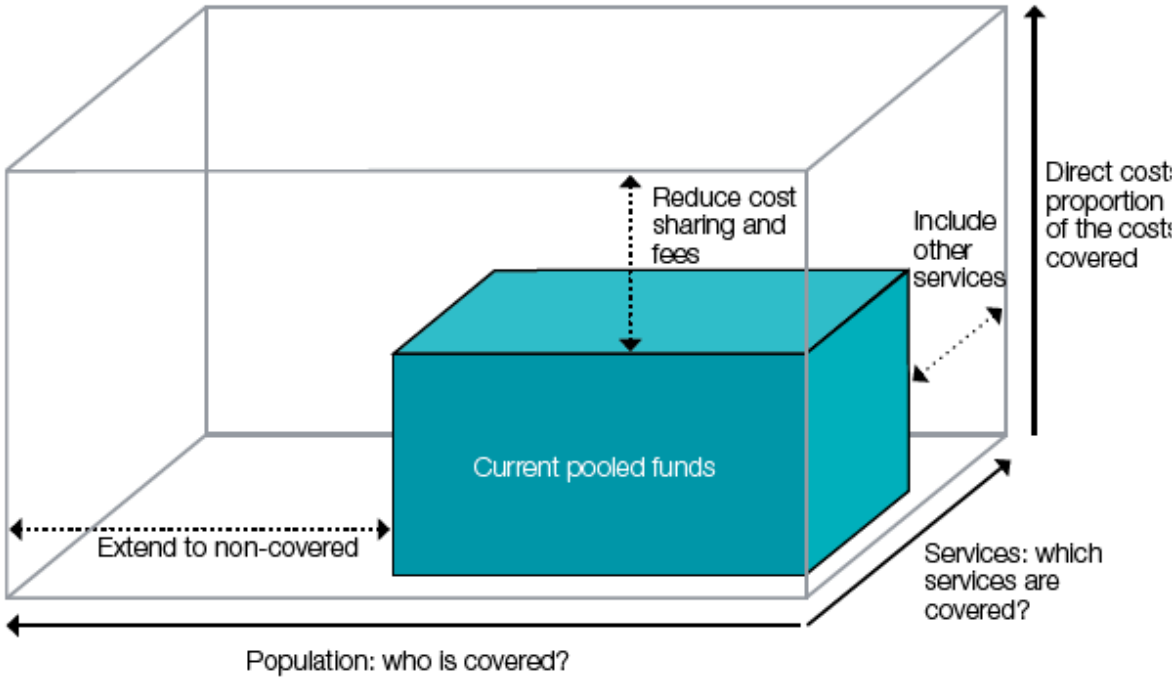

Figure 4.3: The three dimensions of UHC

The path to attainment of UHC is sometimes referred to as a journey rather than a destination because the dynamic process that must be responsive to constantly changing demographics, epidemiological and technological trends. UHC requires an efficient health system that provides the entire population with access to good quality services, health workers, medicines and technologies. It also requires a financing system to protect people from financial hardship and impoverishment from health care costs. The main goal is to provide financial protection against the risks associated with having to pay for healthcare through out-of-pocket payments. The Kenya government health policy has prioritized contributory financing strategy (social health insurance) as the main financing mechanism for UHC. Planning for sustainable access to good quality services is not possible without understanding the health needs of the country which are determined by population factors of population growth and distribution.

Indicators for Measuring UHC

It was not until July 2017 that the United Nations General Assembly (UNGA) adopted two specific indicators SDGs for measuring UHC. The indicator 3.8.1 captures the population coverage dimension of UHC. This indicator implies that everyone irrespective of their living standards should receive the health services they need. The second indicator 3.8.2 captures the financial protection dimension of UHC. It implies that use of health services should not lead to financial hardship. WHO and the World Bank have developed a single metric which combines tracer indicators of health service coverage[16] to summarize coverage of essential health services for

[16] The tracer health service indicators are eight core indicators that include: 1) reproductive and newborn health (family planning, antenatal care, skilled birth attendance); 2) child immunization (three doses of diphtheria, tetanus and pertussis (DTP)-containing vaccine);3) infectious disease (antiretroviral therapy (ART),

each county. Figure 4.4 shows the single composite indicator SDG- indicator 3.8.1 also referred to as Service coverage index for the latest period (2015). The UHC composite score is based on indicators for RMNCH, communicable disease control, NCD risk factors prevalence and service access. The index score for Kenya is slightly above the sub Saharan average but well below the world average. The score for Kenya implies that nearly 19.7 million Kenyans do not receive essential health services which they are in need for.

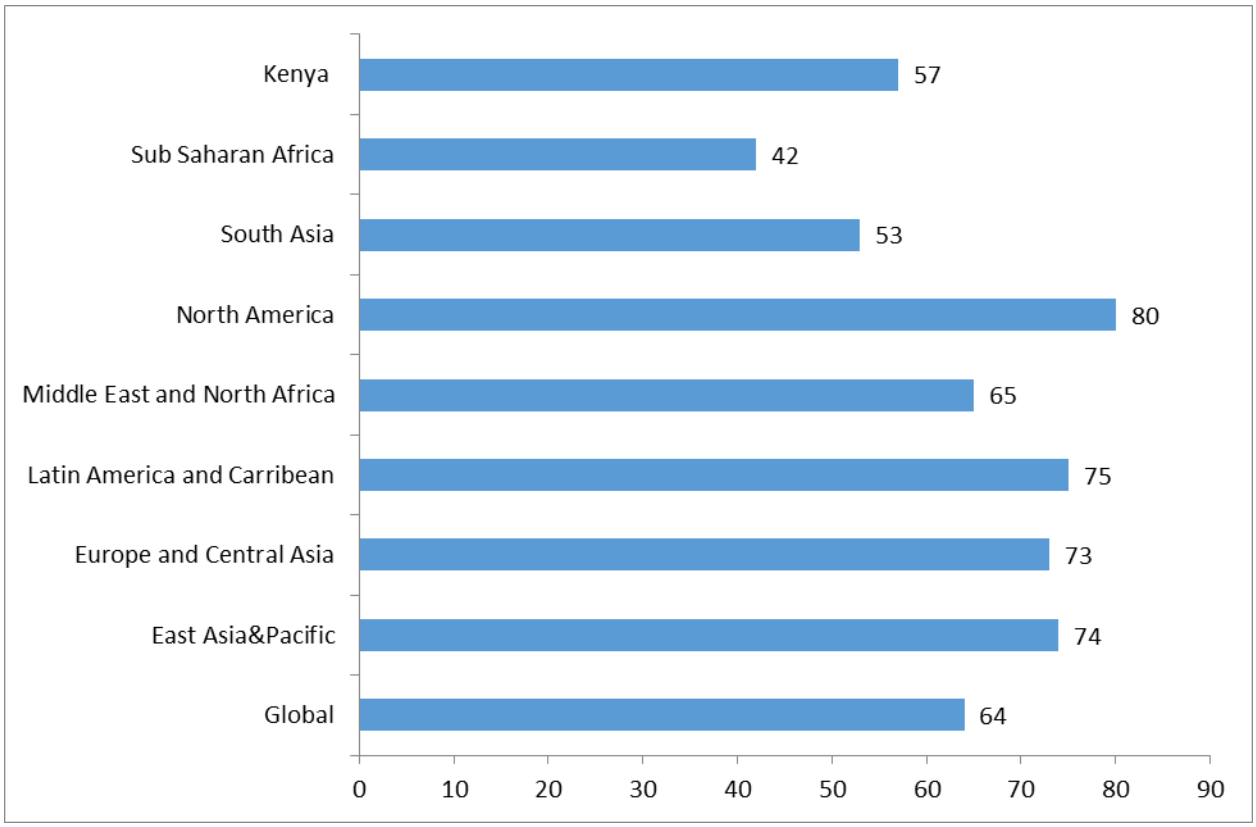

Figure 4.4 Service coverage index for UHC indicator 3.8.1, 2015
Source: WHO and World Bank 2017

The spider graph below shows that relative coverage gap for selected essential services for Kenya (Figure 4.5). The coverage gap is lowest for access to preventive basic sanitary services (almost 70 % of the population) followed by HIV treatment services. However, coverage gap for child immunization services is the lowest.

tuberculosis (TB) treatment); and 4) non-health sector determinants of health (improved water sources and improved sanitary facilities). The indicators involve health interventions from which every individual in every country should benefit – no matter what the country's level of socioeconomic development or epidemiological circumstances, and no matter what type of health system it may have – and because recent, comparable data are available for most countries.

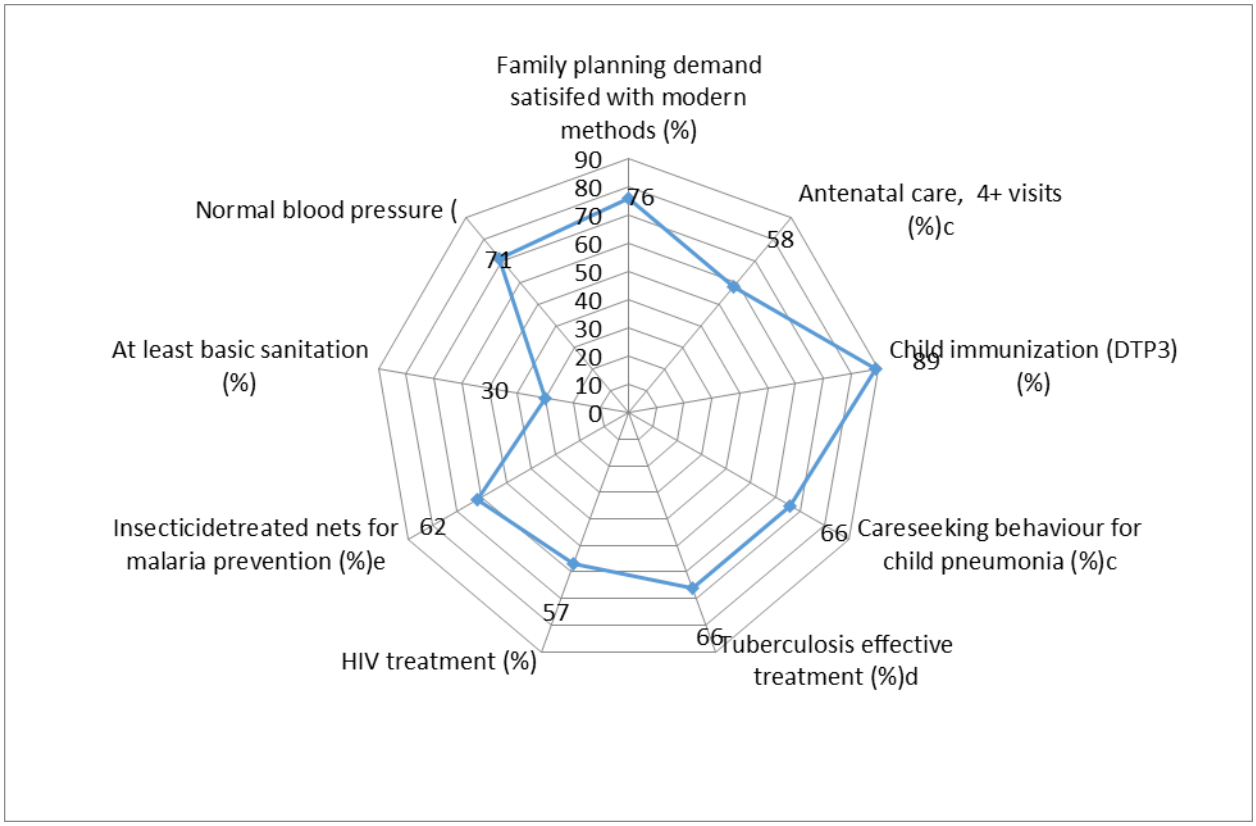

Figure 4.5: Service coverage for essential health services for Kenya

In line with the approach proposed by Wagstaff *et al* (2015); Barasa E, et. al,. (2018) computed time trends for UHC Index for Kenya by combing both financial risk protection and service coverage in a single index (see Figure 4.6). Barasa et. al., (2018) argue that the main sources of change in coverage index include increased coverage for both preventive and curative healthcare services, except for the attendance of at least four ANC visits by pregnant women. The most dramatic increase was in skilled birth attendance between 2008 and 2014.

In terms of financial risk protection, the incidence of catastrophic healthcare expenditure reduced over the study years but the poor continued to bear a disproportionate burden of catastrophic healthcare costs. Although the incidence of catastrophic healthcare expenditure reduced over the study period, but the proportion of Kenyans pushed into, or further poverty increased over the same period. They argue that the country has still a long way go to achieve UHC. Over-reliance on out of pocket expenditure exposes households to catastrophic payments and impoverishment and limits progress towards UHC.

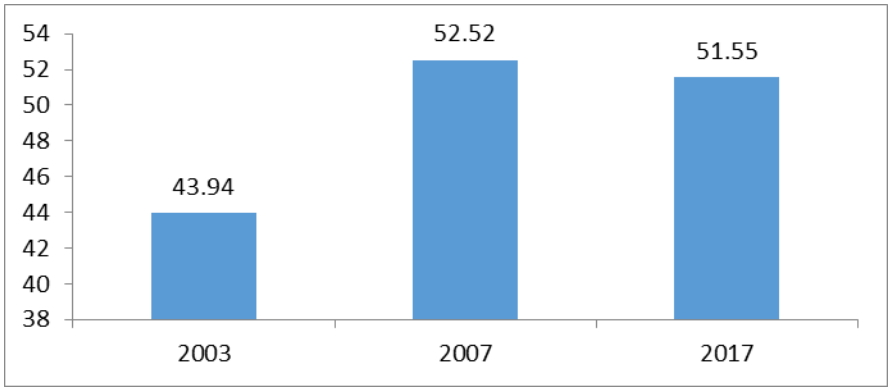

Figure 4.6: Trends in weighted UHC index for Kenya
Source: Barasa et al 2018

4.6 Population Factors

Use of healthcare services varies according to the cultural, social, economic and demographic characteristics of the person who may need care. In certain contexts, it particularly varies with age and sex of the potential user (Amente and Kebede, 2016). Risk of illness and death also vary by age and sex. In childhood, mortality rate is high only in the first year, but high frequency rates of illness are observed throughout early childhood (Butler NR, 1986). The incidence of illness falls sharply in the late childhood and youth but picks up again in the middle and old age.

According to Fogel (2003) younger people are more susceptible to communicable diseases, middle ages are more susceptible to injuries while elderly are more susceptible to non-communicable diseases. Changes in the structure of the population will therefore have a significant effect on the future of illness. Increase in the number of susceptible individuals at older ages for example will increase the overall incidence and prevalence of non-communicable diseases, thereby accelerating the epidemiological transition (change in patterns of disease). Epidemiological transition influences health systems and health financing by affecting population health needs and the type and level of services demanded, and thus the amount and distribution of funds available to pay for them. Women are more frequently ill than men and are therefore more likely to use healthcare system. However statistics show that women ultimately have lower mortality rates than men. Hing et al (1982) suggests that women have higher morbidity rates for illnesses that are rarely causes of death, while men have higher rates of diseases that are also leading causes of death. Goldenberg explains that infections show a sex-biased incidence; women are more susceptible to many infections caused by viruses, bacteria, parasites, and fungi. This is due to their biological/genetic makeup differences (Goldenberg *et al.*, 2006). Women exhibit significantly higher life expectancies while frequently experiencing disabilities earlier in life (Van Oyen *et al.*, 2013).

Alterations in age structure and composition will cause a change in the pattern of diseases and hence health needs. The rate of population growth will affect long-range planning of community health and medical facilities. Where population growth

is high but population structure does not change, proportions of health needs will remain the same but higher numbers.

Females use more health care services compared to even after correcting for the use of health care services, such as gynecology, that are specific for women (Koopmans et al, 2007). Women tend to have more minor illnesses and nonfatal chronic diseases, while men have more fatal chronic diseases and higher mortality rates (Wingard et al, 1989). Also some illness like prostate cancer and cervical cancer are known to affect one sex and not the other.
Anticipated increase in number of the elderly will emerge as an increasing challenge because increase in age is not necessarily linked to better health status - people may live longer but may also experience longer periods of ill health. The health care systems might also not be sufficiently prepared to cope with the health needs of older people. Increase in the portion of the elderly population will therefore lead to some increase in overall health expenditures. On average, health care costs among the elderly are much higher than among other segments of the population (Fogel 2003; Mahal and Berman 2001). In the United States for example, a person aged 65 to 74 years spends on health on average, between 3.0 and 4.4 times as much as a person age 35 to 44 (Mays and Lazar 2003; Cutler and Meera 1997; Reinhardt 2000).

As the population grows, so does the demand for health care (All Party Parliamentary Group on Population, 2007).Changes in the size and age structure of the population will have important consequences for current and future health financing needs. It had been projected by the World Bank 2000 that countries will experience between 14% and 62% increase in health spending in the next 20 years from 2005-2025 as a result of population change. Countries with high population growth rates and relatively long life expectancies, will face a 62 percent increase (3% per year), while countries (in Sub-Saharan Africa) with high population growth rates and shorter life expectancies, will experience a 52 percent increase. Kenya with high population growth rates and short life expectancies was expected to experience a 52 percent increase in health spending between 2005 and 2025 periods (some 2.6 percent per year) as a result of population changes alone. About 43 percentage points were attributable to increases in population size and the remaining 9 percentage points due to age-sex structure changes. Rapid population growth will put most pressure on health care financing; cost pressure of health will increase mostly due to the population size. Population growth is therefore the prominent issue, with major implications for health policy.

4.7 Conclusion

The present age structure of the population is broad at the base and through the child bearing years, thus ensuring that population growth will be substantial far into the future. The large child population will continue to present the challenges of provision of child health services while the high dependency ratio increase pressure on resource generated. This implies that only a small proportion of the population shoulders the burden of taxation to finance universal healthcare. The rapid population growth will increase the overall health needs of the population while any

change in structure and composition will have a significant effect on the future of illness (epidemiology transition) and consequently proportions of health needs. The epidemiological transition will influence health systems and health financing by affecting population health needs and the type and level of services demanded, and thus the amount and distribution of funds available to pay for them. The increasing number of aging population will also pose multiple challenges to the healthcare systems as older people usually need higher amount of health services compared with other age groups.

Understanding the role population factors is therefore important in aligning the population's true health challenges, and guiding decision-makers to effectively allocate resources. It will also help decision-makers to better understand if the health system is effectively addressing those challenges. Several country case studies have indicated major data gaps for coverage of interventions and risk factors for NCDs[17]. NCDs have also been reported to have caused more than half of the global burden of disease in and are estimated to kill around 38 million people per year[18]. In Kenya, NCDs cause nearly one in three of total deaths (27 %). It is therefore critical to monitor UHC that includes NCD-related interventions (WHO and World Bank, 2015).The WHO and World Bank report shows that it is impossible to talk meaningfully about population health without reference to NCDs, and impossible to monitor UHC without monitoring NCD-related interventions (WHO and World Bank, 2015).

While it has been indicated that more people have access to essential health services today than at any other time in history but there is still a long way to go on the road to UHC, both in terms of health service and financial protection coverage. Financial protection is generally low (only 19 % of total population) in Kenya, requiring most patients to pay for health services from their own household income, so-called out-of-pocket (OOP) payments. Out-of-pocket payments have increased in nearly all countries, and the regional average has increased from US$15 per capita in 1995, to US$38 in 2014. In Kenya, several individuals or households are falling into poverty every year due to high out-of-pocket payments (see Barasa et al 2018). Protecting people against the impoverishing effect of health payments is a cornerstone of UHC and will help prevent poverty in Kenya (World Bank 2016). This will require enacting large-scale health-care reforms and adopting nationwide social health insurance programmes, which enable populations to access essential health services without incurring large financial burdens if the country has make notable gains on the UHC index. Greater investments in health are required among the worst off population in Kenya but such efforts require inter-sectoral action.

It is important to note that even at national level UHC monitoring is currently constrained by the limited number of indicators of service coverage that are relevant, of reasonable quality and feasible to measure with existing instruments, especially for the coverage of treatment services. Further, tracking of progress in

[17] Available at: http://www.ploscollections.org/article/browse/issue/info:doi/10.1371/issue.pcol.v07.i22

[18] WHO Global Health Observatory. http://www.who.int/gho/ncd/mortality_morbidity/en/ .

financial protection measures is also hampered by lack of data. Investment is required to develop methods for devising a more comprehensive set of UHC indicators through household surveys with standardized questions and from facilities on services provided for assessing coverage of services and financial protection in the pursuit of the goal of UHC.

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Chapter Five: Population and Food Security

5.1 Introduction

The transformational vision of the 2030 Agenda for Sustainable Development calls on all countries and stakeholders to work together to end hunger and prevent all forms of malnutrition by 2030. This vision also coincides with the launch of the United Nations Decade of Action on Nutrition (2016–2025), adding impetus to these commitments by providing a time-bound, cohesive framework for action. Consequently, FAO, et al (2017) in "The State of Food Security and Nutrition in the World 2017" suggests that this ambition can only be fulfilled if agriculture and food systems become sustainable, so that food supplies are stable and all people have access to adequate nutrition and health. The overarching aim is to fulfill the UN General Assembly, (2012) statement that "*All people have a right to adequate food that not only meets the minimum requirements for survival but is also nutritionally adequate for health and well-being*". The progressive realization of this right cannot be achieved without functional, sustainable food systems that ensure food security and nutrition for all now and in the future, and that provide food that is healthy, of sufficient quality and quantity, affordable, safe and culturally acceptable (HLPE. 2017). Good health and nutrition in any country are only possible if effective food systems cover the dietary needs of everyone the marginalized and most disadvantaged groups.

5.2 Food systems

Food systems influence diets and nutrition. Diets are the core link between food systems and their health and nutrition outcomes while the food environment facilitates healthy and sustainable consumer food choices which takes into account the impacts of agriculture and food systems on sustainability in its three dimensions; economic, social and environmental.

According to HLPE (2017), a *food system* gathers all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, including socio-economic and environmental outcomes. There are three constituent elements of food systems, as entry and exit points for nutrition, namely: food supply chains; food environments; and consumer behaviour.

1) The food supply chain encompasses all activities that move food from production to consumption, including production, storage, distribution, processing, packaging, retailing and marketing. The decisions made by the many actors at any stage of this chain have implications for other stages. They influence the types of food available and accessible, as well as the way they are produced and consumed.
2) The food environment refers to the physical, economic, political and socio-cultural context in which consumers engage with the food system to acquire, prepare and consume food. The food environment consists of: "food entry

points", i.e. the physical spaces where food is obtained; the built environment that allows consumers to access these spaces; personal determinants of food choices (including income, education, values, skills, etc.); and the political, social and cultural norms that underlie these interactions. The key elements of the food environment that influence food choices, food acceptability and diets are: physical and economic access to food (proximity and affordability); food promotion, advertising and information; and food quality and safety.

3) Consumer behaviour reflects the choices made by consumers, at household or individual levels on what food to acquire, store, prepare and eat, and on the allocation of food within the household (including gender repartition, feeding of children). Consumer behaviour is influenced by personal preferences determined by taste, convenience, culture and other factors. However, consumer behaviour is also shaped by the existing food environment. Collective changes in consumer behaviour can open pathways to more sustainable food systems that enhance food security and nutrition and health. These three components of food systems impact consumers' capacity to adopt *sustainable diets* that are: protective and respectful of biodiversity and ecosystems; culturally acceptable.

HLPE (2017) also notes that a wide variety of food systems and food environments can exist or co-exist at all levels and identified three broad types of food systems: (1) traditional food systems; (2) mixed food systems; and (3) modern food systems.

1) In traditional food systems, consumers rely on minimally processed seasonal foods, collected or produced for self-consumption or sold mainly through informal markets. Food supply chains are often short and local, thus access to perishable foods such as animal source foods or certain fruits and vegetables can be limited or seasonal. Food environments are usually limited to one's own production and informal markets that are daily or weekly and may be far from communities.
2) In mixed food systems, food producers rely on both formal and informal markets to sell their crops. Highly-processed and packaged foods are more accessible, physically and economically, while nutrient-rich foods are more expensive. Frequent branding and advertising accompany everyday activities, seen on billboards and in print publications, while food labeling is sometimes provided in markets. Even when food-based dietary guidelines are available, most consumers have little or no access to this information. Food safety and quality standards exist, but may not always be followed by producers.
3) Modern food systems are characterized by more diverse food options all year long, and by processing and packaging to extend food's shelf life. These systems include both formal and easily accessible markets in high-income areas and food deserts and food swamps in low-income areas. While the cost of staples is lower relative to animal source foods and perishable foods,

specialty foods (e.g. organic, local) are more expensive. Consumers' access to detailed information on food labels, store shelves, and menus and food is highly promoted. Food safety is monitored and enforced, and storage and transport infrastructures (including cold chain) are generally prevalent and reliable.

With globalization, urbanization and income growth, people are experiencing new food environments, expanding their food choices and diversifying their dietary patterns in both positive and negative directions (HLPE 2017) these has resulted into rapidly changing dietary patterns in recent decades. The food supply chain, the food environment, consumer behaviour, diets and nutrition/health outcomes is influenced by five key drivers (see Box 5.1)

Box 5.1: Drivers of Food System Changes

1) *Biophysical and environmental drivers.*

Food production is heavily dependent on biodiversity and ecosystems, including not only agriculture but also forests, aquatic ecosystems and mosaic landscapes. Agricultural systems and food supplies are becoming increasingly homogeneous and dependent on a small number of 'global' crops, including major cereal and oil crops. At the same time, agricultural practices are increasingly moving towards intensified monoculture, which may improve grain yields in the short term but limits the biological diversity necessary for high-quality diets. Climate change and variability, as well as more severe and frequent floods and droughts, will impact health, productivity, and resilience of ecosystems, communities and households, particularly for the most vulnerable. Food systems need to adapt to climate change and can also significantly contribute to its mitigation.

2) *2 Innovation, technology and infrastructure drivers.*

Innovation has been a major engine for food system transformation in the past decades and will be critical to address the needs of a rapidly growing population in a context of climate change and natural resource scarcity. Building more sustainable food systems to enhance food security and nutrition will require not only new research and new technologies, but also better access to and use of existing technologies, developing context-specific solutions for local ecosystems, adapted to local socio-economic and socio-cultural conditions. More investment is needed in research and development of nutritious food crops (such as fruits, vegetables and pulses, as well as neglected and orphan crops) as opposed to major staple commodities. The limitations and potential risks of technologies for food security and nutrition, health, livelihoods and the environment must also be considered. Infrastructure, especially for food transportation, needs to be improved and equitably accessible.

3) *3 Political and economic drivers.*

Leadership, as well as inclusive governance mechanisms, from global to local levels, is crucial: to invest in sustainable food systems; to design and implement policies and programmes to strengthen food systems, improve diets and enhance food security and nutrition; and to overcome power imbalances. Accountability and sustained commitment require significant political will. Political and economic drivers also include: globalization, foreign investment and trade; food policies, including food-based dietary guidelines and taxes and subsidies; food prices and price volatility; land tenure; conflicts and humanitarian crises.

4) *4. Socio-cultural drivers.*

Individual food choices, although deeply personal, also reflect cultures, rituals and social traditions. Food is an important part of culture: The types of foods we consume and the way we prepare and eat those foods, with whom and where, are repositories of traditions and shape cultural identity. Food systems and food environments are consistently shaping cultures and traditions and vice versa. Gender relationships and norms are among the most significant drivers of food environments and diets. Women can influence the household diet and, as primary caregivers, have an influence on children's nutritional status. Therefore, women and girl's empowerment, through education, information and access to resources and services, is key for food security and nutrition.

5) *5 Demographic drivers.*

Population growth and changing age distribution, urbanization, migration and forced displacement have driven radical changes in food systems and diets in the past decades and will remain major drivers in the future. The concentration of population growth in the poorest countries such as Kenya will make it harder to combat hunger and malnutrition. Urbanization is expected to put additional stress on food systems through increased demand for a greater diversity of foods. Urban demand will increasingly dictate what foods are grown by rural producers and how these foods are processed, distributed and marketed. Food insecurity can be both a cause and consequence of migration and forced displacement.

Source: HLPE 2017

Food production depends on croplands and water supply, which are under strain as human populations increase. Pressure on limited land resources, driven in part by population growth, can mean expansion of cropland which often involves destruction of vital forest resources or overexploitation of arable land. The world is becoming more urban and most urban residents have access to a wider array of foods, without land to farm. The food security of urban residents is highly dependent on their income and ability to purchase food products. Poor families in urban areas in Kenya spend up to 60 percent of their budget on food. Globally, the understanding food security also needs to be contextualized in a world of changing drivers and new trends. These new trends include:

- protracted conflicts which increase the proportion of people who are food insecure;
- increasing urbanization and a rising middle class;
- Increasing occurrence of overweight and obese individuals in populations;
- climate change - expected to have a significant negative effect on food security;
- new technologies such as digitalization, robots in agriculture, vertical indoor farming, gene editing, meat produced in laboratories; and
- value chain changes, e.g. power relations and the role of supermarkets.

5.3 Measurement of Food Security

Food security has many definitions because it is a multidimensional concept that involves a whole range of different drivers and variables such as social inequalities, sustainable food systems, power relations (Haug 2018). However, most used definition internationally is that food security exists when all people at all times have both physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (World Bank, 1986; FAO, 1996). According to FAO, food security consists of four pillars: food availability, physical and economic access, stability and utilization. Given these broad dimensions, measuring food security has been difficult.

FAO has historically measured food security as availability of calories at the national level in relation to the population in the country. Chronic undernourishment has been the main indicator comprising estimates based on average availability of calories per person at national level and the main cause of chronic undernourishment in the world today is poverty. Food security addressed under Goal 2 of the Sustainable Development Goals precisely sets out *to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture*. The zero

hunger goal consists of eight targets with several indicators, some of which are not yet decided, however there is a consensus behind the first five targets and accompanying indicators but some targets sustainable agriculture still miss a complete set of indicator.

To track down progress, Global Hunger Index (GHI) has frequently been used to measure food security[19]. The International Food Policy Research Institute (IFPRI) combines four indicators, namely: undernourished people, child wasting, child stunting and child mortality to compute hunger index. The 2017 Global Hunger Index (GHI[20]) indicates that worldwide levels of hunger and under-nutrition have declined over the long term. Despite these improvements, a number of factors, including deep and persistent inequalities undermine efforts to end hunger and under-nutrition worldwide. Figure 5.1 shows trends in the GHI for the four East African countries together by their most recent ranking worldwide. The values all the East African countries Kenya included are in the range between 20.0 to and 34.9 which indicate serious hunger in the countries.

[19] The Global Hunger Index (GHI) is a multidimensional statistical tool used to describe the state of countries' hunger situation

[20] This calculation results in GHI scores on a 100-point scale, where 0 is the best score (no hunger) and 100 is the worst. A value of 0 would mean that a country had no undernourished people in the population, no children younger than five who were wasted or stunted, and no children who died before their fifth birthday. Values less than 10.0 reflect low hunger, values from 10.0 to 19.9 reflect moderate hunger, values from 20.0 to 34.9 indicate serious hunger, values from 35.0 to 49.9 reflect alarming hunger, and values of 50.0 or more reflect extremely alarming hunger levels.

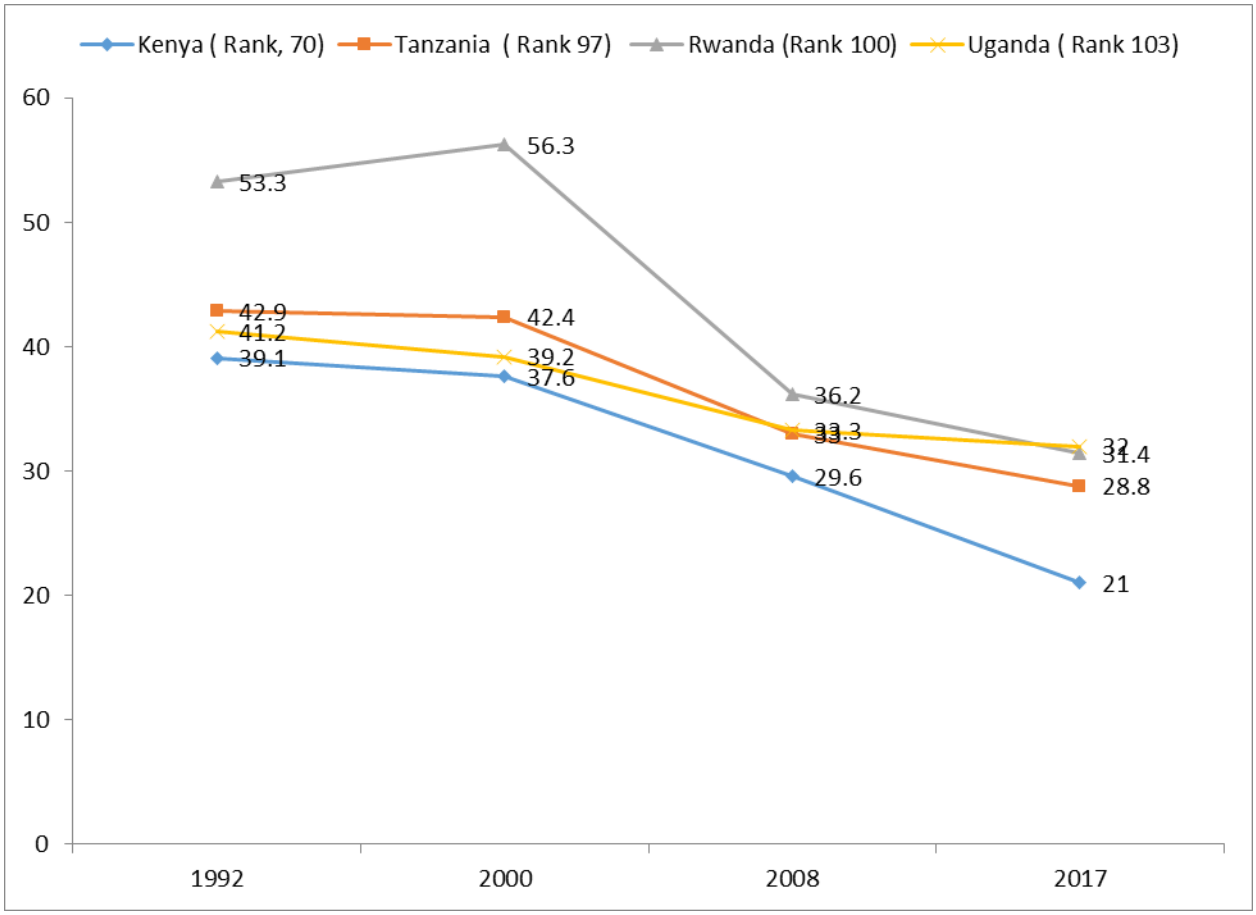

Figure 5.1 Trends in global hunger index for selected east African countries

IFPRI (2017) states that across the East African countries, socioeconomic class and geography intersect with, and often surpass, gender as an axis of inequality. The key factors that play greater role in determining whether children are food secure are; families' income, social status, and location. The uneven distribution of hunger and nutrition reflects the unequal distribution of power in the food system often stemming from economic inequalities" (IPES 2015, 5). Trends in indicators of malnutrition in Kenya are presented in Figures 5.2a to 5.2c. Although stunting has declined, it is still very high among children in the poorer households while wasting has narrowed in nearly all the households except the poorest. The gap in percent of children underweight has nearly remained the same overtime.

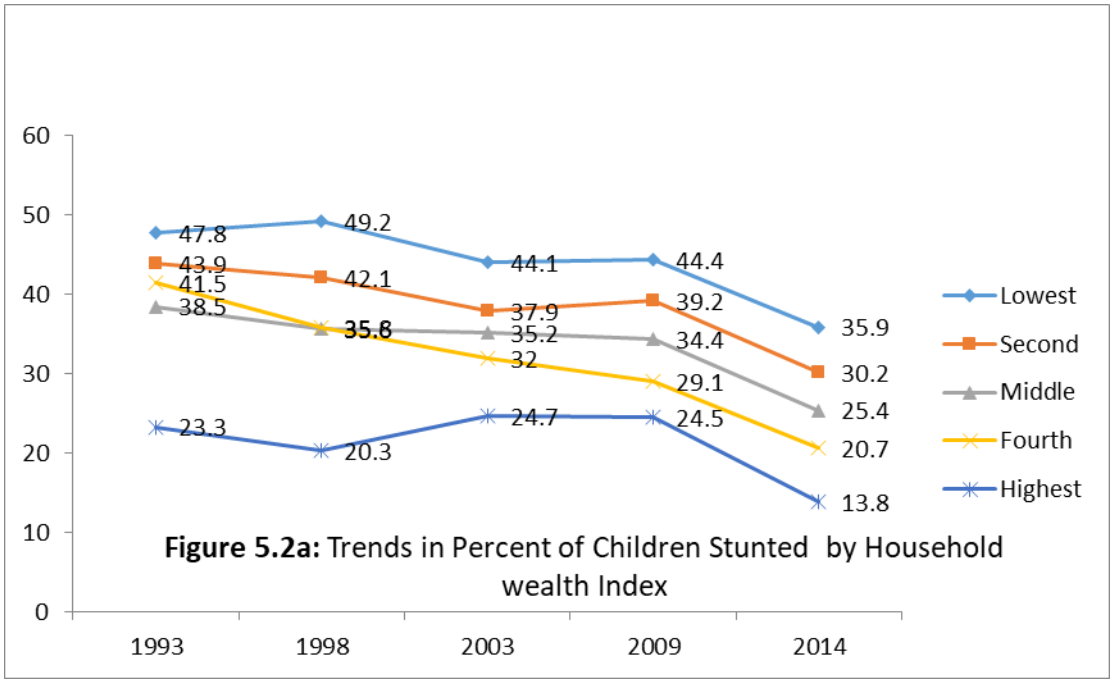

Figure 5.2a: Trends in Percent of Children Stunted by Household wealth Index

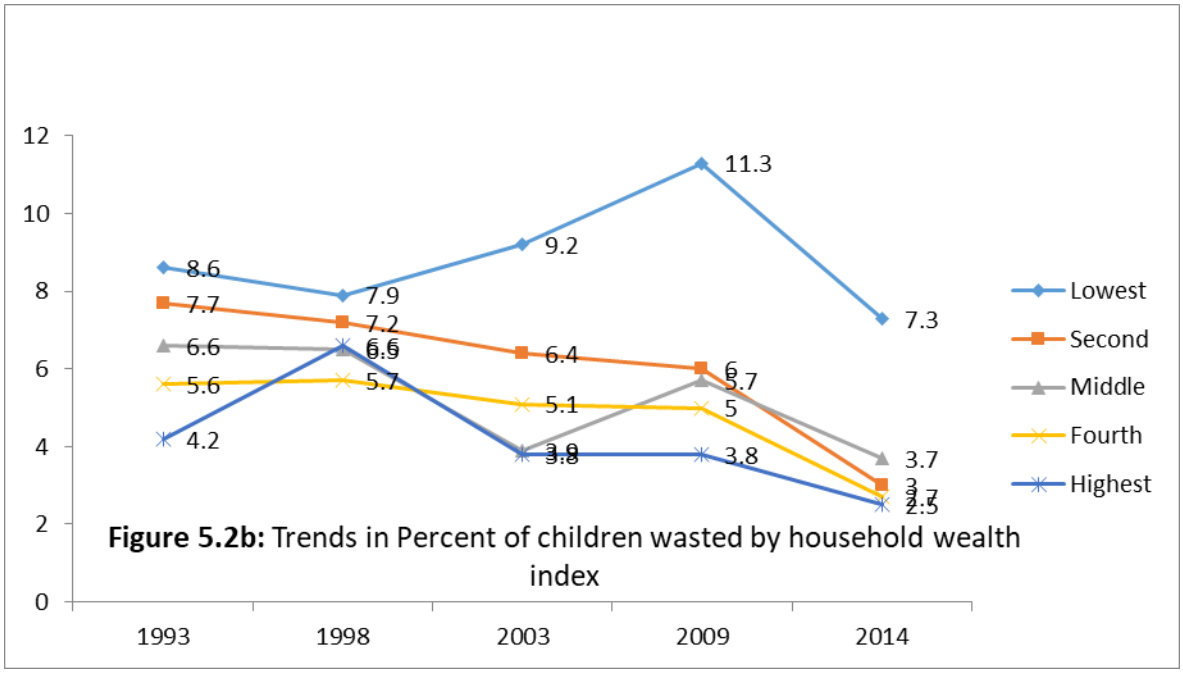

Figure 5.2b: Trends in Percent of children wasted by household wealth index

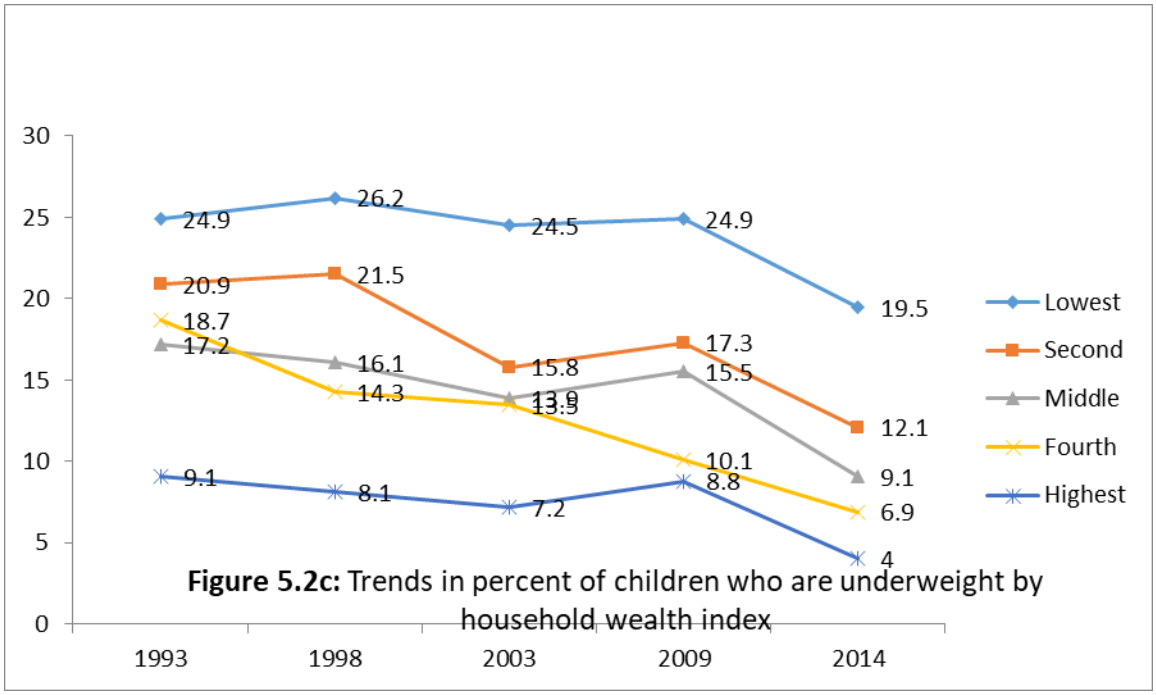

Figure 5.2c: Trends in percent of children who are underweight by household wealth index

Source for Figures 5.2a to5.2c: http://www.statcompiler.com Accessed August 17 2018.

An important aspect of poor nutrition is the prevalence of obesity. Overweight and obesity are a major risk factor for non-communicable diseases such as cardiovascular diseases, diabetes and some types of cancer. The results of Kenya STEP wise survey of 2015 indicate that nearly 28 percent of adult Kenyans aged 18 to 69 are obese or overweight (Table 5.1).

Table 5.1: Percent distribution of Population age 18-69 who are obese or overweight (BMI ≥ 25)

Age group	Men	Women	Both sexes
18-29	11.7	31.4	21.5
30-44	21.0	44.6	32.5
45-59	25.0	46.1	35.6
60-69	23.2	39.6	31.6
Total 18-69	17.5	38.5	27.9

Source: Ministry of Health, KNBS and WHO

5.4 Status of Food Poverty in Kenya

The basic food needs are anchored on the nutritional requirements for good health and the required daily per adult equivalent calorie requirement for Kenyans has been specified as 2,250 kilocalories. Therefore the national definition of food poverty in Kenya is defined as the households and individuals whose monthly adult equivalent food consumption expenditure per person is less than Kenya shillings 1,954 in rural and peri-urban areas and less than 2,551 in core-urban areas respectively.

According to the 2015/16 Kenya Household and Budget Survey, the national food poverty headcount rate for individuals was 32 per cent, implying that 14.5 million individuals did not meet the food poverty line threshold. Thus, one in every three individuals in Kenya is unable to consume the minimum daily calorific requirement of 2,250 Kcal as per their expenditures on food. Food poverty incidence is highest in rural areas, where 10.4 million individuals are living below food poverty line (35.8 % of the population) compared to almost 1 million in peri-urban and 3.2 million in core urban areas respectively. Food poverty ranges from a high of 66.1 per cent in Turkana County and lowest in Meru and Nyeri counties at 15.5 per cent (see Figure 5.2).

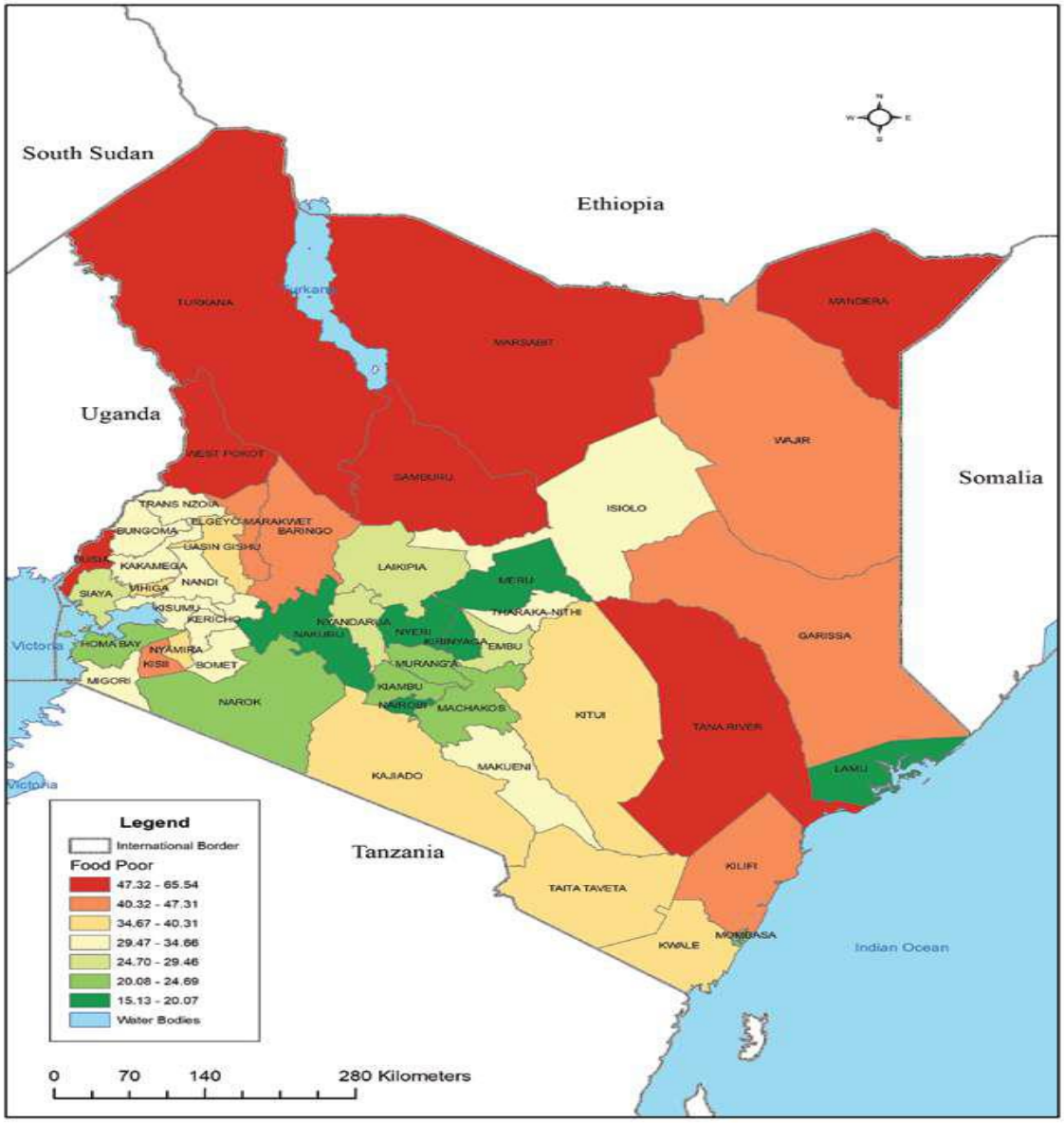

Figure 5.2: Food Poverty Headcount by County (Source KNBS 2018).

In seven counties, namely; Turkana (66.1 %), Mandera (61.9 %), Samburu (60.1 %), Busia (59.5 %), West Pokot (57.3 %), Marsabit (55.6 %) and Tana River (55.4 %), food poverty incidence affect more than half of the population. Turkana and Nairobi City Counties with populations of over 715 thousand food poor people each

jointly account for almost ten per cent of all food poor individuals in the country while Turkana (4.9 %), Nairobi City (4.9 %), Kilifi (4.7 %), Kakamega (4.3 %), Kisii (4.1 %) and Bungoma (3.5 %) together account for 26 percent of the national total of 14.5 million food poor individuals.

A manifestation of food poverty and food insecurity is the effect on malnutrition and mortality. Figure 5.4 shows that deaths due to malnutrition have only marginally changed over the last two decades with more children under age 5 more affected.

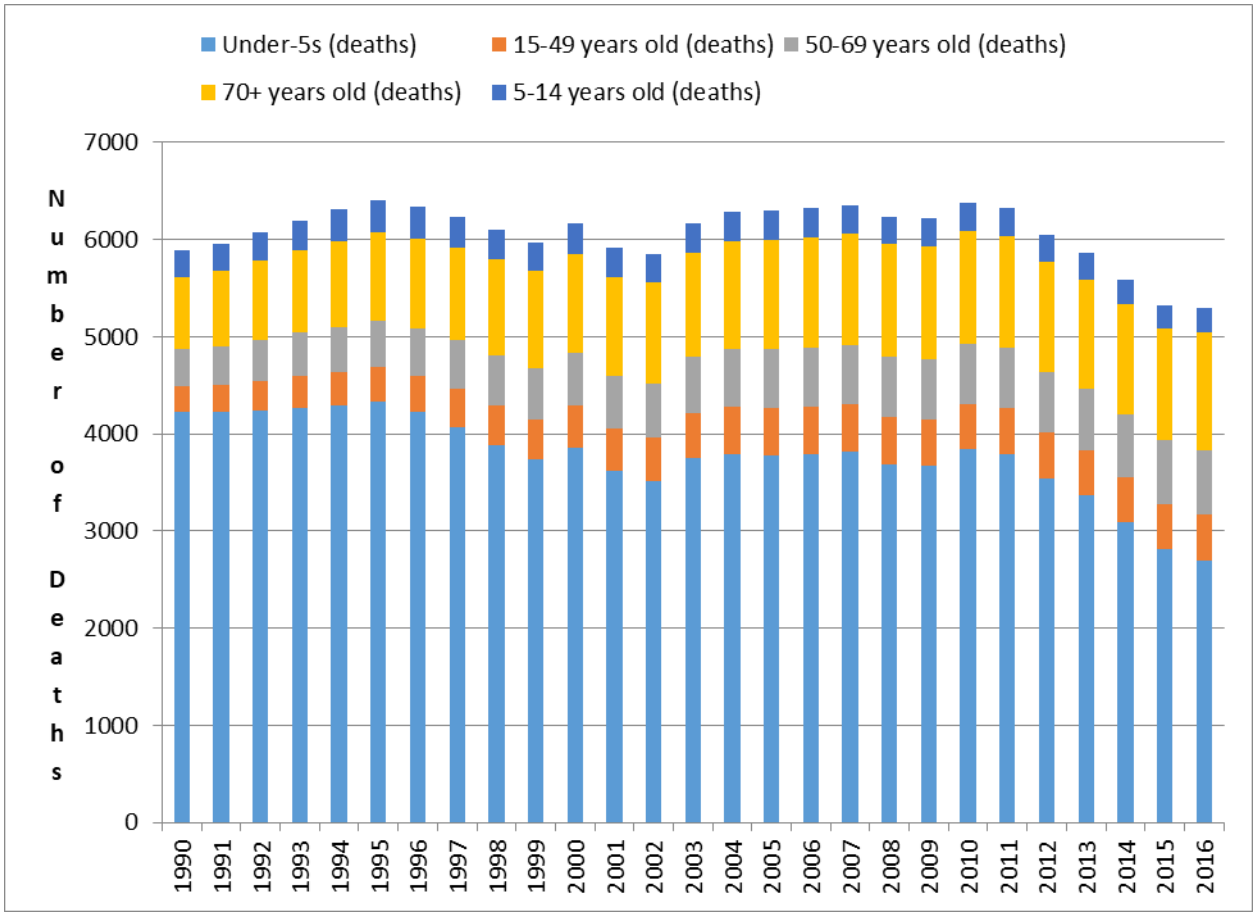

Figure 5.4: Trends in deaths due to malnutrition by broad age groups 1990-2016

Muyanga and Jayne (2014) noted that changing population densities in rural Kenya have implications of food security. In 2010, nearly 40 percent of Kenya's rural people resided on 5 percent of its rural land. The changing population densities lead to small farm sizes and shrinking gradually as households subdivide their land to the next generation. The proportion of Kenya's farms smaller than one hectare rose from 45 to 74 percent between 1994 and 2006 (see also Figure 5.5).

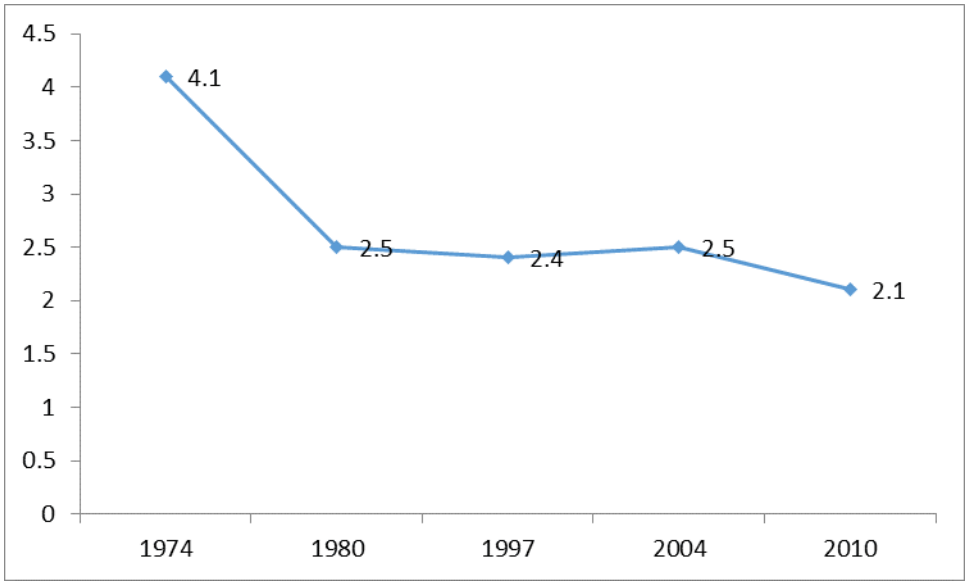

Figure 5.5: Average farm sizes in Kenya 1974-2010
Source: Headey and Jayne (2014)

The other alternative to growing scarcity of land is that rural households respond by shifting labor to non-farm activities. The food security is related to the determinants of migration and displacement of people caused by scarcity of water and land, conflicts over natural resources, natural hazards and natural disasters (Naude, 2010).

5.6 Policy Implications

Increased production of food alone will not solve the food security problem. Hall et. al., (2017) have shown that rapid population growth will be the leading cause of food insecurity and widespread undernourishment across Africa from now to the year 2050. Projections from the International Food Policy and Research Institute (IFPRI) suggest that slower population growth could significantly lower malnutrition along with increased agricultural productivity, economic growth and investment in health and education. Because population trends will continue to affect the demand for food for decades to come, it is important that demographic projections be incorporated into plans to improve agricultural production and achieve greater food security. IFPRI (2018) policy report recognizes that private investments in agriculture can help in meeting the "Zero Hunger goal". However, there is need for improvements in open access data in improving livelihoods as well as updating data sets on agricultural investment, public expenditures. Improving food systems provides a path to address food security issues within the sustainability parameters.

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CHAPTER 6: Implications of Development Agenda for the Implementation of Demographic Dividend Roadmap

7.1 Introduction

Kenya is a signatory to the 2013 Addis Ababa Declaration on Population and Development in Africa Beyond 2014, under the theme" *Harnessing the Demographic Dividend: The Future We Want for Africa.* This declaration recognizes the role of population dynamics in socio-economic transformation and seeks to unleash the full potential of the youth to boost socio-economic development. According to Bloom and Williamson (1998), demographic dividend can be defined as the potential

economic benefit offered by changes in the age structure of the population, during the demographic transition, when there is an increase in working-age population and an associated decline in the dependent age population.
This change can accelerate economic growth through the increased productivity of a relatively larger labour force if there are adequate decent jobs for them. Further impetus for economic growth is generated through increased household savings and investment, which result from reduced costs for basic needs since there are fewer children (John Ross 2014). However, the benefits of the demographic dividend are not automatic, and it depends on the proactive initiatives taken by a country to productively engage its workforce, the nature of political, economic and social reforms undertaken. In recognition of this fact, The African Union development theme for the year 2017 "*Harnessing the Demographic Dividend through investments in Youth*" had two objectives. The first was to help in expediting the implementation of demographic dividend initiatives in Africa, and second to develop a roadmap with key deliverables and milestones to guide Member States on concrete actions to be undertaken in 2017 and beyond.

Kenya Demographic Dividend Road map Pillars

Kenya government through NCPD has subsequently developed "*The Demographic Dividend Roadmap"* with the main objective of ensuring that the country harnesses the potential of its youthful population in driving the country towards the aspirations of Vision 2030. This roadmap is anchored in four pillars borrowed from the prototype African roadmap.

- ***Pillar 1- Healthy Families***. The family is an institution in Kenyan life and therefore policies and investments should support the young Kenyan people have healthy families that enjoy good nutrition, immunisations, and basic health care including mental health. By focusing on the reducing infant mortality and enabling young couples to time and space their children is critical to triggering the demographic dividend. The Kenya roadmap which follows the AU roadmap subsumes family planning within the health pillar but AFIDEP report of 2018 suggests that due to the importance of achieving rapid fertility decline greater emphasis should be placed on family planning and advocacy for universal access to modern contraception as a pathway to faster demographic transition.

- ***Pillar 2- Education for the 21st century***. To succeed in the 21st century, the government and stakeholders must help the Kenyan young people go to school, stay in school, and learn the skills. This means that science, technology, engineering and mathematics education is critical to prepare our youth for economies of the future.

- ***Pillar 3- Work opportunities that turn potential into prosperity***. The economic transformation in the country should endeavour to grow young entrepreneurs and employers as well as employees, in both the formal and informal sectors. Therefore Investments in physical infrastructure, like roads,

ports and factories, must be matched by investments in skilled workers to build and manage them.

- ***Pillar 4 - Inclusive and accountable governance*** **to create a country young people want to be part of** where there exists strong public services that respects human rights, transparent, accountable to support young people in their ambitions.

The demographic dividend (DD) roadmap makes the case that investing in family planning; education, jobs, and governance will create dramatic economic growth. To transform Kenya, all stakeholders must work together to deliver true multi-sectoral action in education, employment, health, and governance. The Kenya roadmap has included both a time frame and the institutions with the responsibility for implementation of the recommended actions. The timeframe is defined as short (1-3 years), medium (4 – 5 years), and long term (6 or more years). This section of the report focuses on how the big four agenda and the prospects for the demographic dividend in Kenya. Three broad strategic areas for intervention which can be prioritized over the next five years under the "Big Four" agenda include : skills and technology development and technology transfer to enhance innovation capabilities in supporting product diversification; provision of an enabling business environment at both national and county government levels including the regulatory interventions; and external market access interventions. To enhance these initiatives the strategy lies in simultaneity and not "silo" like activities and greater integration of policies and strategies.

Pillar 1 healthy families

Available evidence indicates that there is a relationship between health and development (Phillips and Verhasselt, 1994). Poor health poses significant threats to the economy, as the untimely and unnecessary death particularly during adulthood, results in a loss of any social and economic investment made in them. It is estimated that a 10 percent increase in life expectancy leads to a 0.4 percent increase in economic growth (WHO, 2014). According to WHO (2017), the health perspective of development can be said to be "sustainable" when resources – natural and manufactured – are managed by and for all individuals in ways which support the health and well-being of present and future generations. Consequently, almost all development efforts should consider human health as a core input. "Health in AII Policies" offer new ways to confront major 21st century challenges to health and wellbeing, including safety and security[21].

According to recent review by AFIDEP, the health sector is increasingly contributing directly to economic growth and job creation (AFIDEP 2018). This means that UHC is not merely a social equalizer, but also a sound investment in human capital, health security, and a driver for employment creation in the health sector (AFIDEP 2018). Although there has been progress towards universal coverage for reproductive, maternal, newborn, child and adolescent health and nutrition, it has been uneven. In

[21] Adelaide Statement ‖: Outcome Statement from the 2017 International Conference Health in All Policies: Progressing the Sustainable Development Goals

a recent analysis of universal coverage for basic essential maternal and child health services[22] by various stratifiers(Figures 7.1a and 7.1b), young people have lower coverage for essential health needs for child and maternal health (UNICEF and WHO 2017). The lower social class and those living in rural areas have lower coverage for essential health needs. The key challenges which should be addressed include: a) early childbearing which has implications for total achieved fertility, maternal mortality and morbidity, child survival, and women's empowerment; b) child marriages which contribute significantly to the high adolescent childbearing and adversely affect their health. Young people, especially those who are not married, have a high unmet need for contraception.

Although HIV/AIDS, diarrhoeal diseases, malaria, lower respiratory tract infections and tuberculosis are the main causes of death another challenge is the rising prevalence of young people who are overweight or obese, which may lead to increases in non-communicable diseases such as hypertension and diabetes.

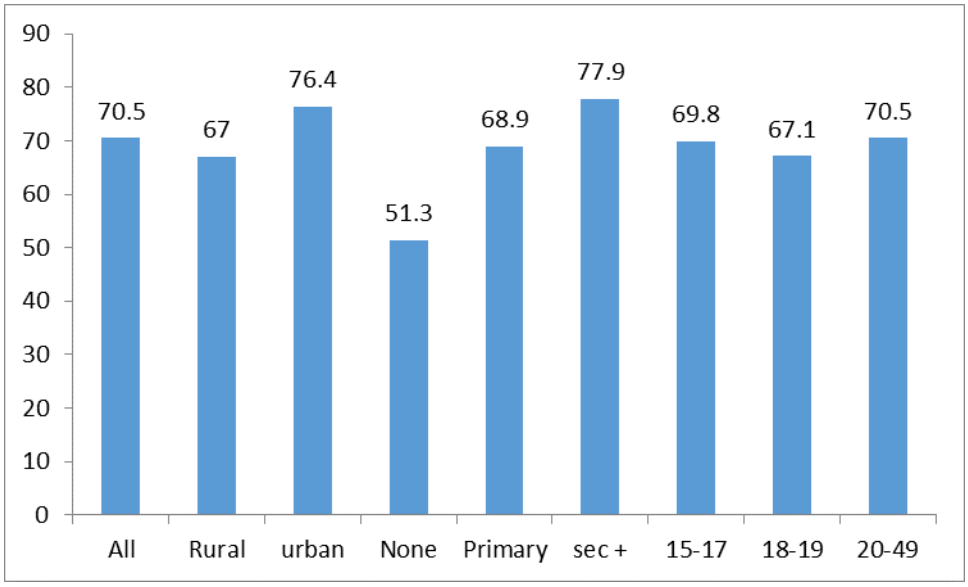

Figure 7.1a: Composite coverage index, by urban–rural residence, woman's age and education
Source: United Nations Children's Fund (UNICEF) and the World Health Organization (WHO), 2017

[22] The composite coverage index (CCI), is a weighted average of the coverage of eight interventions: reproductive health (demand for family planning satisfied with modern methods [FPSm]), maternal health (at least four antenatal care visits [ANC4] and skilled birth attendant [SBA]), immunization (Bacillus Calmette–Guérin [BCG], three doses of diphtheria-tetanus-pertussis [DTP3] and measles [MSL]) and management of child illness (oral rehydration salts for diarrhoea [ORS] and care seeking for children with symptoms of pneumonia [CPNM]).
CCI= ¼{ (FPSm + [ANC4 + SBA]/2+ [BCG + 2DTP3 + MSL]/4 +[ORS + CPNM]/2}

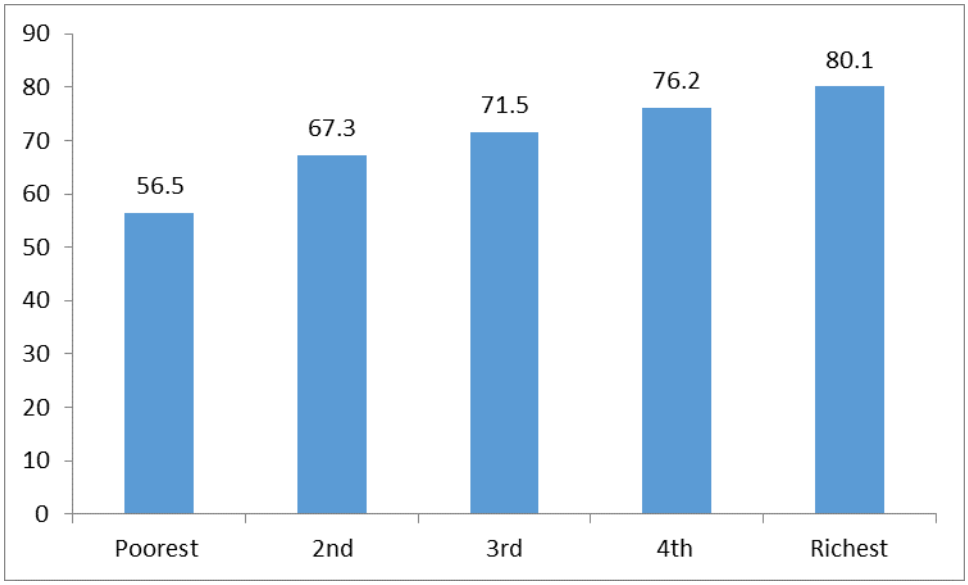

Figure 7.1b: Composite coverage index by wealth quintile
Source: United Nations Children's Fund (UNICEF) and the World Health Organization (WHO), 2017

To achieve the health objectives for demographic dividend, all the aspects of the big four must first and foremost contribute to the health goal. Strengthening health systems to enable universal health coverage is essential to: accelerate social and health investments that enhance child survival; accelerated action for the health of adolescents; prevent and treat HIV/AIDS and TB and mitigate against adverse outcomes of HIV/AIDS and TB incidence.

Achievement of the UHC requires building of better systems for health by placing health in all sectors of policy-making so as to combine the strengths of multiple stakeholders. Further, embedding disease-control programmes in a comprehensive health system that provides complete coverage through fully staffed and well-managed health services, with financial risk protection ensures improvements in health for whole populations by including all individuals and "leaving no one behind". Therefore, health plans need to incorporate a clear orientation towards determinants rather than an exclusively health care systems focus which will allow for greater inter-sectoral alignment.

Pillar 2 - Education for the 21st century

A general conclusion of various analysis of demographic dividend potential for Kenya (PRB 2018, AFIDEP 2018, NCPD, 2017) rests on the both government and stakeholders putting more emphasis on quality education. Young people need access to quality education that helps them make the transition to a knowledge-based society with skills relevant to today's world. Education must be able to motivate young people to prepare for the transition from school to work. The current system perpetuates the idea that educational attainment will automatically lead to a job. This is no longer true, not even of technical and vocational training (TVET). Young people must learn to take more responsibility for their future, but they must also be given proper support.

The skills that the private, public and social enterprise sectors demand are rapidly evolving but the skills of potential employees are tending to lag (Martinez-Fernandez and Choi 2012). The formal TVET sector and much of the informal training sector are supply-driven rather than demand-driven (Majumdar 2011). This is based on a lack of understanding of the needs of the labour market and leads to skill mismatches (Martinez-Fernandez and Choi 2012). Labour market assessments to enhance skills matching should be given priority in rapidly emerging areas. The core links between this pillar and the big four agenda is "*addressing the infrastructure to acquire and apply knowledge.* The fact is that "many countries such as Kenya lack sufficient facilities and equipment or qualified instructors," (Martinez-Fernandez and Choi (2012, pp.14–15) and many institutions provide training that is technically handicapped by poor access to the latest equipment and facilities.

Pillar 3- Work opportunities that turn potential into prosperity

The government envisions supporting value addition and raising the manufacturing sector's share to GDP to 15 percent by 2022 in its current budget policy statement (GOK, 2018). A significant barrier to addressing this pillar in the demographic dividend roadmap is the misalignment of skills with labour market demands which causes potential drag on the economy.

The World Economic Forum has developed a typology of skills and qualities of character required by students to deal with the globalized world. Therefore, a new approach to education especially among rural livelihoods is required in Kenya if subsistence agriculture is to be intensified sufficiently to produce a reliable surplus, create a local market for food products and address nutrition issues. This arises from the fact that the bulk of work in Kenya takes the form of self-employment, family employment, and micro-enterprises in agriculture or other activities. Therefore, education among farmers and potential farmers should become adequately oriented to problem-solving. Many sustainable livelihoods could be created by shifting the value added and the marketing associated with primary products from the subsistence economy to the formal economy. Therefore, a focus on rural livelihoods and food security highlight key areas that efforts are needed. Furthermore, with increase in population through high growth rates, creating increased densities have resulted in greater inequalities to land. The rural infrastructure which accounts for many rural services need to be supplemented, this could help retain young people in viable rural livelihoods and slow the flow of rural migration to the cities, where it contributes to urban unemployment.

The building of youth capabilities should not be instrumentally linked to a particular training or work programme, without consideration of capability-building. This necessarily means investment in broader human and youth capabilities, particularly education, health care and rural livelihoods because of the deficits in educational outcomes in Kenya. This implies that investment in skills and in the development of social enterprises and other relevant programmes should be linked to much more comprehensive investment in education. Experience elsewhere shows that raising school completion rates up to secondary level can become a major factor in reducing youth unemployment.

Key areas for Big Four and Demographic Dividend Road map

The critical linkage between the big four and the demographic dividend road map lies in their contribution to implementation of economic reforms and development of necessary infrastructure to accelerate economic growth and job creation for the rapidly expanding labour force. To achieve goals envisaged in the road map there is need for:

a. Support to investments in sectors with high job-multiplier effects (e.g. ICT, manufacturing, agriculture and agro-industries) to create employment and spur inclusive growth;
b. the promotion of modern agriculture practices and agri-business among the youth by expanding agriculture infrastructure requirements and education;
c. the expansion of internships, apprenticeships and on-the-job training for youth, particularly young women;
d. Institution of an evidence-based mechanism to inform education and training to cater for the current and future labour market needs in partnership with the private sector.

Particular opportune areas are:

1) Tapping opportunities for employment creation in the manufacturing sector

The growth of manufacturing sector is expected to play a vital role in supporting the country's social economic development particularly with regard to employment creation. A vibrant manufacturing sector is key to this policy aspiration due to its high labour intensity and linkages with other sectors of the economy such as agriculture and services. Currently, Kenya's manufacturing sector accounts for 9.2% of GDP, 11.7% of total employment in the formal sector, and 20.4% of informal employment. A significant proportion of enterprises in the sector operate informally, employing nine times the formal manufacturing enterprises. The manufacturing sector is in fact the second largest source of employment in the informal sector after wholesale and retail trade, hotels and restaurants. Additionally, over 90% of the manufacturing sector enterprises, formal or informal, are micro and small - defined as enterprises employing less than 50 persons - yet they contribute to only about 20% of the sector's GDP. Manufacturing has the potential to advance socio-economic development and enhance demographic dividend through increased and diversified exports, reduced import bills and enhanced employment creation. Intervention package should include; promoting the competitiveness of the manufacturing sector aiming at enhancing product diversity and complexity, improving the business environment, developing relevant infrastructure, enhancing credit and market access, strengthening technology transfer and innovation, and building an industrial culture.

2) **Increased investments in the agriculture Sector**

The agriculture industry in Kenya remains the most prominent, important and dominant industry. In 2016, the industry accounted for over 26% of the total GDP,

20% of employment, 75% of the labour force, and over 50% of revenue from exports. There is need to expand public spending on rural infrastructure including feeder roads, extension services, and promoting agricultural research, science and technology. Resource allocation to the agriculture and rural development sector has averaged about 3% per annum of national expenditure, which falls short of the Malabo Declaration (KiPPRA, 2018) and therefore calls for mobilization of more financial resources to the agricultural sector.

3) Enhancing universal health coverage to leave no one behind

Family planning and health particularly to enhance child survival programmes such as immunisation programmes and efforts to eradicate malaria, to improve human capital and to accelerate fertility decline are important cornerstones for achieving demographic dividend. Therefore universal access to contraception is needed to address the high unmet need, especially among those living in rural areas, urban slums, and among the youth. Furthermore, the prevention of new HIV infections among youth and treatment of those who are infected to improve human capital is imperative. However, efforts are also needed to enhance good nutrition and promoting active life-styles to prevent overweight/obesity epidemic among youth

Upscaling of insurance scheme to all Kenyans is considered as an imperative step in realizing universal healthcare coverage. Currently, the National Health Insurance Fund (NHIF) only covers a small percent of the population, but other initiatives are being implemented to enhance universal healthcare coverage. Partnership and collaboration between levels of government and working closely with the health service providers in the private sector is key in the realization of universal healthcare coverage. Other policy interventions could include development of adequate healthcare workforce, equitable distribution of healthcare human resources, reduction of reliance on external support, strengthening of county supply chain management systems, and enhancing coordination in disease prevention, detection and response.

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