

Research Article**The Impact of Lifestyle Changes on the Prevalence of Cancer in Kenya****Matunda N. Conradus¹, Miruka Ondieki Conrad², and Moenga Abere Eric¹.**¹Sessional Lecturer at Technical University of Kenya, M.sc Biotechnology, Nairobi, Kenya.²Lecturer at Kampala International University Uganda***Corresponding author**

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Abstract: This paper studied on the impact of lifestyle changes that was occasioned by economic transition, rural-urban migration in Kenya from 2002 to 2013 to give a clear picture on the extent to which the adaptation of unhealthy lifestyle changes has influenced cancer prevalence in Kenya. The paper used secondary data of literature review from 2000 to 2012. There was a correlation between unhealthy diet, physical inactivity, overweight/obesity, tobacco use and alcohol intake with the prevalence of breast, stomach, oesophagus, colorectal in female and prostate, oesophagus, stomach, liver, larynx and pancreatic cancers in male. It was concluded that the prevalence of cancer especially the types mentioned above may have been because of adoption of risk lifestyle behaviours such as unhealthy diet, physical inactivity, being overweight or obese, smoking and excessive alcohol intake in Kenya.**Keywords:** Cancer prevalence in Kenya, alcohol intake, tobacco use, obesity, red meat consumption, physical inactivity and lifestyle behaviours

INTRODUCTION

In Kenya, since 2002 to 2013 there had been a significant economic development, which has led to huge rural-urban migration and expansion of the middle class. Urbanization and economic developments had led to new and improved marketing, distribution infrastructure, which had attracted large supermarkets such as Nakumatt, Tusksys, Uchumi, Ukwala and Naivas, which had branches across the country. Their major contribution in the food distribution was on their expansion to low income estates, thereby improved access of refined and processed food suppliers, which turn had influenced on how Kenyans eat [1]. The social and economic transition, which had been taking place since 2002 through economic development policies adopted by President Mwai Kibaki's government, had led to the reduction of below-poverty indexes and expansion of middle class over the last decade. This had promoted new habits such as snacking on foods that are high on fat, sugar and starch. It became the norm in Kenya that these 'westernized' habits had been highly linked to the raise of non-communicable disease such cancer in the country [2]. This review, will be carried out with a sole aim of highlighting on the impact of lifestyle changes that are occasioned by economic transition in Kenya to give a clear picture on the extent to which unhealthy behaviours and harmful exposures are voluntary as the country's economic opportunities increase — though it is a complex issue still being explored by researchers according to Suhrcke and

Nugent [3]. Cancer is the leading cause of non-communicable disease as Ferlay, Shin, and Bray indicated that more than half of all cancer cases were diagnosed in the developing countries therefore, without intervention this proportion was predicted to rise in the coming decades hence increases the cancer burden in the developing countries [4]. Based on demographic population changes worldwide, it is estimated that 22.2 million new cancer cases will be diagnosed annually worldwide by 2030 [5]. Data from China Health and Nutrition Survey, suggests that there was an increase in the consumption of fats, oils and meat and dairy foods higher among urban residents as compared with those living in the rural areas [6]. Witherspoon and Reardon observed similar trend in developing-countries, which differentially affects wealthy and poorer population groups across developed and developing nations leaving them at a higher risk of non-communicable diseases [7]. The increase of obesity cases in Sub-Saharan Africa was credited to physical inactivity and nutrition transitions that included the rapid adaptation of 'Westernized diets' and the availability of fast food, and socioeconomic changes. Cervix cancer was the most common cause of cancer death in Africa women, while liver cancer was the second leading cause of cancer death in Africa [4]. In Uganda there was an increase of reported incidences of cancer of the prostate and breast [8].

Unhealthy Diet

The World Cancer Research Fund has estimated that half of cancer could be prevented by improving diet, physical activity and body composition [9]. Linos *et al.*, they assessed the relationship between red meat intake during adolescence and premenopausal breast cancer. 39,268 premenopausal women completed a validated 124-item food frequency questionnaire on their diet during high school, were followed for seven years, from 1998 to 2005 [10]. Cox proportional hazards regression was used to estimate relative risks. They studied 455 cases of invasive premenopausal breast cancer were diagnosed between 1998 and 2005. Compared with women in the lowest quintile of red meat intake during high school; as such they concluded that higher red meat intake in adolescence may increase the risk of premenopausal breast cancer [10].

Physical Inactivity

The level of physical inactivity was an important risk factor for chronic diseases that were undergoing profound change in developing countries; available evidence suggested that the declining physical activity might be a cause of chronic disease prevalence [11]. Irwin *et al.*, they investigated the association between pre- and post-diagnosis physical activity and mortality among women with breast cancer[12]. They used a prospective observational study of 933 women enrolled onto the Health, Eating, Activity, who between 1995 and 1998 were diagnosed with local or regional breast cancer. The primary exposures were physical activity in the year before and two years after diagnosis and the pre- to post-diagnosis change in physical activity. They concluded that Moderate-intensity physical activity after a diagnosis of breast cancer might improve prognosis [12]. Meyerhardt *et al.*, they carried out a study using a prospective, observational of 573 women with stage I, II and III colorectal cancer, to minimize bias by occult recurrences[13]. This study was carried out concerning colorectal cancer-specific and overall mortality according to a predefined physical activity category before, after diagnosis, and change in activity after diagnosis. They found out that the increased levels of exercise after diagnosis of non-metastatic colorectal cancer reduced cancer-specific mortality (P for trend = .008) and overall mortality (P for trend = .003) [13].

Overweight and Obesity

Obesity and overweight increased the risk of non-communicable diseases such as cancer, it accounted for over 1 million deaths and 12 million ill health life-years, each year and overweight was found to be accountable for a substantial proportion of the total burden of disease[14]. With urbanization and westernized lifestyle these risk factors were spreading, within many low resource countries in Africa[15].

Tobacco Use

Tobacco use was responsible for about 30% of cancer worldwide while developing countries continued to experience an increase in tobacco use[16]. Current smokers were estimated to consume about six trillion cigarettes annually [17]. Of these deaths, just over 600,000 were attributed to second-hand smoke exposure, and more than five million to direct tobacco use[18]. Boffetta *et al.*, they estimated the proportion of cancer deaths in France in 2000 attributable to a known risk factor [19]. They found out that tobacco smoking was responsible for 23.9% of cancer deaths (33.4% in men and 9.6% in women), alcohol drinking for 6.9% (9.4% in men and 3.0% in women) and chronic infections for 3.7%. Occupation is responsible for 3.7% of cancer deaths in men; lack of physical activity, obesity and exogenous hormones use are responsible for 2%–3% of cancer deaths in women. Thus, known risk factors explain 35.0% of cancer deaths, and 15.0% among never smokers[19].

Harmful Use of Alcohol

The harmful use of alcohol was a major risk factor for premature deaths and disabilities in the world. There was a direct relationship between higher levels of alcohol consumption and rising risk of some cancer [20-21]. Lucenteforte *et al.* the role of alcohol consumption in relation to pancreatic cancer, by conducting a pooled analysis of 10 case-control studies [22]. They computed pooled odds ratios (ORs) by estimating study-specific ORs adjusted for selected co-variant and pooling those using random effects models. In addition, compared with abstainers and occasional drinkers, they observed no association for light-to-moderate alcohol consumption with pancreatic cancer risk; however, associations were positive for higher consumption levels. This collaborative-pooled analysis provided additional evidence for a positive association between heavy alcohol consumption and the risk of pancreatic cancer[22].

STATEMENT OF THE PROBLEM

This study was carried out with a sole aim of highlighting, on the impact of lifestyle changes that were occasioned by economic transition in Kenya from 2002 to 2012 to give a clear picture on the extent to which unhealthy lifestyle changes has influenced cancer prevalence in Kenya.

OBJECTIVES OF THE STUDY

- To review literature on the impact of lifestyle changes in the prevalence of cancer in Kenya.
- To compare the prevalence on cancer that is attributed to risky lifestyle factors such as unhealthy diet, physical inactivity, obesity, tobacco use and alcohol consumption trends in Kenya.

RESEARCH METHODOLOGY

Area of study

The impact of lifestyle changes in the prevalence of cancer in Kenya

Period of Study

The study period covered a period of 10 years from January 2002 to December 2012.

Sources of Data

This study was mainly based on secondary data. The required data were collected from Annual Report published by NACADA, KEMRI, Nairobi Cancer Registry, various reputed journals.

LIMITATIONS OF THE STUDY

The study was a theoretical paper and based on secondary data, which may not be biased, as a result more risk indicators may have been missed out.

DISCUSSION AND CONCLUSION

The middle class accounts for the large majority of meat consumers in the urban centres. The large cities of Nairobi and Mombasa have the highest per capita meat consumption within Kenya. An estimation of red meat consumption in Nairobi's would be 25.8 kg per person and Mombasa's at 21.2 kg per person in 2011 per year [23]. In the case of the entire country's average, Kenyans consumed an average of 15-16 kg of red meat annually [24].

Kenya Alcohol and Tobacco Consumption

Table I indicated different levels of use of various drugs and substances in the general population. The report indicated that about 5.8% of Kenyans were abusing alcohol while another 5.5% were dependent on alcohol use; 3.7% were abusing tobacco while 4.5% were dependent on tobacco use (table I)

Table-1: Levels of use in the general population (15 -65 years)

Type of drug/substance	Levels of usage			General Annual Prevalence (%)
	Proportion of moderate users (%)	Proportion of abusers (%)	Proportion of dependent persons (%)	
Alcohol	4.7	5.8	5.5	16.0
Tobacco	1.7	3.7	4.5	9.9
Miraa	0.9	1.6	1.5	4.0
Bhang	0.5	0.4	0.4	1.3
Heroin	0.2	-	-	0.2%

Source; National Authority for the Campaign against Alcohol and Drug Abuse (NACADA 2010)

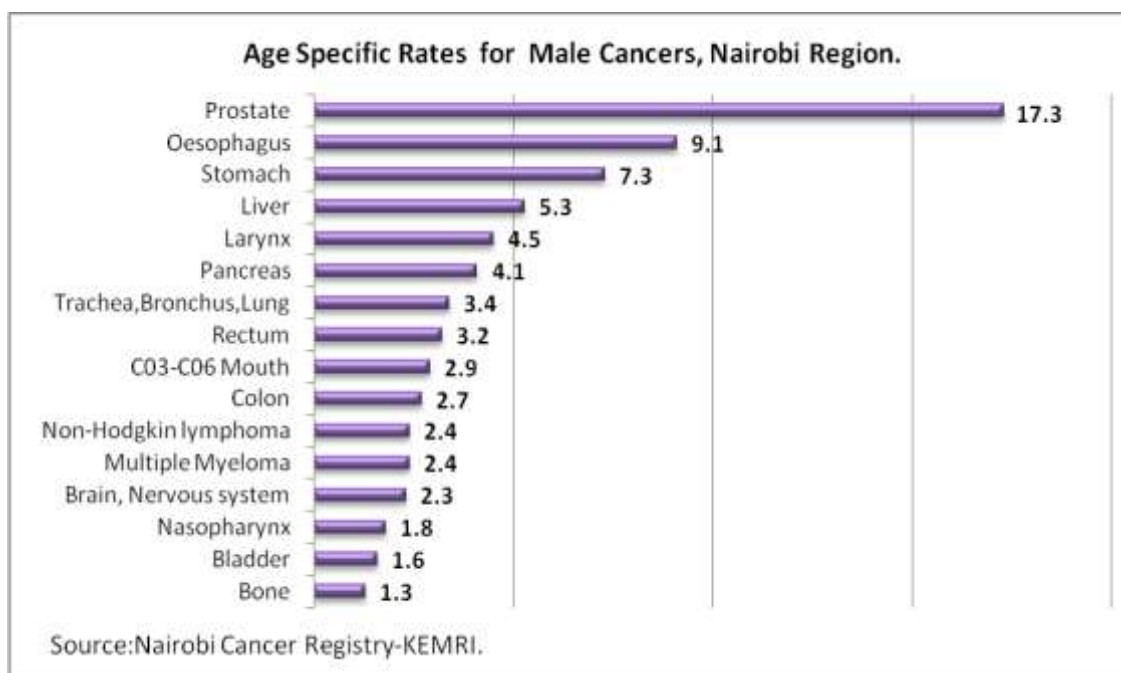


Fig-1: Most common Cancers as registered by Nairobi Cancer Registry- KEMRI

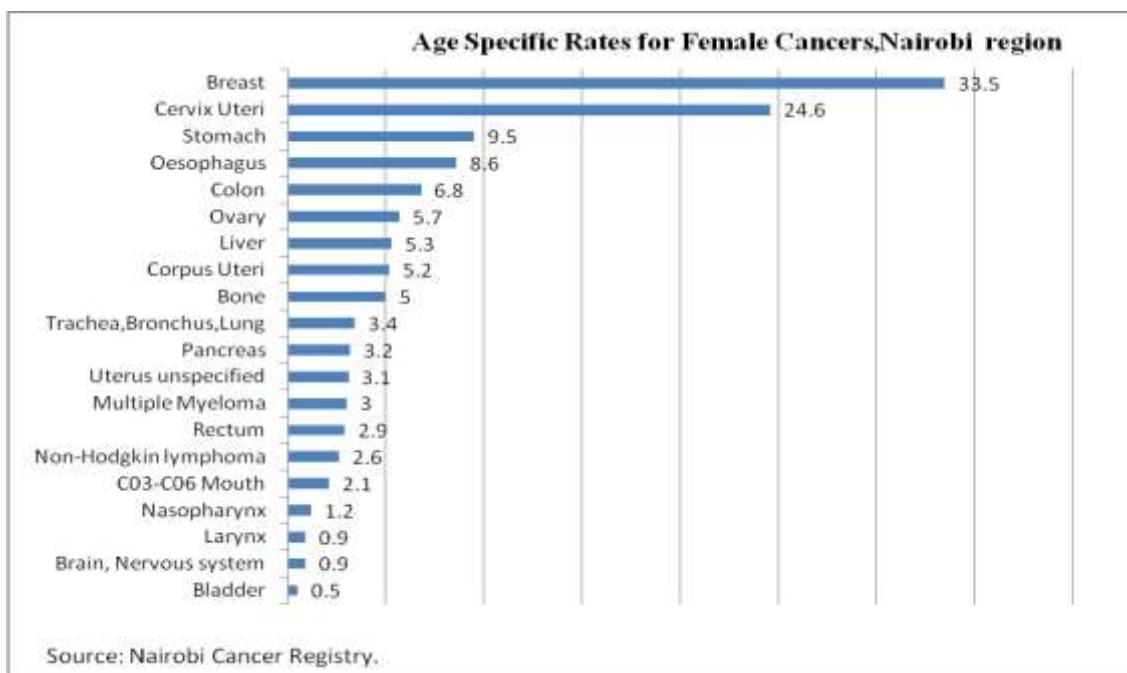


Fig-2: There was an increase of reported cases of cancer in Kenya over the period of study as it was indicated in (Figure I and II). (Mutuma 2012).

There was an increase of reported cases of cancer in Kenya over the period of study as it was indicated in (Figure I and II). Breast, Cervix uteri, Stomach, Oesophagus and colon between women and Prostate, Oesophagus, Stomach, Liver, Larynx and pancreatic cancer among men were the most common cancers reported in Kenya over the period of study [25].

In Kenyan culture and traditions red meat has been the main source of animal protein that was either consumed as boiled, fried or roasted beef. Among adult male, alcohol drinking and roast red meat consumption go hand in hand as a pastime activity among especially of the middle class. Over consumption of red meat has been cited elsewhere that it was the major risk factor for pancreatic, prostate and colorectal cancer. Because of the over consumption of red meat, it was assumed that red meat might have contributed to the increase of reported cases of pancreatic, prostate, stomach and colorectal cancer especially among Kenyan male [26]. Hayes *et al.*, they carried out a population-based case-control study in three geographic areas of the United States to evaluate the reasons for the racial disparity in incidence rates [27]. They used 449 black men and 483 white men who had been newly diagnosed with pathologically confirmed prostate cancer and controls 543 black men and 658 white men were interviewed. Increased consumption (grams/day) of foods high in animal fat was linked to prostate cancer among American blacks, but not among American whites. The study linked greater consumption of fat from animal sources had an increased risk for prostate cancer between American blacks and to advanced prostate cancer between American blacks and whites [27]. Rodriguez *et al.*, they examined intake of red meat, and

poultry in relation to incident prostate cancer between black and white men [28]. They used questionnaire in 1992 to 1993, on diet, medical history, and lifestyle. They used 692 black and 64,856 white men were included. During follow-up, they documented 85 and 5,028 cases of incident prostate cancer between black and white men [28]. No measure of meat consumption was associated with risk of prostate cancer among white men. Between black men, total red meat intake was associated with higher risk of prostate. They suggested that high consumption of cooked processed meats might contribute to prostate cancer risk between black men in the United States.

Due to the rapid economic development and the resultant white collar jobs, most middle income earners lead a sedentary lifestyle, which was characterized by physical inactivity of many urban dwellers and even the poor who are living in slums did not have space to exercise. Therefore, the increase of reported of breast, colorectal, pancreatic, and liver cancer cases might have been because of physical inactivity and sedentary lifestyle changes. As McTiernan indicated in his epidemiologic study that women who engaged in 3–4 hours per week of moderate to vigorous levels of exercise have a 30%–40% lower risk for breast cancer than sedentary women [31]. Women who were overweight or obese had a 50%–250% greater risk for postmenopausal breast cancer [29]. Alcohol use, even at moderate levels increased risk for premenopausal and postmenopausal breast cancer.

As the Kenyan economy expanded in the last decade, Kenyans have had a high purchasing power and

the availability of large supermarket chains which import and sell fast and processed food. As led to higher consumption of fatty and sugary food which coupled with sedentary lifestyle has led to higher number of overweight and obese population. These overweight and obesity might have contributed to the rise of breast, colon, oesophagus and liver cancer cases in Kenya. As indicated by Kamangar *et al.*, overweight and obesity, and chronic gastroesophageal reflux disease, which triggers Barrett's oesophagus, was thought to be the major risk factors for adenocarcinoma of the oesophagus in the United States and some Western countries [30]. Liver cancer incidence rates are increasing in many parts of the world including the United States and Central Europe, possibly due to the obesity epidemic [31,32].

As (Table I), indicated the percentage of Kenyans who were heavy and dependent smokers, and the percentage of people affected from second-hand smoke maybe high. Therefore, rise in oral cavity, pharynx and lung cancer in Kenya may be due to high dependent of tobacco and exposure to second-hand smoke in the general population. There are reports indicating that smokeless tobacco products and betel as risk factors for oesophageal cancer in Asia [33,34]. Smoking, alcohol use, and smokeless tobacco products were the major risk factors for oral cavity cancer, with smoking and alcohol having synergistic effects [35]. Smoking of tobacco accounts for 80% of the worldwide lung cancer burden in males and at least 50% of the burden in females [36].

Alcohol consumption was and is a pastime activity for many Kenyan of all classes, and the alcohol would vary from local brews like "chang'aa", "muratina", (locally brewed spirit) and processed like beer, whisky, brandy and spirits. As the percentage of alcohol abuse and dependence was indicated on (Table I) there was a significant number of Kenyans who were and are misusing alcohol, and this may be reflected on the number of reported cases of liver, oesophagus and stomach cancer on men and women in Kenya. In the United States, and several other low-risk Western countries, alcohol-related and possibly non-alcoholic fatty liver disease, which were associated with overweight, were thought to account for the majority of liver cancer [37]. In low-risk areas such as the United States, smoking and excessive alcohol consumption account for about 90% of the total cases of squamous cell carcinoma of the oesophagus [38]. Chang *et al.*, they investigated whether history of alcohol drinking affected risks of non-Hodgkin lymphoma (NHL) and multiple myeloma among 102,721 eligible women, a prospective cohort study in which 496 women were diagnosed with B-cell NHL and 101 were diagnosed with multiple myeloma between 1995–1996 and 2007[39]. The higher risk among former drinkers' emphasizes the importance of classifying both current and past alcohol consumption.

The prevalence of cancer especially breast, stomach, oesophagus, colorectal cancers among women, and prostate, oesophagus, stomach, liver, larynx, lungs and pancreatic in men may be attributed to the economic growth and adoption of risk lifestyle behaviours such as unhealthy diet, physical inactivity, being overweight or obese, smoking and excessive alcohol intake in Kenya. Tobacco, obesity, and physical inactivity are the modifiable causes of cancer that generated the most diseases worldwide and Kenya was not an exception. The prevalence of cancer in Kenya that was associated with lifestyle changes, could be reduced by alterations in individual and population behaviours and by public health efforts as long as these changes are driven through sound scientific knowledge, social and individual lifestyle and behavioural change. The obstacles to these efforts are societal, individual inclinations and in the habits of daily life. To achieve cancer prevention and control, we will need better ways to disseminate information implement what we know and improved infrastructure that will better incentivize and support trans-disciplinary, multilevel research and successful intervention in Kenya.

The limitation of this study was in the use of secondary data, and more research should be done to ascertain to what extent do individual factors such as physical inactivity, overweight/obesity, unhealthy diet, alcohol and tobacco use contributed to the incidences of cancer in the Kenyan population.

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DISCLOSURES

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