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Non-Communicable Diseases and Urbanization in African Cities: A Narrative Review

*Kenneth Juma, Pamela A. Juma, Constance Shumba,
Peter Otieno and Gershim Asiki*

Abstract

Rapid urbanization in Africa has been linked to the growing burden of non-communicable diseases (NCDs). Urbanization processes have amplified lifestyle risk factors for NCDs (including unhealthy diets, tobacco use, harmful alcohol intake, and physical inactivity), especially among individuals of low and middle social economic status. Nevertheless, African countries are not keeping pace with the ever increasing need for population-level interventions such as health promotion through education, screening, diagnosis, and treatment, as well as structural measures such as policies and legislation to prevent and control the upstream factors driving the NCD epidemic. This chapter highlights the NCD burden in urban Africa, along with the social determinants and existing interventions against NCDs. The chapter concludes by offering insights into policy and legislative opportunities and recommends stronger efforts to apply multisectoral and intersectoral approaches in policy formulation, implementation, and monitoring at multiple levels to address the NCD epidemic in African cities.

Keywords: NCDs, risk factors, urbanization, African cities, Africa

1. Introduction

Over the last few decades, the proportion of the world's population living in urban areas has grown to 55%, and is expected to increase to 68% by 2050 [1]. Africa's urban growth is unfolding more rapidly than anywhere in the world, with the share of urban dwellers projected to exceed 50% by 2035 [1]. However this growth has been characterized as "rapid, unplanned and unmanaged" because 62% of the urban population in Africa lives in informal settlements characterized by conditions of squalor, overcrowding, and small make-shift structures mostly made of sub-standard housing materials such as mud and scraps of wood or corrugated metal [2]. Unplanned settlement in cities is associated with increased inequality, urban poverty, social deprivation and lifestyle changes that could lead to an increased burden of non-communicable diseases (NCDs) [3]. Thus, changes in physical and social environment in the urban space favor the adoption of behaviors that promote unhealthy lifestyles such as physical inactivity, unhealthy diets, tobacco consumption and harmful alcohol consumption that predispose individuals living in the slums to NCDs [4, 5]. Even so, there is generally lack of consensus as to whether there exists any NCDs health advantages in urban area.

NCDs represent a leading threat to human health and development [6]. In 2015 alone, four major NCDs-cardiovascular diseases (CVDs), cancers, diabetes, and chronic respiratory diseases accounted for 72% of all deaths globally; 85% of these were from low and middle income countries (LMICs) [7]. In urban areas of SSA, NCDs are rising faster than anywhere else in the world [8]. The economic consequences of NCDs are enormous across the globe, and are felt at the individual, household, community and health systems levels. Bloom et al. (2011) [9], estimated that economic losses due to NCDs could amount to approximately 75% of the global GDP. While there is wider recognition of the increasing burden of NCDs across Africa [5], scanty literature exists on the link between urban environments and NCD risks in Africa, as well as the associated health and social consequences, and access to health services. Considering that future population growth will take place predominantly in African cities, there is need for a deeper understanding of urban health and the context of NCDs in African cities to identify tailored interventions to curb the epidemic. Urbanization in sub-Saharan Africa provides a unique opportunity to explore the mechanisms by which urban environment influences NCD epidemiology.

This chapter describes both the health determinants and outcomes in African cities with special attention to low-income urban areas. It further highlights the burden, impact and possible interventions for NCDs in African cities. The chapter draws on insights from relevant peer-reviewed and gray literature on NCDs, and the authors’ own experiences on the subject in Africa.

2. Increasing urbanization and health consequences in Africa

While the African continent remains largely rural, it is one of the fastest urbanizing regions in the world [1]. Africa’s transition into the ‘urban age’ is seen in the prolific growth of megacities as well as smaller towns [10]. The urban population increased from 14 to 32% between 1950 and 1990 and is projected to rise to 54.1% by the year 2025 [11]. In absolute terms, the urban population will rise from 395 million in 2010 to 1.339 billion in 2050 [12]. Currently, the continent has seven megacities (cities with populations over 10 million): Cairo, Kinshasa, Lagos, Accra, Johannesburg, –Pretoria and Khartoum with cities such as Lagos having an average annual growth rate of 5.8% (**Table 1**).

Other big cities expected to join the megacity list include Nairobi, Luanda, Dar es Salaam and Addis Ababa [13]. Urbanization trends in most of African

	Urban population as a percentage of total population [*]			Urban population average annual growth rate		
	1970	1991	2000	1970–1980	1980–1990	1991–2000
Low-income countries	28	39 (3127)	–3686	3.7	5	2.4
Kenya	10	24 (25)	32 (34)	8.5	7.8	7
Zimbabwe	17	28 (10)	35 (12)	5.6	5.8	5.4
Nigeria	20	36 (99)	43 (128)	6.1	5.8	5.4

^{*}Figures in parenthesis are estimates of total population in millions.

Table 1.
Urbanization of low-income countries in sub-Saharan Africa.

countries are mainly demographically driven without commensurate socio-economic development [14]. With no massive social, economic and infrastructural transformations in place, growing cities and towns in Africa experience high rates of poverty, unemployment, low wages and inequality [15, 16]. Urbanization in African is rather chaotic and is dogged with complex urban health crises arising from inadequate safe water supply, squalor and shanty settlements (**Figure 1**), poor sanitation, poor solid waste and toxins disposal that contaminates food and water [3]. These living conditions drive a high incidence of infectious diseases [17].

Injuries are also common because of inefficient, congested, and risky transport system [18]. It is estimated that up to 62 percent of SSA's urban population live in informal settlements characterized by pervasive poverty and overcrowding [19]. While the poor in the cities continue to suffer marginalization and experience excess social and economic vulnerability from unstable employment, external shocks such as natural disasters, the affluent section of cities are much more planned and with significant policy attention, and development that ensures healthy living such as presence of walk ways, parks and playing fields (**Figure 2**) [20, 21]. Therefore, the divide between the rich and poor urban dwellers remains wide in African cities, and the extent of inequality reduces access to healthy living as well as essential and quality health services particularly for the poor. Young people face several challenges when transitioning to adulthood within such settings.

There is substantial evidence from studies conducted in Nairobi slums, indicating an increase of smoking along decreasing social economic status (SES) gradient, and within overcrowded settings, thereby elevating the risks of second hand smoking [22]. While urban poverty remains a critical trigger of NCD risks, the existing obesogenic environments and weak health systems in most of urban Africa portend a bleak future for NCD prevention and control. Studies in Kenya, Ghana and South Africa have also shown that living in a city is associated with higher odds of obesity and cardio-metabolic risk factors [23–25]. Similarly, Peer et al., (2013) [26], in South Africa found that urban environments are associated with an increase in prevalence of the traditional risk factors for NCDs including smoking, harmful alcohol consumption, inadequate physical activity, and inadequate fruit/vegetable consumption. In addition, early life exposure to urban environment has been linked to an increased risk of obesity and impaired fasting glucose in later adulthood [27].



Figure 1.
Korogocho slums in Nairobi. Credit: APHRC.

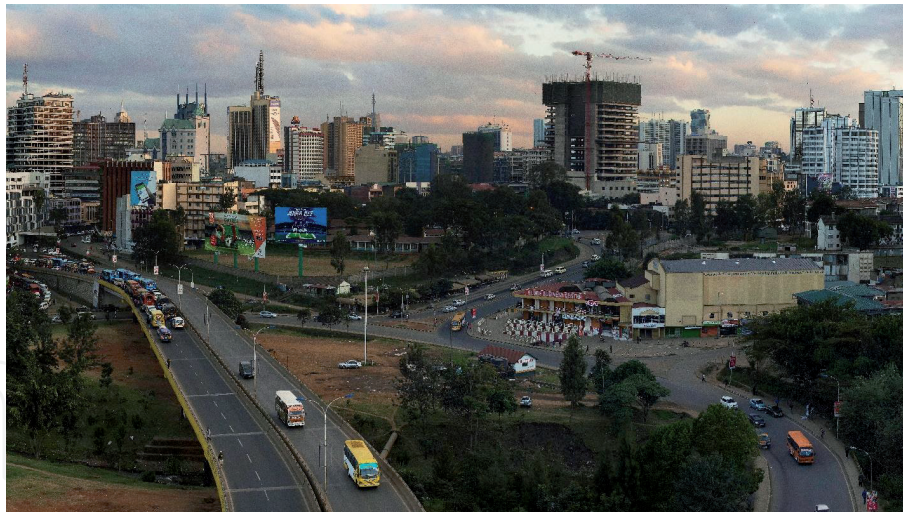


Figure 2.
A section of the Nairobi Central Business District (CBD).

3. Burden and trends of NCDs in Africa

The world health organization (WHO), defines NCDs as any medical condition or disease that is non-infectious and non-transmissible among people. The four main NCDs include cardiovascular diseases, chronic respiratory diseases, diabetes, and cancers which share a set of four key behavioral risk factors: tobacco use, harmful alcohol use, physical inactivity, and unhealthy diet [28]. These behaviors mediate biological risk factors such as obesity, raised blood pressure, and increased blood glucose, elevated blood lipids which ultimately progress to more advanced disease [29]. Other examples of NCDs include mental illnesses, injuries, and chronic kidney diseases. From 1990 to 2015, NCDs related deaths in SSA increased from 25% (1.7 million) to 34% (2.7 million). During the same period, the total NCD burden expressed as disability adjusted life years (DALYs) increased by 45% [7]. Cardiovascular diseases (CVDs) are the leading cause of NCD deaths. In 2013, CVDs caused nearly 1 million deaths in SSA, constituting 38.3% of non-communicable disease deaths and 11.3% of deaths from all causes in the region [30]. Cancers come second causing 12% NCDs deaths with wide variations across regions in SSA. Among males in SSA, leading cancer cases (in age-standardized incidence rate (ASIR) per 100,000 population) included, prostate cancer (27.9), liver cancer (10.2), Kaposi sarcoma (7.2), oesophageal cancer (6.8) and colorectal cancer (6.4). While among females, cervical cancer (34.8), breast cancer (33.8), liver cancer (5.4), colorectal cancer (5.4), ovarian (4.6) [31], are the most common causes of death. Tragically, survival from cancer is worse than in the rest of the world. For many cancers, the risk of getting cancer and the risk of dying from it are nearly the same in SSA [32]. Chronic respiratory diseases and diabetes are each responsible for about 10% and 5% of total deaths in SSA respectively [7]. The NCD risk factors such as high blood pressure, poor diets, air pollution, high body-mass index, tobacco smoking, alcohol and drug use, high fasting plasma glucose, high total cholesterol, and low physical activity are the top 10 global risk factors for death [7].

Other forms of NCDs such as injuries are responsible for a significant proportion of DALYs. Injuries resulting from road accidents (motor vehicles and motor bikes) have increasingly taken a growing toll on human health [33]. Mental disorders, including depression and anxiety, or severe forms like psychosis, schizophrenia and bipolar, as well as alcohol and substance dependence are common. Over the next decade, it is projected that NCD associated DALYs will surpass that contributed by infectious diseases, perinatal and maternal conditions combined (**Figure 3**).

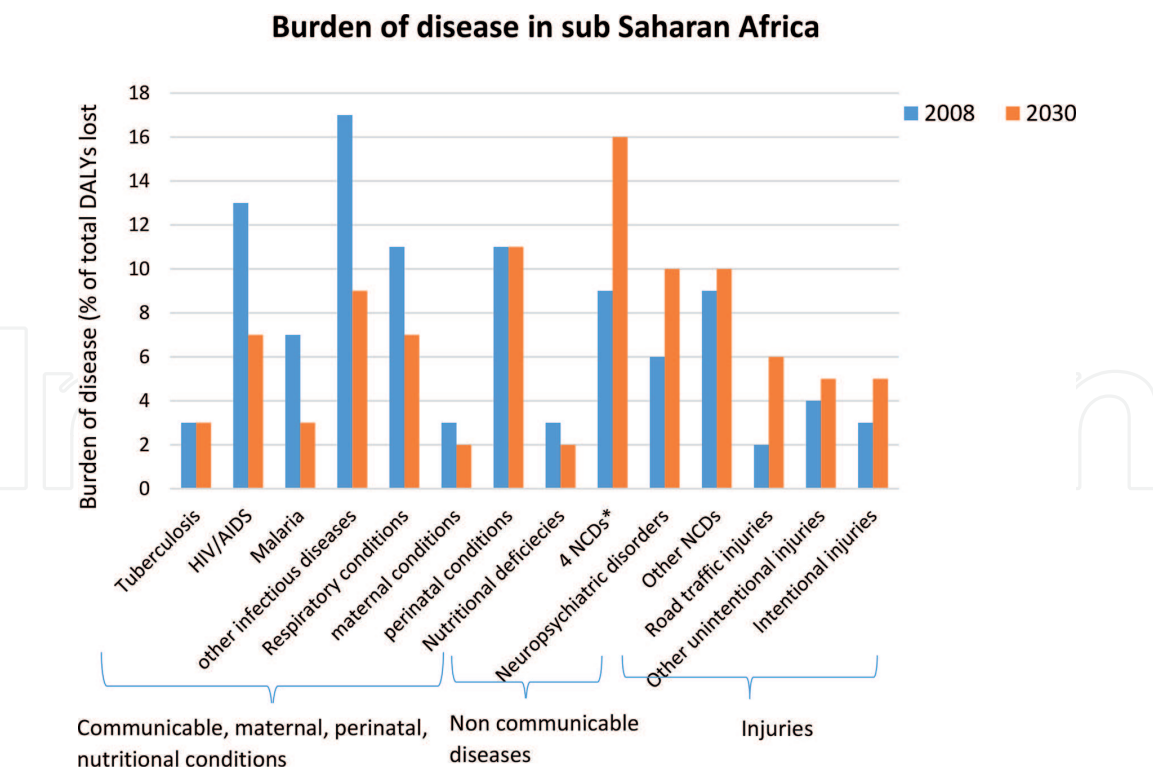


Figure 3.
Projected burden of disease in SSA, 2008 and 2030. Source of data: Authors from (World Health Organization, 2008). NCDs: Cardiovascular diseases, cancer, diabetes, chronic respiratory diseases.*

4. Hypertension in African cities

Hypertension is a leading risk factor for mortality, and is the prime risk factor for the CVD epidemic in Africa [34]. Hypertension is defined as an average systolic blood pressure ≥ 140 mmHg and/or average diastolic blood pressure ≥ 90 mmHg among adults aged at least 18 years. Data available on hypertension prevalence are from a wide range of studies [35, 36], majority of which are not age-standardized, and this limits the opportunity for reliable comparison between different African countries and cities. Nevertheless, several WHO STEPwise surveys reported a hypertension prevalence of 19.3–39.6% in Africa [35, 37]. Additional data from epidemiological modeling project suggest that 216.8 million people will have hypertension by 2030. Urban settings consistently have a higher prevalence of hypertension compared to rural areas [38, 39] (**Figure 4**).

Of great concern, is the proportion of individuals with hypertension who remain underdiagnosed, lack access to treatment and are prone to severe complications and increased risk of premature deaths [40]. Evidence from a review of hypertension in 23 African countries, shows that less than half of those with hypertension are aware of their diseases and only one third of those who are aware start treatment, and less than 10% of those on treatment have their blood pressure controlled [41]. It is thus crucial to understand the risk factors driving the rise of hypertension in urban areas to inform preventive interventions. Several factors have been cited as responsible for the rise of hypertension among urban populations in Africa.

Early studies by Donnison et al. (1929) in an African rural community established the role of civilization and urbanization on the development of hypertension [42]. Later, Poulter et al. (1990) established social-behavioral origins with sedentary lifestyles and increased consumption of unhealthy diets among rural–urban migrants in Kenya as major factors driving elevated blood pressure [43]. Researchers also observed that mean diastolic blood pressure of migrants (aged 15–34 years) who moved to the cities increased markedly over time, compared to

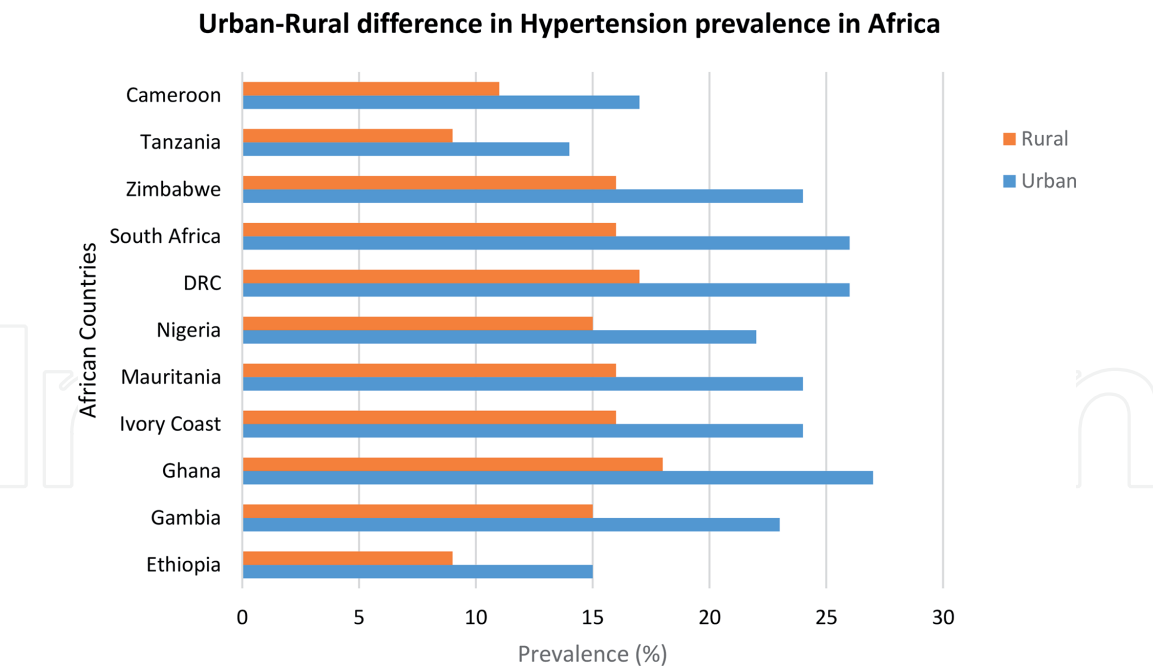


Figure 4. *Prevalence of hypertension by rural–urban residence in selected African countries. Source of data: World Health Survey (2003).*

their controls in the rural areas. In addition, migrants’ mean urinary sodium: potassium ratio, weight and pulse rate were higher than for controls [43]. Cooper et al., also hypothesized that environmental and behavioral changes that occur when individuals move from rural to urban settings all coalesce to increase predisposition to hypertension [44].

Urban poverty which is common in African cities, is also known to mediate deleterious risks factors for hypertension among urban residents [45]. In LMICs, poverty exposes people to behavioral risk factors for NCDs and in turn, resulting NCDs become an important driver for poverty. The urban poor experience increased vulnerability to unhealthy diets and physical inactivity. Evans et al., (2010) found that informal settlements within cities in South Africa had unhealthy diets and inadequate physical activity because they lacked access to organized markets for healthy foods, and had inadequate resources for physical activity [46].

Urban living in South Africa, Tanzania and Cameroon was also reported to be associated with increased exposure to tobacco use, excessive alcohol intake, unhealthy diets (high in salt, and sugar and less in fiber) and also physical inactivity [47, 48]. In the next section, we review how urban environment modifies NCD risk factors.

5. How urban environment determines the rise of NCD risk factors in African cities

5.1 Unhealthy diets in African cities

There is evidence alluding to the link between diet and development of overweight, obesity and occurrence of NCDs [49]. However, the understanding of the nexus between urbanization and changes in dietary patterns and nutrient intakes in Africa remains limited. As African cities grow, the rise in urban population’s increases pressure on arable land for farming, and coupled with rural urban migration, this reduces the ratio of food producers to food consumers [16]. This

consequently leads to severe disruptions in healthy food availability, distribution, access and affordability [50, 51]. As healthy foods such as fresh vegetables and fruits, cereals and plant proteins diminish in urban settings, populations resort to the readily available which often unhealthy. A survey in major cities of Cape Verde, Ghana and Senegal reported an increased consumption of energy-dense foods such as candies, ice cream and sweetened beverages up to seven times as frequently as fruit and vegetables [50]. This finding affirms previous studies that showed rapid rise in fat intake across low income countries, including in Africa [52]. Proliferation of fast-food outlets, supermarkets, food vendors, and restaurants in cities have facilitated increased access to unhealthy diets, thus transforming urban settlements into highly obesogenic environments. Nevertheless, for individuals of higher socio-economic status, these changes may offer improved access to nutritious foods since they can afford more healthy foods [53]. While for the urban poor, choices for healthy foods are restricted and they easily resort to the most easily available and affordable diets that are largely unhealthy [54]. In the cities, there are aggressive powerful commercial and emotional advertisements and marketing through various media outlets, which greatly influence preferences and choices of fast-foods and sugary drinks, especially among children and young adults [55, 56].

5.2 Physical inactivity and sedentary lifestyles in cities

Physical activity (PA) has many health-promoting effects and is associated with reduced risk of cardiovascular and metabolic diseases, obesity, and some cancers [57]. Insufficient physical activity is a leading risk factor for NCDs and has a negative effect on mental health and quality of life. Levels of physical activity in many African countries vary widely across geographic regions and population subgroups. For instance, country level prevalence of PA ranged from 46.8% in Mali to 96.0% in Mozambique [58]. While current data shows that SSA has the least prevalence of insufficient physical activity compared to the rest of the world [59], trend data shows decreasing levels of physical activity and increasing levels of sedentary lifestyles across all age groups [60]. Country-specific population-based data on physical activity prevalence show lower levels of PA in urban environments attributed to built-up environment leaving no green spaces for physical activity [61]. In addition, congestion in cities, availability of motorized transport and absence of paved walk-ways makes it impractical for physical activity to happen in African cities. In low income informal settlements in African cities, several physical barriers and insecurity limit physical activity [46]. In Kenya for instance, young adults in rural areas were found to be more physically active compared to those in urban areas. A study conducted by Mashili et al. (2018) in Tanzania also found that being employed, higher education and wealth status (mainly among urban residents) were associated with less physically activity [62].

5.3 Tobacco and alcohol use in African cities

The WHO considers tobacco use as the single leading cause of avoidable death and ill health, contributing to lung cancer, chronic respiratory disease and cardiovascular disease [63]. While the use of cigarette and other tobacco products has declined in high-income countries [64], cigarette use in LMICs including in SSA is rising [65]. Demographic Health Surveys (DHS) conducted in 16 African countries revealed that cigarette use was highest among urban dwellers, less educated, and lower socioeconomic status individuals [66]. Consistent with previous studies in Africa, urban residents are most at risk for cigarette use [67], and start smoking at a younger age [68]. A study by Williams et al., (2008) in Cape Town concluded

that urbanicity was associated with smoking attitudes among women [69]. Notably, increased marketing of tobacco products target women and youths in urban SSA [66]. Young adults in African cities, for example in Nairobi, Kigali and Dar-es-salaam, have taken into trendier smoking habits such as “*shisha*” (*pipe smoking*) [70–72]. In addition, since informal settlements in the cities are overcrowded, there is increased the risk of second hand smoking and indoor pollution from cooking—all linked to cardiovascular and respiratory complications [73].

Comparative literature about alcohol use in urban and rural settings is rare. Some studies have linked urban living to the rise of psychological distress and alcohol-related problems. However, there is paucity of research that investigates the link between urbanization stress and alcoholism in SSA [74]. Similarly, harmful use of alcohol is often associated with injuries, violence, crime, suicide and risky sexual behaviors [75].

5.4 Obesity and overweight

The link between obesity, poor health outcomes and all-cause mortality is well established. Obesity is known to increase the likelihood of diabetes, hypertension, coronary heart disease, and stroke, certain cancers, obstructive sleep apnoea and osteoarthritis. It also negatively affects reproductive performance [24, 27, 76]. Research evidence now characterizes the rapid rise in obesity levels in urban parts of Africa over the last 25 years as an epidemic. A study in Nairobi informal settlements found three times higher obesity prevalence than that rural areas in Kenya [77]. An analysis of demographic and health survey data from 24 African countries over the past 25 years revealed a consistent increase in obesity levels in all study countries. Obesity more than doubled or tripled in 12 of the 24 countries including Kenya, Benin, Niger, Rwanda, Ivory Coast and Uganda, Zambia, Burkina Faso, Mali, and Malawi, while Tanzania experienced a three-fold increase over the same period [78]. Substantial differences were observed between countries: Egypt and Ghana had the highest prevalence of obesity in the survey estimated at 39 and 22% respectively [79]. Obesity was higher among women aged between 15 and 49 years and those living in urban areas [80]-see **Figure 5**.

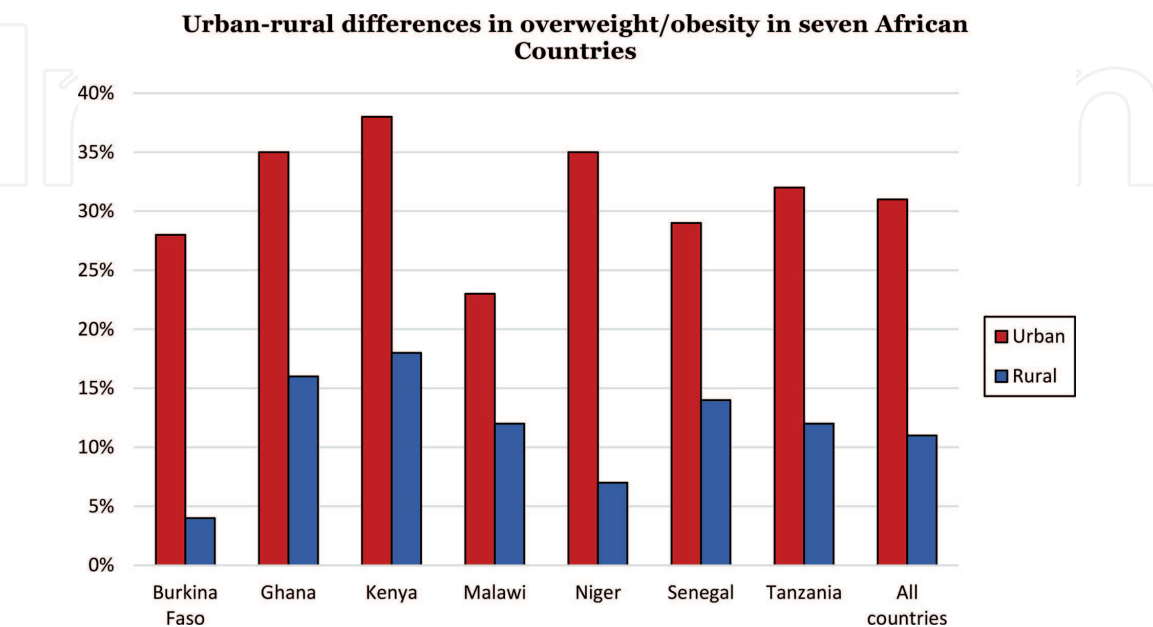


Figure 5. Differences in urban and rural overweight and obesity prevalence in Africa. Source of data: Demographic Health Surveys (DHS).

Several studies have described the role of urbanization in the rising obesity epidemic in the African continent [79–81]. Urbanization along with socioeconomic transformation lead to increased access to high energy-dense foods and more sedentary lifestyles resulting in a positive energy balance leading to obesity. Access to cheap foods, high in fat and sugar content among the urban poor is easier than in rural communities, thus the higher prevalence of obesity in urban areas [82]. In an analysis of data from seven African countries including Malawi, Senegal, Kenya, Ghana, Tanzania, Niger and Burkina Faso, Ziraba et al., found that the greatest increase in prevalence of overweight and obesity over a ten-year was among the poorest people living in the cities [83].

6. Control of NCDs in Africa cities

Many interventions for prevention and control of NCDs exist but because most African countries have limited resources, choices have to be made about which of the interventions are prioritized [84]. WHO proposed several NCD “best-buy” strategies - proven and cost-effective approaches for addressing NCDs- within LMICs through tackling of the modifiable risk factors for NCDs [85]. Examples of the “best buys” include increasing taxes on tobacco and alcohol, legislation to restrict smoking zones, bans on advertising, reducing salt and sugar in food and raising public awareness on dangers of all risk factors for NCD and promoting healthy behaviors. A number of African governments made commitments in domesticating and implementing NCD related international commitments, such as the Global NCD Action Plan 2013–2020 with targets and indicators to accelerate NCD control [86]. Nevertheless, progress has been slow, and in some cases off-track in achieving the NCDs indicators by the set deadlines [87]. Scarcity of resources and several competing priorities in the health sectors across African countries limits the ability of countries to achieve their targets. A recent WHO NCD Progress Monitor report revealed that less than half of WHO Member States have set NCD targets/indicators to track progress of implementing NCD “best buys” [88]. Some of the “best-buys” that have been implemented by African countries include; taxes and legislations to create a protective environment that limits exposure to harmful behaviors especially for the most vulnerable.

Both excise and sales tax on tobacco products in Kenya and South Africa were increased [89]. Similarly, several countries including Botswana, Kenya, The Gambia, Ghana, South Africa, Tanzania, and Zimbabwe have imposed taxes on alcoholic beverages [90]. While the enforcement of the alcohol and tobacco policies may be lacking the needed regulatory teeth, there is some evidence suggesting higher levels of alcohol and tobacco abstinence in countries implementing these interventions compared to countries without any regulations [90]. Between 1993 and 2009, cigarettes sales declined by 30% in South Africa, and the rate of smoking among adults dropped by 25%, even as government revenues from tobacco taxes increased by 800% [91, 92]. South Africa imposed taxes on sugary drinks in 2017, becoming the first African country to do so, in an attempt to reduce excessive consumption of sugary drinks [93], the effect of this is yet to be seen. South Africa also passed a legislation to enforce salt reductions in the food industry by establishing maximum sodium content limits to be achieved by 2019 [94]. Some countries are now pushing for bans on alcohol advertising. In Gambia, alcohol advertising is banned on national television and radio.

Some African cities have chosen a more positive and interactive approach through health promotion such as raising awareness about NCDs and encouraging disease screening through campaigns (e.g. for hypertension and diabetes). Most of

these health promotion approaches are aimed at achieving positive health behaviors at individual and community levels [95]. For example in Kigali, Rwanda physical activity is promoted among city residents by encouraging people to leave work early once in a week to engage in physical activity [96]. Such preventive approaches to NCD control targeting the behavioral risk factors are more cost-effective than treating the NCDs. A more concerted, strategic, and multi-sectorial policy approach is essential to help reverse the negative trends of NCDs in urban Africa.

7. Challenges of NCD control in urban Africa

Several challenges hinder efforts to address the NCD burden in cities. The main challenges include lack of data needed to inform primary prevention, care and treatment, low community awareness on NCDs and risk factors, weak policies and poverty in the informal settlements.

7.1 Dearth of NCD data

Limited availability of representative data on the burden of NCDs in Africa [97], leads to a gross underestimation of burden, thus the inability to lobby for investment in NCD care service delivery. Some countries have collected national NCD data through the NCD WHO STEPwise surveys. Up to 33 countries in WHO African Region have conducted at least one round of STEPwise survey which draws a nationally representative sample and about 19 countries have conducted the global school-based student health surveys (GSHS) [98]. Routine data captured by health facilities on morbidity and mortality could be a potential sources of data, but these data are limited by non-representativeness due to differential use of health services, inaccuracies from paper-based data capture systems, thus the data are largely regarded as of poor quality [99]. Insurance firms also provide important morbidity data, but these have limited value since a small proportion of the population access health insurance. The Global Burden of Disease study combines several datasets to model national NCD morbidity and mortality estimates, but rarely reports NCD burden by rural versus urban locations. Data challenges such as the variation in methodologies used to capture data, the rigor of instruments, sampled populations, design used as well as the variations in how the indicators are defined continue to hamper the comparability and learning across countries [100]. Planning of NCD services without reliable data is almost impossible.

7.2 Lack of community awareness

Lack of knowledge and awareness on risk factors at community level hinders healthy behavior change and uptake of early NCD screening and treatment services [101]. A study in Abuja reported a high prevalence of hypertension among the elderly populations, and majority of whom were unaware about their conditions [102]. Other studies have suggested that low levels of knowledge and awareness of hypertension are associated with undiagnosed, severe or complicated, and uncontrolled hypertension [103], lack of patients' adherence to lifestyle modifications and to medications [104, 105]. Certainly raising awareness particularly on uptake of screening services for most NCDs could be beneficial at both individual and population-levels. And in the context of urban Africa, such efforts could leverage on wide spread mass-media for health promotion. Low levels of NCD awareness or knowledge levels among health workers is also associated with reduced ability for case-finding, treatment and referrals [106].

7.3 Weak policies

Urban populations in Africa tend to be very diverse by education, religion, socioeconomic status and culture [5]. As a result, NCD prevention and control policies and programs need to be tailored to cater for variations at population levels [107]. In a review CVD policies in Kenya Asiki et al. (2018) found no standalone policies for CVD management and care but some aspects of CVD policy were covered in general NCD policy document [108]. NCD policies in most African countries suffer the same deficiencies as they do not reflect the typical realities of urban living –pervasive food marketing and complex urban food environments that may offer diversity as well as greater exposure to unhealthy foods [8]. These policies are also not well integrated with policies in other sectors such as spatial planning, infrastructure and housing, transport planning, education policy, access to energy, and water and sanitation policies and interventions [53]. As such minimum intersectoral and multisectoral engagements in policy formulation lead to standalone NCD policies that are not coherent with other policies [90]. Furthermore, national policies and plans for the prevention and control of NCDs often suffer from underfunding [109], and are thus not implemented. In addition, interference from commercial and economic interests of industry for tobacco, alcohol, and food industries makes it difficult to regulate these NCD risk factors as policy makers and law enforcers are often bribed or threatened not to formulate and or implement such policies [110].

7.4 Slow health system response

Health systems in SSA are characteristically weak and overburdened by the rapidly increasing double burden of communicable diseases and NCDs [17]. With more focus and investment on infectious diseases such as malaria, TB and HIV, very little attention is given to the rising NCD burden in cities [111]. As a consequence, several gaps and missed opportunities exist to offer services for patients and many miss diagnosis, and treatment to when they present to hospitals with other diseases [112]. Inadequate staff and as well as capacity of health staff in most countries, negatively affects NCD prevention and treatment at facilities. For instance, nurses at primary healthcare facilities should have skills to use simple point-of-care equipment such as glucometers for early screening, treatment and referral of individuals with abnormal blood glucose [113]. Frequent stock-outs of medicines and supplies remains a critical barrier to prompt treatment and adherence to these treatments. In Nairobi, Kenya medicines for NCDs are hardly available in public hospitals, and there is lack of integration of NCD services with other chronic diseases such as HIV or TB services [114]. Knowing that interventions targeted against one of the disease burdens will impact the other, it is critical that interventions are conducted jointly instead of competing for limited resources. A study in Malawi reported that the full cost of NCD care is often borne directly by patients through out-of-pocket (OOP) payments individuals [115]. Similarly, a study by Mwai and Muriithi (2016) in Kenya reported that NCDs reduce household income by almost 30%, compared to other general ailments that reduce household income by 13.6%. As a consequence, many people suffering from NCDs in Africa face risks of experiencing catastrophic health expenditures, impoverishment and may be deterred from seeking the care they need [116].

7.5 Poverty in informal settlements

Poverty is common among urban residents in Africa and this plays a fundamental role in the onset, progress and mortality of NCD patients [117]. Studies

have suggested that the groups most at risk of NCDs in the next decade will be the urban poor [118]. While NCD epidemiology in high income countries is largely driven by explosion of traditional risk factors in Rwanda, increasing evidence points to a greater contribution of malnutrition, infections, and toxic environments - all exacerbated by poverty [119]. Poverty also limits access to quality NCD care. Majority of the urban poor lack access to health insurance and therefore resort to out-of-pocket payments, consequently leading to catastrophic spending [120]. Research on social and economic implications of NCDs remain scarce in most SSA countries yet such information is important for prioritization of NCDs by all relevant sectors [121].

8. Conclusion

The rapid urbanization in Africa continues to drive the NCD epidemic, increasing vulnerability of individuals, threatening development and sustainability of African cities. To mitigate this rising threat - effective evidence-informed multi-sectoral policies are needed to address prevention and control of NCD focusing on the major NCD risk factors. While several countries have developed national strategies for NCD prevention following the global WHO NCD prevention strategies, implementation of these policies is still inadequate. Thus there is need for governments to put more effort in strengthening implementation of these policies including allocation of financial and other resources to support implementation. NCD policies need to be integrated into urban planning to address air pollution as well as physical inactivity by designing and developing parks and recreational facilities including pedestrian and cycling tracks, zoning walk-ways where motorized vehicles are not allowed and providing incentives for the non-use of motorized vehicles. Fiscal policies and regulatory measures to restrict unhealthy food environment in urban areas of Africa are also needed to curtail the ever growing food marketing by a burgeoning food industry.

There is need to strengthen health care systems to make them more responsive to NCD prevention and control. This include building capacity of health workforce on prevention and control of NCDs, strengthening infrastructure, providing essential commodities and supplies and strengthen surveillance systems to be able to plan, monitor, and assess the effects of NCDs on population health and monitor the performance of interventions. A good balance of investment is required for the delivery and coordination of both curative and preventive and promotive services to avert the NCD disease burden. Countries need to explore various models of partnership with private sector partners aimed at scaling up their contributions to addressing NCDs directly or indirectly through various multi-sectoral strategies.

There is need to strengthen primary prevention interventions at community-levels. These interventions include early detection, active screening, case finding, referral and treatment and working with at-risk individuals to reduce high risk behavior. Expanding opportunities for early detection at the community and in primary health facilities could yield positive outcomes, especially through deliberate implementation of task shifting and task sharing models, involving community health workers (CHWs), while consistently mentoring and evaluating performance of such a model. Further community interventions include health education and promotion focusing on NCD risk factors including importance of reduced alcohol and tobacco consumption, physical activity and decreased consumption of high-calorie foods and highly processed foods while increasing consumption of fruits and vegetables. Some evidence exist on the potential positive results of such small-scale healthy food interventions utilizing platforms such as school feeding programs and

workplaces. While documented community interventions addressing alcohol and tobacco consumption are scarce, interventions to enhance awareness and engagement in physical activity in major cities such as in Rwanda and Cameroon have been shown to work. Above all pro-poor primary health care programs targeting vulnerable and disadvantaged groups in African cities are needed to reduce the equity gap in NCD services.

Author details

Kenneth Juma^{1*}, Pamela A. Juma², Constance Shumba³, Peter Otieno¹ and Gershim Asiki¹

1 African Population and Health Research Center, Nairobi, Kenya

2 London School of Economics and Political Science, London, UK

3 Aga Khan Foundation and Aga Khan University, SONAM-EA, Nairobi, Kenya

*Address all correspondence to: kjuma@aphrc.org

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