

## Non communicable diseases in Tanzania: a call for urgent action

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**Abstract:** Globally there is evidence of the growing burden of Non Communicable diseases (NCDs) especially in developing countries including Tanzania. This paper summarises the review of published papers on the magnitude of Non Communicable Diseases in the country. Current opportunities for management and control of NCDs are also explored. In this review diseases such as diabetes and hypertension have been shown to have increased over the years. Prevalence of risk factors such as obesity, dyslipidemia and smoking has been shown to be high with clear gender and urban rural differences. Generally there is paucity of national representative data on the burden of risk factors and prevalence of non-communicable diseases. The main risk factors for NCDs namely smoking, alcohol intake, unhealthy diet and low physical activity are prevalent in both rural and urban communities. The socio-demographic and economic transition has a big role in the current rise of non-communicable diseases in Tanzania. There are initiatives to control the burden of non-communicable diseases in the country. However there is need to focus more on primary prevention at population level targeting interventions to reduce exposure to tobacco, reduce alcohol intake, reduce salt intake, promote healthy diets and physical activity. For the prevention and control of NCDs, there needs to be a continuum from primary to tertiary prevention and a scope of interventions from the community level up to the national level. Community-based interventions are needed targeting the risk factors for primary prevention. In addition, secondary prevention measures are needed targeting those at high risk to ensure that they are identified early through a high risk targeted screening for early identification and appropriate care. Effective policies are needed to support such interventions.

**Keywords:** non communicable diseases, risk factors, policies, Tanzania

### Introduction

There is growing burden of non-communicable diseases (NCDs) globally. It is estimated that non communicable diseases such as cardiovascular diseases, cancers, diabetes and chronic respiratory diseases are estimated to cause 60% of all deaths globally with estimated increase by 17% over 10 years (WHO, 2005). In Tanzania although communicable diseases are still the major causes of morbidity and mortality, non communicable diseases also contribute significantly to the disease burden especially among adult populations (AMMP, 1997; WHO, 2005, 2010). Diseases that were once considered rare such as diabetes and cardiovascular diseases are now considered a normal phenomenon. The increase in the burden of non communicable diseases is being fuelled by the socio demographic transition that has rapidly been occurring in developing countries (WHO, 2005). Rapid urbanisation of rural areas and rapid migration from rural to urban areas has also contributed to the increased burden of non-communicable diseases, as a result of urbanisation populations are more exposed to sedentary lifestyles and unhealthy diets. The major lifestyle factors implicated in the aetiology of non communicable diseases are unhealthy nutrition, smoking, physical inactivity, and excess use of alcohol (WHO, 2005).

Studies have demonstrated interaction between HIV and Non Communicable Diseases (Dagogo, 2008). People living with HIV/AIDS also tend to have high rates of non-communicable diseases. This could be due to the fact that people with HIV/AIDS are living longer and growing

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older thus developing non-HIV related chronic conditions similar to the rest of population. Some of the non-communicable diseases are related to HIV infection itself and some to the side effects of the anti-retroviral drugs used to manage HIV/AIDS (Carr et al., 1999). One study in Kenya demonstrated that, when people were screened for HIV infection and non-communicable diseases, HIV positive people had significantly higher rates of hypertension than those who were HIV negative. More than one third of the people who came for HIV testing had elevated blood pressure, and one quarter had obesity (F. Mwangemi & P. Lamptey unpubl.).

In Tanzania, between 18 and 24 % of deaths are attributable to non-communicable diseases and injuries (AMMP, 1997). The chronic diseases contributing most to overall mortality in Tanzania, according to the AMMP are cardiovascular diseases, cancer, central nervous system diseases, diabetes and chronic respiratory disease. WHO projected that about 20% of all deaths in Tanzania in 2005 were attributable to chronic diseases; CVD 9%, cancer 4%, chronic respiratory disease 2%, diabetes 1% and other chronic disease 4% (WHO, 2005).

The burden of non-communicable diseases is predicted to increase if measures are not taken to combat the current trends (WHO, 2008). A review of the current situation is important to raise awareness of the current situation in Tanzania. This paper summarises the current burden of non-communicable diseases in Tanzania and the existing infrastructure to combat them. The current and future opportunities for non communicable diseases prevention and control are explored.

## Methods

The information presented in this paper was obtained by review of key literature published on MEDLINE and EMBASE from 1980 to first week of March 2011 and citation tracking from those key publications. Two key searches were performed, one on the prevalence of risk factors for non-communicable diseases using key words such as smoking, obesity, urbanization, diet, physical activity. Another key search was performed on the prevalence of specific non communicable diseases such as diabetes, hypertension, ischemic heart disease, renal disease, cancers. In addition, information was also obtained from various reports and policy documents from the World Health Organization and Tanzania Ministry of Health and Social Welfare. Data was also obtained from key personnel from the Ministry of Health and Social Welfare, Ocean Road Cancer Institute and Muhimbili University of Health and Allied Sciences. All publications were reviewed by two individuals, and were included if they reported any of the aforementioned outcomes of interest and if they scored more than 5 points on the methodology assessment criteria (von Elm et al., 2007).

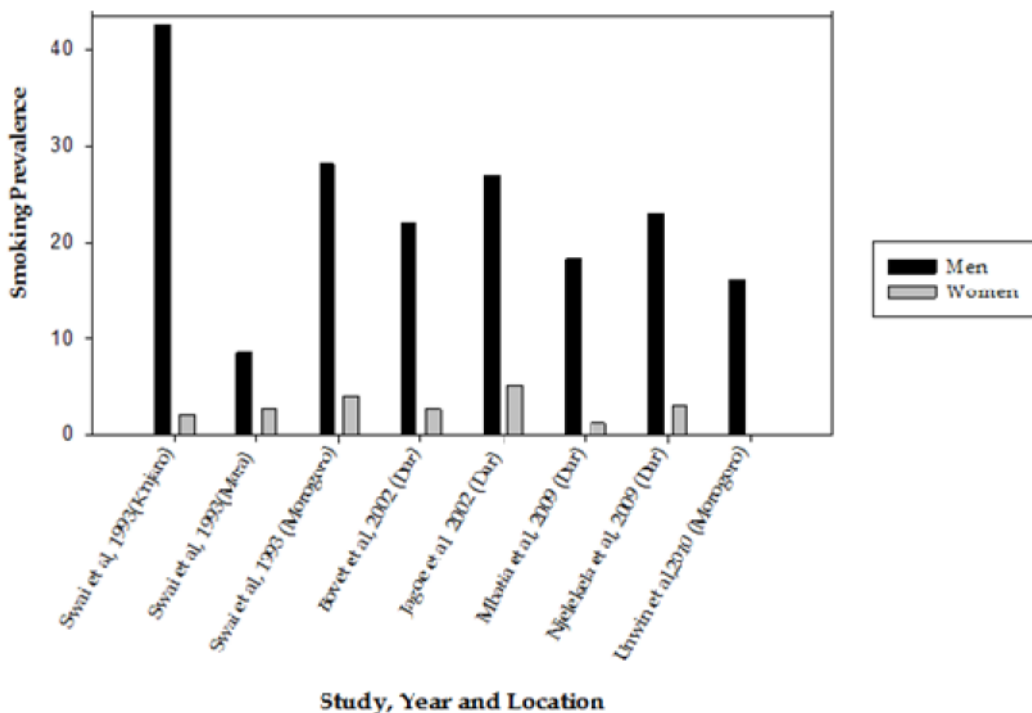
## Burden of risk factors for non communicable diseases

Overweight and obesity, unhealthy diet, tobacco use, alcohol consumption, high blood pressure, high cholesterol levels, and lack of physical activity have been described as the major risk factors in non-communicable diseases. Available reports indicate high prevalence of both overweight and obesity. For example the reported body mass index (BMI) levels from a number of studies showed that the mean values for females were generally higher than the recommended threshold value of  $<25\text{kg/m}^2$  (Aspray et al., 2000; Njelekela et al., 2002, 2003; Mbalilaki et al., 2007; Unwin et al., 2010). The mean BMI levels were higher in urban compared to rural areas. Prevalence of obesity is markedly higher in males and females. A ten-fold increase in the prevalence of obesity among women in the rural population over a 10-year period was reported by Njelekela et al. (2001). The prevalence of overweight and obesity is estimated to be around 22% in males and 26% in females (WHO, 2010).

There are no national representative data on the pattern of dietary intake. However studies were found looking at various dietary factors and the risk of cardiovascular diseases. These studies showed that dietary patterns contributed to differences in the risk of cardiovascular diseases and the pattern of cardiovascular diseases risk factors (Mtabaji *et al.*, 1990; Njelekela *et al.*, 2003; Hamada *et al.*, 2010). A study that characterized the diet eaten in a community in Tanzania showed that a big proportion of diet is comprised of carbohydrates with limited protein and vegetable and fruits intake (Mazengo, 1997).

Currently there is little information that documents the level of physical inactivity in the Tanzanian population. Studies were found reporting measures of physical activity among their study respondents. These studies have reported that physical activity levels were low in urban compared rural areas and consequently the urban population had higher levels of BMI and cholesterol levels compared to rural counterparts (Aspray *et al.*, 2000; Mbalilaki *et al.*, 2007; Unwin *et al.*, 2010).

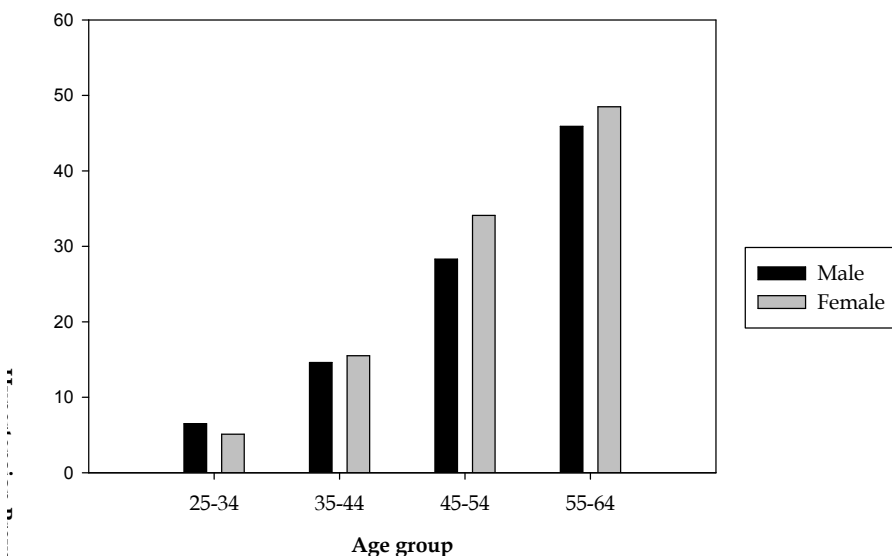
According to available statistics the prevalence of current smokers in Tanzania is estimated at 17.7% in males and 2.5% in females (WHO, 2010). Several studies were also found that report prevalence of smoking in Tanzania (Figure 1). Most of these studies report a prevalence of >15% in males, with the highest prevalence of about 43% in Kilimanjaro (Swai *et al.*, 1993; Jagoe *et al.*, 2002; Bovet *et al.*, 2002; Njelekela *et al.*, 2009; Mbatia *et al.*, 2009; Unwin *et al.*, 2010). In females all studies report a prevalence of <5% (Swai *et al.*, 1993; Jagoe *et al.*, 2002; Bovet *et al.*, 2002; Njelekela *et al.*, 2009; Mbatia *et al.*, 2009; Unwin *et al.*, 2010). Smoking is not only a problem among adults but also affects adolescents; a study in Tanzania (Siziya *et al.*, 2007) showed a prevalence of 3.0% and 1.4% among male and female adolescents less than 15 years respectively.



**Figure 1: Prevalence of smoking by sex in Tanzania**

Alcohol use is prevalent among adult populations in Tanzania. The prevalence of current alcohol users is reported to range from about 23% to 37% in males and 13% to 23% in females (WHO, 2010). It is estimated that per capita consumption of pure alcohol in Tanzania is 7.8 litres (WHO, 2010). The type of alcohol consumed is mainly local brew which accounts for about 86% of all alcohol consumed in the country (WHO, 2011)

Hypertension was defined as a blood pressure of  $\geq 140/90$  mmHg and only information from population based studies involving the general population was included. The prevalence of hypertension was found to range from 27.1% to 32.2% and 28.6% to 31.5% in men and women, respectively (Edwards *et al.*, 2000; Bovet *et al.*, 2002). The Study by Bovet *et al.* (2002) presented the prevalence of hypertension across various age groups by sex, and demonstrated that hypertension prevalence rose steadily with increasing age strata and females had a higher hypertension prevalence compared to males (Figure 2). WHO country projections estimates the prevalence of elevated blood pressure (BP > 140/90mmHg) in Tanzania is 40% among those >25years in both males and females (WHO, 2010).



**Figure 2: Prevalence of hypertension by sex and age group in Tanzania**

Studies in Tanzania have reported mean cholesterol values above the optimum threshold and women had generally higher cholesterol levels compared to men (Swai *et al.*, 1993; Mbalilaki *et al.*, 2007; Unwin *et al.*, 2010). In the 8 village survey of the Adult Morbidity and Mortality Project study (AMMP, 1997) the prevalence of high cholesterol ranged from 2.5% to 10.8% and 1.5% to 16.7% in males and females respectively, across the 3 study areas which comprised of both rural and urban populations. According to WHO estimates the prevalence of raised total cholesterol ( $\geq 5$ mmol/l) in Tanzania is 20% to 24% in males and females respectively (WHO, 2010).

### **Burden of non-communicable diseases**

#### **Cardiovascular Diseases**

Hypertensive heart diseases such as left ventricular hypertrophy are common in Tanzania (M. Mayige unpubl.). However, there is limited data on the magnitude of ischemic heart diseases including myocardial infarction. This could be due to the complicated methodologies for their diagnosis. With regard to stroke, a study by Walker *et al.* (2010) demonstrated that age-

standardized stroke incidence rates in Hai are similar to those seen in developed countries. However, age-standardized incidence rates were strikingly higher in Dar-es-Salaam than seen in most studies in developed countries, hypertension being a major risk factor (AMMP, 1997). Stroke causes significant morbidity that leaves the patients with considerable disabilities (Walker et al., 2000). Similarly mortality rates from strokes were higher in Dar es Salaam compared to other areas (Walker et al., 2010). Stroke has been described as an emerging problem in Tanzania. However, it is poorly known among the communities. An anthropological study in Tanzania has shown stroke in urban Dar es Salaam is widely believed to emanate from supernatural causes (demons and witchcraft), while in rural Hai District in northern Tanzania is described to be mostly due to 'natural' causes (Mshana et al., 2008).

### Diabetes

There is a marked difference in prevalence of diabetes among rural (<2%) and urban (>5%) populations (Aspray et al., 2000) and higher in people of Asian origin where the prevalence is >7% (Table 1) (Kaushik et al., 1991). Findings from these surveys have also shown a prevalence of more than 80% of undiagnosed diabetes in their study populations.

**Table 1: Prevalence of Diabetes from Community Surveys in Tanzania**

Setting	Age group	Diagnosis Criteria	Prevalence (%) (95% CI*)			Reference
			Male	Female	Total	
Rural and Urban	All	WHO 1980 FPG** OGTT***	-	-	0.7	Ahren & Corrigan (1984)
Rural	>15yrs	WHO 1985 OGTT	-	-	0.9 (0.7-1.1)	McLarty et al (1989)
Urban	>15yrs†	WHO 1985 OGTT	9.1(6.9- 11.8)	9.09(6.7-11.7)	9.1(7.4- 10.9)	Kaushik et al (1991)
Urban	>15yrs	WHO 1998 FPG	5.9 (3.4- 8.4)	5.7(3.53-7.87)	-	Aspray et al (2000)
Rural	>15yrs	WHO 1998 FPG	1.7(0.4-3.0)	1.1(0.2- 2.0)	-	Aspray et al (2000)

\*Confidence Interval \*\*Fasting Plasma Glucose \*\*\*Oral Glucose Tolerance Test; †= Asians

### Chronic Respiratory Diseases

Chronic respiratory diseases such as chronic obstructive pulmonary disease (COPD) and asthma also contributes to the burden of non-communicable diseases. COPD also known as 'smokers cough' is a chronic respiratory condition characterized by chronic cough, sputum production accompanied by difficulty in breathing. There is limited information on the prevalence of COPD in the general population in Tanzania. However, chronic respiratory symptoms have been reported among cement factory workers (Mwaiselage et al., 2005). In this study the prevalence of COPD was higher for the exposed group (18.8%) than for the controls (4.8%) and the authors concluded that the symptoms were related to cumulative cement dust exposure and the risk of COPD was independent of smoking status in this particular study population. Asthma is another type of chronic respiratory conditions also characterized by difficulty in breathing. Unlike COPD which occurs in adults mostly above 40 years, asthma is more common in children and is one of the important childhood chronic illnesses (AMMP, 1997). Three studies have reported prevalence of asthma in Tanzania to range from 2% to 5% (AMMP, 1997; Mugusi et al., 2004; Berntsen et al., 2009).

## **Cancers**

Cancers have long been reported as an important cause of morbidity and mortality in Tanzania. Male cancer of the oesophagus, oral cavity and pharynx, liver, stomach, lung and skin are most common. In females the common ones are cancers of the cervical, breast, liver and stomach (AMMP, 1997). Data from Cancer registry 2006 to 2009 shows that cervical cancer, Kaposi's sarcoma and breast cancers are the three most common cancers seen at Ocean Road Cancer Institute proportionately representing 35%, 12% and 8% of all cancers seen respectively. The emergence of HIV epidemic has also led to increasing prevalence of certain cancers for example cervical cancer and Kaposi's sarcoma (Meulen et al., 1992; Kahesa et al., 2008). Regional differences also have been noted in the distribution in the types of cancers seen in the country (George, 1983).

## **Impact of NCDs on health system and socio-economy**

As illustrated in this review Non Communicable Diseases have emerged as significant causes of morbidity and mortality especially in an inadequate health system where many patients present in late stages of the diseases or don't have access to care. Diseases such as diabetes, cancers, cardiovascular diseases have been demonstrated to be preventable through screening and early treatment of early stages of the diseases, also by adopting a healthy lifestyle such as avoiding cigarette smoking, alcohol intake, maintaining a healthy diet and participating in physical activities. In a health system that lacks preventive programs the burden on the health care system will continue to grow. At present, the health care system is faced with a challenge to deal with the double burden of both communicable and non communicable diseases that are now on the rise. The lack of infrastructure, human resource and lack of sustainable funding mechanisms for health services means there is poor access to drugs and other services for the care and treatment of non communicable diseases.

In addition to the health impact, NCDs also causes loss of income for the families as many depend on out of pocket expenditure to meet their health care cost. Also, many employees fall in the category of a group that is demonstrated to be at risk > 35years. If a number of them are affected then there is also loss of national income through loss of manpower as NCDs causes repeated absenteeism at work places. There is also loss of income through providing care for those affected with NCDs. Costs for medical care for most Non Communicable diseases are very high. It has been estimated that for Tanzania to provide essential care for diabetes patients, the government would need to spend more than of half the entire health care budget (Chale et al., 1992).

## **Opportunities for prevention and control of non communicable diseases**

The global response to the growing burden of non communicable diseases was formally initiated in 2000 with the release of the WHO Global Strategy for Prevention and Control of Non Communicable Diseases (WHO, 2000). This provided a strategic framework to curb the growing burden of these diseases. In 2002 and 2004 WHO released two other key guidelines namely, WHO Framework Convention on Tobacco Control (FCTC) (WHO, 2003) and the Global Strategy on Diet and Physical Activity and Health (WHO, 2004) respectively and most recently in 2008, WHO released the 2008-2013 Action Plan for the Global Strategy for the Prevention and Control of Non communicable Diseases (WHO, 2008). These documents provide the roadmap for the prevention and control of non communicable diseases. Recently non-communicable diseases have gained global recognition and in September 2011 UN held a special session on NCDs which was aimed at increasing awareness of NCDs and advocacy towards increased allocation of resources for prevention and control of non communicable diseases.

With regard to the local response, Tanzania is one of the few countries in Africa to respond to non communicable diseases. Initiatives to respond had begun more than two decades ago, with the activities of the adult morbidity and mortality projects and others such as the essential NCD Health Intervention Project (AMMP, 1997; Unwin et al., 1999). However some of these initiatives could not be sustained over the years due to lack of resources. In recognition of the growing burden of NCDs and the need to respond, the Ministry of Health and Social Welfare established a department within the ministry to deal with non communicable diseases and is currently working to strengthen the capacity for both prevention and management of non communicable diseases and has a functional National Steering Committee for non communicable diseases.

In 2009, the Ministry of Health launched the National Strategy for Prevention of non communicable diseases which was developed based on the WHO strategic framework and Global Strategy on Diet, and Physical Activities and is currently drafting its implementation Plan. The strategy has four objectives which are strengthening NCD related legislations, health promotion for prevention, strengthening care and management of non communicable diseases at all levels, and strengthening the capacity for research and monitoring and evaluation of NCDs (MOH&SW, 2009). As mentioned earlier, aetiology of non communicable diseases is deeply rooted in socio-cultural and environmental factors, most of which are outside the health sector. Therefore for effective management and control a multi-sectoral approach is necessary. Effective NCD legislations and a good infrastructure are necessary for implementing effective interventions. Few NCD legislations exists relating to the control of exposure to tobacco and alcohol and also those related to food labelling and importation and marketing of food products. However, they are currently not well enforced.

In Tanzania also there exists necessary infrastructure that needs strengthening to be able to respond effectively. Such opportunities include well established health care system that span from primary care to tertiary care. At present also there exists a National Diabetes Project which is aimed at strengthening diabetes services throughout the country, which presents an opportunity to strengthen services for other non communicable diseases. Cancer services have been expanded to the referral hospitals with aim to extend services to the regional level. Other key institutions with role to play in the prevention of Non Communicable Diseases include the Tanzania Food and Nutrition Centre, Tanzania Food and Drug Authority. Several Non Governmental Organisations for NCDs are present in Tanzania; these include the Tanzania NCD Alliance, Tanzania Diabetes Association, National Kidney Foundation, Tanzania Heart Foundation, Sickle Cell Foundation and Tanzania Cancer Society. The NGOs serve as a platform for advocacy and resource mobilization for non communicable diseases. However there lacks community based organizations working in this area.

### **The way forward**

Although Tanzania has made efforts to respond to the growing burden of NCDs more efforts are needed at the country level to increase the capacity for prevention and control of non communicable diseases. Sound and explicit policies such as tobacco and alcohol policies, nutrition/diet policy, policies on food labelling and marketing and school health policy are essential. Currently such policies are inadequate or are lacking. WHO proposes a STEPWISE approach for control of Non Communicable Diseases which act on different policy levels such as health care financing, legislations and regulations, improving the built environment, community mobilization and health services organisation (WHO, 2005). Priority should be given to develop and implement preventive interventions based on action plan for the country's NCDs strategy bearing in mind available interventions that have been shown to be effective.



Countries that have had success in the prevention and control of non communicable diseases such as Finland (Pekka *et al.*, 2009) have used legislations and community based approaches. Primary prevention is the most cost effective approach through the control of modifiable risk factors such as interventions to stop smoking and reducing populations' exposure to tobacco products, and reduce alcohol intake. Also, interventions that promote increased intake of fruits and vegetables and promotion of physical activity.

Early identification and proper management of cases is also important but proves to be costly to health systems. In Tanzania NCD policies and legislations are still not well enforced or need strengthening for successful implementation. The infrastructure for implementation is available through the various programs and agencies and through existing public private partnership. Further community mobilisation is needed to implement prevention strategies and reduce and prevent exposure to the non communicable diseases risk factors and subsequently reduce the burden of the diseases.

## Conclusion

The review has shown that there is evidence that NCDs had long been recognized as an impending problem from research that was done in Tanzania about 2 decades ago (AMMP, 1997), recent studies have also shown that non communicable diseases are continuing to take pace in both rural and urban areas (Mbalilaki *et al.*, 2007; Kahesa *et al.*, 2008; Hamada *et al.*, 2010; WHO, 2010). The main risk classical factors for NCDs namely smoking, alcohol intake, unhealthy diet and low physical activity were found to be prevalent in both rural and urban communities. The socio-demographic and economic transition has a big role in the current rise of non-communicable diseases in developing countries. Increased urbanization in developing countries means that people are more at risk because the urban environment exposes to more risky behaviour (Unwin *et al.*, 2010; Assah *et al.*, 2009). The observed differences in risk factors and prevalence of non-communicable diseases in urban areas could also be explained by the fact that in urban areas people have more access to refined processed foods which are energy dense and or high fat diets than the traditional foods characterised by high roughage content. This could either be due to poverty or lack of information and misconceptions also lack of access to healthy food which means that many are forced to eat what is cheaply available especially during business hours when outside their homes hence at increased risk of NCDs.

In addition to the socioeconomic factors, cultural factors and lay beliefs also further contribute to the current trends in NCDs which further compound the poor health seeking behaviours. For example obesity is culturally embraced and seen as a sign of wealth in most of our communities. With regard to gender, this review has shown that women have a propensity to have more of the biological risk factors e.g. were more obese, had higher prevalence of hypertension, hypercholesterolemia etc and men were had higher prevalence of alcohol drinking and were more likely to smoke. More importantly the mean values for body mass index, blood pressure and cholesterol were found to be above the optimal threshold. The risk of diseases caused by these risk factors start to rise way below these marked cut off points therefore having population values above these optimum threshold means that a number of people in the studied populations were within the risky categories (WHO, 2005).

As mentioned earlier a larger proportion of the disease determinants for NCDs fall outside the health sector for example; with globalization and open market economy cigarette and beverage companies have found their way into the unexplored market in developing countries such as Tanzania. The booming alcohol industry has led to mushrooming of local bars in residential areas hence people have more exposure to readily available alcohol which may eventually lead to irresponsible (excessive) and under-age drinking.

The lack of effective policies and legislations and also lack of enforcement of existing policies means that the population is at risk from these unregulated harmful products. Lack of resources in the health sector means it is difficult for the health sector to provide health education to protect the communities from harmful use of alcohol or to run anti smoking campaigns. The poor infrastructure in urban areas is an impediment to an active lifestyle. The heavy traffic jams encountered to and from work means that people spend more time being sedentary rather than involving themselves in physical activities. Lack of sidewalks for pedestrians and other facilities make difficult and unsafe for pedestrians and cyclers to commute. Better measures are needed to reduce population exposures to the risk factors.

Urgent action is needed to curb the rising burden of NCDs in Tanzania. For the prevention and control of NCDs, there needs to be a continuum from primary to tertiary prevention and a scope of interventions from the community level up to the national level. Population wide interventions are needed targeting the risk factors for primary prevention. Secondary prevention measures are needed targeting those at high risk to ensure that they are identified early through a high risk targeted screening such as provider initiated screening or screening of high risk groups in the communities so that diseases can be identified early and referred for proper care. For this to be effective it is imperative that effective policies are in place and appropriate care and treatment services are available at all levels.

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