

Neighborhood Factors and the Risk of Noncommunicable Diseases in Ghana

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Abstract

Chronic disease conditions now predominate in high- middle- and most low-income countries. In Ghana, chronic diseases are a major cause of morbidity and mortality, yet routine data collection systems and the broad evidence- base for increased awareness, management and control of NCDs are lacking. Using data drawn from the 2014 Ghana Demographic and Health Survey, the first national study in the country with information on hypertension, we examine the socio-economic correlates of hypertension, obesity and anemia and investigate if neighborhood factors play a role in the risks of NCDs. We find that hypertension prevalence among Ghanaian women was 16 percent and 17 percent of respondents were considered overweight/obese, while 41 percent had anemia of any form. On neighborhood characteristics, the aggregate level of poverty in a community was significantly associated with lower risks of all three NCDs, while aggregate employment had higher risks. The wealth status of a household, educational level, age-group and urban residence were also significant predictors of NCDs. We interpret the results in the context of the literature on neighborhood factors and interventions to accelerate the attainment of SDG target 3.4. to improve health, reduce death and disability due to NCDs and to improve the prospects of a demographic dividend in sub-Saharan Africa.

Introduction

Noncommunicable diseases (NCDs), which includes cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases are collectively responsible for 70 percent of all deaths worldwide. Nearly 75 percent of all NCD deaths occur in low-and middle-income countries. Similarly, over 85 percent of people who die from NCDs before reaching their seventieth birthday, die in low-and middle-income countries (WHO 2019). In Africa, deaths from NCDs are rising faster than anywhere else in the world and we now know that the raging COVID-19 pandemic, which has relatively low rates of infections in Sub-Saharan Africa (SSA), has the highest morbidity and mortality risks among older adults especially those with underlying conditions such as NCDs (Katzmarzyk, Salbaum and Heymsfield 2020).

In Ghana, the few population-based surveys available have shown that NCDs are growing among the urban poor with a dual burden of infectious and chronic diseases. The prevalence of hypertension (raised blood pressure), for example, has been increasing over several decades and has significant impact on cardiovascular disease morbidity and mortality, (Sanuade, Boatemaa and Kushitor 2018; Aikins, Kushitor, Koram, Gyamfi and Ogedegbe 2014; Wiredu and Nyame 2001; Addo et al. 2012). Similarly, there is a high and rising prevalence of obesity among Ghanaian adults – over 43 percent of the adult population are either overweight or obese (Ofori-Asenso, Agyeman and Laar 2016; Biritwum, Gyapong and Mensah 2005; Anderson 2017). Also, anemia which disproportionately affects children, women and individuals from low-income areas of the country is associated with many chronic conditions, including Human Immunodeficiency Virus (HIV) and sickle cell disease (Anderson 2017), as well as malaria and other cognitive and physical performance conditions. All three chronic diseases (hypertension,

obesity and anemia) are asymptomatic in nature (silent killers), especially during the early stages when interventions and treatments are most effective.

The economic and social impact of the emerging threat of NCDs is most palpable in Sub-Saharan Africa now more than ever, as poverty and national productivity levels continue to decline thereby draining scarce family resources for NCD treatment. NCDs are thus a threat to the attainment of 2030 Agenda for Sustainable Development (SDGs), which includes a target to reduce by one third [relative to 2015 levels] premature mortality from NCDs through prevention and treatment and promotion of mental health and well-being (SDGS 2015). NCDs also threaten the attainment of the demographic dividend- the eventual aging of the population which results in fewer dependent children and elderly and therefore, greater economic productivity. Yet, despite all these threats, routine data collection systems and the broad evidence- base for increased awareness, management and control of NCDs are lacking in Ghana and other resource constrained settings.

Thus, in this paper, we draw on the first nationally representative sample of women aged 15-49 from the Demographic and Health Surveys (DHS) that include high-quality data on NCDs to examine the influence of individual, household and neighborhood/community-level effects on risks factors of NCDs with special focus on the prevalence of hypertension, overweight/obesity and anemia in Ghana. We interpret the results in the context of interventions to accelerate the attainment of SDG target 3.4. to improve health, reduce death and disability due to NCDs and to improve the prospects of a demographic dividend in sub-Saharan Africa.

Literature Review and Theory

Socio-economic Factors and NCDs

In developing countries, research has shown that NCD and risk factor burdens, although currently concentrated among the rich, are rapidly shifting towards the poor as prevails in developed settings (Engelgau Rosenhouse, El-Saharty and Mahal 2011). Poor people are at greater risk of exposure to harmful products such as tobacco use, unhealthy dietary practices (including iron deficiency), overweight/obesity as a result of physical inactivity and alcohol over-consumption. Poverty is also associated with the lack of access to affordable health services (Engelgau Rosenhouse, El-Saharty and Mahal 2011). In Ghana, emerging evidence suggest that the burden of NCDs is growing in tandem with infectious diseases in urban communities. The prevalence of hypertension among the urban poor is 32.3 percent compared to 27 percent in rural areas and although hypertension is the fifth commonest cause of outpatient morbidity nationally, among the urban poor in Greater Accra Region, hypertension is the second cause of outpatient mortality (de-Graft Aikins et al. 2014, Addo et al. 2012). Also, in the urban communities of Sekondi-Takoradi in the Western Region and Cape Coast in the Central Region, the overall prevalence of hypertension was 27.0%. Of those with hypertensive blood pressure, only 12.6% had prior diagnosis for hypertension and hypertension was higher among study participants from Takoradi (30.4%) compared to residents of Cape Coast (21.8%) (Anderson 2017).

Similarly, urban dwelling was associated a high Body Mass Index (BMI), increases in waist-to-hip circumference, chronic alcohol use and the level of salt intake (Cappuccio, Kerry, Micah, Plange-

Rhule and Eastwood, 2006; Addo, Amoah and Koram, 2006). In the Takoradi/Cape Coast study cited above, almost half (47.8%) of the participants were either overweight or obese (BMI > 25 kgm⁻²). In Cape Coast, 18.4% of the participants were obese, whereas 53.7% of participants from Takoradi were either overweight or obese (Anderson 2017). The prevalence of overweight/obesity was higher among female participants compared to male participants. In another study from 2016, higher prevalence of overweight (27.2% vs 16.7%) and obesity (20.6% vs 8.0%) were estimated for urban than rural dwellers. Prevalence of overweight (27.8% vs 21.8%) and obesity (21.9% vs 6.0%) were also significantly higher in women than men (Ofori-Asenso, Agyeman and Laar 2016).

Most of the studies conducted on anemia are in the context of malaria, diabetes, HIV and tuberculosis among other conditions and are also hospital-based (Obirikorang, et al. 2016; Antwi-Bafour et al. 2016; Koram et al. 2000). Most of these studies report a high level of anemia among women and children in Ghana. Thus, very few studies are at the population-level and use high quality data and current measurements of hemoglobin levels. The few studies we found are in selected communities. For example, Anderson 2017 found that about 47 percent of participants in a study in Takoradi and Cape Coast had mild to severe anemia and females were more likely to be affected than males.

Needed in the literature on NCDs is an examination of the impact of community characteristics such as the aggregate levels of women's education, poverty and employment on the risk factors of NCDs. Although the literature on community/neighborhood effects has been applied to reproductive health (Tienda, Dias and Smith 1985; Lesthaeghe 1985; Hirschman and Guest 1990; Kravdal 2000; 2002; Axinn and Barber 2001; DeRose and Kravdal 2007; Benefo 2006;

Morsound and Kravdal 2003; Avogo and Somefun 2019), healthcare utilization (Mohen, Schneider and Droomers, 2019) and in other social phenomena (delinquency, violence, depression, high-risk behavior), especially among adolescents (Baumer 2001; Roux and Mair 2010), not much is known on neighborhood effects of NCDs. For example, how does NCD risks impact poor women who reside in communities with higher levels of aggregate education (or similarly aggregate levels of wealth, or employment) compared to other poor women in other communities?

Aggregate-level Effects of Community Characteristics on NCDs

In the demographic literature, the average length of education in a district and the proportion of women who are literate in a community are related to fertility desires and contraceptive use among married women (Kravdal 2000). In another study on the decline in school enrollments during the 1980s and 90s and its impact on fertility, individual and aggregate-levels of community education were found to be influential in entry into parenthood (DeRose and Kravdal 2007). Also, Avogo and Somefun (2019) found that net of individual women's characteristics, community variables are strong predictors of union formation and childbearing among adolescents.

We extend the reproductive health literature on neighborhood effects to NCD risks and argue that community effects will influence risk factor burdens of NCDs. We draw on two mechanisms to conceptualize this relationship. First, diffusion theory highlights the role of social learning and social influence through individual social interaction in the community (Montgomery & Casterline, 1993, 1996; Bongaarts & Watkins, 1996; Kohler, 2001; Benefo 2006; Kravdal 2002;

DeRose and Kravdal 2007). Social learning and social influence through education and employment levels in a community may afford women the information and awareness of NCDs and appropriate health seeking behaviors to avoid its risks. These spillover effects from other women's education and awareness of NCDs and behaviors may affect the behavior of uneducated women in communities with high aggregate levels of education compared to uneducated women elsewhere (Kravdal 2002).

On the other hand, neighborhood effects could have negative impact on NCD risks. The broader social and economic transformation which has led to a rise in average community education and employment may have sped up the ongoing nutritional and epidemiological transition thereby leading to poor dietary habits from processed Western food and foods high in calories, sugar, salt, and total fat (Anderson 2017; Schmidhuber and Shetty 2005; Popkin, Adair and Ng 2012) as well as the lack of physical exercise and immoderate alcohol consumption. These habits, which are peculiar to the affluent and educated in urban centers are known to increase the prevalence of obesity, hypertension and diabetes. Thus, women living in communities with high levels of aggregate education, wealth and employment will be impacted by risk of NCDs independent of their individual education and employment.

Finally, Ghana's health care system despite the decentralization of health services to the community-level through the Community-based Health Planning and Services (CHPS) is still weak- basic healthcare services for NCDs are inaccessible, not equitable or targeted towards the poor (de-Graft Aikins 2014). Thus aggregate-level health coverage in a community in terms of the National Health Insurance Scheme (NHIS) and health seeking behavior in the community

will impact NCD risks at population level. Poor women who reside in communities with high aggregate-level health coverage will have low risks factor burdens of NCDs.

Materials and Methods

Data

Data is drawn from the cross-sectional study of Ghana Demographic and Health Survey (GDHS) conducted in 2014, the first survey in Ghana to include several anthropometric and blood pressure measurements, Body Mass Index (BMI) and anemia testing. The analysis relies on a total of 9396 women aged 15-49. Women who did not have information on their blood pressure readings, as well as pregnant women were excluded from the measurement of obesity and anemia. The 2014 GDHS was conducted by the Ghana Statistical Service (GSS), the Ghana Health Service (GHS), and the National Public Health Reference Laboratory (NPHRL) of the GHS in collaboration with the Measure DHS+ program of the United States Aid for International Development (USAID). The survey was designed to assist program managers, researchers and policymakers involved in planning, managing, and coordinating strategies for improving the health of Ghanaians.

The MEASURE DHS+ program also has experience with addressing ethical issues related to the protection of human subjects during biological sampling. Ethical clearance was provided by the Ghana Health Service Ethical Review Committee, Research and Development Division, Ghana Health Service; and the Institutional Review Board of ICF International. Descriptions of the protocols for biological testing can be found in a separate documentation on the DHS website (e.g. Anemia Testing Manual for Population-Based Surveys (Sharmanov, 2000).

The DHS surveys used a two-stage sample design to produce estimates of key indicators at the national level. In the first stage, stratified sampling techniques are used to select clusters, delineated from 2010 Ghana Population and Housing Census (PHC), as the primary sampling unit (PSU). This resulted in a total of 427 clusters selected in the entire country (216 clusters in urban areas and 211 clusters in rural areas).

The second stage involved a systematic random sampling of households within each PSU. About 30 households were selected from each cluster and a total of 12,831 households were selected throughout the country. Since the sample is not self-weighting at the national and sub-sample levels, weighting factors (provided in the data) are used to produce results that are proportional at the national level and account for unequal probability of selection. On the response rate, 97 percent of the eligible women in each household were interviewed.

Variable Measurement

Dependent Outcomes

A. Hypertension

Blood pressure measurements were taken from consenting women age 15-49 at intervals of 10 minutes during the individual interview. Blood pressure was measured using the LIFE SOURCE® UA-767 Plus blood pressure monitor: a digital oscillometric blood pressure measuring device with automatic upper-arm inflation and automatic pressure release. In this paper, hypertension was defined as an average of the second and third measurements of systolic blood pressure (SBP) ≥ 140 mmHg and/or an average diastolic blood pressure (DBP) ≥ 90 mmHg according to internationally recommended categories (WHO 1999).

B. Obesity

The GDHS survey also includes height (in cm) and weight (in kg) measurements for women age 15-49. Weight and height measurements were used to estimate body mass index (BMI = weight in kg ÷ [height in meters, ²]). BMI was further classified as underweight (BMI < 18.5 kgm⁻²), normal weight (BMI = 18.5– 24.9 kgm²), overweight (BMI = 25.0–29.9 kgm⁻²), and obese (BMI ≥ 30.0 kgm⁻²). BMI excluded pregnant women at the time of the survey.

C. Anaemia Testing

Blood specimens for anemia testing were collected in half of the selected households from women age 15-49 who voluntarily consented to be tested. Blood samples were drawn from a drop of blood taken from a finger prick and the haemoglobin concentration was measured using the HemoCue photometer system. Hemoglobin levels were further categorized into severe anemia if less than 7.0 g/dl and moderate between 7 and 9.9 g/dl and mild 10 and 11.9 g/dl (10.0 and 10.9 g/dl for pregnant women) and not anemic (12 g/dl and above). Anemia was recoded as a dichotomous outcome (1- any form of anemia vs 0- not anemic).

Independent Variables

Community Variables

We use two variables to capture aggregate levels of education and employment in the community. The first is the percentage of educated women in the community. This variable was constructed by aggregating the individual and household level variables at the primary sampling unit (PSU). The second aggregate level variable is the percentage of working women in the community. Finally, we include the percentage of poor women in the community.

These three community variables have been demonstrated to be associated with reproductive outcome (Kravdal 2002; Adedini et al. 2014).

Covariates

The DHS surveys collected information on the characteristics of respondents at the time of the survey. We use individual educational attainment (1. No education, 2. Primary education, Secondary or higher education) as a covariate to examine the impact of community variables on the dependent outcomes, controlling for individual education. We also include variables on the place of residence (urban or rural) to capture the effect of urbanization, age group of the respondent (15-24; 25-34; 35-49), region of residence (Southern vs. Northern), ethnicity (Akan vs other tribes), the wealth index of the household (in quintiles but recoded into two categories of 1. Poorest and poorer and 2. Middle, richer and richest). We also include smoking status (non-smokers vs smokers), National Health Insurance coverage (no, yes), visits to health facilities in the last 6 months (yes, no), and frequency of fruits and vegetable consumption and employment status (yes, no).

Analytical Methods

Descriptive statistics were used to produce cross tabulations and chi-square tests to describe variations in the dependent outcomes. Binary logistic regression was used to examine the impact of community variables and covariates on hypertension, overweight/obesity and anemia.

Appropriate survey weights were applied before the analysis since the 2014 GDHS used a two-stage stratified cluster sampling design. As recommended by DHS, sampling weights were

calculated based on sampling probabilities separately for each sampling stage and for each cluster. The bivariate and multivariate analysis then applied sampling weights and the survey logistic procedure to produce results that account for standard errors. The data were analyzed using STATA 12.

Results

Descriptive Results (Pending)

Multivariate Results

We start with the logistic regression results for hypertension. The aggregate-level of education was not a significant predictor of the prevalence of hypertension. However, the aggregate-levels of poverty and employment in the community were significantly associated with hypertension, holding all other covariates constant. The odds of hypertension were lower if aggregate levels of poverty are high in the community (compared to lower levels of poverty)- (Odds Ratio (OR)= 0.79, $p<0.05$). Following the same pattern, a high aggregate level of employment in the community was associated with higher odds of hypertension (Odds Ratio (OR)= 1.2, $p<0.05$).

On individual and household correlates of hypertension, individual women's education, ethnicity and region of residence (South vs the North) was not significantly significant. The odds however were higher with the level of wealth of a household. The odds of hypertension among rich compared to poor households were 1.4 times ($p<0.05$). Older women and visiting a health facility in the last 12 months were associated with higher odds of hypertension (Odds Ratio (OR)= 2.8, $p<0.01$ and 1.16, $p<0.05$; respectively). The results also showed that having health

insurance had higher odds of hypertension and urban residence had lower odds, although this was not statistically significant at $p < 0.05$ level.

Next, we consider the multivariate results of the prevalence of obesity. Like hypertension, the aggregate level of education in the community did not significantly predict of obesity. However, the aggregate-level of poverty and employment in the community was significantly associated with obesity. The odds of obesity were lower if aggregate levels of poverty are high in the community (Odds Ratio (OR)= 0.59, $p < 0.001$) and odds were higher if the aggregate level of employment was higher (Odds Ratio (OR)= 1.41, $p < 0.05$).

On covariates, unlike hypertension, an increase in individual education had significantly higher odds of obesity (Odds Ratio (OR)= 1.21, $p < 0.05$). Similarly, household wealth status and women's age had higher odds of obesity. Ethnicity (Akan vs other tribes) had lower odds of obesity (Odds Ratio (OR)= 0.77, $p < 1.0$), although this was not statistically significant at $p < 0.05$ level. Urban residence, having health insurance and visit to a health facility in the last 12 months were not significant predictors of obesity.

Finally, we consider the models for anemia. Although the odds were in the right direction, community-level variables did not significantly predict anemia. Only, the aggregate-level of poverty was marginally associated with an increase in the prevalence of anemia (Odds Ratio (OR)= 1.2, $p < 1.0$).

On covariates of anemia, wealth status of a household has lower odds of anemia (Odds Ratio (OR)= 0.70, $p < 0.05$), while urban residence had higher odds (Odds Ratio (OR)= 1.29, $p < 0.05$). Residence in Southern Ghana marginally increases the odds of anemia (Odds Ratio (OR)= 1.2,

p<1.0) and being older also marginally (Odds Ratio (OR)= 0.91, p<1.0) decreased your odds. Both were not significant at p<0.05 level.

Discussion

NCDs are rising rapidly in Africa and undermining social and economic development. Ghana, like many middle- to low income countries, is dealing with the triple burden of *infectious diseases, malnutrition/overweight obesity and chronic diseases*.

Using data drawn from the 2014 Ghana Demographic and Health Survey, the first national study in the country with information on hypertension, we examine the socio-economic correlates of hypertension, obesity and anemia and investigate if neighborhood effects play a role in the risks of NCDs. The analysis showed that hypertension prevalence among Ghanaian women aged 18-49 years was 16 percent. Seventeen percent of respondents were considered overweight/obese and 41 percent had anemia of any form. On neighborhood characteristics, the aggregate level of poverty in a community was associated with lower risks of all three NCDs, while aggregate employment had higher risks (except for anemia). On household characteristics, richer households had an elevated risk of hypertension and obesity and a lower risk of anemia. On individual women's characteristics, educational level was only associated with a higher risk of obesity. Finally, advancement in age was associated with higher risk of hypertension and obesity and lower risk of anemia, while living in urban areas had a higher risk of hypertension and anemia.

The results are largely consistent with the neighborhood effects literature on one hand and the nutritional and epidemiological literature on the other. First, the results confirmed that there is

considerable social inequality among communities and NCD risks tend to be bundled together at the neighborhood level. In developing countries like Ghana, the current NCD disease burden is greater among the rich. This is consistent with our results that there is a high risk of NCDs in communities with a high level of women employed and in wealthier households as well as for educated women. While there are lower risks in communities with high levels of poverty. It is thus urgent to develop targeted primary intervention strategies in both communities (rich and poor) as we know that in the near future, if not already, NCDs will concentrate among the poor, similar to what prevails in developed settings (Engelgau Rosenhouse, El-Saharty and Mahal 2011).

Second, within the context of the epidemiological and nutritional transition – that focuses on “the complex change in patterns of health and disease and on the interactions between these patterns and the demographic, economic, and sociological determinants and consequences (Oman 1971)- It is clear that developing countries like Ghana have scarcely completed the previous stages of the transition before shifting to the age of degenerative and lifestyle diseases with NCDs as the major causes of death.

Diffusion of lifestyle behaviors such as poor dietary habits from processed Western food and foods high in calories, sugar, salt, and total fat (Anderson 2017; Schmidhuber and Shetty 2005; Popkin, Adair and Ng 2012) as well as the lack of physical exercise and immoderate alcohol consumption has occurred in parallel with the increasing prevalence of obesity and NCDs in developing countries (Katzmarzyk & Mason, 2009; Popkin, 2004; Popkin, Adair, & Ng, 2012). There is thus a need to design effective awareness and early intervention programs to mitigate the human resource and economic burden of NCDs while tackling the scourge of infectious

diseases and malnutrition. This will accelerate rather than undermine the attainment of the 2030 Agenda for Sustainable Development (SDGs) and a demographic dividend.

Finally, our study is not without limitations. Apart from its cross-sectional design, the differential selection of individuals into communities and other indirect pathways of neighborhood factors or simultaneity biases prevent us from drawing causal inferences (Duncan & Raudenbush 1999, Sobel 2001, Winship & Morgan 1999). Nonetheless, neighborhood-level mechanisms have proven effective in other outcomes and can be usefully applied to NCDs.

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Table 1: Background Characteristics		
Characteristics	Number	Percentage
Prevalence of Non-communicable Diseases		
Hypertension	1240	16.16
Obesity	543	17.19
Anemia	1692	41.05
Community-level variables		
Percent of women educated		
Low	2778	24.24
Medium and High	5517	75.76
Percent of poor women		
Low	2820	44.59
Medium and High	5475	55.41
Percent of working women		
Low	4306	47.13
Medium and High	3744	52.27
Respondent's Education		
None	2231	20.93
Primary	1431	16.72
Secondary/higher	4633	62.36
Wealth Index		
Poorest/Poorer	3510	32.21
Middle/Richer/Richest	4785	67.79
Ethnicity		
Akan	3444	50.73
Other Tribes	4758	49.27
Region		
Northern	2289	14.16
Southern	5809	85.84
Place of Residence		
Urban	4131	45.51
Rural	4164	54.49
Age group		
18-24	2226	26.56
25-34	2907	35.49
35-49	3162	37.95
Health Insurance Coverage		
	5504	62.55
Visited Health facility in last 12 months		
	4543	54.08
Source: GDHS 2014; Weighted Frequencies		

Table 2: Crosstabulation of Non-communicable Diseases by Community Variables and Covariates (Percentages)

	Hypertension	Obesity	Anemia
Community-level variables			
Percent of women educated			
Medium and High	18.02	20.96	40.05
Percent of poor women			
Medium and High	12.32	9.28	42.94
Percent of working women			
Medium and High	18.48	21.61	41.41
Respondent's Education			
None	14.3	9.03	45.29
Primary	17.22	18.15	42.28
Secondary/higher	16.49	19.66	39.25
Wealth Index			
Poorest/Poorer	10.49	4.3	45.77
Middle/Richer/Richest	18.86	23.23	38.76
Ethnicity			
Akan	17.02	18.63	38.76
Other Tribes	15.42	15.68	43.23
Region			
Northern	0.1001	0.0479	0.4303
Southern	0.1745	0.1939	0.4073
Place of Residence			
Urban	19.81	22.7	40.67
Rural	11.79	9.95	41.5
Age group			
18-24	5.03	4.69	44.59
25-34	12.09	16	39.15
35-49	27.77	28.82	40.33
Health Insurance Coverage			
	14.46	17.6	41.04
Visited Health facility in last 12 months			
	17.15	18.48	39.61

Source: GDHS 2014; Weighted Frequencies

Table 3: Odds Ratios of Community Variables and Covariates and Non-communicable Diseases

Community-level variables			
	Hypertension	Obesity	Anemia
Percent of women educated			
Low	1	1	1
Medium and High	1.19	1.51	1.13
Percent of poor women			
Low	1	1	1
Medium and High	0.79**	0.59***	1.22+
Percent of working women			
Low	1	1	1
Medium and High	1.19**	1.41**	1.10
Respondent's Education			
None/primary	1	1	1
Secondary/higher	1	1.20**	0.92
Wealth Index			
Poorest/Poorer	1	1	1
Middle/Richer/Richest	1.41**	3.53***	0.70**
Ethnicity			
Other Tribes	1	1	1
Akan	0.91	0.77+	0.88
Region			
Northern	1	1	1
Southern	1.17+	1.41	1.24+
Place of Residence			
Rural	1	1	1
Urban	1.22+	0.89	1.30**
Age group			
18-24/25-34	1	1	1
35-49	2.83***	2.85**	0.91+
Health Insurance Coverage			
No	1	1	1
Yes	1.16+	0.89	1.07
Visited Health facility in last 12 months			
No	1	1	1
Yes	1.23**	1.16+	0.88
Source: GDHS 2014; Weighted Frequencies			
p<0.05; *p<0.001; +p<1.0			