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Relationship Between Household Food Insecurity and Health in the Upper West Region of Ghana

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A thesis submitted in partial fulfillment of the requirements for the Master of Arts degree in Geography

RELATIONSHIP BETWEEN HOUSEHOLD FOOD INSECURITY AND HEALTH IN THE UPPER WEST REGION OF GHANA

(Thesis format: Integrated Article)

by

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Abstract

Although the importance of food as a social determinant of health has been elucidated, it remains underexplored in Sub-Saharan Africa (SSA), where a significant population is faced with challenges of accessing food, largely from a combination many factors including low economic power, poor livelihoods, political instability and policy gaps. Despite tremendous improvement on food security in Ghana, the northern part of the country including the Upper West Region still experience disproportionally high levels of deprivation and food insecurity. Research has tends to explain the dynamics and complexities of food insecurity in the Region, yet variation of the incidence of food insecurity across different geo-political districts in the region and its association with human health is less examined. In response, this thesis examines the relationship between household food insecurity and health in the Upper West Region of Ghana.

Results from quantitative survey (n=1438) conducted in all the eleven districts of the Upper West Region from May to August, 2014 show that households that received remittance and located in both rural and urban areas as well as non-remittance receiving households in rural areas were more likely to report being severely food insecure compared to non-remittance receiving households in urban areas. Those who reported being food insecure were more likely to report poor mental health. Although migration and remittance have been used by households to address food insecurity, the findings here show that migration and remittance may not adequately impact on food insecurity in all contexts, giving prominence to the role of local context in influencing the persistent food insecurity situation in the Upper West Region of Ghana. The research demonstrates that use of Household Food Insecurity Access Scale (HFAIS) in most sever periods of food insecurity would produce much

higher scores of food insecurity compared to scores produced from use of Food Consumption Scores (FCS). Also, the use of subjective health rating tool (the DUKE Health Profile) in this research indicates its wider applicability. The study makes suggestions for an integrated food security policy, decentralization of mental health care, and expansion of the economic potential of the Upper West Region. Future research directions are also discussed.

Key words: Household food insecurity; subjective health; remittance, DUKE Health Profile, Upper West Region, Ghana

Co-Authorship Statement

This thesis consists of two papers, one submitted and under review and the other being processed for publication. The research problem, objectives and organization of the thesis, explaining the relationship of the two manuscripts are outline in the introductory chapter. The study context and methodology are discussed in chapters two and three, respectively. The research manuscripts are as follows:

Chapter four: Atuoye, K. N. and Luginaah I. The effect of residential remittance on food security in the Upper West Region of Ghana

Submitted: *Food Security*

Chapter five: Atuoye, K. N. and Luginaah I., Household food insecurity as a social determinant of mental health among household heads in the Upper West Region of Ghana

Even though both manuscripts are co-authored with my supervisor, I conducted the actual research; the research design, literature review, data collection and analysis, and writing this thesis.

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Chapter 1

1 Introduction

This thesis interrogates persistent food insecurity in the Upper West Region of Ghana by examining two interconnected questions hinging on household responses to food insecurity and the complex discourses around food as a social determinant of health. This first chapter provides a brief background on the shifting food insecurity conceptualization over time and the dynamics of food insecurity in Ghana's Upper West region (UWR). Following this brief background, the research questions are presented. The chapter then outlines significance of the study and provides a structure of the rest of the thesis, demonstrating how the chapters are linked up and shaped into a one piece.

1.2 Research Background: The persistent food insecurity problem and health

The concept of food security has been explained differently based on different conceptualizations and disciplinary approaches (Pinstrup-Andersen, 2009). Phrases such as "unless 50% or more food … are available by 2030, a 'perfect storm' is envisage…This becomes an even more 'wicked problem' when climate change and an expanding global population act in concert, making the challenge of achieving global food security even more complex and demanding" (Poppy, et. al., 2014: 1) and research titles such as "Food security: the challenge of feeding 9 billion people" (Godfrey et al., 2010) strongly suggest that food security is a food production problem. Others such as Sen (1982) conceive food security as more of an access issue which is influence by economic and market structures either than a food production problem. Despite the conceptual and philosophical divide and debates on what the problem of food insecurity and what is important in solving it, the World Food

Summit in 1996 provides a definition that encompasses the seemingly two divides and repositions the discourse of food insecurity as not about either/or but a combination of dimensions. Overall, it conceptualizes food security as "…a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO, 2001). On the basis of this definition, food security tends to reflect the state of nutrition, health and wellbeing, inequality, vulnerability, human rights, and human security (Fullbrook, 2010; Godfrey et al., 2010; Lobell et al., 2008; Weis, 2007).

Generally food security is analyzed based on three pillars: availability, accessibility and utilization (Barrett, 2010; Maxwell, 1996; Pinstrup-Andersen, 2009). Barrett (2010) explains that these pillars are loosely hierarchical as accessibility can only happen after food availability is satisfied and utilization is possible when accessibility is also satisfied. A fourth pillar – stability – was added following the expansion of the frontiers of the food security literature to include vulnerability (see Figure 2-2 in chapter two). The capacity of an individual, a household, or a country to maintain a food secure status during and immediately after crises indicates the extent to which stability can be guaranteed, which is an important measure of vulnerability to food insecurity (Maxwell, 1996). Theories and concepts of food security continue to evolve after Sen's intervention to shift perspectives to include unequal access. For instance, theorists have increasingly expanded food security conceptualization to include social health (Mcintyre, 2003), social production of health and diseases (Siefert, et al., 2001), and multiple conceptual frameworks such as political ecology (Nyantakyi-Frimpong & Bezner-Kerr, 2014) to capture more nuanced dimensions of food insecurity.

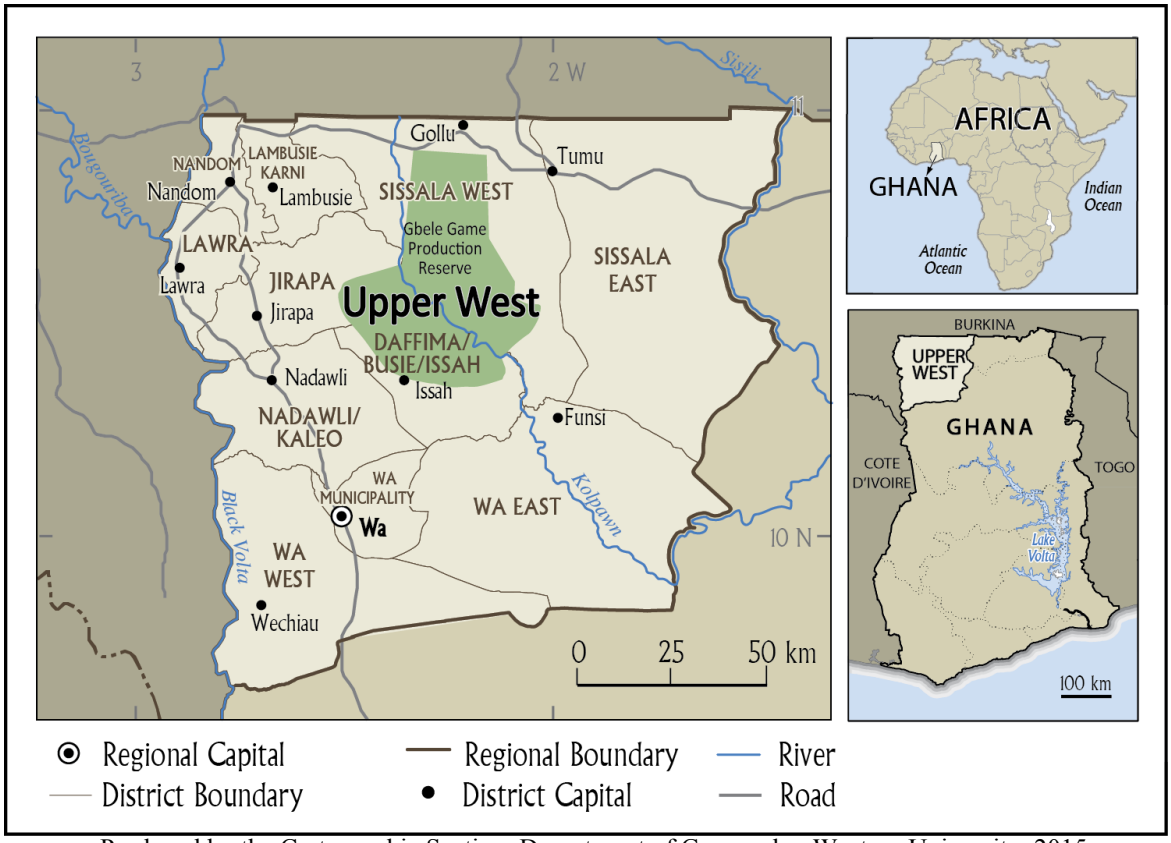
Despite the improvements in the way food security has been conceptualized, it remains a problem in many developing countries. A moderate estimate of 805 million people faced a daily challenge of accessing food in sufficient quantities for their dietary needs and almost all of whom (791 million) reside in developing countries (FAO, et al., 2014). While the number has been reducing in other parts of the developing world over time, Africa has witnessed an increase to nearly one in every four persons living with some degree food insecurity (FAO et al., 2014).

In Ghana, local disparities of food insecurity incidence are masked by national food insecurity statistics that have been shown to be close to the attainment of the United Nations' sponsored Millennium Development Goals (MDGs) target on hunger (FAO et al., 2014; UNECA, et. al, 2014). While the northern part of the country experiences a high degree of food insecurity, the southern and middle zones have a relatively low incidence of food inscecuirty (Hesselberg & Yaro, 2006; WFP & MoFA, 2012). Factors accounting for this situation are numerous, ranging from climatic stressors, local economic vulnerability, poor distribution networks because of poor transportation infrastructure, social change, to policy marginalisation. These factors interact in complex relationships to produce food insecurity in the northern region (Abdul-Korah, 2011; Kuuire, et al , 2015; Luginaah et al., 2009; Van der Geest, et al., 2010).

Consequently, individuals and households in the Upper West Region (Figure 1-1) tend to employ various strategies for sustenance. For instance, Luginaah et al. (2009) examined migration as a livelihood strategy in response to environmental change and food insecurity in the region and found that although migration to the southern part of the country had been occuring since colonial times, the phenomenon had inctreased in recent times owing to depleted farmlands and rainfal variability.

Titles of research works, such as “abandoning land in search of farms” (Kuuire et al., 2015) and “abandoning farms in search of food” (Kuuire, Mkandawire, Arku, & Luginaah, 2013) aptly depict the worrying situation of food insecurity in the region. Other studies such as Van der Geest et al. (2010) and Rademacher-Schulz, et. al. (2014) also found increasing trends of out migratinon in the region in recent times because of the challenges facing food production and worsening food insecurity situation.

Figure 1 - 1: Regional Map of Upper West



Produced by the Cartographic Section, Department of Geography, Western University, 2015

Regrettably, strategies such as migration and associated remittance, which are targeted at individual and household level food security in the region might not be achieving their desired objectives as research findings continuously report food insecurity and

poverty (Kuuire et al., 2015; Luginaah et al., 2009; Nyantakyi-Frimpong & Bezner Kerr, 2014; Rademacher-Schulz et al., 2014; Wiemers, 2015).

Furthermore, the relationship between food security and health is conceptualised and studied in two main strand. The first strand examines the association between food security and biological health, mostly with the objective of uderstanding how nurtients intake affects biological health of humans. Reports from the World health Organisation and the Food and Agricultural Organisation mostly higly biological effects of food insecurity. The second strand explores association between health and social commponents of health. This second strand of research gained prominence with the emergence of social factors as determinants of health, which are significantly inflruenced by contextual factors (Mcintyre, 2003). Beyond this binary, studies such as Friel & Ford, (2015) have examined the relationship between food security and health subjectively and objectively.

1.3 Research Questions

Food is central to health and research on food security has significantly drawn motivation from health narratives on the effects of too much food and food inadequacy (Cook et al., 2004; Ding, et al., 2015; Gundersen & Kreider, 2009; Kassebaum et al., 2014; Oh & Hong, 2003; Smith & Haddad, 2014; Stuff et al., 2004; Swindale & Bilinsky, 2006; Whitaker, et al., 2006; Zaslow et al., 2009). Households and individuals, over time, have employed different strategies including migration (Dietz, van der Geest, & Obeng, 2013; Luginaah et al., 2009; Rademacher-Schulz et al., 2014) to smoothen consumption or improve upon their incomes in periods of failing traditional livelihoods. However, knowledge on the extent to which remittances receipt resulting from migration influence food security of households in the Upper West Region has remained sparse. The Upper West Region still experiences

food insecurity, which has dire health implications. Yet, health implications of household food insecurity in the region have not been explored.

Despite numerous studies on household food insecurity and health in developed countries (Alaimo, Olson, Frongillo E.A., & Briefel, 2001; Shannon, 2014; Siefert et al., 2001), knowledge of the relationship between perceived food security and perceived health in the unique context of developing countries is limited, and food security policies tend to miss this relationship particularly in Ghana, (Sipsma et al., 2013). Thus, the main objectives of this study are to attempt to examine the incidence, explore the effects of remittances on food security of households located in urban and rural areas in the region, assesses how household food insecurity relates to the health of adult population in the region. I ask the following three questions in order to address the objectives of the study:

1. What is the incidence of household food insecurity in the Upper West Region?
2. What effect do remittances have on household food insecurity in the Upper West Region of Ghana?
3. What is the association between food security and self-rated mental health in the Upper West Region of Ghana?

These questions will be examined within broader concepts of Health Geography. This study is intended to contribute to the understanding of food insecurity among households and its association with perceived health status of adult population. The study also contributes to our understanding of food security issues in a rapidly changing climate.

1.4 Thesis structure

This thesis consists of six chapters, including this first chapter. Chapter two provides a review of literature on food security and health. It traces the food insecurity problem in the world and considers linkages between food insecurity and health. It also provides a theoretical context for the study, connecting theories and conceptual frameworks used in both food and health studies to create a theoretical and conceptual space within which the research questions are examined. Also, the chapter explains the study context of the Upper West Regions.

The third chapter describes in details the methodology used for the study. It explains the philosophical and epistemological underpinnings of the research, driven by the research questions. It describes theory and methods, which bind the detailed methods and theories in the individual papers together into an integrated thesis.

The next two chapters present the two manuscripts which examined food security and health. These are presented as separate articles but together explore the theme of this thesis. The first manuscript (chapter four) is submitted to a special issue in the Food Security Journal. It provides insights into the effect of remittance on the food insecurity status of urban and rural households. The second manuscript (chapter five) is being prepared for submission to a peer-reviewed journal. It examines the association between food insecurity and the mental health of household heads. The essence of this paper is to illustrate how food insecurity affects mental health of household heads in northern Ghana

Chapter six summaries the thesis and draws out key theoretical and methodology contributions in the field of food security and health. It presents policy relevant approaches for addressing food insecurity and health in the Upper West Region and indicates some important future research directions.

1.5 Summary

This first chapter lays a background for the thesis. It briefly summarized the different conceptualizations and evolution of food security with emerging theoretical and disciplinary development. It demonstrates a link between food security and health and hints on how food as a social determinate of human health has been explored in this thesis. This chapter also explains the main motivation for the research. Further questions are asked about the association between food insecurity and health of adult populations in a context where access to quality health care is low. It summaries the theoretical framework within which the research questions are interrogated, provides a brief summary on the expected theoretical and methodological contributions. It indicates the policy relevance of the research findings and ends with a layout of the structure of the thesis. This is an important foundation of the thesis.

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Chapter 2

2 Literature Review

2.1 Introduction

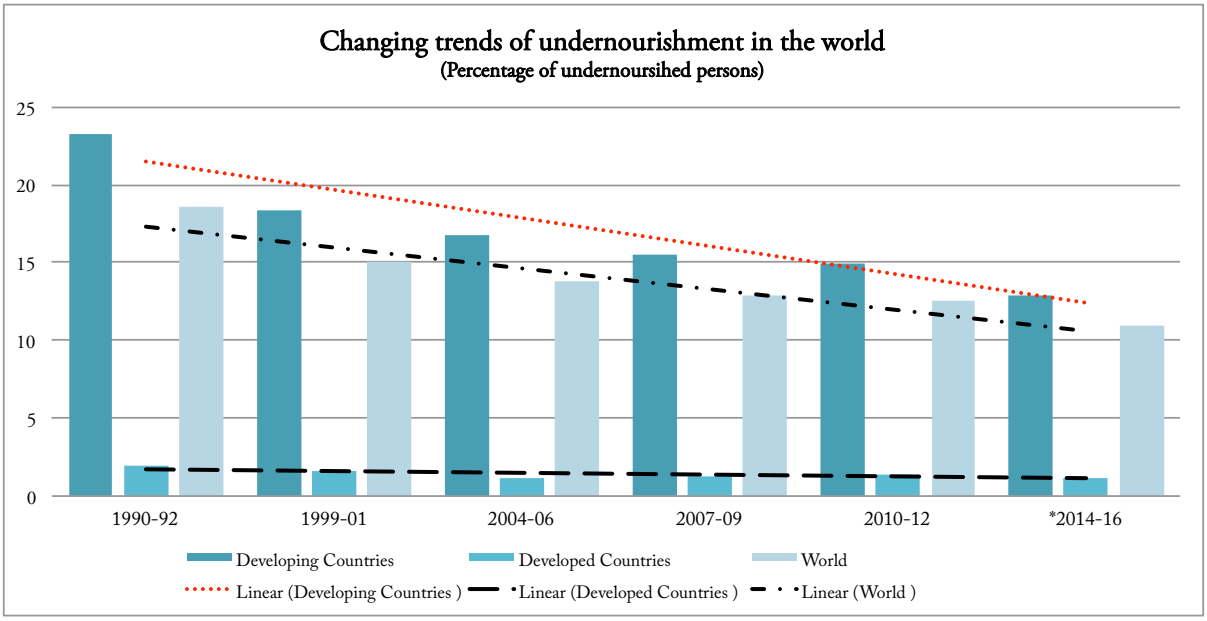
This chapter reviews literature on food insecurity, capturing global, regional and local dimensions. It is a follow up from chapter one which laid a background to global food insecurity problems. Tied to the literature review is a discussion of health geography and the 'new' geographies of food insecurity theoretical foundations. Based on the diversity and multi-scalar nature of factors influencing food insecurity and the association between food insecurity and health, theoretical and conceptual constructs in health geography provide a framework for interrogating the research questions. The epistemological and ontological underpinnings of these theories and concepts are linked up to the methodological approach used for the study. Further, this chapter provides an overview of the Upper West Region of Ghana (the study area) with specific attention on food security and health characteristics.

2.2 Scoping food insecurity: from global spread to local focus

Food insecurity remains a challenge for the world and developing countries have the greatest burden of the problem (Duncan, 2015; Fullbrook, 2010; See Figure 2-1). In 2015, the Food and Agriculture Organization (FAO) reports that there are still about 795 million people who are malnourished (FAO, IFAD, & WFP, 2015). This number is a decline by 216 million from the 1990-92 levels and it is estimated to further decline beyond 2015 given the current trends. Although seemingly improving, the trend has been uneven in various world regions. As shown in Figure 2-1, the decline in the proportion of the undernourished population in developed countries could be described as being at a stable point beyond which reduction is more gradual.

In developing countries however, the decline is remarkable as indicated by the bars and the linear for developing countries in Figure 2-1.

Figure 2 - 2: Undernourishment in the world



Source: FAO, 2015

Reduction in undernourishment is uneven in different world regions. Among the developing regions, Sub-Saharan Africa (SSA) is relatively slow in reducing the incidence of poverty and hunger (FAO et al., 2015; United Nations, 2014). More than one in every four persons in the region experiences chronic malnutrition in 2010-2012 and although this is estimated to have declined slightly, it may still be above 20% in 2014-16 (FAO et al., 2015). At the level of some individual countries, significant progress has been made. Ten countries have reduced the proportion of hungry people by half, seven of the countries were also able to reduce the number of hungry people by half by 2015. Among the countries in Sub-Saharan Africa, South Africa is the only country that maintained a less than 5% of undernourished population since 1990-92 (Table 2-1). Although the estimates indicate that the SSA region will miss the MDGs

and World Food Summit (WFS) targets, many more countries in the region are likely to make good progress (FAO et al., 2015).

Table 2 - 1: Countries that have achieved the international hunger targets in SSA

Countries that have achieved the international hunger targets in SSA					
Countries that met the MDG 1c target by halving the proportion of hungry people or bringing it under 5 percent by 2015		**Countries that reached both the MDG 1c target and the WFS goal of halving the number of hungry people by 2015**		**Countries that maintained undernourishment below or close to 5 percent since 1990–92**	
1	Benin	1	Angola	1	South Africa
2	Ethiopia	2	Cameroon		
3	Gambia	3	Djibouti		
4	Malawi	4	Gabon		
5	Mauritania	5	Ghana		
6	Mauritius	6	Mali		
7	Mozambique	7	Sao Tome and Principe		
8	Niger				
9	Nigeria				
10	Togo				

Source: FAO, 2015

Efforts at reducing food insecurity at the world stage have generally been organized under the United Nation's sponsored Millennium Development Goals (MDGs) and the World Food Summit commitments. These two undertakings have served as platforms and provided indicators for countries to prioritize on addressing world hunger through policy, and establish program interventions (Duncan, 2015). They have provided progress reports on the extent to which the problems are being addressed. For instance, the MDG progress reports provide global and regional picture on the implementation of MDGs, highlighting successes as well as failures, and indicating future direction for policy (United Nations, 2014). Annual reports on the state of food insecurity in the world specifically provide information on where the world is with the MDG and World Food Summit food security targets (FAO et al., 2015). Policies and programs championed by bilateral and multilateral arrangements at various platforms such as the World Bank and the United Nations, and development

agency such as FAO and UNDP, have largely shaped food insecurity actions in developing countries (Qureshi, et al., 2015).

Extensive studies exploring current trends of food insecurity can be grouped into studies emphasizing food supply and food access. At country level, economic progress is often cited as the driver of food demand. Countries that have reduced food insecurity and ultimately achieved international food security targets have consistently maintained high economic growth. The African focused-assessment of progress report makes a specific point that economy growth in SSA within in recent years was the key contributor to attainment of food security in countries that had made great progress (UNECA, AU, AfDB, 2014). The demands side of food insecurity concerns about food production and population growth. Low production of food relative to population growth has been given significant space in food literature as the problem for food insecurity in the world. It is suggested that climate change and changing food political economy are affecting the production of food (Armah et al., 2011; Schmidhuber & Tubiello, 2007; Tomlinson, 2013). However, this position has been critical appraised by other scholars. Weis (2013) suggests that global food insecurity in recent times is significantly influenced by changing food consumption patterns from mainly grains to meat and poultry production especially in South East Asia, shifting investment away from cereals.

Furthermore, political economy analyses of food insecurity problems, particularly in recent food price volatility and political instability in recent food price volatilities experienced in 2007-2008 and in 2010-2011 show that food security could lead to political tensions and riots as recorded in North Africa and Middle East (Arezki & Bruckner, 2011; Hendrix & Haggard, 2015). Increase in food prices also led to political riots in Ethiopia, Burkina Faso, Cote D'Iviore, Senegal, Mauritania,

Cameroun, Senegal, and Guinea. It turned into riots and violence in Egypt, Yemen, Morocco, Algeria and Libya, which eventually resulted regime change in some of these countries. The food price riots and conflict resulted in disruption of food production and distribution systems. Also, in central Africa and the horn of Africa, political conflict and draught have devastated local food production systems contributing to proportionally high levels of undernourishment (FAO et al., 2015; UNECA, AU, AfDB, 2014).

In spite of the gloomy picture about food insecurity on the African continent, Ghana was one of four countries (Malawi, Angola and Rwanda) that were claimed to have met the MDG target in 2013, and subsequently the WFS target (FAO et al., 2015). The Global Hunger Index (GHI), which statistically computes multiple-dimensions of hunger in countries annually, declared that Ghana had reduced hunger by 67.84% between 1990 and 2013 (FAO et al., 2014; UNECA, AU, AfDB, 2014). The reason for Ghana's phenomenal performance could be traced to concerted implementation of food production strategies such as the Food and Agriculture Sector Development Program (FASDEP). In addition, the country escaped the food riots partly due to sustained democracy and was implemented sustained food production and livelihood interventions. Further, modest economic growth experienced within the period translated into high purchasing power, which ultimately led to decline in the Population of undernourishment (FAO et al., 2015).

Significantly, national, regional and global GHI averages have often masked unfavourable local statistics. For instance, a study on comprehensive food security and vulnerability analysis conducted by World Food Programme (WFP), the Government of Ghana (GoG) and partners in Northern Ghana showed significantly different statistics from the national average. While the national GHI was 8.9% in 2012 (FAO,

2012), the study found that 28%, 10% and 16% of households in Upper East, Northern and Upper West Regions (UWR), respectively were either severely or moderately food insecure (WFP & MoFA, 2012). Other studies such as Hesselberg & Yaro (2006), Kuuire, et al. (2013) and Nyantakyi-Frimpong & Bezner-Kerr (2014) have all identified the devastating food insecurity situation in the northern part of Ghana that suggest that national statistics may not be presenting the reality on the ground. Food security in the region follows a long-standing development divide between the northern and the southern parts of Ghana as a result of government neglect (Songsore, 2011). It is these disparities that have motivated this research to examine the implication of food insecurity on health in the UWR.

2.3 Food as a determinant of health

The link between food insecurity and the health of populations has been established in the literature. As stated in the definition of food security (see FAO, 2001), accessing and consuming right dietary needs for proper human functioning is a critical component for human health. Invariably, food insecure households consume inadequate quantities of nutrients and are more likely to be low income households (see Alaimo, et. al, 2001; Kennedy & Peters, 1992). The MDG goal of reducing poverty and hunger highlights health consequences of food insecurity among children and mothers in particular (see UNECA, AU, AfDB, 2014; United Nations, 2014). Other empirical studies have examined the relationship between food insecurity, child under-nutrition and their health effects.

A study by Smith & Haddad (2014) assessed the drivers of child under-nutrition from 116 out of the 132 developing countries over a 42-year period and found that perceived food insecurity was positively associated with child under-

nutrition. Their conclusions underscored the important role of household food security in the nutrition and health of children. Malnutrition may only be a condition of inadequate food intake but the health implications are severe. Gundersen and Kreider studied the relationship between food insecurity and health using the National Health and Nutrition Examination data from 2001-2006 and found that food security was positively associated with good general health and healthy weight in the United States. Many people who are food insecure eat too much bad nutrients, which mostly results in obesity. Also, Cook et al. (2004) working in five states in the United States and Washington DC found a strong association between food insecure and low-income households and health problems among children. They made the argument that to reduce the hospitalization of children, there is a need to address food insecurity in poor households.

Furthermore, other studies have found a strong correlation between food insecurity and risk of poor physical and mental health and health (Alaimo et al., 2001; Ding et al., 2015; Stuff et al., 2004; Whitaker et al., 2006; Zaslow et al., 2009), as well as low body mass index (BMI) among children and adults (Young et al., 2014). Siefert et al. (2001) found that food insecure households were more likely to rate their health poor or fair. Invariably, the association between food insecurity and health problems is more very strong that food insecurity is mostly considered a health problem. This research adds to the food insecurity and health literature in the context of poverty and environmental change in the UWR of Ghana. This relationship between household food security and health is examined with the aid of geography of health conceptualizations.

2.4 Geographies of health and food in/security

The study of food can be examined within the discipline of Geography. Health geography tends to examine food security and its implication on the health and wellbeing of populations in different spatial context. This research was therefore constructed to use the health geography and geographies of food approaches in order to examine the food insecurity situation among households in the UWR and its implication.

2.4.1 Geographies of health

The emergence of health geography followed years of evolution of medical geography to become more socially oriented, supported by expansion in the study of spatial distribution of health related phenomena with emphasis on place variables (Eyles, 1993; Foster, 1987; Kearns & Moon, 2002; Law et al., 2005; Luginaah, 2009; Yiannakoulias, Karosas, Schopflocher, Svenson, & Hodgson, 2007). The development of the field of health geography was based on the understanding that health is socially, culturally, economically, and environmentally constructed, hence can be studied as a social concept influenced by factors such as poverty, vulnerability, gender, food security and socio-economic status (Cutchin, 2007; Kearns & Moon, 2002; Luginaah, 2009; Mayer, 1996). Indeed, Dummer (2008) explained that the 'new health geography' is a holistic discipline that connects society and space in the study of health and well-being, and health geographers have examined a vast range of issues relating to human population, their society and environment (Luginaah, 2009).

Almost within the same period that health geography got established as a sub-discipline, medical geography shifted in approach and outlook (Kearns & Moon, 2002; Luginaah, 2009). It changed from pure biomedical to bio-psychosocial foci and

made considerable efforts to incorporate non-biological factors such as food insecurity that have potential effect on human health disposition.

Health geographers emphasize the importance of 'place' as a distinguishing element. 'Place' is conceptualized to encompass the uniqueness of a locale as a social, economic and environmental space and the many complex ways that place-based factors produce risks to disease and health. Indeed, "health geographers have re-conceptualized the notion of 'place' as a complex cultural symbolic phenomenon, constructed through relationships between people and their settings, rather than mere sites where observations are located" (Luginaah, 2009:92).

Studies in health geography emphasizing 'place' are in two main overlapping streams: disease ecology which focuses on examining the diffusion and spatial distribution of diseases (Eyles, 1993; Foster, 1987; Law et al., 2005; Yiannakoulias et al., 2007), and health services accessibility and utilization which focuses on inequities in relation to the availability of health care (physically and economically) and factors that affect the utilization of health care services (Comber, et al., 2011; Luginaah, 2009; Rosenberg, 1998). However, unlike the raw focus on disease ecology in medical geography, health geography examines the intricate interaction of contextual and compositional factors on health. Consequently, the thrust of the discipline opened up to questions about the state of poverty, food insecurity, vulnerability, gender inequality, health systems effectiveness, and health care access, which have implications for health and wellbeing, rather than blaming the individual for ill-health (Kearns & Moon, 2002; Luginaah & Bezner-Kerr, 2015). This study utilizes the concepts in the health geography to examine the household food security and health relationships in order to appreciate constructed and subjective perspectives about food access in the UWR of Ghana.

2.4.2 Geographies of Food In/security

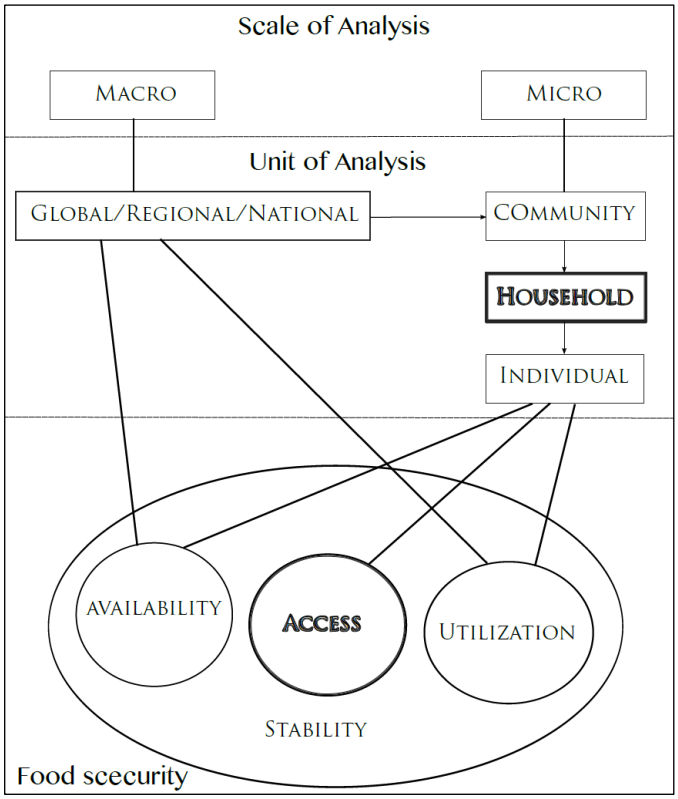
The concept of geography of food in/security is relatively new within the discipline of Geography and as such is at a high stage of fluidity. Unlike health geography, which has become an established sub discipline with well-defined principal concepts, geographies of food insecurity is going through conceptual formation (Del Casino, 2014; Gatrell, Reid, & Ross, 2011). Concepts such as food deserts (Battersby, 2012; Gatrell et al., 2011; Hallett & McDermott, 2011; Shannon, 2014), food inequalities (Weis, 2007), urban and rural food insecurity (Crush & Frayne, 2011; Lynch, et al., 2013; Ruel et al., 1998), production capacities, accessibility and food culture (Cook et al., 2010), and implications of vulnerability for food security (Luginaah et al., 2009; Rademacher-Schulz et al., 2014; Sen, 1982) have inherent socio-spatial, political and ecological dimensions which require the use of social geographies in order to study them (Del Casino, 2014).

Consequently, this study draws heavily on the emerging geographies of food in/security to contextualize household food insecurity and health relationships in the Upper West Region of Ghana. Importantly, the close association of the concept of food insecurity and poverty, climate change, inequality, food culture, food production and food accessibility provides a guide for the theoretical framing of this study, with particular attention on local context, at the same time of national and regional relevance. Figure 2-2 presents a conceptualization of food security.

Food security conceptualization and analysis are based on scales and units of analysis of the four main pillars (see Figure 2-2). In terms of scale, global, regional, and national food security analyses are macro in nature while community, household and individual food insecurity analyses are micro. Global level analyses focus on explaining global food insecurity problem using population data. The essence is to

give a snapshot of global food problems. (Battisti & Naylor, 2009; Rosegrant & Cline, 2003; Weis, 2013).

Figure 2 - 3: Food security dimensions



Source: Adopted from Smith (2002)

Regional and national level analyses also use aggregate data to show progress on food security. The focus at this level is mostly on availability of national food stocks and the capacity of countries to import food in times of scarcity (Dorosh, 2001; Siamwalla & Valdés, 1980). In household food security assessments, the ability of households to provide adequate food for the needs of all members is the main focus. Emphasis shifts from production of adequate stocks, capacity to acquire food when needed to availability of asserts and other resources that can be turned into household capacities to acquire food (Maxwell & Smith, 1992; Maxwell, 1996; Pinstrup-Andersen, 2009). Individual food insecurity analyses go beyond household food

insecurity to examine household power and control dynamics in resource and food allocation. Understanding variation of food insecurity and across different categories of individuals in a household drives analysis at the individual level (Maxwell & Smith, 1992; Pinstrup-Andersen, 2009). For instance, how differently food insecurity affects males and females in a household are examined using individual household food insecurity.

Scales and units of food security analyses are related to the pillars of food insecurity. While global regional and national level conceptualization and examination of food security center on food availability and utilization, units of analyses below the national level typically examine food accessibility in addition to food availability and utilization. The capacity of global, national, community, houslds and individuals to sustain food security status at all times is a key factor in the analysis of food security (Maxwell & Smith, 1992; Sonnino, 2014).

2.4.4 The Concept of Self-Rated Health

Self-Rated Health (SRH) is a subjective and individual perception rating of health status elicited by basic questions "How is your health in general? Is it excellent, very good, good, fair, or poor?" It is used in a wide range of disciplines including health sociology, health and medical geography, economics, epidemiological and medical studies since the 1950's (Jylhä, 2009) in predicting mortality, morbidity and future health status of different population groups in different contexts (Abdollahpour, et al., 2014; Burström & Fredlund, 2001; Kennedy, et al., 1998; Miilunpalo, et al., 1997; Mossey, 1982; Nedjat, et al., 2012; Riise, et al., 2013). The popularity of SRH is as a result of its high predictive power over other health measures. For instance, Burström & Fredlund (2001) in examining whether SRH was a good predictor of mortality among lower and higher social groups found it to have a very high

predictive power with socio-economic factors. Other studies such as Miilunpalo et al. (1997), Dowd & Zajacova (2007), Jylhä (2009) and Finch, et al. (2002) confirmed the strength of SRH in predicting health related outcomes. Jylhä (2009) suggests that SRH has the ability of capturing different dimensions of health because the single question motivates respondents to deconstruct what is health and what are its main components as constructed in their social and cultural context before making a rating of their health status, making it such a powerful tool for accessing health status of individuals.

Notwithstanding the potentials of SRH, other empirical studies have questioned its applicability at a global scale with the argument that SRH is so much dependent on social and cultural conceptualizations of health, which could make generalization and comparison of results from different contexts problematic (Fillenbaum, 1979; Wu et al., 2013). Fillenbaum (1979) illustrates this position with a study that examined variations in self-rated health among persons from different communities in health institutions in the United States revealed that people from the same community with the same objective health score and located in different health facilities tended to have similar self rating scores. However, those from different communities in the same health institution with the same objective health rated their health differently, suggesting community effect on self-rated health.

This study uses SRH as a measure of health status in examining the relationship between food security and health. I conceptualize SRH as a health outcome influenced by household food security status based on literature showing a relationship between food insecurity and health (Alaimo et al., 2001; Cook et al., 2004; Ding et al., 2015; Gundersen & Kreider, 2009; Kassebaum et al., 2014; Siefert et al., 2001; Stuff et al., 2004). With an understanding that food security and health

relationships take place within political, environmental, and economic contexts, this study is further informed by theoretical constructs from of health geography.

2.5 Study Context

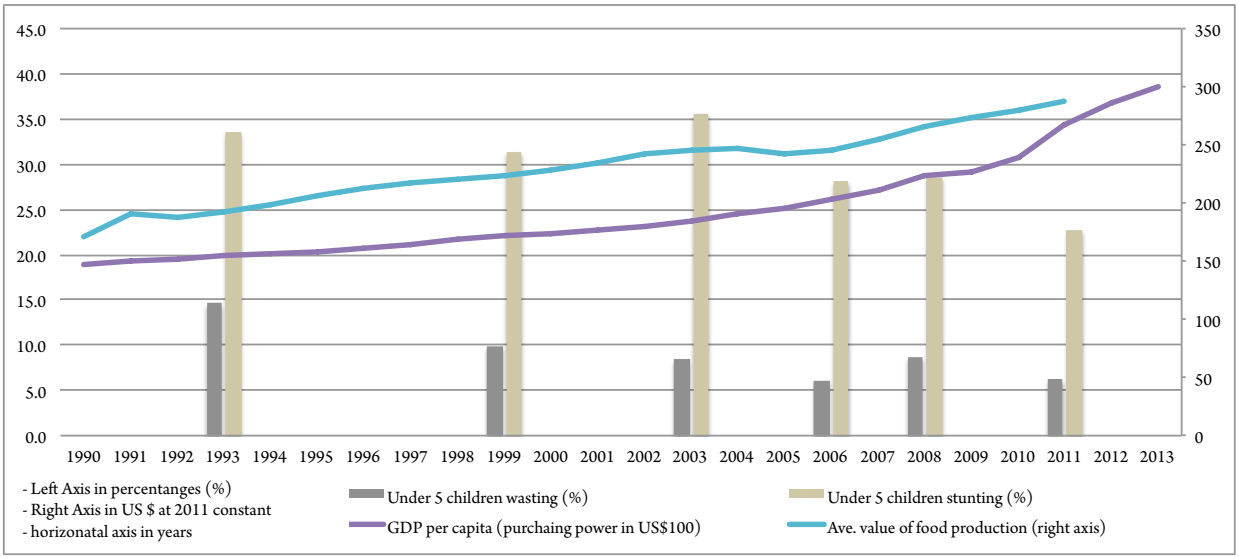
2.5.1 Food insecurity, health and poverty in Ghana

Ghana's journey towards improved food security can be described as roughed. Growth in the agricultural sector declined between 1974 and 1982 to an average rate of 3.1% after a consistent positive growth average of 2.6% since 1961. The decline was attributed to a combination of factors. The price of cocoa experienced a major drop in the world market. Cocoa was the major export community of the Ghanaian economy and the effect of a price drop devastated the economy. Also, the country witnessed a prolonged draught affecting food production, and in addition to government mismanagement of resources and political instability at the time, the effect on food security was disastrous (Pearce, 1992). After the downturn, the growth picked up again from 1983 at an average of 5.1%, one of top five highest growth rates in the world (Leturque & Wiggins, 2010). Leturque and Wiggins (2010:4) suggest that "the single most important driver of change has been the economic reforms undertaken since 1983".

According to FOA statistics, food security indicators have continued to show tremendous improvement in the last two decades (see Figure 2-3). Average value of food production, which indicates the value of food produced per head in a country (calculated as a three year average at 2004-2006 price constant) increased consistently from US $171 in 1990-1992 to US $287 in 2011-2013. Within the same period, the purchasing power per individual measured as Gross Domestic Product per capita (at

2011 constant in US $) also increased from 1,891.60 in 1990 to 3,864.00 in 2013 (see Figure 2-3).

Figure 2 - 4: Trends of selected food security indicators in Ghana (1990-2013)



Source: FAOSTAT dataset

Ghana has consistently and effectively used the gains in economic growth over the last two decades to design social welfare systems to reduce the incidence of poverty in the country. According to the Ghana Living Standards Survey (GLSS 5), the country reduced the incidence of poverty from 36.5% in 1991 to 18.2% in 2006 and rural poverty fell from 64% to 40% within the same period. Also, the number of people living below the upper poverty line ($1.25 per day) reduced from 51.7% to 28.5% (GSS, 2008). It is suggested that these reductions in poverty provided a cascading positive effect on food security situation in the country (Ecker, et al., 2012).

Reduction in the percentage of children under five years suffering from stunting and wasting became steady after 2003 (see Figure 2-3). Overall, the percentage of children below age five suffering from stunting reduced from 33.5% in 1993 to 22.7% in 2011 whilst the percentage suffering from wasting reduced from

14.6% to 6.2% over the same period. These statistics suggest that even though Ghana experienced increased food production, it did not seem to have a significant effect on the health of children under five. A practical reason could be that although food availability has improved, food utilization in a manner that optimizes intake of critical nutrients remains a challenge for the country. This gap is recognized in agricultural and health policy targets expressed in the Shared Growth and Development Agenda II (2014-2017) and in earlier development frameworks. The other factor could be accessibility. Considering the importance of road transport in food access in the country, poor roads have significant implication for food security in the country. A study by Luginaah et al. (2009) found that migrant families in the Upper West Region found it difficult receiving food remittance from migrant family members in the Brong-Ahafo Region partly because of poor roads. Also, a comprehensive study on the status of post-harvest losses conducted by Alliance for a Green Revolution in Africa (AGRA) in eleven countries (including Ghana) in 2013 showed that almost half of all food produced in the Ghana do not get to the final consumer (AGRA, 2014).

Food security strategies within the general Food and Agricultural Sector Policy Framework (FASDEF) have highlighted low education on nutrition, and poor road network in rural areas as some of the barriers challenging food security in the country. Despite the vivid explanation of these problems, the strategy provides limited measures for dealing with food transportation barriers in particular. Rather, the main emphasis remains mechanization of agriculture to increase production of food. Food production has been the main focus of agriculture policy and interventions in the country since independence. For instance, a historical analysis of the agriculture policy environment by Nyantakyi-Frimpong and Bezner Kerr (2014) highlights a

limited policy space for food access and utilization in the country. Indeed, the Ghana Shared Growth and Development Agenda (GSGDA II), the main medium term development framework for the country for the period 2014 to 2017, acknowledged that "there is a general lack of national nutrition and food security policy" (Government of Ghana, 2014: p.104).

2.5.2 The Upper West Region

The Upper West Region is located on the northwestern corner of Ghana (1º25" and 2º30" W; 9º30" and 11º N) and shares boundaries with Burkina Faso to the North and West, Northern Region to the South and Upper East Region to East (See Figure 2-4). It occupies a landmass of 18,476 km^2, constituting 12.7% of Ghana's land area (Luginaah, 2008; Rademacher-Schulz et al., 2014). The region is located in the semi-arid Guinea Savannah belt with one season of rainfall occurring from April/May to October (Rademacher-Schulz et al., 2014). There are eleven geo-political districts and Wa Municipal is where Wa, the capital, is located. The region has 702,110 inhabitants and a sex ratio of 94.5 men to every 100 women (51.4% female) and a population density of 103 persons per square kilometers, the least populated in the country (GSS, GHS, & DHS/ICF International, 2014). It remains largely rural (GSS, 2012).

The region has 174 health facilities comprising 91 Community based Health Planning and Service (CHPS) compounds, 6 hospitals (1 regional and 5 district), 6 clinics and 60 health centers (GHS, 2013). These facilities are generally manned by inadequate professional staff. For instance, the doctor to patient ratio in 2013 stood at 1:53,064 compared to the national average of 1:10,170. Given the level deprivation, it is not particularly surprising to find that institutional maternal mortality rate increased from 157.7 to 192.9 from 2010 to 2013 when the national average decreased from

164.1 to 154.6 per 100,000 live births over the same period (Ministry of Health, 2014).

Subsistence Agriculture is the main livelihood in the region, yet, food insecurity is a major problem because of climatic variability and soil infertility, resulting in significant migration of people out of the region (Abdul-Korah, 2011; Hesselberg & Yaro, 2006; Kuuire et al., 2015; Luginaah et al., 2009; Rademacher-Schulz et al., 2014; WFP & MoFA, 2012). According to a research conducted in the three regions of northern Ghana, the UWR is the second most food insecure (WFP & MoFA, 2012). Other livelihoods in the region in addition to agriculture include animal rearing, baking, weaving, and small scale trading. These livelihoods remain on a low scale as a result of limited economic opportunities, low infrastructure and high incidence of poverty in the region. Poverty in the region has been described as endemic where nine (9) in every ten (10) people live on less than US $1.25 a day (GSS, 2012).

2.6 Summary

This chapter summarizes the scholarly context of the research. It provides a background literature on food security situation in the world and in Ghana. It highlights disparity in food security among the world regions and within countries, which lend credence to the questions being asked about the incidence of food insecurity in the Upper West region in this study. It followed with a discussion of geographies of health and the political ecology of health framework, which provided theoretical and conceptual construct for interrogating the research questions. The chapter also provides the basic political, environmental and demographic

characteristics of the study area, giving a sense the situation of contextual and compositional factors relevant to food security and health.

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Chapter 3

3 Study Design and Methods

3.1 Introduction

This chapter explains the methodology of the study and discusses how it is linked back to philosophical, ontological and epistemological positions in food security and health. This is important because the individual manuscripts in the thesis do not give a detailed methodological discussion as conceived and implemented as a result of limitation imposed by journal guidelines and preferences. In addition, the concept of food security and health is complex and with many dimensions (Maxwell & Smith, 1992; Pinstrup-Andersen, 2009) such that failure to demonstrate the philosophical, epistemological and methodology underpinnings of the thesis could risk misinterpreting and misunderstanding of the thesis questions, the design used, and the findings.

3.2 Philosophy, epistemology and methodology

An underlying purpose of research is to build knowledge and understanding of the complexity of the world, and philosophy simplifies what we know and how we know about the world (Stuart & Gill, 2006). In this thesis, what we know as food insecurity and health and how we know they exist is conceptualized and explained with the help of philosophy. More detail understanding of food insecurity and health and how they can be discussed and communicated as reality in the world is invariably directed by ontology. According to Guba and Lincoln (2004), ontology concerns what is reality in the world and explains whether reality is objective, existing without human manipulations or it is created by the subjective human mind and susceptible to human influence and interpretation. Tied to philosophy and ontology is epistemology

which relates to what is admissible knowledge and how it can be obtained. Epistemology sets knowledge into positivism and interpretivism, and the processes and ways of knowing is put into objectivism and subjectivism dualism. Flowing from these are a continuum of theories explaining different degrees and shades of epistemological position (Crotty, 1998; Lincoln, Lynham, & Guba, 2011; Onwuegbuzie & Leech, 2005).

Food insecurity and health is laced with philosophical and epistemological thinking. As indicated in chapter two, the conceptualization of food insecurity as a problem of low production of food and low nutrient intake (Godfrey et al., 2010) is rooted in positivists thinking whiles food access as explained by Sen (1982), is mostly explained with interpretivist epistemology. This thesis examines food insecurity in terms of food access and tends to conceptualize food insecurity as a concept influenced influenced by contextual variables.

Despite the linkage of this conceptualization to methodological design, assumptions of Sayer (1992)'s intensive versus extensive research suggest that research methods are less important than the expected generalizability of the research output in the determination of the type of methodological design to use. Extensive research design focuses on generalizability and showing patterns across different spatial contexts and different groups of people whiles the main aim of intensive research is digging out deeper meanings that are uniquely constructed and influenced by context and place based variables (Warshawsky, 2014). This is not to suggest that philosophical and epistemological conceptualization of a study is not relevant in the choice of study design, rather that the nature of the expected research output and intended level of generalizability should be tied back into theory, epistemology and

philosophy (Babbie, 2014; et al., 2009). This thesis was intended to answer the following questions:

1. What is the incidence of household food insecurity in the Upper West Region?
2. What effect do remittances have on household food insecurity in the Upper West Region of Ghana?
3. What is the association between food security and self-rated mental health in the Upper West Region of Ghana?

The purpose of the research questions was to examine food insecurity and show its variations across the UWR, a region with persistent food insecurity. It is also to provide an understanding of food and health relationships, which could be generalizable in the UWR. These assumptions prescribe a post-positivist philosophical paradigm, with pragmatist epistemological underpinnings within health geography (see chapter two) to address the research question and satisfy the level of generalizability of the study findings.

3.3 Design of the study and sampling

The study used a quantitative survey research approach in order to make a generalization about the incidence of food security and explore associations between food security and health in the Upper West Region (Creswell, 2003). More so, earlier research had provided pockets of in-depth analysis of food security in parts of the region (Nyantakyi-Frimpong & Bezner-Kerr, 2014) laying a strong basis for a quantitative research on food security problems in the Upper West Region of Ghana. Qualitative empirical research has described food insecurity and explained possible factors that could be driving it in the region. However, knowledge about its spatial distribution is limited. In addition, health geography supports a pragmatist

philosophical approach, allowing for the use of mixed methods, or either quantitative or qualitative methods, depending on the objectives and the demands of the research questions (Morgan, 2007; Poon, 2009). There are several studies that have used quantitative methods to examine food security, as many as there are qualitative and mixed methods studies; hence, the emphasis is on methodological appropriateness in addressing the research questions and not philosophical dogmatism.

The nature of the research questions required targeting of household heads. Participants were selected proportional to the population characteristics of the Upper West Region based on the 2010 population and housing enumeration clusters (GSS, 2012). Out of a total of 110,175 households and using Sloven's formula for sample determination at a confidence level of 95%, a sample of 1,438 households was enough to give statistical power to the study. A multi-stage stratified sampling was used to arrive at specific households for interviews in order not to bias the study results (Agresti & Finlay, 2009). The first stage sample communities were based on the 2010 PHC sampling frame to select one hundred and twenty-eight study communities. The second stage used probability sampling to identify the specific households to interview. The house numbers were used as identifies in the sampling process. In the selected households, the household heads were interviewed. The use of this approach was not only based on its strengths in answering the research questions but was also informed by its extensive use in similar studies (Garcia et al., 2013; Kennedy & Peters, 1992; Leroy, et al., 2001; Mcintyre, 2003).

3.4 Data collection and methods

The study used the Household Food Insecurity Access Scale (HFIAS) and the DUKE self-rated health tool in collecting data to answer the research questions.

HFIAS is a nine-point item developed by Coates, et al. (2007) to capture perceptions of household heads regarding the food security of their households. The United Nation's Food and Agricultural Organization (FAO) as well as some researchers (Kabunga, et al., 2014; Maisonneuve et al., 2014) have adopted this scale and extensively used it in examining the access component of food insecurity because of its strengths in measuring perceptions, which are not easily measured by other tools like Household Hunger Scale and Household Dietary Diversity Scale (Maxwell, et al., 2006). Key questions asked with this instrument included 'In the past four weeks, did you worry that your household would not have enough food? In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food? In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?' All key questions are followed with sub-questions on frequency of occurrence with categories: rarely, sometimes, and often (see Appendix A).

The second standardized tool was the 17-point DUKE health profile, which allowed respondents to measure six (6) components of their own health (physical, mental, social, general, perceived health, and self-esteem) and four components of their dysfunction (anxiety, depression, pain, and disability) (Parkerson, et al., 1990). The research also used SRH (Finch et al., 2002; Salomon, et al., 2009). Data on gender, marital status, highest educational attainment, occupation, religion, household annual income, household assets and other theoretically relevant variables were collected. Collections of these variables are based on two main reasons. Demographic, socio-economic and other compositional factors influence both food security and health and would moderate a relationship between the two. Accounting for their effect

on the analyses of food security and health is important would give robust parameter estimates of the relationship. The second reason was to understand how the association differs among individuals with different characteristics.

In order to ensure quality in the data collection process, twelve research assistants with appreciable knowledge and understanding of research, familiar with the study area and with strong communication skills in Dagaare, Waale, Brifo and Sissala – local languages in the study area – were recruited and trained on the data collection instrument and the data collection process before they got onto the field. Their training involved mock exercises on asking the survey questions appropriately in the local languages, learn techniques of capturing responses and completing surveys, and strategies at encouraging participation of respondents throughout the survey period. I supervised the research process in the field and conducted debriefing after every three days with the entire research team to tighten loose ends. The data collection took place in the months of May to August, during which period hunger is severest in the study area (WFP & MoFA, 2012).

3.5 Data analysis

Data collected from the field was processed using STATA13 and SPSS. Data cleaning removed coding and data entry errors, which could have biased the results. The detailed analytic strategy for each of the manuscripts is presented in the manuscripts. Briefly, the outcome variable in manuscript one was food insecurity with a ordered four categories from severally food insecure to food secure (Pampel, 2000). I utilized ordered logistic regression to examine the relationship between the outcome variable and remittance. The outcome variable for manuscript two was perceived mental health, a continuous variable constructed from the DUKE Health Profile. I

utilized ordinal least squares (Allison, 1999) to examine the relationship between food insecurity and perceived mental health of household heads.

The ethics approval for this research was obtained from the Western University Health Sciences Research Ethics Board to protect the research participants. For instance, the study guaranteed participants' rights of anonymity, confidentiality of responses and allowed voluntary participation (voluntary entry and withdrawal from the study). These rights were communicated to participants using the research participants consent form before the start of the study. To make the study relevant to participants and stakeholders, results from the study will be shared with stakeholders through published articles in open journals.

3.6 Robustness of findings

Robustness of the study findings was promoted all throughout the stages of the study (study design, study implementation and data analysis) to guarantee generalizability of the study findings. At the study design stage, the choice of survey and the subsequent several rounds of revisions based on inputs made by my thesis committee and senior graduate students ensured that the questionnaire put together was comprehensive and adequate in responding to the data demands of the research questions. Also, coming out with a criteria for the appointment of research assistants at the design stage of the study was useful in ensuring qualified persons were chosen based the context and content demands of the study, thereby helping to ensure that the study findings were robust. Probabilistic simple random sampling gave a statistical validity for generalization of the findings. Training of research assistants on the questionnaire, appropriate questioning, documenting responses and coding ensured that research assistants had common understanding on the most appropriate way of

administrating the question. Pre-testing was an additional validity strategy for the findings.

Close monitoring of field activities and debriefing meetings every three days ensured the study was implemented according to plan. Internal validity testing during data analyses for the two manuscripts assured of the robustness of the findings and satisfied assumptions for generalization in the study context.

3.7 Summary

This chapter explained the methodological designed of the thesis as it was conceived and implemented. It discussed the linkages between philosophical, ontological, epistemological, and theoretical underpinnings of the thesis and justified the choice of the study methodology within food insecurity and health conceptualization. The chapter integrated the methods in the individual manuscripts in this thesis to give a holistic methodology of the thesis.

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Chapter 4

4 The Effect of Residential Remittance on Food Security in the Upper West Region of Ghana

4.1 Introduction

The conceptualization of food security has become more complex over time (FAO, IFAD, & WFP, 2014; Maxwell, 1996; Pinstrup-Andersen, 2009; Sen, 1982), with research shaping and reflecting this complexity. Generally, research on food security centers on food availability, access, utilization and stability. These themes are dealt as isolated items for the purpose of clarity, but they mostly overlap and intertwine in research. In recent times, food security discourse is moving from an overly rural focus to include urban context as a result of increasing urbanization which is occurring with increasing urban poverty and food insecurity (Crush & Frayne, 2011; Maxwell, 1999; Tawodzera, 2012). In investigating household food security strategies, migration and remittance are highlighted as possible pathways out of household food insecurity (Crush, et al., 2006; Kuuire et al., 2013; Luginaah et al., 2009). This paper contributes to expanding literature and theory around the complex effect of remittance on food security among rural and urban households in the Upper West region of Ghana.

A strand of food security literature focuses on food production and distribution. At the heart of this literature is that the root of food insecurity lies in the fact that food production is below the growth of population. Hence, the focus is on increasing the production of food, while advocating for reduction in population growth, particularly in developing countries where population growth rates have been relatively high (Godfrey et al., 2010; Lobell et al., 2008). This conceptualization of

food security is related to Malthusians' proposition that population growth was geometric while production was arithmetic (Sen, 1982). Sen argues that this simplistic description of food security often fuelled misplaced diagnostics and the application of food security strategies, resulting in failure to achieve anticipated outcomes. In constrast, Sen (1982) conceptualizes food security in the context of power dynamics, entitlements and society's orientation that tend to marginalize and create vulnerability among some sections of a population. Literature following this school mostly highlights inequality as the major issue in food security, as opposed to population growth. Researchers within this tradition have typically ruralized food insecurity by aligning rural poverty and vulnerability with food insecurity (Gladwin, et al., 2001; Hesselberg & Yaro, 2006; Nyantakyi-Frimpong & Bezner-Kerr, 2014).

The 1996 World Food Summit conceptualized of food security to exist when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 1997), and this is the most widely accepted definition in the food security literature. This definition highlights food availability, access, stability and utilization as key pillars of food security (Renzaho & Mellor, 2010). Food availability is a description of whether food is physically available or not. Possible determinants of food availability include the existence of national food stocks, food imports, and household or community's own food production and storage systems. Food access on the other hand includes food availability and the ability of households to acquire food. It relates to the availability of physical infrastructure to support the distribution of food and also to the food pricing system. Luginaah, et al. (2009) highlight the importance of food remittances and transportation networks as important aspects of food security in the Northern part of the country. According to Renzaho & Mellor

(2010), availability and access alone does not guarantee food security; utilization and stability (assets creation) are equally important. Stability is a measure of the ability of households to adjust to difficult times. In effect it estimates the coping mechanisms available for a household to rely on in difficult times, which include social networks, subsistence farming and employment activities and income transfers (mostly remittances) (Renzaho & Mellor, 2010).

Even though the impacts of poverty and vulnerability on food security have been comprehensively articulated in the literature, the discussion mostly excludes urban settings because poverty and vulnerability have been disproportionately concentrated in rural areas. However, there is emerging evidence of urban poverty and vulnerability in recent years partly due to increasing urbanization (Crush et al., 2006; Crush & Frayne, 2011; Tawodzera, 2012). In addition, food security analysis tends to mask intricate and nuanced associations of contextual and economic variables among households, missing the urban food security dimension (Crush, et al., 2010). In recent times, increasing research in urban food security such as the Hungry Cities research project is adding a new perspective to the analysis of food security, particularly in Sub-Saharan Africa (SSA), which is experiencing rapid urbanization (see Crush & Frayne, 2011; Crush et al., 2010; Ruel et al., 1998). Despite the emergence of urban food security and the important role of remittances, little is known about how differently remittances effect food insecurity in rural and urban settings. This study examines the relationship between residential remittance and food insecurity to provide some understanding of the persistent food insecurity in the Upper West Region.

Rapid urbanization in developing countries has been identified as one of the greatest threats to food security, especially in sub-Saharan Africa (Crush et al., 2006;

Ruel et al., 1998); and rural-urban migration is a significant contributor to urbanization (Crush et al., 2006; Kuuire et al., 2013). Young men and women leave the fields in rural areas to urban centers in search of employment. This is mostly the trend in rural areas where livelihoods are unsustainable due a mirage of factors including environmental stressors and relatively low local economic base. This tends to produce a double jeopardy for urban areas; increasing urban population pressures and reducing the quantity of food supplied from rural areas in a situation where out migration from rural areas is followed by a decrease in agricultural production. Consequently, populations in urban areas are fast becoming food insecure and may even experience a worse form of food insecurity relative to rural areas in the near future (Crush et al., 2006; Von Braun, 1993). Urban households attempt two main strategies to deal with the food security problem; farming in nearby locations and relying on social links with rural dwellers (Foeken & Owuor, 2001; Tawodzera, 2012). In extreme situations, household members are sent to friends and relatives in rural areas or some other well-endowed households in urban centers to reduce the number of people to feed (Frayne, 2004).

4.2 The New Economic and Labour Migration Discourse

The New Economic and Labor Migration (NELM) literature provides a basis for examining remittances and food security, as it presents the combined interplay of agency and structure in migration analysis (Abreu, 2012). Three explanations emerge from the assumptions of NELM: relative deprivation, investment, and insurance (Fransen & Mazzucato, 2014).

Relative deprivation signifies that more deprived households are likely to engage in migration as a means of diversifying sources of income. The key motivation

for migration is the anticipated increase in income at migration points which tend to benefit households in a form of remittance (Stark & Taylor, 1989) and the possibility of reducing the number of mouths in the household for feeding (Frayne, 2004). Remittances from migration also have the tendency to increase the investment portfolio of households (Frayne, 2004). Although there is fierce debate on the areas household will utilize remittance, much of the literature indicate that households are likely to invest remittances in productive activities such as agriculture after satisfying the consumption demands of household members. In developing countries, particularly in SSA, remittances have formed a significant portion of the investment capital for development (Taylor, 1999).

Moreover, remittances are also used to stabilize household food consumption in times of financial risk. Combes, et al. (2014) demonstrate the power of remittances in reducing the effects of food price shocks in low-income countries and SSA countries. Generally, it is assumed that households that receive remittance are more likely to withstand risk of food insecurity (Ahmed, et al., 2007; Mango, et al., 2014; Nguyen & Winters, 2011). This manuscript examines disparities in food insecurity among urban and rural households based on receipt of remittance.

4.3 Remittance and food security in the Upper West Region

Food insecurity in Ghana has persisted especially in the three northern regions for years (Hesselberg & Yaro, 2006; Kuuire et al., 2013; Luginaah et al., 2009; Rocah-Sch, 2014). For instance, a study conducted by the World Food Program and the Ministry of Food and Agriculture using the Food Consumption Score (FCS) in both urban and rural areas shows that 26% of households in the three northern regions experience severe to mild food insecurity (WFP & MoFA, 2012). In the Upper West

Region, where our study was conducted, 16% of households were found to be moderately to severely food insecure. The region is generally poor owing to years of marginalization largely created by colonial and post-colonial development policies, and agro-climatic negative effects (Kuuire et al., 2013; Luginaah et al., 2009; Van der Geest et al., 2010). As of 2010 the Upper West Region was the poorest region in the country, having nine in every ten people being poor – defined as living on less than US $1.25 per day (GSS, 2012).

Given the deep-seated poverty and persistent food insecurity in this region, it is not surprising that migration from the UWR and other northern parts of the country to the southern parts has been a long-standing practice. Young men and women (mostly active labour) migrate in search of better economic opportunities and fertile farmlands in the southern part of the country (Kuuire et al., 2013; Van der Geest et al., 2010). Indeed, WFP and MoFA (2012) indicates that 34% of households interviewed in the Upper West Region reported having had at least one member migrate to other parts of the country a year before the study. These migrants remit food and cash back home to sustain their families (Kuuire et al., 2013; Luginaah et al., 2009; Van der Geest et al., 2010). This research examines the effect of remittance on food security status of households in the Upper West Region of Ghana. Considering the changing dynamics of urban food security, we examine nuanced differences in remittance effects on food security of households in urban and rural areas. Specifically, we examine the following questions:

1. What is the prevalence of household food insecurity in the Upper West Region of Ghana?
2. What is the relationship between remittances and food security in urban and rural parts of Upper West Regions of Ghana?

4.4 Methods

4.4.1 Data and sample

The Upper West Region has a population of 702,110 people and 110,175 households living in all 11 districts, according to the Ghana 2010 census. A survey of households (n=1438) was carried out in all of the districts in the Upper West Region from May to July 2014. The study employed a two-stage stratified random sampling with probability proportional to size to select households based on the 2010 population and housing census enumeration clusters. In the first stage, enumeration areas were clustered into rural and urban to prevent unbiased representation of population characteristics and subsequent bias in study findings. The second stage used random sampling to select households from the two clusters in each of the districts proportional to the 2010 census figures.

Our survey instrument was tested prior to the start of the data collection to ensure content rationality and clearness. Interviews were carried out in the local language by trained enumerators, who were supervised by the researchers. We collected quantitative data on household assets, biosocial and demographic characteristics, and livelihood strategies including remittance. The questionnaire also included the Household Food Insecurity Access Scale (HFIAS) module to examine household heads perceptions of their own food security status (Coates et al., 2007; Swindale & Bilinsky, 2006). HFIAS is easy to use in food security data collection relative to other food security measures such as dietary recalls or anthropometric indicators (Coates et al., 2007; Kabunga et al., 2014). A total of 1,438 households were interviewed and their responses form the analytical basis of this study.

4.4.2 Measures

Food insecurity status, our dependent variable, was built using the Household Food Insecurity Access Scale (HFIAS). Coates et al. (2007) developed this scale, and it is being used extensively to measure the perception of food insecurity of households within a four-week recall period. Although the scale can be created as a continuous variable, it is mostly an ordered variable with four categories – food secure, moderately food insecure, mildly food insecure, and severely food insecure for the purposes of ease of comparison. Moderate food insecurity was a combination of mildly and moderately food insecure because of the relative small distribution of the mildly food insecure category. The focal independent variable – residential remittance – is created by cross-referencing place of residence (rural and urban) with household receipt of remittance to enable us avoid analytical simplification often associated with the contrast between remittance and non-remittance receivers. This variable was coded '0' for rural remittance receivers, '1' rural non-remittance receivers, '2' Urban remittance receivers, '3' Urban non-remittance receivers.

Biosocial variables included in the analysis are age of the household head, gender of household head (coded Male=0; Female=1), Ethnicity (Dagaaba=0; Sissala=1; Waala=2; Brifor=3; other tribes of northern Ghana decent=4; other tribes of southern Ghana decent=5). *Sociocultural* variables used include occupation of the household head (coded farming=0; trading=1; civil service=2; Other self-employ=3), marital status coded (never married=0; currently married=1; widowed=2), religion of household head (Christianity=0; Muslim=1; Traditionalist=2; no religion=3), household size (5 or less=0; 6 to 10=1; more than 10=3) and wealth status; a composite index based on the household's ownership of a number of consumer items including television and a car, flooring materials in the house, drinking water, toilet

facilities, livestock, was categories based on quintile district and coded as richest=0; richer=1; middle=2; poorer=3; poorest=4.

4.4.3 Data Analysis

Ordered logistic regression was employed to examine the association between residential remittance receipt and household food insecurity status. The primary reason for the choice of this analytic method is that the dependent variable, food insecurity, is an ordered variable, where as lower categories of food insecurity are preferred to higher levels of food insecurity. Ordinal logistic model is denoted by:

$$\log\left[\frac{P(Yij \leq 1)}{(1 - P(Yij \leq 1)]} = \alpha_0 + \sum_{k=1}^{p-1} \alpha_{jk} X_{ijk} + V_{ij}\,, C = 1, \ldots . \Omega - 1$$

Where α_0 and $\Omega - 1$ are the 'intercept terms that help model the marginal frequencies in the ordered categories. α_{jk} is the coefficient term, X_{ijk} are the explanatory variables, V_{ij} is the error term in the model, $P(Yij \leq 1)$ is the probability given that the event will happen, $(1 - P(Yij \leq 1)]$ is the probability that the event will not occur, k=1 is the first explanatory variable, and p – 1 is the last explanatory variable in the logistic model (Hedeker, et al., 2000). A positive value for the regression coefficient α in the equation indicates a positive relationship between the outcome variable and the covariate. In the context of this research, the outcome variable is coded as 1=food secure, 2=moderately food insecure, and 3=severely food insecure. Thus, a covariate with a positive coefficient would suggest transiting into a higher order category – higher levels of food insecurity and the exponentiation of which would mean households are more likely to be food insecure. Similarly, a covariate with a negative coefficient would mean transiting into lower order categories – more likely to be food secure and the exponentiation of the coefficient would imply households are less likely to be severely food insecure. Odds ratios are

estimated using the maximum likelihood estimation procedure (Akaike, 1998). Thus, an odds ratio greater than one, in this research context, is interpreted as households being 'more likely to be food insecure', while an odds ratio less than one indicates 'a less likelihood of being food insecure'. In all, three main models are estimated. The first examines the impact of socio-economic variables on household food insecurity, which include residential remittance as the focal independent variable, occupation, education and wealth; the second model adds bio-socio-cultural predictors, and the third, locational variables, to understand the effect sizes attributable to the various the key independent variable.

We first present a univariate distribution of selected independent variables and the dependent variable – household food insecurity – as shown in Table 4-1. Table 4-2 presents the bivariate associations between predictor variables and household food insecurity, while results of multivariate models are presented in Table 4-3.

4.5 Results

The majority of the households in our study (63.6%) were found to be severely food insecure, while those categorized as moderately food insecure and food secure were 34.6% and 1.8%, respectively. In terms of receipt of remittance, 2.43% of urban and 15.37% of rural households reported receipt of remittance of any kind at any point in the twelve months preceding the study. Farmers were the majority in the study (66.6%), followed by civil servants (13.3%), traders (12.7%) and those in various forms of self-employment (7.4%). In terms of wealth distribution, the richer category has the highest distribution of respondents (24.9%). About half (41.3%) of household heads did not have any form of formal education and less than 15.1% had tertiary education. The study sample characteristics are presented on Table 4-1.

Results from our bivariate analysis of the dependent (food insecurity) and selected independent are presented in Table 4-2. Generally, remittance receiving households in both urban and rural as well as rural non-remittance receiving households were all found to be more likely to be in a higher category of food insecurity compared to urban non-remittance receiving households (OR=2.18, $p<0.05$; OR=4.09, $p<0.001$ and OR=2.48, $p<0.001$, respectively). Our bivariate analysis also found significant associations between socio-economic factors and food security. Household headed by traders, civil servants, and self-employed were all significantly less likely to report being severely food insecure compared to farmers (OR=0.51, $p<0.001$; OR=0.25, $p<0.001$ and OR=0.40, $p<0.001$, respectively). Compared to the richest, households in any of the wealth categories were more likely to be in a higher category of food insecurity at 99.99% confidence level of prediction. In terms of education, household heads with no education were more than two times more likely to report being severely food insecure compared to those with tertiary education (OR=3.52, $p<0.001$). Similarly, household heads with primary education and those with secondary education were more likely to report being severely food insecure compared to those with tertiary education (OR=2.69, $p<0.001$ and OR=2.19, $p<0.001$ respectively).

Table 4 - 1: Descriptive statistics of selected variables

	Freq./Mean	Percent. /Std. Dev.
Food Insecurity		
Food secure	26	1.81
Moderate	497	34.6
Severe	915	63.6
Household Residential Remittance Receipt		
Urban non-remittance receiving households	209	14.5
Urban remittance receiving households	35	2.4
Rural remittance receiving households	221	15.4
Rural non-remittance receiving households	973	67.7
Occupation		
Farming	957	66.6
Trading	183	12.7
Civil Service	191	13.3
Other self-employed	107	7.4
Wealth Quintile		
Richest	295	20.5
Richer	343	23.9
Middle	270	18.8
Poorer	262	18.2
Poorest	268	18.6
Educational level		
Tertiary	217	15.1
Secondary	274	19.1
Primary	353	24.6
No education	594	41.3
Household Size		
5 or less	298	20.7
6 to 10	603	41.9
More than 10	537	37.3
Age	44.63978	10.42237 (min. 20, Max. 70)
Gender		
Male	918	63.8
Female	520	36.2
Marital status		
Currently married	1,242	86.4
Currently single	68	4.7
Widowed	128	8.9
Ethnicity		
Dagaaba	778	54.1
Sissala	354	24.6
Waala	199	13.8
Brifo	71	4.9
Other (Outside Upper West Region)	36	2.5
Religion		
Christian	786	54.7
Muslim	419	29.1
Traditionalist	206	14.3
Others/No religion	27	1.9
Districts of residence		
Wa Municipal	212	14.7
Wa East	144	10.0
Wa West	164	11.4
Nadowli/Kaleo	99	6.9
Jirapa	176	12.2
Lawra	106	7.4
Nandom	91	6.3
Lambussie/Karni	102	7.1
Sissala East	144	10.0
Sissala West	101	7.0
Daffiama/Bussie/Issah	99	6.9
Observations	1,438	100

Table 4 - 2: Bivariate results from ordered logistic regression prediction food insecurity

Food insecurity	OR (Robust std. Err.)
Urban/rural and remittance (ref: Urban non-remittance receiving households)	
Urban remittance receiving households	2.18(0.82)*
Rural remittance receiving households	4.09(0.85)***
Rural non-remittance receiving households	2.48(0.38)***
Occupation (ref: farmer)	
Trading	0.51(0.083)***
Civil Service	0.25(0.040)***
Other self employed	0.40(0.080)***
Wealth quintile (ref: Richest)	
Richer	2.97(0.49)***
Middle	3.59(0.64)***
Poor	2.83(0.50)***
Poorest	3.28(0.58)***
Education (ref: tertiary)	
Secondary	2.19(0.40)***
Primary	2.69(0.47)***
No education	3.52(0.57)***
Household size (ref: 5 or less)	
6 to 10	1.53(0.22)**
More than 10	2.34(0.35)***
Age	1.02(0.00549)***
Gender (ref: male)	
Females	1.041(0.12)
Marital status (ref: currently married)	
Currently single	1.10(0.29)
Widowed	1.79(0.38)**
Ethnicity (ref: Dagaaba)	
Sissala	1.35(0.18)*
Waala	1.22(0.20)
Brifor	0.75(0.20)
Other	0.86(0.30)
Religion (ref: Christians)	
Muslim	1.64(0.21)***
Traditionalists	1.59(0.26)**
No religion	1.71(0.73)
District (ref: Wa Municipal)	
Wa East	4.54(1.17)***
Wa West	1.79(0.38)**
Nadowli/Kaleo	3.62(1.01)***
Jirapa	1.99(0.42)***
Lawra	1.13(0.27)
Nandom	0.77(0.19)
Lambussie/Karni	2.59(0.67)***
Sissala East	1.65(0.36)*
Sissala West	2.12(0.53)**
Daffiama/Busie/Issah	1.08(0.26)
Observations	1,438

***p<0.001, **p<0.01, *p<0.05, †p<0.1

Moreover, households with more than six members were more likely to report being severely food insecure compared to household size of five or less. Also,

households with older heads were shown to have 2% more likelihood of reporting bring severely food insecure (OR=1.02, p<0.001). Households headed by widows were more likely to be severely food insecure compared to those headed by a married couple (OR=1.79, p<0.01).

Furthermore respondents of Sissala ethnicity were more likely to report being severely food insecure compared to Dagaaba (OR=1.35, p<0.05), and households that have Muslim and Traditional religious believers as heads were more likely to be severely food insecure compared to Christians (OR=1.64, p<0.001 and OR=1.59. p<0.01 respectively). Also, the district of residence was significant in our bivariate analysis. Households located in Wa East, Wa West, Nadowli/Kaleo, Jirapa, Lambussie/Karni, Sissala East, and Sissala West were all more likely to be in higher levels of food insecurity compared to households resident in Wa Municipal.

In our multivariate analysis, we built three models to show the net effect of other independent variables on the association between residential remittance and household food insecurity (see Table 4-3). In the first model we controlled for socio-economic variables. The findings show similar results as in the bivariate analysis. Remittance receiving households located in urban and rural areas, as well as non-remittance receiving households in rural areas were more likely report being in severely food insecurity compared to urban non-remittance receiving households (OR=2.40, p<0.05; OR=2.09, p<0.01 and OR=1.36, p<0.1, respectively). However, we find changes in the prediction power of other socio-economic variables after controlling for the effect of residential remittance in model 1. Although still more likely to report being severely food insecure when compared to the richest, the prediction power reduced slightly from 99.999% to 90% for households in the poorest and poor wealth categories.

Table 4 - 3: Multivariate ordered logistic models predicting food insecurity

	Model 1 Socio-economic OR (Robust Std. Err.)	Model 2 Bio-socio-cultural OR (Robust Std. Err.)	Model 3 Location OR (Robust Std. Err.)
Urban/rural and remittance (ref: Urban non-remittance receiving households)			
Urban remittance receiving households	2.40(0.93)*	2.38(0.93)*	2.44(0.96)*
Rural remittance receiving households	2.09(0.49)**	2.19(0.52)***	2.46(0.68)***
Rural non-remittance receiving remittance	1.36(0.25)†	1.36(0.25)†	1.49(0.34)†
Occupation (ref: farmer)			
Trading	0.63(0.11)**	0.67(0.12)*	0.64(0.12)*
Civil Service	0.49(0.11)**	0.46(0.11)***	0.42(0.97)***
Other self employed	0.56(0.13)**	0.61(0.14)*	0.61(0.14)*
Wealth quintile (ref: Richest)			
Richer	2.12(0.39)***	1.93(0.36)***	1.85(0.36)***
Middle	2.28(0.45)***	2.04(0.43)***	2.08(0.45)***
Poorer	1.81(0.36)**	1.68(0.35)**	1.82(0.40)**
Poorest	1.72(0.36)**	1.62(0.35)*	1.79(0.40)**
Education (ref: tertiary)			
Secondary	1.36(0.30)	1.30(0.29)	1.27(0.29)
Primary	1.66(0.36)*	1.53(0.34)†	1.42(0.32)
No education	1.71(0.37)**	1.49(0.34)†	1.25(0.29)
Household size (ref: 5 or less)			
6 to 10		1.10(0.18)	1.13(0.19)
More than 10		1.41(0.25)*	1.31(0.24)
Age		1.01(0.00636)	1.007(0.00658)
Gender (ref: male)			
Females		0.90(0.11)	0.91(0.12)
Marital status (ref: currently married)			
Currently single		1.20(0.34)	1.31(0.38)
Widowed		1.87(0.44)**	2.10(0.51)**
Ethnicity (ref: Dagaaba)			
Sissala		1.13(0.19)	1.15(0.22)
Waala		0.87(0.18)	0.75(0.17)
Brifor		0.80(0.22)	0.71(0.20)
Other		0.89(0.33)	0.88(0.34)
Religion (ref: Christians)			
Muslim		1.46(0.25)*	1.53(0.27)*
Traditionalists		1.00(0.17)	1.00(0.20)
No religion		1.98(0.888)	1.93(0.88)
District (ref: Wa Municipal)			
Wa East			1.75(0.57)†
Wa West			0.90(0.26)
Nadowli/Kaleo			1.50(0.53)
Jirapa			1.02(0.27)
Lawra			0.65(0.18)
Nandom			0.31(0.10)***
Lambussie/Karni			1.11(0.39)
Sissala East			0.72(0.20)
Sissala West			0.76(0.25)
Daffiama/Busie/Issah			0.49(0.14)**
Constant cut1	0.0426(0.0135)***	0.0702(0.0290)***	0.0520(0.0225)***
Constant cut2	1.638(0.434)*	2.826(1.068)***	2.217(0.880)**
Log likelihood	-973.44665	-958.36766	-933.25047
Observation	1,438	1,438	1,438

***p<0.001, **p<0.01, *p<0.05, †p<0.1

On the hand, we find that there was no significant difference in levels of food security between households headed by people with secondary education and those by tertiary education in model 1. There were only slight variations in power and effect size of prediction in occupation and food insecurity in model 1. While the power of significance reduces from $p<0.001$ to $p<0.01$, the effect size increased across all occupation types compared to farmers.

Even after controlling for bio-socio-cultural variables in model 2, residential remittance remained robust with a slight increase in the effect size. Also, occupation of household head and wealth of households remained significant predictors of food insecurity. However, the effect of education attainment of household head attenuated. Similarly, households headed by widows remained significantly more likely to report being severely food insecure compared to those headed by currently married people, even after controlling for socio-economic and other bio-socio-cultural variables (OR=1.87, $p<0.01$). Compared to Christians headed households, Muslim headed households remain more likely to report being severely food insecure (OR=1.46, $p<0.05$). Also, household with more than 6 members remained a significant predictor of food insecurity with a 41% more likely to report being severely food insecure compared to households with 5 or less members.

In model 3 of our multivariate analysis, residential remittance remained robust from model two. We also find that compared to Wa Municipal, only Wa East remains significant from the bivariate analysis, and Nandom and Daffiama/Bussie/Issah becomes significant predictors of food insecurity in model 3 (OR=1.75, $p<0.1$; OR=0.31, $p<0.001$; and OR=0.49, $p<0.01$, respectively). Interestingly, further analysis shows residential remittance and wealth quintiles give such results. Moreover, we find

slight changes in odds of reporting being severely food insecure in model three with other covariates.

4.6 Discussion and Conclusion

In this study, we examined the impact of remittances on household food security of rural and urban dwellers in the UWR of Ghana. It is generally assumed that remittances received by households would ameliorate the food insecurity situation (Ahmed et al., 2007; Crush, 2013; Mango et al., 2014; Nguyen, et al., 2011; Nyikahadzoi et al., 2012). However, our findings show that although remittance has the effect of reducing the likelihood of households becoming severely food insecure, it does not seem to be enough to take households into food security status in both urban and rural areas. Specifically, we found that urban remittance-receiving households were more likely to report being severely food insecure compared to urban non-remittance-receiving households, although the likelihood of falling into food insecure reduced after we controlled for socio-economic factors. Again, rural remittance receiving households were also more likely to be food insecure. The general notion, in Northern Ghana at least, has been that remittance flows are from migrants in urban centers sending home monetary and other items for the collective wellbeing of those at home. The finding of food insecurity among urban recipients of remittance potentially signifies a reverse of fortunes with significant implication for other determinants of health.

Since remittance to urban areas seems not to be what the literature would suggest, one can say that this sub group of remittance recipients must be poor households that are lacking access to food, health and good jobs. These findings are corroborated by earlier research in UWR which indicates that households which

receive remittances are more likely to be vulnerable households that rely on various strategies such as food remittances in an attempt to meet their food needs (Kuuire et al., 2013). This study thus partly describes the nuanced dynamics of remittance effects on household food insecurity in both rural and urban areas in the Upper West Region. Several other studies have observed the reliance of households on a combination of remittances and other strategies by poor households to meet their food needs. For example, Ratha (2007) indicates that reliance on other strategies is not only because remittance is not adequate to require livelihoods of households during tough times, but also because of the fluctuating nature of remittance flows. Therefore, remittances as a diversification strategy may minimize the negative impacts of shocks on poor households by smoothening consumption in the short run (Tsegai, 2007). Under such circumstances remittances may not result in the attainment of food security as observed in this study. Given the poverty levels in the UWR, it is understandable that remittance may only help to manage the symptoms of food insecurity but not achieve food security entirely.

Additionally, remittances may not be adequate to compensate for the overall effect of losing household labour through migration in rural areas. Regassa & Stoecker (2012) indicates that migration of household members tends to follow food shortages. However, participation in migration itself should not be viewed as a cause of the food insecurity. Research shows that incidence of climatic stressors, poverty and food insecurity has the effect of pushing adult members of households to migrate in search of income and livelihoods to support their families (Luginaah et al., 2009; Regassa & Stoecker, 2012; Warner & Afifi, 2014). Therefore, migration can create farm labour shortages in the household resulting in over dependence on remittances transferred to the family. However, urban-poor households who may be relying on

family capital or family members in rural food producing areas would be affected when labour for food production is lost to migration. Research has articulated this point as part of the motivation of urban agriculture (Zezza & Tasciotti, 2010). Urban areas in the UWR rely on food produced from rural parts of the region and from the Brong-Ahafo Region (Kuuire et al., 2013; Luginaah et al., 2009; Van der Geest et al., 2010) and reduction in food production may have worsening food security implications for urban areas (Von Braun, 1993). Another dynamic may be that urban spiral which is consuming land that urban dwellers may have previously relied on for livelihood creating worsening urban food insecurity in the region.

Our analyses also show a relationship between wealth status and food insecurity. Poor households were more likely to report being severely food insecure compared to rich households. Interestingly, we find that households in the poorest and poor wealth quintiles formed 22% and 21% of remittance receiving households compared to 16% for the richest wealth category. This supports our earlier argument that poor households are relying on remittance, which does not seem to be leading to food security. It is important to state that categorization of households into wealth quintiles only depicts relative wealth and in the Upper West region where nine out of every ten people are poor. Hence, this categorization can be described as showing relative poverty in the region. However, our finding corroborates a study in Ethiopia which shows that respondents in the poorer wealth quintile were more likely to be food insecure regardless of remittance receipt (Regassa & Stoecker, 2012).

The finding that individuals engaged in trading activities and the civil service are relatively food secured when compared with farmers can be viewed in the context of the main driving force of migration in UWR. Agriculture employs over a third of the labour force in the UWR. However, drastic changes in the agro-ecological

environment from at least the last three decades have had dire consequences on agricultural livelihoods (Van der Geest et al., 2010). This has created a situation where migration is heavily relied on by peasant farmers fleeing hardships associated with reduction in food outputs due to low quality lands for agriculture and changing climate. It is therefore, not surprising that people who rely on agriculture as a means of livelihood consider outmigration important for youth from the region (Van der Geest et al., 2010) regardless of the challenges which exits in their destination areas (Kuuire et al., 2013) and the dwindling internal food aid to the UWR (Luginaah et al., 2009), emphasizing the point that the region has hungry farmers (Nyantakyi-Frimpong & Bezner-Kerr, 2014).

Meanwhile, the findings show an interesting relationship between religion and food insecurity. Interestingly, Muslims who are predominantly urban in context are more likely to be food insecure. A possible explanation could be that Muslim headed households are mostly polygamous, large in size, and consequently, have a higher likelihood of insufficient food. Second, until recently Muslims in this context did not participate in formal education hence are less likely to enter the civil services. Similar to our findings, some studies have also established links between household sizes and food security status. Available evidence shows that large households tend to be food insecure relative to smaller households (Aidoo, et. al., 2013; Garrett & Ruel, 1999; Mango et al., 2014). According to Garrett & Ruel (1999), in poor locations, additional members in a household results in difficulties to improve household income and food availability due to limited opportunities. This is pertinent in a region such as UWR where poverty levels are generally high and tends to be compounded by a paucity of resources and a general lack of economic opportunities (Hesselberg & Yaro, 2006). The unique situation in the region is that most rural areas are largely underserved with

transport. Migrants who have food cannot quickly and cheaply send it to their families in rural areas in the region.

Despite the limitation of this study being cross-sectional, it provides important understanding of the association between remittances and place of residence in two main ways. First, it contributes to the food security literature with the finding that there is a relationship between food security and remittance and that the association differs by urban and rural, and district of residence in this study area. Also, it suggests that remittance may be able to reduce food insecurity of households but may not lead to food security in very poor socio-economic environments such as the Upper West Region.

The second area of contribution is to policy. Based on the findings, there is an urgent need to redirect policy to increase agricultural productivity. Irrigation projects, agricultural extension services and subsidies to farmers are needed to change the story of the hungry farmer in the region. At the same, strategies such afforestation agro-ecological agriculture should be encouraged to contribute towards slowing down environmental change. Investing in road infrastructure to facilitate transportation of food from other parts of the country to the UWR is strongly recommended. One previous study emphasized the need for the development of transport facilities to connect the region in order to improve food security (Luginaah et al., 2009). Social interventions such as the Livelihood Empowerment Against Poverty (LEAP) and the National Health Insurance should target vulnerable people as the widow in the Upper West Region.

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Chapter 5

5 Household Food Insecurity as a Social Determinant of Mental Health among Household Heads in the Upper West Region of Ghana

5.1 Introduction

Household food security concerns access to safe and sufficient nutritious food in a socially acceptable way for a healthy living. Food insecurity, on the other hand, is conceptualized as "limitation or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire food in socially acceptable ways" (Stuff et al., 2004: p. 2330). Food insecurity remains a significant challenge for the world. For instance, 795 million people in 2015 still have the burden of malnutrition, of which more than 80% are in sub-Saharan Africa (SSA). High incidence of poverty, low agriculture technologies and associated low productivity, low infrastructure, political instability and poor governance are often cited as potential causes of the food insecurity problem in the sub region (FAO et al., 2015).

Food insecurity is known to have direct effect on health (Ding et al., 2015; Leung, et al., 2015; To, et al., 2014). From a nutrition point of view, populations with high incidence of food insecurity are also known to have high proportions of children suffering from malnutrition (FAO et al., 2015; Gundersen & Kreider, 2009). Among adults, food insecurity has been shown to relate with physical and psychological health (Stuff et al., 2004). A study in Toronto by Tarasuk (2001) examined the health effects of food insecurity among women over a three-year period and found that women from households with high incidence of food insecurity were more likely to consume compromised diets, which ultimately affect their health. Consumption of cheap food containing inadequate nutrients is a coping strategy for most food insecure

households (Gowda, et al., 2012; Townsend, et al., 2001). Generally, food insecure households have a high degree of vulnerability and high exposure to health problems including poor mental health (Hadley & Patil, 2006; Stuff et al., 2004). Food insecure households may experience anxiety about uncertain availability of food and stress associated with accessing food, which have the potential to deteriorate the psychological and mental conditions of household members (Siefert, et al., 2004; Whitaker et al., 2006).

Although the effect of food insecurity on health has been established in the literature, it has largely been focused on health of children, mothers (Stuff et al., 2004) and adults in specific age categories (Onadja, et al., 2013). An earlier study by Stuff et al (2004) in the United States expanded the literature by examining the association between food insecurity and health status of adults in 36 counties in the Lower Mississippi Delta region of Arkansas, Louisiana and Mississippi. Using the household food insecurity scale and the Short Form 12 point (SF-12) self-rated health, the study found that adults from food insecure households were more likely to report poor health. In a more recent study, Leung et al. (2015) found that food insecurity was associated with depression among individuals in a Supplementary Nutrition Assistance Program (SNAP) and those in low-income households in the United States. However, the study called for further research on the relationship between food insecurity and depression among participants of SNAP in the light of differing results.

While the food insecure-health nexus has been well researched in developed nations, this is not the case in SSA, a context where food insecurity is chronic in many areas (FAO et al., 2015). Building on existing research and using the Social Determinants of Health (SDH) theory (Raphael, 2006; Solar & Irwin, 2010; Wilkinson & Marmot, 2003), this study examined the relationship between household

food insecurity and perceived mental health in the Upper West Region of Ghana. We hypothesize that household heads from food secure households would rate their mental health as good when compared with those from food secure households when the effects of empirically relevant factors are accounted for. To the best of our knowledge, this study is the first to examine self-rated household food insecurity status and perceived mental health among household heads in SSA.

5.2 Theoretical Context

The SDH theory recognizes that the health of individuals and populations are influenced by various social factors outside the realm of biomedical and risky behaviours. It conceptualizes production and distribution of health as a factor of social organization and its influence on distribution of material resources among members of society (Marmot & Wilkinson, 2000; Raphael, 2006). This theory has evolved over time and at every stage it emphasizes different conceptualization of the influence of the social world on health (Solar & Irwin, 2010). The first strand of the theory emphasizes psychosocial factors, the second focuses on economic and political determinants of health in the social production and distribution of disease/political economy of health framework, while the third strand includes multi-dimensional frameworks such as the eco-social theory by Krieger (2001).

This study used the social production and distribution of diseases framework. This theoretical framework recognizes the significant role of negative psychosocial conditions as a result of income disparity on poor health outcomes of individuals and populations. Moreover, the crux of the theory is that inequality in the distribution of income and other material resources and political power are structural in nature. Disparities in incomes, infrastructure, level of education, food, health, transport

access, and economic wellbeing are reflections of inequality in investment and development of economic activities driven by structural forces such as government policies, environmental, climatic and individual composition factors as well as local social settings (Lynch et al., 1998). In examining social determinants of health, Dahlgren & Whitehead (1992) suggest five broad groups of factors, individual attributes (compositional factors), individual lifestyle factors, social and community support and networks, living and working environment, and general socio-economic and cultural environmental factors.

Individual compositional factors are age, sex, ethnicity and hereditary related factors. These factors reflect differences in biological make-up and social orientation and are influential in forming individual health attributes and individual perceptions about their own health (Rogers & Pilgrim, 2014). Individual lifestyle factors include alcohol use, smoking, drug misuse, poor diet and lack of physical activities, which have debilitating effects on the health of individuals. Social and material support from family, friends and community are protective of good health particularly for vulnerable individuals in society (Cohen, et al., 1986). Dahlgren & Whitehead (1992) suggest that these factors have the potential of remedying worsening health conditions produced by individual compositional and lifestyle factors. The fourth group captures factors relating to living and working conditions such as access to education, health, transportation, housing, water and sanitation amenities and food. These tend to reflect deprivation and socio-economic disparities in the immediate community. The fifth group considers structural level socio-economic, cultural and environmental conditions, which shape factors in groups one to four (Dahlgren & Whitehead, 1992).This provides a fitting conceptual framework for accessing the relationship between household food insecurity and health in the Upper West Region.

5.3 Food insecurity in the Upper West Region

The Upper West Region is located in the Northwestern part of Ghana. It falls within the semi-arid Guinea Savannah belt which experiences one season of rainfall occurring from April/May to October (Rademacher-Schulz et al., 2014).

The climate and agro-ecological factors in the region are not supportive of productive agriculture (Armah et al., 2011; Kuuire et al., 2013; Luginaah et al., 2009). The region is the most deprived in the country, having nine in every ten persons living on less than US $1.25 a day (GSS, 2012), low infrastructural development such as a poor quality transportation network, a limited number of education and health facilities, and disproportionality high population per professional staff ratio in health and education (GSS, 2012; Ministry of Health, 2014).

There is a high incidence of food insecurity that results in significant outmigration to the middle and southern belt of the country in recent period (Rademacher-Schulz et al., 2014). The World Food Program reports that 16% of households in the Upper West Region are moderately and severely food insecure , (WFP & MoFA, 2012). Other qualitative studies suggest a more worrying trend of food insecurity in the region (Kuuire et al., 2013; Luginaah et al., 2009; Nyantakyi-Frimpong & Bezner-Kerr, 2014). These have significant implications for the health of the people in the region, and form the background on which this study was developed.

5.4 Methods

5.4.1 Data and Sampling

The study used cross-sectional data collected from 1,438 household heads from all the eleven geo-political districts in the Upper West Region from May to August 2014 as part of a bigger food insecurity project. Two-stage sampling techniques were used to select respondents. The first stage used the 2010 Ghana National Population Housing Census (PHC) enumeration data (GSS, 2012) and the second stage used probability random sampling. Twelve (12) graduates from the University of Development Studies who were knowledgeable in research and fluent in the local languages – Dagaare,Waale, Brifo and Sissala – conducted face-to-face interviews with household heads. In the context of the Upper West region, household heads are have the responsibility of providing food for their households and would be the most appropriate individuals to responds to questions about food insecurity. Interviewers were trained on the survey instruments before they moved onto the field and debriefing meetings were held every three days to ensure all surveys were administered appropriately. Close monitoring by lead researcher ensured data was without missing cases.

Ethical clearance was provided by the Non-Medical Research Ethics Board of the University of Western Ontario and the University for Development Studies, Ghana and was keenly enforced to ensure the protection of both research participants and researchers.

5.4.2 Measures

In order to address the study objective of examining the relationship between household food insecurity and mental health of household heads, we constructed

perceived mental health as the outcome variable and household food insecurity as the key focal independent variable.

Outcome variable: Perceived Mental Health

Perceived mental health was constructed from a set of five (5) questions from the 17-item DUKE Health Profile (DUKE), which respondents answered (see Table 5-1). Selection of questions was informed by a guide provided by the DUKE Health Profile, and other empirical research (Parkerson et al., 1990). Respondents were asked to answer these questions on a three point Likert scale. Principal Component Analysis was used to derive 'perceived mental health' (Jolliffe, 2002; Moore, 1981).

Table 5 - 1: Relevant mental health variables from the DUKE health profile

Question	**Possible response**		
I like who I am	Yes, describes me exactly=0	Somewhat describe me=1	No, doesn't describe me at all=2
I give up too easily	Yes, describes me exactly=0	Somewhat describe me=1	No, doesn't describe me at all=2
I have difficulty concentrating	Yes, describes me exactly=0	Somewhat describe me=1	No, doesn't describe me at all=2
During the past four weeks, how much trouble would you say you had with:			
Feeling depressed or sad	None=2	Some=1	A lot=0
Felling	None=2	Some=1	A lot=0

We tested for the reliability and internal consistency of the construct. Cronbach's alpha value was 0.53, exceeding 0.50 which is considered reasonably acceptable for support of reliability (Helmstadter, 1964) especially when using the DUKE Health Profile (Parkerson, et al., 1990). A high value of the constructed composite variable (mental health) means good mental health.

Key independent variable: Household food insecurity

The household food insecurity variable was constructed using the 9-item Household Food Insecurity Access Scale (HFIAS) developed by Coates, et al (2007). This scale has been used extensively in studies in the US and other parts of the world

to access food insecurity status of households (Maxwell et al., 2014). It measures the status of household food insecurity over a four-week recall period. Coates, et al (2007) explain that the 9-item questions relate to "anxiety and uncertainty about household food availability", "insufficient quality of food", and "insufficient food intake and its physical consequences". Respondents answered a question about the frequency of occurrence of conditions of food insecurity on a 3-point Likert scale (Rarely=1, sometimes=2, and often=3), if response to any of the nine questions was "yes". The 18 questions (9 main and 9 frequency questions) were combined and categorized into 'food secure', 'mildly food insecure', 'moderately food insecure' and 'severely food insecure'.

In this study, we combined mildly and moderately food insecure into moderately food insecure because of small sample sizes and given that they both conceptually measure mid-point food insecurity condition on the HFIAS.

Study Covariates

Covariates were selected and grouped based on the SDH conceptual framework suggested by Dahlgren & Whitehead (1992) and other empirical studies (Leung et al., 2015). The first group of control variables included demographic and individual lifestyle factors (age, sex, alcohol consumption and ethnicity). Social support factors were membership of a social group, participation in social activities, remittance receipt, marital status, and religion. Living and working condition factors were occupation, education and wealth of households whilst general social-economic environmental factors were distance from health facility, urbanization level (rural or urban) and district of residence (see Table 5-2).

Table 5 - 2: Description of variables used in predicting perceived mental health

Variable	Description
Dependent variable	
Food insecurity	Constructed from the 9-item Household Food Insecurity Access Scale (HFIAS). Three categories derived by combining moderately and mildly food insecure. Coded as Severely food insecure=0, Moderately food insecure=1, Food secure=3
Control variables	
Individual level	
Age	Respondent age at interview was coded as less than 40=0, 40-49=1, 50-59=2, 60 and above=3
Alcohol Consumption	Respondents were asked if they had ever consumed alcohol apart from "pito" and responses were coded as No=0, Yes=1
Ethnicity	Respondents' ethnic background was coded as Dagaaba=0, Sissala=1, Waala=2, Brifo=3. Other ethnic groups outside the study region was coded as Others (outside UWR)=4
Social support	
Group membership	Respondents were asked if they belonged to any social group. Coded as, No=0 and Yes=1
Social participation	Respondents were asked how often they participated in social activities in the month preceding the interview. Coded as None=0, Some=1, A lot=2
Remittance Receipt	Respondents were as if they received remittance of any kind. Coded as No=0, Yes=1
Marital Status	Status of marriage of respondent at time of interview. Coded as Currently married=0, Currently single=1, Widowed=2
Religion	The religion affiliation of respondents was coded as Christianity=0, Muslim=1, Traditionalist=2
Living and working conditions	
Occupation	Respondents were asked of their main occupation and responses were coded as Civil Service=0, Farming=1, Trading=2, Other self-employed=3
Education level	Respondents were asked their highest educational attainment. Coded as None=0, Primary=1, Secondary=2, Tertiary=3
Household Wealth	Wealth of derived from report household assets and annual income using PCA and factor analysis and categorized into quintiles consistent with DHS. Coded as Richest=0, Rich=1, Middle=2, Poor=3, Poorest=4
Locational variables	
Distance to health facility	Respondents were the distance to health facility and categorized into more than 5km=0, 1-5km=1, less than 1km=2
Urbanization level	Dummy variable coded as Urban=0, Rural=1
District of residence	The region of residence of respondents at the time of interview. Coded as Wa Municipal=0, Wa East=1, Wa West=2, Nadowli/Kaleo=3, Jirapa=4, Lawra=5, Nandom=6, Lambussie/Karni=7, Sissala East=8, Sissala West=9, Daffiama/Bussie=10

5.4.3 Statistical Analysis

We employed Ordinary Least Square (OLS) regression to examine the association between household food insecurity and perceived mental health of household heads, given that our outcome variable, "perceived mental health", is continuous. We conducted a diagnostic test to ascertain that the variables met the assumptions of regression models. OLS models are built on the assumption of

independence of respondents. However, the cross-sectional nature of our survey has the potential of having respondents nested within clusters, which poses a potential bias to the standard errors. Using STATA version 13.SE (Stata Corporation, College Station, TX, USA), which is designed to address this kind of problem, we imposed unique Index Numbers (IDs) assigned to each respondent on our models, and adjusted for the standards errors to produce statistically robust parameter estimates. A negative coefficient for any of the covariates indicates poor mental health whilst a positive coefficient indicates good mental health.

Bivariate regression models to examine zero-order associations between perceived mental health and the predictors for the purpose of estimating the net change in effect between bivariate and multivariate relationships. We estimated four multivariate models. Model 1 examined the effects of demographic and individual lifestyle factors. Model 2 added social network factors. Model 3 included living and working condition factors and last model added socio-economic and environmental factors (locational factors). These models were nested and we employed a stepwise modeling approach to indicate the net effect of the groups of predictors.

5.5 Results

5.5.1 Descriptive statistics

Descriptive statistics of the attributes of participants are presented in Table 5-3. Out of 1,438 study participants, 63.6% of them reported experiencing severe food insecurity in their households. In the study context, household heads are mostly males and this is reflected in our study. The majority of them were between 40-49 years old. More than half of the participants (59.5%) reported having consumed other alcoholic drinks beside “pito”, a local alcoholic beverage with very low alcoholic content.

Table 5 - 3: Descriptive statistic of selected variables

Variable	Freq./Mean	Percent./Std. Dev.
Food insecurity		
Severely food insecure	915	63.6
Moderately food insecure	497	34.56
Food secure	26	1.81
Age		
Less than 40	491	34.14
40 - 49	518	36.02
50 - 59	294	20.45
60 and more	135	9.39
Sex		
Male	918	63.8
Female	520	36.2
Alcohol Consumption		
No	582	40.5
Yes	856	59.5
Ethnicity		
Dagaaba	778	54.10
Sissala	354	24.62
Waala	199	13.84
Brifo	71	4.94
Others (outside UWR)	36	2.50
Group membership		
No	315	21.91
Yes	1,123	78.09
Social Participation		
None	174	12.10
Some	504	35.05
A lot	760	52.85
Remittance Receipt		
No	1,182	82.20
Yes	256	17.80
Marital status		
Currently married	1,242	86.4
Currently single	68	4.7
Widowed	128	8.90
Religion		
Christianity	786	54.66
Muslim	419	29.14
Traditional	233	16.20
Occupation		
Civil Service	191	13.3
Farming	957	66.6
Trading	183	12.7
Other self-employed	107	7.4
Education		
No education	594	41.3
Primary	353	24.6
Secondary	274	19.05
Tertiary	217	15.09
Wealth Quintile		
Richest	295	20.5
Richer	343	23.9
Middle	270	18.8
Poorer	262	18.2
Poorest	268	18.6
Distance to health facility		
>5 km	466	32.4
1-5 km	667	46.4
<1 km	305	21.2
Urbanization level		
Urban	244	16.97
Rural	1,194	83.03
District of residence		
Wa Municipal	212	14.74
Wa East	144	10.01
Wa West	164	11.40
Nadowli/Kaleo	99	6.88
Jirapa	176	12.24
Lawra	106	7.37
Nandom	91	6.33
Lambussie/Karni	102	7.09
Sissala East	144	10.01
Sissala West	101	7.02
Daffiama/Busie/Issah	99	6.88
Observations	**1,438**	---------

Consistent with the socio-economic characteristics of the study area, the majority (66.6%) of the respondents were farmers who had never attended school. The

sample was evenly distributed across wealth categories. Dagaaba were the majority (54.1%) in the sample. In terms of religion, 54.6% were Christians. More than 75% belonged to groups or associations, 86.4% were currently married, and majority was residing in rural areas and the Wa Municipal at the time of the study. The region is generally rural and 32.5% indicated staying more than 5 km away from a health facility.

5.5.2 Bivariate results

The bivariate results are presented in Table 5-4. Heads of moderately food insecure ($b = 0.297$, $p < 0.001$) and food secure households reported good mental health compared with those from severely food insecure households ($b = 1.085$, $p < 0.001$). Demographic factors and individual lifestyle variables were generally not significantly associated with perceived mental health, except gender. Females in food insecure households reported poor mental health compared with males ($b=-0.151$, $p<0.05$).

Table 5 - 4: Bivariate OLS models predicting perceived mental health in Upper West Region of Ghana

Variable	Coefficients (Robust S.E)
Food insecurity (ref: severely food insecure)	
Moderately food insecure	0.297(0.106)***
Food secure	1.085(0.108)***
Age (ref: less than 40)	
40 - 49	0.101(0.036)
50 - 59	-0.0762(0.023)
60 and more	-0.112(0.025)
Sex (ref: male)	
Female	-0.151(0.054)*
Alcohol Consumption (ref: no)	
Yes	-0.109(0.040)
Ethnicity (ref: Dagaaba)	
Sissala	0.0705(0.023)
Waala	-0.200(0.052)†
Brifo	0.0458(0.007)
Others (outside UWR)	0.253(0.030)
Group membership (ref: no)	
Yes	0.234(0.072)**
Social Participation (ref: no)	
Some	0.002(0.001)
A lot	0.172(0.064)
Remittance Receipt (ref: no)	
Yes	-0.349(0.100)***
Marital status (ref: currently married)	
Currently single	0.236(0.038)
Widowed	-0.210(0.045)
Religion (ref: Christianity)	
Muslim	-0.0710(0.024)
Traditionalist	-0.0737(0.020)
Occupation (ref: civil service)	
Farming	-0.248(0.088)*
Trading	-0.0864(0.022)
Other self-employed	0.0583(0.012)
Education (ref: none)	
Primary	0.341(0.110)***
Secondary	0.274(0.081)**
Tertiary	0.341(0.092)***
Wealth Quintile (ref: richest)	
Richer	-0.061(0.020)
Middle	-0.070(0.020)
Poorer	-0.020(0.006)
Poorest	-0.244(0.071)*
Distance to health facility (ref: >5 km)	
1-5 km	1.128(0.069)***
<1 km	0.894(0.094)***
Urbanization level (ref: urban)	
Rural	-0.252(0.071)**
District of residence (ref: Wa Municipal)	
Wa East	-0.742(0.167)***
Wa West	-0.540(0.128)***
Nadowli/Kaleo	-0.233(0.044)
Jirapa	-0.127(0.031)
Lawra	0.092(0.018)
Nandom	0.126(0.023)
Lambussie/Karni	0.050(0.010)
Sissala East	0.197(0.044)
Sissala West	-0.327(0.063)†
Daffiama/Busie/Issah	0.137(0.026)
Observations	1,438

† p<0.1, * p<0.05, ** p<0.01, *** p<0.001; Coefficients are adjusted for clustering; Robust standard errors in parenthesis

With regards to the influence of social support, being a member of social group was associated with good mental health compared with those in no social group. Compared with non-remittance receiving households, remittance-receiving households reported poorer mental health ($b = 0.349$, $p < 0.001$). Living and working condition variables were significantly associated with perceived mental health. Household heads who were in the poorest wealth category and farming had significantly lower mental health scores whilst those with any level of education had higher mental health scores. General contextual factors were significant predictors of perceived mental health. Residence within five kilometers away from a health facility was associated with higher scores of perceived mental health compared with residence more than five kilometers away. Household heads residing in rural areas, in Wa East, Wa West and Sissala West District tended to report higher levels of poor mental health.

5.5.3 Multivariate results

The results of the multivariate analysis are presented in Table 5-5 and indicate the net effect of covariates on the relationship between food insecurity and perceived mental health. Consistent with bivariate results, the predictive power of food insecurity on perceived mental health remained robust even after controlling for demographic individual lifestyle, and demographic variables in model 1. Contrary to the bivariate results, Model 1 indicates a significant relationship between alcohol consumption and perceived mental health. Compared with those who have never consumed alcohol, those who indicated they have ever consumed alcohol (males=71.5%; females = 28.50) reported lower scores of perceived optimal mental health ($b=-0.192$, $p < 0.05$). Further analysis shows that ethnicity and gender have a combined suppressing effect on the relationship.

Table 5 - 5: Multivariate OLS models predicting perceived mental health in Upper West Region of Ghana

Variables	Model 1	Model 2	Model 3	Model 4
Food insecurity (ref: severely food insecure)				
Moderately food insecure	0.295(0.073)***	0.261(0.073)***	0.244(0.077)**	0.175(0.072)*
Food secure	1.098(0.223)***	1.013(0.224)***	1.014(0.226)***	0.934(0.230)***
Age (ref: less than 40)				
40 - 49	0.137(0.083)*	0.146(0.083)†	0.165(0.084)*	0.112(0.078)
50 - 59	-0.033(0.098)	-0.021(0.100)	0.0219(0.101)	0.073(0.094)
60 and more	-0.025(0.133)	-0.003(0.137)	0.082(0.139)	0.129(0.128)
Sex (ref: male)				
Female	-0.203(0.075)**	-0.187(0.077)*	-0.170(0.078)*	-0.164(0.072)*
Alcohol Consumption (ref: no)				
Yes	-0.192(0.075)*	-0.194(0.079)*	-0.195(0.079)*	-0.223(0.073)**
Ethnicity (ref: Dagaaba)				
Sissala	0.054(0.086)	0.054(0.099)	0.041(0.099)	-0.123(0.105)
Waala	-0.264(0.112)*	-0.232(0.130)†	-0.264(0.130)*	-0.238(0.119)*
Brifo	-0.028(0.138)	-0.051(0.140)	0.001(0.144)	-0.012(0.139)
Others (outside UWR)	0.189(0.229)	0.159(0.230)	0.078(0.236)	-0.085(0.229)
Group membership (ref: no)				
Yes		0.163(0.087)†	0.170(0.087)*	0.161(0.080)*
Social Participation (ref: none)				
Some		-0.035(0.112)	-0.044(0.113)	-0.024(0.107)
A lot		0.137(0.110)	0.127(0.111)	0.087(0.104)
Remittance Receipt (ref: no)				
Yes		-0.303(0.092)***	-0.242(0.084)**	-0.246(0.083)***
Marital status (ref: currently married)				
Currently single		0.234(0.150)	0.219(0.152)	0.100(0.141)
Widowed		-0.0846(0.136)	-0.077(0.135)	-0.170(0.122)
Religion (ref: Christianity)				
Muslim		-0.092(0.108)	-0.038(0.109)	-0.006(0.099)
Traditionalist		-0.019(0.106)	0.061(0.108)	0.204(0.102)*
Occupation (ref: civil service)				
Farming			-0.057(0.146)	-0.017(0.136)
Trading			0.003(0.155)	-0.008(0.150)
Other self-employed			0.152(0.190)	0.083(0.187)
Education (ref: none)				
Primary			0.152(0.190)	0.083(0.187)
Secondary			0.287(0.092)**	0.151(0.086)†
Tertiary			0.186(0.105)†	0.102(0.097)
Wealth Quintile (ref: richest)				
Richer			0.097(0.111)	0.158(0.109)
Middle			0.079(0.119)	0.102(0.111)
Poorer			0.171(0.119)	0.220(0.115)†
Poorest			-0.025(0.127)	0.005(0.121)
Distance to health facility (ref: >5km)				
1-5 km				1.164(0.074)***
<1 km				0.890(0.097)***
Urbanization level (ref: urban)				
Rural				0.403(0.128)**
District of residence (ref: Wa Municipal)				
Wa East				-0.635(0.180)***
Wa West				-0.485(0.162)**
Nadowli/Kaleo				-0.091(0.182)
Jirapa				-0.291(0.142)*
Lawra				-0.104(0.164)
Nandom				-0.112(0.188)
Lambussie/Karni				0.212(0.180)
Sissala East				0.071(0.167)
Sissala West				-0.312(0.188)†
Daffiama/Busie/Issah				0.019(0.186)
R^2	0.036	0.052	0.064	0.229
Observation	1,438	1,438	1,438	1,438

† p<0.1, * p<0.05, ** p<0.01, *** p<0.001; Coefficients are adjusted for clustering; Robust standard errors in parenthesis

After further controlling for social and community support variables in the Model 2, the relationship between food insecurity and perceived mental health still remains significant and the association between the control variables remains largely consistent with bivariate results. However, the predictive power of the moderately food insecure category on perceived mental health slightly attenuated in Model 3 ($b = 0.244$, $p < 0.01$) after further controlling for living and working conditions. Also, while belonging to a social group increases in level of significance as a predictor of mental health, remittance receipt attenuated. Further analysis shows education has a confounding effect on both associations. Compared with household heads with no education, those with secondary education or higher reported higher scores of perceived mental health.

The effect of location and contextual variables in the final model is profound. They contributed more than 20% to the overall R-square of .229, indicating that locational factors alone explain more of the relationship between food insecurity and mental health in this study. Generally, the results did not change, except education, which was no longer significant. In contrast with bivariate results, the relationship between urban/rural and perceived mental health changed in direction of significance whereby rural residents would report good mental health ($b = 0.403$, $p < 0.01$) compared with urban residents. Further analysis indicates that differences in distance to health facility were largely confounding the relationship. Compared with residents in more than five kilometers to a health facility, those residing five kilometers and less would report good mental health, and residing in Wa East, Wa West, Jirapa and Sissala West Districts would rate mental health poor ($b = -0.635$, $p < 0.001$; $b = -$

0.485, $p < 0.01$; b = -0.291, $p < 0.05$; b = -0.312, $p < 0.1$, respectively) compared with Wa Municipal.

5.6 Discussion

We examined the relationship between household food insecurity and mental health in the Upper West Region of Ghana, one of the poorest regions of the country (Luginaah et al., 2009; Songsore, 2011). With the social determinants of health framework, food access has now been largely conceptualized as a determinant of health. However, it is highly underexplored in the context of developing countries. With the high incidence of food insecurity in SSA, this study contributes to the literature on the relationship between food insecurity and mental health.

The finding that the potential effect of household food insecurity likely goes beyond physical and general health outcomes is a significant addition to the literature and has a potential policy implication for addressing food insecurity and health gaps. In the context of Ghana, food insecurity is largely considered a biological health condition and strategies at addressing its health effects lie within the general health system. The findings in this study could draw the attention of policy makers to consider mental health care services as part of strategies at dealing with the effects of food insecurity. Food insecurity as a result of food access difficulties can increase stress level among household heads, who have the obligation of ensuring household food availability. Earlier studies have suggested that debilitating climatic, economic and poor transportation conditions combine to create severe food insecurity in the UWR (Kuuire et al., 2013; Luginaah et al., 2009) and in a context of low mental health care (Sipsma et al., 2013), depression and poor mental health are likely health outcomes. Other studies on food insecurity and adults mental health have produced

mixed results. Whereas Leung et al. (2015), Siefert et al. (2004) and Whitaker et al. (2006) found positive associations, Kim & Frongillo (2007) found no relationship between food insecurity and depression among participants of Supplementary Nutrition Assistance Program (SNAP). In the African sub-region, Hadley & Patil (2006) examined food insecurity and depression among caretakers in four ethnic groups in two rural communities in Tanzania and discovered that food insecurity and depression were positively correlated.

Consequently, the fact that those who are food insecure in the UWR are more likely to report poor mental health after accounting for the effect of theoretically and empirically relevant variables, suggests a robust independent effect of food insecurity on perceived mental health status of household heads in this context.

Moreover, the finding that consumption of alcohol is associated with poor mental health scores could support the general position that alcohol has the tendency of worsening mental health conditions (Boschi et al., 2000). Yet in the context of food insecurity, alcohol may be used as a coping strategy to mental health conditions such as anxiety, depression and stress (Boschi et al., 2000; Williams & Clark, 1998). Although social alcohol drinking is a common practice in Ghana, Luginaah & Dakubo (2003) found an increase in solitary drinking of locally brewed strong gin (akpeteshie) in the Upper West region of Ghana. A possible explanation for a strong relationship between alcohol consumption and perceived mental health in our study could be that heads of food insecure household use alcohol consumption to dampen anxiety and depression, and overcome social stigma of being food insecure. Furthermore, existing work suggests that some male household heads may trade food and farm labour for akpeteshie, reducing labour productive on the household farm and ultimately reduce the food produce from the farm (Luginaah & Dakubo, 2003). Further research is

needed to understand the complex relationship between food insecurity, different degrees of alcohol consumption and perceived mental health in the study area.

Social support in the context of resources provided by other people (Cohen et al., 1986) has a buffering role for mental health (Cohen & Wills, 1985; Dressler, 1985). Consistent with the literature, we found that membership of social group had a positive effect on mental health as members of a group have a high likelihood of getting food and other support to acquire food, thereby reducing anxiety and stress associated with being food insecure.

The finding that those who reported receiving remittance were more likely to report poor mental health is surprising. Remittance as a product of migration is supposed to smoothen consumption, improve economic status of households (Tsegai, 2007) and can reduce anxiety and stress related to food insecurity. Meanwhile, social stress theory (Aneshensel, 1992) would suggest a negative consequence of migration on household heads as migration tends to withdraw "active members" of households. As a result, migration has the potential effect of increasing the emotional stress of household heads having to care for "non-active members" left behind. Migration in the study area is characterized by the movement of active members of households to the southern part of the country and remittance of cash and food items back to their households (Kuuire et al., 2013). Remittance receipt in the study area may not be enough to remedy the emotional stress experienced by household heads as a result of absence of a migrant household member. Studies elsewhere revealed similar results (Graham, et al., 2015; Lu, 2012). Furthermore, Luginaah et al. (2009) discuss the seasonal nature and difficulty of transporting food remittance to UWR. This means that households are waiting and hoping for food to come from the Brong-Ahafo Region and are likely to be stressed in the process.

The findings of this study contribute to the literature on food insecurity and have implications for policy on food security and health in Ghana, and other low and middle-income countries. First of all, the finding that distance to health facilities confounds the relationship between food insecurity and perceived mental health indicates the complexity of food and health in low and middle-income countries. Food insecurity in a context of low health access presents a bigger health burden for populations. Meanwhile the value of social support is an important revelation in this study in the sense that the social environments of most African communities provide enormous social support for their members. Although social support/capital has been explored in the psychosocial studies, it remains under-explored in food security and mental health. To this extent, it is an addition to previous studies on mental health in similar context (see Sipsma et al., 2013).

Secondly, it is essential to increase priority on innovative food production in the Upper West Region not only as a food security strategy but also as a way of improving health and wellbeing in the region. Considering the severity of climatic and economic stressors on food production in the region (Luginaah et al., 2009), it is fundamental to increased investment on irrigation and increase support for other agricultural inputs such as tractors and fertilizers to increase food production. This strategy should factor in concerns of local peasant farmers in order not to jeopardize their livelihoods. Ultimately there is the need to invest in transportation facilities to increase movement of food from other parts of the country where food is abundantly produced.

Finally, our findings reflect the level of deprivation in the region. Contextual factors such as distance from a health facility point to an urgent need for policy on increasing health access and economic activities in the region. The region is the most

deprived in the country and for the situation to change it would require concerted and effective investment in creating accessibility which should propel businesses in the region. Providing capital to small-scale businesses and development of cottage industries could also increase livelihood and improve upon the economic situation in the region.

Despite the important findings, there are a number of limitations worth noting. The data used in the study is cross-sectional in nature. As a result, our interpretation of the findings is limited to associations between the outcome and predictor variables. In addition, although self-rated health and food insecurity are robust assessment tools there is room for bias owing to self-reporting. Furthermore, some of the variables used four-week and 12 months recalls, which creates room for recall bias. Also, this study is the first to use HFAIS and the DUKE in Ghana and given that these tools are greatly influenced by context, there is room for potential error. Notwithstanding the limitations, the results are generally consistent with theoretical and empirical literature.

5.7 Conclusion

This study examined the association between food insecurity and perceived mental health in the Upper West region of Ghana. We also investigated the net effect of compositional and contextual factors on the relationship between the two variables. The Upper West Region is the most deprived and among the most food insecure areas in Ghana. It is also associated with high alcohol consumption levels. Overall, food insecurity is associated with low scores of perceived mental health. Consumption of alcohol is associated with lower scores of perceived mental health. Locational factors

had a greater influence on the relationship between food insecurity and perceived mental health.

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Chapter 6

6 Summary and Conclusions

This chapter summarizes the major findings of the dissertation and highlights theoretical and methodological contributions in respect of the relationship between household food insecurity and health in the Upper West Region (UWR) of Ghana. It also discusses the policy and practical implications of the findings in light of the persistent nature of food insecurity in the region and lays out direction for future research.

6.1 Introduction

The study aimed at examining the relationship between household food insecurity and health in Ghana's UWR. The over-arching objective was to understand the complexity of food insecurity and its health implications in the UWR of Ghana. Despite the remarkable achievement of reducing food insecurity in Ghana at a national scale (FAO et al., 2015), there exists disproportionately persistent food insecurity in the northern part of the country where the UWR is located. In the estimates of the 2012 report of the World Food Programme on food insecurity and vulnerability, 16% of the households in the UWR were experiencing moderate to severe food insecurity based on the hunger index (WFP & MoFA, 2012). In contrast, this research found that more than 60% of households were severely food insecure. The time of the year the study data was collected and the tools used could be the main factors accounting for the wide disparities. Household food insecurity is seasonal in the study context. It is most severe in July and August when the granaries are empty and the crops in the farm are yet to mature for harvest (Hesselberg & Yaro, 2006; WFP & MoFA, 2012). This study was conducted from May to August to coincide

with the peak of food insecurity in the region, while the study by WFP and MoFA was conducted in April and May. The WFP and MoFA study raised timing of the data collection as a potential limitation and suggested their results could be different if the data was collected during the peak of the hunger period (WFP & MoFA, 2012).

Secondly, while the WFP used a combination Food Consumption Scores (FCS) and wealth of households, this study used the Household Food Insecurity Access Scale (HFIAS). The use of wealth as a measure of food insecurity in the context of Upper West Region could be problematic since asset which is an important component of wealth is subjectively defined by society and could have different values based on relative importance. In addition, income is mostly difficult to capture as most households engage in non-cash activities such as farming and animal rearing. The HFIAS on the other hand, captures different dimensions of food insecurity relating to fear of not have food, changing pattern of consumption, and effect the volume and regularity of food intake making it a good measure of food insecurity (Maxwell et al., 2014).

Food insecurity, encompasses food availability (production), food accessibility, food utilization and stability (Pinstrup-Andersen, 2009), While some studies portray inadequacies in food production and limited intake of nutrition as being the cause of food insecurity, deteriorating soils and low investment in agricultural production (Armah et al., 2011; Dewitte, et al., 2012; Godfrey et al., 2010; Tomlinson, 2013), others have argued that food insecurity is instead attributable to the problem of unequal food access resulting from economic vulnerability and/or physical accessibility difficulties created by the world economic system and local government policies (Sen, 1982; Weis, 2007).

In examining the persistent food insecurity in the UWR, some studies have emphasized climate variability, agro-ecological stressors, and low investment in production of food. For instance, Armah et al. (2011) discuss the environmental and climatic implications for food insecurity in the Guinea Savannah zone of Ghana which includes the UWR, suggesting that the region requires investment in food production and the adoption of innovative technologies such as agro-ecology to address food insecurity. Luginaah et al. (2009) recognize the role of environmental factors but add that poor policy targeting on development of transportation facilities is one of the major factors contributing to food insecurity in the region. They suggested that changing climate is adversely affecting production of food and deepening food insecurity and vulnerability, while policy and structural forces seem uninterested and to some extent incapable of addressing the problem. The region and the rest of the northern part of the country have suffered policy marginalization dating back to pre-independence times and this marginalization tends to play out as vulnerability in different forms including food insecurity in recent times (Luginaah et al., 2009; Songsore, 2011). To add to the complexity of persistent food insecurity in the UWR, Nyantakyi-Frimpong & Bezner-Kerr (2014) rather suggest that agricultural policies such as recommending high input adoption and mechanized agriculture are rather the main drivers of food insecurity in the region. Their thesis departs from the long held position that investment in technology and use of high inputs is the way out of food insecurity.

Apart from the need for expanded food production, migration has been highlighted as a strategy to mitigate the food insecurity in the study area. In this context, the narrative has been that deprivation and low food production drive active adults of households into the middle and southern belts of the country in their bid to

improve their livelihood options, and these migrants then remit back to their household to improve their food security status (Abdul-Korah, 2011; Kuuire et al., 2013; Van der Geest et al., 2010). Although some seasonal migration out of the UWR has long occurred, it has increased in recent years as a result of worsening food insecurity and deprivation (Rademacher-Schulz et al., 2014). Generally, migration and remittance are emerging as prominent livelihood strategies in recent times in developing countries (Crush, 2013; Zezza, et al., 2011).

While migration and remittance can potentially reduce food insecurity (Ahmed et al., 2007; Crush, 2013; Nguyen & Winters, 2011), it often fails to eliminate it in food insecure regions like the UWR? Considering the complex nature of food insecurity and the diversity of research findings, could it be that some important aspects of food insecurity are still missing in the literature? For instance, food as a social determinant of health has gained currency in the literature in recent years (Mcintyre, 2003; Solar & Irwin, 2010; Wilkinson & Marmot, 2003), yet the non-medical aspects of health closely associated with persistent food insecurity in the region is underexplored. Broadly speaking, and with few exceptions, this topic has remained underexplored in low and middle-income countries (Hadley & Patil, 2006). The foregoing issues motivate the study. This dissertation set out to investigate remittance effect on food insecurity based on place of residence. It also set out to assess the association between household food insecurity and health and provide a nuanced understanding of the complex relation between food insecurity and health in the UWR.

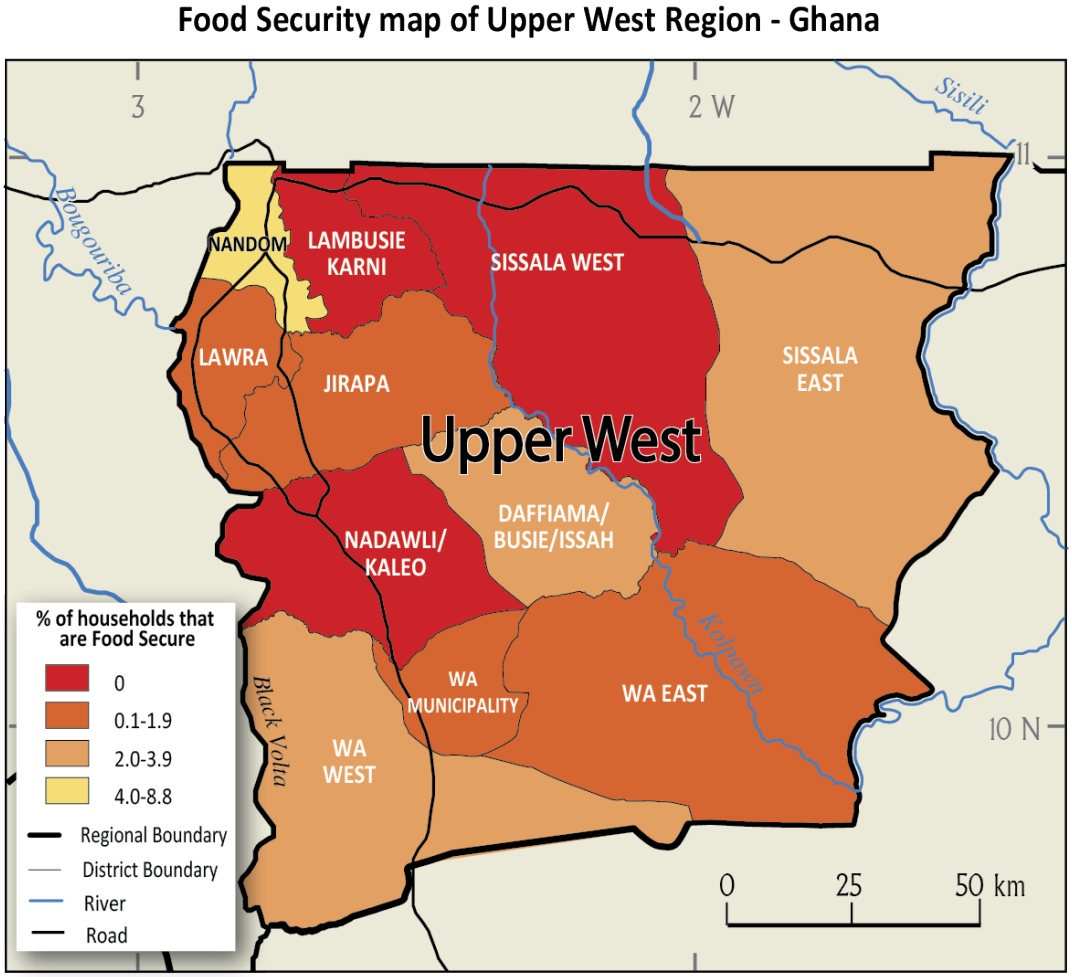
6.2 Summary of Findings

6.2.1 Objectives one and two: prevalence of food insecurity and the effect of residential remittance on food insecurity

Quantitative approaches were used to determine the prevalence of food insecurity and examine the relationship between residential remittances and household food insecurity in rural and urban areas in the UWR of Ghana (see Chapter 4).

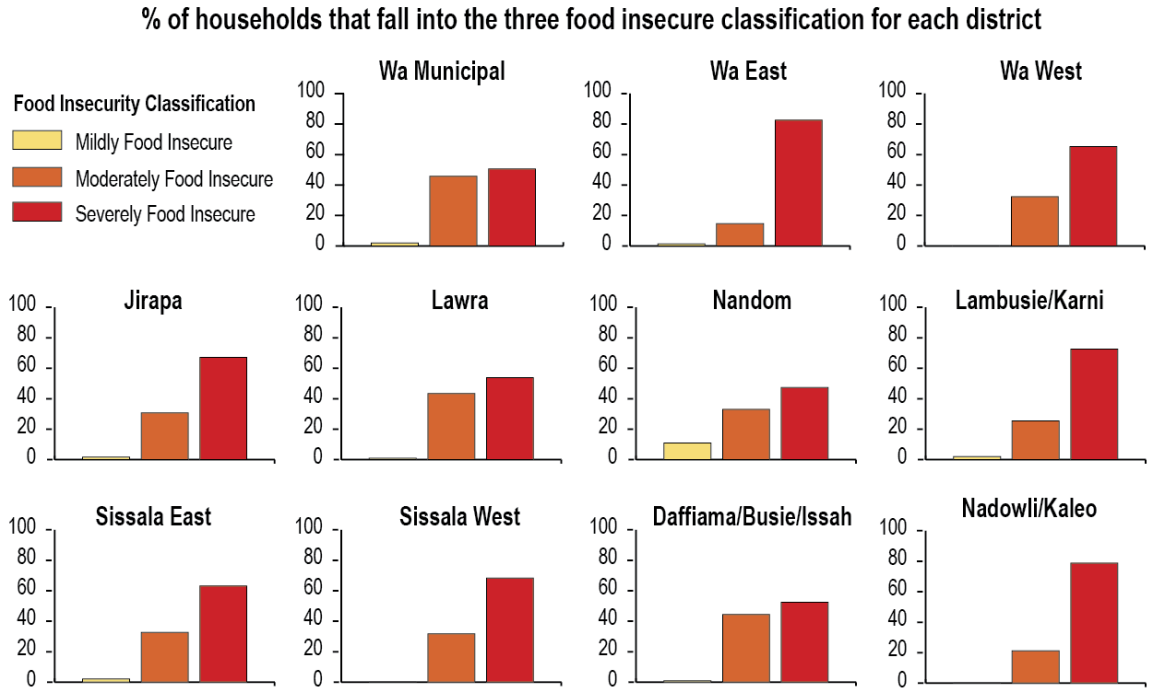
Descriptive statistics revealed variations in household food insecurity across and within the different geo-political districts in the region (see Figure 5-1).

Figure 6 - 1: Food security map of Upper West Region



Produced by the Cartographic Section, Department of Geography, Western University, 2015

Figure 6 - 2: Food security map of Upper West Region



Produced by the Cartographic Section, Department of Geography, Western University, 2015

While eleven percent of households in Nandom District reported being mildly food insecure, all the households in Wa West, Sissala West and Nadowli/Kaleo reported moderately or severely food insecure. Also, there is wide disparity between the percentage of household in severely food insecure and modelrately food insecure in Wa East, Nadowli Kaleo and Lambusie/Karni District. In contrast, Daffiama/Bussie/Issah, Lawra, Nandom and Wa Municipal show small disparities in the two food insecurity categories as shown in Figure 5-1 and Figure 5-2. These differences are as a result of different local factors. Across and within the districts variations of food insecurity in this study could result from a combination of factors including differences in occupation, household wealth, and residential remittances as indicated in chapter four. For instance, occupation of household heads seems to widen

the disparities in Wa East. Civil servants were more inclined to report a mild form of food insecurity than farmers.

Furthermore, results from ordinal logistic regressions examining the relationship between residential remittance and household food insecurity revealed that households that received remittances were more likely to report being food insecure whether they were located in rural or urban areas, compared to those that did not receive remittance and were resident in urban areas. These results suggest that, the effect of remittance on household food insecurity does not vary based on location in this context. This finding may be surprising since the dominant assumption in the literature is that remittance will tend to have a positive effect on household food insecurity. However, the data examining remittance within the context of the UWR revealed an important dimension that majority of remittance-receiving households are food insecure. This corroborates the findings of Luginaah et al. (2009) and Rademacher-Schulz et al. (2014) that migration, in the first place, is a desperate measure taken by poor and food insecure households. Remittances following migration tend to be irregular and inadequate partly because of transportation challenges faced by migrants in sending food remittance home (Luginaah et al., 2009) and as a result may not be adequate to change the food insecurity status of households. I suggest in this thesis that remittance in a context where there is poor transportation infrastructure, limited economic activities, and general deprivation, as is the case in the UWR, may not have a positive impact on household food security. This could partly explain the persistent food insecurity in the UWR in spite of the increase in migration in recent times.

Furthermore, the hungry farmer paradox described by in Nyantakyi-Frimpong & Bezner-Kerr (2014) was supported be the evidence in this study. A combination of

factors makes the farmers in this region hungry. Productivity is declining in recent years (Kuuire et al., 2013; Rademacher-Schulz et al., 2014), and farmers have to sell some of the produce immediately after harvesting to address other household demands, resulting in empty granaries for many a few months after harvest. As suggested in chapter four, remittances might not also be adequate to fill the gaps for remittance-receiving households. Also, widows and poor households, are likely to report being food insecure. Widows are a vulnerable group of people in the study context particularly in recent years when social changes seem to be weakening the extended family system. Active members of the household migrate (Rademacher-Schulz et al., 2014) and because of challenges in remitting may be unable to support the widow household heads back home.

6.2.2 Objective three: Relationship between household food insecurity and perceived mental health

After shedding light on the dynamics of food insecurity by exploring the incidence and the effect of remittance on household food insecurity, the focus in chapter 5 was to examine the health effect of household food insecurity as reported by household heads. Using ordinary least squares regressions and the Social Determinants of Health (SDH) theoretical framework, the study examined the relationship between household food insecurity and the perceived mental health of household heads and found that heads of food insecure households were more likely to report poor mental health. In addition to the burden, stress and anxiety of feeding household members in a generally deprived and food insecure context such as the UWR, the household head is also faced with the stigma of heading a food insecure

household. This could explain why food heads of food insecure households are more likely to report poor mental health.

The study also revealed that females would report poor mental health because they carry the daily burden of feeding the household in this study context, and thus would have greater anxiety and stress than male household heads when the household is faced with food insecurity. Previous studies suggested that females tend to have higher expectation of health and would rate their health lower when experiencing relatively similar health condition as males (Spiers, et al., 2003).

6.3 How the manuscripts integrate

The two manuscripts examined persistent food insecurity and how it impacts on human health in the UWR. The first manuscript, Chapter 4, described the effects of remittance on food insecurity based on place of residence and gave a picture of the persistent food insecurity in the region. It demonstrates that remittances are not contributing enough to household food security relative to need.

The second manuscript, Chapter 5, explored the effect of household food insecurity on self-rated mental health of household heads. It highlights the psychosocial effect of food insecurity (access) on mental health of household heads and suggests that limited mental health care services and high consumption of alcohol in a context of general deprivation could exacerbate the effect of food insecurity on human health in the area. Overall, the two manuscripts provide insight on the persistent food insecurity in the region and how it could affect human health.

6.4 Contributions of the study

6.4.1 Theoretical contributions

This study helps informs our understanding of food as a social determinant of health in northern Ghana in number of ways. Consistent with the findings of Luginaah et al. (2009), I suggest that remittances may not be reducing food insecurity as expected because of transportation challenges in remitting food from the Brong-Ahafo Region to the UWR, and also the suggestion by Karamba, et al. (2011) that the value of remittance may not change consumption patterns in Ghana, the study suggests that remittances may not be adequate in changing the food insecurity status of households. I argue that the effect of migration and remittance is greatly influenced by place-based factors. In the UWR, where deprivation and marginalization is very pronounced, the quantity and value/cost remittances is affected by transportation challenges (Luginaah et al. 2009), yet households over-rely on remittance because of limited economic activities and low crop yields (Rademacher-Schulz et al., 2014). These combine to reduce the ability of remittance to improve household food security (see Chapter 4). Households that were receiving remittance were mainly poor and needed it for sustenance. This suggests the need to rethink of the role of remittances as a food security strategy taking into consideration place-based factors.

Furthermore, the findings in this study confirmed an argument in the literature on food insecurity and mental health (Hadley & Patil, 2006; Leung et al., 2015), and more importantly, contributes to an understanding of food as a social determinant of health (Marmot & Wilkinson, 2000; Wilkinson & Marmot, 2003) in the SSA context. Biomedical theoretical thinking seems to have dominated literature on food insecurity and health in SSA. This study demonstrates that the dynamics of access to food, even when production is adequate, significantly affects perceived mental health of

household heads, suggesting that discussions of food insecurity should not be limited to biological consequences of inadequate consumption of critical nutrients but should also focus on the social consequences of experiencing food insecurity. Social stigma, feelings of low self-worth, and the stress associated with food insecurity together make food insecurity an important social determinant of health.

6.4.2 Methodological Contributions

The study provides important methodological contributions to the study of food security, remittances and health. Using residential remittance, which references place of residence and remittance receipt, this study was able to demonstrate variations in the effect of remittances on rural and urban households. To my knowledge, this is the first to have used residential remittance to reveal a nuanced understanding of remittance effect on food insecurity, making this an important addition to methods seeking to examine geographic variations of food insecurity (Crush et al., 2010; Frayne, 2005).

Furthermore, the use of subjective measurements of food insecurity, particularly the household Food Insecurity Access Scale (HFIAS), is limited in SSA. However, considering the sensitivity of the tool to context (Coates et al., 2007), it is important to appraise its applicability and usefulness in measuring household food insecurity in SSA. Based on the application of the HFAIS in Ghana and SSA, this study makes a significant addition to Maxwell, et al. (2014), Reardon, et al. (1992) and Gebreyesus, et al (2015). In addition, the use of the HFIAS allowed the study to illustrate the proportion of households experiencing food insecurity in the UWR (see Figure 5-1). Similarly, using the DUKE Health Profile as a tool for measuring perceived mental health was not only validated in this study, it also allowed for the measurement of perceived mental health, which is not as pronounced in SSA research

as it is in the United States especially. Indeed, subjective food insecurity and subjective health contributes to methods on examining food as a social determinant of health in SSA.

6.4.3 Policy relevance of the study findings

The study findings highlight policy and practical recommendations for food security and health in Ghana and other low and middle-income countries. First of all, the finding that more than 60% of household in the UWR were severely food insecure in a country acclaimed to have achieved both the Millennium Development Goals (MDG) target of reducing the proportion of people suffering from malnutrition by half illustrates the extent to which context specific variables are producing food insecurity. Making matters worse, when remittance is not significantly improving food security, in this context. The Government has to reduce the level of deprivation in the area by opening up economic activities and improving accessibility. Tied to this, policy actions have to improve conditions for agriculture through construction of irrigation facilities, increasing access to capital for agriculture and effectiveness in provision of extension services.

Furthermore, the findings raise important questions about food security strategies in Ghana. Policy on agriculture is fundamental to food security strategy. In chapter two, I discussed the food security policy environment in Ghana and indicated that the Food and Agricultural Sector Policy Framework (FASDEF II), which is the main policy framework for food security is only focused on mechanization of agriculture, leaving out important components that influence food access. Amidst the gaps in policy, there is an urgent need for a national food security policy for the country to address food security in the northern part of the country. It should comprehensively address food availability (production and storage), access

(transportation) and utilization. I recognize that there have been various attempts at food storage, for instance the Buffer Stock Company (in recent times), but suggest that absence of a national food security policy may partly have contributed to its current dysfunctional state.

Despite the linkages between food and other dimensions of health, the policy focus has been on biological effects in Ghana, largely measured in malnutrition, stunting and wasting among children. This seems to drive policy to concentrate on food production and nutrition. However, the finding that food insecurity has a debilitating effect on mental health provides a strong basis for the expansion of existing health policy to include this issue. There is the need for an integrated food and health policy in the country. The specific finding on perceived mental health in the Ghanaian context points to the need to increase access to health care services, including mental health care at primary health level. This recommendation supports the call by Sipsma et al. (2013) for the decentralization of mental health care services to primary health care.

6.5 Study limitations

Despite the contributions of this study to the literature on food and health, there are a number of limitations. Firstly, the study used cross-sectional data, which the limited interpretation of the results to associations. For instance, the complex relationship between remittance and food insecurity and also between food insecurity and health are associations even though they make important addition to the literature.

Secondly, the study heavily relied on self-reported data on food insecurity, health and remittances. Notwithstanding the strength of self-rated health (Burström & Fredlund, 2001; Finch et al., 2002; Miilunpalo et al., 1997), the DUKE Health Profile

(Parkerson et al., 1990) and the self-rated Household Food Insecurity Access Scale (HFIAS) (Coates et al., 2007), data from these tools are prone to confounding. For example, seasonality of household food insecurity could influence how individuals respond to questions about food insecurity. Coates et al. (2007) recognize this limitation but explain that the various categories of food insecurity may address the slight differences in conceptualization and interpretation of food insecurity.

Thirdly, both the HFIAS and DUKE Health Profile are recalls of four weeks and 12 months and may be affected by recall bias. This may be a limitation with this study. Finally, I recognize that examining food insecurity with remittance to understand the complexity of the persistent food insecurity in the UWR is limiting. Food insecurity maybe influenced by other livelihood strategies such as livelihood diversification (Abdulai & CroleRees, 2001; Ellis, 2000), and remittance may not be the strongest predictor of food insecurity in this context.

In spite of these limitations, the findings are considered statistically and practically robust given that the study design followed validated methodology (Karamba et al., 2011; Leung et al., 2015; Van der Geest et al., 2010). One of the key findings is that difference in methodological approach between this study and a study by World Food Program in the region revealed wide differences in the incidence of food insecurity. While the WFP reports indicates that households experiencing moderately and severe food insecurity was 16%, this study found that households experiencing food secure is more than 60%.

6.6 Further research direction

The findings and the limitations associated with this study present opportunity for future research. First, food security is both a positivist and subjectivist conceptualization (Pinstrup-Andersen, 2009), interpreted differently by various

societies and individuals based on their social and cultural dispositions, but also as a universal concept that quantifies available food stock and nutrients intake relative to acceptable levels for human survival (Gebreyesus et al., 2015; Maxwell & Smith, 1992). A combination of qualitative and quantitative studies, which would capture subjective meanings of food insecurity and at the same time record levels of nutrition intake in households, can provide a more comprehensive analysis of food insecurity in the SSA context.

Second, future research could extend the examination of food insecurity and health to other aspects of health. In this respect, the current study is an important addition to the literature. However, examination of the association between food insecurity and physical, social and general health would likely show more nuanced relationship and further develop the literature in the context of SSA, particularly as studies in other contexts have shown mixed results (Leung, et al., 2014; Siefert et al., 2001).

Third, in order to reveal causal associations between food insecurity and health, and also between other variables, it will be necessary to use longitudinal data. Causal relationship could model effect margins when policy is shifted around the variables. For example, results from longitudinal data analysis would be able to indicate the extent to which policy on food insecurity would impact on mental health. This could be important for policy making in food security and health on SSA.

Finally, the study findings are context laden and may be difficult to generalize beyond the UWR. For instance, a positive relationship between remittance and food insecurity within this context largely reflect the depth of deprivation and food insecurity in the region. It may be difficult to suggest the same relationship exist outside the rest of northern Ghana. Studies in different contexts, probably where

deprivation and food insecurity is less pronounced than the UWR, could be a good point for comparison. Similarly, this study is unable to generalize about the effects of livelihoods on food insecurity, though migration and remittances are major livelihood strategies. It requires examination of other livelihood strategies such as livelihood diversification, which has been promoted for a while in the region by NGOs. Could other livelihood strategies such as livelihood diversification have greater impact? Which livelihood strategy presents nascent policy implication for addressing food insecurity in the study area and in similar context? Ultimately, more research is needed to further disentangle the relationships between food insecurity and health in the UWR.

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Appendices

Appendix A: Research Ethics Approval

Western Research

Research Ethics

Western University Health Science Research Ethics Board
NMREB Delegated Initial Approval Notice

Principal Investigator: Dr. Isaac Luginaah
Department & Institution: Social Science\Geography,Western University

NMREB File Number: 105493
Study Title: Household food security and health relationships in the Upper West Region of Ghana.
Sponsor:

NMREB Initial Approval Date: July 30, 2014
NMREB Expiry Date: December 31, 2015

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Other	Confidentiality Agreement	2014/06/23
Other	Survey questionnaire	2014/06/23
Letter of Information & Consent	LOI Cleaned	2014/07/18
Western University Protocol		2014/07/18

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the HSREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of HSREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

Ethics Officer, on behalf of Riley Hinson, NMREB Chair

Ethics Officer to Contact for Further Information

Erika Basile	Grace Kelly	Mina Mekhail	Vikki Tran
ebasile@uwo.ca	grace.kelly@uwo.ca	mmekhail@uwo.ca	vikki.tran@uwo.ca

This is an official document. Please retain the original in your files.

Appendix B: Survey Instrument

QUESTIONNAIRE ID:_____/_____/_____ Year_2014_ /Month_____/Date_____

Interviewer Number ID:_____

General Information		
	NAME OF LOCALITY _____ **NAME OF DISTRICT** _____	
	LOCATION: (1 = RURAL 2 = URBAN)	.|__|
	LOCALITY CHARACTERISTICS: (1 = LARGE TOWN, 2 = SMALL TOWN, 3 = VILLAGE)	.|__|

NO	QUESTION	RESPONSE OPTIONS	CODE
1.	What is your occupation?	1 = Agriculture/farmer 2 = Trading 3 = Civil servant 4 = Other self-employed 5 = Unemployed 9 = Refused	….|___|
2.	How do you rate the adequacy of rainfall amounts for farming now in comparison with the situation 10 years ago?	1 = Less adequate 2 = The same 3 = More adequate	….|___|
3.	In your estimation has the quality of farmland changed in the last 10 years?	1 = Yes 2 = No 8 = Don't know **(NO SKIP TO Q6)**	….|___|
4.	**IF YES IN Q3 ASK** How would you describe the observed change in the quality of your farmland?	1 = Much better 2 = Better 3 = The same 4 = Worse 5 = Much worse 9 = Refused	….|___|

5.	In your opinion what is responsible for the above change?	1 = Better irrigation 2 = Better farming practices 3 = Drought/dryness 4 = Loss of fertility 5 = Overgrazing 6 = Desertification 7 = Flooding 8 = Other (specify)	….|___|
	Livelihood diversification		
6.	What were the sources of income for your **household** during the previous 12 months? For each of the following questions, **NO= 0 and YES=1**		**NO=0 YES=1**
6a.	Sale of cereals (maize, wheat, rice, sorghum, etc.)		….|___|
6b.	Sale of beans, groundnuts and Bambara beans		….|___|
6c.	Sale of tubers and root crops (cassava, potatoes, yam, etc.)		….|___|
6d.	Sale of vegetables (fresh and dried)		….|___|
6e.	Sale of fruits (fresh and dried)		….|___|
6f.	Sale of toddy products (alcoholic beverage, *pito*)		….|___|
6g.	Sale of other crops/agricultural products (cashew, shear nuts, dawadawa, perennial trees, etc.)		….|___|
6h.	Sale of other wild food products (fruits and animals) – fresh or processed		….|___|
6i.	Sale of fish – fresh or processed		….|___|
6j.	Sale of firewood, timber/poles, bamboo, charcoal, thatch, etc.		….|___|
6k.	Sale of livestock or livestock products (whole animals, meat, milk, eggs, etc.)		….|___|
6l.	Small business - small scale production (not agricultural products) IF YES, INDICATE NATURE OF THIS BUSINESS	_____	….|___|
6m.	Small business – trading, buying and selling IF YES, INDICATE NATURE OF THIS BUSINESS		….|___|

6n.	Small business – services (including transport services, repair, mechanical, post-harvest processing, etc.)		….|___|
6o.	Casual labour – agriculture		….|___|
6p.	Casual labour – fishing		
6q.	Casual labour – Other		….|___|
6r.	Cash for work IF YES, INDICATE NATURE OF THIS WORK		….|___|
6s.	Regular full-time employment		….|___|
6t.	Regular part-time employment		….|___|
6u.	Interest from lending		….|___|
6v.	Remittances		….|___|
6w.	Pensions		….|___|
6x.	Government/NGO assistance (cash vouchers)		….|___|
6y.	Gifts of money		….|___|
6z.	Other 1 (specify)		….|___|
6aa	Other 2 (specify)		….|___|
6ab	Did not have income		….|___|
	Household Food Insecurity Access Scale (HFIAS) Measurement Tool		
7.	In the past four weeks, did you worry that your household would not have enough food?	0 = No **(SKIP to Q8)** 1=Yes	….|___|
7.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	….|___|
8.	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	0 = No **(SKIP to Q9)** 1= Yes	….|___|

8.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	….|___|
9.	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	0 = No **(SKIP to Q10)** 1 = Yes	….|___|
9.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	….|___|
10.	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	0 = No **(SKIP to Q11)** 1 = Yes	….|___|
10.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	….|___|
11.	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	0 = No **(SKIP to Q12)** 1 = Yes	….|___|
11.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	….|___|
12.	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	0 = No **(SKIP to Q13)** 1 = Yes	….|___|

12.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	….|___|
13.	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	0 = No **(SKIP to Q14)** 1 = Yes	….|___|
13.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	….|___|
14.	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?	0 = No **(SKIP to Q15)** 1 = Yes	….|___|
14.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	….|___|
15.	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	0 = No 1 = Yes	….|___|
15.a	How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	….|___|
	Hepatitis B Knowledge and Awareness		
16.	Now I would like to talk about something else. Have you ever heard of an illness called **Hepatitis B**?	1 = Yes 2 = No 8 = Don't Know	….|___|
17.	Do you know how a person can get infected with **Hepatitis B**?	1 = Yes 2 = No 8 = Don't Know	….|___|

18.	Can people reduce their chances of getting **Hepatitis B** by having just one uninfected sex partner who has no other sex partners?	1 = Yes 2 = No 8 = Don't Know	….|___|
19.	Can people get the **Hepatitis B** from mosquito bites?	1 = Yes 2 = No 8 = Don't Know	….|___|
20.	Can people reduce their chance of getting the **Hepatitis B** by using a condom every time they have sex?	1 = Yes 2 = No 8 = Don't Know	….|___|
21.	Can people get the virus by sharing food and drink with a person who has **Hepatitis B**?	1 = Yes 2 = No 8 = Don't Know	….|___|
22.	Can people get the **Hepatitis B** because of witchcraft or other supernatural means?	1 = Yes 2 = No 8 = Don't Know	….|___|
23.	Is it possible for a healthy-looking person to have **Hepatitis B**?	1 = Yes 2 = No 8 = Don't Know	….|___|
24.	Can the virus that causes **Hepatitis B** be transmitted from a mother to her baby: During pregnancy? During delivery? By breastfeeding?	Yes No DK During pregnancy 1 2 8 During delivery 1 2 8 By breastfeeding 1 2 8	….|___|
25.	I don't want to know the results, but have you ever been tested to see if you have the **Hepatitis B** for prenuptial purposes?	1 = Yes 2 = No	….|___|
26.	I don't want to know the results, but have you ever been tested if your partner has the **Hepatitis B** virus?	1 = Yes 2 = No	….|___|
27.	Do you know **Hepatitis B** can be prevented through vaccination?	1 = Yes 2 = No	
28.	Have you taken the **Hepatitis B** vaccine?	1 = Yes 2 = No	….|___|
29.	Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had the **Hepatitis B** virus?	1 = Yes 2 = No 8 = Don't Know	….|___|
30.	If a member of your family got infected with the **Hepatitis B**, would you want it to remain a secret or not?	1 = Yes, remain a secret 2 = No 8 = DK/Not sure/depends	….|___|
31.	If a member of your family became sick with **Hepatitis B**, would you be willing to care for her or him in your own household?	1 = Yes, remain a secret 2 = No 8 = DK/Not sure/depends	….|___|

	General Health Status		
32.	I would like to ask you about your health. In general, how does your health compare with that of other people of your age group? Would you say your health is Excellent, Very Good, Good, Fair or Poor?	1 = Excellent 2 = Very good 3 = Good 4 = Fair 5 = Poor 8 = DK/Not sure	….|___|
33.	***(*Adapted from the Duke Health Survey*)*** Here are a number of questions about your health and feelings. I will read you a statement. Please answer which of the three options is most closely suited to you. I like who I am	1 = Yes, describes me exactly 2 = Somewhat describes me 3 = No, doesn't describe me at all	….|___|
34.	I am not an easy person to get along with	1 = Yes, describes me exactly 2 = Somewhat describes me 3 = No, doesn't describe me at all	….|___|
35.	I am basically a healthy person	1 = Yes, describes me exactly 2 = Somewhat describes me 3 = No, doesn't describe me at all	….|___|
36.	I give up too easily	1 = Yes, describes me exactly 2 = Somewhat describes me 3 = No, doesn't describe me at all	….|___|
37.	I have difficulty concentrating	1 = Yes, describes me exactly 2 = Somewhat describes me 3 = No, doesn't describe me at all	….|___|
38.	I am happy with my family relationships	1 = Yes, describes me exactly 2 = Somewhat describes me 3 = No, doesn't describe me at all	….|___|
39.	I am comfortable being around people	1 = Yes, describes me exactly 2 = Somewhat describes me 3 = No, doesn't describe me at all	….|___|
40.	Today, would you have physical trouble or difficulty walking?	1 = None 2 = Some 3 = A Lot	….|___|
41.	Today, would you have physical trouble or difficulty doing physical work?	1 = None 2 = Some 3 = A Lot	….|___|

42.	During the PAST 4 WEEKS how much trouble have you had with: Sleeping?	1 = None 2 = Some 3 = A Lot	….|___|
43.	Hurting or aching in any part of your body?	1 = None 2 = Some 3 = A lot	….|___|
44.	Getting tired easily?	1 = None 2 = Some 3 = A lot	….|___|
45.	Feeling depressed or sad?	1 = None 2 = Some 3 = A lot	….|___|
46.	Nervousness?	1 = None 2 = Some 3 = A lot	….|___|
47.	During the PAST 8 WEEKS how often did you: Socialize with other people (talk with or visit relatives)	1 = None 2 = Some 3 = A lot	….|___|
48.	Take part in social, religious, or recreation activities (community, church, political party meetings)	1 = None 2 = Some 3 = A lot	….|___|
49.	Stay in your home or hospital because of sickness, injury, or other health problem	1 = None 2 = Some 3 = A lot	….|___|
	AUDIT and General Health Behaviours		
50.	Have you ever drunk any alcoholic beverage except *pito*?	1 = Yes 2 = No 9 = Refused	….|___|
51	What type of alcoholic beverage do you normally drink?	1 = Don't drink alcohol 2 = Akpeteshie 3 = Bitters (e.g. Alomo) 4 = Beer 5 = Wine 6 = Other	….|___|

52	How often do you have a drink containing alcohol?	0 = Never **[SKIP TO Qs 60-61]** 1= Monthly or less 2= 2 to 4 times a month 3= 2 to 3 times a week 4= 4 or more times a week	….|___|
53.	How many drinks containing alcohol do you have on a typical day when you are drinking?	0 = 1 or 2 1 = 3 or 4 2 = 5 or 6 3 = 7, 8, or 9 4 = 10 or more	….|___|
54.	How often do you have six or more drinks on one occasion?	0 = Never 1 = Less than monthly 2 = Monthly 3 = Weekly 4 = Daily or almost daily **Skip to Questions 60 and 61 if Total Score for Questions 53 and 54 = 0**	….|___|
55.	How often during the last year have you found that you were not able to stop drinking once you had started?	0 = Never 1 = Less than monthly 2 = Monthly 3 = Weekly 4 = Daily or almost daily	….|___|
56.	How often during the last year have you failed to do what was normally expected from you because of drinking?	0 = Never 1 = Less than monthly 2 = Monthly 3 = Weekly 4 = Daily or almost daily	….|___|
57.	How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	0 = Never 1 = Less than monthly 2 = Monthly 3 = Weekly 4 = Daily or almost daily	….|___|
58.	How often during the last year have you had a feeling of guilt or remorse after drinking?	0 = Never 1 = Less than monthly 2 = Monthly 3 = Weekly 4 = Daily or almost daily	….|___|

59.	How often during the last year have you been unable to remember what happened the night before because you had been drinking?	0 = Never 1 = Less than monthly 2 = Monthly 3 = Weekly 4 = Daily or almost daily	….|___|
60.	Have you or someone else been injured as a result of your drinking?	0 = No 2 = Yes, but not in the last year 4 = Yes, during the last year	….|___|
61.	Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?	0 = No 2 = Yes, but not in the last year 4 = Yes, during the last year	….|___|
62.	Do you smoke cigarettes or tobacco?	1 = Daily 2 = Occasionally 3 = Not at all 8 = Don't know 9 = Refused	….|___|
63.	**IF NO TO 62 ASK** Does anyone in your household smoke?	1 = Yes 2 = No 3 = Don't know 9 = Refused	….|___|
64.	**IF YES TO Q63 ASK** How often does [NAME] smoke?	1 = Daily 2 = Occasionally 3 = Not at all 8 = Don't know 9 = Refused	….|___|
65.	During the past 4 weeks have you had a drink of *akpeteshie*?	1 = Yes 2 = No 8 = Don't know 9 = Refused	….|___|
66.	How often do you consume any of these beverages? *Akpeteshie, Alomo bitters, Agya Appiah, Herb Afrik, Mandingo, Gin, Atemuda, K20, etc.*	1 = Daily 2 = Weekly 3 = Occasionally 4 = Not at all 8 = Don't know 9 = Refused	….|___|
67.	How often do you consume *pito*?	1 = Daily 2 = Weekly 3 = Occasionally 4 = Not at all 8 = Don't know 9 = Refused	….|___|

68.	Has the amount of alcohol you consume changed since the introduction of the alcohol tax in 2010?	1 = Drink less 2 = No change 3 = Drink more 4 = Never consumed alcohol 8 = Don't know 9 = Refused	….|___|
69.	Are you a member of any society or group?	1 = Yes 2 = No 8 = Don't know 9 = Refused	….|___|
70.	What kind of society are you a member of?	1 = No group 2 = Farmers association 3 = Women's union 4 = Youth group 5 = Religious group 6 = Credit/savings group 7 = Political group 8 = Don't know 9 = Refused	….|___|
	Access to Healthcare		
71.	Have you ever been enrolled in the NHIS?	1 = Yes 2 = No 9 = Refused	….|___|
72.	**IF NO TO Q71 ASK** In your opinion how will you assess the nature of services you get at health facilities compared to those who have the NHIS card?	1 = Better 2 = Same 3 = Worse 9 = Refused	….|___|
73.	**IF YES TO Q71 ASK** In your opinion how will you assess the nature of services NHIS cardholders get at health facilities compared to those who have no NHIS?	1 = Better 2 = Same 3 = Worse 9 = Refused	….|___|
74.	When did you **FIRST** enroll in the NHIS?	0 = Never enrolled Year……..Month..……	….|___|
75.	Are you **CURRENTLY** enrolled in the NHIS?	1 = Yes 2 = No 9 = Refused	….|___|
76.	**IF NO TO Q75 ASK** Why are you not currently enrolled?	1 = Lack of money 2 = Not interested in NHIS 3 = No Registration desk here 4 = Other 8 = Don't know	….|___|

77.	Have you ever visited a health facility to seek treatment for your illness since 2005?	1 = Yes 2 = No 3 = Never been ill 9 = Refused	….|___|
78.	**IF YES TO Q77 ASK** When did you last visit a health facility to seek treatment for your illness?	1 = Within last 4 weeks 2 = 1 month to 6 months 3 = 7 months to 1 year 4 = More than 1 year 8 = Don't know 9 = Refused	….|___|
79.	Since the introduction of the NHIS how would you rate its impact on how frequently people use health facilities?	1 = Less use of health facilities 2 = No change in use 3 = More use of health facilities 8 = Don't know	….|___|
80.	How far is it from where you live to the nearest health facility?	1 = Less than 1 km 2 = Between 1 and 5 km 3 = More than 5 km 8 = Don't know 9 = Refused	….|___|
81.	Have you ever been diagnosed with any illness in the last 4 weeks?	1 = Yes 2 = No 8 = Don't know 9 = Refused	….|___|
82.	During your last illness where did you seek treatment?	1 = Did not seek treatment 2 = Health center 3 = Hospital 4 = Community health worker 5 = Traditional healer 6 = Drug kiosk/store 8 = Don't know 9 = Refused	….|___|
83.	**IF RESPONDENT DID NOT SEEK TREATMENT ASK** Why did you not seek treatment for your illness?	1 = Do not have insurance 2 = Distance too far 3 = Other (specify) 8 = Don't know 9 = Refused	….|___|
84.	Are there any community health workers in this village/town?	1 = Yes 2 = No 8 = Don't know 9 = Refused	….|___|
85.	Do you have a drug dispensing kiosk/outlet/store (mini-pharmacy) in this community?	1 = Yes 2 = No 8 = Don't know 9 = Refused	….|___|

86.	Are there any non-governmental organizations working in this area?	1 = Yes 2 = No 8 = Don't know 9 = Refused	….|___|
87.	What is your most important source of information about health matters in this community?	1 = Community health worker 2 = Government health center/hospital 3 = Faith-based health center/hospital 4 = NGO 5 = Other (specify) 8 = Don't know 9 = Refused	….|___|
	Socio-Demographic Information		
88.	Gender	1 = Male 2 = Female	….|___|
89.	What is your age?	_____	
90.	Marital status	1 = Never married 2 = Currently married 3 = Divorced 4 = Widowed 9 = Refused	….|___|
91.	What is your highest level of education?	1 = No education 2 = Primary education 3 = Secondary education 4 =Tertiary education 5 = Middle school 9 = Refused	….|___|
92.	How many people in total live in your household?	_____	
93.	How many of the people in your household are children?	_____	
94.	What is your religion?	1 = Christianity 2 = Muslim 3 = Traditionalist 4 = No religion 5 = Others 9 = Refused	….|___|
95.	Ethnicity	1 = Sissala 2 = Waala 3 = Brifo 4 = Dagaaba 5 = Other (Northern) 6 = Other (Southern)	….|___|

96.	What is your annual household income?	Record …….. 8 = Don't know 9 = Refused	….|___|
97.	Which one of the following housing type best describes the type of dwelling this household occupies? **DO NOT READ ALOUD. CIRCLE ONLY ONE ANSWER FOR THE COLUMN LABELLED CODE**	1 = House 2 = Traditional dwelling/homestead 3 = Compound house 4 = Room in house 5 = Hut/shack 6 = Other (specify)	….|___|
98.	Does your house have electricity?	1 = Yes 2 = No 8 = Don't know 9 = Refused	….|___|
99.	Does your house have running water?	1 = Yes 2 = No 8 = Don't know 9 = Refused	….|___|
100.	Does this household own any livestock?	1 = Yes 2 = No 8 = Don't know 9 = Refused	….|___|
101.	How many of the following types of animals does your household have?	Goats Pigs Cattle Donkey Sheep Chicken	

102.	Which of the following best describes the household structure? **DO NOT READ ALOUD- ASK ABOUT HOUSEHOLD TYPE AND CIRLCE ONLY ONE ANSWER**	1 = Female Centered (No husband/male partner in household, may include relatives, children, friends 2 = Male Centered (No wife/female partner in household, may include relatives, children, friends) 3 = Nuclear (Husband/male partner and wife/female partner with or without children) 4 = Extended (Husband/male partner and wife/female partner and children and relatives) 5 = Polygamous (husband with more than one wife) 6 = Other (specify):	….|___|

Appendix C: Curriculum Vitae

Name:	Kilian Nasung Atuoye
Post-secondary Education and Degrees:	University of Ghana Legon, Accra, Ghana 2001-2005 B.A The University for Development Studies Tamale, Northern Region, Ghana 2011-2013 MPhil. The University of Western Ontario London, Ontario, Canada 1993-1995 M.A. (candidate)
Awards:	Western Graduate Research Scholarship 2014-2015 Canadian Bureau for International Education/Department of Foreign Affairs and International Trade (CBIE/DFAIT) Scholarship 2012
Teaching Experience:	Teaching Assistant The University of Western Ontario 2014-2015 Subject Teacher St. Francis Xavier Junior Seminary (High School) 2000-2005 (periodically)

Publications:

Peer-reviewed articles

Atuoye, K. N. and Odame, F. S. (2013). 'Queenmother' concept in the Upper West Region of Ghana: Is this advancement or an emerging conflict with tradition in a patriarchal society? *European Scientific Journal*, *9* (35), 222-239

Atuoye, K. N., Dixon J., Rishworth A., Galaa, Z. S., Boamah, S., Luginaah, I. Can she make it? Transportation barriers to accessing maternal and child health care services in rural Ghana. *BMC Health Services Research, 15(1) 333*

Articles under review

Atuoye, K. N. and Luginaah, I. Residential remittance effects on food security in the Upper West Region of Ghana. *Special issue, Food Security* (Under review)

Atuoye, K. N., Vercillo, S., Antabe R., Galaa, Z. S., Luginaah, I. Is Ghana's health insurance scheme threatened by a capitation policy? *Health Policy and Planning.* (Revised)

Atuoye, K. N., Amoyaw, J. A., Kuuire, V. Z., McMorris, M., Vercillo, S., Boamah, S., Antabe, R., Kangmennaang, J., Luginaah, I. Access to and Utilization of Skilled Birth Attendants in the context of MDG 5 in Sub-Saharan Africa. *Special issue, Health in Africa and the Post-2015 Millennium Development Agenda*

Vercillo, S., **Atuoye, K. N.,** Osei, L., Luginaah, I. Hunger in the Midst of Plenty – The Messy National Buffer Stock Company Policy Debate in Ghana. *Food security* (submitted)

Sano, Y., Antabe, R., **Atuoye, K. N.,** Hussey, L. Bayne, J., Galaa, Z. S., Mkandawire, P., Luginaah, I. Persistent Misconceptions about HIV Transmission among Males and Females in Malawi. *BMC International Health and human Rights* (submitted)

Kuuire, V. Z., Kangmennaang, J., **Atuoye, K. N**., Vercillo, S., Boamah S., Antabe, R. Amoyaw, J. A., Luginaah, I. Timing and utilization of antenatal care services in Nigeria and Malawi. *Special issue, Health in Africa and the Post-2015 Millennium Development Agenda*

Un-submitted manuscripts

Atuoye, K. N., and Luginaah, I. Household food insecurity as a social determinant of mental health among household heads in the Upper West Region of Ghana

Atuoye, K. N., Antabe R., Sano, Y. Vercillo, S., Kuuire, V. Z., Luginaah, I. Understanding the paradox of high health insurance enrolment in a hungry region: Food insecurity and health insurance in the Upper West Region of Ghana

Atuoye, K. N., Bayne, J., Luginaah, I. Is more necessarily better?: Examining the relationship between income diversification and household food insecurity in the Upper West region of Ghana

Book Chapter

Odame, F. S., Kuuire Z. V., **Atuoye, K. N.** Gendered motives and behaviours in North-South Migration in Ghana. In Critical Notes on Northern Ghana's Development: History, Politics and Development in Contention. (Under submitted).

Conference Presentations

Atuoye, K. N., Kuuire Z. V., Kangmennaang, J., Amoyaw, J. A., Luginaah I. Access to and Utilization of Skilled Birth Attendants in the Context of MDG 5 in Sub-

Saharan Africa. Health in Africa and the Post 2015 Millennium Development Agenda Symposium, Urbana-Champaign, 20-22 **May 2015.**

Kuuire, V. Z., Kangmennaang, J., **Atuoye, K. N**., Vercillo, S., Boamah S., Antabe, R. Amoyaw, J. A., Luginaah, I. Timing and utilization of antenatal care services in Nigeria and Malawi. Health in Africa and the Post 2015 Millennium Development Agenda Symposium, Urbana-Champaign, 20-22 **May 2015.**

Atuoye, K. N., Kuuire Z. V., Kangmennaang, J., Antabe, R., Armah, A. F., Luginaah, I. Impact of remittance on food security in Upper West Region of Ghana. Association of American Geographers Annual Meeting, Chicago, 21 – 25 **April 2015**

Antabe, R., **Atuoye, K. N.,** Kuuire, Z. V., Luginaah, I. The Impact of Household Food Security Status on NHIS Enrolment in Upper West Region of Ghana. Association of American Geographers Annual Meeting, Chicago, 21 – 25 **April 2015**

Atuoye, K. N., Dixon J., Rishworth A., Galaa, Z. S., Armah A. F., Luginaah, I. Can she make it?: Transportation barriers to accessing maternal and child health care services in rural Ghana. Canadian Association of Geographers, Ontario Division Annual Meeting, York University, Toronto, 24 – 25 October, 2014

Atuoye, K. N. and Odame, F. S.**,** 'Queenmother' Concept in the Upper West Region of Ghana: Is this Advancement or an Emerging Conflict with Tradition in a Patriarchal Society? International Conference on African Studies, Accra, 24 – 26 **October 2013**

Reviewer for International Journals:

Social Science and Medicine

Community Development

Professional Membership:

Association of American Geographers
2014 to date

Canadian Association of Geographers
2014 to date

Canada Association of Geographers – Ontario Division
2014 to date