Scholarly Project Report - Ghana: A Health System's Response to Diabetes

Title Page

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Abstract

TITLE: Ghana: A health systems response to Diabetes

Malm, C.; Sharma, A.; Conn, A.; Okunade, K.; Syed, A.; Awasthi, A.

Purpose: This study aims to convey the current response of the Ghanaian health system to the growing diabetes burden.

Methods: This study adopted a mixed methods approach. Using a Systemic Rapid Assessment Toolkit, semi-structured, key informant interviews were conducted in January 2016. Field observations and interactions with physicians as well as a primary literature review provided further insight. Quantitative data from these studies as well as from the Center of Health Information Management (CHIM) complimented the qualitative information in order to provide a holistic understanding of the situation.

Results: Ghana formed a NCD control program two decades ago led by a multi-sectoral steering committee, relaying the understanding of the diverse actors and interventions needed to operationalize efforts. Since then, a failure to commit resources to the program has limited its effectiveness and resulted in a significant gap between policy rhetoric and action. Disproportionate investment in vertical programming has limited the system's ability to respond adequately to the demands of NCD prevention. Ghana's transition to a LMIC and declining external resources for health mean innovative financing instruments like microtaxes/levies will become increasingly important. Experience from the sub-continent shows that these mechanisms can generate significant and reliable streams of revenue enabling longer-term planning and improved service delivery. Ghana's National Health Insurance Scheme is a potential boon for NCD control efforts that has been insufficiently utilized. Difficulties in expanding enrollment, lack of guidelines standardizing treatment, lack of comprehensive data on the extent of DM, and limited training of health workers continues to stymy the provision of efficacious, equitable care. A resurgent civil society organization, increasing political will, DHIMS II platform with increasing resources however, present opportunities for Ghana and lessons for the subcontinent.

Conclusions: Our findings reveal many opportunities available to Ghana's still nascent health system as it seeks to reform to meet the changing needs of its populace. In addition to awareness

among policy makers of the enormity of the challenge, bold rhetoric and the outlined strategies require sufficient resource allocation to enable translation. Ghana provides a strong example of a lower middle-income country grappling with this shifting burden of disease; although the challenges and opportunities outlined above are context specific, the underlying lessons transcend borders and may provide lessons for similar countries across the continent.

Intellectual contribution:

1. Team lead. I led a team of 4 including (Conn, Okunade, Sharma) for our in-country data collection efforts using Systemic Rapid Assessment toolkit. Interviews and field observations performed by 4 members of in country team. Literature review conducted by all 6 team members. Analysis of quantitative data provided by the Center of Health Information Management (CHIM) performed by Malm. C. and Conn, A.

2. Sections of report by primary author:
   Overall synthesis, editing: Malm, C.
   Sub-sections:
   Executive Summary: Malm, C.
   Context: Conn, A.
   The Problem: Awasthi, A.
   Stewardship and Governance: Okunade, K
   Financing: Malm, C
   Planning: Syed, A
   Service Delivery: Conn, A. & Awasthi A
   Monitoring and Evaluation: Conn, A. and Sharma, A
   Demand Generation: Okunade, K. and Syed A
   Summary of Findings: Sharma, A. and Malm, C.

How work fits in field: This is done extensively by the executive summary of report uploaded; copied here for ease of access.

Introduction

Ghana, like many other sub-Saharan countries, is undergoing an epidemiological transition. Ghana's protracted polarized model is characterized by the simultaneous existence of infectious and chronic non-communicable diseases (NCDs) as significant causes of

morbidity and mortality. Additionally, the impact of this double burden is polarized across socio-economic strata with those in lower strata experiencing worse health outcomes[1].

NCDs currently account for ~35% of deaths and DALYs in Ghana with an estimated 78 000 deaths per year and 2.32 million DALYs per year. They are projected to become the major cause of mortality by 2035[2]. Diabetes prevalence, reported at 0.4% in 1958 had risen to between 6% and 9% by 2001[3]. Importantly, an estimated 70% of Ghanaians with diabetes are undiagnosed and unaware of their status, while among the diagnosed adequate control is unacceptably low[3]. Meanwhile, risk factors for diabetes and other NCDs are on the increase: 30% of women aged 15-49 years are overweight or obese compared to 12.8% in 1993; 5% of children under five are overweight versus 1% in 1988; 86% of adults report low levels of physical activity while 20% report heavy drinking in the last seven days[4].

Ghana's NCD Control Program (NCDCP) was established in 1992 to coordinate the national response to cardiovascular disease, cancers, diabetes, chronic obstructive pulmonary disease and sickle cell disease. "The overall purpose was to design, monitor, and coordinate interventions to reduce the incidence and prevalence of NCDs, prevent disability and deaths from NCDs and to improve the quality of life of persons living with NCDs"[4].

The program's main output has been strategy papers created in 1993, 1998, 2002, 2006, 2008, and 2011[5]. The current policy framework and strategy was finalized in 2014 with a target of full disbursement and implementation by 2016[6].

The current iteration of the NCDCP is led by a multisectoral committee headed by the Minister of Health and seeks to increase primary prevention through awareness creation, early detection and lifestyle changes, as oppose to the clinical care focus of earlier response efforts[6].

Study Objectives

The objectives of this study were to:

- Providing analysis on diabetes care and prevention, including its intersections with maternal and child health, and infectious diseases.

- Developing a platform for stakeholders to share unique viewpoints and to address challenges and approaches to prioritization of diabetes care and non-communicable disease care.
- Increasing the attention to diabetes care and prevention as well as the health systems provisions for high quality, cost-effective care.
- Using the data collected from Ghana and other study countries to inform a comprehensive comparative analysis and establish a baseline for impact assessment.

Methods

This study adopted a mixed methods approach. Using the multi-modular Systemic Rapid Assessment Toolkit, semi-structured interviews of key informants at major stakeholder organizations were conducted in January, 2016. Stakeholders involved were from the Ministry of Health, Ghana Health Service, National Health Insurance Authority and the National Diabetes Association, the major diabetes civil society organization. Field observations and interactions with physicians within the public health sector in Ghana were also conducted and included in the analysis. Finally, primary literature on the Ghanaian health system, local context, policy environment and programmatic responses was accessed to provide secondary data for the study.

Major Findings and Implications

Ghanaian politicians and policy makers are aware of increasing burden of diabetes, and other non-communicable diseases. However, despite support operationalized through the formation of the NCDCP and the development of multiple strategy documents a lack of financial backing reveals the limited extent of this rhetoric. Ghana's recent GDP rebasing and subsequent LMIC classification poses a threat to the health system's fiscal sustainability unless steps are taken to innovate around financing and develop long term financing strategies. Ghana's health system, designed to respond to acute episodes of care is unprepared to respond adequately to the increasing burden. Service delivery challenges on both demand and supply sides threaten to preclude any successful national policies. Despite a widespread, regularly utilized structure for health information management, a lack of indicators relevant to chronic disease care and the sequelae of NCDs hampers

comprehensive characterization of disease burden as well as the monitoring and evaluation of instituted programs. Irregular engagement of the private sector and civil society both impacts their reporting relationships and policy influence. Given the relatively significant role that private providers play in the Ghanaian health system a strategy that brings them to the table would accelerate efforts to improve the goals of the health system.

Conclusion

In many ways Ghana is ahead of the curve among similar countries in preparing to respond to the crisis of NCDs that threatens to erode gains in health outcomes across the continent. It has appropriate structures that can be employed to deliver a substantive national response. Policy makers and political leaders should take advantage of the multi-sectoral steering committee for NCDs to increase visibility and political sponsorship of the NCDCP. The National Insurance Scheme, while a boon for many in the population, may prove to be insufficient for purposes if its current focus on curative services is not replaced with primary care and preventative services.

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EXECUTIVE SUMMARY

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1. Country Context

1.1 Demography

Situated on the northwestern border of Africa, The Republic of Ghana stretches across 238,533 square kilometers. Low plains roll over primarily agricultural lands and hot climates[7]. The majority of the population is concentrated in the southern region where the conditions are more hospital. Within this region, the capital, Accra, is the most highly populated city in the country followed by Kumasi[8].

Ghana's population totals approximately 26.3 million people. About half of the population, 54%, live in urban areas surrounding Accra and Kumasi[7]. Ghana is also a young population as 57.07% of residents are under the age of 25. As fertility rates begin to decline and life expectancy continues to increase, the country could capitalize on the demographic dividend[9].

Over 100 linguistic and cultural groups reside in Ghana, however, the three largest ethnic groups are Akan (47.5%), Mole-Dagbon (16.6%), and the Ewe (13.9%) [10]. The Volta River divides these groups horizontally into the north and the south. The southern region, home to the Akan and Ewe populations, is characterized by a higher degree international influence than the northern region where the Mole-Dabgon groups reside[10].

The majority of the population, 71.2%, is Christian followed by the Muslim population that comprises 17.6% of the population[7]. Although the national language is English, numerous languages, including Asante, Ewe, and Fante, are spoken across the country. The majority of the country is educated with a literacy rate of 71.5%[7].

1.2 Economy

1.2.1 The Economy

Ghana has operated under a relatively free, market economy since independence in 1957. The country has an abundance of natural resources including gold, timber, and cocoa that have used to leverage foreign trade. Despite the presence of these resources, the economy has been characterized by undulations of growth over the past several years. In 2007, the introduction of oil into the market allowed the growth rate to increase from 4.3% to 9.1%[11]. The rate then fell below the average growth rate in Sub-Saharan Africa, 4.1%, in 2009[12]. After this year, however, robust foreign trade and the introduction of oil production allowed Ghana to achieve a growth rate of 14% and become the fast growing economy in the world in 2011[13].

After 2011, the economy fell. An energy crisis, unsustainable domestic and external debt, macroeconomic and financial imbalances, and the fall of currency slowed the growth rate significantly[14]. Debt remained high increasing from 55.8% of GDP in December 2013 to 67.1% of GDP one year later[13]. In response to the economic strains, in 2015, Ghana received an IMF loan of $918 million to stabilize the economy and support job creation[15]. The loan, however, required the government to reduce public sector wages, including those in hospitals and health care centers, and cut subsidies[14].

1.2.2 Current Economic Situation

Ghana now has a GDP of 113.3 billion and a low, but recovering, growth rate of 3.5%[7]. The economy is primarily dependent upon the services sector (51.6%), followed by agricultural (20.7%) and industrial sectors (27.7%). Primary exports include gold, cocoa, and individual remittances. Agricultural and industry account for about half of the GDP while the services industry accounts for the other half. The majority of the population is employed through the agricultural sector though the unemployment rate the remains high at 5.2%[7]. Moving forward, oil production, private sector investment, strengthened infrastructure, and political stability are projected to rise to 6%[12]. Ghana also has developed economic policies to guide development including the Growth and Poverty Reduction Strategy (2006-2009) and the Ghana Shared Growth and Development Agenda (GSGDA) 2014-2017. With respect to healthcare, 5.4% of GDP is spent on health[16].

1.2.2 Distribution of Resources and Earnings

Ghana ranks 140 out of 187 countries on the Human Development Index with 28.6% of the population living below $1.25 per day[17]. Inequality is present across the country and increasing. From 1992 to 2013, the Gini Coefficient rose from .353 to .428[14]. In addition to regional divides, inequality between the urban and rural centers has increased[14]. The Ghana Living Standards Survey 2014 indicates that employment for persons above the age of 15 in urban areas is 11.8% higher than those living in rural areas[18]. Poverty is also twice is high in the northern regions than in the southern regions[19].

The government recognizes the growing economic divide. Programs including Livelihood Empowerment against Poverty, the National Health Insurance Scheme, School Feeding Program, and Free School Uniforms and Exercise Book Program have received political and monetary support from the government to decrease the drastic disparity.

Gender disparity also contributes to the distributive inequality across the nation. In 2012, Ghana ranked 122 out of 187 countries in the gender inequality index[14]. Despite the presence of women in the marketplace and the government, these women often do not have access to decision-making power. The government has begun to address the gender divide by developing a legal framework for gender equality that increases women's participation in decision-making.

1.3 Political Factors

1.3.1 Political History

Ghana achieved independence from Britain in 1957. The country was initially established under a one-party system and was subject to military rule for thirty-five years[7]. In 1992, the country developed a two-party system and the first presidential elections were held. Jerry John Rawlings, representing the National Democratic Congress, won the election and the Fourth Republic of Ghana came to power. Rawlings stabilized the political system and strengthened the economy. This success led to his re-election in 1996. In 2001, John Kufuor won the election that placed his party, the New Patriotic Party, in power. Kufuor focused on social reforms, including a focus on health and the revision of the National Health Insurance of Ghana[20]. He was re-elected in 2004 and began the Ghana School Feeding Programme in 2005. In 2008, John Atta Mills won the presidency and the power

shifted back to the National Democratic Congress. In 2012, John Dramani Mahama assumed the presidency upon the death of Mills and was subsequently elected to the position. Mahama included health reform in his campaign platform in response to the health demands of the population. As a result, health was placed on the agenda by the National Democratic Congress.

1.3.2 The Current Political Situation

Elections are scheduled to occur in November 2016. Mahama will be running for another term while Nana Addo Dankwa Akufo-Addo will be running for the New Patriotic Party. The upcoming elections provide additional leverage for health policy and reform initiatives.

1.4 Legal Factors

Over the past several years, the Ghanaian government has adopted various policies and legislative acts to reform the healthcare sector. As the World Bank suggests, the goal of health sector policy is to improve health outcomes, offer financial protection, and ensure the system is responsive, efficient, equitable, and sustainable[21].

In 1996, Ghana introduced Act 525 that established the Ghana Health Service (GHS). The goal of the act was to provide an implementing arm of the Ministry of Health (MoH). Although the GHS and the MoH work together to improve the health system, efficiency remains a challenge. Specifically, the lack of clear delineation of responsibilities within the Act results in a duplication of tasks[22]. The Act also removed teaching hospitals from the public service sector. The autonomy creates division between the public sector and the teaching hospitals and makes regulations and data collection from these entities challenging.

In 2003, the government passed the National Health Act, Act 650. The Act established the National Health Insurance Authority and aimed to extend universal health coverage across the country. Although coverage of the National Health Insurance Scheme (NHIS) is expanding, limited resources limit the ability of NHIS to reach the entire country. The

majority of the insured population is located outside of highly populated urban areas but the program does not yet capture the most destitute[23].

During the same year, the National Decentralization Policy and Action Plan and Act 656 were established to decentralize the health system. Despite the policies, complete decentralization has yet to take place[21]. Local authorities do not have power over resource allocation and responsibility is not clearly delineated among the national, regional, and local levels. As a result, decentralization has yet to take full effect[21].

In 2007, the National Health Policy was passed in order to better meet the health demands of the Ghanaian population. The policy established a national health plan and placed health on the political agenda. The policy is ongoing and has been transformed into the Medium Term Health Sector Development Plan 2014 – 2017.

In 2013, the government revised the Private Health Sector Development Policy to increase the coordination between the public and private sector of the health care system. Originally introduced in 2003, the goal of the policy was to improve the quality, access, and information sharing between the private and public sectors. As Ghanaian lawyer Barbara Mensah-Agbokpor suggests, the policies are focused on promoting geographic access to healthcare through private sector partnerships. However, the World Bank suggests that the policy has yet to address the gap between the degree of regulation and quality of service provision between private and public clinics.[21]. Despite the establishment of a Private Sector unit within the MoH, communication between the public and private sectors remains a challenge.

In November 2014, the government revised the National Community Health Planning and Services (CHPS) Policy. The policy, created in 1999, aims to increase UHC and bridge the inequality gap across Ghana[24]. The most recent revisions to the program hope to bring a package of services, human resources, and infrastructure and equipment to every community by 2020. The program has begun to scale up and collect lessons learned, such as mobilizing local resources, to inform decision making[26].

These health policies are linked to wider multi-sectoral approaches. The National Health Policy and subsequent Health Sector Medium Term Development Plan were established

to complement the Millennium Development Goals, now the SDGs. Health policies were also a part of the Ghana's Growth and Poverty Reduction Strategy I and II that tied economic and social growth the health of the population.

1.5 Health Profile

1.5.1 Epidemiology

The leading causes of Disability Adjusted Life Years (DALYS) in Ghana are Malaria, Lower Respiratory Infection, and HIV/AIDS[26]. It follows that communicable diseases are responsible for 53% of deaths in Ghana[21]. Children under five are particularly susceptible to the prevalence of communicable disease in the country. Children in rural areas have lower access to clean drinking water and medical care than children in urban areas. Children in urban areas, however, are vulnerable to higher levels of pollution than those in urban areas[27].

The rise of non-communicable diseases (NCDs) place a double burden of disease on Ghana. The prevalence of these disease, including cancer, diabetes, cardiovascular disease, and chronic respiratory disease, are increasing[28]. In 2002, the prevalence of diabetes in Accra was estimated to be about 5.6 – 6%, much higher than previous estimates in 1956[5]. Risk factors, including nutrition, alcohol use, and lack of exercise actively contribute to the growing burden.

1.5.2 Nutrition

Despite the economic stability of Ghana, food security persists[29]. In total, about 1.2 million Ghanaians are food insecure[30]. The majority of this population is focused in the northern regions. As are result of limited access to food, child anemia and wasting are both above the WHO thresholds for intervention[29]. In contrast, rates of obesity are increasing among urban women and leading to an increased prevalence of hypertension and diabetes[21]. Lack of dietary diversity and low access to health services pose challenges to nutrition[29]. With respect to dietary diversity, the Ghanaian diet is comprised primarily of starch-based roots with limited intake vegetables, fruit, and cereals. Ghana Health Services reports that less than 5% of adults eat the prescribed among of fruit and vegetables[4]. Urbanization has magnified the issue and increased demand for wheat and

rice[31]. Limited consumption of fruits and vegetables has contributed to Iodine deficiency and resulted in low levels of vitamin A and Iron[31].

1.5.3 Maternal and Child Health

Although maternal mortality has decreased across the country, Ghana is lagging behind in maternal and child health indicators. Maternal mortality rates have decreased from 570 deaths to 1,000 live births in 2000 to 380 deaths per 1,000 live births in 2013. Under five mortality rates have also decreased to 72 deaths per 1,000 lives births in 2012[32]. However, neonatal mortality has risen and newborn deaths comprise 40% of under-five mortality in Ghana[32]. In response, in July 2014, Ghana established a National Newborn Health Strategy and Action Plan to reduce neonatal mortality from 32 deaths in 1,000 to 21 per 1,000 by 2018. The country has begun to strengthen immunization efforts, midwife training, and data management for newborn health to achieve their goal[32]. Across the board, rates of antenatal care by a skilled provider, births occurring in a health facility, and births attended by a skilled provider have increased[33].

Fertility rates in Ghana also remain high at 4.2 children per woman[33]. In response, the government has attempted to strengthen family planning activities. The private sector has also begun to increase the supply of contraception. However, these efforts have yet to reach the poorest segments of society[21].

1.6 Technology and Health Systems Innovation

Ghana's public health system aims at improving the health outcomes of its citizens. Currently, increasing costs of both infrastructure and services has led to an increased burden on the health system to deliver good quality care to its citizens. Ghana, under the National Health Insurance, wants to expand the available services to close down the gap of inequitable distribution between urban and rural areas and ensure coverage to the underserved communities. The system also aims to narrow the differences in services that the rich and poor receive. However, these goals face human resource challenges at many levels. In the last few years the Ministry of Health has been considering innovation across the board to deal with the challenges and make the best use of available resources aimed

at better returns for investments of public resources. Some of the avenues explored by the Ministry include close-to-client policy, free maternal care, review of the premium payment systems to remove existing financial barriers, and the introduction of incentive packages to entice staff to work in deprived areas[34].

Ghana, like many other health systems in developing countries, faces challenges in readiness for any ICT innovations mainly due to lack of institutional readiness. Often, the problem is compounded by an absence of systems assessment tools and guidelines for implementation. Although the health system and the Ghana health Service are eager for integrated Electronic Health Records (EHR), the system as a whole struggles with training of staff in computing, provision of alternate source of electricity, provision of internet and internet infrastructures and the provision of EHR. In our conversations with the Ghana health Service, we found that the staff indicated their readiness and eagerness for EHR as well as willingness to acquire knowledge in and integrated computing and collaborative data management with the Ministry and the National Health Insurance. Moreover, in a study at the University of Ghana hospital, Adjorlolo and Ellingesen have demonstrated that despite willingness and interest, there are apparent limitations 'relating to finance, a functioning ICT Department, ICT logistics and procurement of EHR that must be well addressed for a successful and sustainable EHR implementation'[35].

2. The Problem

2.1 Background

The Ghana Health Service (GHS) and the World Health Organization (WHO) indicate that NCDs account for about 30%-34% of deaths and disability-adjusted life years in Ghana[4]. According to the Center for Health Information Management (CHIM), morbidities specifically from diabetes have risen from 39,789 in 2005 to 151,094 in 2010 to 186,807 in 2015[36]. These figure are likely a considerable underestimation of the burden because the system does not receive information from teaching hospitals, and receives information from private hospitals on a voluntary basis[36]. The diagnostic rate may also be low across the country.

Prevalence of diabetes is naturally higher in urban areas because of the presence of risk factors such as lack of exercise, unhealthy diet, alcohol, and tobacco use. The GHS

indicates that 86% of the population in the Greater Accra Region, a highly urbanized area, reports low levels of physical activity[4]. Across the country, the percentage of women who are overweight or obese increased from 12.8% in 1992 to 30% in. Risk factors are also increasing among children whose diet and lack of exercise contribute to their risk of developing the disease at young age[4].

2.2 Opportunity and Necessity

Although the prevalence of diabetes is increasing, the incidence, demographic, and geographic distribution of the disease is unknown. As a result, Ghana has the opportunity to use health system monitoring tools as well as private-public partnerships to gain a better understanding of the disease burden.

Primary interviews with officials at GHS also reveal that the MOH acknowledges a growing burden of diabetes in Ghana[22]. Although a non-communicable disease strategy was established in 2012, a diabetes specific program has not yet been constructed. Currently, most patients are diagnosed incidentally at primary health clinics while seeking treatment for other ailments. Patient preference for alternative health centers, including traditional healers, also presents a challenge. Ghana has the opportunity to fill these needs and construct a diabetes-specific plan of action, invest in the education of medical professionals, and leverage a strong civil society to increase community awareness. The current National Health Policy of Ghana 2007 and Ghana Shared Growth and Development Agenda (GSGDA), 2010 are two political instruments that have the potential to help translate rhetoric into action. These instruments specifically mention the need for health systems strengthening for chronic care management.

Finally, diabetes disproportionately affects the rural poor. This population is least likely to understand diabetes and the risk factors. As a result, diabetes goes undetected and subsequently presents itself in complications that patients are unable to afford to treat. The cost of treatment may dig them deeper into debt and entrench the cycle of poverty. Ghana has the opportunity to end the cycle by incorporating poverty reduction strategies into diabetes related programming.

2.3 Intervention

Ghana has a national NCD Control Program (NCDCP) that oversees diabetes detection and management[3]. The NCDCP was established by the MoH in 1992 to "design, monitor, and coordinate interventions to reduce the incidence and prevalence of NCDs, prevent disability and deaths from NCDs and to improve the quality of life of persons living with NCDs."[4]. The major NCDs targeted are CVD, cancers, DM, COPD and SCD[6]. The NCDCP coordinates the national intersectoral response in partnership with other agencies in the health sector, MoH agencies, CSOs and NGOs[6].

The main strategies of the NCD program include multi-sectoral coordination, modifications of lifestyles and early detection of NCDs in high risk individuals, establishing and strengthening multi-sectoral structures and mechanisms for improving the coordination and governance of NCD programs, strengthening health systems to improve clinical outcomes and finally increasing the financing for NCD programs[4].

In March 2002, a draft national policy framework for NCDs was constructed. The framework included NCD prevention and control, strategic objectives, strategies, capacity building, drugs, health care and risk sharing and monitoring and evaluation[5]. In 2008, a position paper on the state of NCDs was published and highlighted recommendations to address the growing burden[5]. In 2011, the NCDCP constructed a new framework for a national NCD strategic plan 2012 – 2016[4].

In 2012, the framework was revised and titled the Strategy for the Management, Prevention, and Control of Chronic Non-Communicable Disease in Ghana 2013 – 2017[4]. The strategy reaffirmed the commitment to address NCDs and a multi-sectoral Steering Committee on NCDs was proposed. The committee is comprised of a range of stakeholders from private sector actors to research to ministry officials to civil society[4]. The committee would address NCDs in Ghana by setting objectives and better understanding the impact of the disease across sectors[4].

Within the strategy, the government also established the NCD Prevention and Control department under the Public Health Division of the Ghana Health Service[4]. The department is led by a Deputy Director and Programme Managers are appointed for

specific programs or group of programs[4]. The department is tasked with coordinating the implementation of the NCD strategy[4].

By 2016, the program intends to identify focal officers a provide each of the district health electorates with an NCD management framework. The program also hopes to increase population awareness about diabetes and its causes, prevention and treatment[6].

In line with WHO resolutions, MoH plans to give high priority to promoting healthy lifestyles among in- and out-of-school youth[6]. Health promotion policy will promote intake of fruits and vegetables; high fiber diet, moderate physical activity; reducing intake of energy dense foods, salt, trans-fats, and sugar; avoiding tobacco; reducing excessive alcohol intake; and undergoing periodic medical check-ups[6].

Although the policy and NCD program are documented, the government has yet to translate rhetoric into action. Limited political will and scarce support from international development partners to prevent diabetes presents a challenge to addressing the burden[5]. The majority of donor funds funnel into vertical programming for communicable diseases[5]. Investment in vertical programming limits the ability of the health system to develop holistically to respond to the demands of NCD prevention[5]. With respect to demand generation, there is very low awareness about diabetes in Ghanaian population. Civil Society Organizations, namely the Association of Diabetes, play an increasingly active role in advocacy as well as promoting diabetes awareness[37]. However, the culture of screening for diabetes and its complications is not entrenched at the primary care level.

2.3.1 Desirability and Sustainability

The first and foremost driver for a focus on chronic care management is political commitment. Although the government acknowledges the prevalence of NCDs and established a strategic framework, the MOH has yet to dedicate a budget to the program. Funding for diabetes-specific programming is also unavailable.

Prevention strategies, including the promotion of healthy foods, the regulation of processed high carb food products, the construction wellness initiatives, and the increase

of community education programs will result in cost savings in the future and improve the ultimate financial sustainability of chronic care management.

2.4 Stakeholder Analysis

The main stakeholders for NCD prevention include government ministries, specifically the MoH, the Ministry of Finance, the Ministry of Food and Agriculture, and the Ministry of Education, private sector actors, civil society organizations, medical officials, international organizations, and development partners.

The two ministries directly involved in NCD strategic planning and policy are the Ministry of Finance and the MoH. Within the MoH, agencies including the Policy, Planning, Monitoring, Evaluation, and Development (PPMED) office, the Research Statistics and Information Management office, the Private Sector Unit, the Budget Sector, and the National Coordinating Committee for NCD control program are responsible for policy formulation and budget allocation. Additional actors, including the Ghana Health Service and the NHIS, that are responsible for implementing policy also play a role in formulation.

The level of political commitment is moderate in terms of policy support but low when it comes to budget allocation. Civil society organizations including the Diabetes Association have a high interest in promoting diabetes management, however, the organization lacks funding support from the government and development partners[37]. As previously discussed, diabetes is not a top priority for development partners. One challenge to engagement with these partners is the nature of the disease. Diabetes management requires overhauling of the entire health systems from prevention to screening to treatment to follow up care. The process is protracted and does not fall within highly regulated budget timelines that most donors are required to follow. Returns on investment are also difficult to demonstrate given the chronic and prolonged nature of the disease

3. Overview of the Health Care System

3.1 Stewardship and Governance

Since Ghana's independence there have been several waves of reform moving the country towards decentralization. The Local Government Act of 1993 (Act 462), the most recent and comprehensive legal framework around decentralization in Ghana, mandated the establishment of District Assemblies to which the central government would transfer responsibilities. These District Assemblies were created to "exercise political and administrative authority in the district, provide guidance, give direction to, and supervise the other administrative authorities in the district" through an executive committee38.

Not long after, the Ghana Health Service and Teaching Hospitals Act of 1996 led to the establishment of the Ghana Health Service (GHS) to whom the Ministry of Health delegated the responsibility of managing and operating majority of the publicly owned health facilities and services in the country. The exception to these are the tertiary teaching hospitals and a number of mission hospitals, which are funded by the government[21,39]. The GHS is divided into 3 administrative levels, the national level, the regional level and the district level, which is further sub-divided into the sub-district and community levels. Overall planning and coordination of activities for the GHS is done centrally at the national level to ensure that they match the priorities set by the Ministry of health. This structure and the allocation of resources from the central offices to the regional and district levels limits the decision making latitude at the regional and district levels. A proportion of revenues available are internally generated through a range of avenues including NHIS reimbursements. The management of these funds which occur at the facility level have allowed for a greater flexibility in the management of health facilities[21,40].

The model for devolution in the Local Government Act 462 and that for delegation to GHS in the Ghana Health Service and Teaching Hospitals Act 525 are in conflict with each other. While the former supports devolution of power to local governments, the latter is in favor of delegation to GHS and deconcentration within GHS in a hierarchical fashion

from the national level down to the community level[21]. This is one of the main conflicts impeding the progress towards full decentralization.

Decentralization remains high on the government's agenda as can be seen in the president's "Coordinated program of economic and social development policies 2014-2020". Based on the priorities set out in this document, the Ghana Shared Growth and Development Agenda (GSGDA) II for 2014-2017 was developed, which built on the progress made in the GSGDA I[41].

The National Health policy

The National Health Policy was developed in 2007. Titled "Creating health through wealth" the policy recognizes the relationship between socio-economic factors and ill health and places health within the national framework for socio-economic development[42]. The policy establishes a technical advisory committee as part of the Ministry of Health's Policy Planning, Monitoring and Evaluation Directorate, which is being implemented through the Health Sector Medium Term Development Plan (2014-2017)[41,42].

The responsibility for policy making, strategic planning and development remains with the Ministry of Health which operates with the aim of "improving the human capital -- thus 'creating wealth through health' -- through the development and implementation of proactive policies that will ensure improved health and vitality"[43]. The Ministry achieves its mission of providing health services to the Ghanaian population through a number of agencies, which include the following:

The Ghana Health Service (GHS) is the main public health service delivery and implementation arm of the Ministry of Health. Operation of the country's Teaching Hospitals is excluded from the mandate to the GHS; instead these are run autonomously.

At present there are two large tertiary centers, Korle-Bu Teaching hospital, in Accra and Komfo Anokye Teaching Hospital, located in Kumasi. There are plans to construct a new ultra-modern teaching hospital for the University of Ghana Medical School as well as upgrading the Central and Volta regional Hospitals[40].

The Christian Health Association of Ghana (CHAG) comprises a number of private, mission driven health facilities who receive funding from the ministry of health. These primarily serve the less privileged within the Ghanaian society. There are 173 facilities and 10 training institutions within the CHAG network[44]. Hospitals under CHAG are primarily self-funded but receive support from the government with regards to personnel reimbursement costs, training and the supply of some equipment.

Privately owned and run for-profit health facilities also play a significant role in healthcare delivery in the country. Together with hospitals under CHAG they provide about 55% of all healthcare services in the country[45]. Unlike the health facilities grouped under CHAG, these are facilities receive no government funding. However, the ministry of health realizes the potential benefit effective partnerships with the private sector can bring and actively seeks to foster and coordinate collaboration with the private sector[45].

In 2003, the National Health Insurance Act, 650 was passed. The Act established the National Health Insurance Authority (NHIA) which was tasked with implementing the National Health Insurance Scheme (NHIS), as well as establishing private health insurance schemes. The purpose of the scheme is to provide access to universal health Insurance to residents as well as non-residents visiting the country. The wording within Act 650 was at times vague and as a result it was replaced by the National Health Insurance Act 852 in 2012, with the hope of reducing the opportunities for corruption and gaming, while improving the transparency of the system and removing administrative bottlenecks[46,47,48].

Private Health Sector

A report published by the World Bank found that there were a number of areas that needed strengthening in order for the private healthcare sector in Ghana to reach its maximum potential. There are channels for dialogue between the public and private

sectors, however, this dialogue is limited and not much collaboration exists. In particular, the document highlights, the need to strengthen the private sector's representation and participation in the national policy making process[49].

The Private Health Sector Development Policy was developed in 2003, to ensure that the rapidly developing private health sector was moving in a direction that was congruent with the national health objectives and goals. One of the main goals was to strengthen partnerships between the private and public sector. Unfortunately, implementation was weak and slow leading to the development of the 2012 Private Health Sector Development Policy. Its core policy objectives center around improving the investment climate for private health sector growth, supporting the private sector in meeting industry expectations, building the capacity of private healthcare providers – particularly in the area of business skills and, leveraging private sector investment to improve healthcare access to the poor. Its implementation is to be overseen by the Private Health Sector Advisory Group, established by the Minister of Health. Following this, a slightly revised version of the Policy was published in 2013. However, the core policy objectives remain essentially unchanged[45,50,51].

The existing private sector unit within the Ministry of Health was not equipped with the resources needed to effectively liaise between the Ministry and private sector due to being understaffed and under-resourced. As a result, the private sector had not been involved in the planning and program level implementation of national health policies, often resulting in the duplication of efforts. With the new policy, the private sector unit was upgraded into a Division within the Ministry[45].

3.1.1 Regulatory Function

The Ministry of Health has ultimate oversight of the all regulatory activity within the health sector. To help it fulfil its responsibility, there are a number of regulatory bodies established. These are accountable to the Ministry for their actions.

The Health Institutions and Facilities Act, 2011 (829) aims to establish an agency to deal with the issues concerning the licensing, accreditation, monitoring and evaluation of health providers[52]. It replaced the Private Hospitals and Maternity Homes Board Act, Act

9 of 1958. Act 829 was intended to "harmonize the operations of all health institutions, service and medicines providers and regulatory bodies."[52]. The private health sector development policy of 2012 reinforces the importance of including the private sector representation on the board of the agency[45,52].

The Health Professions Regulatory Body Act, 2013 (Act 857) was developed in 2013 in order to regulate professional standards amongst healthcare providers and define the role and function of regulatory councils amongst health and allied professions[53].

Regulation of Pharmaceutical and medical products is done by the Food and Drugs Authority (FDA), which was established in 1997. Part seven of the Public Health Act 851 of 2012 gives the FDA the mandate to regulate food drugs and supplements, amongst others[54].

3.1.2 Accountability and Performance Management

The Health Sector Medium Term Development Plan 2014-2017 sets out how progress towards meeting set goals and targets within the health sector will be measured[55]. The monitoring and evaluation process is to be integral to the management within the health sector and forms an important part of the policy planning process. Data from health facilities to measure how effectively these goals are being met is routinely collected at all functional levels of GHS through the government data management office, the Centre for Health Information Management (CHIM). The data collected is used to formulate reports on a monthly, quarterly and annual basis. Other indicators used to measure progress are collected through the Demographic Health Survey and the Multiple Indicator Cluster Survey.

There is also a sector wide independent annual review of the program of work at all levels within the health sector, the purpose of which is to provide an in-depth analysis of the factors affecting performance. This process includes a Holistic Assessment that summarizes the performance of the health sector in a single indicator, which is used in the annual Performance Assessment Framework for Multi-Donor Budget Support. Majority of the analysis occurs at the national levels within GHS and the Ministry of Health and the information is used to inform ongoing policy directions. In addition to the

regular evaluation of progress being made, a number of milestones have been agreed to monitor the progress of the health sector in regard to health development. The table below, taken from the Health Sector Medium Term Development Plan 2014-2017, shows the annual milestones against which health objectives will be measured[55].

Table 1: Milestones measuring progress against health objectives

Objective	2014	2015	2016	2017
HO1: Bridge the equity gaps in geographical access to health services	Capital investment plan developed	Revised CHPS strategy implemented	Coverage of specialized services at lower level expanded	One flagship telemedicine project based in one teaching hospital established
HO2: Ensure sustainable financing for health care delivery and financial protection for the poor	Develop implementation plan for Health Financing Strategy	Resource allocation criteria developed	Implement the Health Financing strategy	Appropriate mix of provider payment mechanisms established
HO 3: Improve efficiency in governance and management of the health system	Comprehensive leadership programs developed for the health sector	Health sector response to decentralization developed	LIs for passed health legislation developed	Private sector data fully integrated into the public system

	Finalize the sector staffing norms	Staffing norms implemented Research agenda developed		
Ho4; Improve quality of health services delivery including mental health services s	Hospital strategy developed	LI for Mental Health Bill develop Mental health strategy implemented	Hospital emergency and referrals, protocols and guidelines implemented Quality of care standards and patient safety strategy fully implemented	Mentorship program for specialist /consultants to support lower levels introduce
Ho5: Enhance national capacity for the attainment of the health related MDGs and sustain the gains	MAF implementation improved	Neonatal policy developed	Evaluation of new vaccines done	Maternal mortality survey carried out
HO6: Intensify prevention and control of non-communicable and other communicable diseases	Policy on climate change developed Non communicable disease policy and strategy finalized National nutrition policy finalized	International conventions and treaties including frame work convention on tobacco control (FCTC implemented	Strategic plan for under provided specialist services eg dermatology, physiotherapy developed	Improve orthotics and prosthetic institutionalize services

Source: Health sector Medium term policy document 2014-2017, Ministry of Health, 2014[55]

3.2 Financing

3.2.1 Resource Generation, Pooling and Funding Flows

Financing sources for the Ghanaian health system include Government of Ghana (GoG) budgetary funding, development partner support and private financing[55, 56]:

1. Funds from the GoG flow through 2 routes:

    a. Discretionary funds allocated to the MoH as part of routine budget

    b. Statutory funding allocated to the National Health Insurance Council as the National Health Insurance fund (NHIF). This is composed of a 2.5% levy on imported goods and services, the National Health Insurance Levy, and 2.5% payroll tax on formal sector workers earmarked from the Social Security and National Insurance Trust contributions.

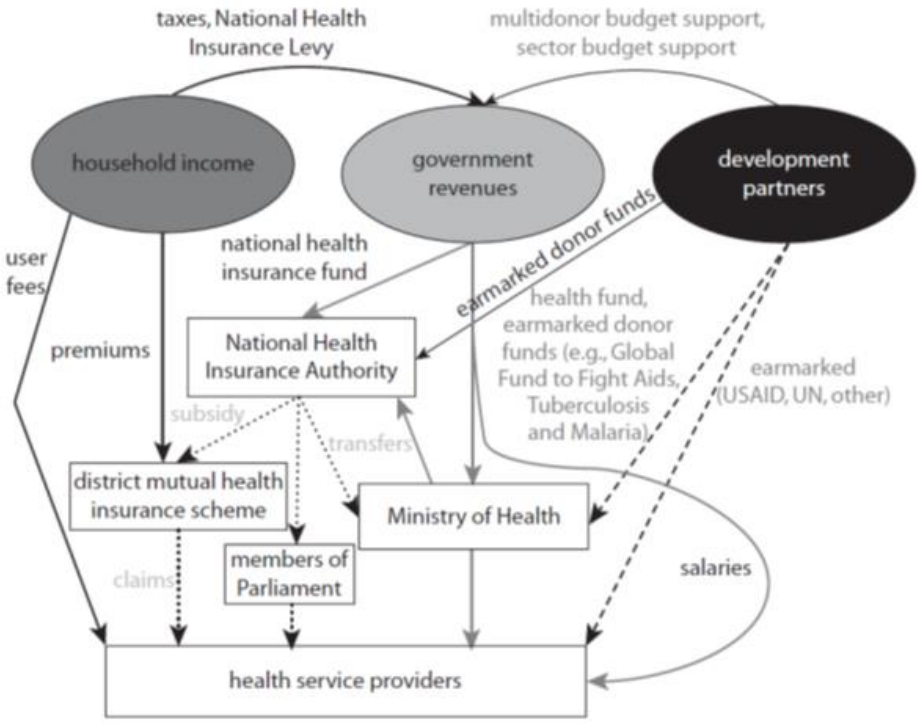
2. Development partner funding is provided through:

a. Earmarked funding for specific activities (from bilateral and multilateral partners as well as agencies like the Global Fund for AIDS, TB and Malaria and the Global Alliance for Vaccines and Immunizations)

b. General budgetary support (Multi-donor budgetary support – MDBS) to the GoG or to Sector Budget Support (SBS) channeled through the Ministry of Finance and Economic Planning (MoFEP). As part of the change from the Sector-Wide approach and the move towards increased aid effectiveness as promoted by the Paris Declaration and the Accra Agenda for Action, development partners continue to move away from the MoH Health fund to the MDBS and SBS facilities[42].

3. Private financing including corporate and individual insurance premiums and household out of pocket payments, which form an important fraction of the facility level internally generated funds. These have exhibited a downward trend since the establishment of the National Health Insurance System in 2005[55].

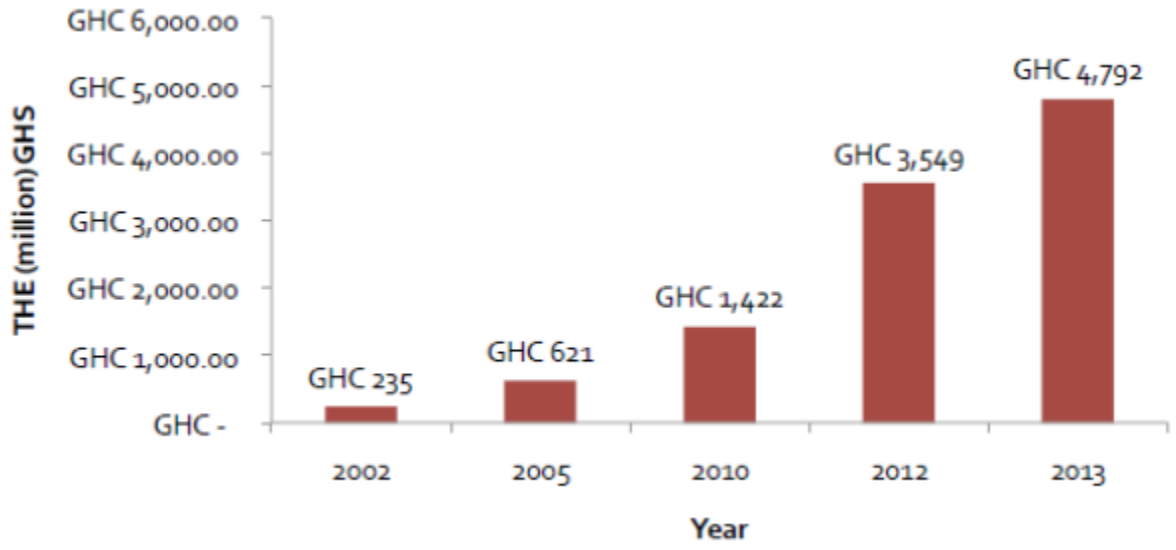
Flow of Funds in Ghana's Health System



Source: Schieber et al. Health Sector Financing, 2012. Adapted from Enemark et al, 2005[57]

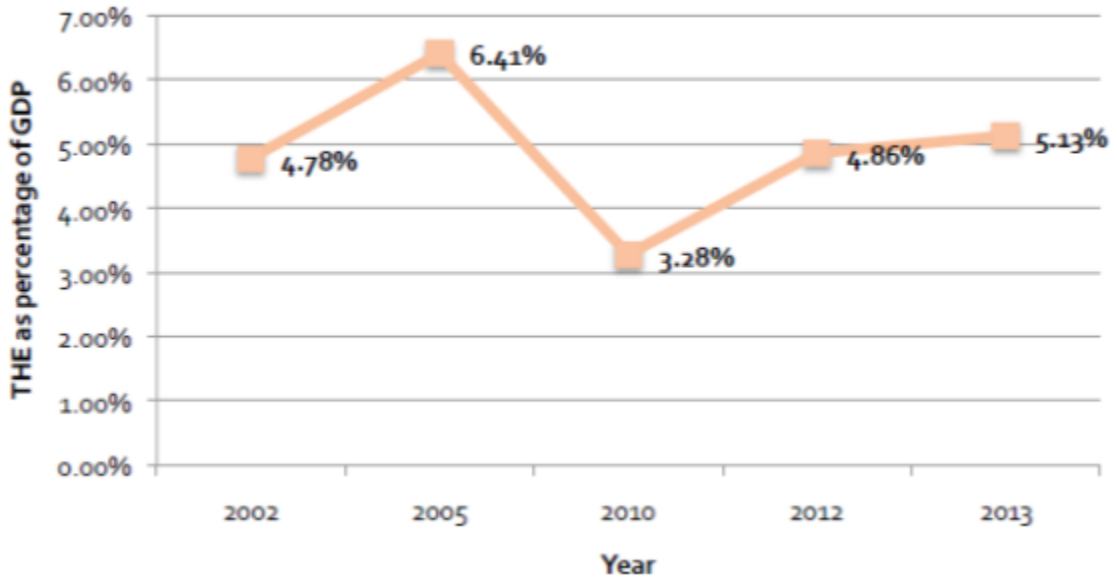
Total and per capita health spending has increased steadily; doubling between 1995 and 2009 from $27 per capita to $54 per capita[57] (PPP: $63 to $125) and increasing further to US$ 83.85 in 2013[56]. The increase in per capita expenditure in the local currency outpaced the growth rate in US dollar terms during this period due to depreciation of the Ghanaian cedi[56]. Nominally, total health expenditure (THE) increased to US$ 2,215 million in 2013[56]. Overall, THE as a proportion of GDP fell from 5.3% in 1995[57] to 5.13% of Ghana's GDP[56], falling some way short of the 15% target set by the Abuja declaration[58].

Trends in Total Health Expenditure (2002 – 2013)



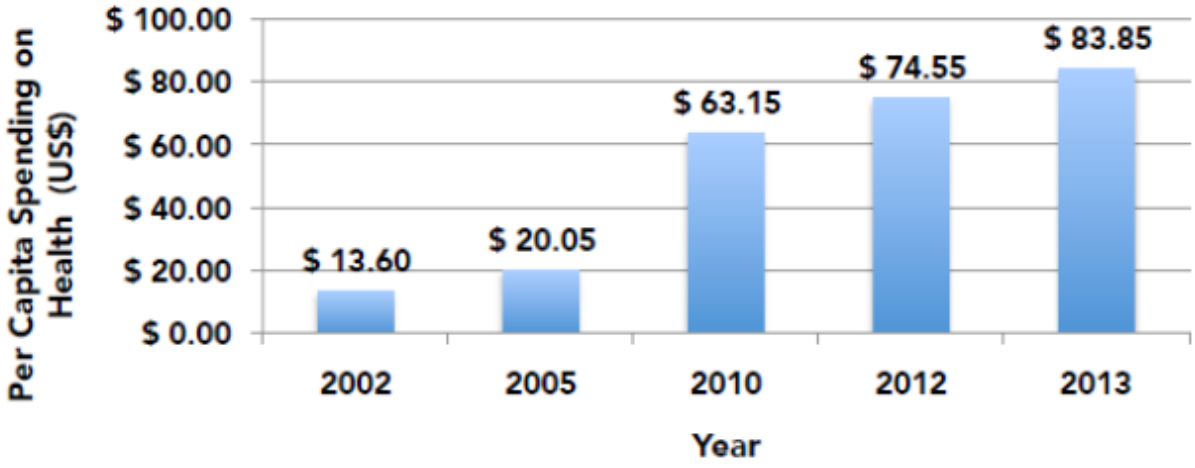
Source: 2013 Ghana Health Account[56]

Trends in Total Health Expenditure as a percentage of GDP



Source: 2013 Ghana Health Account[56]

Trends in per capita health spending in US Dollars



Source: 2013 Ghana Health Account[56]

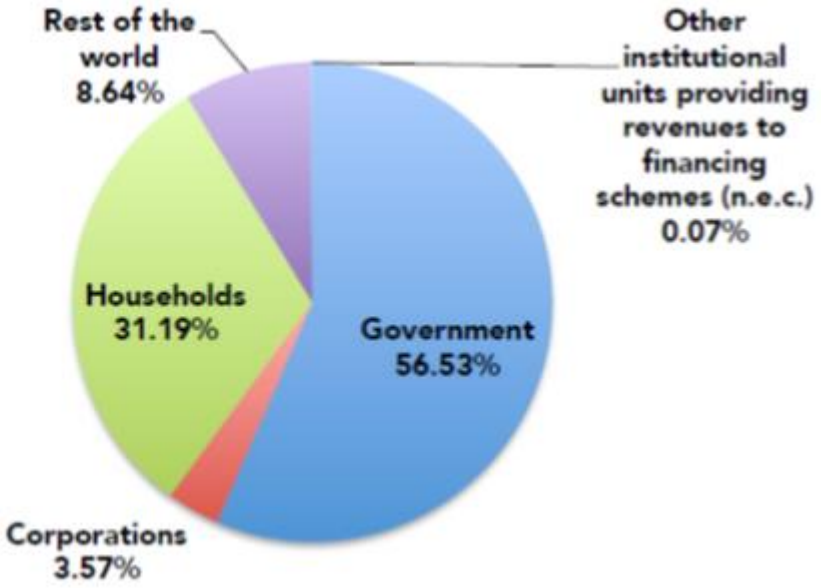
Public funds consisting of government domestic revenue overtook private spending within the same time period (1995 to 2013) to become the major source of funding for the system increasing from 44% to 56.5% (US$ 1,252 million). This was well above the global average for lower middle income countries[57].

Trends in Funding Sources and per Annum percentage changes

Financing Sources	2005 (US$)	2010 (US$)	Percentage Change (2005/2010)	2012 (US$)	Percentage Change (2010 /2012)	2013 (US$)	Percentage Change (2012 /2013)
Public Funds	201.41	662.92	229.14%	1,097.47	65.55%	1252.75	14.15%
Private Funds	118.66	122.83	3.51%	660.36	437.62%	770.27	16.64%
International Funds	360.48	178.93	-50.36%	175.43	-1.96%	192.89	9.95%
Total	680.55	964.68	41.75%	1,933.26	100%	2,215.91	14.62%

Source: 2013 Ghana Health Account[56]

THE breakdown by source (percentages)



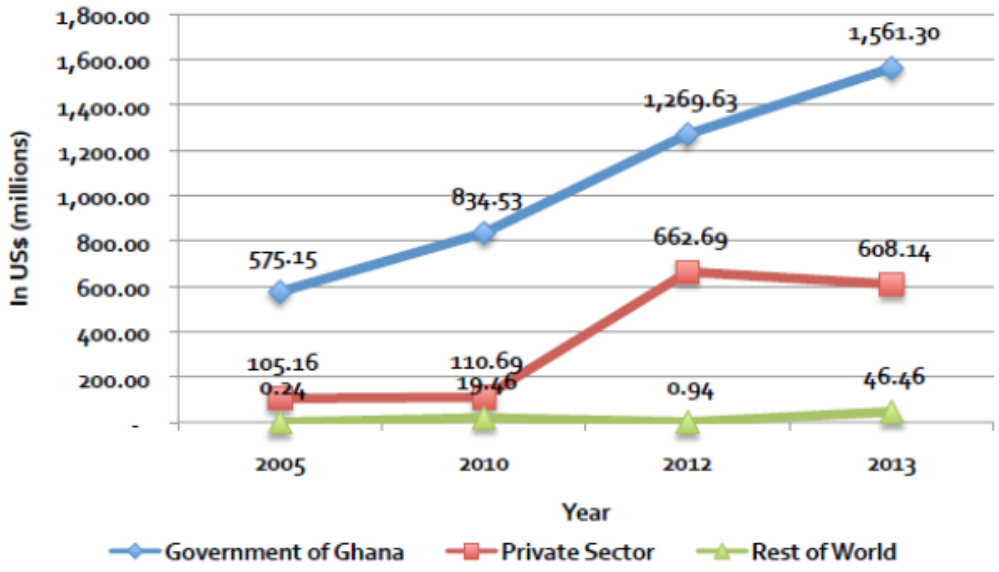
Source: 2013 Ghana Health Account[56]

Household spending continues to make up a significant proportion of THE (31.19%) compared to the WHO suggested threshold of 15-20% for financial risk protection and remains slightly above average for countries with similar levels of income[57].

In sum, Ghana's overall level of health spending is marginally lower than the global average for countries at a similar income level, its public spending is above average and out of pocket payments was slightly above average[57].

As a financing agent, the GoG manages the largest amount of resources for health (70.44% of THE in 2013) with households managing 27.44%; meanwhile other sources amounted to 2.10% of THE[57]. The majority of the GoG funds originated from the government itself[57].

Trends in THE by Financing Agent



Source: 2013 Ghana Health Account[56]

Public funding is pooled at the national, regional, and district levels. There is no pooling for household or corporate funding[59].

National level pooling occurs through the dwindling Health Fund (which was the mechanism used under the Sector Wide Approach) and the National Health Insurance Fund. Resources from the Ghana Health Service, the service delivery agency of the MoH, are first pooled at national levels and then allocated to regions based on an allocation formula, described in detail in the next chapter of this report[59]. The final level of pooling occurs at the district level before local stakeholders use a variant of the national allocation formula to disburse it at the sub-district level[59].

A senior official at the MoH reports that budgets are generally in agreement to actual expenditure with the exception of interyear transfers[59].

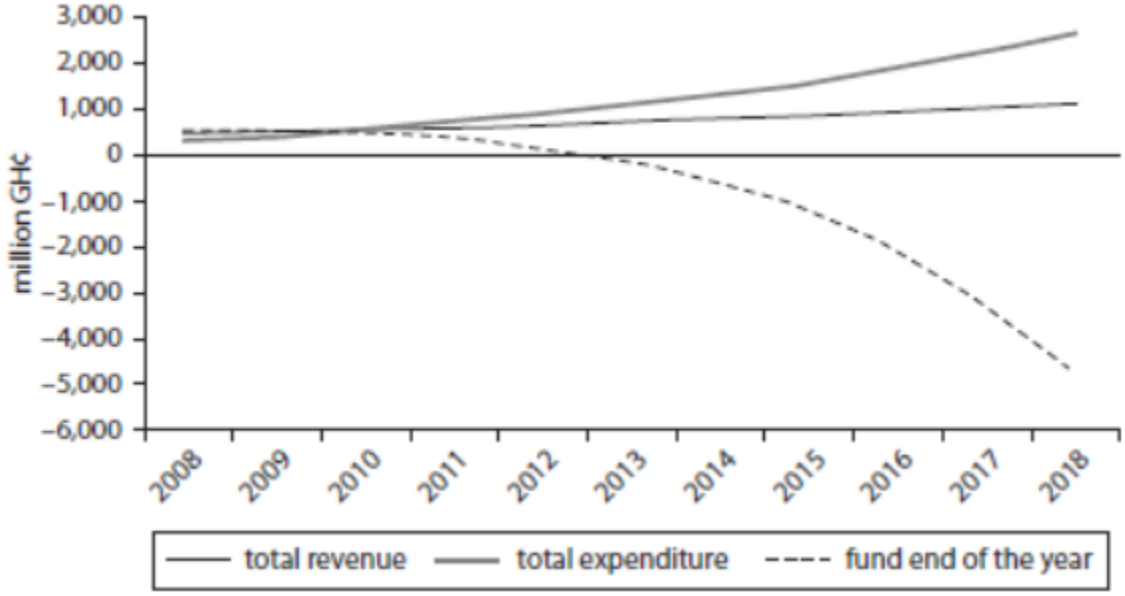
3.2.2 Expected Changes

As a low-income country, Ghana received significant donor support; however, now that it has achieved lower-middle income status that is unlikely to continue[57]. In the future, the preponderance of resources for the sector will likely consist of GoG and NHIS funding.

As part of national policy on public financial management reforms, the health sector has moved from an Activity Based Budget to a Program Based Budget consisting of 5 main programs and 19 sub-programs[60]. The programs include:

1. Management and Administration
2. Health Service Delivery
3. Tertiary and Specialized Health Services
4. Human Resources for Health Development and Management
5. Health Sector Regulation

Projected Revenues and Expenditures of Ghana's National Health Insurance Scheme ('08 – '18)



Source: Schieber et al. Health Sector Financing, 2012[57].

3.2.3 Program specific resource generation and pooling

A senior official at the NCDCP in an interview with the team reports no financing for the program's programmatic functions by the GoG in the last few years[61]. All programs are currently supported by development partners (WHO, international pharmaceutical companies), and consist of mostly earmarked resources[61].

This is substantiated by the one budget item in the procurement plan of the MoH's 2014 Program of Work specifically related to diabetes care (Procurement of Blood Glucose Monitors and Test Strips)[60]. This line item has an estimated need of GHS 1,176,000.00 and no approved budget. The source of funding listed is the GoG[60].

Predictably, the NCDCP official reports that this hampers local ownership and direction of programs and precludes the development of a long term financing strategy[61].

As a result of this arrangement, there are no formalized financing flows for the program. A request for expenditure data is still pending.

3.2.4 Provider Payment Methods

The present provider payment system is a mixture of wages, other operating subsidies, and NHIS reimbursements[57]. The NHIS payments are based on the Ghana Diagnosis Related Groups system for services provided to insured clients, and uncapped fee schedules (itemized fee for service) for medicines provided to insured client (NHIS, accessed 2016). The rates for these are adjusted upwards for private providers to account for the lack of public subsidies[57]. A pilot of a primary care capitation model among other results-based financing options was recently carried out in the Ashanti Region, one of the 10 administrative regions, and is set to be expanded to three more regions (Takyi E, 2015). This pilot was the first attempt to steer the primarily curative focused NHIS towards primary care and preventative services in a bid to control costs and provide fiscal sustainability of the scheme[57]. It also evaluated the inclusion of basic primary care medicines under the capitated rate aimed at ameliorating the rise in pharmaceutical expenditures[57].

Individual providers are remunerated based on sector of employment. As civil servants, providers within the public health system – Ghana Health Service and tertiary/teaching hospitals – are salaried under the Single Spine Salary Structure of the Ghana Civil Service[59].

Private providers are paid by facility specific policies[23,59].

There are no specialized payment mechanisms at program level[23,59,].

3.3 Planning

3.3.1 Needs Assessment and Priority Setting

Within the general health system the health needs assessment and planning of activities is usually conducted by the Policy, Planning, Monitoring and Evaluation (PPME) department of GHS and MoH. Planning is based on data provided by monitoring and evaluation system. Often, health interventions are prioritized based upon the availability of earmarked funds from vertical, donor-funded programs such as HIV and TB rather

than by local disease profile[5]. Interventions that are cost-effective, reduce poverty, target severe diseases, or target the young have a higher probability of being chosen than others[64]. The current priority items are achieving the Sustainable Development Goals as well as tackling communicable diseases. NCDs are lower down on the list.

3.3.2 Resource Allocation

At the systems level, resource allocation follows a formula established by the MoH. Funds are allocated to each level of operation within GHS according to this resource allocation criteria (RAC). The allocation process also takes contextual factors into account. Including contextual factors allows for a more equitable distribution of funds across the nation and for resources to be efficiently directed towards priority areas of need. The process also ensures that all budget management centers (BMC) are able to operate under scarce resources. The resource allocation criteria are not fixed for the year but are continuously reviewed and revised based on influx of resources and changing service demand.

Resource allocation is conducted with overall needs of health sector in view as opposed to focusing on disease specific programs. As such, resources are invested in systems strengthening. Given the system wide approach, the gains for each specific program are slower to materialize than if had there been a program specific approach.

Resources are divided between the different levels of operation with 13% going to the headquarters, 17.4% to the regional zones, 17.4% to the district zones, 23% to sub-district zone and finally 30% for the CHPS zones[65].

Resource Allocation Criteria: Headquarters

CRITERIA	**%**
Equal Share	**40%**
service delivery	**10%**

DG/DDG Office Coordination and Special Initiatives	**15%**
Administrative overheads	**10%**
maintenance	**8%**
ICT	**5%**
GHS Council Activities	**7%**
Research	**5%**

Resource Allocation Criteria: Regions

CRITERIA	**%**
Equal Share	10%
Number of districts	40%
Size of region	50%

The “equal share” provides a base for all the regions to operate. The more the number of districts, the more the BMCs that operate under it, hence they require more funds. The size of the region is indicated by land area, which influences the administrative costs and the overhead that has to be financed by the BMCs.

Resource Allocation Criteria: Districts

CRITERIA	%
Equal Share	10%
Population	50%
Number of sub-districts	40%

The “equal share” offers a minimum funding support for operations and service delivery activities. The larger the population of the districts, the more funding required to undertake effective service delivery. The number of sub districts reflects the geographical accessibility, scope of services provided, and management and administration.

Resource Allocation Criteria: Sub districts

CRITERIA	%
Equal Share	10%
Population	40%
Number of CHPS zones	50%

Resource Allocation Criteria: CHPS zones

CRITERIA	%
Equal Share	20%
WIFA	40%
Number of households	40%

A base allocation of 20% is equally distributed to all CHPS zones. The more the number of households, the more the resources needed for service provision. At the CHPS level, the focus is on maternal health services. Women in Fertile Age (WIFA) is employed as the criteria to indicate this demand. Hence there is a relationship between an identified health priority and resource allocation.

In 2014, the GHS budget was 91,005,000 Ghanaian Cedi, out of which 32.3% (29,400,000 Ghanaian Cedi) was allocated to the head office, 52.8% (48,050,640 Ghanaian Cedi) to all the regions 14.9% (13,450,000 Ghanaian Cedi) to the three psychiatric hospitals of Accra, Pantang and Ankaful. However only 3,500,000 Ghanaian Cedi of the budgeted amount was approved. This approved GHS budget allocated 3,300,000 Ghanaian Cedi for all the regions and 200,000 for the psychiatric hospitals. 2,079,418.41 Ghanaian Cedi, or just 2.9% of the approved GHS budget was actually released, and the entire amount allocated to the regions[67].

3.4 Service Delivery

3.4.1 Human Resources

Ghana has human resource deficient in the healthcare field. While the WHO recommends at least 2.02 to 2.54 Health Workers (HWs) per 1,000 population, a GHS survey conducted in 2009 estimates that Ghana has about 1.24[67]. The majority of healthcare workers are nurses, midwives, and community health nurses. Doctors are noticeably lacking within the system[21]. Despite being one of the top producers of physicians in the region, only about 1% of healthcare workers in the public sector are doctors[36]. As is the

case in countries throughout Sub Saharan Africa, many doctors educated in the country move abroad towards higher pay and increased access to medical services. Doctors who remain are also often incentivized to move to urban areas where quality of care and salaries are higher.

The largest concentration of healthcare workers is in the wealthier, urban areas while the lowest concentrations are in the more rural, northern regions. To illustrate, while the southern Volta region has about 2 health workers per 1,000 the northern region has about .5[21]. As in the case with doctors, factors including financial incentives and employment opportunities pull healthcare workers to the urban areas.

Community Based Health Planning and Services Program (CHPS)

Government efforts to reduce the divide have been focused on the Community-based Health Planning and Services program (CHPS). Established in 1999, the program aims to strengthen and expand the health care force. The program gains the commitment of local leaders directly in order to ensure community buy in and more fully understand local needs[24].

The program then recruits and trains healthcare professionals to serve areas of need[24]. These areas include the provision of immunizations, family planning, supervision of delivery, antenatal/postnatal care, treatment for minor ailments, and health education[24]. The initiative has been revised several times since inception and has moved forward from the planning phase, 85% complete in 2005, into the implementation phase. In 2012, the MoH conducted an analysis of the program and determined that the number of CHPS zones had increased to 1,863 but faced a series of challenges to implementation, including lack of engagement with local leaders, high rate of attrition for community health officers, and a focus on curative services at the expense of preventative and promotive services[68].

In addition to offering the CHPS program, the government provides incentives including tax waivers, housing benefits, allowances, and career opportunities to retain health care workers[21]. Medical students are also required to serve in rural areas as part of the training program. Finally, the government works with nonprofit organizations such as CHAG to

offer more effective and efficient services[21]. Despite these efforts, human resource asymmetries remain across the rural and urban communities.

Formal Training of Health Workers

Ghana has four large teaching colleges that act as medical colleges. Although a forerunner in Sub Saharan Africa in medical education, several officials in the GHS indicated that these colleges lack the resources needed to train the number of health workers needed to respond to the demands of the country. Despite increasing class sizes, these institutions do not receive a parallel increase in budget to support the larger classes[21]. The lack of investment has led to low student-teacher ratios, cramped conditions, and inadequate equipment and infrastructure[21].

In addition to medical schools, the country has 82 institutions, both public and private, that train health care workers[21]. The CHPS program, detailed above, is also responsible for recruiting and training healthcare workers across the country. With respect to distribution of training centers, training for nurse and medical staff is more prevalent in rural areas while training for physicians is more prevalent in urban areas[69].

External Training Support

On a macro-level, the MoH constructed a pooled funding account for international donors in the mid-1990s. From 2007 to 2011 the pool evolved into a health sector working group for donor-government coordination[70]. During this time, investment in the health sector was provided. When Ghana received the status of a lower income country and in 2012, however, large donors including the World Bank and the IMF began to depart from public sector health funding and enter into program-specific support.

On a micro-level, programmatic support is received from various organizations. In April 2014, the MoH, GHS, NGOS, academics, and global funding agencies came together in the One Million Community Health Workers Campaign to complete the Community Health Worker Program Operational Roadmap. The roadmap details the final services to be delivered, supplies, training requirements, terms of reference, and management structure for community health care workers over a ten year period. The Ghanaian

government has 40% of the funds to launch the campaign and may need to rely on additional sources for the remainder[71].

Ghana has also received support and assistance from nonprofit and private organizations such as Save the Children, Global Cancer Control, Clinton Health Access Initiative, USAID, and GlaxoSmithKline, for assistance with education and training of health care professionals.

3.4.2 Infrastructure

The health system is comprised of primary, secondary, and tertiary care. Local health posts as well as health centers and clinics provide primary care. District and regional hospitals provide secondary care. Tertiary hospitals provide tertiary care. The public sector is responsible for the largest percentage of health care facilities across all three tiers. The public sector and nonprofit organizations, such as the Christian Health Association (CHAG), provide facilities across both urban and rural areas while private organizations concentrate facilities in urban areas[21].

The distribution of these health care facilities is inadequate and uneven. Across the 216 districts, 42% have at least one hospital, 11% have less than one, and 47% have none[21]. The shortage of medical facilities is particularly pronounced in the rural areas. The northern region averages .72 hospitals and 8.22 health centers per district while the southern regions such as Greater Accra average 2.33 hospitals per district and 12.17 health centers per district[67]. Lack of investment in human and physical capital in addition to poor infrastructure strengthens the divide results in lower access to health care[21].

In order to address the asymmetric distribution of health facilities, the government has focused on increasing the quality and quantity of the Community-Based Health Planning and Services (CHPs) compounds at the local level. However, the program is not yet scaled or able to support the demand of the rural areas. At the regional level, health centers and clinics similarly fail to reach the high demand for medical services[21].

Equipment and Utilities

Diagnostic equipment, laboratories, pharmacies, and operating theaters are scarce in the rural regions[52]. The World Bank notes that the absence or scarcity of operating theaters in district hospitals, health centers, and clinics is particularly burdensome as emergency patients necessitate a referral to regional or teaching hospitals[21]. Electricity and water needs are generally met in most health facilities though access is much more challenging in the northern, rural districts[21]. The northern region also faces the challenge of fewer beds per hospital. While the region has about .56 per 1,000 population, the Volta regions have about 1.14 per population[67]. The availability of medical equipment is also skewed in favor of the southern areas[21].

4.3 Access to Medicine

Access to medicine in Ghana is high in comparison with the other countries in Sub Saharan Africa. The country has over 2,000 pharmacies and 11,400 chemical sellers[21] that operate in both the private and the public sector to provide 65 tracer medicines at an access rate of more than 85%[72]. In terms of accessibility, however, more than 80% of private pharmacies are located in urban areas where access to medicine is much higher[72]. With respect to affordability, NIHS covers 548 medicines, including 13.1% antibiotics but requires out of pocket payment for preexisting conditions[72]. Quality is maintained by the National Drug Policy, the Standard Treatment Guidelines, Essential Medicine Lists, and Food and Drugs Authority Register. However, quality has yet to be regulated and maintained across the country. A study cited by the Ministry of Health indicates that 91% of antibiotics procured from street venders in the study was substandard while 52%-65% from formal supplies was substandard[72].

3.4.3 Care pathways, Guidelines, and Referral System

The Ministry of Health and the Policy, Planning, Monitoring and Evaluation division design and develop care pathways, protocols, and clinical guidelines for the health system. The care pathway originates in primary care where qualified patients are referred to secondary care. Those who then quality for tertiary care are referred to hospitals for specialized treatment. In practice, lack of access to secondary care allows primary care to

submit a referral straight to the tertiary level. Alternatively, patients will self-select to go to the hospital as the first point of contact with the medical system.

Since 1984, the MoH has published a list of Essential Drugs with Therapeutic Guidelines to ensure quality and consistency across medical care providers[73]. The document is revised as new knowledge and treatments become available. The most current version of the guidelines is 2010 Standardized Treatment Guidelines. The document is published and reviewed by the Ghana National Drugs Program under the MoH.

The protocols and guidelines are implemented, monitored, and enforced by the regional director of health services. The regional directorate liaises with a district management team, led by a district manager, within each region who is responsible for compiling and sharing information from the monitoring and evaluation framework. The district manager works with sub-district management teams and the community level to ensure all information is provided at all levels. The regional director reviews the information provided by each district and conducts site visits to medical facilities periodically.

3.4.4 Procurement and Supply Chain Management

Procurement and supply chain management in Ghana for drugs and medical supplies is guided by the presence of the Procurement Law, Act 663.There is also a National List of Essential Medicines which list out a limited number of medicines which are procured and provided by the government. The body responsible for overseeing this function at the state level is the Supplies, Stores and Drug Management Division at the Ghana Health Service. The division has a procurement and a logistics department that oversees the implementation of the national procurement plan.[5]

The Supply Chain network in Ghana is three tiered. On the top are the Central Medical Stores, included in the Procurement and Supply Directorate of the MoH, that are responsible for receipt, storage, and distribution of all commodities procured by the MoH. The peripheries are supplied by the center's Regional Medical Stores and Service Delivery points. The MoH has a number of parallel supply chains for various types of medicine. The integration of the same is under way. Currently, drugs are purchased through

international competitive bidding (ICB) and from local private suppliers and manufacturers.[6]

At the central level, there are functioning warehousing facilities and distribution networks. Though the hard infrastructure is there, the procurement guidelines and standard protocols have not been widely disseminated. Also a lot many essential medicines are still not included in the NLEM. At the peripheral level, both the hard infrastructure and the reporting standards are poor. There is very little coordination between the center and the periphery. Forecasting mechanism at the hospitals is also weak thereby reducing decision making for quantification of supplies. Thus most of the hospitals rely on internal stock management. Also the rules for engagement with the suppliers are not regularly applied.

A special mention here needs to be made of the cold chain management network which is responsible for distribution of insulin (primary treatment for type 2 diabetes).

The two distribution channels for cold chain medicines supply in Ghana are: public facilities (Expanded Programme for Immunization-EPI, Central Medical Stores and hospital pharmacies) and private facilities (Wholesalers, community pharmacies and hospital pharmacies).

EPI distributes all cold chain medicines procured by the government from the national cold chain room. Then these are transported from here to regional cold chain facilities. The structure is very centralized and distribution in the periphery is demand based and ad hoc.[7]

3.4.5 Innovations

Lack of infrastructure, R&D, financial investment and political commitment has led to a situation where innovations in diabetes care on the international scene have failed to be translated locally.

There are however, some demand side innovative approaches being planned by the MoH. The government intends to use pricing controls to discourage consumption of unhealthy foods; regulate advertising of unhealthy foods and non- alcoholic beverages particularly to children; enact legislation for manufacturers to display food content labels and to manufacture foods that meet defined standards. The composition of various local foods will be studied and published. Guidelines of healthy eating and healthy foods will be published. There will be advocacy to include healthy eating into curricula of various training institutions from the primary level upwards.

On the supply side, the area of public private partnership is being explored. Only recently, 2 new clinics under Novo Nordisk's Base of the Pyramid program have been opened in Ghana. It will act as a model of patient centered innovation with a focus on diabetes care in low and middle income countries like Ghana.

4.1 Monitoring and Evaluation

4.1.1 Data Collection and Analysis

Monitoring and Evaluation Framework

The Ghana Health System adheres to a comprehensive Monitoring and Evaluation Framework that ensures quality control. All agencies and stakeholders, including the MoH Directorates, Agencies, MDAs, Universities, Development Partners, Civil Society and Non-Governmental Organizations, and the Private Sector, are required to use the M&E collection tool to collect information periodically and use that information to make decisions[74]. The information is also submitted to the data repository in the MoH and used to inform decision making and ensure national level objectives are meet. The PPMED at Ghana Health Services is responsible for reviewing and analyzing the data periodically to make decisions.

Integration of External Actors

International donor organizations and NGOs often demand a unique set of evaluation frameworks and indicators. The Monitoring and Evaluation Framework used by the MoH

accounts for the diversity of frameworks by integrating the use of external reports into the national data reporting system. Agencies and stakeholders are able to submit these reports to the national level as part of the data reporting system.

Data Collection System

Data is also collected from local, regional, and national health facilities and input into a national database called the District Health Information Management System (DHIMS II). With respect to quality control, regional level hospitals will provide assistance to local institutions should capacity or electricity present an issue. The government data management office, CHIM, provides training and technical assistance to all institutions to ensure quality data collection and submission. Periodic validation of the tools used to input data is also complemented by the regulatory agencies in the MoH.

4.1.2 Information Technology Infrastructure

Ghana's health system is one of the better equipped health systems in Africa, in terms of Information Technology Infrastructure. A majority of health facilities in the country have basic IT infrastructure that includes computing equipment, multimedia device, imaging and printing system, communication and internet. However, the existing IT systems have not been integrated yet and collaboration between IT systems is lacking. Moreover, the existing systems do not comply with common data standards. The existing ICT infrastructure have not been fully integrated and networked in a manner that will support healthcare services locally or across facilities. The District Health Information Management System is primarily used to capture data, aggregating and generating management reports. It has been deployed nationwide.

The Ministry of Health, Ghana Health Service and the National Health Insurance Service, each have their own ICT units that work in isolation and often data or data-platform sharing is non-existent. Most often each unit uses different operating systems and generates different reporting formats with distinct looking data sets. Therefore a common problem is the inability of interfacing data from one system with data from any other.

Overall, the three units follow the International Classification of Diseases (ICD) in terms of data segmentation but other than this, there is hardly any software level integration[75].

The health system also doesn't use an integrated health management information system (HMIS). However, to report data, there are different programs being used for information management especially for clinical business process and aggregation of data. There are at least 4-5 different software used in the management of hospital operations. These software are used for specific utilities only and don't cover the entire healthcare spectrum even within a facility. Different facilities may differ in utilization of data management program depending on type of care provided. Many components of hospital admissions and processes are captured in paper files manually and the same applies for imaging and diagnostics.

Electronic versions of prescription history are not available and there is no electronic logistics and supply chain management system in place for medicines and non-consumables. Most activities are carried out manually. There are no systems for the generation of electronic medical records. This impacts significantly on the arrangements for referrals and patient management.

The National Health Insurance Service (NHIS) has implemented an ICT infrastructure for the automation of health insurance services[23]. NHIS is pivotal for making financing arrangements for the health care providers under the public health system in Ghana. In NHIS's ICT platform, all care providers have common protocols and processes for patient management and data entry. This is critical for claims management and coordination with care providers. However this ICT system does not support shared devices and/or collaborative interface with other units and is only used as a business processing tool.

One of the big challenges that the public health system faces is the lack of availability of skilled staff to operate the data management and integration process. A mix of clinical and IT skills is required for such jobs but the currently there is a shortage of such skilled personnel. There are skilled IT personnel in Ghana but one of the obstacles to lure them to the integration of IT services in public health is the lack of clarity and coordination among different units on how the an integrated IT system should look like and what are the objectives that the Ministry may want to achieve. The MoH does not have adequate

staff with skill sets who have undergone professional IT training. Also, within the MoH the existing Human Resource establishment post does not have a structure for ICT professionals. There is a lack of capacity building trainings for personnel already working in the system in areas of networking, systems administration, database administration, security, among others[34].

5.1 Demand Generation

5.1.1 Incentives

Excessive out-of-pocket payments are one of the major barriers to seeking healthcare. The implementation of the NHIS in 2004 aimed to remove this barrier by limiting these costs. A cross-sectional study by Kusi et al. evaluating the benefits of the NHIS showed that out of pocket expenditures were significantly lower among insured patients compared to those that were uninsured. Perhaps more importantly, the incidence of catastrophic health expenditures was also significantly lower among the insured (6%) compared to the uninsured (23%)[76].

Currently about 34% of the population is enrolled in the National Health Insurance scheme; 28% of households in Ghana are insured, while an additional 26% are partially insured. The uninsured are most likely to belong to the lower socio-economic quintiles within the country. The most frequent reason cited for non-insurance or partial insurance was the prohibitive cost of contributions (64% and 47% respectively)[77]. The study also showed that those with a perceived poor health status were more likely to be uninsured than those who felt their health was good and this was true across all socio-economic strata.

The services covered by the NHIS include outpatient and inpatient services, investigations relating to these services and any prescribed medications that are listed on the NHIS Medication List. Of note, medical devices such as those used in the monitoring of diabetes are currently not included in the benefits package[78].

5.1.2 Information, Education, and Communication

The main focus areas of health education in the country at present are those related to the Sustainable development Goals. Programs have generally focused on health promotion and awareness with an emphasis on lifestyle. In 2005 the MoH established the Regenerative Health and Nutrition Program (RHNP) which promoted a preventative model of public health, rather than a curative model. This was indirectly associated with chronic disease by focusing on activities that reduce risk, for example, eating more fruits and vegetables, reducing consumption of fatty foods and alcohol. This is an important initiative for chronic disease prevention, but works in isolation from health services provided by the GHS. This program has not been replicated or scaled up[79].

The lay and patient knowledge of major chronic diseases is poor. This lack of knowledge manifests as late presentations at medical facilities, healer-shopping (between biomedicine, ethno-medicine and faith healing) and poor self-care. Individuals gather knowledge on health including diabetes from a number of sources: social (e.g. family and friends), cultural (traditional handed-down knowledge), cross-cultural (through regional and international travel), institutions (pluralistic health professionals, mass media) and self (unique experiences of self in health and disease). These eclectic sources of knowledge inform multiple theories of diabetes which encompass diet (excessive sugar/starch), lifestyle, heredity, physiological disruption, contaminated foods and spiritual disruption (witchcraft and malevolent social actions). Concepts of illness chronicity and incurability differ within cultures in Ghana; some ethnic groups such as the Akan accommodate chronicity, others like the Ga do not. Hence there is a complex and unpredictable relationship between knowledge, beliefs and health seeking behaviors[80].

There needs to be a multifaceted and multi-institutional framework for chronic disease prevention. Structural level strategies include policy, fiscal measures, working with industry and private businesses, and international collaboration for building intellectual, technical and financial capacity through partnerships. In Ghana, the RHNP engages with industry and businesses through annual health fairs and public education via mass media.

Community level interventions include mass media measures of providing public health education via radio, television and newspapers. This is a key area of intervention in Ghana. Articles regarding chronic diseases like cancer, sickle-cell disease, leukemia, diabetes, hypertension and stroke occur in national publications. The local radio stations also tackle chronic diseases on their health programs and present selected information on their websites. Media information is either culled from international media sources or produced by local medical experts. Some experts write their own newspaper columns or host TV and radio shows. A point of concern is the trend of influential herbalists providing incorrect disease information on radio and television as part of their advertising strategy[81].

Radio has wider national coverage than newspapers. Ghana has 84 radio stations and 68.91% of the population listen to radio once a day[82]. But there is little knowledge of what is broadcast on rural radio. To address some of these challenges, the NCDP organized a training workshop for media representatives to increase media awareness, knowledge and reporting of chronic diseases[83].

Voluntary and advocacy organizations can contribute by public education, patient support, and lobbying by special interest groups. These patient advocacy groups have the support of the medical community and exist for diabetes, asthma, cancers, cardiovascular diseases, epilepsy and kidney disease. The organizations differ in structure and operations. The Ghana Diabetes Association provides information and education on diabetes especially through World Diabetes Day events[84].

Institution-based interventions on diet, physical activity and smoking can be undertaken by schools, workplace and churches. Faith-based institutions play an important role in health promotion by facilitating mass health walks, screening and health expert talks on public health issues. Since an estimated 65% of Ghana's population is Christian, churches are a main source of information and psychosocial support. The primary health care system also plays a crucial role in disseminating health information by community outreach services. Routine advice is given by doctors and nurses on major risk factors[84].

At the individual level, interventions are mainly behavioral like tobacco cessation, increased physical activity, dietary change and promotion of weight loss. Pharmacological interventions can be prescribed for high risk individuals.

It is not known how these activities have impacted service utilization and clinical indicators. There are currently no studies evaluating the actual impact of these interventions on health seeking behaviors. The impact is measured based on the audience figures. However this does not take into account whether the information is useful to or appropriate for audiences[85]. Assessing the impact of media campaigns, particularly in rural and poorer areas is difficult to achieve. The content of messaging is often influenced by funding. Concurrently running campaigns across different media like television and billboards can make it difficult to assess what information people find most accessible and useful.

Recommendations for disseminating public health information to the masses include regulating its sources. This includes who should be considered an expert to provide information on prevention including its cultural and behavioral dimensions. Journalists must be trained in chronic disease reporting to be more effective.

4. Managing Diabetes

4.1 Stewardship and Governance

Governance

Ghana does not have a specific program targeting diabetes, rather, the policies on diabetes care are housed within the NCDCP established in 1992 by the Ministry of Health. The main aim of the program is to reduce the incidence of NCDs, prevent complications and disability[5]. Over time, a number of strategy papers were developed. The current strategy framework is the "Strategy for the Management, Prevention and Control of Chronic Non-Communicable Diseases in Ghana 2014-2017". In it, a national multi-sectoral steering committee on NCD was established to review the plans to tackle NCDs and monitor their progress. The members of the committee represent a range of sectors from the society, including government ministries, the private sector and civil society. The document also

makes the case for elevating the NCDCP to the level of department within the Public health division, in order to raise its profile and attract higher funding. To improve primary prevention, it pushes for strengthening of regulatory bodies, such as the Food and Drugs Board, and enforcement of legislation, new or existing, around appropriate food labelling and the advertising of sweetened drinks[4].

Whilst the overall responsibility of health care delivery will continue to rest with the MoH, NCD focal persons will be appointed at the regional and district levels.

The NCD strategic plan also places emphasis on health system strengthening. The following areas are singled out[4,6]:

- Health management information systems. The aim is to strengthen the data capture by the Centre for Health Information Management (CHIM) to capture better quality data but also for data to be captured from teaching hospitals, who are currently excluded from the system.
- Surveillance of risk factors for chronic NCDs.
- To coordinate research into the factors contributing to the NCD disease burden in order to inform policy and practice.

Accountability

The NCD policy focuses on the primary prevention, early diagnosis, treatment and palliative and rehabilitative care for NCDs. Given the scope of the NCD policy, its implementation rests on a wide range of actors. Apart from the Ministry of Health, the main actors currently influencing the NCD policy, either directly through formulation or indirectly through the implementation of policy include Ghana Health Service, the National Health Insurance Authority, tertiary health care centers private and other non-governmental healthcare facilities and NHIA. These actors are involved directly in the diagnosis, care provision and palliative/rehabilitative aspect of NCD and therefore diabetes care.

Currently, input from private health care facilities and civil society organizations (CSOs) is limited, though both the NCD Strategic Plan and the Private Health Sector

Development Policy address this issue. Of note, there have been some reported improvements in the communication channels between policy makers at the Ministry and CSOs, in particular the National Diabetes Association, which is affiliated with the International Diabetes Federation[37].

The International Diabetes Federation African Region has developed treatment guidelines for the management of diabetes. However, it is not clear how widely these are adhered to among clinicians. There is a perceived lack of knowledge/expertise with regards to the diagnosis of and treatment of diabetes in the NHIA and a belief that the diagnosis and treatment is not always evidence based[23].

There is a requirement for Doctors and Dentists to participate in ongoing professional development activities and demonstrate this yearly in order to maintain their licensure. This has led to an update of the skills and knowledge base surrounding NCDs in the country[5].

4.2 Financing

The unit responsible for NCD care (including diabetes care), does not currently receive any budgetary allocation from the GoG. Its programmatic support is from development partners and multilaterals (eg. WHO) and large multinational companies (eg. pharmaceutical companies). Because most of these funds are earmarked for specific programs by donors, local direction of programs based on locally determined priorities is severely lacking.

The political support for NCD prevention and care has failed thus far to translate into financial resources needed to execute the NCD policy and strategy.

The NHIS was set up to provide mainly curative services and despite initiation of talks between relevant stakeholders (MoH, GHS, and NHIA) expansion of coverage for preventative visits and screenings has yet to materialize. This has prevented a serious attack on the progress towards decreasing the proportion of diabetics with undiagnosed disease, estimated at some 70%[3], despite the education campaigns by both the GHS and the National Diabetes Association, among others.

Additionally, the NHIS at present does not provide for medical devices, a critical component in long term diabetes care and management. This places undue financial strain on patients and their families to purchase costly glucose monitors and test strips. Patients unable to routinely monitor their blood glucose levels have to rely on visits to their physicians which are irregular and infrequent, leading to poor control of their diabetes and the resultant sequelae.

Ghana has shown commitment to evolving from a supply-side focused, budget driven system to a system focused more on demand-side financing. The introduction of Ghana Diagnosis Related Groups and the capitation scheme paves the way for payment mechanisms that incorporate performance based incentives and encourage more efficient, cost effective preventative care. This is especially important for diabetes and other NCD related care that require control of risk factors for successful mitigation of population level effects.

Finally, as donors phase out funding in the near future policy makers in the Ghanaian health system will have to develop innovative financing mechanisms to enable the maintenance of current care provision and even expand access.

4.3 Planning

With respect to diabetes, a planning assessment was conducted based on the WHO Package of Essential Non-communicable (PEN) Disease Interventions for Primary Health Care in Low-Resource Settings. The package defines a prioritized set of cost-effective interventions for NCD control and emphasizes on NCD integration with the primary healthcare system[86].

The NCDCP is the national program responsible for planning, program implementation, coordination and monitoring of NCDs[5]. They take a public health approach to these activities. They collaborate with the Health Promotion department and the Family Health Directorate to implement programs related to health promotion, breast cancer, and female reproductive cancers. However, the program is said to lack the professional and material capacity to achieve its goals[84].

An integrated approach is used in planning for chronic diseases. NCDs are stated as a current priority for national policy. Following the United Nations High level meeting on NCDs in September 2011, Ghana endorsed the declaration including the adoption of a "whole-of-government and a whole-of-society effort" in tackling national NCD burdens[87]. Diabetes was placed on the priority health intervention list of the Ministry of Health (MoH) under the Medium Term Health Strategy (MTHS) 1997-2001[88].

But Ghana lacks the political will for implementation. There is a significant gap between policy rhetoric and action. Despite discussions on the need for a policy, there is no integrated plan for tackling NCDs (as of 2012). There is no specific program or policy on diabetes control. There are no systematic screening programs for diabetes in place. Local experts believe that chronic diseases are "neglected, constitute low policy priority and receive low interest from development partners"[89]. The National Health Insurance system focusses more on curative than preventive treatment which slows the ability of the system to respond to the NCD demands. Hence the challenge for diabetes lies in early detection.

Priority setting also suffers from a lack of sufficient data. According to Mr. Isaac Adams, Director of RSIM[90]:

"The country cannot and probably will not do anything about the prevalence of diabetes without strong evidence. An expansive study has not yet been conducted to understand the scale or scope of the situation."

There is a need for population based studies to estimate the indirect costs of non-communicable diseases on households, for example. Action oriented research looking into implementation, operations, evaluation and impact as well as qualitative and ethnographic studies to look into the cultural context must be undertaken[28].

The Diabetes program is embedded within the national NCD program. Hence the funds are not allocated specifically for the disease and rather must come from the general pool. Donors often provide funding for vertical programming that requires agencies to earmark donations for specific programs. Historically, these programs include maternal and child health and infectious diseases. Ghana's transition from a developing to a low and middle

income country exacerbated the emphasis on vertical programming by pulling donor funding out of the general pool and into vertical programs.

4.4 Service Delivery

The increasing prevalence of diabetes across the country places a large burden on the service delivery sector to respond. Despite the initiatives outlined in the 2014, Non Communicable Disease (NCD) Strategic Plan, the majority of the urban population and the rural populations remain without access to diabetes diagnostic or follow-up care. Wellness clinics have not been constructed and strategically placed to screen persons for body mass index, blood pressure, blood glucose, cholesterol and triglycerides. The lack of clinic access, screening equipment, and health workers who understand how to diagnose and treat diabetes remain particularly apparent in rural areas.

With respect to diagnosis, Ghana adheres to the Standardized Treatment Guideline to diagnose and treat diabetes. However, no guideline or incentive structure has been created to ensure consistent diabetes screening across the country. In addition, training facilities, particularly those under the CPHS programme, emphasize the diagnosis and treatment of visible, communicable diseases such as malaria, TB, and HIV/AIDS instead of those that are less visible. NCDs are often overlooked due to their lack of visibility as well as their latent presentation. The prevalence of program specific funding for communicable diseases such as HIV/AIDS also leads to disproportionate training on communicable diseases fewer opportunities to focus on non-communicable diseases. The NCD Strategic Plan identifies the need to reform training initiatives to treat multi-morbidities during one appoint, however, rhetoric has yet to translate into practice.

Upon diagnosis, the difficulty of accessing and affording a consistent supply of insulin coupled with insufficient understanding of the disease allows diagnosed patients to go untreated. The NHIS only covers about 40% of the population so those without NHIS coverage encounter financial barriers to treatment[23]. Moreover, the NHIS suggests that,

although select medical treatments, including periodic insulin, are paid for and prescribed for refill every two months, patients are often unable to follow the treatment guidelines due to under-education of how to treat their illness, ability to access pharmacy periodically, or the provision of medication to others[23]. The NCD Strategic Plan identifies the need to consult patients and support compliance but anecdotal evidence from the NHIS and the GHS suggests that these efforts have not yet created behavior change.

Lack of monitoring compliance within health facilities is another obstacle to delivering diabetes care. Corruption within the healthcare system can result in clinical staff charging patients for diabetes diagnosis or treatment that is covered under NHIS. Although a feedback channel exists for patients with in the NHIS, accountability for these health clinics is not provided.

The NCD Strategic Plan also acknowledges the need to strengthen rehabilitative and palliative care. However, rehabilitative and palliative care remain inaccessible and of poor quality. NHIS does not cover the cost of rehabilitative care or prosthetic care. Despite the fact that a significant number of prosthetic patients result from diabetes, these patients are often unable to access prosthetics. The out-of-pocket cost of a prosthetic, roughly 12,200 cedi, is prohibitive to the gross majority of the population (Koha, Moses). In addition, the scarcity of prosthetic clinics, namely one functioning location in Accra, Ghana and one semi-functioning location in Nsawam, prohibits patients from being able to access the care without significant transportation barriers. Once at the clinic, patients may then need to wait for months in order to receive a prosthetic. The wait time is the result of the lack of procurement of prosthetics by the government. The prosthetic clinic, including the equipment, input materials to build a leg or an arm, and the tools, is reliant on non-governmental organizations exclusively. With respect to service providers, the country is reliant upon only a handful of prosthetic providers and technicians who are challenged to work with inadequate and limited materials.

4.5 Monitoring and Evaluation

At the base level, the government has yet to conduct an assessment of the prevalence of diabetes in the country. As a result, the country does not have a clear understanding of

the gravity of the situation and is unable to assess the significance of fluctuations in surveillance data.

With respect to monitoring and evaluation, the need for strengthened surveillance system for diabetes is identified in the NCD Strategic Plan. A call for adherence to the International Classification of Diseases and the monitoring of risk factors is proposed. Although progress has been made to strengthen monitoring, diabetes is not yet properly monitored across the country. Within the DHIMS II system, diabetes morbidities are now listed and disaggregated by gender and age. However, geographic distribution as well as prevalence and incidence are unknown. Notably, data collected from the DHIMS II system excludes private sector information and data from teaching hospitals. Due to the fact that diagnostic rate may be under-reported and the private sector and teaching hospitals may see a significant number of diabetic patients, the estimate is considered to be on the lower end of the spectrum.

An overarching need for monitoring and evaluation of the health systems response to NCDs is also proposed in the NCD Strategic Plan. However, although a comprehensive plan of action is outlined, the plan has yet to result in health system NCD monitoring.

4.6 Demand Generation

Demand Generation for NCD Services

There is no specific diabetes program, rather, the policies on diabetes care are housed within the Non-Communicable Disease Control and Prevention Programme (NCDCP) established in 1992. The main aim of the program is to reduce the incidence of NCDs, prevent complications and disability[5]. Over time, a number of strategy papers were developed. The current strategy framework is the “Strategy for the Management, Prevention and Control of Chronic Non- Communicable Diseases in Ghana 2013-2017” In it, a national multi-sectorial steering committee on NCD was established. Its role is to review the plans to tackle NCDs and monitor their progress. The members of the committee will represent a range of sectors from the society, including government ministries, the private sector and civil society. (NCD strategic plan) The document also elevates the NCDCP to the level of department within the Public health division, in order

to raise its profile and attract higher funding. To improve primary prevention, regulatory bodies, such as the Food and Drugs Board, would be strengthened while legislation, new or existing, would be enforced to around appropriate food labelling and the advertising of sweetened drinks.

The main strategies to increase demand for healthcare services center primarily around public education on the available services, expanding the services, and increasing access to these services by expanding the coverage of the NHIS. Similarly, primary prevention strategies, apart from the legislative function of regulatory bodies, focus on public health education and promotion approaches[4].

Current approaches to educating the public about diabetes is via media, particularly television at the national level and radio at the local level. Ghana has a strong chronic disease media coverage. There are also intermittent campaigns and screening programs organized by non-governmental organizations and patient advocacy groups. These are often funded, at least in part, by commercial companies including drug companies. These activities are not necessarily coordinated with other public health campaigns.

5. Summary of Findings

5.1 Findings & Analysis

Need for Diabetes Management Strategy

The burden of NCDs is recognized and identified to be a priority area. However weak political will means there is a significant gap between policy rhetoric and action. There is no integrated plan or policy to tackle NCDs at the National Level. NCDCP was formed in 1992 to prioritize NCD control, however, there is no clear outline on what the national level plan for the control of onset of NCDs is. There has been a continuous thought on how an NCD control strategy should look like, however, there is no concerted effort to bring all stakeholders together and carve out a comprehensive national level strategy for NCD control.

Rethinking Service Delivery

Like many other developing countries, Ghana's Population is going through an epidemiological transition and therefore the health system - designed to control infectious diseases - needs to adopt to manage chronic condition. Some key challenges that the health system faces are:

- *Limited access to clinical care*: The majority of the population is unable to access diabetes care. Although select centers in urban regions have the human resources and equipment to diagnose and treat diabetes, populations in the rural regions have limited access to these areas.
- *Low human resource capacity*: Health workers, from those who operate inside the CHPS system to those who graduate from medical universities, are conditioned to focus on the immediate burden of communicable diseases. A broader understanding of the rising prevalence disease as well as how to diagnose and treat the disease is needed.
- *Need for increased patient education upon treatment*: Upon diagnosis, patients often do not follow treatment guidelines for several reasons including under-education of their illness, how to treat it, and the financial requirements necessary to treat the disease.
- *Inaccessible rehabilitative and palliative care*: Rehabilitative and palliative care are inaccessible financially and physically for the majority of the population. The NHIS does not cover the cost of these services, including prosthetic care. With an out of pocket cost of roughly 12,2000 cedi per limb, a single, functioning clinic that provides care, and a waiting time of up to six months per limb, diabetic patients who incur an amputation are placed at high risk for immobility.
- *Lack of health clinic accountability*: Despite regulations guiding pharmaceutical provision, hospitals that make a profit on diagnostic treatment have a dis-incentive to provide treatment at limited or no cost to the patient. Hospitals who do not make profit from diagnostic services are also susceptible to corruption within the healthcare system. Corruption within the system can result in clinical staff charging patients for diabetes diagnosis or treatment that is covered under NHIS. Limited monitoring and accountability focus on this issue.

Capacity building for Implementation of the Monitoring and Evaluation Plan

The government has put together a plan of action for effective monitoring and evaluation of its health services. However, the problem is the implementation of the plan due to the following reasons;

- *No baseline data*: The government has yet to conduct an assessment of the prevalence of diabetes in the country. As a result, the country does not have a clear understanding of the gravity of the situation and is unable to assess the significance of fluctuations in surveillance data.
- *Limited diabetes surveillance data*: Despite the call to action to better monitor diabetes in the 2014 NCD Strategy document, diabetes is not properly monitored across the country. The geographic and demographic distribution of the disease is unknown. Data is collected across demographics on the mortality rates, however, the data excludes private sector information and teaching hospital data.
- *Strong NCD Plan of Action*: The MoH created a monitoring framework, the NCD Plan of Action, to respond to the prevalence of NCDs. Although the indicators have not yet been reached, the framework is a useful tool to create accountability and measure results.

Improved Private Sector Engagement

The private health sector is a major player in terms of health service provision in Ghana. According to an estimate they could be providing about 55% of healthcare services in the country[49]. Currently the dialogue with the private sector is sparse and irregular. While the public health system may function in isolation from the private sector, management and control of diabetes will require private sector involvement as patients will need not just medical care but also access to specialized commodities and services that the private sector already provides. These may include, specialized food products, glucose monitoring equipment, services and avenues for increased physical activity, technology for blood sugar tracking etc.

Technology Integration

Increasing incidence of chronic diseases like diabetes will result in need for long term management of chronic diseases. Moreover, for prevention, early diagnosis and management of diabetes in rural areas, increased impetus on care and treatment maintenance will be required at the community level. Health care providers who are currently trained for infectious diseases and maternal and child care will need training in supporting care providers to manage chronic conditions and on tools they need to access and share relevant health information. Geographical disparities and limited human resources mean that reliance on technology to efficiently deliver care will increase. An integrated technological approach can have a huge impact on how treatment decisions are made and the outcome of individual encounter with health facilities. The growing need to capture data on health and health events using faster and efficient means to enable prompt evidence-based decision-making is making the use of mobile phones for health an alternative to traditional paper means of data capture. However, the rate at which technology is changing is huge. Diagnostic equipment now comes with monitoring, feedback, information and communication elements. These new innovations can increase savings and improve the overall quality of care for patients and better feedback mechanism for care providers. Moreover, it provides enormous opportunities for research and knowledge management for health care professionals reducing poor communication which is often associated with inefficiencies in the health sector.

5.2 Lessons Learned

Ghana provides a strong example lower-middle income country grappling with the double burden of disease. Although the challenges and opportunities outlined below may be specific to the local context, the underlying lessons transcend borders and may be applicable to similar countries across the continent.

5.2.1 Challenges

- One of the biggest challenge for the health system is the increasing burden of diabetes and other comorbidities. Increasing prevalence of risk factors, importantly also increasing among children. This will put an unprecedented burden on the health system as it will have to tackle both the unfinished agenda as well as the onset of chronic conditions.
- Ghana is also facing the challenge of decreased funding due its new found status of a middle income country. This has resulted in decreasing Foreign Direct Assistance from donors as well as multilateral agencies. There is an increased tendency for vertical programs rather than health system strengthening programs that can support sustainable capacity building of the health system.
- There is also a low desire among local policy analysts (from MoH) for vertical program dedicated to diabetes. Given the complex structures within the MoH and the Ghana Health Service, there is an increased push for more horizontal/health system strengthening approaches due to distortions in health sector, prioritization, and distribution of human resources for health, and healthcare provisions that resulted from prior and existing vertical programs. This prevents prioritizing diabetes specific programs.
- Prevalence of vertical programming: Strength of Malaria, HIV, AIDS programming a result of strong donor support. With resultant distortionary effects on national priorities and health budgets
- Underutilized Health Information Management System: Nationwide health information management system (District Health Information Management System—DHIMS II) with remarkable potential to detect trends, perform needs assessment, monitor and evaluate various aspects of response. Unfortunately, due to structure of Ghanaian health system, public teaching hospitals are not under Ghana Health Service and as such do not report data to DHIMS. Similarly, private providers can choose to but are not required. Also note lack of data collected on sequelae of diabetes to allow for proper characterization of diabetic burden
- Moreover there are some diabetes specific challenges that arise from a combination of factors. Those are - absence of national treatment guidelines, shortage of specialists, inequities in access, diagnostic capabilities, treatment options, and low adherence to treatment.

5.2.2 Opportunities

- There is an increased awareness of key stakeholders of current and future magnitude of problem and most of them realize both the disease burden and the health sector opportunities that will arise due to that burden. This is a good opportunity for the MoH to form partnerships and look forward to increased collaboration among stakeholders.
- The civil society understands the magnitude of the problem and is increasingly advocating for sensitization of the public through media campaigns (radio and TV) and free screenings. This should provide a good support system to the MoH in its endeavors to promote education about diabetes treatment and nutrition. Additionally, changing cultural perceptions about body image and health (Duda, 2006) indicate societal interest in reducing obesity and other lifestyle risk factors. This should provide a good basis for public health messaging and awareness among the population.
- Ghana has had a strong NCD plan of action since 1992. This indicates efficacy of the health system to identify and prioritize the areas that need attention. It could be expected that the MoH will invest in making that plan of action stronger and devise a diabetes specific strategy.
- Ghana has an advanced HMIS compared to many African countries. However disintegrated and underutilized, the District Health Information Management System can be used to capture preventative, service output and outcomes data in all facilities for improved surveillance. Also an integrated HMIS can be utilized for big data analysis on behavioral indicators, once completely functional.
- To channelize funding and improve concerted efforts on diabetes the MoH could contemplate potentially integrating Regenerative Health and Nutritional Program with NCDCP. This could lead to better utilization of increase funding and efficiency through decrease in duplicative functions and programs

5.3 Recommendations

- There is a need for a strategic plan of action that spells out more specifically the approach to tackling the rising burden of diabetes in Ghana. This can be initiated through the multisectoral committee. The policy should include:
    - a diabetes control framework
    - objectives and achievable targets
    - stakeholders analysis
    - financial commitment
    - personnel and teams
    - System assessment
    - Capacity building
- Capacity building of personnel and systems strengthening for better coordination of surveillance activities is needed to effectively implement the monitoring and evaluation framework. Data collected by the MoH should be integrated with the data available to the private sector. Since the private sector treats a large proportion of its patients for non-communicable diseases, the MoH could collaborate in building a robust monitoring and evaluation plan and implement it from learnings coming from the data provided by the private sector.
- A diabetes control policy should consider active collaboration with the private sector as the costs of managing diabetes may be much higher than of infectious diseases and early partnership with private sector may help drive down those costs. An assessment carried out by Results for Development in 2010 found that there were a number of areas that needed strengthening in order for the private healthcare sector to reach its maximum potential. Whilst there is a dialogue between GHS and CHAG, for example, it is limited and there is not much collaboration. In particular, a need to strengthen the private sector's representation and participation in the national policy making process.
- Research and development: At the base level, the government has yet to conduct an assessment of the prevalence of diabetes in the country. In order to understand the problem and how to effectively deal with the problem, local stakeholders believe

Ghana needs to conduct a baseline survey[90]. After the assessment, decisions can be made concerning how best to design, implement, and evaluation the program.

- Technologies for health targeted toward the management of NCDs will be very different from how health systems have adopted monitoring and treatment technologies for infectious diseases. The most successful health systems will be those that either prevent the onset of NCDs or diagnose early and prevent complications and co-morbidities arising from any NCD. The health system will have to look at technologies from a different point of view with a focus on integrated technology platforms which have the following functions in synchronization to manage NCDs and diabetes in particular:
    - Informing and educating populations (health and nutrition literacy)
    - Improving early diagnosis
    - Communication with care providers within the health system
    - Review and feedback to the care providers
    - Peer support and community engagement
    - Monitoring and compliance
    - Treatment of complications and co-morbidities
- Other recommendations include
    - Increased visibility and political sponsorship of NCD control program
    - Provision of resources to enable NCDCP implement its strategy framework
    - Integrating NCD detection and treatment coverage into NHIS benefits package
    - Demand and supply incentives to increase primary care utilization
    - Introduction of structured health screenings into primary care guidelines
    - Refinement of resource allocation criteria to incorporate disease burden
    - Development of national treatment protocols
    - Formalizing reporting requirements for all providers
    - National policy and operationalization of public health interventions targeting the risk factors for diabetes (and other NCDs) particularly to reduce their incidence in children

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