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The Transitioning Nutrition Status of Countries in Sub-Saharan Africa

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Abstract

Countries in Sub-Saharan Africa (SSA) are experiencing the double burden of malnutrition (under- and over-nutrition) due to an on-going nutrition transition. Little research exists that explores the underlying causes of this double burden phenomenon within and across countries in SSA. This study examined potential causes among women in 34 countries, with an objective of identifying malnutrition groups and determining the key correlates of women nutritional status. Cross country analyses showed that fertility rate and gross domestic product were key correlates of nutrition transition. Within country analyses showed that age, wealth and parity were key correlates of women's nutritional status. Parity was a risk factor for underweight in underweight burdened countries, and a risk factor for overweight in overweight and obese burdened countries. Based on the findings, the study suggests that policy makers and public health practitioners should consider linking nutritional programs with reproductive health services.

Keywords

Nutritional Status, Nutrition transition, Double Burden of Malnutrition, Sub-Saharan Africa, Under-nutrition, Over-nutrition

Co-Authorship Statement

This thesis consists of publicly available data that will be included in a manuscript. Jason Were will be the first author, as he steered the research by acquiring the data, designing the study, conducting the literature review, analyzing the data and writing of the manuscript. Dr. Saverio Stranges will be a co-author as he co-supervised the work and edited the manuscript. Dr. Irena Creed will be a co-author because of her overall supervisory contributions: she helped in acquiring the data, conceptualizing the study, editing the manuscript and providing the necessary funding for the completion of this thesis.

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List of Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
BMI	Body Mass Index
CHW	Community Health Workers
DHS	Demographic and Health Survey
FAO	Food and Agriculture Organization
FGM	Female Genital Mutilation
GDP	Gross Domestic Product
GNP	Gross National Income
HIV	Human Immunodeficiency Virus
LMIC	Low and Middle-Income Countries
NCD	Non-Communicable Diseases
PSU	Primary Sampling Units
RRR	Relative Risk Ratios
SSA	Sub-Saharan Africa
UN	United Nations
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VIF	Variance Inflation Factor
WHO	World Health Organization

Chapter 1

1 Introduction

1.1 Background

Over-nutrition is one of the greatest public health challenges in the modern-day world. Recent estimates indicate that close to 700 million adults are obese, with the majority of these cases occurring in developed countries (WHO, 2017). However, despite the persistent scourge of under-nutrition, studies have also shown that the prevalence of overweight in low and middle-income countries (LMICs) has reached epidemic proportions (Shrimpton & Roks, 2012). These findings have led to the assertion that majority of the LMICs are encountering the 'double burden of malnutrition', a phenomenon characterized by the simultaneous existence of both underweight and overweight people (Popkin, 2004; Subramanian & Smith, 2006; Moore et al., 2010). Considering that health care systems in developing countries are consistently overwhelmed because they are inadequately facilitated, the co-existence of both malnutrition extremities presents a major public health concern in such settings (WHO, 2010).

A classic example of a region encountering the dual burden of malnutrition is Sub-Saharan Africa (SSA). While under-nutrition related sequalae such as diarrhoea still rank among the top ten leading causes of death, evidence suggests that obesity related Non-Communicable Diseases (NCDs) are increasing at a faster rate in SSA, compared to high-income countries (WHO, 2014a; WHO, 2014b). For example, in 2015, the World Health Organization (WHO) estimated that 46% of adults in Africa (majority from SSA) were hypertensive, the highest recorded prevalence in the world (WHO, 2016a). Furthermore, projections based on current evidence depicts that close to 150 million SSA adults will be hypertensive by 2025 (Van de Vijver et al., 2014). These are conservative estimates considering the fact that accurate data are unavailable for most countries in the region (Ekpenyong et al., 2012).

The double burden scourge affects all population subgroups, with both men and women equally afflicted (Kennedy et al., 2006). However, malnutrition concerns with regards to women deserve special attention (Ransom & Elder, 2003; Kamal et al., 2015). Gender roles, poverty, lack of education, diminished decision-making powers and higher biological susceptibility to some diseases (e.g. HIV/AIDS) are just but a few primary contributors of women's vulnerability to malnutrition (WHO, 2010; WHO, 2012). Moreover, within the SSA context, the risk level is further elevated by punitive socio-cultural norms, harmful traditional practices such as Female Genital Mutilation (FGM) and forced/early marriages (WHO, 1997; WHO, 2016b). Therefore, findings revealing higher incidences of nutrition-related diseases among the female subgroups compared to their male counterparts (Danaei et al., 2014; NCD Risk Factor Collaboration – Africa Working Group, 2017) does not depict a surprising scenario.

Beyond the health impacts of malnutrition for the individual, a generational link between prepartum malnutrition and life course health implications has been established (Barker et al., 1993; Victora et al., 2008; Papachatzi et al., 2013) thereby inferring that the rapid transitioning nutritional status in SSA is not only a concern to the current generation, but also to the future generations. Therefore, understanding the patterns and correlates of nutritional status for women of reproductive age is of paramount importance in designing context specific health interventions.

In the SSA, previous studies have established an inverse relationship between socioeconomic status and the occurrence of underweight and overweight cases (where poor people are more at risk of being underweight), contrary to what is observed in the developed world (where poor people are more at risk of being overweight) (Olalekan, 2009; Tebekaw et al., 2014; Doku & Neupane, 2015). However, given that the SSA population is highly heterogeneous, inferences drawn from a few country specific studies can only present a partial picture of the double burden phenomenon in the region.

This study seeks to provide a comprehensive image for the malnutrition correlates influencing the distribution of underweight and overweight cases in SSA by answering the following research question: *What are the key correlates of the transitioning nutrition*

status among women of reproductive age in Sub-Saharan Africa? This is explored under the following research objectives:

1. To categorize Sub-Saharan African countries by malnutrition prevalence of women of reproductive age (i.e., Do SSA countries differ in their likelihood of malnutrition?).
2. To determine country-level indicators that are related to the malnutrition groups within Sub-Saharan Africa (i.e., What country-level indicators drive malnutrition groups in SSA?).
3. To determine within country-level indicators that are related to women malnutrition categories within Sub-Saharan Africa (i.e., What country-specific indicators drive malnutrition among women?).

The following hypotheses were tested:

1. Countries vary in terms of the type and extent of malnutrition in Sub-Saharan Africa.
2. Malnutrition in Sub-Saharan Africa is shaped by country level indicators of economic growth and development.
3. Malnutrition within countries of Sub-Saharan Africa is associated with socio-demographic factors that vary among specific countries in Sub-Saharan Africa.

1.2 Thesis Outline

This thesis contains six chapters. Chapter 1 introduces the problem of malnutrition in SSA and provides a rationale together with goals, questions and hypotheses that frame the thesis. Chapter 2 reviews the literature on the double burden of malnutrition, describing the historical trends of nutritional status, the potential correlates of the dual burden of malnutrition, and the theoretical basis of the thesis. Chapter 3 describes the study design, data sources, data used, and statistical analysis performed. Chapter 4 describes the results for each research objective. Chapter 5 presents a discussion of the results for each research objective in relation to previous findings and the nutrition transition theory. Additionally, it highlights the limitations of the study

Chapter 6 summarizes the scientific findings, presents the contribution of this study to literature, and the conclusion/policy implications.

Chapter 2

2 Literature Review

This chapter provides a review of literature covering three bodies of knowledge: first, a review of global and regional patterns of nutritional status; second, a review of the macro- and micro-level correlates of the double burden of malnutrition phenomenon; and third, a review of the theoretical basis for the thesis.

2.1 Trends in Nutritional Status

A recent study by the Non-Communicable Disease Risk Factor Collaboration (NCD-RisC) program (a consortium of health scientists concerned with providing accurate and timely global data for monitoring and evaluating NCDs risk factors) presented evidence demonstrating an accelerated global trend towards overweightness among the adult population (18 years and above) in the last four decades (NCD Risk Factor Collaboration, 2016). The age-standardized findings suggested that, on average, a woman's body weight was increasing at a rate of over 1.5 kg per decade since 1975. This corresponds to a global mean Body Mass Index (BMI-weight in Kg divided by height in m^2) increase from 22.1 kg/m^2 to 24.4 kg/m^2 between 1975 and 2014.

Generally, heavier women (mean BMI > 26 kg/m^2) were more likely to be found in high-income English-speaking countries, North Africa, the Middle East, and Southern Africa, whereas lighter women (mean BMI < 23 kg/m^2) were most likely located in South Asia, East and Central Africa (NCD Risk Factor Collaboration, 2016). The global proportion of underweight (BMI < 18.5 kg/m^2) women decreased from 14.6% in 1975 to 9.7% in 2014, while that of obese (BMI > 30 Kg/m^2) women doubled from 6.4% to 14.9% over the same time (NCD Risk Factor Collaboration, 2016). Despite reductions in underweight women, underweightness is still common in East and Central Africa, with a prevalence as high as 13% recorded in Ethiopia and the Democratic Republic of Congo by 2014.

Within SSA, a mean increase of 0.98 kg/m^2 in BMI per decade (approximately two times the global average) suggests that the SSA adult female bodyweight increased by 10 kgs

between 1975 and 2014 (NCD Risk Factor Collaboration, 2016). Regional variations were depicted, with the highest rate of increase in mean BMI consistently found in Southern Africa, followed by West Africa, East Africa and finally Central Africa. In 2014, the highest mean BMI (29.43 kg/m^2) was recorded in South Africa, whereas the lowest mean BMI (21 Kg/m^2) was recorded in Ethiopia.

Consistent with the global trend, SSA exhibited a significant decrease in the prevalence of underweightness for adult women, ranging from a regional average of 18% in 1975 to 9.8% in 2014 (NCD Risk Factor Collaboration, 2016). Out of the 48 SSA countries in the study, 31 had a less than 10% prevalence of underweight in 2014, compared to only one country (South Africa) in 1975. At the other end of the spectrum, the prevalence of obesity in women increased from an average of 3% in 1975 to 13.8% in 2014. Obesity prevalence in 2014 was greater than 10% in 37 countries compared to one country (South Africa) in 1975. Overall, these findings revealed that nutrition transition occurred more rapidly in SSA compared to other regions of the world (Mendez et al., 2005).

2.2 Correlates for the Double Burden of Malnutrition

Various models have been developed to describe factors driving an individual's nutritional status (UNICEF, 1991; Swirnburn et al., 2011; Shrimpton & Roks, 2012; Scott et al., 2012; Gillespie et al., 2013; Haddad et al., 2014; Sartorius et al., 2015; Butzlaff & Minos, 2016). A common underlying theme across the different models is that the nutritional status (under-nutrition or over-nutrition) of an individual is shaped by a spectrum of multilevel and interacting factors operating in the environment where the person is situated (Darling, 2007). Common direct and indirect factors operating at macro- and micro-levels associated with the double burden of malnutrition are described below.

2.2.1 Direct Factors

Both forms of malnutrition can be attributed to health behaviors that promote energy imbalance in the body. While under-nutrition is a result of expending more calories in physical activities relative to the amount consumed, over-nutrition is a result of

consuming more calories compared to what is expended (Neupane et al., 2015). Principally, under-nutrition results from inadequate dietary intake and health impairments that impact nutrient absorption or lead to a loss of nutrients (Haddad et al., 2014). For instance, nutrition detrimental diseases such as digestive tract infections, diarrhea, and pneumonia may result in nutrient malabsorption and loss that may result in under-nutrition (Haddad et al., 2014; Beal & Ervin, 2018). On the other hand, overconsumption of energy-dense foods that are rich in saturated fats, sugars and carbohydrates may result in over-nutrition (Swirnburn et al., 2011).

Both forms of malnutrition can also be a result of genetic predisposition. For example, with respect to under-nutrition, evidence suggests that individuals with an extra patch of genes found in chromosome 16, have a 23-fold and five-fold increased risk of being underweight in men and women, respectively (Jacquemont et al., 2011). With respect to over-nutrition, evidence also suggests that fetal development in nutritionally stressed environments increases the likelihood of becoming obese in instances where such individuals grow up in 'obesogenic' environments (Hales & Barker, 1992; Swirnburn et al., 1999; Josefson, 2012).

2.2.2 Indirect Factors

Indirect factors are those that confound the relationship between direct factors and nutritional outcomes. They encompass both macro- and micro-level factors, as discussed below.

Macro-Level Factors

These entail country-level factors that influence the impact of micro-level factors on a person's nutritional status. These include both economic, social, and political indicators of growth and development, such as globalization, industrialization, and urbanization (Abrahams et al., 2011; Popkin, 2002). For instance, under-nutrition can be linked to the rapid urban growth in SSA that has resulted in the creation of overcrowded slums in major urban settlements (Haddad et al., 2014). Skyrocketing food prices, brought about by frequent economic recessions and globalization of food markets, make food

economically inaccessible for the majority of the urban poor, who spend approximately half of their income on food (Haddad et al., 2014; Nickanor & Kazembe, 2016). Conversely, over-nutrition can be linked to the expansion of transnational corporations that have made processed foods more accessible even in rural areas (through supermarkets), technological innovation in workplaces, and entertainment industries have promoted a more passive lifestyle, thus increasing the risk of over-nutrition (Monteiro et al., 2004; Shrimpton & Roks, 2012; Scott et al., 2012).

Micro-Level Factors

Micro-level indicators entail factors in close proximity to the individual. These include individual socio-demographic factors such as age, gender, occupation and education; socio-cultural factors such as family influences, household wealth, culture, religion; and environmental factors such as location and region of residency (Haddad et al., 2014; Sartorius et al., 2015; Butzlaff and Minos, 2016).

Concerning under-nutrition, the capability of assuring sufficient dietary intake consistently is dependent on access to quality diets, both physically (food is within reach), economically (affordability) and culturally (acceptability of food within cultural constructs) (FAO, 2015; Haddad et al., 2014). Gender inequities in employment and education opportunities, discriminatory social and cultural norms against females in household, poor health services, and lack of clean water and sanitation are some of the barriers that would lead to increased risk of under-nutrition (Hadley et al., 2008; FAO, 2013).

Concerning over-nutrition, the overconsumption of energy-dense foods may be as a result of accessibility of fast foods in urban areas, increased household income that influences food choices and enhances purchasing power, and occupational shifts towards long working hours, thus promoting frequent snacking and consumption of processed foodstuffs over self-prepared meals (Balarajan & Villamor, 2009; Reardon & Berdegué, 2002; Delisle et al., 2013; Steyn & Mchiza, 2014). Furthermore, decreased metabolic rate due to aging, increased women engagement in modern sedentary labour markets, and increased residency in environments that limit physically active lifestyles may further

contribute to the increased risk of over-nutrition (Shrimpton & Roks, 2012; Steyn & Mchiza, 2014; Bosu, 2015; Neupane et al., 2015). In addition, affinity for 'plumpness' within the SSA context may be promoted by cultural roles for women in households, child bearing and rearing, and social norms that revere overweightness as a symbol for beauty and social standing in the society (Brown & Konner, 1987; Sobal & Stunkard, 1989; Arber & Khlat, 2002; Batnitzky, 2008; Kandala & Stranges, 2014).

2.3 Theoretical Basis

2.3.1 Nutrition Transition Theory

The study of the double burden of malnutrition can be conceptualized in the field of geography by examining trends in population changes, life expectancy, and disease patterns within a place. In literature, these changes have been captured as two main transition processes: *the demographic transition* that describes the shift from a period of high births and deaths to a period of low births and deaths as a result of economic development (Lee, 2003; Galor & Weil, 2000); and *the epidemiologic transition* that describes the pattern of disease burden, shifting from an era characterized with high deaths due to infectious diseases to an era where chronic and degenerative diseases are the main cause of mortality (Omran, 2005). However, recent studies have suggested the importance of examining nutritional changes preceding or occurring simultaneously with these two transitions (Drewnowski & Popkin, 1997; Popkin, 1994; Popkin, 2004; Abrahams et al., 2011).

In 1993, Barry Popkin proposed the *nutrition transition theory*, which describes the historical shifts in dietary and physical activity patterns (Popkin, 1993; Popkin, 2001). He denotes that modernization in developing countries due to increased global connectivity, income growth and liberalization of food markets has resulted in a dietary shift from traditional foods characterized by high proportions of unrefined carbohydrates and vegetables to a 'Western diet', characterized by large amounts of animal-sourced foods rich in caloric content, salt and sugar (Popkin, 2002; Popkin 1993; Popkin, 2012). This dietary transition has brought about marked changes in nutritional outcomes (such as

stature and body composition) associated with the rapid changing disease profile as depicted by the rising incidences of nutrition-related NCDs (Popkin, 2002; Popkin et al., 2012).

The theory of nutrition transition is described at a population or a community level through five stages (Popkin, 1993):

1) *Collecting food:* an era characterized with diets high in starch and fibre and low in saturated fat (Truswell, 1977). Hunting and gathering is the main occupation and therefore, physical activity levels are high and obesity cases rare.

2) *Famine:* a period associated with acute scarcity of food and low dietary diversity. Lack of adequate food leads to slowed growth and stunting (Popkin, 2002). These changes are associated with the shift from foraging culture to cultivation and settlements (Abrahams, et al. 2011). However, individuals are still physically active despite the changes in the type of physical activity.

3) *Receding famine:* a period characterized with productive agriculture due to advancements in technology. Consumption of animal-sourced proteins, fruits and vegetables increases. Notably, diets become less starchy and physical activity levels decreases as people become more established in settlements (Popkin, 1993).

4) *Degenerative disease:* is a stage characterizing most high-income societies where high calorie foods are easily accessible and affordable. Diets are typically high in cholesterol, fat, sugar and refined carbohydrates and low in fibre (Popkin, 1993). This dietary culture is often accompanied by low levels of physical activity and high incidences of obesity, hypertension, diabetes and other nutrition-related NCDs.

5) *Behavioral change:* faced with an increased risk of mortality due to NCDs, individuals initiate behavioral changes with a desire to prevent or delay nutrition-related NCDs and prolong life (Popkin, 1993; Popkin 2002). These

> changes entails increasing consumption of starch, vegetables and fruits, reducing the consumption of meat, dairy products and processed foods and engaging in regular physical activity (Popkin., 1993; Abrahams et al., 2011).

Popkin's work was primarily based on the 4th stage of transition, in particular centering on the nature and implications of nutrition-related NCDs (Popkin, 2001; Popkin et al., 2004; Beal & Ervin, 2018).

Similar to the demographic and epidemiological transitions, nutrition transition exhibits a wide degree of spatial heterogeneity (Beal & Ervin, 2018). Globally, high-income developed countries, except those in East Asia, commenced transitioning from stage 3 to stage 4 in the early twentieth century and progressed slowly up to 1980s (Popkin 2002; Beal & Ervin, 2018). However, in lower-income developing countries, the onset of transitioning to stage 4 began in only 1980 but has since rapidly accelerated through stage 4, compared to the rate seen earlier in developed countries (Popkin, 2002; Ng et al., 2014; Beal & Ervin, 2018).

Uneven patterns in transitions based on residential settings have also been observed within countries. In developed countries, findings indicate that stage 4 is prominent among the urban poor and in rural areas (Beal & Ervin, 2018). In contrast, in developing countries, findings indicate that stage 4 is prominent in urban areas but stage 3 is prominent in rural areas (Mendez & Popkin, 2004; Neuman et al., 2013; Beal & Ervin, 2018). These differences in transition patterns extends further to the community and household levels (Galal, 2002), where socio-demographic and locational factors (micro-level factors) mediates the transition process (Doak et al., 2002; Subramanian & Smith, 2006; Sanchez-Vaznaugh et al., 2009; Beal & Ervin, 2018).

Despite the importance of micro-level factors in shaping the transition process, national measures of economic development and global connectivity appear to be the key correlates of nutrition transition (Jaacks et al., 2014; Goryakin & Suhrcke, 2014; Beal & Ervin, 2018). For instance, Monteiro et al. (2004) found a strong positive correlation between Gross National Product (GNP) per capita and over-nutrition. Their findings,

largely obtained from national surveys in SSA, demonstrated that when a country's GNP per capita hits the 2500 US dollars mark, the burden of overweight shifts towards the poor. These results were supported by other findings that showed a weakening socio-economic gradient in relation to over-nutrition as LMICs continue to experience economic growth (Subramanian et al., 2011; Dinsa et al., 2012).

2.3.2 Conceptualizing Nutrition Transition Theory in SSA

Popkin cautions that though historical findings are important in providing insight concerning future changes, developing countries may not necessarily follow dietary patterns observed in high-income countries (Popkin, 1993). To predict future patterns, Popkin and colleagues suggests that nutrition transition should be examined through the lens of demographic and socio-economic changes (Popkin, 1993; Popkin, 2002; Popkin et al., 2012; Popkin et al., 2009; Bishwajit, 2015). The following subsections discuss two propositions set forth by Popkin to provide a greater understanding of the transitioning nutrition status among women of in SSA.

Changes in Population Demographics

The majority of SSA countries are experiencing significant shifts towards an older age distribution because of decreasing levels of fertility and mortality (Popkin 1993; UN, 2017). For instance, 2017 estimates from the World Bank have shown that on average, 54.5% of the female population in SSA are between the ages of 15 to 64 years compared to 1987 when the same age group formed 51.6% of the female population (WDI, 2018). However, substantial variations exist between countries, with higher proportions ($\geq$ 60%) observed in South Africa, Mauritius, Lesotho and Swaziland whereas lower proportions ($\leq$ 50%) are observed in countries such as Eritrea, Niger, Mali and Uganda (WDI, 2018). Innately, physical/physiological (e.g. chronic illnesses, changes in body composition) and psychosocial changes (e.g. depression, social isolation) associated with aging are anticipated to have significant impacts on dietary patterns (Leslie & Hankey, 2015; Popkin 1993).

However, the demographic changes that have a greater influence on dietary practices are the observed transitions in spatial distribution of the population (Popkin 1993; Popkin, 1999). Evidence suggests that increasing urbanization rates are associated with increased consumption of foods considered to be superior in cities such as refined grains (rice, maize, millet) and diets rich in fat and sugar (Schmidhuber & Shetty, 2005; Popkin, 1993; Popkin & Bisgrove, 1988). The prominence of energy-dense diets in urban settings have been aided by improved efficiency in transportation, food distribution, marketing, and occupational shifts that discourage consumption of home cooked meals that are deemed to be healthier (Popkin, 1993; Mendez & Popkin, 2004).

SSA is one of the regions that has experienced rapid urban growth, largely due to rural-to-urban migration, as people move to major cities and towns in search of economic and social opportunities (Byerlee, 1974; Awumbila, 2017). Current estimates show that 39% of SSA population are urban dwellers, with the projections indicating that urban populations are likely to increase by approximately 10% by 2020 (WDI, 2018; UN, 2017). However, country-specific estimates depict a wide variation within the SSA, with countries such as Gabon (87.6%) and Djibouti (77.5%) having proportions similar to what is observed in high-income countries, whereas Uganda (16.6%) and Malawi (16.8%) depict some of the lowest proportions observed in the world (WDI, 2018).

Changes in Women's roles as a result of Industrial Revolution

Similar to other regions in the world that are actively engaged in global trade, SSA is undergoing major transformations with regards to the economic structure, with countries experiencing transitions from agrarian based economies to industrial ones (Henley, 2012, Pack, 1993; Popkin, 1993; Bishwajit, 2015). Consequently, these changes have been linked with occupational shifts from agriculture to the service sector (Bishwajit, 2015), especially within the urban setting (Neupane et al., 2016; Popkin et al., 2012). Of importance with regards to nutrition transition are the drastic societal changes in women's roles associated with increases in household income and the evolution of home food production technology such as refrigeration, canning and improved cookware (Popkin, 1993).

An indication of the changing socio-economic status among women SSA can be proxied by evaluating trends in adult female literacy and labor force participation in the service industry. Recent (2016) statistics suggest that the proportion of adult females (≥ 15 years) who are literate and employed in the service sector stands at 57.1% and 62.8% respectively (WDI, 2018). However, these regional estimates mask diverse heterogeneity that exists between countries in SSA. For example, out of 48 countries in SSA, the proportion of literate women exceeds 80% in 11 and is less than 30% in 10 countries (WDI, 2018). On the other hand, the proportion of women employed in the service sectors is below 50% of the female population in three quarters of the countries in SSA while countries such as Sao Tome and Principe and South Africa record proportions greater than 80% (WDI, 2018). In line with the nutrition transition theory, these differences in socio-economic status between countries in SSA are expected to be reflected in women's nutritional status (Popkin, 1993).

Given the aforementioned understanding of the nutrition transition process as a spatially defined concept, shaped by both global and local contexts (Swirnburn et al., 2011; Beal & Ervin, 2018), and the empirical evidence of diverse patterns of the transition displayed in SSA (Abrahams et al., 2011), this study draws from nutrition transition theory and propositions posited by Popkin (1993), to examine the state of the transitioning nutritional status and its implications among women of reproductive age in SSA.

Chapter 3

3 Methods

This chapter explains the methods used in this study. In particular, it describes the study population, the sources from which data were drawn for analysis, and the data collection processes employed by those sources. The chapter also describes the statistical techniques used in data analysis.

3.1 Study Location

Figure 1 shows the map of the SSA countries included in this study. A total of 34 countries where chosen for this study based on availability of data. SSA is the largest region in Africa, composed of 48 countries located south of the Sahara Desert. The region has a population of about one billion people, occupying a land mass area of 23.6 million km^2. About 60% of the population reside in rural areas; however, the United Nations projects that half of the population will be urban dwellers by 2020 (UN, 2017). Food insecurity is one of the major challenges in the region, with the most affected being women and children. Recent estimates showed that one in four people are undernourished in the region (FAO, 2015). Poverty, conflicts, and environmental degradation are just but a few of the reasons for hunger problems in SSA.

Beyond the fact that malnutrition is a major public health problem in SSA, this study focused on SSA, as opposed to the entire African continent, due to the availability of data and a dearth in cross-country malnutrition research in the region. The availability of only a single time point (cross-sectional) values for the parameters measured within each of the countries makes it challenging to fully utilize concepts from nutrition transition theory to understand nutritional outcomes. However, by swapping time for space, with an understanding that SSA countries are heterogeneous with regards to their socio-demographic and epidemiological profiles (as a reflection of development status), adoption of the nutrition transition theory provides important insights on the transitioning nutrition status among women of reproductive age in SSA.

Figure 1: Map of SSA Countries Included in the Study.

Produced by the Cartographic Section, Department of Geography, Western University, 2018.

3.2 Data Sources

This study utilized two levels of data: macro-level data that were comprised of country-level indicators of nutrition transition; and micro-level that included within country socio-demographic correlates of the nutritional status of the individual.

Macro-level data were obtained from the World Bank data base (available at http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators), except for globalization index, which was developed by the Swiss Federal institute of technology (Dreher, 2006). In all but one variable (GINI Index), data acquired corresponded to the DHS survey year for the SSA countries used in this study. For GINI Index, the most recent data available for each country were utilized in the analysis (Table 1).

Micro-level data were acquired from the Demographic and Health Survey (DHS) program (available at https://dhsprogram.com/). Established in 1984 by the United States Agency for International Development (USAID) to monitor and evaluate development and health programs in LMICs, the DHS program has conducted over 400 surveys in 89 countries. These surveys are typically public health oriented, with a substantial focus on women of reproductive age (15-49 years). The most common data collected on women include nutrition, fertility, infant and child mortality, maternal mortality, family planning, HIV/AIDS, female genital mutilation, education, wealth and women empowerment (MEASURES DHS, 2013). National representative surveys (Standard DHS) are conducted about every five years, though small scale tailored surveys based on country-specific needs can be done at shorter intervals (Vaessen et al., 2005).

Standard DHS uses a stratified multi-stage sampling procedure for selecting respondents. In the first stage, a list of areal units, known as Primary Sampling Units (PSUs), is generated from enumeration areas used in the country's most recent national census (Corsi et al., 2012b; Yansaneh, 2005). The PSUs are then stratified within geographically-defined strata that consider residential settings (urban/rural) and the country's administrative regions. Each PSU is then sub-divided into segments using

standard segment size (Vaessen et al., 2005). Thereafter, a sample of segments are randomly selected in each stratum, proportional to the total count of segments in each PSU (Corsi et al., 2012a). Survey teams then move into the field for a mapping exercise, where an exhaustive list of boundaries, households, and dwellings is compiled. Once completed, the generated list is used as a sampling frame for systematic selection of participating households. The majority of surveys end up selecting 20-25 households in urban areas and 30-40 households in rural areas for interviews (Corsi et al., 2012a).

Data collection is primarily done through structured interviews with standardized questionnaires administered by personnel recruited and trained by DHS. Field staff recruitment is objectively done where candidates are tested considering the person's interview-conducting ability, fluency in the languages through which the interviews will be conducted, and ability to walk long distances and establish good relationships with the respondents (Vaessen et al., 2005). Interviewer training takes approximately one month, which involves at least 5 – 10 field practice interviews (Vaessen et al., 2005). Afterwards, a final selection of the field staff is done based on their performance during practice interviews as well as written tests (Vaessen et al., 2005).

Typical measures of interest are household socio-demographic variables for both men and women, and specific health outcomes for women and children under the age of five, measured in both an objective and subjective manner (Corsi et al., 2012b). With a response rate of above 90% in most of the surveys, coupled with strict adherence to ethics protocols approved by the International Coach Federation Macro Institutional Review Board, Maryland, USA and the participating country, the DHS is acclaimed as a reputable data source for cross-country demographic studies (Neuman et al., 2014).

Table 1: Summary of the most recent DHS dataset for women of reproductive age in SSA with macro-level indicators corresponding to the DHS survey year.

Country	Survey Year	GDP Per Capita (Current US$)	Urbanization (%)	GINI Index	Globalization Index	Fertility Rate	Life Expectancy (Years)
Benin	2011\12	837	42.67	0.48	42.60	5.25	59.80
Burkina Faso	2010	575	25.66	0.35	43.62	5.87	57.01
Burundi	2010	231	10.64	0.33	33.07	6.26	54.84
Cameroon	2011	1,296	50.10	0.47	42.90	5.05	55.81
Chad	2014\15	777	22.47	0.43	39.57	6.05	52.55
Comoros	2012	789	28.02	0.45	30.84	4.63	62.58
Congo	2011\12	2,952	64.10	0.49	45.19	4.88	62.15
D R Congo	2013\14	461	41.98	0.42	39.98	6.29	58.75
Ethiopia	2016	707	19.92	0.33	-	4.32	65.00
Gabon	2012	9,774	86.36	0.42	49.37	4.01	64.10
Gambia	2013	486	58.37	0.47	49.72	5.60	60.46
Ghana	2014	1,432	53.39	0.42	54.17	4.10	62.11
Guinea	2012	502	35.75	0.34	42.54	5.18	57.76
Ivory Coast	2011\12	1,263	52.04	0.42	48.42	5.16	51.49
Kenya	2014	1,335	25.20	0.48	46.64	3.99	66.19
Lesotho	2014	1,175	26.79	0.54	45.94	3.19	53.09
Liberia	2013	454	48.92	0.33	39.28	4.79	61.04
Madagascar	2008\09	416	31.29	0.43	41.26	4.69	62.92
Malawi	2015\16	301	16.45	0.46	-	4.65	62.54
Mali	2012\13	778	38.36	0.33	45.11	6.32	56.53
Mozambique	2011	527	31.18	0.46	44.70	5.52	55.19
Namibia	2013	5,488	44.68	0.61	52.63	3.56	61.85
Niger	2012	392	17.98	0.34	45.33	7.42	58.17
Nigeria	2013	2,997	46.90	0.43	52.49	5.71	52.11
Rwanda	2014\15	710	28.81	0.50	45.56	3.97	66.62
Sao Tome and Principe	2008\09	1,100	61.18	0.31	31.36	4.84	65.64
Senegal	2010\11	1,080	42.49	0.40	52.38	5.04	64.71
Sierra Leone	2013	711	39.27	0.34	44.79	4.79	50.39
Swaziland	2006\07	3,047	21.78	0.51	42.83	3.76	47.68
Tanzania	2015\16	879	31.61	0.38	-	5.08	64.90
Togo	2013\14	620	39.47	0.43	53.70	4.59	59.58
Uganda	2011	584	14.80	0.41	44.60	6.06	57.72
Zambia	2013\14	1,738	40.47	0.56	52.47	5.10	60.72
Zimbabwe	2015	1,019	32.38	0.43	44.04	3.84	60.67

- Indicates missing data

3.3 Study Population and Sample Size

To address the first two objectives of this study, the national prevalence estimates of both underweight and overweight cases were used, derived from anthropometric data in the DHS. Respondent's height and weight values were determined objectively for a subsample (approximately 50%) of the surveyed population in Standard DHS surveys. Standing height was measured using millimetre calibrated height/weight (Shorr) boards with an accuracy of ±1 mm, whereas weight data was captured using solar-powered scales with a ±0.1 kg accuracy (Macro & Calverto, 2006; Neupane et al., 2015). In line with the objectives of the study, 34 countries (based on data availability) with the most recent surveys containing national representative height and weight data for women of reproductive age were selected for the cross-country analyses (Figure 1).

To address the third objective, which aimed at identifying social-demographic characteristics that influence women's nutritional status, *a prior* decision was applied to only include participants with valid anthropometric measurements. Therefore, participants with no values on height and weight, biological implausible BMI values (<12 kg/m^2 and > 60 kg/m^2), pregnant women, and those who had given birth two months prior to the interview were excluded from the study (Neuman et al., 2014; Madise & Latemo, 2017). Table 2 presents the crude sample, observations dropped, and the final sample (i.e., the analytical sample) for all countries used in the study.

Table 2: A summary of the creation of the final sample size for the study's third objective for each country.

COUNTRY	INITIAL SAMPLE SIZE	INELIGIBLE PARTICIPANTS				FINAL SAMPLE SIZE
		Missing/Biological Implausible values	Pregnant Respondents	Two Months Post Partum Respondents	Missing data (Covariates)	
Benin	16,599	424	1,595	519	1	14,060
Burkina Faso	17,087	8,617	837	356	65	7,212
Burundi	9,389	4,796	482	170	12	3,929
Cameroon	15,426	7,533	762	254	64	6,813
Chad	17,719	6,417	1,572	554	303	8,873
Comoros	5,329	143	339	133	235	4,479
Congo	10,819	5,161	598	227	11	4,822
D R Congo	18,827	9,465	1,203	453	56	7,650
Ethiopia	15,683	827	1,075	526	33	13,222
Gabon	8,422	2,872	590	193	554	4,213
Gambia	10,233	5,656	389	218	84	3,886
Ghana	9,396	4,646	357	142	13	4,238
Guinea	9,142	4,419	494	171	20	4,038
Ivory Coast	10,060	5,208	532	212	51	4,057
Kenya	31,079	16,656	968	407	86	12,962
Lesotho	6,621	3,233	142	86	3	3,157
Liberia	9,239	4,637	421	153	30	3,998
Madagascar	17,375	8,988	710	289	9	7,379
Malawi	24,562	16,513	642	223	5	7,179
Mali	10,424	5,153	619	249	6	4,397
Mozambique	13,745	137	1,409	501	81	11,617
Namibia	10,018	4,862	280	125	830	3,921
Niger	11,160	5,995	729	319	13	4,104
Nigeria	38,948	544	4,493	1,381	452	32,078
Rwanda	13,497	6,799	481	169	53	5,995
Sao Tome and Principe	2,615	199	225	89	24	2,078
Senegal	15,688	9,892	518	255	3	5,020
Sierra Leone	16,658	8,659	688	253	87	6,971
Swaziland	4,987	118	273	115	79	4,402
Tanzania	13,266	107	1,132	487	5	11,535
Togo	9,480	4,652	433	123	34	4,238
Uganda	8,674	5,965	288	113	0	2,308
Zambia	16,411	169	1,408	546	159	14,129
Zimbabwe	9,955	305	592	304	33	8,721

3.4 Measures

3.4.1 Dependent Variables

Previous malnutrition studies in LMIC suggest that a 10% prevalence of a nutritional disorder would signal a public health problem (Black et al., 2013; Kimani-Murage et al., 2015; Hanandita & Tampubolon, 2015; Corsi et al., 2011, Delisle et al., 2013; Steyn & Mchiza, 2014; Amugsi et al., 2017; Doku & Neupane, 2015). Using this 10% threshold, countries were grouped into four malnutrition groups, which were then subsequently sub-divided into three subgroups for each group (objective 1). The resulting twelve subcategories signifying the presumed phases of nutrition transition from stage 3 to stage 4 in SSA, were used as the dependent variable for the macro-level analysis (objective 2) for this study. A detailed statistical approach for the creation of the malnutrition groups is described in the data analysis section.

Body Mass Index (BMI) was calculated as the respondent's weight in kilograms by height in metres squared (kg/m^2) as recommended by the World Health Organization (WHO, 1995). BMI proved suitable for this study since it provides a valuable estimate of the full spectrum of individual's nutritional status, similar to the highly preferred density measures of adiposity (Neuman et al., 2014; Willet, 2012). Respondent's nutritional status was defined according to WHO guidelines as follows: underweight <18.5 kg/m^2; normal weight 18.5 to 24.9 kg/m^2; and overweight ≥ 25 kg/m^2 (WHO, 2006). These BMI categories (the quetelet index) were used as the dependent variable in the micro-level (within country) analysis (objective 3).

3.4.2 Independent variable

Macro-level variables included gross domestic product (GDP), urbanization rates, KOF index of globalization, GINI index, life expectancy at birth, and fertility rate. Micro-level variables included demographic characteristics (age, religion, ethnicity, parity, and marital status), locational characteristic (residential setting, region), socio-economic factors (occupation, wealth quintile, and educational attainment), media exposure and hormonal contraceptive use. These variables are discussed in detail below and are described in Table 3.

Macro-Level Variables

The ongoing nutritional transition in SSA has been associated with increases in globalization, industrialization, and urbanization (Abrahams et al., 2011; Popkin et al., 2012; Kennedy et al., 2004; Madise & Latemo, 2017; Tebekaw et al., 2014). For this study, correlates that reflect these processes at the national level were selected for the macro-level analysis. Gross Domestic Product (GDP) and urbanization rates were used as indicators for economic development and urbanization respectively. KOF index of globalization was used as an indicator for globalization. GINI index was used as a measure for economic inequality. Additionally, life expectancy at birth and fertility rate were used as indicators of the demographic context (Madise & Latemo, 2017).

Micro-Level Variables

1. **Age** is defined as the respondent's age in years at the time of the interview (DHS, 2013). A positive association has been shown between age and BMI (Huffman & Rizov, 2010; Mamun & Finlay, 2015; Butzlaff & Minos, 2016). Respondent's age was grouped into seven categories as follows: 15-19 years (1), 20-24 years (2), 25-29 years (3), 30-34 years (4), 35-39 years (5), 40-44 years (6), and 45-49 years (7). A five-year categorization of age approach is consistent with other related studies (Subramanian & Smith, 2006; Olalekan, 2009).

2. **Ethnicity** shapes the individual's lifestyle and behaviors, which in turn influences food choices, eating behaviours, and bodyweight (Caprio et al., 2008; Butzlaff & Minos, 2016). The respondent's ethnic affiliation was used to capture the effect of culture on nutritional status. However, the DHS surveys for Burundi, Comoros, Lesotho, Madagascar, Namibia, Niger, Rwanda, Sao Tome and Principe, Swaziland, Tanzania and Zimbabwe did not have data for ethnicity, and therefore, the analyses for these countries did not include ethnicity.

3. **Religion** has an impact on dietary behaviours and lifestyle, which in turn influences an individual's nutritional status (Cline & Ferraro, 2006; Lapane et al., 1997; Ferraro, 1998). In the DHS surveys, except for Tanzania and Niger, respondents were asked to

state their religious affiliation. Since this is a country-specific indicator, the responses were not standardized across the countries. To facilitate cross-country comparison, religious categories were collapsed and re-categorized into six broad categories as follows: Catholics (1), Other Christians (2), Islam (3), Traditionalists (4), Others (5), and No religion (6). Kandala and Stranges (2014) used a similar construction of the religion variable. Furthermore, data from Comoros indicated that a clear majority of the respondents were Muslims (> 99%), thus the religion variable was excluded from the analysis.

4. **Parity** is defined as the number of children a respondent had given birth to prior to the survey (DHS, 2013). A positive association has been shown between parity and BMI, though this relationship is highly masked by other socio-demographic factors (Koch et al., 2008; Mamun & Finlay, 2015; Ertem et al., 2008; Agyemang et al., 2016; Olalekan, 2009). In the DHS, parity was captured as a continuous variable. However, to counter the linearity assumption for the analytical approach employed in this study, parity was converted into a seven-level categorical variable. This was achieved by truncating the parity value at six, where six indicates six or more children (Koch et al., 2008; Mamun & Finlay, 2015).

5. **Marital status** is associated with BMI, with women who are currently or formerly in union having a higher BMI compared to those who are single (Teachman, 2016; Averett et al, 2008; Jeffery & Rick, 2002; Lowe & Gibson et al., 1955; Sartorius et al., 2015). Marital status was defined as a trichotomous variable with the following levels: single (never married) (1), married (married/partnered) (2); formerly married (widowed/divorced/separated) (3).

6. **Residential Setting** is associated with BMI, with urban dwellers having a higher BMI compared to their rural counterparts (Kennedy et al., 2004; Hawkes, 2006; Madise & Latemo, 2017; Ziraba et al., 2009). Residential setting is a binary variable of whether the respondents' household/dwelling was in an urban or a rural area (DHS, 2013).

7. **Region** is a country-specific variable defined as the administrative region in which the respondent was interviewed (DHS, 2013). Studies have shown significant regional variation in relation to women nutritional status (Kandala & Stranges, 2014; Hanandita & Tampubolon, 2015). Region is considered a proxy measure for nutritional correlates such as socio-economic inequalities, access to resources, and health seeking behavior (Subramanian & Smith, 2006; Elliot & Waternberg, 2004). Region was adopted as is from the DHS surveys.

8. **Level of Education** is an indicator of the respondent's socioeconomic status, with higher educational attainment associated with higher BMI (Mamun & Finlay, 2015; Kandala & Stranges, 2014; Neupane et al., 2016). Respondents were asked to state the highest level of education attained. Responses were standardized into 4 categories: no education (1), primary (2), secondary (3), and higher (4).

9. **Wealth Quintile** is an indicator of the respondent's socioeconomic status in terms of household asset holdings, with higher wealth associated with higher BMI (DHS, 2013). The wealth quintile was created from easy-to-collect household assets such as bicycles, television, housing features such as flooring materials, type of toilet and other possessions that indicate wealth status (Rutstein et al., 2004; DHS, 2013). With information from these assets, a standardized factor score was generated using Principal Component Analysis to create a continuous scale of relative wealth (DHS, 2013). The scores were then separated into five quintiles, which defined household wealth status as follows: poorest, poorer, middle, richer, and richest (DHS, 2013). Since wealth quintiles were already constructed for all the countries in DHS surveys, the wealth variable was used as is for this analysis, consistent with previous studies (Kandala & Stranges, 2014; Tebekaw et al., 2014; Corsi et al., 2011; Subramanian & Smith, 2006).

10. **Occupation** is an indicator of the respondent's socio-economic status and associated physical activity, with higher occupation grade associated with higher BMI (Lopez-Arana et al., 2014; Pampel et al., 2012; Olalekan, 2009; Subramanian & Smith, 2006). Respondents were asked to describe the kind of work they do for a living.

Thereafter, a standardized variable was created that categorized the responses based on the International Standard Classification of Occupations (ISCO-08) codes (Lopez-Arana et al., 2014; ILO, 1990; DHS, 2013). To suit the objective for this study and consistent with previous studies (e.g. Subramanian & Smith, 2006; Corsi et al., 2011), these codes were collapsed into five major categories: not working (1); nonmanual (managerial, professional, technical, clerical, sales, and services) workers (2); manual (skilled and unskilled) workers (3); agricultural (employee and self-employed) workers (4); and others (5). The occupation variable for Lesotho was excluded from the analysis since more than half of the respondents (57%) had missing data.

11. **Media Exposure** contributes to higher BMI through multiple pathways such as promotion of sedentary lifestyle and adoption of energy-dense diets influenced by persuasive advertisements (O'donoghue et al., 2016; Popkin, 2006; Strasburger, 2011; Rosiek et al., 2015; Mamun et al., 2013; Pearson et al., 2011). In the DHS surveys, respondents were asked about the frequency of reading a newspaper or magazine, listening to the radio, and watching television (DHS, 2013). Responses to the questionnaire concerning each of these media outlets were standardized into a categorical indicator with the levels defined as follows: Not at all (1), less than once a week (2); at least once a week (3); and almost every day (4) (DHS, 2013). In this study, a single variable encompassing all the information from the three media sources was created with categories defined as follows:

    i. Not exposed – Respondent stated she was not exposed to any of the three media outlets.

    ii. Exposed to one media source – Respondent stated she was exposed to one of the media outlets, less than once a week or more.

    iii. Exposed to two media sources – Respondent stated she was exposed to any two of the media outlets, less than once a week or more.

    iv. Exposed to three media sources – Respondent stated she was exposed to all the three media outlets, less than once a week or more.

For this variable, missing cases were defined as those who did not respond to having been exposed to any of the three media sources.

12. **Hormonal contraceptive use** has been associated with higher BMI (Hasnat Milton et al., 2010; Rahman et al., 2015; Edelman et al., 2010; Beksinska et al., 2011; Bahamondes et al., 2001; Clark et al., 2005). In the DHS surveys, respondents were asked to describe the contraception method they use (DHS, 2013). For this study, a binary variable was created from the standardized responses to contraceptive use as follows: No (1) – Respondents did not use hormonal contraceptives (not using, condom, intrauterine device, female sterilization, male sterilization, periodic abstinence, withdrawal, abstinence, foam/jelly, lactational amenorrhea and other modern methods); Yes (2) – Respondents used hormonal contraceptives (pill, injections and implants).

Table 3: Definition of key variables in this study.

MACRO-LEVEL ANALYSIS	
Variable	**Definition**
Dependent Variable	
Malnutrition Groups	12 SSA malnutrition groups obtained from objective 1
Independent Variable	
Gross Domestic Product (GDP)	Gross domestic product divided by midyear population (Current USSD)
Urbanization Rates	Proportion of the total population living in urban areas (% of the total)
GINI Index	Measure of deviation of individual's income from a perfectly equal distribution (0=Perfect Equality while 1=Perfect Inequality)
KOF Index of Globalization	Measure of the degree of Globalization incorporating, the social, political and economic dimensions
Fertility Rates	Average number of live births per woman until the end of her child bearing years
Life Expectancy at Birth (females)	Average number of years a new born female is expected to live if mortality patterns remain the same
MICRO-LEVEL ANALYSIS	
Dependent Variable	
BMI Categories	WHO standard categorization of BMI
Underweight	Respondents with a BMI < 18.5 (Kg/m^2)
Normal weight	Respondents with a BMI 18.5-24.9 (Kg/m^2)
Overweight	Respondents with a BMI ≥ 25 (Kg/m^2)
Independent Variables	
Age Group	Respondents age in 5-year groups
Region	Respondents administrative Area of residents within the country
Ethnicity	Respondent ethnic group
Residential setting	Respondent place of residence (Rural/Urban)
Religion	Respondent religious affiliation
Level of Education	Respondent highest level of education attained
Wealth Quintile	Respondent economic status ranking
Occupation	Respondent type of occupation
Parity	Total number of children the respondent has ever given birth to
Marital status	Whether the respondent is single/never married, currently married or formerly married (or living with a partner)
Media Exposure	Number of media sources a respondent is exposed to
Hormonal Contraceptive Use	Whether the respondent uses or does not use hormonal contraceptives

3.5 Missing Data

In DHS surveys, missing values are questionnaires without any information on the variable of interest (DHS, 2013). These cases arose either due to sampling errors (the question was not posed to the respondent) or the respondent refused to answer the question (DHS, 2013). Data may have also been missing or deemed unfit for analysis if the respondent was not required to respond to the question as it was irrelevant, the

respondent replied “Don’t Know” to the question, and the respondent’s data were inconsistent with other responses (DHS, 2013).

For this study, missing values across all covariates in most of the countries was generally low (<5%) and therefore these respondents were excluded from the analysis. However, missing values of specific independent variables (ethnicity, hormonal contraceptive use, and occupation) formed 11.6%, 17.4% and 57.9% in the Gabon, Namibia and Lesotho surveys, respectively. To determine if there would be any significant changes in the results, data analysis in these countries were conducted without the missing observations and then without the variables containing majority of the missing cases. Results for Gabon and Namibia showed no significant changes and therefore missing values were removed from the study. However, results for Lesotho showed that exclusion of missing data resulted in a sparse dataset and regression estimates could not be computed due to convergence problems (Allison, 2008). For this reason, the occupation variable was excluded from the analysis for Lesotho.

3.6 Data Analysis

Both parametric and non-parametric strategies were used to analyze the data. Parametric analyses were conducted using STATA version 14 software, with the resulting regression estimates interpreted at the 5% significance level. The choice of STATA was based on its reliability in accounting for complex survey sampling undertaken by the DHS surveys (Oyeyemi et al., 2010). Decision tree (non-parametric) analysis was conducted using R version 3.3.2 software. R is the recommended statistical software for conducting conditional inference tree analysis (Hothorn et al., 2006). The following describes the statistical analyses performed for each study objective.

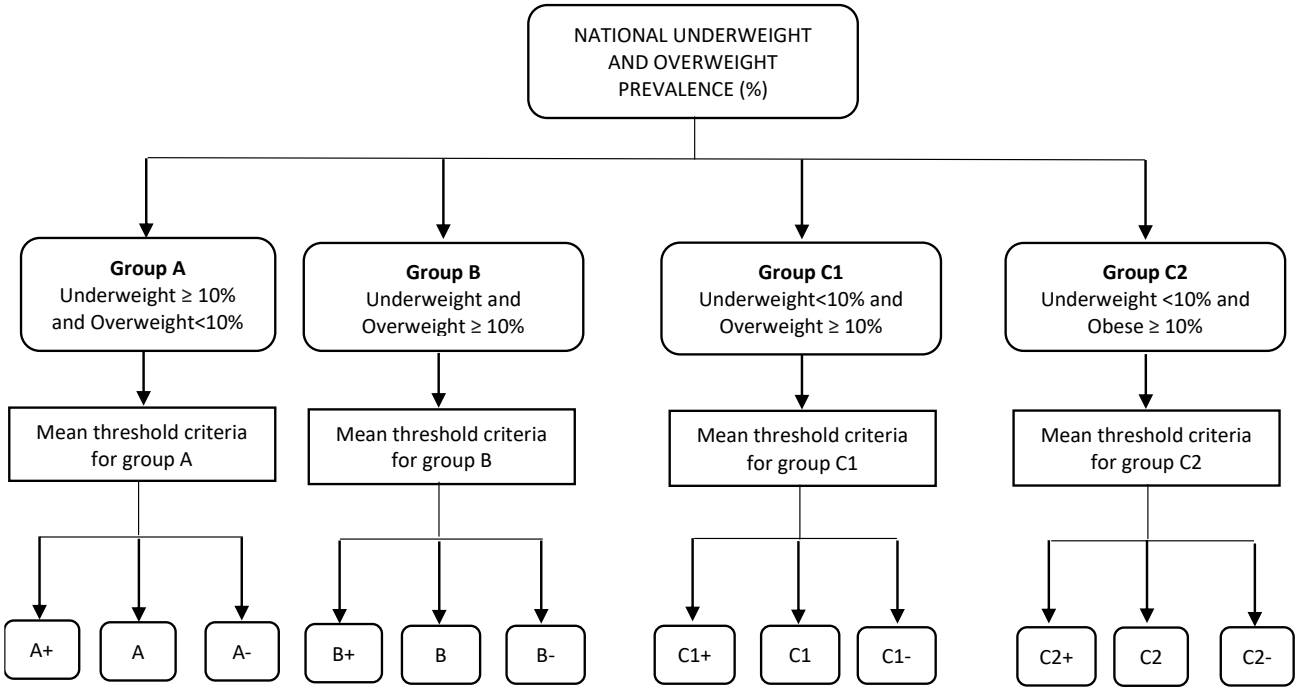
3.6.1 Objective 1 (Malnutrition Groups)

Univariate analysis was conducted to determine the prevalence estimates of underweight and overweight for each country. As recommended by DHS, sample weights for this analysis were accounted for using STATA’s ‘iweight’ command. Using the 10% prevalence threshold, countries were subdivided into malnutrition groups as follows:

countries with an underweight prevalence ≥ 10% and overweight prevalence < 10% were coded as ‘A’; countries with an underweight and overweight prevalence ≥ 10% were coded as ‘B’; countries with an underweight prevalence < 10% and overweight prevalence ≥ 10% were coded as ‘C1’; and countries with an obese (BMI ≥30 kg/m^2) prevalence ≥ 10% were coded as ‘C2’.

Each of these groups were further subdivided into three subgroups that depict the nutrition transition phases presumed to occur in SSA. This was achieved using a two-step process. First, the arithmetic mean of underweight and overweight prevalence estimates was calculated for each malnutrition group. Second, using the mean values as thresholds, logic expressions were constructed to determine the malnutrition subgroups. The resulting subgroups where coded using both the letter codes from the main group and an arithmetic operator as a suffix to highlight the extremities in the presumed transition spectrum for each group. For instance, subgroups of group A countries were defined as follows: A+ (early phase of transition), A (intermediate phase) and A- (late phase of transition). Figure 2 provides a detailed description of the creation of these malnutrition subgroups.

Figure 2: Flowchart summary for the creation of malnutrition subgroup.



KEY: MEAN THRESHOLD CRITERIA

Group A
If underweight (%) is ≥ 21.89 AND overweight (%) is < 7.11 then A+
If underweight (%) is <21.89 OR overweight (%) is ≥ 7.11 then A
If underweight (%) is <21.89 AND overweight (%) is ≥ 7.11 then A-

Group B
if underweight (%) is ≥ 14.67 AND overweight (%) is < 20.09 then B+
If underweight (%) is <14.67 OR overweight (%) is ≥ 20.09 then B
If underweight (%) is <14.67 AND overweight (%) is ≥ 20.09 then B-

Group C1
If underweight (%) is ≥ 7.60 AND overweight (%) is < 22.18 then C1+
If underweight (%) is <7.60 OR overweight (%) is ≥ 22.18 then C1
If underweight (%) is <7.60 AND overweight (%) is ≥ 22.18 then C1-

Group C2
If underweight (%) is ≥ 6.82 AND obese (%) is < 13.86 then C2+
If underweight (%) is <6.82 OR obese (%) is ≥ 13.86 then C2
If underweight (%) is <6.82 AND obese (%) is ≥ 13.86 then C2-

3.6.2 Objective 2 (Macro-Level Analysis)

To determine significant correlates for malnutrition categories, decision tree analysis was identified as the most suitable statistical model (Strobl & Tutz, 2009). Decision trees are simple non-parametric models used for classification, prediction, and determination of variable importance (Morgan & Sonquist, 1963; Strobl & Tutz, 2009). Decision trees can fit models with both continuous response variables (regression tree) and categorical response variables (classification tree).

In decision tree analysis, a non-parametric recursive partitioning occurs in a three-step process (Levshina, 2015). First, the association between the dependent and each independent variable is determined, after which the independent variable with the strongest relationship with the dependent variable is selected for splitting. Second, a univariate split is performed on the selected variable, partitioning the data into two subsets (nodes) with similar response values. Finally, the first two steps are iteratively repeated for each node until a pre-determined stopping criterion is met (Levshina, 2015; Strobl & Tutz, 2009).

There are different approaches through which recursive partitioning can be achieved. Popular algorithms such as C4.5 (Quinlan, 1993) and CART (Breiman et al., 1984) employ information measures, such as the Gini coefficient and entropy or information gain, to determine suitable variables for splitting. However, studies have found that this approach leads to bias selection of covariates and overfitting of trees (Hothorn et al., 2006; white & Liu, 1994). To overcome these problems, Hothorn et al. (2006) suggested the utilization of conditional inference procedures that measure the relationship between the dependent and the independent variables through hypothesis testing (Hothorn et al., 2006). For this study, conditional inference classification trees were used to regress the relationship between malnutrition subgroups and country level indicators.

A classification tree model was fitted using the ‘ctree’ algorithm in the party package (Hothorn et al., 2015). Prior to running the analysis, the ‘set.seed’ function with an arbitrary selected random number was utilized to ensure that the results were reproducible (Levshina, 2015). The stopping criterion was set at a 10% significance level

(mincriterion=0.9), to facilitate a visually interpretable tree (Goldstein & Buja, 2013). Since tree models are very unstable, previous studies (Shih, 2011; Strobl et al., 2009) suggests that multiple runs (at least two) of the same model should be conducted with different random seed numbers to insure stability of the results. For this study, the analysis was repeated seven times (selected arbitrarily) with different random seed numbers.

Random forest analysis using the 'cforest' algorithm from the same package was used to determine the importance of each independent variable in explaining the malnutrition groups (Hothorn, 2015). Random forest constitutes a set of decision trees generated from a subsample of the data. However, as opposed to a single tree analysis, random forests are built by randomly restricting the number of variables considered for splitting at each node (Strobl et al., 2008; Shih, 2011). This approach ensures that the contribution of each variable is captured, thereby improving the prediction accuracy (Strobl et al., 2009).

Before conducting random forest analyses, model parameters were adjusted to suit the data requirements. This entailed setting the forest size (number of trees) at 1000 ('ntree=1000') and the number of independent variables considered for splitting at each node as the square root of the total count of all the predictors in the model ('mtry=2') (Strobl et al., 2009; Shih, 2011). Variable importance was determined using the standard variable importance function 'Varimp' (Hothorn, 2015). The threshold for determining true predictors rank was the absolute value of the lowest ranking variable, as suggested by Strobl (2009). Similar to single tree analysis, multiple runs (7) for both random forest and variable importance algorithms using different random seed numbers were conducted to ensure robustness of the results.

3.6.3 Objective 3 (Micro-Level Analysis)

This objective involved identifying micro-level correlates of nutritional status for each country. For descriptive purposes, univariate analysis was conducted to obtain weighted proportions for all micro-level variables within each country. To determine the most significant correlates for nutritional status, two types of analytical approaches were implemented: Random Forest analysis, and Multinomial Logistics Regression.

Random Forest Analysis

Similar to the analytic approach for the second objective, conditional random forest and standard variable importance analyses were conducted to identify significant micro-level correlates of nutritional status for each country. However, unlike the second objective, the forest size for each country was set at 500 ('ntree=500') since all countries had large sample sizes (>2000). Considering that random forest and variable importance analyses are computationally intensive algorithms, using the default setting for forest size (500) provided the best balance between precision and computation times (Oshiro et al., 2012; Strobl 2009). To confirm the appropriateness of the forest size, five countries (Ethiopia, Burundi, Ghana, Nigeria and Sao Tome and Principe) were selected at random and the random forest analysis was done with forest sizes of 500 and 1000 for each country.

Multinomial Logistic Regression

The trichotomous nature of the dependent variable informed the adoption of multinomial logistic regression analysis to model the relationship between the respondents' socio-demographic characteristics and their nutritional status (Vittinghoff et al., 2011). Univariable multinomial regression models were used to determine the unadjusted relationship between each predictor and the outcome for individual countries. Thereafter, multivariable multinomial regression models were implemented to calculate the adjusted associations for each country. Using the normal body weight as the reference category, multinomial logistic regression model was fitted using the maximum likelihood method written as:

$$\ln (\pi^{(s)}/ \pi^{(t)}) = \beta^{(0)} + \beta^{(s)}X$$

Where the notations π represents the probability of the outcome, s = underweight or overweight, t = normal weight, X being the vector of predictors. The notation $\beta^{(s)}$ represents the adjusted measure of the anticipated change in the outcome given a one-unit change in the predictor variable. For ease of interpretation, the parameter estimates were presented as Relative Risk Ratios (RRR) calculated by exponentiating $\beta^{(s)}$ values. All logistic regression models incorporated the 'svy' function

in STATA to account for survey design features (stratification and sample weights) as recommended by DHS (Rutstein & Rojas, 2006).

3.6.4 Regression Diagnostics

Regression diagnostics tools were used to evaluate the fitness of the regression models. Different approaches were used for the different analytic procedures. For conditional inference trees, few techniques are in existence for conducting model fitness because of the relatively novel approach used in the analysis. However, most studies have suggested the use of classification accuracy as a significant approach to evaluate fitness between similar models (Das et al., 2009; Sardá-Espinosa et al., 2017). Higher accuracy implies the model fits the data well. For this study, classification accuracy was computed from a confusion matrix using the caret package in R (Kuhn, 2008). Accuracy values for the single tree analysis was compared to the random forest model for the second objective. In addition to comparing values from a single tree, random forest model accuracy was also evaluated against the accuracy value obtained from a multivariable multinomial logistic regression for the third objective. In both cases, accuracy values for random forest models where consistently above those obtained from a single classification tree or multinomial logistic regression.

In the multivariable multinomial logistics regression, diagnostic entailed assessing the degree of multicollinearity of independent variables in the model. Multicollinearity is often determined using Variance Inflation Factor (VIF). Generally, VIF values of above 10 suggests collinearity problems. For this study, VIF values were computed using 'collin' command in STATA. Across all the countries, VIF values were <3 thus suggesting the models provided valid estimates.

Chapter 4

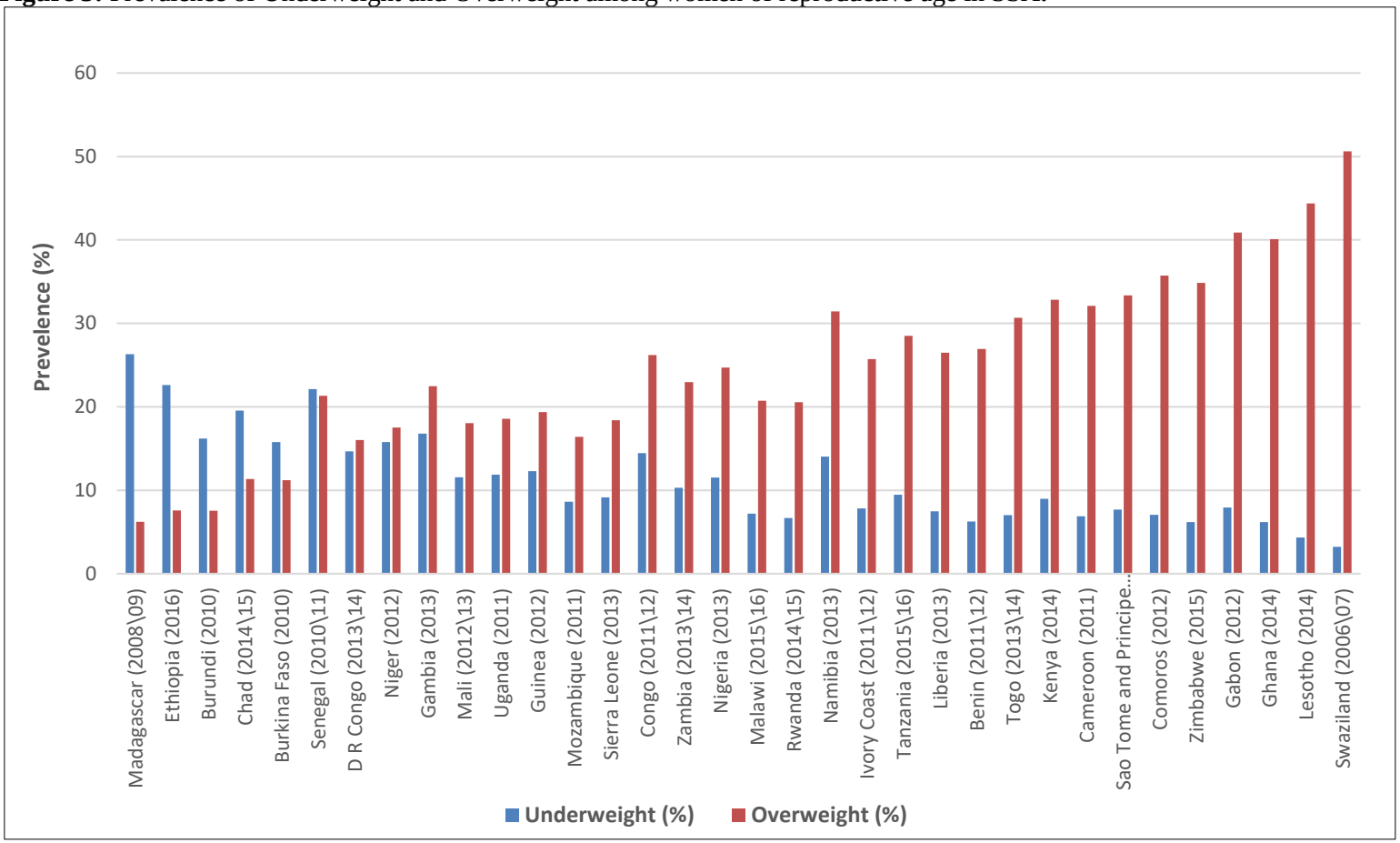
4 Results

This chapter presents the results for each objective: a description of the malnutrition groups in SSA (objective 1), the significant macro-level correlates of malnutrition groups in SSA (objective 2), and the univariate and multivariable analyses for the micro-level correlates of women's nutritional status in SSA (objective 3).

4.1 Objective 1

A total of 34 countries were included in the study from the possible 43 SSA countries with DHS surveys. Countries excluded because of lack of data were: Angola, Botswana, Cape Verde, Central African Republic, Equatorial Guinea, Eritrea, Mauritania, South Africa and Sudan. Figure 3 presents the prevalence estimates for nutritional status for women of reproductive age for the 34 countries. Apart from six countries, most countries had the prevalence of overweight exceeding that of underweight. The prevalence of underweight was highest in Madagascar (26.9%) but lowest in Swaziland (3.2%). Conversely, the prevalence of overweight was highest in Swaziland (50.6%) and lowest in Madagascar (6.2%). A detailed presentation of the prevalence estimates is provided in Appendix A.

Figure 3: Prevalence of Underweight and Overweight among women of reproductive age in SSA**.**



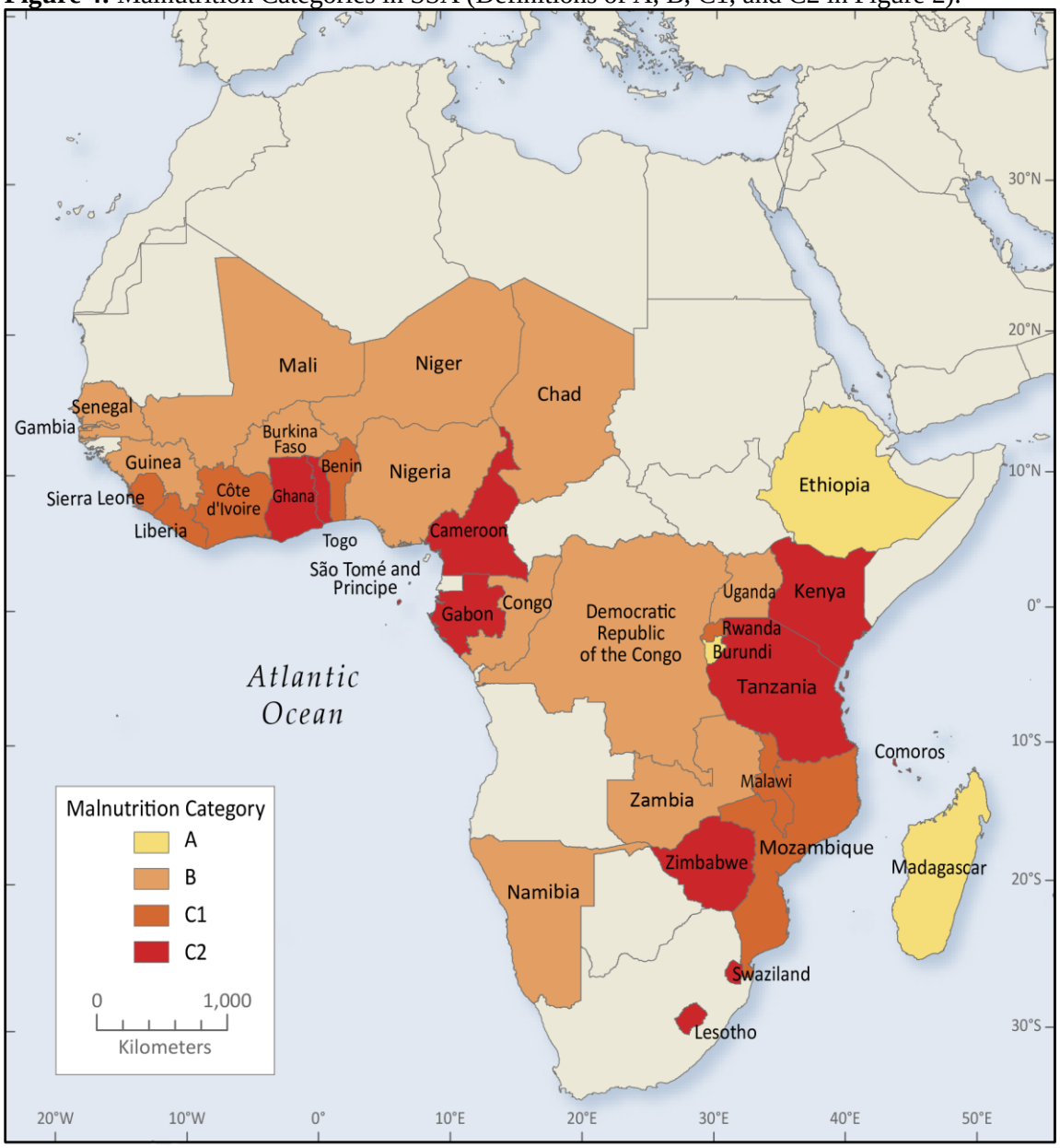
The malnutrition groups of the SSA countries are presented in Figure 4 and Table 4. Three countries were categorized as group A countries, where the burden of underweight was significantly higher (>10%) than that of overweight (<10%). Countries in this group were Burundi, Ethiopia and Madagascar. A further split yielded three subgroups showing Madagascar (A+) as the most extreme case among group A countries followed by Ethiopia (A) and Burundi (A-).

Group B contained 13 countries characterised by the simultaneous burden of both underweight and overweight (≥ 10% for each category). These countries were: Burkina Faso, Chad, Congo, Democratic Republic of Congo, Gambia, Guinea, Mali, Namibia, Niger, Nigeria, Senegal, Uganda and Zambia. A further subdivision to indicate the phases of transition in this group identified Burkina Faso, Chad, Democratic Republic of Congo and Niger as B+ (early phase); Gambia, Guinea, Mali, Senegal and Uganda as B (intermediate phase); Congo Namibia, Nigeria and Zambia as B- (late phase) in the double burden of malnutrition.

Group C1 contained 7 countries characterized by the burden of overweight being significantly higher (≥ 10%) than that of underweight (<10%). These countries were: Benin, Ivory Coast, Liberia, Malawi, Mozambique, Rwanda and Sierra Leone. A further subdivision to indicate the phases of transition in this group identified Mozambique and Sierra Leone as C1+ (early phase), Ivory Coast, Malawi and Rwanda as C1 (intermediate phase), and Benin and Liberia as C1- (late phase).

Group C2 contained 11 countries with the prevalence estimates of obesity (≥ 10%) overshadowing that of underweight (<10%). These countries were Cameroon, Comoros, Gabon, Ghana, Kenya, Lesotho, Sao Tome and Principe, Swaziland, Tanzania, Togo and Zimbabwe. A further subdivision to indicate the phases of transition in this group identified Cameroon, Comoros, Kenya, Sao Tome and Principe, Tanzania and Togo as C2+ (early phase); Gabon and Zimbabwe as C2 (intermediate phase), and Ghana, Lesotho and Swaziland as C2- (late phase).

Figure 4: Malnutrition Categories in SSA (Definitions of A, B, C1, and C2 in Figure 2).



Produced by the Cartographic Section, Department of Geography, Western University, 2018.

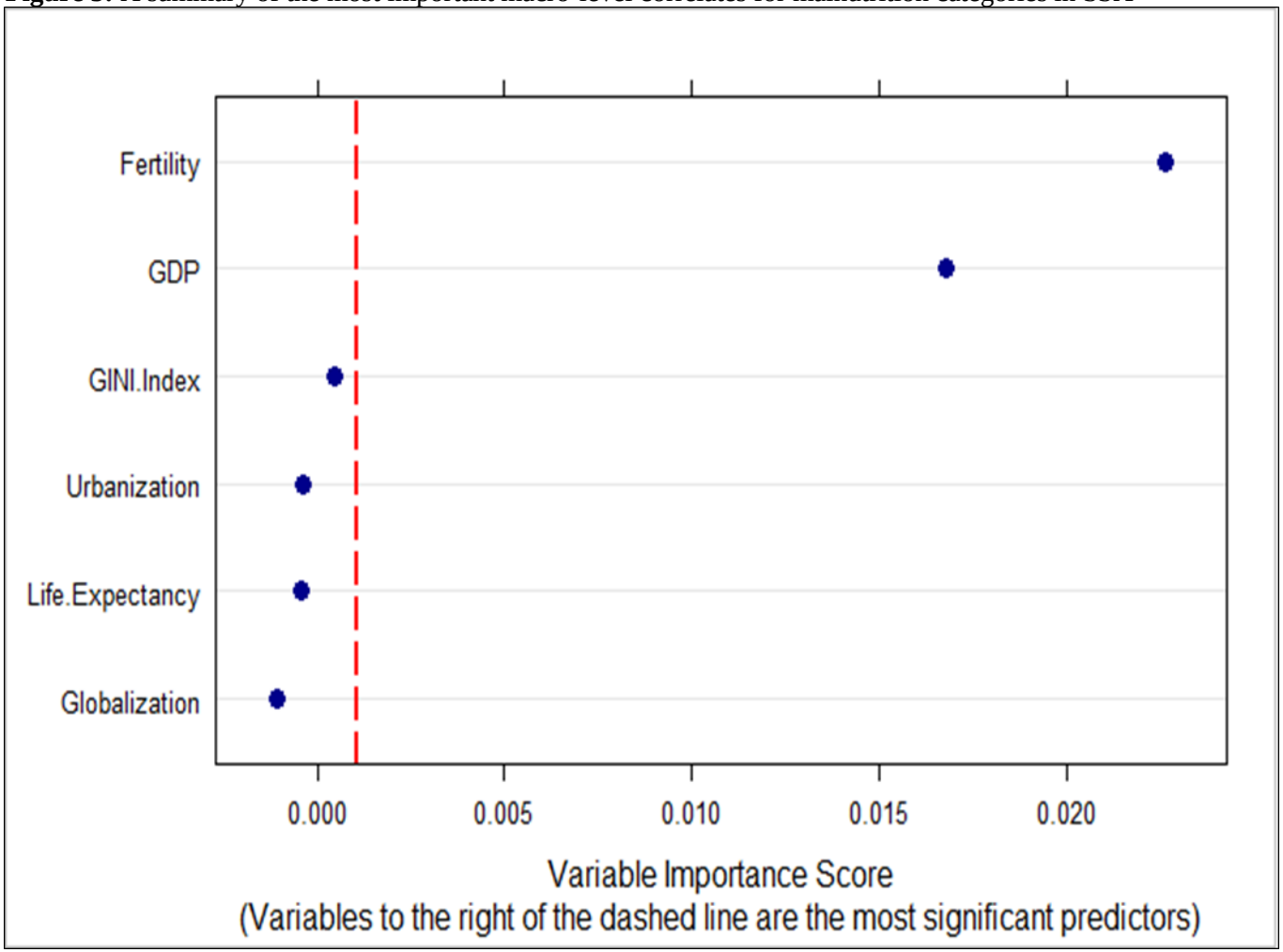
Table 4: Malnutrition categories in SSA.

Groups	Subgroups	Countries
Group A	A+	Madagascar
	A	Ethiopia
	A-	Burundi
Group B	B+	Chad, Burkina Faso, Niger, D R Congo
	B	Mali, Uganda, Guinea, Gambia, Senegal
	B-	Namibia, Zambia, Nigeria, Congo
Group C1	C1+	Mozambique, Sierra Leone
	C1	Rwanda, Malawi, Ivory coast
	C1-	Benin, Liberia
Group C2	C2+	Cameroon, Comoros, Togo, Sao Tome and Principe, Kenya, Tanzania
	C2	Gabon, Zimbabwe
	C2-	Swaziland, Lesotho, Ghana

4.2 Objective 2

Important macro-level correlates of malnutrition groups in SSA are presented in Figure 3. Fertility rate and GDP were the only macro-level variables associated with the malnutrition groups. With regards to the strength of association among the established correlates, fertility rates ranked the highest compared to GDP (Figure 3). Furthermore, a univariate split of the fertility variable from the tree analysis depicted seven countries within A-, B+ and B categories had a fertility rate of more than six. A detailed presentation of the tree analysis is found Appendix B.

Figure 5: A summary of the most important macro-level correlates for malnutrition categories in SSA



4.3 Objective 3

4.3.1 Descriptive Statistics of the Surveyed Population

Descriptive statistics for the 10 independent variables for each of the countries is presented in Table 5. A total of 247,691 respondents were included in the analysis. Highlights of these statistics include the following:

- Most respondents were below the age of 40 years, with the most populous age group being 15-19 years across all the countries, with 80% of these respondents having had four children or less.
- Most respondents were married women (except in Namibia), with the highest proportion in marital union found in Niger (85.2%) and Mali (83.2%).
- Most respondents were affiliated with a religious group, either Christian (Catholics and other Christians) or, in the Muslim countries of Mali, Guinea, Senegal and Comoros.
- Most respondents lived in rural areas (except in Gabon, Liberia and Sao Tome and Principe).
- The respondents had a wide variation in formal education. Generally, group C2 countries had the highest literacy levels with women with at least a primary level of education attainment in Gabon, Zambia, and Lesotho, forming close to 99% of the respondents. In contrast, groups A and B constituted countries with the lowest literacy levels with Burkina Faso, Mali, and Niger having approximately 70% of the respondents with no formal education.
- Each country had roughly equal proportions of respondents distributed across all the levels of the wealth quintiles.
- In most countries, majority of the respondents were not engaged in any form of occupation, except for Burundi, Madagascar and Rwanda where agricultural workers formed > 60% of the population. Of importance are the trends observed with regards to the proportion of respondents categorized as non-manual workers (a proxy for women working in the service industry)

where majority of countries in groups A and B had < 30% of the respondents' categorized as non-manual workers whereas in group C2, most of the countries had > 35% of respondents' as non-manual workers.

- In Gabon, Ghana and Sao Tome and Principe, > 90% of the population were exposed to at least one media outlet, whereas in Chad, 70.7% of the respondents were exposed to no media outlet.
- Most respondents across all the countries indicated that they did not use any form of hormonal contraception.

Appendix C has a comprehensive summary of the descriptive statistics for each of the micro-level variables for each of the countries in the study.

Table 5: Descriptive statistics of the study population.

Variable	Madagascar (%)	Ethiopia (%)	Burundi (%)	Burkina Faso (%)	Chad (%)	Congo DR (%)	Niger (%)	Mali (%)	Gambia (%)	Uganda (%)	Guinea (%)	Senegal (%)
Sample Size	7,379	13,222	3,929	7,212	8,873	7,655	4,104	4,397	3,886	2,308	4,038	5,020
Age												
15-19	22.8	22.8	27.9	20.8	22.9	23.3	17.5	18.3	24.2	25.4	24.0	23.8
20-24	14.8	16.5	17.8	18.0	15.4	17.3	16.3	16.8	20.5	16.1	17.1	19.4
25-29	15.7	17.9	15.7	16.1	17.4	17.0	18.1	18.6	17.1	17.6	15.6	16.2
30-34	13.8	14.4	10.6	14.8	13.8	13.2	16.0	15.0	14.6	11.9	12.6	12.9
35-39	12.1	12.3	10.6	11.9	12.0	11.8	13.4	12.2	10.0	12.6	12.4	10.6
40-44	11.3	8.8	8.5	9.6	9.2	9.6	9.8	10.7	7.7	8.4	9.8	10.0
45-49	9.5	7.3	8.9	8.8	9.3	7.9	8.9	8.4	5.9	8.0	8.5	7.1
Parity												
0	25.4	34.3	38.7	24.3	21.6	28.2	17.1	19.0	35.1	28.4	27.1	37.6
1	14.4	11.0	9.9	11.1	9.6	12.9	9.6	12.3	12.8	8.7	13.7	12.6
2	13.5	9.7	9.4	11.1	8.9	10.5	9.4	12.8	11.0	10.3	11.7	10.5
3	12.1	9.1	8.3	11.0	9.5	8.9	9.8	11.5	9.1	9.4	8.9	8.5
4	9.1	7.7	7.2	10.1	9.2	8.8	10.1	11.3	7.8	10.0	9.5	7.3
5	7.8	7.8	6.9	8.8	8.3	8.0	9.3	10.7	7.6	7.5	9.0	6.5
6+	17.7	20.4	19.6	23.6	32.9	22.6	34.7	22.4	16.6	25.7	20.1	17.0
Marital Status												
Single	19.9	28.4	38.0	20.2	19.0	29.9	10.6	15.5	31.1	29.3	26.7	32.7
Married	66.8	61.6	52.3	76.2	71.1	58.6	85.2	82.3	63.2	57.3	68.7	62.4
Formerly Married	13.3	10.0	9.7	3.6	9.9	11.5	4.2	2.2	5.7	13.4	4.6	4.9
Religion												
Catholics	35.2	0.8	61.8	23.7	21.1	30.6	-	2.7	3.7	42.1	0.0	0.0
Other Christians	35.7	68.6	33.6	7.1	25.1	66.5	-	1.7	96.3	44.3	9.2	0.0
Islam	0.6	29.5	2.1	61.3	50.8	1.0	-	92.4	0.0	12.3	86.1	95.1
Traditionalist	2.2	0.0	0.0	7.1	0.3	0.5	-	0.7	0.0	0.0	0.0	0.0
Others	6.0	1.1	2.5	0.8	2.7	1.5	-	0.0	0.0	1.3	0.0	4.9
No Religion	20.3	0.0	0.0	0.0	0.0	0.0	-	2.5	0.0	0.0	4.7	0.0

- Indicates missing data

Table 5: Cont.

	Madagascar (%)	Ethiopia (%)	Burundi (%)	Burkina Faso (%)	Chad (%)	Congo DR (%)	Niger (%)	Mali (%)	Gambia (%)	Uganda (%)	Guinea (%)	Senegal (%)
Residential Setting												
Rural	82.5	77.2	89.3	71.7	76.1	62.0	80.8	74.1	44.1	78.3	63.3	49.4
Urban	17.5	22.8	10.7	28.3	23.9	38.0	19.2	25.9	55.9	21.7	36.7	50.6
Level of Education												
No Education	18.4	47.2	44.6	72.7	61.4	15.8	79.9	74.6	46.1	11.7	65.0	55.6
Primary	48.7	35.3	42.1	14.2	23.3	36.2	11.6	9.4	13.4	59.6	14.2	21.7
Secondary	30.5	11.8	12.5	12.0	14.4	44.1	8.0	14.6	35.2	23.0	17.6	20.9
Tertiary	2.4	5.7	0.8	1.1	0.9	4.0	0.5	1.4	5.3	5.7	3.2	1.8
Wealth Quintile												
Poorest	17.0	16.1	20.0	18.0	19.8	18.4	17.5	19.0	16.6	16.4	17.1	15.3
Poorer	18.3	17.2	19.8	18.3	18.9	18.6	19.0	18.1	19.4	16.6	18.9	16.7
Middle	18.3	19.4	19.3	18.3	19.3	19.2	19.9	18.9	16.8	18.2	18.7	20.5
Richer	21.1	20.2	20.1	19.6	20.4	19.4	21.2	19.8	21.9	21.8	21.0	22.5
Richest	25.3	27.1	20.8	25.8	21.6	24.4	22.4	24.2	25.3	27.0	24.3	25.0
Occupation												
Not Working	15.9	48.6	20.5	21.1	48.7	28.3	72.2	50.5	48.7	27.4	26.5	53.1
Nonmanual	13.7	22.2	6.4	24.4	35.0	30.1	22.5	20.3	27.1	24.0	29.1	36.3
Manual	8.6	5.6	0.0	6.6	1.3	0.4	2.6	14.0	2.3	0.0	6.4	1.7
Agricultural	61.6	21.1	72.1	45.7	14.3	41.2	2.7	15.2	21.9	48.6	38.0	8.9
Others	0.2	2.5	1.0	2.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Media Exposure												
Not Exposed	31.2	55.6	18.4	25.6	70.7	50.2	34.0	26.1	8.5	12.6	29.1	7.2
Exposed to one media source	39.1	20.6	53.2	43.7	15.0	25.1	42.3	26.4	24.9	43.9	29.6	21.2
Exposed to two media sources	16.0	16.0	21.9	22.6	8.7	17.7	20.1	39.4	50.0	26.8	33.0	50.5
Exposed to three media sources	13.7	7.8	6.5	8.1	5.6	7.0	3.6	8.1	16.6	16.7	8.3	21.1
Hormonal Contraceptives use												
No	77.6	74.3	90.7	88.1	96.7	97.5	91.1	89.3	93.5	81.1	96.1	91.6
Yes	22.4	25.7	9.3	11.9	3.3	2.5	8.9	10.7	6.5	18.9	3.9	8.4

- indicates missing data

Table 5: Cont.

Variable	Namibia (%)	Nigeria (%)	Congo (%)	Zambia (%)	Sierra Leone (%)	Mozambique (%)	Ivory Coast (%)	Malawi (%)	Rwanda (%)	Benin (%)	Liberia (%)
Sample Size	3,921	32,078	4,822	14,129	6,971	11,617	4,057	7,179	5,995	14,060	3,998
Age											
15-19	21.0	21.3	21.2	22.8	22.3	22.3	21.6	21.5	22.5	18.8	21.6
20-24	19.2	16.3	17.7	17.4	15.6	16.5	18.7	19.6	17.7	16.2	18.0
25-29	15.6	16.7	16.9	16.3	16.5	16.0	17.8	16.0	16.3	17.8	16.9
30-34	13.1	13.1	14.7	14.5	13.5	14.0	13.5	15.1	14.4	15.5	12.4
35-39	12.7	12.2	12.8	12.5	14.3	12.6	11.6	11.8	11.6	13.4	12.7
40-44	10.0	10.1	8.8	9.6	8.7	9.3	8.9	9.0	9.5	10.7	9.9
45-49	8.4	10.3	7.9	6.9	9.1	9.3	7.9	7.0	8.0	7.6	8.5
Parity											
0	32.5	31.5	23.5	25.2	25.0	22.4	27.7	22.4	36.8	26.5	22.1
1	19.6	10.2	15.9	13.7	13.5	15.5	15.3	14.5	13.2	12.2	17.1
2	17.8	9.6	16.9	12.7	12.3	13.8	13.3	14.7	12.4	13.3	14.6
3	12.2	9.5	14.4	11.3	10.8	11.9	10.9	13.2	9.9	12.6	11.0
4	7.5	9.3	10.4	9.5	10.8	10.8	8.3	10.7	8.3	11.4	8.8
5	4.5	8.1	6.8	7.9	9.2	7.9	7.8	8.8	7.1	8.5	7.6
6+	5.9	21.8	12.1	19.7	18.4	17.7	16.7	15.7	12.3	15.5	18.8
Marital Status											
Single	60.4	27.9	26.9	30.1	29.2	20.1	32.9	22.6	41.4	26.3	33.1
Married	32.1	66.9	55.5	57.0	63.6	65.0	59.6	63.4	47.5	67.5	55.8
Formerly Married	7.5	5.2	17.6	12.9	7.2	14.9	7.5	14.0	11.1	6.2	11.1
Religion											
Catholics	19.7	11.6	31.6	18.4	0.0	29.4	18.6	18.1	40.2	33.5	86.4
Other Christians	70.8	37.6	58.7	80.5	21.6	42.1	26.3	68.9	57.5	25.1	11.2
Islam	0.0	49.9	1.1	0.6	78.2	17.0	40.4	12.4	2.0	22.0	0.0
Traditionalist	0.0	0.9	4.7	0.0	0.0	0.0	2.2	0.0	0.0	12.6	0.0
Others	8.4	0.0	0.6	0.5	0.2	2.2	1.3	0.1	0.0	1.9	2.4
No Religion	1.1	0.0	3.3	0.0	0.0	9.3	11.2	0.5	0.3	4.9	0.0

- Indicates missing data

Table 5: Cont.

Variable	Namibia (%)	Nigeria (%)	Congo (%)	Zambia (%)	Sierra Leone (%)	Mozambique (%)	Ivory Coast (%)	Malawi (%)	Rwanda (%)	Benin (%)	Liberia (%)
Residential Setting											
Rural	45.7	56.3	31.8	52.4	63.0	64.2	48.6	81.5	80.1	53.1	39.2
Urban	54.3	43.7	68.2	47.6	37.0	35.8	51.4	18.5	19.9	46.9	60.8
Level of Education											
No Education	4.7	35.8	5.5	7.9	55.0	30.9	53.5	12.3	12.0	58.4	33.2
Primary	20.1	17.2	24.6	46.3	13.7	49.6	25.1	60.8	64.3	17.6	29.0
Secondary	66.4	37.3	65.1	40.6	28.0	18.0	19.0	23.7	21.2	22.1	34.6
Tertiary	8.8	9.7	4.8	5.2	3.3	1.5	2.4	3.2	2.5	1.9	3.2
Wealth Quintile											
Poorest	15.9	17.1	16.8	16.7	17.7	18.1	17.0	18.5	19.5	16.8	17.3
Poorer	18.0	18.3	20.3	16.8	18.4	18.0	18.0	19.3	19.7	18.0	17.9
Middle	19.5	19.4	21.4	18.7	19.1	18.6	19.2	18.9	18.8	18.6	17.6
Richer	24.2	21.1	20.0	21.6	19.9	20.3	21.1	19.1	18.6	21.7	23.9
Richest	22.4	24.1	21.5	26.2	24.9	25.0	24.7	24.2	23.4	24.9	23.3
Occupation											
Not Working	55.6	36.8	34.0	48.1	28.4	52.9	28.6	31.9	15.3	37.9	42.2
Nonmanual	39.7	44.3	40.8	25.1	5.5	16.6	42.9	13.2	16.2	37.0	30.3
Manual	3.2	8.9	4.9	1.2	27.3	1.1	5.7	15.1	3.9	5.9	2.6
Agricultural	1.5	9.9	19.4	24.2	38.8	29.4	22.8	39.8	64.6	14.2	23.5
Others	0.0	0.1	0.9	1.4	0.0	0.0	0.0	0.0	0.0	5.0	1.4
Media Exposure											
Not Exposed	8.0	26.7	26.1	24.1	33.9	28.3	26.9	43.9	13.9	28.9	21.8
Exposed to one media source	19.7	21.3	27.6	27.7	43.7	39.0	30.7	29.6	37.3	26.3	35.8
Exposed to two media sources	31.7	31.8	28.6	26.3	15.4	21.1	27.5	17.1	30.6	32.0	26.3
Exposed to three media sources	40.6	20.2	17.7	21.9	7.0	11.6	14.9	9.4	18.2	12.8	16.1
Hormonal Contraceptives use											
No	72.5	94.5	94.9	70.7	79.7	90.0	90.8	63.1	74.2	95.7	78.6
Yes	27.5	5.5	5.1	29.3	20.3	10.0	9.2	36.9	25.8	4.3	21.4

- Indicates missing data

Table 5: Cont.

Variable	Kenya (%)	Sao Tome and Principe (%)	Togo (%)	Cameroon (%)	Comoros (%)	Tanzania (%)	Zimbabwe (%)	Gabon (%)	Ghana (%)	Lesotho (%)	Swaziland (%)
Sample Size	12,967	2,078	4,238	6,813	4,479	11,535	8,721	4,213	4,238	3,157	4,402
Age											
15-19	18.9	21.8	19.6	24.5	26.3	22.1	22.7	22.5	18.4	22.0	26.0
20-24	17.2	16.7	17.2	19.2	18.0	17.7	16.1	17.8	16.5	19.1	19.7
25-29	19.4	15.9	15.6	16.8	15.4	15.1	16.0	15.5	15.9	16.3	14.2
30-34	14.6	14.9	13.8	11.8	13.3	12.9	15.8	14.1	14.2	14.4	12.5
35-39	12.7	9.8	13.6	10.8	11.8	12.5	12.7	12.1	13.6	10.9	10.1
40-44	9.4	11.9	11.1	8.4	9.2	11.2	10.5	9.9	11.6	9.2	9.2
45-49	7.8	9.0	9.1	8.5	6.0	8.5	6.2	8.1	9.8	8.1	8.3
Parity											
0	26.3	26.2	29.7	31.1	47.9	26.4	27.4	28.3	32.6	30.3	30.7
1	15.2	13.2	14.5	13.8	8.8	15.4	14.7	19.2	13.1	21.9	18.5
2	16.0	14.0	12.7	12.3	8.6	13.6	17.7	15.0	13.2	19.2	14.6
3	13.2	13.3	11.5	10.0	8.4	11.2	16.7	10.6	11.9	12.3	10.8
4	10.0	10.6	9.6	8.2	7.4	9.3	11.3	8.6	9.7	7.3	7.3
5	6.8	7.7	7.1	7.0	5.3	7.5	6.0	4.9	7.4	4.4	5.5
6+	12.5	15.0	14.9	17.6	13.6	16.6	6.2	13.4	12.1	4.6	12.6
Marital Status											
Single	30.5	25.2	29.8	30.7	35.9	27.4	27.3	38.5	34.4	33.9	50.6
Married	57.6	62.5	62.5	60.1	57.1	59.0	58.9	48.7	54.1	52.8	40.2
Formerly Married	11.9	12.3	7.7	9.2	7.0	13.6	13.8	12.8	11.5	13.3	9.2
Religion											
Catholics	20.0	70.2	0.0	37.3	0.0	-	6.9	42.4	10.5	39.6	4.8
Other Christians	72.2	14.5	61.9	37.7	0.0	-	87.4	50.6	70.1	58.8	90.9
Islam	5.9	0.0	16.9	19.1	99.6	-	0.3	0.0	15.0	0.0	0.0
Traditionalist	0.0	0.0	14.2	2.7	0.0	-	0.0	0.0	2.1	0.0	0.4
Others	0.3	4.9	0.0	1.2	0.4	-	0.6	1.7	0.0	1.6	3.9
No Religion	1.6	10.4	7.0	2.0	0.0	-	4.8	5.3	2.3	0.0	0.0

- Indicates missing data

Table 5: Cont.

Variable	Kenya (%)	Sao Tome and Principe (%)	Togo (%)	Cameroon (%)	Comoros (%)	Tanzania (%)	Zimbabwe (%)	Gabon (%)	Ghana (%)	Lesotho (%)	Swaziland (%)
Residential Setting											
Rural	60.0	36.4	53.4	44.4	65.6	62.9	61.7	12.9	45.0	64.6	73.9
Urban	40.0	63.6	46.6	55.6	34.4	37.1	38.3	87.1	55.0	35.4	26.1
Level of Education											
No Education	6.5	6.0	30.2	17.8	30.8	14.2	1.2	1.3	18.8	1.1	8.0
Primary	50.2	57.2	34.0	34.2	18.6	61.5	25.8	22.4	18.2	39.3	32.5
Secondary	32.6	36.8	32.4	42.1	41.1	22.9	65.7	66.5	57.1	51.8	52.0
Tertiary	10.7	0.0	3.4	5.9	9.5	1.4	7.3	9.8	5.9	7.8	7.5
Wealth Quintile											
Poorest	14.7	17.4	16.7	14.9	15.8	15.8	16.9	16.0	16.5	14.1	15.6
Poorer	17.8	18.6	15.7	17.0	19.7	16.8	16.9	18.6	17.0	16.6	16.9
Middle	19.9	16.8	18.1	18.7	21.0	17.6	18.0	21.9	20.8	18.9	19.7
Richer	21.4	21.9	23.7	24.1	21.2	21.6	22.7	19.4	22.5	24.0	22.6
Richest	26.2	25.3	25.8	25.3	22.3	28.2	25.5	24.1	23.2	26.4	25.2
Occupation											
Not Working	33.6	41.4	27.0	31.0	61.1	23.1	48.7	52.5	23.3	-	56.4
Nonmanual	38.1	50.8	43.2	31.1	19.5	14.0	37.9	37.6	45.4	-	32.9
Manual	7.2	7.8	11.4	12.2	9.7	20.4	2.9	4.4	12.8	-	6.8
Agricultural	21.1	0.0	18.4	25.7	9.7	42.5	9.4	5.5	18.5	-	3.9
Others	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	-	0.0
Media Exposure											
Not Exposed	11.6	3.7	27.0	24.6	18.2	14.4	23.6	4.2	7.5	17.0	9.3
Exposed to one media source	29.2	4.2	30.7	23.3	22.9	25.4	27.5	20.9	22.4	32.2	23.9
Exposed to two media sources	32.7	38.2	31.2	30.0	39.6	29.3	27.1	35.5	53.6	30.0	35.8
Exposed to three media sources	26.5	53.9	11.1	22.1	19.3	30.9	21.8	39.4	16.5	20.8	31.0
Hormonal Contraceptives use											
No	65.2	79.1	88.4	94.8	92.5	77.7	54.1	95.8	84.6	71.4	80.9
Yes	34.8	20.9	11.6	5.2	7.5	22.3	45.9	4.2	15.4	28.6	19.1

- Indicates missing data

4.3.2 Random Forest Results

Age and wealth variables were consistently observed as the strongest correlates of nutritional status across all the malnutrition groups in the study while parity's influence was observed for overweight countries (Table 6). However, some distinct findings emerged in the different groups as illustrated below.

Group A: Age, wealth, and region (the respondent's administrative region of residence) were the strongest correlates of nutritional status in Madagascar and Ethiopia. In contrast, in Burundi, age, marital status and residential setting were the strongest correlates of nutritional status.

Group B: Similar to group A countries, age, wealth, and region were important correlates of nutritional status. However, some unique patterns emerged in this group: Ethnicity was a key correlate for the B+ countries of Burkina Faso, Chad, and Democratic Republic of Congo; residential setting was a key correlate for the B countries of Mali and Senegal; and parity was a key correlate in the B- countries of Nigeria and Zambia.

Group C1: Similar to groups A and B countries, age and wealth were important correlates of nutritional status, except for Benin and Rwanda. Other important correlates were: parity in Sierra Leone, Mozambique, Malawi and Rwanda; occupation in Rwanda and Liberia; residential setting in Ivory Coast; and region in Benin.

Group C2: Similar to C1 countries, age, wealth, parity, and occupation were important correlates of nutritional status. However, ethnicity in Kenya and Cameroon, region in Togo and Tanzania, and marital status in Sao Tome and Principe were also observed as important correlates of nutritional status in this group.

In general, moving from A to C2, the correlates of nutritional status increase in number and diversify among the countries. A detailed variable importance plot encompassing all the independent micro-level variables for each of the countries in the study can be found in Appendix D.

Table 6: A summary of the most important micro-level correlates of nutritional status in SSA.

COUNTRY	SUB-GROUP	VARIABLES BY RANK OF IMPORTANCE		
		First	Second	Third
Group A				
Madagascar	A+	Region	Wealth Quintile	Age Group
Ethiopia	A	Region	Age Group	Wealth Quintile
Burundi	A-	Age Group	Marital Status	Residential Setting
Group B				
Burkina Faso	B+	Age Group	Ethnicity	Wealth Quintile
Chad	B+	Ethnicity	Region	Age Group
D R Congo	B+	Wealth Quintile	Age Group	Ethnicity
Niger	B+	Wealth Quintile	Region	Age Group
Mali	B	Age Group	Wealth Quintile	Residential Setting
Gambia	B	Age Group	Region	Wealth Quintile
Uganda	B	Wealth Quintile	Age Group	Marital Status
Guinea	B	Age Group	Region	Wealth Quintile
Senegal	B	Age Group	Residential Setting	Region
Namibia	B-	Age Group	Wealth Quintile	Region
Congo	B-	Age Group	Wealth Quintile	Region
Nigeria	B-	Age Group	Wealth Quintile	Parity
Zambia	B-	Wealth Quintile	Age Group	Parity
Group C1				
Sierra Leone	C1+	Age Group	Wealth Quintile	Parity
Mozambique	C1+	Age Group	Wealth Quintile	Parity
Malawi	C1	Age Group	Wealth Quintile	Parity
Ivory Coast	C1	Age Group	Wealth Quintile	Residential Setting
Rwanda	C1	Wealth Quintile	Parity	Occupation
Liberia	C1-	Age Group	Wealth Quintile	Occupation
Benin	C1-	Age Group	Region	Wealth Quintile
Group C2				
Kenya	C2+	Wealth Quintile	Age Group	Ethnicity
Sao Tome and Principe	C2+	Age Group	Wealth Quintile	Marital Status
Togo	C2+	Age Group	Wealth Quintile	Region
Cameroon	C2+	Age Group	Ethnicity	Wealth Quintile
Comoros	C2+	Age Group	Parity	Wealth Quintile
Tanzania	C2+	Age Group	Wealth Quintile	Region
Zimbabwe	C2	Age Group	Wealth Quintile	Parity
Gabon	C2	Age Group	Wealth Quintile	Parity
Ghana	C2-	Age Group	Wealth Quintile	Occupation
Lesotho	C2-	Age Group	Wealth Quintile	Parity
Swaziland	C2-	Age Group	Parity	Wealth Quintile

4.3.3 Multinomial Logistic Regressions

The multinomial logistic regressions that explore the risk of being underweight and overweight relative to normal weight among SSA women were based on three independent variables that were the most important correlates of nutritional status as observed in the random forest analysis. The adjusted relative risk ratios describing the relationship between a women's nutritional status and the respondents age, wealth quintile, and parity are presented in Tables 7, 8, 9, and 10. A complete presentation of the multinomial logistic regression results with confidence intervals for all countries are presented in Appendix E.

Univariable (Unadjusted) Results

For each country with significant findings, increasing age, parity, and wealth were positively associated with increased risk of overweight and a decreased risk of underweight.

Multivariable (Covariate Adjusted) Results

The groups below are described in terms of age, parity and wealth.

Group A: Age, wealth quintile, and parity were all significantly associated with women's nutritional status (except for parity in Madagascar). A strong positive association between age and overweight was noted in Madagascar and Ethiopia, whereas a negative association between age and underweight was noted in Ethiopia. However, for women in the 45 to 49-year age group in Burundi, the risk of being underweight was 87% higher compared to their 15 to 19-year-old counterparts (RRR: 1.87, 95% CI: 1.03, 3.40).

After adjusting for age, the association between parity and women's nutritional status reversed. Higher parity was found to be associated with a higher risk of underweight. For instance, in Ethiopia, a higher risk of being underweight was noted for mothers with three (RRR = 1.53, 95% CI: 1.09, 2.14) and five (RRR = 1.54, 95% CI: 1.04, 2.24) children compared to childless women. A similar association between parity and women's nutritional status was observed in Burundi.

An exposure-response relationship was noted with regards to wealth quintile and women's nutritional status across all the three countries in this group. Compared to women in the lowest wealth quintile (poorest), respondents in the highest wealth quintile (richest) had the greatest likelihood of being overweight and the lowest likelihood of being underweight relative to normal weight respondents. Though there was not much variation across the countries with regards to underweight risk, the risk for overweight varied among the respondents in the highest wealth quintile, ranging from 336% in Ethiopia (RRR = 4.36, 95% CI: 2.73, 6.97) to 611% in Madagascar (RRR=7.11 95% CI: 3.47, 14.6). (Table 7)

Table 7: Adjusted Relative Risk Ratios of being underweight and overweight by selected independent variables for Group A countries.

VARIABLES	MADAGASCAR (A+)		ETHIOPIA (A)		BURUNDI (A-)	
	Underweight	Overweight	Underweight	Overweight	Underweight	Overweight
Age						
15-19 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
20-24	0.84	2.78**	0.68***	1.19	0.48***	1.02
25-29	0.96	3.74**	0.56***	1.99**	0.69	1.14
30-34	1.00	5.76***	0.62**	3.79***	0.77	1.22
35-39	1.16	7.32***	0.70*	3.66***	1.31	1.64
40-44	1.04	6.29***	0.73	5.15***	1.42	1.98
45-49	1.24	6.29***	0.81	4.40***	1.87*	2.21
Parity						
0 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
1	1.03	1.23	1.26	0.88	2.12**	0.73
2	1.06	1.68	1.21	0.93	1.75	0.72
3	1.12	1.4	1.53*	1.39	2.21*	0.95
4	1.23	1.22	1.18	0.73	2.17*	0.89
5	0.99	1.42	1.54*	0.68	2.12*	0.97
6+	1.14	1.45	1.33	0.67	1.64	0.74
Wealth Quintile						
Poorest (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
Poorer	0.97	1.44	0.85	1.43	0.58***	0.69
Middle	0.76*	1.65	0.96	1.27	0.67*	1.39
Richer	0.67**	3.20***	0.92	2.12**	0.62**	1.17
Richest	0.55**	7.11***	0.82	4.36***	0.57**	1.80

- Normal weight used as the reference
- * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
- Models adjusted for: Ethnicity, religion, marital status, region, residential setting, level of education, occupation, media exposure, and hormonal contraceptive use

Group B: Age was often positively associated with overweight among the countries, but age was rarely negatively associated with underweight. Compared to women in the youngest age group (15-19 years), older women above the age of 40 years were noted to be at most risk of overweight, with the highest being a 13-fold increase in risk of overweight among the 45 to 49-year-olds in Congo (RRR=12.9, 95% CI: 6.45, 25.8).

Parity was significantly associated with women's nutritional status in nine countries, including Burkina Faso, Niger, Mali, Uganda, Guinea, Senegal, Namibia, Nigeria and Zambia. Contrary to results for group A countries, increased parity in group B was negatively associated with the likelihood of being underweight in Niger, Mali, Guinea, Senegal, Namibia and Nigeria, with a similar negative association also being noted for the likelihood of overweight in Burkina Faso, Niger, Uganda and Guinea for different levels of parity. However, positive associations between parity and overweight were depicted for countries in the late phase (B-) of transition in this group. For instance, compared to childless women, the highest risk of overweight was observed for women with five children in Namibia (RRR=2.81, 95% CI: 1.64, 4.83) and six or more children in Zambia (RRR=1.50, 95% CI: 1.08, 2.08).

Consistent with wealth results from group A countries, an exposure-response relationship was also observed across majority of the countries in group B, with the highest risk for overweight and the lowest risk for underweight being experienced among respondents in the richest wealth quintile as compared to those in the poorest quintile. (Table 8)

Table 8: Adjusted Relative Risk Ratios of being underweight and overweight by selected independent variables for Group B countries.

VARIABLES	BURKINA FASO (B+)		CHAD (B+)		D R CONGO (B+)		NIGER (B+)	
	Underweight	Overweight	Underweight	Overweight	Underweight	Overweight	Underweight	Overweight
Age								
15-19 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20-24	0.75	1.14	0.80	1.51	0.90	1.25	0.67*	1.50
25-29	0.78	2.04**	0.87	3.30***	0.64	2.01**	0.54*	3.67***
30-34	1.07	3.67***	0.83	5.31***	0.66	2.76***	0.52*	6.72***
35-39	1.19	4.49***	0.93	7.62***	0.88	3.53***	0.42**	6.45***
40-44	1.51	11.1***	1.05	9.01***	0.85	3.51***	0.59	7.68***
45-49	1.38	10.5***	0.97	8.40***	0.48*	4.56***	0.72	7.68***
Parity								
0 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1	0.76	1.10	1.26	0.82	1.02	0.67	0.61*	1.02
2	0.75	0.86	1.06	1.07	0.75	0.78	0.54*	0.87
3	0.64	0.93	1.09	0.74	1.07	0.86	0.67	0.71
4	1.00	0.88	1.10	0.94	1.33	0.69	0.71	0.66
5	0.74	0.82	0.85	0.72	0.99	0.80	0.64	0.50*
6+	0.66	0.53*	0.81	0.76	0.73	0.78	0.82	0.51*
Wealth Quintile								
Poorest (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Poorer	0.88	1.45	0.98	1.41*	1.11	0.98	0.94	1.04
Middle	0.78*	1.59	1.07	1.15	0.89	1.18	0.88	0.95
Richer	0.70**	1.91**	1.05	1.37	0.88	2.06**	0.69	1.46
Richest	0.47***	3.58***	0.72*	1.73**	0.61*	4.34***	0.50**	3.31***

- Normal weight used as the reference
- * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
- Models adjusted for: Ethnicity, religion, marital status, region, residential setting, level of education, occupation, media exposure, and hormonal contraceptive use

Table 8: Cont.

VARIABLES	MALI (B)		GAMBIA (B)		UGANDA (B)	
	Underweight	**Overweight**	**Underweight**	**Overweight**	**Underweight**	**Overweight**
Age						
15-19 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
20-24	0.77	1.65*	0.92	1.44	0.81	0.93
25-29	0.80	4.30***	1.09	3.15***	0.67	1.27
30-34	0.51*	4.90***	1.02	3.28***	0.85	2.55**
35-39	0.54*	7.84***	0.92	6.57***	0.83	3.10**
40-44	0.89	7.61***	1.30	8.71***	1.24	4.04***
45-49	0.70	7.84***	0.99	8.52***	0.96	4.99***
Parity						
0 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
1	1.08	0.82	1.15	1.13	0.55	1.07
2	0.52**	0.82	1.12	0.90	0.76	0.75
3	0.46**	0.66	1.00	1.47	0.70	0.42*
4	0.82	0.80	1.15	1.60	0.73	0.77
5	0.88	0.66	0.59	0.85	0.74	0.54
6+	0.75	0.86	0.65	0.98	0.56	0.39*
Wealth Quintile						
Poorest (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
Poorer	1.00	0.89	1.23	0.99	1.04	1.21
Middle	1.06	0.92	1.13	1.64**	0.58	1.39
Richer	1.15	1.57*	0.79	1.88**	0.61	2.66**
Richest	0.99	2.96***	0.67	1.95**	0.47	3.12**

- Normal weight used as the reference
- * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
- Models adjusted for: Ethnicity, religion, marital status, region, residential setting, level of education, occupation, media exposure, and hormonal contraceptive use

Table 8: Cont.

VARIABLES	GUINEA (B)		SENEGAL (B)	
	Underweight	**Overweight**	**Underweight**	**Overweight**
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.86	2.01***	1.05	1.93**
25-29	0.69	3.59***	0.88	2.60**
30-34	0.82	4.42***	0.84	3.48***
35-39	0.91	6.62***	0.71	4.97***
40-44	1.23	7.74***	0.57*	5.39***
45-49	0.90	9.20***	0.70	6.63***
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.80	0.76	1.01	1.22
2	0.83	0.77	0.95	0.85
3	0.69	0.56*	0.87	1.27
4	0.74	0.50*	0.72	0.97
5	0.40*	0.79	0.66	1.16
6+	0.56*	0.52*	0.58*	1.33
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	1.04	1.18	0.99	0.98
Middle	0.73	2.35***	0.98	1.22
Richer	0.62*	2.58***	1.37	1.38
Richest	0.88	2.65**	0.84	1.67*

- Normal weight used as the reference
- * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
- Models adjusted for: ethnicity, religion, marital status, region, residential setting, level of education, occupation, media exposure, and hormonal contraceptive use

Table 8: Cont.

VARIABLES	NAMIBIA (B-)		CONGO (B-)		NIGERIA (B-)		ZAMBIA (B-)	
	Underweight	Overweight	Underweight	Overweight	Underweight	Overweight	Underweight	Overweight
Age								
15-19 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20-24	0.84	1.53*	0.74	2.59***	0.72***	1.73***	0.76*	1.51**
25-29	0.74	2.53***	0.69	4.59***	0.66***	2.97***	0.74*	1.93***
30-34	0.67	4.32***	0.81	8.85***	0.57***	4.13***	0.82	2.55***
35-39	0.99	4.43***	0.73	9.06***	0.57***	6.58***	1.11	2.88***
40-44	1.05	7.65***	1.04	12.60***	0.53***	7.05***	1.07	4.06***
45-49	0.70	5.76***	0.50	12.90***	0.58***	8.26***	1.26	4.82***
Parity								
0 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1	0.71	2.00***	1.13	1.58	0.76**	0.93	0.89	1.02
2	0.58*	1.93***	0.86	1.35	0.84	0.87	1.03	1.19
3	0.44**	1.59*	0.69	1.30	0.87	0.99	0.93	1.41*
4	0.64	2.17***	1.32	1.69	0.92	0.98	1.17	1.41*
5	0.62	2.81***	1.10	1.27	0.81	0.99	0.70	1.46*
6+	0.90	1.69	1.05	1.06	0.78*	0.91	0.83	1.50*
Wealth Quintile								
Poorest (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Poorer	0.82	1.33	0.96	1.21	0.91	1.45***	0.83	1.34**
Middle	0.81	2.08***	1.01	1.30	0.96	1.97***	0.62***	1.84***
Richer	0.82	3.58***	0.58	2.08**	0.90	2.70***	0.44***	3.23***
Richest	0.62	3.52***	0.44*	2.77***	0.69**	3.74***	0.47***	4.53***

- Normal weight used as the reference
- * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
- Models adjusted for: Ethnicity, religion, marital status, region, residential setting, level of education, occupation, media exposure, and hormonal contraceptive use

Group C1: Consistent with groups A and B, age was positively associated with overweight and negatively associated with underweight. Compared to the youngest age group (15-49 years), the highest risk of overweight was observed among the 45 to 49-year-olds in Mozambique (RRR=8.84, 95% CI: 6.10, 12.8) while the lowest risk of underweight was recorded among the 20 to 24-year-olds in Rwanda (RRR=0.35, 95% CI: 0.24, 0.52) relative to normal weight.

The risk of overweight was highest among fourth-time mothers in Ivory Coast (RRR=1.91, 95% CI: 1.03, 3.56), and fifth-time mothers in Rwanda (RRR=1.59, 95% CI: 1.01, 2.49) and Liberia (RRR=3.31, 95% CI: 1.64, 6.67). However, a protective effect of increased parity on overweight status was noted for women in Malawi. Compared to childless women, a 38% reduction in risk of underweight was noted for first-time mothers in Sierra Leone (RRR=0.62, 95% CI: 0.42, 0.92), relative to a 48% risk reduction of underweight observed in Liberia for mothers in the same parity category (RRR=0.56, 95% CI: 0.32, 1.00).

An exposure-response relationship between wealth quintile and women's nutritional status was evident. A substantial variation was seen among respondents in the richest wealth quintiles ranging from a 3-fold increase in risk of being overweight in Malawi (RRR=2.95, 95% CI: 2.08, 4.19) to a 5-fold greater risk of overweight in Mozambique (RRR=5.17, 95% CI: 3.41, 7.85).

Table 9: Adjusted Relative Risk Ratios of being underweight and overweight by selected independent variables for Group C1 countries.

VARIABLES	SIERRA LEONE (C1+)		MOZAMBIQUE (C1+)		MALAWI (C1)		IVORY COAST (C1)	
	Underweight	**Overweight**	**Underweight**	**Overweight**	**Underweight**	**Overweight**	**Underweight**	**Overweight**
Age								
15-19 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20-24	0.67*	1.73***	0.63**	1.46**	0.76	2.18***	0.65	1.84**
25-29	0.48**	2.59***	0.71	2.67***	1.02	4.41***	0.88	2.80***
30-34	0.73	3.77***	0.65*	3.87***	1.40	7.58***	1.20	5.24***
35-39	0.67	4.03***	0.69	4.71***	1.22	8.98***	1.47	5.14***
40-44	0.74	5.25***	0.90	6.53***	1.34	7.47***	1.68	6.78***
45-49	0.46*	5.32***	1.20	8.84***	1.20	8.81***	1.53	6.42***
Parity								
0 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1	0.62*	1.09	0.81	0.75*	0.91	0.61*	0.87	0.94
2	0.90	1.05	0.86	0.94	0.76	0.58*	0.62	0.82
3	0.94	1.18	0.80	1.03	0.97	0.50**	0.57	1.05
4	1.03	1.19	0.79	0.88	0.96	0.47**	0.86	1.91*
5	0.91	1.17	0.85	0.87	0.63	0.37***	0.39*	0.69
6+	1.00	1.17	0.71	0.76	0.64	0.50*	0.38**	1.02
Wealth Quintile								
Poorest (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Poorer	0.97	1.42*	0.94	0.99	0.77	1.07	0.88	1.33
Middle	0.88	1.54*	0.66**	1.56*	0.83	1.51*	0.54*	1.44
Richer	0.94	1.99***	0.71*	2.27***	0.92	1.96***	0.41*	1.71*
Richest	0.71	2.89***	0.76	5.17***	0.94	2.95***	0.51	2.16**

- Normal weight used as the reference
- * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
- Models adjusted for: Ethnicity, religion, marital status, region, residential setting, level of education, occupation, media exposure, and hormonal contraceptive use

Table 9: Cont.

VARIABLE	RWANDA (C1)		BENIN (C1-)		LIBERIA (C1-)	
	Underweight	**Overweight**	**Underweight**	**Overweight**	**Underweight**	**Overweight**
Age						
15-19 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
20-24	0.35***	1.32*	0.68**	1.37**	0.56*	1.40
25-29	0.60*	1.23	0.45***	2.09***	0.47	2.25*
30-34	0.77	1.28	0.58**	3.03***	0.66	3.00**
35-39	0.92	1.37	0.59**	4.32***	0.54	4.11***
40-44	0.79	1.29	0.56**	4.74***	1.22	5.61***
45-49	1.42	1.25	0.59*	5.28***	1.53	6.38***
Parity						
0 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
1	0.84	0.87	1.09	1.14	0.52*	1.62*
2	0.91	1.11	1.08	1.10	0.67	2.07
3	0.60	1.21	0.86	1.19	0.64	1.92
4	0.91	1.39	0.89	1.29	0.76	2.29*
5	1.02	1.59*	0.96	1.10	0.76	3.31***
6+	0.60	1.47	0.97	1.09	0.39*	2.20*
Wealth Quintile						
Poorest (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
Poorer	0.68*	1.33*	0.85	1.36***	0.86	1.27
Middle	0.69*	1.42**	0.70*	1.63***	0.57*	1.35
Richer	0.45***	2.03***	0.79	2.04***	0.38**	1.94**
Richest	0.43***	2.72***	1.04	2.40***	0.54	2.60***

- Normal weight used as the reference
- * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
- Models adjusted for: Ethnicity, religion, marital status, region, residential setting, and level of education, occupation, media exposure, and hormonal contraceptive use

Group C2: Age was positively associated with overweight for all the countries in this group. However, a 33% reduction in underweight risk was observed for women aged between 20 to 24 years in Tanzania (RRR=0.67, 95% CI: 0.52, 0.87) and 30 to 34 years in Kenya (RRR=0.67, 95% CI: 0.45, 1.00). Compared to the youngest age group (15-19 years), old age (≥ 45 years) was associated with an increase in the risk of being overweight, with the risk ranging from 270% in Sao Tome and Principe (RRR=3.70, 95% CI: 01.86, 7.34) to 920% in Ghana (RRR=10.20, 95% CI: 5.92, 17.40).

For all the countries with significant findings, parity was found to be a risk factor for overweight. For instance in Swaziland, the risk of overweight was highest among mothers with at least six children (RRR=2.40, 95% CI: 1.66, 3.48), followed by mothers with five children (RRR=2.35, 95% CI: 1.56, 3.55), four children (RRR=2.19, 95% CI: 1.49, 3.21), three children (RRR=1.79, 95% CI: 1.79, 2.53), two children (RRR=1.62, 95% CI: 1.24, 2.12) and lastly those with only one child (RRR=1.53, 95% CI: 1.20, 1.94), compared to childless women.

A similar exposure-response relationship between wealth quintile and women's nutritional status was evident for this group compared to the other groups, with the richest wealth quintile associated with both the highest risk for overweight and the lowest risk for underweight in majority of the countries. (Table 10)

Table 10: Adjusted Relative Risk Ratios of being underweight and overweight by selected independent variables for Group C2 countries.

VARIABLES	KENYA (C2+)		SAO TOME AND PRINCIPE (C2+)		TOGO (C2+)		CAMEROON (C2+)	
	Underweight	**Overweight**	**Underweight**	**Overweight**	**Underweight**	**Overweight**	**Underweight**	**Overweight**
Age								
15-19 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20-24	0.83	1.08	1.36	1.35	0.94	1.29	0.81	1.34*
25-29	0.93	1.73**	0.52	1.64	1.13	2.17***	0.84	1.96***
30-34	0.67*	2.63***	0.45	2.14	1.41	3.56***	0.63	2.92***
35-39	0.79	2.85***	0.63	3.17**	1.94	5.20***	1.19	4.52***
40-44	0.70	3.82***	0.32	2.65*	1.98	6.71***	1.05	5.57***
45-49	0.84	4.35***	0.60	3.70***	2.12	6.87***	1.01	4.92***
Parity								
0 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1	0.93	1.23	0.92	0.84	0.88	0.75	1.24	1.30
2	0.90	1.57**	0.79	0.55	0.82	0.86	1.70*	1.44*
3	0.98	1.54*	1.15	0.66	0.82	0.86	1.49	1.24
4	0.85	1.40	1.30	0.86	0.78	0.77	1.37	1.45*
5	0.99	1.38	1.11	0.83	0.87	0.92	1.52	1.57*
6+	0.81	1.09	0.91	0.63	0.58	0.77	1.18	1.44*
Wealth Quintile								
Poorest	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
(Reference)	0.86	1.50***	0.66	1.03	0.81	1.16	0.73	1.44*
Poorer	0.63***	1.83***	0.66	1.19	0.70	1.41	0.50**	2.21***
Middle	0.58***	2.82***	0.42*	1.89**	0.32**	2.11**	0.63	2.50***
Richer	0.55***	3.75***	1.21	2.03***	0.35*	3.12***	0.51*	3.51***
Richest								

- Normal weight used as the reference
- * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
- Models adjusted for: Ethnicity, religion, marital status, region, residential setting, level of education, occupation, media exposure, and hormonal contraceptive use

Table 10: Cont.

VARIABLES	COMOROS (C2+)		TANZANIA (C2+)		ZIMBABWE (C2)		GABON (C2)	
	Underweight	Overweight	Underweight	Overweight	Underweight	Overweight	Underweight	Overweight
Age								
15-19 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20-24	0.81	1.69***	0.67**	1.70***	0.89	1.42**	0.77	1.83**
25-29	0.78	2.71***	0.65*	3.12***	0.64	2.08***	0.55	2.93***
30-34	0.66	3.47***	1.00	4.94***	1.21	3.28***	0.41	5.42***
35-39	0.53	3.14***	1.08	5.86***	1.29	3.60***	0.58	6.42***
40-44	1.04	2.97***	1.29	8.44***	0.92	4.56***	0.32	7.02***
45-49	1.22	4.31***	1.27	8.99***	1.31	4.77***	0.48	9.10***
Parity								
0 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1	1.19	1.45*	0.84	1.07	0.83	0.86	0.75	0.89
2	1.08	1.27	0.70	1.06	0.58*	0.96	0.83	1.42
3	0.68	1.76**	0.79	0.92	0.48*	1.04	1.80	0.89
4	0.53	1.74**	0.79	0.92	0.46*	1.00	0.81	0.98
5	0.94	1.27	0.66	0.80	0.45*	1.11	1.71	1.12
6+	1.05	1.75**	0.56**	0.78	0.55	1.37	0.82	1.13
Wealth Quintile								
Poorest (Reference)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Poorer	1.38	1.60**	1.06	1.33*	1.04	1.44**	0.73	1.35
Middle	1.08	2.00***	0.75*	1.71***	0.94	1.92***	1.00	1.85**
Richer	0.83	1.95***	0.74*	2.92***	0.48**	2.89***	0.66	1.96**
Richest	1.08	2.63***	0.57**	4.57***	0.26***	4.16***	1.22	2.57***

- Normal weight used as the reference
- * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
- Models adjusted for: Ethnicity, religion, marital status, region, residential setting, level of education, occupation, media exposure and hormonal contraceptive use

Table 10: Cont.

VARIABLES	GHANA (C2-)		LESOTHO (C2-)		SWAZILAND (C2-)	
	Underweight	**Overweight**	**Underweight**	**Overweight**	**Underweight**	**Overweight**
Age						
15-19 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
20-24	0.67	3.04***	1.29	1.61*	0.82	1.46**
25-29	1.03	5.51***	0.63	2.96***	0.80	2.06***
30-34	1.04	8.56***	1.33	3.12***	0.77	3.10***
35-39	1.06	9.00***	0.42	4.32***	2.05	4.39***
40-44	0.54	12.00***	0.91	5.93***	1.54	5.81***
45-49	0.65	10.20***	0.92	6.99***	1.42	4.89***
Parity						
0 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
1	0.60	0.94	0.71	1.14	0.98	1.53***
2	1.03	1.34	0.43	1.33	0.59	1.62***
3	0.72	1.22	0.20*	1.23	1.12	1.79***
4	0.92	0.98	0.59	1.47	0.48	2.19***
5	0.39	0.83	0.27	1.56	0.21	2.35***
6+	0.85	1.30	0.42	1.11	0.37	2.40***
Wealth Quintile						
Poorest (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
Poorer	0.89	1.65**	0.94	1.80***	0.88	1.28
Middle	0.62	2.73***	0.73	2.16***	0.67	1.52**
Richer	0.76	4.41***	0.58	2.76***	0.66	2.02***
Richest	0.55	6.47***	0.65	3.65***	0.63	2.55***

- Normal weight used as the reference
- * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
- Models adjusted for: Ethnicity, religion, marital status, region, residential setting, level of education, occupation, media exposure, and hormonal contraceptive use

In addition to age, parity, and wealth, other significant results included the following.

For countries with data on ethnicity, there was a significant association between ethnicity and nutritional status. For example, in Ethiopia, Somali women were at most risk of overweight compared to the Oromos, the majority tribe in Ethiopia. Likewise, within country regional variation of risk estimates of overweight and underweight were also evident across all the countries except for Burundi, Malawi, Sao Tome and Principe, Rwanda, Swaziland and Lesotho.

For most countries, urban settlers were more likely to be overweight and less likely to be underweight compared to rural settlers. However, urban living was significantly associated with a higher risk of underweight in Zimbabwe (RRR=1.78, 95% CI: 1.04, 3.07), and a lower risk of overweight in Ghana (RRR=0.71, 95% CI: 0.55, 0.92), in comparison to rural living. Wealth accounted for the directional change observed in these countries.

For countries with significant results concerning marital status, women in marital unions or those who were formerly married were more likely to be overweight and less likely to be underweight compared to their single counterparts.

For countries with significant findings concerning education, there was a positive association with levels of education and overweight, and a negative association with levels of education and underweight. A similar pattern was also noted concerning the media exposure variable.

For countries with significant results concerning occupation, there was a higher likelihood of overweight among women engaged in non-manual work, while the risk of overweight decreased for manual work, as compared to non-working women. Conversely, non-manual work was a protective factor for underweight, whereas manual and agricultural work served as risk factors for underweight.

The risk of overweight was higher among hormonal contraceptive users in Burundi, Burkina Faso, Niger, Zambia, Mozambique, Malawi and Rwanda compared to women

who did not use hormonal contraception. In contrast, the risk of being underweight was observed to be lower among hormonal contraceptive users in Uganda, Guinea, Namibia, Nigeria, Zambia, Malawi, Rwanda, Kenya, Togo, and Ghana compared to women who did not use hormonal contraception.

See Appendix E for a detailed presentation of the relative risk ratios with confidence intervals for each country.

Chapter 5

5 Discussion

This chapter presents a discussion of the results for each of the three objectives and describes the limitations of the study

5.1 Malnutrition in SSA

Malnutrition is a significant problem in SSA. Prevalence of over-nutrition is increasing in most SSA countries (Mendez et al., 2005; Jaacks et al., 2014; NCD-RisC, 2016). Over-nutrition in SSA is likely linked to increasing globalization, urbanization and economic development. These correlates are thought to have an impact on food systems by changing the culture of food production from subsistence to commercial agriculture, enhancing the accessibility of inexpensive energy-dense foods due to economic liberalization and aggressive marketing of processed food products that leads to the adoption of 'Western' dietary patterns (Kennedy et al., 2004; Hawkes, 2006; Popkin, 2014; Madise & Latemo, 2017). Over-nutrition may also be associated with the ongoing progress of women empowerment in the region. Increased engagement of women into white-collar labour markets has promoted overconsumption of fast foods due to increased levels of income and decision-making power within households (Kennedy et al., 2004; Steyn & Mchiza, 2014; Neupane et al., 2015).

The pattern of malnutrition was not uniform throughout the SSA region. This study identified four malnutrition groups exist in SSA that could be described as: countries with a higher burden of underweight exceeding that of overweight (group A), countries battling with high prevalence of both under- and over-nutrition (group B), countries where overweight prevalence surpasses that of underweight (group C1); and countries that have significantly higher prevalence of obesity compared to underweight (group C2). Drought, political instability and economic recession effects on food security could be a reason as to why SSA countries, particularly those in groups A and B, still encounter high burden of under-nutrition (Unit, 2017; Unit, 2016). For instance, under-nutrition in

Madagascar and Ethiopia (group A) could be accounted by the recent episodes of severe drought, coupled with El Niño, that resulted to harvest failures (Sasson, 2012; Masih et al., 2014). Furthermore, perennial conflicts, combined with harsh climatic conditions have also been associated with failed harvests and increased food prices among the Sahelian countries of Niger, Chad, Mali and Burkina Faso (group B countries). On the other hand, evidence suggests that countries with functional democracies (majority in group C1 and C2) provide serine environment for infrastructure development and expansion of transnational food corporations, increasing access and overconsumption of packaged foods and soft drinks (Mendez et al., 2005; Sasson, 2012; Haris, 2014; Popkin, 2014).

To a large extent, malnutrition group findings reflected the socio-demographic profile of the majority of the countries as expected. However, classification of Namibia, Nigeria, Senegal and Zambia as group B countries does not reflect the relatively high socio-economic status (GDP > 1000 USD and KOF Globalization index > 50) of these countries at the macro-level in SSA. These findings suggest that the nutrition transition theory may not be entirely adequate in explaining nutritional outcomes for women of reproductive age, and therefore, there is a need to develop an alternative theoretical framework that would capture distinct effects of demographic and socio-economic changes on women nutritional status (Batnitzky, 2008).

5.2 Cross-country (macro-level) correlates of nutritional status

Malnutrition patterns in SSA was associated with national indices of fertility rate and GDP. The finding that fertility rate was the strongest correlate of the malnutrition groups after adjusting for the effects of economic indicators was interesting. It is possible that within SSA context, parity has a strong bidirectional relationship with both forms of malnutrition. A strong link between parity and under-nutrition in food insecure settings may be a reflection of frequent reproductive cycles (repeated rounds of closely spaced pregnancy and lactation) that has been found to deplete maternal nutritional status (Shell-

Duncan & Yung, 2004; Merchant & Martorell, 1988), whereas the high correlation between parity and over-nutrition is as a result of the ongoing nutrition transition (Kim et al., 2007). This assertion is supported by the study finding that fertility rate (≥ 6) was associated with seven countries that had the prevalence of underweight exceeding 10% (group A and group B countries).

In contrast, the finding that GDP was a strong correlate of the malnutrition groups was not surprising. The impact of GDP, both nationally and locally seen through changes in socioeconomic correlates such as income, education and occupation, on both forms of malnutrition is well established in literature, and thus as GDP increases, transition towards over-nutrition is evident and vice versa (Monteiro et al., 2004a; Mendez et al., 2005).

5.3 Within-country (micro-level) correlates of nutritional status

Regardless of the country of residence or the state of nutrition transition within the country, this study identified the consistent strong influence of women's age and wealth in determining their nutritional status.

Age and associated physiology provide a plausible biological explanation for the effect of age on body weight (Huffman & Rizov, 2010; Butzlaff & Minos, 2016). Beyond the impact of aging on an individual's physical active lifestyle, metabolism, stress levels, and sleeping patterns (Hickson, 2006), age is also associated with the loss of muscle tissue (Sarcoponea) that is subsequently replaced by fat (Marcell, 2003; Vincent et al., 2012). The effect of age on nutritional status is universal, irrespective of the ongoing nutrition transition in SSA. Additionally, age as a key determinant of one's social standing and how labour is divided within the household may also provide useful insights on the effect of age on women's nutritional outcome (Gallagher, 1997; Batnitzky, 2008). Heavy domestic chores are most likely to be assigned to younger women, as older women

perform supervisory roles or other light duties such as childcare, which are often less energy exerting (Batnitzky, 2008).

Household wealth determines the amount of disposable income available for food (Subramanian & Smith, 2006; Olalekan, 2009). Furthermore, a majority of 'rich' households within the SSA context are likely to hire house helps, which always reduces the amount of energy exerting chores that female household members engage in (Batnitzky, 2008). Wealthy women living in well equipped houses may also own home appliances such as refrigerators and washing machines that drastically reduces energy expenditure associated with household chores (Lanningham-Foster et al., 2003; Banks et al., 2011; Batnitzky, 2008). The spare time resulting from reduced household labor may be allocated for leisure activities associated with affluence such as TV watching, which further increase sedentariness (Chen et al., 2015; Batnitzky, 2008).

However, the observed consistency of wealth influence on nutritional status across the majority of SSA countries does not align with previous studies that suggest a weakening association of wealth on nutrition status as countries transition into middle income economies (Monteiro et al., 2004b; Subramanian et al., 2010). The novel analytical approach (decision tree analysis) used in this study combined with the use of wealth index as a proxy for socioeconomic status may contribute to the difference in findings between this and other studies.

In addition to age and wealth, parity influenced nutritional status. Increased parity was associated with increased over-nutrition. The existence of more obesogenic environments in overweight countries may exacerbate the already high biological risk of over-nutrition (weight gain and retention during reproductive cycles) for women of reproductive age compared to the general population (King, 2000; Kim et al., 2007). However, the contradictory findings depicting parity as a risk factor for underweight in Ethiopia and Burundi while having a protective effect for overweight in Malawi is a likely proof that these countries are still on early stages of nutrition transition (Abrahams et al., 2011).

This assertion can be further supported by the fact that these countries rank among the lowest in the region with regards to urbanization rates (< 20%) (WDI, 2018).

Other variables that were observed to play an important role in predicting nutritional status were administrative region of residence, residential setting, marital status and ethnicity.

Residential (both region and urban/rural residency) influence on women's nutritional status may be due to wealth and health inequalities, coupled with differences in climatic conditions that impact food production (Elliot & Waternberg, 2004; Kennedy et al., 2004; Hanandita & Tampubolon, 2015). However, the influence of the rampant political instability, civil strife and conflicts in shaping the observed malnutrition patterns cannot be overlooked (Haris, 2014; Unit, 2016). Furthermore, exposure to Western lifestyle may result in changes in dietary behaviours for economically empowered urban women (Doku & Neupane, 2015). Moreover, in urban environments, over-nutrition may be a result of built environments that are characterized by narrow congested roads, lack of sidewalks and recreational parks, pollution, and high crime rates, each of which discourages a physical active lifestyle (Misra & Khurana, 2008; Nugent, 2008; Scott et al., 2012).

However, findings in Ghana and Zimbabwe reported unexpected associations with regards to the urban-rural divide. In Zimbabwe, urban underweightness could be a reflection of the increasing poverty and high-income inequalities among urban residents (ZIMSTAT, 2013; Manjengwa et al., 2016). However, in Ghana, consistent economic growth and increased public healthcare spending (Saleh, 2012) may protect urban women from over-nutrition as they have access to better health care services that make them more conscious of their health status compared to their rural counterparts.

Marital status may also influence risk of malnutrition. There are two perspectives on the link between marital union and weight gain (Teachman, 2016). First, the resource model emphasizes the importance of food on building marital bliss (Averett et al., 2008; Umberson et al., 2009; Teachman, 2016). Most activities that couples enjoy doing

together involve eating and individuals are likely to influence their partner's eating behaviour, which may result in weight gain (Wilson, 2012). Second, the attractiveness model associates body weight with sexual beauty (Teachman, 2016). Unlike their single counterparts who are interested in attracting mates, married individuals are less likely to be concerned with gaining weight since they are already 'off the market' (Joyner, & Sobal, 2008; Teachman, 2016; Fitzgibbons, 2010).

Finally, ethnic affiliations may influence risk of malnutrition. Cultural customs in relation to food, household power dynamics, and social norms in reference to body image and social status are cultural constructs that may relate to changes in nutritional status (Brown & Konner, 1987; Cline & Ferraro, 2006; Caprio et al., 2008). For example, in Ethiopia, men are highly revered in families and, therefore, boys are always given preferential treatment by being fed first while women and girls are left to feed on the left overs (Sasson, 2012).

5.4 Study Limitations

This study had several limitations that should be considered while interpreting the findings. First, as already argued by many authors (e.g., Yusuf et al., 2005; Burkhauser & Cawley, 2008; McCarthy et al., 2006), BMI is not necessarily the best marker of nutritional status, since it is a measure of relative weight and does not capture the difference between body fat distribution and muscle (Madise & Latemo, 2017). Furthermore, evidence suggest that Africans, compared to other ethnicities, are more likely to experience nutrition-related NCDs at lower BMI values because of having high deposition of adipose fat (Lee et al., 2011; Aranetta & Barrett-Connor, 2005). Therefore, the WHO recommended BMI cut offs may fail to fully indicate African population groups at risk of malnutrition (Popkin, 2002). However, the facts that BMI values were measured objectively in DHS surveys (Macro & Calverto, 2006; DHS, 2013) and BMI values are strongly correlated to density measures of body fat (Neuman et al., 2014) make it a useful indicator for this study.

Second, due to missing data in some countries, the study findings may be biased as a result of failing to control for potential confounders. Additionally, the DHS surveyed data does not capture other important determinants of body weight such as dietary behaviors and lifestyle, which would facilitate a more comprehensive understanding of malnutrition in SSA (Kandala & Stranges, 2014).

Finally, it is also worthy to point out some limitations associated with the independent variables used in this study. Most of the macro variables providing estimates for economic development such as the GDP and the KOF index of globalization does not fully capture the informal economy (Feige & Urban, 2008; Gygli et al., 2018), which offers economic opportunities for majority of vulnerable populations including women (Medina et al., 2017). On the other hand, systematic errors associated with face-to-face interviews such as response and/or reporting biases may have affected the quality of micro level data obtained from the DHS surveys (Althubaiti, 2006; Bowling, 2005). Table 11 provides a summary of strengths and weaknesses associated with the independent variables for this study.

Table 11: Strengths and weaknesses of variables included in the analysis.

MACRO-LEVEL VARIABLES		
Variable	**Strengths**	**Weaknesses**
Gross Domestic Product (GDP)	• Precise indicator of a country's economic size (Samuelson & Nordhaus, 2006) • Provides the best proxy for economic growth at the national level (Samuelson & Nordhaus, 2006)	• GDP calculations does not capture the informal economy (Feige & Urban, 2008) • GDP estimates inadequately considers inequities in wealth distribution (Samuelson & Nordhaus, 2006)
Urbanization Rates	• Provides comparable measures for urban population density (Allender et al., 2008). • Proven useful as a single urbanization measure for estimating chronic disease risk (Allender et al., 2008).	• Urban areas are not standardly defined i.e. urban area quantification is country specific, thus results from cross country analysis may be biased (Allender et al., 2011; Hall et al., 2006)
GINI Index	• Provides an accurate estimate of both economic and social inequalities, consistent with theory (Hey & Lambert, 1980) • Provides a standard measure of income inequality for all the countries, thus values are comparable (WDI, 2018)	• Does not capture the income from the informal economy (Feige & Urban, 2008) • Lack of timely data for most of the countries limits its usability in analysing current income inequalities (WDI, 2018)
KOF Index of Globalization	• Captures both the political, economic and social aspects of globalization (Dreher, 2006) • Provides a single standardized index that supports comparative studies (Dreher, 2006; Gygli et al., 2018)	• The index does not capture the environmental aspect of globalization (Gygli et al., 2018). • Trade calculations does not capture the informal economy (Gygli et al., 2018)
Fertility Rates	• Provides a simple summary measure of fertility aggregated at the national level (Schmertmann & Hauer, 2017) • Standardized calculations for the index ensure that fertility rates can be used for comparative studies between countries (Hanernberg, 1983)	• The estimates may be biased since it does not capture periodic fluctuations of fertility rates which occurs in reality (Schmertmann & Hauer, 2017; Brunsdon et al., 1998)
Life Expectancy at Birth (females)	• A simple indicator that is widely used, and clearly interpreted (Edigi & Spizzichinno, 2012) • Standardized calculation of life expectancy values allows the variable to be used in comparative analysis (Edigi & Spizzichinno, 2012)	• Calculations for life expectancy does not capture disability and other non-fatal health outcomes (Edigi & Spizzichinno, 2012, WHO, 2016c)

Table 11: Cont.

MICRO-LEVEL VARIABLES		
Variable	**Strengths**	**Weaknesses**
BMI Categories	• High levels of accuracy since BMI measurements are objectively determined in DHS surveys (DHS, 2013) • A simple standardized indicator for the entire spectrum of nutritional status (Neuman et al., 2014) • BMI accuracy in measuring nutritional status is similar with the highly revered density measures of body fat (Neuman et al., 2014)	• Established BMI categories underpredicts the risk of overnutrition for individuals of African decent (Popkin, 2002; Lee et al., 2011) • Does not capture the difference between 'bad' fat and muscles (McCarthy et al., 2006)
Age Group	• The most precise indicator for determining the functionality of physiological processes e.g. metabolism (Barzillai et al., 2012; Wouters-Adriaens & Westertep, 2006) • Supports cross country analysis since age is a standardly measured variable across all the countries in DHS surveys (DHS, 2013)	• Categorizing the age variable for analytic purpose in this study may have led to underestimation of risk between the age groups (Altman & Royston, 2006) • Data accuracy may have been affected by information bias such as intentional/unintentional responder bias due to self reporting approach used in collection (Althubaiti, 2006; Bowling, 2005)
Region	• The most efficient and widely reported proxy for socio-economic and health inequities (Elliot & Waternberg, 2004) • High accuracy of data since information concerning the region variable was collected objectively from government records (DHS, 2013)	• Does not allow for cross country comparative studies since the definition of region variable is country specific (DHS, 2013)
Ethnicity	• Provides an efficient indicator for respondent's culture within the SSA context (Caprio et al., 2008; Butzlaff & Minos, 2016)	• For most countries, information on ethnicity was only available for the major ethnic groups (DHS, 2013) • Does not allow for cross country comparison since ethnicity variable is country specific (DHS, 2013)
Residential setting	• High accuracy of data since residential setting data was collected objectively from government records (DHS, 2013) • Supports cross country analysis since the residential setting is a standardly dichotomised variable across all the countries in DHS surveys (DHS, 2013)	• Though residential setting is standardly dichotomised (urban\rural), the definition of an urban or rural area is country specific, limiting variable use for cross country analysis (Allender et al., 2011; Hall et al., 2006)
Religion	• Provides an efficient indicator for respondents' culture within the SSA context (Ferraro, 1998; Lapane et al., 1997)	• For most countries, information on Religion was only available for the major ethnic groups (DHS, 2013) • Standardization of religion variable for analytic purpose in this study may have biased the findings as a result of combining dissimilar categories (Altman & Royston, 2006)

Table 11: Cont.

Variable	Strengths	Weaknesses
Level of Education	• Provides an efficient indicator for respondent's socio-economic status (Neupane et al., 2016) • Supports cross country analysis since the levels of education are standardly defined across all the countries in DHS surveys (DHS, 2013)	• Data accuracy may be affected by information bias such as intentional/unintentional responder bias and/or reporting bias due to self reporting approach used in data collection (Althubaiti, 2006; Bowling, 2005) • Cross country findings may be biased since this variable does not capture the variations in education system between countries (DHS, 2013)
Wealth Quintile	• Provides an efficient indicator for respondent's socio-economic status (Neupane et al., 2016; Corsi et al., 2011) • Supports cross country analysis since the wealth quintiles are standardly defined across all the countries in DHS surveys (DHS, 2013). • High levels of accuracy since wealth quintile are objectively determined in DHS surveys (DHS, 2013)	• DHS wealth quintiles are relative wealth measures based on the country's situation at the time of the survey, hence economic status cannot be directly compared between respondent's in different countries (Rutsein & Staveteig, 2014)
Occupation	• Provides an efficient proxy for respondent's socio-economic status and physical activity levels (Lopez-Arana et al., 2014) • Supports cross country analysis since the occupation groups are standardly defined across all the countries in the DHS surveys (DHS, 2013).	• Data accuracy may be affected by information bias such as intentional/unintentional responder bias and/or reporting bias due to self reporting approach used in data collection (Althubaiti, 2006; Bowling, 2005) • Recategorization of occupational variable for analytic purpose in this study may introduce bias in the findings because of combining dissimilar occupation categories (Lopez-Arana et al., 2014)
Parity	• A precise proxy for determining post partum weight gain/loss (King, 2000) • Supports cross country analysis since parity is a standardly measured variable across all the countries in DHS surveys (DHS, 2013)	• Categorizing the parity variable for analytic purpose might have led to underestimation of risk between the different groups (Altman & Royston, 2006) • Data accuracy may be affected by information bias such as intentional/unintentional responder bias and/or reporting bias due to self reporting approach used in data collection (Althubaiti, 2006; Bowling, 2005)

Table 11: Cont.

Variable	Strengths	Weaknesses
Marital status	• Supports cross country comparison since marital status is a standardly defined variable across all the countries in DHS surveys (DHS, 2013)	• Recategorizing the variable for analytical purpose for this study might have led to bias findings due to loss of information by combining similar categories (Altman & Royston, 2006; Koch et al; 2008) • Data accuracy may be affected by information bias such as intentional/unintentional responder bias and/or reporting bias due to self reporting approach used in data collection (Althubaiti, 2006; Bowling, 2005)
Media Exposure	• Supports cross country comparison since media is a standardly defined variable across all the countries in DHS surveys (DHS, 2013). • Incorporation of different forms of media to create a single variable for this study provided a strong proxy for measuring the impact of media on nutritional status (Rosiek et al., 2015)	• Data accuracy may be affected by information bias such as intentional/unintentional responder bias and/or reporting bias due to self reporting approach used in data collection (Althubaiti, 2006; Bowling, 2005)
Hormonal Contraceptive Use	• Supports cross country comparison since the method of contraception is standardly defined across all the countries in DHS surveys (DHS, 2013).	• Data accuracy may be affected by information bias such as intentional/unintentional responder bias and/or reporting bias due to self reporting approach used in data collection (Althubaiti, 2006; Bowling, 2005)

Chapter 6

6 Conclusion

This chapter highlights contributions to understanding risks leading to the double burden of malnutrition in SSA and presents some policy implications for decision makers to consider when seeking ways to improve women's health in SSA.

6.1 Scientific Contributions

This is the first study that examines the double burden of malnutrition across 34 countries in SSA. Previous related studies in existence have either been country-specific (Olalekan, 2009; Tebekaw et al., 2014; Doku & Neupane, 2015) or regionally-focused using aggregated data (Mamun & Finlay, 2015).

This study confirms the within-country association of under-nutrition with poverty and over-nutrition with riches in SSA. However, this study significantly adds to the existing literature in several ways.

First, this study provides novel information on the existing patterns of malnutrition in SSA. By emphasizing on the characterization of malnutrition trends using theoretically derived thresholds, our study makes an attempt of positioning each country within the larger nutrition transition spectrum. This highlights the marked differences in malnutrition in SSA and facilitates prediction of areas within SSA in dire need of public health interventions (Abrahams et al., 2011).

Second, this study provides an easy-to-understand novel approach (decision trees) of determining key nutritional status correlates that are necessary for designing successful public health interventions (Hanandita & Tampubolon, 2015).

Finally, this study discloses the inadequacies of the nutrition transition theory in explaining nutritional outcomes with regards to women of reproductive age and

highlights the important effect of reproductive measures on women nutritional status (Kim et al., 2007; Brooks & Maklakov, 2010). The study findings associating higher fertility rate with the predominance of under-nutrition at the macro-level and increased parity as a risk factor for underweight for Group A countries and as a risk factor for overweight for Group B to C2 countries emphasizes the intricate relationship between women's reproductive status and the ongoing nutrition transition in SSA.

6.2 Policy Implications

The study findings indicate that the overweight population has already exceeded the underweight proportion in a majority of the countries in SSA, despite the persistent scourge of under-nutrition in some countries. Rapid economic growth has resulted in the engagement of more women into modern labour markets, thus raising the level of income in many households (Luci, 2009). However, there is no evidence to suggest that the burden of over-nutrition is shifting from the rich towards the poor, despite the rapid economic growth experienced in the region. Conversely, unequal wealth distribution has resulted in the creation of two contrasting population subgroups of women: the poor who are unable to meet their nutritional requirements and the rich who are capable of purchasing foods beyond their nutritional requirements (Subramanian & Smith, 2006). This suggests of a looming public health crisis characterised by the double burden of nutrition-related diseases if public health interventions are not scaled up in SSA.

Most importantly, beyond the more commonly known effects of economic development on women's nutritional status (Kennedy et al., 2004; Popkin et al., 2012), this study revealed that the role of reproductive functions cannot be overlooked. Policy makers and public health practitioners must link reproductive health services and nutritional-related programs. A potential avenue to facilitate this linkage is through the Community Health Workers (CHW) program, a widely utilized primary care service in majority of the SSA countries (Kumar et al., 2014). As the lowest ranking cadre of the public health system in the majority of the countries, CHWs are the most contacted health practitioners during critical moments such as pregnancy (Singh & Sachs, 2013; McCord et al., 2013).

Considering this, coupled with the fact that health care practitioners are highly esteemed in the society (McCord et al., 2013; Popkin et al., 2012), the CHW program provides an influential platform for promoting healthy diets and lifestyle change in SSA societies (Tulenko et al., 2015; Lehmann & Sanders, 2007). In addition, the high prevalence estimates for both malnutrition conditions suggests that there is a need for country-specific educational and sensitization programs (Roemling & Qaim, 2013; Hanandita & Tampubolon, 2015).

Furthermore, age, parity, and wealth were the within-country correlates with the strongest association with women's nutritional status. Specifically, in the majority of the countries, aging, having children, and gaining wealth were associated with the highest risk of overweight and the lowest risk of being underweight. Policy makers drawing from these findings should consider introducing educational campaigns targeting older, wealthy mothers in an effort to inspire behavioral changes in relation to diet and physical activity (Hanandita & Tampubolon, 2015).

Though it was not a significant factor for women's malnutrition in many countries, the role of urban environment (residential setting) in promoting overweightness cannot be ignored. Estimates show that by 2020, half of SSA's population will be residing in urban areas (UN, 2017). Furthermore, the majority of cities in SSA experience major challenges with regards to motorised traffic, where individuals using public transit spend approximately 1-3 hours on traffic daily (Trans-Africa Consortium, 2008; Kumar & Barret, 2008; Attri, 2017). This kind of sedentariness potentially elevates the risk of being overweight among urban residents.

Therefore, there is a need to address the 'obesogenic' urban environment (Hanandita & Tampubolon, 2015). Nutritionally healthy urban planning must be encouraged in cities across the SSA region. This include but not limited to construction of sidewalks and cycling routes (Misra & Khurana, 2008), restoration of recreation facilities such as parks and playing grounds (Ahianba et al., 2008), and improvement security in residential areas to encourage physical activity in urban neighbourhoods (Nugent, 2008). However, SSA

policy makers can also learn from other contexts. A potential suggestion may be the introduction of car free days, to discourage passive transit and promote physical activity among urban residents as piloted in Arlington (Kavanaugh et al., 2012).

6.3 Future Research Directions

Future directions for research can be drawn from the study's findings and limitations. First, it is necessary to conduct studies using longitudinal (time series) data to fully explore concepts of the nutrition transition theory from both the time and space perspectives (Popkin, 1993). Longitudinal data will be useful in determining causal associations between changes in women's socio-demographic characteristics and their nutritional status within the SSA setting. Establishing causal inferences could be important for policy targeting and designing successful interventions particularly when the potential risk factors (e.g. built environment) are mutable and can be changed to reduce the level of risk (Glass et al., 2013; Westreich et al., 2016).

Second, it is appropriate to explore alternative theoretical frameworks that captures, to a greater extent, the impact of the changing societal roles for women in influencing their dietary patterns and physical activity behaviors. For instance, Batnitzky (2008) suggested the utilization of the role theory to explain the obesity pandemic among Moroccan women which could provide insights into the malnutrition phenomenon within the SSA context. Additionally, future theories should consider incorporating genetic and reproductive differences between women within and across countries, in order to capture the biological diversity that exist in SSA. Research should also expand and evaluate the accuracies and inadequacies of the nutrition transition theory among the male gender in SSA.

Finally, to counter inadequacies presented using BMI values, future studies should consider using 'gold standard' measures for nutritional status such as optical density measures for adiposity (Willet, 2012). Furthermore, this study was limited in scope with regards to the number of variables available for analysis. Therefore, future research

should also go beyond socio-demographic factors and incorporate variables such as physical activity, dietary habits and individual's genetical biomarkers in the analysis to avoid biased findings (Kandala & Stranges, 2014).

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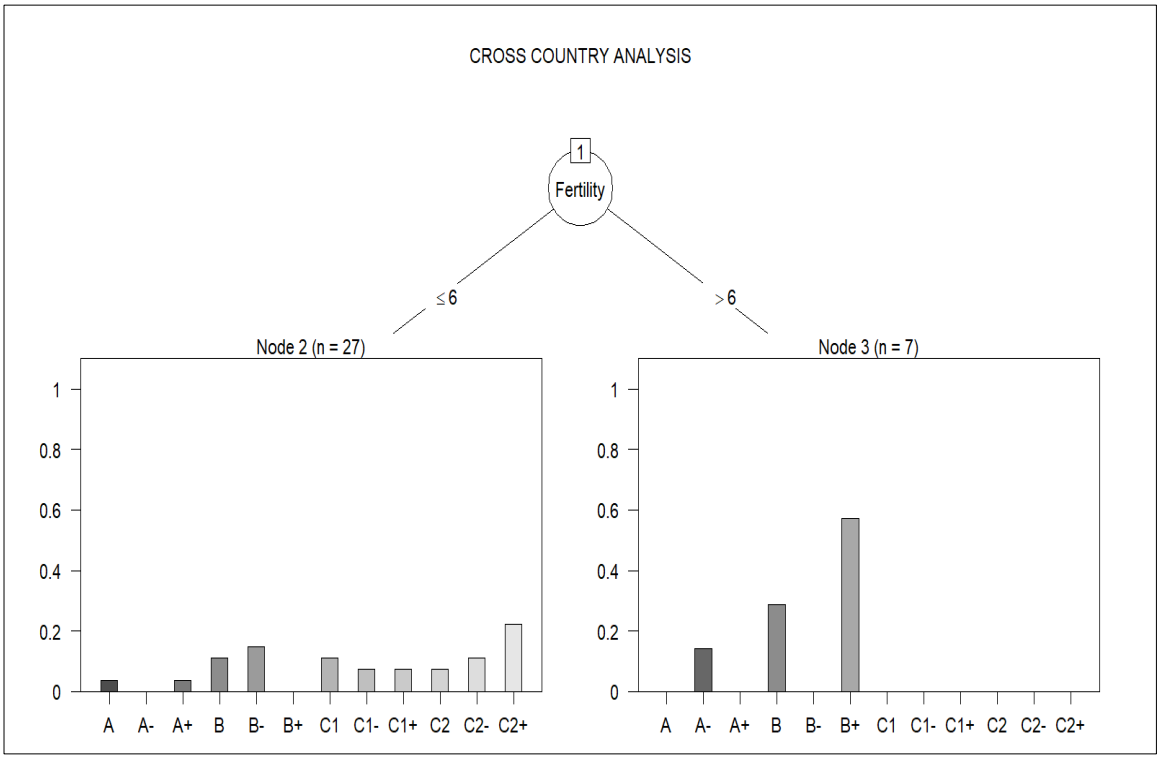
Appendices

Appendix A: Prevalence of underweight, normal weight and overweight women of reproductive age in SSA.

Country	Underweight (%)	Normal Weight (%)	Overweight (%)
Madagascar	26.9	66.9	6.2
Ethiopia	20.6	69.8	7.6
Burundi	16.2	76.3	7.5
Chad	19.5	69.1	11.4
Burkina Faso	15.8	73.0	11.2
Senegal	22.1	56.6	21.3
D R Congo	14.7	69.3	16.0
Niger	15.8	66.6	17.6
Gambia	16.8	60.7	22.5
Mali	11.6	70.4	18.0
Uganda	11.9	69.6	18.6
Guinea	12.3	68.3	19.4
Mozambique	8.6	75.0	16.4
Sierra Leone	9.2	72.4	18.4
Congo	14.4	59.4	26.2
Zambia	10.3	66.7	23.0
Nigeria	11.5	63.8	24.7
Malawi	7.2	72.1	20.7
Rwanda	6.7	72.7	20.6
Namibia	14.0	54.5	31.5
Ivory Coast	7.8	66.5	25.7
Tanzania	9.5	62.0	28.5
Liberia	7.5	66.0	26.5
Benin	6.3	66.8	26.9
Togo	7.0	62.3	30.7
Kenya	9.0	58.2	32.8
Cameroon	6.9	61.0	32.1
Sao Tome and Principe	7.7	59.0	33.3
Comoros	7.1	57.2	35.7
Zimbabwe	6.2	59.0	34.8
Gabon	7.9	51.2	40.9
Ghana	6.2	53.7	40.1
Lesotho	4.3	51.3	44.4
Swaziland	3.2	46.2	50.6

Appendix B: Classification tree results (Objective 2).



Appendix C: Univariate analysis results for all the 34 countries in SSA (Objective 3)

Table 12: Descriptive Statistics for the Study Population in Madagascar.

Variable	Sample Size n (%)
Total Sample Size	7,379
Nutritional status	
Underweight	1,985 (26.9)
Normal Weight	4,937 (66.9)
Overweight	457 (6.2)
Age	
15-19	1,682 (22.8)
20-24	1,092 (14.8)
25-29	1,159 (15.7)
30-34	1,018 (13.8)
35-39	893 (12.1)
40-44	834 (11.3)
45-49	701 (9.5)
Religion	
Catholics	2,597 (35.2)
Other Christians	2,634 (35.7)
Islam	44 (0.6)
Traditionalist	162 (2.2)
Others	443 (6.0)
No Religion	1,498 (20.3)
Parity	
0	1,874 (25.4)
1	1,063 (14.4)
2	996 (13.5)
3	893 (12.1)
4	671 (9.1)
5	576 (7.8)
6+	1,306 (17.7)
Marital Status	
Single	1,468 (19.9)
Married	4,929 (66.8)
Formerly Married	981 (13.3)
Residential Setting	
Rural	6,088 (82.5)
Urban	1,291 (17.5)

Table 12: Cont.

Variable	Sample Size n (%)
Region	
Analamanga	1,299 (17.6)
Vakinankaratra	649 (8.8)
Itasy	303 (4.1)
Bongolava	214 (2.9)
Haute Matsiatra	391 (5.3)
Anamoroni'i mania	251 (3.4)
Vatovavy Fitovinany	362 (4.9)
Ihorombe	140 (1.9)
Atsimo Atsinanana	229 (3.1)
Atsinanana	472 (6.4)
Analanjirofo	369 (5.0)
Alaotra Mangoro	369 (5.0)
Boeny	258 (3.5)
Sofia	450 (6.1)
Betsiboka	103 (1.4)
Melaky	74 (1.0)
Atsimo Andrefana	354 (4.8)
Androy	170 (2.3)
Anosy	214 (2.9)
Menabe	170 (2.3)
Diana	199 (2.7)
Sava	339 (4.6)
Level of Education	
No Education	1,358 (18.4)
Primary	3,594 (48.7)
Secondary	2,251 (30.5)
Higher	177 (2.4)
Wealth Quintile	
Poorest	1,254 (17.0)
Poorer	1,350 (18.3)
Middle	1,350 (18.3)
Richer	1,557 (21.1)
Richest	1,867 (25.3)
Occupation	
Not Working	1,173 (15.9)
Nonmanual	1,011 (13.7)
Manual	635 (8.6)
Agricultural	4,545 (61.6)
Others	15 (0.2)
Media Exposure	
Not Exposed	2,302 (31.2)
Exposed to one media source	2,885 (39.1)
Exposed to two media sources	1,181 (16.0)
Exposed to three media sources	1,011 (13.7)
Hormonal Contraceptives use	
No	5,726 (77.6)
Yes	1,653 (22.4)

Table 13: Descriptive Statistics for the Study Population in Ethiopia.

Variable	Sample Size n (%)
Total Sample Size	13,222 (100)
Nutritional status	
Underweight	2,988 (20.6)
Normal Weight	9,229 (69.8)
Overweight	1,005 (7.6)
Age	
15-19	3,015 (22.8)
20-24	2,182 (16.5)
25-29	2,367 (17.9)
30-34	1,904 (14.4)
35-39	1,626 (12.3)
40-44	1,164 (8.8)
45-49	965 (7.3)
Ethnicity	
Amhara	4,112 (31.1)
Affar	79 (0.6)
Guragie	383 (2.9)
Hadiye	304 (2.3)
Oromo	4,350 (32.9)
Sidama	542 (4.1)
Somali	331 (2.5)
Tigray	1,045 (7.9)
Welaita	410 (3.1)
Others	1,666 (12.6)
Religion	
Catholic	106 (0.8)
Other Christians	9,070 (68.6)
Islam	3,900 (29.5)
Others	145 (1.1)
Parity	
0	4,535 (34.3)
1	1,454 (11.0)
2	1,283 (9.7)
3	1,203 (9.1)
4	1,018 (7.7)
5	1,031 (7.8)
6+	2,697 (20.4)
Marital Status	
Single	3,755 (28.4)
Married	8,145 (61.6)
Formerly Married	1,322 (10.0)
Residential Setting	
Rural	10,207 (77.2)
Urban	3,015 (22.8)

Table 13: Cont.

Variable	Sample Size n (%)	
Region		
Tigray	978	(7.4)
Afar	106	(0.8)
Amhara	3,279	(24.8)
Oromia	4,667	(35.3)
Somali	344	(2.6)
Benishangul	132	(1.0)
Snnpr	2,763	(20.9)
Gambela	40	(0.3)
Harari	26	(0.2)
Addis Adaba	820	(6.2)
Dire Dawa	66	(0.5)
Level of Education		
No Education	6,241	(47.2)
Primary	4,667	(35.3)
Secondary	1,560	(11.8)
Higher	754	(5.7)
Wealth Quintile		
Poorest	2,129	(16.1)
Poorer	2,274	(17.2)
Middle	2,565	(19.4)
Richer	2,671	(20.2)
Richest	3,583	(27.1)
Occupation		
Not Working	6,426	(48.6)
Nonmanual	2,935	(22.2)
Manual	740	(5.6)
Agricultural	2,790	(21.1)
Others	331	(2.5)
Media Exposure		
Not Exposed	7,351	(55.6)
Exposed to one media source	2,724	(20.6)
Exposed to two media sources	2,116	(16.0)
Exposed to three media sources	1,031	(7.8)
Hormonal Contraceptives use		
No	9,824	(74.3)
Yes	3,398	(25.7)

Table 14: Descriptive Statistics for the Study Population in Burundi.

Variable	Sample Size n (%)
Total Sample Size	3,929 (100)
Nutritional status	
Underweight	636 (16.2)
Normal Weight	2,998 (76.3)
Overweight	295 (7.5)
Age	
15-19	1,096 (27.9)
20-24	699 (17.8)
25-29	617 (15.7)
30-34	416 (10.6)
35-39	416 (10.6)
40-44	334 (8.5)
45-49	350 (8.9)
Religion	
Catholics	2,428 (61.8)
Other Christians	1,320 (33.6)
Islam	83 (2.1)
Others	98 (2.5)
Parity	
0	1,521 (38.7)
1	389 (9.9)
2	369 (9.4)
3	326 (8.3)
4	283 (7.2)
5	271 (6.9)
6+	770 (19.6)
Marital Status	
Single	1,493 (38.0)
Married	2,055 (52.3)
Formerly Married	381 (9.7)
Residential Setting	
Rural	3,509 (89.3)
Urban	420 (10.7)
Region	
Bujumbura	287 (7.3)
North	1,163 (29.6)
Centre East	963 (24.5)
West	648 (16.5)
South	868 (22.1)
Level of Education	
No Education	1,752 (44.6)
Primary	1,654 (42.1)
Secondary	491 (12.5)
Higher	31 (0.8)
Wealth Quintile	
Poorest	786 (20.0)
Poorer	778 (19.8)
Middle	758 (19.3)
Richer	790 (20.1)
Richest	817 (20.8)

Table 14: Cont.

Variable	Sample Size n (%)
Occupation	
Not Working	805 (20.5)
Nonmanual	251 (6.4)
Agricultural	2,833 (72.1)
Others	39 (1.0)
Media Exposure	
Not Exposed	723 (18.4)
Exposed to one media source	2,090 (53.2)
Exposed to two media sources	860 (21.9)
Exposed to three media sources	255 (6.5)
Hormonal Contraceptives use	
No	3,564 (90.7)
Yes	365 (9.3)

Table 15: Descriptive Statistics for the Study Population in Burkina Faso.

Variable	Sample Size n (%)
Total Sample Size	7,212 (100)
Nutritional status	
Underweight	1,139 (15.8)
Normal Weight	5,265 (73.0)
Overweight	808 (11.2)
Age	
15-19	1,500 (20.8)
20-24	1,298 (18.0)
25-29	1,161 (16.1)
30-34	1,067 (14.8)
35-39	858 (11.9)
40-44	692 (9.6)
45-49	635 (8.8)
Ethnicity	
Bobo	368 (5.1)
Fulfuldé / Peul	534 (7.4)
Gourmantché	454 (6.3)
Gourouns	325 (4.5)
Lobi	173 (2.4)
Mossi	3,765 (52.2)
Sénoufo	346 (4.8)
Dagara	195 (2.7)
Bissa	303 (4.2)
Others	750 (10.4)
Religion	
Catholic	1,709 (23.7)
Other Christians	512 (7.1)
Islam	4,421 (61.3)
Traditionalists	512 (7.1)
No Religion	58 (0.8)
Parity	
0	1,753 (24.3)
1	801 (11.1)
2	801 (11.1)
3	793 (11.0)
4	728 (10.1)
5	635 (8.8)
6+	1,702 (23.6)
Marital Status	
Single	1,457 (20.2)
Married	5,496 (76.2)
Formerly Married	260 (3.6)

Table 15: Cont.

Variable	Sample Size n (%)
Residential Setting	
Rural	5,171 (71.7)
Urban	2,041 (28.3)
Region	
Boucle de mouhoun	772 (10.7)
Cascades	274 (3.8)
Centre	1,118 (15.5)
Centre-Est	534 (7.4)
Centre-Nord	483 (6.7)
Centre-Ouest	555 (7.7)
Centre-Sud	317 (4.4)
Est	584 (8.1)
Hauts Basins	916 (12.7)
Nord	512 (7.1)
Plateau Central	339 (4.7)
Sahel	498 (6.9)
Sud-Ouest	310 (4.3)
Level of Education	
No Education	5,243 (72.7)
Primary	1,024 (14.2)
Secondary	865 (12.0)
Higher	79 (1.1)
Wealth Quintile	
Poorest	1,298 (18.0)
Poorer	1,320 (18.3)
Middle	1,320 (18.3)
Richer	1,414 (19.6)
Richest	1,861 (25.8)
Occupation	
Not Working	1,522 (21.1)
Nonmanual	1,760 (24.4)
Manual	4,76 (6.6)
Agricultural	3,296 (45.7)
Others	1,59 (2.2)
Media Exposure	
Not Exposed	1,846 (25.6)
Exposed to one media source	3,152 (43.7)
Exposed to two media sources	1,630 (22.6)
Exposed to three media sources	584 (8.1)
Hormonal Contraceptives use	
No	6,354 (88.1)
Yes	858 (11.9)

Table 16: Descriptive Statistics for the Study Population in Chad.

Variable	Sample Size n (%)
Total Sample Size	8,873 (100)
Nutritional status	
Underweight	1,730 (19.5)
Normal Weight	6,131 (69.1)
Overweight	1,012 (11.4)
Age	
15-19	2,032 (22.9)
20-24	1,366 (15.4)
25-29	1,544 (17.4)
30-34	1,224 (13.8)
35-39	1,065 (12.0)
40-44	816 (9.2)
45-49	825 (9.3)
Ethnicity	
Toupouri/Kéra	186 (2.1)
Gorane	515 (5.8)
Arab	816 (9.2)
Baguirmi/Barma	89 (1.0)
Kanembou/Bornou/Boudouma	896 (10.1)
Boulala/Médégo/Kouka	328 (3.7)
Ouadaï/Maba/Massalit/Mimi	710 (8.0)
Zaghawa/Bideyat/Kobé	106 (1.2)
Dadajo/Kibet/Mouro	204 (2.3)
Bidio/Migami/Kenga/Dangléat	213 (2.4)
Moundang	248 (2.8)
Massa/Mousseye/Mousgoume	444 (5.0)
Sara (Ngambaye/Sara Madjin-Gaye/Mbaye)	2,839 (32.0)
Peul/Foulbé/Bodoré	142 (1.6)
Tama/Assongori/Mararit	98 (1.1)
Gabri/Kabalaye/Nangtchéré/Soumraye	160 (1.8)
Marba/Lélé/Mesmé	328 (3.7)
Karo/Zimé/Pévé	115 (1.3)
Others	435 (4.9)
Religion	
Catholic	1,872 (21.1)
Other Christians	2,227 (25.1)
Islam	4,507 (50.8)
Traditionalists	27 (0.3)
No Religion	240 (2.7)
Parity	
0	1,917 (21.6)
1	852 (9.6)
2	790 (8.9)
3	843 (9.5)
4	816 (9.2)
5	736 (8.3)
6+	2,919 (32.9)
Marital Status	
Single	1,686 (19.0)
Married	6,309 (71.1)
Formerly Married	878 (9.9)

Table 16: Cont.

Variable	Sample Size n (%)
Residential Setting	
Rural	6,752 (76.1)
Urban	2,121 (23.9)
Region	
Batha	319 (3.6)
Borkou, Tibesti	44 (0.5)
Chari Baguirmi	355 (4.0)
Guéra	453 (5.1)
Hadjer-Lamis	586 (6.6)
Kanem	346 (3.9)
Lac	506 (5.7)
Logone Occidental	612 (6.9)
Logone Oriental	896 (10.1)
Mandoul	621 (7.0)
Mayo Kebbi Est	665 (7.5)
Mayo Kebbi Ouest	479 (5.4)
Moyen Chari	506 (5.7)
Ouaddaï	479 (5.4)
Salamat	142 (1.6)
Tandjilé	532 (6.0)
Wadi Fira	240 (2.7)
N'Djaména	799 (9.0)
Barh El Gazal	115 (1.3)
Ennedi Est, Ennedi Ouest	44 (0.5)
Sila	133 (1.5)
Level of Education	
No Education	5,448 (61.4)
Primary	2,067 (23.3)
Secondary	1,278 (14.4)
Higher	80 (0.9)
Wealth Quintile	
Poorest	1,757 (19.8)
Poorer	1,677 (18.9)
Middle	1,712 (19.3)
Richer	1,810 (20.4)
Richest	1,917 (21.6)
Occupation	
Not Working	4,321 (48.7)
Nonmanual	3,106 (35.0)
Manual	115 (1.3)
Agricultural	1,269 (14.3)
Others	62 (0.7)
Media Exposure	
Not Exposed	6,273 (70.7)
Exposed to one media source	1,331 (15.0)
Exposed to two media sources	772 (8.7)
Exposed to three media sources	497 (5.6)
Hormonal Contraceptives use	
No	8,580 (96.7)
Yes	293 (3.3)

Table 17: Descriptive Statistics for the Study Population in Democratic Republic of Congo.

Variable	Sample Size n (%)
Total Sample Size	7,655 (100)
Nutritional status	
Underweight	1,125 (14.7)
Normal Weight	5,305 (69.3)
Overweight	1,225 (16.0)
Age	
15-19	1,782 (23.3)
20-24	1,323 (17.3)
25-29	1.301 (17.0)
30-34	1,008 (13.2)
35-39	900 (11.8)
40-44	733 (9.6)
45-49	608 (7.9)
Ethnicity	
Bakongo Nord & Sud	710 (9.3)
Bas Kasaï et Kwilu-Kwango	1,331 (17.4)
Cuvette central	707 (9.2)
Ubangi et Itimbiri	854 (11.2)
Uele Lac Albert	559 (7.3)
Basele-K, Man. et Kivu	1,509 (19.7)
Kasai, Katanga, Tanganyika	1,884 (24.6)
Others	100 (1.3)
Religion	
Catholic	2,339 (30.6)
Other Christians	5,088 (66.5)
Islam	73 (1.0)
Traditionalists	41 (0.5)
No Religion	115 (1.5)
Parity	
0	2,162 (28.2)
1	987 (12.9)
2	805 (10.5)
3	684 (8.9)
4	673 (8.8)
5	611 (8.0)
6+	1,733 (22.6)
Marital Status	
Single	2,287 (29.9)
Married	4,488 (58.6)
Formerly Married	880 (11.5)
Residential Setting	
Rural	4,749 (62.0)
Urban	2,905 (38.0)

Table 17: Cont.

Variable	Sample Size n (%)
Region	
Kinshasa	934 (12.2)
Bandundu	1,238 (16.2)
Bas-Congo	374 (4.9)
Equateur	987 (12.9)
Kasai-Occidental	480 (6.3)
Kasai-Oriental	781 (10.2)
Katanga	682 (8.9)
Maniema	234 (3.1)
Nord-Kivu	701 (9.2)
Orientale	726 (9.5)
Sud-Kivu	517 (6.8)
Level of Education	
No Education	1,210 (15.8)
Primary	2,771 (36.2)
Secondary	3,372 (44.1)
Higher	302 (4.0)
Wealth Quintile	
Poorest	1,409 (18.4)
Poorer	1,424 (18.6)
Middle	1,472 (19.2)
Richer	1,484 (19.4)
Richest	1,866 (24.4)
Occupation	
Not Working	2,169 (28.3)
Nonmanual	2,307 (30.1)
Manual	27 (0.4)
Agricultural	3,152 (41.2)
Media Exposure	
Not Exposed	3,841 (50.2)
Exposed to one media source	1,924 (25.1)
Exposed to two media sources	1,357 (17.7)
Exposed to three media sources	534 (7.0)
Hormonal Contraceptives use	
No	7,462 (97.5)
Yes	193 (2.5)

Table 18: Descriptive Statistics for the Study Population in Niger.

Variable	Sample Size n (%)	
Total Sample Size	4,104	(100)
Nutritional status		
Underweight	648	(15.8)
Normal Weight	2,733	(66.6)
Overweight	722	(17.6)
Age		
15-19	718	(17.5)
20-24	669	(16.3)
25-29	743	(18.1)
30-34	657	(16.0)
35-39	550	(13.4)
40-44	402	(9.8)
45-49	365	(8.9)
Parity		
0	702	(17.1)
1	394	(9.6)
2	386	(9.4)
3	402	(9.8)
4	415	(10.1)
5	382	(9.3)
6+	1,424	(34.7)
Marital Status		
Single	435	(10.6)
Married	3,497	(85.2)
Formerly Married	172	(4.2)
Residential Setting		
Rural	3,316	(80.8)
Urban	788	(19.2)
Region		
Agadez	86	(2.1)
Diffa	127	(3.1)
Dosso	570	(13.9)
Maradi	841	(20.5)
Tahoua	936	(22.8)
Tillaberi	521	(12.7)
Zinder	681	(16.6)
Niamey	341	(8.3)
Level of Education		
No Education	3,279	(79.9)
Primary	476	(11.6)
Secondary	328	(8.0)
Higher	21	(0.5)
Wealth Quintile		
Poorest	718	(17.5)
Poorer	780	(19.0)
Middle	817	(19.9)
Richer	870	(21.2)
Richest	919	(22.4)

Table 18: Cont.

Variable	Sample Size n (%)	
Occupation		
Not Working	2,963	(72.2)
Nonmanual	923	(22.5)
Manual	107	(2.6)
Agricultural	111	(2.7)
Media Exposure		
Not Exposed	1,395	(34.0)
Exposed to one media source	1,736	(42.3)
Exposed to two media sources	825	(20.1)
Exposed to three media sources	148	(3.6)
Hormonal Contraceptives use		
No	3,739	(91.1)
Yes	365	(8.9)

Table 19: Descriptive Statistics for the Study Population in Mali.

Variable	Sample Size n (%)	
Total Sample Size	4,397	(100)
Nutritional status		
Underweight	510	(11.6)
Normal Weight	3,095	(70.4)
Overweight	791	(18.0)
Age		
15-19	805	(18.3)
20-24	739	(16.8)
25-29	818	(18.6)
30-34	660	(15.0)
35-39	536	(12.2)
40-44	470	(10.7)
45-49	369	(8.4)
Ethnicity		
Bambara	1,508	(34.3)
Malinke	317	(7.2)
Peulh	651	(14.8)
Sarakole/Soninke/Marka	506	(11.5)
Dogon	413	(9.4)
Sénoufo/Minianka	466	(10.6)
Others	536	(12.2)
Religion		
Catholics	119	(2.7)
Other Christians	75	(1.7)
Islam	4,063	(92.4)
Traditionalist	31	(0.7)
No Religion	110	(2.5)
Parity		
0	835	(19.0)
1	541	(12.3)
2	563	(12.8)
3	506	(11.5)
4	497	(11.3)
5	470	(10.7)
6+	985	(22.4)
Marital Status		
Single	682	(15.5)
Married	3,619	(82.3)
Formerly Married	97	(2.2)
Residential Setting		
Rural	3,258	(74.1)
Urban	1,139	(25.9)
Region		
Kayes	563	(12.8)
Sikasso	923	(21.0)
Koulikoro	1,011	(23.0)
Segou	791	(18.0)
Mopti	519	(11.8)
Bamako	589	(13.4)

Table 19: Cont.

Variable	Sample Size n (%)	
Level of Education		
No Education	3,280	(74.6)
Primary	413	(9.4)
Secondary	642	(14.6)
Higher	62	(1.4)
Wealth Quintile		
Poorest	835	(19.0)
Poorer	796	(18.1)
Middle	831	(18.9)
Richer	871	(19.8)
Richest	1,064	(24.2)
Occupation		
Not Working	2,220	(50.5)
Nonmanual	893	(20.3)
Manual	616	(14.0)
Agricultural	668	(15.2)
Media Exposure		
Not Exposed	1,148	(26.1)
Exposed to one media source	1,161	(26.4)
Exposed to two media sources	1,732	(39.4)
Exposed to three media sources	356	(8.1)
Hormonal Contraceptives use		
No	3,927	(89.3)
Yes	470	(10.7)

Table 20: Descriptive statistics for the Study Population in Gambia.

Variable	Sample Size n (%)	
Total Sample Size	3,886	(100)
Nutritional status		
Underweight	653	(16.8)
Normal Weight	2,359	(60.7)
Overweight	874	(22.5)
Age		
15-19	940	(24.2)
20-24	797	(20.5)
25-29	665	(17.1)
30-34	567	(14.6)
35-39	389	(10.0)
40-44	299	(7.7)
45-49	229	(5.9)
Ethnicity		
Mandinka/Jahanka	1,348	(34.7)
Wollof	536	(13.8)
Jola/Karoninka	400	(10.3)
Fula/Tukulur/Lorobo	878	(22.6)
Serere	109	(2.8)
Serahuleh	241	(6.2)
Others	190	(4.9)
Non-Gambian	183	(4.7)
Religion		
Other Christians	144	(3.7)
Islam	3,742	(96.3)
Parity		
0	1364	(35.1)
1	497	(12.8)
2	427	(11.0)
3	354	(9.1)
4	303	(7.8)
5	295	(7.6)
6+	645	(16.6)
Marital Status		
Single	1,209	(31.1)
Married	2,456	(63.2)
Formerly Married	222	(5.7)
Residential Setting		
Rural	1,714	(44.1)
Urban	2,172	(55.9)
Region		
Banjul	85	(2.2)
Kanifing	902	(23.2)
Brikama	1,310	(33.7)
Mansakonko	190	(4.9)
Kerewan	443	(11.4)
Kuntaur	194	(5.0)
Janjanbureh	284	(7.3)
Base	478	(12.3)

Table 20: Cont.

Variable	Sample Size n (%)	
Level of Education		
No Education	1,791	(46.1)
Primary	521	(13.4)
Secondary	1,368	(35.2)
Higher	206	(5.3)
Wealth Quintile		
Poorest	645	(16.6)
Poorer	754	(19.4)
Middle	653	(16.8)
Richer	851	(21.9)
Richest	983	(25.3)
Occupation		
Not Working	1,892	(48.7)
Nonmanual	1,053	(27.1)
Manual	89	(2.3)
Agricultural	851	(21.9)
Media Exposure		
Not Exposed	330	(8.5)
Exposed to one media source	968	(24.9)
Exposed to two media sources	1,943	(50.0)
Exposed to three media sources	645	(16.6)
Hormonal Contraceptives use		
No	3,633	(93.5)
Yes	253	(6.5)

Table 21: Descriptive Statistics for the Study Population in Uganda.

Variable	Sample Size n (%)	
Total Sample Size	2,308	(100)
Nutritional status		
Underweight	275	(11.9)
Normal Weight	1,606	(69.6)
Overweight	429	(18.6)
Age		
15-19	586	(25.4)
20-24	372	(16.1)
25-29	406	(17.6)
30-34	275	(11.9)
35-39	291	(12.6)
40-44	194	(8.4)
45-49	185	(8.0)
Ethnicity		
Baganda	411	(17.8)
Banyankole	226	(9.8)
Basoga	185	(8.0)
Bakiga	180	(7.8)
Iteso	164	(7.1)
Others	1142	(49.5)
Religion		
Catholic	972	(42.1)
Other Christians	1,022	(44.3)
Islam	284	(12.3)
Others	30	(1.3)
Parity		
0	655	(28.4)
1	201	(8.7)
2	238	(10.3)
3	217	(9.4)
4	231	(10.0)
5	173	(7.5)
6+	593	(25.7)
Marital Status		
Single	676	(29.3)
Married	1,322	(57.3)
Formerly Married	309	(13.4)
Residential Setting		
Rural	1,807	(78.3)
Urban	501	(21.7)
Region		
Kampala	242	(10.5)
Central 1	245	(10.6)
Central 2	231	(10.0)
East Central	219	(9.5)
Eastern	337	(14.6)
North	192	(8.3)
Karamoja	65	(2.8)
West-Nile	138	(6.0)
Western	332	(14.4)
South West	307	(13.3)

Table 21: Cont.

Variable	Sample Size n (%)	
Level of Education		
No Education	270	(11.7)
Primary	1,376	(59.6)
Secondary	531	(23.0)
Higher	132	(5.7)
Wealth Quintile		
Poorest	379	(16.4)
Poorer	383	(16.6)
Middle	420	(18.2)
Richer	503	(21.8)
Richest	623	(27.0)
Occupation		
Not Working	632	(27.4)
Nonmanual	554	(24.0)
Agricultural	1,122	(48.6)
Media Exposure		
Not Exposed	291	(12.6)
Exposed to one media source	1,013	(43.9)
Exposed to two media sources	619	(26.8)
Exposed to three media sources	385	(16.7)
Hormonal Contraceptives use		
No	1,872	(81.1)
Yes	436	(18.9)

Table 22: Descriptive Statistics for the Study Population in Guinea.

Variable	Sample Size n (%)	
Total Sample Size	4,038	(100)
Nutritional status		
Underweight	497	(12.3)
Normal Weight	2,758	(68.3)
Overweight	783	(19.4)
Age		
15-19	969	(24.0)
20-24	690	(17.1)
25-29	630	(15.6)
30-34	509	(12.6)
35-39	501	(12.4)
40-44	396	(9.8)
45-49	343	(8.5)
Ethnicity		
Soussou	820	(20.3)
Peulh	1,300	(32.2)
Malinké	1,244	(30.8)
Kissi	190	(4.7)
Toma	113	(2.8)
Guerzé	258	(6.4)
Other	113	(2.8)
Religion		
Other Christians	371	(9.2)
Islam	3,477	(86.1)
No Religion	190	(4.7)
Parity		
0	1,094	(27.1)
1	553	(13.7)
2	472	(11.7)
3	359	(8.9)
4	384	(9.5)
5	363	(9.0)
6+	812	(20.1)
Marital Status		
Single	1,078	(26.7)
Married	2,774	(68.7)
Formerly Married	186	(4.6)
Residential Setting		
Rural	2,556	(63.3)
Urban	1,482	(36.7)
Region		
Boké	412	(10.2)
Conakry	852	(21.1)
Faranah	335	(8.3)
Kankan	521	(12.9)
Kindia	557	(13.8)
Labé	363	(9.0)
Mamou	258	(6.4)
N'Zérékoré	739	(18.3)

Table 22: Cont.

Variable	Sample Size n (%)	
Level of Education		
No Education	2,625	(65.0)
Primary	573	(14.2)
Secondary	711	(17.6)
Higher	129	(3.2)
Wealth Quintile		
Poorest	690	(17.1)
Poorer	763	(18.9)
Middle	755	(18.7)
Richer	848	(21.0)
Richest	981	(24.3)
Occupation		
Not Working	1,070	(26.5)
Nonmanual	1,175	(29.1)
Manual	258	(6.4)
Agricultural	1,534	(38.0)
Media Exposure		
Not Exposed	1,175	(29.1)
Exposed to one media source	1,195	(29.6)
Exposed to two media sources	1,333	(33.0)
Exposed to three media sources	335	(8.3)
Hormonal Contraceptives use		
No	3,881	(96.1)
Yes	157	(3.9)

Table 23: Descriptive statistics for the Study Population in Senegal.

Variable	Sample Size n (%)	
Total Sample Size	5,020	(100)
Nutritional status		
Underweight	1,109	(22.1)
Normal Weight	2,841	(56.6)
Overweight	1,069	(21.3)
Age		
15-19	1,195	(23.8)
20-24	974	(19.4)
25-29	813	(16.2)
30-34	648	(12.9)
35-39	532	(10.6)
40-44	502	(10.0)
45-49	356	(7.1)
Ethnicity		
Wolof	2,018	(40.2)
Poular	1,205	(24.0)
Serer	738	(14.7)
Mandingue	186	(3.7)
Diola	216	(4.3)
Soninke	141	(2.8)
Not a Senegalese	126	(2.5)
Others	392	(7.8)
Religion		
Islam	4,774	(95.1)
Other	246	(4.9)
Parity		
0	1,888	(37.6)
1	633	(12.6)
2	527	(10.5)
3	427	(8.5)
4	366	(7.3)
5	326	(6.5)
6+	853	(17.0)
Marital Status		
Single	1,642	(32.7)
Married	3,132	(62.4)
Formerly Married	246	(4.9)
Residential Setting		
Rural	2,480	(49.4)
Urban	2,540	(50.6)

Table 23: Cont.

Variable	Sample Size n (%)	
Region		
Dakar	1,335	(26.6)
Ziguinchor	201	(4.0)
Diourbel	592	(11.8)
Saint-Louis	301	(6.0)
Tambacounda	206	(4.1)
Kaolack	382	(7.6)
Thiès	673	(13.4)
Louga	361	(7.2)
Fatick	236	(4.7)
Kolda	196	(3.9)
Matam	186	(3.7)
Kaffrine	186	(3.7)
Kedougou	35	(0.7)
Sedhiou	131	(2.6)
Level of Education		
No Education	2,791	(55.6)
Primary	1,089	(21.7)
Secondary	1,049	(20.9)
Higher	90	(1.8)
Wealth Quintile		
Poorest	768	(15.3)
Poorer	838	(16.7)
Middle	1,029	(20.5)
Richer	1,130	(22.5)
Richest	1,255	(25.0)
Occupation		
Not Working	2666	(53.1)
Nonmanual	1,822	(36.3)
Manual	85	(1.7)
Agricultural	447	(8.9)
Media Exposure		
Not Exposed	361	(7.2)
Exposed to one media source	1,064	(21.2)
Exposed to two media sources	2,535	(50.5)
Exposed to three media sources	1,059	(21.1)
Hormonal Contraceptives use		
No	4,598	(91.6)
Yes	422	(8.4)

Table 24: Descriptive Statistics for the Study Population in Namibia.

Variable	Sample Size n (%)	
Total Sample Size	3,921	(100)
Nutritional status		
Underweight	549	(14.0)
Normal Weight	2,137	(54.5)
Overweight	1,235	(31.5)
Age		
15-19	823	(21.0)
20-24	753	(19.2)
25-29	612	(15.6)
30-34	514	(13.1)
35-39	498	(12.7)
40-44	392	(10.0)
45-49	329	(8.4)
Religion		
Catholic	772	(19.7)
Other Christians	2,776	(70.8)
Others	329	(8.4)
No Religion	43	(1.1)
Parity		
0	1,274	(32.5)
1	769	(19.6)
2	698	(17.8)
3	478	(12.2)
4	294	(7.5)
5	176	(4.5)
6+	231	(5.9)
Marital Status		
Single	2,368	(60.4)
Married	1,259	(32.1)
Formerly Married	294	(7.5)
Residential Setting		
Rural	1,792	(45.7)
Urban	2,129	(54.3)
Region		
Caprivi	208	(5.3)
Erongo	333	(8.5)
Hardap	149	(3.8)
Karas	157	(4.0)
Kavango	341	(8.7)
Khomas	823	(21.0)
Kunene	110	(2.8)
Ohangwena	412	(10.5)
Omaheke	102	(2.6)
Omusati	388	(9.9)
Oshana	353	(9.0)
Oshikoto	310	(7.9)
Otjozondjupa	235	(6.0)

Table 24: Cont.

Variable	Sample Size n (%)	
Level of Education		
No Education	184	(4.7)
Primary	788	(20.1)
Secondary	2,604	(66.4)
Higher	345	(8.8)
Wealth Quintile		
Poorest	623	(15.9)
Poorer	706	(18.0)
Middle	765	(19.5)
Richer	949	(24.2)
Richest	878	(22.4)
Occupation		
Not Working	2,180	(55.6)
Nonmanual	1,557	(39.7)
Manual	125	(3.2)
Agricultural	59	(1.5)
Media Exposure		
Not Exposed	314	(8.0)
Exposed to one media source	772	(19.7)
Exposed to two media sources	1,243	(31.7)
Exposed to three media sources	1,592	(40.6)
Hormonal Contraceptives use		
No	2,843	(72.5)
Yes	1,078	(27.5)

Table 25: Descriptive Statistics for the Study Population in Congo.

Variable	Sample Size n (%)	
Total Sample Size	4,822	(100)
Nutritional status		
Underweight	694	(14.4)
Normal Weight	2,864	(59.4)
Overweight	1,263	(26.2)
Age		
15-19	1,022	(21.2)
20-24	853	(17.7)
25-29	815	(16.9)
30-34	709	(14.7)
35-39	617	(12.8)
40-44	424	(8.8)
45-49	381	(7.9)
Ethnicity		
Kongo	2,667	(55.3)
Punu	222	(4.6)
Duma	43	(0.9)
Mbéré/Mbéti/Kélé	101	(2.1)
Téké	632	(13.1)
Mbochi	526	(10.9)
Sangha	121	(2.5)
Oubanguiens	39	(0.8)
Pygmée	29	(0.6)
Etranger	391	(8.1)
Others	53	(1.1)
Religion		
Catholic	1,524	(31.6)
Other Christians	2,831	(58.7)
Islam	53	(1.1)
Traditionalists	227	(4.7)
Other	29	(0.6)
No Religion	159	(3.3)
Parity		
0	1,133	(23.5)
1	767	(15.9)
2	815	(16.9)
3	694	(14.4)
4	501	(10.4)
5	328	(6.8)
6+	583	(12.1)
Marital Status		
Single	1,297	(26.9)
Married	2,676	(55.5)
Formerly Married	849	(17.6)
Residential Setting		
Rural	1,533	(31.8)
Urban	3,289	(68.2)

Table 25: Cont.

Variable	Sample Size n (%)	
Region		
Kouilou	130	(2.7)
Niari	246	(5.1)
Lekoumou	87	(1.8)
Bouenza	530	(11.0)
Pool	280	(5.8)
Plateaux	140	(2.9)
Cuvette	149	(3.1)
Cuvette - Ouest	58	(1.2)
Sangha	77	(1.6)
Likouala	193	(4.0)
Brazzaville	1,606	(33.3)
Pointe-noire	1,326	(27.5)
Level of Education		
No Education	265	(5.5)
Primary	1,186	(24.6)
Secondary	3,139	(65.1)
Higher	231	(4.8)
Wealth Quintile		
Poorest	810	(16.8)
Poorer	979	(20.3)
Middle	1,032	(21.4)
Richer	964	(20.0)
Richest	1,037	(21.5)
Occupation		
Not Working	1,639	(34.0)
Nonmanual	1,967	(40.8)
Manual	236	(4.9)
Agricultural	935	(19.4)
Other	43	(0.9)
Media Exposure		
Not Exposed	1,259	(26.1)
Exposed to one media source	1,331	(27.6)
Exposed to two media sources	1,379	(28.6)
Exposed to three media sources	853	(17.7)
Hormonal Contraceptives use		
No	4,576	(94.9)
Yes	246	(5.1)

Table 26: Descriptive Statistics for the Study Population in Nigeria.

Variable	Sample Size n (%)	
Total Sample Size	32,078	(100)
Nutritional status		
Underweight	3,689	(11.5)
Normal Weight	20,466	(63.8)
Overweight	7,923	(24.7)
Age		
15-19	6,833	(21.3)
20-24	5,229	(16.3)
25-29	5,357	(16.7)
30-34	4,202	(13.1)
35-39	3,914	(12.2)
40-44	3,240	(10.1)
45-49	3,304	(10.3)
Ethnicity		
Ekoi	32	(0.1)
Fulani	1,989	(6.2)
Hausa	8,372	(26.1)
Ibibio	770	(2.4)
Igala	321	(1.0)
Igbo	4,876	(15.2)
Ijaw/Izon	642	(2.0)
Kanuri/Beriberi	577	(1.8)
Tiv	642	(2.0)
Yoruba	4,812	(15.0)
Others	9,046	(28.2)
Religion		
Other Christians	12,061	(37.6)
Catholics	3,721	(11.6)
Islam	16,007	(49.9)
Traditionalists	289	(0.9)
Parity		
0	10,105	(31.5)
1	3,272	(10.2)
2	3,079	(9.6)
3	3,047	(9.5)
4	2,983	(9.3)
5	2,598	(8.1)
6+	6,993	(21.8)
Marital Status		
Single	8,950	(27.9)
Married	21,460	(66.9)
Formerly Married	1,668	(5.2)
Residential Setting		
Rural	18,060	(56.3)
Urban	14,018	(43.7)

Table 26: Cont.

Variable	Sample Size n (%)	
Region		
Sokoto	866	(2.7)
Zamfara	1.026	(3.2)
Katsina	1,155	(3.6)
Jigawa	1,091	(3.4)
Yobe	770	(2.4)
Borno	1,123	(3.5)
Adamawa	642	(2.0)
Gombe	417	(1.3)
Bauchi	866	(2.7)
Kano	2,598	(8.1)
Kaduna	1,604	(5.0)
Kebbi	962	(3.0)
Niger	1,123	(3.5)
Fct-Abuja	289	(0.9)
Nasarawa	481	(1.5)
Plateau	545	(1.7)
Taraba	706	(2.2)
Benue	994	(3.1)
Kogi	609	(1.9)
Kwara	545	(1.7)
Oyo	1,315	(4.1)
Osun	706	(2.2)
Ekiti	289	(0.9)
Ondo	706	(2.2)
Edo	674	(2.1)
Anambra	898	(2.8)
Enugu	834	(2.6)
Ebonyi	962	(3.0)
Cross River	609	(1.9)
Akwa Ibom	770	(2.4)
Abia	449	(1.4)
Imo	738	(2.3)
Rivers	1,091	(3.4)
Bayelsa	289	(0.9)
Delta	866	(2.7)
Lagos	1,732	(5.4)
Ogun	738	(2.3)
Level of Education		
No Education	11,484	(35.8)
Primary	5,517	(17.2)
Secondary	11,965	(37.3)
Higher	3,112	(9.7)
Wealth Quintile		
Poorest	5,485	(17.1)
Poorer	5,870	(18.3)
Middle	6,223	(19.4)
Richer	6,768	(21.1)
Richest	7,731	(24.1)

Table 26: Cont.

Variable	Sample Size n (%)
Occupation	
Not Working	11,805 (36.8)
Nonmanual	14,211 (44.3)
Manual	2,855 (8.9)
Agricultural	3,176 (9.9)
Others	32 (0.1)
Media Exposure	
Not Exposed	8,565 (26.7)
Exposed to one media source	6,833 (21.3)
Exposed to two media sources	10,201 (31.8)
Exposed to three media sources	6,480 (20.2)
Hormonal Contraceptives use	
No	30,314 (94.5)
Yes	1,764 (5.5)

Table 27: Descriptive Statistics for the Study Population in Zambia

Variable	Sample Size n (%)	
Total Sample Size	14,129	(100)
Nutritional status		
Underweight	1,455	(10.3)
Normal Weight	9,424	(66.7)
Overweight	3,250	(23.0)
Age		
15-19	3,221	(22.8)
20-24	2,458	(17.4)
25-29	2,303	(16.3)
30-34	2,049	(14.5)
35-39	1,766	(12.5)
40-44	1,356	(9.6)
45-49	975	(6.9)
Ethnicity		
Bemba	3,447	(24.4)
Tonga	1,950	(13.8)
Chewa	1,046	(7.4)
Lozi	819	(5.8)
Nsenga	763	(5.4)
Tumbuka	706	(5.0)
Ngoni	622	(4.4)
Lala	438	(3.1)
Kaonde	353	(2.5)
Namwanga	438	(3.1)
Mambwe	410	(2.9)
Lunda(North-Western)	283	(2.0)
Luvale	325	(2.3)
Others	2,529	(17.9)
Religion		
Catholic	2,600	(18.4)
Other Christians	11,374	(80.5)
Islam	85	(0.6)
Other	71	(0.5)
Parity		
0	3,561	(25.2)
1	1,936	(13.7)
2	1,794	(12.7)
3	1,597	(11.3)
4	1,342	(9.5)
5	1,116	(7.9)
6+	2,783	(19.7)
Marital Status		
Single	4,253	(30.1)
Married	8,054	(57.0)
Formerly Married	1,823	(12.9)

Table 27: Cont.

Variable	Sample Size n (%)	
Residential Setting		
Rural	7,404	(52.4)
Urban	6,725	(47.6)
Region		
Central	1,257	(8.9)
Copperbelt	2,487	(17.6)
Eastern	1,653	(11.7)
Luapula	933	(6.6)
Lusaka	2,896	(20.5)
Muchinga	735	(5.2)
Northern	989	(7.0)
North Western	608	(4.3)
Southern	1,724	(12.2)
Western	848	(6.0)
Level of Education		
No Education	1,116	(7.9)
Primary	6,542	(46.3)
Secondary	5,736	(40.6)
Higher	735	(5.2)
Wealth Quintile		
Poorest	2,360	(16.7)
Poorer	2,374	(16.8)
Middle	2,642	(18.7)
Richer	3,052	(21.6)
Richest	3,702	(26.2)
Occupation		
Not Working	6,796	(48.1)
Nonmanual	3,546	(25.1)
Manual	170	(1.2)
Agricultural	3,419	(24.2)
Other	198	(1.4)
Media Exposure		
Not Exposed	3,405	(24.1)
Exposed to one media source	3,914	(27.7)
Exposed to two media sources	3,716	(26.3)
Exposed to three media sources	3,094	(21.9)
Hormonal Contraceptives use		
No	9,989	(70.7)
Yes	4,140	(29.3)

Table 28: Descriptive Statistics for the Study Population in Sierra Leone.

Variable	Sample Size n (%)	
Sample Size	6,971	(100)
Nutritional status		
Underweight	641	(9.2)
Normal Weight	5,047	(72.4)
Overweight	1,283	(18.4)
Age		
15-19	1,555	(22.3)
20-24	1,087	(15.6)
25-29	1,150	(16.5)
30-34	941	(13.5)
35-39	997	(14.3)
40-44	606	(8.7)
45-49	634	(9.1)
Ethnicity		
Creole	77	(1.1)
Fullah	230	(3.3)
Kono	293	(4.2)
Limba	432	(6.2)
Loko	230	(3.3)
Mandigo	174	(2.5)
Mende	2,307	(33.1)
Sherbro	174	(2.5)
Temne	2,489	(35.7)
Koranko	195	(2.8)
Others	369	(5.3)
Religion		
Other Christians	1,506	(21.6)
Islam	5,451	(78.2)
Other	14	(0.2)
Parity		
0	1,743	(25.0)
1	941	(13.5)
2	857	(12.3)
3	753	(10.8)
4	753	(10.8)
5	641	(9.2)
6+	1,283	(18.4)
Marital Status		
Single	2,036	(29.2)
Married	4,434	(63.6)
Formerly Married	502	(7.2)
Residential Setting		
Rural	4,392	(63.0)
Urban	2,579	(37.0)
Region		
Eastern	1,471	(21.1)
Northern	2,642	(37.9)
Southern	1,443	(20.7)
Western	1,415	(20.3)

Table 28: Cont.

Variable	Sample Size n (%)	
Level of Education		
No Education	3,834	(55.0)
Primary	955	(13.7)
Secondary	1,952	(28.0)
Higher	230	(3.3)
Wealth Quintile		
Poorest	1,234	(17.7)
Poorer	1,283	(18.4)
Middle	1,331	(19.1)
Richer	1,387	(19.9)
Richest	1,736	(24.9)
Occupation		
Not Working	1,980	(28.4)
Nonmanual	383	(5.5)
Manual	1,903	(27.3)
Agricultural	2,705	(38.8)
Media Exposure		
Not Exposed	2,363	(33.9)
Exposed to one media source	3,046	(43.7)
Exposed to two media sources	1,074	(15.4)
Exposed to three media sources	488	(7.0)
Hormonal Contraceptives use		
No	5556	(79.7)
Yes	1415	(20.3)

Table 29: Descriptive statistics for the Study Population in Mozambique.

Variable	Sample Size n (%)	
Total Sample Size	11,617	(100)
Nutritional status		
Underweight	999	(8.6)
Normal Weight	8,713	(75.0)
Overweight	1,905	(16.4)
Age		
15-19	2,591	(22.3)
20-24	1,917	(16.5)
25-29	1,859	(16.0)
30-34	1,626	(14.0)
35-39	1,464	(12.6)
40-44	1,080	(9.3)
45-49	1,080	(9.3)
Ethnicity		
Emakhuwa	2,416	(20.8)
Português	1,104	(9.5)
Xichangana	1,626	(14.0)
Cisena	1,150	(9.9)
Elomwe	871	(7.5)
Echuwabo	732	(6.3)
Cinyanja	883	(7.6)
Cindau	569	(4.9)
Xitswa	488	(4.2)
Cinyungwe	372	(3.2)
Ciyao	256	(2.2)
Others	1,150	(9.9)
Religion		
Catholic	3,415	(29.4)
Other Christians	4,891	(42.1)
Islam	1,975	(17.0)
Other	256	(2.2)
No Religion	1,080	(9.3)
Parity		
0	2,602	(22.4)
1	1,801	(15.5)
2	1,603	(13.8)
3	1,382	(11.9)
4	1,255	(10.8)
5	918	(7.9)
6+	2,056	(17.7)
Marital Status		
Single	2,335	(20.1)
Married	7,551	(65.0)
Formerly Married	1,731	(14.9)
Residential Setting		
Rural	7,458	(64.2)
Urban	4,159	(35.8)

Table 29: Cont.

Variable	Sample Size n (%)	
Region		
Niassa	534	(4.6)
Cabo Delgado	836	(7.2)
Nampula	1,580	(13.6)
Zambezia	2,068	(17.8)
Tete	1,336	(11.5)
Manica	802	(6.9)
Sofala	1,220	(10.5)
Inhambane	755	(6.5)
Gaza	720	(6.2)
Maputo Provincia	953	(8.2)
Maputo Cidade	813	(7.0)
Level of Education		
No Education	3,590	(30.9)
Primary	5,762	(49.6)
Secondary	2,091	(18.0)
Higher	174	(1.5)
Wealth Quintile		
Poorest	2,103	(18.1)
Poorer	2,091	(18.0)
Middle	2,161	(18.6)
Richer	2,358	(20.3)
Richest	2,904	(25.0)
Occupation		
Not Working	6,145	(52.9)
Nonmanual	1,928	(16.6)
Manual	128	(1.1)
Agricultural	3,415	(29.4)
Media Exposure		
Not Exposed	3,288	(28.3)
Exposed to one media source	4,531	(39.0)
Exposed to two media sources	2,451	(21.1)
Exposed to three media sources	1,348	(11.6)
Hormonal Contraceptives use		
No	10,455	(90.0)
Yes	1.162	(10.0)

Table 30: Descriptive statistics for the Study Population in Malawi.

Variable	Sample Size n (%)	
Sample Size	7,179	(100)
Nutritional status		
Underweight	517	(7.2)
Normal Weight	5,176	(72.1)
Overweight	1,486	(20.7)
Age		
15-19	1,543	(21.5)
20-24	1,407	(19.6)
25-29	1,149	(16.0)
30-34	1,084	(15.1)
35-39	847	(11.8)
40-44	646	(9.0)
45-49	503	(7.0)
Ethnicity		
Chewa	2,462	(34.3)
Tombuka	646	(9.0)
Lomwe	1,436	(20.0)
Tonga	122	(1.7)
Yao	969	(13.5)
Sena	244	(3.4)
Nkhonde	65	(0.9)
Ngoni	840	(11.7)
Mang'anja	194	(2.7)
Nyanja	79	(1.1)
Others	122	(1.7)
Religion		
Catholic	1,299	(18.1)
Other Christians	4,946	(68.9)
Islam	890	(12.4)
Other	7	(0.1)
No Religion	36	(0.5)
Parity		
0	1,608	(22.4)
1	1,041	(14.5)
2	1,055	(14.7)
3	948	(13.2)
4	768	(10.7)
5	632	(8.8)
6+	1,127	(15.7)
Marital Status		
Single	1,622	(22.6)
Married	4,551	(63.4)
Formerly Married	1,005	(14.0)
Residential Setting		
Rural	5,851	(81.5)
Urban	1,328	(18.5)
Region		
Northern	818	(11.4)
Central	3,044	(42.4)
Southern	3,317	(46.2)

Table 30: Cont.

Variable	Sample Size n (%)	
Level of Education		
No Education	883	(12.3)
Primary	4,365	(60.8)
Secondary	1,701	(23.7)
Higher	230	(3.2)
Wealth Quintile		
Poorest	1,328	(18.5)
Poorer	1,386	(19.3)
Middle	1,357	(18.9)
Richer	1,371	(19.1)
Richest	1,737	(24.2)
Occupation		
Not Working	2,290	(31.9)
Nonmanual	948	(13.2)
Manual	1,084	(15.1)
Agricultural	2,857	(39.8)
Media Exposure		
Not Exposed	3,152	(43.9)
Exposed to one media source	2,125	(29.6)
Exposed to two media sources	1,228	(17.1)
Exposed to three media sources	675	(9.4)
Hormonal Contraceptives use		
No	4,530	(63.1)
Yes	2,649	(36.9)

Table 31: Descriptive statistics for the Study Population in Ivory Coast.

Variable	Sample Size n (%)	
Sample Size	4,057	(100)
Nutritional status		
Underweight	316	(7.8)
Normal Weight	2,698	(66.5)
Overweight	1,043	(25.7)
Age		
15-19	876	(21.6)
20-24	759	(18.7)
25-29	722	(17.8)
30-34	548	(13.5)
35-39	471	(11.6)
40-44	361	(8.9)
45-49	321	(7.9)
Ethnicity		
Akan	1,266	(31.2)
Krou	430	(10.6)
Mandé du nord	519	(12.8)
Mandé du sud	369	(9.1)
Voltaïque/Gur	609	(15.0)
Autres nationalités	864	(21.3)
Religion		
Catholic	755	(18.6)
Other Christians	1,067	(26.3)
Islam	1,639	(40.4)
Traditionalist	89	(2.2)
Other	53	(1.3)
No Religion	454	(11.2)
Parity		
0	1,124	(27.7)
1	621	(15.3)
2	540	(13.3)
3	442	(10.9)
4	337	(8.3)
5	316	(7.8)
6+	678	(16.7)
Marital Status		
Single	1,335	(32.9)
Married	2,418	(59.6)
Formerly Married	304	(7.5)
Residential Setting		
Rural	1,972	(48.6)
Urban	2,085	(51.4)

Table 31: Cont.

Variable	Sample Size n (%)	
Region		
Centre	272	(6.7)
Centre-Est	110	(2.7)
Centre-Nord	329	(8.1)
Centre-Ouest	552	(13.6)
Nord	207	(5.1)
Nord-Est	166	(4.1)
Nord-Ouest	166	(4.1)
Ouest	475	(11.7)
Sud sans Abidjan	527	(13.0)
Sud-Ouest	312	(7.7)
Ville d'Abidjan	941	(23.2)
Level of Education		
No Education	2,170	(53.5)
Primary	1,018	(25.1)
Secondary	771	(19.0)
Higher	97	(2.4)
Wealth Quintile		
Poorest	690	(17.0)
Poorer	730	(18.0)
Middle	779	(19.2)
Richer	856	(21.1)
Richest	1,002	(24.7)
Occupation		
Not Working	1,160	(28.6)
Nonmanual	1,740	(42.9)
Manual	231	(5.7)
Agricultural	925	(22.8)
Media Exposure		
Not Exposed	1,091	(26.9)
Exposed to one media source	1,245	(30.7)
Exposed to two media sources	1,116	(27.5)
Exposed to three media sources	604	(14.9)
Hormonal Contraceptives use		
No	3,684	(90.8)
Yes	373	(9.2)

Table 32: Descriptive Statistics for the Study Population in Rwanda.

Variable	Sample Size n (%)	
Sample Size	5,995	(100)
Nutritional status		
Underweight	402	(6.7)
Normal Weight	4,358	(72.7)
Overweight	1,235	(20.6)
Age		
15-19	1,349	(22.5)
20-24	1,061	(17.7)
25-29	977	(16.3)
30-34	863	(14.4)
35-39	695	(11.6)
40-44	570	(9.5)
45-49	480	(8.0)
Religion		
Catholic	2,410	(40.2)
Other Christians	3,447	(57.5)
Islam	120	(2.0)
No Religion	18	(0.3)
Parity		
0	2,206	(36.8)
1	791	(13.2)
2	743	(12.4)
3	594	(9.9)
4	498	(8.3)
5	426	(7.1)
6+	737	(12.3)
Marital Status		
Single	2,482	(41.4)
Married	2,848	(47.5)
Formerly Married	665	(11.1)
Residential Setting		
Rural	4,802	(80.1)
Urban	1,193	(19.9)
Region		
Kigali city	797	(13.3)
South	1,445	(24.1)
West	1.307	(21.8)
North	1,001	(16.7)
East	1,445	(24.1)
Level of Education		
No Education	719	(12.0)
Primary	3,855	(64.3)
Secondary	1,271	(21.2)
Higher	150	(2.5)
Wealth Quintile		
Poorest	1,169	(19.5)
Poorer	1,181	(19.7)
Middle	1,127	(18.8)
Richer	1,115	(18.6)
Richest	1,403	(23.4)

Table 32: Cont.

Variable	Sample Size n (%)	
Occupation		
Not Working	917	(15.3)
Nonmanual	971	(16.2)
Manual	234	(3.9)
Agricultural	3,873	(64.6)
Media Exposure		
Not Exposed	833	(13.9)
Exposed to one media source	2,236	(37.3)
Exposed to two media sources	1,834	(30.6)
Exposed to three media sources	1,091	(18.2)
Hormonal Contraceptives use		
No	4,448	(74.2)
Yes	1,547	(25.8)

Table 33: Descriptive Statistics for the Study Population in Liberia.

Variable	Sample Size n (%)	
Sample Size	3,998	(100)
Nutritional status		
Underweight	300	(7.5)
Normal Weight	2,639	(66.0)
Overweight	1,059	(26.5)
Age		
15-19	864	(21.6)
20-24	720	(18.0)
25-29	676	(16.9)
30-34	496	(12.4)
35-39	508	(12.7)
40-44	396	(9.9)
45-49	340	(8.5)
Ethnicity		
Bassa	452	(11.3)
Gio	276	(6.9)
Gola	148	(3.7)
Grebo	332	(8.3)
Kissi	136	(3.4)
Kpelle	1,003	(25.1)
Krahn	116	(2.9)
Kru	272	(6.8)
Lorma	188	(4.7)
Mano	320	(8.0)
Vai	196	(4.9)
Others	560	(14.0)
Religion		
Other Christians	3,454	(86.4)
Islam	448	(11.2)
No Religion	96	(2.4)
Parity		
0	884	(22.1)
1	684	(17.1)
2	584	(14.6)
3	440	(11.0)
4	352	(8.8)
5	304	(7.6)
6+	752	(18.8)
Marital Status		
Single	1,323	(33.1)
Married	2,231	(55.8)
Formerly Married	444	(11.1)
Residential Setting		
Rural	1,567	(39.2)
Urban	2,431	(60.8)
Region		
North Western	360	(9.0)
South Central	2,123	(53.1)
South Eastern A	204	(5.1)
South Eastern B	252	(6.3)
North Central	1,059	(26.5)

Table 33: Cont.

Variable	Sample Size n (%)	
Level of Education		
No Education	1,327	(33.2)
Primary	1,159	(29.0)
Secondary	1,383	(34.6)
Higher	128	(3.2)
Wealth Quintile		
Poorest	692	(17.3)
Poorer	716	(17.9)
Middle	704	(17.6)
Richer	956	(23.9)
Richest	932	(23.3)
Occupation		
Not Working	1,687	(42.2)
Nonmanual	1,211	(30.3)
Manual	104	(2.6)
Agricultural	940	(23.5)
Others	56	(1.4)
Media Exposure		
Not Exposed	872	(21.8)
Exposed to one media source	1,431	(35.8)
Exposed to two media sources	1,051	(26.3)
Exposed to three media sources	644	(16.1)
Hormonal Contraceptives use		
No	3,142	(78.6)
Yes	856	(21.4)

Table 34: Descriptive Statistics for the Study Population in Benin.

Variable	Sample Size n (%)	
Sample Size	14,060	(100)
Nutritional status		
Underweight	886	(6.3)
Normal Weight	9,392	(66.8)
Overweight	3,782	(26.9)
Age		
15-19	2,643	(18.8)
20-24	2,278	(16.2)
25-29	2,503	(17.8)
30-34	2,179	(15.5)
35-39	1,884	(13.4)
40-44	1,504	(10.7)
45-49	1,069	(7.6)
Ethnicity		
Adja	2,207	(15.7)
Bariba	1,195	(8.5)
Dendi	436	(3.1)
Fon	6,468	(46.0)
Yoa	408	(2.9)
Betamaribe	858	(6.1)
Peulh	436	(3.1)
Yoruba	1,772	(12.6)
Other Béninois	56	(0.4)
Other Nationalities	225	(1.6)
Religion		
Catholic	4,710	(33.5)
Other Christians	3,529	(25.1)
Islam	3,093	(22.0)
Traditionalists	1,772	(12.6)
Other	267	(1.9)
No Religion	689	(4.9)
Parity		
0	3,726	(26.5)
1	1,715	(12.2)
2	1,870	(13.3)
3	1,772	(12.6)
4	1,603	(11.4)
5	1,195	(8.5)
6+	2,179	(15.5)
Marital Status		
Single	3,698	(26.3)
Married	9,491	(67.5)
Formerly Married	872	(6.2)
Residential Setting		
Rural	7,466	(53.1)
Urban	6,594	(46.9)

Table 34: Cont.

Variable	Sample Size n (%)	
Region		
Alibori	703	(5.0)
Atacora	1,153	(8.2)
Atlantique	1,758	(12.5)
Borgou	1,012	(7.2)
Collines	942	(6.7)
Couffo	970	(6.9)
Donga	576	(4.1)
Littoral	2,221	(15.8)
Mono	787	(5.6)
Ouémé	1.687	(12.0)
Plateau	984	(7.0)
Zou	1,265	(9.0)
Level of Education		
No Education	8,211	(58.4)
Primary	2,475	(17.6)
Secondary	3,107	(22.1)
Higher	267	(1.9)
Wealth Quintile		
Poorest	2,362	(16.8)
Poorer	2,531	(18.0)
Middle	2,615	(18.6)
Richer	3,051	(21.7)
Richest	3,501	(24.9)
Occupation		
Not Working	5,329	(37.9)
Nonmanual	5,202	(37.0)
Manual	830	(5.9)
Agricultural	1,997	(14.2)
Others	703	(5.0)
Media Exposure		
Not Exposed	4,063	(28.9)
Exposed to one media source	3,698	(26.3)
Exposed to two media sources	4,499	(32.0)
Exposed to three media sources	1,800	(12.8)
Hormonal Contraceptives use		
No	13,455	(95.7)
Yes	605	(4.3)

Table 35: Descriptive Statistics for the Study Population in Kenya.

Variable	Sample Size n (%)	
Total Sample Size	12,967	(100)
Nutritional status		
Underweight	1,167	(9.0)
Normal Weight	7,547	(58.2)
Overweight	4,253	(32.8)
Age		
15-19	2,451	(18.9)
20-24	2,230	(17.2)
25-29	2,516	(19.4)
30-34	1,893	(14.6)
35-39	1,647	(12.7)
40-44	1,219	(9.4)
45-49	1,011	(7.8)
Ethnicity		
Embu	130	(1.0)
Kalenjin	1,595	(12.3)
Kamba	1,504	(11.6)
Kikuyu	2,749	(21.2)
Kisii	791	(6.1)
Luhya	2,049	(15.8)
Luo	1,375	(10.6)
Maasai	246	(1.9)
Meru	765	(5.9)
Mijikenda/Swahili	674	(5.2)
Somali	272	(2.1)
Taita/Taveta	117	(0.9)
Turkana	156	(1.2)
Samburu	52	(0.4)
Other	493	(3.8)
Religion		
Catholic	2,593	(20.0)
Other Christians	9,362	(72.2)
Islam	765	(5.9)
Others	39	(0.3)
No Religion	207	(1.6)
Parity		
0	3,410	(26.3)
1	1,971	(15.2)
2	2,075	(16.0)
3	1,712	(13.2)
4	1,297	(10.0)
5	882	(6.8)
6+	1,621	(12.5)
Marital Status		
Single	3,955	(30.5)
Married	7,469	(57.6)
Formerly Married	1,543	(11.9)

Table 35: Cont.

Variable	Sample Size n (%)	
Residential Setting		
Rural	7,780	(60.0)
Urban	5,187	(40.0)
Region		
Coast	1,245	(9.6)
North Eastern	233	(1.8)
Eastern	1,893	(14.6)
Central	1,673	(12.9)
Rift Valley	3,307	(25.5)
Western	1,413	(10.9)
Nyanza	1,699	(13.1)
Nairobi	1,504	(11.6)
Level of Education		
No Education	843	(6.5)
Primary	6,509	(50.2)
Secondary	4,227	(32.6)
Higher	1,387	(10.7)
Wealth Quintile		
Poorest	1,906	(14.7)
Poorer	2,308	(17.8)
Middle	2,580	(19.9)
Richer	2,775	(21.4)
Richest	3,397	(26.2)
Occupation		
Not Working	4,357	(33.6)
Nonmanual	4,940	(38.1)
Manual	934	(7.2)
Agricultural	2,736	(21.1)
Media Exposure		
Not Exposed	1,504	(11.6)
Exposed to one media source	3,786	(29.2)
Exposed to two media sources	4,240	(32.7)
Exposed to three media sources	3,436	(26.5)
Hormonal Contraceptives use		
No	8,454	(65.2)
Yes	4,513	(34.8)

Table 36: Descriptive statistics for the Study Population in Sao Tome and Principe.

Variable	Sample Size n (%)	
Sample Size	2,078	(100)
Nutritional status		
Underweight	160	(7.7)
Normal Weight	1,226	(59.0)
Overweight	692	(33.3)
Age		
15-19	453	(21.8)
20-24	347	(16.7)
25-29	330	(15.9)
30-34	310	(14.9)
35-39	204	(9.8)
40-44	247	(11.9)
45-49	187	(9.0)
Religion		
Catholic	1,459	(70.2)
Other Christians	301	(14.5)
Other	102	(4.9)
No Religion	216	(10.4)
Parity		
0	544	(26.2)
1	274	(13.2)
2	291	(14.0)
3	276	(13.3)
4	220	(10.6)
5	160	(7.7)
6+	312	(15.0)
Marital Status		
Single	524	(25.2)
Married	1,299	(62.5)
Formerly Married	256	(12.3)
Region		
Região Centro	1,216	(58.5)
Região Sul	305	(14.7)
Região Norte	449	(21.6)
Região do Príncipe	108	(5.2)
Residential Setting		
Rural	756	(36.4)
Urban	1,322	(63.6)
Level of Education		
No Education	125	(6.0)
Primary	1,189	(57.2)
Secondary	765	(36.8)
Wealth Quintile		
Poorest	362	(17.4)
Poorer	387	(18.6)
Middle	349	(16.8)
Richer	455	(21.9)
Richest	526	(25.3)

Table 36: Cont.

Variable	Sample Size n (%)	
Occupation		
Not Working	860	(41.4)
Nonmanual	1,056	(50.8)
Manual	162	(7.8)
Media Exposure		
Not Exposed	77	(3.7)
Exposed to one media source	87	(4.2)
Exposed to two media sources	794	(38.2)
Exposed to three media sources	1,120	(53.9)
Hormonal Contraceptives use		
No	1,644	(79.1)
Yes	434	(20.9)

Table 37: Descriptive Statistics for the Study Population in Togo.

Variable	Sample Size n (%)	
Sample Size	4,238	(100)
Nutritional status		
Underweight	297	(7.0)
Normal Weight	2,640	(62.3)
Overweight	1,301	(30.7)
Age		
15-19	831	(19.6)
20-24	729	(17.2)
25-29	661	(15.6)
30-34	585	(13.8)
35-39	576	(13.6)
40-44	470	(11.1)
45-49	386	(9.1)
Ethnicity		
Adja-Ewé/Mina	1,784	(42.1)
Kabye/Tem	1,110	(26.2)
Akposso/Akebou	174	(4.1)
Ana-Ife	123	(2.9)
Para-Gourma/Akan	737	(17 .4)
Other Togolese	68	(1.6)
Stranger	242	(5.7)
Religion		
Other Christians	2,623	(61.9)
Islam	716	(16.9)
Traditionalist	602	(14.2)
No Religion	297	(7.0)
Parity		
0	1,259	(29.7)
1	615	(14.5)
2	538	(12.7)
3	487	(11.5)
4	407	(9.6)
5	301	(7.1)
6+	631	(14.9)
Marital Status		
Single	1,263	(29.8)
Married	2,649	(62.5)
Formerly Married	326	(7.7)
Residential Setting		
Rural	2,263	(53.4)
Urban	1,975	(46.6)
Region		
Grande Agglomération de Lomé	1,322	(31.2)
Maritime (Sans Agglomération de Lomé)	661	(15.6)
Plateaux	915	(21.6)
Centrale	403	(9.5)
Kara	470	(11.1)
Savenes	466	(11.0)

Table 37: Cont.

Variable	Sample Size n (%)	
Level of Education		
No Education	1,280	(30.2)
Primary	1,441	(34.0)
Secondary	1373	(32.4)
Higher	144	(3.4)
Wealth Quintile		
Poorest	708	(16.7)
Poorer	665	(15.7)
Middle	767	(18.1)
Richer	1,004	(23.7)
Richest	1,093	(25.8)
Occupation		
Not Working	1,144	(27.0)
Nonmanual	1,831	(43.2)
Manual	483	(11.4)
Agricultural	780	(18.4)
Media Exposure		
Not Exposed	1,144	(27.0)
Exposed to one media source	1,301	(30.7)
Exposed to two media sources	1,322	(31.2)
Exposed to three media sources	470	(11.1)
Hormonal Contraceptives use		
No	3,746	(88.4)
Yes	492	(11.6)

Table 38: Descriptive statistics for the Study Population in Cameroon.

Variable	Sample Size n (%)	
Sample Size	6,813	(100)
Nutritional status		
Underweight	470	(6.9)
Normal Weight	4,156	(61.0)
Overweight	2,187	(32.1)
Age		
15-19	1,669	(24.5)
20-24	1,308	(19.2)
25-29	1,145	(16.8)
30-34	804	(11.8)
35-39	736	(10.8)
40-44	572	(8.4)
45-49	579	(8.5)
Ethnicity		
Arabes-Choa/Peulh/Haoussa/Kanuri	579	(8.5)
Biu-Mandara	899	(13.2)
Adamaoua-Oubangui	620	(9.1)
Bantoïde Sud-Ouest	89	(1.3)
Grassfields	1,022	(15.0)
Bamilike/Bamoun	1,703	(25.0)
Côtier/Ngoe/Oroko	293	(4.3)
Beti/Bassa/Mbam	1,254	(18.4)
Kako/Meka/Pygmé	191	(2.8)
Stranger/Others	164	(2.4)
Religion		
Catholic	2,541	(37.3)
Other Christians	2,569	(37.7)
Islam	1,301	(19.1)
Traditionalist	184	(2.7)
Others	82	(1.2)
No Religion	136	(2.0)
Parity		
0	2,119	(31.1)
1	940	(13.8)
2	838	(12.3)
3	681	(10.0)
4	559	(8.2)
5	477	(7.0)
6+	1,199	(17.6)
Marital Status		
Single	2,092	(30.7)
Married	4,095	(60.1)
Formerly Married	627	(9.2)

Table 38: Cont.

Variable	Sample Size n (%)	
Residential Setting		
Rural	3,025	(44.4)
Urban	3,788	(55.6)
Region		
Adamaoua	334	(4.9)
Centre (sans Yaoundé)	463	(6.8)
Douala	824	(12.1)
Est	266	(3.9)
Extrême-Nord	1,036	(15.2)
Littoral (sans Douala)	286	(4.2)
Nord	640	(9.4)
Nord-Ouest	722	(10.6)
Ouest	749	(11.0)
Sud	184	(2.7)
Sud-Ouest	518	(7.6)
Yaoundé	790	(11.6)
Level of Education		
No Education	1,213	(17.8)
Primary	2,330	(34.2)
Secondary	2,868	(42.1)
Higher	402	(5.9)
Wealth Quintile		
Poorest	1,015	(14.9)
Poorer	1,158	(17.0)
Middle	1,274	(18.7)
Richer	1,642	(24.1)
Richest	1,724	(25.3)
Occupation		
Not Working	2,112	(31.0)
Nonmanual	2,119	(31.1)
Manual	831	(12.2)
Agricultural	1,751	(25.7)
Media Exposure		
Not Exposed	1,676	(24.6)
Exposed to one media source	1,587	(23.3)
Exposed to two media sources	2,044	(30.0)
Exposed to three media sources	1,506	(22.1)
Hormonal Contraceptives use		
No	6,459	(94.8)
Yes	354	(5.2)

Table 39: Descriptive statistics for study population in Comoros.

Variable	Sample Size n (%)	
Total Sample Size	4,479	(100)
Nutritional status		
Underweight	318	(7.1)
Normal Weight	2,562	(57.2)
Overweight	1,599	(35.7)
Age		
15-19	1,178	(26.3)
20-24	806	(18.0)
25-29	690	(15.4)
30-34	596	(13.3)
35-39	529	(11.8)
40-44	412	(9.2)
45-49	269	(6.0)
Parity		
0	2,145	(47.9)
1	394	(8.8)
2	385	(8.6)
3	376	(8.4)
4	331	(7.4)
5	237	(5.3)
6+	609	(13.6)
Marital Status		
Single	1,608	(35.9)
Married	2,558	(57.1)
Formerly Married	314	(7.0)
Residential Setting		
Rural	2,938	(65.6)
Urban	1,541	(34.4)
Region		
Ngazidja	2,159	(48.2)
Mwali	269	(6.0)
Ndzuwani	2,051	(45.8)
Level of Education		
No Education	1,380	(30.8)
Primary	833	(18.6)
Secondary	1,841	(41.1)
Higher	426	(9.5)
Wealth Quintile		
Poorest	708	(15.8)
Poorer	882	(19.7)
Middle	941	(21.0)
Richer	950	(21.2)
Richest	999	(22.3)
Occupation		
Not Working	2,737	(61.1)
Nonmanual	873	(19.5)
Manual	434	(9.7)
Agricultural	434	(9.7)

Table 39: Cont.

Variable	Sample Size n (%)	
Media Exposure		
Not Exposed	815	(18.2)
Exposed to one media source	1,026	(22.9)
Exposed to two media sources	1,774	(39.6)
Exposed to three media sources	864	(19.3)
Hormonal Contraceptives use		
No	4,143	(92.5)
Yes	336	(7.5)

Table 40: Descriptive statistics for the Study Population in Tanzania.

Variable	Sample Size n (%)	
Sample Size	11,535	(100)
Nutritional status		
Underweight	1,096	(9.5)
Normal Weight	7,152	(62.0)
Overweight	3,287	(28.5)
Age		
15-19	2,549	(22.1)
20-24	2,042	(17.7)
25-29	1,742	(15.1)
30-34	1,488	(12.9)
35-39	1,442	(12.5)
40-44	1,292	(11.2)
45-49	980	(8.5)
Parity		
0	3,045	(26.4)
1	1,776	(15.4)
2	1,569	(13.6)
3	1,292	(11.2)
4	1,073	(9.3)
5	865	(7.5)
6+	1,915	(16.6)
Marital Status		
Single	3,161	(27.4)
Married	6,806	(59.0)
Formerly Married	1,569	(13.6)
Residential Setting		
Rural	7,256	(62.9)
Urban	4,279	(37.1)
Level of Education		
No Education	1,638	(14.2)
Primary	7,094	(61.5)
Secondary	2,642	(22.9)
Higher	161	(1.4)

Table 40: Cont.

Variable	Sample Size n (%)	
Region		
Dodoma	496	(4.3)
Arusha	450	(3.9)
Kilimanjaro	335	(2.9)
Tanga	623	(5.4)
Morogoro	577	(5.0)
Pwani	254	(2.2)
Dar es salaam	1,384	(12.0)
Lindi	265	(2.3)
Mtwara	381	(3.3)
Ruvuma	323	(2.8)
Iringa	219	(1.9)
Mbeya	715	(6.2)
Singida	311	(2.7)
Tabora	588	(5.1)
Rukwa	242	(2.1)
Kigoma	473	(4.1)
Shinyanga	415	(3.6)
Kagera	542	(4.7)
Mwanza	715	(6.2)
Mara	427	(3.7)
Manyara	335	(2.9)
Njombe	185	(1.6)
Katavi	104	(0.9)
Simiyu	415	(3.6)
geita	404	(3.5)
Kaskazini Unguja	46	(0.4)
Kusini Unguja	35	(0.3)
Mjini Magharibi	185	(1.6)
Kaskazini Pemba	46	(0.4)
Kusini Pemba	46	(0.4)
Wealth Quintile		
Poorest	1,823	(15.8)
Poorer	1,938	(16.8)
Middle	2,030	(17.6)
Richer	2,492	(21.6)
Richest	3,253	(28.2)
Occupation		
Not Working	2,665	(23.1)
Nonmanual	1,615	(14.0)
Manual	2,353	(20.4)
Agricultural	4,902	(42.5)
Media Exposure		
Not Exposed	1,661	(14.4)
Exposed to one media source	2,930	(25.4)
Exposed to two media sources	3,380	(29.3)
Exposed to three media sources	3,564	(30.9)
Hormonal Contraceptives use		
No	8,963	(77.7)
Yes	2,572	(22.3)

Table 41: Descriptive Statistics for the Study Population in Zimbabwe.

Variable	Sample Size n (%)	
Sample Size	8,721	(100)
Nutritional status		
Underweight	541	(6.2)
Normal Weight	5,145	(59.0)
Overweight	3,035	(34.8)
Age		
15-19	1,980	(22.7)
20-24	1,404	(16.1)
25-29	1,395	(16.0)
30-34	1,378	(15.8)
35-39	1,108	(12.7)
40-44	916	(10.5)
45-49	541	(6.2)
Religion		
Catholic	602	(6.9)
Other Christians	7,622	(87.4)
Islam	26	(0.3)
Traditionalists	52	(0.6)
No Religion	419	(4.8)
Parity		
0	2,390	(27.4)
1	1,282	(14.7)
2	1,544	(17.7)
3	1,456	(16.7)
4	985	(11.3)
5	523	(6.0)
6+	541	(6.2)
Marital Status		
Single	2,381	(27.3)
Married	5,137	(58.9)
Formerly Married	1,203	(13.8)
Residential Setting		
Rural	5,381	(61.7)
Urban	3,340	(38.3)
Region		
Manicaland	1,099	(12.6)
Mashonaland Central	759	(8.7)
Mashonaland East	846	(9.7)
Mashonaland West	1,020	(11.7)
Matabeleland North	419	(4.8)
Matabeleland South	366	(4.2)
Midlands	1,099	(12.6)
Masvingo	1,047	(12.0)
Harare	1,552	(17.8)
Bulawayo	515	(5.9)
Level of Education		
No Education	105	(1.2)
Primary	2,250	(25.8)
Secondary	5,730	(65.7)
Higher	637	(7.3)

Table 41: Cont.

Variable	Sample Size n (%)	
Wealth Quintile		
Poorest	1,474	(16.9)
Poorer	1,474	(16.9)
Middle	1,570	(18.0)
Richer	1,980	(22.7)
Richest	2,224	(25.5)
Occupation		
Not Working	4,247	(48.7)
Nonmanual	3,305	(37.9)
Manual	253	(2.9)
Agricultural	820	(9.4)
Others	96	(1.1)
Media Exposure		
Not Exposed	2,058	(23.6)
Exposed to one media source	2,398	(27.5)
Exposed to two media sources	2,363	(27.1)
Exposed to three media sources	1,901	(21.8)
Hormonal Contraceptives use		
No	4,718	(54.1)
Yes	4,003	(45.9)

Table 42: Descriptive Statistics for the Study Population in Gabon.

Variable	Sample Size n (%)	
Total Sample Size	4,213	(100)
Nutritional status	333	(7.9)
Underweight	2,157	(51.2)
Normal Weight	1,723	(40.9)
Overweight		
Age		
15-19	948	(22.5)
20-24	750	(17.8)
25-29	653	(15.5)
30-34	594	(14.1)
35-39	510	(12.1)
40-44	417	(9.9)
45-49	341	(8.1)
Ethnicity		
Shira-Punu/Vili	994	(23.6)
Fang	1,222	(29.0)
Kota-Kele	286	(6.8)
Mbede-Teke	354	(8.4)
Myene	303	(7.2)
Nzabi-Duma	598	(14.2)
Okande-Tsogho	105	(2.5)
Pygmee	21	(0.5)
Other	329	(7.8)
Religion		
Catholic	1,786	(42.4)
Other Christians	2,132	(50.6)
Others	72	(1.7)
No Religion	223	(5.3)
Parity		
0	1192	(28.3)
1	809	(19.2)
2	632	(15.0)
3	447	(10.6)
4	362	(8.6)
5	206	(4.9)
6+	565	(13.4)
Marital Status		
Single	1,622	(38.5)
Married	2,052	(48.7)
Formerly Married	539	(12.8)
Residential Setting		
Rural	543	(12.9)
Urban	3,670	(87.1)

Table 42: Cont.

Variable	Sample Size n (%)	
Region		
Estuaire	472	(11.2)
Libreville-Port-Gentil	2,313	(54.9)
Haut-Ogooué	409	(9.7)
Moyen-Ogooué	135	(3.2)
Ngounié	265	(6.3)
Nyanga	105	(2.5)
Ogooué Maritime	46	(1.1)
Ogooué-Ivindo	139	(3.3)
Ogooué-Lolo	143	(3.4)
Woleu-N'tem	185	(4.4)
Level of Education		
No Education	55	(1.3)
Primary	944	(22.4)
Secondary	2,802	(66.5)
Higher	413	(9.8)
Wealth Quintile		
Poorest	674	(16.0)
Poorer	784	(18.6)
Middle	923	(21.9)
Richer	817	(19.4)
Richest	1,015	(24.1)
Occupation		
Not Working	2,212	(52.5)
Nonmanual	1,584	(37.6)
Manual	185	(4.4)
Agricultural	232	(5.5)
Media Exposure		
Not Exposed	177	(4.2)
Exposed to one media source	881	(20.9)
Exposed to two media sources	1,496	(35.5)
Exposed to three media sources	1,660	(39.4)
Hormonal Contraceptives use		
No	4,036	(95.8)
Yes	177	(4.2)

Table 43: Descriptive statistics for the Study Population in Ghana.

Variable	Sample Size n (%)	
Total Sample Size	4,238	(100)
Nutritional status		
Underweight	263	(6.2)
Normal Weight	2,276	(53.7)
Overweight	1,699	(40.1)
Age		
15-19	780	(18.4)
20-24	699	(16.5)
25-29	674	(15.9)
30-34	602	(14.2)
35-39	576	(13.6)
40-44	492	(11.6)
45-49	415	(9.8)
Ethnicity		
Akan	2,170	(51.2)
Ga/Dangme	335	(7.9)
Ewe	559	(13.2)
Guan	106	(2.5)
Mole-Dagbani	593	(14.0)
Grusi	119	(2.8)
Gurma	242	(5.7)
Mande	34	(0.8)
Others	81	(1.9)
Religion		
Catholics	445	(10.5)
Other Christians	2,971	(70.1)
Islam	636	(15.0)
Traditionalist	89	(2.1)
No Religion	97	(2.3)
Parity		
0	1,382	(32.6)
1	555	(13.1)
2	559	(13.2)
3	504	(11.9)
4	411	(9.7)
5	314	(7.4)
6+	513	(12.1)
Marital Status		
Single	1,458	(34.4)
Married	2,293	(54.1)
Formerly Married	487	(11.5)
Residential Setting		
Rural	1907	(45.0)
Urban	2331	(55.0)

Table 43: Cont.

Variable	Sample Size n (%)	
Region		
Western	500	(11.8)
Central	428	(10.1)
Greater Accra	877	(20.7)
Volta	322	(7.6)
Eastern	373	(8.8)
Ashanti	767	(18.1)
Brong Ahafo	348	(8.2)
Northern	364	(8.6)
Upper East	161	(3.8)
Upper West	97	(2.3)
Level of Education		
No Education	797	(18.8)
Primary	771	(18.2)
Secondary	2,420	(57.1)
Higher	250	(5.9)
Wealth Quintile		
Poorest	699	(16.5)
Poorer	720	(17.0)
Middle	882	(20.8)
Richer	954	(22.5)
Richest	983	(23.2)
Occupation		
Not Working	987	(23.3)
Nonmanual	1,924	(45.4)
Manual	542	(12.8)
Agricultural	784	(18.5)
Media Exposure		
Not Exposed	318	(7.5)
Exposed to one media source	949	(22.4)
Exposed to two media sources	2,272	(53.6)
Exposed to three media sources	699	(16.5)
Hormonal Contraceptives use		
No	3,585	(84.6)
Yes	653	(15.4)

Table 44: Descriptive statistics for study population in Lesotho.

Variable	Sample Size n (%)	
Total Sample Size	3,157	(100)
Nutritional status		
Underweight	136	(4.3)
Normal Weight	1,620	(51.3)
Overweight	1,402	(44.4)
Age		
15-19	695	(22.0)
20-24	603	(19.1)
25-29	515	(16.3)
30-34	455	(14.4)
35-39	344	(10.9)
40-44	290	(9.2)
45-49	256	(8.1)
Religion		
Catholic	1,250	(39.6)
Other Christians	1,856	(58.8)
Other	51	(1.6)
Parity		
0	957	(30.3)
1	691	(21.9)
2	606	(19.2)
3	388	(12.3)
4	230	(7.3)
5	139	(4.4)
6+	145	(4.6)
Marital Status		
Single	1,070	(33.9)
Married	1,667	(52.8)
Formerly Married	420	(13.3)
Residential Setting		
Rural	2,039	(64.6)
Urban	1,118	(35.4)
Region		
Maseru	859	(27.2)
Botha-Bothe	186	(5.9)
Leribe	502	(15.9)
Berea	420	(13.3)
Mafeteng	268	(8.5)
Mohale's Hoek	268	(8.5)
Quthing	161	(5.1)
Qacha's-Nek	95	(3.0)
Mokhotlong	167	(5.3)
Thaba Tseka	230	(7.3)
Level of Education		
No Education	35	(1.1)
Primary	1,241	(39.3)
Secondary	1,635	(51.8)
Higher	246	(7.8)

Table 44: Cont.

Variable	Sample Size n (%)	
Wealth Quintile		
Poorest	445	(14.1)
Poorer	524	(16.6)
Middle	597	(18.9)
Richer	758	(24.0)
Richest	833	(26.4)
Media Exposure		
Not Exposed	537	(17.0)
Exposed to one media source	1,017	(32.2)
Exposed to two media sources	947	(30.0)
Exposed to three media sources	657	(20.8)
Hormonal Contraceptives use		
No	2,254	(71.4)
Yes	903	(28.6)

Table 45: Descriptive Statistics for the Study Population in Swaziland.

Variable	Sample Size n (%)	
Sample Size	4,402	(100)
Nutritional status		
Underweight	141	(3.2)
Normal Weight	2,034	(46.2)
Overweight	2,227	(50.6)
Age		
15-19	1,145	(26.0)
20-24	867	(19.7)
25-29	625	(14.2)
30-34	550	(12.5)
35-39	445	(10.1)
40-44	405	(9.2)
45-49	365	(8.3)
Religion		
Catholic	211	(4.8)
Other Christians	4,001	(90.9)
Traditionalists	18	(0.4)
No Religion	172	(3.9)
Parity		
0	1,351	(30.7)
1	814	(18.5)
2	643	(14.6)
3	475	(10.8)
4	321	(7.3)
5	242	(5.5)
6+	555	(12.6)
Marital Status		
Single	2,227	(50.6)
Married	1,770	(40.2)
Formerly Married	405	(9.2)
Residential Setting		
Rural	3,253	(73.9)
Urban	1,149	(26.1)
Region		
Hhohho	1,171	(26.6)
Manzini	1,461	(33.2)
Shiselweni	929	(21.1)
Lubombo	841	(19.1)
Level of Education		
No Education	352	(8.0)
Primary	1,431	(32.5)
Secondary	2,289	(52.0)
Higher	330	(7.5)
Wealth Quintile		
Poorest	687	(15.6)
Poorer	744	(16.9)
Middle	867	(19.7)
Richer	995	(22.6)
Richest	1,109	(25.2)

Table 45: Cont.

Variable	Sample Size n (%)	
Occupation		
Not Working	2,483	(56.4)
Nonmanual	1,448	(32.9)
Manual	299	(6.8)
Agricultural	172	(3.9)
Media Exposure		
Not Exposed	409	(9.3)
Exposed to one media source	1,052	(23.9)
Exposed to two media sources	1,576	(35.8)
Exposed to three media sources	1,365	(31.0)
Hormonal Contraceptives use		
No	3,561	(80.9)
Yes	841	(19.1)

Appendix D: Random forest results for all the 34 countries in SSA

Variables to the right of the dashed line are the most influential correlates for nutritional status. Correlates are ranked on the y-axis from top to bottom based on the relative importance score.

Figure 7: Variable importance dot plot for Madagascar.

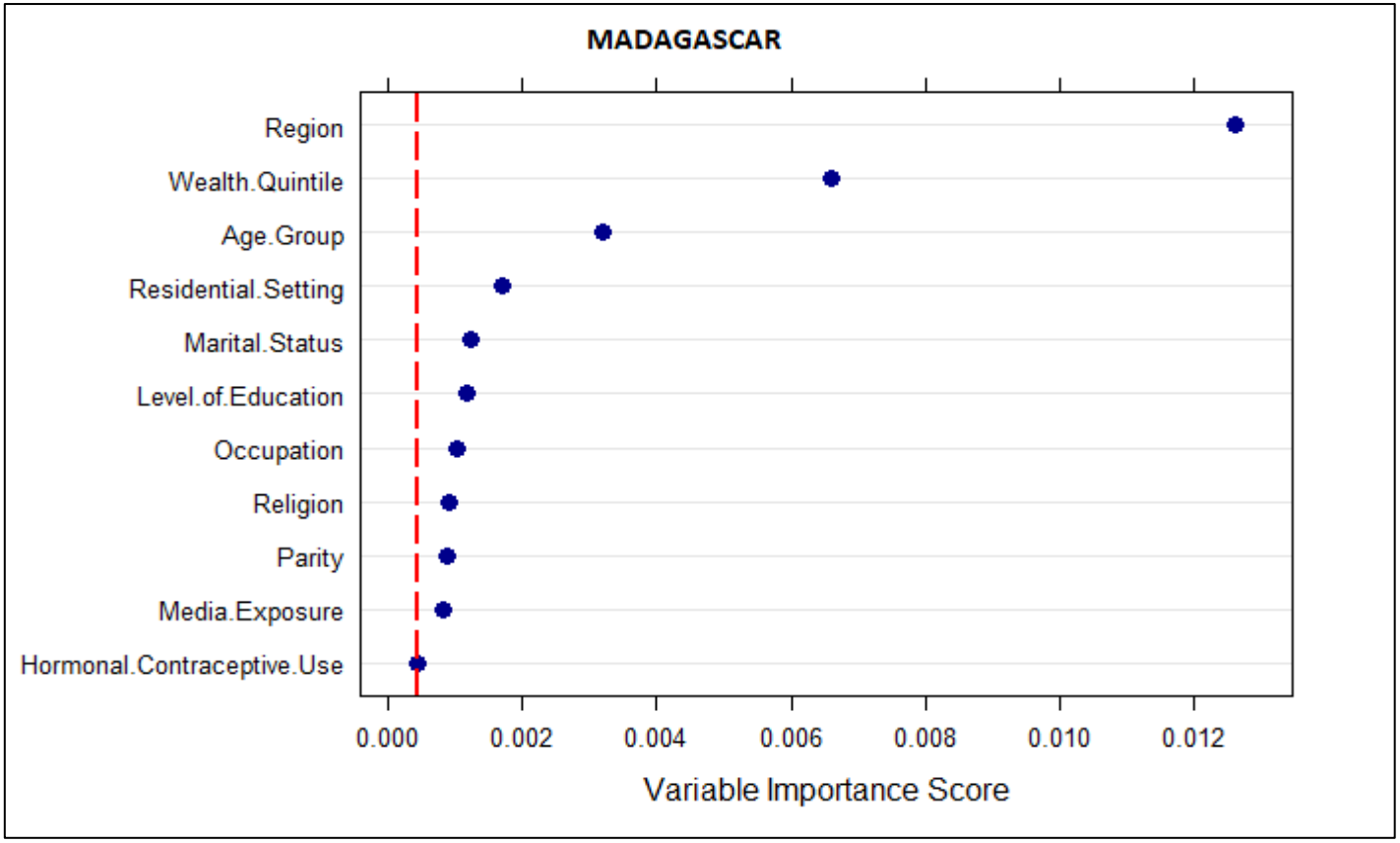


Figure 8: Variable importance dot plot for Ethiopia.

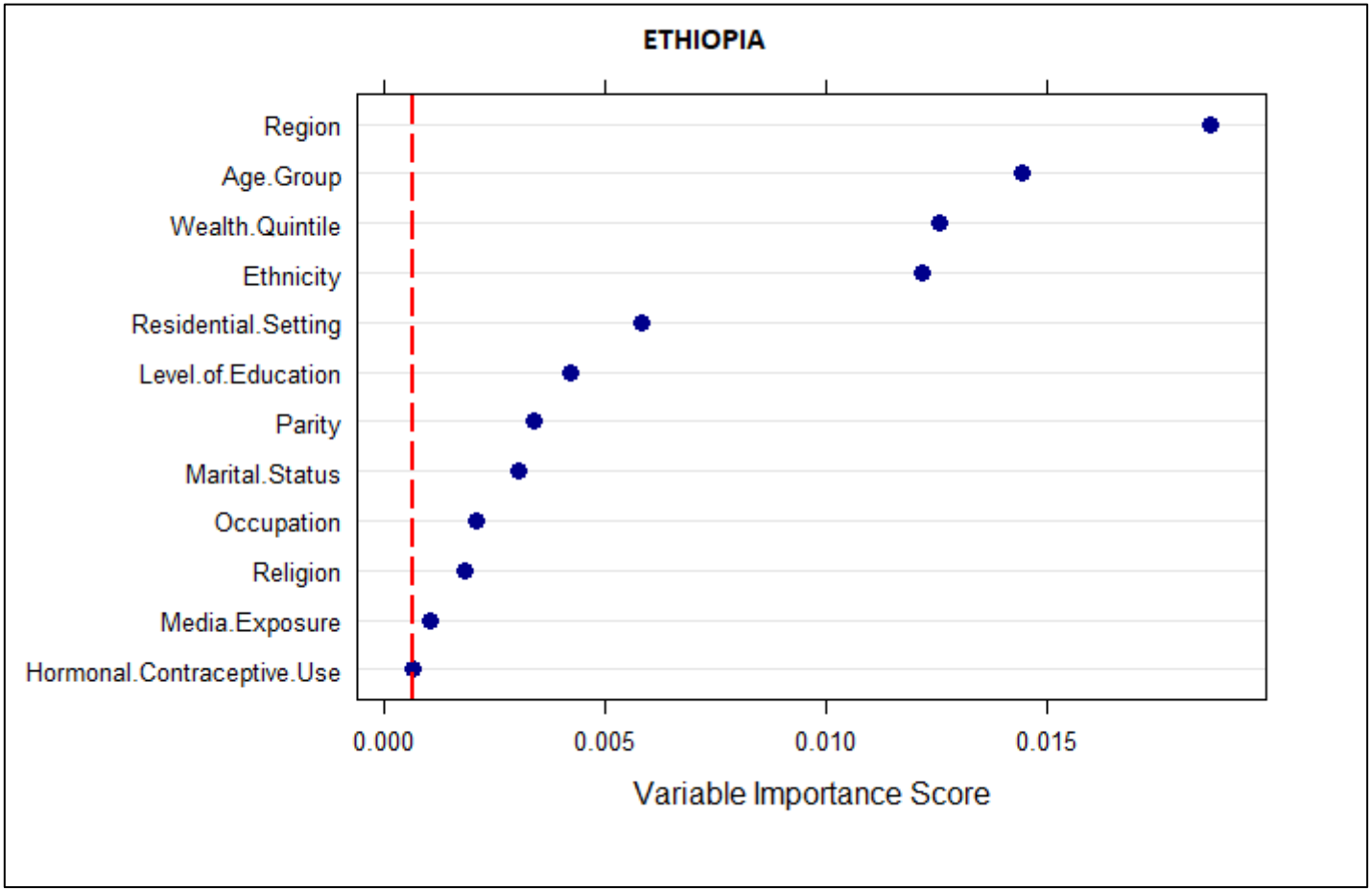


Figure 9: Variable importance dot plot for Burundi.

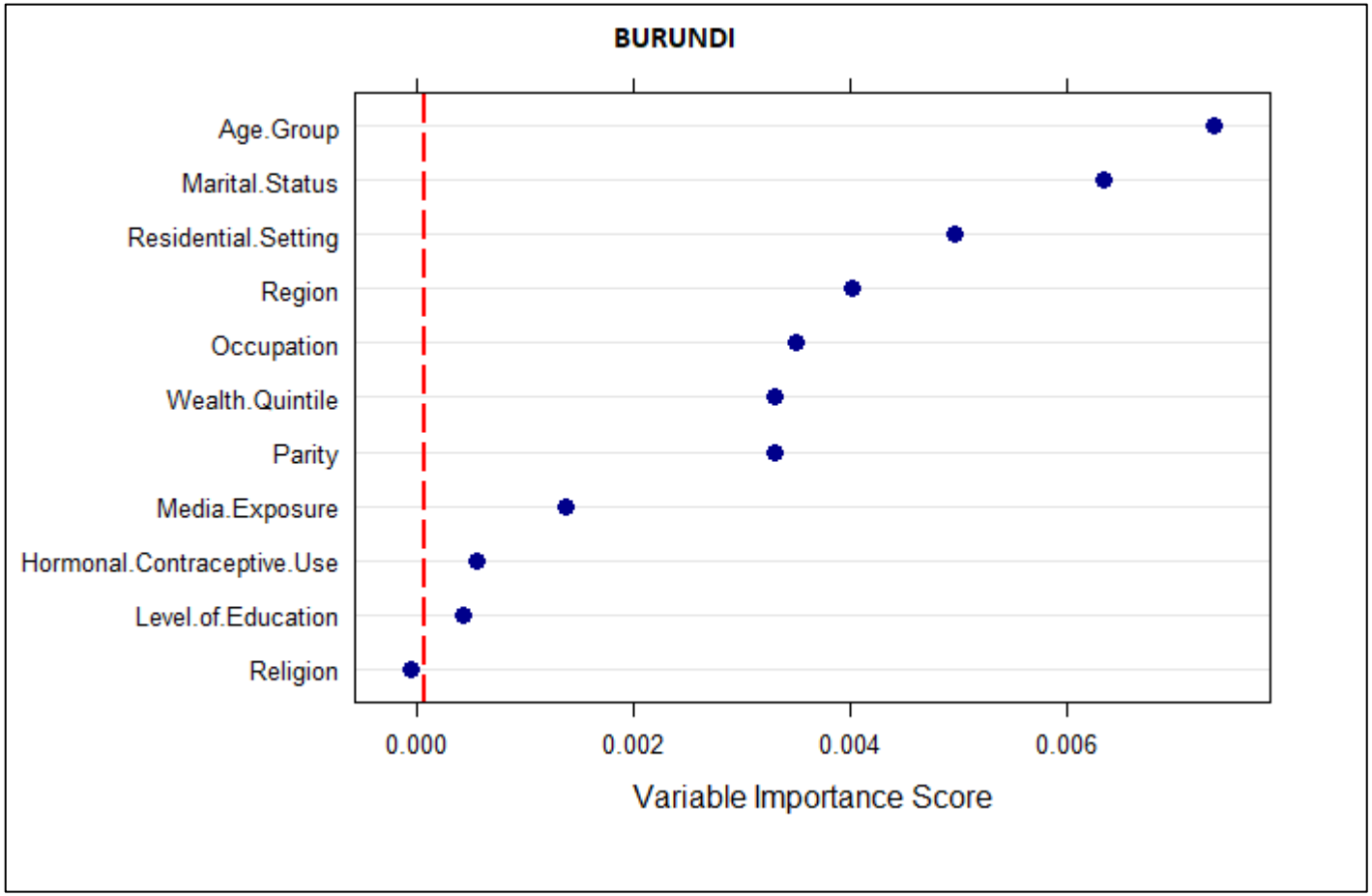


Figure 10: Variable importance dot plot for Burkina Faso.

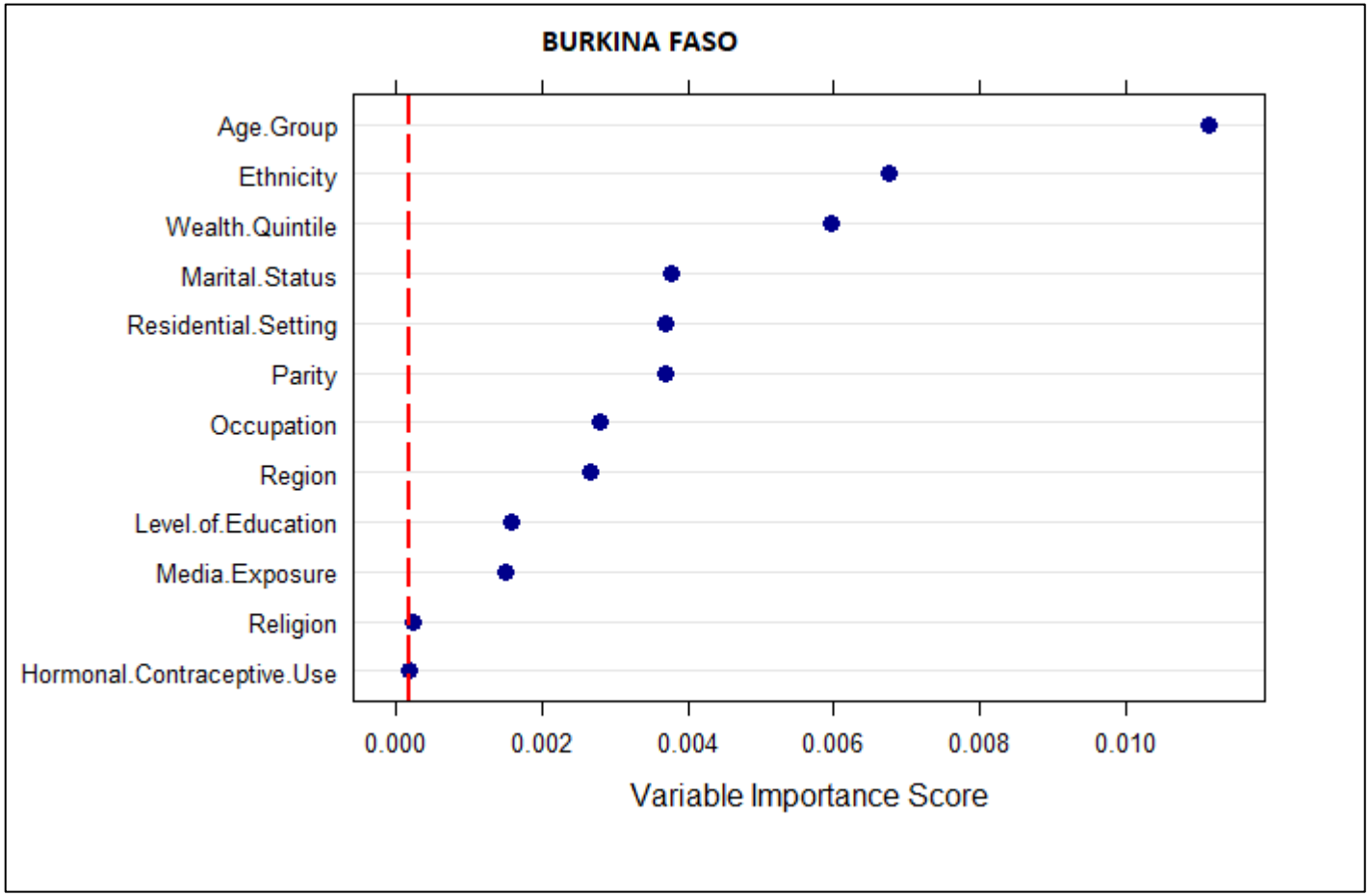


Figure 11: Variable importance dot plot for Chad.

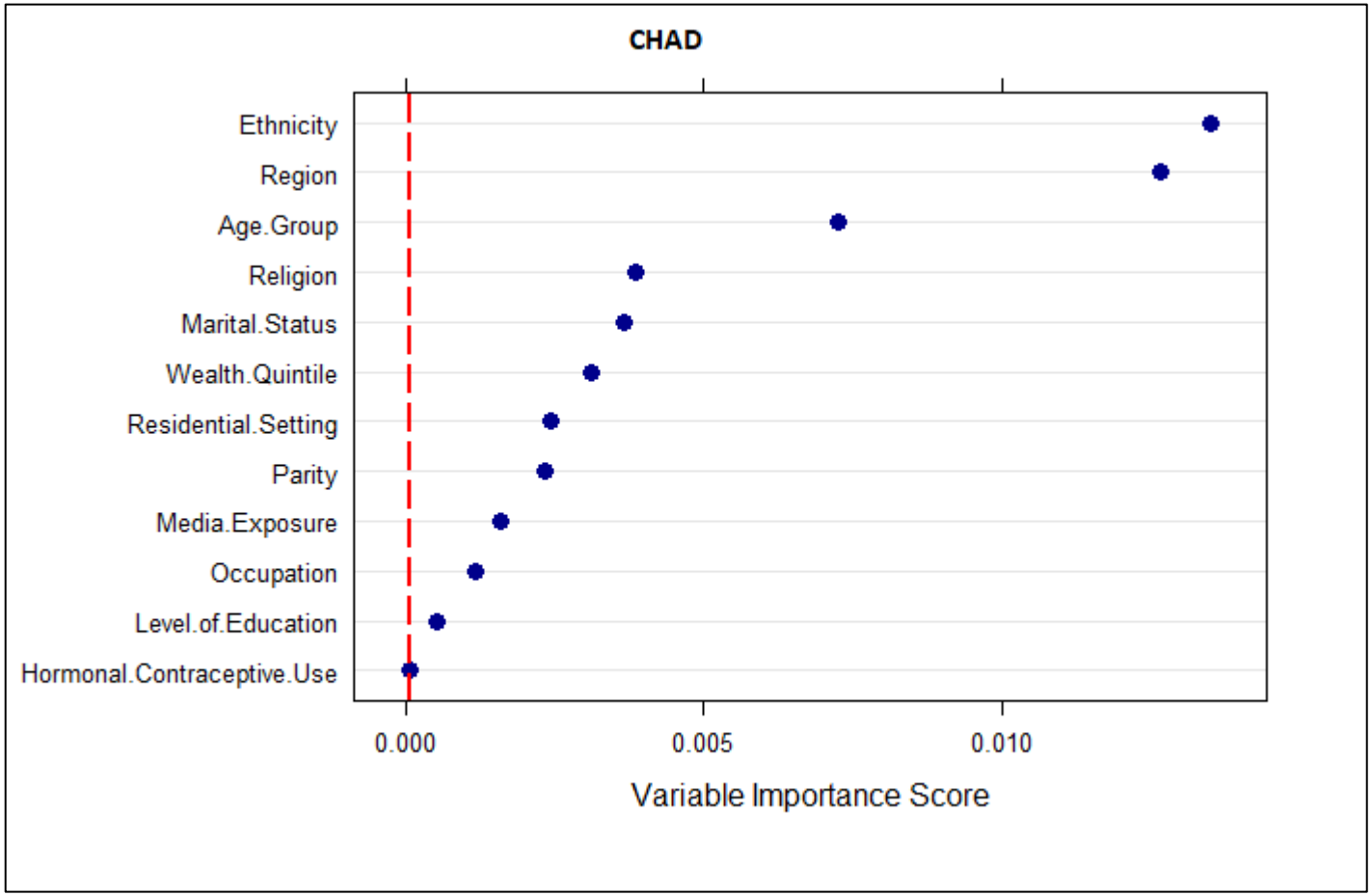


Figure 12: Variable importance dot plot for Democratic Republic of Congo.

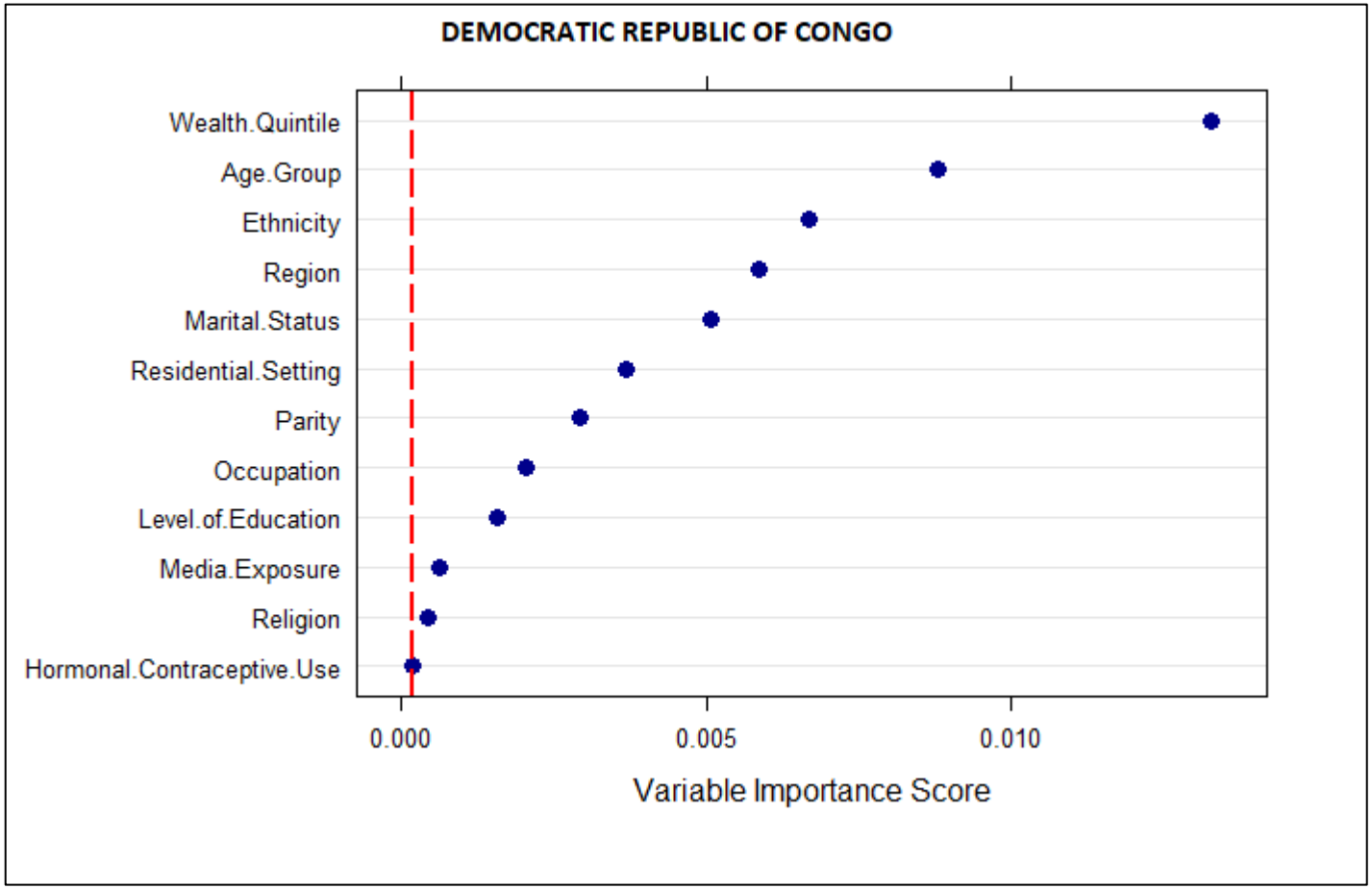


Figure 13: Variable importance dot plot for Niger.

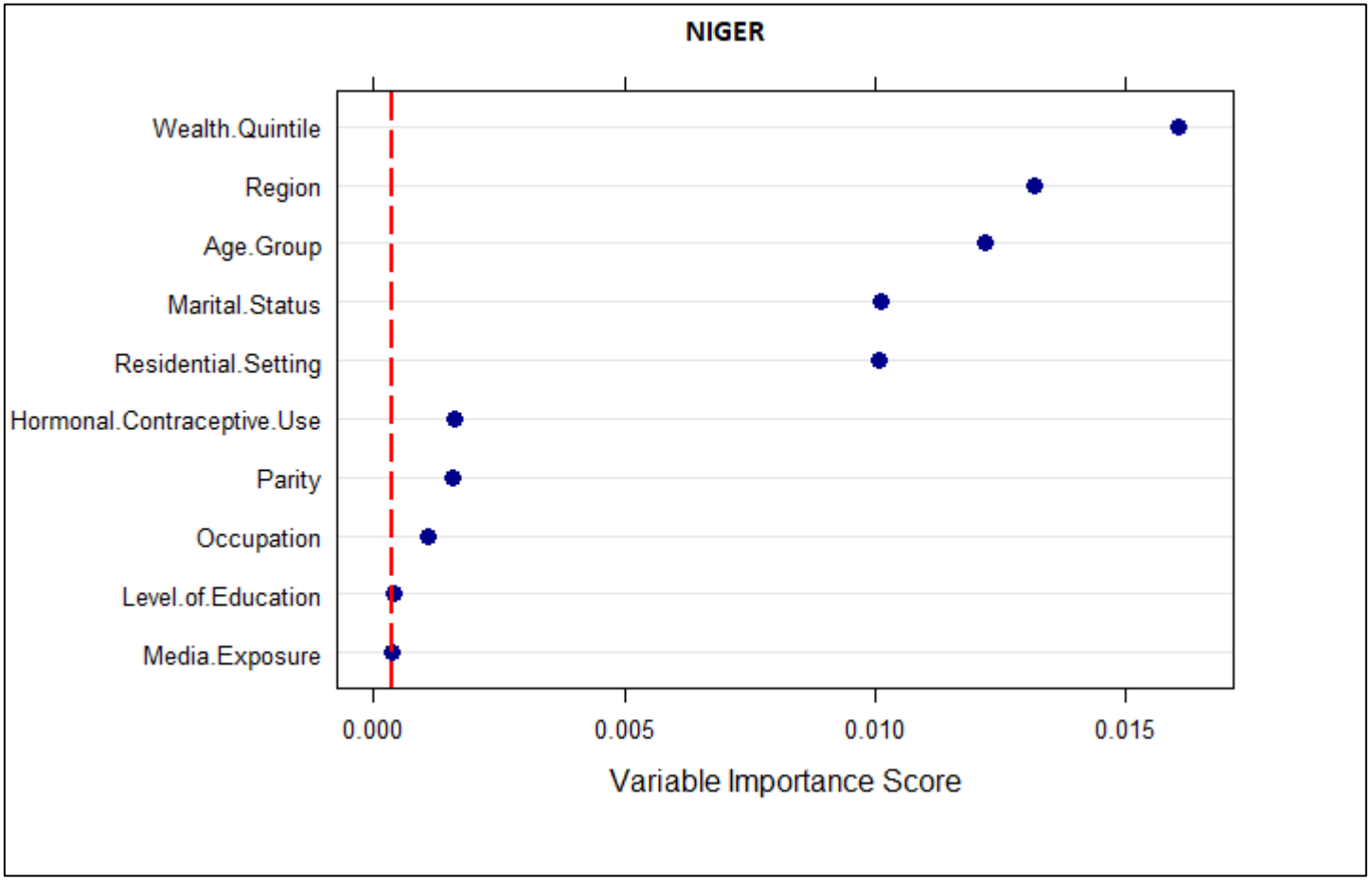


Figure 14: Variable importance dot plot for Mali.

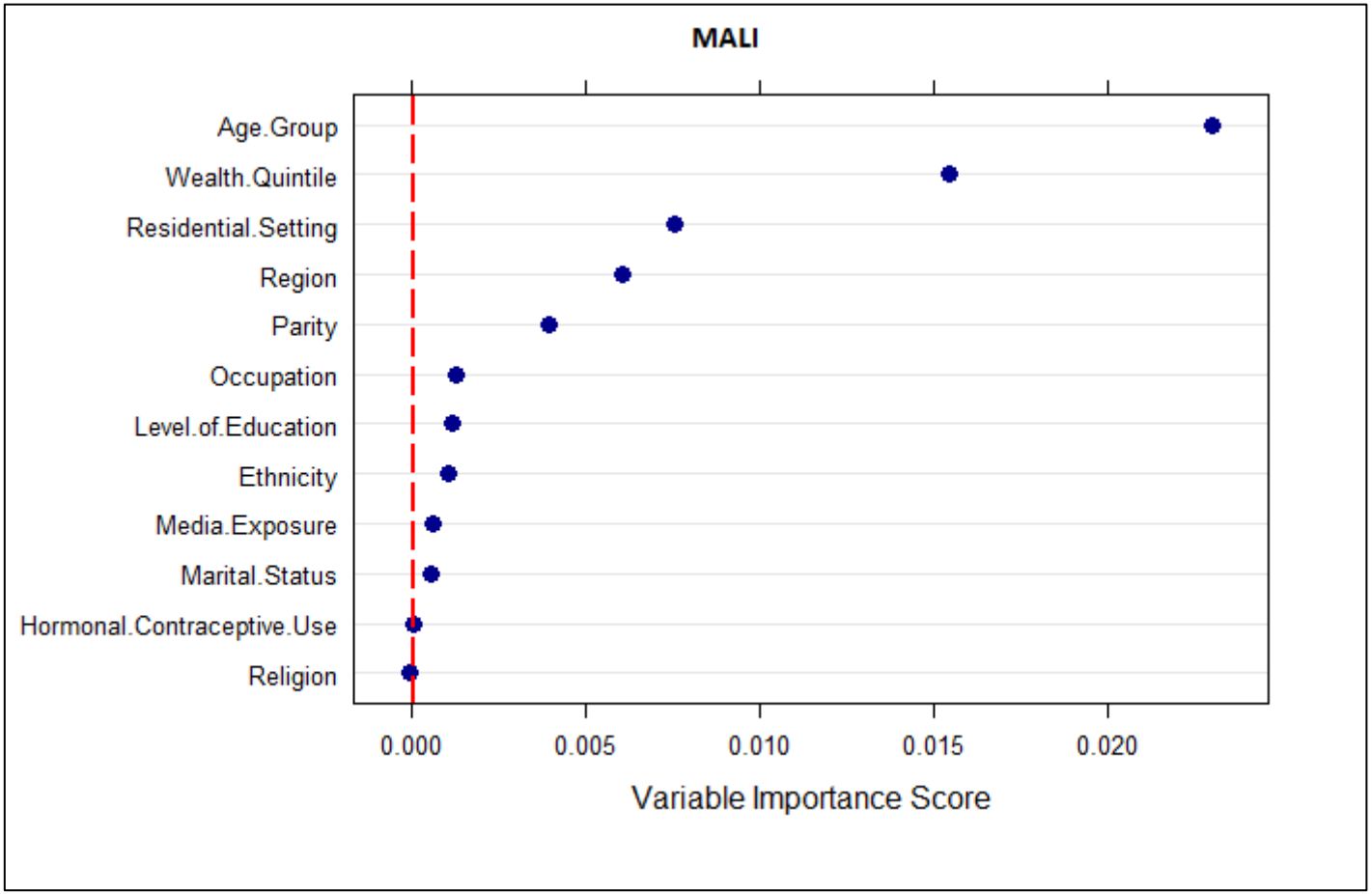


Figure 15: Variable importance dot plot for Gambia.

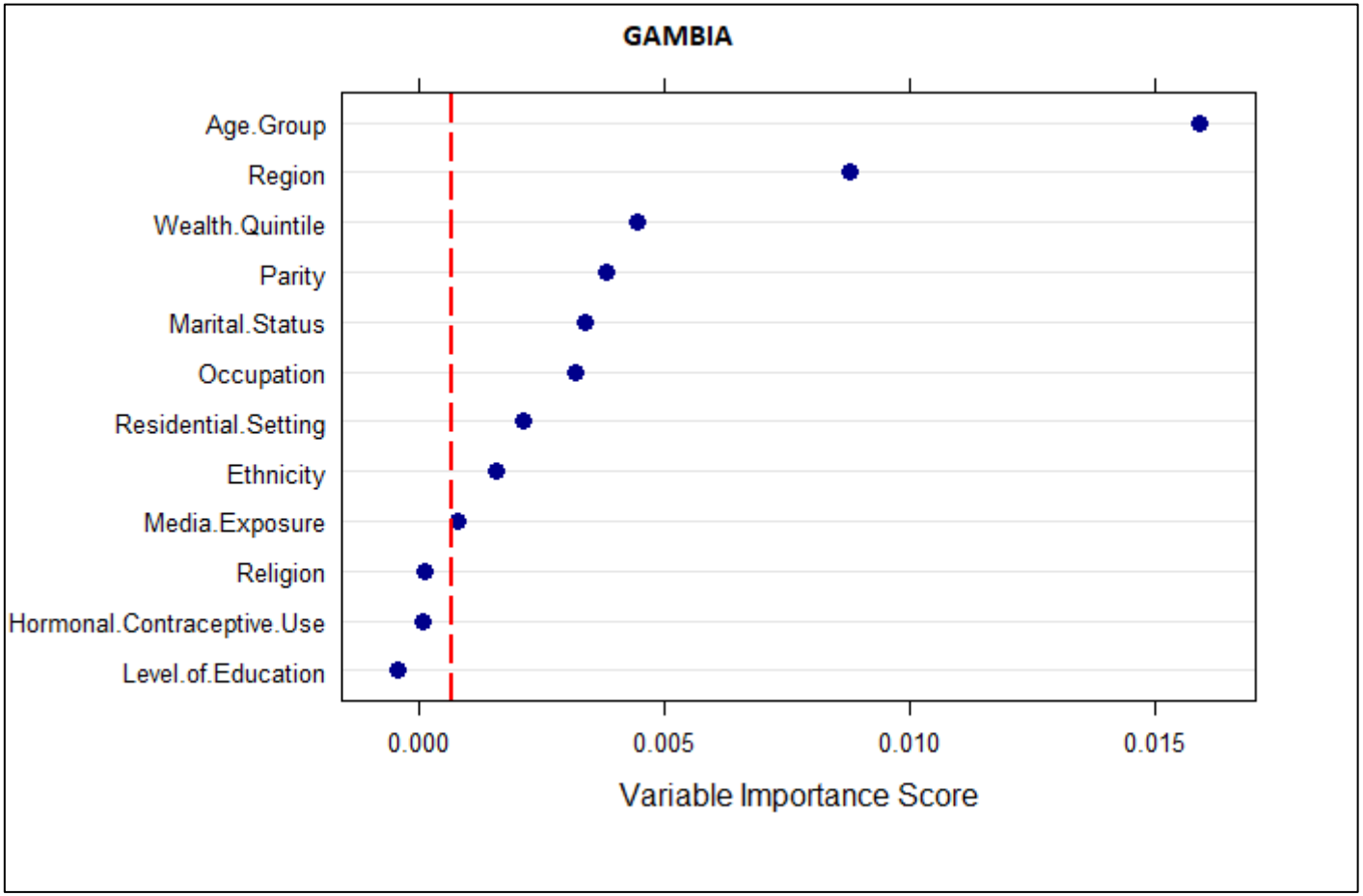


Figure 16: Variable importance dot plot for Uganda.

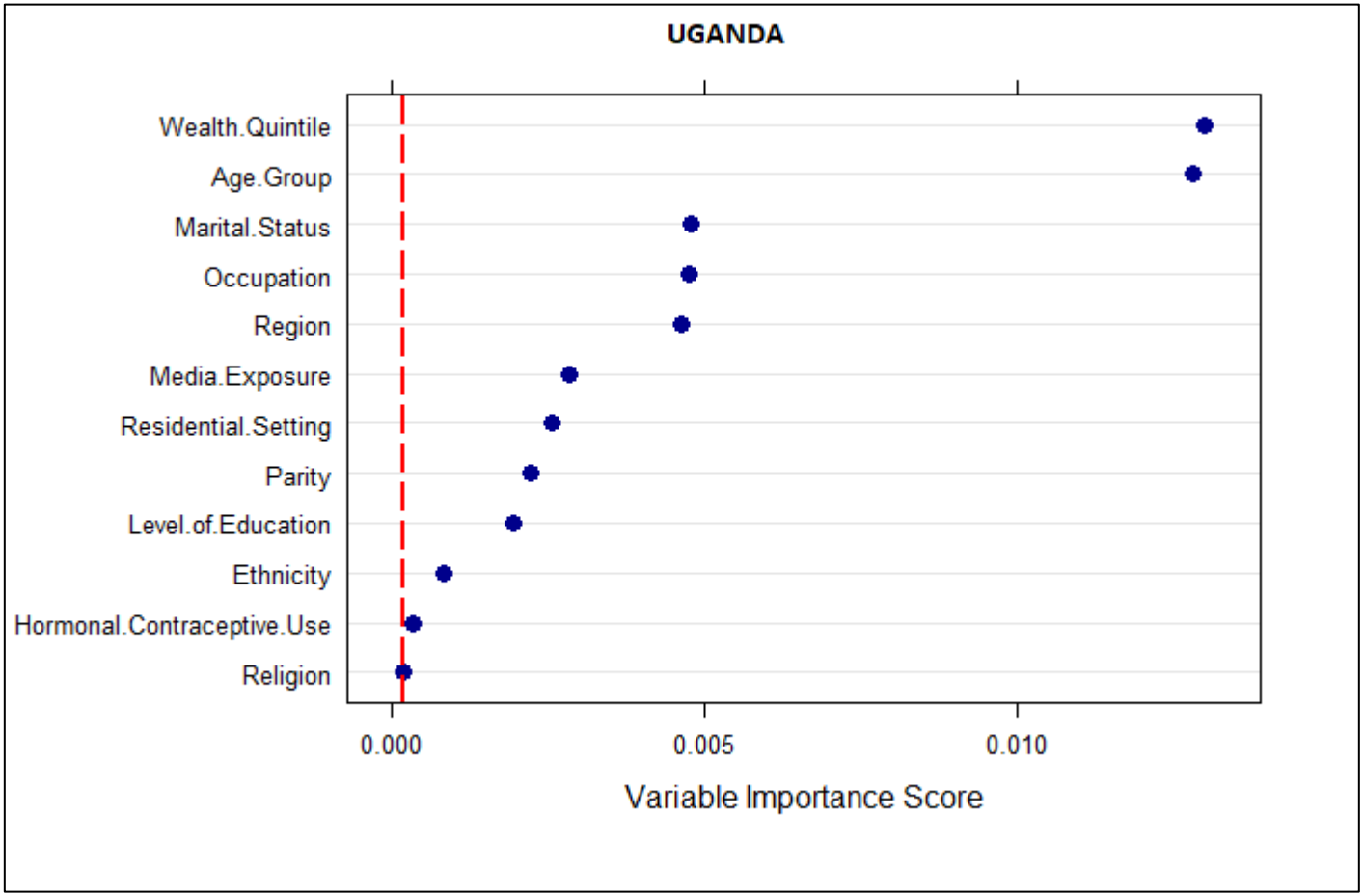


Figure 17: Variable importance dot plot for Guinea.

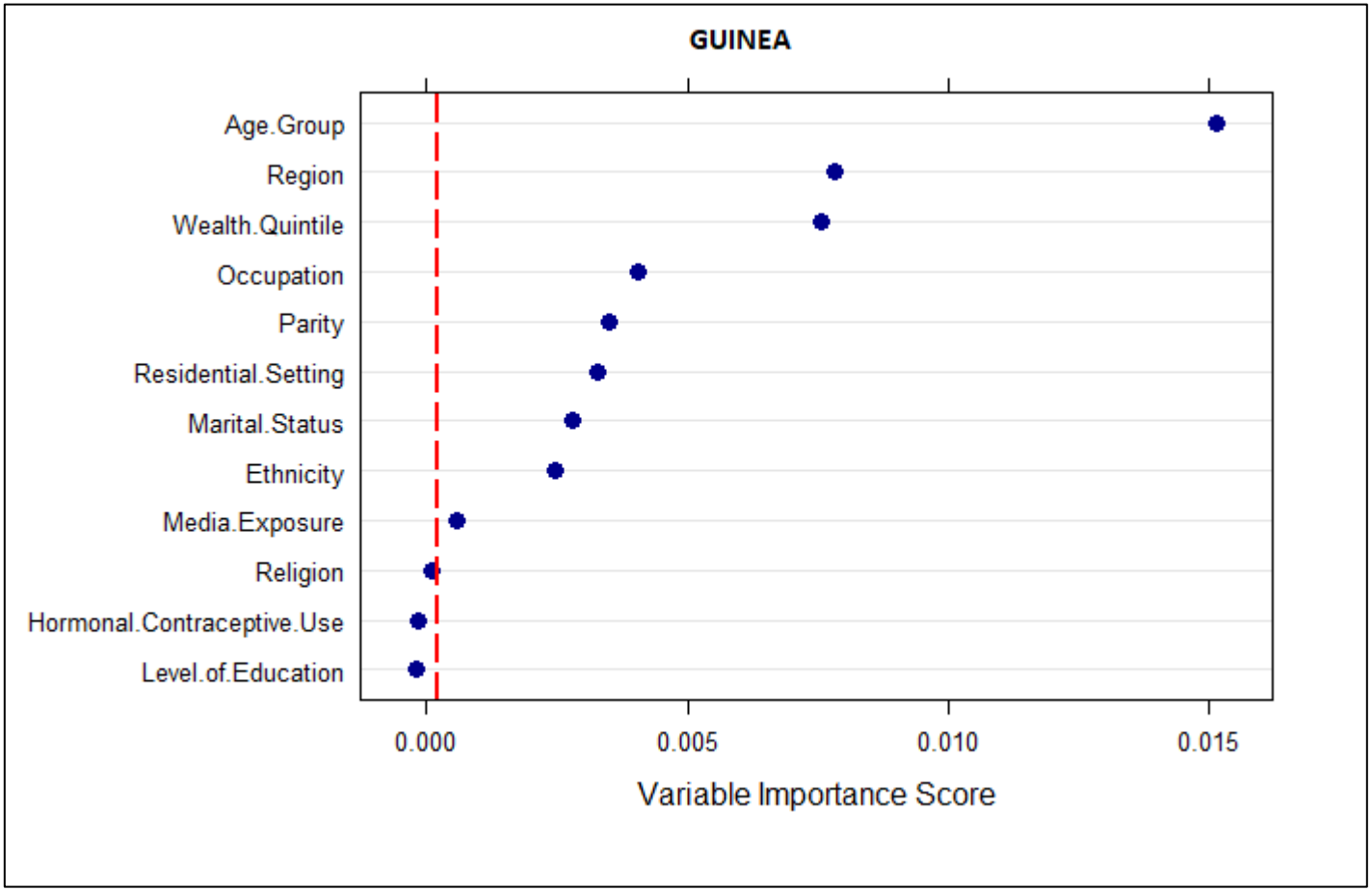


Figure 18: Variable importance dot plot for Senegal.

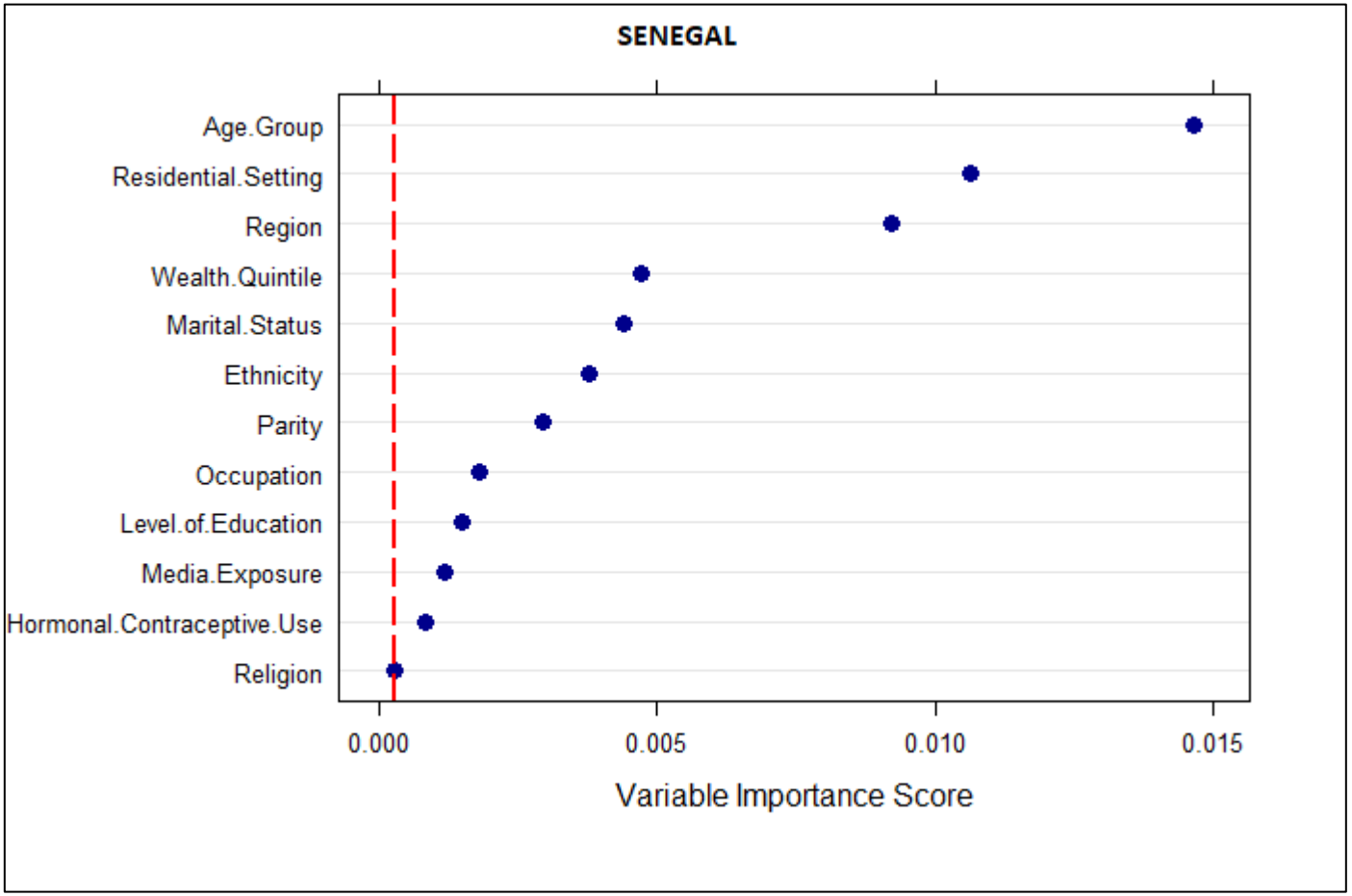


Figure 19: Variable importance dot plot for Namibia.

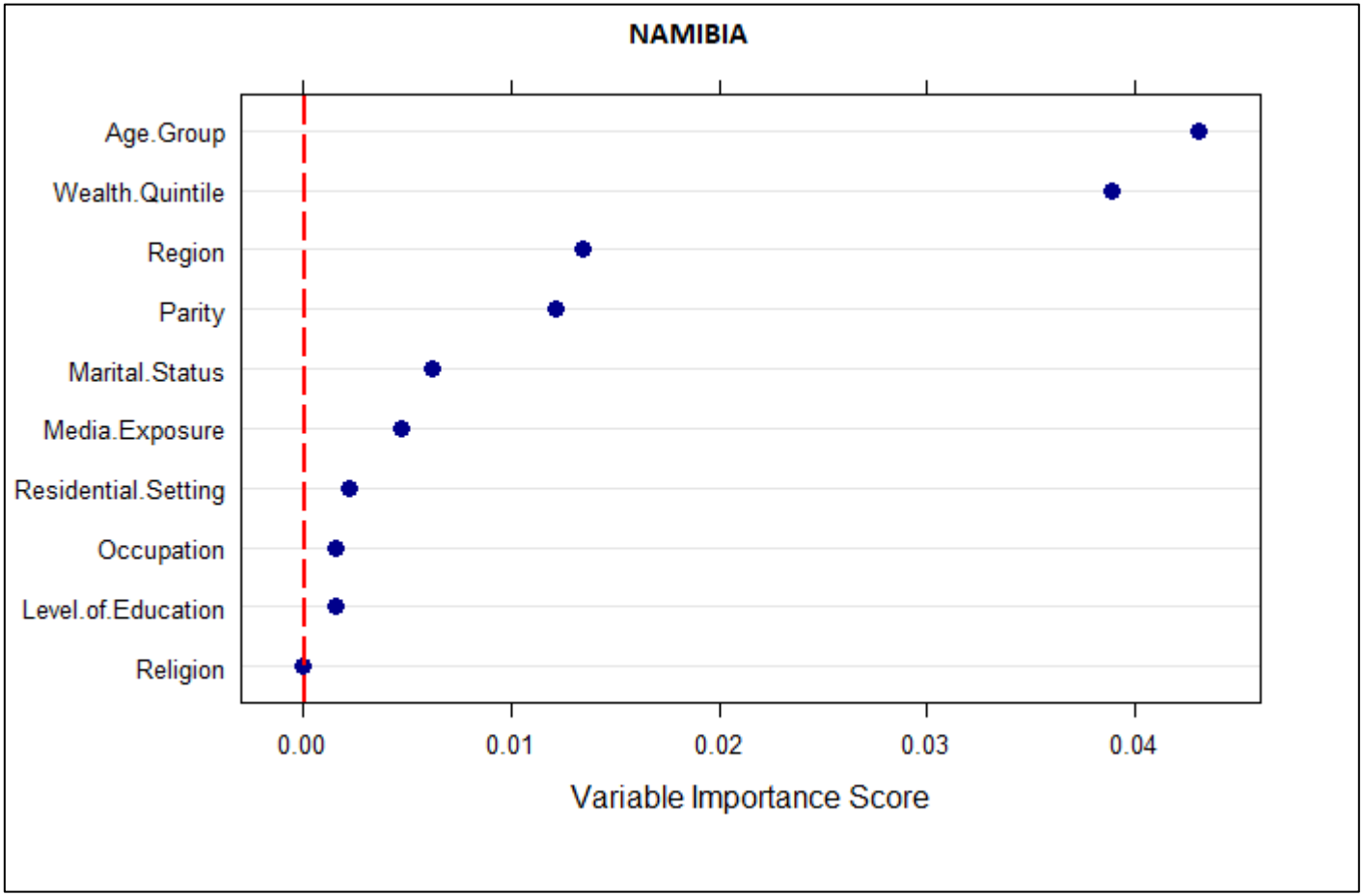


Figure 20: Variable importance dot plot for Congo.

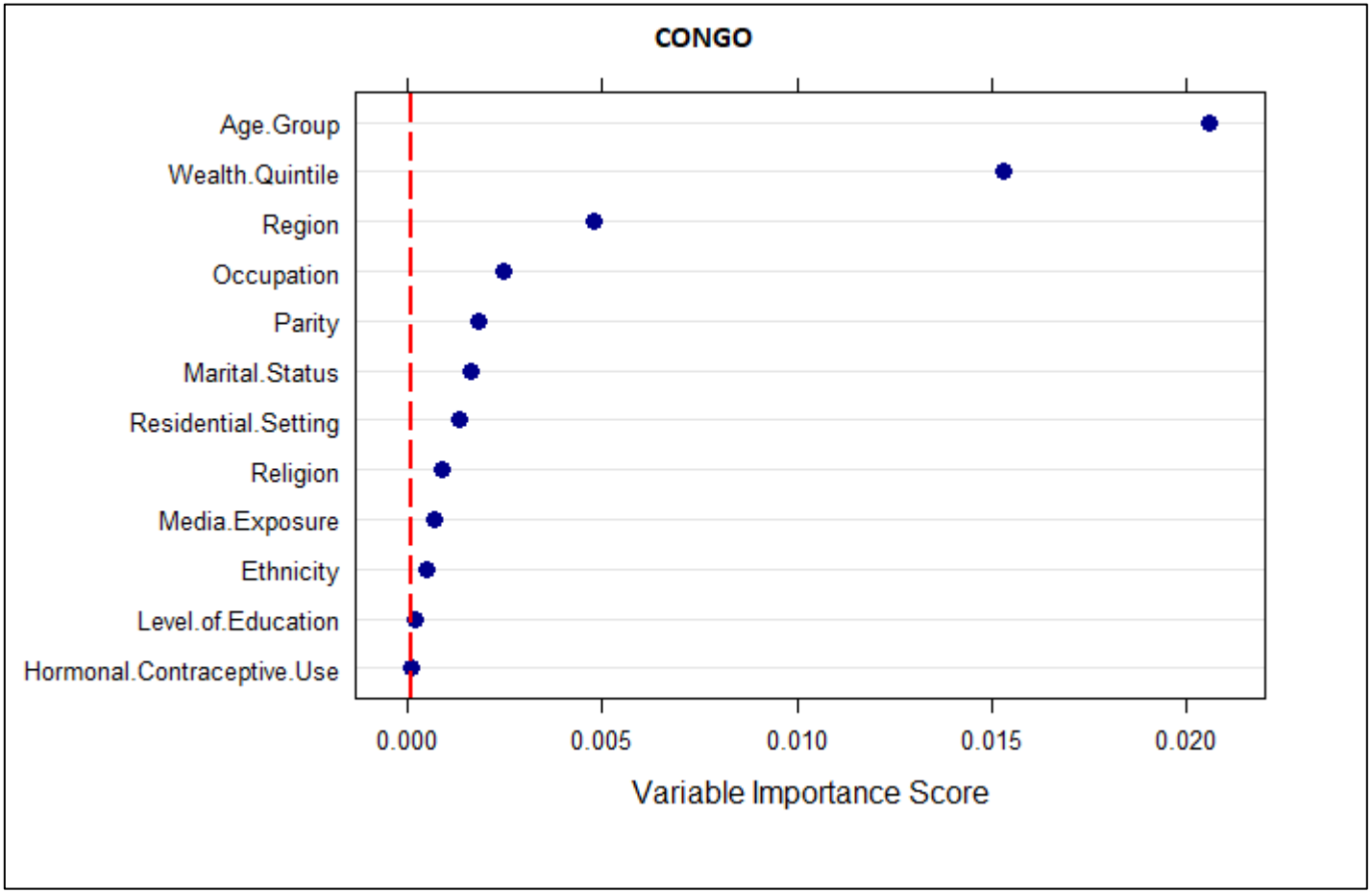


Figure 21: Variable importance dot plot for Nigeria.

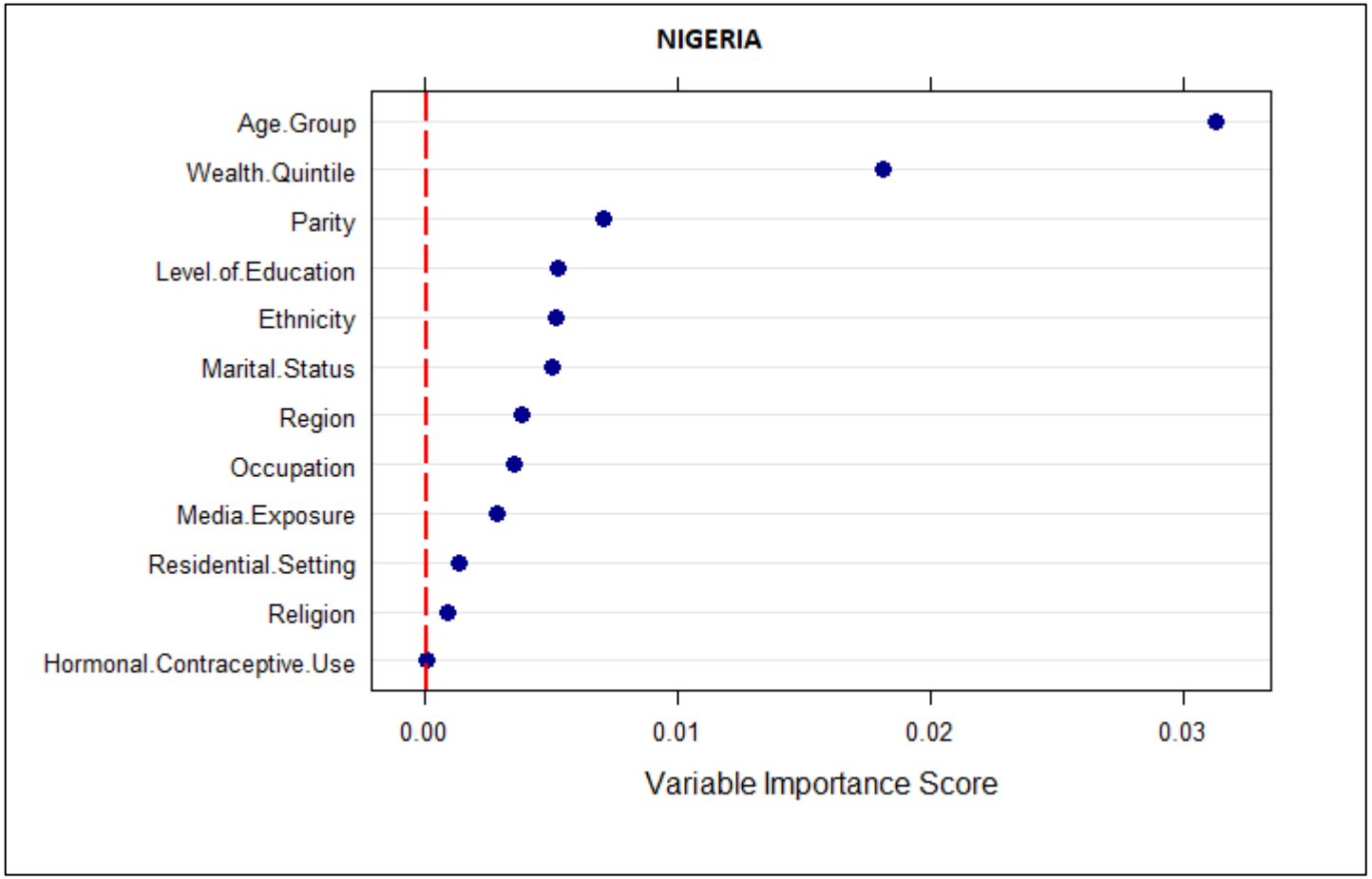


Figure 22: Variable importance dot plot for Zambia.

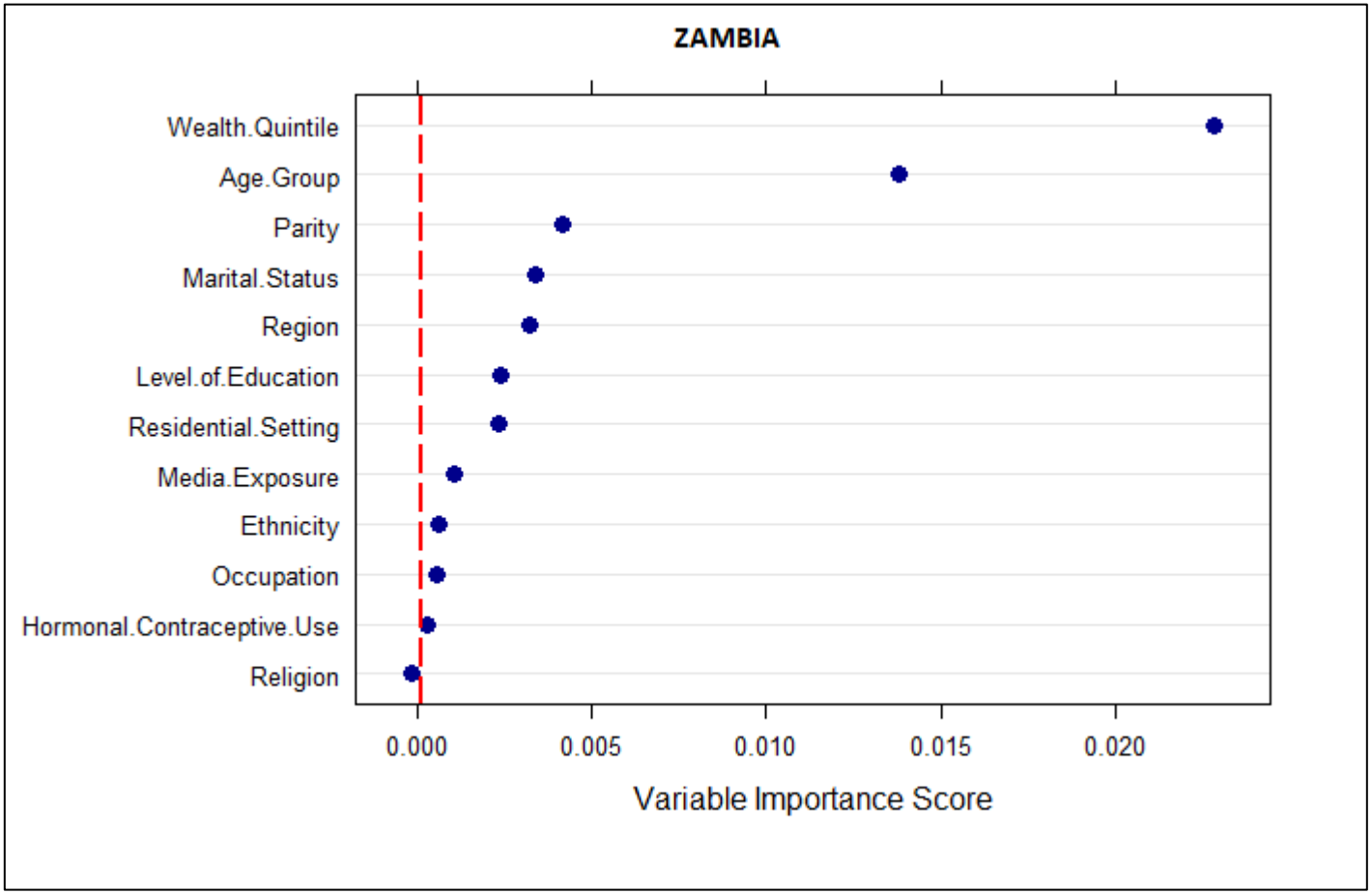


Figure 23: Variable importance dot plot for Sierra Leone.

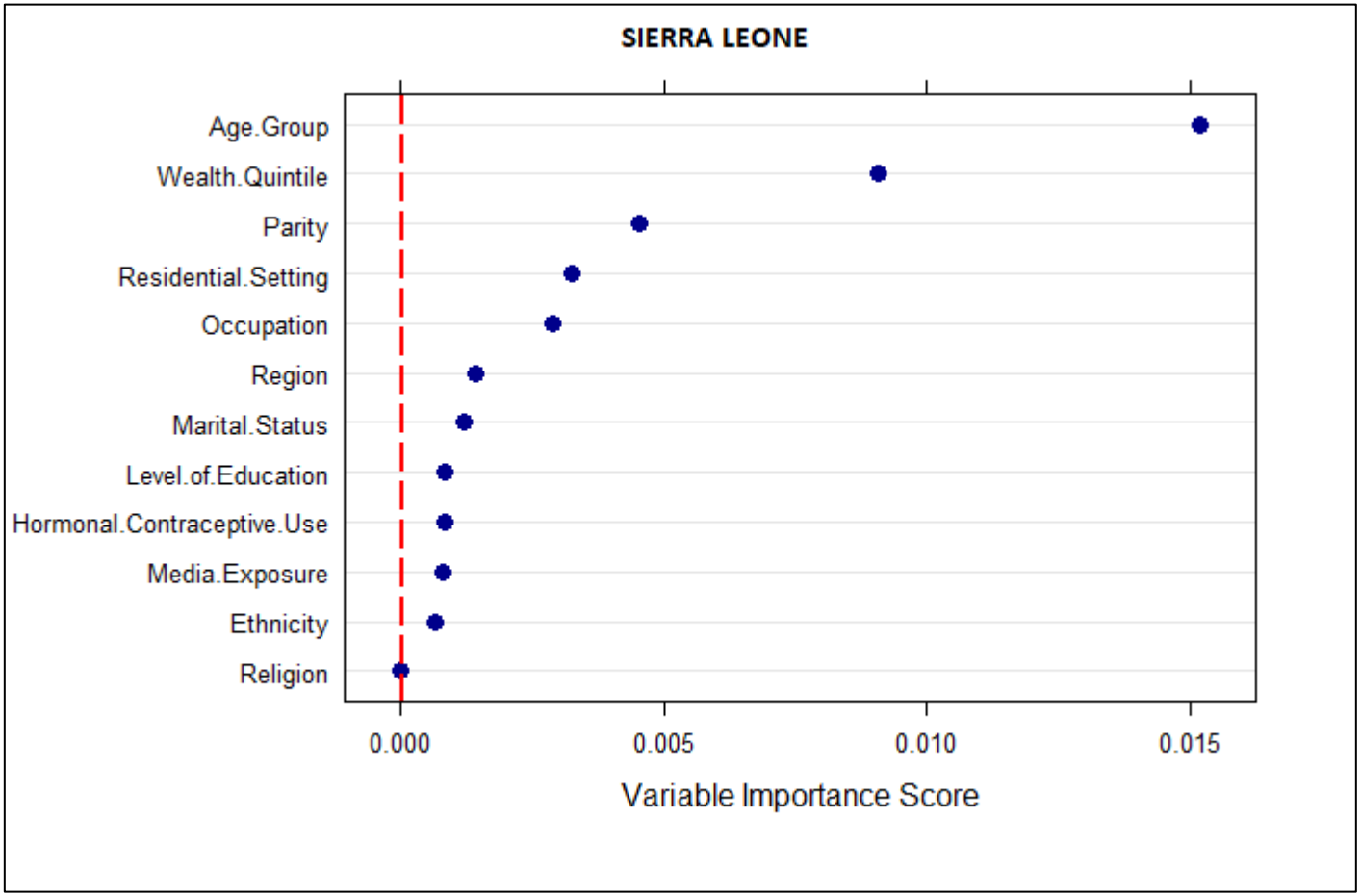


Figure 24: Variable importance dot plot for Mozambique.

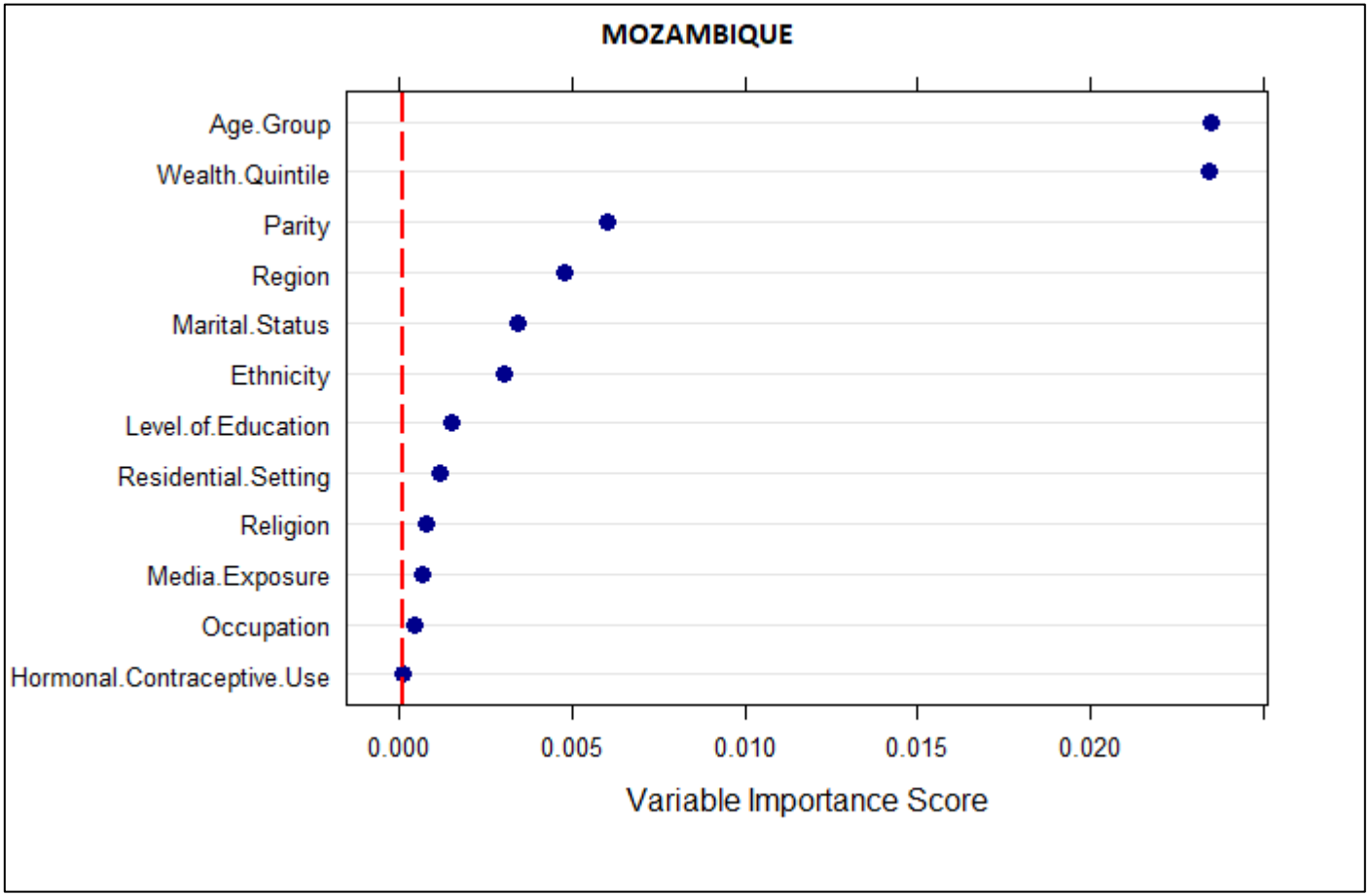


Figure 25: Variable importance dot plot for Malawi.

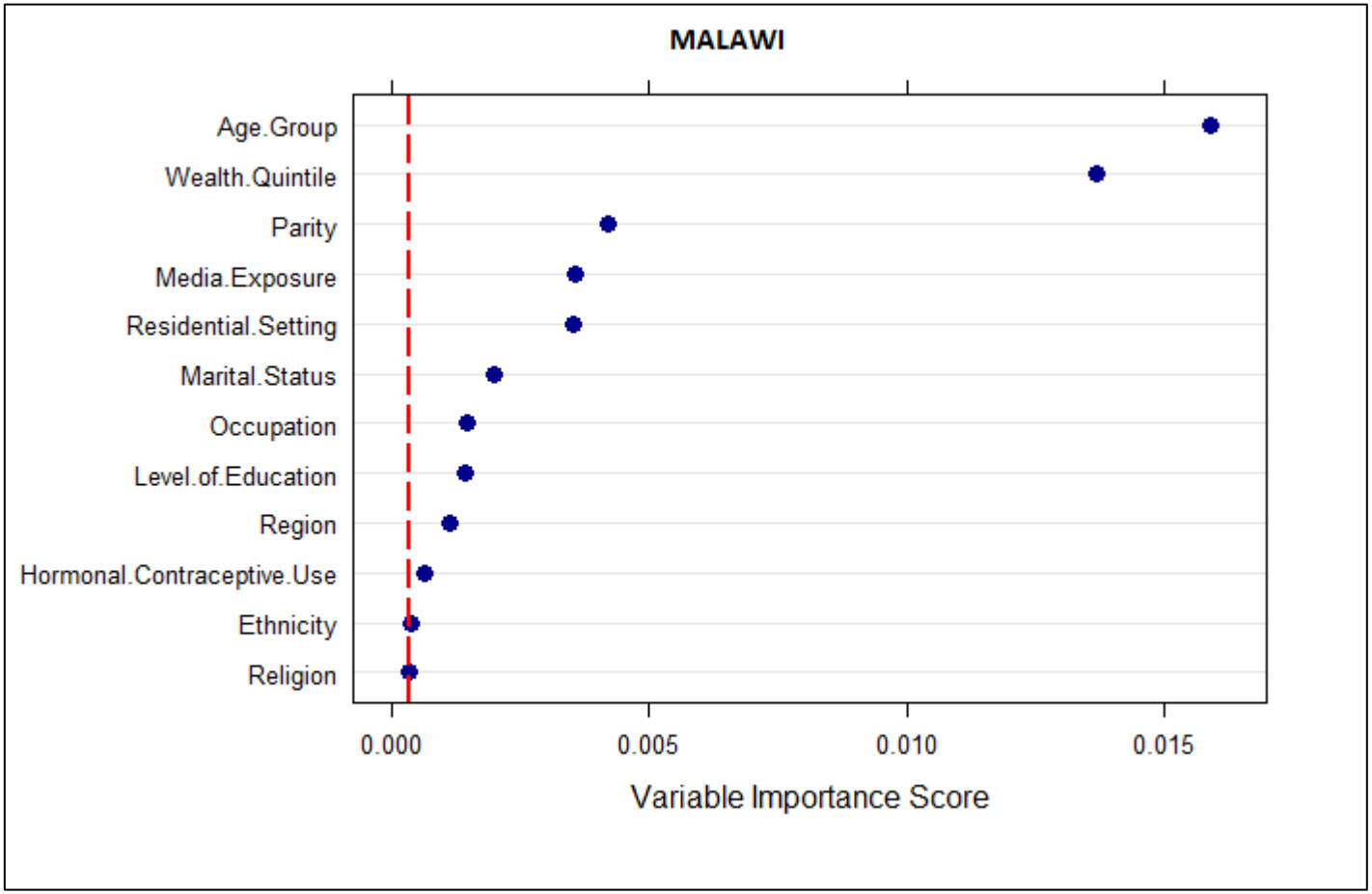


Figure 26: Variable importance dot plot for Ivory Coast.

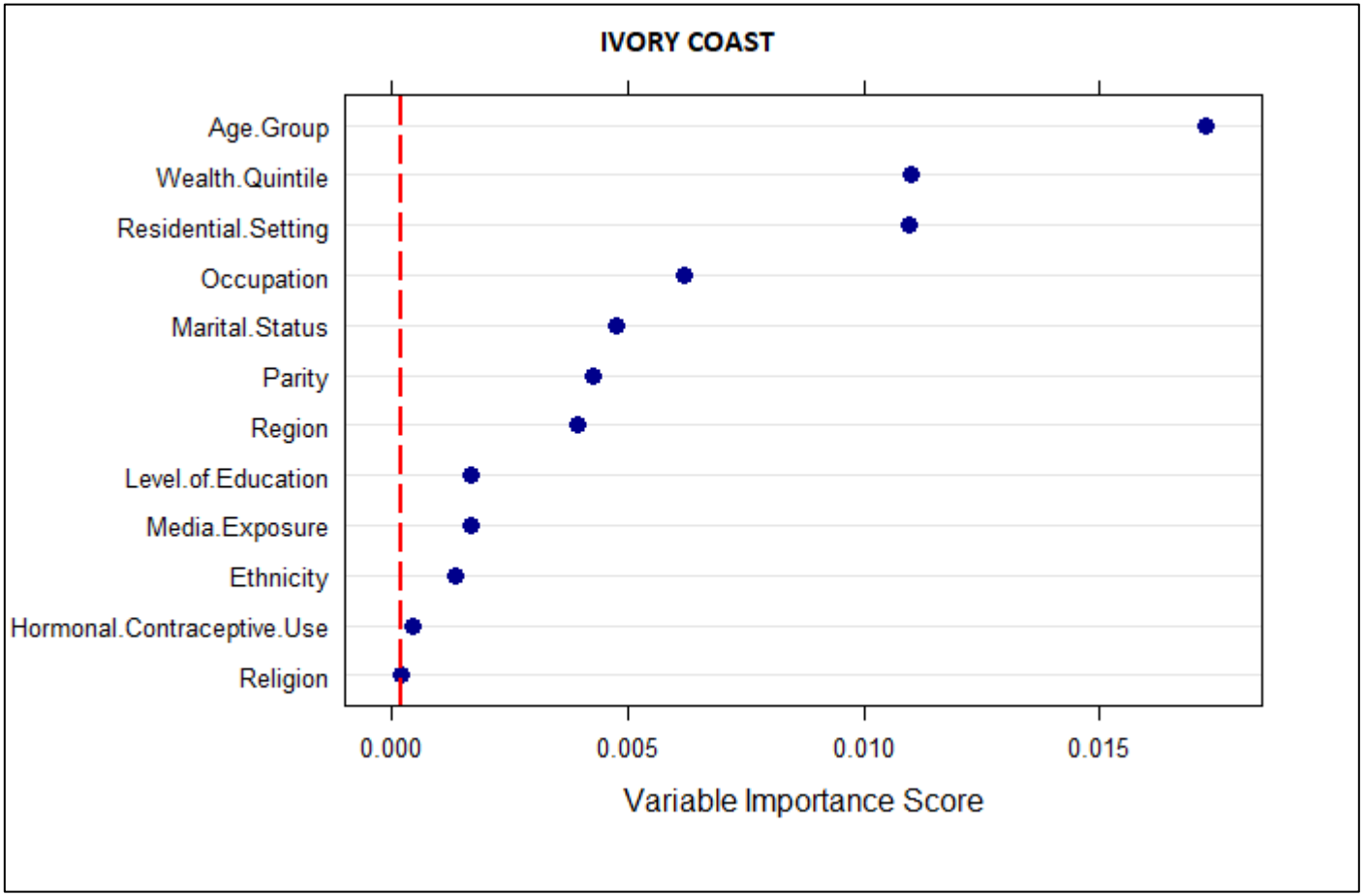


Figure 27: Variable importance dot plot for Rwanda.

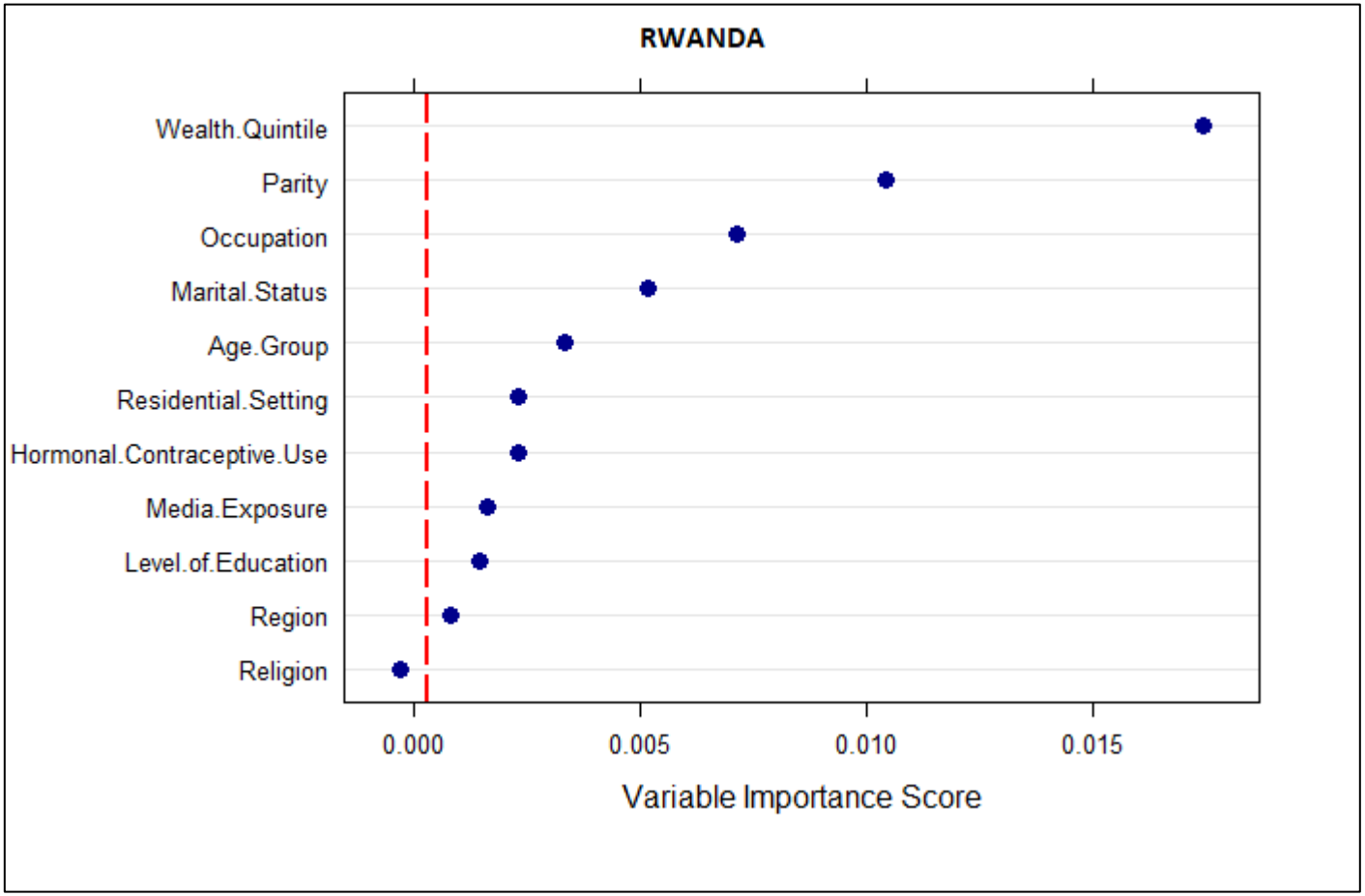


Figure 28: Variable importance dot plot for Liberia.

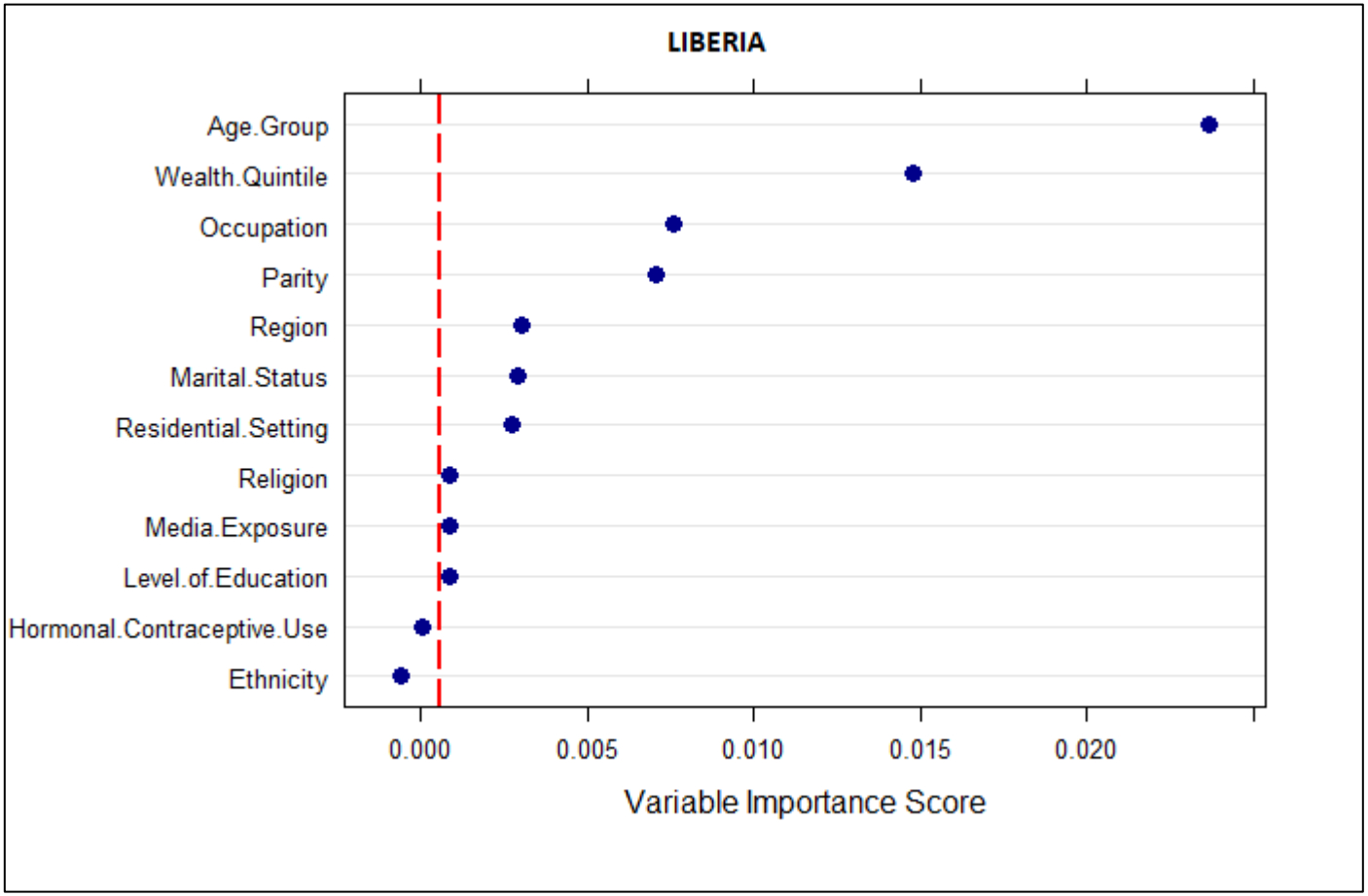


Figure 29: Variable importance dot plot for Benin.

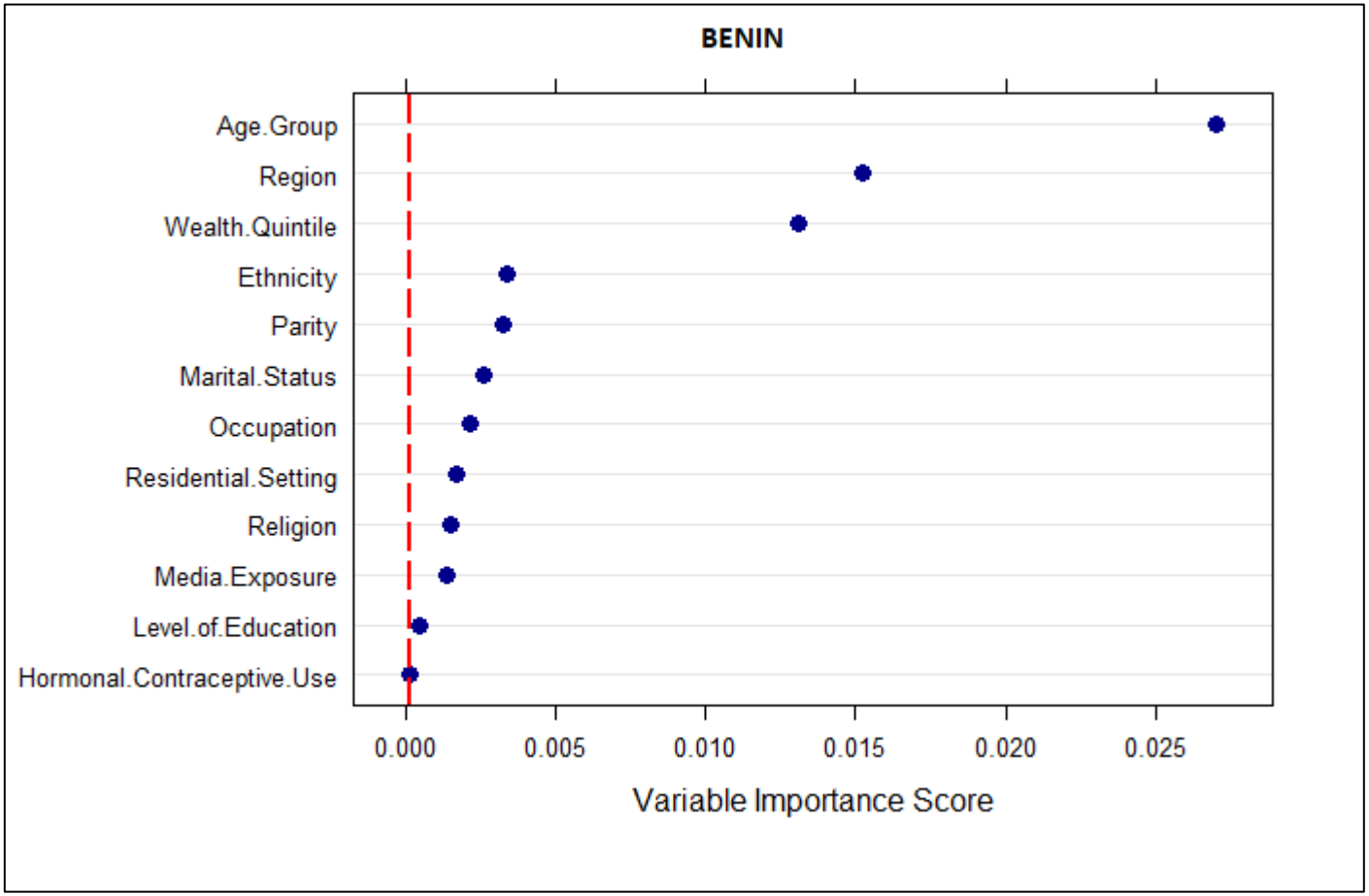


Figure 30: Variable importance dot plot for Kenya.

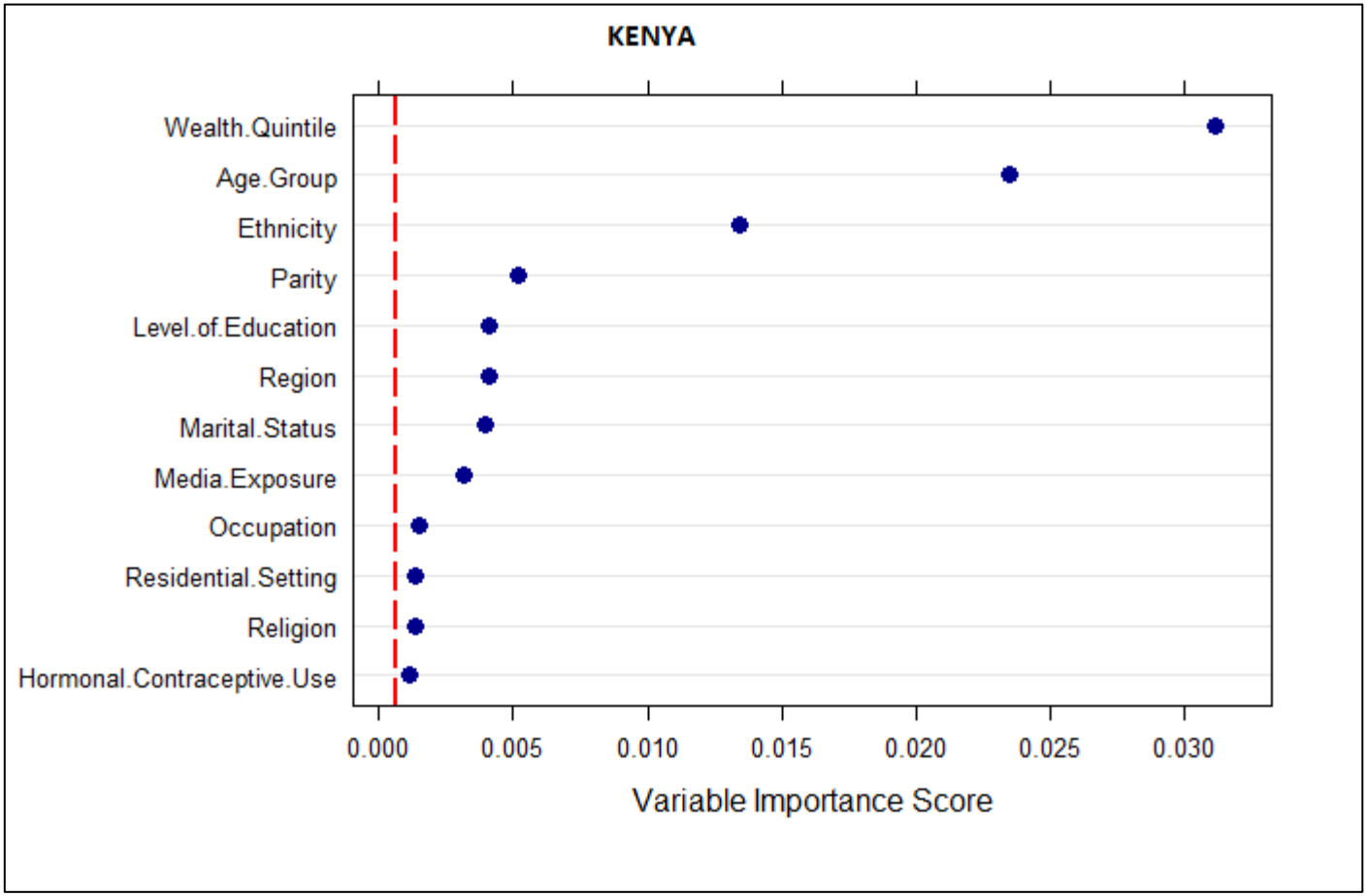


Figure 31: Variable importance dot plot for Sao Tome and Principe.

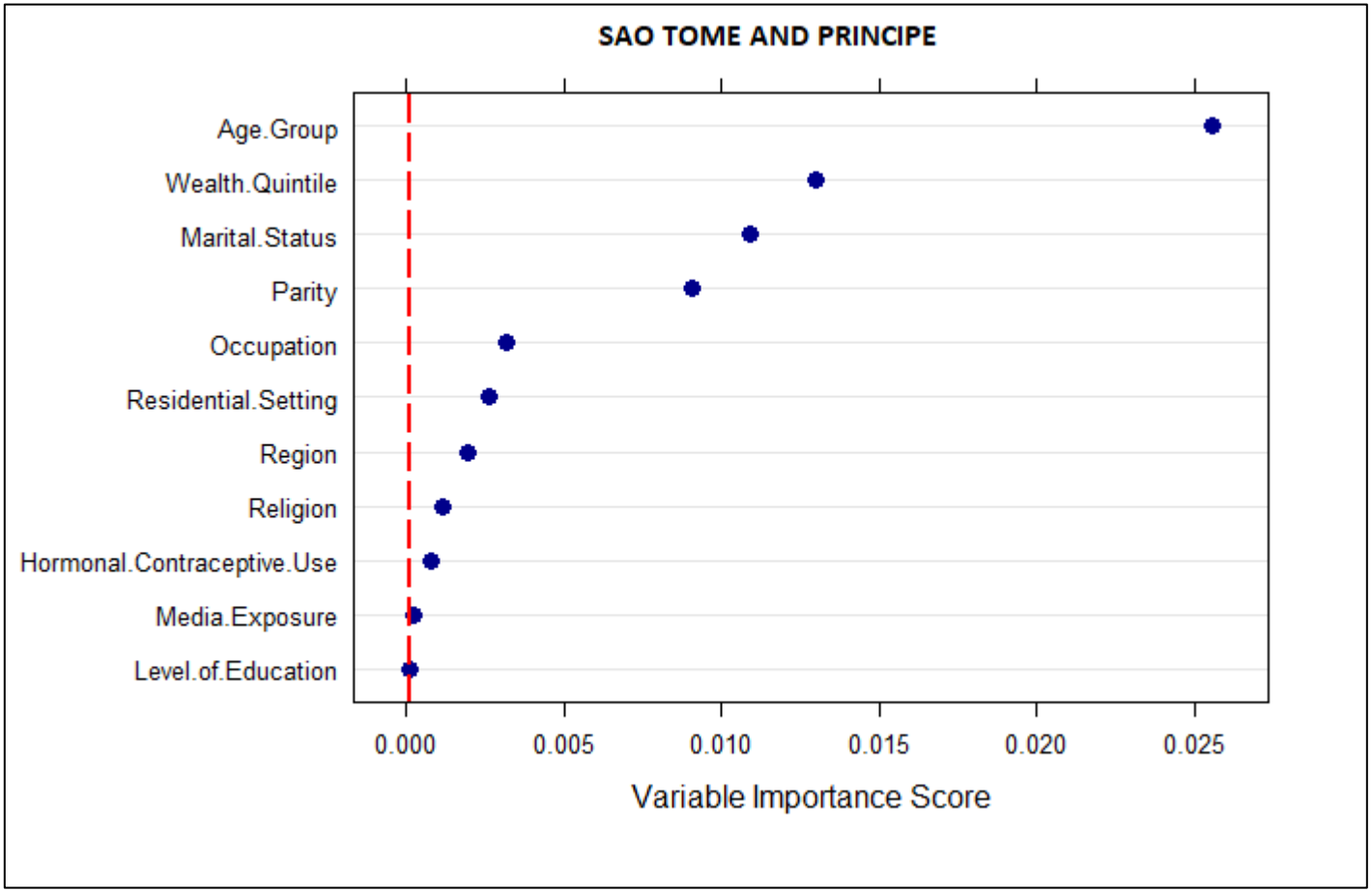


Figure 32: Variable importance dot plot for Togo.

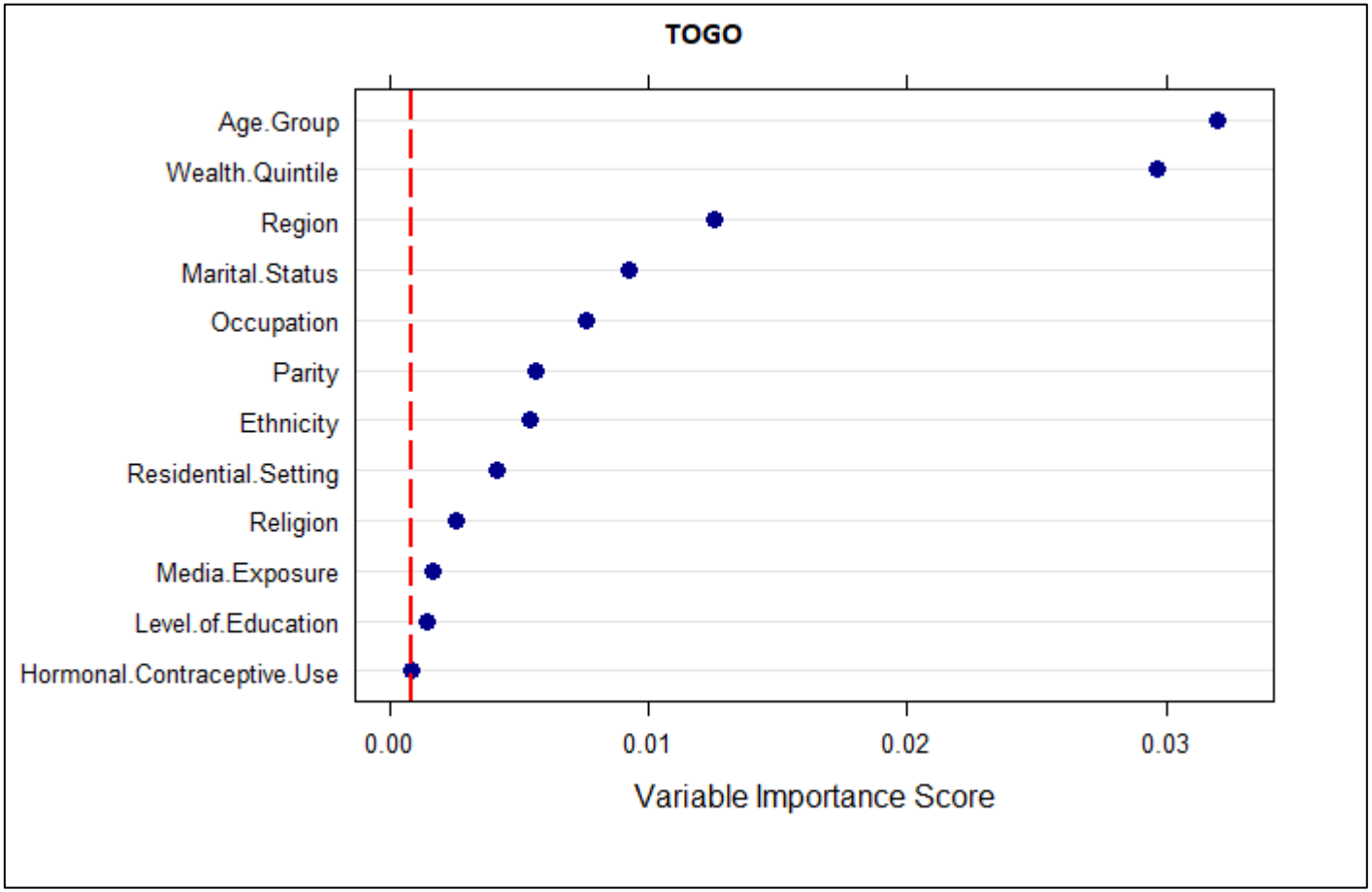


Figure 33: Variable importance dot plot for Cameroon.

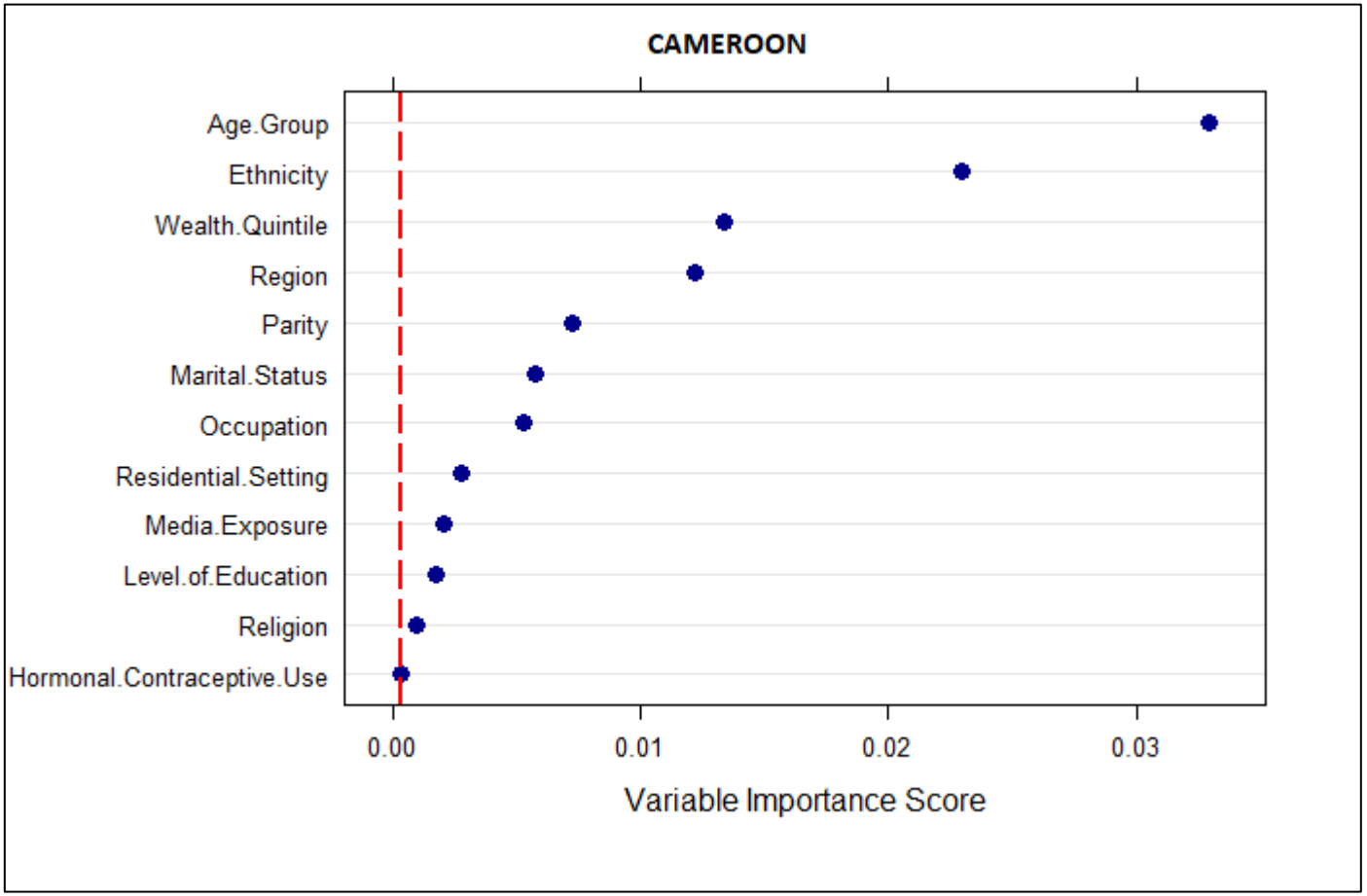


Figure 34: Variable importance dot plot for Comoros.

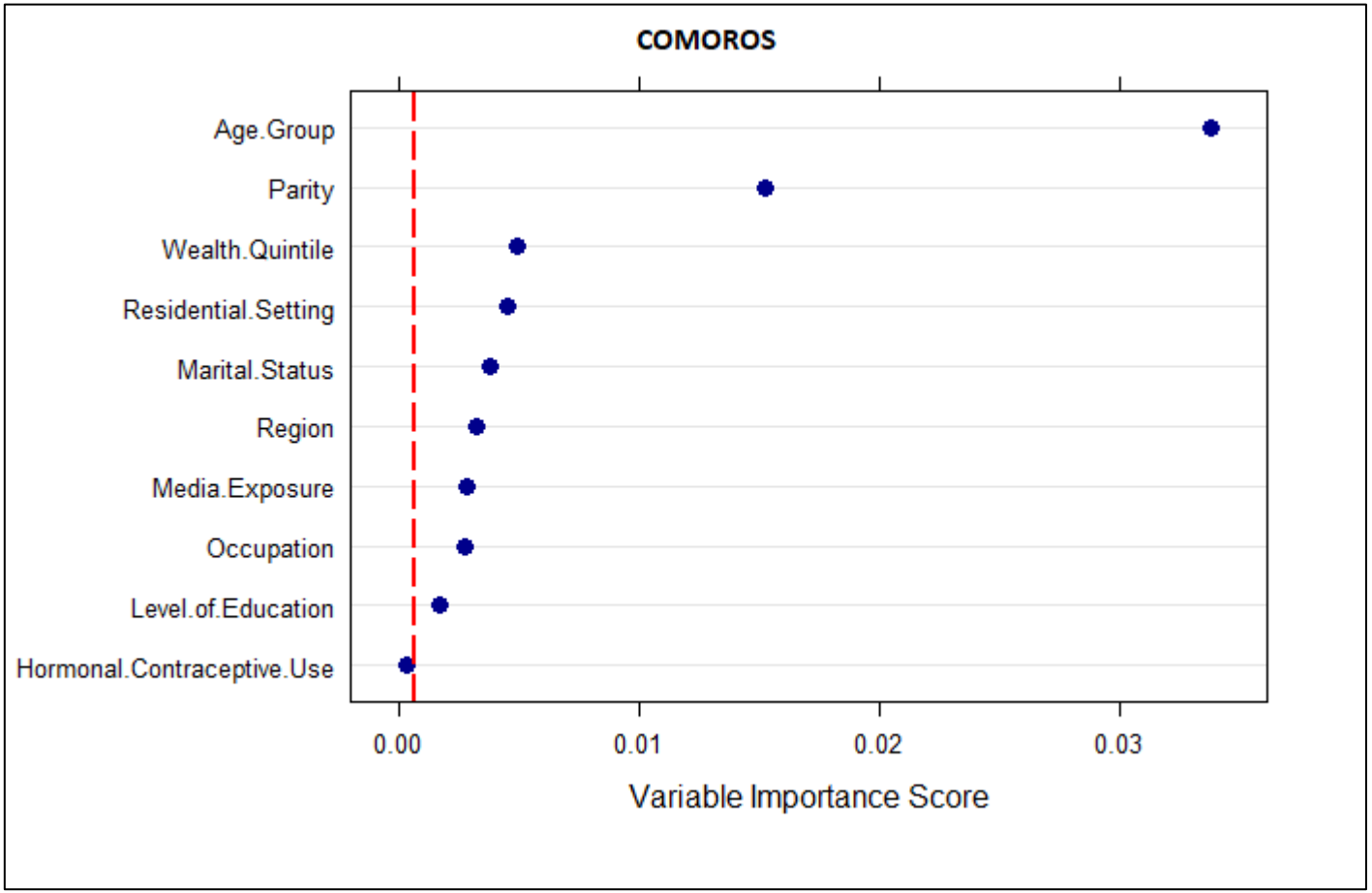


Figure 35: Variable importance dot plot for Tanzania.

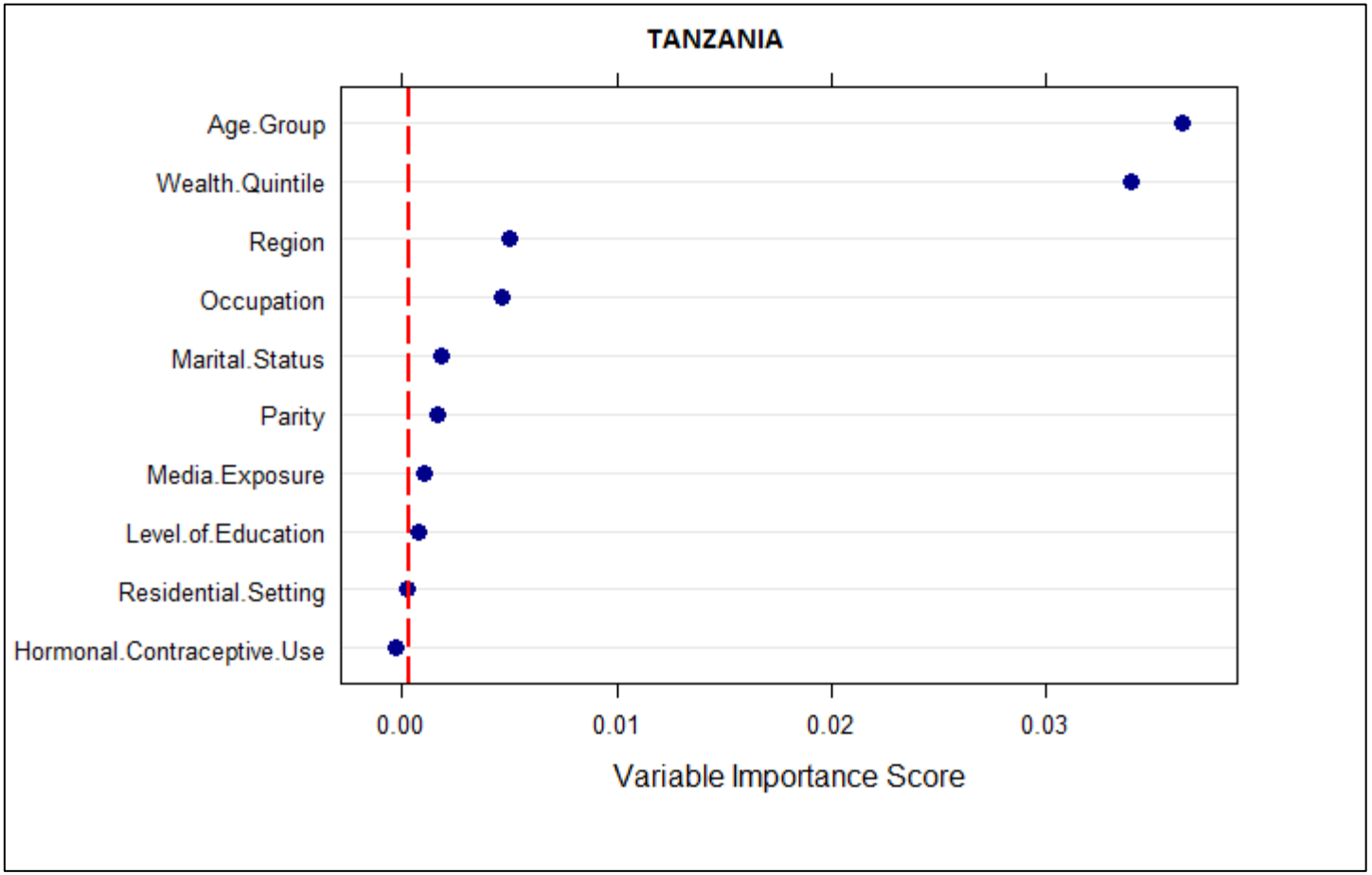


Figure 36: Variable importance dot plot for Zimbabwe.

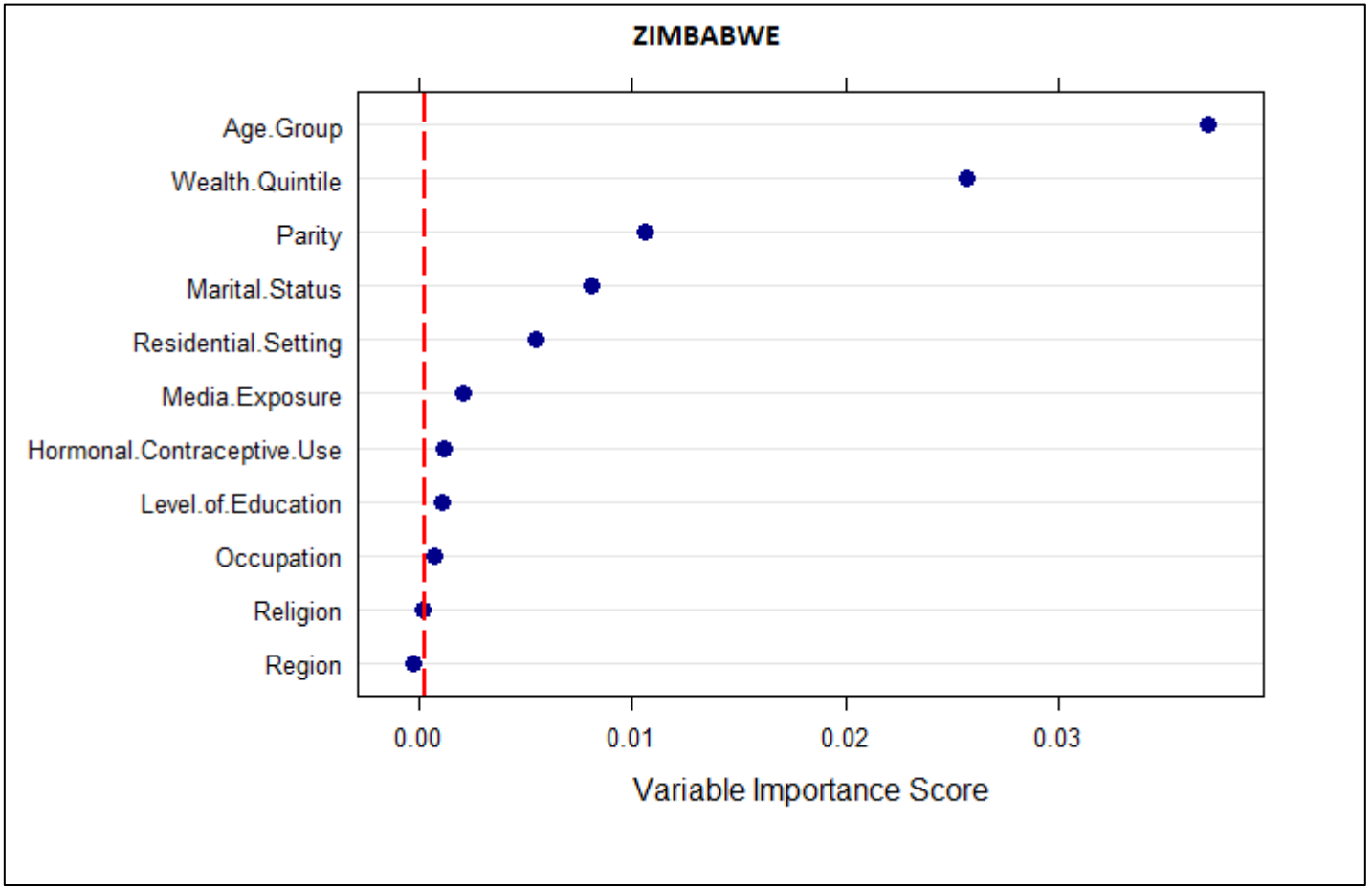


Figure 37: Variable importance dot plot for Gabon.

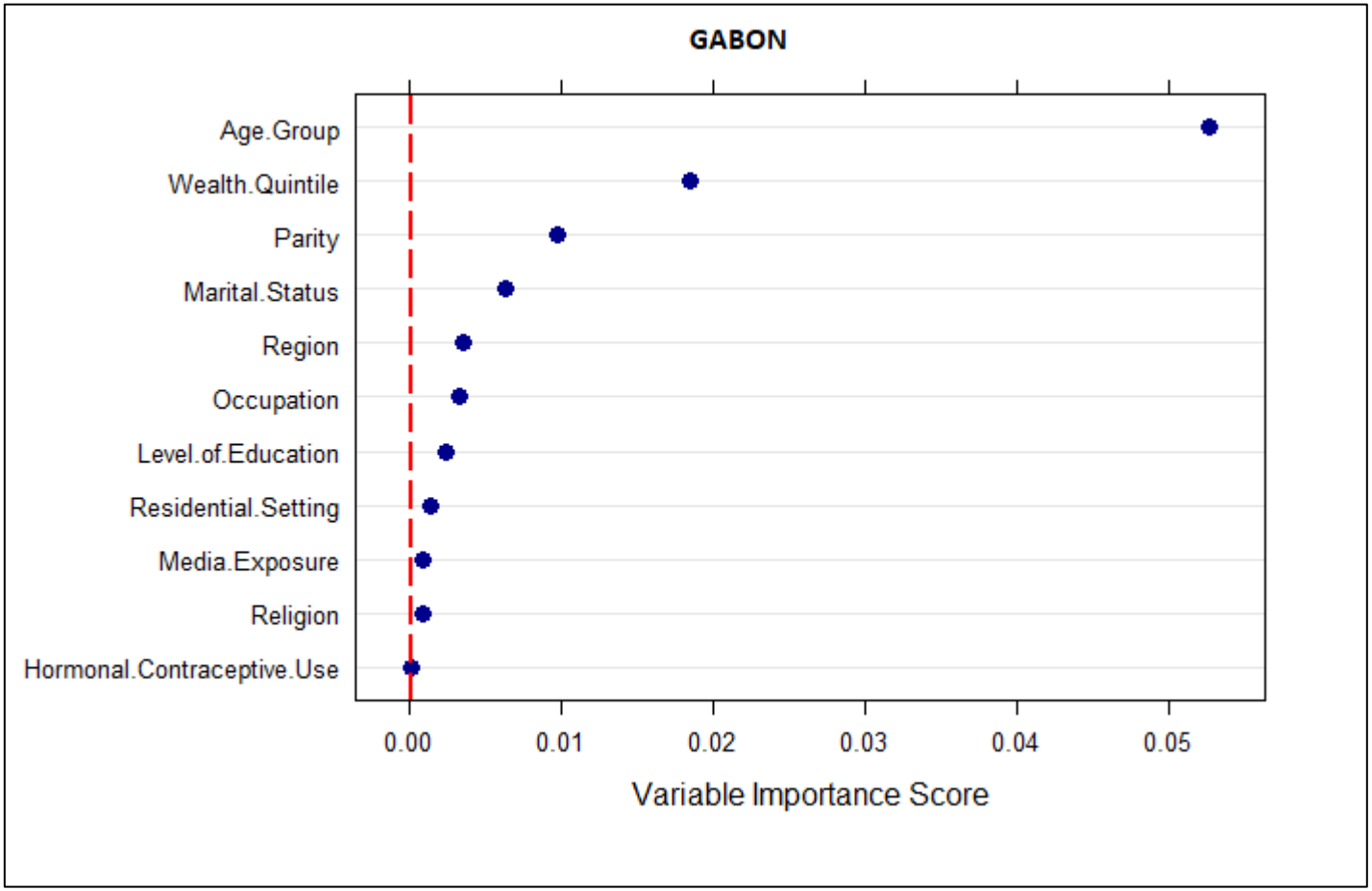


Figure 38: Variable importance dot plot for Ghana.

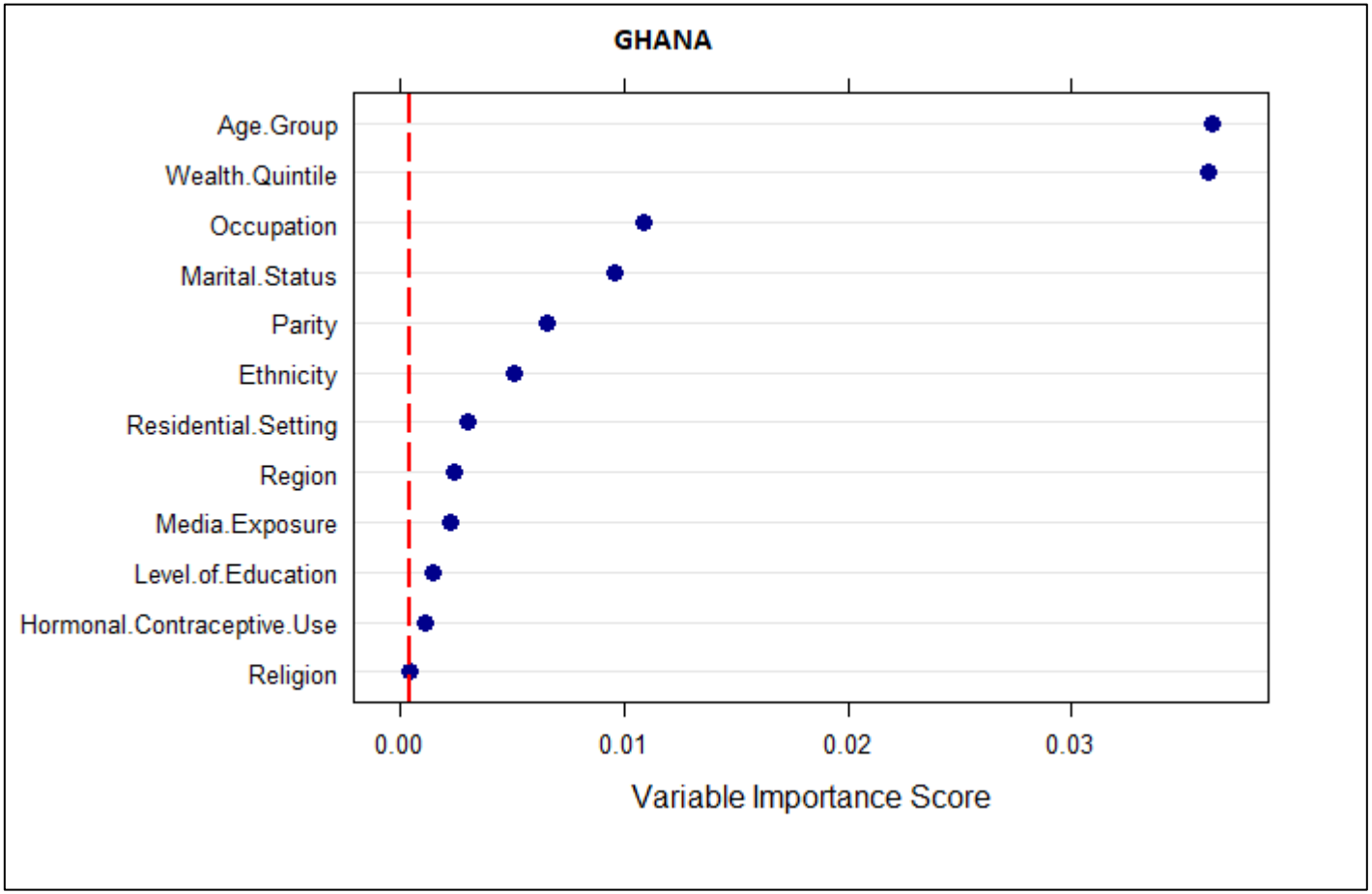


Figure 39: Variable importance dot plot for Lesotho.

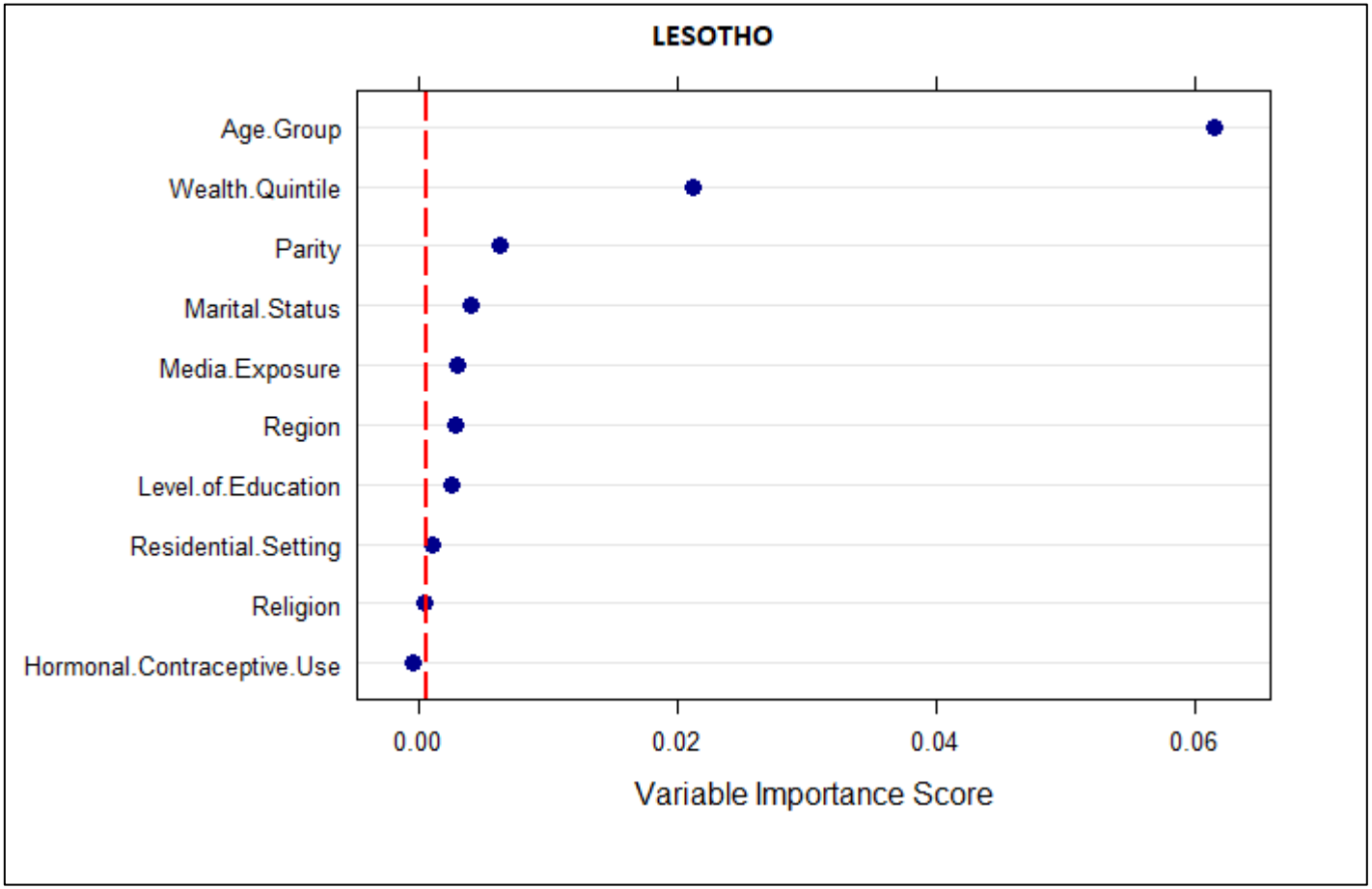
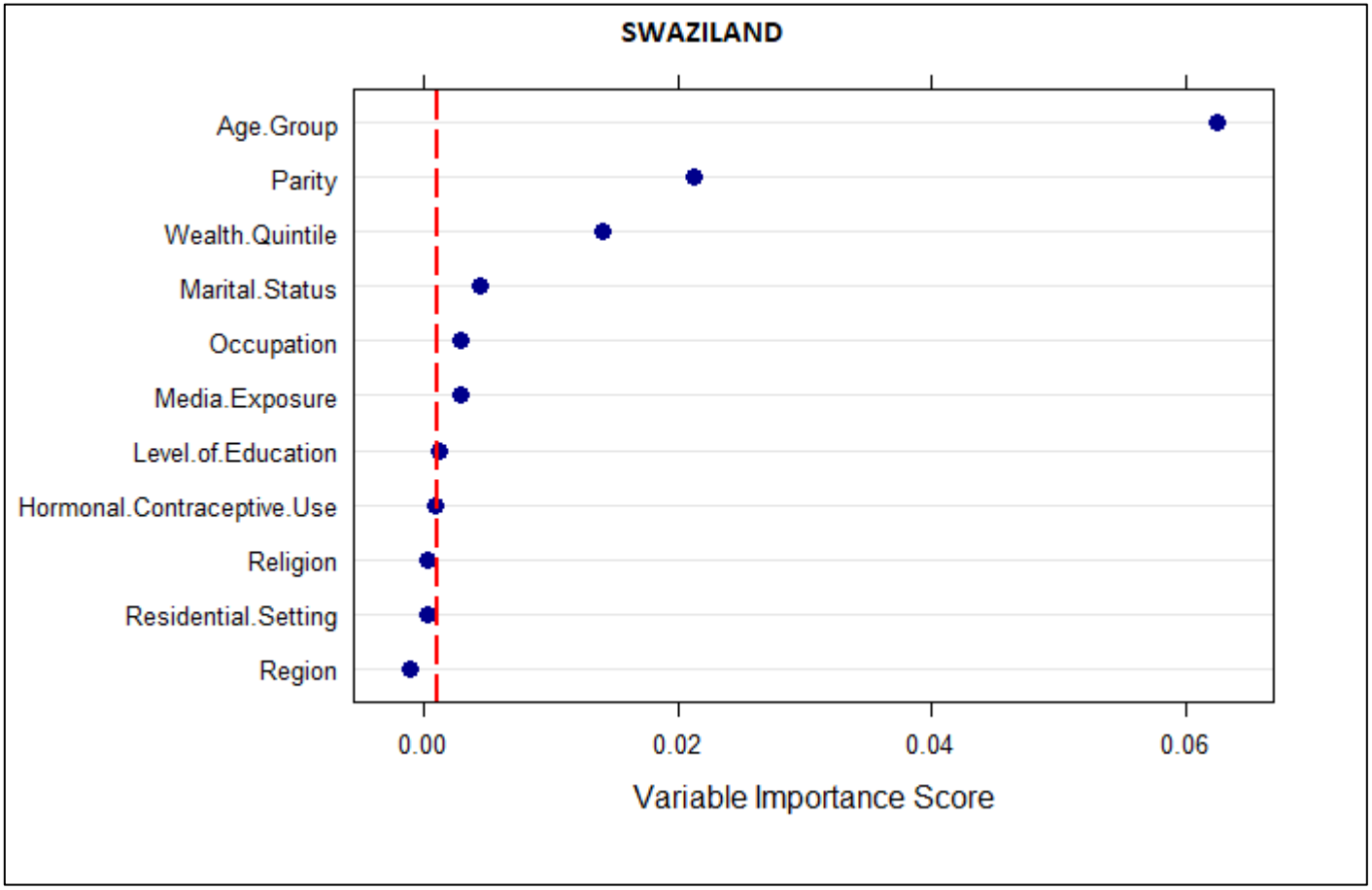


Figure 40: Variable importance dot plot for Swaziland.



Appendix E: Univariable and multivariable multinomial logistic regression results for all the 34 countries in SSA (Objective 3)

Table 46: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age women in Madagascar.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.80 (0.66, 0.98)	0.84 (0.66, 1.06)	3.93 (2.01, 7.67)	2.78 (1.31, 5.89)
25-29	0.95 (0.75, 1.19)	0.96 (0.71, 1.28)	6.21 (3.26, 11.8)	3.74 (1.67, 8.41)
30-34	0.96 (0.76, 1.22)	1.00 (0.74, 1.34)	10.1 (5.29, 19.2)	5.76 (2.60, 12.8)
35-39	1.11 (0.88, 1.40)	1.16 (0.85, 1.59)	13.1 (7.05, 24.5)	7.32 (3.27, 16.4)
40-44	1.04 (0.83, 1.30)	1.04 (0.77, 1.41)	11.0 (5.72, 21.1)	6.29 (2.76, 14.3)
45-49	1.24 (0.97, 1.58)	1.24 (0.89, 1.73)	10.3 (5.27, 20.1)	6.29 (2.64, 15.0)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.89 (0.75, 1.06)	0.93 (0.77, 1.12)	1.00 (0.77, 1.29)	1.01 (0.77, 1.31)
Islam	1.24 (0.66, 2.33)	1.24 (0.67, 2.27)	1.93 (0.66, 5.59)	1.08 (0.46, 2.52)
Traditionalist	1.06 (0.64, 1.75)	1.04 (0.65, 1.69)	0.75 (0.30, 1.87)	2.04 (0.65, 6.43)
Others	0.87 (0.66, 1.13)	0.96 (0.73, 1.26)	1.41 (0.91, 2.17)	1.19 (0.78, 1.83)
No Religion	1.15 (0.96, 1.39)	1.02 (0.81, 1.27)	0.49 (0.33, 0.72)	1.26 (0.77, 2.06)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.94 (0.76, 1.18)	1.03 (0.77, 1.36)	2.32 (1.49, 3.63)	1.23 (0.71, 2.16)
2	0.95 (0.77, 1.18)	1.06 (0.80, 1.40)	4.01 (2.43, 6.62)	1.68 (0.90, 3.15)
3	1.04 (0.80, 1.34)	1.12 (0.81, 1.55)	4.04 (2.59, 6.30)	1.40 (0.74, 2.63)
4	1.19 (0.94, 1.50)	1.23 (0.88, 1.73)	3.13 (1.86, 5.26)	1.22 (0.59, 2.52)
5	1.02 (0.78, 1.35)	0.99 (0.68, 1.43)	3.19 (1.89, 5.36)	1.42 (0.67, 3.01)
6+	1.34 (1.09, 1.65)	1.14 (0.83, 1.57)	2.83 (1.85, 4.33)	1.45 (0.73, 2.88)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.96 (0.81, 1.14)	0.86 (0.66, 1.12)	5.34 (3.42, 8.36)	1.65 (0.92, 2.96)
Formerly Married	1.13 (0.89, 1.43)	0.92 (0.67, 1.26)	4.84 (2.84, 8.27)	1.57 (0.83, 2.96)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.80 (0.66, 0.95)	1.11 (0.85, 1.45)	2.73 (2.10, 3.55)	0.84 (0.61, 1.17)

Table 46: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Analamanga (Reference)	1.00	1.00	1.00	1.00
Vakinankarata	1.29 (0.88, 1.88)	1.01 (0.65, 1.56)	0.45 (0.22, 0.94)	1.26 (0.67, 2.35)
Itasy	1.53 (1.03, 2.27)	1.25 (0.79, 2.00)	0.40 (0.20, 0.80)	1.21 (0.61, 2.38)
Bongolava	0.18 (0.09, 0.36)	0.14 (0.07, 0.30)	0.58 (0.29, 1.18)	1.85 (0.79, 4.34)
Haute Matsiatra	2.35 (1.56, 3.53)	1.89 (1.19, 2.98)	1.01 (0.57, 1.81)	2.51 (1.45, 4.36)
Anamoronn Mania	2.63 (1.76, 3.95)	2.10 (1.32, 3.36)	0.64 (0.27, 1.53)	1.56 (0.78, 3.14)
Vatovavy Fitovinany	2.11 (1.37, 3.24)	1.39 (0.85, 2.30)	0.59 (0.32, 1.10)	2.53 (1.33, 4.78)
Ihorombe	1.23 (0.80, 1.89)	0.82 (0.50, 1.34)	0.53 (0.25, 1.11)	1.99 (0.90, 4.38)
Atsimo Atsinanana	2.10 (1.29, 3.43)	1.34 (0.78, 2.28)	0.25 (0.08, 0.79)	1.59 (0.54, 4.64)
Atsinanana	1.63 (1.15, 2.32)	1.27 (0.86, 1.86)	0.78 (0.42, 1.47)	1.38 (0.74, 2.58)
Ananlanjirofo	2.14 (1.37, 3.36)	1.53 (0.93, 2.50)	0.41 (0.16, 1.06)	1.44 (0.56, 3.67)
Alaotra Mangoro	1.08 (0.72, 1.63)	0.91 (0.57, 1.43)	0.63 (0.32, 1.22)	1.11 (0.58, 2.12)
Boeny	1.71 (1.11, 2.66)	1.33 (0.81, 2.19)	2.27 (1.32, 3.91)	4.22 (2.52, 7.05)
Sofia	1.01 (0.62, 1.65)	0.67 (0.39, 1.15)	0.26 (0.10, 0.69)	0.88 (0.33, 2.39)
Betsiboka	0.91 (0.60, 1.38)	0.65 (0.39, 1.06)	0.21 (0.08, 0.57)	0.61 (0.30, 1.26)
Melaky	0.85 (0.54, 1.33)	0.53 (0.31, 0.91)	0.33 (0.14, 0.80)	1.48 (0.64, 3.40)
Atsimo Andrefana	1.44 (0.86, 2.39)	0.99 (0.57, 1.73)	1.11 (0.62, 1.98)	3.32 (1.74, 6.30)
Androy	1.53 (1.07, 2.20)	0.91 (0.58, 1.43)	0.41 (0.19, 0.88)	2.56 (1.09, 5.99)
Anosy	1.13 (0.68, 1.86)	0.74 (0.43, 1.29)	0.40 (0.15, 1.07)	1.65 (0.70, 3.93)
Menabe	1.15 (0.68, 1.94)	0.78 (0.46, 1.35)	1.32 (0.80, 2.17)	4.90 (2.69, 8.92)
Diana	1.37 (0.87, 2.17)	1.06 (0.65, 1.74)	0.98 (0.53, 1.81)	2.15 (1.08, 4.27)
Sava	1.03 (0.64, 1.65)	0.81 (0.48, 1.38)	0.59 (0.27, 1.29)	1.88 (0.79, 4.47)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.79 (0.66, 0.93)	0.88 (0.72, 1.07)	1.40 (0.93, 2.10)	1.02 (0.62, 1.68)
Secondary	0.67 (0.56, 0.80)	0.85 (0.66, 1.09)	3.17 (2.11, 4.76)	1.02 (0.59, 1.75)
Higher	0.39 (0.21, 0.72)	0.59 (0.30, 1.15)	4.69 (2.35, 9.36)	0.85 (0.35, 2.04)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	1.03 (0.83, 1.27)	0.97 (0.78, 1.21)	1.23 (0.65, 2.32)	1.44 (0.72, 2.88)
Middle	0.77 (0.61, 0.97)	0.76 (0.58, 0.98)	1.40 (0.73, 2.68)	1.65 (0.81, 3.36)
Richer	0.66 (0.51, 0.85)	0.67 (0.49, 0.91)	2.73 (1.58, 4.74)	3.20 (1.61, 6.37)
Richest	0.57 (0.45, 0.72)	0.55 (0.38, 0.80)	7.87 (4.78, 12.9)	7.11 (3.47, 14.6)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.71 (0.55, 0.91)	0.74 (0.56, 0.98)	4.18 (2.86, 6.11)	1.70 (1.13, 2.55)
Manual	0.85 (0.64, 1.13)	0.83 (0.61, 1.13)	1.84 (1.22, 2.79)	1.06 (0.66, 1.68)
Agricultural	1.11 (0.94, 1.32)	0.87 (0.66, 1.13)	0.73 (0.51, 1.02)	0.90 (0.56, 1.44)
Others	0.62 (0.08, 4.85)	0.65 (0.07, 5.69)	0.52 (0.07, 4.20)	0.27 (0.03, 2.20)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.85 (0.73, 1.00)	1.06 (0.89, 1.27)	1.69 (1.18, 2.43)	1.27 (0.81, 1.98)
Exposed to two media sources	0.68 (0.56, 0.83)	1.06 (0.81, 1.38)	3.87 (2.69, 5.56)	1.73 (1.07, 2.79)
Exposed to three media sources	0.63 (0.50, 0.80)	1.10 (0.78, 1.55)	6.08 (4.20, 8.81)	2.24 (1.30, 3.87)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.87 (0.74, 1.04)	0.92 (0.76, 1.11)	1.41 (1.08, 1.83)	1.12 (0.86, 1.47)

Table 47: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Ethiopia.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.66 (0.55, 0.79)	0.68 (0.55, 0.84)	1.37 (0.90, 2.09)	1.19 (0.76, 1.88)
25-29	0.55 (0.45, 0.66)	0.56 (0.43, 0.73)	2.15 (1.58, 2.94)	1.99 (1.30, 3.05)
30-34	0.64 (0.53, 0.79)	0.62 (0.45, 0.85)	3.26 (2.27, 4.67)	3.79 (2.31, 6.24)
35-39	0.75 (0.62, 0.90)	0.70 (0.51, 0.97)	2.90 (1.95, 4.31)	3.66 (2.18, 6.14)
40-44	0.78 (0.62, 0.97)	0.73 (0.51, 1.05)	3.35 (2.20, 5.09)	5.15 (2.87, 9.25)
45-49	0.88 (0.68, 1.14)	0.81 (0.56, 1.18)	2.90 (1.86, 4.53)	4.40 (2.43, 7.96)
Ethnicity				
Oromo (Reference)	1.00	1.00	1.00	1.00
Affar	2.12 (1.56, 2.89)	1.05 (0.58, 1.90)	0.65 (0.36, 1.20)	0.90 (0.42, 1.90)
Amhara	0.81 (0.69, 0.95)	0.89 (0.64, 1.24)	1.00 (0.74, 1.35)	1.07 (0.82, 1.38)
Guragie	1.12 (0.72, 1.75)	1.73 (1.01, 2.98)	2.33 (1.37, 3.98)	0.97 (0.63, 1.50)
Hadiye	0.81 (0.54, 1.23)	1.23 (0.65, 2.30)	0.67 (0.35, 1.28)	0.90 (0.45, 1.80)
Sidama	0.73 (0.47, 1.13)	1.17 (0.65, 2.10)	0.38 (0.21, 0.72)	0.80 (0.35, 1.86)
Somali	1.62 (1.32, 2.00)	1.36 (0.57, 3.25)	2.64 (1.78, 3.90)	2.39 (1.30, 4.38)
Tigray	1.55 (1.28, 1.88)	1.77 (1.05, 2.98)	1.21 (0.82, 1.80)	1.13 (0.79, 1.61)
Welaita	0.44 (0.37, 0.53)	0.70 (0.47, 1.05)	0.64 (0.22, 1.86)	0.68 (0.31, 1.50)
Others	0.42 (0.33, 0.54)	0.61 (0.41, 0.90)	0.79 (0.55, 1.14)	1.10 (0.70, 1.73)
Religion				
Other Christians (Reference)	1.00	1.00	1.00	1.00
Catholics	0.53 (0.25, 1.11)	0.60 (0.30, 1.22)	0.85 (0.26, 2.73)	0.84 (0.14, 5.10)
Islam	1.34 (1.17, 1.55)	1.06 (0.91, 1.25)	0.88 (0.65, 1.19)	1.08 (0.80, 1.48)
Others	1.09 (0.48, 2.45)	1.15 (0.67, 1.97)	0.70 (0.30, 1.64)	1.34 (0.46, 3.94)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.86 (0.70, 1.06)	1.26 (0.94, 1.67)	1.45 (1.06, 2.00)	0.88 (0.54, 1.43)
2	0.75 (0.58, 0.96)	1.21 (0.85, 1.72)	1.81 (1.28, 2.55)	0.93 (0.55, 1.56)
3	0.91 (0.74, 1.11)	1.53 (1.09, 2.14)	2.15 (1.57, 2.96)	1.39 (0.84, 2.32)
4	0.72 (0.56, 0.91)	1.18 (0.82, 1.71)	1.18 (0.82, 1.70)	0.73 (0.42, 1.26)
5	0.99 (0.80, 1.23)	1.54 (1.05, 2.24)	0.87 (0.55, 1.38)	0.68 (0.35, 1.31)
6+	0.96 (0.81, 1.13)	1.33 (0.93, 1.90)	0.91 (0.68, 1.24)	0.67 (0.38, 1.17)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.82 (0.72, 0.92)	0.77 (0.58, 1.01)	1.37 (1.10, 1.71)	1.68 (1.09, 2.59)
Formerly Married	0.91 (0.74, 1.12)	0.84 (0.61, 1.14)	2.14 (1.60, 2.86)	1.71 (1.06, 2.74)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.67 (0.57, 0.80)	0.68 (0.50, 0.93)	6.89 (5.15, 9.23)	1.78 (1.23, 2.58)

Table 47: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Addis Ababa (Reference)	1.00	1.00	1.00	1.00
Tigray	2.44 (1.91, 3.11)	1.13 (0.69, 1.85)	0.18 (0.13, 0.26)	0.52 (0.30, 0.90)
Afar	3.23 (2.54, 4.12)	2.13 (1.34, 3.39)	0.32 (0.22, 0.46)	1.08 (0.62, 1.91)
Amhara	1.33 (1.07, 1.65)	1.20 (0.84, 1.71)	0.09 (0.07, 0.12)	0.35 (0.22, 0.53)
Oromia	1.55 (1.26, 1.90)	1.12 (0.78, 1.61)	0.21 (0.14, 0.32)	0.80 (0.53, 1.23)
Somali	2.47 (1.92, 3.18)	1.14 (0.45, 2.84)	0.54 (0.41, 0.72)	1.64 (0.89, 3.02)
Benishangul	1.21 (0.95, 1.54)	1.22 (0.86, 1.74)	0.19 (0.14, 0.25)	0.95 (0.60, 1.50)
Snnpr	0.81 (0.64, 1.03)	0.70 (0.48, 1.01)	0.14 (0.10, 0.19)	0.71 (0.41, 1.22)
Gambela	2.25 (1.66, 3.06)	2.61 (1.73, 3.94)	0.27 (0.20, 0.38)	0.60 (0.39, 0.92)
Harari	1.54 (1.17, 2.04)	1.28 (0.90, 1.84)	0.67 (0.53, 0.84)	1.04 (0.77, 1.42)
Dire Dawa	1.69 (1.33, 2.14)	1.42 (1.02, 1.97)	0.74 (0.60, 0.91)	1.04 (0.78, 1.38)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.06 (0.93, 1.20)	1.05 (0.90, 1.24)	1.64 (1.35, 2.00)	1.49 (1.11, 1.99)
Secondary	0.73 (0.58, 0.91)	0.80 (0.61, 1.04)	2.92 (2.23, 3.84)	1.57 (1.04, 2.39)
Higher	1.03 (0.79, 1.35)	1.65 (1.19, 2.30)	5.88 (3.88, 8.92)	1.75 (1.00, 3.04)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.77 (0.63, 0.95)	0.85 (0.68, 1.07)	1.01 (0.64, 1.61)	1.43 (0.87, 2.34)
Middle	0.84 (0.68, 1.04)	0.96 (0.76, 1.21)	0.93 (0.58, 1.49)	1.27 (0.75, 2.16)
Richer	0.79 (0.64, 0.96)	0.92 (0.73, 1.16)	1.60 (1.05, 2.43)	2.12 (1.35, 3.32)
Richest	0.61 (0.49, 0.75)	0.82 (0.58, 1.17)	8.24 (5.66, 12.00)	4.36 (2.73, 6.97)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.68 (0.58, 0.80)	0.79 (0.66, 0.94)	2.77 (2.15, 3.55)	1.23 (0.96, 1.59)
Manual	0.70 (0.53, 0.91)	0.75 (0.56, 0.98)	1.35 (0.90, 2.01)	0.77 (0.52, 1.14)
Agricultural	0.84 (0.73, 0.97)	0.77 (0.66, 0.91)	0.42 (0.28, 0.61)	0.64 (0.42, 0.98)
Others	1.10 (0.77, 1.57)	1.11 (0.76, 1.62)	1.02 (0.61, 1.72)	0.61 (0.33, 1.13)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.97 (0.83, 1.14)	1.04 (0.87, 1.24)	1.88 (1.41, 2.49)	0.96 (0.66, 1.40)
Exposed to two media sources	0.87 (0.73, 1.04)	0.99 (0.80, 1.22)	4.02 (2.97, 5.44)	1.34 (0.94, 1.91)
Exposed to three media sources	0.79 (0.63, 1.00)	0.92 (0.68, 1.25)	6.21 (4.64, 8.31)	1.48 (0.91, 2.39)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.73 (0.63, 0.85)	0.89 (0.75, 1.05)	0.98 (0.81, 1.20)	0.90 (0.70, 1.17)

Table 48: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Burundi.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.36 (0.26, 0.48)	0.48 (0.34, 0.68)	1.03 (0.68, 1.57)	1.02 (0.60, 1.76)
25-29	0.47 (0.34, 0.64)	0.69 (0.44, 1.08)	1.26 (0.82, 1.94)	1.14 (0.61, 2.13)
30-34	0.52 (0.37, 0.72)	0.77 (0.46, 1.27)	1.42 (0.92, 2.19)	1.22 (0.60, 2.48)
35-39	0.82 (0.58, 1.17)	1.31 (0.73, 2.36)	1.46 (0.91, 2.34)	1.64 (0.80, 3.39)
40-44	0.88 (0.63, 1.24)	1.42 (0.81, 2.48)	1.48 (0.92, 2.37)	1.98 (0.88, 4.44)
45-49	1.17 (0.84, 1.63)	1.87 (1.03, 3.40)	1.55 (0.99, 2.45)	2.21 (0.96, 5.06)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.75 (0.60, 0.94)	0.84 (0.67, 1.06)	1.47 (1.14, 1.89)	1.30 (1.00, 1.69)
Islam	0.65 (0.32, 1.32)	0.86 (0.40, 1.86)	4.44 (2.59, 7.62)	1.84 (1.07, 3.15)
Others	1.14 (0.67, 1.94)	1.20 (0.69, 2.06)	1.10 (0.44, 2.73)	1.42 (0.51, 3.99)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.68 (0.49, 0.95)	2.12 (1.32, 3.40)	0.94 (0.60, 1.48)	0.73 (0.32, 1.67)
2	0.53 (0.36, 0.78)	1.75 (0.95, 3.23)	1.00 (0.64, 1.54)	0.72 (0.30, 1.73)
3	0.69 (0.46, 1.02)	2.21 (1.18, 4.12)	1.28 (0.85, 1.94)	0.95 (0.39, 2.31)
4	0.86 (0.56, 1.33)	2.17 (1.10, 4.29)	1.34 (0.85, 2.12)	0.89 (0.37, 2.14)
5	0.97 (0.65, 1.46)	2.12 (1.04, 4.32)	1.47 (0.94, 2.31)	0.97 (0.39, 2.41)
6+	0.96 (0.74, 1.25)	1.64 (0.84, 3.20)	1.14 (0.78, 1.66)	0.74 (0.28, 1.93)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.62 (0.50, 0.77)	0.36 (0.22, 0.59)	1.24 (0.95, 1.62)	1.55 (0.72, 3.34)
Formerly Married	1.16 (0.85, 1.56)	0.51 (0.30, 0.87)	0.93 (0.60, 1.46)	1.03 (0.44, 2.39)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.72 (0.52, 0.99)	0.87 (0.43, 1.77)	6.62 (5.04, 8.70)	2.20 (1.36, 3.56)
Region				
Bujumbura (Reference)	1.00	1.00	1.00	1.00
North	1.46 (0.98, 2.17)	1.11 (0.51, 2.41)	0.12 (0.09, 0.18)	0.69 (0.42, 1.15)
Centre East	1.51 (1.01, 2.26)	1.10 (0.51, 2.38)	0.13 (0.09, 0.20)	0.78 (0.45, 1.36)
West	1.32 (0.87, 2.00)	1.12 (0.50, 2.49)	0.16 (0.11, 0.25)	0.95 (0.54, 1.69)
South	1.24 (0.85, 1.83)	1.08 (0.51, 2.29)	0.18 (0.13, 0.25)	0.94 (0.56, 1.58)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.04 (0.83, 1.30)	0.95 (0.76, 1.20)	1.33 (0.99, 1.77)	1.09 (0.76, 1.55)
Secondary	0.81 (0.59, 1.10)	0.62 (0.40, 0.95)	3.13 (2.22, 4.43)	1.19 (0.71, 1.99)
Higher	0.62 (0.18, 2.07)	0.64 (0.18, 2.31)	9.18 (5.40, 15.6)	1.17 (0.59, 2.33)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.61 (0.46, 0.81)	0.58 (0.42, 0.78)	0.77 (0.41, 1.43)	0.69 (0.36, 1.30)
Middle	0.70 (0.51, 0.98)	0.67 (0.47, 0.95)	1.68 (0.95, 2.99)	1.39 (0.77, 2.52)
Richer	0.66 (0.49, 0.89)	0.62 (0.45, 0.86)	1.48 (0.84, 2.61)	1.17 (0.63, 2.18)
Richest	0.54 (0.40, 0.74)	0.57 (0.38, 0.84)	5.79 (3.64, 9.20)	1.80 (0.99, 3.27)

Table 48: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.31 (0.18, 0.52)	0.38 (0.22, 0.68)	3.79 (2.61, 5.51)	1.61 (1.06, 2.43)
Agricultural	0.55 (0.44, 0.70)	0.53 (0.41, 0.69)	0.50 (0.36, 0.68)	0.69 (0.42, 1.14)
Others	0.36 (0.10, 1.27)	0.30 (0.08, 1.08)	1.29 (0.54, 3.05)	0.77 (0.31, 1.94)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.99 (0.76, 1.28)	1.14 (0.86, 1.51)	1.35 (0.85, 2.12)	1.15 (0.70, 1.91)
Exposed to two media sources	1.03 (0.76, 1.40)	1.14 (0.81, 1.59)	2.83 (1.73, 4.63)	1.58 (0.88, 2.82)
Exposed to three media sources	1.13 (0.73, 1.75)	1.88 (1.11, 3.18)	6.68 (3.95, 11.3)	1.54 (0.79, 2.99)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.60 (0.41, 0.88)	0.90 (0.59, 1.38)	1.91 (1.37, 2.65)	1.65 (1.11, 2.46)

Table 49: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Burkina Faso.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.48 (0.38, 0.60)	0.75 (0.56, 1.02)	1.43 (0.95, 2.14)	1.14 (0.73, 1.78)
25-29	0.46 (0.35, 0.59)	0.78 (0.51, 1.19)	2.21 (1.51, 3.23)	2.04 (1.27, 3.28)
30-34	0.59 (0.47, 0.76)	1.07 (0.71, 1.62)	3.00 (2.09, 4.32)	3.67 (2.27, 5.94)
35-39	0.65 (0.51, 0.82)	1.19 (0.78, 1.81)	2.95 (2.06, 4.21)	4.49 (2.66, 7.56)
40-44	0.79 (0.62, 1.00)	1.51 (0.98, 2.32)	5.43 (3.80, 7.77)	11.1 (6.56, 18.8)
45-49	0.74 (0.57, 0.96)	1.38 (0.87, 2.18)	4.37 (3.01, 6.33)	10.5 (6.07, 18.1)
Ethnicity				
Mossi (Reference)	1.00	1.00	1.00	1.00
Bobo	0.72 (0.49, 1.08)	0.89 (0.54, 1.48)	1.31 (0.80, 2.16)	1.33 (0.78, 2.27)
Fulfuldé / Peul	3.01 (2.31, 3.91)	2.81 (2.10, 3.76)	0.71 (0.45, 1.10)	0.95 (0.57, 1.59)
Gourmantché	2.03 (1.47, 2.80)	0.95 (0.61, 1.49)	0.40 (0.23, 0.70)	0.87 (0.46, 1.65)
Gourouns	0.96 (0.59, 1.56)	0.98 (0.58, 1.66)	0.99 (0.63, 1.56)	0.97 (0.58, 1.62)
Lobi	1.01 (0.68, 1.50)	0.67 (0.31, 1.42)	0.62 (0.36, 1.07)	0.86 (0.40, 1.85)
Sénoufo	0.73 (0.44, 1.22)	1.19 (0.66, 2.15)	1.08 (0.75, 1.57)	1.04 (0.63, 1.71)
Dagara	0.67 (0.46, 0.97)	0.52 (0.31, 0.88)	0.91 (0.47, 1.75)	0.85 (0.37, 1.97)
Bissa	0.73 (0.51, 1.04)	0.69 (0.40, 1.18)	0.88 (0.52, 1.50)	1.16 (0.68, 1.98)
Others	0.89 (0.59, 1.36)	1.06 (0.70, 1.59)	1.73 (1.26, 2.38)	1.50(1.06, 2.14)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	1.17 (0.83, 1.65)	0.96 (0.69, 1.33)	0.78 (0.53, 1.15)	0.80 (0.53, 1.20)
Islam	1.18 (0.98, 1.43)	1.02 (0.83, 1.25)	0.97 (0.77, 1.23)	1.41 (1.06, 1.87)
Traditionalists	1.34 (0.97, 1.86)	1.09 (0.78, 1.52)	0.26 (0.15, 0.43)	0.60 (0.32, 1.12)
No Religion	0.87 (0.41, 1.85)	0.62 (0.29, 1.32)	0.39 (0.09, 1.75)	0.92 (0.25, 3.44)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.50 (0.38, 0.66)	0.76 (0.51, 1.13)	1.59 (1.15, 2.21)	1.10 (0.71, 1.71)
2	0.50 (0.38, 0.67)	0.75 (0.48, 1.18)	1.57 (1.14, 2.16)	0.86 (0.53, 1.37)
3	0.45 (0.34, 0.59)	0.64 (0.40, 1.02)	2.02 (1.51, 2.69)	0.93 (0.58, 1.50)
4	0.79 (0.61, 1.02)	1.00 (0.62, 1.63)	2.01 (1.44, 2.80)	0.88 (0.53, 1.45)
5	0.67 (0.50, 0.89)	0.74 (0.44, 1.23)	1.95 (1.37, 2.77)	0.82 (0.47, 1.43)
6+	0.78 (0.64, 0.95)	0.66 (0.41, 1.07)	1.46 (1.11, 1.92)	0.53 (0.30, 0.93)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.62 (0.52, 0.73)	0.50 (0.34, 0.75)	1.90 (1.44, 2.50)	1.81 (1.10, 2.98)
Formerly Married	0.53 (0.34, 0.83)	0.50 (0.29, 0.88)	2.77 (1.74, 4.41)	1.27 (0.61, 2.63)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.47 (0.37, 0.58)	0.62 (0.46, 0.84)	4.65 (3.84, 5.64)	1.51 (1.12, 2.05)

Table 49: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Centre (Reference)	1.00	1.00	1.00	1.00
Boucle de Mouhoun	1.49 (0.99, 2.23)	0.86 (0.55, 1.35)	0.29 (0.20, 0.42)	0.64 (0.39, 1.04)
Cascades	0.96 (0.58, 1.61)	0.61 (0.33, 1.15)	0.41 (0.29, 0.57)	0.76 (0.46, 1.24)
Centre-Est	1.93 (1.22, 3.03)	1.36 (0.79, 2.33)	0.21 (0.15, 0.30)	0.46 (0.30, 0.71)
Centre-Nord	1.60 (1.02, 2.49)	1.03 (0.64, 1.65)	0.15 (0.08, 0.28)	0.45 (0.23, 0.87)
Centre-Ouest	2.10 (1.41, 3.13)	1.38 (0.89, 2.14)	0.25 (0.15, 0.41)	0.73 (0.44, 1.21)
Centre-Sud	2.25 (1.43, 3.54)	1.53 (0.95, 2.45)	0.14 (0.08, 0.26)	0.40 (0.21, 0.75)
Est	4.19 (2.85, 6.16)	2.61 (1.64, 4.15)	0.19 (0.12, 0.31)	0.88 (0.52, 1.50)
Hauts Basins	1.44 (0.93, 2.22)	1.06 (0.65, 1.71)	0.60 (0.45, 0.79)	0.85 (0.63, 1.16)
Nord	2.30 (1.51, 3.50)	1.44 (0.94, 2.22)	0.16 (0.10, 0.25)	0.41 (0.26, 0.64)
Plateau Central	1.31 (0.83, 2.08)	0.86 (0.54, 1.39)	0.18 (0.12, 0.27)	0.54 (0.33, 0.88)
Sahel	2.83 (1.77, 4.54)	0.93 (0.56, 1.55)	0.28 (0.19, 0.43)	0.83 (0.49, 1.40)
Sud-Ouest	1.74 (1.20, 2.54)	1.70 (0.90, 3.22)	0.22 (0.16, 0.32)	1.01 (0.55, 1.88)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.70 (0.55, 0.89)	0.87 (0.67, 1.13)	2.04(1.65, 2.54)	1.34 (1.02, 1.75)
Secondary	0.70 (0.54, 0.92)	0.78 (0.55, 1.11)	3.04 (2.44, 3.79)	1.74 (1.25, 2.42)
Higher	0.77 (0.40, 1.51)	1.63 (0.71, 3.75)	3.62 (1.98, 6.62)	0.89 (0.44, 1.81)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.82 (0.66, 1.01)	0.88 (0.71, 1.08)	1.36 (0.88, 2.10)	1.45 (0.94, 2.26)
Middle	0.67 (0.53, 0.85)	0.78 (0.61, 1.00)	1.50 (0.97, 2.31)	1.59 (1.00, 2.52)
Richer	0.52 (0.41, 0.65)	0.70 (0.54, 0.92)	2.35 (1.50, 3.69)	1.91 (1.17, 3.12)
Richest	0.34 (0.26, 0.45)	0.47 (0.32, 0.67)	8.25 (5.60, 12.2)	3.58 (2.09, 6.13)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.68 (0.53, 0.85)	0.74 (0.58, 0.96)	1.56 (1.23, 1.98)	1.04 (0.82, 1.32)
Manual	0.51 (0.34, 0.76)	0.57 (0.37, 0.87)	0.78 (0.50, 1.21)	0.80 (0.54, 1.19)
Agricultural	0.86 (0.69, 1.06)	0.75 (0.59, 0.95)	0.31 (0.24, 0.41)	0.61 (0.44, 0.84)
Others	0.76 (0.42, 1.36)	0.69 (0.34, 1.39)	0.59 (0.31, 1.10)	0.60 (0.34, 1.07)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.81 (0.69, 0.96)	0.94 (0.79, 1.12)	1.19 (0.92, 1.53)	0.97 (0.74, 1.27)
Exposed to two media sources	0.68 (0.54, 0.85)	1.26 (0.97, 1.65)	3.17 (2.44, 4.12)	1.11 (0.82, 1.50)
Exposed to three media sources	0.54 (0.37, 0.77)	1.27 (0.77, 2.10)	4.83 (3.56, 6.55)	1.11 (0.73, 1.70)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.59 (0.45, 0.76)	0.87 (0.67, 1.15)	2.33 (1.93, 2.81)	1.54 (1.20, 1.97)

Table 50: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Chad.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.71 (0.57, 0.88)	0.80 (0.62, 1.03)	1.40 (0.98, 1.99)	1.51 (0.90, 2.54)
25-29	0.71 (0.58, 0.85)	0.87 (0.64, 1.18)	2.27 (1.65, 3.12)	3.30 (1.84, 5.92)
30-34	0.59 (0.47, 0.73)	0.83 (0.59, 1.15)	3.13 (2.27, 4.31)	5.31 (2.85, 9.90)
35-39	0.66 (0.52, 0.84)	0.93 (0.63, 1.36)	4.33 (3.08, 6.08)	7.62 (3.86, 15.0)
40-44	0.72 (0.57, 0.92)	1.05 (0.73, 1.51)	4.88 (3.49, 6.82)	9.01 (4.35, 18.6)
45-49	0.68 (0.53, 0.88)	0.97 (0.64, 1.47)	4.33 (3.03, 6.17)	8.40 (4.26, 16.6)
Ethnicity				
Sara (Ngambaye/Sara Madjin-Gaye/Mbaye) (Reference)	1.00	1.00	1.00	1.00
Gorane	5.93 (4.03, 8.72)	2.35 (1.18, 4.68)	1.76 (0.88, 3.51)	1.56 (0.60, 4.11)
Arab	4.02 (2.77, 5.84)	2.44 (1.29, 4.61)	1.82 (0.90, 3.69)	1.32 (0.53, 3.30)
Baguirmi/Barma	1.61 (0.79, 3.25)	0.91 (0.40, 2.10)	4.72 (2.24, 9.93)	3.55 (1.39, 9.09)
Kanembou/Bornou/Boudouma	4.43 (3.05, 6.44)	1.81 (0.92, 3.56)	1.30 (0.62, 2.73)	1.70 (0.65, 4.45)
Boulala/Médégo/Kouka	4.19 (2.77, 6.33)	2.17 (1.06, 4.41)	1.58 (0.74, 3.36)	1.10 (0.42, 2.89)
Ouadaï/Maba/Massalit/Mimi	2.65 (1.77, 3.99)	1.75 (0.86, 3.55)	1.21 (0.59, 2.46)	1.09 (0.44, 2.73)
Zaghawa/Bideyat/Kobé	5.64 (3.49, 9.10)	4.07 (1.91, 8.67)	2.80 (1.04, 7.53)	1.81 (0.57, 5.70)
Dadajo/Kibet/Mouro	2.19 (1.35, 3.54)	1.21 (0.58, 2.52)	1.00 (0.36, 2.76)	1.00 (0.33, 3.06)
Bidio/Migami/Kenga/Dangléat	2.23 (1.26, 3.93)	1.38 (0.65, 2.94)	1.08 (0.43, 2.69)	1.08 (0.28, 4.15)
Moundang	0.78 (0.40, 1.50)	1.25 (0.53, 2.98)	1.94 (0.95, 3.96)	1.43 (0.54, 3.78)
Massa/Mousseye/Mousgoume	0.75 (0.40, 1.40)	0.62 (0.31, 1.26)	0.59 (0.25, 1.40)	0.61 (0.26, 1.41)
Toupouri/Kéra	0.79 (0.54, 1.14)	1.03 (0.57, 1.86)	2.43 (1.31, 4.52)	1.90 (0.88, 4.10)
Peul/Foulbé/Bodoré	6.09 (3.54, 10.5)	3.84 (1.89, 7.80)	2.16 (0.90, 5.19)	1.41 (0.48, 4.16)
Tama/Assongori/Mararit	2.16 (1.25, 3.74)	1.64 (0.68, 3.94)	1.26 (0.59, 2.69)	1.49 (0.52, 4.24)
Gabri/Kabalaye/Nangtchéré/Soumraye	0.86 (0.45, 1.63)	1.32 (0.57, 3.06)	2.70 (1.23, 5.93)	2.17 (0.80, 5.89)
Marba/Lélé/Mesmé	0.72 (0.42, 1.23)	1.12 (0.53, 2.33)	0.81 (0.35, 1.87)	0.68 (0.28, 1.66)
Karo/Zimé/Pévé	0.49 (0.17, 1.44)	0.85 (0.24, 3.03)	1.79 (0.87, 3.66)	1.78 (0.67, 4.72)
Others	1.79 (1.09, 2.92)	1.39 (0.72, 2.69)	3.11 (1.55, 6.26)	2.37 (1.04, 5.38)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	1.04 (0.75, 1.44)	0.88 (0.62, 1.24)	1.21 (0.99, 1.49)	1.27 (1.02, 1.58)
Islam	4.77 (3.85, 5.91)	2.02 (1.23, 3.31)	0.92 (0.72, 1.18)	1.80 (1.12, 2.90)
Traditionalists	1.88 (0.46, 7.64)	1.23 (0.26, 5.82)	0.30 (0.04, 2.18)	0.70 (0.09, 5.26)
No Religion	0.85 (0.54, 1.33)	0.78 (0.48, 1.27)	0.37 (0.20, 0.69)	0.69 (0.34, 1.41)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.79 (0.60, 1.04)	1.26 (0.87, 1.83)	0.91 (0.58, 1.45)	0.82 (0.35, 1.91)
2	0.70 (0.55, 0.90)	1.06 (0.72, 1.56)	1.59 (1.11, 2.29)	1.07 (0.51, 2.24)
3	0.74 (0.57, 0.96)	1.09 (0.74, 1.62)	1.41 (0.94, 2.12)	0.74 (0.35, 1.56)
4	0.78 (0.61, 0.99)	1.10 (0.72, 1.69)	1.84 (1.23, 2.75)	0.94 (0.43, 2.04)
5	0.69 (0.54, 0.87)	0.85 (0.57, 1.27)	1.58 (1.08, 2.30)	0.72 (0.35, 1.47)
6+	0.63 (0.53, 0.74)	0.81 (0.56, 1.17)	2.13 (1.62, 2.80)	0.76 (0.39, 1.49)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.72 (0.61, 0.85)	0.72 (0.51, 1.01)	1.58 (1.20, 2.09)	0.92 (0.38, 2.22)
Formerly Married	0.67 (0.51, 0.87)	0.74 (0.49, 1.13)	2.90 (2.04, 4.11)	1.09 (0.42, 2.81)

Table 50: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.95 (0.79, 1.14)	1.20 (0.84, 1.73)	3.71 (3.10, 4.43)	1.81 (1.33, 2.44)
Region				
N'Djaména (Reference)	1.00	1.00	1.00	1.00
Batha	2.31 (1.66, 3.22)	1.24 (0.80, 1.93)	0.30 (0.17, 0.52)	0.64 (0.33, 1.25)
Borkou, Tibesti	1.76 (1.19, 2.62)	0.82 (0.53, 1.29)	0.82 (0.59, 1.14)	1.17 (0.69, 1.96)
Chari Baguirmi	1.77 (1.22, 2.57)	1.12 (0.76, 1.63)	0.26 (0.18, 0.39)	0.53 (0.32, 0.88)
Guéra	1.25 (0.82, 1.89)	0.90 (0.59, 1.40)	0.21 (0.10, 0.45)	0.44 (0.19, 1.01)
Hadjer-Lamis	1.55 (1.08, 2.22)	0.77 (0.52, 1.14)	0.21 (0.12, 0.38)	0.46 (0.26, 0.82)
Kanem	3.38 (2.50, 4.57)	1.65 (1.06, 2.56)	0.14 (0.08, 0.24)	0.25 (0.12, 0.52)
Lac	2.70 (2.09, 3.50)	1.54 (1.00, 2.37)	0.09 (0.05, 0.16)	0.19 (0.09, 0.40)
Logone Occidental	0.45 (0.27, 0.77)	0.93 (0.55, 1.58)	0.57 (0.42, 0.79)	0.95 (0.64, 1.40)
Logone Oriental	0.56 (0.39, 0.82)	1.16 (0.75, 1.78)	0.33 (0.25, 0.45)	0.69 (0.46, 1.02)
Mandoul	0.46 (0.34, 0.62)	1.00 (0.66, 1.52)	0.28 (0.19, 0.41)	0.58 (0.37, 0.92)
Mayo Kebbi Est	0.52 (0.34, 0.80)	1.33 (0.77, 2.27)	0.15 (0.09, 0.26)	0.70 (0.39, 1.28)
Mayo Kebbi Ouest	0.38 (0.24, 0.61)	0.65 (0.33, 1.27)	0.31 (0.23, 0.44)	0.82 (0.47, 1.41)
Moyen Chari	0.40 (0.26, 0.63)	0.65 (0.40, 1.06)	0.46 (0.30, 0.72)	0.75 (0.48, 1.18)
Ouaddaï	1.33 (0.91, 1.94)	0.79 (0.50, 1.25)	0.20 (0.12, 0.33)	0.48 (0.25, 0.91)
Salamat	1.52 (1.02, 2.27)	0.89 (0.56, 1.41)	0.16 (0.09, 0.29)	0.31 (0.17, 0.58)
Tandjilé	0.35 (0.23, 0.53)	0.74 (0.40, 1.40)	0.28 (0.18, 0.42)	0.78 (0.44, 1.38)
Wadi Fira	1.31 (0.95, 1.81)	0.60 (0.37, 0.98)	0.19 (0.13, 0.29)	0.50 (0.26, 0.95)
Barh El Gazal	3.28 (2.19, 4.90)	1.56 (0.96, 2.53)	0.28 (0.15, 0.52)	0.47 (0.23, 0.95)
Ennedi Est, Ennedi Ouest	2.18 (1.21, 3.91)	0.81 (0.40, 1.64)	0.50 (0.27, 0.92)	0.93 (0.44, 1.97)
Sila	1.87 (1.24, 2.82)	1.19 (0.74, 1.92)	0.14 (0.07, 0.28)	0.36 (0.18, 0.73)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.44 (0.36, 0.52)	0.98 (0.80, 1.20)	1.43 (1.14, 1.79)	1.37 (1.01, 1.85)
Secondary	0.55 (0.44, 0.68)	1.22 (0.90, 1.66)	1.69 (1.34, 2.14)	1.48 (1.02, 2.14)
Higher	0.26 (0.08, 0.86)	0.67 (0.18, 2.53)	6.15 (3.63, 10.4)	1.79 (0.96, 3.31)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	1.09 (0.88, 1.35)	0.98 (0.79, 1.22)	1.19 (0.89, 1.59)	1.41 (1.02, 1.94)
Middle	1.41 (1.15, 1.73)	1.07 (0.87, 1.31)	1.02 (0.71, 1.46)	1.15 (0.79, 1.68)
Richer	1.61 (1.29, 2.01)	1.05 (0.79, 1.38)	1.22 (0.87, 1.70)	1.37 (0.94, 1.97)
Richest	1.12 (0.91, 1.37)	0.72 (0.52, 0.99)	4.02 (3.06, 5.26)	1.73 (1.20, 2.49)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.35 (0.29, 0.42)	0.73 (0.61, 0.88)	1.67 (1.35, 2.06)	1.25 (0.99, 1.59)
Manual	0.88 (0.61, 1.27)	0.72 (0.50, 1.03)	0.57 (0.23, 1.43)	0.45 (0.15, 1.36)
Agricultural	0.71 (0.58, 0.86)	1.05 (0.85, 1.30)	0.78 (0.54, 1.11)	1.00 (0.68, 1.47)
Others	0.41 (0.17, 0.99)	0.47 (0.24, 0.95)	0.21 (0.05, 0.91)	0.32 (0.07, 1.49)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.72 (0.59, 0.88)	0.97 (0.77, 1.22)	1.97 (1.50, 2.59)	1.17 (0.85, 1.61)
Exposed to two media sources	0.66 (0.51, 0.85)	0.83 (0.60, 1.13)	2.44 (1.86, 3.21)	1.02 (0.71, 1.46)
Exposed to three media sources	0.72 (0.51, 1.03)	0.90 (0.56, 1.46)	3.80 (2.85, 5.06)	1.25 (0.79, 1.99)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.23 (0.12, 0.46)	0.48 (0.23, 1.01)	1.93 (1.37, 2.74)	0.91 (0.62, 1.33)

Table 51: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Democratic Republic of Congo.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.73 (0.56, 0.94)	0.90 (0.62, 1.30)	1.40 (1.01, 1.92)	1.25 (0.80, 1.93)
25-29	0.58 (0.44, 0.76)	0.64 (0.40, 1.00)	2.05 (1.51, 2.79)	2.01 (1.28, 3.15)
30-34	0.58 (0.42, 0.80)	0.66 (0.38, 1.15)	2.76 (2.07, 3.68)	2.76 (1.75, 4.34)
35-39	0.67 (0.50, 0.92)	0.88 (0.54, 1.45)	3.50 (2.59, 4.73)	3.53 (2.09, 5.96)
40-44	0.66 (0.46, 0.95)	0.85 (0.48, 1.48)	3.29 (2.35, 4.61)	3.51 (2.02, 6.09)
45-49	0.42 (0.29, 0.60)	0.48 (0.27, 0.84)	3.31 (2.40, 4.55)	4.56 (2.76, 7.52)
Ethnicity				
Kasai, Katanga, Tanganyika (Reference)	1.00	1.00	1.00	1.00
Bakongo Nord & Sud	1.18 (0.75, 1.84)	1.13 (0.68, 1.86)	1.90 (1.31, 2.76)	1.19 (0.68, 2.08)
Bas Kasaï et Kwilu-Kwango	1.64 (1.33, 2.02)	1.42 (1.01, 2.01)	0.76 (0.50, 1.14)	0.98 (0.56, 1.73)
Cuvette central	1.21 (0.92, 1.59)	0.90 (0.59, 1.37)	0.75 (0.42, 1.34)	1.06 (0.58, 1.92)
Ubangi et Itimbiri	0.49 (0.36, 0.67)	0.34 (0.18, 0.61)	0.98 (0.64, 1.50)	1.25 (0.68, 2.29)
Uele Lac Albert	0.52 (0.36, 0.75)	0.41 (0.16, 1.06)	1.68 (1.15, 2.44)	1.33 (0.70, 2.53)
Basele-K, Man. et Kivu	0.45 (0.33, 0.62)	0.34 (0.08, 1.40)	2.26 (1.53, 3.35)	2.23 (1.14, 4.35)
Others	1.59 (0.71, 3.58)	1.43 (0.74, 2.75)	2.49 (0.97, 6.41)	1.97 (0.70, 5.53)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	1.01 (0.81, 1.26)	0.97 (0.78, 1.21)	1.18 (0.97, 1.44)	1.18 (0.97, 1.43)
Islam	0.64 (0.32, 1.27)	0.92 (0.45, 1.91)	1.83 (1.03, 3.24)	1.64 (0.84, 3.20)
Traditionalists	3.68 (1.43, 9.46)	2.22 (0.84, 5.84)	2.06 (0.48, 8.86)	2.74 (0.88, 8.50)
Others	0.97 (0.50, 1.91)	0.85 (0.39, 1.84)	0.80 (0.47, 1.57)	1.13 (0.56, 2.31)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.85 (0.63, 1.16)	1.02 (0.68, 1.53)	0.92 (0.67, 1.28)	0.67 (0.42, 1.07)
2	0.58 (0.42, 0.78)	0.75 (0.47, 1.19)	1.30 (0.97, 1.75)	0.78 (0.47, 1.29)
3	0.77 (0.56, 1.05)	1.07 (0.65, 1.77)	1.60 (1.19, 2.14)	0.86 (0.51, 1.46)
4	0.95 (0.69, 1.31)	1.33 (0.75, 2.37)	1.34 (0.95, 1.90)	0.69 (0.41, 1.15)
5	0.76 (0.55, 1.07)	0.99 (0.58, 1.68)	1.52 (1.16, 2.01)	0.80 (0.49, 1.33)
6+	0.56 (0.43, 0.73)	0.73 (0.44, 1.19)	1.75 (1.39, 2.20)	0.78 (0.49, 1.25)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.67 (0.55, 0.82)	0.70 (0.49, 1.02)	1.66 (1.35, 2.03)	2.20 (1.46, 3.32)
Formerly Married	0.75 (0.58, 0.96)	0.87 (0.59, 1.30)	1.72 (1.31, 2.26)	1.63 (1.03, 2.59)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.59 (0.49, 0.71)	0.77 (0.56, 1.06)	3.03 (2.21, 4.16)	1.03 (0.69, 1.54)

Table 51: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Kinshasa (Reference)	1.00	1.00	1.00	1.00
Bandundu	3.08 (2.25, 4.21)	1.29 (0.81, 2.08)	0.11 (0.07, 0.18)	0.49 (0.28, 0.84)
Bas-Congo	3.05 (1.66, 5.59)	1.55 (0.84, 2.89)	0.27 (0.15, 0.48)	0.53 (0.32, 0.89)
Equateur	1.40 (0.98, 1.99)	1.53 (0.83, 2.81)	0.22 (0.14, 0.32)	0.78 (0.48, 1.28)
Kasai-Occidental	1.62 (1.16, 2.27)	0.86 (0.53, 1.41)	0.18 (0.10, 0.33)	0.59 (0.31, 1.14)
Kasai-Oriental	1.97 (1.42, 2.72)	1.16 (0.73, 1.84)	0.25 (0.17, 0.38)	0.68 (0.38, 1.21)
Katanga	2.00 (1.42, 2.83)	1.12 (0.69, 1.81)	0.41 (0.26, 0.65)	1.06 (0.59, 1.88)
Maniema	1.04 (0.64, 1.72)	1.67 (0.40, 7.07)	0.41 (0.30, 0.55)	0.73 (0.35, 1.50)
Nord-Kivu	0.71 (0.47, 1.07)	1.05 (0.27, 4.06)	0.77 (0.54, 1.09)	1.29 (0.68, 2.45)
Orientale	0.92 (0.60, 1.41)	1.15 (0.41, 3.21)	0.57 (0.42, 0.78)	1.74 (1.00, 3.03)
Sud-Kivu	0.91 (0.46, 1.78)	1.45 (0.35, 6.05)	0.76 (0.39, 1.49)	1.32 (0.61, 2.83)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.36 (1.10, 1.67)	1.15 (0.93, 1.43)	1.13 (0.81, 1.58)	1.18 (0.85, 1.64)
Secondary	1.09 (0.84, 1.42)	0.86 (0.62, 1.19)	1.63 (1.23, 2.16)	1.19 (0.85, 1.68)
Higher	0.67 (0.40, 1.12)	0.89 (0.48, 1.66)	3.50 (2.48, 4.93)	1.41 (0.82, 2.43)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	1.13 (0.89, 1.45)	1.11 (0.87, 1.42)	1.02 (0.67, 1.54)	0.98 (0.62, 1.54)
Middle	0.87 (0.66, 1.15)	0.89 (0.66, 1.19)	1.42 (0.98, 2.04)	1.18 (0.78, 1.77)
Richer	0.77 (0.54, 1.10)	0.88 (0.64, 1.21)	2.85 (1.70, 4.78)	2.06 (1.33, 3.19)
Richest	0.51 (0.39, 0.66)	0.61 (0.40, 0.92)	5.97 (4.40, 8.08)	4.34 (2.78, 6.77)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.50 (0.38, 0.64)	0.64 (0.49, 0.85)	1.60 (1.35, 1.91)	1.04 (0.85, 1.26)
Manual	0.14 (0.03, 0.69)	0.25 (0.05, 1.36)	1.08 (0.42, 2.77)	0.66 (0.25, 1.79)
Agricultural	0.95 (0.79, 1.14)	0.93 (0.74, 1.18)	0.49 (0.38, 0.64)	0.56 (0.42, 0.74)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.81 (0.63, 1.03)	1.00 (0.74, 1.35)	1.71 (1.33, 2.20)	0.99 (0.78, 1.25)
Exposed to two media sources	0.68 (0.50, 0.91)	0.92 (0.64, 1.31)	2.65 (2.15, 3.27)	1.15 (0.85, 1.55)
Exposed to three media sources	0.67 (0.42, 1.06)	1.06 (0.62, 1.80)	3.43 (2.54, 4.63)	1.28 (0.92, 1.77)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.28 (0.11, 0.72)	0.45 (0.17, 1.22)	2.49 (1.68, 3.70)	1.33 (0.86, 2.04)

Table 52: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Niger.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.43 (0.32, 0.57)	0.67 (0.46, 0.98)	1.78 (1.16, 2.72)	1.50 (0.89, 2.53)
25-29	0.34 (0.25, 0.46)	0.54 (0.33, 0.89)	3.27 (2.20, 4.86)	3.67 (2.11, 6.36)
30-34	0.36 (0.24, 0.52)	0.52 (0.31, 0.87)	4.96 (3.31, 7.42)	6.72 (3.73, 12.1)
35-39	0.30 (0.21, 0.44)	0.42 (0.23, 0.78)	4.72 (3.20, 6.97)	6.45 (3.67, 11.3)
40-44	0.44 (0.30, 0.65)	0.59 (0.33, 1.05)	5.19 (3.39, 7.96)	7.68 (4.17, 14.1)
45-49	0.54 (0.32, 0.89)	0.72 (0.36, 1.47)	4.91 (3.14, 7.70)	7.68 (4.21, 14.0)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.42 (0.28, 0.62)	0.61 (0.37, 0.99)	1.72 (1.11, 2.65)	1.02 (0.56, 1.85)
2	0.29 (0.19, 0.45)	0.54 (0.31, 0.93)	2.11 (1.43, 3.14)	0.87 (0.46, 1.64)
3	0.37 (0.25, 0.56)	0.67 (0.37, 1.23)	1.87 (1.27, 2.76)	0.71 (0.40, 1.29)
4	0.36 (0.24, 0.53)	0.71 (0.39, 1.31)	2.20 (1.46, 3.30)	0.66 (0.35, 1.24)
5	0.30 (0.19, 0.47)	0.64 (0.34, 1.22)	1.91 (1.28, 2.84)	0.50 (0.27, 0.93)
6+	0.41 (0.31, 0.55)	0.82 (0.45, 1.50)	2.09 (1.49, 2.93)	0.51 (0.28, 0.92)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.35 (0.27, 0.46)	0.57 (0.37, 0.88)	2.60 (1.72, 3.92)	3.93 (2.21, 6.99)
Formerly Married	0.39 (0.22, 0.69)	0.62 (0.31, 1.21)	3.15 (1.82, 5.44)	2.69 (1.30, 5.57)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.90 (0.70, 1.15)	1.04 (0.68, 1.59)	3.99 (3.24, 4.93)	1.57 (1.06, 2.33)
Region				
Niamey (Reference)	1.00	1.00	1.00	1.00
Agadez	1.16 (0.72, 1.87)	1.09 (0.65, 1.84)	0.53 (0.37, 0.75)	0.86 (0.55, 1.34)
Diffa	0.63 (0.35, 1.14)	0.73 (0.38, 1.41)	0.14 (0.09, 0.22)	0.29 (0.15, 0.56)
Dosso	0.97 (0.61, 1.55)	0.97 (0.55, 1.70)	0.38 (0.27, 0.52)	1.18 (0.78, 1.78)
Maradi	1.17 (0.75, 1.85)	1.24 (0.72, 2.16)	0.13 (0.09, 0.19)	0.36 (0.23, 0.56)
Tahoua	0.95 (0.58, 1.53)	0.87 (0.50, 1.52)	0.30 (0.22, 0.43)	0.97 (0.63, 1.47)
Tillaberi	0.99 (0.60, 1.64)	0.99 (0.55, 1.77)	0.35 (0.26, 0.48)	1.04 (0.69, 1.58)
Zinder	1.55 (0.99, 2.43)	1.69 (0.99, 2.87)	0.10 (0.07, 0.16)	0.26 (0.16, 0.43)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.99 (0.71, 1.37)	0.84 (0.58, 1.23)	1.68 (1.31, 2.15)	1.22 (0.92, 1.62)
Secondary	1.53 (1.13, 2.08)	0.92 (0.58, 1.44)	1.89 (1.40, 2.55)	1.38 (0.90, 2.11)
Higher	0.30 (0.07, 1.36)	0.33 (0.06, 1.78)	4.63 (2.08, 10.3)	0.89 (0.34, 2.36)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.90 (0.65, 1.25)	0.94 (0.67, 1.33)	1.09 (0.72, 1.65)	1.04 (0.69, 1.57)
Middle	0.86 (0.63, 1.18)	0.88 (0.63, 1.22)	1.00 (0.65, 1.56)	0.95 (0.61, 1.49)
Richer	0.67 (0.47, 0.96)	0.69 (0.47, 1.01)	1.54 (1.02, 2.31)	1.46 (0.97, 2.20)
Richest	0.66 (0.48, 0.91)	0.50 (0.31, 0.80)	4.68 (3.23, 6.80)	3.31 (2.07, 5.30)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.83 (0.62, 1.12)	0.93 (0.68, 1.27)	1.69 (1.35, 2.10)	1.23 (0.95, 1.60)
Manual	0.60 (0.31, 1.16)	0.63 (0.31, 1.29)	2.32 (1.52, 3.55)	1.50 (0.88, 2.53)
Agricultural	1.04 (0.51, 2.14)	1.10 (0.53, 2.29)	1.40 (0.75, 2.61)	1.45 (0.74, 2.84)

Table 52: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.85 (0.66, 1.09)	0.91 (0.69, 1.19)	1.07 (0.83, 1.38)	0.85 (0.65, 1.11)
Exposed to two media sources	0.90 (0.68, 1.19)	0.97 (0.70, 1.33)	2.50 (1.90, 3.29)	1.08 (0.78, 1.51)
Exposed to three media sources	1.26 (0.81, 1.97)	1.20 (0.66, 2.19)	3.31 (2.21, 4.95)	1.02 (0.59, 1.77)
Hormonal Contraceptives use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.44 (0.26, 0.74)	0.70 (0.42, 1.17)	2.69 (2.04, 3.54)	1.44 (1.07, 1.95)

Table 53: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Mali.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.60 (0.44, 0.83)	0.77 (0.52, 1.13)	1.40 (0.94, 2.07)	1.65 (1.08, 2.50)
25-29	0.59 (0.44, 0.79)	0.80 (0.52, 1.24)	2.90 (2.07, 4.06)	4.30 (2.76, 6.71)
30-34	0.41 (0.28, 0.61)	0.51 (0.30, 0.89)	3.38 (2.31, 4.94)	4.90 (2.98, 8.07)
35-39	0.42 (0.28, 0.63)	0.54 (0.30, 0.95)	5.21 (3.53, 7.71)	7.84 (4.69, 13.1)
40-44	0.68 (0.46, 1.00)	0.89 (0.51, 1.56)	4.96 (3.50, 7.04)	7.61 (4.58, 12.6)
45-49	0.55 (0.34, 0.89)	0.70 (0.38, 1.32)	4.52 (3.12, 6.55)	7.84 (4.72, 13.0)
Ethnicity				
Bambara (Reference)	1.00	1.00	1.00	1.00
Malinke	0.85 (0.56, 1.30)	0.96 (0.60, 1.52)	1.01 (0.71, 1.42)	0.73 (0.51, 1.05)
Peulh	1.37 (0.99, 1.89)	1.31 (0.93, 1.84)	1.10 (0.81, 1.50)	0.99 (0.72, 1.37)
Sarakole/Soninke/Marka	1.19 (0.83, 1.72)	1.34 (0.87, 2.06)	1.25 (0.91, 1.72)	1.03 (0.71, 1.49)
Dogon	0.82 (0.54, 1.24)	0.53 (0.34, 0.83)	0.87 (0.60, 1.26)	1.03 (0.63, 1.68)
Sénoufo/Minianka	0.86 (0.55, 1.34)	0.82 (0.52, 1.29)	0.81 (0.53, 1.23)	0.84 (0.54, 1.29)
Others	0.71 (0.50, 1.02)	0.71 (0.47, 1.06)	1.31 (0.98, 1.76)	1.15 (0.83, 1.59)
Religion				
Islam (Reference)	1.00	1.00	1.00	1.00
Catholics	0.50 (0.20, 1.23)	0.61 (0.23, 1.59)	0.85 (0.44, 1.67)	0.85 (0.43, 1.66)
Other Christians	0.47 (0.18, 1.21)	0.57 (0.22, 1.50)	0.52 (0.29, 0.92)	0.70 (0.40, 1.24)
Traditionalists	0.22 (0.05, 1.04)	0.25 (0.05, 1.22)	0.29 (0.08, 1.02)	0.55 (0.17, 1.82)
No Religion	1.33 (0.72, 2.43)	1.40 (0.74, 2.68)	0.46 (0.20, 1.02)	0.89 (0.37, 2.09)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.88 (0.64, 1.22)	1.08 (0.72, 1.60)	1.10 (0.77, 1.56)	0.82 (0.52, 1.30)
2	0.40 (0.28, 0.57)	0.52 (0.32, 0.84)	1.55 (1.12, 2.15)	0.82 (0.53, 1.28)
3	0.37 (0.24, 0.58)	0.46 (0.25, 0.82)	1.52 (1.06, 2.19)	0.66 (0.41, 1.07)
4	0.64 (0.44, 0.93)	0.82 (0.47, 1.43)	1.93 (1.40, 2.65)	0.80 (0.49, 1.29)
5	0.63 (0.43, 0.92)	0.88 (0.51, 1.50)	1.70 (1.20, 2.40)	0.66 (0.40, 1.10)
6+	0.54 (0.41, 0.73)	0.75 (0.45, 1.26)	2.27 (1.67, 3.08)	0.86 (0.54, 1.37)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.56 (0.45, 0.70)	0.75 (0.51, 1.10)	2.01 (1.45, 2.78)	1.42 (0.85, 2.38)
Formerly Married	0.66 (0.34, 1.29)	0.88 (0.41, 1.87)	2.67 (1.50, 4.78)	1.20 (0.59, 2.45)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.99 (0.79, 1.25)	0.98 (0.63, 1.52)	3.25 (2.67, 3.96)	1.55 (1.08, 2.23)
Region				
Bamako (Reference)	1.00	1.00	1.00	1.00
Kayes	0.89 (0.59, 1.35)	0.74 (0.39, 1.40)	0.36 (0.26, 0.49)	0.87 (0.60, 1.27)
Sikasso	0.92 (0.66, 1.29)	0.91 (0.58, 1.43)	0.30 (0.21, 0.42)	0.71 (0.48, 1.04)
Koulikoro	1.08 (0.79, 1.49)	1.20 (0.79, 1.83)	0.33 (0.25, 0.44)	0.74 (0.52, 1.06)
Segou	0.84 (0.56, 1.24)	0.94 (0.60, 1.50)	0.33 (0.24, 0.46)	0.89 (0.62, 1.27)
Mopti	1.25 (0.89, 1.75)	1.64 (1.01, 2.66)	0.36 (0.26, 0.49)	1.06 (0.63, 1.77)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.89 (0.61, 1.31)	0.75 (0.52, 1.10)	1.93 (1.52, 2.46)	1.62 (1.23, 2.15)
Secondary	0.98 (0.74, 1.30)	0.57 (0.38, 0.84)	1.45 (1.14, 1.84)	1.37 (0.95, 1.99)
Higher	1.39 (0.62, 3.11)	0.83 (0.28, 2.45)	1.34 (0.72, 2.48)	0.73 (0.38, 1.38)

Table 53: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.97 (0.71, 1.34)	1.00 (0.72, 1.40)	0.91 (0.65, 1.28)	0.89 (0.63, 1.27)
Middle	1.05 (0.76, 1.46)	1.06 (0.76, 1.48)	0.93 (0.65, 1.33)	0.92 (0.62, 1.35)
Richer	1.02 (0.72, 1.44)	1.15 (0.76, 1.73)	1.72 (1.23, 2.40)	1.57 (1.06, 2.31)
Richest	0.96 (0.71, 1.29)	0.99 (0.58, 1.69)	3.84 (2.86, 5.16)	2.96 (1.85, 4.76)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.53 (0.38, 0.74)	0.57 (0.41, 0.80)	1.90 (1.48, 2.43)	1.17 (0.90, 1.50)
Agricultural	0.82 (0.60, 1.11)	0.87 (0.63, 1.20)	0.69 (0.49, 0.96)	0.89 (0.61, 1.31)
Don't Know	0.83 (0.59, 1.17)	0.89 (0.63, 1.26)	1.49 (1.17, 1.90)	1.20 (0.93, 1.56)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.96 (0.73, 1.27)	0.97 (0.74, 1.27)	1.14 (0.89, 1.47)	1.02 (0.78, 1.33)
Exposed to two media sources	0.87 (0.66, 1.15)	0.88 (0.65, 1.18)	1.84 (1.44, 2.37)	1.05 (0.79, 1.39)
Exposed to three media sources	1.04 (0.70, 1.56)	1.09 (0.60, 1.99)	2.30 (1.69, 3.13)	0.91 (0.61, 1.37)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.85 (0.60, 1.19)	1.12 (0.79, 1.59)	1.67 (1.30, 2.13)	0.99 (0.76, 1.28)

Table 54: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Gambia.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.61 (0.44, 0.85)	0.92 (0.66, 1.30)	1.44 (1.00, 2.08)	1.44 (0.96, 2.16)
25-29	0.55 (0.37, 0.82)	1.09 (0.65, 1.83)	3.10 (2.06, 4.68)	3.15 (1.89, 5.27)
30-34	0.45 (0.31, 0.65)	1.02 (0.61, 1.69)	2.75 (1.83, 4.14)	3.28 (1.89, 5.68)
35-39	0.38 (0.23, 0.63)	0.92 (0.48, 1.79)	4.97 (3.30, 7.50)	6.57 (3.64, 11.9)
40-44	0.50 (0.30, 0.84)	1.30 (0.64, 2.66)	6.13 (3.88, 9.69)	8.71 (4.55, 16.7)
45-49	0.41 (0.24, 0.69)	0.99 (0.47, 2.07)	5.87 (3.63, 9.48)	8.52 (4.51, 16.1)
Ethnicity				
Mandinka/Jahanka (Reference)	1.00	1.00	1.00	1.00
Wollof	0.98 (0.63, 1.50)	0.95 (0.61, 1.47)	1.09 (0.77, 1.55)	1.12 (0.74, 1.70)
Jola/Karoninka	0.61 (0.39, 0.98)	0.63 (0.37, 1.06)	1.35 (0.93, 1.97)	0.96 (0.62, 1.50)
Fula/Tukulur/Lorobo	1.35 (1.00, 1.82)	1.34 (1.00, 1.79)	1.02 (0.78, 1.34)	1.14 (0.86, 1.52)
Serere	1.00 (0.49, 2.02)	1.15 (0.57, 2.33)	1.83 (1.08, 3.11)	1.14 (0.66, 1.99)
Serahuleh	0.86 (0.53, 1.38)	0.99 (0.58, 1.70)	1.12 (0.74, 1.67)	1.15 (0.76, 1.75)
Others	1.07 (0.62, 1.84)	1.03 (0.46, 2.30)	1.27 (0.76, 2.14)	1.10 (0.58, 2.07)
Non-Gambian	0.53 (0.26, 1.09)	0.64 (0.29, 1.40)	1.60 (0.97, 2.63)	1.43 (0.85, 2.41)
Religion				
Islam (Reference)	1.00	1.00	1.00	1.00
Christians	0.93 (0.54, 1.61)	1.12 (0.49, 2.57)	1.14 (0.68, 1.90)	0.61 (0.33, 1.13)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.64 (0.45, 0.93)	1.15 (0.73, 1.81)	1.41 (1.00, 1.98)	1.13 (0.68, 1.88)
2	0.57 (0.38, 0.84)	1.12 (0.62, 2.03)	1.34 (0.93, 1.92)	0.90 (0.49, 1.67)
3	0.57 (0.37, 0.89)	1.00 (0.55, 1.81)	2.35 (1.55, 3.55)	1.47 (0.79, 2.75)
4	0.68 (0.44, 1.05)	1.15 (0.59, 2.26)	3.05 (2.01, 4.62)	1.60 (0.92, 2.76)
5	0.36 (0.20, 0.64)	0.59 (0.29, 1.21)	1.88 (1.17, 3.03)	0.85 (0.43, 1.69)
6+	0.44 (0.33, 0.60)	0.65 (0.35, 1.21)	2.46 (1.74, 3.47)	0.98 (0.52, 1.86)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.48 (0.39, 0.60)	0.45 (0.31, 0.65)	1.67 (1.26, 2.22)	0.69 (0.42, 1.12)
Formerly Married	0.24 (0.13, 0.46)	0.25 (0.12, 0.49)	3.32 (2.33, 4.73)	0.95 (0.56, 1.61)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.78 (0.61, 1.00)	1.23 (0.81, 1.88)	1.79 (1.46, 2.19)	0.76 (0.48, 1.20)
Region				
Banjul (Reference)	1.00	1.00	1.00	1.00
Kanifing	0.80 (0.53, 1.21)	0.77 (0.49, 1.20)	0.72 (0.54, 0.96)	0.85 (0.62, 1.18)
Brikama	1.05 (0.69, 1.60)	0.99 (0.59, 1.64)	0.42 (0.31, 0.56)	0.56 (0.40, 0.78)
Mansakonko	1.50 (0.99, 2.28)	1.22 (0.68, 2.21)	0.36 (0.25, 0.53)	0.58 (0.34, 0.98)
Kerewan	1.44 (0.99, 2.08)	1.10 (0.64, 1.90)	0.30 (0.21, 0.42)	0.50 (0.29, 0.87)
Kuntaur	1.16 (0.77, 1.76)	0.88 (0.48, 1.61)	0.27 (0.18, 0.41)	0.44 (0.24, 0.81)
Janjanbureh	1.77 (1.14, 2.73)	1.30 (0.71, 2.39)	0.41 (0.30, 0.58)	0.71 (0.43, 1.18)
Base	1.03 (0.67, 1.58)	0.79 (0.41, 1.50)	0.27 (0.18, 0.40)	0.41 (0.23, 0.76)

Table 54: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.88 (0.63, 1.22)	0.70 (0.49, 1.01)	0.83 (0.64, 1.09)	1.18 (0.86, 1.62)
Secondary	1.32 (1.01, 1.72)	0.95 (0.67, 1.35)	0.90 (0.72, 1.14)	1.24 (0.85, 1.82)
Higher	0.51 (0.27, 0.96)	0.42 (0.20, 0.90)	1.26 (0.80, 1.99)	1.24 (0.69, 2.24)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	1.22 (0.92, 1.61)	1.23 (0.92, 1.64)	1.01 (0.68, 1.49)	0.99 (0.66, 1.48)
Middle	1.14 (0.81, 1.59)	1.13 (0.80, 1.59)	1.55 (1.14, 2.12)	1.64 (1.15, 2.34)
Richer	0.80 (0.56, 1.14)	0.79 (0.48, 1.29)	2.01 (1.47, 2.74)	1.88 (1.25, 2.83)
Richest	0.70 (0.49, 1.01)	0.67 (0.38, 1.19)	2.18 (1.59, 2.97)	1.95 (1.20, 3.16)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.59 (0.43, 0.82)	0.86 (0.60, 1.24)	2.32 (1.82, 2.95)	1.41 (1.07, 1.87)
Manual	0.38 (0.13, 1.06)	0.53 (0.18, 1.58)	2.77 (1.70, 4.52)	1.88 (1.16, 3.04)
Agricultural	0.91 (0.71, 1.18)	1.13 (0.82, 1.57)	0.93 (0.74, 1.17)	0.88 (0.66, 1.17)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.81 (0.58, 1.14)	0.88 (0.63, 1.24)	1.09 (0.68, 1.73)	1.11 (0.69, 1.79)
Exposed to two media sources	0.68 (0.46, 1.00)	0.77 (0.52, 1.12)	1.34 (0.84, 2.14)	1.12 (0.66, 1.89)
Exposed to three media sources	0.78 (0.50, 1.22)	0.96 (0.56, 1.65)	1.54 (0.94, 2.50)	0.96 (0.50, 1.87)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.31 (0.15, 0.64)	0.48 (0.22, 1.03)	1.57 (1.09, 2.26)	1.03 (0.72, 1.48)

Table 55: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Uganda.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.77 (0.46, 1.27)	0.81 (0.45, 1.43)	1.20 (0.74, 1.95)	0.93 (0.53, 1.62)
25-29	0.64 (0.42, 0.99)	0.67 (0.34, 1.30)	1.45 (0.95, 2.20)	1.27 (0.72, 2.25)
30-34	0.77 (0.45, 1.30)	0.85 (0.38, 1.89)	2.39 (1.59, 3.58)	2.55 (1.34, 4.84)
35-39	0.85 (0.49, 1.47)	0.83 (0.34, 2.05)	2.25 (1.45, 3.48)	3.10 (1.48, 6.52)
40-44	1.22 (0.72, 2.07)	1.24 (0.55, 2.78)	2.53 (1.53, 4.19)	4.04 (1.89, 8.64)
45-49	1.13 (0.67, 1.90)	0.96 (0.35, 2.63)	3.40 (2.11, 5.47)	4.99 (2.31, 10.8)
Ethnicity				
Baganda (Reference)	1.00	1.00	1.00	1.00
Banyankole	0.64 (0.25, 1.62)	0.87 (0.33, 2.30)	0.59 (0.36, 0.97)	0.99 (0.52, 1.86)
Basoga	0.96 (0.44, 2.09)	0.55 (0.22, 1.35)	0.41 (0.24, 0.70)	0.55 (0.25, 1.21)
Bakiga	1.33 (0.63, 2.80)	2.06 (0.84, 5.04)	0.80 (0.47, 1.35)	1.21 (0.60, 2.41)
Iteso	3.63 (1.88, 7.01)	2.01 (0.82, 4.97)	0.33 (0.18, 0.62)	0.94 (0.39, 2.29)
Others	2.14 (1.27, 3.59)	1.45 (0.74, 2.85)	0.35 (0.24, 0.51)	0.66 (0.40, 1.09)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.84 (0.61, 1.15)	1.03 (0.72, 1.49)	1.31 (0.99, 1.72)	1.13 (0.83, 1.53)
Islam	0.61 (0.37, 0.99)	0.76 (0.45, 1.28)	1.67 (1.13, 2.48)	1.29 (0.82, 2.02)
Others	0.68 (0.15, 3.06)	0.88 (0.16, 4.89)	1.88 (0.54, 6.58)	1.30 (0.36, 4.76)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.59 (0.33, 1.05)	0.55 (0.22, 1.34)	1.73 (1.12, 2.67)	1.07 (0.63, 1.79)
2	0.87 (0.50, 1.49)	0.76 (0.26, 2.19)	1.57 (0.98, 2.51)	0.75 (0.39, 1.44)
3	0.82 (0.44, 1.51)	0.70 (0.21, 2.28)	1.10 (0.68, 1.78)	0.42 (0.21, 0.86)
4	0.94 (0.54, 1.63)	0.73 (0.23, 2.29)	1.91 (1.24, 2.96)	0.77 (0.36, 1.68)
5	0.94 (0.52, 1.70)	0.74 (0.23, 2.38)	1.86 (1.13, 3.05)	0.54 (0.24, 1.22)
6+	0.93 (0.63, 1.37)	0.56 (0.18, 1.71)	1.40 (0.99, 1.98)	0.39 (0.19, 0.81)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.88 (0.63, 1.22)	1.10 (0.42, 2.87)	1.58 (1.17, 2.14)	2.03 (1.11, 3.70)
Formerly Married	1.21 (0.76, 1.92)	1.51 (0.57, 3.97)	1.80 (1.20, 2.69)	1.72 (0.85, 3.47)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.74 (0.52, 1.05)	1.10 (0.66, 1.82)	3.04 (2.33, 3.96)	1.57 (1.00, 2.46)
Region				
Kampala (Reference)	1.00	1.00	1.00	1.00
Central 1	0.71 (0.27, 1.86)	0.46 (0.17, 1.26)	0.44 (0.25, 0.76)	0.86 (0.47, 1.57)
Central 2	0.79 (0.37, 1.69)	0.48 (0.21, 1.12)	0.36 (0.21, 0.61)	0.70 (0.39, 1.23)
East central	1.15 (0.60, 2.20)	0.99 (0.39, 2.46)	0.29 (0.17, 0.48)	0.86 (0.40, 1.86)
Eastern	1.95 (1.08, 3.51)	0.61 (0.24, 1.52)	0.17 (0.10, 0.30)	0.65 (0.28, 1.50)
North	1.45 (0.78, 2.70)	0.45 (0.17, 1.16)	0.12 (0.07, 0.22)	0.51 (0.24, 1.05)
Karamoja	3.32 (1.57, 7.04)	0.90 (0.29, 2.82)	0.02 (0.01, 0.09)	0.10 (0.02, 0.50)
West Nile	1.84 (1.00, 3.40)	0.57 (0.23, 1.43)	0.07 (0.04, 0.14)	0.25 (0.11, 0.57)
Western	0.76 (0.38, 1.52)	0.34 (0.14, 0.84)	0.42 (0.26, 0.68)	1.30 (0.72, 2.37)
South west	0.41 (0.18, 0.95)	0.19 (0.07, 0.50)	0.38 (0.24, 0.60)	1.01 (0.49, 2.10)

Table 55: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.58 (0.37, 0.91)	0.64 (0.38, 1.06)	0.89 (0.57, 1.39)	0.84 (0.50, 1.43)
Secondary	0.28 (0.16, 0.50)	0.43 (0.21, 0.89)	1.20 (0.75, 1.92)	0.63 (0.33, 1.20)
Higher	0.41 (0.18, 0.90)	0.73 (0.29, 1.89)	3.18 (1.74, 5.84)	0.96 (0.47, 1.96)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.80 (0.52, 1.24)	1.04 (0.63, 1.72)	1.61 (0.78, 3.30)	1.21 (0.58, 2.54)
Middle	0.37 (0.22, 0.62)	0.58 (0.31, 1.09)	2.29 (1.23, 4.28)	1.39 (0.72, 2.68)
Richer	0.36 (0.22, 0.59)	0.61 (0.32, 1.16)	4.57 (2.52, 8.29)	2.66 (1.37, 5.16)
Richest	0.31 (0.19, 0.51)	0.47 (0.19, 1.16)	7.61 (4.28, 13.5)	3.12 (1.43, 6.81)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.87 (0.57, 1.32)	0.93 (0.58, 1.49)	2.28 (1.64, 3.17)	1.39 (0.94, 2.05)
Agricultural	0.96 (0.66, 1.39)	0.86 (0.57, 1.30)	0.93 (0.66, 1.32)	0.79 (0.53, 1.17)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.69 (0.46, 1.02)	0.91 (0.60, 1.39)	1.63 (0.99, 2.68)	1.27 (0.76, 2.14)
Exposed to two media sources	0.56 (0.35, 0.90)	0.83 (0.48, 1.45)	2.28 (1.31, 3.96)	1.25 (0.69, 2.24)
Exposed to three media sources	0.36 (0.20, 0.66)	0.65 (0.30, 1.41)	4.13 (2.39, 7.13)	1.36 (0.74, 2.52)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.44 (0.27, 0.70)	0.58 (0.34, 0.97)	1.06 (0.78, 1.45)	0.82 (0.56, 1.20)

Table 56: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Guinea.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.66 (0.48, 0.91)	0.86 (0.59, 1.25)	1.82 (1.33, 2.48)	2.01 (1.39, 2.91)
25-29	0.47 (0.32, 0.69)	0.69 (0.44, 1.07)	2.56 (1.73, 3.77)	3.59 (2.06, 6.26)
30-34	0.49 (0.33, 0.74)	0.82 (0.48, 1.40)	2.88 (1.95, 4.24)	4.42 (2.38, 8.20)
35-39	0.52 (0.36, 0.76)	0.91 (0.55, 1.50)	3.79 (2.69, 5.35)	6.62 (3.73, 11.73)
40-44	0.72 (0.49, 1.05)	1.23 (0.71, 2.13)	3.86 (2.66, 5.62)	7.74 (4.24, 14.13)
45-49	0.59 (0.38, 0.90)	0.90 (0.50, 1.62)	3.98 (2.75, 5.75)	9.20 (4.82, 17.56)
Ethnicity				
Peulh (Reference)	1.00	1.00	1.00	1.00
Soussou	0.54 (0.39, 0.76)	0.63 (0.42, 0.96)	2.27 (1.67, 3.10)	1.80 (1.32, 2.46)
Malinké	0.78 (0.60, 1.01)	0.83 (0.57, 1.22)	1.41 (1.11, 1.81)	1.54 (1.10, 2.15)
Kissi	0.54 (0.31, 0.94)	0.22 (0.08, 0.66)	0.87 (0.54, 1.41)	1.95 (0.81, 4.69)
Toma	0.31 (0.14, 0.68)	0.08 (0.02, 0.41)	0.88 (0.27, 2.84)	1.84 (0.39, 8.64)
Guerzé	0.31 (0.12, 0.83)	0.14 (0.04, 0.45)	1.23 (0.85, 1.79)	1.64 (0.74, 3.66)
Autre/Manquant	0.66 (0.41, 1.06)	0.50 (0.24, 1.06)	1.78 (1.00, 3.19)	1.83 (0.99, 3.41)
Religion				
Other Christians (Reference)	1.00	1.00	1.00	1.00
Islam	1.69 (0.96, 2.96)	0.35 (0.14, 0.84)	1.42 (1.01, 2.01)	1.48 (0.71, 3.07)
No Religion	1.01 (0.39, 2.62)	1.63 (0.44, 6.09)	1.03 (0.52, 2.05)	1.66 (0.76, 3.66)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.69 (0.48, 0.97)	0.80 (0.51, 1.24)	1.06 (0.76, 1.49)	0.76 (0.48, 1.21)
2	0.68 (0.47, 1.00)	0.83 (0.51, 1.36)	1.39 (1.03, 1.87)	0.77 (0.49, 1.23)
3	0.56 (0.36, 0.86)	0.69 (0.40, 1.19)	1.35 (0.96, 1.89)	0.56 (0.33, 0.95)
4	0.62 (0.40, 0.95)	0.74 (0.40, 1.35)	1.28 (0.84, 1.96)	0.50 (0.27, 0.92)
5	0.37 (0.21, 0.67)	0.40 (0.19, 0.83)	1.97 (1.35, 2.86)	0.79 (0.43, 1.45)
6+	0.62 (0.46, 0.83)	0.56 (0.34, 0.95)	1.06 (0.76, 1.49)	0.52 (0.30, 0.93)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.65 (0.51, 0.83)	0.76 (0.53, 1.09)	1.56 (1.15, 2.12)	1.82 (1.12, 2.96)
Formerly Married	0.61 (0.30, 1.22)	0.76 (0.36, 1.60)	1.45 (0.82, 2.55)	1.02 (0.50, 2.09)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.91 (0.69, 1.19)	1.11 (0.68, 1.80)	3.39 (2.70, 4.25)	1.29 (0.92, 1.81)
Region				
Conakry (Reference)	1.00	1.00	1.00	1.00
Boké	0.97 (0.63, 1.48)	0.98 (0.56, 1.70)	0.51 (0.36, 0.73)	0.83 (0.56, 1.24)
Faranah	0.95 (0.59, 1.52)	0.90 (0.43, 1.86)	0.25 (0.16, 0.37)	0.60 (0.36, 0.99)
Kankan	1.12 (0.71, 1.77)	1.07 (0.52, 2.22)	0.31 (0.20, 0.49)	0.75 (0.45, 1.25)
Kindia	0.74 (0.46, 1.19)	0.90 (0.51, 1.60)	0.35 (0.23, 0.52)	0.49 (0.30, 0.79)
Labé	1.23 (0.83, 1.83)	1.00 (0.55, 1.82)	0.20 (0.13, 0.30)	0.61 (0.35, 1.05)
Mamou	1.63 (1.06, 2.51)	1.44 (0.79, 2.62)	0.25 (0.17, 0.37)	0.61 (0.36, 1.02)
N'Zérékoré	0.59 (0.36, 0.98)	0.67 (0.30, 1.49)	0.32 (0.23, 0.44)	0.74 (0.48, 1.15)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.10 (0.81, 1.49)	1.02 (0.74, 1.42)	1.20 (0.93, 1.55)	1.07 (0.81, 1.42)
Secondary	1.12 (0.79, 1.60)	0.94 (0.63, 1.41)	1.84 (1.37, 2.48)	1.44 (1.03, 2.01)
Higher	0.71 (0.34, 1.48)	0.63 (0.24, 1.66)	1.66 (0.98, 2.84)	0.69 (0.34, 1.37)

Table 56: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.77 (0.58, 1.03)	1.04 (0.79, 1.37)	1.35 (0.80, 2.27)	1.18 (0.71, 1.97)
Middle	0.61 (0.44, 0.85)	0.73 (0.52, 1.01)	2.87 (1.81, 4.56)	2.35 (1.50, 3.69)
Richer	0.56 (0.41, 0.76)	0.62 (0.42, 0.92)	4.30 (2.70, 6.84)	2.58 (1.53, 4.35)
Richest	0.75 (0.53, 1.05)	0.88 (0.47, 1.65)	7.34 (4.62, 11.7)	2.65 (1.47, 4.77)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.52 (0.37, 0.74)	0.77 (0.54, 1.11)	1.94 (1.51, 2.49)	0.98 (0.72, 1.34)
Manual	0.66 (0.42, 1.05)	0.71 (0.44, 1.15)	0.74 (0.44, 1.24)	0.63 (0.37, 1.08)
Agricultural	0.86 (0.65, 1.12)	1.10 (0.80, 1.51)	0.49 (0.36, 0.65)	0.61 (0.43, 0.86)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.95 (0.73, 1.23)	0.88 (0.67, 1.15)	1.43 (1.06, 1.93)	1.25 (0.92, 1.70)
Exposed to two media sources	0.77 (0.57, 1.02)	0.74 (0.53, 1.03)	3.39 (2.63, 4.39)	1.72 (1.21, 2.44)
Exposed to three media sources	1.01 (0.62, 1.66)	0.83 (0.44, 1.57)	3.55 (2.18, 5.80)	1.57 (0.78, 3.16)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.28 (0.11, 0.71)	0.35 (0.14, 0.91)	1.81 (1.13, 2.89)	1.22 (0.73, 2.03)

Table 57: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Senegal.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.83 (0.64, 1.07)	1.05 (0.80, 1.39)	2.07 (1.30, 3.28)	1.93 (1.19, 3.12)
25-29	0.58 (0.42, 0.79)	0.88 (0.61, 1.27)	2.95 (1.74, 5.01)	2.60 (1.42, 4.76)
30-34	0.50 (0.36, 0.68)	0.84 (0.56, 1.24)	4.19 (2.87, 6.13)	3.48 (2.14, 5.65)
35-39	0.39 (0.27, 0.58)	0.71 (0.44, 1.14)	5.48 (3.66, 8.20)	4.97 (2.99, 8.25)
40-44	0.28 (0.18, 0.43)	0.57 (0.34, 0.97)	6.65 (4.29, 10.3)	5.39 (3.11, 9.32)
45-49	0.36 (0.23, 0.55)	0.70 (0.43, 1.15)	7.99 (4.81, 13.3)	6.63 (3.53, 12.4)
Ethnicity				
Wolof (Reference)	1.00	1.00	1.00	1.00
Poular	1.01 (0.81, 1.27)	1.05 (0.78, 1.42)	0.74 (0.59, 0.93)	0.72 (0.54, 0.98)
Serer	0.76 (0.55, 1.04)	0.86 (0.61, 1.23)	0.60 (0.45, 0.80)	0.65 (0.46, 0.92)
Mandingue	0.52 (0.34, 0.79)	0.53 (0.32, 0.89)	1.18 (0.71, 1.96)	1.12 (0.60, 2.07)
Diola	0.34 (0.16, 0.73)	0.45 (0.16, 1.29)	0.74 (0.45, 1.20)	0.47 (0.23, 0.95)
Soninke	0.64 (0.35, 1.18)	0.63 (0.31, 1.29)	1.08 (0.62, 1.86)	1.08 (0.63, 1.84)
Not a Senegalese	0.48 (0.17, 1.39)	0.52 (0.20, 1.39)	0.96 (0.49, 1.86)	0.97 (0.48, 1.97)
Others	0.67 (0.44, 1.03)	0.76 (0.48, 1.23)	0.96 (0.56, 1.65)	0.77 (0.42, 1.40)
Religion				
Islam (Reference)	1.00	1.00	1.00	1.00
Others	0.46 (0.30, 0.70)	0.54 (0.35, 0.84)	0.79 (0.48, 1.30)	0.81 (0.41, 1.58)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.75 (0.55, 1.03)	1.01 (0.70, 1.44)	1.86 (1.37, 2.52)	1.22 (0.78, 1.91)
2	0.69 (0.51, 0.93)	0.95 (0.68, 1.33)	1.46 (0.99, 2.16)	0.85 (0.50, 1.44)
3	0.62 (0.44, 0.87)	0.87 (0.57, 1.33)	2.34 (1.66, 3.30)	1.27 (0.73, 2.22)
4	0.51 (0.36, 0.72)	0.72 (0.44, 1.20)	2.00 (1.42, 2.82)	0.97 (0.55, 1.71)
5	0.43 (0.28, 0.67)	0.66 (0.38, 1.16)	2.54 (1.58, 4.09)	1.16 (0.61, 2.20)
6+	0.37 (0.28, 0.49)	0.58 (0.38, 0.89)	2.68 (2.00, 3.59)	1.33 (0.80, 2.21)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.60 (0.50, 0.72)	0.67 (0.50, 0.89)	2.13 (1.64, 2.76)	1.20 (0.75, 1.92)
Formerly Married	0.45 (0.28, 0.71)	0.53 (0.30, 0.93)	2.56 (1.72, 3.81)	1.01 (0.54, 1.87)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.80 (0.64, 1.01)	0.88 (0.68, 1.13)	2.35 (1.91, 2.89)	1.60 (1.22, 2.09)

Table 57: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Dakar (Reference)	1.00	1.00	1.00	1.00
Ziguinchor	0.57 (0.35, 0.93)	0.63 (0.29, 1.33)	0.66 (0.43, 1.00)	1.63 (0.96, 2.76)
Diourbel	1.60 (1.01, 2.54)	1.22 (0.78, 1.92)	0.39 (0.27, 0.56)	0.61 (0.42, 0.89)
Saint-Louis	1.10 (0.70, 1.71)	0.73 (0.46, 1.16)	0.57 (0.39, 0.84)	0.94 (0.60, 1.46)
Tambacounda	1.40 (0.81, 2.42)	1.16 (0.66, 2.04)	0.54 (0.35, 0.83)	1.18 (0.68, 2.04)
Kaolack	0.90 (0.60, 1.34)	0.71 (0.46, 1.09)	0.37 (0.25, 0.55)	0.57 (0.36, 0.92)
Thiès	1.07 (0.66, 1.75)	0.80 (0.48, 1.34)	0.56 (0.40, 0.78)	0.81 (0.54, 1.21)
Louga	2.55 (1.67, 3.91)	1.89 (1.18, 3.00)	0.44 (0.28, 0.70)	0.78 (0.46, 1.31)
Fatick	0.74 (0.44, 1.25)	0.57 (0.32, 1.02)	0.43 (0.28, 0.67)	0.97 (0.60, 1.58)
Kolda	1.34 (0.82, 2.20)	1.06 (0.61, 1.84)	0.48 (0.31, 0.73)	1.13 (0.68, 1.88)
Matam	1.46 (0.96, 2.22)	1.01 (0.64, 1.61)	0.41 (0.28, 0.59)	0.77 (0.49, 1.22)
Kaffrine	1.19 (0.75, 1.87)	0.82 (0.49, 1.37)	0.32 (0.20, 0.50)	0.64 (0.37, 1.08)
Kedougou	0.71 (0.39, 1.30)	0.68 (0.34, 1.38)	0.21 (0.13, 0.34)	0.40 (0.22, 0.71)
Sedhiou	1.01 (0.63, 1.61)	1.06 (0.61, 1.86)	0.32 (0.21, 0.47)	0.62 (0.32, 1.22)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.93 (0.73, 1.18)	0.99 (0.76, 1.29)	1.31 (1.03, 1.66)	1.17 (0.84, 1.62)
Secondary	1.11 (0.86, 1.45)	1.09 (0.73, 1.65)	0.96 (0.72, 1.27)	1.27 (0.89, 1.81)
Higher	0.10 (0.03, 0.38)	0.13 (0.03, 0.53)	1.32 (0.65, 2.68)	0.87 (0.36, 2.08)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.92 (0.71, 1.19)	0.99 (0.73, 1.34)	1.05 (0.79, 1.40)	0.98 (0.72, 1.32)
Middle	0.91 (0.70, 1.18)	0.98 (0.71, 1.35)	1.69 (1.26, 2.27)	1.22 (0.87, 1.72)
Richer	1.16 (0.88, 1.53)	1.37 (0.94, 1.99)	2.36 (1.79, 3.13)	1.38 (0.94, 2.01)
Richest	0.72 (0.52, 0.99)	0.84 (0.55, 1.28)	2.88 (2.05, 4.05)	1.67 (1.11, 2.51)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.65 (0.53, 0.79)	0.76 (0.61, 0.96)	2.58 (2.08, 3.20)	1.53 (1.17, 2.01)
Manual	0.48 (0.20, 1.15)	0.49 (0.21, 1.17)	1.18 (0.67, 2.10)	0.80 (0.42, 1.50)
Agricultural	0.81 (0.62, 1.04)	0.91 (0.69, 1.21)	1.08 (0.79, 1.48)	1.12 (0.78, 1.62)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.80 (0.58, 1.10)	0.76 (0.55, 1.04)	1.11 (0.79, 1.57)	0.95 (0.67, 1.35)
Exposed to two media sources	0.83 (0.61, 1.13)	0.68 (0.49, 0.92)	1.88 (1.34, 2.62)	1.22 (0.84, 1.77)
Exposed to three media sources	0.67 (0.45, 1.00)	0.51 (0.32, 0.82)	1.92 (1.24, 2.97)	1.08 (0.63, 1.86)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.49 (0.28, 0.85)	0.72 (0.42, 1.25)	1.63 (1.20, 2.20)	1.04 (0.70, 1.54)

Table 58: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Namibia.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.56 (0.42, 0.74)	0.84 (0.61, 1.15)	2.51 (1.66, 3.80)	1.53 (1.00, 2.33)
25-29	0.40 (0.27, 0.59)	0.74 (0.46, 1.19)	5.06 (3.33, 7.68)	2.53 (1.66, 3.87)
30-34	0.36 (0.23, 0.56)	0.67 (0.38, 1.18)	8.27 (5.55, 12.3)	4.32 (2.81, 6.63)
35-39	0.57 (0.38, 0.85)	0.99 (0.58, 1.70)	8.77 (5.80, 13.2)	4.43 (2.74, 7.14)
40-44	0.72 (0.47, 1.10)	1.05 (0.61, 1.81)	14.3 (9.14, 22.2)	7.65 (4.46, 13.1)
45-49	0.60 (0.39, 0.94)	0.70 (0.39, 1.27)	11.1 (7.21, 17.1)	5.76 (3.40, 9.75)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.74 (0.56, 0.97)	0.72 (0.53, 0.98)	0.98 (0.79, 1.22)	0.83 (0.64, 1.07)
Others	0.60 (0.35, 1.03)	0.66 (0.37, 1.15)	1.36 (1.00, 1.84)	0.83 (0.58, 1.19)
No Religion	0.46 (0.14, 1.49)	0.41 (0.12, 1.42)	1.35 (0.45, 4.03)	1.52 (0.54, 4.31)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.57 (0.41, 0.79)	0.71 (0.49, 1.03)	3.08 (2.28, 4.16)	2.00 (1.42, 2.82)
2	0.49 (0.35, 0.68)	0.58 (0.37, 0.90)	4.14 (3.14, 5.45)	1.93 (1.37, 2.73)
3	0.37 (0.24, 0.58)	0.44 (0.26, 0.75)	4.47 (3.32, 6.02)	1.59 (1.05, 2.42)
4	0.60 (0.37, 0.98)	0.64 (0.37, 1.10)	5.79 (4.13, 8.13)	2.17 (1.38, 3.41)
5	0.72 (0.41, 1.27)	0.62 (0.33, 1.19)	6.12 (4.14, 9.04)	2.81 (1.64, 4.83)
6+	1.08 (0.71, 1.64)	0.90 (0.48, 1.71)	3.51 (2.43, 5.08)	1.69 (0.97, 2.93)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.65 (0.50, 0.83)	0.86 (0.63, 1.18)	2.79 (2.34, 3.32)	1.52 (1.20, 1.93)
Formerly Married	1.18 (0.75, 1.85)	1.46 (0.87, 2.46)	2.66 (1.96, 3.60)	1.33 (0.90, 1.96)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.75 (0.59, 0.97)	1.25 (0.91, 1.71)	2.23 (1.89, 2.63)	0.97 (0.76, 1.24)
Region				
Khomas (Reference)	1.00	1.00	1.00	1.00
Caprivi	0.85 (0.45, 1.59)	0.79 (0.40, 1.58)	0.48 (0.32, 0.71)	0.69 (0.45, 1.06)
Erongo	0.72 (0.37, 1.41)	0.78 (0.39, 1.55)	1.08 (0.78, 1.49)	0.93 (0.66, 1.31)
Hardap	1.83 (1.01, 3.30)	1.74 (0.91, 3.34)	1.38 (0.96, 1.98)	1.25 (0.83, 1.90)
Karas	0.90 (0.49, 1.67)	0.87 (0.45, 1.68)	1.24 (0.93, 1.66)	1.03 (0.72, 1.47)
Kavango	1.29 (0.74, 2.27)	0.88 (0.45, 1.72)	0.33 (0.23, 0.46)	0.51 (0.35, 0.76)
Kunene	1.43 (0.71, 2.85)	1.42 (0.66, 3.06)	1.36 (0.93, 1.98)	1.72 (1.09, 2.70)
Changwena	1.94 (1.12, 3.36)	1.55 (0.83, 2.90)	0.29 (0.20, 0.42)	0.50 (0.31, 0.81)
Omaheke	1.37 (0.75, 2.48)	1.23 (0.63, 2.39)	0.98 (0.67, 1.44)	1.05 (0.64, 1.71)
Omusati	1.48 (0.85, 2.58)	1.06 (0.56, 2.01)	0.36 (0.25, 0.53)	0.58 (0.35, 0.96)
Oshana	1.27 (0.71, 2.27)	1.12 (0.60, 2.06)	0.63 (0.44, 0.91)	0.77 (0.51, 1.17)
Oshikoto	1.14 (0.63, 2.05)	0.99 (0.51, 1.89)	0.57 (0.42, 0.78)	0.84 (0.58, 1.20)
Otjozondjupa	1.45 (0.76, 2.77)	1.29 (0.65, 2.57)	1.14 (0.83, 1.59)	0.96 (0.66, 1.41)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.52 (0.96, 2.40)	1.47 (0.90, 2.41)	0.68 (0.45, 1.05)	0.87 (0.54, 1.41)
Secondary	0.92 (0.58, 1.46)	1.03 (0.60, 1.74)	0.86 (0.58, 1.27)	0.93 (0.58, 1.48)
Higher	0.64 (0.33, 1.26)	0.85 (0.41, 1.79)	1.19 (0.75, 1.90)	0.96 (0.53, 1.75)

Table 58: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.73 (0.53, 1.02)	0.82 (0.59, 1.16)	1.60 (1.12, 2.29)	1.33 (0.89, 1.99)
Middle	0.71 (0.50, 1.00)	0.81 (0.56, 1.19)	2.71 (1.94, 3.78)	2.08 (1.40, 3.09)
Richer	0.67 (0.48, 0.95)	0.82 (0.52, 1.31)	4.74 (3.46, 6.50)	3.58 (2.35, 5.44)
Richest	0.51 (0.34, 0.76)	0.62 (0.36, 1.07)	4.56 (3.30, 6.31)	3.52 (2.24, 5.53)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.55 (0.42, 0.71)	0.73 (0.54, 0.99)	2.86 (2.38, 3.42)	1.26 (1.01, 1.56)
Manual	0.51 (0.22, 1.21)	0.66 (0.29, 1.50)	2.74 (1.78, 4.21)	1.12 (0.68, 1.84)
Agricultural	0.82 (0.35, 1.91)	0.94 (0.40, 2.23)	1.70 (1.05, 2.78)	1.07 (0.60, 1.92)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.87 (0.62, 1.24)	0.96 (0.67, 1.37)	1.15 (0.78, 1.68)	1.20 (0.79, 1.83)
Exposed to two media sources	0.93 (0.67, 1.29)	1.08 (0.74, 1.57)	1.72 (1.20, 2.45)	1.45 (0.95, 2.22)
Exposed to three media sources	0.58 (0.40, 0.85)	0.75 (0.48, 1.19)	2.71 (1.96, 3.76)	1.68 (1.09, 2.59)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.54 (0.41, 0.71)	0.72 (0.54, 0.95)	1.41 (1.18, 1.68)	1.11 (0.89, 1.38)

Table 59: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Congo.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.56 (0.37, 0.84)	0.74 (0.45, 1.22)	2.95 (1.90, 4.57)	2.59 (1.55, 4.34)
25-29	0.49 (0.32, 0.74)	0.69 (0.39, 1.21)	5.16 (3.31, 8.04)	4.59 (2.53, 8.31)
30-34	0.60 (0.36, 1.00)	0.81 (0.44, 1.47)	9.56 (5.64, 16.2)	8.85 (4.61, 17.0)
35-39	0.56 (0.37, 0.83)	0.73 (0.40, 1.34)	8.96 (5.33, 15.1)	9.06 (4.51, 18.2)
40-44	0.85 (0.51, 1.42)	1.04 (0.57, 1.89)	9.50 (5.97, 15.1)	12.6 (6.29, 25.4)
45-49	0.42 (0.25, 0.70)	0.50 (0.23, 1.12)	7.96 (4.89, 12.9)	12.9 (6.45, 25.8)
Ethnicity				
Kongo (Reference)	1.00	1.00	1.00	1.00
Punu	1.11 (0.58, 2.14)	1.25 (0.60, 2.59)	0.88 (0.56, 1.38)	1.00 (0.59, 1.72)
Duma	0.84 (0.44, 1.60)	0.88 (0.49, 1.61)	0.40 (0.14, 1.09)	0.81 (0.28, 2.35)
Mbéré/Mbéti/Kélé	0.47 (0.20, 1.12)	0.56 (0.24, 1.32)	1.10 (0.55, 2.20)	1.30 (0.53, 3.19)
Téké	0.99 (0.70, 1.40)	1.16 (0.78, 1.73)	1.07 (0.76, 1.51)	1.32 (0.85, 2.06)
Mbochi	1.22 (0.76, 1.96)	1.46 (0.80, 2.67)	0.90 (0.66, 1.22)	0.93 (0.65, 1.33)
Sangha	0.85 (0.43, 1.71)	1.96 (0.67, 5.76)	1.19 (0.73, 1.95)	2.17 (1.13, 4.17)
Oubanguiens	0.45 (0.18, 1.15)	1.19 (0.38, 3.79)	0.84 (0.56, 1.26)	1.90 (1.03, 3.48)
Pygmée	1.54 (0.78, 3.04)	3.05 (1.39, 6.68)	0.15 (0.05, 0.46)	1.08 (0.32, 3.64)
Etranger	0.48 (0.23, 0.99)	0.65 (0.30, 1.38)	1.14 (0.81, 1.60)	1.45 (0.87, 2.45)
Others	1.22 (0.27, 5.42)	1.62 (0.28, 9.24)	1.49 (0.56, 3.97)	2.15 (0.91, 5.11)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.84 (0.63, 1.12)	0.84 (0.65, 1.10)	0.90 (0.73, 1.12)	0.97 (0.76, 1.23)
Islam	0.44 (0.09, 2.23)	1.01 (0.16, 6.33)	1.52 (0.76, 3.03)	1.37 (0.60, 3.11)
Traditionalist	1.39 (0.88, 2.19)	1.30 (0.84, 2.01)	0.49 (0.29, 0.82)	0.64 (0.35, 1.18)
Others	0.30 (0.08, 1.07)	0.29 (0.07, 1.21)	0.64 (0.16, 2.52)	0.83 (0.24, 2.90)
No Religion	0.85 (0.50, 1.45)	0.68 (0.39, 1.18)	0.43 (0.20, 0.90)	0.69 (0.35, 1.36)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.85 (0.58, 1.25)	1.13 (0.77, 1.65)	2.45 (1.62, 3.69)	1.58 (0.89, 2.80)
2	0.61 (0.41, 0.90)	0.86 (0.53, 1.37)	2.81 (1.87, 4.23)	1.35 (0.74, 2.47)
3	0.46 (0.30, 0.71)	0.69 (0.39, 1.21)	3.24 (2.11, 4.97)	1.30 (0.72, 2.34)
4	0.91 (0.57, 1.43)	1.32 (0.73, 2.40)	4.55 (2.97, 6.96)	1.69 (0.83, 3.41)
5	0.70 (0.40, 1.23)	1.10 (0.55, 2.23)	3.57 (2.20, 5.80)	1.27 (0.60, 2.69)
6+	0.70 (0.44, 1.10)	1.05 (0.56, 1.99)	2.77 (1.80, 4.26)	1.06 (0.53, 2.11)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.58 (0.44, 0.76)	0.74 (0.49, 1.10)	2.84 (2.10, 3.84)	0.99 (0.63, 1.54)
Formerly Married	0.85 (0.56, 1.30)	0.99 (0.61, 1.60)	2.53 (1.84, 3.47)	0.85 (0.53, 1.37)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	1.13 (0.87, 1.47)	1.56 (0.90, 2.70)	2.81 (2.28, 3.45)	1.14 (0.65, 2.00)

Table 59: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Brazzaville (Reference)	1.00	1.00	1.00	1.00
Kouilou	0.87 (0.59, 1.27)	1.03 (0.55, 1.90)	0.37 (0.26, 0.53)	1.06 (0.54, 2.06)
Niari	0.97 (0.63, 1.47)	1.01 (0.58, 1.74)	0.51 (0.33, 0.79)	0.84 (0.49, 1.45)
Lekoumou	0.78 (0.50, 1.23)	0.89 (0.43, 1.85)	0.24 (0.15, 0.37)	0.52 (0.24, 1.12)
Bouenza	1.20 (0.79, 1.82)	1.43 (0.84, 2.41)	0.40 (0.26, 0.63)	0.87 (0.49, 1.56)
Pool	0.85 (0.55, 1.33)	1.02 (0.53, 1.98)	0.28 (0.19, 0.41)	0.65 (0.32, 1.32)
Plateaux	1.70 (1.13, 2.56)	1.81 (0.87, 3.78)	0.28 (0.17, 0.46)	0.66 (0.30, 1.45)
Cuvette	0.79 (0.47, 1.34)	0.89 (0.37, 2.15)	0.53 (0.36, 0.79)	0.83 (0.41, 1.68)
Cuvette - Ouest	0.99 (0.53, 1.86)	1.46 (0.60, 3.56)	0.25 (0.14, 0.43)	0.38 (0.16, 0.92)
Sangha	0.49 (0.27, 0.89)	0.34 (0.13, 0.88)	0.71 (0.49, 1.02)	0.87 (0.46, 1.66)
Likouala	0.49 (0.29, 0.82)	0.51 (0.19, 1.33)	0.43 (0.30, 0.61)	0.75 (0.36, 1.57)
Pointe-noire	0.98 (0.57, 1.68)	0.98 (0.59, 1.63)	1.09 (0.80, 1.47)	1.22 (0.85, 1.74)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.17 (0.81, 1.71)	1.05 (0.69, 1.60)	1.19 (0.72, 1.97)	1.48 (0.83, 2.66)
Secondary	1.22 (0.82, 1.83)	1.05 (0.65, 1.69)	1.96 (1.22, 3.16)	1.60 (0.88, 2.90)
Higher	0.34 (0.11, 1.05)	0.39 (0.10, 1.46)	2.52 (1.36, 4.65)	1.27 (0.60, 2.69)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	1.18 (0.86, 1.62)	0.96 (0.66, 1.38)	1.81 (1.28, 2.58)	1.21 (0.88, 1.66)
Middle	1.46 (0.93, 2.28)	1.01 (0.56, 1.81)	2.52 (1.84, 3.45)	1.30 (0.81, 2.08)
Richer	0.81 (0.52, 1.26)	0.58 (0.29, 1.19)	3.74 (2.75, 5.07)	2.08 (1.23, 3.51)
Richest	0.69 (0.47, 1.02)	0.44 (0.22, 0.86)	5.27 (4.06, 6.85)	2.77 (1.68, 4.59)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.73 (0.50, 1.06)	0.83 (0.59, 1.16)	2.13 (1.62, 2.79)	1.15 (0.83, 1.61)
Manual	0.71 (0.37, 1.38)	0.88 (0.46, 1.69)	1.29 (0.75, 2.22)	0.81 (0.45, 1.47)
Agricultural	0.77 (0.58, 1.01)	0.84 (0.54, 1.30)	0.53 (0.40, 0.71)	0.55 (0.35, 0.85)
Others	0.44 (0.14, 1.39)	0.87 (0.28, 2.72)	0.58 (0.14, 2.44)	0.29 (0.07, 1.14)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.83 (0.63, 1.11)	0.92 (0.69, 1.23)	1.50 (1.10, 2.03)	0.88 (0.62, 1.25)
Exposed to two media sources	0.80 (0.56, 1.15)	0.90 (0.60, 1.34)	1.84 (1.36, 2.47)	0.85 (0.58, 1.24)
Exposed to three media sources	0.90 (0.63, 1.27)	1.20 (0.78, 1.87)	2.83 (2.03, 3.96)	1.05 (0.69, 1.60)
Hormonal Contraceptives use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	1.01 (0.39, 2.65)	1.13 (0.42, 3.05)	1.86 (1.25, 2.77)	1.14 (0.72, 1.79)

Table 60: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Nigeria.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.53 (0.47, 0.59)	0.72 (0.64, 0.82)	2.15 (1.85, 2.51)	1.73 (1.47, 2.04)
25-29	0.43 (0.38, 0.49)	0.66 (0.56, 0.78)	4.21 (3.63, 4.89)	2.97 (2.48, 3.55)
30-34	0.36 (0.30, 0.42)	0.57 (0.46, 0.70)	6.01 (5.20, 6.94)	4.13 (3.42, 5.00)
35-39	0.35 (0.30, 0.42)	0.57 (0.44, 0.72)	8.88 (7.65, 10.3)	6.58 (5.39, 8.04)
40-44	0.34 (0.28, 0.41)	0.53 (0.41, 0.68)	8.72 (7.53, 10.1)	7.05 (5.74, 8.66)
45-49	0.40 (0.34, 0.49)	0.58 (0.44, 0.76)	9.02 (7.70, 10.6)	8.26 (6.70, 10.2)
Ethnicity				
Hausa (Reference)	1.00	1.00	1.00	1.00
Ekoi	0.19 (0.02, 1.70)	0.25 (0.02, 2.63)	2.03 (0.62, 6.61)	1.25 (0.40, 3.94)
Fulani	1.36 (1.12, 1.65)	1.33 (1.08, 1.64)	0.71 (0.53, 0.93)	0.78 (0.55, 1.11)
Ibibio	0.56 (0.42, 0.74)	0.84 (0.53, 1.31)	2.89 (2.31, 3.61)	1.65 (1.13, 2.40)
Igala	0.57 (0.29, 1.14)	0.69 (0.36, 1.34)	1.66 (1.27, 2.16)	1.20 (0.83, 1.73)
Igbo	0.47 (0.39, 0.56)	0.88 (0.59, 1.31)	2.45 (2.08, 2.88)	1.45 (1.06, 1.98)
Ijaw/Izon	0.56 (0.39, 0.81)	1.18 (0.64, 2.17)	2.53 (1.99, 3.20)	1.56 (1.11, 2.20)
Kanuri/Beriberi	0.86 (0.57, 1.30)	0.84 (0.54, 1.30)	0.90 (0.61, 1.32)	0.68 (0.46, 1.00)
Tiv	0.45 (0.29, 0.69)	0.88 (0.51, 1.51)	1.22 (0.93, 1.61)	1.47 (0.93, 2.33)
Yoruba	0.73 (0.63, 0.84)	0.99 (0.70, 1.40)	2.69 (2.34, 3.10)	1.11 (0.84, 1.47)
Others	0.55 (0.47, 0.63)	0.79 (0.63, 1.00)	1.71 (1.49, 1.97)	1.15 (0.92, 1.44)
Religion				
Other Christians (Reference)	1.00	1.00	1.00	1.00
Catholics	0.97 (0.78, 1.20)	1.11 (0.88, 1.40)	0.89 (0.80, 0.99)	0.99 (0.87, 1.12)
Islam	1.91 (1.71, 2.12)	1.33 (1.12, 1.59)	0.54 (0.49, 0.60)	1.07 (0.94, 1.23)
Traditionalists	1.12 (0.74, 1.68)	1.01 (0.61, 1.67)	0.39 (0.24, 0.61)	0.74 (0.48, 1.14)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.58 (0.50, 0.68)	0.76 (0.62, 0.93)	1.63 (1.42, 1.87)	0.93 (0.77, 1.14)
2	0.55 (0.47, 0.65)	0.84 (0.68, 1.05)	2.02 (1.76, 2.33)	0.87 (0.70, 1.09)
3	0.54 (0.45, 0.64)	0.87 (0.69, 1.10)	2.67 (2.33, 3.05)	0.99 (0.80, 1.23)
4	0.54 (0.45, 0.65)	0.92 (0.73, 1.17)	3.05 (2.69, 3.45)	0.98 (0.79, 1.20)
5	0.48 (0.39, 0.60)	0.81 (0.62, 1.05)	2.97 (2.57, 3.43)	0.99 (0.79, 1.24)
6+	0.50 (0.44, 0.57)	0.78 (0.62, 0.98)	2.48 (2.21, 2.78)	0.91 (0.74, 1.11)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.58 (0.52, 0.65)	0.54 (0.44, 0.65)	2.51 (2.25, 2.80)	1.74 (1.45, 2.09)
Formerly Married	0.61 (0.49, 0.74)	0.75 (0.59, 0.96)	4.09 (3.53, 4.73)	2.02 (1.62, 2.53)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.90 (0.81, 1.01)	1.11 (0.97, 1.28)	2.15 (1.96, 2.36)	1.15 (1.02, 1.29)

Table 60: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Lagos (Reference)	1.00	1.00	1.00	1.00
Sokoto	1.82 (1.22, 2.71)	1.04 (0.63, 1.72)	0.21 (0.16, 0.27)	0.82 (0.56, 1.18)
Zamfara	1.38 (0.96, 1.99)	0.88 (0.54, 1.43)	0.18 (0.13, 0.24)	0.73 (0.49, 1.09)
Katsina	1.28 (0.87, 1.87)	0.84 (0.52, 1.37)	0.14 (0.10, 0.20)	0.51 (0.35, 0.75)
Jigawa	1.98 (1.36, 2.90)	1.21 (0.73, 2.00)	0.22 (0.14, 0.37)	0.97 (0.52, 1.81)
Yobe	1.10 (0.65, 1.86)	0.51 (0.26, 0.98)	0.34 (0.25, 0.48)	1.90 (1.24, 2.91)
Borno	1.39 (0.92, 2.12)	0.78 (0.48, 1.27)	0.27 (0.19, 0.37)	1.02 (0.73, 1.43)
Adamawa	1.49 (0.94, 2.36)	1.14 (0.72, 1.80)	0.40 (0.28, 0.56)	1.18 (0.83, 1.69)
Gombe	2.44 (1.61, 3.70)	1.68 (1.03, 2.74)	0.29 (0.21, 0.38)	0.92 (0.68, 1.23)
Bauchi	2.37 (1.64, 3.42)	1.39 (0.88, 2.18)	0.24 (0.17, 0.33)	0.97 (0.69, 1.37)
Kano	1.90 (1.35, 2.67)	1.08 (0.69, 1.69)	0.29 (0.22, 0.38)	0.82 (0.58, 1.14)
Kaduna	0.94 (0.61, 1.47)	0.80 (0.48, 1.34)	0.37 (0.28, 0.50)	0.73 (0.53, 1.02)
Kebbi	0.99 (0.66, 1.50)	0.59 (0.36, 0.96)	0.27 (0.19, 0.40)	1.10 (0.67, 1.81)
Niger	0.54 (0.26, 1.10)	0.38(0.21, 0.70)	0.37 (0.28, 0.49)	1.02 (0.71, 1.47)
Fct-abuja	0.61 (0.36, 1.06)	0.58 (0.34, 0.98)	0.92 (0.68, 1.25)	1.38 (1.04, 1.84)
Nasarawa	0.42 (0.16, 1.06)	0.33 (0.13, 0.82)	0.35 (0.28, 0.45)	0.97 (0.74, 1.29)
Plateau	0.44 (0.27, 0.71)	0.39 (0.23, 0.67)	0.44 (0.33, 0.58)	1.12 (0.85, 1.47)
Taraba	0.89 (0.51, 1.53)	0.58 (0.33, 1.03)	0.40 (0.31, 0.52)	1.43 (1.02, 2.02)
Benue	0.71 (0.47, 1.07)	0.61 (0.37, 1.01)	0.28 (0.20, 0.39)	0.88 (0.53, 1.47)
Kogi	0.93 (0.58, 1.50)	0.82 (0.54, 1.24)	0.48 (0.38, 0.60)	0.95 (0.71, 1.26)
Kwara	1.17 (0.79, 1.74)	0.80 (0.53, 1.21)	0.59 (0.47, 0.74)	0.90 (0.70, 1.14)
Oyo	1.49 (0.95, 2.34)	1.23 (0.83, 1.81)	0.53 (0.42, 0.66)	0.70 (0.54, 0.93)
Osun	0.93 (0.63, 1.38)	0.77 (0.52, 1.13)	0.49 (0.39, 0.63)	0.63 (0.49, 0.80)
Ekiti	0.72 (0.46, 1.11)	0.62 (0.40, 0.96)	0.53 (0.40, 0.71)	0.72 (0.51, 1.01)
Ondo	0.88 (0.56, 1.38)	0.74 (0.47, 1.15)	0.56 (0.44, 0.71)	0.88 (0.69, 1.12)
Edo	0.87 (0.54, 1.41)	0.79 (0.48, 1.32)	0.62 (0.50, 0.76)	1.09 (0.81, 1.46)
Anambra	0.33 (0.17, 0.66)	0.29 (0.14, 0.60)	0.65 (0.47, 0.92)	0.78 (0.49, 1.24)
Enugu	0.57 (0.35, 0.94)	0.43 (0.22, 0.82)	0.61 (0.46, 0.79)	1.11 (0.80, 1.53)
Ebonyi	1.16 (0.82, 1.65)	0.89 (0.54, 1.45)	0.26 (0.18, 0.40)	0.51 (0.34, 0.78)
Cross River	0.89 (0.57, 1.41)	0.97 (0.58, 1.61)	0.50 (0.38, 0.65)	0.97 (0.69, 1.37)
Akwa Ibom	0.86 (0.57, 1.30)	0.84 (0.50, 1.40)	0.58 (0.44, 0.77)	0.96 (0.66, 1.40)
Abia	0.71 (0.46, 1.10)	0.72 (0.41, 1.27)	0.53 (0.38, 0.73)	0.64 (0.44, 0.92)
Imo	0.63 (0.40, 1.00)	0.57 (0.31, 1.03)	0.70 (0.50, 0.99)	0.93 (0.61, 1.41)
Rivers	0.71 (0.42, 1.19)	0.70 (0.40, 1.23)	0.80 (0.61, 1.07)	1.24 (0.91, 1.68)
Bayelsa	0.61 (0.40, 0.93)	0.42 (0.21, 0.81)	0.55 (0.45, 0.68)	0.87 (0.62, 1.22)
Delta	0.72 (0.49, 1.06)	0.59 (0.39, 0.90)	0.46 (0.36, 0.58)	0.79 (0.57, 1.09)
Ogun	1.35 (0.89, 2.04)	1.41 (0.93, 2.13)	0.71 (0.54, 0.94)	0.92 (0.67, 1.27)
Level of Education				
No Education	1.00	1.00	1.00	1.00
Primary	0.82 (0.72, 0.93)	1.09 (0.94, 1.28)	2.13 (1.89, 2.40)	1.29 (1.14, 1.46)
Secondary	0.81 (0.72, 0.91)	0.80 (0.67, 0.96)	1.78 (1.59, 1.99)	1.39 (1.22, 1.58)
Higher	0.39 (0.31, 0.50)	0.61 (0.46, 0.82)	4.07 (3.55, 4.65)	1.68 (1.43, 1.97)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.80 (0.69, 0.92)	0.91 (0.78, 1.06)	1.43 (1.20, 1.70)	1.45 (1.22, 1.72)
Middle	0.72 (0.61, 0.84)	0.96 (0.80, 1.14)	2.22 (1.87, 2.63)	1.97 (1.65, 2.36)
Richer	0.67 (0.58, 0.78)	0.90 (0.74, 1.10)	3.49 (2.95, 4.14)	2.70 (2.23, 3.28)
Richest	0.49 (0.41, 0.59)	0.69 (0.54, 0.87)	5.58 (4.70, 6.62)	3.74 (3.04, 4.61)

Table 60: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.52 (0.46, 0.57)	0.76 (0.68, 0.85)	2.91 (2.65, 3.19)	1.27 (1.14, 1.41)
Manual	0.83 (0.70, 0.97)	0.94 (0.80, 1.11)	1.74 (1.52, 1.98)	1.08 (0.94, 1.24)
Agricultural	0.43 (0.36, 0.51)	0.85 (0.69, 1.04)	1.42 (1.22, 1.65)	0.75 (0.63, 0.89)
Others	1.69 (0.82, 3.50)	1.49 (0.78, 2.83)	1.16 (0.38, 3.61)	1.11 (0.45, 2.75)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.83 (0.74, 0.94)	0.87 (0.76, 0.99)	1.40 (1.25, 1.58)	1.19 (1.05, 1.34)
Exposed to two media sources	0.61 (0.53, 0.69)	0.67 (0.57, 0.79)	2.25 (2.01, 2.51)	1.15 (1.02, 1.30)
Exposed to three media sources	0.60 (0.51, 0.70)	0.65 (0.53, 0.79)	2.96 (2.61, 3.35)	1.34 (1.17, 1.54)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.26 (0.19, 0.36)	0.53 (0.38, 0.74)	2.06 (1.81, 2.34)	1.06 (0.93, 1.22)

Table 61: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Zambia.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.58 (0.47, 0.72)	0.76 (0.60, 0.97)	1.97 (1.57, 2.48)	1.51 (1.17, 1.94)
25-29	0.51 (0.41, 0.63)	0.74 (0.55, 1.00)	3.00 (2.44, 3.68)	1.93 (1.48, 2.51)
30-34	0.53 (0.42, 0.67)	0.82 (0.58, 1.15)	4.04 (3.34, 4.90)	2.55 (1.90, 3.41)
35-39	0.72 (0.58, 0.89)	1.11 (0.80, 1.54)	4.53 (3.66, 5.61)	2.88 (2.08, 3.99)
40-44	0.69 (0.53, 0.90)	1.07 (0.72, 1.59)	5.50 (4.48, 6.75)	4.06 (2.97, 5.55)
45-49	0.83 (0.63, 1.09)	1.26 (0.84, 1.89)	6.19 (4.90, 7.82)	4.82 (3.42, 6.79)
Ethnicity				
Bemba (Reference)	1.00	1.00		1.00
Tonga	0.70 (0.55, 0.90)	0.62 (0.42, 0.91)	0.96 (0.78, 1.17)	1.01 (0.79, 1.28)
Chewa	0.76 (0.56, 1.03)	0.89 (0.59, 1.36)	1.21 (0.97, 1.51)	1.30 (0.97, 1.74)
Lozi	1.28 (0.95, 1.73)	0.84 (0.60, 1.19)	0.92 (0.73, 1.17)	1.14 (0.85, 1.52)
Nsenga	0.69 (0.47, 1.01)	0.79 (0.51, 1.21)	1.29 (1.03, 1.62)	1.21 (0.89, 1.66)
Tumbuka	0.69 (0.47, 1.02)	0.78 (0.51, 1.18)	1.16 (0.86, 1.55)	1.18 (0.86, 1.62)
Ngoni	0.73 (0.49, 1.10)	0.92 (0.58, 1.46)	1.59 (1.23, 2.07)	1.27 (0.94, 1.71)
Lala	0.74 (0.49, 1.13)	0.63 (0.39, 1.02)	0.89 (0.64, 1.25)	1.08 (0.77, 1.52)
Kaonde	0.61 (0.37, 0.99)	0.67 (0.39, 1.15)	1.15 (0.80, 1.64)	1.22 (0.84, 1.77)
Namwanga	1.08 (0.76, 1.54)	1.03 (0.72, 1.48)	0.99 (0.71, 1.38)	0.89 (0.60, 1.33)
Mambwe	0.77 (0.50, 1.17)	0.79 (0.51, 1.21)	0.97 (0.71, 1.32)	0.90 (0.66, 1.22)
Lunda(North-Western)	1.06 (0.75, 1.48)	1.29 (0.80, 2.06)	0.98 (0.66, 1.46)	1.47 (0.90, 2.41)
Luvale	0.91 (0.58, 1.42)	0.79 (0.49, 1.29)	1.00 (0.66, 1.52)	1.28 (0.82, 1.99)
Others	1.02 (0.85, 1.24)	0.85 (0.70, 1.05)	1.05 (0.88, 1.25)	1.18 (0.99, 1.42)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	1.00 (0.84, 1.20)	1.02 (0.84, 1.23)	1.01 (0.87, 1.17)	0.97 (0.82, 1.15)
Islam	1.62 (0.76, 3.48)	1.81 (0.84, 3.89)	3.26 (1.70, 6.24)	1.46 (0.80, 2.65)
Others	0.91 (0.43, 1.94)	0.76 (0.34, 1.71)	0.63 (0.32, 1.23)	0.74 (0.37, 1.47)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.64 (0.51, 0.79)	0.89 (0.70, 1.14)	1.46 (1.19, 1.80)	1.02 (0.79, 1.32)
2	0.61 (0.48, 0.76)	1.03 (0.75, 1.42)	2.22 (1.85, 2.66)	1.19 (0.90, 1.57)
3	0.56 (0.44, 0.71)	0.93 (0.65, 1.32)	2.78 (2.33, 3.33)	1.41 (1.03, 1.93)
4	0.76 (0.59, 0.98)	1.17 (0.79, 1.73)	2.69 (2.16, 3.34)	1.41 (1.03, 1.92)
5	0.50 (0.37, 0.67)	0.70 (0.46, 1.07)	2.65 (2.13, 3.28)	1.46 (1.03, 2.07)
6+	0.72 (0.60, 0.85)	0.83 (0.57, 1.21)	2.54 (2.14, 3.00)	1.50 (1.08, 2.08)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.62 (0.54, 0.71)	0.61 (0.47, 0.80)	2.37 (2.04, 2.77)	1.36 (1.04, 1.77)
Formerly Married	0.64 (0.52, 0.80)	0.57 (0.41, 0.81)	2.32 (1.93, 2.78)	1.19 (0.90, 1.59)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.87 (0.75, 1.01)	1.22 (0.99, 1.49)	2.69 (2.39, 3.03)	1.12 (0.96, 1.30)

Table 61: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Lusaka (Reference)	1.00	1.00	1.00	1.00
Central	1.00 (0.75, 1.33)	0.88 (0.63, 1.21)	0.43 (0.35, 0.52)	0.75 (0.61, 0.92)
Copperbelt	1.03 (0.78, 1.38)	0.92 (0.68, 1.25)	0.81 (0.68, 0.96)	0.88 (0.73, 1.07)
Eastern	0.73 (0.55, 0.97)	0.51 (0.36, 0.74)	0.44 (0.37, 0.53)	0.90 (0.71, 1.14)
Luapula	0.98 (0.74, 1.29)	0.63 (0.45, 0.87)	0.27 (0.21, 0.35)	0.62 (0.47, 0.83)
Muchinga	1.33 (0.98, 1.79)	0.84 (0.61, 1.17)	0.29 (0.24, 0.37)	0.69 (0.53, 0.89)
Northern	1.25 (0.95, 1.65)	0.75 (0.54, 1.03)	0.27 (0.21, 0.35)	0.67 (0.51, 0.89)
North Western	0.85 (0.61, 1.17)	0.55 (0.36, 0.84)	0.32 (0.25, 0.42)	0.59 (0.41, 0.84)
Southern	0.94 (0.70, 1.25)	1.01 (0.68, 1.50)	0.52 (0.41, 0.64)	0.91 (0.72, 1.15)
Western	1.98 (1.47, 2.66)	1.31 (0.91, 1.89)	0.24 (0.18, 0.31)	0.51 (0.37, 0.69)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.99 (0.78, 1.24)	0.94 (0.75, 1.18)	1.06 (0.86, 1.31)	1.00 (0.80, 1.26)
Secondary	0.76 (0.59, 0.97)	0.66 (0.50, 0.86)	1.38 (1.12, 1.70)	1.23 (0.95, 1.58)
Higher	0.64 (0.41, 0.99)	0.76 (0.47, 1.24)	3.66 (2.74, 4.88)	1.67 (1.19, 2.36)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.82 (0.68, 0.99)	0.83 (0.69, 1.01)	1.43 (1.17, 1.74)	1.34 (1.09, 1.65)
Middle	0.65 (0.53, 0.79)	0.62 (0.49, 0.79)	2.15 (1.76, 2.62)	1.84 (1.48, 2.28)
Richer	0.56 (0.45, 0.70)	0.44 (0.33, 0.59)	4.16 (3.45, 5.03)	3.23 (2.49, 4.20)
Richest	0.67 (0.53, 0.84)	0.47 (0.33, 0.67)	5.84 (4.83, 7.05)	4.53 (3.42, 6.00)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.66 (0.55, 0.80)	0.79 (0.64, 0.96)	2.16 (1.91, 2.44)	1.15 (0.99, 1.32)
Manual	0.74 (0.36, 1.50)	0.86 (0.42, 1.78)	3.01 (1.95, 4.65)	1.47 (0.90, 2.41)
Agricultural	1.00 (0.87, 1.15)	0.98 (0.84, 1.15)	0.65 (0.57, 0.75)	0.86 (0.74, 1.00)
Others	0.59 (0.28, 1.26)	0.63 (0.29, 1.35)	3.17 (2.17, 4.64)	1.88 (1.26, 2.80)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	1.00 (0.84, 1.18)	1.10 (0.92, 1.32)	1.30 (1.12, 1.52)	0.99 (0.84, 1.16)
Exposed to two media sources	0.97 (0.80, 1.16)	1.23 (1.00, 1.53)	2.08 (1.77, 2.45)	1.03 (0.86, 1.24)
Exposed to three media sources	0.71 (0.57, 0.89)	0.94 (0.71, 1.25)	2.77 (2.37, 3.23)	1.01 (0.83, 1.24)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.61 (0.51, 0.72)	0.80 (0.66, 0.97)	1.54 (1.39, 1.70)	1.27 (1.12, 1.44)

Table 62: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Sierra Leone.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.51 (0.36, 0.72)	0.67 (0.46, 0.98)	1.74 (1.28, 2.38)	1.73 (1.17, 2.54)
25-29	0.37 (0.27, 0.52)	0.48 (0.30, 0.77)	2.42 (1.77, 3.30)	2.59 (1.71, 3.91)
30-34	0.58 (0.40, 0.83)	0.73 (0.43, 1.23)	3.41 (2.45, 4.74)	3.77 (2.40, 5.92)
35-39	0.55 (0.40, 0.76)	0.67 (0.40, 1.12)	3.60 (2.72, 4.76)	4.03 (2.66, 6.10)
40-44	0.63 (0.41, 0.98)	0.74 (0.39, 1.40)	4.92 (3.52, 6.89)	5.25 (3.28, 8.39)
45-49	0.40 (0.26, 0.61)	0.46 (0.25, 0.85)	4.62 (3.39, 6.30)	5.32 (3.30, 8.56)
Ethnicity				
Temne (Reference)	1.00	1.00	1.00	1.00
Creole	1.27 (0.41, 3.91)	1.27 (0.38, 4.28)	3.11 (1.57, 6.16)	1.95 (1.05, 3.64)
Fullah	1.29 (0.82, 2.04)	1.47 (0.87, 2.47)	2.25 (1.43, 3.53)	1.38 (0.85, 2.23)
Kono	1.22 (0.82, 1.82)	1.04 (0.61, 1.77)	0.88 (0.60, 1.30)	0.89 (0.53, 1.51)
Limba	0.76 (0.47, 1.24)	0.69 (0.41, 1.16)	1.11 (0.77, 1.61)	1.04 (0.66, 1.62)
Loko	0.83 (0.33, 2.11)	0.78 (0.30, 2.03)	1.70 (0.78, 3.69)	1.42 (0.80, 2.50)
Mandigo	0.91 (0.46, 1.79)	0.94 (0.46, 1.93)	1.47 (0.90, 2.38)	0.92 (0.56, 1.52)
Mende	0.98 (0.74, 1.29)	0.97 (0.64, 1.49)	1.26 (1.01, 1.58)	1.11 (0.84, 1.47)
Sherbro	0.70 (0.33, 1.49)	0.68 (0.32, 1.44)	1.40 (0.89, 2.21)	1.19 (0.74, 1.92)
Koranko	0.93 (0.50, 1.74)	0.85 (0.44, 1.66)	0.61 (0.35, 1.07)	1.01 (0.62, 1.67)
Others	1.50 (0.97, 2.33)	1.46 (0.89, 2.37)	0.97 (0.64, 1.47)	1.04 (0.69, 1.57)
Religion				
Other Christians (Reference)	1.00	1.00	1.00	1.00
Islam	0.95 (0.76, 1.18)	0.89 (0.71, 1.12)	0.77 (0.63, 0.94)	0.95 (0.77, 1.19)
Other	0.46 (0.10, 2.27)	0.35 (0.07, 1.76)	0.36 (0.10, 1.28)	0.65 (0.18, 2.39)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.43 (0.30, 0.61)	0.62 (0.42, 0.92)	1.52 (1.17, 1.97)	1.09 (0.76, 1.55)
2	0.51 (0.36, 0.72)	0.90 (0.56, 1.44)	1.87 (1.39, 2.51)	1.05 (0.71, 1.54)
3	0.52 (0.36, 0.75)	0.94 (0.56, 1.57)	2.10 (1.62, 2.71)	1.18 (0.80, 1.74)
4	0.57 (0.39, 0.82)	1.03 (0.62, 1.70)	2.38 (1.82, 3.10)	1.19 (0.81, 1.75)
5	0.53 (0.34, 0.82)	0.91 (0.52, 1.57)	2.44 (1.80, 3.30)	1.17 (0.80, 1.73)
6+	0.61 (0.45, 0.82)	1.00 (0.58, 1.72)	2.35 (1.84, 3.01)	1.17 (0.78, 1.76)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.60 (0.47, 0.76)	0.82 (0.53, 1.26)	1.79 (1.46, 2.19)	1.46 (1.11, 1.92)
Formerly Married	0.62 (0.40, 0.97)	0.94 (0.54, 1.62)	3.19 (2.42, 4.19)	1.97 (1.36, 2.86)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.85 (0.64, 1.12)	0.96 (0.62, 1.48)	2.33 (1.91, 2.83)	1.30 (0.97, 1.76)
Region				
Western (Reference)	1.00	1.00	1.00	1.00
Eastern	1.32 (0.81, 2.15)	1.10 (0.67, 1.81)	0.64 (0.47, 0.87)	1.27 (0.89, 1.83)
Northern	1.29 (0.84, 1.96)	1.14 (0.70, 1.85)	0.44 (0.33, 0.58)	1.06 (0.75, 1.49)
Southern	1.24 (0.80, 1.92)	1.05 (0.63, 1.77)	0.66 (0.50, 0.88)	1.46 (1.04, 2.06)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.27 (0.98, 1.65)	1.02 (0.75, 1.40)	0.91 (0.71, 1.15)	1.05 (0.78, 1.39)
Secondary	1.28 (0.99, 1.65)	0.91 (0.62, 1.32)	1.07 (0.85, 1.34)	1.11 (0.84, 1.47)
Higher	0.73 (0.38, 1.42)	1.09 (0.42, 2.80)	1.59 (1.05, 2.40)	0.57 (0.32, 1.03)

Table 62: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.99 (0.71, 1.37)	0.97 (0.70, 1.34)	1.37 (1.00, 1.87)	1.42 (1.03, 1.95)
Middle	0.89 (0.65, 1.24)	0.88 (0.64, 1.23)	1.52 (1.11, 2.07)	1.54 (1.10, 2.16)
Richer	0.94 (0.67, 1.32)	0.94 (0.65, 1.36)	2.29 (1.73, 3.03)	1.99 (1.43, 2.77)
Richest	0.75 (0.51, 1.11)	0.71 (0.39, 1.29)	3.66 (2.78, 4.83)	2.89 (1.89, 4.40)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.25 (0.12, 0.52)	0.34 (0.15, 0.76)	1.81 (1.30, 2.52)	0.92 (0.64, 1.31)
Manual	0.44 (0.31, 0.60)	0.54 (0.38, 0.76)	1.33 (1.08, 1.63)	0.84 (0.67, 1.05)
Agricultural	0.72 (0.56, 0.93)	0.80 (0.60, 1.07)	0.61 (0.48, 0.77)	0.57 (0.44, 0.74)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	1.14 (0.92, 1.43)	1.14 (0.90, 1.44)	1.32 (1.06, 1.64)	1.17 (0.94, 1.46)
Exposed to two media sources	1.00 (0.72, 1.39)	1.03 (0.72, 1.48)	2.06 (1.61, 2.64)	1.39 (1.04, 1.86)
Exposed to three media sources	1.04 (0.68, 1.58)	1.07 (0.69, 1.64)	2.60 (1.97, 3.45)	1.94 (1.39, 2.71)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.82 (0.64, 1.06)	0.87 (0.66, 1.14)	1.14 (0.93, 1.40)	0.96 (0.76, 1.21)

Table 63: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Mozambique.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.43 (0.34, 0.54)	0.63 (0.46, 0.86)	1.52 (1.20, 1.93)	1.46 (1.10, 1.94)
25-29	0.47 (0.34, 0.64)	0.71 (0.47, 1.06)	2.67 (2.15, 3.31)	2.67 (2.00, 3.58)
30-34	0.43 (0.32, 0.58)	0.65 (0.43, 0.99)	3.34 (2.66, 4.20)	3.87 (2.80, 5.33)
35-39	0.48 (0.34, 0.66)	0.69 (0.43, 1.11)	3.49 (2.84, 4.29)	4.71 (3.46, 6.41)
40-44	0.63 (0.45, 0.88)	0.90 (0.60, 1.36)	4.23 (3.30, 5.42)	6.53 (4.52, 9.43)
45-49	0.84 (0.61, 1.17)	1.20 (0.77, 1.87)	4.78 (3.82, 6.00)	8.84 (6.10, 12.8)
Ethnicity				
Xichangana (Reference)	1.00	1.00	1.00	1.00
Emakhuwa	1.21 (0.88, 1.68)	1.08 (0.63, 1.85)	0.31 (0.23, 0.40)	0.67 (0.45, 0.99)
Português	1.63 (1.18, 2.25)	1.34 (0.90, 2.00)	0.92 (0.75, 1.14)	0.88 (0.72, 1.08)
Cisena	1.99 (1.45, 2.72)	1.14 (0.70, 1.86)	0.13 (0.09, 0.19)	0.43 (0.29, 0.63)
Elomwe	2.81 (1.91, 4.11)	1.17 (0.68, 2.01)	0.11 (0.07, 0.18)	0.54 (0.29, 1.03)
Echuwabo	1.58 (0.95, 2.64)	0.79 (0.44, 1.43)	0.25 (0.16, 0.40)	0.77 (0.46, 1.29)
Cinyanja	1.39 (0.96, 2.03)	0.88 (0.52, 1.50)	0.21 (0.15, 0.30)	0.65 (0.41, 1.02)
Cindau	1.40 (0.99, 1.98)	0.93 (0.54, 1.58)	0.34 (0.26, 0.45)	0.88 (0.59, 1.31)
Xitswa	0.86 (0.54, 1.34)	1.01 (0.54, 1.89)	0.72 (0.54, 0.96)	0.84 (0.60, 1.17)
Cinyungwe	2.02 (1.33, 3.08)	1.35 (0.72, 2.53)	0.26 (0.15, 0.42)	0.50 (0.30, 0.85)
Ciyao	1.66 (0.93, 2.95)	1.10 (0.48, 2.55)	0.22 (0.14, 0.35)	0.59 (0.30, 1.14)
Others	1.36 (1.00, 1.84)	1.14 (0.75, 1.72)	0.63 (0.52, 0.76)	0.93 (0.76, 1.15)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.92 (0.73, 1.16)	1.00 (0.76, 1.31)	1.16 (0.98, 1.38)	0.95 (0.80, 1.13)
Islam	0.88 (0.65, 1.18)	1.00 (0.70, 1.43)	0.67 (0.54, 0.83)	0.77 (0.59, 1.01)
Others	1.17 (0.64, 2.14)	1.33 (0.69, 2.56)	1.43 (1.04, 1.95)	0.83 (0.60, 1.14)
No Religion	1.04 (0.78, 1.40)	1.02 (0.74, 1.41)	0.73 (0.56, 0.96)	0.93 (0.70, 1.24)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.51 (0.39, 0.68)	0.81 (0.59, 1.13)	1.11 (0.89, 1.39)	0.75 (0.57, 0.99)
2	0.49 (0.37, 0.65)	0.86 (0.58, 1.28)	1.64 (1.35, 1.99)	0.94 (0.71, 1.23)
3	0.47 (0.34, 0.65)	0.80 (0.52, 1.23)	2.10 (1.70, 2.60)	1.03 (0.76, 1.40)
4	0.48 (0.35, 0.66)	0.79 (0.53, 1.18)	1.81 (1.47, 2.23)	0.88 (0.64, 1.21)
5	0.59 (0.41, 0.84)	0.85 (0.53, 1.37)	1.91 (1.53, 2.37)	0.87 (0.63, 1.19)
6+	0.59 (0.45, 0.78)	0.71 (0.48, 1.06)	1.46 (1.22, 1.75)	0.76 (0.57, 1.02)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.51 (0.42, 0.62)	0.57 (0.44, 0.75)	1.44 (1.24, 1.68)	1.33 (1.05, 1.67)
Formerly Married	0.50 (0.38, 0.65)	0.55 (0.40, 0.76)	1.51 (1.24, 1.83)	0.97 (0.72, 1.31)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.77 (0.63, 0.93)	0.99 (0.77, 1.28)	3.02 (2.56, 3.56)	0.99 (0.79, 1.24)

Table 63: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Maputo Provincia (Reference)	1.00	1.00	1.00	1.00
Niassa	1.39 (0.90, 2.14)	1.49 (0.79, 2.80)	0.26 (0.19, 0.37)	1.21 (0.73, 1.99)
Cabo Delgado	1.32 (0.87, 2.00)	1.03 (0.56, 1.91)	0.26 (0.19, 0.35)	1.17 (0.76, 1.79)
Nampula	0.83 (0.51, 1.34)	0.67 (0.35, 1.29)	0.30 (0.20, 0.44)	1.25 (0.78, 2.00)
Zambezia	1.99 (1.39, 2.86)	1.63 (0.95, 2.79)	0.12 (0.08, 0.18)	0.51 (0.31, 0.83)
Tete	1.35 (0.91, 1.99)	1.32 (0.74, 2.38)	0.21 (0.16, 0.28)	0.80 (0.53, 1.21)
Manica	1.27 (0.84, 1.90)	1.29 (0.78, 2.15)	0.31 (0.24, 0.41)	0.73 (0.54, 1.01)
Sofala	1.43 (1.00, 2.04)	1.14 (0.68, 1.89)	0.22 (0.15, 0.33)	0.65 (0.42, 1.01)
Inhambane	0.71 (0.46, 1.09)	0.61 (0.34, 1.10)	0.61 (0.47, 0.80)	1.24 (0.92, 1.68)
Gaza	0.83 (0.55, 1.26)	0.90 (0.57, 1.40)	0.52 (0.40, 0.68)	0.83 (0.64, 1.08)
Maputo Cidade	1.06 (0.74, 1.53)	1.00 (0.67, 1.49)	1.15 (0.94, 1.42)	0.96 (0.80, 1.16)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.05 (0.85, 1.28)	0.97 (0.79, 1.18)	1.63 (1.40, 1.91)	1.25 (1.03, 1.50)
Secondary	0.79 (0.62, 1.00)	0.67 (0.49, 0.93)	2.79 (2.32, 3.35)	1.38 (1.08, 1.76)
Higher	1.14 (0.62, 2.12)	1.05 (0.55, 2.03)	8.23 (5.82, 11.6)	1.91 (1.17, 3.10)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.91 (0.72, 1.15)	0.94 (0.74, 1.20)	1.17 (0.77, 1.77)	0.99 (0.65, 1.52)
Middle	0.59 (0.45, 0.77)	0.66 (0.51, 0.86)	2.02 (1.42, 2.86)	1.56 (1.07, 2.26)
Richer	0.53 (0.39, 0.71)	0.71 (0.52, 0.96)	3.49 (2.46, 4.95)	2.27 (1.56, 3.30)
Richest	0.60 (0.46, 0.77)	0.76 (0.51, 1.14)	9.76 (6.89, 13.8)	5.17 (3.41, 7.85)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.65 (0.50, 0.84)	0.92 (0.69, 1.22)	2.73 (2.35, 3.17)	1.07 (0.91, 1.26)
Manual	0.54 (0.21, 1.41)	0.78 (0.30, 1.97)	2.63 (1.73, 4.02)	1.14 (0.73, 1.80)
Agricultural	1.16 (0.97, 1.38)	1.36 (1.13, 1.65)	0.69 (0.58, 0.84)	0.83 (0.68, 1.02)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.79 (0.64, 0.97)	0.75 (0.59, 0.94)	1.12 (0.94, 1.32)	1.05 (0.87, 1.27)
Exposed to two media sources	0.66 (0.51, 0.87)	0.76 (0.55, 1.06)	2.43 (2.02, 2.92)	1.18 (0.94, 1.49)
Exposed to three media sources	0.75 (0.56, 1.01)	0.85 (0.56, 1.29)	3.69 (3.00, 4.53)	1.25 (0.97, 1.62)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.54 (0.38, 0.77)	0.86 (0.60, 1.24)	2.41 (2.09, 2.77)	1.35 (1.16, 1.58)

Table 64: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Malawi.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.39 (0.27, 0.56)	0.76 (0.49, 1.18)	2.03 (1.45, 2.84)	2.18 (1.43, 3.33)
25-29	0.45 (0.30, 0.67)	1.02 (0.58, 1.81)	3.61 (2.63, 4.96)	4.41 (2.69, 7.25)
30-34	0.61 (0.41, 0.92)	1.40 (0.78, 2.53)	5.27 (4.01, 6.95)	7.58 (4.73, 12.1)
35-39	0.49 (0.33, 0.74)	1.22 (0.66, 2.23)	5.66 (4.06, 7.89)	8.98 (5.38, 15.0)
40-44	0.60 (0.39, 0.93)	1.34 (0.72, 2.49)	4.63 (3.28, 6.55)	7.47 (4.45, 12.5)
45-49	0.55 (0.33, 0.91)	1.20 (0.59, 2.44)	5.37 (3.84, 7.49)	8.81 (5.14, 15.1)
Ethnicity				
Chewa (Reference)	1.00	1.00	1.00	1.00
Tombuka	0.88 (0.55, 1.42)	0.88 (0.44, 1.79)	1.43 (1.07, 1.90)	1.01 (0.64, 1.61)
Lomwe	1.37 (1.02, 1.85)	1.30 (0.84, 2.00)	1.12 (0.90, 1.40)	0.95 (0.72, 1.25)
Tonga	1.30 (0.69, 2.46)	1.31 (0.58, 2.97)	1.42 (0.88, 2.29)	0.94 (0.50, 1.75)
Yao	1.08 (0.73, 1.58)	0.66 (0.40, 1.09)	1.17 (0.89, 1.54)	1.05 (0.72, 1.54)
Sena	0.80 (0.45, 1.42)	0.77 (0.40, 1.48)	0.98 (0.65, 1.48)	0.75 (0.48, 1.16)
Nkhonde	1.01 (0.45, 2.28)	0.96 (0.38, 2.47)	1.93 (0.97, 3.83)	1.15 (0.55, 2.38)
Ngoni	1.28 (0.87, 1.90)	1.34 (0.89, 2.02)	1.73 (1.37, 2.19)	1.45 (1.13, 1.86)
Mang'anja	1.30 (0.69, 2.46)	1.27 (0.62, 2.61)	1.39 (0.78, 2.48)	0.88 (0.50, 1.53)
Nyanja	0.64 (0.22, 1.90)	0.62 (0.21, 1.84)	1.42 (0.80, 2.55)	1.07 (0.54, 2.12)
Others	0.25 (0.10, 0.65)	0.29 (0.10, 0.84)	1.91 (1.23, 2.98)	1.36 (0.80, 2.30)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.86 (0.67, 1.11)	0.94 (0.72, 1.21)	1.04 (0.87, 1.25)	1.03 (0.85, 1.25)
Islam	1.11 (0.75, 1.64)	1.63 (1.01, 2.62)	0.87 (0.62, 1.21)	0.95 (0.63, 1.45)
Others	0.89 (0.10, 8.37)	0.99 (0.09, 11.1)	0.87 (0.15, 4.96)	0.84 (0.18, 3.82)
No Religion	1.84 (0.57, 6.00)	2.08 (0.63, 6.95)	1.36 (0.39, 4.68)	1.57 (0.45, 5.50)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.45 (0.31, 0.66)	0.91 (0.57, 1.44)	1.32 (1.00, 1.72)	0.61 (0.39, 0.94)
2	0.36 (0.24, 0.55)	0.76 (0.43, 1.36)	1.91 (1.44, 2.54)	0.58 (0.35, 0.96)
3	0.54 (0.35, 0.83)	0.97 (0.51, 1.84)	2.23 (1.68, 2.97)	0.50 (0.29, 0.83)
4	0.63 (0.40, 0.99)	0.96 (0.49, 1.88)	2.36 (1.78, 3.12)	0.47 (0.28, 0.80)
5	0.45 (0.29, 0.70)	0.63 (0.31, 1.27)	1.84 (1.35, 2.50)	0.37 (0.21, 0.65)
6+	0.49 (0.34, 0.71)	0.64 (0.33, 1.22)	2.44 (1.89, 3.14)	0.50 (0.29, 0.86)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.43 (0.33, 0.56)	0.50 (0.32, 0.80)	2.13 (1.71, 2.67)	1.31 (0.83, 2.07)
Formerly Married	0.56 (0.39, 0.82)	0.53 (0.32, 0.88)	2.05 (1.55, 2.72)	1.35 (0.84, 2.16)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	1.11 (0.78, 1.59)	1.25 (0.81, 1.93)	2.78 (2.35, 3.29)	1.41 (1.13, 1.76)
Region				
Central (Reference)	1.00	1.00	1.00	1.00
Northern	0.89 (0.62, 1.29)	1.09 (0.58, 2.05)	1.23 (0.99, 1.52)	1.11 (0.73, 1.68)
Southern	1.21 (0.95, 1.55)	1.08 (0.74, 1.58)	1.00 (0.85, 1.18)	1.02 (0.82, 1.26)

Table 64: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.04 (0.75, 1.45)	0.95 (0.67, 1.36)	0.70 (0.56, 0.86)	0.77 (0.60, 0.99)
Secondary	0.95 (0.64, 1.42)	0.75 (0.45, 1.24)	1.21 (0.95, 1.53)	0.86 (0.63, 1.17)
Higher	0.29 (0.05, 1.60)	0.24 (0.04, 1.43)	2.21 (1.42, 3.45)	0.76 (0.42, 1.37)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.79 (0.56, 1.12)	0.77 (0.54, 1.11)	1.05 (0.75, 1.46)	1.07 (0.77, 1.50)
Middle	0.87 (0.63, 1.20)	0.83 (0.59, 1.17)	1.57 (1.13, 2.18)	1.51 (1.08, 2.11)
Richer	0.96 (0.68, 1.35)	0.92 (0.63, 1.34)	2.23 (1.62, 3.07)	1.96 (1.42, 2.71)
Richest	0.94 (0.66, 1.35)	0.94 (0.60, 1.47)	4.20 (3.11, 5.67)	2.95 (2.08, 4.19)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.57 (0.37, 0.89)	0.85 (0.52, 1.39)	2.28 (1.79, 2.90)	1.08 (0.83, 1.42)
Manual	0.87 (0.60, 1.24)	1.16 (0.80, 1.69)	1.53 (1.23, 1.91)	1.15 (0.90, 1.48)
Agricultural	0.78 (0.60, 1.01)	1.04 (0.77, 1.39)	0.73 (0.61, 0.89)	0.71 (0.58, 0.88)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.72 (0.54, 0.97)	0.76 (0.56, 1.04)	1.32 (1.11, 1.57)	1.04 (0.87, 1.26)
Exposed to two media sources	0.75 (0.53, 1.07)	0.74 (0.51, 1.09)	1.96 (1.58, 2.42)	1.17 (0.91, 1.49)
Exposed to three media sources	0.66 (0.41, 1.06)	0.64 (0.37, 1.09)	2.41 (1.90, 3.07)	1.05 (0.77, 1.43)
Hormonal Contraceptives use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.49 (0.38, 0.64)	0.67 (0.50, 0.90)	1.23 (1.06, 1.44)	1.32 (1.10, 1.60)

Table 65: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Ivory Coast.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.38 (0.25, 0.57)	0.65 (0.40, 1.05)	1.88 (1.31, 2.71)	1.84 (1.28, 2.64)
25-29	0.34 (0.23, 0.52)	0.88 (0.49, 1.59)	2.74 (1.88, 3.99)	2.80 (1.83, 4.31)
30-34	0.37 (0.21, 0.66)	1.20 (0.58, 2.48)	4.98 (3.38, 7.35)	5.24 (3.15, 8.71)
35-39	0.38 (0.23, 0.65)	1.47 (0.74, 2.94)	4.44 (3.05, 6.46)	5.14 (3.10, 8.53)
40-44	0.41 (0.24, 0.70)	1.68 (0.78, 3.65)	5.11 (3.58, 7.28)	6.78 (4.08, 11.3)
45-49	0.37 (0.21, 0.65)	1.53 (0.71, 3.28)	5.13 (3.62, 7.26)	6.42 (3.83, 10.8)
Ethnicity				
Akan (Reference)	1.00	1.00	1.00	1.00
Krou	0.95 (0.58, 1.55)	0.90 (0.48, 1.67)	0.91 (0.65, 1.28)	0.80 (0.55, 1.17)
Mandé du nord	1.13 (0.70, 1.81)	1.29 (0.68, 2.46)	1.58 (1.15, 2.15)	0.92 (0.57, 1.49)
Mandé du sud	0.77 (0.44, 1.35)	0.74 (0.38, 1.45)	0.80 (0.54, 1.20)	0.84 (0.50, 1.41)
Voltaïque/Gur	1.23 (0.79, 1.94)	1.25 (0.77, 2.03)	0.78 (0.54, 1.12)	0.77 (0.48, 1.26)
Autres nationalités	1.14 (0.75, 1.72)	1.30 (0.80, 2.10)	1.04 (0.77, 1.39)	0.84 (0.57, 1.24)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	1.07 (0.67, 1.71)	1.21 (0.76, 1.94)	0.98 (0.73, 1.30)	1.01 (0.74, 1.36)
Islam	1.14 (0.74, 1.77)	1.23 (0.78, 1.94)	1.26 (0.97, 1.63)	1.33 (0.92, 1.93)
Traditionalist	1.04 (0.43, 2.52)	1.37 (0.50, 3.76)	0.77 (0.42, 1.39)	1.39 (0.69, 2.79)
Others	0.80 (0.18, 3.46)	1.05 (0.21, 5.21)	0.94 (0.38, 2.34)	1.28 (0.54, 3.02)
No Religion	0.81 (0.45, 1.47)	1.01 (0.54, 1.88)	0.53 (0.37, 0.75)	0.93 (0.63, 1.36)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.61 (0.39, 0.95)	0.87 (0.53, 1.43)	1.33 (0.95, 1.85)	0.94 (0.60, 1.47)
2	0.36 (0.23, 0.57)	0.62 (0.35, 1.11)	1.36 (0.93, 1.98)	0.82 (0.50, 1.34)
3	0.34 (0.17, 0.68)	0.57 (0.27, 1.23)	1.96 (1.42, 2.69)	1.05 (0.64, 1.73)
4	0.56 (0.32, 0.99)	0.86 (0.41, 1.82)	3.13 (2.10, 4.66)	1.91 (1.03, 3.56)
5	0.26 (0.14, 0.47)	0.39 (0.18, 0.85)	1.52 (1.04, 2.24)	0.69 (0.38, 1.24)
6+	0.30 (0.19, 0.48)	0.38 (0.19, 0.77)	1.91 (1.45, 2.51)	1.02 (0.59, 1.76)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.36 (0.27, 0.47)	0.46 (0.29, 0.73)	1.76 (1.44, 2.15)	1.11 (0.77, 1.61)
Formerly Married	0.47 (0.25, 0.88)	0.57 (0.26, 1.25)	2.66 (1.85, 3.83)	1.29 (0.82, 2.03)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	1.31 (0.98, 1.76)	1.59 (0.82, 3.09)	2.73 (2.23, 3.35)	1.67 (1.15, 2.43)

Table 65: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Ville d'Abidjan (Reference)	1.00	1.00	1.00	1.00
Centre	0.77 (0.48, 1.23)	0.82 (0.47, 1.45)	0.40 (0.25, 0.63)	0.73 (0.45, 1.17)
Centre-Est	1.20 (0.68, 2.12)	1.29 (0.69, 2.42)	0.46 (0.30, 0.70)	0.84 (0.52, 1.34)
Centre-Nord	0.69 (0.38, 1.25)	0.65 (0.36, 1.17)	0.46 (0.31, 0.66)	0.68 (0.46, 0.99)
Centre-Ouest	0.84 (0.46, 1.54)	1.02 (0.53, 1.95)	0.53 (0.38, 0.75)	1.07 (0.72, 1.58)
Nord	1.05 (0.60, 1.82)	1.42 (0.77, 2.60)	0.26 (0.17, 0.40)	0.50 (0.31, 0.81)
Nord-est	1.24 (0.79, 1.93)	1.08 (0.61, 1.92)	0.21 (0.14, 0.34)	0.49 (0.28, 0.85)
Nord-Ouest	1.03 (0.65, 1.63)	1.33 (0.73, 2.42)	0.36 (0.24, 0.54)	0.71 (0.42, 1.22)
Ouest	0.77 (0.42, 1.41)	1.00 (0.48, 2.08)	0.40 (0.27, 0.58)	0.88 (0.56, 1.37)
Sud sans Abidjan	0.75 (0.41, 1.38)	0.76 (0.38, 1.49)	0.54 (0.37, 0.79)	0.94 (0.61, 1.46)
Sud-ouest	0.58 (0.30, 1.13)	0.63 (0.33, 1.21)	0.31 (0.20, 0.50)	0.76 (0.47, 1.24)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.53 (1.05, 2.23)	1.51 (1.02, 2.24)	1.32 (1.08, 1.61)	1.33 (1.04, 1.71)
Secondary	1.80 (1.25, 2.59)	1.35 (0.79, 2.31)	1.20 (0.93, 1.55)	1.10 (0.76, 1.60)
Higher	0.05 (0.01, 0.40)	0.04 (0.01, 0.38)	2.02 (1.02, 4.00)	1.24 (0.60, 2.56)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	1.00 (0.65, 1.56)	0.88 (0.56, 1.39)	1.55 (1.06, 2.27)	1.33 (0.86, 2.05)
Middle	0.92 (0.58, 1.45)	0.54 (0.30, 0.96)	1.95 (1.33, 2.87)	1.44 (0.91, 2.29)
Richer	0.87 (0.56, 1.37)	0.41 (0.21, 0.83)	3.41 (2.42, 4.79)	1.71 (1.08, 2.71)
Richest	1.23 (0.82, 1.85)	0.51 (0.25, 1.05)	4.07 (2.89, 5.74)	2.16 (1.28, 3.63)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.49 (0.33, 0.72)	0.56 (0.39, 0.82)	2.10 (1.67, 2.64)	1.31 (1.01, 1.70)
Manual	1.02 (0.55, 1.88)	1.02 (0.53, 1.97)	1.29 (0.84, 2.00)	1.21 (0.74, 1.97)
Agricultural	0.58 (0.41, 0.84)	0.82 (0.52, 1.28)	0.64 (0.47, 0.86)	0.74 (0.51, 1.07)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	1.11 (0.74, 1.66)	0.98 (0.63, 1.54)	1.68 (1.29, 2.18)	1.10 (0.81, 1.49)
Exposed to two media sources	1.08 (0.74, 1.58)	0.82 (0.52, 1.29)	2.21 (1.73, 2.83)	1.23 (0.91, 1.66)
Exposed to three media sources	1.01 (0.60, 1.69)	0.69 (0.34, 1.39)	2.53 (1.80, 3.54)	1.27 (0.79, 2.03)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.61 (0.33, 1.14)	0.83 (0.43, 1.59)	1.84 (1.41, 2.41)	1.38 (0.99, 1.90)

Table 66: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Rwanda.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.30 (0.21, 0.43)	0.35 (0.24, 0.52)	1.47 (1.18, 1.83)	1.32(1.01, 1.73)
25-29	0.45 (0.31, 0.65)	0.60 (0.37, 0.99)	1.66 (1.30, 2.10)	1.23 (0.91, 1.66)
30-34	0.54 (0.37, 0.80)	0.77 (0.43, 1.38)	1.92 (1.53, 2.40)	1.28 (0.92, 1.79)
35-39	0.61 (0.42, 0.91)	0.92 (0.50, 1.71)	2.29 (1.80, 2.91)	1.37 (0.94, 2.00)
40-44	0.55 (0.36, 0.83)	0.79 (0.42, 1.51)	1.95 (1.51, 2.51)	1.29 (0.86, 1.95)
45-49	1.02 (0.71, 1.46)	1.42 (0.76, 2.66)	1.67 (1.26, 2.21)	1.25 (0.81, 1.93)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.83 (0.66, 1.04)	0.88 (0.69, 1.12)	1.22 (1.06, 1.40)	1.18 (1.02, 1.35)
Islam	0.65 (0.29, 1.45)	0.58 (0.24, 1.42)	1.94 (1.21, 3.12)	1.07 (0.68, 1.67)
No Religion	1.62 (0.34, 7.63)	1.78 (0.38, 8.36)	2.05 (0.73, 5.81)	2.41 (0.82, 7.07)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.53 (0.36, 0.77)	0.84 (0.48, 1.48)	1.22 (0.99, 1.52)	0.87 (0.64, 1.19)
2	0.64 (0.45, 0.92)	0.91 (0.46, 1.82)	1.57 (1.26, 1.97)	1.11 (0.77, 1.60)
3	0.51 (0.33, 0.79)	0.60 (0.28, 1.27)	1.62 (1.29, 2.03)	1.21 (0.80, 1.81)
4	0.87 (0.59, 1.29)	0.91 (0.42, 1.97)	1.73 (1.38, 2.16)	1.39 (0.93, 2.08)
5	1.07 (0.70, 1.63)	1.02 (0.47, 2.21)	1.94 (1.48, 2.55)	1.59 (1.01, 2.49)
6+	0.69 (0.47, 1.00)	0.60 (0.27, 1.37)	1.60 (1.29, 1.99)	1.47 (0.93, 2.31)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.63 (0.50, 0.80)	0.97 (0.56, 1.69)	1.76 (1.52, 2.05)	1.58 (1.19, 2.11)
Formerly Married	1.14 (0.82, 1.58)	1.10 (0.62, 1.98)	1.32 (1.05, 1.65)	1.46 (1.02, 2.08)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	1.05 (0.81, 1.35)	1.24 (0.88, 1.74)	2.86 (2.43, 3.37)	1.45 (1.14, 1.85)
Region				
Kigali City (Reference)	1.00	1.00	1.00	1.00
South	1.39 (0.99, 1.94)	1.31 (0.87, 1.97)	0.38 (0.31, 0.47)	1.02 (0.77, 1.37)
West	0.73 (0.49, 1.09)	0.65 (0.41, 1.03)	0.46 (0.37, 0.59)	1.23 (0.90, 1.70)
North	0.70 (0.45, 1.08)	0.64 (0.39, 1.06)	0.49 (0.38, 0.62)	1.34 (0.98, 1.83)
East	1.15 (0.80, 1.65)	1.24 (0.82, 1.88)	0.48 (0.39, 0.60)	1.26 (0.93, 1.70)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.86 (0.62, 1.20)	0.95 (0.67, 1.34)	1.27 (1.02, 1.58)	1.23 (0.98, 1.56)
Secondary	0.84 (0.58, 1.23)	0.83 (0.52, 1.34)	1.67 (1.30, 2.13)	1.33 (1.00, 1.77)
Higher	1.94 (1.02, 3.68)	2.58 (1.19, 5.57)	4.39 (2.87, 6.74)	1.77 (1.12, 2.80)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.68 (0.49, 0.94)	0.68 (0.49, 0.94)	1.42 (1.09, 1.85)	1.33 (1.00, 1.76)
Middle	0.67 (0.48, 0.93)	0.69 (0.50, 0.95)	1.55 (1.21, 1.99)	1.42 (1.09, 1.85)
Richer	0.50 (0.35, 0.73)	0.45 (0.31, 0.67)	2.32 (1.78, 3.01)	2.03 (1.51, 2.72)
Richest	0.65 (0.48, 0.88)	0.43 (0.28, 0.64)	4.54 (3.56, 5.79)	2.72 (1.93, 3.85)

Table 66: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.47 (0.32, 0.69)	0.55 (0.36, 0.83)	2.07 (1.67, 2.55)	1.26 (0.98, 1.61)
Manual	0.71 (0.39, 1.29)	0.79 (0.44, 1.43)	1.27 (0.87, 1.85)	0.97 (0.67, 1.39)
Agricultural	0.54 (0.41, 0.70)	0.51 (0.37, 0.71)	0.68 (0.56, 0.81)	0.67 (0.52, 0.87)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.70 (0.52, 0.95)	0.78 (0.56, 1.07)	1.70 (1.32, 2.18)	1.41 (1.08, 1.84)
Exposed to two media sources	0.62 (0.45, 0.85)	0.66 (0.46, 0.95)	2.35 (1.83, 3.00)	1.53 (1.15, 2.03)
Exposed to three media sources	0.86 (0.61, 1.21)	0.88 (0.58, 1.32)	2.71 (2.10, 3.50)	1.51 (1.12, 2.04)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.48 (0.35, 0.65)	0.63 (0.45, 0.88)	1.55 (1.34, 1.80)	1.33 (1.11, 1.61)

Table 67: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Liberia.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.36 (0.22, 0.58)	0.56 (0.32, 1.00)	2.18 (1.17, 4.05)	1.40 (0.67, 2.89)
25-29	0.29 (0.16, 0.53)	0.47 (0.22, 1.01)	4.18 (2.31, 7.55)	2.25 (1.08, 4.69)
30-34	0.45 (0.27, 0.78)	0.66 (0.34, 1.28)	6.13 (3.47, 10.8)	3.00 (1.36, 6.61)
35-39	0.32 (0.16, 0.65)	0.54 (0.18, 1.59)	8.60 (4.97, 14.9)	4.11 (1.86, 9.08)
40-44	0.69 (0.37, 1.29)	1.22 (0.45, 3.33)	10.4 (5.94, 18.2)	5.61 (2.47, 12.7)
45-49	0.86 (0.45, 1.63)	1.53 (0.54, 4.35)	10.8 (6.05, 19.3)	6.38 (2.92, 13.9)
Ethnicity				
Kpelle (Reference)	1.00	1.00	1.00	1.00
Bassa	1.29 (0.81, 2.06)	2.10 (1.09, 4.02)	0.78 (0.57, 1.05)	0.59 (0.38, 0.93)
Gio	1.52 (0.73, 3.13)	2.77 (0.50, 15.5)	0.65 (0.34, 1.24)	0.72 (0.35, 1.45)
Gola	0.77 (0.39, 1.52)	1.24 (0.59, 2.59)	1.23 (0.83, 1.84)	0.84 (0.47, 1.51)
Grebo	0.85 (0.47, 1.54)	1.86 (0.61, 5.64)	1.27 (0.78, 2.07)	1.01 (0.44, 2.32)
Kissi	0.77 (0.37, 1.63)	1.01 (0.44, 2.30)	1.47 (0.75, 2.88)	1.28 (0.63, 2.64)
Krahn	0.49 (0.25, 0.94)	0.76 (0.33, 1.72)	1.28 (0.79, 2.06)	1.13 (0.47, 2.75)
Kru	0.85 (0.38, 1.90)	2.03 (0.64, 6.38)	1.89 (1.21, 2.97)	1.15 (0.52, 2.52)
Lorma	0.99 (0.40, 2.44)	1.53 (0.59, 3.94)	1.22 (0.69, 2.15)	1.07 (0.51, 2.25)
Mano	0.26 (0.11, 0.60)	0.48 (0.12, 2.01)	0.81 (0.57, 1.17)	0.90 (0.46, 1.75)
Vai	1.03 (0.33, 3.17)	2.01 (0.57, 7.14)	1.91 (1.13, 3.24)	1.41 (0.70, 2.83)
Others	1.30 (0.71, 2.38)	2.08 (1.08, 4.01)	1.02 (0.70, 1.49)	0.82 (0.50, 1.36)
Religion				
Other Christians (Reference)	1.00	1.00	1.00	1.00
Islam	0.80 (0.39, 1.64)	0.67 (0.30, 1.50)	1.23 (0.93, 1.64)	1.07 (0.70, 1.65)
No Religion	0.76 (0.29, 1.98)	0.69 (0.30, 1.57)	0.53 (0.28, 0.98)	0.94 (0.41, 2.13)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.33 (0.20, 0.54)	0.52 (0.31, 0.87)	2.21 (1.45, 3.36)	1.62 (0.94, 2.80)
2	0.40 (0.25, 0.64)	0.67 (0.40, 1.14)	3.81 (2.38, 6.11)	2.07 (1.08, 3.98)
3	0.40 (0.19, 0.86)	0.64 (0.28, 1.49)	3.78 (2.32, 6.14)	1.92 (0.97, 3.79)
4	0.54 (0.28, 1.03)	0.76 (0.34, 1.66)	4.89 (2.93, 8.18)	2.29 (1.08, 4.86)
5	0.67 (0.37, 1.22)	0.76 (0.33, 1.75)	8.63 (5.69, 13.1)	3.31 (1.64, 6.67)
6+	0.48 (0.30, 0.74)	0.39 (0.17, 0.92)	5.92 (3.77, 9.28)	2.20 (1.05, 4.60)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.66 (0.46, 0.96)	0.90 (0.55, 1.50)	3.93 (2.98, 5.17)	1.66 (1.10, 2.51)
Formerly Married	0.38 (0.22, 0.66)	0.45 (0.24, 0.86)	4.14 (2.77, 6.19)	1.57 (0.96, 2.55)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.93 (0.67, 1.29)	1.21 (0.81, 1.81)	1.50 (1.20, 1.88)	1.15 (0.84, 1.56)

Table 67: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Montserrado (Reference)	1.00	1.00	1.00	1.00
Bomi	1.05 (0.52, 2.10)	1.12 (0.47, 2.68)	0.98 (0.67, 1.44)	1.67 (0.99, 2.83)
Bong	1.31 (0.80, 2.15)	1.47 (0.72, 3.00)	0.47 (0.29, 0.73)	0.77 (0.41, 1.45)
Gbarpolu	1.60 (0.91, 2.79)	1.23 (0.59, 2.58)	0.79 (0.48, 1.32)	1.38 (0.77, 2.46)
Grand Basa	1.21 (0.66, 2.24)	0.76 (0.34, 1.68)	0.56 (0.41, 0.77)	1.13 (0.72, 1.78)
Grand Cape Mount	0.48 (0.20, 1.17)	0.35 (0.11, 1.19)	0.96 (0.62, 1.46)	1.18 (0.65, 2.14)
Grand Gedeh	0.70 (0.36, 1.37)	0.95 (0.44, 2.06)	0.62 (0.42, 0.93)	0.76 (0.31, 1.85)
Grand Kru	0.43 (0.15, 1.25)	0.21 (0.05, 0.88)	0.71 (0.44, 1.14)	1.21 (0.50, 2.94)
Lofa	0.99 (0.53, 1.83)	0.88 (0.39, 2.02)	0.35 (0.24, 0.51)	0.57 (0.32, 1.04)
Margibi	1.31 (0.74, 2.32)	1.14 (0.54, 2.41)	0.72 (0.52, 0.98)	1.00 (0.66, 1.49)
Maryland	0.70 (0.35, 1.38)	0.40 (0.13, 1.21)	0.66 (0.39, 1.11)	0.88 (0.35, 2.25)
Nimba	0.87 (0.48, 1.59)	0.70 (0.15, 3.21)	0.44 (0.28, 0.69)	0.71 (0.28, 1.81)
River Cess	0.93 (0.53, 1.64)	0.41 (0.17, 0.98)	0.41 (0.28, 0.61)	1.04 (0.56, 1.93)
River Gee	0.83 (0.43, 1.61)	0.60 (0.21, 1.73)	0.63 (0.33, 1.22)	0.92 (0.35, 2.41)
Sinoe	0.93 (0.45, 1.92)	0.56 (0.20, 1.59)	0.84 (0.53, 1.33)	1.06 (0.50, 2.25)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.39 (0.95, 2.04)	0.99 (0.64, 1.52)	0.61 (0.49, 0.77)	1.04 (0.76, 1.44)
Secondary	0.70 (0.40, 1.22)	0.47 (0.23, 0.96)	0.86 (0.66, 1.12)	1.13 (0.77, 1.67)
Higher	0.37 (0.06, 2.43)	0.28 (0.04, 2.00)	2.15 (1.13, 4.06)	1.94 (0.90, 4.18)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.91 (0.64, 1.28)	0.86 (0.58, 1.29)	1.22 (0.93, 1.60)	1.27 (0.96, 1.70)
Middle	0.63 (0.42, 0.93)	0.57 (0.36, 0.90)	1.38 (1.05, 1.82)	1.35 (0.98, 1.86)
Richer	0.57 (0.33, 1.00)	0.38 (0.21, 0.70)	1.94 (1.35, 2.77)	1.94 (1.30, 2.89)
Richest	0.92 (0.55, 1.56)	0.54 (0.25, 1.19)	2.51 (1.90, 3.31)	2.60 (1.50, 4.49)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.67 (0.44, 1.01)	0.95 (0.59, 1.52)	2.24 (1.69, 2.97)	1.04 (0.73, 1.47)
Manual	1.51 (0.68, 3.36)	1.60 (0.82, 3.13)	2.35 (1.39, 3.96)	1.24 (0.74, 2.08)
Agricultural	1.04 (0.74, 1.46)	0.97 (0.64, 1.48)	0.88 (0.67, 1.16)	0.67 (0.49, 0.91)
Others	1.47 (0.48, 4.46)	1.00 (0.34, 3.00)	0.77 (0.18, 3.20)	2.14 (0.57, 7.99)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	1.31 (0.91, 1.89)	1.50 (1.01, 2.20)	1.45 (1.16, 1.80)	1.23 (0.95, 1.59)
Exposed to two media sources	1.03 (0.63, 1.68)	1.31 (0.68, 2.52)	1.78 (1.39, 2.27)	1.37 (0.99, 1.88)
Exposed to three media sources	1.15 (0.65, 2.04)	1.67 (0.79, 3.55)	1.66 (1.22, 2.27)	1.17 (0.67, 2.05)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.52 (0.32, 0.84)	0.71 (0.42, 1.20)	1.13 (0.92, 1.39)	1.09 (0.84, 1.42)

Table 68: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Benin.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.57 (0.46, 0.70)	0.68 (0.53, 0.86)	1.46 (1.21, 1.78)	1.37 (1.09, 1.73)
25-29	0.32 (0.24, 0.41)	0.45 (0.32, 0.62)	2.24 (1.86, 2.70)	2.09 (1.62, 2.69)
30-34	0.39 (0.31, 0.50)	0.58 (0.41, 0.82)	3.06 (2.55, 3.66)	3.03 (2.30, 3.98)
35-39	0.39 (0.29, 0.51)	0.59 (0.39, 0.88)	4.27 (3.57, 5.10)	4.32 (3.27, 5.72)
40-44	0.38 (0.28, 0.51)	0.56 (0.36, 0.86)	4.41 (3.68, 5.28)	4.74 (3.55, 6.33)
45-49	0.41 (0.27, 0.60)	0.59 (0.36, 0.95)	4.81 (3.98, 5.81)	5.28 (3.93, 7.09)
Ethnicity				
Fon (Reference)	1.00	1.00	1.00	1.00
Adja	0.92 (0.74, 1.15)	0.91 (0.60, 1.37)	0.83 (0.72, 0.96)	1.23 (0.97, 1.56)
Bariba	0.73 (0.50, 1.04)	1.38 (0.69, 2.73)	0.47 (0.39, 0.57)	0.72 (0.52, 1.00)
Dendi	0.66 (0.38, 1.14)	1.16 (0.59, 2.30)	0.72 (0.57, 0.91)	0.92 (0.67, 1.26)
Yoa	0.53 (0.32, 0.87)	1.35 (0.69, 2.67)	0.41 (0.32, 0.53)	0.84 (0.59, 1.21)
Betamaribe	1.04 (0.78, 1.38)	1.24 (0.60, 2.58)	0.21 (0.16, 0.28)	0.76 (0.53, 1.10)
Peulh	0.80 (0.49, 1.32)	1.56 (0.78, 3.10)	0.42 (0.31, 0.56)	0.70 (0.46, 1.04)
Yoruba	1.11 (0.85, 1.44)	1.11 (0.78, 1.56)	0.85 (0.72, 1.00)	0.79 (0.65, 0.95)
Other Béninois	1.08 (0.29, 4.01)	1.96 (0.51, 7.50)	0.76 (0.31, 1.85)	0.95 (0.44, 2.03)
Other Nationalities	1.07 (0.47, 2.43)	1.33 (0.55, 3.19)	1.54 (1.10, 2.15)	1.27 (0.90, 1.79)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	1.08 (0.86, 1.37)	1.12 (0.89, 1.41)	0.89 (0.78, 1.00)	0.95 (0.83, 1.09)
Islam	0.78 (0.60, 1.02)	0.92 (0.66, 1.29)	0.68 (0.60, 0.78)	1.24 (1.03, 1.50)
Traditionalists	1.46 (1.14, 1.85)	1.76 (1.37, 2.27)	0.51 (0.43, 0.61)	0.77 (0.64, 0.94)
Others	0.97 (0.54, 1.73)	0.97 (0.55, 1.71)	0.94 (0.69, 1.28)	1.13 (0.80, 1.58)
No Religion	1.07 (0.78, 1.48)	1.13 (0.82, 1.57)	0.51 (0.40, 0.64)	0.78 (0.61, 1.00)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.64 (0.50, 0.82)	1.09 (0.79, 1.50)	1.51 (1.28, 1.79)	1.14 (0.87, 1.50)
2	0.53 (0.42, 0.67)	1.08 (0.75, 1.57)	1.90 (1.63, 2.23)	1.10 (0.84, 1.45)
3	0.39 (0.30, 0.52)	0.86 (0.57, 1.28)	2.14 (1.84, 2.49)	1.19 (0.89, 1.58)
4	0.41 (0.30, 0.54)	0.89 (0.57, 1.37)	2.52 (2.15, 2.95)	1.29 (0.97, 1.73)
5	0.44 (0.32, 0.61)	0.96 (0.62, 1.49)	2.12 (1.78, 2.53)	1.10 (0.82, 1.49)
6+	0.45 (0.35, 0.58)	0.97 (0.63, 1.51)	2.09 (1.79, 2.43)	1.09 (0.81, 1.47)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.47 (0.40, 0.55)	0.77 (0.56, 1.05)	1.97 (1.74, 2.23)	0.96 (0.73, 1.28)
Formerly Married	0.37 (0.23, 0.60)	0.57 (0.32, 1.01)	2.54 (2.08, 3.12)	0.88 (0.63, 1.23)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	1.03 (0.86, 1.23)	1.08 (0.88, 1.34)	1.92 (1.73, 2.13)	1.26 (1.12, 1.43)

Table 68: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Ouémé (Reference)	1.00	1.00	1.00	1.00
Alibori	0.73 (0.43, 1.24)	0.66 (0.33, 1.32)	0.45 (0.36, 0.56)	0.69 (0.49, 0.98)
Atacora	0.99 (0.69, 1.43)	0.71 (0.32, 1.57)	0.20 (0.16, 0.25)	0.35 (0.25, 0.49)
Atlantique	1.15 (0.82, 1.62)	1.06 (0.75, 1.48)	0.84 (0.69, 1.01)	0.89 (0.71, 1.10)
Borgou	0.56 (0.37, 0.86)	0.45 (0.25, 0.82)	0.56 (0.45, 0.69)	0.71 (0.52, 0.97)
Collines	0.93 (0.64, 1.35)	0.94 (0.61, 1.45)	0.79 (0.64, 0.96)	1.14 (0.90, 1.43)
Couffo	0.72 (0.49, 1.05)	0.65 (0.38, 1.13)	0.33 (0.25, 0.44)	0.41 (0.29, 0.60)
Donga	0.38 (0.24, 0.61)	0.35 (0.19, 0.65)	0.30 (0.23, 0.38)	0.33 (0.23, 0.47)
Littoral	0.73 (0.48, 1.10)	0.57 (0.37, 0.89)	1.38 (1.14, 1.66)	1.01 (0.81, 1.26)
Mono	1.21 (0.83, 1.76)	1.08 (0.63, 1.88)	0.96 (0.79, 1.17)	1.05 (0.77, 1.44)
Pateau	1.38 (0.96, 1.98)	1.35 (0.90, 2.05)	0.72 (0.55, 0.95)	1.03 (0.76, 1.40)
Zou	1.08 (0.80, 1.46)	0.95 (0.69, 1.31)	0.74 (0.61, 0.90)	0.92 (0.74, 1.13)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.26 (1.01, 1.57)	1.10 (0.86, 1.42)	1.62 (1.45, 1.81)	1.26 (1.10, 1.43)
Secondary	1.62 (1.34, 1.95)	1.11 (0.85, 1.46)	1.07 (0.95, 1.20)	1.06 (0.90, 1.25)
Higher	0.88 (0.42, 1.85)	0.90 (0.40, 2.03)	1.66 (1.20, 2.28)	0.92 (0.64, 1.33)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.82 (0.64, 1.05)	0.85 (0.66, 1.09)	1.40 (1.18, 1.67)	1.36 (1.15, 1.62)
Middle	0.72 (0.55, 0.94)	0.70 (0.53, 0.93)	1.86 (1.57, 2.19)	1.63 (1.37, 1.95)
Richer	0.80 (0.61, 1.04)	0.79 (0.58, 1.07)	2.78 (2.36, 3.28)	2.04 (1.70, 2.45)
Richest	0.96 (0.73, 1.27)	1.04 (0.72, 1.49)	3.72 (3.16, 4.37)	2.40 (1.94, 2.98)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.54 (0.45, 0.65)	0.78 (0.63, 0.97)	2.06 (1.85, 2.28)	1.23 (1.09, 1.38)
Manual	0.96 (0.73, 1.28)	1.14 (0.84, 1.54)	1.24 (1.01, 1.51)	0.90 (0.73, 1.12)
Agricultural	0.64 (0.50, 0.81)	0.81 (0.63, 1.05)	0.88 (0.75, 1.03)	0.96 (0.81, 1.13)
Others	0.60 (0.39, 0.92)	0.85 (0.54, 1.35)	2.17 (1.75, 2.69)	1.15 (0.92, 1.43)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.84 (0.66, 1.07)	0.82 (0.64, 1.07)	1.04 (0.92, 1.18)	0.82 (0.72, 0.94)
Exposed to two media sources	0.87 (0.71, 1.06)	0.80 (0.63, 1.02)	1.66 (1.48, 1.87)	0.93 (0.81, 1.06)
Exposed to three media sources	1.23 (0.93, 1.64)	0.84 (0.60, 1.19)	1.42 (1.23, 1.65)	0.88 (0.72, 1.08)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.58 (0.37, 0.92)	0.80 (0.50, 1.29)	1.65 (1.36, 2.00)	1.19 (0.95, 1.48)

Table 69: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Kenya.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.59 (0.47, 0.75)	0.83 (0.63, 1.09)	1.82 (1.43, 2.32)	1.08 (0.80, 1.46)
25-29	0.58 (0.46, 0.73)	0.93 (0.66, 1.32)	3.51 (2.78, 4.42)	1.73 (1.25, 2.39)
30-34	0.42 (0.32, 0.55)	0.67 (0.45, 1.00)	5.21 (4.11, 6.60)	2.63 (1.82, 3.79)
35-39	0.55 (0.42, 0.71)	0.79 (0.53, 1.18)	4.83 (3.85, 6.06)	2.85 (1.97, 4.14)
40-44	0.50 (0.37, 0.68)	0.70 (0.44, 1.10)	5.93 (4.70, 7.48)	3.82 (2.66, 5.49)
45-49	0.63 (0.46, 0.86)	0.84 (0.52, 1.34)	6.18 (4.80, 7.94)	4.35 (2.97, 6.37)
Ethnicity				
Kikuyu (Reference)	1.00	1.00	1.00	1.00
Embu	0.93 (0.39, 2.21)	1.06 (0.44, 2.57)	0.46 (0.28, 0.75)	0.50 (0.29, 0.86)
Kalenjin	1.45 (1.07, 1.96)	1.10 (0.71, 1.70)	0.26 (0.22, 0.31)	0.42 (0.33, 0.54)
Kamba	1.28 (0.91, 1.81)	1.24 (0.70, 2.20)	0.54 (0.44, 0.67)	0.68 (0.48, 0.96)
Kisii	0.55 (0.32, 0.95)	0.54 (0.26, 1.12)	0.49 (0.40, 0.60)	0.75 (0.54, 1.04)
Luhya	0.85 (0.61, 1.18)	0.63 (0.36, 1.12)	0.44 (0.35, 0.55)	0.77 (0.58, 1.02)
Luo	0.84 (0.60, 1.16)	0.79 (0.45, 1.37)	0.35 (0.29, 0.43)	0.58 (0.42, 0.80)
Maasai	4.04 (2.80, 5.83)	2.34 (1.40, 3.91)	0.37 (0.25, 0.56)	0.76 (0.47, 1.22)
Meru	1.22 (0.80, 1.86)	1.23 (0.64, 2.35)	0.40 (0.31, 0.53)	0.47 (0.31, 0.71)
Mijikenda/Swahili	1.48 (1.03, 2.12)	0.51 (0.28, 0.91)	0.33 (0.25, 0.42)	0.56 (0.38, 0.84)
Somali	4.80 (3.39, 6.78)	1.22 (0.45, 3.31)	0.42 (0.30, 0.60)	1.27 (0.58, 2.79)
Taita/Taveta	0.76 (0.32, 1.79)	0.55 (0.20, 1.46)	1.06 (0.73, 1.54)	0.90 (0.56, 1.45)
Turkana	7.05 (4.85, 10.2)	2.95 (1.75, 4.99)	0.09 (0.05, 0.20)	0.22 (0.10, 0.48)
Samburu	6.66 (4.19, 10.6)	3.18 (1.86, 5.43)	0.06 (0.02, 0.13)	0.10 (0.04, 0.26)
Other	1.94 (1.32, 2.84)	0.85 (0.48, 1.51)	0.39 (0.29, 0.53)	0.72 (0.47, 1.09)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.81 (0.66, 0.98)	0.89 (0.72, 1.09)	0.93 (0.80, 1.08)	0.94 (0.82, 1.09)
Islam	2.35 (1.81, 3.03)	1.70 (1.11, 2.59)	0.90 (0.72, 1.13)	1.19 (0.84, 1.67)
Others	1.38 (0.42, 4.54)	1.41 (0.51, 3.94)	1.06 (0.54, 2.10)	0.65 (0.36, 1.18)
No Religion	1.46 (0.94, 2.27)	1.19 (0.75, 1.89)	0.36 (0.23, 0.55)	0.62 (0.38, 1.02)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.59 (0.45, 0.77)	0.93 (0.67, 1.28)	2.22 (1.83, 2.68)	1.23 (0.93, 1.63)
2	0.54 (0.42, 0.71)	0.90 (0.63, 1.28)	3.48 (2.92, 4.16)	1.57 (1.16, 2.13)
3	0.65 (0.50, 0.86)	0.98 (0.66, 1.45)	3.64 (2.97, 4.45)	1.54 (1.11, 2.14)
4	0.66 (0.50, 0.87)	0.85 (0.57, 1.28)	3.15 (2.57, 3.86)	1.40 (0.98, 1.98)
5	0.67 (0.50, 0.91)	0.99 (0.63, 1.56)	3.01 (2.42, 3.74)	1.38 (0.95, 2.00)
6+	0.74 (0.59, 0.93)	0.81 (0.53, 1.25)	1.99 (1.66, 2.38)	1.09 (0.76, 1.57)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.65 (0.56, 0.76)	0.74 (0.57, 0.96)	2.74 (2.39, 3.14)	1.42 (1.13, 1.79)
Formerly Married	0.66 (0.51, 0.86)	0.78 (0.55, 1.12)	2.59 (2.14, 3.15)	1.16 (0.88, 1.54)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.60 (0.50, 0.72)	1.03 (0.84, 1.27)	2.06 (1.82, 2.34)	1.13 (0.98, 1.31)

Table 69: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Nairobi (Reference)	1.00	1.00	1.00	1.00
Coast	3.53 (1.97, 6.31)	2.08 (1.10, 3.95)	0.61 (0.45, 0.82)	1.27 (0.86, 1.88)
North Eastern	10.1 (5.56, 18.4)	1.24 (0.44, 3.53)	0.39 (0.25, 0.59)	0.69 (0.33, 1.45)
Eastern	2.98 (1.67, 5.30)	1.40 (0.75, 2.62)	0.54 (0.40, 0.71)	1.17 (0.79, 1.74)
Central	2.43 (1.33, 4.44)	1.95 (0.96, 3.96)	1.08 (0.82, 1.42)	1.10 (0.80, 1.52)
Rift Valley	3.58 (2.04, 6.29)	1.59 (0.85, 2.95)	0.50 (0.39, 0.66)	1.15 (0.85, 1.55)
Western	2.31 (1.27, 4.20)	1.94 (0.96, 3.92)	0.39 (0.26, 0.57)	0.85 (0.55, 1.32)
Nyanza	1.67 (0.93, 3.01)	1.37 (0.71, 2.65)	0.42 (0.32, 0.56)	0.93 (0.65, 1.33)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.34 (0.28, 0.42)	0.82 (0.63, 1.07)	1.60 (1.24, 2.05)	1.18 (0.85, 1.63)
Secondary	0.25 (0.20, 0.31)	0.64 (0.46, 0.89)	1.93 (1.50, 2.49)	1.29 (0.91, 1.81)
Higher	0.24 (0.16, 0.36)	0.86 (0.54, 1.38)	2.96 (2.20, 3.99)	1.27 (0.86, 1.87)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.52 (0.43, 0.63)	0.86 (0.69, 1.08)	1.70 (1.39, 2.07)	1.50 (1.21, 1.87)
Middle	0.37 (0.30, 0.46)	0.63 (0.50, 0.80)	2.29 (1.89, 2.78)	1.83 (1.47, 2.28)
Richer	0.30 (0.23, 0.39)	0.58 (0.43, 0.78)	4.12 (3.39, 5.00)	2.82 (2.24, 3.56)
Richest	0.28 (0.21, 0.37)	0.55 (0.39, 0.77)	5.92 (4.88, 7.19)	3.75 (2.88, 4.89)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.41 (0.33, 0.50)	0.67 (0.53, 0.84)	2.62 (2.27, 3.01)	1.25 (1.04, 1.50)
Manual	0.38 (0.27, 0.52)	0.54 (0.39, 0.75)	1.71 (1.37, 2.14)	1.05 (0.81, 1.37)
Agricultural	0.55 (0.45, 0.66)	0.78 (0.63, 0.98)	1.63 (1.40, 1.89)	1.00 (0.82, 1.22)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.47 (0.39, 0.57)	0.73 (0.59, 0.90)	1.70 (1.40, 2.06)	1.26 (1.02, 1.55)
Exposed to two media sources	0.34 (0.28, 0.42)	0.61 (0.48, 0.78)	2.31 (1.91, 2.79)	1.21 (0.97, 1.50)
Exposed to three media sources	0.32 (0.25, 0.41)	0.58 (0.42, 0.80)	3.12 (2.53, 3.84)	1.56 (1.22, 1.99)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.44 (0.36, 0.54)	0.70 (0.56, 0.87)	1.55 (1.39, 1.73)	1.14 (1.00, 1.31)

Table 70: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Sao Tome and Principe.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.99 (0.63, 1.55)	1.36 (0.73, 2.55)	1.98 (1.30, 3.04)	1.35 (0.78, 2.33)
25-29	0.42 (0.19, 0.92)	0.52 (0.15, 1.78)	3.03 (1.88, 4.89)	1.64 (0.92, 2.94)
30-34	0.36 (0.17, 0.76)	0.45 (0.12, 1.69)	4.31 (2.69, 6.90)	2.14 (1.12, 4.11)
35-39	0.53 (0.22, 1.29)	0.63 (0.15, 2.65)	6.37 (3.96, 10.24)	3.17 (1.62, 6.20)
40-44	0.27 (0.11, 0.65)	0.32 (0.08, 1.24)	5.29 (3.15, 8.89)	2.65 (1.27, 5.52)
45-49	0.63 (0.24, 1.70)	0.60 (0.23, 1.59)	7.17 (4.79, 10.75)	3.70 (1.86, 7.34)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.43 (0.20, 0.95)	0.35 (0.15, 0.80)	0.86 (0.62, 1.20)	1.12 (0.76, 1.64)
Others	0.17 (0.03, 0.88)	0.14 (0.02, 0.77)	1.08 (0.62, 1.88)	1.19 (0.68, 2.09)
None	0.69 (0.37, 1.29)	0.57 (0.30, 1.08)	0.61 (0.37, 0.99)	0.76 (0.45, 1.29)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.58 (0.30, 1.14)	0.92 (0.40, 2.09)	2.73 (1.59, 4.71)	0.84 (0.36, 1.96)
2	0.42 (0.21, 0.81)	0.79 (0.23, 2.73)	2.43 (1.52, 3.90)	0.55 (0.21, 1.42)
3	0.42 (0.20, 0.90)	1.15 (0.32, 4.12)	3.36 (2.09, 5.41)	0.66 (0.26, 1.64)
4	0.47(0.19, 1.17)	1.30 (0.27, 6.29)	4.74 (2.92, 7.68)	0.86 (0.32, 2.33)
5	0.36 (0.14, 0.91)	1.11 (0.27, 4.53)	5.33 (3.34, 8.50)	0.83 (0.31, 2.24)
6+	0.31 (0.12, 0.75)	0.91 (0.24, 3.50)	4.16 (2.64, 6.54)	0.63 (0.23, 1.72)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.40 (0.25, 0.62)	0.59 (0.24, 1.48)	4.46 (3.13, 6.36)	3.57 (1.78, 7.18)
Formerly Married	0.55 (0.29, 1.04)	0.71 (0.25, 2.04)	3.04 (1.98, 4.66)	2.26 (1.21, 4.21)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	1.77 (1.02, 3.06)	1.33 (0.82, 2.14)	1.36 (1.09, 1.70)	1.36 (1.03, 1.79)
Region				
Região Centro (Reference)	1.00	1.00	1.00	1.00
Região Sul	0.73 (0.42, 1.26)	0.89 (0.51, 1.57)	0.89 (0.68, 1.16)	1.22 (0.84, 1.76)
Região Norte	0.54 (0.27, 1.09)	0.65 (0.33, 1.28)	0.79 (0.60, 1.03)	1.04 (0.75, 1.45)
Região do Príncipe	0.93 (0.43, 2.02)	1.22 (0.51, 2.89)	1.01 (0.77, 1.33)	1.33 (0.88, 2.01)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.21 (0.51, 2.87)	1.01 (0.38, 2.67)	1.32 (0.80, 2.17)	1.38 (0.89, 2.13)
Secondary	1.42 (0.55, 3.68)	0.49 (0.16, 1.58)	0.93 (0.57, 1.51)	1.15 (0.70, 1.90)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.72 (0.33, 1.57)	0.66 (0.29, 1.50)	1.07 (0.71, 1.59)	1.03 (0.69, 1.55)
Middle	0.79 (0.43, 1.46)	0.66 (0.33, 1.32)	1.21 (0.79, 1.85)	1.19 (0.76, 1.87)
Richer	0.54 (0.28, 1.03)	0.42 (0.20, 0.89)	1.77 (1.20, 2.61)	1.89 (1.25, 2.84)
Richest	1.65 (0.89, 3.06)	1.21 (0.56, 2.62)	1.81 (1.28, 2.56)	2.03 (1.39, 2.98)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.96 (0.70, 1.31)	1.22 (0.80, 1.84)	2.26 (1.80, 2.83)	1.46 (1.13, 1.89)
Manual	0.54 (0.21, 1.40)	0.71 (0.25, 1.99)	2.06 (1.29, 3.28)	1.20 (0.73, 2.00)

Table 70: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.39 (0.09, 1.71)	0.38 (0.08, 1.89)	1.31 (0.60, 2.87)	1.51 (0.67, 3.44)
Exposed to two media sources	0.97 (0.28, 3.33)	0.92 (0.25, 3.52)	1.33 (0.74, 2.39)	1.40 (0.75, 2.63)
Exposed to three media sources	1.34 (0.40, 4.55)	1.10 (0.28, 4.31)	1.32 (0.77, 2.28)	1.36 (0.73, 2.54)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.42 (0.21, 0.86)	0.63 (0.31, 1.28)	1.10 (0.82, 1.48)	0.87 (0.64, 1.18)

Table 71: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Togo.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.58 (0.40, 0.85)	0.94 (0.60, 1.48)	1.83 (1.33, 2.51)	1.29 (0.93, 1.81)
25-29	0.55 (0.35, 0.86)	1.13 (0.59, 2.16)	3.35 (2.48, 4.52)	2.17 (1.46, 3.24)
30-34	0.62 (0.39, 0.97)	1.41 (0.67, 2.97)	4.96 (3.63, 6.78)	3.56 (2.32, 5.47)
35-39	0.76 (0.47, 1.22)	1.94 (0.91, 4.12)	6.31 (4.70, 8.46)	5.20 (3.38, 8.00)
40-44	0.77 (0.49, 1.23)	1.98 (0.85, 4.62)	7.36 (5.34, 10.2)	6.71 (4.30, 10.5)
45-49	0.82 (0.50, 1.34)	2.12 (0.93, 4.82)	6.35 (4.55, 8.84)	6.87 (4.25, 11.1)
Ethnicity				
Adja-Ewé/Mina (Reference)	1.00	1.00	1.00	1.00
Kabye/Tem	0.68 (0.49, 0.95)	0.55 (0.34, 0.90)	0.70 (0.56, 0.86)	0.93 (0.71, 1.22)
Akposso/Akebou	0.36 (0.12, 1.05)	0.39 (0.12, 1.27)	0.89 (0.60, 1.33)	1.34 (0.89, 2.01)
Ana-Ife	0.82 (0.23, 2.87)	0.92 (0.25, 3.38)	0.77 (0.52, 1.15)	1.21 (0.77, 1.92)
Para-Gourma/Akan	1.35 (1.01, 1.79)	0.67 (0.39, 1.17)	0.33 (0.25, 0.45)	0.70 (0.44, 1.11)
Other Togolese	1.31 (0.61, 2.83)	1.04 (0.34, 3.16)	0.31 (0.15, 0.65)	0.40 (0.16, 0.95)
Stranger	0.95 (0.50, 1.80)	1.21 (0.59, 2.48)	1.98 (1.45, 2.72)	1.66 (1.17, 2.36)
Religion				
Other Christians (Reference)	1.00	1.00	1.00	1.00
Islam	0.92 (0.64, 1.31)	0.89 (0.57, 1.41)	1.12 (0.91, 1.38)	1.61 (1.22, 2.12)
Traditionalists	1.66 (1.23, 2.23)	1.32 (0.91, 1.91)	0.35 (0.27, 0.47)	0.68 (0.48, 0.96)
No Religion	1.05 (0.69, 1.60)	0.87 (0.56, 1.35)	0.61 (0.45, 0.81)	0.99 (0.70, 1.39)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.61 (0.40, 0.95)	0.88 (0.49, 1.57)	1.66 (1.28, 2.17)	0.75 (0.51, 1.10)
2	0.56 (0.35, 0.92)	0.82 (0.41, 1.63)	2.85 (2.15, 3.77)	0.86 (0.57, 1.30)
3	0.66 (0.40, 1.07)	0.82 (0.39, 1.71)	3.00 (2.31, 3.90)	0.86 (0.55, 1.37)
4	0.67 (0.38, 1.16)	0.78 (0.35, 1.76)	2.91 (2.21, 3.85)	0.77 (0.47, 1.26)
5	0.92 (0.54, 1.59)	0.87 (0.38, 2.02)	2.57 (1.86, 3.57)	0.92 (0.55, 1.53)
6+	0.80 (0.56, 1.15)	0.58 (0.26, 1.33)	1.84 (1.42, 2.38)	0.77 (0.48, 1.24)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.73 (0.56, 0.95)	0.73 (0.41, 1.30)	2.87 (2.35, 3.49)	2.03 (1.35, 3.06)
Formerly Married	0.45 (0.24, 0.86)	0.40 (0.16, 0.99)	3.76 (2.71, 5.20)	2.01 (1.22, 3.32)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.71 (0.52, 0.97)	1.73 (0.87, 3.42)	2.80 (2.37, 3.31)	0.94 (0.64, 1.39)
Region				
Grande Agglomération de Lomé (Reference)	1.00	1.00	1.00	1.00
Maritime (Sans Agglomération de Lomé)	1.82 (1.16, 2.86)	1.47 (0.71, 3.05)	0.56 (0.43, 0.74)	0.99 (0.70, 1.39)
Plateaux	0.87 (0.53, 1.44)	0.82 (0.40, 1.68)	0.42 (0.33, 0.52)	0.72 (0.52, 1.01)
Centrale	0.97 (0.58, 1.60)	1.31 (0.61, 2.84)	0.45 (0.36, 0.57)	0.70 (0.49, 0.98)
Kara	1.65 (1.04, 2.63)	1.82 (0.88, 3.78)	0.28 (0.21, 0.37)	0.59 (0.40, 0.87)
Savenes	2.23 (1.46, 3.39)	2.15 (1.00, 4.66)	0.14 (0.09, 0.20)	0.46 (0.25, 0.81)

Table 71: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.92 (0.67, 1.25)	1.27 (0.89, 1.83)	1.59 (1.31, 1.93)	1.38 (1.11, 1.71)
Secondary	0.97 (0.70, 1.34)	1.28 (0.82, 2.01)	1.28 (1.03, 1.60)	1.46 (1.06, 2.01)
Higher	0.75 (0.33, 1.70)	1.18 (0.45, 3.13)	1.83 (1.20, 2.78)	1.70 (0.99, 2.93)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.69 (0.49, 0.97)	0.81 (0.56, 1.17)	1.80 (1.26, 2.57)	1.16 (0.80, 1.69)
Middle	0.69 (0.50, 0.97)	0.70 (0.46, 1.06)	2.59 (1.91, 3.52)	1.41 (0.98, 2.04)
Richer	0.45 (0.28, 0.72)	0.32 (0.14, 0.70)	4.50 (3.34, 6.07)	2.11 (1.29, 3.46)
Richest	0.53 (0.36, 0.79)	0.35 (0.15, 0.84)	6.75 (5.09, 8.94)	3.12 (1.82, 5.35)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.52 (0.37, 0.74)	0.57 (0.39, 0.84)	3.54 (2.84, 4.41)	1.59 (1.24, 2.03)
Manual	0.82 (0.53, 1.28)	0.98 (0.60, 1.60)	1.93 (1.47, 2.54)	1.16 (0.84, 1.59)
Agricultural	0.93 (0.67, 1.29)	0.81 (0.53, 1.26)	0.88 (0.65, 1.18)	0.94 (0.67, 1.31)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.79 (0.59, 1.05)	0.89 (0.65, 1.22)	1.36 (1.10, 1.68)	1.13 (0.91, 1.41)
Exposed to two media sources	0.65 (0.47, 0.89)	0.90 (0.62, 1.32)	2.53 (2.04, 3.13)	1.36 (1.04, 1.77)
Exposed to three media sources	0.68 (0.41, 1.11)	0.89 (0.48, 1.65)	2.50 (1.87, 3.33)	1.39 (0.95, 2.04)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.37 (0.21, 0.66)	0.44 (0.24, 0.80)	1.08 (0.87, 1.34)	0.98 (0.76, 1.28)

Table 72: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Cameroon.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.85 (0.64, 1.12)	0.81 (0.56, 1.16)	1.65 (1.35, 2.02)	1.34 (1.03, 1.72)
25-29	0.91 (0.63, 1.32)	0.84 (0.52, 1.37)	2.43 (2.01, 2.95)	1.96 (1.49, 2.59)
30-34	0.60 (0.38, 0.93)	0.63 (0.37, 1.08)	3.53 (2.82, 4.43)	2.92 (2.13, 4.02)
35-39	1.23 (0.85, 1.78)	1.19 (0.70, 2.00)	5.01 (4.01, 6.26)	4.52 (3.19, 6.40)
40-44	0.98 (0.64, 1.51)	1.05 (0.58, 1.90)	5.20 (4.13, 6.55)	5.57 (3.89, 7.98)
45-49	0.91 (0.58, 1.43)	1.01 (0.55, 1.86)	4.52 (3.57, 5.73)	4.92 (3.35, 7.24)
Ethnicity				
Bamilike/Bamoun (Reference)	1.00	1.00	1.00	1.00
Arabes-Choa/Peulh/Haoussa/Kanuri	16.1 (9.41, 27.4)	6.48 (2.65, 15.9)	0.23 (0.16, 0.31)	0.31 (0.19, 0.50)
Biu-Mandara	5.49 (3.19, 9.44)	2.42 (0.97, 6.03)	0.15 (0.10, 0.21)	0.44 (0.28, 0.70)
Adamaoua-Oubangui	5.65 (3.23, 9.88)	2.62 (1.10, 6.24)	0.21 (0.15, 0.30)	0.40 (0.27, 0.59)
Bantoïde Sud-Ouest	3.65 (1.20, 11.1)	3.16 (0.85, 11.8)	0.61 (0.33, 1.14)	0.51 (0.29, 0.89)
Grassfields	1.26 (0.65, 2.43)	1.10 (0.43, 2.81)	0.62 (0.51, 0.77)	0.70 (0.49, 0.98)
Côtier/Ngoe/Oroko	2.62 (1.18, 5.79)	2.89 (1.26, 6.60)	0.55 (0.41, 0.73)	0.45 (0.31, 0.64)
Beti/Bassa/Mbam	2.96 (1.69, 5.17)	3.52 (1.92, 6.47)	0.50 (0.41, 0.60)	0.42 (0.33, 0.54)
Kako/Meka/Pygmé	4.24 (2.18, 8.27)	2.46 (0.98, 6.19)	0.31 (0.23, 0.43)	0.26 (0.15, 0.45)
Stranger/Others	8.50 (3.90, 18.6)	5.09 (1.89, 13.7)	0.58 (0.37, 0.90)	0.68 (0.44, 1.05)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	1.28 (0.97, 1.69)	1.24 (0.93, 1.66)	1.01 (0.88, 1.16)	1.01 (0.87, 1.18)
Islam	3.64 (2.55, 5.19)	1.31 (0.82, 2.09)	0.66 (0.54, 0.81)	1.10 (0.83, 1.47)
Traditionalists	1.95 (1.12, 3.40)	1.04 (0.52, 2.06)	0.27 (0.14, 0.52)	0.54 (0.30, 0.98)
Others	1.53 (0.53, 4.45)	1.56 (0.51, 4.76)	0.88 (0.50, 1.56)	0.68 (0.36, 1.30)
No Religion	1.66 (0.72, 3.84)	1.30 (0.56, 3.03)	0.81 (0.54, 1.21)	0.94 (0.61, 1.45)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	1.02 (0.70, 1.48)	1.24 (0.82, 1.87)	1.78 (1.46, 2.16)	1.30 (1.00, 1.69)
2	1.38 (0.86, 2.21)	1.70 (1.03, 2.81)	2.21 (1.78, 2.74)	1.44 (1.06, 1.96)
3	1.20 (0.82, 1.74)	1.49 (0.89, 2.50)	2.04 (1.63, 2.55)	1.24 (0.91, 1.71)
4	1.07 (0.66, 1.75)	1.37 (0.77, 2.44)	2.87 (2.27, 3.63)	1.45 (1.02, 2.05)
5	1.27 (0.80, 2.02)	1.52 (0.83, 2.78)	2.90 (2.22, 3.78)	1.57 (1.04, 2.35)
6+	1.42 (1.02, 1.98)	1.18 (0.70, 2.00)	2.24 (1.87, 2.68)	1.44 (1.02, 2.04)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	1.31 (1.00, 1.72)	0.63 (0.42, 0.96)	2.04 (1.77, 2.35)	1.37 (1.08, 1.75)
Formerly Married	0.62 (0.38, 1.01)	0.33 (0.18, 0.60)	2.16 (1.72, 2.71)	1.01 (0.73, 1.40)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.66 (0.50, 0.85)	1.28 (0.88, 1.88)	2.32 (2.01, 2.67)	0.89 (0.70, 1.12)

Table 72: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Yaoundé (Reference)	1.00	1.00	1.00	1.00
Adamaoua	4.69 (2.47, 8.91)	2.37 (0.88, 6.40)	0.40 (0.29, 0.55)	0.75 (0.49, 1.13)
Centre (sans Yaoundé)	0.86 (0.44, 1.72)	0.77 (0.38, 1.58)	0.45 (0.33, 0.62)	0.65 (0.43, 0.97)
Douala	1.01 (0.46, 2.20)	1.13 (0.52, 2.46)	1.01 (0.79, 1.28)	0.82 (0.62, 1.07)
Est	2.81 (1.50, 5.23)	2.09 (0.94, 4.62)	0.50 (0.37, 0.68)	1.25 (0.81, 1.94)
Extrême-Nord	3.81 (2.09, 6.93)	2.01 (0.76, 5.31)	0.11 (0.07, 0.17)	0.31 (0.17, 0.58)
Littoral (sans Douala)	0.69 (0.26, 1.83)	0.68 (0.25, 1.85)	0.89 (0.65, 1.22)	1.04 (0.73, 1.48)
Nord	2.88 (1.59, 5.21)	1.58 (0.61, 4.07)	0.29 (0.20, 0.41)	0.71 (0.43, 1.19)
Nord-Ouest	0.68 (0.32, 1.44)	1.20 (0.40, 3.65)	0.62 (0.47, 0.81)	0.93 (0.60, 1.45)
Ouest	0.53 (0.22, 1.27)	1.06 (0.42, 2.68)	0.93 (0.73, 1.19)	0.91 (0.66, 1.27)
Sud	1.86 (0.92, 3.78)	1.44 (0.66, 3.15)	0.50 (0.37, 0.67)	0.81 (0.58, 1.12)
Sud-Ouest	0.94 (0.43, 2.07)	1.06 (0.43, 2.60)	0.91 (0.68, 1.21)	1.20 (0.83, 1.74)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	0.49 (0.38, 0.64)	0.94 (0.67, 1.31)	2.40 (1.89, 3.06)	1.07 (0.78, 1.46)
Secondary	0.28 (0.21, 0.38)	0.82 (0.51, 1.32)	2.89 (2.31, 3.62)	1.21 (0.86, 1.70)
Higher	0.20 (0.10, 0.40)	0.84 (0.35, 2.02)	4.12 (3.04, 5.58)	1.05 (0.67, 1.65)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.54 (0.39, 0.76)	0.73 (0.49, 1.10)	2.52 (1.83, 3.47)	1.44 (1.01, 2.05)
Middle	0.40 (0.28, 0.58)	0.50 (0.31, 0.81)	4.64 (3.35, 6.44)	2.21 (1.50, 3.26)
Richer	0.44 (0.30, 0.66)	0.63 (0.35, 1.15)	5.77 (4.22, 7.87)	2.50 (1.61, 3.90)
Richest	0.32 (0.21, 0.48)	0.51 (0.26, 1.00)	8.03 (5.91, 10.9)	3.51 (2.24, 5.50)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.70 (0.51, 0.96)	0.81 (0.58, 1.12)	2.43 (2.08, 2.85)	1.20 (0.99, 1.46)
Manual	0.70 (0.42, 1.17)	0.79 (0.52, 1.19)	1.72 (1.40, 2.12)	1.18 (0.94, 1.48)
Agricultural	0.75 (0.56, 1.00)	0.76 (0.52, 1.10)	0.88 (0.73, 1.06)	0.61 (0.48, 0.78)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.72 (0.56, 0.94)	1.15 (0.87, 1.52)	2.16 (1.73, 2.69)	1.08 (0.84, 1.39)
Exposed to two media sources	0.49 (0.37, 0.66)	0.96 (0.68, 1.34)	2.64 (2.16, 3.22)	1.08 (0.83, 1.41)
Exposed to three media sources	0.33 (0.22, 0.50)	0.79 (0.48, 1.31)	3.21 (2.62, 3.94)	1.24 (0.93, 1.66)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.65 (0.35, 1.21)	0.91 (0.50, 1.69)	1.33 (1.03, 1.72)	0.79 (0.59, 1.06)

Table 73: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Comoros.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.70 (0.46, 1.06)	0.81 (0.54, 1.21)	2.10 (1.56, 2.82)	1.69 (1.25, 2.28)
25-29	0.55 (0.35, 0.87)	0.78 (0.48, 1.28)	4.28 (3.26, 5.62)	2.71 (1.99, 3.69)
30-34	0.39 (0.22, 0.71)	0.66 (0.34, 1.26)	5.81 (4.49, 7.53)	3.47 (2.39, 5.03)
35-39	0.31 (0.16, 0.60)	0.53 (0.24, 1.17)	5.77 (4.43, 7.51)	3.14 (2.24, 4.40)
40-44	0.62 (0.34, 1.16)	1.04 (0.50, 2.19)	5.81 (4.32, 7.81)	2.97 (2.01, 4.39)
45-49	0.73 (0.35, 1.51)	1.22 (0.44, 3.38)	8.23 (5.75, 11.79)	4.31 (2.79, 6.66)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.78 (0.44, 1.38)	1.19 (0.60, 2.36)	2.65 (2.04, 3.45)	1.45 (1.03, 2.06)
2	0.65 (0.36, 1.16)	1.08 (0.51, 2.31)	2.63 (1.97, 3.51)	1.27 (0.89, 1.85)
3	0.40 (0.20, 0.82)	0.68 (0.32, 1.47)	3.64 (2.76, 4.81)	1.76 (1.25, 2.49)
4	0.30 (0.13, 0.69)	0.53 (0.20, 1.46)	3.86 (2.77, 5.37)	1.74 (1.11, 2.71)
5	0.50 (0.24, 1.05)	0.94 (0.36, 2.43)	2.99 (2.15, 4.15)	1.27 (0.82, 1.96)
6+	0.63 (0.35, 1.11)	1.05 (0.48, 2.31)	3.73 (2.93, 4.75)	1.75 (1.17, 2.64)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.51 (0.39, 0.67)	0.75 (0.45, 1.25)	3.84 (3.11, 4.76)	1.42 (1.02, 1.96)
Formerly Married	0.93 (0.54, 1.59)	1.25 (0.67, 2.34)	2.59 (1.89, 3.55)	0.97 (0.66, 1.44)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.94 (0.68, 1.30)	0.87 (0.60, 1.27)	1.55 (1.27, 1.89)	1.28 (1.03, 1.60)
Region				
Ngazidja (Reference)	1.00	1.00	1.00	1.00
Mwali	1.34 (0.86, 2.07)	1.31 (0.72, 2.37)	1.33 (1.07, 1.67)	1.85 (1.37, 2.50)
Ndzuwani	1.07 (0.76, 1.51)	1.12 (0.71, 1.74)	1.03 (0.84, 1.27)	1.27 (0.98, 1.64)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.38 (0.87, 2.17)	1.27 (0.76, 2.11)	0.92 (0.71, 1.20)	1.15 (0.87, 1.53)
Secondary	1.86 (1.27, 2.72)	1.43 (0.90, 2.28)	0.59 (0.49, 0.71)	0.96 (0.75, 1.21)
Higher	1.28 (0.67, 2.44)	1.25 (0.61, 2.56)	1.05 (0.81, 1.35)	0.88 (0.65, 1.21)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	1.47 (0.94, 2.28)	1.38 (0.87, 2.19)	1.34 (0.99, 1.81)	1.60 (1.19, 2.16)
Middle	1.11 (0.68, 1.80)	1.08 (0.61, 1.91)	1.67 (1.24, 2.26)	2.00 (1.43, 2.79)
Richer	0.89 (0.55, 1.42)	0.83 (0.47, 1.46)	1.65 (1.23, 2.20)	1.95 (1.40, 2.71)
Richest	1.23 (0.74, 2.04)	1.08 (0.57, 2.07)	2.18 (1.63, 2.91)	2.63 (1.87, 3.70)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.72 (0.48, 1.06)	0.82 (0.52, 1.29)	2.17 (1.77, 2.67)	1.32 (1.07, 1.64)
Manual	0.76 (0.47, 1.23)	0.85 (0.53, 1.37)	0.99 (0.72, 1.36)	0.86 (0.61, 1.22)
Agricultural	0.68 (0.41, 1.14)	0.92 (0.50, 1.68)	1.63 (1.20, 2.23)	1.15 (0.79, 1.68)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	1.23 (0.79, 1.92)	1.09 (0.69, 1.72)	1.18 (0.91, 1.54)	1.15 (0.87, 1.51)
Exposed to two media sources	1.08 (0.75, 1.56)	0.97 (0.67, 1.41)	1.29 (1.01, 1.66)	1.28 (0.96, 1.72)
Exposed to three media sources	1.55 (1.00, 2.41)	1.24 (0.77, 2.00)	1.19 (0.92, 1.53)	1.61 (1.13, 2.28)

Table 73: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.47 (0.22, 0.98)	0.68 (0.32, 1.47)	2.04 (1.56, 2.65)	1.15 (0.87, 1.52)

Table 74: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Tanzania.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.44 (0.35, 0.56)	0.67 (0.52, 0.87)	1.85 (1.47, 2.34)	1.70 (1.27, 2.27)
25-29	0.35 (0.27, 0.46)	0.65 (0.46, 0.92)	3.22 (2.53, 4.11)	3.12 (2.24, 4.36)
30-34	0.48 (0.37, 0.64)	1.00 (0.69, 1.47)	4.52 (3.61, 5.67)	4.94 (3.58, 6.81)
35-39	0.49 (0.37, 0.65)	1.08 (0.73, 1.59)	4.75 (3.81, 5.93)	5.86 (4.19, 8.21)
40-44	0.59 (0.45, 0.77)	1.29 (0.87, 1.91)	5.63 (4.53, 6.99)	8.44 (6.05, 11.8)
45-49	0.59 (0.44, 0.79)	1.27 (0.82, 1.97)	5.48 (4.46, 6.73)	8.99 (6.51, 12.4)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.51 (0.39, 0.66)	0.84 (0.62, 1.16)	1.65 (1.37, 1.98)	1.07 (0.84, 1.38)
2	0.39 (0.30, 0.51)	0.70 (0.47, 1.05)	2.42 (2.02, 2.89)	1.06 (0.80, 1.41)
3	0.47 (0.35, 0.62)	0.79 (0.51, 1.23)	2.53 (2.11, 3.04)	0.92 (0.69, 1.24)
4	0.53 (0.40, 0.72)	0.79 (0.53, 1.18)	2.29 (1.82, 2.88)	0.92 (0.66, 1.30)
5	0.51 (0.37, 0.71)	0.66 (0.41, 1.05)	1.96 (1.54, 2.48)	0.80 (0.57, 1.12)
6+	0.52 (0.42, 0.64)	0.56 (0.38, 0.85)	1.81 (1.49, 2.20)	0.78 (0.57, 1.08)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.49 (0.42, 0.57)	0.62 (0.48, 0.81)	2.01 (1.76, 2.30)	1.32 (1.06, 1.64)
Formerly Married	0.52 (0.40, 0.68)	0.66 (0.47, 0.93)	2.03 (1.72, 2.40)	1.07 (0.84, 1.35)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.93 (0.78, 1.10)	1.07 (0.85, 1.35)	2.66 (2.33, 3.05)	1.05 (0.88, 1.25)

Table 74: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Region				
Dar es salaam (Reference)	1.00	1.00	1.00	1.00
Dodoma	1.35 (0.89, 2.06)	1.07 (0.66, 1.72)	0.35 (0.24, 0.51)	0.85 (0.58, 1.25)
Arusha	1.52 (1.01, 2.30)	1.28 (0.81, 2.03)	0.56 (0.41, 0.77)	0.94 (0.71, 1.23)
Kilimanjaro	0.92 (0.54, 1.59)	0.78 (0.44, 1.39)	0.82 (0.55, 1.23)	1.20 (0.82, 1.74)
Tanga	1.01 (0.62, 1.64)	0.82 (0.47, 1.43)	0.67 (0.46, 0.99)	1.22 (0.87, 1.71)
Morogoro	0.34 (0.20, 0.59)	0.33 (0.19, 0.58)	0.60 (0.42, 0.86)	1.17 (0.83, 1.64)
Pwani	1.13 (0.75, 1.70)	1.04 (0.67, 1.64)	0.70 (0.47, 1.03)	1.35 (0.87, 2.10)
Lindi	0.68 (0.40, 1.14)	0.62 (0.34, 1.15)	0.42 (0.31, 0.58)	1.06 (0.72, 1.58)
Mtwara	0.93 (0.57, 1.52)	0.86 (0.50, 1.47)	0.46 (0.34, 0.62)	1.12 (0.82, 1.53)
Ruvuma	0.63 (0.36, 1.12)	0.59 (0.33, 1.08)	0.29 (0.19, 0.47)	0.63 (0.42, 0.96)
Iringa	0.79 (0.52, 1.20)	0.68 (0.43, 1.06)	0.43 (0.29, 0.64)	0.72 (0.49, 1.07)
Mbeya	0.40 (0.22, 0.71)	0.31 (0.17, 0.57)	0.54 (0.36, 0.80)	1.19 (0.80, 1.75)
Singida	1.63 (1.08, 2.46)	1.42 (0.91, 2.23)	0.35 (0.25, 0.51)	0.97 (0.66, 1.41)
Tabora	1.02 (0.65, 1.60)	0.83 (0.49, 1.41)	0.38 (0.29, 0.52)	1.34 (0.97, 1.85)
Rukwa	0.46 (0.26, 0.80)	0.39 (0.22, 0.71)	0.29 (0.20, 0.42)	0.78 (0.52, 1.16)
Kigoma	0.96 (0.63, 1.46)	0.81 (0.50, 1.32)	0.25 (0.19, 0.35)	0.78 (0.54, 1.14)
Shinyanga	0.77 (0.50, 1.18)	0.64 (0.40, 1.04)	0.35 (0.25, 0.48)	0.90 (0.67, 1.21)
Kagera	1.16 (0.73, 1.86)	1.02 (0.61, 1.71)	0.19 (0.13, 0.28)	0.53 (0.35, 0.79)
Mwanza	0.82 (0.51, 1.33)	0.65 (0.40, 1.03)	0.31 (0.21, 0.45)	0.68 (0.48, 0.98)
Mara	0.89 (0.58, 1.36)	0.79 (0.50, 1.26)	0.21 (0.13, 0.32)	0.46 (0.31, 0.68)
Manyara	1.53 (0.99, 2.36)	1.14 (0.71, 1.82)	0.30 (0.22, 0.42)	0.91 (0.62, 1.32)
Njombe	0.47 (0.25, 0.86)	0.44 (0.23, 0.85)	0.44 (0.34, 0.58)	0.81 (0.59, 1.12)
Katavi	0.70 (0.41, 1.22)	0.61 (0.34, 1.10)	0.28 (0.20, 0.40)	0.86 (0.62, 1.20)
Simiyu	1.24 (0.81, 1.91)	0.98 (0.60, 1.60)	0.19 (0.13, 0.28)	0.67 (0.47, 0.96)
geita	1.17 (0.75, 1.82)	1.01 (0.61, 1.66)	0.28 (0.19, 0.41)	0.85 (0.61, 1.19)
Kaskazini Unguja	1.58 (0.98, 2.52)	1.29 (0.75, 2.22)	0.71 (0.55, 0.92)	1.38 (0.94, 2.03)
Kusini Unguja	1.51 (0.97, 2.34)	1.37 (0.84, 2.23)	0.81 (0.57, 1.15)	1.32 (0.88, 1.97)
Mjini Magharibi	1.78 (1.29, 2.48)	1.63 (1.16, 2.29)	0.97 (0.76, 1.24)	1.05 (0.78, 1.42)
Kaskazini Pemba	1.34 (0.89, 2.02)	0.96 (0.61, 1.51)	0.46 (0.30, 0.71)	0.95 (0.60, 1.49)
Kusini Pemba	0.89 (0.57, 1.40)	0.61 (0.37, 1.01)	0.59 (0.40, 0.87)	1.36 (0.94, 1.96)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.02 (0.81, 1.28)	1.05 (0.83, 1.33)	1.44 (1.23, 1.69)	1.04 (0.88, 1.24)
Secondary	1.22 (0.95, 1.57)	0.99 (0.72, 1.36)	1.79 (1.48, 2.15)	1.14 (0.91, 1.44)
Higher	0.59 (0.17, 2.02)	0.73 (0.20, 2.67)	6.09 (3.96, 9.36)	1.55 (1.04, 2.31)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.98 (0.79, 1.23)	1.06 (0.86, 1.32)	1.38 (1.11, 1.72)	1.33 (1.06, 1.67)
Middle	0.72 (0.57, 0.91)	0.75 (0.60, 0.96)	1.79 (1.45, 2.23)	1.71 (1.36, 2.14)
Richer	0.82 (0.65, 1.04)	0.74 (0.57, 0.96)	3.52 (2.88, 4.32)	2.92 (2.32, 3.68)
Richest	0.79 (0.63, 1.00)	0.57 (0.41, 0.81)	6.19 (5.07, 7.56)	4.57 (3.42, 6.12)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.49 (0.38, 0.63)	0.67 (0.50, 0.89)	2.80 (2.40, 3.27)	1.30 (1.08, 1.57)
Manual	0.54 (0.42, 0.70)	0.81 (0.61, 1.06)	2.19 (1.86, 2.58)	1.09 (0.91, 1.30)
Agricultural	0.58 (0.49, 0.68)	0.74 (0.60, 0.92)	0.78 (0.67, 0.92)	0.79 (0.66, 0.95)

Table 74: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.74 (0.59, 0.93)	0.74 (0.59, 0.93)	1.26 (1.03, 1.54)	0.97 (0.79, 1.18)
Exposed to two media sources	0.79 (0.62, 1.00)	0.74 (0.58, 0.94)	1.94 (1.60, 2.36)	1.18 (0.98, 1.43)
Exposed to three media sources	0.72 (0.58, 0.91)	0.67 (0.52, 0.88)	2.80 (2.29, 3.42)	1.30 (1.05, 1.62)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.54 (0.44, 0.67)	0.83 (0.66, 1.05)	1.23 (1.08, 1.39)	1.10 (0.97, 1.26)

Table 75: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Zimbabwe.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.55 (0.42, 0.72)	0.89 (0.65, 1.23)	1.94 (1.58, 2.38)	1.42 (1.11, 1.82)
25-29	0.28 (0.19, 0.42)	0.64 (0.40, 1.03)	3.06 (2.48, 3.79)	2.08 (1.55, 2.80)
30-34	0.48 (0.35, 0.66)	1.21 (0.72, 2.02)	5.19 (4.21, 6.40)	3.28 (2.44, 4.42)
35-39	0.53 (0.36, 0.77)	1.29 (0.72, 2.31)	5.67 (4.52, 7.12)	3.60 (2.62, 4.93)
40-44	0.42 (0.27, 0.65)	0.92 (0.49, 1.73)	7.09 (5.71, 8.81)	4.56 (3.33, 6.26)
45-49	0.64 (0.40, 1.04)	1.31 (0.67, 2.57)	6.95 (5.35, 9.03)	4.77 (3.28, 6.93)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	1.04 (0.71, 1.51)	1.09 (0.74, 1.60)	0.83 (0.68, 1.02)	0.95 (0.76, 1.19)
Islam	0.77 (0.09, 6.49)	0.91 (0.14, 6.07)	1.01 (0.35, 2.92)	1.13 (0.35, 3.63)
Traditionalist	0.55 (0.08, 3.83)	0.66 (0.10, 4.53)	1.09 (0.57, 2.08)	1.26 (0.63, 2.54)
No Religion	0.89 (0.46, 1.71)	0.91 (0.47, 1.78)	0.75 (0.56, 0.99)	1.05 (0.77, 1.43)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.65 (0.49, 0.86)	0.83 (0.57, 1.21)	1.68 (1.42, 1.98)	0.86 (0.65, 1.13)
2	0.43 (0.31, 0.59)	0.58 (0.34, 0.97)	2.58 (2.14, 3.12)	0.96 (0.71, 1.32)
3	0.37 (0.26, 0.52)	0.48 (0.27, 0.85)	3.18 (2.66, 3.79)	1.04 (0.75, 1.45)
4	0.42 (0.29, 0.63)	0.46 (0.24, 0.89)	3.01 (2.44, 3.71)	1.00 (0.70, 1.42)
5	0.43 (0.25, 0.74)	0.45 (0.21, 0.95)	3.00 (2.28, 3.93)	1.11 (0.74, 1.66)
6+	0.61 (0.39, 0.95)	0.55 (0.27, 1.12)	3.43 (2.73, 4.32)	1.37 (0.93, 2.01)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.42 (0.34, 0.53)	0.69 (0.48, 0.99)	2.88 (2.48, 3.33)	1.80 (1.38, 2.35)
Formerly Married	0.68 (0.52, 0.90)	1.10 (0.72, 1.67)	2.95 (2.48, 3.52)	1.55 (1.14, 2.12)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.73 (0.58, 0.93)	1.78 (1.04, 3.07)	2.16 (1.88, 2.49)	0.93 (0.72, 1.21)
Region				
Harare (Reference)	1.00	1.00	1.00	1.00
Manicaland	1.07 (0.68, 1.70)	0.81 (0.46, 1.41)	0.50 (0.39, 0.65)	0.88 (0.67, 1.17)
Mashonaland Central	1.15 (0.70, 1.88)	0.88 (0.49, 1.58)	0.45 (0.35, 0.58)	0.87 (0.65, 1.16)
Mashonaland East	2.69 (1.68, 4.31)	2.22 (1.29, 3.82)	0.61 (0.48, 0.78)	0.93 (0.71, 1.22)
Mashonaland West	1.98 (1.25, 3.12)	1.64 (0.94, 2.85)	0.54 (0.43, 0.68)	0.83 (0.62, 1.12)
Mashonaland North	2.85 (1.70, 4.76)	1.87 (1.01, 3.45)	0.48 (0.35, 0.65)	1.05 (0.77, 1.43)
Mashonaland South	2.99 (1.86, 4.79)	2.07 (1.17, 3.63)	0.50 (0.39, 0.65)	0.93 (0.68, 1.26)
Midlands	1.84 (1.16, 2.94)	1.37 (0.76, 2.46)	0.54 (0.40, 0.72)	0.93 (0.67, 1.30)
Masvingo	0.94 (0.55, 1.61)	0.66 (0.36, 1.20)	0.51 (0.39, 0.66)	0.91 (0.69, 1.20)
Bulawayo	1.59 (0.99, 2.57)	1.44 (0.87, 2.38)	0.95 (0.76, 1.19)	1.07 (0.82, 1.39)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.03 (0.38, 2.82)	0.95 (0.35, 2.57)	0.77 (0.48, 1.25)	1.01 (0.57, 1.78)
Secondary	1.04 (0.39, 2.79)	0.91 (0.34, 2.42)	1.07 (0.67, 1.72)	1.15 (0.65, 2.04)
Higher	0.65 (0.22, 1.97)	0.99 (0.32, 3.08)	2.48 (1.51, 4.09)	1.29 (0.71, 2.36)

Table 75: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	1.07 (0.79, 1.44)	1.04 (0.78, 1.38)	1.39 (1.12, 1.73)	1.44 (1.16, 1.80)
Middle	1.10 (0.82, 1.47)	0.94 (0.68, 1.28)	1.87 (1.54, 2.28)	1.92 (1.55, 2.39)
Richer	0.80 (0.58, 1.11)	0.48 (0.29, 0.78)	2.83 (2.30, 3.48)	2.89 (2.21, 3.78)
Richest	0.56 (0.40, 0.78)	0.26 (0.14, 0.48)	3.94 (3.26, 4.76)	4.16 (3.02, 5.75)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.58 (0.46, 0.74)	0.75 (0.57, 1.00)	2.16 (1.92, 2.44)	1.17 (1.02, 1.36)
Manual	0.58 (0.30, 1.13)	0.79 (0.39, 1.59)	1.85 (1.37, 2.50)	0.89 (0.64, 1.24)
Agricultural	0.59 (0.38, 0.91)	0.76 (0.48, 1.21)	1.24 (1.01, 1.52)	0.91 (0.73, 1.13)
Others	1.28 (0.56, 2.97)	1.62 (0.70, 3.72)	2.24 (1.32, 3.80)	1.07 (0.62, 1.84)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.89 (0.69, 1.17)	1.01 (0.77, 1.32)	1.18 (1.01, 1.37)	0.97 (0.83, 1.14)
Exposed to two media sources	0.85 (0.63, 1.15)	1.03 (0.75, 1.41)	1.70 (1.44, 2.00)	1.09 (0.91, 1.30)
Exposed to three media sources	0.61 (0.45, 0.84)	0.87 (0.60, 1.26)	2.45 (2.08, 2.89)	1.29 (1.06, 1.58)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.53 (0.42, 0.65)	0.87 (0.64, 1.18)	1.49 (1.34, 1.67)	1.04 (0.90, 1.19)

Table 76: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Gabon.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.61 (0.37, 0.99)	0.77 (0.40, 1.46)	1.88 (1.26, 2.80)	1.83 (1.16, 2.89)
25-29	0.40 (0.22, 0.73)	0.55 (0.22, 1.40)	3.43 (2.29, 5.14)	2.93 (1.77, 4.84)
30-34	0.30 (0.14, 0.64)	0.41 (0.13, 1.23)	6.49 (4.20, 10.0)	5.42 (3.18, 9.23)
35-39	0.38 (0.16, 0.91)	0.58 (0.15, 2.21)	7.25 (4.98, 10.5)	6.42 (3.96, 10.4)
40-44	0.20 (0.09, 0.43)	0.32 (0.09, 1.22)	7.99 (5.04, 12.7)	7.02 (4.12, 12.0)
45-49	0.24 (0.11, 0.51)	0.48 (0.13, 1.69)	9.04 (5.81, 14.0)	9.10 (5.03, 16.5)
Ethnicity				
Shira-Punu/Vili (Reference)	1.00	1.00	1.00	1.00
Fang	0.48 (0.28, 0.83)	0.46 (0.25, 0.84)	1.31 (0.90, 1.91)	1.37 (0.87, 2.17)
Kota-Kele	0.57 (0.31, 1.03)	0.51 (0.21, 1.23)	0.78 (0.51, 1.19)	0.98 (0.58, 1.64)
Mbede-Teke	0.67 (0.36, 1.26)	0.61 (0.26, 1.47)	1.12 (0.73, 1.71)	1.04 (0.62, 1.76)
Myene	1.20 (0.59, 2.44)	0.89 (0.39, 2.05)	1.68 (1.04, 2.73)	1.80 (1.05, 3.06)
Nzabi-Duma	1.06 (0.67, 1.68)	1.02 (0.66, 1.59)	1.07 (0.78, 1.47)	1.10 (0.77, 1.57)
Okande-Tsogho	0.64 (0.36, 1.13)	0.65 (0.36, 1.17)	0.74 (0.45, 1.20)	1.29 (0.70, 2.36)
Pygmee	0.22 (0.04, 1.33)	0.28 (0.04, 1.86)	0.08 (0.03, 0.23)	0.10 (0.02, 0.52)
Other	0.43 (0.24, 0.80)	0.44 (0.23, 0.83)	0.88 (0.60, 1.30)	0.93 (0.57, 1.53)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	1.72 (1.18, 2.53)	1.53 (0.99, 2.35)	1.02 (0.82, 1.27)	1.19 (0.91, 1.54)
Others	1.08 (0.36, 3.27)	0.83 (0.25, 2.74)	1.05 (0.52, 2.14)	1.18 (0.54, 2.60)
No Religion	1.45 (0.74, 2.85)	1.39 (0.65, 2.99)	0.82 (0.56, 1.19)	1.39 (0.82, 2.34)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.47 (0.30, 0.72)	0.75 (0.48, 1.15)	1.57 (1.05, 2.35)	0.89 (0.55, 1.44)
2	0.40 (0.19, 0.84)	0.83 (0.34, 2.06)	3.54 (2.39, 5.24)	1.42 (0.84, 2.43)
3	0.68 (0.31, 1.47)	1.80 (0.73, 4.45)	3.00 (1.88, 4.78)	0.89 (0.50, 1.59)
4	0.25 (0.11, 0.57)	0.81 (0.27, 2.43)	3.55 (2.40, 5.25)	0.98 (0.57, 1.66)
5	0.55 (0.25, 1.22)	1.71 (0.49, 6.00)	4.31 (2.75, 6.77)	1.12 (0.62, 2.03)
6+	0.21 (0.12, 0.37)	0.82 (0.29, 2.37)	4.21 (2.80, 6.33)	1.13 (0.66, 1.92)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.38 (0.24, 0.59)	0.61 (0.35, 1.05)	2.72 (2.15, 3.44)	1.29 (0.96, 1.73)
Formerly Married	0.44 (0.24, 0.79)	0.89 (0.46, 1.71)	4.13 (2.80, 6.09)	1.70 (1.07, 2.72)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	1.13 (0.84, 1.52)	0.70 (0.48, 1.03)	1.49 (1.16, 1.89)	1.10 (0.80, 1.51)
Region				
Estuaire (Reference)	1.00	1.00	1.00	1.00
Libreville-Port-Gentil	1.42 (0.92, 2.20)	1.69 (1.01, 2.82)	1.23 (0.86, 1.76)	1.04 (0.69, 1.59)
Haut-Ogooué	1.28 (0.80, 2.07)	1.51 (0.73, 3.14)	0.89 (0.60, 1.31)	1.04 (0.62, 1.75)
Moyen-Ogooué	2.02 (1.23, 3.32)	2.40 (1.26, 4.55)	0.97 (0.66, 1.44)	1.08 (0.71, 1.65)
Ngounié	1.19 (0.75, 1.87)	1.27 (0.76, 2.12)	0.46 (0.31, 0.70)	0.58 (0.35, 0.95)
Nyanga	0.93 (0.56, 1.53)	0.93 (0.53, 1.64)	0.66 (0.43, 1.01)	0.86 (0.50, 1.49)
Ogooué Maritime	1.13 (0.62, 2.06)	1.09 (0.55, 2.14)	0.98 (0.64, 1.51)	0.88 (0.54, 1.44)
Ogooué-Ivindo	1.08 (0.71, 1.66)	1.96 (1.01, 3.82)	0.56 (0.38, 0.83)	0.92 (0.58, 1.46)
Ogooué-Lolo	1.09 (0.64, 1.86)	1.37 (0.73, 2.56)	0.73 (0.47, 1.13)	0.99 (0.60, 1.63)
Woleu-N'tem	0.56 (0.22, 1.44)	1.05 (0.39, 2.84)	0.88 (0.62, 1.26)	0.92 (0.58, 1.44)

Table 76: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	4.23 (1.01, 17.8)	3.57 (0.77, 16.6)	2.95 (1.46, 5.95)	2.89 (1.47, 5.68)
Secondary	8.31 (2.01, 34.4)	5.22 (1.15, 23.7)	2.96 (1.55, 5.63)	3.39 (1.74, 6.63)
Higher	4.06 (0.83, 20.0)	3.04 (0.56, 16.5)	3.85 (1.75, 8.47)	2.48 (1.10, 5.61)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.95 (0.61, 1.48)	0.73 (0.45, 1.19)	1.33 (1.01, 1.77)	1.35 (0.91, 1.99)
Middle	1.26 (0.80, 2.00)	1.00 (0.58, 1.75)	1.85 (1.43, 2.39)	1.85 (1.19, 2.87)
Richer	0.98 (0.61, 1.58)	0.66 (0.37, 1.17)	1.93 (1.41, 2.64)	1.96 (1.21, 3.17)
Richest	1.65 (1.01, 2.69)	1.22 (0.70, 2.12)	2.45 (1.75, 3.41)	2.57 (1.59, 4.15)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.45 (0.27, 0.75)	0.67 (0.39, 1.17)	2.16 (1.71, 2.73)	1.01 (0.78, 1.32)
Manual	0.56 (0.16, 1.87)	0.71 (0.20, 2.58)	3.40 (1.97, 5.85)	1.82 (1.04, 3.18)
Agricultural	0.55 (0.34, 0.88)	1.01 (0.61, 1.69)	1.13 (0.73, 1.74)	0.93 (0.58, 1.48)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	1.62 (0.96, 2.73)	1.51 (0.83, 2.73)	1.35 (0.83, 2.21)	0.98 (0.55, 1.75)
Exposed to two media sources	1.33 (0.79, 2.23)	1.24 (0.67, 2.28)	1.58 (0.97, 2.57)	0.91 (0.52, 1.61)
Exposed to three media sources	1.67 (1.01, 2.77)	1.49 (0.75, 2.95)	1.60 (1.02, 2.51)	0.77 (0.42, 1.40)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	1.28 (0.46, 3.60)	1.77 (0.67, 4.72)	1.85 (0.97, 3.56)	1.45 (0.70, 2.99)

Table 77: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Ghana.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.47 (0.29, 0.76)	0.67 (0.41, 1.10)	3.63 (2.55, 5.18)	3.04 (2.01, 4.60)
25-29	0.56 (0.34, 0.91)	1.03 (0.57, 1.84)	7.91 (5.62, 11.1)	5.51 (3.53, 8.61)
30-34	0.58 (0.35, 0.96)	1.04 (0.49, 2.20)	11.1 (7.71, 16.1)	8.56 (5.19, 14.1)
35-39	0.57 (0.34, 0.97)	1.06 (0.44, 2.52)	11.1 (7.76, 15.8)	9.00 (5.33, 15.2)
40-44	0.31 (0.16, 0.64)	0.54 (0.19, 1.56)	13.6 (9.39, 19.8)	12.0 (7.02, 20.6)
45-49	0.42 (0.24, 0.75)	0.65 (0.26, 1.58)	10.7 (7.27, 15.6)	10.2 (5.92, 17.4)
Ethnicity	.			
Akan (Reference)	1.00	1.00	1.00	1.00
Ga/Dangme	0.91 (0.48, 1.73)	0.74 (0.36, 1.52)	1.11 (0.83, 1.50)	1.00 (0.65, 1.53)
Ewe	0.89 (0.53, 1.47)	0.59 (0.30, 1.18)	0.72 (0.53, 0.98)	0.79 (0.56, 1.11)
Guan	0.77 (0.38, 1.56)	0.51 (0.24, 1.09)	0.86 (0.58, 1.25)	1.00 (0.66, 1.50)
Mole-Dagbani	1.12 (0.79, 1.58)	0.68 (0.34, 1.36)	0.36 (0.26, 0.49)	0.71 (0.49, 1.02)
Grusi	0.57 (0.30, 1.07)	0.39 (0.19, 0.80)	0.38 (0.24, 0.62)	0.79 (0.51, 1.22)
Gurma	1.11 (0.74, 1.67)	0.57 (0.27, 1.18)	0.21 (0.13, 0.33)	0.78 (0.45, 1.36)
Mande	0.35 (0.07, 1.77)	0.14 (0.02, 0.89)	0.67 (0.28, 1.60)	1.27 (0.42, 3.85)
Others	3.03 (1.34, 6.83)	2.08 (0.91, 4.77)	1.49 (0.85, 2.61)	1.54 (0.75, 3.16)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	1.09 (0.69, 1.74)	1.14 (0.68, 1.90)	1.31 (1.01, 1.70)	0.86 (0.64, 1.15)
Islam	1.44 (0.86, 2.39)	1.51 (0.85, 2.69)	0.97 (0.66, 1.43)	1.38 (0.91, 2.08)
Traditionalist	1.76 (0.78, 3.95)	1.52 (0.67, 3.46)	0.61 (0.32, 1.16)	1.69 (0.88, 3.21)
No Religion	0.33 (0.10, 1.12)	0.37 (0.11, 1.30)	0.65 (0.39, 1.07)	0.78 (0.42, 1.42)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.42 (0.25, 0.72)	0.60 (0.34, 1.05)	2.09 (1.59, 2.74)	0.94 (0.65, 1.36)
2	0.71 (0.40, 1.27)	1.03 (0.50, 2.11)	3.87 (2.94, 5.10)	1.34 (0.90, 1.99)
3	0.51 (0.29, 0.90)	0.72 (0.36, 1.45)	3.65 (2.80, 4.75)	1.22 (0.80, 1.86)
4	0.66 (0.38, 1.17)	0.92 (0.42, 1.98)	3.25 (2.37, 4.46)	0.98 (0.60, 1.60)
5	0.29 (0.13, 0.67)	0.39 (0.12, 1.20)	2.21 (1.57, 3.11)	0.83 (0.51, 1.36)
6+	0.59 (0.38, 0.94)	0.85 (0.36, 2.02)	2.23 (1.67, 2.96)	1.30 (0.78, 2.16)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.54 (0.39, 0.75)	0.83 (0.50, 1.37)	3.14 (2.58, 3.81)	1.48 (1.06, 2.06)
Formerly Married	0.75 (0.42, 1.33)	1.26 (0.59, 2.68)	4.55 (3.47, 5.96)	1.74 (1.14, 2.66)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	0.96 (0.72, 1.28)	1.12 (0.76, 1.66)	2.30 (1.91, 2.78)	0.71 (0.55, 0.92)
Region				
Greater Accra (Reference)	1.00	1.00	1.00	1.00
Western	0.83 (0.45, 1.52)	0.72 (0.35, 1.48)	0.55 (0.42, 0.72)	0.81 (0.59, 1.12)
Central	0.55 (0.27, 1.12)	0.47 (0.21, 1.06)	0.50 (0.38, 0.66)	0.73 (0.51, 1.03)
Volta	1.01 (0.50, 2.06)	1.18 (0.50, 2.78)	0.35 (0.23, 0.51)	0.79 (0.51, 1.23)
Eastern	1.04 (0.56, 1.94)	0.93 (0.44, 1.93)	0.47 (0.35, 0.62)	0.72 (0.49, 1.04)
Ashanti	1.01 (0.54, 1.86)	0.81 (0.38, 1.73)	0.59 (0.44, 0.79)	0.77 (0.54, 1.10)
Brong Ahafo	0.92 (0.51, 1.67)	0.72 (0.33, 1.59)	0.39 (0.27, 0.55)	0.85 (0.57, 1.27)
Northern	1.24 (0.74, 2.07)	1.04 (0.47, 2.32)	0.11 (0.08, 0.18)	0.41 (0.22, 0.75)
Upper East	1.12 (0.66, 1.89)	0.94 (0.40, 2.20)	0.18 (0.12, 0.26)	0.73 (0.45, 1.19)
Upper West	0.82 (0.46, 1.46)	0.73 (0.31, 1.75)	0.19 (0.13, 0.27)	0.71 (0.41, 1.24)

Table 77: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.52 (1.04, 2.23)	1.67 (1.06, 2.64)	1.70 (1.33, 2.17)	1.44 (1.10, 1.88)
Secondary	1.22 (0.90, 1.66)	1.26 (0.81, 1.96)	2.06 (1.67, 2.54)	1.45 (1.11, 1.89)
Higher	1.36 (0.62, 3.02)	1.93 (0.74, 5.06)	3.91 (2.70, 5.66)	1.38 (0.82, 2.31)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.84 (0.57, 1.23)	0.89 (0.57, 1.40)	2.42 (1.84, 3.20)	1.65 (1.20, 2.26)
Middle	0.57 (0.38, 0.85)	0.62 (0.34, 1.15)	4.50 (3.40, 5.95)	2.73 (1.90, 3.93)
Richer	0.79 (0.51, 1.23)	0.76 (0.38, 1.51)	7.89 (5.88, 10.6)	4.41 (2.87, 6.75)
Richest	0.74 (0.47, 1.16)	0.55 (0.25, 1.23)	10.7 (8.15, 14.1)	6.47 (4.00, 10.5)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.51 (0.34, 0.78)	0.62 (0.38, 1.02)	3.70 (2.97, 4.60)	1.24 (0.96, 1.60)
Manual	0.42 (0.24, 0.74)	0.55 (0.29, 1.03)	2.50 (1.88, 3.32)	1.14 (0.83, 1.57)
Agricultural	0.74 (0.52, 1.06)	1.07 (0.64, 1.78)	0.79 (0.61, 1.03)	0.57 (0.39, 0.81)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.86 (0.55, 1.33)	0.89 (0.55, 1.46)	2.49 (1.75, 3.53)	1.75 (1.16, 2.65)
Exposed to two media sources	0.73 (0.46, 1.16)	0.79 (0.45, 1.40)	4.42 (3.14, 6.22)	1.88 (1.24, 2.87)
Exposed to three media sources	0.84 (0.50, 1.41)	0.78 (0.39, 1.56)	4.89 (3.26, 7.34)	2.09 (1.25, 3.48)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.36 (0.21, 0.61)	0.44 (0.25, 0.76)	0.96 (0.78, 1.19)	0.85 (0.65, 1.11)

Table 78: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Lesotho.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.85 (0.50, 1.45)	1.29 (0.72, 2.28)	2.12 (1.54, 2.90)	1.61 (1.10, 2.37)
25-29	0.33 (0.16, 0.69)	0.63 (0.28, 1.44)	4.28 (3.02, 6.05)	2.96 (1.90, 4.60)
30-34	0.55 (0.26, 1.16)	1.33 (0.56, 3.14)	4.73 (3.41, 6.57)	3.12 (2.04, 4.77)
35-39	0.18 (0.05, 0.58)	0.42 (0.11, 1.64)	6.48 (4.52, 9.28)	4.32 (2.61, 7.16)
40-44	0.37 (0.14, 0.99)	0.91 (0.34, 2.43)	8.09 (5.91, 11.1)	5.93 (3.72, 9.46)
45-49	0.37 (0.16, 0.89)	0.92 (0.27, 3.12)	8.75 (5.73, 13.4)	6.99 (3.94, 12.4)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.70 (0.47, 1.04)	0.72 (0.48, 1.10)	0.96 (0.79, 1.16)	0.91 (0.74, 1.13)
Others	0.28 (0.04, 2.17)	0.29 (0.04, 1.91)	0.73 (0.40, 1.35)	0.78 (0.36, 1.68)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.61 (0.37, 1.00)	0.71 (0.36, 1.38)	2.26 (1.73, 2.95)	1.14 (0.79, 1.65)
2	0.34 (0.16, 0.72)	0.43 (0.15, 1.22)	3.45 (2.60, 4.58)	1.33 (0.84, 2.09)
3	0.16 (0.05, 0.54)	0.20 (0.05, 0.81)	3.55 (2.60, 4.84)	1.23 (0.74, 2.02)
4	0.43 (0.18, 1.01)	0.59 (0.17, 2.11)	4.90 (3.26, 7.36)	1.47 (0.84, 2.56)
5	0.22 (0.05, 0.98)	0.27 (0.04, 1.72)	4.59 (2.82, 7.46)	1.56 (0.84, 2.88)
6+	0.34 (0.10, 1.11)	0.42 (0.09, 1.90)	3.42 (2.29, 5.09)	1.11 (0.60, 2.07)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.46 (0.29, 0.72)	0.80 (0.41, 1.55)	3.11 (2.51, 3.86)	1.50 (1.08, 2.08)
Formerly Married	0.33 (0.15, 0.73)	0.64 (0.24, 1.73)	2.71 (2.03, 3.60)	1.03 (0.70, 1.51)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	1.15 (0.75, 1.78)	1.27 (0.70, 2.31)	1.42 (1.14, 1.77)	0.92 (0.70, 1.20)
Region				
Maseru (Reference)	1.00	1.00	1.00	1.00
Botha-Bothe	0.58 (0.25, 1.33)	0.65 (0.27, 1.55)	0.97 (0.69, 1.36)	1.33 (0.91, 1.95)
Leribe	0.75 (0.35, 1.63)	0.83 (0.39, 1.78)	1.03 (0.73, 1.45)	1.14 (0.79, 1.65)
Berea	1.46 (0.72, 2.93)	1.48 (0.72, 3.04)	1.09 (0.80, 1.49)	1.04 (0.74, 1.47)
Mafeteng	1.42 (0.69, 2.92)	1.56 (0.78, 3.10)	1.10 (0.76, 1.60)	1.18 (0.80, 1.73)
Mohale's Hoek	0.75 (0.35, 1.62)	0.79 (0.35, 1.75)	0.95 (0.67, 1.34)	1.29 (0.92, 1.79)
Quthing	1.15 (0.58, 2.28)	1.24 (0.61, 2.50)	0.90 (0.60, 1.35)	1.19 (0.82, 1.74)
Qacha's-Nek	1.11 (0.56, 2.20)	1.06 (0.52, 2.19)	0.91 (0.62, 1.33)	1.28 (0.86, 1.92)
Mokhotlong	0.81 (0.36, 1.83)	0.75 (0.31, 1.81)	0.44 (0.31, 0.62)	0.74 (0.51, 1.08)
Thaba Tseka	1.12 (0.57, 2.20)	1.25 (0.61, 2.56)	0.54 (0.36, 0.81)	0.79 (0.53, 1.20)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.87 (0.36, 9.76)	1.00 (0.20, 4.99)	1.27 (0.52, 3.08)	1.35 (0.55, 3.31)
Secondary	1.85 (0.35, 9.70)	0.67 (0.12, 3.63)	1.33 (0.53, 3.33)	1.76 (0.70, 4.43)
Higher	1.68 (0.26, 10.8)	0.63 (0.09, 4.19)	2.31 (0.90, 5.92)	1.78 (0.69, 4.61)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.99 (0.52, 1.87)	0.94 (0.45, 1.96)	1.88 (1.38, 2.55)	1.80 (1.31, 2.47)
Middle	0.82 (0.45, 1.51)	0.73 (0.35, 1.50)	2.32 (1.75, 3.06)	2.16 (1.55, 3.00)
Richer	0.76 (0.41, 1.40)	0.58 (0.26, 1.29)	2.87 (2.14, 3.86)	2.76 (1.92, 3.97)
Richest	1.09 (0.58, 2.03)	0.65 (0.23, 1.86)	3.75 (2.84, 4.96)	3.65 (2.42, 5.51)

Table 78: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	0.75 (0.46, 1.22)	0.82 (0.48, 1.41)	1.54 (1.20, 1.97)	1.02 (0.76, 1.36)
Exposed to two media sources	1.07 (0.64, 1.78)	1.16 (0.63, 2.13)	2.01 (1.54, 2.61)	1.10 (0.79, 1.52)
Exposed to three media sources	1.10 (0.61, 1.98)	1.07 (0.49, 2.35)	1.99 (1.51, 2.61)	1.13 (0.77, 1.64)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.53 (0.31, 0.91)	0.85 (0.45, 1.58)	1.59 (1.32, 1.92)	1.21 (0.97, 1.50)

Table 79: Unadjusted and adjusted effects (Relative Risk Ratios-RRR & 95% confidence interval) on the risk of underweight and overweight women of reproductive age in Swaziland.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Age				
15-19 (Reference)	1.00	1.00	1.00	1.00
20-24	0.54 (0.32, 0.92)	0.82 (0.44, 1.53)	1.99 (1.62, 2.46)	1.46 (1.13, 1.90)
25-29	0.36 (0.16, 0.79)	0.80 (0.27, 2.33)	3.38 (2.74, 4.18)	2.06 (1.54, 2.75)
30-34	0.29 (0.12, 0.71)	0.77 (0.25, 2.38)	5.68 (4.53, 7.11)	3.10 (2.18, 4.40)
35-39	0.70 (0.30, 1.66)	2.05 (0.68, 6.23)	7.99 (6.28, 10.2)	4.39 (3.08, 6.26)
40-44	0.48 (0.18, 1.28)	1.54 (0.40, 6.00)	10.6 (7.88, 14.3)	5.81 (3.68, 9.17)
45-49	0.50 (0.20, 1.28)	1.42 (0.47, 4.32)	8.20 (6.25, 10.7)	4.89 (3.29, 7.26)
Religion				
Catholics (Reference)	1.00	1.00	1.00	1.00
Other Christians	0.59 (0.28, 1.23)	0.59 (0.28, 1.26)	1.10 (0.79, 1.53)	1.38 (0.99, 1.92)
Traditionalists	0.80 (0.09, 7.47)	0.74 (0.07, 8.35)	0.63 (0.28, 1.41)	0.73 (0.34, 1.58)
No Religion	0.66 (0.20, 2.17)	0.67 (0.20, 2.30)	1.01 (0.62, 1.63)	1.07 (0.67, 1.70)
Parity				
0 (Reference)	1.00	1.00	1.00	1.00
1	0.67 (0.40, 1.10)	0.98 (0.55, 1.74)	2.22 (1.83, 2.70)	1.53 (1.20, 1.94)
2	0.35 (0.17, 0.71)	0.59 (0.26, 1.35)	3.07 (2.49, 3.79)	1.62 (1.24, 2.12)
3	0.67 (0.33, 1.34)	1.12 (0.44, 2.82)	4.28 (3.32, 5.51)	1.79 (1.27, 2.53)
4	0.33 (0.09, 1.29)	0.48 (0.12, 1.96)	5.64 (4.28, 7.43)	2.19 (1.49, 3.21)
5	0.17 (0.02, 1.22)	0.21 (0.03, 1.76)	6.72 (4.84, 9.34)	2.35 (1.56, 3.55)
6+	0.37 (0.15, 0.92)	0.37 (0.10, 1.38)	6.66 (5.41, 8.19)	2.40 (1.66, 3.48)
Marital Status				
Single (Reference)	1.00	1.00	1.00	1.00
Married	0.30 (0.17, 0.54)	0.41 (0.21, 0.78)	2.85 (2.47, 3.28)	1.08 (0.88, 1.31)
Formerly Married	0.92 (0.45, 1.91)	1.14 (0.48, 2.71)	3.20 (2.60, 3.95)	0.99 (0.77, 1.28)
Residential Setting				
Rural (Reference)	1.00	1.00	1.00	1.00
Urban	1.10 (0.74, 1.64)	1.49 (0.88, 2.54)	1.30 (1.11, 1.52)	0.85 (0.70, 1.05)
Region				
Hhohho (Reference)	1.00	1.00	1.00	1.00
Manzini	1.82 (1.00, 3.31)	1.59 (0.86, 2.95)	1.02 (0.85, 1.21)	1.10 (0.90, 1.34)
Shiselweni	1.76 (0.96, 3.22)	1.52 (0.80, 2.88)	0.93 (0.78, 1.11)	1.19 (0.99, 1.44)
Lubombo	1.75 (0.94, 3.28)	1.59 (0.87, 2.93)	0.88 (0.72, 1.07)	1.01 (0.81, 1.27)
Level of Education				
No Education (Reference)	1.00	1.00	1.00	1.00
Primary	1.15 (0.56, 2.36)	0.76 (0.36, 1.62)	0.81 (0.62, 1.05)	1.18 (0.86, 1.62)
Secondary	0.94 (0.47, 1.87)	0.57 (0.26, 1.27)	0.88 (0.70, 1.11)	1.36 (1.00, 1.86)
Higher	0.44 (0.14, 1.44)	0.38 (0.11, 1.40)	1.64 (1.19, 2.26)	1.11 (0.72, 1.72)
Wealth Quintile				
Poorest (Reference)	1.00	1.00	1.00	1.00
Poorer	0.94 (0.57, 1.55)	0.88 (0.53, 1.48)	1.25 (1.00, 1.57)	1.28 (0.97, 1.68)
Middle	0.70 (0.40, 1.24)	0.67 (0.36, 1.26)	1.40 (1.10, 1.79)	1.52 (1.11, 2.07)
Richer	0.78 (0.48, 1.27)	0.66 (0.35, 1.24)	1.74 (1.38, 2.19)	2.02 (1.47, 2.77)
Richest	0.73 (0.44, 1.22)	0.63 (0.28, 1.45)	2.23 (1.76, 2.82)	2.55 (1.79, 3.63)
Occupation				
Not Working (Reference)	1.00	1.00	1.00	1.00
Nonmanual	0.40 (0.24, 0.67)	0.49 (0.29, 0.83)	2.46 (2.15, 2.82)	1.23 (1.03, 1.47)
Manual	0.84 (0.34, 2.06)	0.90 (0.33, 2.43)	2.33 (1.75, 3.11)	1.21 (0.91, 1.60)
Agricultural	0.11 (0.02, 0.48)	0.10 (0.02, 0.48)	1.78 (1.30, 2.43)	1.00 (0.73, 1.36)

Table 79: Cont.

VARIABLES	UNDERWEIGHT		OVERWEIGHT	
	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)	Unadjusted RRR (95% CI)	Adjusted RRR (95% CI)
Media Exposure				
Not Exposed (Reference)	1.00	1.00	1.00	1.00
Exposed to one media source	1.30 (0.71, 2.39)	1.29 (0.67, 2.46)	0.99 (0.77, 1.27)	1.07 (0.80, 1.43)
Exposed to two media sources	0.97 (0.51, 1.83)	0.93 (0.45, 1.92)	1.07 (0.85, 1.34)	1.16 (0.85, 1.57)
Exposed to three media sources	1.11 (0.60, 2.03)	1.21 (0.54, 2.67)	1.35 (1.06, 1.71)	1.30 (0.91, 1.86)
Hormonal Contraceptive Use				
No (Reference)	1.00	1.00	1.00	1.00
Yes	0.43 (0.22, 0.86)	0.72 (0.35, 1.47)	1.46 (1.22, 1.74)	1.14 (0.94, 1.38)

Curriculum Vitae

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