

ACCELERATING THE CONTROL AND PREVENTION OF NON-COMMUNICABLE DISEASES IN GHANA: THE KEY ISSUES*

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Introduction

NCDs were particularly prominent in the global, regional and national public health agenda in 2011. Globally, the "First global ministerial conference on healthy lifestyles and non-communicable disease control" was held in Moscow on 28-29 April 2011 and the UN High-level Meeting of the General Assembly on Non-Communicable Diseases in September 2011. Regionally, the WHO African Regional Consultation on the preparation for the Moscow Ministerial Meeting and the UN High Level Summit on NCDs was held in Brazzaville on 4-6 April 2011. Nationally, the University of Ghana fifth College of Health Sciences' Annual Scientific Conference had "The increasing burden of NCDs in Ghana" on 21-23 September as its theme. The Health Summit of the health sector in Ghana reviewed the national response to NCDs on 24 November 2011. The Ghana College of Physicians & Surgeons (GCPS) chose the theme "NCDs: Lifestyle and Health" for its Annual General and Scientific Meeting (AGSM). These meetings in Ghana were intended to galvanize response to NCDs. Globally, NCDs are the leading causes of death accounting for 63% of the 57 million deaths that are reported every year, with 80% of these deaths occurring in developing countries and one-third occurring in people younger than 60 years¹. Obesity reduces overall mortality by 2-4 years among persons with a body mass index of 30-35 kg/m² and by 8-10 years at 40-45 kg/m².²

Not surprisingly, NCDs have been described as a global emergency requiring urgent action. In his concluding remarks to the Forum on Global Health on 15 June 2009, the UN Secretary General, Ban Ki-Moon described NCDs as "a public health emergency in slow motion"³. "Cancer, diabetes, and heart diseases are no longer the diseases of the wealthy. Today, they hamper the people and the economies of the poorest populations even more than infectious diseases. This represents a public health emergency in slow motion." The World Bank reports that NCDs are a "chronic emergency" in middle and low-income countries which should be considered a priority by decision-makers.⁴

Closer home, an epidemic of hypertension in Ghana⁵ and an epidemic of diabetes and physical inactivity in adults in West Africa⁶ have been described. For those of us in Africa, it is pertinent to note that NCDs are projected to become the commonest cause of death by the year 2030⁷. Africa is the region with the fastest rate of increase of various NCDs. For instance, the number of persons living with diabetes aged 20-79 years in Africa is projected to increase by 98% from 12.1 million in 2010 to 23.9 million by 2030, compared with a global average of 54% increase over the same period⁸. Again, the share of NCD deaths among persons aged 15-59 years, is expected to increase by 44% from 28% to 41% between 2008 and 2030⁴. This paper would like to communicate five key messages (which will be discussed in turn) with respect to the control of NCDs in Ghana:

1. The burden of NCDs is higher than is often appreciated
2. NCDs are now developmental issues
3. NCDs are largely preventable
4. National response has been weaker than it should be
5. There are many opportunities for improved national response

NCDs are now a developmental issue

In addition to being the leading global killers, NCDs impose huge financial burden on nations and households. According to a joint report by the Harvard School of Public Health (HSPH) and the World Economic Forum published in September 2011, the world would lose a staggering \$47 trillion over the period 2010-2030 due to the economic impacts of NCDs⁹. This loss represents 75% of global GDP in 2010 (US\$ 63 trillion). In 2010, the World Economic Forum ranked NCDs among the most important threats to global economic development¹⁰. It has been estimated that each 10% rise in the mortality rates of chronic NCDs is associated with an almost 0.5% decline in the rates of annual economic growth¹¹.

NCDs have the capacity to push people into poverty and to maintain them in that state. Poor populations may have increased exposure to common modifiable risk factors as well as have limited access to effective health care interventions¹. NCDs decrease national productivity and country competitiveness; place high fiscal pressures through lost tax revenue and increased health and social protection expenditures; impoverish

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families through their direct health effects and worsen poverty, inequity and opportunity loss⁴.

At the household level, Ghanaians spent 2.6% of their total annual household expenditure on alcoholic beverages and 1.6% on tobacco in 2005¹². The combined household expenditure on alcohol and tobacco was more than the proportion spent on health-related expenses (3.5%). In the Ghana Demographic and Health Survey (GDHS 2008), men from the poorest households were 1.8 times as likely to have consumed alcohol four times or more in the past 7 days as those from the richest households (17.6% vs. 10.0%)¹³. NCDs hinder the attainment of the Millennium Development Goals (MDGs), particularly of MDG 1 (poverty), MDG 4 (child health), MDG 5 (maternal health) and MDG 6 (AIDS, TB, malaria) through biological and social pathways¹⁴⁻¹⁸. Stuckler et al found that high burdens of NCDs contribute to worse child health and poorer tuberculosis outcomes, both as a result of biological risks from co-morbidities and as a result of reduced household resources¹⁶. They estimated that each 10% higher NCD mortality is associated with a 7.6% reduction in progress toward tuberculosis mortality targets, a 5.6% reduction in achieving the child mortality target and a 6.3% reduction in achieving the infant mortality targets.

The burden of NCDs in Ghana is higher than is often appreciated

The burden of NCDs can be derived from three sources – mathematically-modelled estimates (using the Global Burden of Disease approach), local surveys and administrative (routine) reports. WHO estimates that NCDs kill 78,000 persons in Ghana annually, representing 354 deaths per 100,000 population¹. NCDs (including neuropsychiatric disorders) cause 2.32 million Disability-adjusted life years (DALYs) representing 10,500 DALYs lost per 100,000 populations. They account for 34.0% of the total deaths and 31% of total DALYs¹⁹. CVDs are the leading cause of NCD-deaths with an estimated 35,000 deaths or 15% of the total deaths.

Surveys on NCDs and their risk factors have been limited to four regions and mostly to Accra and Kumasi. Surveys in and around Accra suggest that the prevalence of hypertension has increased from about 25%-28% in the 1976-1998 period to about 37%-45% in 2002-2006⁵. Even in the poorest rural districts, such as the Kassena-Nankana district in the Upper East Region, about one in five adults have raised blood pressure²⁰. It is estimated that at least, 3 million adults have hypertension. This contrasts with an estimated 236,000 adults living with HIV in Ghana.

A major public health problem that is not well acknowledged is that the majority of those with hypertension (up to 70%) are unaware of their condition and adequate control is disturbingly low^{5, 21}.

Not surprisingly, a significant proportion of them have severe hypertension or evidence of target organ damage. In the Civil Servants Study of Accra in 2006, 19% of those with hypertension had severe (Grade 3) hypertension and 48% of those examined had evidence of organ damage^{22, 23}.

The prevalence of diabetes in Accra and Kumasi ranges between 4% and 9% and hyperlipidaemia between 17% and 23%^{24, 25}. The prevalence of diabetes in men around Accra of about 7.8% in 1998 is much higher than the 0.2% among men in Ho in 1963^{26, 27}. The prevalence of exercise-induced bronchospasm (EIB), a proxy for asthma, increased from 3.1% (95% CI 2.2%–4.3%) to 5.2% (4.3%–6.3%) among school children in and around Kumasi between 1993 and 2003²⁸. The prevalence of sensitisation to at least one allergen similarly increased from 7.6% to 13.6% over the same period.

Reported cases of newly diagnosed outpatient hypertension have increased from about 60,000 in 1990 to around 700,000 in 2010. These figures exclude reported cases from the Teaching Hospitals in Accra and Kumasi. Currently, about 150,000 newly diagnosed outpatient cases of diabetes and 70,000 cases are reported each year. Hypertension has ranked as the fifth commonest newly diagnosed outpatient disease for about two decades (Table 1). In some regions such as the Greater Accra Region, it has on some occasions ranked second.

Cardiovascular diseases are among the top causes of admission and institutional deaths Based on limited reports, the Centre for Health Information Management (CHIM) of the Ghana Health Service (GHS) estimates that CVDs were the leading cause of institutional deaths in 2008 accounting for 14.5% of reported total deaths compared with 13.4% deaths from malaria²⁹. Five years earlier, CVDs had been responsible for 8.9% of the deaths and ranked as the third leading cause of death after malaria (17.1%) and anaemia (9.6%).

Corresponding with the increase in the prevalence of NCDs, risk factors for chronic NCDs have generally been worse or are worsening. Risk factors such as physical inactivity, obesity, high consumption of salt and sugars, indoor smoke from solid fuels, alcohol misuse and tobacco use are prevalent. For example, the prevalence of overweight or obesity in women aged 15-49 years has increased from 13% in 1993 to 30% in 2008¹³. In the Women's Health Survey of Accra (WHSA) 2002/2003 and in the chronic NCD risk factors survey of Greater Accra Region 2006, more than 60% of subjects were overweight or obese^{24, 30}. In the World Health Survey 2002-2003, fruits and vegetable consumption in Ghana were the lowest among 52 mainly low- and middle-income countries including 19 African countries³¹. It is only with tobacco that Ghana has managed to reduce the prevalence in men aged 15-49 years from 11% in 2003 to 8% in 2008¹³.

Table 1: Regional ranking of top 21 newly diagnosed outpatient diseases in Ghana

Rank	Disease	WR	CR	GAR	VR	ER	AR	BAR	NR	UER	UWR
1	Malaria including pregnancy and unconfirmed	1	1	1	1	1	1	1	1	1	1
2	Other Acute Respiratory Infections	2	2	2	2	2	2	2	2	2	2
3	Skin Diseases & Ulcers	3	3	4	5	5	5	3	4	3	3
4	Diarrhoea Diseases	4	4	6	6	6	4	5	3	4	4
5	Hypertension	6	5	3	3	3	3	8	5	12	9
6	Rheumatism and Joint Pains	5	6	7	4	4	6	4	7	6	7
7	Intestinal worms	8	9	14	7	7	7	6	13	10	13
8	Acute Eye infection	7	10	8	11	9	11	7	11	5	5
9	Anaemia	11	7	9	8	10	10	10	9	13	14
10	Injuries – Road Traffic Accidents, home, occupational, sexual violence	9	8	10	9	8	9	9	10	11	6
11	Pregnancy and Related Complications	10	12	5	13	11	16	11	20	18	18
12	Acute Urinary Tract Infection	13	13	13	12	17	8	13	12	16	11
13	Typhoid/Enteric Fever(Typhoid)	12	11	17	14	14	12	19	8	7	17
14	Acute Ear infection	16	16	15	15	13	15	12	14	8	8
15	Diabetes Mellitus	17	15	11	16	12	13	17	25	27	35
16	Gynaecological conditions	15	14	12	10	15	17	14	17	20	15
17	Vaginal Discharge	14	18	18	18	16	14	15	15	14	16
18	Pneumonia	19	17	19	17	18	18	16	6	9	10
19	Dental Caries	18	19	16	20	21	24	22	24	24	19
20	PUO (not Malaria)	21	23	22	19	23	21	18	18	15	12
21	Asthma	22	20	20	21	19	19	20	19	22	25

There is often clustering of risk factors in the same individual. In the chronic NCD risk factors survey of Greater Accra Region 2006, 56% of adults had at least three risk factors³⁰. Risk factors in the youth tend to track to adulthood. Under-five obesity which was <1% in 1988 has increased to 5.3% in 2008¹³. The Global School-Based Survey in Ghana in 2008 found that 7.8% of Senior High School adolescents were overweight or obese (Males 2.4%, Females 13.9%)³². Only about one in five students were physically active on all 7 days during the past 7 days for a total of at least 60 minutes per day.

NCDs are largely preventable

WHO estimates that up to 80% of NCDs are preventable through lifestyle changes¹. About 40% of cancers are preventable. Experiences from prospective studies, community-based interventions and cost-effectiveness analyses have provided evidence of the health effects of various risk factors. Let us examine the effect of these risk factors in two studies: European Prospective Investigation into Cancer and Nutrition

Potsdam Study (EPIC) and INTERHEART. In the EPIC conducted to examine the reduction in relative risk of developing major chronic NCDs associated with 4 healthy lifestyle factors, more than 23000 participating German adults aged 35 to 65 years were enrolled and followed-up for a mean of 7.8 years between 1994 and 2006³³. The end points included confirmed incident type 2 diabetes mellitus, myocardial infarction, stroke, and cancer. The 4 factors were never smoking, having a BMI<30, performing 3.5 h/wk or more of physical activity, and adhering to healthy dietary principles (high intake of fruits, vegetables, and whole-grain bread and low meat consumption). The 4 factors (healthy, 1 point; unhealthy, 0 points) were summed to form health behaviour score that ranged from 0 to 4. After adjusting for age, sex, educational status, and occupational status, subjects with all 4 healthy factors at baseline had a 78% (95% confidence interval [CI], 72% to 83%) lower risk of developing a chronic disease than participants without any healthy factor. The benefits ranged from 36% [95% CI, 5% to 57%]) reduction for cancer to 93% [95% CI, 88% to 95%] for

diabetes. The level of reduction in developing a chronic NCD declined as the number of healthy behaviours declined.

The EPIC study also examined the relationship between lifestyle and the risk of dying among about 20,000 men and women aged 45–79 living in Norfolk UK who were enrolled between 1993 and 1997 and followed up for a mean of 11 years³⁴. The four health behaviours - current non-smoking, not physically inactive, moderate alcohol intake (1–14 units a week), and consuming five or more fruit and vegetable servings daily – were summed into a score which ranged from 0 to 4. The study found that the adjusted risk for all-cause mortality increased progressively with decreasing number of healthy behaviours. The risk of death from any cause for those with no healthy behaviour was four times that of those with four healthy behaviours. The greatest differentials were observed with deaths from cardiovascular diseases.

The INTERHEART Africa data involving nine African nations showed that only five risk factors account for 89.2% of the risk for first myocardial infarction³⁵. These risk factors are current/former tobacco smoking, self-reported hypertension and diabetes, abdominal obesity measured as the waist-to-hip ratio (WHR), and lipoprotein ApoB/ApoA-1 ratio. Of these risk factors, four can be easily determined by taking a medical history and performing simple physical measurements in primary healthcare services. They explain 83.1% of the risk for an initial acute myocardial infarction. We know that a combination of population and high-risk strategies is required for the control and prevention of chronic NCDs. In many Western countries, death rates from coronary heart disease (CHD) have declined by 25% - 75% over the past 20–40 years. It has been estimated from various models that changes in risk factor may explain 45% - 75% of the mortality decline while medical treatment explains about 25% - 50%.^{36, 37} About 5% - 24% of the CHD mortality decline remains unexplained.

WHO has compiled a list of cost-effective actions that should be implemented immediately to produce accelerated results which it has called “best buys”¹. Some of these actions are implemented at the population and others at the health-care delivery level. Examples of the best buy for tobacco control include protecting people from tobacco smoke and banning smoking in public places; warning about the dangers of tobacco use; enforcing bans on tobacco advertising, promotion and sponsorship; and raising taxes on tobacco. Examples of individual health-care actions are counselling and multidrug therapy, including glycaemic control for diabetes for persons aged > 30 years with a 10-year risk of fatal or nonfatal cardiovascular events; aspirin therapy for acute myocardial infarction; and treatment of persistent asthma with inhaled corticosteroids and beta-2 agonists.

Since 1972, several community-based interventions such as the North Karelia Project in Finland, the Depok (Indonesia), Ballabgarh (India) Project and the Isfahan Healthy Heart Program in Iran have demonstrated modest-to-significant successes in changing behaviour and outcomes.^{38–40} In the Isfahan Program, the incidence of diabetes was reduced by 65% in the intervention groups compared to controls after a mean follow up of 3.6 years⁴¹.

National response has been weaker than it should be

Since the mid-90s, there have been a number of positive initiatives by Ghana in response to the increasing epidemic of NCDs. Some of these developments are as follows:

- Ratification of the Framework Convention on Tobacco Control,
- Incorporation of tobacco control measures into a national Public Health Bill
- Inclusion of NCD prevention and control in the Ghana Shared Growth and Development Agenda (GSGDA), 2010–2013
- Development of various policies– Health Promotion Policy, School Health Policy, NCD policy, Alcohol Policy
- Development of strategic plans cancer, sickle cell disease, NCDs, Regenerative Health and Nutrition Programme (RHNP)
- Health promotion– celebration of national and international days; development of educational materials; public education using the mass media
- Growing phenomenon of health walks and fun games to mark anniversaries and recreation
- Vaccination – hepatitis B since 2001 and from 2012 introduction of pneumococcal vaccine
- Scale up of newborn screening for sickle cell disease
- Early detection– visual inspection of the cervix after application of acetic acid (VIA)
- Expansion of infrastructure e.g. Radiotherapy in KBTH and KATH with a loan of \$14.8 million secured by the Government of Ghana
- Training and conferences
- Introduction of the national health insurance scheme
- Surveillance – inclusion of some NCDs and risk factors into the Integrated Disease and Surveillance Response
- Surveys and research– multi-country studies e.g. World Health Survey, WHO Study on global Ageing and adult health (SAGE) and the addition of NCD-relevant questions to the GDHS modules
- National Diabetes Management and Research Centre based at the KBTH has obtained a grant from

the World Diabetes Foundation to build capacity in diabetes screening, treatment and care, to improve awareness and to monitor risk factors for the disease.

In the five-year period since the Tobacco Bill was first presented to the Parliament of Ghana, the Food & Drugs Board has supervised the implementation of some of the Framework Convention on Tobacco Control (FCTC) provisions. It has set up registers for tobacco companies and tobacco products; introduced an import permit regime for tobacco products; prohibited direct and indirect advertisements by tobacco companies; introduced textual health warnings on tobacco product packs; and strengthened the Tobacco Control Bill. Despite these initiatives, there are several gaps in the national response. The structures for coordination are weak and inefficient. Contrary to WHO recommendations, there is no multi-sectoral coordinating structure, as exists for other disease control programmes such as AIDS, malaria and the Expanded Programme on Immunization⁴². The tobacco control programme is not integrated into the NCD Control Programme. Neither is there meaningful little collaboration between the Non-Communicable Diseases Control Programme (NCDCP) and the RHNP. The independent team that reviewed the health sector performance of 2008 observed that:

“The RHNP is operating in isolation in the Ministry and does not work together with the Department of Public Health, where the non-communicable diseases programme is located. The parallel programmes in MOH and GHS do not seem to be effective use of resources. The way forward seems to be: integration in the GHS public health activities, maintaining the sector wide cooperation with all agencies and the intersectoral collaboration with other ministries”⁴³.

NCD control is not mainstreamed into regional and district health services. This is compounded by the absence of Regional or District NCD Focal Persons, who could plan, monitor and coordinate local level programmes.

There is limited capacity at the NCD Control Programme (NCDCP). The national programme has only three professional staff who cover the various constituent diseases. Funding for the programme is limited. There is currently no system to track how much of the health budget is allocated to NCD control. Development Partners have traditionally not been interested in NCD control.

Awareness of NCDs is generally low among the general public. For example, patients attending a hypertension clinic in Sekondi, believed that high blood pressure was due to having “too much blood in the body,” and that hypertension caused a variety of physical ailments, such as joint pain, and dizziness⁴⁴. About 58% of the patients believed that hypertension was curable. The investigators concluded that the low

knowledge of hypertension contributed to the low uptake of treatment and the poor control (5%) of their blood pressure. Some herbal practitioners fuel misinformation when they advertise cure of NCDs.

Clegg-Lamprey and colleagues reported that ignorance, fear of mastectomy, recourse to medical treatment, spiritual consultation at prayer camps and lack of funds were common reasons for delay in seeking medical care or absconding from treatment⁴⁵. Low knowledge about NCDs is not limited to the lay public or those of low socio-economic status. Adanu found that only about 37% of a group of medical students, nonmedical undergraduate students, nurses, and senior university workers in Accra had adequate knowledge about cervical cancer⁴⁶.

Along with the low knowledge, the culture of having periodic medical check-ups is lacking, except compelled by travel, education or employment. Considering that up to 70% of patients with diabetes or hypertension have no symptoms, it becomes important to open up access for medical examination of such persons, for example through self-referral or mass screening²⁷. In the chronic NCD risk factor survey in the Greater Accra Region in 2006, only about 60% of those identified to have raised BP reported BP check during the past 12 months; 17% had not received a BP check for more than five years³⁰. Improving this culture is undermined by the fact that the national health insurance scheme (NHIS) benefits package does not cover medical examination.

There is generally no organized screening programme in place. Surveys suggest that 2% - 12% of Ghanaian women undergo cervical cancer screening using Pap smears⁴⁶⁻⁴⁸. The Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO) -initiated VIA screening programme which was introduced in 2001 in Accra, Kumasi and Amasaman has not been scaled up beyond these initial centres. Indeed, the rural screening programme at Amasaman has collapsed for a number of years.

At the institutional level, there is late reporting, late diagnosis, limited infrastructure and low compliance with treatment. About 60% of patients with breast cancer attending KBTH report with Stage III and IV disease, and they report with average 8-10 months duration of symptoms⁴⁹. Among 80 diabetics identified with soft tissue and foot disease at the Surgical Unit of 37 Military Hospital during the period May 2005 -Apr 2007, 28% were newly diagnosed⁵⁰. There is a limited supply of some cadre of health workers such as pathologists, psychologists, dieticians, physiotherapists and health promotion specialists.

The national NCD Control Programme (NCDCP) was established in 1992, two years before the National Tuberculosis Programme (NTP) was established. However, while the NTP has been evaluated (often by external reviewers) several times, the NCDCP has not been formally evaluated. Unlike the other disease con-

trol programmes e.g. NTP, National AIDS Control Programme (NACP) which have their own dedicated set of reporting tools, the NCDCP relies completely on the CHIM for reports on routine data. Such data are often incomplete and untimely.

There are some problems with routine reports. Multiple diagnoses such as hypertension and diabetes, or gestational diabetes are not routinely reported. The severity of hypertension is not reported although this has prognostic value and implications for public education. It is also not possible to determine from routine reports which NCDs presented as medical emergencies. A large proportion of NCDs reporting as emergencies could be an indictment on the public health education programmes. For example, during an 8-month period in 1995 and 1996 at KATH, 18% of 3317 acute medical admissions were ascribed to a cardiovascular cause (hypertension, heart failure, stroke); 29% of these died⁵¹.

There are many opportunities for improved national response

Having identified some of the gaps in the national response, we can now consider some suggestions on how to accelerate the current response. We know enough of what works in order to act. It is essential to establish and strengthen structures for whole-of-government response. It is proposed that, the Ministry of Health coordinates an inter-sectoral response within the framework of the national development agenda. In particular, a multi-sectoral committee should be established to advise the government on the needed actions and the progress towards achieving defined targets. The NCDCP will serve as the technical department for day-to-day planning, coordination, and monitoring appropriate interventions. The NCDCP will work closely with various partners in this effort. Horizontal and vertical integration will be required at all levels within the health sector and between governmental and non-governmental organizations involved in healthcare delivery⁵². This model is similar to that used for the control of HIV/AIDS in Ghana and is similar to the structural arrangements for control of NCDs in Kenya. The capacity of the NCDCP itself will need to be strengthened through a hierarchical elevation, improved human resources and finances.

Primary prevention involves implementing interventions to improve the four major lifestyle behaviours (diet, physical activity, tobacco, alcohol) and vaccination against liver and cervical cancer. The various policies have to be finalised and implemented. There should be continuing advocacy for the Tobacco Bill or now the Public Health Bill after it has been passed. Legislation is needed for alcohol control, marketing of alcoholic and non-alcoholic beverages, food labelling, fiscal controls to promote healthier lifestyle choices. Promoting healthy diet and healthy eating will involve

reducing salt, reducing industrially-produced trans-fatty acids (IPTFAs), reducing consumption of saturated fat, promoting consumption of fruits and vegetables, legumes and wholegrain. Many of these measures are clearly beyond the health sector. However, the MOH Ghana could take the lead in a number of these interventions - for example, organize a stakeholders' consultative meeting on reducing the consumption of salt.

The Ghana Medical Association has traditionally been in the news on issues relating to salaries. It has the capacity to advise government and the public on various health issues. However, this role has not been quite visible. The GMA, along with other professional bodies including the various faculties in the Ghana College of Physicians & Surgeons could publish monographs or scientific papers on various health topics such as alcohol, tobacco, salt, cocoa drinks. Professional bodies can take a cue from the British Medical Association which produced a monograph on alcohol in 2008⁵³.

Local champions such as politicians, policy makers, entertainers should encourage healthy lifestyles. Ghanaian professors and leaders should overturn existing taboos and ride bicycles to their offices or clinics! Politicians should talk NCDs. Physical activity should be emphasised in the education curriculum of our schools. The media should be regularly engaged to communicate messages on healthy living to the public. Research and surveillance are needed to guide the national response. The three demographic surveillance sites at Navrongo, Kintampo and Dodowa are uniquely placed to monitor changes in health behaviour and health outcomes. More research from these and the various training institutions on NCDs are needed, particularly in the area of health economics and how to neutralize the unhealthy activities of the food and beverage industry. Nationwide surveys of risk factors, including the GDHS should be periodically undertaken. Qualitative studies to understand health behaviour of communities are also needed. Globally, continuing research is helping to identify the role of drugs such as aspirin and statins in primary prevention of cardiovascular diseases and diabetes⁵⁴. The recent meta-analysis finding that prehypertension is associated with an increased risk of stroke (relative risk 1.55, 95% Confidence Interval 1.35-1.79) calls for randomized controlled trials (RCTs) to assess the effect of reducing BP in this group⁵⁵.

The primary care level should be strengthened and trained to prevent and manage common NCDs. There is the need for re-thinking of the traditional paradigm that non-physicians cannot manage certain diseases. The WHO-developed Package of Essential NCD (WHO-PEN) interventions for the prevention and control of four major NCDs at the primary care level could be adapted for national use⁵⁶. Primary care could reduce hospital admissions related to NCDs. There is good evidence that conditions such as tobacco cessa-

tion, counselling to reduce hazardous use of alcohol, management of impaired glucose tolerance and persons at high-risk of CVD could be effectively delivered in primary health care⁵⁷.

Screening programmes should be scaled up. It is proposed that a 'know your blood pressure' month be instituted during which free BP measurements and medical examination may be performed. The GHS has already started establishing 'Wellness Clinics' in some regional hospitals. In Australia, a 'wellness check' is recommended for every adult aged 18 years and above⁵⁸. In Ghana, wellness checks could be incorporated into HIV workplace programmes. In a recent project by the German Technical Agency, the uptake of workplace screening increased from 60% to over 90% when assessment of BMI, blood pressure, and fasting glucose were added to the HIV testing and counselling over a period of two to three years⁵⁹.

The division between NCDs and communicable diseases is becoming blurred. The adverse impact of NCDs on some MDGs has been previously discussed. In a recent mathematical model, smoking was estimated lead to 40 million extra deaths from TB from 2010 to 2050 and 18 million new cases of TB⁶⁰. Smokers are two-to-three times as likely as non-smokers to develop TB. Passive smokers are also at higher risk of TB¹⁵. Up to 36% of diabetics are found to have TB when they are actively screened⁶¹. Conversely, up to 35% of TB patients are found to have diabetes. A bi-directional screening for TB and diabetes has therefore been advocated. Post-tuberculosis patients are at high risk of developing COPD. There is therefore the need for better collaboration between NCD control and the better resourced TB control programme.

The final intervention area that I would discuss is NCD financing. Limited financing is a serious threat to accelerating response. Innovative financing mechanisms for NCDs are needed. It has been recommended that governments invest funds derived from tobacco and alcohol taxes into their control, as done in New Zealand and some Asian countries¹. Other countries (e.g. the Pacific islands) invest a proportion of revenue from national health insurance into NCD control. In the 2012 budget, the Government of Ghana proposed to further reduce the ad valorem tax on alcohol and tobacco in a bid to generate more revenue, as it did in 2011 (after replacing excise duty with the ad valorem tax)⁶². The Government should consider investing funds into tobacco and alcohol control and not only to decrease unemployment, increase capital investment and acquisition of new technology.

Finally, I conclude by emphasizing some key points:

- NCDs contribute significantly and increasingly to disease burden
- NCDs are a development issue

- National response is undermined by low awareness, weak structures, weak capacity, limited funding and insufficient will
- It is essential to adopt whole-of-government and whole-of-society approaches, integrate into existing systems, and strengthen primary care.

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