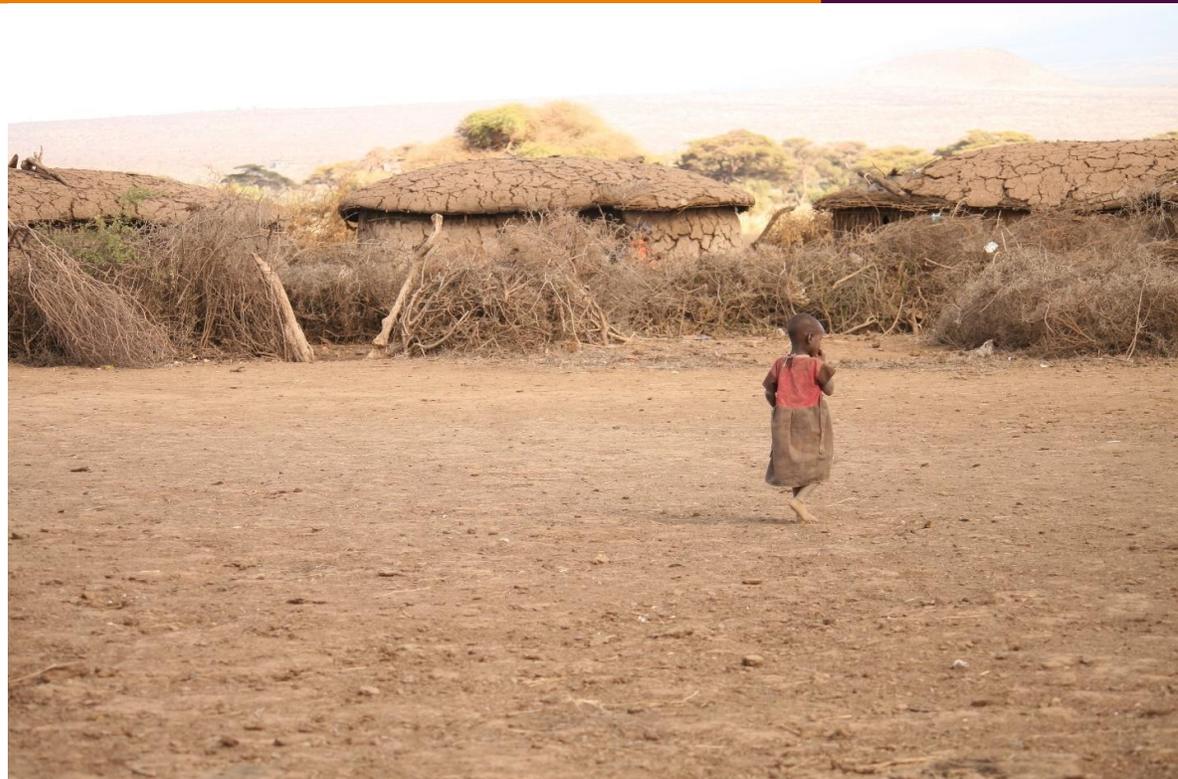


Post-2015 Development Agenda

Kenya Perspectives



Non-Communicable
Diseases

SPEAKERS AND CONTRIBUTORS

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Elizabeth Brouwer

Elizabeth joined the Disease Control Priorities Network as a Health Economics Analyst in the spring of 2013 to provide research support to senior project staff on health economics research and program management. Elizabeth wears many hats, including assistance with long-term project planning, communication strategy, and data analysis. Additionally, Elizabeth manages grant proposals, manuscripts, and capacity building workshops with DCP3's international partners. Elizabeth received her Bachelor Degree in Public Policy and French, as well as a Master in Health Economics, from the University of Michigan with the goal of pursuing research on improving efficiency, equity, and financial risk protection in global health policies.

Dr. Charles Kariuki

Dr. Kariuki has been in practice for 7 years. He holds an MBChB from the University of Nairobi, Internal Medicine from the Royal College of Physicians, London. Trained in Cardiology at the University of Cambridge and in Interventional Cardiology at the London Chest Hospital. He is a fellow of the Royal College of Physicians, London. He is the Director of the Cardiac Catheterization Lab at The Nairobi Hospital.

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Summary: White Paper Report by Rachel Nugent and Elizabeth Brouwer

Non-communicable diseases (NCDs) – ‘lifestyle’ diseases such as diabetes, cancer and stroke – are a major global problem, and the post-2015 development agenda will most likely include a target to reduce premature death from NCDs by one third by 2030. Although often thought of as conditions suffered in the developed world, in fact about half of all deaths in low- and middle-income countries are due to NCDs, with about 30% being premature (below age 60).

Kenya has a young but aging population. Currently the proportion of the population aged over 50 is 17% and by 2050 the number of adults is expected to almost triple, from 21 million to about 60 million. A growing number of premature deaths are due to NCDs, with half of all hospital admissions and deaths being NCD related at present. Roughly a quarter of all deaths are caused by NCDs, with cancer and cardiovascular disease (including heart attacks and strokes) being the biggest killers.

Apart from the human problems, there are real economic consequences: NCDs are often chronic, trapping households in a cycle of poor health and debt and increasing social and economic inequality. Kenya and regional neighbours have ratified the WHO Framework Convention on Tobacco Control and civil society organisations are partnering with universities and global institutions to raise awareness of NCDs more generally and take action against them. But more must be done and there are policies which can address the two most important risk factors for NCDs, tobacco use and hypertension.

Long experience in high-income countries has demonstrated a clear link between smoking and health. This also shows that introducing relatively high rates of taxation is a cost-effective way to reduce both tobacco consumption and its negative effects on health.

Kenya currently has a relatively low prevalence of smoking, which puts it in a good position to stem the epidemic and particularly influence the younger generation of would-be smokers away from starting. Currently, by far the greatest consumption of tobacco is from adult males smoking cigarettes, with estimates of about one in five Kenyan men being smokers. The Tobacco Control Act already prohibits smoking in public or in places of work, but it is poorly enforced, and between 18 and 30% of adults are exposed to smoke in public places or at work.

Although taxes are levied on cigarettes in Kenya, the current price of a pack is 103 shillings. We propose a 150% increase in the real price of tobacco products, bringing the price of a packet of cigarettes to around 250 shillings. We expect this to reduce demand by 60% by 2030. Assuming 7,600 deaths from smoking in 2030, a 60% cut in this would save up to 4,600 lives. Each death averted would lead on average to 15 extra years of productive life. Assuming a year of life is worth between \$1,000 and \$5,000, this tax increase would on average produce benefits of over 14 shillings for each one spent.

A second serious health risk is hypertension (high blood pressure) which is the most common cardiovascular problem in sub-Saharan Africa. Untreated, this can lead to heart disease, stroke or diabetes, any one of which could be fatal. Obesity, stress, reduced physical activity, poor diet and smoking are all contributing to higher rates of hypertension in Kenya, although this is still lower than for other sub-Saharan African countries.

Relatively cheap drugs are in principle available to manage blood pressure successfully if taken regularly. However, these are not always readily available or affordable to the people who need them. Assuming the current death rate from high blood pressure remains the same, there would be about 27,000 deaths from the condition in 2030. Assuming about half the people in need could be reached and about 30% of them continued to take the medicine, at least 4,000 lives could be saved.

At a cost of \$2.50 per head, treating 1.4 million people would cost just \$3.5 million in 2030. The benefits would greatly outweigh this, and every shilling spent on treating hypertension would pay back 37 shillings in benefits.

White Paper Report by Elizabeth Brouwer

Given the monumental success of the Millennium Development Goals, the international community has worked to keep up the current momentum in the post-2015 era by setting new and even more ambitious goals. The next set of development goals will likely include a target to reduce premature mortality from non-communicable diseases (NCDs) by one-third globally. While the majority of development assistance goes towards infectious and maternal conditions, there are compelling reasons for low- and middle-income countries (LMICs) to invest in NCD prevention. A common misconception is that NCDs, such as diabetes, heart disease, and cancer, primarily affect high-income countries. **More than half of all deaths in LMICs, however, are due to NCDs and about 30% of these deaths occur before the age of 60** (Alwan 2011). In sub-Saharan Africa, increases in NCD prevalence are projected to outpace the reduction of infectious diseases. These estimates have important economic implications for countries with already strained health resources.

Kenya will not be spared. About half of all hospital admissions and deaths in Kenya are from NCDs, and about one-fourth of all deaths are due to NCDs. In this paper, we argue there are cost-effective and feasible preventative actions for NCDs in Kenya that will avert potentially catastrophic costs. Specifically, we explore the benefits and costs of increased taxation on tobacco products and increased coverage of pharmaceutical management of hypertension in medium to high risk patients. Our calculations indicate that both of these policies would have high benefit to cost ratios (Table 1).

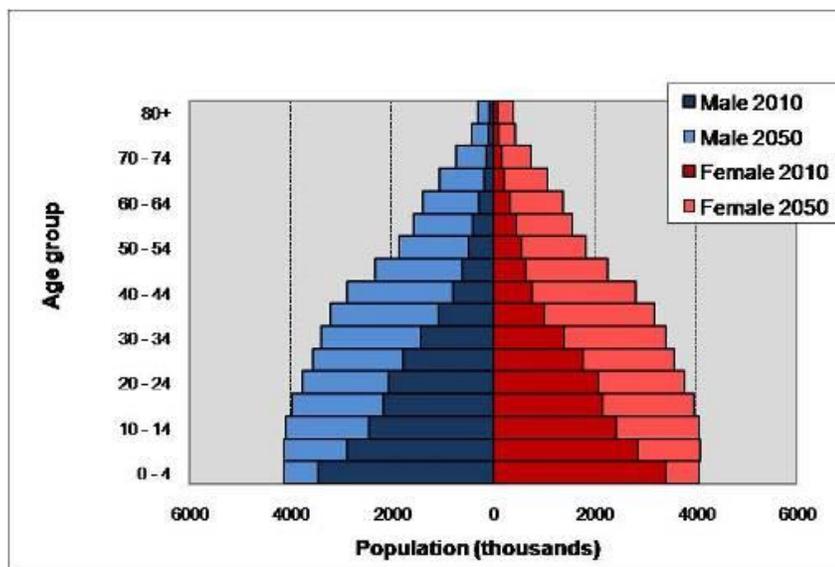
Table 1: Benefit-Cost Ratios of two hypothetical interventions to manage NCD prevalence in Kenya

BCRs by discount and DALY values		3% Discount Rate	5% Discount Rate	Median Value
Tax tobacco to increase its price 150%	DALY = \$1,000	5	5	14.5
	DALY = \$5,000	27	24	
Hypertension Management with pharmaceuticals, 50% coverage of high risk adults, 30% adherence	DALY = \$1,000	14	12	37
	DALY = \$5,000	68	59	

The Current NCD Situation in Kenya

Kenya has a relatively young and rural population. Less than one quarter of the Kenyan population lives in urban areas and slightly more than one quarter of the population is between 30 and 70 years old (WHO Country Profile 2014). This population structure is transitioning, however, as the fastest growing group in Kenya's population is no longer young children, but adults. The number of adults in Kenya is expected to almost triple in size from 21 million to about 60 million in 2050 (World Bank blog) (Figure 1).

Figure 1: Population and age structure in Kenya in years 2010 and 2050



(Citation:

<http://blogs.worldbank.org/african/can-rapid-population-growth-be-good-for-economic-development>)

In part because of changing age structure, and in part because of changing disease conditions, a growing number of premature deaths in Kenya are due to NCDs. Urbanization, modernization, and smoking prevalence are other contributing factors. Data regarding the NCD burden in Kenya is unfortunately variable due to weak or non-existent reporting systems. We can make educated guesses, however, based on existing data from small-scale studies, hospital records, and trends in related countries. **For example, 50% of all current hospital deaths and hospital admissions in Kenya are NCD related.** The two largest studies of disease burden have estimated that NCDs cause about a quarter of all deaths in Kenya (Table 2). According to the Kenyan Ministry of Health Annual Status Report of 2007, NCDs contributed to over half of the top 20 causes of morbidity and mortality in the country.

Table 2 : NCDs as a percent of all deaths in Kenya WHO GHE 2012, and IHME GBD 2010

	WHO GHE 2012
<i>Non-communicable disease (total)</i>	26.6%
Cancer	7.0%
Diabetes mellitus	1.5%
Respiratory diseases	1.0%
Cardiovascular diseases	8.6%
Hypertensive heart disease	0.5%
Ischaemic heart disease	2.5%
Stroke	4.0%
Cardiomyopathy, myocarditis, endocarditis	0.6%

These numbers are worrisome for several reasons, not least of which are the economic implications. Unlike infectious diseases, NCDs are often chronic, requiring continued expenditures that can trap poor households in cycles of debt, illness, and poor health, leading to social and economic inequalities. Additionally, NCDs often affect people in their most productive years and when they have families dependent on their earning

potential. While the number of older Kenyans is expected to increase, the birth rate is not projected to reduce fast enough to free up health resources to focus on NCDs. Therefore, low-cost prevention becomes of upmost importance to balance competing health concerns.

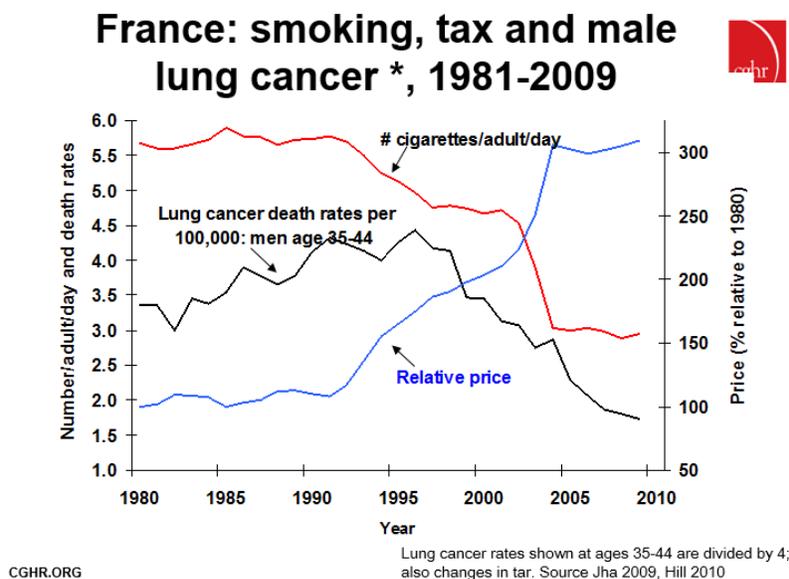
Kenyan governmental and civic groups are taking steps to bring attention and action to the situation. For example, there is a loose coalition of civil society organizations called the “East African NCD Alliance Post-2015 Initiative,” with partners from universities and global institutions. The NCD Alliance Kenya (NCDAK) includes members from the Kenya Cardiac Society, Kenyan Heart-National Foundation, the Kenya Diabetes Association, and others.

To effectively slow the rise of NCDs, however, Kenya will have to take some bold steps in the next 15 years. Fortunately, many NCDs share the same risk factors and interventions targeting those risk factors can prevent premature mortality from a variety of conditions. We suggest policies aimed at addressing two of the most important risk factors for NCD mortality: tobacco usage and hypertension. Reducing these two risks will dramatically improve the health outlook related to heart disease including stroke, cancer, and other debilitating conditions.

Tobacco Taxation

Decades of experience in high income countries indicate that there are consistent trends in how tobacco prevalence grows and affects health. This same experience has indicated that taxing tobacco products at relatively high rates is one of the most effective and cost-effective ways to reduce tobacco consumption and subsequently reduce its negative health consequences. For example, three decades of data in France show that there is a strong correlation between increased price of tobacco, decreased tobacco consumption, and the decreased rate of lung cancer (as a proxy for tobacco attributable disease) (Figure 2).

Figure 2



Kenya currently has a low prevalence of tobacco usage relative to other countries, which means the country has a historic opportunity to manage the tobacco culture and stem the epidemic before it can have comparable health effects to other populations. Particularly, Kenya has an opportunity to influence younger generations of would-be smokers, because younger age groups, such as school children, are increasingly the ones initiating tobacco use.

Although the availability and quality of tobacco prevalence data varies, the World Health Organization and Kenya published prevalence estimates from its Global Adult Tobacco Survey (GATS) in 2014. These estimates place total adult tobacco use (including both cigarettes and smokeless tobacco products) at about 11.6% (19.1% males, 4.5% females). The overwhelming majority of this prevalence is from adult males consuming cigarettes. GATS estimates that about 15.1% of all Kenyan males smoke cigarettes, although the 2009 Demographic Health Survey estimated 20% of adult males, and the World Health Organization 2011 Country Profile put adult male smoking as high as 26%. Kenyan women tend not to smoke cigarettes, with prevalence estimates from multiple sources being below 1% (GATS 2014, WHO 2011). However about 4.5% of Kenyan adults use smokeless tobacco products, and this prevalence split fairly evenly between men and women (5.3% males, 3.8% females).

Kenya has multiple tobacco regulations in place. In 2007, for example, the Tobacco Control Act was passed to prohibit smoking in public and work places except for specially designated areas (GATS 2014). This regulation seems to be poorly enforced, however, with survey evidence that between 18-30% of adults are exposed to tobacco in the workplace, in restaurants, and at universities (GATS 2014). When enforced, and there are dedicated funds to enforce the law, the WHO Tobacco Surveillance Study found that the fines were levied on the smoker. Kenya, like its regional neighbors, has also ratified the WHO Framework Convention on Tobacco Control (FCTC). Additionally, Kenya has a specific national government objective and a national agency or technical unit for tobacco control with about 2 full time equivalent staff. Tobacco products in Kenya are required to have health warnings on their packages, and there are both direct and indirect bans on certain advertising.

A proposed tobacco tax increase

Taxes are currently levied on tobacco products in Kenya, although the tax system has been in a constant state of reform, switching between ad valorem, specific, and a combination of the rates. The existing tax structure, an ad valorem tax with a specific floor, is complex and does not apply uniformly to all tobacco products, creating incentives for substitution among brands and products (ILA 2011). Additionally, the WHO reported that taxes are declining as a percent of retail price, from 76% in 2008 to about 50% in 2012 (WHO Report on global tobacco epidemic 2013). Currently, the average price of a pack of cigarettes in Kenya is only 103 ksh (about \$1 USD) (GATS 2014). We examine the effect of a 150% increase in the real price of tobacco products. This is a feasible strategy given evidence from high-income countries and from our knowledge that almost all males in Kenya purchase their cigarettes at shops and kiosks where it is possible to enforce taxation.

In 2030, Kenya is predicted to have about 66 million people with a crude death rate of 7.7 per 1,000 population (UN, Pardee). If we assume that the current tobacco attributable death rate of 1.5% stays consistent, about 7,600 – 10,000 deaths in 2030 will be attributable to tobacco usage. This is a conservative estimate, however, as the percent of smokers is likely to increase in the absence of further intervention due to strong marketing efforts from global tobacco companies. The World Health Organization estimates that death rates from cancer, diabetes, and cardiovascular disease will increase by 34%, 37% and 20%, respectively in the sub-Saharan Africa region (WHO GHE). If the rate of tobacco attributable death is increased by 25% in 2030, expected deaths from tobacco increases to 13,000. Because the average life expectancy in Kenya is about 65, we assume that all tobacco attributable deaths are avertable. We find that raising the real price of tobacco by 150% would lead to a 60% decrease in tobacco demand. Assuming that the 60% decrease in demand in 15 years would directly translate into a 60% decrease in tobacco-attributable mortality, this tax increase could prevent from 4,600 to 7,600 deaths in 2030 among productive adults.

We use the conservative estimate in our analysis because a relative price increase in Kenya will likely increase smuggling activity. While smuggling is unavoidable to a certain extent, a well-enforced tobacco tax that is consistent through 2030 and applied uniformly to all tobacco products will lead to a significant decrease in consumption and a change in tobacco culture. It is also possible that a portion of the revenues from the tax can fund border enforcement or other anti-smoking regulations.

There would be certain costs incurred in changing and enforcing a new tax structure. Asaria and colleagues (2007) estimate that in upper-middle income countries, tobacco tax increases would cost about \$0.50 per capita per year in upper-middle income countries, but could cost as little as \$0.15 per capita per year in low income countries. Without considering tax revenue, which may be funneled into other various governmental sectors, this means that a tax increase would cost approximately \$10 million dollars in Kenya in 2030. Using conservative costs and benefits, Kenya would stand to gain about \$14.5 USD in benefits for each \$1 it invested in tobacco taxation (our results ranging from \$5 - \$46) by 2030 (Table 1).

Hypertension management

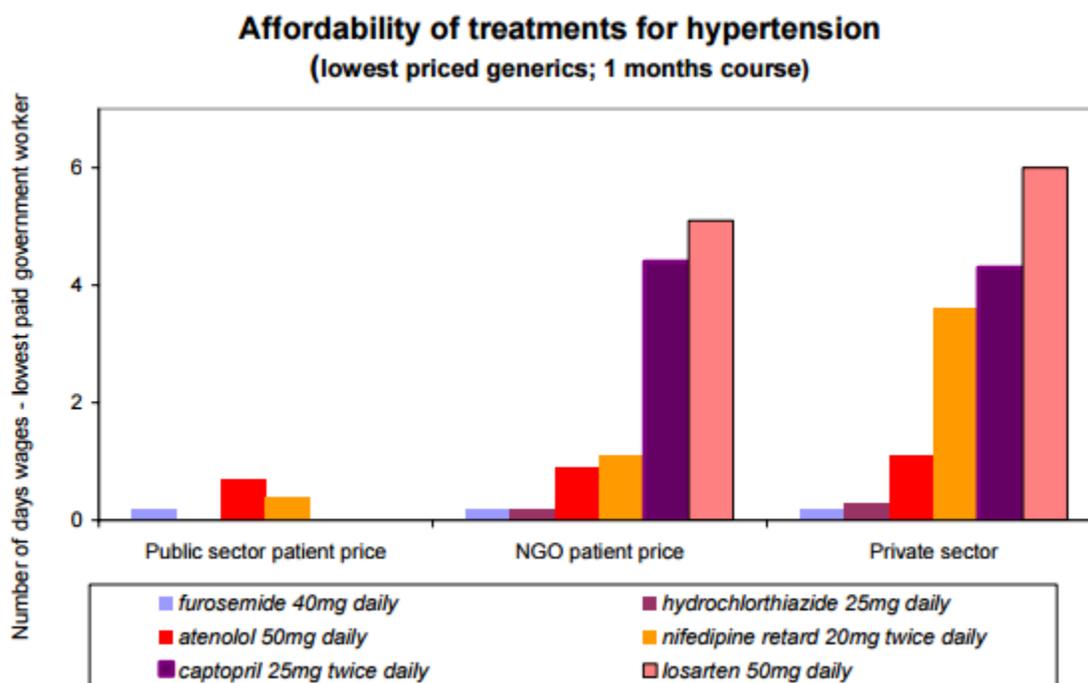
Hypertension, or elevated blood pressure, has been referred to as the silent killer in many LMICs due to its frequent under-diagnosis and high prevalence. In sub-Saharan Africa, hypertension is the most common cardiovascular problem (Joshi 2014). When left untreated, hypertension can have serious complications, often leading to such conditions as heart disease, stroke, and diabetes. Without access to advanced care, these conditions can quickly become fatal.

Prevalence of hypertension is growing in Kenya due to many risk factors, including obesity, stress, decreased physical activity, poor diets, and tobacco use. Like NCD prevalence data, hypertension prevalence data from Kenya varies in quality and availability; thus, researchers use data from smaller studies and other countries as proxies. As seen in Table 3, prevalence of hypertension in both men and women in Kenya ranges from 7.4% to 21.4% in rural areas, and from 12.3% to 22.8% in urban areas. This is lower than other sub-Saharan African countries, such as Nigeria, and much lower than the estimates for low-income countries in general.

Existing studies in Kenya reveal that awareness among those who have hypertension is fairly low and successful management is even lower. For example, a 2010 survey in Kibera and a 2012 survey of Nandi District, a rural farming community, showed that only 1 in 5 of the 22% of adults with hypertension were aware of their status (Joshi 2014, Hendricks 2012). Women, however, were more likely than men to be aware of their status and to seek antihypertensive treatment (Van de Vijver 2013). Hypertension prevalence almost universally increased with age.

Relatively cheap medication can successfully treat and manage hypertension if taken on a regular basis. There are several anti-hypertensives on Kenya's national essential medicines list, which are theoretically available to the public. Access to basic care, price of medicine, and the chronic nature of managing hypertension are often barriers to successful treatment, however. Figure 3 shows how many day's wages are required to purchase anti-hypertension medications for 1-month in Kenya.

Figure 3



Source: WHO, Medicine Prices in Kenya, n.d.

Increased access and coverage of hypertension management

We propose that Kenya increase the numbers of hypertensive people on low-cost hypertensive medication to manage their condition. The GBD 2010 study estimated that 5.3% of all Kenyan deaths in 2010 were due to hypertension or high blood pressure. If we assume that this rate remains the same over the next 15 years, which is a conservative estimate as the country grows older and more urban, about 27,000 deaths in 2030 would be attributable to hypertension. If we assume the rate increases by 25% to 6.6% in the next 15 years, as estimated by the WHO GHE data, unmanaged hypertension would cause as many as 33,600 deaths.

We made some assumptions in our analysis, including that 20% of the population will have hypertension in 2030 and that 40% will be at moderate to high risk levels. In our hypothetical situation, 50% of those who need hypertension medication can be reached and they would have about a 30% success rate in terms of adherence. These are fairly conservative estimates, leading us to assume that at least 4,022 deaths could be averted from increased hypertension management.

The WHO global brief on hypertension estimated that a year of hypertension diagnostics and medications would cost between \$1 and \$2.50 per head. We use the higher cost in our calculations. Treating about 1.4 million people at that cost would add up to a total of just over \$3.5 million dollars in 2030. Using similar methods to our tobacco taxation analysis, along Copenhagen Consensus guidelines of 3%-5% discounting and valuing DALYs at both \$1,000 and \$5,000, we found that increased hypertension management would return \$37 in benefits for every \$1 invested (Table 1). This return on investment goes up to \$46 when accounting for increased rates of cardiovascular disease rates increase by 25%. By our calculations, investment in hypertension management is more than double that of tobacco taxation because the estimated cost is lower, even though tobacco taxation would avert a marginally higher amount of mortality.

Conclusions

Kenya has the opportunity to save thousands of lives each year from the growing toll of NCDs by implementing a large tobacco tax increase, and making low-cost drugs available to people with high blood pressure. The burden of NCDs is already substantial, and, like many of its neighbor countries, Kenya is seeking guidance on the first steps to take to prevent an even larger and more expensive problem. Early prevention will be the key to maintaining control of the national health budget, and keeping the health system from further over-burdening.

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Non – Communicable Disease

Special Focus on Cardiovascular Disease

**Dr. Charles Kariuki FRCP FACC MBS.
Interventional Cardiologist**

- Over the past decade, cardiovascular disease has emerged as the single most important cause of death worldwide.
- **30% of all deaths in 2010**
- **11% of all deaths DALY's 2010**
- Leading cause of death in sub-Saharan Africa amongst those over 45 years of age

Manifestations of Cardiovascular Disease

- Stroke
- Heart attacks
- Heart failure
- Debilitating end- stage kidney disease
- Limb amputations and eye disease
- Significant economic consequences of the above

Risk Factors

Hypertension

- An early indication of epidemiologic transition
- 62% of strokes and 49 % of Coronary Heart Disease attributable to suboptimal Bp control world wide

Risk Factors contd.

- **High Cholesterol**

56% of heart attacks and 18% of strokes attributed to high cholesterol

- **Diabetes**

Growing rapidly

80 % of people with diabetes live in LMICs

Middle East and N. Africa 12.5% of the adult population

Associations include rising rates of obesity, urbanisation and aging .

Obesity

- Increasingly a problem and starts in childhood
- “ Nutritional Transition”
 - Diet
 - Transfats
 - Processed foods
 - Intake of Simple carbohydrates

Physical Inactivity

- Shift from physically demanding agriculture – based work to largely sedentary service based and office based work

Nakuru Study-Mathenge et al 2010 BMC

- Urban Population Study
- 5,010 Subjects (Adults)
 - Hypertension – 50.1 %
 - Obesity - 13.0 %
 - Diabetes - 6.6 %
 - High Cholesterol – 11.1 %

Elevated prevalence of risk factors generally persists after adjustment for socio-demographic lifestyle, obesity and cardiovascular risk markers

Kibera Hypertension Study 2010- Joshi et al

- Looking at prevalence and risk factors correlates 2061 adults (> 18 yrs).

- Mean Age 33.4

22.8 % had Hypertension

20% with Hypertension were aware

10% current smokers

5% had diabetes

40% of the population had central obesity

Kibera Study on Diabetes Prevalence

- Population based household study.
- Age 18 years and above
- Random capillary blood sugar confirmed with fasting sample
- 2061 subjects
- Mean age 33.4

Kibera Study Contd.

- Only 10.6 % had ever had a blood test for diabetes
- DM 10.5% in the 45 -54 year age
- 13.1% smoked
- 74.9 % alcohol consumption
- 16.3 % obese
- 29% overweight (higher rates in women)

Interventions

- Community led, government initiated including fiscal policy change
- Tobacco use
- Refined carbohydrate restrictions
- Reduction in intake of Transfats
- Salt intake reduction
- Enhanced physical activity
- Early identification of risk factors

Interventions Contd.

Early Treatment of Modifiable Risk Factors

- Eg- Hypertension
 - Diabetes Mellitus
 - Cholesterol
 - **Interventions for acute complications**
 - Heart Attack
 - Stroke
 - Renal Disease

Several Community Intervention Studies in LMIC

Mauritius

Government led change in prime cooking oil from predominately saturated fat palm oil to a non-saturated oil fat.

5 year study 1987 – 1992

Average Cholesterol levels fell by 14 %

South Africa

Coronary Risk Factor Study

- Mass media messages
- Group sponsored educational sessions
- Blood pressure screening
- Led to improvements in blood pressure, smoking rates and cholesterol levels

Summary

- Cardiovascular disease remains a significant global problem.
- Swift pace of economic and social transition
- Rate of change is accelerating
- Less productivity amongst the negative effects
- Need low cost prevention strategies to reduce disease burden
- Both policy and person changes required.

Summary Contd.

- Tobacco control strategies
- Improved dietary choices
- Increased physical activities
- Community based interventions