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THE EFFECT OF HOUSEHOLD HEADS' HEALTH ON SPOUSAL LABOUR SUPPLY DECISIONS IN GHANAIAN HOUSEHOLDS

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DECLARATION

I, Patricia Weittey, hereby declare that this thesis is the result of my own original research conducted under the guidance of my supervisors. No part of this work has been submitted, either in whole or in part, for the award of a degree in this or any other institution of higher learning. All scholarly works cited in this study have been duly acknowledged through referencing.



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ABSTRACT

This study examines the effect of household heads' health on spousal labour supply in Ghana, using data from the Ghana Annual Household Income and Expenditure Survey (AHIES). Existing studies on health and spousal labour supply have largely been conducted outside Ghana and have mainly emphasized gender dynamics. This study extends the literature by investigating whether the health of the household head influences the labour supply of the unaffected spouse across male- and female-headed households, thereby providing new evidence on how intra-household roles shape labour supply decisions in the presence of health disruptions. The study also examines the buffering role of health insurance in shaping spousal labour supply responses when household heads are ill or injured.

Spousal labour supply is measured as weekly hours worked. The distribution of hours worked is discrete and right-skewed, making count data models more appropriate than linear regressions. The main estimation strategy is a random-effects negative binomial model, which accommodates over-dispersed count outcomes. For robustness, a fixed-effects Poisson model with robust standard errors is also estimated. A severity-of-ill-health variable was derived from the health measure to capture three categories of household heads' health: healthy, unhealthy but continuing usual activities, and unhealthy and stopping usual activities.

The results reveal gendered differences in how spousal labour supply responds to household heads' health. Among male-headed households, female spouses significantly reduce their working hours when the household head is in poor health, consistent with increased caregiving responsibilities. In contrast, among female-headed households, male spouses' labour supply remains largely unchanged.

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LIST OF ACRONYMS

AHIES	Annual Household Income and Expenditure Survey
AWE	Added Worker Effect
DALYs	Disability-Adjusted Life Years
FFHs	Female-headed Households
GLSS	Ghana Living Standards Survey
GSS	Ghana Statistical Service
IRRs	Incidence Rate Ratios
MHHs	Male-headed Households
NCDs	Non-communicable Diseases
NHIS	National Health Insurance Scheme
OLS	Ordinary Least Squares
SAP	Structural Adjustment Program
SDG	Sustainable Development Goals

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CHAPTER ONE

INTRODUCTION

1.1 Background

Health is increasingly recognized as a critical factor in the development and economic well-being of individuals and nations (Piabuo and Tieguhong, 2017). As an essential component of human capital, health profoundly influences economic development. Healthier individuals are more capable of participating in the labour force. They tend to be more productive at work and often enjoy longer working lives. Conversely, ill health imposes significant economic costs by reducing productivity, increasing healthcare expenditures, and increasing welfare dependency. The World Health Organization (WHO) recognizes health as both a driver and a beneficiary of well-being economies (WHO, 2023).

There is widespread consensus in academic and policy circles that health, beyond being a fundamental human right, generates substantial economic benefits (Bloom et al., 2001). Frogner (2010), in his analysis of South Africa's health reforms, emphasizes that a healthier and more productive workforce can significantly impact economic growth. She argues that health reform in South Africa, particularly through the implementation of a National Health Insurance (NHI) system, could lead to improved health outcomes, which in turn would enhance worker productivity and stimulate economic growth. Frogner suggests that investing in health reform is not only a moral imperative but also an economic necessity, as it can lead to a more productive workforce and greater economic prosperity. Similarly, Bloom et al. (2019) highlight the strong correlation between health and economic growth as a crucial factor for development. They note that while establishing causality can be challenging, poor health often restricts labour force participation and educational investments, especially in less developed countries.

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This relationship is critical in low and middle-income countries (LMICs), who face a disproportionate burden of infectious diseases, malnutrition, and inadequate healthcare infrastructure. Diseases such as malaria, HIV/AIDS and tuberculosis disproportionately affect developing countries, causing substantial losses in labour productivity and economic output (Bleakley, 2010; Bloom & Canning, 2000). Nomah (2019) further finds that infectious diseases have a more destructive long-term impact on economic growth in developing countries compared to developed ones, as these countries are more vulnerable to the consequences of disease and often lack social safety nets to mitigate the impact of infectious diseases on their economies.

Beyond the effects of an individual's own health on his or her labour market outcomes, among couples, a partner's health has the potential to influence the other's labour supply decisions. When one partner experiences health challenges, especially those that limit their ability to carry out normal daily activities, the other partner may adjust their labour supply to compensate for potential income losses. The Added Worker Effect (AWE) describes the increase in labour supply by a household member, typically the spouse, in response to an income loss that may result from a health limitation or job loss of the other partner. This phenomenon was first identified during the Great Depression and has been extensively studied since then (Ashenfelter, 1980; Lundberg, 1985).

At its core, the AWE is grounded in the economic theory of household labour supply. When a household member's income declines due to illness or disability or any other factor, the household faces a negative income shock. To maintain consumption and meet financial

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obligations, another household member, often the spouse, increases labour supply by entering the labour force, increasing working hours, or shifting to more remunerative employment.

This compensatory behaviour is driven primarily by the income effect: the reduction in household income raises the marginal utility of additional income, incentivizing increased labour supply despite the opportunity cost of leisure. The AWE thus acts as an informal insurance mechanism in the absence of complete formal insurance coverage (Mincer, 1962; Katz, 1961).

Empirical studies provide evidence supporting the Added Worker Effect (AWE). In South Korea, Kim, Lee, and Halliday (2018) found a pronounced AWE among wives following a husband's chronic illness, as they were less likely to exit the labour force, reflecting a compensatory response to income loss. Similarly, Donkor et al. (2016), using data from the Ghana Living Standards Survey (GLSS 5), found evidence of increased male labour supply when wives experience health limitations, indicating that household members adjust their labour supply to stabilize household income.

However, the Added Worker Effect is not universal. Its presence and magnitude are influenced by cultural norms, caregiving responsibilities, and gender roles. In some contexts, spousal labour supply may decrease when caregiving demands outweigh the need to maintain household income (Jolly & Theodoropoulos, 2023).

1.2 Statement of the Research Problem

The health of a household head can profoundly influence the labour supply of their spouse. When illness or injury reduces the head's capacity to work, the household budget constraint

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tightens, altering the trade-off the spouse faces between labour and leisure. Two opposing mechanisms may emerge. On one hand, the loss of household income generates an income effect, which may induce the healthy spouse to enter the labour market or increase labour supply to maintain household consumption. On the other hand, illness increases the demand for non-market time, raising the shadow value of the spouse's leisure and creating a substitution effect away from market work. Since leisure and consumption are generally treated as normal goods, the spouse's adjustment may take the form of either increased or reduced labour supply, depending on whether the drive to preserve consumption or the pull of caregiving responsibilities dominates.

Evidence from high- and middle-income countries shows that spousal labour supply responses to a partner's ill health are not uniform. While some studies find that spouses reduce their labour supply due to increased caregiving responsibilities (e.g., García-Gómez et al., 2013; Jeon & Pohl, 2017), others report increases in labour supply to compensate for lost income (e.g., Fadlon & Nielsen, 2015; Kim et al., 2018; Di Meo & Eryilmaz, 2025). These contrasting findings suggest that the direction of spousal labour adjustment is context-dependent. However, existing literature provides limited Ghana-specific evidence, particularly with respect to how household structure, such as household headship, influences spousal labour supply responses to health limitations.

In the Ghanaian context, household labour supply and caregiving decisions are shaped by entrenched gender norms, where men are traditionally expected to serve as primary income earners while women assume caregiving and domestic responsibilities (Ampim et al., 2022; Bougangue & Ling, 2017). However, the rising prevalence of female-headed households, which constitute approximately 37% of households (2022 DHS), challenges these conventional

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roles. In such households, the dynamics of labour allocation and caregiving may differ, suggesting that spousal labour supply responses to health limitations may depend not only on gender but also on household headship. Furthermore, access to health insurance may influence household responses to health shocks by reducing financial uncertainty and potentially mitigating the need for spouses to adjust their labour supply. Despite these contextual factors, there remains limited empirical evidence on how the health of household heads affects spousal labour supply in Ghana across different household types and insurance coverage.

This study seeks to investigate how the health of household heads affects spousal labour supply, with particular attention to differences between male-headed and female-headed households and the potential moderating role of health insurance coverage

1.3 Summary

The proportion of female-headed households in Ghana is rising, with about 37% of households led by women, exceeding the African regional average of 26% (2022 DHS). This trend may influence household economic dynamics and spousal labour supply, as traditional gender roles for income generation and caregiving may no longer apply. Spouses in male-headed and female-headed households may respond differently to a household head's illness or injury, either by increasing work to offset lost income or reducing labour supply to provide care. This study explores how a household head's illness or injury affects spousal labour supply in male- and female-headed households and the potential moderating role of health insurance coverage.

1.4Research Objectives

General Objective

i. To examine the effect of household head's health on spousal labour supply in Ghana

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Specific Objectives

ii. To examine the effect of household heads' health on spousal labour supply in female-headed and male-headed households

iii. To investigate the moderating effect of household heads' health insurance coverage on the relationship between household heads' health and spousal labour supply in female-headed and male-headed households.

1.5 Research Questions

This study seeks to answer the following questions based on the objectives above:

i. What is the effect of household head health on spousal labour supply in Ghana?

ii. How does the effect of household head health on spousal labour supply differ between male-headed and female-headed households?

iii. Does household heads' health insurance coverage moderate the effect of a household head's health on spousal labour supply in female-headed and male-headed households?

1.6 Significance of the study

This study investigates how household heads' health influences the labour supply decisions of their spouses. It contributes to understanding household labour supply, caregiving responsibilities and gender differences in labour supply, areas that have received limited attention in the Ghanaian context.

The study provides insights for policymakers, such as the Ministry of Health, Ministry of Employment and Labor Relations, and the National Health Insurance Authority, to develop programs and policies that reduce economic and caregiving pressures on households while

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supporting spousal participation in the labour market. It also informs the design of gender-sensitive labour policies, including flexible work arrangements and remote work opportunities, which can help households balance work and caregiving responsibilities more effectively. Community organizations and healthcare providers can use these insights to strengthen support systems and improve household resilience.

At a broader level, the study contributes to Sustainable Development Goal 3 (Good Health and Well-Being) and Goal 5 (Gender Equality). It emphasizes the importance of household health and gender equity in labour decisions and provides a foundation for initiatives that promote more inclusive labour markets, reduce gender disparities, and support households in managing the combined demands of work and caregiving.

1.7 Data

The study utilizes data from the Annual Household Income and Expenditure Survey (AHIES), covering seven quarters from 2022 to 2023. AHIES is Ghana's first nationally representative high-frequency household panel survey, designed to provide quarterly and annual estimates on household consumption, labour market outcomes, food security, poverty, and health status. The survey supports the production of key macroeconomic and welfare indicators such as quarterly GDP, unemployment, inequality, and poverty rates. Its panel structure and broad coverage make it a valuable resource for policy-relevant research on household behaviour and well-being.

1.8 Organization of the study

The study is organized into five chapters. Chapter one introduces the research on "Household Heads' Health and Spousal Labor Supply Decisions in Ghana." It lays out the background,

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defines the problem statement and outlines the research objectives and research questions. The chapter also explains the significance of the study and briefly discusses its methodology and data. Chapter two provides an overview of health and labour supply in Ghana. Chapter three presents a comprehensive review of the relevant literature, encompassing both theoretical and empirical perspectives. Chapter Four details the methodology of the study. Chapter five summarizes the findings, discusses implications, and offers recommendations for policy improvements.



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CHAPTER TWO

HOUSEHOLD HEADS' HEALTH AND SPOUSAL LABOUR SUPPLY DECISIONS IN GHANA

This chapter provides a contextual overview of the relationship between health and the labour market in Ghana. It begins with a Historical Overview that traces Ghana's health system reforms, including the National Health Insurance Scheme (NHIS) and the country's epidemiological transition from communicable to non-communicable diseases. The chapter then examines Health Inequalities and Gender Differences, utilizing data from the Annual Household Income and Expenditure Survey (AHIES) to highlight the distinct vulnerabilities of male- and female-headed households across rural and urban divides. Furthermore, it analyzes labour force participation trends, discussing the dominance of the informal sector and the specific challenges of youth employment and labour market vulnerability. Finally, the chapter assesses the impact of the COVID-19 pandemic on Ghana's economic landscape, providing the necessary background to understand how health influences intra-household labour allocation.

2.1 Historical Overview of Health and Labour Trends in Ghana

Over the past two decades, Ghana has recorded significant improvements in health outcomes, though notable disparities persist across regions, socio-economic groups, and genders. Life expectancy at birth increased from approximately 59.1 years in 2000 to 66.1 years in 2021 (WHO, 2023). Female life expectancy has consistently exceeded that of males, reflecting both biological resilience and gender-specific behavioural patterns, including differences in health-seeking behaviour and lifestyle choices (Rogers et al., 2010). In Ghana, female life expectancy increased from approximately 60.4 years in 2000 to about 68.6 years in 2021, while male life expectancy rose from around 59.1 years in 2000 to approximately 62.1 years in 2021.

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Several policy initiatives and health system reforms have contributed to improvements in health outcomes in Ghana. Notably, the expansion of immunization programs, improvements in water and sanitation, and the introduction of the Community-Based Health Planning and Services (CHPS) initiative have enhanced access to primary healthcare, particularly in rural and underserved areas (Nyonator et al., 2005). These developments have implications for household well-being by reducing morbidity, improving productivity, and potentially influencing the labour supply decisions of household members.

Despite these gains, health outcomes remain uneven. Regions with higher urbanization and better infrastructure, such as Greater Accra and Ashanti, generally exhibit better health indicators than rural regions in the Northern and Upper East areas. Socio-economic inequalities also persist, with households in higher income quintiles accessing preventive and curative health services more readily than those in lower-income groups (WHO, 2023). Gendered disparities are also evident in health utilization patterns: women tend to access maternal and reproductive health services more frequently, whereas men often underutilize preventive healthcare, which may have implications for household labor supply and economic productivity (Rogers et al., 2010).

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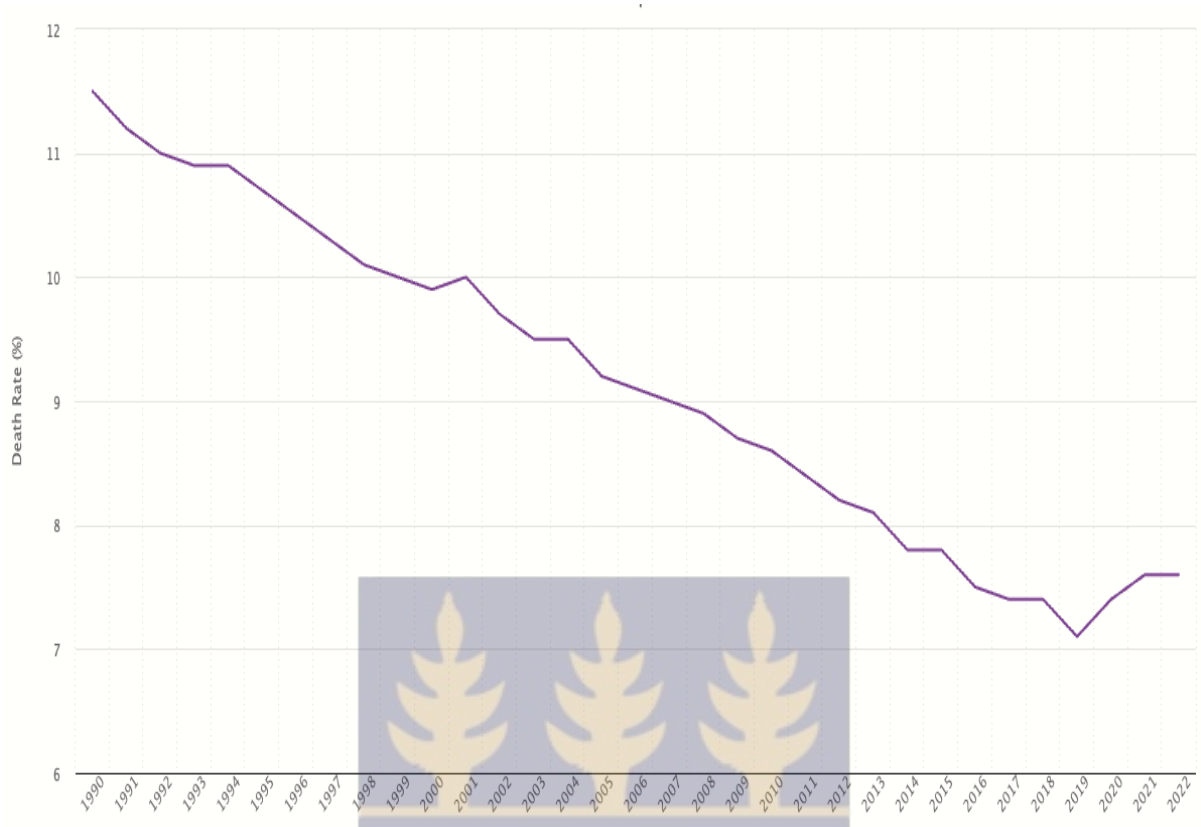


Figure 2. 1 The Changing Death Rate in Ghana from 1990 to 2022

Source: TGM StatBox: Ghana Facts and Figures

Fig 2.1 shows a graph of the death rate in Ghana from 1990 to 2022. Ghana's death rate has steadily declined from 11.5 per 1,000 people in 1990 to 7.6 in 2022. The most notable reductions occurred in the early 2000s, driven by improvements in healthcare access, especially for maternal and child health. Enhanced management of infectious diseases and increased life expectancy also contributed to this downward trend. However, a slight increase to 7.4 per 1,000 was recorded in 2020, likely reflecting the indirect impacts of the COVID-19 pandemic on healthcare services.

Notwithstanding this temporal increase, Ghana has continued making significant health advancements, particularly in reducing child mortality and strengthening public health

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infrastructure. In spite of these improvements, Ghana's health system continues to grapple with a dual burden of disease: the coexistence of infectious diseases and the rising prevalence of non-communicable diseases (NCDs). Historically, communicable diseases such as malaria, tuberculosis (TB), and HIV/AIDS were the dominant causes of morbidity and mortality. However, since the early 2000s, non-communicable diseases including hypertension, diabetes, cardiovascular diseases, and cancers have been on the rise in Sub-Saharan Africa (Bigna & Noubiap, 2019). This epidemiological shift reflects lifestyle changes, urbanization, and an aging population.

In Ghana, hypertension alone affects more than one in four adults (Bosu & Bosu, 2021), signalling a growing public health concern. The World Health Organization projects that the number of adults living with diabetes in Ghana could reach 55 million by 2045. Alongside these chronic conditions, injuries, particularly occupational and road-related remain prevalent, especially among men in transport, construction, and other high-risk sectors (Yankson et al., 2023).

The introduction of the National Health Insurance Scheme (NHIS) in 2003 represents a major institutional reform aimed at improving access to healthcare and reducing out-of-pocket expenditures in Ghana. By 2021, over 16 million individuals were enrolled, representing more than half of the population, although disparities in coverage persist across income and geographic groups. While such reforms have improved access to healthcare services, unequal utilization means that vulnerable households may still face financial burdens from ill-health. At the same time, Ghana is experiencing an epidemiological transition characterized by a rising burden of non-communicable diseases (NCDs) such as hypertension, diabetes, and cardiovascular diseases. These conditions often require long-term management, which can

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impose both direct medical costs and indirect costs through reduced labour supply. Consequently, illness within households has important implications for labour allocation decisions, including adjustments in spousal labour supply to compensate for lost income or reduced productivity.

While the preceding discussion provides a macro-level overview of health trends, disease patterns, and health system developments in Ghana, the economic implications of health are more directly observed at the household level. Any deterioration in the health of a household head can reduce their ability to supply labour and generate income. In response, households may reallocate labour resources internally as a coping mechanism to maintain overall welfare. In particular, spouses may adjust their labour supply by increasing working hours, entering the labour force, or substituting between market and non-market activities to compensate for reduced contributions from the household head. These intra-household adjustments reflect joint decision-making under resource and time constraints, and they form the basis for examining how the health of household heads influences spousal labour supply decisions in this study.

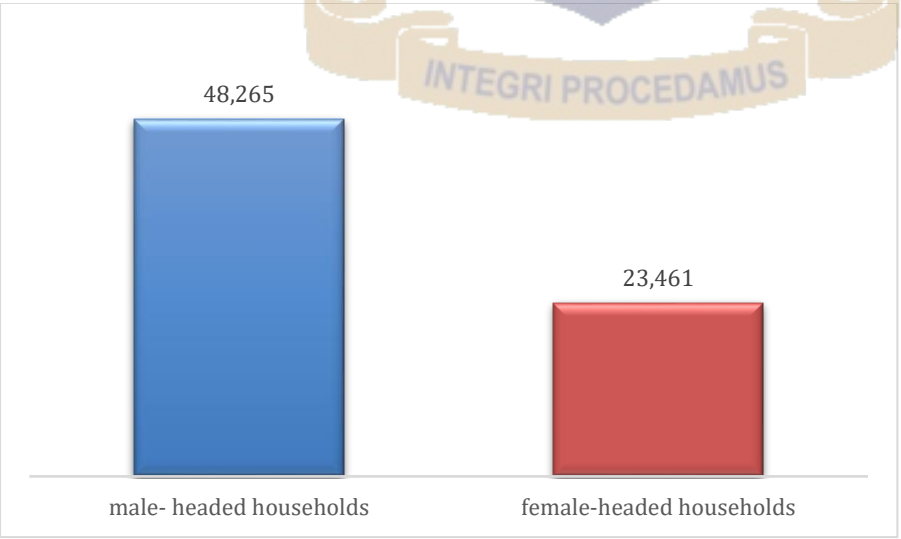


Figure 2. 2 Comparison of male and female-headed households in Ghana

Source: Author's construction from AHIES data (Q12022 to Q32023)

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In Ghana, the majority of households are male-headed, as shown in Figure 2.2. Approximately 67% of households are male-headed, while 33% are female-headed. The dominance of male-headed households suggests persistent sociocultural norms that assign men the role of primary decision-makers and economic providers.

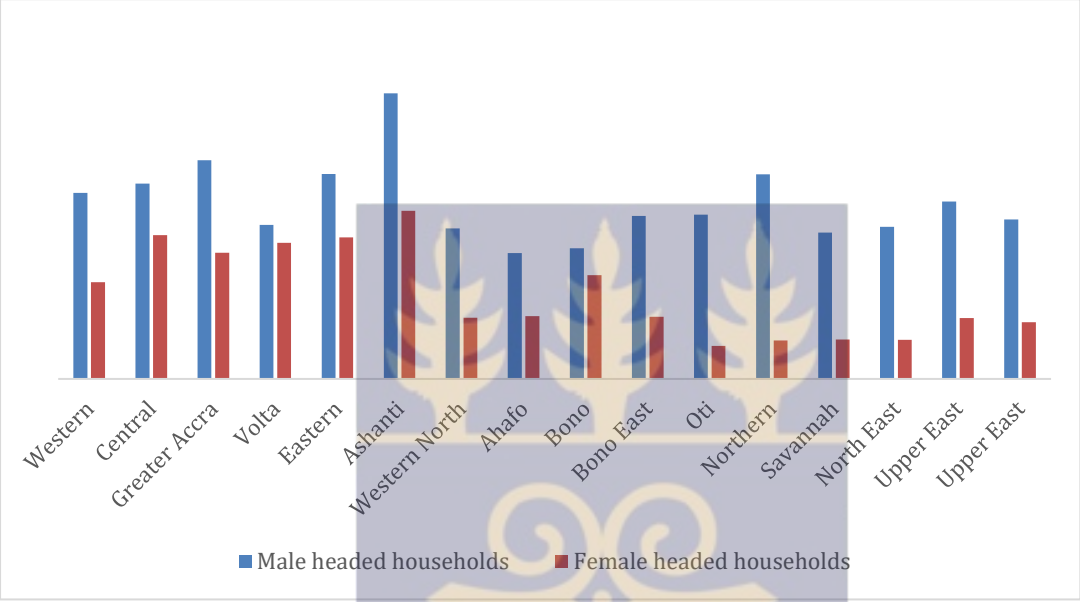


Figure 2. 3 Regional classification of household heads by gender

Source: Author's construction from AHIES data (Q12022 to Q32023)

The regional classification of household heads by gender reveals a consistent dominance of male-headed households across all regions in Ghana (Figure 2.3). The Ashanti, Greater Accra, and Eastern regions record the highest number of male-headed households, reflecting their relatively larger populations, urban growth, and stronger economic activity. Although female-headed households are fewer in number, their presence is notably substantial in some regions. Bono, Central, and Volta regions record relatively higher proportions of female-headed households compared to others. The Northern, Oti, Savannah, and North East regions on the other hand show considerably fewer female-headed households.

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2.2 Health Inequalities and Gender Differences in Household Headship in Ghana

Using data from the sixth round of the Ghana Living Standards Survey (GLSS 6), Cooke et al. (2016) found that female-headed households are more likely to fall below the national poverty line and experience higher levels of food insecurity than male-headed households. This pattern is largely explained by the fact that female-headed households tend to have limited access to productive assets such as land, livestock, and credit. As a result, their capacity to generate stable income and accumulate wealth is constrained, exposing them to higher economic vulnerability. Similarly, Kpoor (2019) observed that male-headed households generally possess a greater endowment of assets and enjoy better livelihood outcomes compared to female-headed households.

Health disparities also mirror these gendered economic differences. Female heads of households may often face a higher likelihood of illness due to the dual burden of caregiving and income**.** Male heads, though often economically better positioned, are more exposed to occupational hazards and injuries, particularly in physically demanding sectors such as construction, transport, and agriculture (Yankson et al., 2023).

Table 2. 1 Health Status of Male and Female Household Heads

Health Status	Male Head	Female head
Healthy (did not report illness or injury)	40,751	17,520
Unhealthy (reported illness and/or injury)	7,514	5,941
Percentage of healthy to unhealthy heads	18%	34%

Source: Author's computation from AHIES data (Q12022 to Q32023)

Table 2.1 reveals that female household heads experience a notably higher incidence of illness or injury compared to their male counterparts. This gap highlights pronounced health

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vulnerabilities among female-headed households, likely due to the combined pressures of earning an income and providing caregiving, which contribute to their poorer health outcomes.

Table 2. 2 Rural Urban Classification of Health Status of Household Heads

	Urban	Rural
Unhealthy female head	3,026	4,488
Unhealthy male head	3,143	2,798
Total	6,169	7,286

Source: Author's computation from AHIES data (Q12022 to Q32023)

Spatial disparities further deepen gendered health inequalities. As reported in Table 2, a greater number of unhealthy female heads reside in rural areas (4,488) compared to urban areas (3,026). Conversely, unhealthy male heads are slightly more concentrated in urban areas (3,143). This rural-urban disparity reflects the uneven distribution of health and educational facilities. Female household heads in rural areas often face vulnerabilities arising from lower educational attainment and limited access to healthcare.

Regional patterns in the distribution of unhealthy household heads highlight substantial disparities across Ghana (Table 2.3). The Ashanti and Eastern regions record the highest total number of unhealthy household heads. This reflects the regions' relatively larger populations and high levels of urbanization. In both regions, the number of unhealthy male and female heads is almost balanced.

In the Greater Accra Region, the total number of unhealthy household heads is moderate compared to Ashanti and Eastern, yet the gender distribution remains relatively balanced as in the case of the Ashanti and Eastern regions, with 350 unhealthy male heads and 320 unhealthy female heads. This few numbers of unhealthy cases may reflect better access to healthcare services and higher health awareness in the region's predominantly urban population and the

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almost balanced unhealthy male and female heads suggests a broadly similar exposure to health risks between genders. Female-headed households show higher concentrations of reported illness or injury in the Volta and Central regions, which may largely reflect the relatively higher proportions of female-headed households in these areas.

Table 2. 3 Distribution of Unhealthy Male and Female Household Heads by Region

	Unhealthy female heads	Unhealthy male heads	Total
Western	297	359	656
Central	576	437	1,013
Greater Accra	320	350	670
Volta	796	680	1,476
Eastern	750	744	1,494
Ashanti	711	835	1,546
Western North	229	381	610
Ahafo	204	252	456
Bono	519	425	944
Bono East	381	590	971
Oti	205	593	798
Northern	155	438	593
Savannah	199	430	629
North East	152	293	445
Upper East	256	444	700
Upper East	191	263	454

Source: Author's computation from AHIES data (Q12022 to Q32023)

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The northern zone, comprising Northern, Savannah, North East, Upper East, and Upper West regions, displays a distinct pattern. Unhealthy male heads consistently outnumber unhealthy female heads, although the total counts are comparatively lower. This trend may reflect the predominance of men in labour-intensive sectors, which increases their exposure to occupational injuries and health risks.

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2.3 Labour Force Participation in Ghana

Labor force participation in Ghana has evolved significantly alongside the country's economic and demographic transformations. In the immediate post-independence era (1957–1970s), agriculture dominated the labour market. Efforts to diversify employment through industrialization policies under the first Republic encountered setbacks due to political instability in the 1970s. By the 1980s, economic reforms under the Structural Adjustment Program (SAP) led to public-sector retrenchments and a rapid expansion of informal-sector employment. The informal sector has emerged as a major source of livelihood and remains dominant. The Ghana Statistical Service reports that the informal sector accounts for 80% of total employment.

In 2024, Ghana's labour force participation rate stood at 63.03%, according to the World Bank's development indicators, which are based on modelled estimates by the International Labor Organization (ILO). This figure shows a slight decline from 63.42% in 2023 but continues to be higher than the global average of approximately 60.63%. The labour force participation rate is the percentage of the population aged 15 and older who are economically active, including those employed and those actively seeking work. The rise in educational attainment has gradually reshaped Ghana's labour force participation structure. Education remains an important factor in determining women's participation in the formal sector. (Abraham et al., 2017)

Table 2.3. 1 Economic activity by gender of household head

Economic activity status	Male head	Female head	Total
Employed	41,328	17,219	58,547
Unemployed	1,621	1,765	3,386
Not active	5,316	4,477	9,793
labor force	42,949	18,984	61,933

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Total	48,265	23,461	71,726
percentage of unemployed to employed	4%	9%	5%

Source: Author's computation from AHIES data (Q12022 to Q32023)

2.4 Gender Differences in Economic Activity of household heads

The data on economic activity by gender of household head reveals clear gender differences in employment outcomes. Among 48,265 male-headed households, 41,328 household heads were employed, while 1,621 were unemployed, representing an unemployment rate of about 4%. For female-headed households, 17,219 out of the 23,461 heads were employed while 1,765 were unemployed. This yielded a higher unemployment rate of approximately 9%. Additionally, 5,316 male heads and 4,477 female heads were classified as not economically active. The total labour force comprised of 42,949 male heads and 18,984 female heads. This data in table 4 highlights the economic vulnerabilities faced by female-headed households and the gender disparities in labour force participation in Ghana.

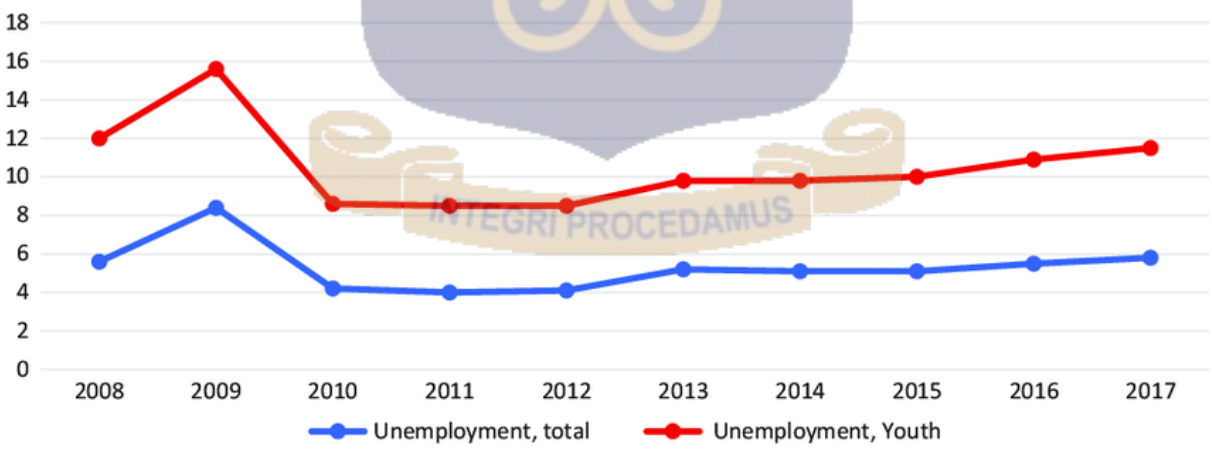


Figure 2. 4 Youth Employment and Labour Market Vulnerability in Ghana: Aggregate Trends and Determinants

Source: World Bank, 2018

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2.5 Youth Employment and Labour Market Vulnerability

Figure 4 illustrates the unemployment trends for both the youth and the total labour force in Ghana from 2008 to 2017. The overall unemployment rate peaked at 8.3% in 2009, reflecting the impact of the global financial crisis (World Bank, 2018). Following this, the unemployment rate stabilized around 4-5% for several years but has shown signs of increasing again in recent times. Throughout this period, youth unemployment has consistently exceeded the aggregate unemployment rate. This highlights the more challenging labour market conditions faced by young people. Youth unemployment continues to be a major concern. As Baah-Boateng (2021) noted, the overproduction of humanities graduates contrasted with a shortage of STEM graduates, combined with training programs that do not align well with job market demands, has limited youth employability. These factors have prompted government initiatives such as the National Youth Employment Program (NYEP). The NYEP is aimed at equipping youth with employable skills and providing temporary employment opportunities.

2.6 Impact of the COVID-19 Pandemic on the labour market.

The COVID-19 pandemic caused unexpected and unprecedented disruptions to labour markets worldwide, and Ghana was no exception. The government implemented stringent lockdowns, in major urban areas like Greater Accra and Kumasi, which led to a sharp decline in economic activities. Subsequently, these restrictions were gradually lifted, allowing businesses to slowly bounce back. The labour market has been recovering gradually since then, with job losses sharply declining and many sectors returning to pre-pandemic participation levels. Although challenges remain, especially for informal workers and rural incomes, the overall trajectory points to steady recovery from the pandemic's economic impact. (Schotte et al., 2023)

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CHAPTER THREE

LITERATURE REVIEW

This chapter provides a comprehensive review of the theoretical and empirical literature on the relationship between health and spousal labour supply. It begins with a theoretical review, tracing the evolution of household economic models from early neoclassical "Chauvinistic" frameworks to the Individual Utility-Family Budget Constraint model. This section establishes the conceptual basis for the Added Worker Effect. The chapter then transitions to an empirical review, synthesizing international evidence from high-income jurisdictions where robust social safety nets often facilitate spousal labour supply reductions with evidence from the Ghanaian context. Also, the review explores the divergent spousal labour supply responses in Ghana, where economic necessity may trigger compensatory work while traditional gender roles often necessitate care-related spousal labour supply reductions. Finally, the chapter highlights how this study addresses existing research gaps by integrating gender, household headship, and the moderating role of health insurance using panel data.

3.1 Theoretical Review

Most analyses of labour supply are based on the neoclassical labour-leisure model (Lewis, 1957; Abbott & Ashenfelter, 1976), which conceptualizes the individual as a utility-maximizing agent who allocates a fixed amount of time between labour (which generates income) and leisure (which provides direct utility). In this approach, individuals maximize utility from consumption and leisure, subject to time and budget constraints. The opportunity cost of leisure is the wage and the labour supply decision depends on the trade-off between the marginal utility of income and the marginal utility of leisure. This framework is consistent with Becker's (1981) household production theory, which models the household as a utility-maximizing unit that allocates time between market work and non-market activities.

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Individual utility models provide insight into personal choices, yet they overlook how these choices are influenced by other household members. Moving to a household or family framework accounts for shared resources and joint decision-making, which are crucial in understanding real-world labour and consumption behaviour.

The Chauvinistic model assumes that one of the partners in a household, usually the male, maximizes their utility independent of the other partner's choices. As used by Barth (1967), Bowen and Finegan (1965), Parker and Shaw (1968), Tella and Green (1971), this framework assumed that the male's preferences entirely dictated how resources were allocated. A limitation of this model is that the male and household utility outcomes might be sub-optimal compared to some non-chauvinistic models.

The family utility-family budget constraint model, which can be traced to Samuelson (1956) and Kosters (1966), departs from the chauvinistic framework by treating the household as a collective decision-making unit. In this model, the maximized utility is the total family utility, which depends on aggregate household consumption and the leisure time of each family member. Earnings from all household members are assumed to be pooled into a common family budget, such that the maximization of utility is subject to a single household budget constraint.

A central feature of this model is the recognition of two types of substitution effects that arise when wages change: the own substitution effect and the cross-substitution effect. The own substitution effect is identical to that in the simple labour supply model, where an increase in an individual's wage raises the opportunity cost of leisure, thereby encouraging more hours of

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work. The cross-substitution effect, however, captures the influence of one member's wage on the labour supply of another household member. This effect can be either positive or negative, depending on whether the leisure time of the two members is a substitute or complement.

If leisure times are substitutes, an increase in member i's wage reduces member j's leisure (and hence increases j's labour supply), implying a negative cross-substitution effect. Conversely, if leisure time is complemented, an increase in member i's wage raises the value of spending time together, leading member j to also increase leisure and reduce labour supply, resulting in a positive cross-substitution effect.

An important implication is that the cross-substitution effect of a change in the husband's wage on the wife's labour supply is symmetric to the effect of a change in the wife's wage on the husband's labour supply. However, the income effects of wage changes need not be equal across members, since the pooling of earnings allows for asymmetric impacts depending on intra-household preferences and consumption needs. Although elegant and widely applied, the model does not account for intra-household differences in preferences. The model overlooks the fact that household members may value leisure differently, even though they share access to common consumption.

The unitary framework has been challenged by collective models, such as those of Bourguignon and Chiappori (1992), who treat the household as a bargaining arena in which individual preferences and intra-household allocations influence labour supply decisions. Leuthold (1968) was among the first to formalize an alternative approach by specifying individual utility functions that combine private leisure with a joint household consumption good, all subject to a common family budget constraint. In this model, household income results from the labour supply of members together with any non-labour income, and it is

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allocated to the shared consumption good. Each individual maximizes utility depending on household consumption and their own leisure, with decisions linked through the shared budget. Ashworth and Ulph (1981) further developed this framework by applying a Lagrangian approach in which the household consumption good enters all members' utility functions symmetrically, while leisure is specific to each member. The first-order conditions show that although the household's consumption is determined jointly, the trade-off between consumption and leisure (the marginal rate of substitution) varies across individuals. This feature enables the derivation of reduced-form labour supply functions that explicitly reflect heterogeneity within households, while still embedding decision-making in a collective budget constraint. Duflo (2012) emphasizes that gender roles and intra-household inequalities influence how resources and opportunities are allocated within households, highlighting that economic outcomes are not uniformly shared between men and women. This is relevant in understanding intra-household decision-making.

Building on this framework, this study employs the individual utility-family budget constraint model to analyse how the health status of the household head affects spousal labour supply decisions within Ghanaian households. Unlike traditional models that treat the household as a single decision-making unit with uniform preferences, this model recognizes that each member maximizes their own utility subject to a common family budget constraint. This is especially relevant in Ghana, where men and women often face distinct economic roles and constraints. The model captures the interdependent nature of intra-household decision-making by illustrating how the health of one member, such as the household head, influences the labour participation choices of another member, typically the spouse in response to the changes in the household budget constraint.

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In this framework, the mechanism underpinning this study can be characterized as a dynamic intra-household adjustment process. A health limitation to the household head raises the demand for caregiving, thereby tightening time constraints on other household members, particularly the spouse. This induces a reallocation of time between unpaid care and market work, with direct implications for the spouse's labour supply decision. On one hand, a reduction in household income may trigger an Added Worker Effect, leading the spouse to increase labour supply. On the other hand, increased caregiving responsibilities may constrain the spouse's ability to participate in market work. As a result, the net effect on the spouse's labour supply is theoretically ambiguous and depends on the relative strength of these competing forces. Though caregiving needs influence labour supply decisions, labour supply in turn determines household income, which subsequently affects how caregiving needs are met. This interdependence establishes a feedback mechanism, which is illustrated in Figure 3.1

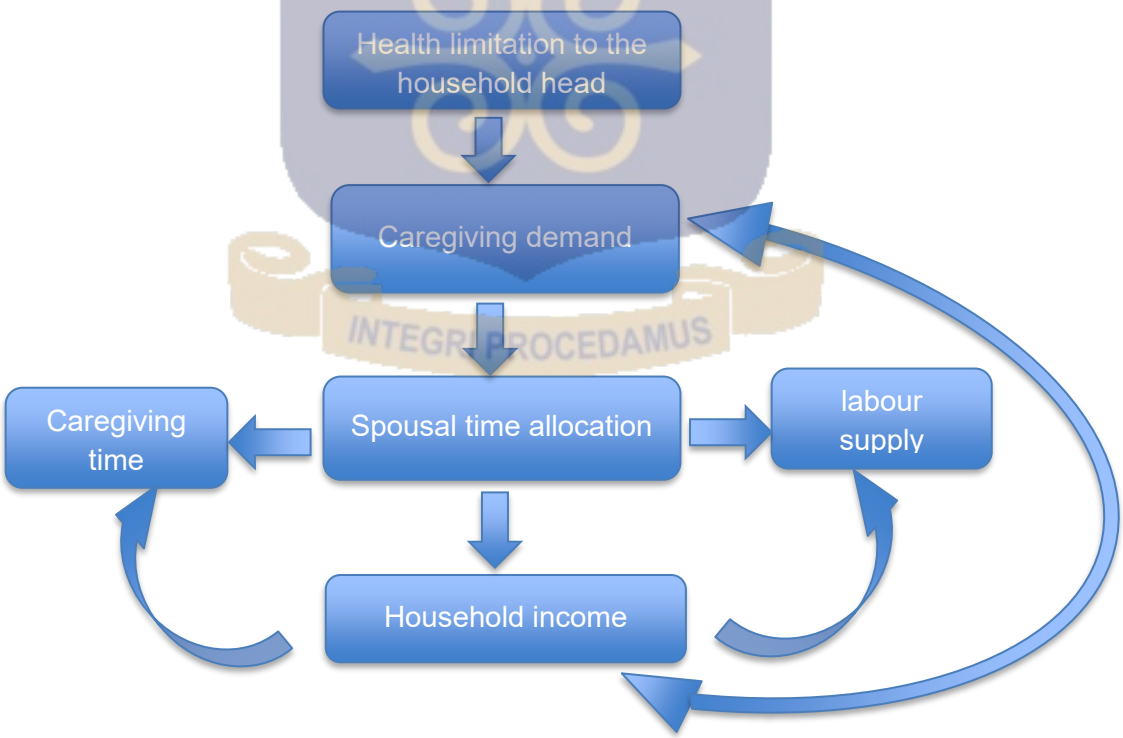


Figure 3. 1 Conceptual Framework of Health and Spousal Labour Supply

Source: Author's construct

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3.2 Empirical Review

A predominant theme in the international literature, particularly across high-income economies, is that health limitations primarily trigger a reduction in spousal labour supply as time is reallocated toward informal care.

Jolly and Theodoropoulos (2023) analyse data from the Survey of Health, Ageing and Retirement in Europe (SHARE) to investigate an international perspective of health shocks and spousal labour supply. Their estimation strategy involved probit models for binary labour outcome, employment status and ordinary least squares (OLS) for the continuous outcome, number of hours worked. They control for country fixed effects, a range of individual and household characteristics, and cluster standard errors at the household level to account for repeated observations. The key explanatory variable is a binary indicator for the onset and subsequent years of a spouse's work-limiting disability. The findings reveal significant reductions in labour supply along the extensive margin following the onset of a spouse's disability. This implies a withdrawal from the labour force to provide care or engage in joint leisure. Spousal disabilities correspond to higher likelihoods of part-time and lower likelihoods of full-time employment. Sensitivity analyses, including separate models for husbands and wives, and alternative health measures indicate that caregiving responsibilities affect wives more than husbands. They also include interactions between disability and country indicators, which uncovered cross-country heterogeneity tied to social safety nets and institutional factors.

Similarly, García-Gómez et al. (2013) provide compelling evidence on the spillover effects of health shocks within households. They employ a robust estimation technique combining propensity score matching with difference-in-differences (DiD) regression, using linked Dutch administrative data from 1998 to 2005. Acute health shocks were defined as unscheduled hospitalizations lasting at least three nights, making such health events likely exogenous and

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unplanned. Propensity scores, estimated via a probit model that included demographics, socioeconomic status, and job characteristics, were used to match treated individuals to comparable controls. A weighted DiD regression was then applied to estimate causal impacts on employment and income over six years, controlling for unobserved fixed effects and pre-treatment trends. Their study found that a spouse's probability of employment declines by 1.5 percentage points three years after the partner's acute health shock, with no signs of recovery over time. Spouses initially employed also face an increased risk of labour market exit. Contrary to the added worker hypothesis, there was no evidence that spouses increase their labour supply to compensate for lost earnings. Notably, male spouses exhibited a greater reduction in employment than female spouses, partly due to men's higher initial employment rates and the assumption of household responsibilities traditionally managed by women. The employment decline is concentrated among wealthier households. This suggests that these couples may prioritize early retirement or reduced labour force participation to enjoy leisure time together rather than withdrawing primarily to provide informal care.

Reinforcing this pattern, Jeon and Pohl (2017) reinforce these patterns. They find a clear decline in labour supply following a spouse's cancer diagnosis, as partners reduce work to provide care and share leisure time with their ill spouses. This reduction leads to a substantial drop in family income. Interestingly, men and women experience similar magnitudes of labour supply decline, and the severity and type of cancer influence the duration of these effects. Using comprehensive Canadian administrative data, the study employs a robust identification strategy that combines matching techniques with individual fixed effects in a generalized difference-in-differences framework, effectively controlling for observable and unobservable heterogeneity.

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Macchioni Giaquinto et al. (2021) also found a spousal reduction in labour supply in favour of caregiving. Using data from the Understanding Society Survey (UKHLS), a nationally representative panel of approximately 40,000 households, the authors studied how partners in the UK respond to acute health shocks such as heart attacks, strokes, or cancer. Focusing on couples where one partner experienced such an event, they examined the effects on the other partner's labour supply and caregiving behaviour. The empirical strategy leveraged the unanticipated timing of health shocks by employing coarsened exact matching and entropy balancing techniques to form equivalent control groups, combined with parametric fixed effects regression models. Lagged outcomes were also incorporated to control for potential confounders and time-invariant unobservable variables. The study showed no increase in working hours or labour force participation following spousal illness. Instead, the primary response is a reallocation of time from leisure activities to informal caregiving, regardless of the household's access to formal care, financial resources, or employment conditions. This caregiving response remains consistent regardless of individuals' labour market status or household income, emphasizing that, emotional and relational considerations, more than financial motivations, primarily influence how households in the UK behave following a health shock.

At the policy level, additional evidence suggests that institutional policies can influence the extent of caregiving-related spousal labour supply reductions. Anand, Dague and Wagner (2022) examine the impact of paid family leave in the United States using a difference-in-differences event study design based on the staggered rollout of state-level policies. They find that although labour force participation declines following a spouse's health shock, access to paid family leave reduces the extent to which individuals cut back their working hours. While the policy does not fully eliminate labour supply reductions, it serves as a buffer that mitigates

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the caregiving burden, highlighting the role of institutional support in shaping household responses.

Evidence from other contexts further supports this caregiving-driven spousal labour supply reductions. Vega (2019) examines labour force participation decisions within couples using data from the Mexican Health and Aging Study (MHAS). Using probit and ordered probit models, the study analyses responses to major health shocks, such as cancer and stroke, affecting either partner. The findings indicate that a spouse's serious health shock is associated with a reduction in the other partner's labour force participation, reflecting a reallocation of time toward caregiving responsibilities within the household. These adjustments occur across both full-time and part-time employment margins, suggesting that caregiving needs are central to household labour supply decisions following health shocks.

This pattern is further strengthened by longitudinal evidence in the study of Fu et al. (2025). They find that labour supply declines persistently following a spouse's disability, with effects lasting several years. Rather than observing compensatory increases in labour supply, the study finds that time is reallocated away from market work toward unpaid household activities, including caregiving.

Focusing more directly on caregiving dynamics, Noël-Miller (2010), using data from the U.S. The health and Retirement Study highlights how caregiving is adjusted within households in response to changes in health status. The study finds that individuals with declining functional ability receive increased care from spouses and other informal sources.

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Extending this perspective to household-level dynamics, Riekhoff and Vaalavuo (2021) use multichannel sequence analysis to examine couples' joint labour market trajectories following severe health shocks. Using data from SHARE, the study shows that such shocks often lead to coordinated adjustments in labour supply, including transitions toward reduced employment or joint retirement. These responses reflect the reallocation of time and roles within the household to accommodate health-related needs, including caregiving responsibilities.

The studies above reveal a consistent pattern: when a spouse falls ill, the healthy partner is more likely to reduce labour supply than increase. Rather than acting as economic substitutes, spouses tend to decrease their labour supply to provide care, spend time with the ill partner, or reprioritize household responsibilities. Although the direction of this response is consistent, its magnitude and underlying mechanisms are not uniform across contexts. These variations are shaped by both household resources and broader institutional conditions, as wealthier households are better positioned to absorb income losses. The consistency of these findings across European and North American contexts, where social safety nets tend to be relatively robust, raises important questions about how these dynamics manifest in lower-income countries with different institutional and social support structures.

This role of institutional context is further supported by Berger and Fleisher (1984), who show that the availability and generosity of public transfers significantly influence whether spouses adjust their labour supply following a decline in their partner's health. Their findings suggest that when more attractive public support is available, households are more likely to reduce labour supply in favour of caregiving.

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In contrast to the caregiving-dominated responses observed in many studies, another strand of literature identifies conditions under which spouses increase labour supply in response to health shocks, commonly referred to as the added worker effect. Di Meo and Eryilmaz (2025) analyse the effects of severe health shocks on labour supply and household outcomes using data from the German Socio-Economic Panel (SOEP). Focusing on individuals aged 25 to 55 at the time of their first observed health shock, they identify sudden and severe shocks using extended sick leave exceeding six weeks. The study excludes individuals in education, military service, self-employment, or those experiencing multiple shocks to reduce confounding influences. Using an event study framework combined with coarsened exact matching and entropy balancing, the authors compare affected individuals with similar untreated counterparts to isolate causal effects. They find that health shocks lead to an average annual gross labour income loss of approximately 4,000 euros, driven by a 16% decline in labour force participation, primarily through reductions in full-time employment. At the household level, these income losses are offset by public transfers and an increase in spousal labour supply.

This suggests that in this instance, although public transfers provide partial income replacement, they are not sufficiently generous to eliminate the financial consequences of the shock. As a result, households still rely on additional spousal labour supply to further compensate for the remaining income loss. However, in studies conducted in contexts with more comprehensive social safety nets, public transfers are sufficiently generous to substantially reduce the need for compensatory labour supply, thereby supporting reductions in spousal labour in favour of caregiving.

Beyond the dominant patterns identified in the literature, several studies point to more varied labour supply responses following health shocks. Rather than conforming to a single adjustment mechanism, these studies show that household responses may differ depending on

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the nature of the shock and household characteristics. In some cases, labour supply remains largely unchanged, while in others, responses differ across groups or circumstances.

Fadlon and Nielsen (2015) show that labour supply responses can differ markedly depending on the nature of the health shock. The study focused on severe health shocks such as heart attacks and strokes. The authors identified causal effects by exploiting the nearly random timing of severe health shocks within households. They achieved this by comparing households that experienced the same shock in different years, constructing counterfactuals to approximate what would have happened without the shock. Event study methods combined with a dynamic difference-in-differences estimator allowed the authors to control for confounding variables such as age, cohort effects, and calendar year trends. This analytical approach isolates the true impact of the health shocks on spousal labour supply. Their findings reveal that non-fatal health shocks (severe, sudden health event that leads to hospitalization but not death), have no significant effect on spousal labour supply, because insurance moderates the financial impact of the illness. However, fatal health shocks (spouse dies from health shocks) lead to an immediate and substantial increase in labour supply among surviving spouses. Widows increase their labour force participation by over 11%, driven by significant income losses, whereas widowers, who generally have greater financial stability, slightly reduce their labour supply by about 4.1%.

Kim, Lee and Halliday (2018) similarly show that labour supply adjustments vary across circumstances. They find that when husbands experience chronic illnesses, wives are less likely to exit the labour force, with a 9.2 percentage point decrease in the probability of labour force exit. They also find that the added worker effect is more pronounced for chronic conditions than for acute illnesses or accidents and stronger in households with adult children living at

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home and among lower-income families. This suggests that family composition and economic necessity influence labour supply adjustments in response to health shocks.

Gallipoli and Turner (2009) provide further evidence of limited responsiveness in spousal labour supply. Using data from the Canadian Survey of Labor and Income Dynamics (SLID), the study uncovered two striking patterns: first, spouses rarely increase their labour supply in response to disability shocks, and second**,** single men exhibit much more persistent labour supply reductions than married men following a disability onset.

Coile (2004) also finds that the added worker effect is small for men and non-existent for women when their partners suffer functional health limitations. The analysis employs reduced-form probit models in which the dependent variable is whether an individual exits the labour force between survey waves. Key independent variables include indicators of own and spousal health shocks, specifically focusing on health events such as heart attacks, strokes, and cancer diagnoses. The models control for demographic variables, including age, education, industry, occupation, and household wealth, to isolate the impact of health shocks.

Acuña, Acuña, and Carrasco (2019) show, however, that labour supply responses can emerge under specific conditions. Using data from the Chilean Social Protection Survey (SPS), they find that while some health conditions have no observable effect, others, such as a diagnosis of arthritis, are associated with substantial increases in labour force entry among previously inactive women. Their estimation strategy involved running fixed-effects regressions on panel data, modelling female labour force entry as a binary dependent variable indicating whether a previously inactive woman joined the labour force by the current survey wave. The fixed-

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effects approach controlled for time-invariant unobserved heterogeneity, focusing on within-individual changes and treating health shocks as exogenous, unanticipated events.

Much of the international literature, particularly from high-income countries, reports an absence or only limited evidence of the added worker effect following spousal health shocks. In these contexts, household adjustments tend to involve reallocation of time toward caregiving, with income losses partly cushioned by formal social protection systems.

In contrast, evidence from Ghana points to a more compensatory labour response. Heath, Mansuri and Rijkers (2022) show that Ghanaian men significantly increase their labour supply following illness within the household, working more hours and days. This response is observed across employment types, suggesting that distinctions between formal and informal work are less pronounced in shaping behavioural adjustments. Donkor et al. (2016) report similar patterns, where men increase their labour supply when their spouses withdraw from work due to illness, while women do not exhibit comparable adjustments. These findings indicate that, in a context with limited social safety nets, income pressures may necessitate labour supply adjustments within the household, particularly among male members.

Although international studies provide extensive insights into spousal labour responses to health shocks, empirical evidence from Ghana remains limited and methodologically constrained. Much of the existing Ghanaian literature relies on cross-sectional data, such as the Ghana Living Standards Survey (GLSS), which capture outcomes at a single point in time and do not adequately track dynamic household adjustments following health shocks. In addition, earlier studies have paid limited attention to how the position of the affected individual within the household influences the labour response of the healthy spouse.

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The present study examines how the health status of the household head, whether male or female, influences the labour supply response of the spouse. The analysis draws on the Annual Household Income and Expenditure Survey (AHIES), Ghana's first nationally representative panel dataset. Unlike cross-sectional data, which capture outcomes at a single point in time, panel data allow researchers to observe how changes in a partner's health affect the other spouse's labour supply over time. This approach provides a more accurate understanding of spousal labour supply to the household head's health limitation.

3.3 Contribution to Literature

This study builds on the existing literature by integrating both gender and household position in analysing spousal labour supply responses to household heads' health. Previous research has consistently documented gendered labour responses, showing that women tend to adjust their labour supply more than men following a partner's illness or disability, whereas evidence on men's labour supply adjustments is mixed, with some studies reporting negligible effects. However, these studies generally did not account for household position, specifically whether the unhealthy individual is the household head, which may influence the unaffected spouse differently and interact with gender to shape labour supply decisions. This study explicitly examines male and female-headed households to explore whether spousal labour supply responses differ when the ill or injured partner is also the household head. The study also examines the buffering role of health insurance in shaping spousal labour supply responses when household heads are ill or injured.

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Table 3.1 below summarizes the diverse empirical findings discussed above. It categorizes these studies by country, methodology, findings, and relevance to the current study.

Table 3. 1 Summary of Empirical Findings

Study (Year)	Country	Methodology	Key Findings	Relevance to Current Study
Jolly and Theodoropoulos (2023)	Europe	Probit (Binary) & OLS (Hours) with Household Clustering	Significant extensive margin reductions; spousal disability leads to withdrawal for care or joint leisure.	The present study draws on the emthodology but tailors it to the nature of the AHIES data
García-Gómez et al. (2013)	Netherlands	Propensity Score Matching (PSM) + Difference-in-Differences (DiD)	no evidence of recovery or Added Worker Effect.	Establishes that spousal health shocks have long-term spillover effects on household income.
Jeon and Pohl (2017)	Canada	Matching + Fixed Effects (Gen-DiD)	Labour supply decline across both genders; severity of illness dictates the duration of the withdrawal.	how caregiving leads to substantial drops in total family income.
Macchioni Giaquinto et al. (2021)	United Kingdom	Coarsened Exact Matching (CEM) + Entropy Balancing + Fixed Effects	Time is reallocated from leisure to nursing regardless of income or formal care access.	Confirms that caregiving is a non-financial, relational priority in high-income contexts.
Anand, Dague and Wagner (2022)	United States	DiD Event Study (State-level rollout)	Paid family leave acts as a buffer, mitigating the extent of working hour reductions.	Demonstrates how policy shapes the opportunity cost of providing care.

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Vega (2019)	Mexico	Probit & Ordered Probit	Reductions in labour participation across full-time and part-time margins.	Shows caregiving-driven withdrawal persists outside of Western Europe/USA.
Fu et al. (2025)	China	Staggered DiD	Persistent, multi-year labour supply decline; time shifted to unpaid activities.	Confirms that caregiving is a structural, long-term shift in household roles.
Noël-Miller (2010)	United States	Bivariate Tobit models	Declining functional ability directly triggers increased spousal care.	Provides empirical proof that caregiving is the specific reason for work reduction.
Riekhoff and Vaalavuo (2021)	Europe	Multichannel Sequence Analysis	Coordinated household transitions toward reduced employment or joint retirement.	Joint Decision-Making: Frames the response as a synchronized household strategy.
Berger and Fleisher (1984)	United States	Heckman Two-Step Selection Model: First-stage Probit (labour force participation) and second-stage selectivity-corrected OLS (weeks worked), addressing sample selection bias via the Inverse Mills Ratio.	Generous public transfers increase the likelihood of choosing care over work.	Institutional Buffer: Explains why safety nets are a critical variable in the care-vs-work trade-off.
Di Meo and Eryilmaz (2025)	Germany	Event Study + CEM & Entropy Balancing	spouses increase labour to offset income loss.	Shows AWE emerges when public transfers are insufficient to cover losses.
Fadlon and Nielsen (2015)	Denmark	Dynamic DiD (Event Study)	Non-fatal shocks: No effect (insurance buffers) on labour supply.	Distinguishes between caregiving needs when the spouse is alive but unhealthy vs. the

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			Fatal shocks: 11% increase for widows.	need to increase labor supply after spouse's death.
Kim, Lee and Halliday (2018)	South Korea	Linear Probability Model (LPM)	Chronic illness reduces wives' exit probability by 9.2%. AWE stronger in low-income homes.	Validates that economic necessity and illness type (chronic) drive the AWE.
Gallipoli and Turner (2009)	Canada	Dynamic Life-Cycle Model.	Spouses rarely increase supply; marital status acts as a buffer for the disabled partner.	Reinforces that in high-income settings, AWE is often negligible.
Coile (2004)	USA	Reduced-form Probit	AWE is small for men and non-existent for women	Shows the dominance of care giving over income seeking.
Acuña et al. (2019)	Chile	linear Probability Model (LPM)	Specific diagnoses trigger labour supply for previously inactive women.	Shows that in less institutionalized settings, AWE begins to emerge.
Heath, Mansuri and Rijkers (2022)	Ghana	Fixed effect linear panel model	Significant increase in male labour supply (hours/days) to compensate for household illness.	Establishes the Added Worker Effect (AWE) as a dominant in Ghana.
Donkor et al. (2016)	Ghana	Heckman two-stage sample selection model combined with a logit first stage and OLS for second stage	Men increase labour supply when spouses withdraw; women show no comparable adjustment.	Highlights the asymmetrical nature of the compensatory response in Ghana.

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CHAPTER FOUR

METHODOLOGY AND ANALYSIS OF EMPIRICAL RESULTS

This chapter presents the theoretical framework, empirical strategy, and analysis of results on spousal labour supply in Ghana. It begins by establishing a Conceptual Model based on the individual utility-family budget constraint framework, which provides the mathematical foundation for the study. The chapter then details the data source and sampling design, describing the use of the Annual Household Income and Expenditure Survey (AHIES) and justifying the sample restrictions based on Ghana's legal marriage and employment age. The chapter also details the Estimation Strategy, justifying the use of random effects negative binomial model to address the skewed, count-data nature of weekly hours worked and the presence of overdispersion. To ensure the credibility of the findings, a fixed effects Poisson model is introduced as a robustness check to control for unobserved household-level heterogeneity. Finally, the chapter provides a descriptive profile of the AHIES dataset and discusses the empirical findings, segmented by the gender of the household head to capture the distinct dynamics of labour supply in male- and female-headed households.

4.1 The Conceptual Model

This study adopts the individual utility-family budget constraint framework as formulated by Ashworth and Ulph (1981) to examine spousal labour supply responses to the household head's health. In this framework, the spouse maximizes utility defined over household consumption and leisure, subject to a shared budget constraint. Consumption is treated as a common household good, while leisure remains private. This model suggests that the spouse's labour supply is not determined in isolation but is influenced by household conditions.

The spouse's utility function is represented as:

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$U_s = U(C, L_s, e_s)$ ..... (1)

where:

C= family consumption (aggregate of both spouse and household head's consumption)

L_s = leisure of the spouse

e_s= represents the unobservable tastes unique to each spouse, allowing the model to realistically account for individual differences not captured by observable data.

The spouse chooses how to allocate the fixed time T between hours of work (H_s) and non-work activities, leisure (L_s) such that:

$T = H_s + L_s$ ..... (2)

The family budget constraint is expressed as:

$\sum_{j=1}^{m} p_j C_j = \sum_{i=1}^{n} w_i H_i + V_f$ ..... (3)

Restricting it to couples, both married or cohabiting, n=2, the family budget constraint becomes:

$\sum_{j=1}^{m} p_j C_j = w_h H_h + w_s H_s + V_f$ ..... (4)

Where:

$H_s = T - L_s$ and

$C = C_s + C_h$

C_h - household head's consumption

C_s- spouse's consumption

The direct approach to finding the spouse's labour supply function is to maximize his or her utility function, $U_s = U(C_s, L_s, e_s)$ subject to the budget constraint, $\frac{w_h}{p} H_h + \frac{w_s}{p} H_s + \frac{V_f}{p} \geq C$

The Lagrangian expression is:

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$$Q = U(C, L_s, e_s) + \lambda\left(\frac{w_h}{p}H_h + \frac{w_s}{p}H_s + \frac{V_f}{p} - C\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Assuming an interior optimum (spouse is choosing a basket that contains positive quantities of all goods), the first order conditions are:

$$Q_C = U_C(C, L_s, e_s) - \lambda = 0 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

The spouse chooses consumption so that the extra satisfaction from consuming one more unit equals the shadow value of household resources (λ). The shadow value shows how much the spouse's well-being would increase if the household had one more unit of resources. In other words, the spouse consumes until the benefit of an additional unit of consumption matches the value of that unit, given the household's budget constraint.

$$Q_{L_s} = -U_{L_s}(C, L_s, e_s) + \lambda\frac{w_s}{p} = 0 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

The spouse optimally allocates time between labour and leisure by equating the marginal disutility of foregoing one additional unit of leisure with the marginal utility of consumption generated by an additional unit of work. That is, the spouse supplies labour until the utility loss from reduced leisure is exactly offset by the utility gain from the additional consumption that the labour effort enables.

$$L_\lambda = \frac{w_h}{p}H_h + \frac{w_s}{p}H_s + \frac{V_f}{p} - C = 0 \quad \ldots\ldots\ldots\ldots\ldots\ldots (8)$$

This condition enforces the household budget constraint. It ensures that total household consumption does not exceed the sum of labour income from the head and spouse, plus family resources. It guarantees that the spouse's consumption and labour decisions are feasible given the household's limited resources.

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The first-order condition for a constrained maximum requires that consumption of commodities and hours of leisure be chosen such that the marginal rate of substitution (MRS) of leisure hours for commodities equals the real wage.

From equation (7) and (8) we have;

$$MRS = \frac{U_{L_S}(C,L_S)}{U_C(C,L_S)} = \frac{w_s}{p} \quad \text{..... (9)}$$

The spouse adjusts labour and consumption so that the rate at which the spouse is willing to trade leisure for consumption equals the real wage. This captures the optimal balance between work and leisure (non-work activities): as the wage rises, leisure becomes more "expensive," and the spouse may choose to supply more labour.

The reduced-form consumption and labour supply equations are expressed as:

$$C = f(w_h/p,\ w_s/p, V_f/p, T, H_h, e) \quad \text{..... (14)}$$

$$H_s = H_s(w_h/p, w_s/p, V_f/p, T, H_h, e) \quad \text{..... (15)}$$

This study incorporates a set of observed characteristics, denoted by Z, to capture more accurately the factors shaping decisions. Given that the study focuses on spouses' labour supply decisions, Z centres primarily on spouse-specific attributes, including age, religious affiliation, education, marital status (whether legally married or cohabiting), and educational attainment. Also, recognizing the critical role of the household head's health in influencing household resource allocation, selected characteristics of the household head are included. Specifically, the head's health status, health insurance ownership and education level are incorporated as they are expected to affect not only the head's productivity but also the household's overall consumption and labour allocation decisions.

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The reduced form consumption and labour supply equations taking into account Z are:

$Cs = f((w_h/p), (w_s/p), (V_f/p), Z, T, H_h, e)$ ..... (16)

$Hs = g((w_h/p), (w_s/p), (V_f/p), Z, T, H_h, e)$..... (17)

The corresponding empirical model (random effects negative binomial model) used to estimate the effect of household head's health on spousal labour supply is specified as:

$$E(\text{weeklyhrsworked}_{sit}|H_{ht}, X_{sit}) =$$

$$\exp[\ \beta_0 + \beta_1(\text{head_severityill}health + \beta_2(unhealthy_{sit}) +$$

$$\beta_3(househead_insured_{it}) + \beta_4(edugrouped_{sit}) + \beta_5(rel_deno_{sit}) +$$

$$\beta_6(region_{sit}) + \beta_7(urbrur_{sit}) + \beta_8(maritalgrouped_{sit}) + \beta_9(age_{sit}) +$$

$$\beta_{10}(agesq_{sit}) + \beta_{11}(ethnicity_{sit}) + \beta_{12}(qtr_{it}) + \beta_{13}(\text{head_edugrouped}_{it}) +$$

$u_i]$

Where, u_i = random household effect

4.2 Estimation Strategy

This study adapts the methodology of Jolly and Theodoropoulos (2023) but tailors it to the Ghanaian context and the limitations of self-reported health data. Jolly and Theodoropoulos (2023) highlighted several potential sources of bias in health-labour research. Justification bias arises when respondents exaggerate poor health to explain labour market outcomes. In this study, this concern is minimal because the spouse, who is the unit of analysis does not report on the household head's health; health information is provided directly by the head, and spouses are linked to the head through the relationship-to-head variable. As a result, spouses cannot use the head's health as an excuse for their labour supply decisions.

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Even though respondents reported doctor-diagnosed conditions in Jolly and Theodoropoulos (2023), measurement error remained a concern. Respondents could fail to report the exact diagnosis, misremember the timing, or omit certain conditions. In the AHIES data used for this research, health is self-reported as a binary variable, healthy, when respondents reported no illness or injury, and unhealthy when otherwise. A limitation of this measure is that it relies on respondents' subjective assessment rather than clinical diagnosis, which may introduce reporting bias and measurement error. Also, the AHIES dataset does not capture data on the type of illness. Respondents might indicate as "unhealthy" on a day when they simply feel off, or claim "healthy" despite feeling unwell to demonstrate strength. Such reporting behaviours can create inaccuracies in capturing true health status and potentially affect estimates. However, research has shown that self-reported health measures can be a reliable and substantial indicator of actual health status (DeSalvo et al., 2006; Schnittker & Bacak, 2014).

Omitted variable bias arises when the measured health variable does not fully capture all dimensions of health that influence spousal labour supply. Jolly and Theodoropoulos (2023) highlighted that even self-reported, medically diagnosed conditions may not reflect the severity or functional limitations associated with an illness. Two individuals with the same diagnosis could experience very different restrictions on daily activities, leading to heterogeneous labour supply responses. Failing to account for these unobserved aspects of health can bias estimates, as the effect of unmeasured health dimensions may be incorrectly attributed to the observed health measure.

In the AHIES dataset, health is reported as a binary variable (healthy or unhealthy). To minimize the possibility of omitted variable bias, this study constructs a severity variable (head_severityillhealth) derived from the survey question asking respondents who report being

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unhealthy whether they had to stop their usual activities due to illness or injury. The variable is coded as follows:

- 0 if the household head is healthy and therefore has no health-induced destruction in usual activities.
- 1 if the household head is unhealthy but continued their usual activities and
- 2 if the household head is unhealthy and had to stop usual activities.

Another concern in analysing the effect of the household head's health on spousal labour supply is potential endogeneity. Endogeneity may occur if unobserved factors influence both the household head's health and the spouse's labour supply. One key concern is assortative mating. Individuals may form households with partners who have similar characteristics. In this case, a spouse's lower labour supply could reflect their own poor health rather than the poor health of the household head. To mitigate this concern, the spouse's own health status is included as a control, separating the effect of the head's health from the spouse's health.

In Jolly and Theodoropoulos (2023), the analysis of spousal labour supply was based on OLS regression, using only positive weekly hours worked. Respondents reporting zero hours were excluded from the sample. In this study, zero hours are retained for two reasons. First, some employed spouses reported zero hours, which could reflect sick leave, annual leave, or seasonal employment. Second, the AHIES question on total hours worked in the past seven days was asked only of employed spouses, so unemployed spouses did not provide responses. To capture the full labour force, unemployed spouses are assigned zero hours worked. Retaining these observations allows the model to account for both employed and unemployed spouses, consistent with the definition of labour supply as encompassing all individuals in the labour force.

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Swaying away from the OLS estimation technique used by Jolly and Theodoropolos (2023), this study follows the approach of Baah-Boateng et al. (2021) by modelling weekly hours worked as a count variable. In the AHIES data, just as in the case of the Ghana Living Standards Survey (GLSS) data used by Baah-Boateng et al. (2021), the distribution of the weekly hours worked variable is skewed. OLS is not appropriate for weekly hours worked in these datasets because the variable consists of non-negative whole numbers and is skewed. Under these conditions, OLS can produce impossible negative predictions, inefficient estimates and unreliable standard errors. Count-data models such as Poisson and negative binomial are better suited, as they account for the discrete, non-negative nature of the data and provide consistent, interpretable estimates of expected weekly hours.

The major difference between the GLSS dataset and the AHIES dataset is that the former is cross-sectional while the latter is panel. Since the dependent variable, weekly hours worked, is a count variable. The analysis begins with a Poisson regression model. However, overdispersion tests revealed that the variance exceeded the mean, violating the assumptions of the Poisson distribution. Ignoring overdispersion can lead to underestimated standard errors and inflated significance levels. A likelihood ratio (LR) test of the dispersion parameter ($\alpha = 0$) confirmed overdispersion. For female-headed households, the LR test yielded $chibar^2(01) = 2{,}823.29$, $p < 0.001$, while for male-headed households, $chibar^2(01) = 66{,}000$, $p < 0.001$, indicating substantial overdispersion in both cases. These findings justify the use of the negative binomial regression model, which accounts for overdispersion unlike the Poisson model.

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Based on this conclusion, the study employs a random-effects negative binomial model (xtnbreg, re) as the main estimation strategy. Although Stata offers a fixed-effects negative binomial estimator, studies by Allison and Waterman (2002), Guimarães (2008) and Hilbe (2011) indicate that it is not a true fixed-effects model and does not fully control for unobserved household-level heterogeneity. For this reason, the random effects negative binomial model is estimated as the main model. To confirm the reliability of the negative binomial results, a fixed effect Poisson regression model with robust standard errors is estimated as a robustness check. The use of robust standard errors enables the Poisson estimator to produce consistent results under mild overdispersion, making it a suitable model for verifying the stability of the main findings. The consistency in coefficient signs and levels of statistical significance across the two models strengthens confidence in the robustness of the baseline results. All regressions include quarterly dummies to capture seasonal and macroeconomic effects, along with controls for the spouse's age group, education, region, urban or rural residence, religion, ethnicity and religious denomination. These controls ensure that the estimated effect of the household head's health reflects within-household variation rather than confounding from time-varying external factors.

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4.3 Data

This study's analysis relies on data from the Annual Household Income and Expenditure Survey (AHIES) 2022/2023, conducted by the Ghana Statistical Service. The AHIES is a nationally representative survey that provides detailed information on demographic characteristics, household income and expenditure, labour market participation, and other socio-economic indicators. The study models two household types to capture differences in spousal labour supply when the household head is ill or injured: male-headed households, where the female is the spouse to the head, and female-headed households, where the male is

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the spouse to the head. Only monogamous households are included in the sample in order to establish a clear link between household heads and their corresponding spouses. This restriction avoids ambiguity that could arise in polygamous households, where more than one spouse is present.

To ensure that the analysis directly reflects the objectives of the study, the sample is restricted along specific dimensions. First, the data is limited to individuals of the opposite sex in married or cohabiting unions. Since the dataset lacks unique spouse identifiers, spouses of household heads and household heads themselves are identified based on their reported relationship to the household head. Only individuals identified as household heads or spouses of household heads were retained for analysis. Again, due to the absence of spousal codes, couples residing in separate households are not captured. Also, only household heads who were employed were retained, as any illness affecting them can directly influence household income and potentially trigger labour supply responses from the spouse, consistent with the added-worker effect theory. Finally, the study would have typically considered individuals aged 15 years and older, as this is the standard definition of the economically active population. However, since the focus is on married and cohabiting couples in Ghana, the target sample is restricted to persons aged 18 years and above. This adjustment aligns with Ghana's legal provisions, where both the 1992 Constitution and the 1998 Children's Act set the minimum legal age for marriage or cohabitation at 18 years for both girls and boys.

4.4 Expected Results of Regression Variables.

The analysis is stratified by the gender of the household head to capture gender-specific dynamics in household labour allocation. Two separate models are estimated: one for male-

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headed households (where the spouse is female) and another for female-headed households (where the spouse is male).

This stratification acknowledges that gender roles, social norms, and household power dynamics can shape how different factors influence labour supply decisions. For instance, women's participation and working hours may be more sensitive to household income security and caregiving responsibilities, whereas men's hours worked may respond more strongly to economic opportunities and productivity incentives.

Dependent Variable

The dependent variable in both models is the number of hours worked by the spouse, measured as the total number of hours the spouse reports working in a typical week.

Key Explanatory Variables

The health status of the household head (head_severityillhealth) is a categorical variable coded 0 if the head is healthy and therefore has no health-related interactions in usual activities, 1 if the household head reports being in poor health but is able to continue usual activities, and 2 if the head reports poor health that causes him or her to stop usual activities.

Relative to the healthy reference group, if the head is unhealthy but continues usual activities, the spouse's labour supply is expected to be largely unaffected. If the head is unhealthy and cannot continue usual activities, the spouse's labour supply may either increase to compensate for lost income or decrease due to caregiving responsibilities, making the expected effect ambiguous.

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The health status of the spouse (Healthy) is a dummy variable equal to 1 if the spouse reports being in good health and 0 otherwise. A healthier spouse is more physically able to participate in labour market activities and sustain longer working hours. Conversely, an unhealthy spouse may face limitations that reduce labour market participation. Therefore, the expected sign of the health status variable is positive for a healthy spouse, indicating a higher likelihood of labour supply, and negative for an unhealthy spouse, associated with lower labour supply.

Insurance ownership of the household head (household_Insured) is a dummy variable equal to 1 if the household head is insured, and 0 if otherwise. The presence of insurance coverage may provide a form of financial security to the household by reducing exposure to unexpected medical costs. This protection can help stabilize household income and consumption patterns, even in the absence of illness. Consequently, insurance ownership may influence the spouse's labour market behaviour. On one hand, it may reduce the need for precautionary labour supply since the household is financially cushioned against potential health shocks, leading to a negative effect on the spouse's hours worked. On the other hand, the economic stability and confidence associated with insurance coverage may encourage greater labour force participation if the household perceives improved financial security and is able to pursue more productive opportunities. Hence, the expected sign of the effect of the household head's insurance ownership on the spouse's labour supply is ambiguous.

Other Control Variables

Education of spouse (Edugrouped) is a categorical variable grouped into four levels: no education, primary, secondary, and tertiary. Higher educational attainment is generally associated with greater human capital and access to formal sector employment opportunities. Education also enhances productivity, which together increases the likelihood of labour market

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participation. Therefore, the expected effect of education on the spouse's labour supply is positive.

Religious denomination of the spouse (rel_deno) is a categorical variable that captures the spouse's religious affiliation. Religious beliefs and norms can shape attitudes towards some forms of work. Certain denominations may promote gender equality and encourage women's economic engagement, while others may emphasize traditional domestic roles and household responsibilities. Consequently, the expected effect of religious denomination on the spouse's labour supply is indeterminate, as it depends on the specific values and teachings associated with each religious group.

Region of residence (region) is a categorical variable that indicates the administrative region in which the household reside. Regional disparities in economic structure, labour market opportunities, infrastructure, and access to services can influence the number of hours the spouse works. Spouses in more economically vibrant regions may have access to more stable working hours, while those in less developed regions may be limited to seasonal or informal work with fewer hours. Therefore, the expected effect of region on the spouse's hours worked is ambiguous, depending on the level of economic development and employment opportunities within each region.

Urban-rural status (urbrur) is a dummy variable equal to 1 if the household resides in an urban area and 0 if rural. Urban areas generally provide more diverse and structured employment opportunities, particularly in the formal sector, compared to rural areas where economic activity is often informal and seasonal. Hence, the expected effect of urban residence on the spouse's hours worked is positive.

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Marital Status of Spouse (Maritalgrouped) is a dummy variable distinguishing between spouses in formal or customary marriages and those in cohabiting unions. The analysis is restricted to married and cohabiting couples only. Within this group, differences in the nature of the union may influence labour supply behaviour. Formal or customary marriages are often associated with stronger legal, social, and financial security, which may reduce the spouse's need to supply additional hours of work. Conversely, cohabiting unions may provide less economic stability, potentially increasing the spouse's need to work longer hours to ensure financial independence. Therefore, the expected effect of being in a formal marriage on the spouse's hours worked is expected to be negative on spousal labour supply, relative to being in a cohabiting union.

Age of spouse (age) is measured in completed years, and agesq is the square of age variable. The squared term is included to capture potential non-linearities in the relationship between age and weekly hours worked. Age serves as a proxy for work experience, physical capacity, and life-cycle stage. At younger ages, individuals are typically building experience and establishing themselves in the labour market, whereas at older ages, declining health, higher reservation wages, and proximity to retirement may reduce labour supply. Including both age and its squared term allows the model to capture this inverted U-shaped relationship between age and labour supply. Empirical evidence supports this life-cycle pattern. Humpert (2012) finds that reservation wages increase with age, leading to lower employment at older ages. Similarly, Opoku et al. (2025) document a hump-shaped relationship between age and labour participation. The coefficient of age is therefore expected to be positive, while that of agesq is expected to be negative.

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Ethnicity is a categorical variable representing the spouse's ethnic background. Cultural norms, traditions, and social expectations associated with different ethnic groups may influence individuals' attitudes toward work and household roles. These cultural factors can shape the extent and intensity of labour market engagement, thereby affecting the spouse's number of hours worked. The expected effect of ethnicity on hours worked is ambiguous, as it depends on the specific cultural and socio-economic attributes of each ethnic group.

Education of household head (Househead_edugrouped) is a categorical variable grouped into four levels: no education, primary, secondary, and tertiary. A more educated head may command higher earnings, generating an income effect that reduces the spouse's need to work long hours. However, higher education may also reflect more egalitarian household values and encourage a dual-earner structure, leading to an increase in the spouse's hours worked. Consequently, the expected effect of the household head's education on the spouse's hours worked is ambiguous.

Quarter of interview (qtr) is a categorical variable indicating the survey quarter in which the household was interviewed. This variable controls for seasonal variations in labour demand and supply, which are especially relevant in agricultural and informal sector employment. Fluctuations across quarters may reflect differences in economic activity, climatic conditions, or market opportunities. Therefore, the expected effect of the quarter of interview on the spouse's hours worked is indeterminate and will be determined empirically.

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Table 4.4. 1 Variables, Definitions, and Expected Signs

Variable	Definition	Expected Sign
headunhealthyseverity	Categorical: grouped into health effect on usual activities	+/- (disruption) and no effect (for no disruption)
Spouse Unhealthy	Dummy =1 if spouse is in poor health	−
Head Insured	Dummy =1 if head owns health insurance	+/−
Education (Spouse)	Categorical: grouped years of schooling	+
Education (Head)	Categorical: grouped years of schooling	+/−
Marital Status	Dummy =1 if married,0 if cohabiting	+/−
Age	Spouse's age in complete years	+
Age²	Squared age term	−
Ethnicity	Ethnic group dummies	+/−
Religion	Denomination dummies	+/−
Region	Regional dummies	+/−
Urban/Rural	Dummy =1 if urban	+
Quarter (Time)	Survey quarter (time fixed effects).	Undetermined

4.5 Descriptive Statistics of Regression Variables

The data from Tables 4.5.1 and 4.5.2 show that male-headed households (33,510) are far more prevalent than female-headed households (1,603). This is expected, as men are traditionally regarded as the primary earners and, consequently, the household heads in many Ghanaian families. On average, female spouses in male-headed households work 28.7 hours per week,

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whereas male spouses in female-headed households work 35.1 hours per week. This indicates that male spouses in female-headed households tend to work longer hours than their female counterparts in male-headed households, possibly because women are more likely to allocate time away from paid work to caregiving and domestic responsibilities. The range of hours worked, however, shows a more varied pattern among female spouses. Weekly working hours among female spouses range from 0 to 112 hours, compared to 0 to 98 hours for male spouses.

Table 4.5. 1 Descriptive statistics for continuous regression variables in male-headed households. (females are spouses and not heads)

Variable	Obs	Mean	Std. dev.	Min	Max
Spousal weeklyhrswrkd	27,329	28.69842	16.61384	0	112
age	33,510	38.89752	10.91995	18	99

Table 4.5. 2 Descriptive statistics for continuous regression variables in female-headed households. (males are spouses but not heads)

Variable	Obs	Mean	Std. dev.	Min	Max
Spousal weeklyhrswrkd	1,396	35.12894	17.10019	0	98
age	1,603	47.58203	11.45332	22	88

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The existence of spouses reporting zero hours suggests some level of non-participation or temporary withdrawal from the labour force, while the very high upper limits, particularly among female spouses may reflect engagement in extended work activities. Such patterns are often observed in the informal sector, where working hours tend to be unregulated, and individuals may combine several income-generating activities to sustain household livelihoods. In terms of age, male spouses in female-headed households are, on average, older (47.6 years) than female spouses in male-headed households (38.9 years). This difference suggests that female-headed households are more common among older age groups. These might be unions

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where women have attained greater economic stability, autonomy, or seniority, allowing them to be recognized as heads. Notably, while the data only capture individuals aged 18 years and above, the youngest female spouse in male-headed households is 18 years old, compared to 22 years for the youngest male spouse in female-headed households. This suggests that women are more likely to enter marriage or spousal roles at younger ages. Such early transitions into marital roles can have long-term implications for women's labour market participation, as young women may face greater domestic and caregiving responsibilities that limit their ability to engage fully in paid employment, especially during their most productive years, unlike their male counterparts who are more likely to remain continuously active in the labour force with minimal interruptions to their economic activities and career progression.

Table 4.5. 3 Descriptive statistics for categorical regression variables in male and female-headed households

	Male-headed Households			Female-headed Households		
Variable	Freq.	Percent	Cum.	Freq.	Percent	Cum.
head_severityillhealth						
Healthy	28,677	85.58	85.58	1,243	77.54	77.54
Unhealthy but continued activities	1,981	5.91	91.49	154	9.61	87.15
Unhealthy and stopped activities	2,852	8.51	100	206	12.85	100
unhealthy						
healthy	27,804	82.97	82.97	1,447	90.27	90.27
unhealthy	5,706	17.03	100	156	9.73	100
househead_insured						
no	11,337	44.88	44.88	535	36.42	36.42
yescovered	13,921	55.12	100	934	63.58	100
edugrouped						
no education	10,446	31.2	31.2	168	10.48	10.48
primary	17,598	52.56	83.77	985	61.45	71.93
secondary	3,530	10.54	94.31	253	15.78	87.71
tertiary	1,895	5.66	99.97	191	11.92	99.63
other	10	0.03	100	6	0.37	100
rel_deno						
No religion/other	566	1.69	1.69	217	13.54	13.54
christian	22,566	67.34	69.03	1,093	68.18	81.72
islam	8,876	26.49	95.52	237	14.78	96.51
traditionalist	1,502	4.48	100	56	3.49	100

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Table 4.5.3 (continued)

	Male-headed Households			Female-Headed Households		
Variable	Freq.	Percent	Cum.	Freq.	Percent	Cum
region						
Western	2,109	6.29	6.29	103	6.43	6.43
Central	2,319	6.92	13.21	161	10.04	16.47
Greater Accra	2,364	7.05	20.27	139	8.67	25.14
Volta	1,596	4.76	25.03	235	14.66	39.8
Eastern	2,448	7.31	32.34	234	14.6	54.4
Ashanti	3,239	9.67	42	211	13.16	67.56
Western North	1,968	5.87	47.88	117	7.3	74.86
Ahafo	1,619	4.83	52.71	117	7.3	82.16
Bono	1,545	4.61	57.32	65	4.05	86.21
Bono East	2,067	6.17	63.49	52	3.24	89.46
Oti	2,166	6.46	69.95	26	1.62	91.08
Northern	2,730	8.15	78.1	10	0.62	91.7
Savannah	1,831	5.46	83.56	34	2.12	93.82
North East	1,822	5.44	89	14	0.87	94.7
Upper East	1,880	5.61	94.61	43	2.68	97.38
Upper West	1,807	5.39	100	42	2.62	100
urbrur						
rural	18,725	55.88	55.88	669	41.73	41.73
urban	14,785	44.12	100	934	58.27	100
maritalgrouped						
living together	4,621	13.79	13.79	508	31.69	31.69
married	28,889	86.21	100	1,095	68.31	100
Ethnicity						
Akan	11,557	34.92	34.92	819	52.07	52.07
Ga-Dangme	1,358	4.1	39.03	71	4.51	56.58
Ewe	3,898	11.78	50.81	368	23.39	79.97
Guan	1,196	3.61	54.42	36	2.29	82.26
Gurma	3,541	10.7	65.12	39	2.48	84.74
Mole-Dagbani	8,510	25.72	90.84	163	10.36	95.1
Grusi	1,004	3.03	93.87	37	2.35	97.46
Mande	554	1.67	95.55	8	0.51	97.97
All Other Tribes (Hausa, Baribari, Zabr)	1,473	4.45	100	32	2.03	100
househead_edugrouped						
no education	7,750	23.14	23.14	317	19.78	19.78
primary	16,804	50.17	73.31	1,058	66	85.78
secondary	5,153	15.39	88.7	134	8.36	94.14
tertiary	3,759	11.22	99.92	94	5.86	100
other	27	0.08	100			

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Table 4.5.3 presents the descriptive statistics of key variables of household heads and their spouses in female-headed households (FHHs) and male-headed households (MHHs). The analysis distinguishes between three key explanatory variables related to the household head: health status, education level, and National Health Insurance Scheme (NHIS) coverage, as well as several variables related to the spouse of the head, including health status, education, religion, urban-rural residence, marital status, and ethnicity.

4.5.1 Household Head's Variables

The health status of household heads, measured by the variable head_severityillhealth, highlights differences between female- and male-headed households. The question of whether the head stopped usual activities serves as a practical and intuitive proxy for capturing illness severity, distinguishing between mild and severe health events even in the absence of detailed clinical measures or illness breakdowns. This approach aligns with Jolly and Theodoropoulos (2023), who emphasize that the severity of health events strongly influences labour supply adjustments. In female-headed households, 77.54% of heads are reported as healthy, 9.61% are unhealthy but continue their usual activities, and 12.85% are unhealthy and have had to stop their activities. By comparison, male-headed households report a higher proportion of healthy heads at 85.58%. Overall, female-headed households exhibit a larger share of heads experiencing health limitations, with 22.46% of female heads classified as unhealthy (combining those who continue usual activities and those who stop due to ill health), compared to 14.42% of male heads. Additionally, the proportion of heads who had to stop their usual activities is higher among female-headed households (12.85%) than male-headed households (8.51%), suggesting that health disruptions among female heads are more likely to interfere with usual activities.

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In terms of education, female heads are predominantly concentrated at the primary level, with 66% completing primary education, 19.78% without formal education, 8.36% with secondary education, and 5.86% with tertiary education. Male heads show a broader distribution of educational attainment, with 50.17% at the primary level, 23.14% without formal education, 15.39% with secondary education, and 11.22% with tertiary education. This pattern suggests that male heads have higher levels of formal education than female heads. Data from Tables 8 to13 further show that a larger proportion of female heads have access to health insurance relative to male heads. Specifically, enrolment in the scheme was 63.58% among female heads, compared to 55.12% among male heads. This is consistent with findings in Ghana showing that females, particularly due to policies like the Free Maternal Health Policy under the NHIS, are more likely to enrol in health insurance than males.

4.5.2 Spouse's Variables

The religious composition of spouses differs between female and male-headed households. Among male spouses in female-headed households, 68.18% identify as Christian, 14.78% as Muslim, 3.49% as Traditionalist, and 13.54% report no religion or other religions. In male-headed households, 67.34% of female spouses are Christian, 26.49% Muslim, 4.48% Traditionalist, and 1.69% report no religion or other. Christianity is the most common religion in both household types, consistent with Ghana's religious distribution. Male-headed households have a higher proportion of Muslim spouses compared to female-headed households, while female-headed households have a larger share of spouses reporting no religion or other religions.

Analysis of urban-rural residence shows that 58.27% of male spouses in female-headed households live in urban areas, while 41.73% reside in rural areas. Conversely, 55.88% of

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female spouses in male-headed households reside in rural areas, with 44.12% in urban areas. Since the dataset includes only households in which both the head and spouse live together, these figures suggest that female-headed households are more concentrated in urban areas, whereas male-headed households are more prevalent in rural settings. The predominance of male-headed households in rural areas reflects longstanding traditional and agrarian lifestyles, while the urban concentration of female-headed households is likely influenced by social and economic factors common in urban environments.

The educational distribution of spouses also differs by household type. Spouses (male) in female-headed households have 61.45% with primary education, 10.48% with no education, 15.78% secondary education, 11.92% tertiary education, and 0.37% other. Spouses (female) in male-headed households have 52.56% with primary education, 31.20% with no education, 10.54% secondary education, 5.66% tertiary education, and 0.03% other. This highlights that male spouses generally have higher levels of education than female spouses. The data also shows a clear gendered pattern in education. Whether the male is the household head (male-headed households) or the spouse of the household head (female-headed households), he tends to have higher educational attainment than the female. This is largely evident in the greater proportions of males with secondary and tertiary education. In female-headed households, 15.78% of male spouses have secondary education and 11.92% have tertiary education, compared to 8.36% and 5.86% of female heads. Similarly, in male-headed households, 15.39% of male heads have secondary education and 11.22% have tertiary education, compared to 10.54% and 5.66% of female spouses. In both household types, females are more concentrated in primary or no education categories. The disparity in educational outcomes highlights gender inequalities in educational access, influenced by cultural expectations and historical barriers that have disproportionately affected women.

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Female-headed households (FHHs) and male-headed households (MHHs) are represented across all regions of Ghana, though their regional concentrations differ substantially. Among female-headed households, 6.43% are situated in Western, 10.04% in Central, 8.67% in Greater Accra, 14.66% in Volta, 14.60% in Eastern, 13.16% in Ashanti, 7.30% in Western North, 7.30% in Ahafo, 4.05% in Bono, 3.24% in Bono East, 1.62% in Oti, 0.62% in Northern, 2.12% in Savannah, 0.87% in North East, 2.68% in Upper East, and 2.62% in Upper West. Male-headed households are more evenly distributed across the country, with Northern at 8.15%, Savannah 5.46%, Upper East 5.61%, and Upper West 5.39%, while other regions such as Greater Accra (7.05%), Eastern (7.31%), and Ashanti (9.67%) also have substantial shares. In regions with higher household concentrations, such as Ashanti, Eastern, and Greater Accra, the proportions of female-headed and male-headed households vary. In Eastern and Ashanti, female-headed households account for a larger share than male-headed households (Eastern: 14.60% compared to 7.31%; Ashanti: 13.16% compared to 9.67%), while in Greater Accra, the proportions are roughly comparable (8.67% compared to 7.05%). The regional distribution of household types largely reflects patterns of urbanization and economic activity across the country.

Marital status differs between female- and male-headed households. In female-headed households, 68.31% of spouses are married to the household head, while 31.69% are living together with the head. In male-headed households, 86.21% of spouses are married to the household head, and 13.79% are living together. The figures indicate that formal marriage between the household head and the spouse is more common in male-headed households, whereas cohabiting arrangements are more common in female-headed households. The differences reflect social and cultural patterns in household formation. In many Ghanaian

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communities, once a man is married to a woman, societal norms typically recognize him as the household head. Male-headed households therefore have a higher proportion of formally married co-residing couples, while female-headed households have a relatively higher proportion of cohabiting couples.

The composition of ethnic groups differs between female- and male-headed households. In both household types, the Akan group is the largest, accounting for 52.07% of female-headed households and 34.92% of male-headed households. Among female-headed households, the next largest groups are Ewe (23.39%) and Mole-Dagbani (10.36%), while other groups, including Ga-Dangme (4.51%), Guan (2.29%), Gurma (2.48%), Grusi (2.35%), Mande (0.51%), and all other tribes (2.03%), account for smaller shares. In male-headed households, the distribution is more evenly spread beyond the Akan group. Mole-Dagbani represents 25.72%, Ewe 11.78%, Gurma 10.7%, Ga-Dangme 4.1%, Guan 3.61%, Mande 1.67%, and other tribes 4.45%. The data show that while Akan households dominate both household types, female-headed households are more concentrated among Akan and Ewe ethnicities, whereas male-headed households have a higher representation of Northern ethnic groups, such as Mole-Dagbani and Gurma.

INTEGRI PROCEDAMUS

4.6 Presentation of Empirical Results For male-headed households (female is the spouse to the head)

This section presents the results of the random-effects negative binomial and the fixed effect poison models used to investigate how the health status of male household heads affects the labour supply of their spouses. The results are expressed as incidence rate ratios (IRRs).

An IRR measures how a variable influences the outcome, in this case the number of weekly hours worked by female spouses:

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IRR = 1: no change relative to the reference group.

IRR > 1: an increase relative to the reference group.

IRR < 1: a decrease relative to the reference group.

To convert IRRs into percentage changes:

$(\text{IRR} - 1) \times 100, \text{where IRR} = e\text{^}\beta$

For interactions between variables, such as head health and insurance, the total effect on labour supply is obtained by multiplying the main effects and the interaction effect:

$\text{IRR_total} = \text{IRR_main 1} \times \textit{IRR_main 2} \times \text{IRR_interaction}$

The resulting IRR_total is then converted into a percentage using the same formula.

Table 4.6. 1 Results of Spousal Labour Supply Function of Male Headed Households: Random Effects Negative Binomial Model

weeklyhrsworked	IRR	Std. err.	P>z
head_severityillhealth			
Unhealthy but continued activities	0.924337	0.026105	0.005**
Unhealthy and stopped activities	0.939226	0.022472	0.009*
househead_insured			
no	0.942523	0.009787	0.000***
head_severityillhealth#househead_insured			
Unhealthy but continued activities#no	1.136119	0.04675	0.002**
Unhealthy and stopped activities#no	1.04121	0.037251	0.259
unhealthy			
unhealthy	0.894348	0.012314	0.000***
edugrouped			
no education	0.950134	0.024712	0.049**
primary	0.988343	0.022944	0.613
secondary	0.994234	0.024573	0.815
other	1.027937	0.217786	0.897
rel_deno			
christian	0.964249	0.040832	0.39
islam	0.980863	0.043199	0.661
traditionalist	0.983396	0.047937	0.731
region			
Central	0.919143	0.02505	0.002**
Greater Accra	1.164725	0.032078	0.000***
Volta	0.922001	0.032189	0.02**

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Eastern	0.940733	0.024457	0.019**
Ashanti	0.997889	0.023702	0.929
Western North	0.833894	0.022739	0.000***
Ahafo	0.945033	0.026525	0.044**
Bono	0.797181	0.022461	0.000***
Bono East	0.921846	0.025888	0.004**
Oti	0.897726	0.027598	0.000***
Northern	0.982663	0.028127	0.541
Savannah	1.018829	0.034132	0.578
North East	0.782732	0.023661	0.000***
Upper East	0.918777	0.027564	0.005**
weeklyhrsworked	IRR	Std. err.	P>z
Upper West	0.894627	0.027161	0.000***
urbrur			
urban	1.09226	0.011699	0.000***
maritalgrouped			
married	1.053916	0.018441	0.003**
ethnicity			
Ga-Dangme	0.950709	0.027141	0.077*
Ewe	0.922369	0.02012	0.000***
Guan	0.896229	0.028577	0.001**
Gurma	0.964187	0.021727	0.106
Mole-Dagbani	0.980375	0.017811	0.275
Grusi	0.98133	0.031222	0.554
Mande	0.910621	0.038331	0.026*
Other Tribes (Hausa, Baribari, Zabrama)	0.999173	0.026927	0.976
househead_edugrouped			
no education	0.974607	0.021465	0.243
primary	0.968504	0.017596	0.078*
secondary	0.962786	0.018773	0.052*
other	1.082787	0.172019	0.617
age	1.036634	0.002988	0.000***
agesq	0.999593	3.27E-05	0.000***
qtr			
2022q2	1.169848	0.023841	0.000
2022q3	1.367003	0.02681	0.000
2023q4	1.86325	0.03435	0.000
2023q1	1.764867	0.033988	0.000
2023q2	1.847049	0.034294	0.000
2023q3	1.843167	0.033966	0.000
_cons	0.800042	0.063859	0.005
/ln_r	4.147411	0.150663	
/ln_s	6.677878	0.158446	
r	63.26998	9.532469	
s	794.6309	125.9064	

*, ** and *** refers to significance at 10%, 5% and 1% respectively

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Random effects negative binomial model	Number of observations =	20,170
	Number of groups =	5,149
	Log likelihood =	-85289.196
	Wald χ^2 (50) =	3598.87
	Prob>Chi2 =	0.0000

4.6.1 Effect of Main Explanatory Variables on Spousal Weekly Hours worked

The findings from the analysis of spouses in male-headed households indicate that the health and insurance status of the household head significantly influence spousal labour supply. Spouses of healthy but uninsured heads are expected to work 5.7% fewer hours per week than those whose heads are healthy and insured (IRR = 0.943, $p < 0.001$). This pattern suggests that insurance coverage for the household head may enable or incentivize the spouse to work more hours. A plausible explanation is that insurance reduces financial uncertainty and increases the household's capacity to take risks or invest in income-generating activities. This observation aligns with Boyle and Lahey (2016), who showed that expansions in government health insurance for husbands led wives to increase their labour supply. Their study suggests that financial incentives and the need to secure coverage for oneself can outweigh the complementarity of spousal leisure. The presence of insurance appears to encourage greater labour supply among spouses.

Spouses of heads who were unhealthy but continued their usual activities are expected to work about 7.6% fewer hours per week (IRR = 0.924, $p = 0.005$) compared to spouses of healthy and insured heads, while those whose heads stopped activities entirely are expected to work 6.1% fewer hours (IRR = 0.939, $p = 0.009$). This reduction in hours highlights the gendered nature of the care economy in Ghana, where women are culturally designated as the primary providers of unpaid domestic labour. Within the Ghanaian cultural context, the concept of 'the

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home' as a female domain means that when a male head falls ill, the burden of care falls almost exclusively on the spouse. This results in a 'time poverty' effect, where the woman must sacrifice formal labour hours to fulfill these non-market care obligations, reinforcing traditional gender norms that prioritize male productivity over female economic participation.

These results are consistent with international studies showing that spousal ill-health generally reduces female labour supply. For instance, Vega (2019) finds that women significantly reduce their labour supply when their husbands experience serious health events, such as cancer or strokes. Similarly, Fu et al. (2025) report that women's employment declines sharply and persistently following a spouse's disability. These findings are consistent with this study's observation that head ill-health constrains female spouses' labour supply.

In male-headed households, spouses' labour supply decisions respond to the health and work status of the household head. When the head is unhealthy but continues his usual activities, female spouses tend to reduce their labour supply, possibly due to caregiving responsibilities. However, when the head becomes unhealthy and is unable to continue his usual activities, the reduction in spouses' work hours is smaller. This pattern suggests a mild compensatory response, where female spouses slightly increase their labour effort to cushion the household against potential income losses. The compensatory behaviour becomes even more apparent when the interaction between the head's health status and insurance coverage is examined.

In line with the objective to investigate the moderating role of health insurance, this section analyzes the interaction effects between the head's health status and insurance coverage. The result reveals evidence of a partial compensatory labour response. When uninsured household heads are unhealthy but able to continue their usual activities, their female spouses are expected to work about 4.9% more hours per week compared to spouses of healthy and insured heads.

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This finding aligns with Fadlon and Nielsen (2015) and Kim et al., (2018), who report that surviving spouses or those in households facing chronic conditions may increase labour supply to offset income losses. Though these studies did not specifically focus on female spouses, the findings provide a general context for potential compensatory labour responses in households facing health disruptions.

For spouses of uninsured heads who were unhealthy and had stopped their usual activities, the estimated increase in hours worked is 4.1% relative to spouses of healthy and insured heads (IRR = 1.041, p = 0.259). However, this effect is not statistically significant, indicating insufficient evidence to conclude that these spouses increased their labour supply. Nonetheless, this finding is consistent with Fadlon and Nielsen (2015), who report that non-fatal health shocks do not lead to statistically significant changes in spousal labour supply.

4.6.2 Effect of Control Variables on Spousal Weekly Hours Worked

The health status of the spouses themselves significantly affects their labour supply. Spouses who report being unhealthy work about 10.6% fewer hours per week compared to their healthy counterparts (IRR = 0.894, $p < 0.001$). This indicates that poor health directly constrains their ability to participate fully in economic activities. This finding aligns with Cai and Kalb (2006) and Currie and Madrian (1999), who emphasize the negative effect of poor health on labour supply through reduced productivity and physical capacity.

Several socio-demographic and geographic factors also influence female spouses' labour supply. Age has a positive but diminishing effect on labour supply: each additional year of age increases weekly hours worked by approximately 3.7% (IRR = 1.037, $p < 0.001$). However, the negative coefficient on age squared (IRR = 0.9996, $p < 0.001$) indicates that this increase

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slows at higher ages. This likely reflects that younger and middle-aged women are more active in the labour market, but older women reduce their hours due to physical limitations or competing household responsibilities.

Marital status significantly affects labour supply. Female spouses who are married worked 5.4% more hours per week compared to those who are unmarried or in consensual unions (IRR = 1.054, p = 0.003), holding other factors constant. This may be because formal marital arrangements encourage higher labour contributions to support the household financially and manage daily responsibilities jointly with the male head.

Spouses living in urban areas worked 9.2% more hours per week than rural counterparts (IRR = 1.092, $p < 0.001$). This likely reflects greater availability of formal and informal employment opportunities in urban centres, as well as higher living costs that require additional labour contributions.

There are notable regional differences in spousal labour supply in male-headed households. Female spouses in Greater Accra worked 16.5% more hours per week compared to the Western (reference) region (IRR = 1.165, $p < 0.001$), possibly due to the concentration of jobs and economic activities in the capital region. Conversely, female spouses in Bono and North East regions worked 20.3% (IRR = 0.797, $p < 0.001$) and 21.7% (IRR = 0.783, $p < 0.001$) fewer hours, respectively, likely reflecting limited employment opportunities, lower economic activity, and higher dependence on subsistence agriculture in these areas.

Other socio-economic factors, such as ethnicity, education, religion, and seasonal effects (quarter of survey) had smaller or more inconsistent effects. These variables are included to ensure that the estimated effects of head health and insurance are not confounded, though their

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influence on labour supply may operate through cultural norms, skill levels, or seasonal labour demands.

4.6.3 Robustness Check

To assess the robustness of the main findings, the analysis compares the negative binomial (NB) model with a Poisson model using robust standard errors. In the NB model, spouses of heads who were unhealthy but continued their usual activities had an IRR of 0.924 ($p = 0.005$), corresponding to an expected 7.6% reduction in weekly hours, while those whose heads were unhealthy and stopped activities entirely had an IRR of 0.939 ($p = 0.009$), corresponding to a 6.1% reduction. In the Poisson model, the IRRs were 0.975 ($p = 0.324$) and 0.954 ($p = 0.042$), implying expected reductions of 2.5% and 4.6% in weekly hours worked, respectively. Although the expected reduction in weekly hours for spouses of heads who continued activities is not statistically significant in the Poisson model, the direction of the effect remains consistent: spousal labour supply declines when the household head is ill. This study finds that female spouses reduce their labour supply in response to the head's illness. These findings align with Vega (2019) and Fu et al. (2025), who found evidence of reduced labour supply among women following a spouse's illness.

For household head insurance, the NB model indicates that spouses of uninsured heads are expected to work approximately 5.7% fewer hours per week (IRR = 0.943, $p < 0.001$), while the Poisson model suggests a 3.7% reduction (IRR = 0.963, $p < 0.001$). This confirms that spousal labour supply is higher when the household head is insured, likely because insurance reduces financial uncertainty and allows households to invest in income-generating activities, consistent with Boyle and Lahey (2016).

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Regarding the interaction between head ill-health and insurance, the NB model suggests that female spouses of uninsured heads who were unhealthy but continued their usual activities are expected to increase labour supply by 13.6%, while those whose heads stop activities entirely are expected to increase labour supply by 4.1%; however, the latter is not statistically significant (IRR = 1.041, p = 0.259). In the Poisson model, the effects are smaller and also not statistically significant: female spouses of heads who are unhealthy but continue activities are expected to work 1.1% more hours per week (IRR = 1.0105, p = 0.787), and those whose heads stop activities are expected to work 0.2% fewer hours per week (IRR = 0.9985, p = 0.964). These results indicate that the apparent compensatory response observed in the NB model is sensitive to model specification.

Table 4.6. 2 Results of Spousal Labour Supply Function of Female-Headed Households: Random Effects Negative Binomial Model

weeklyhrsworked	IRR	Std. err.	P>z
head_severityillhealth			
Unhealthy but continued activities	0.9336632	0.0602	0.287
Unhealthy and stopped activities	1.009377	0.0534	0.860
head_severityillhealth#unhealthy			
Unhealthy but continued activities#unhealthy	0.95458	0.1698	0.794
Unhealthy and stopped activities#unhealthy	0.942421	0.1621	0.730
househead_insured			
no	0.9662924	0.0358	0.354
unhealthy			
unhealthy	0.7201034	0.0669	0.000***
edugrouped			
no education	0.9539492	0.0982	0.647
primary	1.125341	0.0878	0.130
secondary	1.190441	0.0995	0.037**
other	0.7640078	0.2357	0.383
urbrur			
urban	1.054203	0.0474	0.240
rel_deno			
christian	0.8734908	0.0483	0.014**
islam	1.08359	0.0989	0.379
traditionalist	0.9504675	0.1238	0.697

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region			
Western			
Central	1.056301	0.0975	0.553
Greater Accra	1.068333	0.1197	0.555
Volta	0.927697	0.095	0.464
Eastern	1.096251	0.0918	0.272
Ashanti	1.221957	0.1053	0.02**
Western North	1.101887	0.1089	0.326
Ahafo	0.9914516	0.1049	0.935
Bono	0.9681766	0.1133	0.782
Bono East	0.9885156	0.1294	0.930
Oti	0.7973552	0.1502	0.229
Northern	0.8026724	0.1923	0.359
Savannah	0.8298463	0.1395	0.267
North East	1.328396	0.2636	0.152
Upper East	0.7734869	0.1245	0.111
Upper West	0.9675622	0.1496	0.831
maritalgrouped			
married	1.02047	0.0472	0.661
age	1.018861	0.0133	0.151
agesq	0.9997346	0.0001	0.045**
ethnicity			
Ga-Dangme	0.9822203	0.1031	0.864
Ewe	1.127716	0.0781	0.083*
Guan	1.010692	0.1676	0.949
Gurma	1.444601	0.1801	0.003**
Mole-Dagbani	0.9807248	0.0994	0.848
Grusi	1.056524	0.1372	0.672
Mande	0.9960389	0.3278	0.990
All Other Tribes (Hausa, Bariba Zabr)	0.5975451	0.1245	0.013**
househead_edugrouped			
no education	0.9484604	0.1141	0.660
primary	0.9572366	0.1046	0.689
secondary	0.913906	0.1093	0.452
qtr			
2022q2	1.217002	0.0764	0.002**
2022q3	1.082475	0.0702	0.222
2023q4	1.352905	0.0858	0.000***
2023q1	1.254054	0.0787	0.000***
2023q2	1.336672	0.085	0.000***
2023q3	1.321748	0.0833	0.000***
cons	2.098884	0.7105	0.029**
ln_r	4.174981	0.5514	
ln_s	6.485925	0.5863	
r	65.03862	35.866	
s	655.8455	384.51	

*, ** and *** refers to significance at 10%, 5% and 1% respectively

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Random effects negative binomial model	Number of observations =	1,163
	Number of groups =	294
	Log likelihood =	-5022.8188
	Wald χ^2 (50) =	199.75
	Prob>Chi2 =	0.0000

4.7 Presentation of Empirical Results For female-headed households (male is the spouse to the head)

The analysis of spouses in female-headed households uses the negative binomial and Poisson model approach as for spouses in male-headed households. IRRs are interpreted in the same manner as in the male-headed households, with values above 1 indicating an increase in weekly hours worked, and values below 1 indicating a decrease.

4.7.1 Effect of Main Explanatory Variables on Spousal Weekly Hours worked

The analysis of spouses in female-headed households shows that neither the female head's health nor her insurance coverage has a statistically significant effect on the spouse's labour supply. The absence of a significant effect of the female head's health on the spouse's labour supply suggests that household position does not override traditional gender norms. This finding empirically demonstrates the structural asymmetry of the care economy in Ghana. While female labour is often treated as a 'flexible' household resource as seen in the analysis of male-headed households, male labour supply remains rigid, even when the female head who is the primary breadwinner experiences a health limitation. This suggests that gendered divisions of labour are more resilient than household hierarchy, leaving female-headed households vulnerable during health crises since the male spouse does not traditionally transition into a compensatory caregiving role. It is also understandable that health insurance ownership does not have a significant effect, given that the health status itself shows no significant influence on the spouse's labour supply.

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Spouses of heads who were unhealthy but continued their usual activities are expected to work approximately 6.6% fewer hours per week compared to those whose heads were healthy and insured (IRR = 0.934, p = 0.287). Those whose heads stopped all activities entirely due to ill health are expected to work about 0.9% more hours (IRR = 1.009, p = 0.860), while spouses of heads who were healthy but uninsured are expected to work 3.4% fewer hours (IRR = 0.966, p = 0.354). None of these effects are statistically significant, indicating that male spouses' labour supply is not meaningfully influenced by the household head's health or insurance status.

The moderating role of health insurance in the female-headed households is investigated through the interaction between the head's health severity and insurance coverage variables, which also shows no significant effect. Compared to the reference group of healthy and insured heads, spouses of uninsured heads who were unhealthy but continued their usual activities, and those whose uninsured heads were unhealthy and had stopped all activities, are expected to experience only marginal changes in weekly hours worked (IRRs = 0.955 and 0.942, p = 0.794 and 0.730, respectively). Both estimates are statistically insignificant, suggesting that the combined effects of the female head's ill health and insurance coverage also do not meaningfully affect male spouses' labour supply.

These findings are consistent with international evidence showing limited male labour response to spousal health limitations. Vega (2019) reports that men's employment remains largely unaffected by serious health events, such as cancer or strokes affecting their wives, while Fu et al. (2025) similarly find that male labour supply does not respond to a spouse's disability.

In contrast, in the Ghanaian context, Heath et al. (2022) find that men work more hours and days when another adult in the household is unexpectedly ill. The contrasting response may

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reflect differences in sample characteristics: Heath et al. (2022) focus exclusively on urban households, where income pressures and employment structures may necessitate compensatory labour, whereas this study includes both rural and urban residents.

4.7.2 Effect of Control Variables on Spousal Weekly Hours worked

The analysis highlights the critical role of the male spouse's own health in shaping labour supply. Spouses who were unhealthy worked approximately 28% fewer hours per week compared to their healthy counterparts (IRR = 0.720, $p < 0.001$). This effect is statistically significant, indicating that the spouse's own health substantially reduces labour supply, independent of the female head's health or insurance status. This finding aligns with Cai and Kalb (2006) and Currie and Madrian (1999), who emphasize the negative effect of poor health on labour supply through reduced productivity and physical capacity.

Age shows a modest but significant effect: each additional year of age increases weekly hours worked by approximately 1.9% (IRR = 1.019, $p = 0.151$), while the negative coefficient on age squared (IRR = 0.9997, $p = 0.045$) suggests a diminishing marginal effect of age at older ages. In other words, labour supply rises with age initially but slows down as the spouse grows older. The urban-rural location of the spouse does not significantly influence labour supply (IRR = 1.054, $p = 0.240$). This indicates that differences in settlement type are not strongly associated with weekly hours worked. Similarly, marital status has no significant effect (IRR = 1.020, $p = 0.661$). Other factors such as ethnicity also show some significant variation. Male spouses belonging to the Gurma ethnic group work approximately 44% more hours per week the Akan group (IRR = 1.445, $p = 0.003$,). Male spouses in the "All Other Tribes" category work 40% fewer hours (IRR = 0.598, $p = 0.013$, 95% CI: 0.397–0.899) than the Akan group. This suggests that cultural or community-specific labour patterns may shape male spouses' labour supply.

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4.7.3 Robustness Check

To ensure the robustness of the results, the model was re-estimated using a Poisson regression model with robust standard errors. The findings are largely consistent with those from the baseline negative binomial model. As in the main estimates, neither the female head's health status nor her insurance coverage significantly influences the spouse's weekly hours worked. Spouses of heads who were unhealthy but continued their usual activities are expected to work about 6.3% fewer hours (IRR = 0.937, p = 0.322), while those whose heads had stopped all activities due to ill health are expected to work about 6.8% more hours (IRR = 1.068, p = 0.172), relative to spouses of healthy and insured heads. Similarly, spouses whose heads were healthy but uninsured are expected to work about 2.4% fewer hours (IRR = 0.976, p = 0.568). None of these estimates are statistically significant, confirming that spouses' labour supply remains largely unresponsive to the health and insurance status of the female household head. Also, spouses whose partners were both uninsured and unhealthy, whether the heads continued their usual activities or had to stop entirely, do not differ significantly in weekly hours worked compared to those whose partners were healthy and insured (IRR = 0.955, p = 0.648; IRR = 0.993, p = 0.935, respectively). These results align with international evidence indicating that men's labour supply is generally unresponsive to spousal health shocks. For instance, Vega (2019) finds that men's employment remains largely unaffected when their wives experience serious health events, such as cancer or strokes, while Fu et al. (2025) similarly report no significant change in male labour supply in response to a spouse's disability.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

This concluding chapter synthesizes the empirical evidence on the effect of household head illness on spousal labour supply in Ghana. It begins with a Summary of the main findings, detailing the gendered asymmetry in labour responses and the moderating role of the National Health Insurance Scheme (NHIS). The chapter then draws formal Conclusions on the influence of traditional gender norms, followed by an outline of the study's contribution to the literature. Based on the identified caregiving-induced labour supply reductions and labour rigidity observed in the data, a set of policy recommendations is proposed. Finally, the chapter addresses the limitations of the study and offers recommendations for future research.

5.1 Summary of Main Findings

This study examines how the health of household heads affects spousal labour supply in Ghana, using data from the Annual Household Income and Expenditure Survey (AHIES). The analysis employs a random-effects negative binomial model as the primary estimator, with a fixed-effects Poisson model with robust standard errors as a robustness check. Separate models are estimated for male- and female-headed households to account for potential gender differences in labour supply responses.

The findings reveal a clear gendered pattern. In male-headed households (spouse is female), the health of the household head significantly influences labour supply. Spouses of heads who were unhealthy but continued their usual activities are expected to work 7.6% fewer hours per week, while those whose heads stopped all activities due to ill-health are expected to work 6.1% fewer hours. This suggests that female spouses reduce their working hours in response to a head's ill health, likely due to increased caregiving responsibilities.

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In female-headed households (spouse is male), the head's health does not significantly affect spouse's labour supply. Spouses of heads who were unhealthy but continued their usual activities are expected to work 6.6% fewer hours, while those whose heads stopped all activities are expected to work 0.9% more hours; neither effect is statistically significant. Similarly, insurance coverage of the head does not significantly influence the spouse's labour supply, indicating that men's work patterns remain largely unchanged regardless of the head's health or insurance status.

International evidence supports this gendered pattern of labour supply responses. Vega (2019) finds that women significantly reduce their labour supply when their husbands experience serious health events, such as cancer or strokes, while men's employment remains largely unaffected. Similarly, Fu et al. (2025) report that women's employment declines sharply and persistently following a spouse's disability, whereas male labour supply shows little change. This alignment suggests that the observed differences in spousal labour supply responses in Ghana reflect broader patterns of gendered labour adjustments to household health limitations. In the Ghanaian context, some urban-focused studies suggest men may increase labour supply in response to household health limitations. Studies such as Heath et al. (2022) found that men in urban Ghana work more hours and more days when another adult in the household falls ill. The combined rural and urban data in this study shows a different pattern. Male spouses' labour supply remains largely unresponsive to the health status or insurance coverage of household heads. This suggests that when considering the broader population, including rural areas where alternative coping mechanisms such as family support, shared agricultural labour, or flexible work schedules exist, male spouses may not need to adjust their working hours in response to a partner's ill health.

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Health insurance plays a moderating role in male-headed households. Spouses of heads who are unhealthy and uninsured are expected to work 13.6% more hours, reflecting a compensatory response to financial pressure caused by uncovered medical costs. Conversely, spouses of healthy but uninsured heads work 5.7% fewer hours, suggesting that insurance coverage provides financial security, allowing households to maintain labour supply without overextending. In female-headed households, this buffering effect is weaker, as spouses' labour supply remains largely unaffected by the head's insurance status. The finding that insurance moderates labour supply in male-headed households but not in female-headed ones suggests a gendered dependency on formal safety nets. For women, the presence of insurance acts as a critical financial buffer that reduces the necessity for compensatory labour supply. However, for men, the lack of a significant moderation effect reinforces the earlier finding of labour rigidity; male labour supply remains detached from the household's health and insurance status, which further highlights the asymmetric nature of the care economy.

5.2 Conclusion

The overall findings indicate that the labour supply response to household head illness in Ghana is gender-specific. In male-headed households, female spouses generally reduce their weekly hours when the head is ill, reflecting the time devoted to caregiving and household management. The reductions in hours are consistent across both the negative binomial and Poisson models, confirming a robust pattern of constrained labour supply due to spousal illness. In contrast, in female-headed households, male spouses' labour supply shows no statistically significant change in response to the head's illness. This suggests that the added-worker effect, where a spouse increases labour supply to compensate for a partner's lost income is largely absent in this context. The absence of this effect may be explained by social and cultural norms in Ghana that assign primary caregiving responsibilities to women, limiting men's engagement

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in household management and care.

Furthermore, the study concludes that health insurance acts as a partial economic stabilizer rather than a total buffer against ill-health. In male-headed households, insurance coverage significantly reduces direct financial strain by removing the need for spouses to provide compensatory labour to cover medical bills. However, the data reveals that the National Health Insurance Scheme (NHIS) does not offset the indirect opportunity costs of illness. Even with insurance, female spouses continue to work fewer hours. This suggests that while the NHIS covers clinical treatment, it does not protect against income losses that may arise from substituting paid work with caregiving. Ultimately, insurance mitigates the immediate cost of care, but it cannot override the deep-seated gender norms that reallocate a woman's time toward unpaid care.

5.3 Contribution to Literature

The study integrates both gender and household position in the analysis of spousal labour supply responses to household head's health. Previous studies have documented gendered labour responses, showing that women generally adjust their labour supply more than men following a partner’s illness. For males, some studies do not find any effect of a spouse's health on the labour supply of the man. These studies, however, did not account for household position and how they may change the gender dynamics. This study explicitly examines male and female-headed households, and analyses the spousal labour supply response to illness or injury to the head of the household. The findings reveal that household position does not override traditional gender norms. The results for female spouses are consistent with prior findings where household position was not considered. Even when the female head occupies the primary breadwinning role, male spouses do not significantly adjust their labour supply when she falls ill. Female spouses however, continue to reduce labour supply when male heads are ill or

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injured. This highlights that cultural and social norms governing gender roles exert a stronger influence on labour supply adjustments than formal household roles or economic contributions. Also, the study highlights the buffering role of health insurance, specifically in male-headed households. When household heads are unhealthy and uninsured, female spouses tend to increase labour supply to compensate for medical and income shortfalls. This indicates that health insurance mitigates the economic strain associated with illness and reduces the need for labour reallocation within households.

5.4 Policy Recommendation

As an evidence-based recommendation, reinforcing the National Health Insurance Scheme (NHIS) is crucial. The study finds that in male-headed households, health insurance helps spouses maintain their labour supply when the head is ill or injured, while the absence of insurance increases financial pressure and forces women to work longer hours. To address this, the government should implement strategies to increase NHIS enrolment among uninsured households and raise awareness of the benefits of coverage. Expanding access to essential and chronic care services within the NHIS would reduce out-of-pocket medical expenses, protect households from income shocks, and support continuous labour market engagement among women.

The analysis also suggests an inferential need to strengthen gender-sensitive labour policies. The study reveals that female spouses significantly reduce their working hours when the male household head is ill, whereas male spouses do not adjust their labour supply in female-headed households. To mitigate this gender disparity, the Ministry of Employment and Labour Relations and the Ministry of Gender, Children and Social Protection should develop and implement gender-sensitive labour policies. These may include flexible working arrangements,

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caregiving leave, and remote work options that allow women to balance employment with caregiving responsibilities. To ensure widespread adoption, especially among private sector employers, the government could introduce incentives such as tax reliefs or public recognition for organizations that implement these policies. Such measures would promote greater gender equity in the labour market.

The study proposes a forward-looking policy recommendation to move beyond clinical cost coverage toward a more integrated social protection framework. The findings indicate that the National Health Insurance Scheme (NHIS) functions only as a partial stabilizer, as it covers medical expenses but does not compensate for the loss of productive labour time.

Future policy should explore the feasibility of linking the NHIS database with the Livelihood Empowerment Against Poverty (LEAP) programme. Such integration would enable the provision of temporary "sickness relief funds" to vulnerable, insured households experiencing prolonged illness or injury. This support would allow women to finance external caregiving services while maintaining their labour market participation, rather than depleting household resources or reducing working hours to provide informal care.

INTEGRI PROCEDAMUS

5.5 Limitation of the Study

The main limitation of this study stems from the nature of the AHIES dataset. First, the survey lacks a detailed breakdown of illness and injury types. This restricts the ability to analyse how specific health conditions of household heads differentially affect spousal labour supply, limiting the depth of the findings. However, the credibility of the results is maintained as the study focuses on the functional severity of illness specifically whether it caused the household head's to stop usual activities or not, which directly captures the effect on household labour supply regardless of the specific medical diagnosis.

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Second, the study relies on self-reported health measures. Household heads indicate whether they consider themselves healthy or unhealthy, but it is unclear whether these assessments are based on doctor-diagnosed conditions. This uncertainty introduces the possibility of misreporting or misclassification. To ensure the credibility of the findings against this potential bias, the results from the primary Random Effects Negative Binomial model are validated through a Fixed Effects (FE) Poisson model as a robustness check. The FE estimator nets out time-invariant unobserved heterogeneity such as stable individual differences in health perception which ensures that the estimated labour supply responses are not merely reflections of unobserved household traits.

Finally, the dataset does not include spousal identifiers making it difficult to accurately trace and link spouses across households. As a result, certain partner dynamics, specifically those that may arise from couples living in different households may be excluded from the analysis. Nonetheless, this does not compromise the validity of the results for married couples who live together or cohabiting couples, who represent the population most directly affected by the immediate caregiving and income-pooling needs identified in this study.

INTEGRI PROCEDAMUS

5.6 Recommendations for Future Research

Based on the findings and limitations of this study, several avenues for future research emerge. First, the Ghana Statistical Service could incorporate more detailed health information, including the type and severity of illnesses or injuries into future datasets. This would allow researchers to assess whether specific health conditions have differential effects on spousal labour supply and better understand the mechanisms through which health limitations influence household labour supply. Also, Future research could benefit from datasets that include spousal

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identifiers. Such information would allow for a more comprehensive analysis of spousal labour supply responses, capturing dynamics among partners who do not co-reside but still share economic responsibilities. Finally, efforts should be made to ensure that, respondents report doctor-diagnosed conditions, rather than on self-reports which may sometimes be based on the respondent's own judgement. Doing so would reduce potential misclassification and measurement error and improve the accuracy and reliability of estimates regarding the effect of household head health on spousal labour decisions.



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APPENDICES

Appendix 1: Results of Spousal Labour Supply Function of Male Headed Households: Fixed Effects Poisson with Robust Standard Errors

weeklyhrsworked	IRR	std. err.	P>z
head_severityillhealth			
Unhealthy but continued activities	0.974657	0.025344	0.324
Unhealthy and stopped activities	0.954355	0.021957	0.042**
househead_insured			
no	0.963034	0.01016	0.000***
head_severityillhealth#househead_insured			
Unhealthy but continued activities#no	1.010545	0.039312	0.787
Unhealthy and stopped activities#no	0.998476	0.033832	0.964
unhealthy			
unhealthy	0.925965	0.012424	0.000***
maritalgrouped			
married	0.897525	0.195733	0.620
age	1.122407	0.035604	0.000***
agesq	0.99849	0.000365	0.000***
qtr			
2022q2	1.066427	0.018747	0.000***
2022q3	1.127293	0.0211038	0.000***
2023q4	1.229205	0.0223788	0.000***
2023q1	1.157754	0.232314	0.000***
2023q2	1.205812	0.0266587	0.000***
2023q3	1.210587	0.029734	0.000***

*, ** and *** refers to significance at 10%, 5% and 1% respectively

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Appendix 2: Results of Spousal Labour Supply Function of Female Headed Households: Fixed Effects Poisson with Robust Standard Errors

weeklyhrsworked	IRR	std. err.	P>z
head_severityillhealth			
Unhealthy but continued activities	0.936562	0.062043	0.322
Unhealthy and stopped activities	1.068441	0.051836	0.172
househead_insured			
no	0.975869	0.04179	0.568
head_severityillhealth#househead_insured			
Unhealthy but continued activities#no	0.955411	0.095457	0.648
Unhealthy and stopped activities#no	0.99313	0.083852	0.935
unhealthy			
unhealthy	0.893719	0.057567	0.081*
maritalgrouped			
married	1.109313	0.286391	0.688
age	1.190819	0.127742	0.104
agesq	0.998272	0.00111	0.120
qtr			
2022q2	1.097172	0.055095	0.065
2022q3	1.009556	0.057992	0.868
2023q4	1.072892	0.064453	0.242
2023q1	1.016038	0.072898	0.824
2023q2	1.072368	0.078823	0.342
2023q3	1.085268	0.091144	0.330

*, ** and *** refers to significance at 10%, 5% and 1% respectively

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