

Cardiovascular diseases in Ghana within the context of globalization

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Abstract: This paper discusses how globalization and its elements are influencing health dynamics and in particular Cardiovascular diseases (CVDs) in Ghana. It assesses the growing burden of CVDs and its relationship with globalization. It further describes the conceptual framework on which to view the impact of globalization on CVDs in Ghana. It also set out the dimensions of the relationship between CVD risk factors and globalization. The paper concludes with a discussion on strategies for tackling the growing burden of CVDs in Ghana.

Keywords: Cardiovascular diseases (CVDs); health; globalization; Ghana

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Background

Cardiovascular diseases (CVDs): Diseases of the heart or blood vessels, which include Coronary artery disease (CAD), Stroke, Peripheral arterial disease and aortic disease, have assumed significant importance in the global public health arena. CVDs are now regarded as the number one cause of death globally and are projected to remain so for many years to come (1). In 2012, an estimated 17.5 million people died from CVDs, representing 31% of all global deaths (2). Of these deaths, an estimated 7.4 million were due to CAD and 6.7 million were due to stroke (1). The World Health Organization (WHO) predicts that there will be nearly 20 million CVD-related deaths globally in 2015 (3). Interestingly, about 80% of CVD-related deaths as well as 87% of CVD-related disabilities worldwide are known to occur in low and middle-income countries (4).

In sub-Saharan Africa, the region regarded to comprise of the youngest population globally (5), the pattern of CVD-related morbidity and mortality has been rather interesting. Between 1990 and 2013, Sub-Saharan Africa remained the only part of the world where CVD-related deaths increased (6). In other regions, the rates were steady or declined. CVD-related deaths account for nearly 9.2% of all deaths and also the leading cause of death among those aged over 45 years in the African region (7). CVDs also

account for about 7-10% of all adult medical admissions to hospitals within Africa, with heart failure alone representing around 3-7% (8). Although, Africa has the lowest CAD death rates, Cerebrovascular accident (stroke) death rates are comparable to those in Western high-income countries (9). In 2010, Stroke was the leading CVD cause of death and mortality in Africa. In 2012 alone, there were nearly half a million deaths due to stroke in Sub-Saharan Africa and this represented 4.4% of all deaths in the region (10). In Africa, the prevalence of Rheumatic Heart disease—the most important form of acquired CVD in children and adolescents remains the highest globally (15-20 per 1,000 population) (11). Overall, more than 50% of CVD-related deaths in Africa occur among persons 30-69 years of age, which is 10 years or more below the equivalent group in the developed world (12). Projections indicate that Africa's CVD burden will continue to rise and by 2020 will double the burden of 1990 (13). The rising burden of CVDs and associated conditions or risk factors on the African continent has been partly attributed to megatrends such as globalization which is driving an epidemiological transition.

Globalization, the increased interconnectedness and interdependence of peoples and countries, has reduced the world into a “global village”. This is generally understood to include two inter-related elements: the opening of

international borders to increasingly fast flows of goods, services, finance, people and ideas; and the changes in institutions and policies at national and international levels that facilitate or promote such flows (14). Several factors have been identified as accelerating the phenomenon of globalization some of which include, the rapid turnover of new technologies and its adoption by populations of different background and cultures, advancement in communication and transportation, and its widespread availability. In effect, as Maiyaki and Garbati (15) point out, globalization “has bridged geopolitical divides and led to the rapid adoption of liberal economic policies, opening up hitherto circumscribed markets, with attendant interdependence of national economies”. These have brought to fore the concept of globalization. For instance, the charge for a three-minute New York-London call has decreased tremendously to about \$0.30 today from \$300 in 1930 (16). Also by 1990, with the internet being in existence for only 7 years, just 3 million people across the world had access to it with more than 70% of this number residing in the US alone (17). Today, over 3 billion people across the world have access to internet with more than 250 million residing in Africa (18). Such trends have allowed easy communication and interaction between populations at different ends of the world and have allowed many individuals to share hitherto unknown information and lifestyle with the broader global community, some of which contribute to the risk of CVDs. One of the main challenges of globalization has therefore been its tendency to globalize health risks. The relationship between globalization and CVDs is complex with the former impacting on the latter directly through the effects on communities, individuals and nationalities as well as indirectly through effects on economies, education, health policies, and health systems among others (14,15). Although, some studies have targeted at providing in-depth understanding of the epidemiology of Non communicable diseases (NCDs) including CVDs in Ghana, quite a few have focused on addressing the relationship between globalization and CVDs in the country (19,20). In this paper, we aim at sharing some viewpoints on how globalization is contributing to the burden of CVDs and their associated risk factors in Ghana.

Burden of CVDs in Ghana

The WHO has identified CVDs as one of the top two (2) causes of death in Ghana after diarrheal illnesses (21).

In 2008, CVDs were the most prevalent contributor to mortality in Ghana among all NCDs as well as the leading cause of institutional deaths accounting for 14.5% of reported total deaths in the country compared to 13.4% deaths from malaria (22). The WHO estimates that for Ghana, the probability (%) of dying from CVD, cancer, diabetes, or chronic respiratory disease between ages 30 and 70 is 20 percent (23). In Ghana's capital, Accra, CVDs rose from being the seventh and tenth cause of death in 1953 and 1966 respectively to becoming the leading cause of death in 1991 and 2001 (20). Even for a peri-urban district in the eastern region of Ghana, CVDs ranked as the leading cause of death in 2014 (24). A study in Kumasi, Ghana's second largest city identified 17.9% of acute medical admissions as attributable to CVD causes including heart failure and stroke (25). In 2011, Stroke and CAD ranked as the 3rd and 5th leading causes of death in Ghana accounting for 7.34% and 6.97% of all deaths respectively (26). A one year review of in-patient records at Ghana's second largest tertiary hospital also identified stroke as constituting 9.1% of total medical adult admissions and 13.2% of all medical adult deaths within the period under review (27). The stroke case fatality rate was 5.7% at 24 hours, 32.7% at 7 days, and 43.2% at 28 days. In a 5-year (2006-2010) review of autopsy cases recorded by the Department of Pathology of the Korle-Bu Teaching Hospital (KBTH), Ghana's premier health care facility, it was identified that among 19,289 autopsy cases completed, deaths due to CVDs accounted for about one fifth (22.5%) (28). Overall, it is important to highlight that data on CVD morbidity and mortality in Ghana has been hampered by the lack of a nationally representative population-based data on death and causes of deaths. As such, many studies on causes of death have typically been based on health facility records due to the poor coverage of the Civil Registration and vital Statistics System (29).

CVD risk factors in Ghana

The epidemiology of CVDs has been thoroughly studied and the associated risk factors have been well documented. They include age, high blood pressure (hypertension), smoking, high blood cholesterol, diabetes, overweight or obesity, lack of exercise and family history of heart disease (30,31). Globally, nearly 13%, 9%, 6% and 5% of CVD related deaths are attributable to hypertension, diabetes, physical inactivity and overweight and obesity respectively (32). However, several of the

CVD risk factors are linked to each other, for example, physical inactivity contributes to overweight, which is a risk factor for developing hypertension.

In Ghana, the burden of hypertension is on the ascendency. Between 1988 and 2007, the number of reported new cases of hypertension in the country's outpatient public health facilities increased more than 1,000 percent (33). Estimate of the prevalence of hypertension is high at 36.4% (34). A systematic review also identified the prevalence of hypertension in Ghana to range from 19.3% in rural to 54.6% in urban areas (35). However, there remains a significant undiagnosed hypertensive population in Ghana. In a recent study in three (1) urban communities for instance, only 7.4% of persons with high blood pressure were aware (36). Even among the hypertensive population in Ghana, BP control remains terribly low at less than 5% (36,37). Diabetes is also on the rise in Ghana. Current estimate of the prevalence of diabetes in Ghana is around 6% with about 450,000 cases of the disease in the country in 2014 (38,39). The current prevalence rate is significantly high when compared with rate of 0.4% in 1956 (40). It is estimated that undiagnosed diabetes accounts for about 70% of those with the disease in Ghana (39). Although, insufficient physical activity (less than 5×30 minutes of moderate activity or less than 3×20 minutes of vigorous activity per week) is a recognized CVD risk factor, country-level data indicate that about 4 in 5 adult Ghanaians do not achieve enough physical exercise (32). Results from Ghana's 2014 Report Card on Physical activity for Children and Youth also identified that about one-third of Ghanaian children and youth do not achieve adequate physical activity (41). On the other hand, overweight and obesity trends are on the increase in Ghana. The prevalence of overweight or obesity in Ghanaian women aged 15-49 years has increased from 13% in 1993 to 30% in 2008 (40). In children under 5 years, obesity rates increased from <1% in 1988 to 5.3% in 2008 (40). The overall prevalence of obesity and overweight in Ghana increased from 25.5 % in 2003 to 30.5 % in 2008 (41). Unhealthy eating patterns are becoming common among Ghanaian communities. 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 nations (42). The prevalence of hyperlipidemia in Ghana is estimated to range between 17 and 23 percent (22). In the women's health study in Accra, nearly a quarter (23%) of the 3,200 cohort were hypercholesterolemic (43). A study among patients reporting at a tertiary center in Ghana, by

Micah and Nkum, also identified the prevalence of lipid abnormalities to be 60% for high total cholesterol (TC), 32% for high triglycerides, 17% for Low HDL and 61% for high LDL (44). In Ghana, recent estimate indicate a smoking prevalence around 10% with higher rates in men (14%) than women (7%) (45). The current rate of smoking in men is higher compared to rates in 2008 (8%) (22). In 2003, alcohol consumption among adults aged 15 years and above, was 1.57 (liters per person per year) compared to an average of 4.09 across the African continent (46). However, in recent times, there has been reported increase in alcohol use across Ghana. In 2007 for instance, the mental health unit of the Pantang Mental Hospital, one of the three psychiatry hospitals in Accra, reported an increase in alcohol-related admissions by 21.1% over the previous year's figures (47). Also, in a recent assessment of substance use among Junior High School students in parts of Accra, Ghana's capital, Substance use prevalence was 17% with Alcohol been recorded as the only substance used by the JHS pupils (47). Additionally, regarding CVD risk factors, it is important to highlight that there is often a clustering of risk in the same individuals. For instance, in a risk factors survey of Greater Accra Region in 2006, 56% of adults had at least three risk factors (40).

Globalization and CVDs: a framework for analysis

The conceptual framework of the impact of globalization on Ghana will be analyzed from the perspective of a liberalized economy that encourages open international trading, while endorsing multi-lateral trade agreements, characterized by increased foreign direct capital investment (15). This is in alignment with the framework for globalization and health developed by Woodward *et al.* (48). In effect, globalization is seen to influence health through effects on population-level health influences, health sector effects, national economy politics and society. These onwardly influence individual health risk, household economy and the health care system (48). Of prime focus in this piece is how globalization influences individual risk for CVDs. Over the past decades, Ghana has experienced unprecedented increased access to information technology, global media, and increased ease of communication. For instance, as recently as 1996, telephone density in Ghana was 0.26 percent, which meant that there were close to three telephone lines for every 1,000 persons, including 35 payphones in the entire country, out of which 32 were

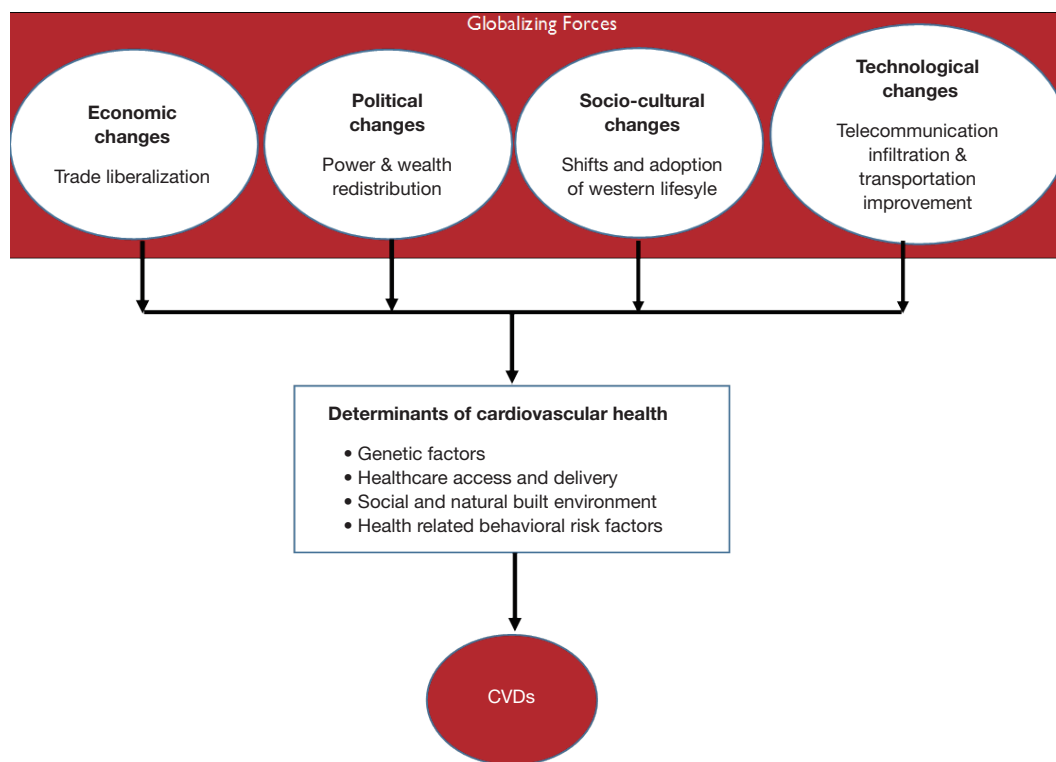


Figure 1 Globalization and the determinants of cardiovascular health.

located in Accra, Ghana's capital city (49). However, as of January 2013, the number of mobile phone users in Ghana stood at 26.09 million (50). Ghana's population using internet increased from less than 0.1% in 1999 to 8.4% in 2011 (51). Such formidable spread of communication technologies has made it relatively easy for Ghanaians to share ideas with each other and with the outside world. Aside the positives of such developments including impacts on economic activities, there remains the potential of sharing or copying unhealthy lifestyles which might be deleterious to health. Habits like alcohol usage, smoking and changes in dietary choices have been given significant boost with the global liberalization of these social habits.

Globalization directly and indirectly facilitates increase in the burden of NCDs in general including CVDs (*Figure 1*).

The indirect impact is facilitated mainly through changes in international economic dynamics. Factors like global monetary policies from the International Monetary Fund (IMF) and World Trade Organization (WTO) agreements have not generally worked to the advantage of many nations in the global south including Ghana. According to Maiyaki and Garbati, such policies

and agreements have often led to reduction in household incomes, cuts in government public sector spending and a general decline in purchasing power in the global arena owing to rising debt profile (15). The direct influence of globalization on Ghanaians' health can also be expected through the opening up of Ghana's market to foreign goods which often results in a balance of trade deficit to the detriment of the Ghanaian economy. For instance, just recently, Ghana signed on to the European Union (EU) Economic partnership agreement (EPA) (52). The EPA is a policy aimed at creating a free trade between the EU and African, Caribbean and Pacific Group of States (ACP). It aims at removing tariffs on imports between the EU and the ACP in conformity with WTO rules (53). Many economists have pointed out that the EPA will kill local industries as Ghanaians will rely more on cheap EU imported goods which would flood the country (53). Historical and ongoing unleashed trade liberalization is resulting in profound changes in consumption patterns and the widespread availability of cheap foreign goods in Ghanaian markets means local producers cannot compete resulting in factories closing down, diminished income

and retrenchment of workers. In effect, the socioeconomic standing of many Ghanaians will be adversely affected and this will impact their health in general and risk of CVDs. Commonly linked to trade liberalization has also been the emergence of large companies which have established footprints across many countries including Ghana and which often embark on global marketing campaigns targeting cigarette use, high-fat meals and carbonated drinks replacing locally produced low-fat and fibre-rich foods (54). Hence, as Bovet (55) points out, “By fuelling vectors that can alter people’s lifestyles, particularly with regards to tobacco use and unhealthy dietary patterns, globalization is certainly an important factor for the increasing prevalence of overweight, high blood pressure, dyslipidemia, type II diabetes, and ultimately CVD”.

On the other hand, globalization also offers a great potential for improving public health, including the prevention of CVDs. If properly managed, globalization can result in important health gains in Ghana. At a general level, globalization and the global flow of ideas can positively influence health policy, legislation and education access, which eventually affect the delivery of health services. The fast spread of information technology also permits rapid and inexpensive dissemination of evidence-based knowledge to individuals, health personnel and policy makers (55). Educational materials and best practices can be easily disseminated and accessed. A massive amount of information and data is available to anyone via access to the Internet, which is now available in even quite remote areas. Such information can be fairly easily accessed to find out about CVD risk factors, treatment and prevention, as well as management and delivery of CVD health care services. The availability of technology tools also allow for easier tracking of risk factors and disease prevalence to inform relevant policies and interventions. The globalization process also strengthens our collective ability to cooperate to address some of the concerns centered around health. For example, The Codex Alimentarius Commission, an intergovernmental body created by WHO and the Food and Agriculture Organization (FAO), ensures that internationally agreed food standards, guidelines and recommendations are consistent with the protection of health, and in turn the reduction of CVDs in countries including Ghana (56). The globalization of health also comes with expanded trade and foreign direct investment in health products and services which can have positive influence on health outcomes of Ghanaians. Moreover,

globalization has been recognized as a key driver of economic growth and Ghana has experienced rapid growth in the economy with rising income levels. Higher incomes and poverty reduction are seen to translate into better health as Richard Feachem, founding Executive Director of the Global Fund to Fight AIDS, Tuberculosis and Malaria, argues, “Economic growth is good for the incomes of the poor and what is good for the incomes of the poor is good for the health of the poor” (16).

Globalization and the changing behaviours landscape in Ghana

Globalization has had different impacts on societies, one of them being on individual health. In the recent decades, shifts resulting from globalization have accelerated and become more intense, Ghana has been no exception. Along with positive fluctuations, there have been adverse behavioral changes; the country has seen an increase in poor dietary practices, physical inactivity, alcohol consumption and obesity. These are all risk factors contributing to CVDs. Overnutrition is now becoming an issue of concern in Ghana. Along with globalization, Ghana has seen an increase in the presence of fast food chains, wider availability of soft drinks, and an increased marketing of processed foods, affecting dietary patterns of Ghanaians. Rapid rates of urbanization in areas such as Accra, coupled with the Westernization of diets, has led to poor dietary practices; there has been a shift away from the consumption of local food products such as vegetables, fruits and legumes, to the consumption of frozen foods, foods high in saturated fats, sugar, and salt, all contributing to the incidence of overweight and obesity. It is important to understand Ghana’s food production, dietary practices and supply policies in the context of trade liberalization and the food guidelines of the Structural Adjustment and Poverty Reduction eras. Agyei-Mensah and Aikins (20) explain recent changes: before the year 2000, in poor countries like Ghana, there was an increase in the production of cash crops for export, this production was encouraged by the World Bank and the IMF. Unfortunately, less emphasis was placed on production of basic food crops for local consumption and as a result, poor countries became dependent on importation of these food items.

As a result of trade liberalization in the last decade, low-income countries have been under pressure to eradicate subsidies for their farmers while subsidies for farmers in

richer countries have been retained. A consequence of this has been that food production in poorer countries has been put out of business as international food prices have been artificially inflated. For example, the IMF dissuaded the Ghanaian government when it attempted to raise import tariffs on poultry from the EU; this led to the demise of the local poultry industry. Compounding to this is the change in food consumption patterns of Ghanaians as a result in part of massive marketing campaigns of processed and fast foods. Cities like Accra have witnessed most of this change first-hand as its residents consume but do not produce local and foreign foods.

In addition to changing their diet, Ghanaians also appear to be engaging in less physical activity. In the past Ghanaians would walk long distances to school and work, however they are now less active, they walk less frequently and use 'trotros' (public transportation in the city) or cars even for very short-distance trips. More families now own cars and are therefore more likely to use them and avoid walking. There are many more vehicles in Ghana and people in most urban areas thus spend long hours in traffic congestion. In addition, there are limited fitness facilities in Ghana, and very few walkways and parks in Ghanaian cities are available for people to engage in running and exercise; these conditions can lead Ghanaians to adopt a sedentary lifestyle (20). Research suggests that "the nutrition transition and the rise in technology-aided, sedentary lifestyles (cars, computers at home and in internet cafes, games consoles for elite and middle class youth) are strongly implicated in Ghana's obesity and chronic disease epidemics" (20). In the past years, Ghana has also seen an increase in alcohol consumption and research shows that Ghanaians who consume alcohol have a higher proportion of overweight or obesity (57). A recent review suggests that in the short term, small amounts of alcohol consumed prior to meals cause a clear and consistent increase in food intake (58). Heavy drinking has also been reported to lead to overeating (59). In addition to its high caloric content, alcohol is a complement for sedentary activities, such as watching television and attending sporting events, which further promote weight gain (60). As Agyei-Mensah and de-Graft Aikins (20) point out, in the urban areas of Ghana, "there is an emerging trend of individuals working late or hanging out at after-work bars to beat the heavy evening traffic; these practices are implicated in late eating and increased alcohol intake, and by extension increased chronic disease risks". As globalization trends impact the health of Ghanaians, it

is imperative to promote a lifestyle that includes exercise and healthy food choices along with increased awareness of the above-mentioned risk factors that contribute to cardiovascular disease. These risk factors are lifestyle-related and can be prevented or modified.

Tackling Ghana's CVD epidemic

The individual and collective contributions of the main risk factors of CVDs are well understood and prevention and control strategies should primarily aim at reducing these risk factors among Ghanaians. Globally, a two-way approach is recommended which should include screening and treatment of high-risk persons while pursuing population-wide prevention strategies that adopt a life-course perspective and begins from childhood aimed at reducing the level of risk factors in the general population (55). Compared to developed nations, the CVD epidemic in developing countries like Ghana is generally still in its early stage. This presents a great opportunity for the adoption of primary prevention strategies and this has been widely supported by the WHO (61). While primary prevention strategies can potentially lead to the reduction of the number of new cases of CVDs, they are usually less costly and less likely to impose huge pressures on already limited health resources. With limited resources available for health in Ghana, this remains an important consideration. Primary prevention strategies must however move away from focusing on isolated CVD risk factors such as high blood pressure and lipid disorders towards targeting a comprehensive assessment and management of the risk factors under the banner of absolute CVD risk (62). Primary prevention needs to embrace the empowering of communities through targeted and mass education campaigns. Community approaches to CVD prevention remain attractive, in that as they tend to target all groups within the community and, if successful, may achieve extensive behavioral changes and risk reduction (55). The widespread use of internet by Ghanaians could be tapped into as a medium for providing CVD prevention education to the public.

While pursuing the use of community-wide primary prevention strategies to reduce risk among Ghanaians, efforts must be also drawn to creating an enabling environment that facilitates the adoption of positive behavioral changes. This must include the creation of an enabling environment that takes a broader view on educational, legislative, fiscal and environmental policies.

For instance, a closer look at urban planning policies to include the creation of recreational parks and walkways will encourage persons to exercise safely. Educational policies may include the adoption of health education and physical activity sessions in schools' curriculum. Other policies may include the provision of incentives to farmers to produce more fruits and vegetables and local produce which can increase availability of local foods and also set the farmers up to compete on the price level with imported foodstuffs. Although, some of the suggested policy shifts may come as additional cost implication on public spending, other measures that can also be pursued such as increasing taxation of tobacco and alcoholic products can in fact generate additional revenue for public spending (55,63). Since signing and ratifying the Framework Convention on Tobacco Control in 2004 and 2006, Ghana has taken some steps towards tobacco control albeit failure to ratify the Protocol on illicit trade of tobacco products in the country (64). The country must take urgent steps to address such lapses by teaming up with global teams that deal with cross border illegal activities.

While CVD control in Ghana should generally rely on the promotion of healthy behaviours, screening and treatment of high-risk individuals should also be rigorously pursued. However, the provision of such services must take into consideration available health resources and must thus focus on cost-effective and affordable measures. For instance, the use of diuretics (e.g., bendroflumethiazide) and beta blockers (e.g., atenolol) for the treatment of high blood pressure and low dose aspirin for the prevention of recurrent heart attacks are some of the highly effective (reduce CVD risk by at least 20% and yet inexpensive (costing less than USD30 per annum) measures that should be made readily available (55,65). Generic versions of other highly effective medications such as statins for lipid disorders and Angiotensin Converting Enzyme inhibitors for heart failure and hypertension should also be made available for eligible individuals. In order to ensure proper use of these interventions, efforts must be put into developing appropriate guidelines to guide diagnosis and treatment. These must be backed with training packages to develop needed competencies of health staff. Lack of requisite CVD skills and training opportunities has been identified as a problem within the Ghanaian health sector and the widespread availability of information technologies can help in the development and easy dissemination of these training content (32).

It is evident however that addressing Ghana's CVD

epidemic will require a multi-dimensional approach. A strong political will coupled with strong stakeholder support will be needed in this instance. De-Graft Akins points out that one of the main reasons for the lack of progress in the control of NCDs including CVDs in Ghana has been the longstanding misconception that NCDs do not pose a significant public health challenge in comparison with infectious diseases, which has resulted in governments and non-governmental organizations focusing their attention towards diseases like malaria and HIV/AIDS (66). A strong political will for CVD prevention should aim at lobbying the legislature and engaging development partners to secure appropriate investments and friendly policies (15). The aim will be to solidify the inclusion of CVD prevention in the overall national health agenda and salvage the needed resources to execute the necessary interventions. It is also important to highlight the need for adoption of culturally sensitive interventions to allow for acceptability among the intended populations (67). There is also the need to pay greater attention to strengthening Ghana's health system including effective data collection and monitoring on health indicators including CVDs as well as structuring to allow for easy access to care. This must include eliminating all barriers including financial barriers to access. Although, Ghana's National Health Insurance Scheme introduced in 2001 has worked to improve access to health services, out of pocket payment has not been totally eliminated and still poses a huge barrier to access and more efforts are needed to securing effective and sustainable financing mechanism towards achieving universal health coverage (68). Also, majority of CVD-related health services in Ghana are concentrated in secondary and tertiary centers. Importantly, a strengthening of the capacity of the primary health care centers to be able to contribute to assessing CVD risk factors and initiating basic prevention and treatment interventions will be needed. New technological innovations such as telemedicine can be explored where specialist health personnel based in higher centers could support primary health service personnel. Ghana has been lauded for making significant improvement in its primary health services notably the Community-based Health Planning and Services (CHPS) which have primarily focused on maternal and child health services. A broadening of the CHPS strategy to emphasize CVD prevention will boost early detection and improve awareness (69).

The enormous challenge posed by CVDs in Ghana means that government's efforts alone will be insufficient to address the growing epidemic. A strategic focus on securing collaborations with other bodies (i.e., international agencies,

Pharmaceutical firms, research bodies etc.) is required to harness the needed resources and streamline efforts (55). For instance, a strong alliance with the Pharmaceutical industry can lead to the availability of cheaper medications. The recently launched Ghana Accessibility and Affordability Programme as a unique private-public partnership project involving pharmaceutical giants Pfizer, MSD and Sanofi-Aventis and the government of Ghana is one of such partnerships designed to improve access to medicines that patients in the pilot areas might not be able to afford including medications for hypertension and diabetes (70). Globalization exposure also allows collaborative research with leading scientific institutions across the globe to design customized interventions that could help address the CVD challenges in Ghana and the country must earnestly pursue this. One such research project, the Community-based Hypertension Improvement Project (ComHIP) is a partnership between the Ghana Health Service, FHI 360, the London School of Hygiene and Tropical Medicine and the Novartis Foundation aims at testing a new model of community-based hypertension control in Ghana (23). Going forward it will be important to channel significant efforts at obtaining strategic partnerships with the private sector to deliver innovative solutions to tackling the CVD epidemic. In effect, the growing CVD burden in Ghana will require strong leadership that explores innovative ways to develop locally derived and appropriate initiatives that fit into the Ghanaian environment and which are cost effective, culturally acceptable and sustainable.

Conclusions

The burden of CVDs is on the rise in Ghana and globalization is certainly contributing to this trend by driving significant behavioral changes across the country. To address this rising burden, multi-faceted efforts are needed. These must include a strong policy environment and a strengthening of the Ghanaian health system. Although, population-wide interventions that are cost-effective should be adopted, they must be supplemented by care at the individual levels, especially targeting high-risk groups. Concerted efforts from all stakeholders within Ghana are needed to win the battle against CVDs including harnessing all the potential that globalization brings in improving population health.

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Footnote

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References

1. WHO. Cardiovascular Diseases (CVDs), Factsheet: (Accessed on 2015 May 02). Available online: <http://www.who.int/mediacentre/factsheets/fs317/en/>
2. WHO. Deaths from Cardiovascular diseases and diabetes. (Accessed on 2015 May 02). Available online: http://www.who.int/gho/ncd/mortality_morbidity/cvd/en/
3. WHO. Chronic Diseases: A vital Investment (Accessed on 2015 April 03). Available online: http://www.who.int/chp/chronic_disease_report/full_report.pdf
4. World Heart Federation. World Heart Federation Statement Provisional agenda item 12.6 The Global Strategy on Diet, Physical Activity and Health (Accessed on 2015 April 12). Available online: http://webcache.googleusercontent.com/search?q=cache:flfQXFstXXsJ:www.world-heart-federation.org/fileadmin/user_upload/documents/wha-nutrition-statement.pdf+&cd=1&hl=en&ct=clnk&gl=gh
5. Ighobor K. Africa's youth: a "ticking time bomb" or an opportunity? (Accessed on 2015 April 13). Available online: <http://www.un.org/africarenewal/magazine/may-2013/africa%E2%80%99s-youth-%E2%80%9Cticking-time-bomb%E2%80%9D-or-opportunity>
6. Roth GA, Forouzanfar MH, Moran AE, et al. Demographic and epidemiologic drivers of global cardiovascular mortality. *N Engl J Med* 2015;372:1333-41.
7. Livesay JJ. Cardiovascular Diseases in Africa. *Tex Heart Inst J* 2007;34:6-7.
8. Mocumbi AO. Lack of focus on cardiovascular disease in sub-Saharan Africa. *Cardiovasc Diagn Ther* 2012;2:74-7.
9. World Heart Federation. Global Cardiovascular disease Atlas: Sub-Saharan Africa (Accessed on 2015 June 03). Available online: <http://www.medbox.org/cardiovascular-diseases/global-cardiovascular-disease-atlas-sub-saharan-africa/preview>
10. Africa Check. Factsheet: The Leading Causes of death in Africa (Accessed on 2015 June 09). Available online: <http://africacheck.org/factsheets/factsheet-the-leading-causes-of-death-in-africa/>
11. WHO Regional Committee for Africa. Cardiovascular diseases in the African region: current situation and perspectives-report of the regional director 2005. (Accessed

- on 2015 June 03). Available online: http://www.afro.who.int/rc55/documents/afr_rc55_12_cardiovascular.pdf
12. Agyemang C. Cardiovascular diseases in poor resource settings (Accessed on 2015 May 23). Available online: <http://globalmedicine.nl/issues/gm10/article6.pdf>
 13. Mbewu A, Mbany J. Chapter 21: Cardiovascular Disease. In Disease and Mortality in Sub-Saharan Africa (Accessed on 2015 June 13). Available online: <http://www.ncbi.nlm.nih.gov/books/NBK2294/>
 14. WHO. Globalization (Accessed on 2015 June 13). Available online: <http://www.who.int/topics/globalization/en/>
 15. Maiyaki MB, Garbati MA. The burden of non-communicable diseases in Nigeria: in the context of globalization. *Ann Afr Med* 2014;13:1-10.
 16. Feachem RG. Globalisation is good for your health, mostly. *BMJ* 2001;323:504-6.
 17. Worldmapper. Internet Users in 1990 (Accessed on 2015 June 13). Available online: <http://www.worldmapper.org/display.php?selected=335>
 18. Internet World Stats. Internet Users in Africa 2014-Q2 (Accessed on 2015 June 03). Available online: <http://www.internetworldstats.com/stats1.htm>
 19. de-Graft Aikins A, Addo J, Ofei F, et al. Ghana's burden of chronic non-communicable diseases: future directions in research, practice and policy. *Ghana Med J* 2012;46:1-3.
 20. Agyei-Mensah S, de-Graft Aikins A. Epidemiological transition and the double burden of disease in Accra, Ghana. *J Urban Health* 2010;87:879-97.
 21. WHO. The World Health Report on Global Health and Causes of Deaths 2010. Geneva: World Health Organization 2010.
 22. Bosu WK. Accelerating the control and prevention of non-communicable diseases in Ghana: The Key Issues. *Postgraduate Medical Journal of Ghana* 2013;2:32-40.
 23. WHO. Risk of premature death from target NCDs Data by Country (Accessed on 2015 April 01). Available online: <http://apps.who.int/gho/data/view.main.2485>
 24. Ofori-Asenso R, Irina O. In Ghana a louder approach to a silent killer; Hypertension (Accessed on 2015 June 12). Available online: <http://degrees.fhi360.org/2015/05/in-ghana-a-louder-approach-to-a-silent-killer-hypertension/>
 25. Plange-Rhule J, Phillips R, Acheampong JW, et al. Hypertension and renal failure in Kumasi, Ghana. *J Hum Hypertens* 1999;13:37-40.
 26. World Life Expectancy. Health Profile (Accessed on 2015 May 20). Available online: <http://www.worldlifeexpectancy.com/country-health-profile/ghana>
 27. Agyemang C, Atta-Adjepong G, Owusu-Dabo E, et al. Stroke in Ashanti Region of Ghana. *Ghana Med J* 2012;46:12-7.
 28. Sanuade OA, Anarfi JK, Aikins Ad, et al. Patterns of cardiovascular disease mortality in Ghana: a 5-year review of autopsy cases at Korle-Bu Teaching Hospital. *Ethn Dis* 2014;24:55-9.
 29. Ghana Statistical Services. Developing a Reliable and Sustainable Strategy for Measuring and Monitoring the Probability of Dying from CVDs in Ghana (Accessed on 2015 May 20). Available online: http://webcache.googleusercontent.com/search?q=cache:pchxhHntWtQJ:unstats.un.org/unsd/post-2015/activities/egm-on-indicator-framework/docs/Ghana%25E2%2580%2599s%2520Perspective_Expert%2520Group%2520Meeting%2520on%2520Indicator%2520Framework.pdf+&cd=1&hl=en&ct=clnk&gl=gh
 30. World Heart Federation. Cardiovascular disease risk factors (Accessed on 2015 May 20). Available online: <http://www.world-heart-federation.org/press/fact-sheets/cardiovascular-disease-risk-factors/>
 31. NIH. Who Is at Risk for Heart Disease? (Accessed on 2015 May 20). Available online: <http://www.nhlbi.nih.gov/health/health-topics/topics/hdw/atrisk>
 32. GBCEW. Cardiovascular disease/Heart Disease (Accessed on 2015 May 15). Available online: http://webcache.googleusercontent.com/search?q=cache:7oqF1ly7p4wJ:www.gbcew.org/resources/IEC_Materials/World%2520Heart%2520Day.pdf+&cd=1&hl=en&ct=clnk&gl=gh
 33. Bosu WK. Epidemic of Hypertension in Ghana: A systematic Review. *BMC Public Health* 2010;10:418.
 34. WHO. Global Status report on non-communicable diseases 2010 (Accessed on 2015 May 18). Available online: http://www.who.int/nmh/publications/ncd_report2010/en/
 35. Addo J, Agyemang C, Smeeth L, et al. A review of population-based studies on hypertension in Ghana. *Ghana Med J* 2012;46:4-11.
 36. Awuah RB, Anarfi JK, Agyemang C, et al. Prevalence, awareness, treatment and control of hypertension in urban poor communities in Accra, Ghana. *J Hypertens* 2014;32:1203-10.
 37. Lloyd-Sherlock P, Beard J, Minicuci N, et al. Hypertension among older adults in low- and middle-income countries: prevalence, awareness and control. *Int J Epidemiol* 2014;43:116-28.
 38. Danquah I, Bedu-Addo G, Terpe K. et al. Diabetes

- mellitus type 2 in urban Ghana: characteristics and associated factors. *BMC Public Health* 2012;12:210.
39. International Diabetes Federation. Ghana. (Accessed on 2015 May 18). Available online: <http://www.idf.org/membership/afr/ghana>
 40. Bosu WK. A comprehensive review of the policy and programmatic response to chronic non-communicable disease in Ghana. *Ghana Med J* 2012;46:69-78.
 41. Ocansey R, Aryeetey R, Sofo S, et al. Results From Ghana's 2014 Report Card on Physical Activity for Children and Youth. *J Phys Act Health* 2014;11 Suppl 1:S58-62.
 42. Dake FA, Tawiah EO, Badasu DM. Sociodemographic correlates of obesity among Ghanaian women. *Public Health Nutr* 2011;14:1285-91.
 43. Hill AG, Darko R, Seffah J, et al. Health of urban Ghanaian women as identified by the Women's Health Study of Accra. *Int J Gynaecol Obstet* 2007;99:150-6.
 44. Micah FB, Nkum BC. Lipid Disorders in Hospital Attendants in Kumasi, Ghana. *Ghana Med J* 2012;46:14-21.
 45. WHO. Ghana Country Profile (Accessed on 2015 June 03). Available online: <http://www.who.int/nmh/countries/en/>
 46. Ghana Health Service. The Health Sector in Ghana Fact and Figures 2010. Available online: http://www.moh-ghana.org/UploadFiles/Publications/GHS%20Facts%20and%20Figures%202010_22APR2012.pdf
 47. Cofie CN. Prevalence of Substance Use Among Junior High School Pupils of the Dangme West District (Accessed on 2015 June 03). Available online: <http://ugspace.ug.edu.gh/handle/123456789/5143?show=full>
 48. Woodward D, Drager N, Beaglehole R, et al. Globalization and health: a framework for analysis and action. *Bull World Health Organ* 2001;79:875-81.
 49. Asiedu M, Sarfo JO. A multi-dimensional service delivery among mobile network providers in Ghana: a case of customer satisfaction. *Eur Sci J* 2013;9:86-101.
 50. GhanaWeb. Ghana has 26.09 million mobile phone users (Accessed on 2015 May 17). Available online: <http://www.ghanaweb.com/GhanaHomePage/NewsArchive/Ghana-has-26-09-million-mobile-phone-users-268640>
 51. Quarshie HO, Ami-Narh J. The Growth and usage of internet in Ghana. *Journal of Emerging Trends in Computing and Information Sciences. Journal of Emerging Trends in Computing and Information Sciences* 2012;3:1302-8.
 52. SpyGhana. EPA Begins; Duty, Tax Free EU Goods Coming To Ghana (Accessed on 2015 June 12). Available online: <http://www.spyghana.com/epa-begins-duty-tax-free-eu-goods-coming-ghana/>
 53. Peacefm. EPA Will Kill Ghanaian Businesses (Accessed on 2015 May 22). Available online: <http://news.peacefmonline.com/pages/news/201404/195217.php>
 54. Sokol N. Non-communicable diseases: The role of global food, tobacco, soft drink and alcohol industries (Accessed on 2015 May 16). Available online: <http://journalistsresource.org/studies/environment/food-agriculture/non-communicable-diseases-role-global-food-drink-tobacco-alcohol-industries>
 55. Bovet P. The cardiovascular disease epidemic: global, regional, local. *Trop Med Int Health* 2002;7:717-21.
 56. WHO. International food standards (Codex Alimentarius) (Accessed on 2015 June 04). Available online: http://www.who.int/foodsafety/areas_work/food-standard/en/
 57. Biritwum R, Gyapong J, Mensah G. The Epidemiology of Obesity in Ghana. *Ghana Med J* 2005;39:82-5.
 58. Yeomans MR. Alcohol, appetite and energy balance: is alcohol intake a risk factor for obesity? *Physiol Behav* 2010;100:82-9.
 59. National Obesity Observatory. Obesity and Alcohol: an overview (Accessed on 2015 May 12). Available online: http://www.noo.org.uk/uploads/doc/vid_14627_Obesity_and_alcohol.pdf
 60. French MT, Norton EC, Fang H, et al. Alcohol consumption and body weight. *Health Econ* 2010;19:814-32.
 61. WHO. Cardiovascular diseases; Strategic priorities (Accessed on 2015 May 18). Available online: http://www.who.int/cardiovascular_diseases/priorities/en/
 62. Nelson MR, Doust JA. Primary prevention of cardiovascular disease: new guidelines, technologies and therapies. *Med J Aust* 2013;198:606-10.
 63. Chaloupka FJ, Yurekli A, Fong GT. Tobacco taxes as a tobacco control strategy. *Tob Control* 2012;21:172-80.
 64. GhanaWeb. Take measures on illicit tobacco trade – WHO urges Ghana (Accessed on 2015 June 02). Available online: <http://www.ghanaweb.com/GhanaHomePage/health/artikel.php?ID=362129>
 65. Nyman I, Larsson H, Wallentin L. Prevention of serious cardiac events by low-dose aspirin in patients with silent myocardial ischaemia. *Lancet* 1992;340:497-501.
 66. de-Graft Aikins A. Ghana's neglected chronic disease epidemic: a developmental challenge. *Ghana Med J* 2007;41:154-9.
 67. Deedwania PC. Prevention of Cardiovascular Disease: A Continuum, An Issue of Cardiology Clinics. Elsevier Health Sciences, 2011.

68. Ayindenaba Dalaba M, Akweongo P, Aborigo R, et al. Does the national health insurance scheme in Ghana reduce household cost of treating malaria in the Kassena-Nankana districts? *Glob Health Action* 2014;7:23848.
69. Awoonor-Williams JK, Sory EK, Nyornator FK, et al. Lessons learned from scaling up a community-based health program in the Upper East Region of northern Ghana. *Glob Health Sci Pract* 2013;1:117-33.
70. Awia DM. Project on affordable medicines for non-communicable diseases launched (Accessed on 2015 June 02). Available online: <http://graphic.com.gh/news/general-news/18353-project-on-affordable-medicines-for-non-communicable-diseases-launched.html#sthash.UeikEoHQ.dpuf>

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