**HEALTH OUTCOMES OF CHILD LABOUR IN GHANA**

**Abstract**

The study examined the effect of child labour and health outcomes of children between 5-17 years. The Ghana Living Standard Survey of round six of the child labour data was adopted, which involved 14,062 children from 16772 households. The study considered household, child, and community variables for which the probit regression model was the estimation technique. Generally, the findings of the study showed that child labour hours, household head education, household wealth quintiles (4th, 3rd, 2nd), local area, accessibility and usage of pipe water and flushing toilet facilities, child relationship to household head are important variables that have the possibility of affecting the injury/illness of the child. Hence, among the variables, the econometric result suggested a trade-off relationship between child labour and health outcomes. It is recommended that the district assemblies must sensitize and educate the public on the hazardous nature of child labour activities and the likely health implications on children’s welfare.

**Key Words: child labour, injury, illness, human capital, health outcomes**

**Introduction**

Health stock is acknowledged as one aspect of human capital formation for economic development. According to Grossman's (2000) hypothesis, each person has an innate pool of health from birth that decreases over time but increases with investment. Based on this premise, Bharti and Agarwal (2013) found that children who participate in economic activities are more likely to be at risk for health problems, which could lead to a decline in their health stock. According to the International Labour Organisation Report (ILO, 2013), evidence shows that in Asia, Latin America, and Africa, over 265 million children work, with 168 million of those between the ages of 5 and 17 being involved in child labour. Specifically, more than 85 million of these children are engaged in dangerous jobs, with 115 million of them living in Africa. According to the Ghana Statistical Service (GSS, 2014) Child Labour Report, 81.1% of children aged 5 to 17 who work are engaged in child labour, with 21.8% of them working up to 42 hours per week. Similarly to the GSS (2019) survey, 29.2% of the 7 million children aged 5 to 14 who are employed are child labourers, and 88.6% of them are employed themselves. As a result, the data shows a steady rise in the number of children engaged in economic activity, which is likely to hinder their health stock capital. According to the ILO (2017), the majority of these children work in agriculture, particularly in deep-sea fishing and allied fields. For instance, in Ghana, 76.8% of children work in agriculture or fishing, 14.9% provide services, and less than 5% are involved in other activities (GSS, 2014).

Accordingly, Hamenoo, Dwomoh, and Dako-Gyeke (2018) observed that the majority of the activities are hazardous and have a high degree of intensity. Following the thrust of the study, children are not allowed to work on activities that could endanger them or have an adverse effect on their welfare under the Children Act of 1998. Studies have been conducted based on this assumption because the subject matter raises concerns about the child's development (ILO, 2016; Sundjo et al., 2016; Nicollela & Kassouf, 2018). These authors maintained that many children are subjected to health risks and the most severe types of child labor. Thus, child labor and the potential harm to their health stock capital are the main subjects of the study.

Following the discussion above, the study looks at the extent to which some work activities impede health outcomes. As contained in the Child Labour Report, over half of the child labour population suffers abuse and some incidence of illness or injury (GSS, 2014). Furthermore, child labour is likely to increase health risk and decrease health capital stock, which could have short, medium, or long-term implications (Ahmed & Ray, 2014; Nicollela & Kassouf, 2018). This, according to Grossman's (2000) and Jacobson's (2000) theory, noted that young children are susceptible to health issues due to the nature of their work, which is more likely to drain their natural health capital. This implies that human conduct can significantly affect one’s health.

Notwithstanding the theoretical significance of health stocks, the empirical data linking child labor to negative health outcomes appears to be still in its infancy, and the majority of current research focuses on long-term effects, which is also insufficient (Nicollela & Kassouf, 2018). Given this, it also seems that nothing is known about the short-term impacts. Few studies, such Sundjo, Baye, Egbe and Mbu (2016) and, Guacerllo, Lyon and Valdivia (2016), have examined the short-term impact on children's overall health. Using body-mass-index (Beegle, Dehejia & Gatti, 2009) and weight-for-age (O'Donnell, Rosati & Doorslaer, 2005) as indices, other studies have also looked at the impact of child labor on health status. The results were inconsistent or unclear, making it challenging to draw conclusions. In addition, they ignored the issue of endogeneity of child labour for which estimates could be bias. Studies on health is very difficult to assess and therefore the use of anthropometric measurements also have their limitations. One important drawback in these indexes is the fact that it measures the nutritional status and general fitness of the individual rather than the specific physical health injury occurred during labour activities. In this empirical paper, self- reported health assessment is more preferred because it is a good predictor of present and future mortality and as such subjective measures should not be regarded as an ad hoc measurement (Idler & Benyamini, 1997).

Therefore, the purpose of this research is to ascertain how child labour affects child health outcomes, such as injuries or illnesses, while also taking child labour into account as a choice variable, which should strengthen the validity of our conclusions. The theory, techniques, data, and empirical strategy are presented in the following parts, followed by the results and recommendations.

**Human Capital Theory**

Grossman (1972 & 2000) inspired the idea of investing in health. The crucial point is that human beings are viewed as a form of capital. However, capital requires investment, and therefore, households decide to make investments in their children’s health because it is anticipated that capital stock will have an impact on the child’s physical and mental development. In this instance, children’s potential is less likely to be impeded by illness. As a result, health investment stocks have long-lasting effects on the well-being and productivity of children. To put it another way, the human capital theory clarifies the importance of health for the people’s socioeconomic growth within the society and the economy. When the predicted benefit of parental health investment matches the cost, or when the net present value of such investment is zero, the best results are obtained (Becker, 1964; Grossman, 2000).Modeling health investment is a way by which households combine purchased resources and time to improve their children’s health. Nevertheless, it is difficult to quantify such investment, let alone the differential earnings that accrue to such investment in the market place (Poulson, 1994). It is an established theory that demand for health care directly relates to the relative cost of health inputs. This suggests that, given the characteristics of households, health conditions are likely to enhance productivity and increase efficiency and quality of life. Hence, health stock has an increasing effect on wages. In reference to Grossman (2000), health is a durable good, and child labour participation may reduce health capital, which could lead to future productivity and income declines. This is regarded as a source of disutility.

Jacobson’s (2000) ground breaking study views the family as a source of health. The underlying premise of this model is that, given the health production function, which is dependent on a number of variables such as child, community, and household characteristics, health service purchases, and food intake, the family selects a quantity of market goods to maximize family lifetime utility. Considering this framework and evidence that health is consumption and investment, the husband and wife with a child make up the family utility function. Psacharopoulos and Woodhall (1997) mention that human resources are wealth, and they eventually determine the rate of economic and social advancement. In other words, individuals actively contribute to the build-up of human capital.

**Methods and Data Description**

The study uses Ghana Living Standard Survey of round 6 (GLSS-6) conducted in Ghana with the support of World Bank (GSS, 2014). It involves 16772 households and the questionnaire contains issues related to household characteristics, child characteristics, child labour characteristics and community characteristics. The study focuses on age cohort of children between 5-17 years for which the sample size is 14,062.

**Empirical Strategy**

The child health outcome is the dependent variable measured in terms of injury/illness. Injury/illness is defined as: child who suffered any gravity of work-related accidents/illness or otherwise. Since the nature of the variable is binary, by conventional measure, probit model becomes necessary for estimation. The key variable here is child labour hours () also known as . This is followed by control variables, constructed based on the health production function and these include household factors (), child characteristics () and community factors (). Therefore, represents:

……………………….….(1)

The outcome =1, if the child suffered injury/illness or otherwise. However, child labour variable cannot assume random response, but inherently considered as endogenous. In view of that the probit estimations of (1) is likely to become inconsistent. We move on to the second stage and the appropriate framework employed is the ivprobit regression analysis. It seeks to find the joint probability of a child who engages in child labour, with the probability that he/she suffers from injury/illness. It then becomes possible that some characteristics could influence both child labour and child health outcome (Greene, 2012). Hence, we develop the empirical framework from (1) as:

Child labour hours is the number of hours worked per week. Recall that child labour is being considered as endogenous and so we then instrument child labour with child wage () and distance to school (). These variables may instigate child to work at the detriment of good health. We present the system in the form:

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The second definition of child labour (child labour hours) is a continuous variable and for that matter, OLS is appropriate for estimation. The IV estimations is conditional on the validity and relevance of the instrument. Hence, the empirical model:

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**Results and Discussions**

**Table 1: Measurement of Variables and Descriptive Statistics**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Measurement** | **Sample** | **Mean** | **Std dev** | **Min** | **Max** | **%** |
| Weekly Hours of labour | Continuous | 9,029 | 43.41 | 21.12 | 0 | 120 |  |
| ***Health outcome***  Illness  Injury  Neither | Binary | 7,666  1,272  91 |  |  |  |  | 84.90  14.06  1.04 |
| ***Wealth proxy Index***  Quintile 1  Quintile 2  Quintile 3  Quintile 4  Quintile 5 | Categorical | 9,029  1252  1455  1622  2670  2030 |  |  |  |  | 13.87  16.11  17.96  29.57  22.48 |
| Head of household education | Continuous | 9,029 | 9.55 | 3.53 | 0 | 19 |  |
| Household Size | Continuous | 9,029 | 5.82 | 2.26 | 1 | 21 |  |
| Actual Age of child | Continuous | 9,029 | 9 | 3.52 | 5 | 17 |  |
| ***Sex of child***  Male  Female | Binary | 7,012  2,017 |  |  |  |  | 77.66  22.34 |
| ***Relationship link to child***  Biological  Foster/househelp | Binary | 4768  4261 |  |  |  |  | 47.19  52.81 |
| Child’s Wage | Continuous | 9,029 | 486.48 | 1394.2 | 0 | 4500 |  |
| Distance to school(hour | Continuous | 9,029 | 0.652 | 2.031 | 0 | 50 |  |
| ***Location***  Urban  Rural | Binary | 4,960  4,069 |  |  |  |  | 54.93  45.07 |
| ***Source of water***  Tap water  Well water | Binary | 2733  6296 |  |  |  |  | 30.27  69.73 |
| ***Toilet facility***  Flushing  Pit latrine | Binary | 4735  4294 |  |  |  |  | 52.44  47.56 |

Source: GLSS-6 (2014)

Table 1 presents the simple descriptive statistics of children between 5-17 years who engage in various economic activities. The study revealed that the hours that children spent at work spanned up to 120 hours per week, whilst the mean working hours recorded 43.4 hours. Again, the data in Table 1 indicates that 84.9% of children suffer injury as a result of engaging in strenuous economic activities, while 14.06% of children in child labour suffer illness. Children who have never been ill or had an injury accounted for 1.04%. Table 1 further shows the wealth quintiles, which represent the economic standing of the household. The proportion of children from very poor households falls within the 1st quintile (13.87%); the 2nd quintile is the poor households (16.10%); the 3rd quintile represents children from medium households (17.96%); the 4th quintile shows the rich households (29.57%); and lastly, the 5th quintile (22.48%) is the very rich household. In general, the households’ economic status is fairly distributed across the wealth quintiles. With respect to the educational attainment of the household head, the years of schooling were averaged to be 9.55 years, suggesting that most heads of households have obtained basic school education and are assumed to be literate, which is also likely to play a critical role in reducing adverse health outcomes. In terms of household size, the average number of members per household was approximated to be 6 persons. The majority of the working children start work at 9 years old. The summary statistics also show that male children are considerably higher (77.66%) than female children (22.34%). Parent-child relationships were also noted in the study, and the child is either biological or foster to the head of household. From the results, approximately 52% of children are biological to the head of household, while 47% of children are foster to the head of household. Regarding the child labour wage, GHC 486.48 is the average amount earned per month. In addition, the distance covered by children to school had a mean of 0.652 hours. The Table further indicates that among the children, about 55% of them are found in the urban areas and that 45% are rural dwellers. Also, community variables play an important role in children’s health outcomes, and for that matter, accessibility of water facilities revealed that 30% of households have access to tap water and 70% for well water. Concerning toilet facilities, almost 48% of households have access to pit latrines and 52% of them use flushing toilets, respectively.

**Effect of Child Labour on Health Outcome**

Table 2 reports the results of the multivariate analysis of child labour on health outcomes. In terms of estimation technique, the study first used the probit model. However, as indicated in literature, child labour is not random but depends on both observed and unobserved factors; consequently, estimating the effect using the probit model may produce bias or less efficient results. To this end, the study further used the ivprobit model to estimate the effect of child labour on injury/illness. Prior to the discussions, a number of robust checks were examined, and the results show that our model is well specified and suffers no misspecification. The insignificant nature of Hatsq shows that the model fits very well. The pseudo R-squared specifies how well child labour explains adverse child health outcomes. The F-test of 14.04 suggests that the model is not weakly identified. The Sargan score, which shows an insignificant behaviour, verifies that the instrument is better or valid. The mean variance inflator factor specifying multicollinearity checks of 2.23 suggests the condition index is within the acceptable range (Hansen, 2022). Hence, the diagnostic tests all proved satisfactory, and consequently, we discuss the average marginal effects of the probit and ivprobit models.

**Table 2: Average Marginal Effects of Child Labour and Injury/illness**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Model 1**  **Probit** | **Model 2**  **IVprobit** |
| Child Labour Hours | 0.060\*\*  (0.165) | 0.074\*\*  (0.036) |
| Household size | 0.238  (0.161) | 0.056  (0.037) |
| Household head education | -0.503\*\*  (0.294) | -0.154\*  (0.093) |
| Age of household | 0.116  (0.151) | 0.031  (0.041) |
| Age squared of head | -0.048  (0.148) | -0.089  (0.123) |
| Wealth quintiles (1st quintile)  2nd quintile  3rd quintile  4th quintile  5th quintile | 0.067\*\*  (0.033)  -0.765\*\*\*  (0.030)  -0.208\*\*  (0.042)  -0.020  (0.037) | 0.057\*\*  (0.037)  -0.068\*\*\*  (0.037)  -0.223\*\*\*  (0.037)  -0.423  (0.282) |
| Relation link to child (biological)  Non-biological | -0.498\*  (0.285) | -0.149\*\*  (0.081) |
| Sex of child (male)  Female | -0.213\*  (0.238) | -0.056\*  (0.029) |
| Age of child | -0.690\*\*  (0.264) | -0.216\*\*  (0.095) |
| Location (rural)  Urban | -0.048  (0.148) | -0.089  (0.123) |
| Main source of water (pipe)  Well( protected) | 0.160\*  (0.111) | 0.157\*  (0.082) |
| Main toilet facility (WC toilet)  Pit latrine | 0.132\*  (0.107) | 0.149\*  (0.081) |
| Observations | 5433 | 5433 |
| *Pseudo R-squared* | 0.027 |  |
| *VIF* |  | 2.23 |
| *F-test for excluded instrument*  *Sargan score chi2(1)* |  | 14.04  (0.000)  0.0726(0.787) |

Source: GLSS-6 (2014) \*\*\*p<0.01 \*\*p<0.05 \*p<0.1 Variables in parenthesis are base category

According to the findings of the probit and ivprobit models, child labour impacts negatively on a child’s health status. As a result, children who labour longer hours are more often prone to getting hurt or sick. Thus, there is a 6 percent (column 1) or 7 percent (column 2) chance that further increases in the number of hours that children work may result in negative health consequences. At the 5% threshold of significance, the p-values are significant. The findings are in line with our expectations. A study conducted in Cambodia by Guarcello et al. (2016) supports the idea that child labour hours have a favourable impact on negative health consequences. The authors noted that additional weekly child labour participation appears to increase the likelihood of poor health outcomes by 3% points. They explained that the length of weekly engagement affects the likelihood of injury/illness. Furthermore, from the empirical standpoint of Nicolella and Kassouf (2018), they investigated the health effect of child labour in Brazil. The authors discovered a negative correlation between child labour hours and child health status using a fractional response model. According to the study, a child’s health decreases with increasing work hours. In Bangladesh, a similar study by Ahmed and Ray (2014) sought to explore the consequences of child labour and revealed that hours of work are statistically important to the likelihood that a child will report an accident or illness. The authors noted that children are more likely to report poor health since they are exposed to occupational hazards.

According to Sundjo et al. (2016), who examined the health effects of child labour in Cameroon, concluded that there is a U-shaped relationship between child labour and the development of human capital. A similar result of Thevenon and Edmonds (2019) study revealed that almost half of the children were engaged in unsafe labour and were severely exploited, toiling in poor to terrible conditions and engaging in risky behaviours. Excessive stress, fatigue, and injury were found to have an impact on health outcomes. Furthermore, there is evidence that heavy responsibilities and lengthy work hours have a detrimental impact on their physical development. In addition, Mohammed, Mahfouz, and Ewis (2014) examined the environmental and occupational health issues associated with child labour using national data. The study revealed epidemiological evidence of the detrimental effects of occupational exposures on a child’s development. According to the authors, children engaged in various kinds of labour have a direct and substantial impact on health outcomes, including the risk of serious injuries and overall frailty.

Additionally, Shendell, Noomnual, Chisti, Allacci, and Madrigano (2016) pointed out that children who work are exposed to psychological stress and poor ergonomics. Children suffer from a range of ailments as a result, from minor symptoms to serious handicap or even morbidity. The psychological trauma and psychosocial stressors are other manifestations of the detrimental health impact. This, according to Grossman (2000), from the theoretical perspective, may consequently reduce health capital, which raises the likelihood of reduced productivity and wages.

**Household and other control factors affecting Child’s Health Outcome**

In addition to the focus variables, we took into account other control variables. Head of household education is an important determinant of a child’s health outcome. Thus, the study found that on average, the education of the household head is likely to decrease the probability of the child labourer having an injury/illness. Both models show that years of education of the household head have the probability of decreasing the likelihood of a child suffering from injury by 50 percent and 15.4 percent, respectively. The result is consistent with most of the previous studies. Different empirical studies have found an indirect link between parents’ education and the adverse health outcome of the child labourer (Ahmed & Ray, 2014; Mohammed et al., 2014; Sundjio et al., 2016; Nicollela & Kassouf, 2018). Ahmed and Ray (2014), for example, found a negative relationship between parental education at the secondary school level and its impact on a child’s health in the area of injury. Generally, the level of education of parents significantly influences the health outcomes of their children. This explains the fact that the highly educated parent may be more aware of the consequences of the health impact on the child labourer, and will adopt preventive measures to injury/illness. Furthermore, as noted by Grossman (2000) and Jacobson (2000), well-educated parents are less likely to have poor health outcomes for their child. It is worthy to note also that parental investment in a child’s capital stock formation may have the effect of making children more resourceful and willing to engage in behaviours that may have longer-term consequences for better health.

In order to explain the poor health of children, we now focus on the household wealth. As expected, household wealth of the 2nd quintile is positive and significant at the 5% level. This is an indication that a child from a 2nd wealth quintile household is more likely to encounter injury or complain of illness. The average marginal effect confirms that, on average, a child from a poor household has a 6.7 percent (probit) or 5.7 percent (IV probit) chance more likely to suffer from injury/illness. In addition, it can be noted that child labourers from middle households are less likely to suffer from injury/illness. This also implies that a child from a middle household, on average, is 8 percent less likely to suffer from injury/illness, but the coefficient reduces in the ivprobit model. Again, children from households with wealth in the 5th quintile are important in the child’s health outcomes (injury/illness). Hence, the direction of effect is consistent throughout the models. According to the theory of luxury axiom, poverty induces child labour (Basu & Van, 1998). Therefore, children with early entry to the labour market are more likely to encounter work-related health risks and, consequently, adverse health problems such as the illness. Accordingly, Sundjo et al. (2016) pointed out that whenever household wealth levels are unstable, children are less likely to report good health, as poverty may influence child labour participation and hours spent at work, which greatly impacts the state of the child’s health. Health, according to Grossman (2000), depreciates over time and enters the utility function and is positively related to wealth in the consumption model. The argument is that parents are the producers of their child’s health. Based on this assertion, a child is likely to have better health if parents themselves care about their own health and are able to spend on the sick child. Grossman emphasised that health itself is wealth, and having adverse health outcomes reduces the wealth base of the household. Thus, child adverse health outcomes of injury/illness become a disutility to the household.

Following Table 2 again, the household is seen as the basic social and economic unit from which the children derive their socialization. The household head also plays a critical role in the welfare of the household, especially children. Referring to Table 2, it is observed that non-biological children, on average, are more likely to encounter injury/illness relative to biological children. Perhaps parents have low altruistic behaviour toward such children. Sundjo et al. (2016) have also confirmed that children of biological links with household heads are less likely to be exposed to health risks. Uddin et al. (2014) concluded that over-exertive work exhausts children’s energy stock below the minimum required to sustain physical growth and combat infection.

On the gender basis, girls are less likely to encounter illness/injury, suggesting that the nature of the workload and risk factor is less on girls relative to boys. Guarcello et al. (2016) also found that male children in child labour have more potential threats of health effects relative to females. The results suggest that male children perhaps work in areas with higher intensity risk- related work and health issues. The relationship is negative, and the average marginal effect expresses that a female child who is engaged in child labour is 21% less likely to suffer some form of illness relative to the male. In other words, being a male significantly increases the effect of injury/illness. Our result confirms Shendell et al. (2016) that there is difficulty in regulating the working environment that is invariably informal or even illegal that further raises the health risk faced by children in general. Accordingly, Ibrahim et al. (2018) noted that physical work that is over-exertive depletes a child’s stock of energy required to sustain physical growth.

However, Sturrock (2016) examined the connection between child labour and health outcomes using data from low- and middle-income countries. It has been noted that individuals who join the workforce too young suffer from bad health outcomes. While this supports the findings of Sabates-Wheeler and Sumberg (2020), they consistently showed that children who work are more likely to damage their health investment because they are socially dependent and biologically and physically underdeveloped. According to the study, children between the ages of 5 and 17 experience a variety of health issues such as illness, injuries, psychological trauma, and social well-being. These issues can have a long-term detrimental impact on the child’s health outcome as an adult. Al-Gama et al. (2013) and Ahmed and Ray (2014) have reported similar findings in Guatemala. Consequently, our findings are supported by the literature.

In the analysis of child labour and health, the empirical literature is inconclusive if the geographic location of the children in the labour market is not discussed. Again, Ahmed and Ray (2014) and Nicollela and Kassouf (2018) found that children’s health outcomes were much worse when they lived in metropolitan regions. Another important point is access to clean water and toilet facilities. Consequently, access to potable water supply and water closet toilet facilities is likely to reduce the health stock depreciation. Our coefficients confirm these previous studies and suggest that child labourers who have access to pit latrines as well as wells are more likely to encounter adverse health outcomes.

**Conclusions and Policy Implications**

This empirical paper investigated child labour and its implications for health outcomes in terms of injury/illness in Ghana. The theoretical framework that underpinned the study was Grossman’s human capital theory on health. The study focused on age cohorts of 5-17 years and employed the GLSS-6 data set. By virtue of the nature of the dependent variable, the empirical strategy adopted was the probit and ivprobit models, respectively. Based on the objective of the study, it was found that the child labour hours, education of the head of household, child relationship to the household head, sex of the child, household wealth and urban areas, and accessibility and usage of potable water and closet toilet facilities are important in the health outcome of the child.

It is therefore worthy to draw conclusions that child labour participation (hours of work) has a consistent effect on adverse health outcomes regarding injury/illness. Considering the framework of health as human capital, there is evidence that children who engage in economic activities are prone to adverse health outcomes. Hence, the study suggests that a number of children in child labour are likely to increase health stock depreciation, which may lead to long-term consequences for the individual, family, society, and the nation. Overall, our study concludes that child labour participation provides a substantial threat to child human capital formation. It is recommended that the government must strictly enforce the Children’s Act, the 1992 Constitution, the Child Right Regulation and Criminal Code Amendment Act, and make operational as regards the restrictions regarding the employment of children. Also, district assemblies must sensitize and educate the general public about the hazardous child labour activities and the likely health implications, such as fatigue, on children’s welfare. The enforcement agencies, such as Child’s Right International, must also be engaged to ensure appropriate sanctions against parents who flout the child rights laws or constitutional rights of children in order to provide adequate protection for the children.

Finally, the key findings have contributed additional knowledge in literature regarding child labour and health. Thus, studies on child labour and health have shown that the long-term effect and the short-term effect seem limited. This research has brought to light the short-term effect of child labour on health outcomes in terms of injury/illness for which endogeneity was considered.

**REFERENCES**

Ahmed, S. & Ray, R. (2014). Health consequences of child labour inBangladesh. *Demographic*

*Research,* *30* (1). 111-150.

Al-Gamal, E., Hamdan-Mansour, A. M., Matronk, R. & Nawaiseh, M. A. (2013). The

psychosocial impact of child labour in Jordan: A national study. *International journal psychological,* 48 (6). 1156-1164.

Basu, K. & Van, P. H. (1998). The economics of child labour. *The American* *Economic review,*

*58*(3). 412-427.

Becker, G. S. (1964). *Human capital: A theoretical and empirical Analysis, with special reference*

*to education.* University of ChicagoPress: Chicago.

Beegle, K., Rajeev, D. & Gatti, R. (2009). Why should we care about child labour? The education,

labour market and health consequences of child labour. *The Journal of Human Resources. 44* (4). 871-889. Retrieved from http://[www.jstor.org/stable/20648923](http://www.jstor.org/stable/20648923).

Bharti, S. & Agarwal, S. (2013). Physical and psychological hazards faced by child labour: A

Review article, *Journal of Humanities and Social Science.* 13, 6. Pp 29-33.

Children’s Act 560 (1998). *The Children’s Act*. Accra: Government of Ghana.

Greene, W. H. (Ed.). (2012). *Econometric analysis*. Prentice Hall: Pearson Education, Inc.

Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of*

*Political Economy. 80*(2), 223-255.

Grossman, M. (2000). The human capital model. In A. Culyer & J. Newhouse (Eds.), *Handbook*

*of Heath Economics.* *1A*, (347-408) Amsterdam, The Netherlands: Elsevier Science.

GSS (2014). *Ghana living standards survey round 6, 2013. Child labour report.* Accra, Ghana:

Ghana Statistical Service.

GSS (2019). *Ghana Living standard Survey round 7. Main report*. Accra, Ghana: Ghana Statistical

Service.

Guarcello, L., Lyon, S. & Valdivia, C. (2016). *Adolescents in hazardous work: Child Labour*

*among Children aged 15-17 years.* Understanding Children’s Work, Geneva:ILO.

Hamenoo, E. S., Dwomoh, E. A. & Dako-Gyeke, M. (2018). Child labour in Ghana: Implications

for children’s education and health. *Children and Youth Services Review,* 93. 248-254.

Hansen, B. E. (2022). *Econometrics*. Princeton University Press.

Ibrahim, A., Abdalla, S.M., Jafer, M., Abdelgadir, J. & de Vries, N. (2018). Child labour and

health: A systematic literature review of the impacts of child labour on child’s health in low-and-middle-income countries. *Journal of Public Health.* *14*(1).18-26*.*

Doi: 10.1093/pubmed/fidy018.

Idler, E. L. & Benyamini, Y. (1997). Self-rated health and mortality: A Review of twenty-seven

community studies. *Journal of Health and Social Behaviour, 38* (1): 21-37.

ILO (2013). *Making progress against child labour: Global estimates and trends, 2000-2012.*

IPEC. Geneva: ILO.

ILO (2016). *Child labour in the fish supply chain on the Lake Volta, Ghana: The Torkor Model.*

IPEC. Geneva: ILO

ILO (2017). *Global estimates of child labour: Results and trends, 2012-2016.* Geneva: ILO

Jacobson, L. (2000). The family as producer of health: An Extended Grossman Model. *Journal of*

*Health Economics. 19,* 611-637.

Mohammed, E. S., Mahfouz, E. & Ewis, A. A. (2014). Child labour in a rural Egyptian

Community: An epidemiological study. *International Journal of Public Health,* *59,* 637-644. Retrieved from http://doi: 10.1007/s00038-014-0559-5.

Nicolella, A. C. & Kassouf, A. L. (2018). The effect of child labour on children’s health in Brazil.

*International Journal of Social Economics, 45* (2). 357-371.

O’Donnell, O., Rosati, F. C. & van Doorslaer, E. (2005). Health effects of child work: Evidence

from Rural Vietnam. *Journal of Population Economics, 18* (3). 437-467.

Poulson, B. W. (1994). *Economic development: Private and Public Choice.* New York, USA: West

Publishing Company.

Psacharopoulos, G. & Woodhall, M. (1997). *Education for development: An analysis of investment*

*choice.* New York:Oxford University Press.

Sabates-Wheeler, R. & Sumberg, J. (2020). *Understanding children’s harmful work in African*

*Agriculture: Points of departure*. ACHA Working Paper 1, Brighton: Action on Children’s

Harmful Work in African Agriculture, IDS.

Shendell, D. G., Noomnual, S., Chishti, S., Allacci, M. S. & Madrigano, J. (2016). Exposures

resulting in safety for child labourers in less Developed countries. *Journal of Environmental and Public Health,* *6,* 1-10. DOI: 10.1155/2016/3985498.

Sturrock, S. (2016). Child labour in low and middle income countries and its consequences for

mental health: A systematic literature review of epidemiologic studies. *European child and adolescent Psychiatry*, 25. 1273-1286.

Sundjo, F., Baye, F. M., Egbe, J. E. & Mbu, D. T. (2016). Contemporaneous health consequences

of child labour in Cameroon*. International Academic Journal of Economics and Finance, 2* (2). 48-75.

Thevenon, O. & Edmonds, E. (2019). *Child labour: Causes, Consequences and Policies to tackle*

*it.* OECD Social, Employment and MigrationWorking Papers. No. 235.

Retrieved from <http://dx.doi.org/10.1787/f6883e26-en>

Uddin, M. N., Hamiduzzama,M. & Morad, M. (2014). Hazardous child labour and psycho-

Physical and economic consequences: A Study in Sylhet City: Bangladesh. *Innovative Issues and Approaches in Social Sciences, 7 (1).* 6-18.

**APPENDIX A: First Stage Regression Model of Child Labour Hours**

|  |  |  |
| --- | --- | --- |
| **Variable** | **Coefficient** | **Standard Error** |
| Child wage | 0.227\*\* | 0.089 |
| Distance to school | 0.318\*\*\* | 0.095 |
| Constant | 1.479\*\*\* | 0.212 |
| R-squared | 0.338 |  |
| F-statistic | F(2, 5,423)=14.04  Prob>F=0.000 |  |
| Sargan score | 0.07265(p=0.7878) |  |
| Basmann chi2(1) | 0.0724(p=0.7878) |  |
| **Observation** | **5,433** |  |

Source: GLSS (2014) \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Note that a statistically significant test statistic of sargan score or Basmann chi always indicate that the instruments may not be valid. Since the test statistic isn’t statistically significant, it indicates that, the instruments used is valid.