

Household burden of chronic non-communicable disease in Ghana: Rural – urban dichotomy

Abstract

Economic improvement and rapid urbanization and the accompanied behavioural change have resulted in improved life expectancy in developing societies. The resultant socio-demographic, economic and epidemiological transition had resulted in a marked increasing prevalence of non-communicable diseases (NCDs) in the Global South. Using nationally representative survey (World Health Survey Ghana 2003) covering 3,808 households, this paper assess the burdens of chronic NCDs on the Ghanaian households as they manifest in rural and urban areas within a context of a paradigm shift in health policy in the country. Employing both descriptive and analytical framework, the result argues that there is no statistically significant difference in direct burden but in indirect burden. Health policy reform with focus on NCDs would avert the high burden and the vicious cycle of poverty.

Key words: chronic disease; non-communicable disease; burden of disease; rural-urban; health policy; Ghana.

Introduction

The Global Burden of Disease (GBD) projected that by the year 2020, the proportion of the overall burden of non-communicable disease in sub-Saharan Africa will increase to between 26 percent and 34 percent, and among the population aged 15-59 years to between 37 percent and 42 percent (Murray, C. and Lopez, A. Eds., 1996, and Lopez, et al., 2006). This phenomenon of increasing prevalence of NCDs in developing countries is largely attributed to economic

development and rapid urbanisation and the resultant behavioural change and epidemiological transition in most developing societies.

It had been identified that some conditions such as hypertension and diabetes, age specific rates are likely to increase with urbanisation (Economist, 1997 and Kuafman et al. 1999). Increasing rate of obesity, a major risk factor to NCDs such as type 2 diabetes, cardiovascular diseases in developing countries such as Ghana are linked to urbanization, modernization, affluence and changing lifestyles - particularly sedentary occupations and consumption of a wider diversity of local and foreign foods rich in high complex fat contain (Agyei-Mensah et al., 2007, WHO/FAO, 2003, Amoah, 2003a, 2003b, Levine, 1999).

This paper assesses whether the burden of non-fatal outcome of chronic disease (directly and indirectly) differed significantly by geographical area. Secondly, how the burden of disease on the household is management by geographical area. This is measured in terms of direct cost of treatment and other health products. Management of these cost as an indirect burden of disease on the household is also assessed using the financial source used by the household to finance household health expenditure.

In Ghana, clinical manifestations of some NCDs, including diabetes, hypertension, cardiovascular diseases and metabolic syndromes associated with overweight and obesity have been increasing in the adult population over the past two decades or so (Amuna 2006, Amoah 2005). Other conditions like chronic obstructive pulmonary disease, epilepsy, and mental illness are some of the important, chronic NCDs that also pose significant challenges in terms of management and follow-up.

Non-communicable disease burden on Ghana

The burden of non-fatal outcome of NCDs in Ghana can be assessed at the national and the household level using both micro and macro statistics. Cost of treating and managing NCDs forms a burden on household income and resources. This burden has become significant in the midst of a paradigm shift in national health policies. The shift from free health care delivery service to full cost recovery in 1983 in Ghana aggravated the burden of disease on the household in terms of direct cost of treatment. The reductions of public spending on health care and the introduction of user fees have created problems of inaccessibility and inequity in health care (Asenso-Okyere et al., 1998).

Studies indicates that Ghana like most countries in the Global South is experiencing epidemiological transition with increasing prevalence of NCDs and its associated significant burden of disease on the society (Agyei-Mensah and de-Graft Aikins, 2007; Badasu, 2007; 2001). Type 2 diabetes is now emerging as the new pandemic in the 21st century and is estimated that there are 150 million people with the condition worldwide, with the number expected to double by 2025. The prevalence of type 2 diabetes has increase in urban areas in sub-Saharan Africa in the last decade (Unwin, et al. 2001).

Diabetes, one of the common NCDs in Ghana and one of the disease conditions of the study have shown an increase in cost of control and treatment over the years. Based on statistics and patient account report from the Korle Bu Teaching Hospital, the cost of diabetes care in Ghana, 2001 and 2007 shows an increase. In 2001, controlling one case of diabetes a month cost between \$15.00 and \$35.00 and dialysis per person per month is \$750.00 (Teprey, 2001). de-Graft Aikins, 2003, in a study in rural Nkroranza indicates that the monthly cost of insulin in 2001 was

between GH¢6.0 (\$6.60) and GH¢9 (\$10.00). This constituted between 40 percent and 60 percent of monthly income of the average farmer. In an unpublished study (Amoateng et al, 2007), the cost of controlling one case of diabetes per month in 2007 was between GH¢100.00 (\$106.33) and GH¢600.00 (\$638.33).

Comparatively, the mean for the two years: 2001 and 2007 indicates an increase from \$300.00 to \$4,468.00 representing an increase of 1,389.33 percent for controlling one case of diabetes a year. The increasing cost of controlling NCDs is not commensurate with increase in household income. The national minimum daily wage has increased from \$1.20 to \$2.00 representing an increase of 66.67 percent. This is a clear evidence of the burden of NCDs on the Ghanaian household. With the increasing treatment cost and prolonged treatment of NCDs, household with member(s) living with NCD will continue to be under this burden of disease.

There is loss of healthy life due to the challenges posed by illness conditions. Bosu, (2007) in a study found that 17,500 days of healthy life was lost through sickle cell disease, 10, 400 days to cardiovascular disease and 5,100 days to hypertension. The relatively high cost of treating and controlling NCDs also pose a burden to the household. With the average income of people with chronic illness noted to be considerably lower than that of healthy people (Heijmans, et al, 2004, van Agt, et al 200) is evidence that households with chronically ill members are in a relatively disadvantaged situation.

Such situations often result in high dependence on family members and friends for financial support to finance health care expenditure (de-Graft Aikins, 2005; 2007). The dependence on family members and friends can determine the type of treatment and continuity of the treatment regime, as it may not be reliable, effective and adequate.

Non-communicable diseases are noted to cause biographical disruptions with direct and indirect burdens. In a study in Ghana, diabetes one of the NCDs and a common condition in Ghana was identified to caused disruption to: body-self, social identity, family/social relationships, economic circumstance and nutrition (de-Graft Aikins, 2007; 2006; 2003).

Conceptually, this paper stems on two theoretical concepts - Suhreke et al. (2006) Cost of Illness (COI) and Bury's (1982) Biographical disruption. The COI study separated the cost of illness into three components namely direct, indirect and intangible costs. Direct costs are the cost of medical care in relation to prevention, diagnosis and treatment of disease. They include costs such as ambulances, inpatient or outpatient care, rehabilitation, community health services and medication. Of all the cost components, this is the least controversial measurement (which is far from saying there are no problems involved).

Indirect costs seek to measure the loss of human resources caused by morbidity or premature death. The measurement of indirect costs is a matter of much debate. Some COI studies consider the loss of future earnings (the human-capital approach) and thereby restrict the estimate to the working population. Others use the much broader willingness-to-pay method, which assesses what people are willing to pay for relatively small changes in the risk of death. From these figures, which are not restricted to the working population, one can derive the value that people assign to life. Intangible costs capture the psychological dimensions of illness including pain, bereavement, anxiety and suffering. This is the cost category that is typically the hardest to measure.

The other concept employed is Bury's (1982) concept of 'biographical disruption'. This refers to the disturbance that a chronic illness causes to the biophysical body and the interruption of the life trajectory of the sufferer as well as the meanings ascribed to such disruptions. Through such

destabilisation, chronic illnesses reshape life circumstances and social relationships. The focus of these negative effects is at the level of the individual and related to economic activities, social interactions and relationships.

In addition, a person's inability to perform everyday tasks including self-care (Radley, 1994) creates psychological strain, which can lead to social isolation. Strauss (1975) describes the way individuals strategically withdraw from social interaction precipitated by disease condition. But individuals are members of households, and households are organized in a way that aggregates both contributions and needs across members. Households that include people with chronic illness must rebalance contributions to account illness-related changes in employment, and redistribute resources relative to increased needs of members with NCDs.

Socio-economic development, rapid urbanisation, and epidemiological transition have resulted in an increase trend in the prevalence rate of NCDs in many SSA countries. In recent periods, government budget allocation to the health sector has seen a decline (PPME, 2008) and the increase cost of health care services and products have become a major component of household budget. In the midst of a paradigm change in Ghana's health policy that shifts healthcare costs to persons and households, this paper explore the following research questions: to what extent is the direct burdens of NCDs on the household in terms of financial cost of healthcare services and products differ by geographical area? How is this burden on the households managed spatially?

Data and methodology

Data are drawn from the World Health Survey (WHS) conducted under the World Health Organisation (WHO) in Ghana in 2003. The WHS is a multi-country survey implemented in 70 countries including Ghana. The data focused on three areas of health: the health status of the

population and related health risks, the responsiveness of the health system to peoples' expectations, and out-of-pocket health expenses that must be borne by households.

The national survey in Ghana included 5,662 households from all ten administrative regions, sampled without replacement using a stratified sampling frame based on primary sampling unit, secondary sampling unit, tertiary sampling unit and quaternary sampling unit. At each household, one person was interviewed, which yielded 4,005 individuals from the general population aged 18 years or older. Respondents per household were selected through a random selection procedure using the Kish table method. The response rates were 73 percent for households and 97 percent for individuals.

The World Health Survey comprises two parallel surveys, household and individual survey using standard survey instruments. Variables are from both surveys, with the household survey administered to head of household or adult household member 18 years or older providing the information used to assess the direct and indirect burden of illness. This information includes household health care expenditure for the last four weeks preceding the survey, household member institution of care due to ill health, and household member needing home based care.

Individual socio-demographic characteristics are drawn from the individual survey instrument administered to eligible household members aged 18 years or older. Information reported by respondent on their chronic disease condition was used to stratify the households into households with respondent currently living with or without an NCD. Respondents classified as currently living with an NCDs are those who received treatment, medication or any therapy during the two weeks immediately preceding the survey for a non-communicable disease condition. The health

cost component is computed from household health care expenditures for the last four weeks preceding the survey.

There are two measures of the household burden of chronic disease. The first measure is of the direct cost of health care services and includes. The cost of treatment and use of other health care services and products is defined as:

$$H = x_1 + x_2 + x_3 + . . . + x_n,$$

Where H is direct burden, or the sum of household healthcare expenditures,

$x_1 - x_n$ are the costs of overnight stays in a hospital or health facility; care that did not require overnight stay; care by traditional or alternative healers; dentists; medication or drugs; health care products such as prescription glasses, hearing aids, prosthetic devices, etc.; diagnostic and laboratory test such as X-rays or blood test; and any other health care products or services that were not included above. Analysis of Variance (ANOVA) was used to assess the mean differentials between households with respondents currently living with NCDs and households with respondents currently not living with an NCD. F-tests were used to assess the relationships between household health expenditures and non-communicable disease status.

Household indirect burden of disease is referenced by the management of illness conditions. It is measured here with the information collected with the household instrument on the main financial source used by households to finance health care expenditure in the last 12 months.

Result and discussions

Background characteristics of respondents

Non-communicable diseases considered are: osteoarthritis (arthritis), angina (also called angina pectoris or ischaemic heart diseases), asthma, diabetes and two mental health conditions - depression and schizophrenia (psychosis). A total of 665 respondents, representing about 18 percent of the total 3,808 respondents have ever been diagnosed with at least one NCDs condition. To measure the burden of NCDs on the household effectively, respondents are classified as currently living with NCDs if they received treatment, medication or any therapy during the two weeks immediately preceding the survey for a non-communicable disease condition. Respondents who received treatment or any other therapy for NCDs conditions two weeks preceding the survey numbered 306. This represent 8 percent of the total respondents and 46 percent of respondents ever diagnosed with at least one disease condition.

The distribution of the respondents indicates that more than a halve (58.2 percent) of the respondent are residing in rural areas and females constitute 62.1 percent of the respondents. There is a normal distribution of age as the mean age approximate the media age (50.57 and 51.00) respectively with age ranging from 18 to 107 years.

Table 1 presents the summary distribution of respondents by background characteristics and type of place of residence. Marital status, educational attainment, working status, and household income quintile are respondent background characteristics that show statistically significant association between NCD status and type of residence at alpha level of 0.05. Presented in Table 1, the result revealed that sexes of respondent, age, marital status, working status are statistically significant associated with NCD status in urban setting. However, in rural setting, age, marital

status, working status and wealth are the statistically significant indicators of NCD. Prevalence of NCDs is relatively higher among female respondents in both rural and urban settings. The distribution by age reveals that advancing age is associated with increasing prevalence of NCDs. The age effect is more pronounced at age 50 years and above (Table 1). Prevalence of NCDs is high among currently married/cohabiting and separated/divorce/widowed in both urban and rural settings, likewise among non-working individuals. Though statistically, there was no association between household wealth and NCD in urban settings as in the case in rural settings, as household wealth improved, the prevalence of NCDs increases.

.....Table 1 Summary of socio-demographic characteristics of respondents by NCDs status

The distribution of respondents by the disease condition (Table 2) indicates that more than one in ten respondents reported currently living with more than one NCD. This can be attributed to the share common risk factor associated with NCDs. The frequently mentioned by NCD was arthritis (52 percent) followed by angina (23 percent), asthma (18 percent), diabetes (9 percent), schizophrenia (6 percent), and depression (4 percent). The result revealed that in terms of rural-urban distribution, the most mentioned disease condition is arthritis (49.4% for urban and 55.4% for rural). Angina, diabetes and schizophrenia were disease conditions with relatively higher prevalence among urban respondents as compared to their rural counterparts.

.....Table 2 Distribution of respondents by NCDs condition

Direct burden of non-communicable disease on the household

With the shift in health care cost from public to individual and household through the introduction of health care cost recovery and the lack of national policies at the tertiary level on the treatment of NCDs (Badasu, 2007), the burden of disease especially NCDs has impacted

greatly on the household. The burden is aggravated with the absence of a National Health Insurance Scheme (NHIS) before 2004 and effective health policy to effectively finance household health expenditure especially chronic non-communicable diseases at the household level.

Direct burden of disease was estimated based on the aggregated costs from health care services and products incur by household during the last four weeks preceding the survey. The health care service and products including overnight stays in a hospital or health facility; care by doctors, nurses or trained midwives that did not require an overnight stay; care by traditional or alternative healers; dentist; medication or drugs; diagnostic and laboratory tests such as X-rays or blood test; other health care products and any other health care services.

About a quarter (23.89 percent) of the households with respondent currently living with NCD did not incur any cost or report health care cost during last four weeks preceding the survey. The mean household health care expenditure among the households with respondents currently living with NCD that incur health care cost was GH¢14.84, with a median of GH¢5.00 and a range GH¢201.15.¹

Comparing the mean household health care expenditure between urban and rural household shows no statistically significant difference (p-value of 0.577). The mean household health care expenditure for urban households with respondent living with NCD was GH¢16.10, 15.36 percent higher than their rural counterpart (GH¢13.96). Due to the positively (3.881) skewed nature of the distribution of the household health care expenditure, the median of the two geographical areas were compared. Half of households with respondents living with NCD in

¹ Computation is based on household healthcare expenditure in the last four weeks preceding the survey. National minimum daily wage 2003 = GH¢ 0.92. Bank of Ghana exchange rate as at December 2003: GH¢1=US\$0.8845.

urban area spent more than GH¢5.00, while half their counterpart in the rural area spent GH¢4.00, which is 25 percent less than that of urban households.

Health loss is associated with ill health conditions especially chronically ill NCDs patients and often also affect their financial situation. The relatively lower average income of ill population compared to healthy persons (Rijkan and Groenewegen, 2008, Heijmans, et al., 2005; van Agt, Stronks, and Mackenbach, 2000) and the biographical disruption, body-self, and social withdrawal (Barry, 1982; de-Graft Aikins, 2007; 2006; 2003) put a strain of double burden on the household.

There is no significant difference in direct burden of disease between urban and rural households with respondents currently living with NCD as total household health care expenditure between the two groups shows no statistically significant difference. Chronic illness are accompanied by additional cost, for instance direct costs of health care utilization, technical aids and domestic care, and also indirect costs or so-called 'hidden costs' (de Judicibus and McCabe, 2005; Heijmans et al., 2005).

Management of household burden of disease

Increasing health care cost and decline in Government budget allocation to health put the direct burden (cost of treatment and services) on the household. According to the Ministry of Health (MoH) Ghana, the percentage of the Government of Ghana (GoG) budget spent on health declined by 39 percent in 2003 (the year of the World Health Survey was conducted in Ghana) (PPME, 2008). In the midst of the shift in health care financing from the mainly public sector to the individual and the household, cost of treating and managing illnesses, especially chronic and NCDs.

The household survey collected information on the main financial source used by the household to finance health care during the 12 months preceding the survey. This is used to estimate the indirect burden of disease on the household. Increasing health care cost in the country means no single source can adequately meet the health care cost of the household. More than two in every five households with member living with NCDs use more than a single source to finance household health care expenditure.

Current income of household is the commonest mentioned financial source (Table 3) followed by support from family member, borrowing from someone other than friends and family members and savings in the bank. This situation of high dependency on economic and social determinant sources to finance health care rather health insurance schemes could result in psychosocial burden of illness on the household. This is because households have to continuously look for sources to finance household health care.

Depending on current household income in a midst of any economic recession will mean loss of income as well savings. Borrowing and depending on family members who may also be financially insecure is noted to cause family tension and frictions (de-Graft Aikins, 2007). The psychological burden on the infected person and affected persons of not having a reliable means to finance their health care becomes an intangible indirect burden of disease, which often not measured due to difficulties.

While urban household depend more on savings in the bank, rural households relies more on social ties and networks such as family members and friends and borrowing to finance household health care. These differentials can be attributed partly to differences in economic activity in the two geographical spaces. Urban economy is mostly formal while rural is informal and mostly

agrarian in nature. There exists high level of social ties in most rural communities compared to urbanised communities which allows rural households to depend on social ties and institutions to widen and access resources (Berry, 1989; Bebbington, and Perreault, 1999).

.....Table 3 Financial sources of household health care expenditure by type of place of residence

Conclusion

The relatively low direct cost of illness in the Global South compared to the developed regions is partly linked to the lack of medical options which tend to be associated with a significant increase in indirect costs (World Bank Report 2007). The implication on NCDs management cannot be over emphasis. Financial resource and its availability in the rural areas are closely related to rural economy dominated by seasonal agriculture, which have, becomes expressed in terms of money (UNPD, 2007). This has necessitated the high usage of financial resource from sales of household assets; borrowing from someone other than a friend or family; and family members or friends outside the household. This is comparable with the finding of de-Graft Aikins (2003; 2005) in a rural-urban study in Ghana on diabetes experiences indicates that many poor rural diabetes patients often relied on financial support from immediate and distant family members.

The financial situations of chronically ill persons have been described as vulnerable, like their health as they have lower income and higher illness-related cost than the general population (Rijkman and Groenewegen, 2008, Heijmans, et al., 2005; van Agt, Stronks, and Mackenbach, 2000). The replacement of the full health care cost – health care cost recovery by the NHIS in 2004 has come as an opportune time to reduce the burden of disease on the household and the

individual. However, the limitations in the scheme have to be revisited for a greater benefit to policy holders.

The 18 percent of the respondents who indicated to have ever been diagnosed with at least one of the NCDs under consideration of this paper but only 8 percent are received treatment two weeks before the survey. Apart from effective treatment or cure for the disease condition, one major reason can be the lack and un-affordability of treatment for the 55 percent who did not receive treatment. The dependency on external sources to finance health expenditure can lead to interruption of treatment. There is also family abandonment and social isolation as over dependence often result in family tensions and frictions as family members may themselves be financially insecure (de-Graft Aikins, 2007).

The current NHIS should be nationalised to allow for free medical treatment under the policy from any part of the country. This would minimise the burden of disease in terms of direct cost. As the very nature of NCDs treatment require highly technological advance facilities often only available at the Regional and teaching hospitals. Persons living with NCDs in rural areas have to cross district and regional boundaries to access health care but the current district based scheme is limited in this area.

The exemption policy under the health insurance scheme also limits the exemption age to children under 18 years and elderly 70 years and above. Though the scheme does not cover all NCDs the most common ones in the country – hypertension; diabetes; asthma, the prevalence of NCDs increases with age. This study found that the proportion of respondents currently living with NCDs progressively increased from 2.2 percent among 18 -19 years age group to 17.3 percent in 70 and above years old respondents. Thus, a significant proportion of the population

living with NCDs have to self-finance treatment cost with their limited retirement benefit before exemption from payment.

The questions therefore are: Can the nation rely on the current national health policies to effectively manage the burden of NCDs? What forms of health policy interventions would take the households with persons living with NCDs from the current situation? Without answers to these questions, households with persons living with NCDs would continue to be trapped in the vicious cycle of poverty due to lower income, high health related cost and biographical disruption.

Malaria, one of the major health constrain in the country is described to affects the health and wealth of nations and individuals alike. In Africa, it is both a disease of not only poverty, but that could worsen the poverty situation of the people (Asenso-Okyere, 1993; Gallup and Sachs, 2001). It is a major constraint to economic development, with significant direct and indirect costs (McCarthy *et al.* 2000, Asante *et al* 2005). It is also described as being hooked with poverty in a vicious cycle (Asenso-Okyere, 1993), so is NCDs with much greater economic and developmental burden.

The almost standardised health care treatment and management services of NCDs in the country and the lack of treatment option in rural areas which compels rural patients to access treatment from urban areas might have accounted for the no statistically significant difference in direct burden of disease spatially. However, other related cost such transportation, logging etc were not accounted for in this present paper due to data constraints. These categories of health care cost component are relatively high in the case of rural patients. This is due to the disparities in the per capital availability of health facility and professionals between urban and rural areas.

The economic differences in the two geographical areas also cause rural households to rely on social ties and networks to finance health care through depending on family member, friends, borrowing and selling of household assets while urban household depend more on savings in the bank. Economic interventions and infrastructural development to reduce the spatial disparities between rural and urban areas and increase per capita availability of health care services nationwide should be pursued and intensified by the state.

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Table 1 Summary of socio-demographic characteristics of respondents by NCDs status

Background characteristics	Setting	
	Urban	Rural
Sex	*	
Female	10.1	8.5
Male	7.0	6.6
Age group	***	***
18-19	2.7	1.9
20-39	4.9	3.7
30-39	4.8	4.9
40-49	9.2	6.8
50-59	14.9	11.8
60-69	18.8	14.5
70 and above	17.8	17.1
Marital status	*	***
Never married	5.4	3.2
Currently married/cohabiting	9.4	7.1
Separated/divorce/widowed	11.3	13.2
Educational attainment		
No formal education	9.8	8.4
Primary	8.9	7.2
Secondary	5.8	6.4
Higher	8.7	5.7
Working status	**	*
Working	7.5	6.9
Not working	12.3	11.7
Household income quintile		**
Poorest	5.6	6.6
Poorer	6.9	6.8
Middle	7.8	7.1
Rich	8.9	10.9
Richest	9.6	12.0
Total	41.8	58.2

***P < 0.001 **P < 0.01 *P < 0.05. Source: Computed from Ghana-WHS, 2003

Table 2 Distribution of respondents by NCDs condition

Disease Condition	Responses		Percent of Cases
	Urban	Rural	
Arthritis	49.4	55.4	52.3
Angina	25.2	21.6	22.9
Asthma	18.1	18.6	18.3
Diabetes	12.7	4.5	7.8
Depression	3.2	4.5	3.9
Schizophrenia	7.1	4.5	5.6
Total	128	178	110.8

Percentage of cases is a multiple response variable

Source: Computed from Ghana-WHS, 2003

Table 3: Financial sources of household health care expenditure by type of place of residence

Source of finance	Settings		Total
	Urban (120)	Rural (158)	
Current income of household	43.36	56.64	81.29
Savings	75.86	24.14	10.43
Sold items	22.72	77.27	7.91
Family members	47.89	52.11	25.54
Borrowed from someone	36.11	63.89	12.95
Other	30.00	70.00	7.19

Source: Computed from WHS, Ghana 2003 Note: Multiple response variables.

The computation is based on sources used by household in the last 12 months prior to the survey.