

# Sustaining Increase in Life Expectancy in Africa Requires Active Preventive Measures against Non-Communicable Diseases

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## Abstract

It is projected that aged population ( $\geq 60$  years) will continue to increase globally, including in Africa. This is due to reduced population growth, decreased fecundity and improved medical interventions; factors which increase life expectancy. While this is typical for developed countries, it is not the same for Africa and similar developing regions. In these regions, a significant proportion of death is due to non-communicable diseases (NCD's) such as hypertension, cerebrovascular accident, coronary heart disease, diabetes mellitus, chronic renal disease and cancer, among others. Rising prevalence of NCD's due mainly to western style diets and sedentary living is made worse by inadequate nutrition education, high prevalence of low birth weight, poor health services, lack of efficient tobacco control and deficient planning of built environment. In order to halt the possible reduction in life expectancy occasioned by NCD's, efforts by the community, health planners and governments in Africa to address relevant NCD's, must be put in place. Suggested measures are: nutrition education, regular community directed physical exercise, improved environmental planning and development. Others are review of present health service model, early detection, prevention and treatment of NCD's, including improved antenatal care to reduce low birth weights, and establishment of policies and measures that decreased access to tobacco especially by women of childbearing age. Africa and similar developing regions cannot fund the health bill due to NCD's and their complications; hence it is important that this scourge is attended to with all seriousness.

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## Keywords

### Life Expectancy, Developing Countries, Non-Communicable Diseases, Prevention, Community Role and Health System Review

## 1. Introduction

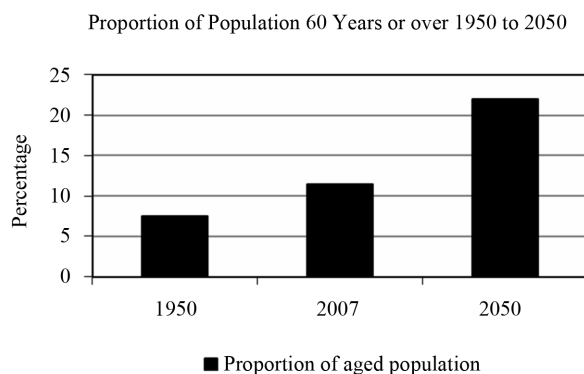
Population ageing is a major feature of the world population in the 20<sup>th</sup> century with developed and developing countries witnessing increases in number of old people (60+ years). Globally, the population of older persons is said to be growing at 2.6 percent per year, and this is higher than the annual world population growth rate of 1.1% [1]. The faster population growth rate of older people raises a general concern about the future implications of such an inverted demographic pyramid, especially considering the mis-match of increasing population of older people and the accompanying slow rate of growth of socio-economic activities (Figure 1).

Improvement in living standards; improved hygiene, advancements in medical care and improved socio-economic development, have contributed to the decline in mortality across the populations with consequent gradual rise in life expectancy [2]. Added to these, improved survival at older ages and a lower birth rate has also contributed to “ageing” of population in Europe and North America [3] [4]. In 2006, 64 percent of the global population aged 60 and above were said to reside in developing countries, and this is projected to increase to nearly 73 percent by 2030 [1]. Whereas the developed countries presently have the highest proportion of the oldest ones, the fastest increase of social ageing will take place in developing region over the next half a century. Importantly, it is not the absolute figure of aged population in developing countries that is crucial, but the speed at which it is occurring vis-à-vis development in socio-economic activities. This should be a cause for worry for social scientists, medical community and policy makers in developing regions, especially Africa as she lacks the ability to cope with projected new demographic transition. This expectation could be delayed if the events/activities that currently threaten life expectancy in the region are not quickly addressed. The threat posed by rising prevalence of NCD’s in the Africa region, if unabated will not only decrease expected rise in aged population, it could further stretch thin the already strained health infrastructures in the region.

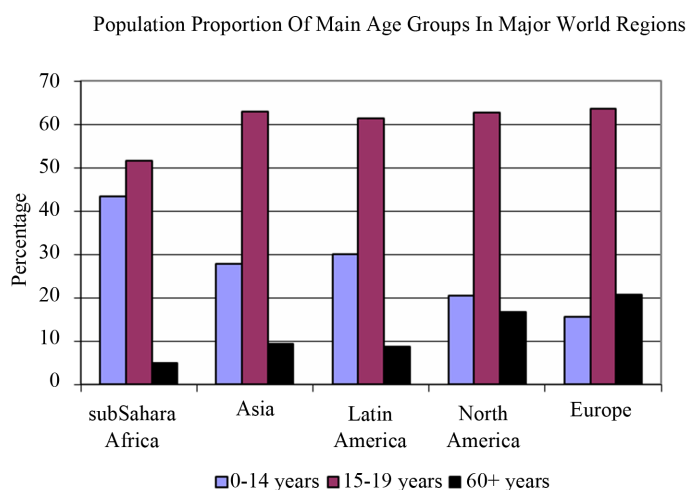
## 2. Projected Dynamic of Population Ageing in Africa

In less developed regions of the world, older people account for about 8% of the population, and this is expected to increase to 20% by 2050 [1]. The projected increase in aged population, though lower than that expected for developed economies over the same period; 20% to 30%, is occurring at a faster rate in developing economies (Figure 2).

The faster rate of population ageing in developing regions including Africa, and is related to the continuing fertility decline in the population [5]. In these regions there are inter- and intra-regional variations in projected life expectancy and aged populations. The population of aged people in Sub-Saharan Africa is about half that in



**Figure 1.** Proportion of population 60 years old over 1950 to 2050. Adapted from: World Population Ageing 2007.



**Figure 2.** Population proportion of main age groups in major world regions. Adapted from source: United Nations (2005), World Population Prospects. 2004 Revision.

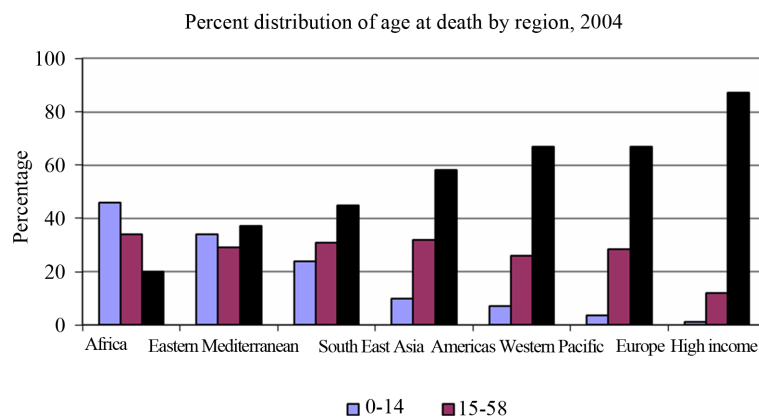
Asia and Latin America. The projection in Africa is that between 2006-2030, the aged population (60+ years) in South Africa will increase from 3.5 million to 4.8 million (approximately 37% increase), while in the same period the aged population in Nigeria will increase by about 86% (6.6 million to 12.3 million) [6]. This increase in aged population may underlie the expectation that Africa will reduce its young dependency burden by 57% and increase old age dependency by 93%, between 1995 and 2050 [7]. Consequently, faster rate of population ageing in developing countries will not allow for proper adaptation of such places to evolving demographic transition [4], unlike was obtained in developed economies in the past [5]. This is particularly important given the unpreparedness of most African countries for the projected demographic shift in ageing population. While it is true that most African states aren't adequately prepared to handle increasing aged population [7], most of these projections might not come true if NCDs continue its present increasing trend unabated.

Presently, there are biological and non-biological factors that will hinder increasing life expectancy in Africa. We are aware of the caution of Mathers and Loncar [8], which stated that statistical projections aren't cast-in-stone, but on certain assumptions premised on continued present trend of socio-economic dynamics. Still we think that the present trend of increasing NCDs in Africa and similar regions will need active preventive measures, otherwise projection of possible decrease in life expectancy in the region, may not be too simplistic as [8] suspects it might.

### 3. Non-Communicable Diseases Burden and Mortality in Africa

Exact estimate of mortality is difficult in certain regions of the world including Sub-Saharan Africa because of limited death registration [8]. In spite of this, there are estimates that can help in arriving at useful health statistics and formulation of health policies. A mortality report in 2004 showed that 20% of deaths in Africa occurred in those 60 years and above, while it was more than 50% in the same aged group worldwide [9] (see **Figure 3**). This report also showed that the second highest mortality due to NCD's occurred among African adults aged 15 - 59 years.

In 1997, NCD's aggregate was found to be higher in low-income regions than in high income established market economies. But in terms of proportions of death due to NCD's, it is still higher in established market economies than in Sub-Saharan Africa [10] and this is related to the low proportion of deaths due to infections and its complications. The high level of NCD deaths in developing world including Africa is related to the high prevalence of determinants of NCD mortality in these regions [10]. In 2003, International Diabetes Federation (IDF) reported that about two-thirds of the world population of diabetics lives in developing countries [11]. Similarly, other workers have reported higher age-specific level of diabetes mellitus and hypertension in many urban areas of Sub-Saharan Africa than in most Western European countries [12]-[14]. Hence the prediction in 1997 that by 2020, NCD's including hypertension and DM will outstrip communicable diseases as cause of



**Figure 3.** Percent distribution of age at death by region, 2004. Adapted from: Source: Global Burden of Disease: 2004 update. WHO 2008.

death in Africa [10]. Closely tied to the rising prevalence of NCD's is the rise in the prevalence of obesity and this has been linked with urbanization, increase in house-hold income, high energy intake and decreasing physical activity, in some African populations [15]. Whether in West Africa blacks or those in Jamaica and USA, there is an increasing prevalence of NCD's in blacks, more so in blacks in the Diaspora. The underlying risk factors for NCD's in these blacks includes, decreasing physical activity, westernization of diet, and raised body mass index (BMI) [16].

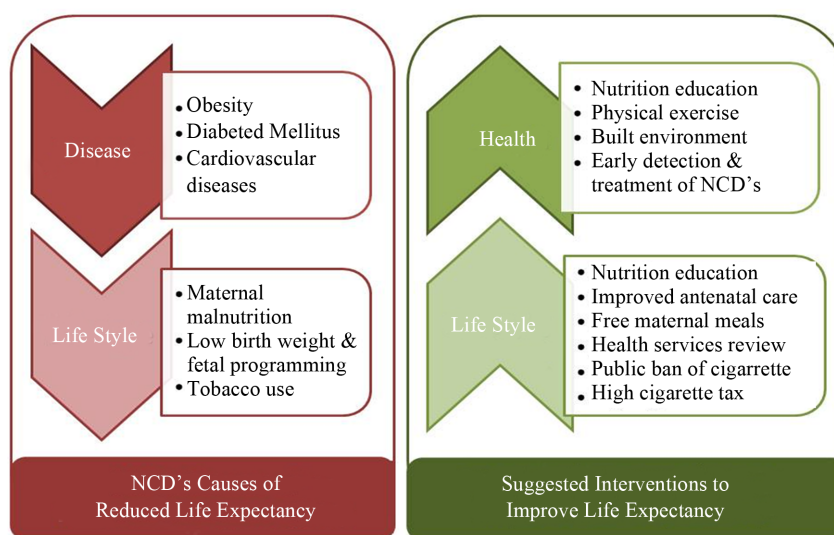
Considering the present level of mortality, disease burden and the projections for the region, it is hard to foresee a continued rise in life expectancy in Africa. This is especially so considering the inadequate health care structure, personnel inadequacy, dwindling health expenditure and other social care facilities in most African states [17]. The usual practice of "cash and carry" health systems as in most of Africa puts a huge burden on personal, family and governmental resources, thus not a very effective system [17] [18]. The net effect of this inadequate health system is the dismal statistics of NCD's in Africa. The IDF report of 2003 shows the numerous problems associated with management of DM in Africa. The report noted that only 11% of DM patients in some communities have access to insulin and insulin syringes. Other ills impeding rise in life expectancy in Africa includes, inadequate infrastructures, improper health structures, contracting and in some cases poorly trained members of staff [19] [20].

#### 4. Some Ways to Sustain Improved Life Expectancy in Africa

Despite the contribution by communicable diseases to overall disease mortality in Africa and other developing countries, deaths due to NCD's will become higher in 2020 [10] [21]. This is expected across developing region, from Sub-Saharan Africa to South East Asia to China [22]. Attention in this paper focuses on issues outside communicable diseases that need to be addressed to ensure continued increase in life expectancy or sustenance of present level (see Figure 4). The factors in this regard that should attract the attention of all (health workers, community and government) include the role of the community, nutrition education, regular physical exercise and built environment design. Others are reduction of fetal programming for NCD's, control of tobacco use and review of overall health systems.

##### 4.1. Community and Non-Communicable Diseases

The relevance of the community in reducing the impact of NCD's on life expectancy is because they are rooted in unhealthy lifestyles, adverse physical and social environments [23]. A well crafted community based program could significantly help to positively address these risk factors. When population is targeted as a whole, even a modest risk factor change will translate to a huge public health impact [23]. A sustained and effective community level risk reduction such as decrease in fat and salt intake, increase in potassium intake from fruits and vegetables, regular blood pressure and lipid checks, could lead to substantial reduction of mortality in middle ages. The advice is that such efforts should commence at early stages, early secondary school age or even while in primary school, because the risk factors for NCD's commences in early life [24] (see Figure 4).



**Figure 4.** Some ways of sustain improved life expectancy in Africa.

In Africa, a good community program is based on low-cost lifestyle modification and effective community participation [23] [25] given cultural, political, psychological and economic factors that may hinder positive results [23]. Community nutrition education should emphasize the benefits of nutrition in redressing NCD's. Non-governmental organizations can play prominent roles here and such groups include, house wives organization, lay opinion leaders [26] and spiritual bodies such as churches and mosques. The government's role here is conceptualization of nutrition policy and education and their implementation. The media should be enlisted for educating the community on proper nutrition, need for regular blood pressure, blood lipids and glucose checks, and other schemes necessary to curtail NCD's prevalence. They should emphasize the role of primary health care worker in achieving success in this agenda [23].

#### 4.2. Nutrition and Physical Exercise

Major lifestyle changes that impact negatively on life expectancy are adoption of westernized diet and sedentary habit. Diets high in saturated fats and salt, but low in carbohydrate, fruits and vegetables, are implicated in increasing emergence of chronic diseases. The ongoing nutrition transition in Africa is characterized by large consumption of fat and sugar, marked increases in animal products and declining intake of fibers due to reduced consumption of cereals [27]. In most urban areas in developing countries, income increase due to improved economy, is associated with changes in diet preference. This change is satisfied by increase in supply and varieties of food products in such communities [28]. The combination of pro-NCD's diet and poor physical exercise couple with increasing urbanization, growing private/public transportation and less physical employments, is driving the rising cases of NCD's [29] with consequent impact on life expectancy.

Ability to afford pro-NCD's meals in developing countries and use of cars for personal transportation is usually for those at the upper bracket of the socio-economic structures in most of Africa. For example, high seniority civil servants with higher household income have been found to have lower levels of physical activity than their junior counterparts and greater energy consumption. Hence they have higher BMI, waist-to-hip-ratio, blood pressure, insulin levels and dyslipidemia [15] [30]. It appears that higher education and income contributes to NCD's risk in this region. To address this, there is the need for nutrition education with emphasis on traditional diets. This should be inculcated into school curricula, even at higher education levels. Such efforts should be tied with increased encouragement to engage in physical exercise. Encouragements should include providing safe neighborhoods for safe walking and modification of built environment in a manner that increases energy expenditure in the community.

#### 4.3. Built Environment and Non-Communicable Diseases

Studies in developed countries shows that the present obesity pandemic has a root in issues in physical environ-

ment that supports obesity [31] [32]. Addressing built environment contribution to NCD's could help in reducing its prevalence in Africa. The relevance of built environment to health was first recognized during the industrial revolution, when insanitary condition and overcrowding facilitated the spread of infection [32]. At the time, built environment manipulations such as installation of comprehensive sewer systems, design of buildings that allowed inflow of light and fresh air and relocation residential quarters from noxious industrial facilities, were responsible for bringing infections under control [33].

Present threat is from chronic NCD's and built environment still has a role in its control. The observation is that sprawling nature of neighborhoods [31], lack of safe open spaces for exercise, poor access to nutritious food, promotion of use of alcohol and tobacco products through outdoor advertisements [33] promotes NCD's. A spread out residential design encourages use of automobile transportation rather than walking thus encouraging sedentary living. When "open spaces" in the community are left unattended to, they end up becoming dumping sites for garbage, habitats for vermin and favored spots for criminal activities [34]. They thus discourage physical activities in and around such locations. Items that should be addressed in the community include, the present pattern of sprawling neighborhoods, availability of safe parks, neighborhood safety through adequate lighting, access to nutritious food market, reduced availability and access to alcohol and cigarette, and construction of safe and widely inter-connected walk ways. Added to educating people, healthy behavior should be encouraged through the provision of appropriate physical space [33].

#### 4.4. Tobacco Use and Non-Communicable Diseases

Due to increasing control of tobacco use in developed countries, the tobacco industry has shifted its marketing to middle and low income countries. This shift is encouraged by the inadequate tobacco-control and large prospective consumer size in these poorer countries [35]. The targeting of young persons in low income countries [36] is worrisome giving that early exposure to tobacco use in the face of poor dietary choices will increase the risk for developing NCD's in affected individuals. In Sub-Saharan Africa, men are found to presently use more cigarette than women [35] and this has made females to become the new target by tobacco advertisements [37]. Apart from increased NCD's in women who use cigarette, there is the added issue of high prevalence of low birth weight babies by women who consumed tobacco during pregnancy. The already high cases of low birth weight babies in Africa and similarly poor regions will increase further with the use of tobacco products among women. Therefore the projection of substantial increase in number of children with NCD's risk in the 21<sup>st</sup> century [35], as a result of fetal programming for such diseases, can only come true in Africa.

A substantial increase in price of tobacco products will discourage its regular use [38] and this should be coupled with restriction of tobacco advertisement in developing countries low income countries should be assisted in implementing tobacco control policies and educating their subjects on the dangers of tobacco use. Such education should be extended to hand-rolled cigarette, pipe smoking and use of snuff which is a common mode of tobacco use among women in Africa [39]. These measures have been well encapsulated in the WHO Framework Convention on Tobacco Control (WHO FCTC) to which most African and South East Asia countries have signed to [40]. It is therefore imperative that countries must be pressured by academia, professional groupings and civil society to implement the measures contained in such convention to which they have signed. The rise in prevalence of NCD's due to tobacco use in adults, coupled with the risk in offspring's of pregnant tobacco users, constitutes a big threat to improved life expectancy in Africa.

#### 4.5. Reducing Fetal Programming for Non-Communicable Diseases

Epidemiological evidence suggests that hypertension, insulin resistance and dyslipidemia leading to cardiovascular diseases and type 2 diabetes mellitus in adulthood, originate in early life [41]. The preparatory mechanism for such later life NCD's is related to fetal malnutrition. This fact is supported by the findings that low birth weight due to inadequate maternal nutrition is associated with chronic NCD's emergence in later life [42]-[44]. Therefore, the present high prevalence of low birth weight in some Africa states will lead to higher prevalence of NCD's in the region [45]. Some workers are of the opinion that the present high prevalence of NCD's in Africa could be related to food shortages in parts of the region decades ago, and now [35]. The following are suggested measures to reduce increase in NCDs due to low birth weight/fetal programming.

1) Affected regions should consider malnutrition in pregnancy as an emergency situation. Women of child bearing age should be well educated on the impact of nutrition on materno-fetal well being. A good suggestion

is establishment of a “pregnant woman meal” similar to previous school child meal programs. A similar venture has recorded success in a part of Africa thus suggesting its practicality [46].

2) Primary health care workers should be adequately trained in nutrition education in a sustainable scheme that will guarantee continued education in the community. In particular, women should be taught how to source and utilize locally available health food materials.

3) In places that utilizes Traditional Birth Attendants are still common, they should be trained in nutrition education so as to pass it on to their clients.

Since it is possible that many subjects are already genetically primed to develop NCD's in poor regions of the world, it is again important that the WHO NCD Draft Action for 2008-2013 [47] be not only adopted by regional governments, but they should be assisted to make and drive anti-tobacco policies in their regions. This is a prime factor in the implementation of the WHO FCTC to cut down consumption of tobacco in different societies.

#### 4.6. Health System Review

The model of health service in most of Africa is one that focuses on acute illnesses and immediate need of the patients. The pattern of operation is episodic interaction between the patient and the health services, and this is usually denominated in a “cash and carry” service. In this model, an ill patient who comes to the clinic or hospital is treated and payment is made for services rendered. Even in chronic disease clinics, compliance with clinic attendance could be influenced by the ability to pay for the service offered. Such a pattern of care does not allow for effective monitoring of chronic diseases in Africa. Hence a WHO report [23] emphasize the need to move away from Acute Care Model to a Patient-Centered Care type, which can be efficiently co-ordinate. In the patient-centered care model, a continuous relationship between the patient and health care provider is cultivated and maintained. The health care provider goes beyond the premises of the clinic or health facility to ensure the patient's health is better managed. Information, education and other personal personal/community tools are recruited to enhance the patient's well being [48]. The bedrock of this system of health care is that the patient relationship with the system goes beyond mere understanding of ill health, but to creating a platform for prevention and management of chronic diseases and associated risk factors [49].

The system of spending a large chunk of public health expenditure on tertiary-level hospitals should be reconsidered [50]. It does not remove from the importance of tertiary hospitals which have immense regional and education roles, rather it makes them even more efficient. The point is that health needs are usually country-wide and centralized services as represented by tertiary hospitals can not address the roots of these chronic diseases. There need to be a change of tactics in order to improve life expectancy which is threatened by chronic non-communicable diseases. An expansion of primary health care is advised, in a manner that de-emphasizes centralization of health authority. Such an expansion will form the platform that will allow it effectively manage risk factors of NCD's in the community. While ensuring this relocation of health responsibility to the periphery (primary health care centers), the central health authority can still maintain its hold on regulatory and infrastructural interventions [50]. Closely linked to health system review is the issue of health insurance as a means of improving funding of health care services. Health insurance is grossly absent in most of Africa, especially in Sub-Saharan Africa. Even in South Africa, talk about public health insurance as the way to go in health funding, has barely moved beyond discussion documents. Governments should muster the political will to overcome public sector unpreparedness [50] in allowing the establishment of health insurance. This can only add to the advice of the World Bank [51] that Sub-Saharan African countries to employ the simultaneous solutions of engaging in public wide prevention and promotion activities, and effective management of those subjects already affected by NCD's. The expansion of public health care with well trained staff that takes health care to the door steps of the patients, coupled with a properly positioned health regulatory organ, will assist greatly in improving health care delivery in Africa in a manner that increases the quality of life and life expectancy. The price of poor preparedness of public health sector in developing regions of the world including Africa will attract the expensive cost of compromised life expectancy which is now in the horizon. This is the point we recently emphasized during an ageing conference in Barcelona, Spain [52] and to which we continue to bring attention. Supporting our alarm is a study done in Oman in which the authors concluded that chronic diseases threatens the past four decades of advancements in health and longevity [53].

## 5. Conclusion

The gain from socio-economic advancements in developing countries including those of Sub-Saharan Africa is

beginning to witness the collateral effects of increasing prevalence of NCD's. The indicators are that the large population size of the region coupled with the conducive environment for development of NCD's, means that this region will be spending a huge and unsustainable amount of money in combating these diseases. At the present level of socio-economic development in the region, there can hardly be a commensurate health care system to tackle its health burden, and this could lead to a fall in health indices including life expectancy. The way to go is to ensure that preventive and less expensive means advocated above are implemented in a manner that carry along the individual, community and policy makers/government, in a wholesome sustainable fashion.

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