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The Impact of the Public Health Insurance Scheme on Child Labour in Ghana

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Abstract

Using the fourth and fifth wave of the Ghanaian Living Standard Household Survey, I empirically investigate whether the implementation of the National Health Insurance Scheme affects child labour in Ghana. My findings suggest that the implementation of the insurance scheme leads to a decrease in out-of-pocket payments for health purposes, which is linked to a substantial reduction in the incidence of child labour. Furthermore, I find that the overall reduction in child labour is strongest in rural areas and the agricultural sector. I conclude that the provision of public health insurance improves the financial protection of households, which removes the necessity for households to send their children to work. Thus, health insurance schemes seem to be an effective social protection instrument to fight child labour.

JEL classification: I13, I15, J43, O12

Keywords: Public health insurance, child labour, out-of-pocket payments, Ghana

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Bonn, September 2016 Christoph Strupat

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Abbreviations

BMZ	German Ministry for Economic Cooperation and Development
DIE	Deutsches Institut für Entwicklungspolitik / German Development Institute
DMHIS	District Mutual Health Insurance Schemes
GHC	Ghana Cedis
GLSS	Ghanaian Living Standard Household Survey
ILO	International Labor Organization
NHIA	National Health Insurance Authority
NHIS	Ghanaian National Health Insurance Scheme
SDGs	Sustainable Development Goals

1 Introduction

The recently agreed 17 Sustainable Development Goals (SDGs) ensure that the elimination of child labour in all its forms will retain its importance for the foreseeable future. In particular, Goal 8 includes the target of eradicating child labour by 2025, and generally aims to break down intergenerational poverty traps. The latest International Labor Organization (ILO) estimates of child labour indicate that Sub-Saharan Africa has the highest incidence of children in economic activity – 28.4% of all 5–17 year-olds, compared to 14.8% for Asia and the Pacific and 9.0% for Latin America (ILO-IPEC, 2013).[1] Thus, progress towards the elimination of child labour in Sub-Saharan Africa is lagging behind that of other regions of the world, making the fight against child labour in the region even more important.

The strongest drivers of child labour are economic or health shocks for low-income households (Edmonds, 2008). As these households often have limited savings, access to credit and tangible assets, they cannot afford the additional costs and loss of income caused by ill health in the household. As a result, they may have to take children out of school to save school fees, and/or send children to work as an additional source of income. Thus, child labour is widely seen as a risk-coping strategy that helps households to smooth consumption but leads to substantial negative effects for the children concerned. For example, Heady (2003) finds that child labour negatively affects learning achievement in the key areas of reading and mathematics in Ghana. Gunnarsson et al. (2006) find similar results on test scores in 11 Latin American countries. Child labour lowers maths scores by 7.5% and language scores by 7%. Emerson and Souza (2011) also show that child labour has a large negative impact on earnings in later life, even when controlling for schooling. Additionally, Kassouf et al. (2001) find that child labour has a negative effect on self-reported health in adulthood.

In order to decrease vulnerability to economic shocks and to prevent child labour, the implementation of insurance schemes might be an effective instrument of social protection. To the best of my knowledge, only two empirical studies investigate the relationship between (micro) health insurance schemes and child labour. Cakrabarty (2012) finds that micro life and health insurance in combination with credit can reduce child labour for poor households in Bangladesh. Exploiting the extension of micro health for households in Pakistan, Landmann and Frölich (2015) found a lower incidence of child labour and earnings from child labour as a result of the scheme.

Both studies investigate the impacts of micro insurances on child labour outcomes; this paper delivers the first empirical evidence on whether child labour is influenced by a public and country-wide health insurance scheme in Sub-Saharan Africa. The launch of the Ghanaian National Health Insurance Scheme (NHIS) in 2003, coupled with differences in the date of implementation between local districts, makes Ghana an ideal setting for examining the relationship between public health insurance and child labour. As child labour is still common in Ghana (21.8% of children aged 5–17 years are engaged in child

1 The definition of child labour is based on the ILO Conventions C138 from 1973 and C182 from 1999. Child labour occurs if different conditions are met. Young children below 12 years who work more than 1 hour per week, children between 12 and 13 who work more than 14 hours per week, and adolescents between 14 and 17 who work more than 43 hours are defined as child labourers.

labour) and is often widespread in the agricultural sector (see Figure A1 in the Appendix), I investigated, in particular, whether the insurance scheme impacts the incidence of child labour in rural areas and in specific labour market sectors. Furthermore, I conducted a separate analysis for males and females, in order to explore gender differences.

For my analysis, I collected the exact NHIS implementation dates of 100 districts and found that by the end of 2005 the health insurance scheme had been implemented by most district authorities.[2] I combined this information on the implementation dates with the 1998/1999 and 2005/2006 waves of the Ghanaian Living Standard Household Survey (GLSS) that covered the same 100 districts. The districts in this cross-sectional household surveys contain enumeration areas (which I will call sub-districts), where interviews were conducted in different months during a 12-month survey period.[3] Thus, I was able to observe the districts in the 2005/2006 wave before and after the implementation of the NHIS, which allowed me to observe individuals from the same districts at three points in time: before the NHIS implementation in 1998/1999, before the NHIS implementation in 2005/2006, and after the implementation of the NHIS in 2005/2006. As most of the treatment districts had implemented the NHIS by the end of 2005, the average exposure to the scheme by the end of the survey period in September 2006 was 8 months. The control group consists of districts that implemented the NHIS after the survey period in 2005/2006. Hence, I employed an extension of the standard difference-in-difference estimator and carefully checked if the parallel time trend assumption holds in my context.

According to the literature, two possible channels can lead to changes in child labour (Edmonds, 2008; Landmann and Frölich, 2015). First, in the absence of insurance, health shocks can lead to health expenditure that reduce household income and force households to send children to work in order to reduce school-related expenditures and gain additional household income. The implementation of an insurance scheme can lower health expenditures and improve the financial protection of households in the short term, which can translate into lower incidence of child labour in the aftermath of health shocks.

Second, if households are afraid of shocks they might use child labour in order to diversify their income sources to cope with a volatile health status and economic environment. The implementation of an insurance scheme can create a more secure environment in the long run, in which households feel sufficiently confident about their situation not to send their children to work.

Exploring the first channel, I assessed whether children's households were financially relieved in the form of lower out-of-pocket payments for health purposes after the implementation of the NHIS. I found that the implementation had a positive impact on household finances, as out-of-pocket payments for health purposes decreased by a substantial extent. In a second step, I examined the impact of the NHIS on child labour. I found that the introduction of the public health insurance scheme substantially reduced child labour by 7 percentage points, mainly due to a reduction of child labour for girls. Furthermore, I found that the overall reduction in child labour was mainly driven by the

2 Membership in the health insurance scheme is voluntarily for all adults (age 18-69) that work in the informal sector and enrollment rates increased substantially between 2005 and 2007 from 6% to 37% of the population (NHIA, 2010).

3 In the 2005/2006 wave of the GLSS every district consists on average of four sub-districts.

decrease of child labour in rural areas and in the agricultural sector, but was not accompanied by an increase in school attendance.

The remainder of this paper is organized as follows. Section 2 provides information about the national health insurance scheme in Ghana. In Section 3, I describe the data and give details on my identification strategy. Section 4 presents the results and further robustness checks before Section 5 concludes with a summary of the main findings and a research outlook.

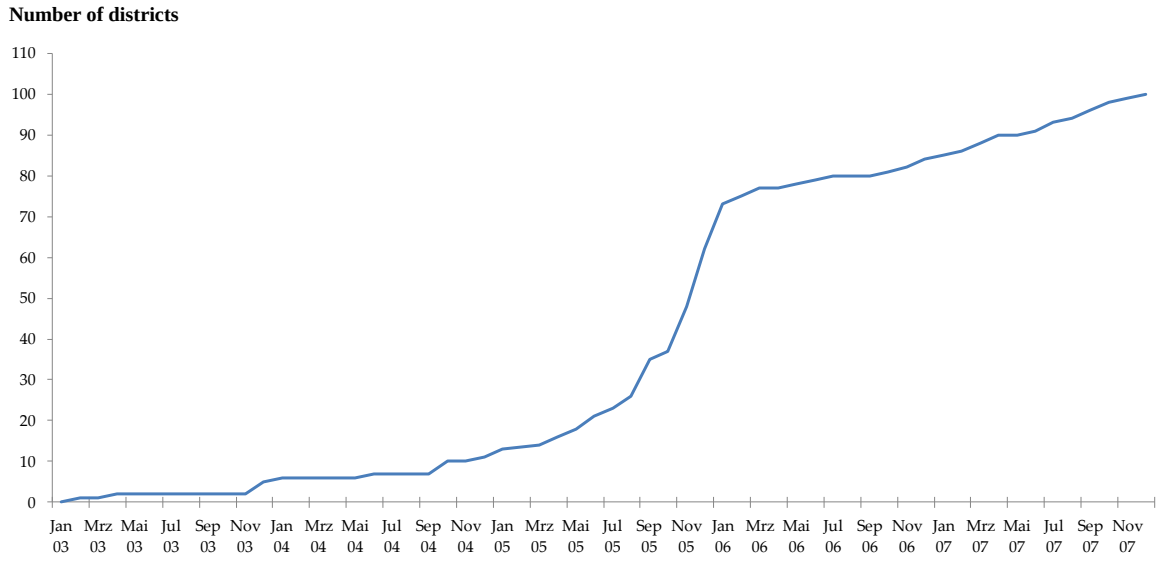
2 The National Health Insurance Scheme in Ghana

The law on the National Health Insurance Scheme was passed by the Ghanaian parliament in 2003 and the scheme was successively implemented at the district level over the next four years. Its aim was to provide health care services to a large part of the population and to establish an alternative to the existing 'cash and carry' system. The insurance covers (i) the cost of full outpatient department and admission treatment (both surgery and medical), (ii) full payment for medicine and (iii) payments for referrals (Salisu & Prinz, 2009). Specifically, it covers oral health, eye care, emergencies and maternity care, including prenatal care, normal delivery, and some complicated deliveries, as well as treatment for malaria, diarrhoea, upper respiratory tract infections, skin diseases, hypertension, asthma and diabetes (Mensah et al., 2009). Membership of the health insurance scheme is voluntary for all adults (age 18–69) who work in the informal sector, such as self-employed individuals, while for formal-sector employees, membership is mandatory and insurance premiums are deducted from their monthly payrolls. The income-related insurance premium varies between a minimum of 7.2 Ghana Cedis (GHC) (US$3) and a maximum of 48.0 GHC (US$19) and must be paid on an annual basis.[4] All children less than 18 years of age whose parents have enrolled with the scheme, and all people aged above 70 years are covered by the insurance but are exempted from paying premiums.

The NHIS is monitored and regulated by the National Health Insurance Authority (NHIA). The health services covered are mainly financed by a health insurance levy (a 2.5% addition to the value added tax), the payment of insurance premiums and money allocated by the government. The NHIA licensed District Mutual Health Insurance Schemes (DMHIS) that were established by the district authorities to run the insurance scheme and to collect a sufficient amount of insurance premiums in order to meet the expected health care claims within each district. As the ability of the district to set up a DMHIS and the acceptance of the health insurance varied between districts, the health insurance scheme has been implemented at different dates, but most district authorities launched the scheme in 2005 and 2006. Figure 1 shows how the NHIS implementation evolved over time and districts. As most districts had implemented the NHIS by the end of 2005, and the survey period ends in September 2006 (see dashed line), the average exposure to the scheme at the time of the survey was 8 months. 77 districts had implemented the scheme by September 2006, while 23 districts introduced the scheme afterwards.

4 1GHC=0.4US$

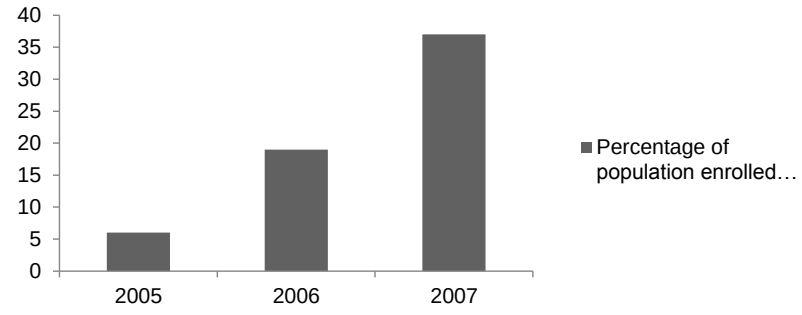
Figure 1: Availability of the NHIS on the district level



Source: Collected data on the exact implementation dates

Figure 2 presents the enrolment with the NHIS. 19% of the population had been enrolled with the NHIS at the end of 2006 (NHIA, 2009). Regional differences in enrolment rates are wide and range from 24.6% in the central region to 50.9% in the upper west region.

Figure 2: NHIS enrolment rates



Source: National Health Insurance Scheme annual report. Accra, Ghana: National Health Insurance Authority; 2010

3 Data and identification strategy

3.1 Data description

For my analysis I use the 4th and 5th wave of the Ghana Living Standards Survey (GLSS), which are based on interviews conducted by the Ghana Statistical Office and the World Bank during the period from October 1998 until September 1999 and from October 2005 until September 2006. These nationwide surveys contain nationally representative samples of households that cover the same 100 districts across both waves. The surveys include all major socio-economic variables measured at the individual and household level.

My treatment variable is a binary indicator representing the availability of the NHIS in an individual's district. In order to construct this variable, I collected the exact implementation dates of the NHIS at the district level by contacting district officials and using district-specific media reports about the health insurance.[5]

To define dependent variables for child labour, I followed the ILO definition of child labour, based on the ILO Conventions C138 from 1973 and C182 from 1999. Child labour occurs if different conditions are met: young children less than 12 years of age who work more than 1 hour per week, children between 12 and 13 years who work more than 14 hours per week, and adolescents between 14 and 17 years who work more than 43 hours are defined as child labourers.[6] As the GLSS also captures hours worked at home, I also considered non-labour-force work in my analysis, which is especially important for girls. Thus, the two main outcome variables in my analysis are: child labour incidence and hours worked by children during the seven days prior to the interview. Furthermore, I study whether the implementation of the NHIS affects the school attendance of children (children who attend school at least one hour during the seven days prior to the interview date).

In order to explore whether the NHIS changes the health status (reflecting whether a respondent had to stop usual activities for two weeks), the amount of out-of-pocket payments for health purposes and the utilization of public health facilities, I considered 8,706 parents (age 18–69) living in the same 4,457 households as the children in my analysis. In order to examine if the NHIS changes child labour I considered children between 7 and 17 years as potential child labourers, as the GLSS only contains information on employment for children age 7 or older. Thus, my sample consisted of 9,373 children.

3.2 Identification strategy

In order to investigate the relationship between child labour and formal health insurance, I relied on a comparison of districts where the NHIS is implemented with districts where it is not. I collected data on the exact implementation dates of the NHIS, i.e. on when health insurance coverage became available at the district level. As most districts implemented

5 This information is available upon request.

6 I also examined alternative definitions (e.g. different age categories) of child labour and results remain robust to those specifications.

the NHIS at the end of 2005 (see Figure 1) and district's sub-districts were surveyed at different points in time in the 5th wave of the GLSS, I was able to use the variation in interview dates to compare individuals within a district where the insurance scheme had been introduced who were interviewed before and after the introduction of the scheme.[7] Considering the 1998/1999 wave of the GLSS as the baseline, I was able to observe individuals at three points in time: before the NHIS implementation in 1998/1999, before the NHIS implementation in 2005/2006 and after the implementation of the NHIS in 2005/2006. The treatment group consists of 77 districts where the NHIS had been implemented by the end of the survey period in 2006, while the control group contains 23 districts that introduced the NHIS after September 2006.

The main assumption underlying my difference-in-difference analysis is that the implementation of the NHIS represents a random event and districts that implemented the scheme would have followed the same time trend as the control districts in the absence of the NHIS. As the ability of district municipalities to implement the NHIS varied between districts, two problems make this parallel trend assumption unlikely to hold: first, the order of the NHIS rollout might be driven by time-invariant district characteristics that are also correlated with my dependent variables. For example, wealthy districts might have been able to implement the NHIS earlier than less affluent districts and also might have had a lower incidence of child labour. Second, changes in the economic situation during the course of the year could influence the potential outcomes of my analysis.

In order to deal with both problems, I included district dummies and interview-month dummies in all specifications. More formally, my estimates are based on the following equation:

$$y_{idt} = \beta_0 + \beta_1 NHIS_{idt} + \mu_d + \delta_t + \epsilon_{idt} \qquad (1)$$

The dependent variable y_{idt} indicates if child i who lives in district d and was surveyed in month t, is a child labourer or not. This variable is regressed on the binary treatment variable $NHIS_{idt}$, which takes the value 1 if the respondent was surveyed after the district implemented the NHIS and 0 otherwise. β_0 is a constant, while μ_d represents a district fixed effect and δ_t interview-month fixed effects.

In order to increase the precision of my estimates and to control for confounding factors that might be correlated with the introduction of the NHIS and the dependent variable, I furthermore included individual and household-specific variables X_{idt} in my specifications.[8] Thus, I extended equation (1):

$$y_{idt} = \beta_0 + \beta_1 NHIS_{idt} + \beta_2' X_{idt} + \mu_d + \delta_t + \epsilon_{idt} \qquad (2)$$

The coefficient of interest is β_1, which represents an intention-to-treat effect (ITT) i.e. the effect of an offer to participate in the NHIS on the incidence of child labour. This

7 The districts in this cross-sectional household surveys contain sub-districts that were interviewed in different months during a 12-month survey period. In the 2005/2006 wave of the GLSS every district consists on average of four sub-districts.

8 The description of the variables is presented in the next section.

parameter has a causal interpretation, if the parallel trend assumption holds. The following reasons confirm that this is very likely to be the case in this context.

First, in order to check whether treatment and control groups were fundamentally different before the implementation of the NHIS (baseline), I provide a balance table of my dependent variables. The results indicate that both groups are balanced across all outcome variables before the NHIS implementation (see Table 1). Second, I present the results of placebo regressions. Placebo regressions assume counterfactually that the NHIS implementation took place in a different year. Should the implementation of the scheme affect child labour in 1998/1999, the parallel trend assumption would be seriously challenged. This is, however, not the case (see Table A3 in the Appendix). Finally, in the next section I display the averages for two of my outcome variables for the pre- and post-implementation time periods and the treatment and control groups. In both cases I observe parallel curves for both groups in the time before the NHIS implementation (see Figure 3 and 4).[9]

4 Results

Before I turn to the empirical results, Table 1 displays the means of my dependent variables at baseline, distinguished by treatment and control group. As can be seen from the p-values, two-sided tests of equality of the values for the two compared groups do not reveal statistically significant differences. This indicates that both groups are balanced across all outcome variables before the NHIS implementation.

Table 1: Difference in means of the treatment and control group before the implementation of the NHIS

		Means			
		Treatment	**Control**	**Diff. in means**	**p-value**
Adults (age 18-69)	Low health status (1/0)	0.17	0.18	-0.01	0.28
	Out-of-pocket-payments (GHC)	25.01	30.11	-5.11	0.17
	Utilize public health f. (1/0)	0.06	0.07	-0.01	0.87
	N	3,179	921		
Children (age 7-17)	Child labour (1/0)	0.18	0.17	0.01	0.13
	Weekly working hours	5.17	5.63	-0.46	0.34
	School attendance (1/0)	0.80	0.78	0.02	0.28
	N	3,496	1,009		

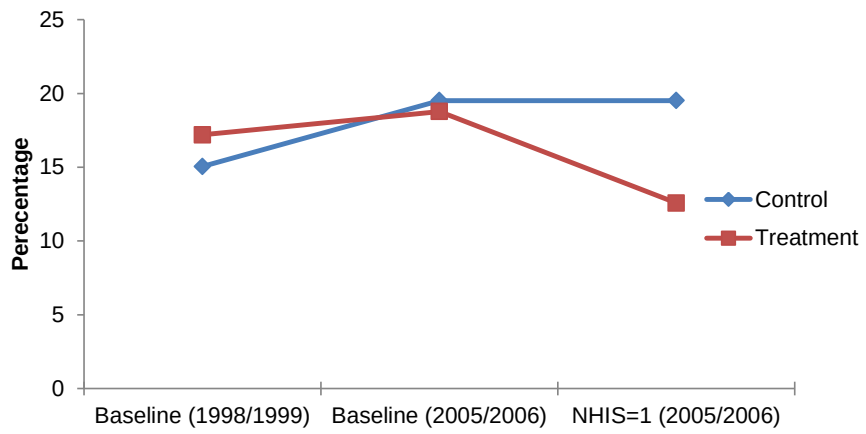
Note: For my calculation I use the GLSS (1998/1999) and the GLSS (2005/2006).

Source: Author

9 Figures A2 – A5 in the Appendix show the trends for the other outcome variables.

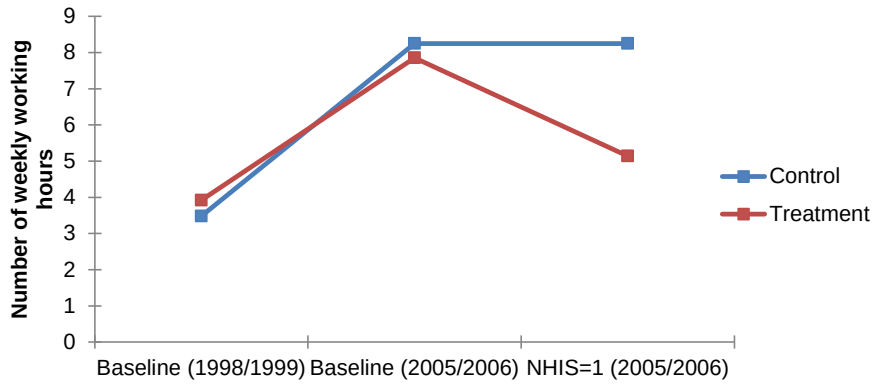
In order to explore whether treatment districts followed the same time trend as the control districts before the implementation of the NHIS, Figures 3 and 4 show the trends for two main outcome variables, i.e. average incidence of child labour and the number of working hours of children, for the pre- and post-implementation time periods and both groups. In both cases I observed parallel curves for both groups in the time before the NHIS implementation. After the NHIS was implemented, the incidence of child labour and the number of working hours slightly shifts downwards.

Figure 3: Average incidence of child labour (children age 7–17)



Source: Author

Figure 4: Average number of working hours (children age 7–17)



Source: Author

In Table 2, I first provide regression estimates of the NHIS implementation on the outcomes of the parents (age 18–69) of the children in my sample. In order to explore whether the NHIS affects males and females differently, I separate my analysis by gender. Furthermore, I consider in all my regressions a range of variables that are typically used to control for socioeconomic characteristics such as the level of education, age and sex. In addition, I include household expenditures, as an important control variable for the financial potential of a household (Deaton 1997). Expenditures are corrected with a

region-specific consumer price index and an equivalence scale, which reflects age- or sex-specific relative consumption needs (GSS, 2008). Furthermore, I control for household size, marital status, owning a savings account, living in urban areas and migration status (see Table A1 and A2 in the Appendix).

First, I look at changes suggesting poor health status, indicated by a respondent having to stop usual activities for two weeks. The availability of the NHIS improves health status of females as they have 5 percentage points lower probability of being sick after the implementation of the NHIS, while the effect for males is small and not statistically significant. The same pattern can be found for out-of-pocket payments for health purposes. They decrease on average by 12 GHC in the female sample, which corresponds to a relative reduction of 37%. In order to examine whether the NHIS implementation also affects health facility utilization, I also present the estimates for visiting a public health facility as an outcome variable. It seems that females slightly increase their utilization, which is statistically significant at a 10% level.

Table 2: Effect of the NHIS implementation on health status, out-of-pocket expenditures and public health facilitiy utilization of adults (age 18–69)

Dep. var.:	**Low health status (1/0)**			**Out-of-pocket payments (GHC)**			**Utilize public health facility (1/0)**		
	Full sample	**Male**	**Female**	**Full sample**	**Male**	**Female**	**Full sample**	**Male**	**Female**
Variables	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
NHIS	-0.032	-0.007	-0.050*	-8.738	-4.509	-11.730*	0.009	0.012	0.021*
	(0.020)	(0.031)	(0.027)	(6.264)	(7.464)	(6.834)	(0.012)	(0.016)	(0.011)
N	8,705	3,767	4,938	8,705	3,767	4,938	8,705	3,767	4,938
adj. R-sq	0.019	0.014	0.023	0.008	0.013	0.007	0.011	0.004	0.013

District and month dummies are included. Individual and household control variables are included. Standard errors (in parenthesis) are clustered at the district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Author

In Table 3, I provide estimates of the NHIS implementation on the outcomes for children (age 7–17). In the first three columns I investigate the relationship between NHIS and incidence of child labour. The introduction of the NHIS reduces child labour substantially by around 6 percentage points. The effect is driven by girls, as they experience a reduction of child labour by 10 percentage points. I also examine whether the number of weekly working hours is influenced by the NHIS introduction. Girls reduce their number of working hours by 35%, while the estimates for boys are not statistically different from zero. In the last three columns, I scrutinize if the reduction in child labour translates into a higher school attendance of children. The coefficients are positive but not statistically significantly different from zero.

Table 3: Effect of the NHIS implementation on child labour, number of working hours and school attendance of children (age 7–17)

Dep. var.:	Child labour (1/0)			Number of weekly working hours			School attendance (1/0)		
	Full sample	Boys	Girls	Full sample	Boys	Girls	Full sample	Boys	Girls
Variables	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
NHIS	-0.062	-0.032	-0.097**	-2.242	-2.226	-2.116**	0.012	0.022	0.037
	(0.043)	(0.049)	(0.050)	(1.568)	(1.672)	(1.073)	(0.037)	(0.034)	(0.047)
N	9,373	4,860	4,513	9,373	4,860	4,513	9,373	4,860	4,513
adj. R-sq	0.061	0.059	0.062	0.079	0.076	0.082	0.059	0.049	0.066

District and month dummies are included. Individual and household control variables are included. Standard errors (in parenthesis) are clustered at the district level. * p < 0.10, ** p < 0.05, *** p <0.01

Source: Author

In the next subsection I explore the heterogeneity of the NHIS effect between rural and urban areas and different labour market sectors, using information on child labour in the agricultural, manufacturing and service sector.

4.1 Treatment heterogeneity

In order to empirically examine if the reduction in child labour is driven by the kind of child labour, I explore the heterogeneity of the NHIS effect using detailed information on the working activities of children. Using this information, I defined three sectoral groups: agricultural, manufacturing and service. Among the child workers in my sample 83% work in the agricultural sector, while 5% and 12% are child labourers in the manufacturing and service sector. First, I examine whether my respondents have reduced child labour in the agricultural sector and estimate the group-specific effects of the NHIS implementation (see Table 4). The probability of being a child worker is negative and statistically significant in the agricultural sector. The probability for boys decreases by 10 percentage points, while girls experience a reduction of 12 percentage points. Secondly, I turn to children that who work in the manufacturing and service sector, and do not find any statistically significant effects. Furthermore, the sizes of the coefficients are much smaller compared to the agricultural sector, suggesting that the overall reduction in child labour is mainly driven by the decrease of child labour in the agricultural sector.

In order to explore if these results are also driven by the geographical heterogeneity of the NHIS effect, I conduct a separate analysis for rural and urban areas. Table 5 shows the estimates of the NHIS implementation differentiated by rural and urban areas. The probability of child labour is negative and statistically significant in rural areas, while the coefficients for urban areas are small and not statistically different from zero. The same pattern can be found for the number of weekly working hours, which account for a reduction of nearly 50 %. Thus, the overall impact of the NHIS implementation is mainly driven by the decrease of child labour in rural areas and the agricultural sector.

Table 4: Effect of the NHIS implementation on child labour in different sectors

Dep. var.:	Child labour in the agricultural sector (1/0)			Child labour in the manufacturing sector (1/0)			Child labour in the service sector (1/0)		
	Full sample	Boys	Girls	Full sample	Boys	Girls	Full sample	Boys	Girls
Variables	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
NHIS	-0.106*	-0.101*	-0.117*	-0.014	-0.030	-0.074	-0.021	-0.042	-0.057
	(0.099)	(0.105)	(0.086)	(0.046)	(0.021)	(0.108)	(0.023)	(0.039)	(0.124)
N	8,427	4,386	4,041	7,378	3,764	3,614	7,213	3,690	3,523
adj. R-sq	0.171	0.177	0.165	0.016	0.018	0.026	0.036	0.028	0.021

Individual and household control variables are included. District and month dummies are included. Standard errors (in parenthesis) are clustered at the district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Author

Table 5: Effect of the NHIS implementation on child labour and number of working hours (age 7–17)

	Rural					
	Child labour (1/0)			Number of weekly working hours		
	Full sample	Boys	Girls	Full sample	Boys	Girls
Variables	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
NHIS	-0.104*	-0.079	-0.131**	-4.398**	-4.690*	-4.731
	(0.056)	(0.067)	(0.061)	(2.174)	(2.401)	(3.683)
N	7,072	3,734	3,338	7,072	3,734	3,338
adj. R-sq	0.068	0.069	0.066	0.088	0.086	0.086
	Urban					
	Child labour (1/0)			Number of weekly working hours		
	Full sample	Boys	Girls	Full sample	Boys	Girls
Variables	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
NHIS	-0.028	-0.011	-0.057	-0.544	-0.145	-1.203
	(0.039)	(0.039)	(0.051)	(1.142)	(0.878)	(1.603)
N	2,301	1,126	1,175	2,301	1,126	1,175
adj. R-sq	0.066	0.082	0.050	0.077	0.131	0.049

Individual and household control variables are included. District and month dummies are included. Standard errors (in parenthesis) are clustered at the district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Author

5 Conclusion

In this paper I provided empirical evidence that a country-wide public health insurance scheme reduces child labour in Ghana. I analysed cross-sectional data from the fourth and fifth Ghanaian Living Standard Surveys and benefitted from the fact that the districts' sub-districts were surveyed at different points in time during the survey periods, which allowed me to employ an extension of the standard difference-in-difference estimator. I evaluated whether the availability of public insurance results in a lower incidence of child labour and also investigated the impact of the NHIS on school attendance of children. Furthermore, I explored whether children's households are financially relieved in the form of lower out-of-pocket payments for health purposes and examined whether my general results are triggered by rural areas and the children's working sector.

I found that the implementation of the insurance scheme had a positive impact on the financial protection of households, as out-of-pocket payments for health purposes decreased. This was accompanied by a substantial reduction in the incidence of child labour. The general effect was driven by a reduction in child labour among girls of 10 percentage points. The number of hours girls worked also decreased by a substantial extent, which might be explained by the fact that certain child labour activities were more common amongst female children in my sample. Furthermore, I found that the overall reduction in child labour was mainly driven by the decrease of child labour in rural areas and in the agricultural sector. However, I did not find that the reduction in child labour translated into a higher school attendance, which might take more time to become apparent and which is in line with a study of Heady (2003) showing that child labour does not affect school attendance in Ghana.

My findings suggest that the provision of public health insurance improves the financial protection of households and decreases the vulnerability to health shocks. As a result, it seems that households are able to avoid sending their children to work. This is in line with the sparse empirical literature on this topic. Landmann and Frölich (2015) and Cakrabarty (2012) also find lower incidence of child labour and child labour earnings after the implementation of a micro health insurance in Pakistan and Bangladesh. However, micro insurance schemes are not directly comparable to the country-wide health insurance scheme in Ghana.

Against the background of my results, public health insurance schemes seem to be an effective instrument to fight child labour. As the latest ILO estimates indicate that Sub-Saharan Africa is lagging behind other regions of the world in eliminating child labour, policy makers should consider the indirect impacts of implementing insurance schemes on child labour in their cost-benefit analysis. The reduction of child labour can contribute to the breakage of the intergenerational poverty trap and to the achievement of SDG Goal 8, which targets the elimination of child labour by 2025. Given the long-lasting negative consequences of child labour, it would be of interest to study how insurance schemes mediate human capital accumulation in the later life of children. As the sixth round of the GLSS is available from 2014, a promising avenue for future research would therefore be to examine whether the implementation of the NHIS also translates into higher educational attainment and labour market success through the reduction of child labour in the long run.

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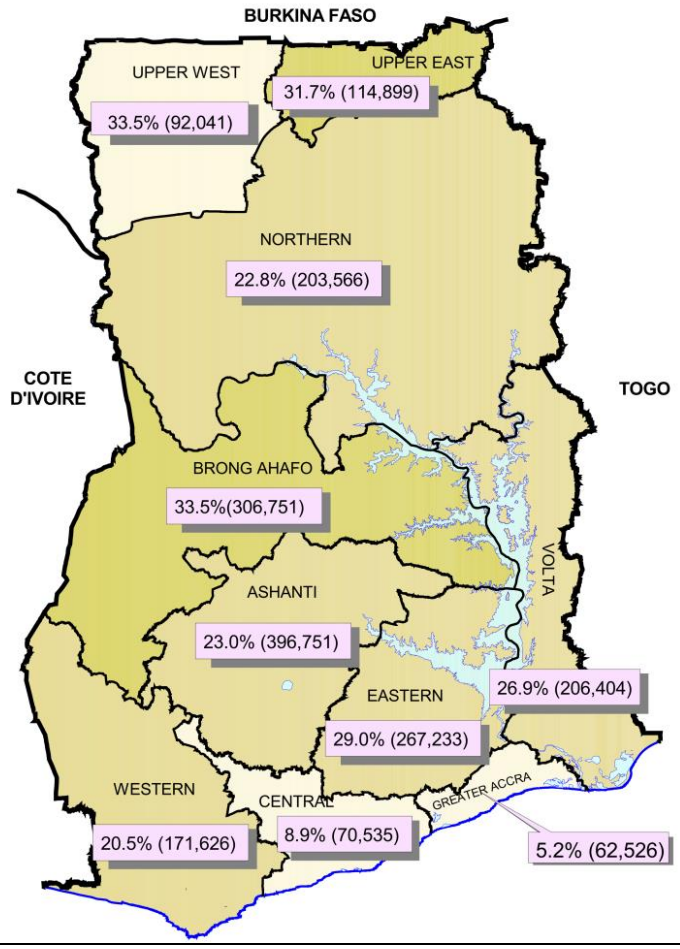
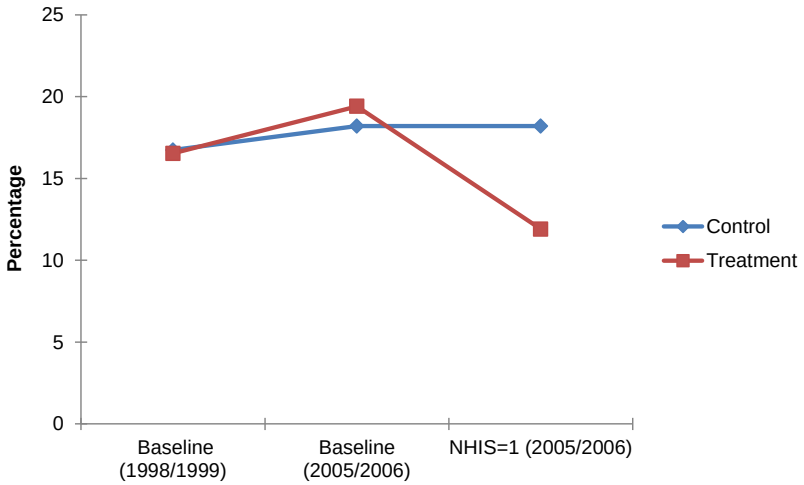
Appendix

Figure A1: Distribution of child labour (age 6–17) in Ghana



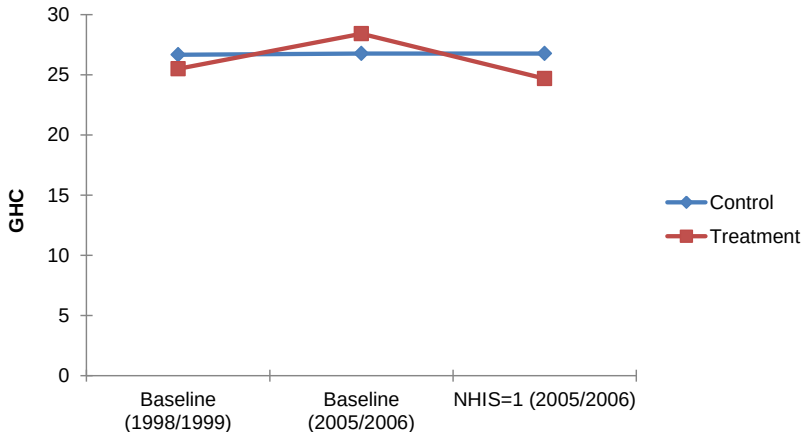
Source: GSS 2014

Figure A2: Prevalence of a low health status over time (adults age 18–70)



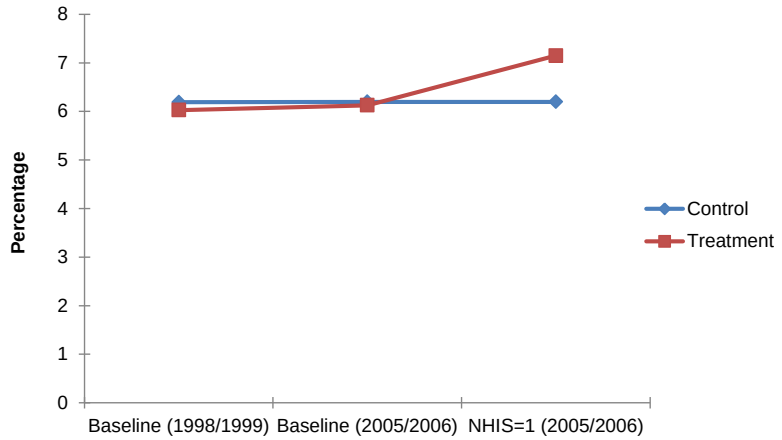
Source: Author

Figure A3: Annual out-of-pocket payments (adults age 18-70)



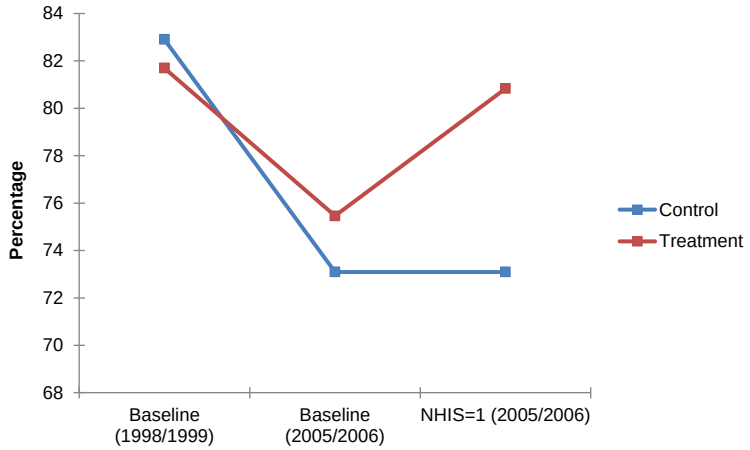
Source: Author

Figure A4: Utilization of public health facilities (adults age 18–70)



Source: Author

Figure A5: School attendance (children age 7–17)



Source: Author

Table A1: Descriptive statistics of adults (age 18–69)	
Variable	**Mean**
Household size	6.86
HH expenditures Quintile 2 (0/1)	0.23
HH expenditures Quintile 3 (0/1)	0.19
HH expenditures Quintile 4 (0/1)	0.16
HH expenditures Quintile 5 (0/1)	0.11
HH saving account (0/1)	0.27
Public service (0/1)	0.07
Wage-priv-formal (0/1)	0.03
Wage-priv-informal (0/1)	0.03
Self-agro-export (0/1)	0.07
Self-agro-crop (0/1)	0.59
Self-enterprise (0/1)	0.27
Migrant (0/1)	0.19
Primary School (0/1)	0.17
Junior High School (0/1)	0.15
Secondary High School (0/1)	0.16
Technical School (0/1)	0.03
University (0/1)	0.01
Female (0/1)	0.57
Age	39.32
Married (0/1)	0.71
Urban (0/1)	0.22
Number of observation	8,705
Source: Author	

Table A2: Descriptive statistics of children (age 7–17)	
Variable	**Mean**
Household size	6.86
HH expenditures Quintile 2 (0/1)	0.23
HH expenditures Quintile 3 (0/1)	0.19
HH expenditures Quintile 4 (0/1)	0.16
HH expenditures Quintile 5 (0/1)	0.11
HH saving account (0/1)	0.27
Female (0/1)	0.48
Married parents (0/1)	0.69
Age	11.34
Urban (0/1)	0.22
Number of observation	9,373
Source: Author	

Table A3: Placebo effects of the NHIS implementation using the GLSS 1998/1999

Dep. var.:	**Child labour (1/0)**			**Number of weekly working hours**			**School attendance (1/0)**		
	Full sample	**Boys**	**Girls**	**Full sample**	**Boys**	**Girls**	**Full sample**	**Boys**	**Girls**
Variables	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.	Coeff.
NHIS	-0.012	0.026	-0.019	-0.158	-0.179	-0.156	0.065	0.041	0.123
	(0.085)	(0.112)	(0.088)	(0.217)	(0.257)	(0.289)	(0.061)	(0.040)	(0.128)
N	2,987	1,534	1,453	2,987	1,534	1,453	2,987	1,534	1,453
adj. R-sq	0.055	0.050	0.062	0.077	0.073	0.079	0.065	0.067	0.060

Individual and household control variables are included. District and month dummies are included. Standard errors (in parenthesis) are clustered at the district level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Author

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