Socioeconomic Impacts of Non-Communicable Diseases in Kenya: Systematic review

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Summary

BACKGROUND

Non-communicable diseases (NCDs), also termed as chronic diseases, are of long duration which are as a result of a combination of genetic, environmental ,physiological and behavioral factors. The NCDs that have the highest impact are cardiovascular diseases, cancers, chronic respiratory diseases and diabetes mellitus. NCDs pose a major health and development challenges of the 21st century. The aim of the study was to review the socioeconomic impacts of non-communicable diseases in Kenya, which have been on the rise in the last decade.

MATERIALS AND METHODS

To identify relevant literature, three freely available databases at University of Debrecen namely: PubMed, Web of Science and Scopus were used. The key words used were: socioeconomic impacts or factors, cancer or neoplasm, diabetes mellitus, asthma, chronic obstructive pulmonary disease, cardiovascular disease. Inclusion criteria was publications from year 2008 onwards, full articles and published in English language,31 research articles were reviewed. Quality assessment was done for the 31 included research articles.

RESULTS

NCDs impose a financial and emotional burden on households in Kenya. The households spend more on treatment of NCDs at the expense of other household welfare expenses. The rapid rise of NCDs strained the health care system in terms of the human resource and finances. The county and national governments are strained economically by the NCDs as they have to purchase most advanced technology equipment required for diagnosis and treatment of NCDs which is usually expensive as it is imported.

CONCLUSION

NCDs contribute approximately more than 27% of all deaths in Kenya, and socioeconomic impacts are felt from household level to the government level.

Keywords: *Socioeconomic Impacts, Cancer, Neoplasm, Diabetes Mellitus, Asthma, Chronic Obstructive Pulmonary Disease, Cardiovascular Diseases, Kenya*

***[Afr. J.** Health Sci. 2021 34(5): 604-619*

Introduction

Non-communicable diseases (NCDs), also termed as chronic diseases, are of long duration of time which are as a result of a combination of genetic, environmental, physiological and behavioral factors. The NCDs that have the highest impact are cardiovascular diseases (heart diseases and stroke), cancers,

chronic respiratory diseases (chronic obstructive pulmonary disease and asthma) and diabetes mellitus (1). NCDs have a major health and development challenges of this 21st century, not only in human suffering but also inflict on the socioeconomic status of individuals and countries, particularly low- and middle-income countries (2).

NCDs threaten progress towards the 2030 Agenda for Sustainable Development Goals (SDGs) number 3 (Ensure healthy lives and promote well-being for all at all ages), which has among other aims to reduce premature deaths from NCDs by one-third by 2030 (3). The rapid rise in NCDs will limit poverty reduction initiatives in low-income countries, mostly by increasing household costs associated with health care. People of low socioeconomic status get sick and die sooner than people of higher social positions, especially because they are at greater risk of being exposed to harmful exposures, like tobacco, or unhealthy diet and have limited access to health services (1).

Four main risk factors have been highly associated with NCDs according to the World Health Organization (WHO) which include tobacco use, physical inactivity, unhealthy diet and harmful use of alcohol (1).

More than 38 million people die annually from NCDs (67.9% of global deaths), this includes more than 14 million people who die between the ages of 30 and 70 years. Cardiovascular diseases account for (46.2%), cancers or neoplasms (21.7%), chronic respiratory diseases (10.7%) and diabetes mellitus (4.0%) of the global deaths (2). Thus the four main NCDs account for more than 82.2% of all deaths from non-communicable diseases.

Kenya (my home country) is classified as a lower-middle-income economy ($996 to $3,895**)** country (4) struggling with a double burden of diseases; communicable diseases and non-communicable diseases, and the NCDs have been on the rise the last decade. (5). They contribute approximately more than 27% of all deaths in Kenya, with a probability of dying between the ages of 30 and 70 years from the NCDs being 18% (6).

Trend of NCDs in Kenya

The total disease burden measured as the number of DALYs (Disability-Adjusted Life Years) of NCDs in Kenya has increased from 3.8 million per year in 2006 to 4.98 million per year in 2016,as shown in Figure 1.

Causes of rising trend of NCDs in Kenya

The rise of NCDs has been contributed by several factors such as a growth in Kenyan economy (8) which among other factors has led to improvement of life expectancy at birth from 51.75 years in 2000 to 66.69 years in 2015 (7)

This has increased the number of elderly population who are at increased risk of NCDs. Tobacco prevalence use in Kenya 11.0% (9) and this has increased the incidences of NCDs from active and passive smoking of tobacco and other forms of tobacco use. Alcohol consumption in Kenya is approximately 4.3 litres of alcohol per capita (15 years and older) consumption of pure alcohol (10).Most of the alcohol is produced illegally and using traditional methods where standards of regulation are not met, and there has been outbreaks of death and blindness after consumption of methanol contaminated alcohol (11). This has contributed to increase in the number of people getting NCDs in the last decade. The Kenyan population has drastically increased leading to overcrowding in the cities (12) and there has not been a good planning in the cities, infrastructure such as footpaths and cycling paths are not adequate making most

people rely on public transport. This rapid and unplanned urbanization has led to increase in physical inactivity of many Kenyans which in turn pose as risk factor of cardiovascular diseases.

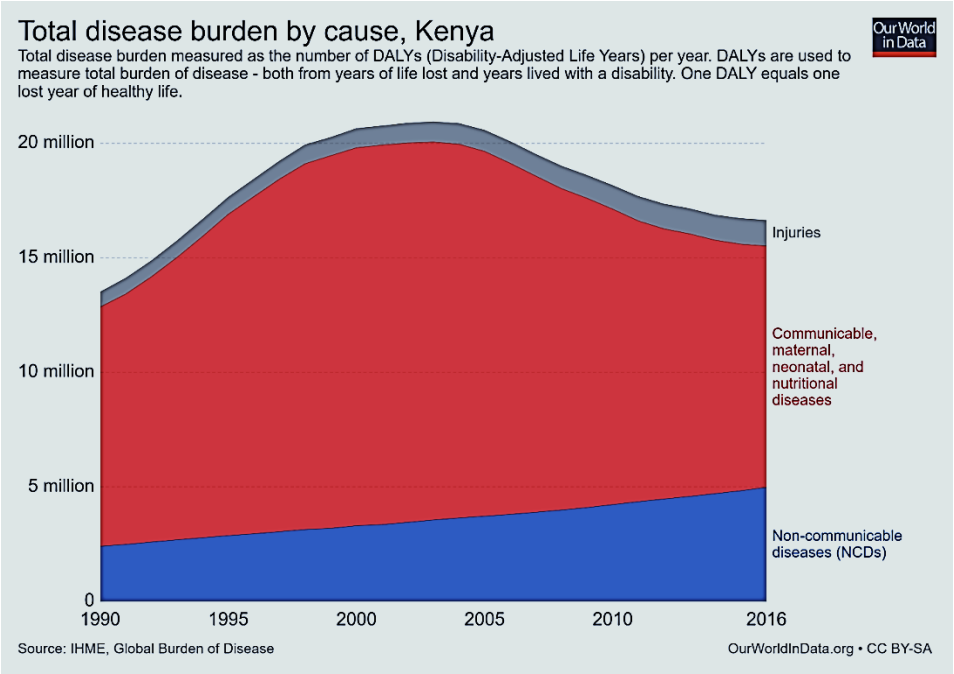

Figure 1: Trend of Total Burden of NCDS in Kenya - Source: (7)

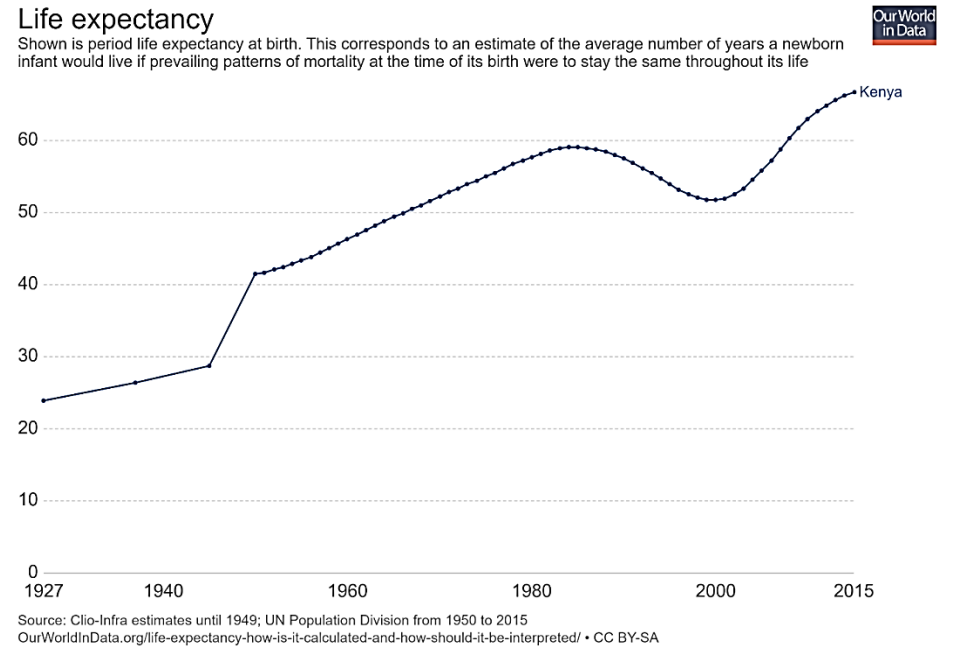

Figure 2: Life Expectancy at Birth in Kenya - Source: (7)

Table 1: Databases Literature Search

Database	Keywords Combinations	Filters Activated	Results
PubMed	("Socioeconomic Factors"[Mesh]) AND "Cardiovascular Diseases"[Mesh]) OR "Neoplasms"[Mesh]) OR "Diabetes Mellitus"[Mesh]) OR "Asthma"[Mesh]) OR "Pulmonary Disease, Chronic Obstructive"[Mesh]) AND "Kenya"[Mesh]	Journal article Full free text 10 years English	179
Web of Science	(TI=("socioeconomic impacts "AND "cancer" OR "cardiovascular diseases "OR "asthma "OR "chronic obstructive pulmonary disease "OR" diabetes mellitus "AND Kenya))	Title English Articles 2008-2018 Kenya	32
Scopus	(("socioeconomic factors" AND "cancer" OR "cardiovascular diseases" OR "asthma" OR "chronic obstructive pulmonary disease" OR " diabetes mellitus" AND Kenya))	Article Journal English 2008-2018 Kenya	72

This urbanization also increases exposure to air pollutants and consumption of 'junk' food. In Kenya and other developing countries, health-care expenses for NCDs rapidly drain household income, savings and resources. The long, expensive treatment and care of most NCDs and even death of breadwinners in families, make most people get into poverty annually and national wide development is hindered. This systematic review focusing on the publications of the last 10 years aims to show the social and economic impacts of non-communicable diseases in Kenya, with a major focus of the impacts at households, health care system and the national economy level.

Materials and Methods

To identify relevant literature for the purpose of this thesis, three freely available databases at University of Debrecen namely: PubMed, Web of Science and Scopus were used. The key words used were: socioeconomic impacts or factors, cancer or neoplasm, diabetes mellitus, asthma, chronic obstructive pulmonary disease, cardiovascular disease. Table 1 shows the databases, the keywords combinations used and the filters activated.

PRISMA guideline flow chart (13) has been used for the selection process of the articles to be used for generation of the results. The steps of the selection procedure (identification, screening, eligibility, inclusion) can be seen in Figure *3*.

Quality assessment

The 31 included records were assessed for quality, since the articles had different study designs the assessment was done using different quality assessment tools. For cohort and cross-sectional study articles (14) was used . The other articles were assessed using Critical Appraisal Tools designed by Joanna Briggs Institute (JBI) (15).

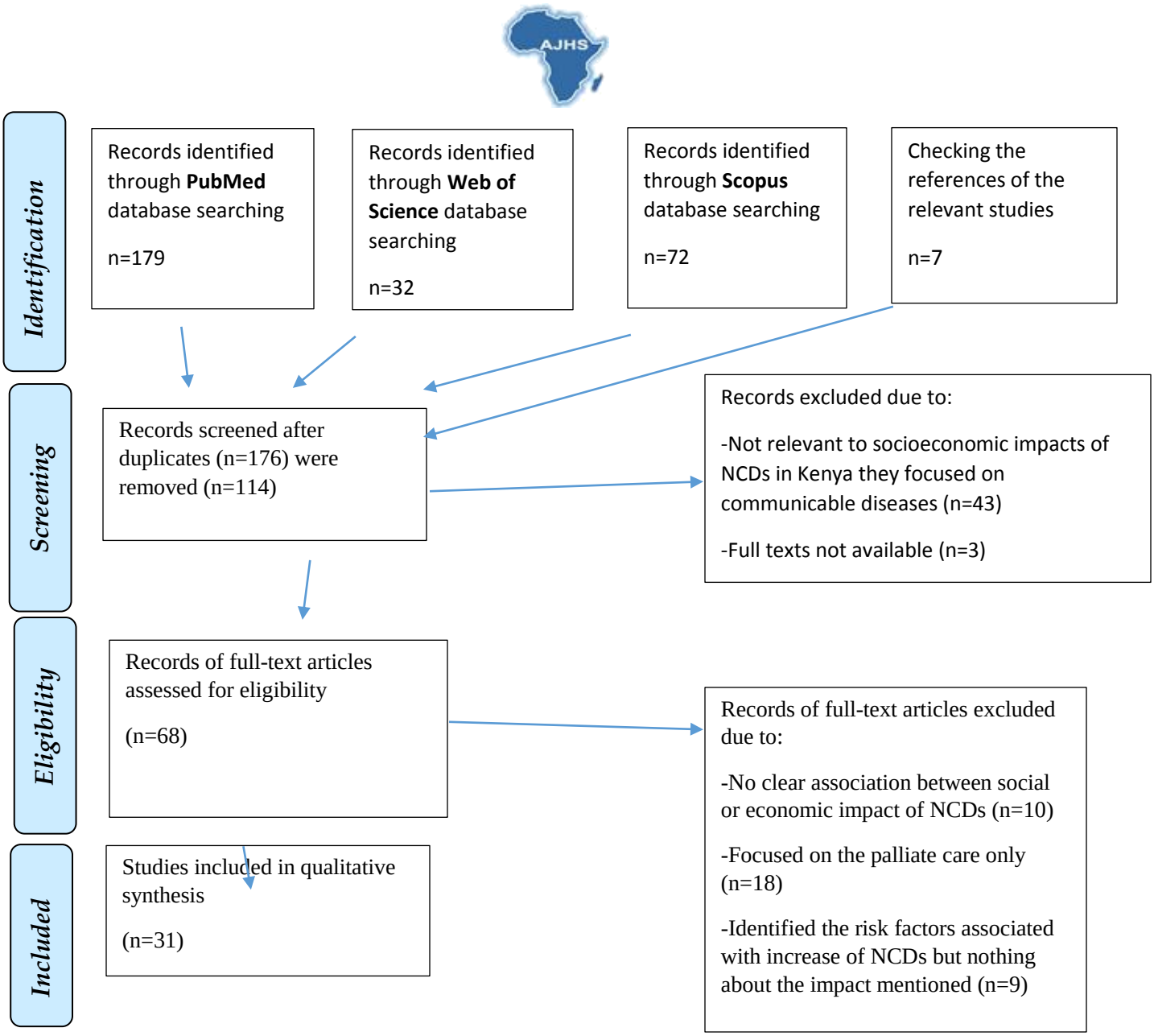

Figure 3: Flow Chart Showing Selection Procedure Followed Adapted from (13)

Results

The first task was the *identification of records*, Records search was done using three databases: PubMed, Web of Science and Scopus that are freely available at the University of Debrecen. Key word combinations as shown on ***Table 1*** were used. Inclusion criteria was publications from year 2008 onwards, full articles and published in English language. A total of 283 full articles were identified from this step. In addition, through checking the references of the relevant studies 7 more records were found and included as shown in

***Figure** 3.*

The next step was to read through the abstracts of the records (*screening records*) that met the inclusion criteria in step one for the relevance of the topic, 43 records were discarded because they were not relevant to

socioeconomic impacts of NCDs in Kenya, they focused on communicable diseases. Full texts were not available for 3 records thus they were discarded too.

The full texts of the remaining 68 records were read in details for the *eligibility* purposes. After a thorough reading through the records, 10 records did not show clearly the association between social or economic impact of NCDs, 18 records focused on the palliative care only and 9 records identified the risk factors associated with increase of NCDs but nothing about the impact mentioned. Therefore, a total of 37 records were excluded and finally 31 records were *included* for the review of this systematic review study.

The quality assessment tool for cohort and cross-sectional study articles had 14 questions and the tool for the other articles had 8 questions. Each question had 3 choices ("Yes" "No" and "Not applicable / clear") 1 point was given to each "YES "and zero point for the other two choices. Total points were summed and graded, for the tool with 14 questions: Good (10-14), Fair (5-9), Poor (1-4).The tool with 8 questions grading was: Good (6-8), Fair (4-5), Poor (1-3). 17 articles were graded good, 9 graded fair and 5 graded as poor.

Socioeconomic impacts of NCDs at the household level

Majority of the articles focused on the impacts at the household level, as the basic unit for a community or a nation is the family. NCDs impose a financial burden on households and reduce their abilities to spend in other areas, reducing household welfare. The risks of suffering financial burden as a result of out of pocket health payments was consistently higher for households with NCDs than others (19). Out of pocket expenditures on medications was high for most households, average monthly cost for a patient with uncomplicated diabetes and hypertension was approximately $33, about one-third of the average monthly income. (21).

Generally, ailments reduce household income by 13.63%, NCDs reduced household income by 28.64%. NCDs are associated with a 23.17% reduction in household income relative to a household affected by communicable disease. This could be attributable to the high treatment cost of NCDs, as well as lost labour hours by sick members and the household, members offering care to the affected member(s) of the family (20). Kenyan households spend over a tenth of their budget on health care payments. With the increase of NCDs which require expensive and long treatments the households are drained to poverty each year, 1.48 million Kenyans are pushed below the national poverty line yearly due to health care payments as most do not have the health insurance cover.(36).

Poverty, late and poor cancer diagnosis and lack of medical cover were found to be the top ranking serious challenges facing cancer patients in the country. Low income earners were less likely to seek treatment on time due to financial constraints, 81% of the 245 sample size incurred debts while seeking cancer treatments. Poor parents with children who had any form of cancer abandoned hospital treatment due to financial constraints to seek traditional treatment which was considered cheaper but no research done to show that the traditional medicine reduced the tumors (39) (45).

There was also emotional aspect which mostly led to depression of the family members. Spending a higher proportion of family's income was associated with higher psychological distress index (P = 0.009). The economic challenge led to significantly heightened tension in the family (P = 0.021) (17).

There was two-times increase in depression in people with diabetes compared with the general global population, resulting in adverse effects on morbidity and mortality. Depression also increased risk for morbidity and mortality in those with diabetes and this was common among socially and economically disadvantaged populations (26).

Socioeconomic impacts of NCDs on the Kenyan health system

The health system in Kenya is devolved, all the hospitals apart from two national hospitals are run by the county governments. The rapid rise of NCDs has strained the health care in terms of the human resource and finances. The rise of NCDs has increased workload in the hospitals and the government funds allocation to hospitals has not improved so much (23).

Cancer cases increase every year, most hospitals have inadequate chemotherapy and radiotherapy services, suitable strong analgesics and palliative care facilities (34). This is because the budg*et al*location for non-communicable diseases does not match the rising cases the health care has to handle on a daily basis.

Health profiles in Africa show that health care systems struggle to start and maintain integrated policies and deliver a comprehensive variety of essential primary care services, including health promotion, early detection, timely and quality management of NCDs. This due to inadequate resource allocation, poor priority setting and insufficient effective and feasible approaches, as the health funding by the governments is still far away below the WHO recommendation(15% of GDP) (43).

Socioeconomic impacts of NCDs on the national and county governments

Kenya is a lower-middle-income economy (47), most advanced technology required for diagnosis and treatment of NCDs is usually imported from the developed countries, this drains the national economy. These pieces of equipment are expensive and require the government to train health professionals on how to operate them (33). The government has made NCDs a national priority and has developed a cancer registry this has increased budg*et al*location to health as well as human resource (34). The funding of this development has been from the donations from developed countries and loans from international Monetary Fund (IMF).The funds that could have been used for other developmental programs are channeled to management of NCDs.

Most policies have been formulated to counter the rise of NCDs but only few are implemented. This is because of the financial constraint as most communicable diseases that affect majority of Kenyans are still given the first priority (40).The major hindrances to the implementation of these policies are the cost they incur and the inadequate human resources available.

Discussion

This systematic review identified 31 studies that focused on socioeconomic impacts of NCDs in Kenya. Non-communicable diseases have socioeconomic implications from the household level to national level in Kenya. The basic unit of any community is the family and when NCDs causes poverty to the family, the community is affected and thus the whole nation gets affected in the long run. The lower the socioeconomic status individuals are, the severe

the impacts. The poor individuals could not get the treatment in time and the cost of the treatment was high as many did not have the health insurance coverage (39). Having a chronic disease or taking care of a family member who has the condition was associated with high levels of depression which led to mental illness. Depression also increases risk for morbidity and mortality especially to the individuals who have NCDs (26).

NCDs are key to development and socioeconomic issue, striking both the rich and the poor people, but inflicting more ill health and other consequences on the poor in all countries (2) . The losses the household incur are termed as the cost of illness. This includes both direct and indirect costs spent by the household. Directs costs are medical care costs for diagnosis, procedures, drugs, inpatient and outpatient care. Indirect costs include transportation to seek treatment and income losses due to lost labor hours (48).

Poverty has implications on NCDs due to the fact that the poor might not be able to afford healthy food or access quality care due to the high cost of preventive and curative health services for NCDs (49).

Kenyan government allocated only about 4% of the national budget to the health sector (50). Despite increasing health care costs, NCDs continue to be under-prioritized in the health sector budget, this is due to poor economic status of the nation which is faced by a double burden of diseases. This makes the preventive strategies not to be well implemented due to financial constraint as well as inadequate man power. In the last decade the NCDs have strained the health care system which was already strained by the communicable diseases.

The Kenyan health system, apart from the financial burden is faced with the shortage of health workers, this is mainly due to health workers migration to the developed countries (51). Most of them citing lucrative factors such as better remuneration, conducive working conditions and opportunities for career growth. This makes the health workers who remain to be overworked and with the rise of NCDs the entire health system gets overwhelmed. Countries like UK and Canada have filled a percentage of their domestic shortages by recruitment of health professionals from low income countries like Kenya.

This systematic review shows almost similar findings with the study conducted in India to evaluate the impacts of the non-communicable diseases in India (52). NCDs have significant social and economic implications to households, healthcare system and the economic growth and development of India. Kenya and India are both considered developing countries therefore facing almost similar challenges but NCDs account for 62% of the total disease burden in India 23,999.17 DALYS per 100000 in 2016, and Kenya 17,439.29 per 100000 in 2016 accounting for 32% (53).

Interventions to alleviate the impacts of NCDs

Prevention is always considered cheaper than cure, so strategies to reduce the modifiable risk factors of NCDs have been suggested by WHO. The term “Best-buys” has been used, a list of options is presented for each of the four key risk factors for NCDs (tobacco, harmful use of alcohol, unhealthy diet and physical inactivity) and for four disease areas (cardiovascular disease, diabetes, cancer and chronic respiratory disease) (54).

Kenya has developed a national strategy for the prevention and control of NCDs, the strategic plan was set to run from 2015-2020.The goal of this strategic plan is to reduce

the preventable burden of morbidity, mortality and disability due to non-communicable diseases through multi-sectoral collaboration at the county and national levels. To ensure the highest attainable standards of health and productivity throughout the life cycle for sustainable socioeconomic development (55).

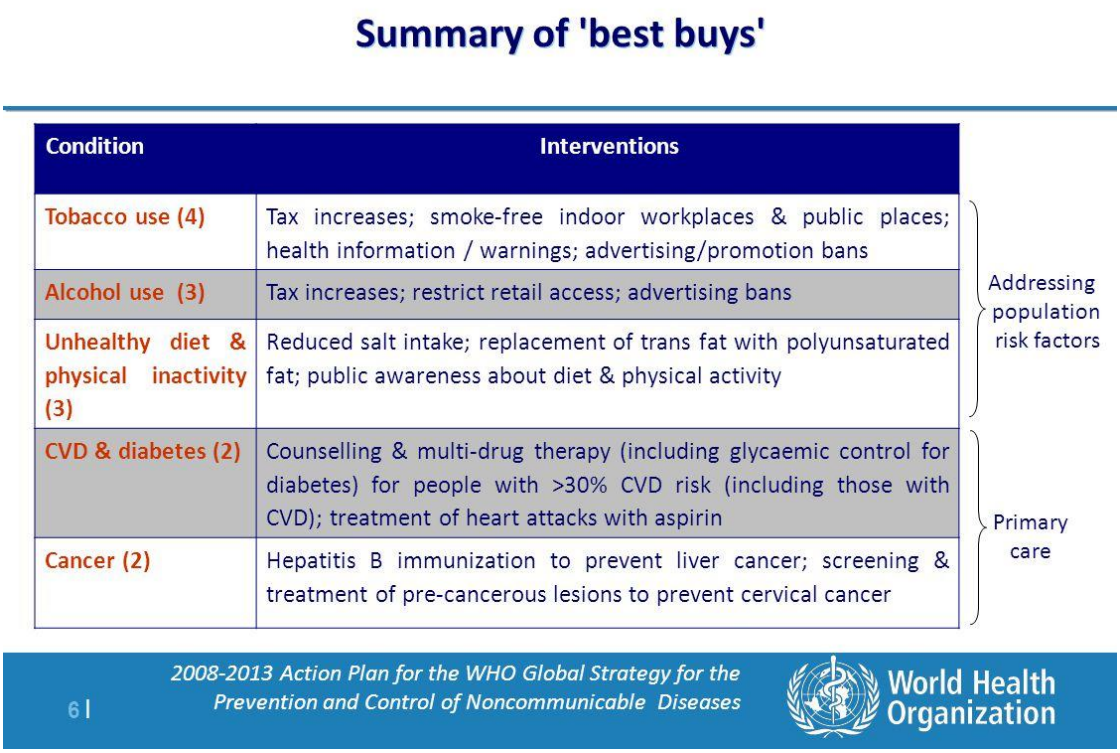

figure 4: WHO Best-Buys Interventions- Ssource: (54)

The plan has three action plans: Disease prevention and Health Promotion, Early diagnosis and control of NCDs through Health Systems strengthening and Monitoring, Surveillance and Research.

Recommendations

Tobacco prevalence use in Kenya is at 11.0% (9) this is high and being a major modifiable risk factor for NCDs, it should be dealt with. It is estimated that a country uses three dollars to treat tobacco related diseases for every dollar earned as tobacco revenue. Apart from health burden imposed by tobacco use, tobacco production equally impose a heavy social and economic burden too. In Kenya women and child labour have been noted in tobacco production which has been found to adversely affect girls' educational levels, children nutrition, and female reproductive health.(56).Therefore, there is need for enforcement of the existing legislation on sales of tobacco to youths, high tobacco taxation and adoption of smoke-free policies in workplaces and places frequented by the general public in Kenya.

Adopt and implement effective measures to eliminate illicit trade in **alcohol**, including smuggling, illicit manufacturing and counterfeiting. Educate the public on the

harmful health effects, economic, and social consequences of alcohol consumption especially its long term effects on health when one gets liver cancer due to alcohol consumption.

Most households in Kenya cannot afford **NCDs treatment** and families have to sell assets, borrow from financial institutions, and call for fundraising ("harambees") after depleting all their family savings to pay for NCDs treatment (39).Hence there is need for the government to ensure that there is improvement of health insurance coverage as more than 60% of Kenyans do not have the Nation health insurance fund (NHIF) cover.

The national and county governments should increase **the budg*et* *al*location for health sector** to at least 8% of the GDP, this will ensure that there are enough funds to purchase the modern technology equipment required for early diagnosis and treatment of NCDs. When the health sector has enough funds it gets liberty to train health professionals on the NCDs through seminars and conferences organized nationally and even internationally. The knowledge gained will be in turn used to educate the public on the prevention on the NCDs and this will reduce to a certain percentage the number of Kenyans who gets affected by impacts of the NCDs either directly or indirectly.

Conclusion

Non-communicable diseases contribute approximately more than 27% of all deaths in Kenya, with a probability of dying between the ages of 30 and 70 years from the NCDs being 18% (6).The socioeconomic impacts are felt at household levels, health care system level and the county and national governments. The poor are the most affected because they cannot afford to seek early treatment, do not afford healthy diet and most do not have the health insurance covers. Therefore, the Kenyan government needs to give more priority to the NCDs as it gives to communicable diseases. This is because it is now evident that the trend of the NCDs is on the rise and if not focused on, it will claim more Kenyan lives. Intervention of "Best –buy" suggested by the WHO should be implemented fully in addition to other preventive measures that have been proven to reduce the rise of NCDs menace.

Acknowledgements

I would first like to thank God for the good health, strength and ability He has given me throughout. Earnest appreciation to my supervisor Dr.Szilvia Fiatal, her office door was always open for me to consult. She allowed me to email her at any time of the clock and she was kind enough to reply. She ensured that this is my original work,and directed me in the right direction. Finally, profound gratitude to my dad for providing me with constant support and encouragement since childhood. This accomplishment would not have been possible without them. Thank you. I dedicate this work to my late mum and my wife; the two most important ladies in my life.

List of abbreviations

COPD - Chronic Obstructive Pulmonary Disease
CVDs - Cardiovascular Diseases
DALYs - Disability Adjusted Life Years
GDP - Gross Domestic Product
IMF - International Monetary Fund
NCDs - Non-communicable Diseases
NHIF - National Health Insurance Fund
PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-analyses
SDGs - Sustainable Development Goals
UK - United Kingdom
WHO - World Health Organization

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