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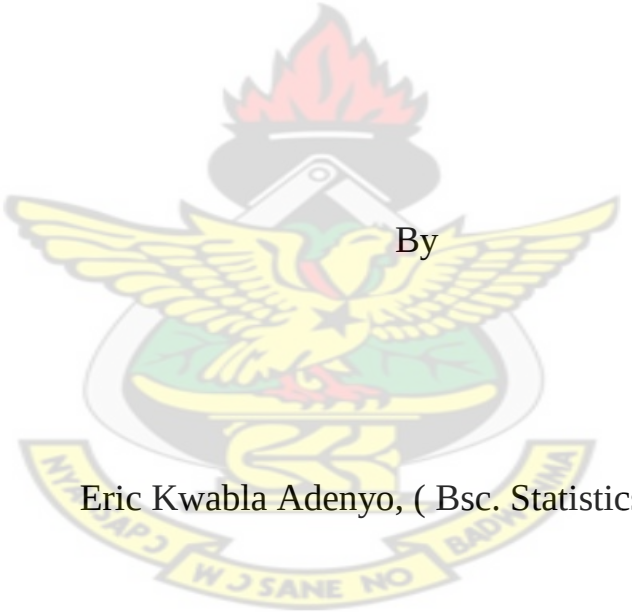
COLLEGE OF SCIENCE
DEPARTMENT OF MATHEMATICS

Using Logistic Regression Model to Identify Key Socio-Demographic Variables of Child Labour Vulnerability in Ghana



By

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June, 2013

USING LOGISTIC REGRESSION MODEL TO IDENTIFY KEY SOCIO –DEMOGRAPHIC VARIABLES OF CHILD LABOUR VULNERABILITY IN GHANA

By

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DECLARATION

I hereby declare that, this submission is my own work towards the Mphil. and that, to the best of my knowledge; it contains no materials previously published by another person nor material which has been accepted for the award of any other degree of the university, except where due acknowledgement has been made in the text.

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DEDICATION

I dedicate this piece of work to my lovely mother and all my siblings.

ABSTRACT

This study examined the Ghana Child Labour Survey (2003) data with particular interest in children aged 5-17 years, since children within this age group are the vulnerable.

The objectives of the study were to (i) identify key socio-demographic variables among the speculated ones that can contribute significantly to child labour in Ghana. (ii) Examine how these variables vary across the ten regions of Ghana. (iii) To suggest solutions to child labour in Ghana based on the findings.

Logistic regression model was considered an appropriate statistical tool for analysing the data since the selected variables were both categorical and continuous in nature. With child labour (that is work or no work) as the dependent variable and a set of socio-demographic variables as explanatory variables.

Analysis of the data using the logistic regression model revealed that Age of child, literacy of head of household and Residence made strong significant statistical contribution to child labour in all the ten regions of Ghana. The results showed further that in exception of three variables (sex of child, marital status of parents and relationship of child to head of household) that made insignificant contribution to child labour all the variables made significant statistical contribution to child labour in Ghana. This showed that 70% of the selected variables made significant statistical contribution to child labour whilst 30% of the selected variables made no statistical contribution to child labour in Ghana. It was also discovered that only three out of the ten regions namely Greater Accra, Ashanti and Upper East recorded low levels of child labour when the analysis was performed combining all the ten regions of Ghana.

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LIST OF ABBREVIATIONS OR/ACRONYMS

CACL : Campaign Against Child Labour.

CHRAJ : Commission on Human Rights and Administrative Justice.

CRC : Convention on the Rights of the Child.

EAs : Enumeration Areas.

FFE : Food For Education

FIDA : Federation International De Abogadas

FCUBE **:** Free Compulsory Universal Basic Education.

GCLS : Ghana Child Labour Survey.

GES : Ghana Education Service.

GNCRC : Ghana NGO Coalition on the Rights of the Child.

GSS : Ghana Statistical Service.

ILO : International Labour Organization.

IPEC : International Programme on the Elimination of Child Labour.

JHS : Junior High School.

LRT : Likelihood Ratio Test.

LL : Log Likelihood.

MLE : Maximum Likelihood Estimation.

MICS : Multiple Indicator Cluster Survey.

MOWAC: Ministry of Women and Children Affairs

NCWD : National Council on Women and Development's.

NGOs : Non Governmental Organizations.

OLS : Ordinary Least Square.

SPSS : Statistical Package for Social Sciences.

UN : United Nations.

UNICEF : United Nations International Children Educational Fund.

US : United States.

WAJU : Women and Juvenile unit

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CHAPTER ONE

1.0 INTRODUCTION

Child labour is an insidious evil. Leaving aside pathological cases of child abuse and abandonment, it exists because it is the best response people can come up with to intolerable circumstances. It is particularly dangerous because it involves the sacrifice of a child's future welfare in exchange for immediate benefit, and difficult to combat because it involves questions of agency and power within households.

The primary cost of child labour is the associated reduction in investment in the child's human capital, which occurs chiefly because child labour interferes with schooling. Not all work by children has this effect; this research excludes such work from consideration in this essay and defines child labour as the sacrifice of the future welfare of the child in exchange for additional current income. Although there are important challenges associated with empirically distinguishing child labour from the unproblematic light work that is an important component of rearing a child.

Many economists argue that child labour is a symptom of poverty and that its reduction can most effectively be accomplished through the alleviation of poverty. It is surely correct that child labour is a symptom of poverty: rarely do well-off parents sacrifice their children's education by sending them to work. However, child labour is also a cause of future poverty, so direct measures to move children from work into school can make an important contribution to poverty alleviation and to development in general.

1.1 Background of the study

The development of children is an important issue to all countries in the world. It is often said that children are the future leaders of every society. Unfortunately however, the incidence of child labour is very high in many developing countries of the world including Ghana. The International Labour Organization (ILO, 2002) defines child labour as any economic or non-economic activity performed by a child, that has the potential of negatively affecting his or her health, schooling and normal developments constitute child labour.

The ILO (1995) publication in developing countries based on very limited statistical information obtained from about 100 countries indicated that there were 73 million working children between 10 and 14 years of age. However, a recent experimental survey carried out by the ILO's Bureau of Statistics in a number of countries indicated that this figure was a gross underestimation. The study further indicated that even children below 10 years of age are at work in substantial numbers. The Bureau now estimated that, in the developing countries alone, there were at least 120 million children between the ages of 5 and 14 who were fully at work. Of these, 61 per cent were found in Asia, 32 per cent in Africa, and 7 per cent in Latin America. Although Asia had the largest number of child workers, Africa had the highest incidence at around 40 per cent of the children between 5 and 14 years.

In Ghana, the incidence of child labour is considered very high. The Ghana Child Labour Survey (GCLS, 2003) data shows that 6,361,111 children in the age group 5-17 years were found to be economically active. This puts child labour force at about 12 percent of the total labour force in Ghana. The highest proportion of child laborers' in

Ghana is found in agriculture/ fishing/forestry (57.0 %) followed by sales (20.7%), production (9.5%), the rest were engaged throughout the text as truck-pushers, porters, labourers, drivers mates (11.0%). The major occupation for both males (69.0 %) and females (44.0%) is Agriculture, Fishing and Forestry. Another major occupation, for females is sales (30.4%).

In our Ghanaian society, it is a tradition that children engage in all kinds of work which form part of their training. Unfortunately, the rate at which these children flock the streets of Ghana for economic ventures these days in a bid to assist parents has assumed increasing dimensions and therefore, questionable and has become an issue of major concerned. It was this observation that had aroused the interest to research into these areas to look at the socio-demographic factors of child labour vulnerability in Ghana.

1.2 Statement of the problem

The high incidence of child labour in many developing countries, including Ghana, may be attributed to socio-cultural norms in these settings. In the olden days, children were considered as factor of production; labour force for the family.

This was not a problem because, in the absence of modern technology, majority of the parents had to depend on their children as sources of labour, especially in the cocoa growing areas, fishing communities such as Yeji, Abotoase, Dambai and others where manual labour was most certainly required. Traditionally, children predominantly feature in the family upkeep in many ways. However, it is this mode of contribution today due to social change and money-using economics that raises an enquiry and understanding of the phenomenon.

Most often, the labour force of a nation consists of men, and to a lesser extent women and children. Child labour is socially and legally considered as illegal because in most countries, children of 15 years and below are not permitted by law to be used for full time employment. Often, it is their mode of contribution and where they are employed mostly in commercial activities that have been the major concern for the working child, families and the society as a whole. This high incidence of child labour and the subsequent low school attendance rates in Africa has attracted the attention of most governments, past and present. This is evidenced by constant search for adequate measures to arrest the situation. The issue of child labour is a major concern to the Government of Ghana, as it is for many other countries. The problem has long been recognized and the Government has enacted laws to prohibit child labour, increase school enrolment rates and develop other national programmes to meet the urgent needs of children in the country.

In spite of these efforts, millions of children continue to work as forced labourers in a wide range of sectors, industries or occupations either to pay for the debts of their parents or to help earn income for their care givers. In some instances, these children are drawn into certain economic activities under false pretexts from which they are not allowed to leave. Children perform different types of work under a variety of conditions and for a variety of reasons.

Most children in Ghana are not able to pursue their education these days as it is expected of them. This problem is attributed to the fact that children are often activity engaged in economic activities while attending school, they are seen hawking, cracking stone, farming, weaving kente clothed for money. As a result, most of them are not able

to complete their elementary education. Besides, what they hope to become in future is either hindered or not achieved. Another unfortunate aspect of the whole issue is that, these children tend to pick up some kind of behaviour such as disrespect and the habit of deliberately staying away from school without permission. Furthermore, some of these children later drop-out of school because they are either not able to perform well in class or have more interest in working for money than schooling.

Schooling and other forms of education can help to lower the incidence of child labour. However, the pace of reducing child labour and improvement in school participation rates is somewhat slow in Ghana. In a number of developing countries, targeted enrollment subsidies have been used as an effective way to break the cycle of poverty and illiteracy and address both the income loss to parents and education for children. This problem is all over the country and need to be redressed. In order to implement effective child labour policies there is the need to isolate the factors that contribute to child labour which in turn affect school enrolment rates.

1.3 Objectives of the study

A number of socio-demographic factors (variables) have been speculated to influence child labour. There is the need to verify these suppositions by giving a rigorous empirical basis for the identification of variables that determine the likelihood of child labour. To this end, the purpose of the study is to:

(i) Identify key socio-demographic factors (variables) affecting child labour in Ghana.

(ii) Examine how these variables vary across the ten regions of Ghana. (iii) To suggest solutions to child labour in Ghana based on the findings.

1.4 Methodology

The main statistical tool used in the analysis of data is the logistic regression model. Bivariate and multivariate distributions of child labour are carried out to examine the relationship between child labour and their covariates. In other to make full use of available information, these bivariate were limited to children age 5-17 years that are working and not working under consideration. The study also examined the data structure to find out the levels of child labour among the selected variables across the ten regions of Ghana. Multivariate analyses are then conducted to identify key variables which have influenced the levels of child labour in Ghana. The Statistical Package for Social Service (SPSS) version 16 is the software used to perform the cross tabulation.

1.5 Justification Of The Study

In recent years, child labour has become a tropical issue not only at Global level but nationally because of the unhealthy circumstances the children are subjected to work. The Ghanaian child is a direct victim of low purchasing power of his or her parents. The Ghana Child Labour Survey (2003) revealed that child labour was prevalent in all the 10 administrative regions, and that 2.47 million children 5-17 years, representing 40% of the estimated 6.36 million children were in that age group were economically-active with some engaged in the worst forms of child labour. Further, the data revealed that 1.59 million children (25%) were economically active while in school. Thus, many Ghanaian children work from an early age, rural children more than urban children, and both children in school and children out of school. But children's work activities and their social and economic context vary greatly between ethnic groups and between different social classes. Many of these children are also subjected to a variety of abuses

including severe forms of child labour often involving child trafficking. It is within this context that the phenomenon of child labour in fishing and fish processing is located.

In Ghana, primary education is compulsory for all children. The Government has introduced the Free Compulsory Universal Basic Education (FCUBE) to get all children of school going age to school and to prevent children from early labour. Ghana Education Acts 1961 (Act 87) makes school attendance easier especially for children of poor parents, textbooks are supplied free of charge to all children up to Junior High School (JHS). An alternative subsidy program (the School Feeding Program) or (Food-For Education), has been implemented to help children and their parents. In-spite of all of these measures, a large proportion of children is not enrolled in school.

Working children are disadvantaged in many ways and there is evidence that the early involvement of children in work can have serious health and developmental consequences. Hence, the aim of this study is to examine socio-demographic factors of child labour vulnerability in Ghana.

1.6 Organization Of The Thesis

Chapter one covers the introduction, background of the study, statement of the problem, objectives of the study, methodology, justification of the study and organization of the thesis. Chapter two contains review of literature and methods. Chapter three contains methodology. Chapter four contains the data analysis and results and Chapter five contains conclusions and recommendations.

CHAPTER TWO

2.0 REVIEW OF LITERATURE AND METHODS

2.1 INTRODUCTION

In undertaking empirical studies, researchers need to read related materials to the problem or topic to find out what has already been written about the topic. The review process involves systematic identification, location and analysis of documents that contain information which are related to the research problem. The idea is to avoid unplanned replication, identify useful methodology techniques, develop research hypotheses, and identify contradictory findings and to facilitate interpretation of results of the study (Amedahe, 2005). This chapter reviews available literature on child labour.

2.2 Patterns and concepts of child labour

The ILO (2002) estimates that about 210 million children between the ages of 5 and 14 were working in 2000, about half of them working full-time. This implies that approximately ten percent of the world's children were working full-time. At the same time, UNESCO estimates that about one of every five primary school-aged children were not enrolled in school. The absolute numbers of children working are largest in Asia, but the incidence of child labour seems to be highest in Africa: the ILO estimates that about one-third of children are economically active in Africa, about one-sixth working full-time.

Child labour is overwhelmingly a rural and agricultural phenomenon. For example, in Pakistan, 70% of working children are employed in agriculture (Pakistan FBS, 1996). Boys are more likely to work than girls, and older children are much more likely to be employed than their younger siblings (Grootaert and Patrinos, 1999).

Our concern is with child labour that involves the sacrifice of future welfare of the child in exchange for a current benefit for the household. This is clearly the notion that motivates most of the policy concern over child labour, and lies behind the ILO convention No. 138. The benefits to the household of sending a child to work are the wages of that child (or, equivalently, the increased production on the family farm), and the reduced education expenditures from not sending her to school. The primary costs of child labour are the lower future earnings of the child when she enters the adult labour market with lower educational attainment. In addition, there is very strong evidence of important non-market returns to education in home production and child rearing. The sacrifice of these returns should also be counted as a cost of child labour. Finally, there are benefits to education and thus costs to child labour that extend beyond the immediate family. Educated co-workers may improve the productivity of everyone, and a well-educated populace provides a vital foundation for a vibrant society.

There are certain well-established empirical regularities about child labour that should inform our discussion. First, it is clear that child labour overwhelmingly reflects the poverty of the households in which the children live. Fallon and Tzannatos (1998) review a variety of studies that indicate a strongly negative relationship between the incidence of child labour and household income, but note that this relationship is less marked in more affluent developing countries.

It is important to note that the strong empirical evidence that child labour declines and school enrollment increases with household income does not imply that increases in wages necessarily reduce child labour. Wages of adults and children tend to move together, and an increase in child wages induces a substitution effect that tends to

increase the incidence of child labour. This substitution effect, if sufficiently strong, could outweigh the effect of increasing real income. For example, Kruger (2002) shows that child labour increases and school attendance decreases as coffee prices increase in Brazil. In contrast, Edmonds and Pavcnik (2002) show that in Vietnam, increases in rice prices were strongly associated with declines in child labour.

It is also clear that child labour has important detrimental effects on schooling attainment and thus on the future income of children. As already noted, not all work by children has this effect. Ideally, such benign work by children (occasional light work on the family farm, or limited household work) is excluded from data collection on child labour. An important question to resolve is the extent of work by children that does have the consequence of interfering with schooling and thus future earnings. How many of the ILO's 210 million working children are sacrificing their education? This is inherently a difficult question to answer, because child labour and school enrollment are chosen simultaneously, complicating any causal interpretation of correlations that can be observed. However, the existing evidence is strong. For example, Psacharopoulos (1997) shows much lower educational attainment by children who work in Venezuela and Boliva.

Households that are very poor are much more likely to send their children to work, and child labour contributes to poverty in the next generation by reducing schooling attainment. This circular pattern of positive feedback between poverty and child labour may lead to a vicious cycle of poverty, in which the descendants of the poor remain poor because they were poorly educated. This cycle can be the foundation of a classical 'poverty trap'. However, if the cycle can be broken the same positive circular causation

can contribute to a take-off into sustained growth. If schooling attainments can be improved, then the next generation's income is higher and their children can in turn become yet better educated. It is essential, therefore, to understand the specific mechanisms that can trap people in the awful equilibrium of persistent poverty, excessive child labour and low education over generations.

The crucial mechanisms are: first, an inability to seize advantageous long-run investments in children's human capital because of credit market constraints; and second, and problems of agency within households. These two mechanisms operate simultaneously and can interact in important ways.

2.3 Ghana's situation on the rights of children

The year 1990 witnessed the arduous drafting process within the U.N. Commission on human rights which culminated in the 54th article convection outlining the convection the rights of children. The law was in favour of countries which could not meet the rights of their children due to lack of resources. The law made available three areas of assistance to states in need, provision and participation. Firstly, children were provided with the right to life, to a name and freedom of taught conscious and religion. Secondly, they were protected from physical and mental violence with special attention paid to the protection of children who were disabled or belonged to minorities or who were refugees. Lastly the convention also provides for the child the right to be heard on decisions affecting his or her life. Its continuation, however, was a step towards the provision of minimum standard of treatment.

Another declaration of the right of the child is the U.N. Declaration of the right Rights of Children, article 9 which states in part that "The child shall be protected against all form of neglect cruelty and exploitation. He shall not be the subject of traffic in any form". The Government of Ghana also embarked on a number of reforms to provide education, health, food and security and protection of the rights children from 1990s. In 1992, a ten year national program of action called "The Child Cannot Wait" was drawn up to fulfill the demands of the UN Convention on the Rights of the Child. The process of law reform began in 1995 and the draft children's' bill was prepared in conformity with existing legislation and CRC. The bill was passed by the parliament of Ghana as the 'The Children's Act (Act 560) in June 1998.

The content of the Act rests on the welfare principles that recognize that the interest of the child shall be central in all matters concerning the child. The law requires that every child would have right to name and nationality, and grow up with parents. They would also have right to parental property, right to social activity, opinion, education and well-being. The act further sets out to protect the child from exploitative labour, discrimination, torture and degrading treatment, as well as betrothal and marriage.

These objectives aside, the Act defines the variety of institutions and individuals and the mechanisms for implementing these noble objectives for the betterment of the status of children in Ghana. Among the many requirements are the following:

a) All districts shall have social welfare officers designated for the job of implementing the Act,

b) All parents and other persons who are legally liable to maintain a child is under a duty to supply the necessities of life, health, education and reasonable shelter.

c) There shall be established child rights committees and residential homes to advocate for children's rights and to cater for needs of children outside of their homes.

d) The act also stipulates the establishment of a family tribunal with a panel that would consider and deliberate on all cases involving children.

These provisions are aimed to provide justice to children through mediation and reconciliation and based on the traditional system of arbitration and resolution of conflicts. As part of the support for children's access to legal aid, The Commission on Human Rights and Administrative Justice (CHRAJ) set up by the constitution has offices in all districts to be a referral point on child rights. The law began to be implemented by all District Assemblies (Local Councils) from late 1998.The successes with the implementation of child rights laws in developed countries have been realized through the development of comprehensive structures and or systems that aid compliance with the laws and reasonable provision of resources to support the work of implementing agencies. However, in spite of the availability of substantial resources and support of central governments, there are still reports of some degree of neglect and abuse of children in the developed countries.

Reports on the implementation of the child rights law in Ghana (Ghana Government report 2005, Ghana NGO Coalition on the Rights of the Child (GNCRC), (2005) showed that the governmental agencies tasked with implementing the demands of the Child rights law, such as the Department of Social Welfare, and Department for Children, were not receiving adequate notifications of violations of children's rights and that some parents were non-cooperative with the processes outlined in the law.

Further, research indicates that the implementation of other government policies especially in the social services sector have been ineffective in terms of the scope and quality of service delivery, due to constraints of resources and skilled personnel and limited community knowledge of such policies (Kuyini, 1998; UNICEF-Ghana, 2000). Additionally, questions have been raised about achieving effective implementation of the Government's social policies in a prevailing situation where government revenue is not catching up with the demand for social support services, and a general trend of fluctuating and /or decline in external donor support (Forster & Norton, 2000).

The effects of these varying issues are poised to have some considerable effects on resource allocation to implementing agencies and impact on the implementation on the Ghana child rights law (Children's Act 1998) at all levels. And although the Ghana Government progress reports on child rights to the United Nations in 2005 broadly highlighted issues of implementation across the nation, the report was rather generalized and lacked specificity about district and local level implementation issues.

2.4 Institutional reforms

2.4.1 Ministry of women and children affairs

The Ministry of Women and Children Affairs (MOWAC) was established to fill administrative lapses, which hitherto impeded the successful implementation of the CRC. MOWAC is charged with the responsibility of spearheading and coordinating gender and child responsive development issues. The ministry is therefore mandated to co-ordinate, monitor and review the formulation of gender and child responsive policies and their implementation within sectors.

2.4.2 The women and juvenile unit

Women and Juvenile unit (WAJU) was first established in October 1998 in Accra. Currently, the unit has been opened in all ten administrative regions of the country. WAJU is a unique Police unit and the first of it kinds in West Africa. The WAJU offices are not new Police stations. These units are to serve as information, support and co-coordinating centres apart from providing basic counter services supported by a team of civilians support staff, made of clinical psychologists, social workers, counselors, legal advisers. WAJU is mandated by the Police Administration to work with Federation International De Abogadas, (FIDA) Commission for Human Rights And Administrative Justice (CHRAJ), Legal Aid Board, and other stake holders. The main objectives of WAJU are to prevent, protect, investigate and prosecute crimes against Women and children.

2.5 Child labour laws and agencies

Decisions regarding child labour and schooling are generally made by parents. This raises issues of agency, because decisions are being made by individuals who do not necessarily themselves experience the full implications of these decisions. Even if parents are altruistic towards their children – and surely this is the case for the vast majority of families – issues of bargaining and negotiation within households, and the difficulty of making commitments that bind over generations may make it difficult to achieve optimally low levels of child labour.

First, consider a case in which agency causes no deviation from the socially efficient levels of child labour and schooling, in the spirit of the classic 'rotten kid' theorem of Becker (1974). Suppose that the parent feels altruistic towards the child, in the sense

that the parent's welfare increases when the child's welfare increases, and that the parent has access to perfect financial markets. In addition, suppose that the parent expects to leave a positive bequest to the child. In this case, the parent will choose to set the level of child labour to the socially optimum level. The argument is quite simple: the parent would like to help the child achieve a particular level of welfare, and the parent has two instruments available to do so: the parent chooses the amount of child labour (and thus determines the level of schooling for the child), and the parent can give the child a bequest. The parent will choose the minimal cost means of achieving any given level of child welfare; to do otherwise would waste resources that could be used to achieve higher welfare for the child, the parent, or both. If the parent chose a level of child labour greater than is socially optimal, he would be wasting resources. He could reduce child labour a bit, reduce the future bequest left to the child to compensate, and have money left over to increase everyone's welfare. Therefore, a parent who cares about the welfare of his child and who plans to leave a positive bequest to that child would ensure that the child's labour force participation matches the socially efficient level.

However, suppose that the parent plans to leave no bequest. This is mostly likely to occur in a poor family, most particularly in a family in which the parent's generation is especially poor relative to future generations. Child labour in this circumstance will be inefficiently high and schooling attainment too low, because once bequests have been reduced to zero this is the only instrument available to the parents to transfer resources from the next generation to support current welfare (Baland and Robinson (2000). A potential way to reduce child labour would be for the parent to borrow to finance

current consumption, with the child committing herself to pay back the loan from her future higher earnings.

However, such intergenerational contracts are not enforceable. Therefore, even when financial markets operate perfectly smoothly and parents are altruistic towards their children, agency problems can induce too much child labour and too little investment in education. The source of the problem is that poor parents who plan to leave no bequest to their children use child labour to support the current consumption of the household.

Agency problems become even more salient when they occur in the typical environment of imperfect financial markets. If the household cannot borrow (and does not plan to save), then decisions regarding child labour and educational investments cannot be made by balancing the current financial gain and discounted future financial cost of child labour. Instead, decisions are made by balancing subjective welfare costs and benefits. Parents balance the benefit in terms of current welfare of increasing child labour (and reducing schooling) against the current subjective cost of the child's future reduced welfare.

The immediate question, of course, is whose subjective welfare determines the child's education and labour force participation? The two parents might hold divergent views about these costs and benefits. In fact, there is mounting evidence that this is so, and that these divergent opinions can have important effects on child welfare.

Until fairly recently, economists have ignored issues of agency within households, relying on what has come to be called the "unitary household model". This model assumes that the choices made in households can be treated as if they were made by a

single individual. There was never much of a theoretical justification for this assumption; it was made for convenience, driven by the fact that empirical data (particularly data on consumption) tends to come in household-sized chunks.

An important implication of the unitary household model is that income is pooled. Whether extra income comes from the husband or the wife is irrelevant for decisions regarding expenditure or investment in children, it's all just extra income for the household. When this implication is examined using data, it is almost universally rejected. For example, Duflo (2000) finds that the nutrition of girls' is dramatically improved when their grandmothers receive old-age pensions in South Africa, but is entirely unaffected when the pension is received by their grandfathers. This and much additional evidence implies that the unitary household model is an inappropriate building block for thinking about decisions within the household regarding investment in their children. Parents may have divergent preferences regarding such investments, so that shifts in bargaining power within the household could have important effects on child labour.

Economists are far from a general understanding of intra household bargaining processes. In fact, the dominant successor model to the unitary household model is deliberately agnostic regarding. This is the collective household model, as in Chiappori (1988).

However, some general patterns have emerged from a fairly lengthy sequence of empirical studies. In particular, researchers have found that extra income in the hands of mothers is associated with higher levels of investment in child human capital (see Haddad, Hoddinott and Alderman, 1997).

According to Mundy (1998), legal reform was possible when Non-Governmental Organizations (NGOs) turned from providing only social services to becoming advocates for legal reform. An emerging literature shows how values about children have become legitimated by supranational levels of authority as the result of alliances between national and international NGOs and associations. For example, Brazil was the first Latin American country to enter ILO's program to eradicate child labour, a move that added to the legitimacy of Brazilian children's movements.

According to Post (2001), if the decision was made to leave school for work, then there is a decision to be made about the child's type of work: domestic work or work outside of the home? Hypotheses about what leads children to each outcome at each sequence of this decision tree can be tested using probit regression analysis (but curiously, the authors chosen to report the statistical significance of each test only at 90 percent confidence level, which is an unconventional approach when dealing with large survey data sets). David Post also presented results using a completely different approach to child labour decisions; one based on multinomial logistical regression model that assumes choices are made simultaneously between all available options, rather than sequentially.

Many countries have undertaken labour force surveys that define participation in the labour force as being engaged in 'economic activity'. Such surveys do not adequately capture the participation in economic, but illegal activity and work that was unpaid and undertaken in household enterprises and whose product was mainly for household consumption. Also, some activities, while certainly involving work, are not deemed 'economic' and therefore excluded from the survey. While many of these problems

arise in canvassing information about adults as well as children, they are particularly severe in canvassing information about the work of children.

The new ILO strategy needs the emergent, disparate literature on the child labour paradox. The titles reviewed here are representative of a burgeoning literature that is now appearing and that includes, in its scope, issues of homelessness, poverty, exploitation, and the implications of these issues for schooling. In the field of comparative education, it is sad to say, this area has taken a backseat behind other concerns over social development, economic growth, student achievement, governance, planning, international relations, and curriculum.

Children's engagement in work roles in our Ghanaian traditional society is not a new practice. According to (Mends et al, 1988) research work on the native and problems of child labour stated that children's involvement in work roles form part of their training into adulthood.

In Ashanti, Rettray (1927) mentioned among other things that, male children followed their father to farm, tended animals like cattle and goats which form part of their socialization process. They also learnt crafts like kente weaving and goldsmithing. Oppong (1973) in his research also observed that, male children follow their fathers or learn to become butchers, barbers, blacksmiths, farmers and drummers while the girls helping the home routine tasks like sweeping, cooking and also carry farm produce home, pick legumes and fruits.

Among the Anlos in the Volta region, Nukunya (1969) in his research into child training mentioned that children enjoy freedom until about 10 years when they are

introduced to various occupations like farming and fishing which is their major work. Boys are taught to pursue economic activities which give them substantial income to enable them alleviate their dependence on their parents. The girls on the other hand, help their mothers in female occupations like petty trading, baking and fish smoking.

Acquah (1972) in a survey work in Accra revealed that 30% of the total number of school children in selected districts in Accra were gainfully employed in activities like selling at the markets, currying fish from the beach to the market, domestic servants and newspaper vendors.

2.6 Policies to eliminate child labour

Child labour should be understood as the consequence of people coping with extreme circumstances. It is a result of current poverty and a cause of continued poverty for the children who sacrifice their education in order to work. It is a particularly insidious problem because its primary costs are long-delayed and realized by the child, while the benefits are immediate and directly affect decision-makers within the household.

We know that the ultimate instrument for the elimination of excessive child labour is the alleviation of poverty. The evidence is indisputable: child labour as a mass phenomenon disappears when the population moves out of poverty. While this is a sure solution, we're not willing to wait.

The obvious response is an outright ban of the practice of child labour. The first difficulty is that it is by no means clear that developing country governments have tools available to enforce such a ban. The task would be extremely difficult, because most child labour is in agriculture, much of it on family farms. Where bans have been

imposed, it is not clear that they have been effective. Moehling (1999) shows that there is little evidence that child labour laws contributed to the dramatic decline in child labour in the 19th century United States. This decline was driven instead by changes in technology, immigration and the rise in the real wage.

Even if governments could effectively ban child labour, the consequences could be dire for those poor households (and their children) who are resorting to child labour out of desperation. These children are working to help the household make ends meet. An effective ban on child labour would make these households and these children worse off. Therefore any legal restrictions on child labour in developing countries should be focused on the most odious of forms of child labour, including working under hazardous conditions or as bonded labourers.

A closely related issue is developed-country trade policy. Many have argued for an international labor standards policy that requires the elimination of child labour for access to developed country markets. In some cases, this argument is simply a smoke-screen providing cover for standard-issue protectionism. However, it is often motivated by a genuine concern for the welfare of children in developing countries. If this is indeed the motivation, the implementation of trade sanctions to enforce an international standard against the use of child labour is likely to have perverse consequences.

In fact, there is some evidence that successful engagement in world markets may be an effective instrument for reducing child labour. At the beginning of the 1990's, about 80 percent of child labour in Vietnam was in agriculture. As Vietnam eliminated barriers to trade in rice over the 1990s, the domestic rice price rose by almost one-third, thus

improving the living standards of much of the farming population. Edmonds and Pavcnik (2002) show that these increased prices are associated with strong declines in child labour. Child labour declined by approximately a third over the period; Edmonds and Pavcnik attribute half of the decline to the rise in rice prices. In the right circumstances, trade can be a powerful positive force.

We have seen that dysfunctional financial markets are an important cause of child labour. Child labour would be dramatically reduced if parents could finance their children's exit from the labour force and entry into schooling from the increased future earnings of the child. Unfortunately, extremely well-functioning credit markets are required to make this kind of transaction feasible. The lag between the investment in child education and the return to that investment in the adult labour market is measured in decades, not months. There is little immediate prospect for improvements in financial markets accessible to the poor in developing countries of the order of magnitude required for such long term transactions.

2.6. How to reduce child labour

The most effective way to draw children out of damaging work is to encourage school attendance. One way of doing so would be to improve school quality, and therefore increase the gain to attending school. Handa (2002), for example, argues that school enrollment in Mozambique is quite sensitive to the number of trained teachers. This is an important tool that is available to reduce child labour. However, it has the significant disadvantage of influencing outcomes in the distant future. In his research using multiple regression, it was discovered that higher quality of schooling leads to higher wages as an adult. The influence of these changes in future outcomes on current

decisions regarding work and schooling is scaled down by credit constraints and agency problems.

The most promising tool yet developed for reducing child labour is a targeted subsidy to families sending their children to school. In such a program, a grant is provided to the family of any child who is enrolled in school. The particular value of this intervention is that it addresses the root causes of child labour. It overcomes the problems associated with imperfect or nonexistent financial markets by balancing the current cost of moving a child out of the labour force and into school with a current grant.

It addresses the main agency problem by providing current resources, thus reducing the importance of intergenerational transfers. For a priori reasons, then, we can expect subsidies for school enrollment to be a useful tool in the effort to reduce child labour.

The flagship program of this type is the innovative Progress poverty program in Mexico (the name of the program has recently been changed to 'Opportunidades'). Progress provides mothers of enrolled students in rural Mexico with grants that have a value slightly less than the wage that would be earned by the child which she working full-time. With remarkable foresight, the Progress program was introduced (in 1998) in a randomized sequence. This randomization, combined with systematic data collection, makes it possible to measure with great confidence the impact of the program on both school enrollment and child labour force participation. Schultz (2001) estimated that the program resulted in an increase in school of about two-thirds of a year (off a baseline attainment of 6.8 years), and that child labour correspondingly falls. The most dramatic effects are for secondary school girls, whose broad labour force participation is estimated to drop by almost fifty percentage points upon enrollment in school.

The Food-For-Education program in rural Bangladesh is similar in spirit to the Mexican Progress program. The monthly payment is smaller; 15 to 25 percent of average monthly earnings for working children. Nevertheless, Ravallion and Wodon (1999) estimate that the FFE program moved primary school enrollment from approximately 75% to over 90%. Child labour force participation dropped as well (by about 30% for boys and by about 20% for girls).

Child labour can effectively be reduced by subsidies for school enrollment. This tool dominates alternatives because it addresses directly the tragic circumstances that impel families to send their children to work instead of school. An effective subsidy program is not unreasonably expensive because the costs are tied to the low wages earned by child workers. Therefore, while more careful cost-benefit analyses should be completed on an urgent basis, the expansion of targeted education subsidies into areas of developing countries with high rates of child labour force participation is an extremely promising strategy.

CHAPTER THREE

3.0 METHODOLOGY

3.1 INTRODUCTION

The main analysis depends on multivariate statistical methods, with special focus on logistic regression technique. Other statistical techniques are used but these are largely the routine types of techniques. Due to the importance of logistic regression in this work, it is necessary to briefly review the methods that it involves.

3.2 Logistic regression models

In general, logistic regression is a special case of regression analysis. In regression analysis, we determine the relationship between a continuous dependent variable (Y) which may have one or more continuous independent variables $\mathbf{X}= (X_1, X_2, \dots, X_n)'$ The relationship between Y and $\mathbf{X}$ may be linear or nonlinear. However, if Y is categorical and $\mathbf{X}$ consists of a mixture of categorical and continuous variables, the logistic regression is preferred. The use of logistic regression is more appropriate in this case because it does not make any assumptions about the distribution of the independent variables. If the independent variables are only categorical, logistic regression reduces to a contingency table analysis.

In this research work, the logistic regression is used to determine key variables of child labour given the respondents socio-demographic characteristics such as age, sex, literacy, occupation, locality among others. Some of the situations particularly in science, business and social disciplines in which logistic regression analysis may be used are as follows:

1. Prediction of the probability of a heart attack given a patient's blood pressure, cholesterol level, carorie intake, gender and life style.
2. Determination of the probability of failure of a business establishment given a number of a business profile including the size of the establishment.
3. Determination of the probability of whether or not resident of an area would support a home-based team given the resident's age, whether or not he or she is an indigene of the area, the length of stay in the area, the region of birth, and the occupation of the resident.

Logistic regression analysis is thus, a model building technique which determines the category to which an observation belongs by using the specified characteristics of the observation. It also examines the types of the characteristics that can significantly be used to determine the group to which the observation should be placed. The statistical package for social service (SPSS) 16.0 is used to perform the cross tabulation and the multiple logistic regression.

Logistic regression model may be carried out using a number of methods such as the maximum likelihood method. It uses a number of statistics to determine the significance of variables in the model. Notable among such statistics is the Wald Chi-square statistic.

3.3 Mathematical Background

Suppose Y is a random binary variable whose value is 0 or 1; where 0 and 1 represents two different classes to which a subject may belong. Let the probability that $Y = 1$ be denoted by p. That is $P(Y = 1) = p$. Thus, $P(Y = 0) = 1 - p$. The ratio of p to $1 - p$ is referred to as the odds in favour of the event that Y=1 and is given by

$$\text{Odds } (Y{=}1) = \frac{\text{P}}{\text{1-P}} \qquad (3.1)$$

Generally, the odds in favour of an event is defined as

$$\frac{\text{Number of favourable choices}}{\text{Number of unfavourable choices}}$$

The odds against an event is the reciprocal of the odds in favour of the event in favour of the event and is given by the ratio

$$\frac{\text{Number of unfavourable choices}}{\text{Number of favourable choices}}$$

Odds and probabilities provide the same information, but in different forms. The odds in Equation (3.1) may be converted into probability as

$$p = \frac{odds(Y{=}1)}{1{+}odds(Y{=}1)} \qquad (3.2)$$

It may be more relevant to consider the natural logarithm of the value of the odds obtained in equation (3.1). Thus

$$\ln[odds(Y = 1)] = \ln\frac{p}{1-p} \qquad (3.3)$$

Which is a function of the probability, p. This function of p may be expressed as a linear combination of k independent random variables$(X_1, X_2, X_3, \dots, X_k)$. The function of p is thus known as the logit(p). Thus

Logit(p) = $\ln\ \frac{P}{1-P}$

The logit(p) equation is given as

$$\ln \frac{P}{1-P} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_k X_k \quad (3.4)$$

or, in matrix-vector form

$$\ln \frac{P}{1-P} = \beta X \quad (3.5)$$

Where$\beta' = (\beta_0, \beta_1, \beta_2, \ldots, \beta_k)$ is a vector of $k+1$ coefficients of the logistic regression model;

X=($1, X_1, X_2, X_3, \ldots, X_k$) is a vector of independent variables that are a combination of categorical and continuous variables.

In either of the forms given in Equations (3.4) and (3.5), the odds is then given as

$$\text{Odds}[Y = \frac{1}{X_1, X_2, X_{3,\ldots\ldots}, X_k}] = \frac{P}{1-P}$$

Where p is the probability of the event Y=1 given the independent variables, $(X_1, X_2, X_3, \ldots, X_k)$. As can be seen, Equation (3.5), models the logarithm of the odds as a linear function of the independent variables, and is equivalent to a multiple regression equation with the logarithm of the odds as the dependent variables. It would be recalled that if the Equation (3.4) is given as the usual multiple regression equation given by the equation

$$Y = \beta X + e \quad (3.6)$$

where, in this case,

$\beta' = (\beta_0, \beta_1, \beta_2, \ldots, \beta_k)$ a vector of k+1 coefficients of the logistic regression model;

X'= $(1, X_1, X_2, X_3, \ldots, X_k)$ involving the independent variables; and e is the error term; Y is $\ln \frac{P}{1-P}$ in the case of Equation (3.4).

The predicted probabilities from the model obtained in Equation (3.6) are usually where we run in to trouble. There are three problems with using equation (3.6).

1. The error terms are heteroscedastic (heteroscedasticity occurs when the variance of the dependent variable is different with different values of the independent variables): Var(e)=$p(1-p)$, where p is the probability that Y=1. Since p depends on **X**, the classical regression assumption that the error terms does not depends on the **X** is violated.
2. The error term,e, is not normally distributed because p takes only two values, violating the multivariate normality assumption.
3. The predicted probability can be greater than 1or less than 0, which can be a problem if the predicted values are used in the subsequent analysis.

By using the "logit" model in Equation (3.4), we are able to solve these problems. The "logistic" distribution is an S-shape distribution function, which is similar to the standard normal distribution (which results in a probit regression model) but easier to work with in most applications (the probabilities are easier to calculate).The logit distribution constrains the estimated probabilities to lie between 0 and 1.

Now in Equation (3.5), the probability,p, is obtained by the equation

$$p = \frac{1}{1+exp^{(-\beta X)}} \tag{3.7}$$

With this functional form:

- If you let $\beta X = 0$, then p =0.5;
- As $\beta X \rightarrow \infty$, $p \rightarrow 1$; and
- As $\beta X \rightarrow 0$, $p \rightarrow 0$.

Odds ratio equals to 1 that means that there is a 50/50 chance that the event will occur with a small change in the independent variable. Negative coefficients lead to odds ratios less than one. Odds ratio less than 1 (negative coefficients) tend to be harder to interpret than odds ratios greater than one (positive coefficients). We take note that odds ratio for continuous independent variables tend to be close to one, this does not suggest that the coefficients are in significant.

As can be seen in Equation (3.7), the logit(p) are linearly related to X, then the relation between X and p is non-linear, and has the form of the elongated $S-$ shaped curve. For more on logistic regression one is referred to Tabachnick and Fidel (1996).

3.4 Testing for the significance of the model

3.4.1 Hypothesis Testing

The null and alternative hypotheses for testing the significance of a particular variable in the model is given by $H_0 : \beta_i = 0$ and $H_1 : \beta_j \neq 0,1,2,3, \ldots, K$ 0, i = 1, 2, 3,…,k

Testing the hypothesis that the coefficient of an individual independent variable is significantly different from 0 is similar to testing in ordinary least square models. The Wald test is used to test the statistical significance of each estimated coefficient (β) in

the logistic regression model. This is done by dividing the estimated coefficient of interest by its standard error and squaring the result. It is approximately a chi-square statistic with one degree of freedom. That is,

$$\text{Wald} = \left\{\frac{\beta_i}{se(\beta_i)}\right\}^2, \tag{3.8}$$

Where $\hat{\beta}$ is the parameter estimate and se ($\hat{\beta}$) is the standard error of the parameter estimate, which is distributed as chi-square with 1 degree of freedom. That is the Wald statistic is the squared ratio of the standardized logit coefficient estimate to its standard error. The statistic is simply the square of the (asymptotic) t-statistic. A large value of the statistic leads to the rejection of the null hypothesis of zero coefficients.

The Wald statistic is widely considered (Menard, 2002; Agrestic, 1996) to be less reliable. This is because for large logit coefficients, the standard error is inflated lowering the Wald statistic and leading to Type II errors (false negatives: thinking the effect is not significant when it is).That is there is a flaw in the Wald statistic such that very large effects may lead to large standard errors and small Wald chi-square values. This means that a variable may be considered as non-significant in the model when in fact it is.

3.4.2 The Likelihood Ratio

A ‘’Likelihood’’ is a probability, specifically the probability that the observed values of the dependent variable may be predicted from the observed values of the independent. Like any probability, the likelihood varies from 0 to 1. The log likelihood (LL) is its log and varies from 0 to minus infinity (it is negative because the log of any number less

than 1 is negative). LL is calculated through iteration, using maximum likelihood estimation (MLE).

Log likelihood is the basis for the tests of a logistic model. Because $-2LL$ has approximately a chi-square distribution; $-2LL$ can be used for assessing the significance of logistic regression, analogous to the use of the sum of squared errors in Ordinary Least Square (OLS) regression. The $-2LL$ statistic is the likelihood ratio. It is also called goodness of fit, deviance chi-square, scaled deviance, deviation chi-square, DM, or $L-$ square. It reflects the significance of the unexplained variance in the dependent variable. The likelihood ratio is not used directly in significance testing. But it is the basis for the likelihood ratio test, which is the test of the difference between two likelihood ratios (two$-2LL$), as discussed below. In general, as the model becomes better, $-2LL$ decreases in magnitude.

$\mathrm{G} = \chi^2 = D_{null}$ (for the model without variable) $-D_k$ (for the model with the variable)

$$\mathrm{G} = \chi^2 = D_{null} - D_k = -2LL_{null} - (-2LL) \tag{3.9}$$

Where D_{null} is the deviance for the constant only and D_k is the deviance for the model containing k number of predictors. An equivalent formula is:

$$\chi^2 - 2\ln\frac{L_{null}}{L_k} \tag{3.10}$$

where the ratio of the ML values is taken before taking the log and multiplying by-2. This gives rise to the term 'likelihood ratio test' to describe G.

A better test statistic is the likelihood ratio. This involved looking at the change in the log likelihood when a variable is added or eliminated, depending on whether one is doing a forward or backward selection. Under the null hypothesis, the difference between the -2log likelihood values of the null and reduced models has a chi- square distribution with r degrees of freedom, where r is the difference between the number of terms in the full model and the reduced model.

3.4.3 The Likelihood Ratio Test

The log-likelihood test is based on $-2LL$ (deviance). The likelihood ratio test is a test of the significance of the difference between the likelihood ratio $(-2LL)$ for the researcher's model minus the likelihood ratio for a reduce model. This difference is called is called "model chi-square" The likelihood ratio test uses the ratio of the maximized value of the likelihood function for the full model (L_1) over the maximized value of the likelihood function for the simpler model (L_0).The likelihood ratio test statistic equals:

$$-2\log(\frac{L_o}{L_1}) = -2[\log L_o - \log L_1] = -2(L_o - L_1)$$

This log transformation of the likelihood functions yields a chi –squares statistic. This is the recommended test statistic is used when building a model through backward stepwise elimination. The likelihood ratio test is generally preferred over its alternative, the Wald test, as discussed.

3.4.4 Testing for interaction effects

A common use of the likelihood ratio test is to test the difference between a full model and a reduced model dropping an interaction effect. If model chi-square (which is $-2LL$

for the full model minus $-2LL$ for the reduced model) is significant, then the interaction effect is contribution significantly to the full model and should be retained.

3.4.5 Confidence Interval Estimation

The basis for construction of the interval estimators is the same statistical theory used to formulate the test for significance of the model. The confidence interval estimators for the slope and intercept are based on their respective Wald tests. The end points of a $100(1-\alpha)$ % confidence interval for the slope coefficient are given as

$$\beta_i \pm Z_{1-\alpha/2}\, SE(\hat{\beta}_1),$$

where $Z_{1-\alpha/2}$ is the upper $100\left(1-\frac{\alpha}{2}\right)\%$ point from the standard normal distribution and $SE(\hat{\beta}_1)$, denote a model based estimate of the standard error of the respective parameter estimator.

3.4.6 Stepwise Logistic Regression

The forward or backward stepwise logistic regression methods determine automatically which variables to add or drop from the model. As data driven methods, stepwise procedures run the risk of modeling noise in the data and are considered useful only for explanatory purposes. Selecting model variables on a theoretic basis and using the "Enter" method is preferred. Both binomial and multinomial logistic regression offers both forward and backward stepwise logistic regression, though with slight differences.

3.5 Interpretation of the Logistic Regression Coefficients

To understand the interpretation of the logistic regression coefficients, the logistic model can be written in terms of the odds of an event occurring. As defined earlier, the

odds of an event occurring is the ratio of the probability that it will occur to the probability that it will not occur. The coefficients indicate roughly the change in the log odds associated with one unit change in the independent variable. The $\exp(\beta)$ given in SPSS indicates that factor of change in the odds associated with one-unit change in the independent variables. It actually states the exact relationship. The positive increase in (β) shows the likelihood increase in relation to the reference category while a negative (β) shows the likelihood decrease in the relation to reference category. Zero (β) indicates little or no change in relation to reference category.

3.6 Method of analysis

In SPSS, the parameters of the logistic regression model are the estimated maximum-likelihood method. SPSS employs two main approaches to assess the goodness of fit. These are the Wald test and the Likelihood Ratio Test (LRT).

The socio-demographic characteristics of interest in this study are sex of a child, relationship to head of household, age group of children, size of household, age of head of household, place of residence, literacy of parent, occupation of parents, marital status of parents and gender of head of household. These variables have being speculated to determine or influence child labour. This aspect examines children working and children not working by selected background characteristics. The relative importance of each of the socio-economic characteristics of interest is assessed using logistic regression analysis.

The unit of analysis in this chapter is the child age 5-17 years. The variables included in the logistic regression as well as their estimated coefficients are standard errors, significant values, odds ratio and confidence intervals are estimated.

In SPSS version 16, the data was analyzed by following this command. Log into the SPSS version 16 and followed the procedure below to compute logistic regression.

1. From the menu at the top of the, click on Analyze, then click on Regression and then Binary Logistic

2. Choose your categorical dependent variables (labour) and move it to the dependent box

- Click on your predictor variables (sex of child, relationship to head of household, age group of children, size of household, age of head of household, residence, literacy, occupation of parents, marital status of parents and gender of head of household) and move them into the box labeled covariates
- For method, make sure Enter is displayed

3. If you have any categorical predictors you will need to click on the categorical bottom at the top of the dialogue box. Highlight each of the categorical variables (sex of a child, relationship to head of household, age group of children, size of household, age of head of household, residence, literacy, occupation of parents, marital status of parents and gender of head of household) and move them into the categorical covariates box

- Highlight each of the categorical variables in turn and click on the button labeled first in the change contract section. Click on the change and you will see the word (first) appear after the variable this will set the group to be used as the

reference as the first group listed. Repeat for all categorical variables. Click on continue

4. Click on the options bottom, select classification plots, Hosmer-Lemeshow goodness of fit, Casewise listing of residuals and CI for by $Exp(\beta)$.

5. Click on continue and then ok

3.7 Data collection

The main source of data for this study was the 2001, Ghana Child Labour Survey (GCLS) administered by Ghana Statistical Service (GSS, 2003). The Multiple Indicator Cluster Survey (MICS, 2006) data and other secondary sources were also utilized. The GCLS data were collected during the period February 2001, as part of an impact within the frame work of the International Programme on the Elimination of Child Labour (IPEC).The main objective of this survey (GCLS 2003) was to provide, among others, information on the various aspects of working children in a household as well as children on the street. The survey collected extensive information from both household and street children:

3.8 The Data

The information on households was obtained from 47,955 persons in a sample of 9889 households, Information of street children were also obtained from areas throughout the country. A total of 2,314 street children were interviewed, out of whom 52.4 percent were females. The sample design and sampling procedure for 2001 Ghana Child Labour Survey comprised both a nationwide probability sample survey of all households in Ghana and supplementary non-probability survey of street children.

The sampling frame for the household-based sample survey was the list of all 26,555 Enumeration Areas (EAs) from the 2000 Population and Housing Census of Ghana with corresponding data on number of households. The household sample survey was based on a two-stage stratified cluster design. The frame was stratified into urban and rural localities of residence and by the 10 administrative regions in the country.

At the first stage, 500 Enumeration Areas (EAs) were systematically selected, with probability proportional to size, the measure of size being the number of census households. At the second stage, 20 households were selected from each of the 500 EAs to produce an overall sample size of 10,000 households. The design ensures that every household in the county had the same chance to be selected; in other words, the sample was self-weighing. The sampling process yielded the allocation of households to each stratum (urban\rural and region). The sample also yielded an average weight of 370.12 for each child. This means that each child in the survey represents about 370 children.

CHAPTER FOUR

4.0 DATA ANALYSIS AND RESULTS

4.1 Descriptive Statistics

The data shows that the survey collected extensive information on children aged 5-17 years which were made up of males and females in a sample of 10,000 households. According to the survey, out of 10,000 households selected 9,889 were successfully interviewed, indicating a household response rate of 98.9 per cent. A similar response rate was achieved in all regions and in rural/urban areas. (The survey covered all the ten regions of Ghana). The table below shows the regional distribution of children across the country.

Table (4.0): Regional distribution children aged 5-17 years

Region	**Households**
Western	1,000
Central	860
Greater Accra	1,560
Volta	1,140
Eastern	880
Ashanti	1,740
Brong Ahafo	1,000
Northern	1,020
Upper East	500
Upper West	300
All regions	10,000

Source: Ghana Child Labour survey, 2003

For the estimation of child labour, five years old may be considered as extreme but it is very common in the Ghana. Therefore for the purpose of this study only children in the age group 5-17 years were selected. Table 4.0 above shows the regional distribution of children aged 5-17 years. It can be seen from the table that Ashanti region recorded the highest number of children (1,740) while Upper East recorded the lowest (300).

4.2 Coding of responses

In other to make sense of the results of logistic regression, it is important to set up coding of the responses to each of the selected variable. According to Julie Pallant (2007) in coding responses the value of 0 should be assigned to which ever response indicates a lack or absence of the characteristics of interest. In this research, 0 is used to code the answer No to the question 'Do you work?' The value of 1 is used to indicate a yes answer. A similar approach is used when coding the independent variables. Below is the table showing the coding of the responses of the independent variables.

Table 4.1coding of dependent variable

Dependent Variable Encoding

Original Value	Internal Value
No	0
Yes	1

Table (4.2) coding for independent variables

Variable	Response	Code
Age of child	Less than 15 years	0
	15 years and above	1
Sex of Child	Response	Code
	Female	0
	Male	1
Gender (HHD)	Response	Code
	Female	0
	Male	1
Age (HHD)	Response	Code
	Above 60 years	0
	Less than 60 years	1
Relationship (HHD)	Response	Code
	Other relative	0
	Child	1
Literacy (HHD)	Response	Code
	Not Literate	0
	Literate	1
Marital status (parent)	Response	Code
	Not married	0
	Married	1

Variable	Response	Code
Residence	Rural	0
	Urban	1
Size (HD)	Response	Code
	7 and above	0
	Less than 7	1
Employment (HHD)	Response	Code
	Not employed	0
	Employed	1

4.3 Logistic Regression of child labour

An overall performance of the model was conducted on the following independent variables, sex of child, relationship to head of household, age group of children, size of household, age of head of household, place of residence, literacy of parent, major occupation of parent, marital status of parents and gender of head of household. The Logistic Regression analysis of the data is shown in the table below. The significance of the variable are assessed by the $p-$values (represented in the table by "sig"), the Wald's statistics values or the odd ratios represented by $Exp(\beta)$.

Table (4.3): Estimated parameters of coefficients of study variables on child labour for the whole Ghana.

Variables in the Equation

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age of child	-1.251	.045	784.652	1	.000	.286	.262	.313
	Sex of Child	.020	.034	.350	1	.554	1.021	.954	1.092
	Gender (HHD)	-.259	.044	34.589	1	.000	.772	.708	.841
	Age (HHD)	.157	.043	13.396	1	.000	1.170	1.075	1.272
	Relation (HHD)	-.036	.046	.623	1	.430	.965	.882	1.055
	Literacy (HHD)	.423	.038	123.199	1	.000	1.527	1.417	1.645
	Marital status (parent)	.028	.038	.559	1	.455	1.029	.955	1.108
	Residence	1.296	.041	996.141	1	.000	3.653	3.371	3.960
	Size (HD)	.244	.036	47.083	1	.000	1.276	1.190	1.368
	Employment (HHD)	.407	.055	54.839	1	.000	1.502	1.348	1.672
	Constant	-1.053	.072	211.364	1	.000	.349		

a. Variable(s) entered on step 1: Age of child, Sex of Child, Gender (HHD), Age (HHD), Relation (HHD), Literacy (HHD), Marital status (parent), Residence, Size (HD), Employment (HHD).

4.4 Explanation of the variables

4.4.1 Significant variables

The analysis of the data in table 4.3 shows that the following variables are significant, Age group of children, Gender of head of household, Age of head of household, Literacy of head of household, Locality of residence, Size of household and Employment status of head of household.

4.4.2 Insignificant variables

The analysis has identified the following variables as not significant, sex of the children, Relationship of child to head of household and marital status of parents.

4.5 Regional Analysis

Table (4.4): Estimated parameters of coefficients of study variables on child labour for Ashanti Region.

Variables in the Equation

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age of child	-1.308	.117	125.833	1	.000	.270	.215	.340
	Sex of Child	.215	.097	4.926	1	.026	1.240	1.025	1.500
	Gender (HHD)	-.183	.116	2.490	1	.115	.833	.664	1.045
	Age (HHD)	.206	.127	2.629	1	.105	1.229	.958	1.578
	Relation (HHD)	-.117	.128	.843	1	.359	.889	.692	1.142
	Literacy (HHD)	.444	.106	17.495	1	.000	1.559	1.266	1.920
	Marital status (parent)	-.054	.105	.269	1	.604	.947	.771	1.163
	Residence	1.501	.109	191.111	1	.000	4.486	3.626	5.550
	Size (HD)	.384	.100	14.719	1	.000	1.468	1.207	1.787
	Employment (HHD)	-.074	.136	.297	1	.586	.928	.711	1.213
	Constant	-1.252	.188	44.323	1	.000	.286		

a. Variable(s) entered on step 1: Age of child, Sex of Child, Gender (HHD), Age (HHD), Relation (HHD), Literacy (HHD), Marital status (parent), Residence, Size (HD), Employment (HHD).

4.5.1 Significant variables

Variables that made significant contribution to child labour are shown in table 4.4. Only four of the independent variables made a unique statistical contribution to the model (Age of child, Literacy of head of household, Residence and size of household).

Table 4.5 Model Summary for Ashanti Region.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2621.836[a]	.142	.207

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

The model for Ashanti Region explained between 14.2 % (Cox and Snell R square) and 20.7 % (Nagelkerke R Square) of the variance in child labour status, and correctly classified 77% of cases.

Table 4.6 Hosmer and Lemeshow Test for Ashanti Region.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	10.051	8	.261

For the Hosmer-Lemeshow Goodness of fit test, poor fit is indicated by a significant value of 0.05 so as to support our model we actually want a value greater than 0.05. In table 4.6 the chi-square value for the Hosmer-Lemeshow Test is 10.051 with a significant level of 0.261 this is greater than 0.05 indicating our support for the model.

Table (4.7): Estimated parameters of coefficients of study variables on child labour for Brong Ahafo region.

Variables in the Equation

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age of child	-1.242	.143	75.558	1	.000	.289	.218	.382
	Sex of Child	-.125	.127	.967	1	.325	.883	.689	1.132
	Gender (HHD)	-.056	.153	.134	1	.714	.946	.701	1.276
	Age (HHD)	.012	.160	.006	1	.940	1.012	.739	1.386
	Relation (HHD)	.123	.176	.489	1	.484	1.131	.801	1.597
	Literacy (HHD)	.514	.144	12.786	1	.000	1.671	1.261	2.214
	Marital status (parent)	.001	.135	.000	1	.992	1.001	.769	1.304
	Residence	1.004	.144	48.436	1	.000	2.728	2.057	3.619
	Size (HD)	.377	.129	8.556	1	.003	1.458	1.132	1.877
	Employment (HHD)	.257	.197	1.699	1	.192	1.293	.878	1.904
	Constant	-1.748	.264	43.890	1	.000	.174		

a. Variable(s) entered on step 1: Age of child, Sex of Child, Gender (HHD), Age (HHD), Relation (HHD), Literacy (HHD), Marital status (parent), Residence, Size (HD), Employment (HHD).

4.5.2 Significant variables

Variables that made significant contribution to child labour in Ashanti Region are the same as those in Brong Ahafo Region shown in table 4.7. Only four of the independent variables made a unique statistically contribution to the model (Age of child, Literacy of head of household, Residence and size of household).

Table 4.8 Model Summary for Brong Ahafo Region.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1592.548[a]	.094	.148

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

The model for Brong Ahafo Region explained between 9.4 % (Cox and Snell R square) and 14.8 % (Nagelkerke R Square) of the variance in child labour status, and correctly classified 82 % of cases.

Table 4.9 Hosmer and Lemeshow Test for Brong Ahafo Region.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	10.118	8	.257

For the Hosmer-Lemeshow Goodness of fit test, poor fit is indicated by a significant value of 0.05 so as to support our model we actually want a value greater than 0.05. In table 4.5 the chi-square value for the Hosmer-Lemeshow Test is 10.118 with a significant level of 0.257 this is greater than 0.05 indicating our support for the model.

Table (4.10): Estimated parameters of coefficients of study variables on child labour for Central Region.

Variables in the Equation

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age of child	-1.399	.147	90.589	1	.000	.247	.185	.329
	Sex of Child	.258	.120	4.622	1	.032	1.294	1.023	1.636
	Gender (HHD)	.003	.135	.001	1	.982	1.003	.770	1.307
	Age (HHD)	-.043	.174	.063	1	.803	.957	.681	1.346
	Relation (HHD)	-.045	.159	.081	1	.776	.956	.700	1.304
	Literacy (HHD)	.359	.136	6.978	1	.008	1.432	1.097	1.869
	Marital status (parent)	.076	.132	.326	1	.568	1.079	.832	1.398
	Residence	.694	.131	28.072	1	.000	2.001	1.548	2.587
	Size (HD)	.129	.123	1.097	1	.295	1.137	.894	1.447
	Employment (HHD)	.300	.167	3.232	1	.072	1.350	.973	1.874
	Constant	-.587	.240	5.999	1	.014	.556		

a. Variable(s) entered on step 1: Age of child, Sex of Child, Gender (HHD), Age (HHD), Relation (HHD), Literacy (HHD), Marital status (parent), Residence, Size (HD), Employment (HHD).

4.5.3 Significant variables

Variables that made significant contribution to child labour are shown in table 4.10. Only four of the independent variables made a unique statistically contribution to the model (Age of child, Sex of child, Literacy of head of household and Residence)

Table (4.11) Model Summary for Central Region.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1649.104[a]	.104	.143

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

The model for Central Region explained between 10.4 % (Cox and Snell R square) and 14.3 % (Nagelkerke R Square) of the variance in child labour status, and correctly classified 70.2 % of cases.

Table (4.12) Hosmer and Lemeshow Test for Central Region.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	10.302	8	.244

For the Hosmer-Lemeshow Goodness of fit test, poor fit is indicated by a significant value of 0.05 so as to support our model we actually want a value greater than 0.05. In table 4.12 the chi-square value for the Hosmer-Lemeshow Test is 10.302 with a significant level of 0.244 this is greater than 0.05 indicating our support for the model.

Table (4.13): Estimated parameters of coefficients of study variables on child labour for Eastern Region.

Variables in the Equation

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age of child	-1.292	.135	91.394	1	.000	.275	.211	.358
	Sex of Child	-.152	.098	2.446	1	.118	.859	.709	1.039
	Gender (HHD)	-.088	.124	.507	1	.477	.916	.719	1.167
	Age (HHD)	.370	.128	8.344	1	.004	1.448	1.126	1.861
	Relation (HHD)	-.234	.129	3.285	1	.070	.791	.615	1.019
	Literacy (HHD)	.142	.108	1.739	1	.187	1.153	.933	1.424
	Marital status (parent)	.087	.113	.598	1	.439	1.091	.875	1.362
	Residence	.967	.116	69.335	1	.000	2.631	2.095	3.304
	Size (HD)	.357	.099	13.033	1	.000	1.430	1.177	1.736
	Employment (HHD)	.550	.148	13.855	1	.000	1.733	1.297	2.315
	Constant	-.394	.211	3.503	1	.061	.674		

a. Variable(s) entered on step 1: Age of child, Sex of Child, Gender (HHD), Age (HHD), Relation (HHD), Literacy (HHD), Marital status (parent), Residence, Size (HD), Employment (HHD).

4.5.4 Significant variables

Variables that made significant contribution to child labour are shown in table 4.13. Five of the independent variables made a unique statistically contribution to the model (Age of child, Age of head of household, Gender of head of household, Residence, Size of household and Employment status of head of household). This indicates that in Eastern Region, 50% of the selected variables contribute to child labour.

Table (4.14) Model Summary for Eastern Region.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2433.216[a]	.128	.171

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

The model for Eastern Region explained between 12.8 % (Cox and Snell R square) and 17.1 % (Nagelkerke R Square) of the variance in child labour status, and correctly classified 64.3 % of cases.

Table 4.15 Hosmer and Lemeshow Test for Eastern Region.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	21.860	8	.005

For the Hosmer-Lemeshow Goodness of fit test, poor fit is indicated by a significant value of 0.05 so as to support our model we actually want a value greater than 0.05. In table 4.15 the chi-square value for the Hosmer-Lemeshow Test is 21.860 with a significant level of 0.005 this is less than 0.05 which does not support the model.

Table (4.16): Estimated parameters of coefficients of study variables on child labour for Greater Accra Region.

Variables in the Equation

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age of child	-1.078	.134	65.132	1	.000	.340	.262	.442
	Sex of Child	.364	.125	8.544	1	.003	1.439	1.128	1.838
	Gender (HHD)	-.148	.146	1.035	1	.309	.862	.648	1.147
	Age (HHD)	-.014	.163	.007	1	.931	.986	.717	1.357
	Relation (HHD)	.612	.145	17.883	1	.000	1.843	1.388	2.448
	Literacy (HHD)	.333	.154	4.686	1	.030	1.395	1.032	1.886
	Marital status (parent)	.061	.141	.188	1	.664	1.063	.807	1.400
	Residence	1.464	.142	106.684	1	.000	4.324	3.275	5.710
	Size (HD)	-.089	.128	.489	1	.484	.914	.712	1.175
	Employment (HHD)	.457	.147	9.612	1	.002	1.579	1.183	2.107
	Constant	-1.789	.208	74.291	1	.000	.167		

a. Variable(s) entered on step 1: Age of child, Sex of Child, Gender (HHD), Age (HHD), Relation (HHD), Literacy (HHD), Marital status (parent), Residence, Size (HD), Employment (HHD).

4.5.5 Significant variables

Variables that made significant contribution to child labour are shown in table 4.16 seven of the independent variables made a unique statistically contribution to the model (Age of child, Sex of child, Gender of head of household, Relationship to head of household, Literacy of head of household, Residence, and Employment status of head

of household). This indicates that in Greater Accra Region, 70% of the selected variables contribute to child labour.

Table (4.17) Model Summary for Greater Accra Region.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1722.234[a]	.127	.201

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

The model for Greater Accra Region explained between 12.7 % (Cox and Snell R square) and 20.1 % (Nagelkerke R Square) of the variance in child labour status, and correctly classified 80 % of cases.

Table (4.18) Hosmer and Lemeshow Test for Greater Accra Region.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	19.916	8	.011

For the Hosmer-Lemeshow Goodness of fit test, poor fit is indicated by a significant value of 0.05 so as to support our model we actually want a value greater than 0.05. In table 4.18 the chi-square value for the Hosmer-Lemeshow Test is 19.916 with a significant level of 0.011 this is less than 0.05 which does not support the model

Table (4.19): Estimated parameters of coefficients of study variables on child labour for Northern Region.

Variables in the Equation

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age of child	-1.595	.139	131.359	1	.000	.203	.154	.266
	Sex of Child	-.093	.090	1.066	1	.302	.911	.764	1.087
	Gender (HHD)	-.288	.188	2.342	1	.126	.750	.519	1.084
	Age (HHD)	.415	.099	17.531	1	.000	1.515	1.247	1.840
	Relation (HHD)	-.201	.136	2.193	1	.139	.818	.627	1.067
	Literacy (HHD)	.209	.181	1.329	1	.249	1.232	.864	1.758
	Marital status (parent)	.015	.096	.026	1	.873	1.016	.841	1.227
	Residence	1.401	.122	131.686	1	.000	4.057	3.194	5.154
	Size (HD)	.266	.107	6.234	1	.013	1.305	1.059	1.609
	Employment (HHD)	1.330	.360	13.620	1	.000	3.779	1.865	7.658
	Constant	-1.390	.384	13.140	1	.000	.249		

a. Variable(s) entered on step 1: Age of child, Sex of Child, Gender (HHD), Age (HHD), Relation (HHD), Literacy (HHD), Marital status (parent), Residence, Size (HD), Employment (HHD).

4.5.6 Significant variables

Variables that made significant contribution to child labour are shown in table 4.19. Five of the independent variables made a unique statistically contribution to the model (Age of child, Age of head of household, Residence, Size of household and Employment status of head of household). This indicates that in Northern Region, 50% of the selected variables contribute to child labour.

Table (4.20) Model Summary for Northern Region.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2897.062[a]	.160	.213

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

The model for Northern Region explained between 16 % (Cox and Snell R square) and 23.3 % (Nagelkerke R Square) of the variance in child labour status, and correctly classified 65 % of cases.

Table (4.21) Hosmer and Lemeshow Test for Northern Region.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	7.908	8	.443

For the Hosmer-Lemeshow Goodness of fit test, poor fit is indicated by a significant value of 0.05 so as to support our model we actually want a value greater than 0.05. In table 4.21 the chi-square value for the Hosmer-Lemeshow Test is 7.908 with a significant level of 0.443 this is greater than 0.05 indicating our support for the model.

Table (4.22): Estimated parameters of coefficients of study variables on child labour for Upper East Region.

Variables in the Equation

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age of child	-1.794	.229	61.213	1	.000	.166	.106	.261
	Sex of Child	-.069	.162	.180	1	.672	.934	.680	1.282
	Gender (HHD)	.291	.283	1.058	1	.304	1.338	.768	2.329
	Age (HHD)	-.320	.178	3.213	1	.073	.726	.512	1.030
	Relation (HHD)	.661	.237	7.787	1	.005	1.937	1.217	3.082
	Literacy (HHD)	.185	.269	.475	1	.491	1.203	.711	2.037
	Marital status (parent)	-.136	.175	.605	1	.437	.873	.620	1.229
	Residence	2.392	.570	17.604	1	.000	10.931	3.577	33.409
	Size (HD)	.304	.198	2.359	1	.125	1.356	.919	2.000
	Employment (HHD)	.529	.413	1.645	1	.200	1.698	.756	3.812
	Constant	-1.960	.716	7.498	1	.006	.141		

a. Variable(s) entered on step 1: Age of child, Sex of Child, Gender (HHD), Age (HHD), Relation (HHD), Literacy (HHD), Marital status (parent), Residence, Size (HD), Employment (HHD).

4.5.7 Significant variables

Variables that made significant contributions to child labour as shown in table 4.22 only three of the independent variables made a unique statistically contribution to the model (Age of child, Relationship to head of household and Residence).

Table (4.23) Model Summary for Upper East Region.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	936.313[a]	.136	.183

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

The model for Upper East Region explained between 13.6 % (Cox and Snell R square) and 18.3 % (Nagelkerke R Square) of the variance in child labour status, and correctly classified 68 % of cases.

Table (4.24) Hosmer and Lemeshow Test for Upper East Region.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	9.406	8	.309

For the Hosmer-Lemeshow Goodness of fit test, poor fit is indicated by a significant value of 0.05 so as to support our model we actually want a value greater than 0.05. In table 4.24 the chi-square value for the Hosmer-Lemeshow Test is 9.406 with a significant level of 0.309 this is greater than 0.05 indicating our support for the model.

Table (4.25): Estimated parameters of coefficients of study variables on child labour for Upper West Region.

Variables in the Equation

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age of child	-1.147	.208	30.311	1	.000	.318	.211	.478
	Sex of Child	-.445	.140	10.150	1	.001	.641	.487	.843
	Gender (HHD)	-.204	.234	.765	1	.382	.815	.516	1.288
	Age (HHD)	.205	.178	1.327	1	.249	1.228	.866	1.740
	Relation (HHD)	-.655	.289	5.148	1	.023	.519	.295	.915
	Literacy (HHD)	.322	.213	2.271	1	.132	1.379	.908	2.096
	Marital status (parent)	.143	.149	.923	1	.337	1.154	.861	1.547
	Residence	1.439	.187	59.501	1	.000	4.218	2.926	6.080
	Size (HD)	.436	.148	8.655	1	.003	1.547	1.157	2.069
	Employment (HHD)	.940	.288	10.659	1	.001	2.560	1.456	4.502
	Constant	-.967	.384	6.359	1	.012	.380		

a. Variable(s) entered on step 1: Age of child, Sex of Child, Gender (HHD), Age (HHD), Relation (HHD), Literacy (HHD), Marital status (parent), Residence, Size (HD), Employment (HHD).

4.5.8 Significant variables

Variables that are significant contributions to child labour as shown in table 4.25, six of the independent variables made a unique statistically contribution to the model (Age of child, Sex of child, Relationship to head of household, Residence, Size of household and Employment status of head of household).

Table (4.26) Model Summary for Upper West Region.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1213.424[a]	.134	.183

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

The model for Upper West Region explained between 13.4 % (Cox and Snell R square) and 18.3 % (Nagelkerke R Square) of the variance in child labour status, and correctly classified 66 % of cases.

Table (4.27) Hosmer and Lemeshow for Upper West Region.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	7.535	8	.480

For the Hosmer-Lemeshow Goodness of fit test, poor fit is indicated by a significant value of 0.05 so as to support our model we actually want a value greater than 0.05. In table 4.27 the chi-square value for the Hosmer-Lemeshow Test is 7.535 with a significant level of 0.480 this is greater than 0.05 indicating our support for the model.

Table (4.28): estimated parameters of coefficients of study variables on child labour for Volta Region.

Variables in the Equation

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age of child	-.963	.155	38.497	1	.000	.382	.282	.518
	Sex of Child	.121	.116	1.083	1	.298	1.128	.899	1.416
	Gender (HHD)	-.434	.133	10.674	1	.001	.648	.499	.841
	Age (HHD)	.123	.152	.655	1	.418	1.131	.840	1.522
	Relation (HHD)	-.428	.146	8.604	1	.003	.652	.489	.867
	Literacy (HHD)	.919	.128	51.877	1	.000	2.508	1.953	3.221
	Marital status (parent)	.100	.131	.575	1	.448	1.105	.854	1.429
	Residence	.942	.162	33.960	1	.000	2.565	1.868	3.520
	Size (HD)	-.012	.119	.010	1	.922	.988	.783	1.247
	Employment (HHD)	-.015	.171	.007	1	.931	.985	.705	1.378
	Constant	-.307	.248	1.535	1	.215	.735		

a. Variable(s) entered on step 1: Age of child, Sex of Child, Gender (HHD), Age (HHD), Relation (HHD), Literacy (HHD), Marital status (parent), Residence, Size (HD), Employment (HHD).

4.5.9 Significant variables

Variables that made significant contribution to child labour as shown in table 4.28 five of the independent variables made a unique statistically contribution to the model (Age of child, Gender of head of household, Relationship to head of household, Literacy of head of household, Residence). This indicates that in Volta Region, 50% of the selected variables contribute to child labour.

Table 4.29 Model Summary for Volta Region.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1728.666[a]	.119	.158

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

The model for Volta Region explained between 11.9 % (Cox and Snell R square) and 15.8 % (Nagelkerke R Square) of the variance in child labour status, and correctly classified 66 % of cases.

Table 4.30 Hosmer and Lemeshow for Volta Region.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	27.841	8	.001

For the Hosmer-Lemeshow Goodness of fit test, poor fit is indicated by a significant value of 0.05 so as to support our model we actually want a value greater than 0.05. In table 4.30 the chi-square value for the Hosmer-Lemeshow Test is 27.841 with a significant level of 0.011 this is less than 0.05 which does not support the model

Table (4.31): Estimated parameters of coefficients of study variables on child labour for Western Region.

Variables in the Equation

	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	Age of child	-1.445	.149	94.188	1	.000	.236	.176	.316
	Sex of Child	.040	.104	.152	1	.697	1.041	.850	1.276
	Gender (HHD)	-.518	.143	13.180	1	.000	.596	.450	.788
	Age (HHD)	-.010	.138	.005	1	.942	.990	.755	1.298
	Relation (HHD)	-.113	.132	.737	1	.390	.893	.690	1.156
	Literacy (HHD)	.390	.113	11.904	1	.001	1.477	1.183	1.842
	Marital status (parent)	-.213	.116	3.345	1	.067	.808	.643	1.015
	Residence	.869	.141	38.197	1	.000	2.386	1.811	3.143
	Size (HD)	.194	.105	3.421	1	.064	1.214	.988	1.491
	Employment (HHD)	.730	.152	22.985	1	.000	2.076	1.540	2.798
	Constant	-.182	.216	.707	1	.400	.834		

a. Variable(s) entered on step 1: Age of child, Sex of Child, Gender (HHD), Age (HHD), Relation (HHD), Literacy (HHD), Marital status (parent), Residence, Size (HD), Employment (HHD).

4.5.10 Significant variables

Variables that made significant contribution to child labour as shown in table 4.31, five of the independent variables made a unique statistically contribution to the model (Age of child, Gender of head of household, Literacy of head of household, Residence, and Employment status of head of household). This indicates that in Western Region, 50% of the selected variables contribute to child labour.

Table (4.32) Model Summary for Western Region.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2161.642[a]	.122	.163

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

The model for Western Region explained between 12.2 % (Cox and Snell R square) and 16.3 % (Nagelkerke R Square) of the variance in child labour status, and correctly classified 66 % of cases.

Table (4.33) Hosmer and Lemeshow for Western Region.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	18.546	8	.017

For the Hosmer-Lemeshow Goodness of fit test, poor fit is indicated by a significant value of 0.05 so as to support our model we actually want a value greater than 0.05. In table 4.33 the chi-square value for the Hosmer-Limeshow Test is 18.546 with a significant level of 0.017 this is less than 0.05 which does not support the model.

CHAPTER FIVE

5.0 CONCLUTIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This study examined the relationship between selected socio-demographic variables influencing child labour in Ghana. Critical examination of the selected socio-demographic variables of child labour was carried out using multivariate logistic regression model. This was used to establish the significance of the relationship between the independent variables and the dependent variables. The independent variables were mainly socio-demographic in nature.

5.2 CONCLUSIONS

In examining the selected socio-demographic factors (variables) of child labour in Ghana. Binary logistic regression was applied to all the selected variables in order to capture the predictor of child labour. Region by Region analysis shows that Age of child, literacy of head of household and Residence made strong significant statistical contribution to child labour in Ghana. In other words, these variables contribute to child labour in all the ten regions of country. Other variables that made significant statistical contribution to child labour are Employment status of head of household, Gender of head of household, Size of household, Age of head of household, Sex of child and Relationship to head of household. It is only Marital Status of parent that did not made any statistical contribution to child labour among the selected variables in Ghana. The table below shows region by region contributions of the variables to child labour in Ghana.

5.1 Region by region contributions of the variables to child labour.

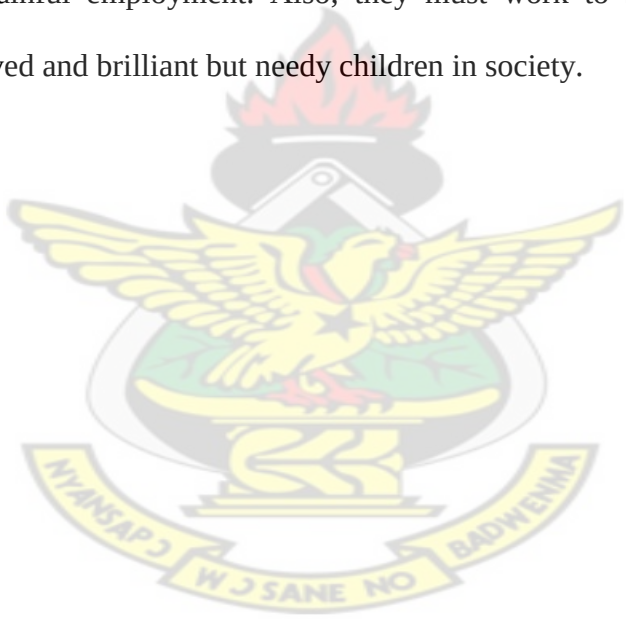
Regions	Significant Variables
Ashanti	Age of child, Literacy (HHD), Residence and size (HD)
Brong Ahafo	Age of child, Literacy (HHD), Residence and size (HD)
Central	Age of child, Sex of child, Literacy (HHD) and Residence
Eastern	Age of child, Age (HHD), Gender (HHD), Residence, Size (HD) and Employment (HHD)
Greater Accra	Age of child, Sex of child, Gender (HHD), Relation (HHD), Literacy (HHD), Residence and Employment (HHD).
Northern	Age of child, Age (HHD), Residence, size (HD) and Employment (HHD)
Upper East	Age of child, Relation (HHD) and Residence.
Upper West	Age of child, Sex of child, Gender (HHD), Literacy (HHD), Residence, and Employment (HHD)
Volta	Age of child, Gender (HHD), Relation (HHD), Literacy (HHD), and Residence.
Western	Age of child, Gender (HHD), Literacy (HHD), Residence, and Employment (HHD)

In combining all the Regions of Ghana, seven of selected socio-demographic variables have made significant statistical contribution to child labour. These variables include Age of child, Gender of head of household, Age of head of household, Literacy of head of household Residence, Size of household and employment status of head of household. This represents 70% of the variables that are very significant in answering the research question ‘‘which variables contribute to child labour?’’.Only three of the variables are insignificant or did not contribute to child labour that is about 30%. These variables are sex of children, marital status of parents and relationship of child to head of household.

5.3 RECOMMENDATIONS

This research work considered logistic regression model of the data generated in the Ghana Child Labour Survey (2003). Based on the results of the analysis it is suggested

that government of Ghana should continue with policies that will encourage children all over the country to attend school. Stakeholders in education should give proper and fruitful implementation of educational policies. Besides, agencies responsible for ensuring child rights laws must work efficiently so that the interests of children are protected and promoted. It is also suggested that parents who do not work must find work to do in other to earn enough income so as to look after themselves and their dependants. Finally, non-governmental organizations, social organizations, churches should target empowering illiterate and unemployed parents particularly and those without any gainful employment. Also, they must work to support less privileged, orphans, deprived and brilliant but needy children in society.



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APPENDIX A

All the ten regions

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	2815.056	10	.000
	Block	2815.056	10	.000
	Model	2815.056	10	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	19901.918[a]	.152	.207

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	22.906	8	.003

Classification Table

Observed			Predicted		
			Labour		Percentage Correct
			0	1	
Step 1	Labour	0	8546	1917	81.7
		1	3483	3088	47.0
	Overall Percentage				68.3

a. The cut value is .500