Università Commerciale “Luigi Bocconi”

Faculty of Economics

Master of Science in Economics and Social Sciences

Fighting child malnutrition in Indonesia: evaluation of two recent pro-poor policies.

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Glossary of terms

Asabri	Social Insurance for the Police and Military Personnel
Askes	Health Insurance (for civil servants)
Askeskin	Health insurance for the poor
BLT	Unconditional Cash Transfer
BPS	Central Bureau for Statistics
Dana Sehat	Health funds (community based health insurance scheme)
IFLS	Indonesia Family Life Survey
ILO	International Labour Organization
Jamsostek	Employees' Social Security
Jamkesmas	Health insurance for the poor (from 2008 on)
JPS	Social Safety Net
Kabupaten	Indonesian District
Kartu Sehat	Health card
SKTM	Village poverty letter
Susenas	National Socioeconomic Survey
WHO	World Health Organization

Abstract

In 2005 the Indonesian government introduced two social protection policies targeted to the poor. The first one, Askeskin, is a subsidized social health insurance program for the poor covering basic healthcare in public health clinics and hospital inpatient care. The second one, BLT, is an unconditional cash transfer program providing a total amount of 1,200,000 rupiah (around US$ 120) to poor households in one year. This thesis evaluates the impact of the two programs on children's nutritional status. I use data on child anthropometrics and employ a difference-in-difference strategy to address the concern that the programs are targeted to poorer households. Results suggest that in particular the health insurance program has a positive impact on children's height-for-age and birth weight. Furthermore, Askeskin reduces significantly expenses for delivery care.

1. Introduction

Indonesia experienced remarkable economic growth and poverty reduction in the last decades of the past century and the health status of its citizens was also positively affected. However, at the beginning of the new millennium Indonesia is underperforming with respect to similar countries in South-East Asia according to most conventional health measures. According to many sources a major reason for this is that public health expenditure in Indonesia has been much lower with respect to most of its neighbors (Rokx et al., 2009; WHO, 2004; World Bank, 2008). Private out-of-pocket expenditures in health has been high in the country (as in most countries in South-East Asia), but not enough to compensate fully for the inadequacy of public spending (World Bank, 2008). Moreover, the economic crisis of the late 90s put serious constraints on the capacity of Indonesian households to cope with health shocks and forced them to reallocate part of their budget from health to less deferrable consumption such as food (Frankenberg et al., 2002). While nutrition indicators improved substantially during the 1990s, progress slowed down in the post-crisis period. Between 2000 and 2005 child malnutrition measured in terms of weight-for-age even increased in a number of provinces (World Bank, 2008). This fact, which is worrisome for the future, needs to be reversed in a period in which Indonesia recovered well from the financial crisis and is back on a path of sustained growth.

In an effort to reshape its social protection system the Indonesian government introduced in 2005 two sizeable programs directed to the poor. The first one, Askeskin, is a social health insurance program, which was introduced starting from the poor as part as a more broad plan of extending health insurance to the whole population of Indonesia. The second one, BLT, is a one-year unconditional cash transfer program, which was financed through a decrease in the existing government fuel subsidy. The two programs are considerable both in terms of coverage and government expenditures. While Askeskin was initially targeted to 60 million

individuals, BLT covered between 2005 and 2006 circa 70 million individuals in almost 20 million households (World Bank, 2006). Providing households with four transfers of Rp. 300,000 (about US$ 30) each, the BLT program was one of the largest targeted cash transfer programs of the developing world (Alatas et al., 2010) and is likely to have a strong impact on poor households. A first evaluation of the Askeskin program (Sparrow et al., 2010) suggests that Askeskin is indeed targeted to the poor and increases significantly utilization of outpatient healthcare.

While the BLT program was aimed as a temporary policy to be replaced by a subsequent conditional cash transfer program, Askeskin insurance was the basis of the ambitious target of reaching universal health insurance and was considered a policy of greater relevance for the future social protection system of Indonesia (World Bank, 2006). One of the main objectives of Askeskin was the pooling of risks and resources in order to allow poor households to cope better with health shocks. There is evidence that Indonesian households are not able to insure properly consumption against major illness shocks (Gertler and Gruber, 2002). In recent years many other developing countries took effort to introduce and expand social health insurance schemes. Previous examples from Southeast Asia include Thailand and Vietnam, which introduced similar programs respectively in 2001 and 2002. Not surprisingly there has also been a growing interest in evaluating these health insurance programs and the focus has been mainly on the impact on health care utilization and out-of-pocket payments (Galárraga et al., 2008; Wagstaff, 2007; Wagstaff, 2010). While there is extensive literature investigating the benefits of health insurance in terms of health outcomes in developed countries (see for example: Card, Dobkin and Maestas, 2009; Currie and Gruber, 1996; Hanratty, 1996), there are very few similar studies for developing countries (Dercon and Kirchberger, 2008). Exceptions include Wagstaff and Pradhan (2005), who find using panel data and propensity score matching that voluntary health insurance in Vietnam affects positively height-for-age and weight-for-age of young children.

Making use of cross-sectional data from the Indonesia Family Life Survey (IFLS) this thesis attempts a first evaluation of Askeskin and BLT programs on health outcomes, in particular on infant and young children nutrition as reflected in anthropometric indicators. The focus is on the one hand on children height-for-age, which is considered a long run indicator of child nutrition reflecting overall social conditions (Strauss and Thomas, 1998; WHO, 1986). On the other hand is analyzed the impact on birth weight, which is an indicator of the nutrition of the mother and is generally considered as an indicator of the general social development of the population (WHO, 1986; WHO, 1995). Identifying the effects of Askeskin and BLT programs on children anthropometrics is not straightforward, given that the programs are directed to poor and more disadvantaged households. To address this problem two methods are used. The first method makes use of the fact that children height-for-age reflects past investments in nutrition and health care, depending especially on nutrition in the womb and under the age of two. If the two polices have a positive effect on health, then children born after 2005 should be taller than their siblings at the same age. Following an estimation strategy proposed by Duflo (2003), the difference in the height-for-age measure between children born after the introduction of the programs in treated households and coetaneous children in non-treated households is compared to the same difference for children born before 2005. The second method exploits past information on children weight at birth revealed by the IFLS questionnaire on pregnancy history. As in the previous case, a difference-in-difference framework is used comparing on the one hand children in treated households with children in untreated households and on the other hand children born after 2005 with older ones. This second method is also used to evaluate the impact of the two policies on a particular type of out-of-pocket payments for health, namely expenditures for delivery care.

The thesis is organized as follows. Chapter 2 provides a description of the Askeskin and BLT programs, as well as the other main social security programs existing in

Indonesia before 2005. Chapter 3 describes the difference-in-difference methods used in the analysis. Chapter 4 presents the data used and descriptive statistics, while chapter 5 presents the results. Finally, chapter 6 concludes.

2. Askeskin Health Insurance and BLT Cash Transfer Programs

2.1. Overview on health status in Indonesia

The health status of Indonesian citizens improved in the '80s and '90s, but at a slower rate with respect to most other countries in Southeast Asia. In 2000 Indonesia was underperforming with respect to its neighbors in terms of most health indicators, such as life expectancy, infant mortality rate and child malnutrition (Rokx et al., 2009). Malnutrition rates are particularly high in Indonesia and have even risen in recent years despite reductions in poverty (World Bank, 2006). One of the main factors responsible for this low performance has been considered the lack of adequate health care financing (WHO, 2004; World Bank, 2008). In particular, financing for the poor and vulnerable groups, such as pregnant mothers, children under five years of age and the elderly, was deemed to be inadequate (WHO, 2004).

In 2004, however, the Indonesian government made a commitment to provide its entire population with health insurance coverage and stated recently the ambition of reaching such universal coverage by 2014[1]. The first significant step towards this direction has been the introduction in 2005 of the Askeskin program (now Jamkesmas), a subsidized social health insurance targeted first to the poor and subsequently expanded also to the near poor. Moreover, in 2005 was introduced also the Unconditional Cash Transfer (BLT) program for the poor, one of the largest transfer program in terms of size of transfer and coverage of the developing world (Alatas et al., 2010). The next section presents an overview of the main health care

[1] See for example the Jakarta Post, 28.02.2010: "Universal healthcare coverage: A benefit for citizens or providers?"

programs existing before 2005. The Askeskin program is described in detail in section 2.3, while section 2.4. provides a summary of the BLT program.

2.2. Health insurance and social protection programs before 2005

2.2.1. Askes and Jamsostek health insurance programs

In 2005, when Askeskin was introduced, only one Indonesian out of ten was covered by social health insurance (ILO, 2008). There were two existing programs: a mandatory health insurance for civil servants, police and military (Askes/Asabri) and a social health insurance scheme for the formal private sector (Jamsostek). In both schemes beneficiaries pay premiums that depend on the earnings, while benefits are equal for all. Moreover, both schemes cover not only workers, but also their families (up to two children).

The Askes social insurance scheme resulted as a modification of an old Dutch colonial government scheme, originally targeted only to European employees. The Askes/Asabri scheme in its current form results from a regulation of 1992 and is managed by *PT Askes*, a for-profit state owned company. The premiums are paid by civil servants and military personnel, who are mandated to contribute 2% of their basic monthly salary. But since early 2003, also the Central Government started contributing with a 0.5% of the basic monthly salary (WHO, 2004). The benefits consist mainly of care in public health centers and public hospitals. In 2004 Askes covered almost 15 million people (civil servants and their families) with an average monthly contribution of about Rp. 4,000 per capita (WHO, 2004).

The Jamsostek scheme dates back to 1993 and it is also managed by a for-profit state owned company. The scheme is mandatory for all private employers with 10 or more employees or with monthly payrolls exceeding Rp. 1 million. However, since employers are allowed to opt out from the scheme in favor of private insurance providing higher level of benefits, the majority of employers choose to do so. Jamsostek is a non-contributory scheme as the premium, consisting in 6% of the

salary of married employees (3% for single ones), is entirely paid by employers. In 2004 Jamsostek covered around 3 million individuals (workers and their families) with an average monthly contribution of Rp. 5 000 per capita (WHO, 2004)

Askes and Jamsostek covered thus in 2005 around 8% of the Indonesian population (ILO, 2008). Private health insurance and other schemes covered around 3% of the population, while less than 1% was covered by *Dana Sehat*, community-based health insurance schemes (Rokx et al., 2009).

2.2.2. Social Safety Nets (JPS) health cards

As described in the previous paragraph, the informal sector did not benefit from social health insurance before 2005. Since in Indonesia around 60% of the labor market is informal (ILO, 2008), health insurance coverage remained limited and restricted to a relatively high income minority. However, the poor could obtain user fee waivers for public healthcare through the Social Safety Net (JPS) health cards.

The social safety net was introduced in the late 1990s with the aim of mitigating the effects of the economic crisis and was launched again after 2000 as social packages for the poor. The health card (*Kartu Sehat*) program was a main component of this package of programs, which included also education programs, rice subsidies, job creation and loan schemes (Daly and Fane, 2002). A health card entitled the owner and family members to free services at public hospital and health centers including both outpatient and inpatient care, contraceptives for women, prenatal care and assistance at birth (Pradhan, Saadah and Sparrow, 2007).

The program succeeded in improving access to healthcare services for the poor during the crisis (Pradhan et al., 2007), however health services utilization among the poor remained low (WHO, 2004). The health card program persisted after the crisis

until 2005[2], when it discontinued due to the introduction of the Askeskin insurance scheme (World Bank, 2006).

2.3. Health Insurance for the Poor (Askeskin)

In 2005 Indonesia introduced the Askeskin program, a subsidized social health insurance for the poor and the informal sector. Insurance premiums, which were set initially at the level of Rp. 5,000 (approximately US$ 0.50) per month (ILO, 2008), were fully subsidized by a government health fund. The program was aimed at a target population of 60 million people and the total budget for 2005 was set at Rp. 3.9 trillion (around US$ 400 million). Eligible individuals received health cards from Askes, an already existing health insurance provider for formal sector workers. Health cards mainly granted free outpatient primary care in the local health centers (Puskesmas) and free inpatient care in third class public hospitals. Moreover insurance included an obstetric service package, mobile health services, immunization programs and medicines.

The targeting of the program was based on a combination of geographic targeting at the district level (*kabupaten*) and selection of eligible individuals within the district. The budget quota for each district was determined according to district poverty indicators based on Statistics Indonesia (BPS) data (Sparrow et al., 2010). The single districts then were in charge to indentify eligible individuals using census-based welfare and poverty indicators from BPS or the local Family Planning (BKKBN), otherwise through own methods (ILO, 2008). The system to identify targeted individuals was therefore not uniform among districts. Moreover, due to delays with coverage extension[3], in 2005 JPS health cards and village poverty

[2] The JPS health program was actually renamed in 2002 “fuel-subsidy compensation program” or PKPS-BBM, however the nature of the program remained the same (Arifianto et al., 2005).

[3] According to Susenas panel data only around 16 million health cards were distributed in 2005, while about 40 million people were covered by the end of 2006 (World Bank, 2008).

letters[4] (SKTM) were accepted in some cases for claiming Askeskin benefits (Arifianto et al., 2005; World Bank, 2008).

Sparrow, Suryahadi and Widyanti (2010) use Susenas data to analyze Askeskin targeting and to estimate its impact on healthcare utilization and out-of-pocket health payments in 2006. They find that targeting was indeed pro-poor, but there was some non-trivial leakage to the non-poor. In the beginning of 2006 more than 20% of the poorest income quartile and around 13% of the second poorest quartile benefited from Askeskin. While the majority of individuals covered by Askeskin belonged to the poorest income quartile, around 20% of the covered lived in households in the top half of the income distribution. Moreover, they find that Askeskin lead to higher utilization of public outpatient care in 2006 and they find no evidence of substitution from private to public health care.

2.4. Unconditional cash transfer for the poor (BLT)

In October 2005 the Indonesian government launched the Direct Cash Assistance (Bantuan Langsung Tunai, or BLT) program, an unconditional cash transfer program targeted specifically for the poor. The BLT program is a one-year program providing a transfer of Rp. 300,000 on a quarterly basis (around US$ 30) to about 70 million individuals in 19.2 million households (World Bank, 2006). The size of the program makes it one of the largest targeted cash transfers of the developing world (Alatas et al., 2010). It was financed through budget surplus from a decrease in the existing fuel subsidy in 2005 and was namely intended to compensate households for the income losses due to the direct and indirect impacts of price increases in fuel and of other commodities (World Bank, 2005)[5]. The total government allocation amounted to Rp. 23 trillion (ILO, 2008).

[4] SKTM (or village poverty letter) is a letter provided by the village leader (*kelurahan*), stating that the person is poor.

[5] The fuel subsidy, which fixed fuel prices at levels well below world prices, represented three-quarters of the total subsidies and transfers of Indonesia's social protection system (World Bank, 2006). Since

The program is targeted to poor households, which were identified by Statistics Indonesia (BPS) through the use of a proxy-means testing methodology[6]. Targeted households received beneficiary cards and receipt coupons, which could be used to collect the funds at local post offices on designated days.

3. Methods

3.1. Overview of the methodology used

The main problem of evaluating the impact of the Askeskin and BLT program on some policy relevant outcome is the usual one of selection into treatment. Enrollment in the programs originates from two processes. The first one is the government targeting of the policy, which consists in selecting poor individuals according to a given set of criteria. The second one is the individual decision to comply with the initial assignment. Discerning causal effects from simple correlation is therefore far from being an easy task. While it is clear that a simple difference in the outcomes of treated and non treated individuals would not represent the causal effect of the policies due to its specific targeting, it also clear that controlling properly for all the characteristics that influence selection is nearly impossible. Moreover, it is likely that unobserved individual (or household) characteristics affect selection into treatment.

One method to control for time invariant unobservable variables would be the one of exploiting the panel structure of the data. However, also because of the long time span between the two last waves (8 years), it is preferred to use just the 2008 wave

richer households consumed relatively more fuel than poorer ones the fuel subsidy was regressive in nature. Exactly for this reason it was strongly reduced in 2005 in favor of the BLT program. Analyzing three different targeting scenarios the World Bank (2006) estimates that lower deciles would have been more than compensated for the impact of the fuel price increase by the BLT transfer even under assumption of great mis-targeting.

[6] In particular, the criteria used by BPS as proxies for household income were: the size of the house in square meters; the flooring material of the house; the material used for house walls; sanitary facilities; source of drinking water; source of main lighting; fuel used for cooking; meat consumption; number of meals; clothing consumption; job of household head; financial ability to go to hospital; possession of specific assets (ILO, 2008).

and to make use of variables revealing not only present but also past information. In a difference-in-difference framework the present difference between treated households and untreated ones is compared with the same difference in the past. As explained in more detail below, the first method exploits the fact that the height-for-age of young children reflects past investments in nutrition and health. The second method makes use of past information provided by the IFLS questionnaire on pregnancy history. Both methods compare nutrition indicators of children born after the program introduction with the same indicators for older children, thereby getting rid of the possible selection into treatment stemming from unobservable differences between families benefiting from the programs and those not benefiting from them. The identifying assumption is the "parallel trend" one, stating that the average difference in the anthropometric indicators between younger and older children for the treatment group (children in covered households) would have been equal to the same difference for the control group (children in non-covered households) in the absence of the policy.

3.2. Height-for-age

Anthropometric indices are widely accepted as the most useful tool for assessing in practice the nutritional status of children (WHO, 1995). Child weight varies in the short run with respect to nutrition and illnesses and is therefore used as a current indicator of nutritional status (Strauss and Thomas, 1998). On the contrary child height is viewed as a longer-run indicator of nutritional status and the height-for-age of younger children is considered to depend on accumulated investments in nutrition and health care over the life of the child (Martorell and Habicht, 1986). The medical literature underlines in particular the crucial role played by nutrition in the womb and in the first two years of life, which is documented to have long lasting effects on child height and adult health (Barker, 1990; Scrimshaw, 1997). Moreover, the possibility of catching up in height after an episode of low growth in infancy is limited and occurs mostly under the age of two (WHO, 1986).

Therefore, if Askeskin led to better healthcare and nutrition, then children born after 2005 in households benefiting from the insurance should be taller than their older siblings at the same age. Younger siblings benefited from the program for a larger fraction of their lives and differently from older brothers and sisters benefited from it at a very early age, which is documented by medical literature to be a crucial period for future child height. To estimate the effect of Askeskin a possibility would be the one of comparing the height-for-age in 2008 of children born after 2005 with the height-for-age of older siblings, measured when they were younger (at the corresponding age). However, such information is not present in the IFLS data. Nevertheless it is possible to follow a difference-in-difference identification strategy similar to the one used by Duflo (2003) to analyze the impact of a cash transfer program in South Africa. The difference in height between young children in benefiting households and coetaneous children in non-benefiting households can be compared with the same difference among relatively older siblings. The simplest form of the estimated equation is the following:

$$(1)\ ha_{ijk} = \alpha + \beta_j \left(Young * Askpar_j\right) + \gamma_j\ Askpar_j + \sum_{l=1}^{5} 1_{(l=k)}\delta_l + \lambda\, X_{ijk} + \sum_{l=1}^{5} 1_{(l=k)} * X_{ijk}\ \theta_l + \mu\, BLT_j + \varepsilon_{ijk}$$

where ha_{ijk} is the height-for-age z-score of children under 5 years old born in cohort *k* of household *j*; *Young* is a dummy equal to 1 for children born in 2006, 2007 or 2008, corresponding to the group of children benefiting the most from the program; *Askpar* is equal to 1 for children with at least one parent covered by Askeskin insurance; $1_{(l=k)}$ is a dummy variable denoting the year of birth of the child; X_{ijk} are family background characteristics, which include children demographic characteristics, parents' education and insurance coverage variables, proxies for household income and other government programs controls at the household level[7];

[7] More precisely the controls included are: sex; religion (Muslim or not); ethnicity (Javanese or not); urban or rural residence; household size; total household consumption; mother's and father's age and education; mother's and father's coverage to Askes or Jamsostek health insurance programs;

$\sum_{l=1}^{5} 1_{(l=k)} * X_{ijk}$ is the interaction between family background variables and cohort dummy variables; the last term, *BLT*, is a dummy equal to 1 for households possessing the BLT card. Ordinary least squares (OLS) are used to estimate equation 1 and standard errors are clustered by household to take into account the correlation of error terms among children in the same family.

The difference-in-differences estimate (the interaction coefficient β) represents a downward-biased estimate of the effect of parents Askeskin coverage on child height-for-age for two reasons. The first one is that also older children were exposed to the program for a fraction of their lives, although not during the crucial one corresponding to the womb and the first months of life. The second one is that some of the households received Askeskin cards short before the survey, a period that could not be sufficient to lead to any effect of the insurance. It is possible to deal with this second issue by looking separately at different effects of Askeskin insurance by first year of parents' coverage. To do so the following equation is estimated:

$$(2)\ ha_{ijk} = \alpha + \beta_{1j}\left(Young * Askpar2005_j\right) + \beta_{2j}\left(Young * Askpar2006_j\right) + \beta_{3j}\left(Young * Askpar2007_j\right) + \beta_{4j}\left(Young * Askpar2008_j\right) + \beta_{5j}\left(Young * JPS_j\right) + \gamma_{1j}\, Askpar2005_j + \gamma_{2j}\, Askpar2006_j + \gamma_{3j}\, Askpar2007_j + \gamma_{4j}\, Askpar2008_j + \gamma_{5j}\, JPS_j + \sum_{l=1}^{5} 1_{(l=k)}\, \delta_l + \lambda\, X_{ijk} + \sum_{l=1}^{5} 1_{(l=k)} * X_{ijk}\ \theta_l + \mu\, BLT_j + \varepsilon_{ijk}$$

where *Askpar2005* is 1 for children having parents receiving first Askeskin cards in 2005 (similarly for *Askpar2006, Askpar2007*and *Askpar2008*); *JPS* is 1 if at least one parent receives a JPS health card before 2005[8]; the notation is otherwise as before. It is reasonable to expect a stronger effect of the insurance program in case parents receive Askeskin cards already in 2005 and 2006. Conversely, it is likely that no

household has SKTM poverty letter; septic toilet in house; house area in squared meters; floor material; main fuel used for cooking (firewood or not).

[8] As it will be explained in more detail in the data description, the data used provide for a unique variable denoting possess of JPS and Askeskin health cards. Nevertheless, since the two programs do not overlap, it is possible to distinguish between the two.

significant effect is found for children living with parents receiving the card only in 2007 or 2008.

A difference-in-difference framework as the one expressed in equation 1 and 2 allows to take into account not only a wide set of observable family characteristics, but also unobservable differences between treated and untreated households affecting similarly (the height-for-age of) children of different cohorts. Moreover, unobserved variables affecting in a different way the height-for-age of children of different cohorts can be controlled through this method, as far as they do affect the treatment and control groups in a similar way.

The identifying assumption of the above equation is that the difference in height-for-age among children of different cohorts is similar in the treatment and control groups. A possible concern to such assumption is the presence of age-specific differences in health and nutritional status across households. This could be due to the presence of other government programs, which were either especially targeted to younger children in benefiting households or targeted to poor households and recently introduced (like Askeskin). As already underlined in the previous chapter another important government program was introduced in 2005 in Indonesia, the Unconditional Cash Transfer (BLT) program. Fortunately the IFLS provides detailed information regarding BLT household coverage. Since for 2005 and 2006 there is evidence of nontrivial overlap between the two programs, it is crucial to properly consider any confounding effect of the BLT program. Moreover, analyzing the potential effect of BLT on height-for-age, as well as the existence of potential positive synergies of the two policies together, is a per se interesting exercise. To investigate the impact of BLT, I estimate a regression very similar to equation 1 adding BLT household coverage in the interaction term instead of Askeskin. Furthermore, I also estimate another equation with both interaction terms included (*Young*BLT* and *Young*Askpar*) in order to disentangle properly the effects of the two programs.

3.3. Birth weight and delivery expenses

Size at birth is universally acknowledged to be an important indicator of neonatal health. Birth weight in particular is strongly associated with neonatal mortality and with child morbidity (WHO, 1995). Being the single most important determinant of infant mortality it can be considered, like the infant mortality rate, as an indicator of the general social development of the population (WHO, 1986). Moreover, to the extent that retarded fetal growth is caused by malnutrition of the mother during pregnancy, birth weight can be regarded as an indicator of the health and nutritional status of the pregnant mother (WHO, 1986).

If Askeskin and BLT programs had a positive impact on health and nutrition of pregnant women, then the weight at birth of children born after 2005 in covered households should be greater than the birth weight of their older siblings. Since the data used provide for historical information on birth weight, it is possible to carry out a difference-in-difference strategy similar to the one concerning the analysis of height-for-age. More specifically, the difference in birth weight between recently born children in benefiting households and coetaneous children in non-benefiting households is compared with the same difference among relatively older siblings. As regards Askeskin coverage the following equation is estimated:

(3) $$wbirth_{ijk} = \alpha + \pi_j \left(Young * Askmother_j\right) + \beta_j\, Askmother_j + \sum_{l=1}^{5} 1_{(l=k)}\delta_l + \lambda\, X_{ijk} + \sum_{l=1}^{5} 1_{(l=k)} * X_{ijk}\, \theta_l + \mu\, BLT_j + \varepsilon_{ijk}$$

where $wbirth_{ijk}$ is the weight at birth of children born in cohort *k* of household *j*; *Young* is a dummy equal to 1 for children born in 1996, 1997 or 1998; *Askmother* is equal to 1 if the mother is covered by Askeskin insurance; $1_{(l=k)}$ is a dummy variable denoting the year of birth of the child; X_{ijk} are family background characteristics, which include mother pregnancy and demographic characteristics, mother and father education and insurance coverage variables (including father JPS coverage), proxies for household income and other government programs controls at the household

level[9]; $\sum_{l}^{5} 1_{(l=k)} * X_{ijk}$ is the interaction between family background variables and cohort dummy variables, while *BLT* denotes households possessing the BLT card. Equation 3 is estimated, as the previous ones, using OLS and adjusting standard errors by household. As for the height-for-age analysis a regression similar to equation 2 is carried out to estimate the effect of Askeskin card possession by first year of coverage. Moreover, similar specifications are used to estimate the effect of the BLT cash transfer program.

Much of the recent economic research on evaluations of health insurance reforms in developing countries analyses the effects on out-of-pockets (OOP) payments for healthcare (e.g. Galárraga et al., 2008; Wagstaff and Pradhan, 2005; Wagstaff et al., 2009; Wagstaff, 2010). One of the reasons of introducing a social health insurance program is namely the one of reducing out-of-pocket payments for health, which can be a considerable share of household consumption in developing countries. It is therefore reasonable to expect that Askeskin would lead to a decrease in OOP payments. However, previous research found that social health insurance programs could lead in some cases to an increase in out-of-pockets payments (Wagstaff and Lindelow, 2008) and this seems also to be the case for the Indonesian Askeskin program (Sparrow et al., 2010). This proves that it is very difficult to tell a priori the direction of the effect. Differently, if there is any effect of BLT cash transfer program on out-of-pocket payments for health care, it is presumable to be a positive one. This would be the case if some budget of the cash transfer is allocated towards health care expenses.

[9] More precisely the control variables included are: child number (relative to siblings); total number of mother healthcare visits during pregnancy; religion (Muslim or not); ethnicity (Javanese or not); urban or rural residence; household size; total household consumption; mother's and father's age and education; mother's and father's coverage to Askes or Jamsostek health insurance programs; household has SKTM poverty letter; septic toilet in house; house area in squared meters; floor material; main fuel used for cooking (firewood or not).

The focus here is on out-of-pocket payments for delivery care. To test the potential effect of the two policies on expenses for delivery care, it is used exactly the same specification showed in equation 3 with the only difference of the dependent variable.

4. Data and Descriptive Statistics

4.1. The data

4.1.1. The Indonesia Family Life Survey (IFLS)

The data come from the IFLS, an ongoing longitudinal survey carried out by RAND Corporation, a non-profit research organization, in collaboration with several universities. The panel survey collects information about more than 30,000 individuals living in 13 of the 27 provinces in the country and the sample is representative of 83% of the Indonesian population. Currently four IFLS waves have been conducted, respectively in 1993, 1997, 2000 and 2007/2008. For the purpose of this analysis only the fourth wave (IFLS4) has been used. In IFLS4[10], 13,535 households and 44,103 individuals were interviewed between November 2007 and April 2008 (Strauss et al., 2009). IFLS collects socioeconomic information including individual physical health measurements and detailed information at individual and household level, such as a detailed consumption model and information about government programs benefits.

4.1.2. Anthropometric indicators and data on pregnancy history

Anthropometric variables, such as height and weight, were measured for all household individuals by two specially trained nurses. According to the World Health Organization environmental factors are especially important determinants of height in early childhood and it is recommended that the analysis of height and weight measures is limited to children aged under five (WHO, 1986). Therefore the models

[10] IFLS fourth wave was carried out jointly by RAND, the center for Population and Policy Studies (CPPS) of the University of Gadjah Mada and Survey METRE.

of the weight-for-age analysis are estimated for children aged 0 to 60 months, consistently with previous economic literature (Case and Deaton, 1998; Duflo, 2003). However, restricting the sample to children aged 6 to 60 months or including also 5 years old children doesn't alter significantly the results[11]. Height-for-age z-scores are constructed for each age in years by standardizing height measurements to a reference group of British well-nourished children using the 1990 British Growth Reference data (Cole, Freeman and Preece, 1998)[12].

IFLS contains also a detailed questionnaire on pregnancy history for all women aged 15 to 49, which includes reported child weight at birth, number of prenatal care visits and expenses for delivery health care. The weight at birth average for children born after 2002 is equal to 3.16 kg. In order to minimize measurement error for birth weight the bottom and top 1% of the distribution is trimmed, remaining with observations in the interval between 1.5 and 4.5 kg.

4.1.3. Variables for Askeskin and BLT programs

Unfortunately, the IFLS does not contain a variable that denotes uniquely household Askeskin insurance coverage. In the survey there is a question that asks if household member ever received Askeskin insurance cards or Social Safety Net (JPS) health cards, which discontinued in 2005 with the introduction of Askeskin (Sparrow et al., 2010; World Bank, 2006). While there is no variable at the household level specifying when the health card was received, there is such a variable at the individual level (for adults). Therefore, by using 2005 as a threshold year it is possible to construct a variable that denotes parents possessing an Askeskin health card. Given that JPS and Askeskin health cards are not the same and that individuals possessing in 2004 a JPS health cards did not automatically receive in 2005 the Askeskin card, individuals having possessed both cards cannot be considered in the analysis. Table

[11] Such analysis is omitted in this thesis to avoid redundancy.

[12] This task can be performed easily through the *zanthro* Stata command (Vidmar et al., 2004).

1 shows the number of individuals ever possessing a health card by first year of coverage. It is possible to notice that in 2005 almost 3.5% Indonesian received the Askeskin health card. Moreover, from the table emerges that the coverage of Askeskin has been much higher than the one of the previous JPS program.

Table 1: Number of individuals receiving health card or BLT transfer by first year of coverage

	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Health card[1]	17	10	117	37	91	124	258	1,055	509	672	231
% of sample total	0.06	0.03	0.38	0.12	0.30	0.41	0.85	3.47	1.67	2.21	0.76
BLT transfer	-	-	-	-	-	-	94	3,969	2,741	111	11
% of sample total							0.31	13.04	9.00	0.36	0.04

[1] The first 1% of observations is not showed due to the likelihood of misreporting errors. In fact, the Social Safety Net (JPS) program was introduced in 1998 (World Bank, 2006).

Source: IFLS4 full sample of individuals over 15 (30,447 observations)

In the analysis concerning height-for-age different variables are used to denote Askeskin coverage. The dummy *Askpar* is set equal to 1 if at least one of the parents possesses a health card, except when at least one of the parents received the card before 2005[13]. It is equal to 0 if neither the father nor the mother ever possessed a health card. The dummy *Askpar2005* is set equal to 1 if the first parent receiving a health card got it in 2005. *Askpar2006*, *Askpar2007* and *Askpar2008* are constructed in a similar way. The dummy *JPS* is equal to 1 if at least one of the parents received a health card before 2005. Finally, *Askmother* (*Askfather*) is equal to 1 for mothers (fathers) receiving the health card in 2005 or after and equal to 0 if they never received it.

As regards the BLT cash transfer program, IFLS4 provides for detailed household information including whether a household ever received BLT transfers, the first and the last year it received money, the total amount received and the number of installments received. Table 1 shows the first year individuals received a cash transfer from the program for individuals living in households that ever received a

[13] In this case missing values are generated in order to exclude the possibility of confounding the effect of Askeskin with the ones of the previous health programs.

BLT transfer. It is possible to notice that, consistently with what stated in chapter 2, the great majority of benefiting households received the transfers in 2005 and 2006 for the first time. According to IFLS data benefiting households received on average Rp. 992,000. The majority (53%) reports to receive Rp. 1,200,000, almost one quarter of them report to receive Rp. 900,000 and another 12% of them reports to receive either 600,000 or Rp. 300,000.[14] This shows that many households didn't receive all four installments. For the analysis the dummy *BLT* is used, which denotes if households ever received transfers from the BLT program.

4.1.4. Variables for other household and individual characteristics

The IFLS contains an extensive set of information concerning individual and household characteristics. Beside standard demographic characteristics there is information on individual health insurance coverage apart from Askeskin (as Askes, Jamsostek and Dana Sehat insurance programs) and also information regarding whether the household possesses a village poverty letter (SKTM), which has been documented to be accepted in some cases to claim Askeskin benefits. Moreover, the IFLS contains extensive information on poverty indicators and proxies for household income. On the one side there is a detailed model on household consumption for both food items and non-food ones, such as medical consumption. On the other side there is also detailed information on dwellings characteristics as house size and house facilities characteristics, which are often listed as criteria used by authorities to classify households as poor.

4.2. Descriptive statistics

4.2.1. Sample for the analysis on height-for-age

Of the original IFLS sample, are included for the height-for-age analysis all children aged from 0 to 60 months for which the height-for-age measure is available, namely

[14] Source: IFLS4 full sample

4653 observations. In order to consider properly program coverage only children living with both parents are then considered, which correspond to 3929 observations. The final sample consists of 3787 observations having non-missing values for all relevant variables.

Table 2 shows descriptive statistics for children in the sample having or not one parent benefiting from Askeskin insurance and living in households having or not a BLT card. Since the two programs are targeted to the poor, we expect children with eligible parents to be on average more disadvantaged with respect to other children. Not surprisingly, children having parents benefiting from the insurance program have a significantly lower height-for-age with respect to other children. They are also more likely to be poor (lower per capita household consumption), to live in a rural area and to belong to an ethnic minority (non Javanese). Moreover, they have on average less educated parents and live in dwellings with worse characteristics (smaller house area, less likely to have septic toilet in house and more likely to use firewood as cooking fuel). Similar results are found when looking at children leaving in households benefiting from the BLT cash transfer program (column 4 and 5). In this case the difference among recipients and non-recipients in terms of the height-for-age indicator, per capita consumption, urban/rural residence and dwelling characteristics is even stronger. Despite the larger number of covered individuals, the BLT program seems to be more successful than Askeskin insurance in targeting the poor.

Table 2 shows also the coverage of the two programs for our sample. While 22% of the children in the sample live in households possessing a BLT card, only about 10% have parents covered by Askeskin insurance. However, as explained in the previous paragraph, the measure used for Askeskin coverage is rather strict and leaves out all the cases in which a parent possessed a health card before 2005. The true coverage of the insurance in our sample lies therefore between 10% and an upper bound of

14%, if all people who possessed health cards before 2005 received also the Askeskin card.

Table 2: Descriptive statistics (height-for-age sample)

	Parents have Askeskin card			Health card before 2005 (JPS)	Household has BLT card		
	No	Yes	|Δ|[1]		No	Yes	|Δ|[1]
Height-for-age z-score	-1.26	-1.61	0.35***	-1.59	-1.21	-1.66	0.45***
	(0.03)	(0.08)	(0.08)	(0.12)	(0.03)	(0.05)	(0.06)
Demographic characteristics							
Urban	0.55	0.42	0.12***	0.48	0.58	0.37	0.20***
	(0.009)	(0.025)	(0.027)	(0.042)	(0.009)	(0.017)	(0.019)
Muslim	0.90	0.92	0.018	0.96	0.91	0.89	0.019
	(0.005)	(0.014)	(0.015)	(0.017)	(0.005)	(0.011)	(0.012)
Javanese	0.39	0.29	0.096***	0.30	0.39	0.33	0.06***
	(0.009)	(0.023)	(0.025)	(0.038)	(0.009)	(0.016)	(0.018)
Household characteristics							
Mother education	2.33	1.56	0.77***	1.67	2.39	1.61	0.78***
	(0.02)	(0.04)	(0.05)	(0.75)	(0.02)	(0.03)	(0.04)
Father education	2.38	1.66	0.72***	1.68	2.45	1.65	0.81***
	(0.02)	(0.05)	(0.05)	(0.76)	(0.02)	(0.03)	(0.04)
Household size	5.91	6.16	0.25	6.30	5.79	6.49	0.70***
	(0.05)	(0.17)	(0.18)	(0.26)	(0.55)	(0.10)	(0.12)
Per capita consumption	3059	1469	1594***	1429	3229	1406	1820***
(in thousands rupiah)	(67)	(65)	(93)	(81.4)	(72)	(41)	(83)
Dwelling characteristics							
House area	77.3	58.1	19.2***	51.9	79.5	55.9	23.6***
	(1.3)	(3.4)	(3.7)	(3.0)	(1.5)	(1.21)	(1.91)
Septic toilet in house	0.68	0.46	0.22***	0.41	0.72	0.41	0.31***
	(0.008)	(0.025)	(0.027)	(0.041)	(0.008)	(0.017)	(0.019)
Cooking fuel	0.31	0.51	0.21***	0.52	0.27	0.59	0.32***
(firewood)	(0.008)	(0.026)	(0.027)	(0.041)	(0.008)	(0.017)	(0.019)
Program coverage							
Mother has Askeskin[2]	0	0.82		0.48	0.05	0.25	0.19***
		(0.019)		(0.079)	(0.004)	(0.016)	(0.016)
Father has Askeskin[2]	0	0.76		0.34	0.04	0.23	0.19***
		(0.022)		(0.07)	(0.004)	(0.015)	(0.016)
Household has BLT	0.16	0.54	0.37***	0.57	0	1	
	(0.007)	(0.025)	(0.026)	(0.041)			
Observations	3255	384		148	2965	822	

Note: standard errors in parentheses

[1] T-test for difference in means; *** p<0.01, ** p<0.05, * p<0.1

[2] In the descriptive statistics by BLT coverage the number of observations for father and mother Askeskin coverage is slightly lower than reported, because missing values are assigned if the health card was received before 2005.

The first two columns of the table above show also the overlap between the two programs considered. While among children not having parents with Askeskin cards 16% live in families benefiting from BLT, the majority of children affected by Askeskin lives in households covered by BLT. Even if there is positive correlation between the two programs, this correlation is not perfect and it is therefore possible to disentangle the effects of the two programs. The second column of the previous table shows also that there is not perfect correlation between Askeskin coverage of fathers and mothers. Mothers appear to possess the Askeskin card slightly more often than fathers (9% of mothers and 8% of fathers are covered), but they do not possess the card automatically if the father has it.

4.2.2. Sample for the analysis on birth weight and delivery expenses

Pregnancy data are available for women age between 15 and 65 years having had at least one child. For the analysis are considered those women having given birth to a child after 2002, for which there is information on weight at birth and expenses for delivery health care (4620 observations). As previously mentioned, the bottom and top 1% in birth weight measurements are dropped to minimize measurement error. As before, only married women living with the spouse are considered. The final sample includes 3611 observations for which there are non-missing values for all the relevant variables.

Descriptive statistics for this sample are showed in Table A1 (in the appendix), which shows mean values and differences in means for mothers benefiting or not from Askeskin insurance and living in households having or not a BLT card. The data are very similar to the height-for-age sample, with households covered by the two programs being relatively more disadvantaged than others according to most variables considered. Again BLT seems to succeed in targeting better poor households looking at income level indicators as per capita consumption and dwelling characteristics. Even if children affected by the programs have on average a

lower birth weight with respect to other children, this difference is not statistically significant. As expected, mothers in covered households have significantly lower expenses for delivery care and less healthcare visits during pregnancy.

5. Results

5.1. Height-for-age results

Table 3 shows the results of estimating the main models discussed in section 4.1. Results for equation 1 are presented in the second column, while the first one shows results for the same estimation but with the exclusion of the interaction between cohort dummies with family background controls. The two regressions show a positive and significant effect of the interaction term *Young*Askpar*, denoting that having parents with Askeskin cards is associated with an increase of 0.3-0.4 standard deviations in height-for-age. The coefficient of *Askpar* is negative and significant showing that children of individuals covered by Askeskin are on average shorter for their age than other children. Column 3 and 4 show results for very similar regressions, where another dummy (*Young2*) is used to denote the most affected group from the policy. Instead of comparing children born in 2006 or after with older ones, now children born in 2007 and 2008 are compared with children born before 2007. In this case the predicted effect of parents Askeskin coverage is stronger (the coefficients of the interaction terms are close to 0.5). This is probably due to the fact that a health insurance reform like the one of Askeskin takes some time to deliver results in terms of health.

Column 5 shows the effect of Askeskin by first year of coverage of (at least one of) the parents. This specification permits also to test for any positive effect of child height-for-age implied by possessing JPS health cards before 2005. The coefficient of the interaction term *Young2*JPS* shows however that no effect is found in this case. On the contrary receiving the Askeskin card in 2005 is associated with an

increase in children height-for-age of more than 0.7 standard deviations. As expected the coefficient is large (even if not significant) also if parents receive the card in 2006, while it is lower and not significant if they receive it in 2007 or 2008.

Table 3 : Effect of parents Askeskin coverage on children height-for-age

	(1)	(2)	(3)	(4)	(5)
Young*Askpar	0.389**	0.320*			
	(0.17)	(0.19)			
Young2*Askpar			0.502**	0.464*	
			(0.23)	(0.26)	
Young2*Askpar2005					0.736**
					(0.36)
Young2*Askpar2006					0.631
					(0.64)
Young2*Askpar2007					0.310
					(0.39)
Young2*Askpar2008					0.483
					(0.85)
Young2*JPS					-0.0163
					(0.35)
Askpar	-0.220**	-0.213**	-0.175*	-0.186*	
	(0.10)	(0.11)	(0.093)	(0.095)	
BLT	-0.0522	-0.0479	-0.0506	-0.0473	-0.0698
	(0.070)	(0.071)	(0.070)	(0.071)	(0.069)
Askpar2005					-0.202
					(0.15)
Askpar2006					-0.116
					(0.19)
Askpar2007					-0.213
					(0.18)
Askpar2008					-0.121
					(0.20)
JPS					0.0240
					(0.15)
Cohort dummies[1]	Yes	Yes	Yes	Yes	Yes
Family background variables[2]	Yes	Yes	Yes	Yes	Yes
Family background variables * cohort dummies	No	Yes	No	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes
Observations	3639	3639	3639	3639	3787
R-squared	0.15	0.18	0.15	0.18	0.18

Note: Robust (clustered by household) standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

[1] Dummy variables for whether the child was born in 2002, 2003, 2004, 2005, 2006 or 2007

[2] Sex; religion (Muslim or not); ethnicity (Javanese or not); urban or rural residence; household size; total household consumption; mother's and father's age and education; mother's and father's coverage to Askes or Jamsostek health insurance programs; household has SKTM poverty letter; septic toilet in house; house area in squared meters; floor material; main fuel used for cooking (firewood or not).

In table 4 are presented results for the same regressions of the previous table, but with household BLT card coverage in the interaction terms instead of Askeskin coverage. The first two columns show that possessing BLT cards is associated with an increase in child height-for-age, but this effect appears to be significant only if the interactions between cohort dummies with family background controls are not included. When the dummy *Young2* is used the coefficients increase and are significant in both specifications (column 3 and 4). The increase in height-for-age implied by BLT appears to be slightly smaller than the one due to Askeskin coverage but still sizeable (of 0.35 standard deviations when all controls are added).

Table 4: Effect of household BLT coverage on children height-for-age

	(1)	(2)	(3)	(4)	(5)
Young*BLT	0.328**	0.181			
	(0.13)	(0.15)			
Young2*BLT			0.461**	0.348*	0.278
			(0.18)	(0.20)	(0.20)
Young2*Askpar					0.393
					(0.26)
BLT	-0.181**	-0.118	-0.116	-0.0914	-0.103
	(0.080)	(0.084)	(0.11)	(0.11)	(0.075)
Askpar	-0.0697	-0.0857	-0.0681	-0.0869	-0.175*
	(0.090)	(0.092)	(0.090)	(0.092)	(0.095)
Cohort dummies[1]	Yes	Yes	Yes	Yes	Yes
Family background variables[2]	Yes	Yes	Yes	Yes	Yes
Family background variables * cohort dummies	No	Yes	No	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes
Observations	3639	3639	3639	3639	3639
R-squared	0.15	0.18	0.15	0.18	0.18

Note: Robust (clustered by household) standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

[1] Dummy variables for whether the child was born in 2002, 2003, 2004, 2005, 2006 or 2007

[2] Sex; religion (Muslim or not); ethnicity (Javanese or not); urban or rural residence; household size; total household consumption; mother's and father's age and education; mother's and father's coverage to Askes or Jamsostek health insurance programs; household has SKTM poverty letter; septic toilet in house; house area in squared meters; floor material; main fuel used for cooking (firewood or not).

Column 5 shows results for a regression with as dependent variables *Young2* interacted with both *BLT* and *Askpar*. The interaction term *Young2*Askpar* denotes then the effect on children height-for-age of parents' Askeskin coverage independently on whether households benefited also from the BLT program (for

*Young2*BLT* the opposite is true). Even if the coefficients are much closed to the ones in the respective simple regressions, both of them are not significant at standard confidence levels.

Table 5 presents results for regressions testing if there are any heterogeneous effects of the two policies concerning the sex of the child. The first column shows results for estimating equation 1 on the subsamples of girls and boys. The coefficients of interest denote a stronger impact of parents' Askeskin coverage on girls with respect to boys. For girls, having parents with Askeskin cards is associated with an increase in height-for-age of 0.76 standard deviations. For boys instead the coefficient is closed to 0.5 but is not significant. The second column shows results for a similar regression that uses mother coverage only instead of coverage of both parents in the interaction term. When the mother has the Askeskin card, both boys and girls benefit significantly from the policy (increase of 0.88 standard deviations for girls and of 0.81 for boys). On the contrary, no effect is found when fathers are covered. Moreover in this case there is a huge difference between the coefficient of interest for girls (0.5) and the one for boys (-0.12), which is surprisingly negative[15]. Column 4 shows the effects of BLT household coverage for boys and girls, which are similar between each other and close to the results of Table 4. However, in this case the coefficients are not significant due to higher standard errors.

Finally, the last two columns investigate whether each of the two policies has a significant effect on children height-for-age independently from the other. Column 5 shows that having parents with Askeskin cards is associated for girls to an increase of 0.7 standard deviations independently on living or not in households benefiting from BLT. On the contrary, the other coefficients of interest are not significant. Column 6 shows instead that Askeskin has a positive effect on both boys and girls independently from BLT, when only mother coverage is used.

[15] It is not fully clear why this happens, but is likely to be due to the presence of some outliers.

Table 5: Effect of Askeskin and BLT on children height-for-age by sex of the child

	(1)	(2)	(3)	(4)	(5)	(6)
Girls						
Young2*Askpar	0.759**				0.697**	
	(0.35)				(0.35)	
Young2*Askmother		0.877**				0.817**
		(0.39)				(0.38)
Young2*Askfather			0.496			
			(0.39)			
Young2*BLT				0.366	0.230	0.224
				(0.29)	(0.29)	(0.29)
Askpar	-0.176			-0.0199	-0.170	
	(0.13)			(0.13)	(0.14)	
BLT	-0.0228	-0.0248	-0.0228	-0.0833	-0.0659	-0.0670
	(0.10)	(0.10)	(0.10)	(0.11)	(0.11)	(0.11)
Askmother		-0.189	0.0149			-0.178
		(0.20)	(0.20)			(0.20)
Askfather		0.0191	-0.0892			0.0138
		(0.19)	(0.21)			(0.19)
Observations	1765	1765	1765	1765	1765	1765
R-squared	0.26	0.26	0.26	0.26	0.26	0.26
Boys						
Young2*Askpar	0.498				0.432	
	(0.42)				(0.42)	
Young2*Askmother		0.812*				0.759*
		(0.44)				(0.44)
Young2*Askfather			-0.121			
			(0.51)			
Young2*BLT				0.341	0.266	0.253
				(0.31)	(0.31)	(0.31)
Askpar	-0.176			-0.0671	-0.163	
	(0.15)			(0.15)	(0.15)	
BLT	-0.133	-0.130	-0.137	-0.207*	-0.190	-0.184
	(0.11)	(0.11)	(0.11)	(0.12)	(0.12)	(0.12)
Askmother		-0.0927	0.0728			-0.0764
		(0.19)	(0.19)			(0.19)
Askfather		-0.126	-0.0960			-0.132
		(0.21)	(0.21)			(0.21)
Observations	1874	1874	1874	1874	1874	1874
R-squared	0.24	0.24	0.24	0.24	0.24	0.24
Cohort dummies[1]	Yes	Yes	Yes	Yes	Yes	Yes
Family background variables[2]	Yes	Yes	Yes	Yes	Yes	Yes
Family background variables * cohort dummies	Yes	Yes	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust (clustered by household) standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

[1] Dummy variables for whether the child was born in 2002, 2003, 2004, 2005, 2006 or 2007

[2] Sex; religion (Muslim or not); ethnicity (Javanese or not); urban or rural residence; household size; total household consumption; mother's and father's age and education; mother's and father's coverage to Askes or Jamsostek health insurance programs; household has SKTM poverty letter; septic toilet in house; house area in squared meters; floor material; main fuel used for cooking (firewood or not).

Summarizing, results of Tables 3, 4 and 5 show evidence of a positive impact of the two policies on children height for age. For Askeskin health insurance it was showed that the effect is strong and significant independently on whether the household benefits also from the BLT transfer. Conversely, possessing BLT cards independently from Askeskin has a positive but not significant effect on height-for-age. The following chapter investigates if similar results on health outcomes are obtained using a different dependent variable and a different sample.

5.2. Birth weight results

Table 6 shows the impact of possessing Askeskin health card for mothers on child birth weight. Column 2 presents results for equation 3, while in column 1 interaction terms between family background variables and cohort dummies are omitted. The coefficient of *Young*Askmother* is positive, but significant (at the 90% confidence level) only for the first specification. In column 3, where the dummy Young2[16] is used instead of Young, the interaction term coefficient is large and significant. Askeskin coverage of mothers implies an increase of almost 130 grams in children weight at birth. Column 4 shows the results when women receiving Askeskin cards in 2005 are omitted from the analysis. The effect in this case is even stronger and allows us to exclude completely any possible bias due to benefits from JPS health cards. This is testified by results in column 5, which shows that receiving Askeskin cards in 2005 had no effect on child birth weight. Conversely having mothers receiving the card in 2006 is associated with an increase of around 300 grams in birth weight. Consistently with what found in Table 3 the effect is much lower and not significant if Askeskin was first received in 2007 or 2008.

[16] As already stated in the previous paragraph the dummy Young2 is equal to 1 for children born in 2007 and 2008 and 0 otherwise (children born in 2003, 2004, 2005 or 2006).

Table 6: Effect of mother Askeskin coverage on child weight at birth

	(1)	(2)	(3)	(4)	(5)
Young*Askmother	0.114*	0.106			
	(0.065)	(0.068)			
Young2*Askmother			0.128*		
			(0.077)		
Young2*Askmother2				0.154*	
				(0.087)	
Young2*Askmother2005					-0.0140
					(0.15)
Young2*Askmother2006					0.297**
					(0.14)
Young2*Askmother2007					0.115
					(0.12)
Young2Askmother2008					-0.0233
					(0.22)
Young2*JPS					-0.136
					(0.15)
Askmother	-0.0528	-0.0401	-0.0226		
	(0.054)	(0.055)	(0.051)		
Askmother2				-0.0332	
				(0.062)	
Askmother2005					-0.0296
					(0.065)
Askmother2006					-0.0397
					(0.090)
Askmother2007					-0.0336
					(0.090)
Askmother2008					0.0486
					(0.088)
JPS					0.0940
					(0.069)
BLT	-0.0156	-0.0190	-0.0185	-0.0259	-0.0133
	(0.027)	(0.027)	(0.027)	(0.028)	(0.027)
Cohort dummies[1]	Yes	Yes	Yes	Yes	Yes
Family background variables[2]	Yes	Yes	Yes	Yes	Yes
Family background variables * cohort dummies	No	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes
Observations	3525	3525	3525	3417	3611
R-squared	0.11	0.13	0.13	0.14	0.14

Note: Robust (clustered by household) standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

[1] Dummy variables for whether the child was born in 2003, 2004, 2005, 2006 or 2007.

[2] Child number (relative to siblings); total number of mother healthcare visits during pregnancy; religion (Muslim or not); ethnicity (Javanese or not); urban or rural residence; household size; total household consumption; mother's and father's age and education; mother's and father's coverage to Askes or Jamsostek health insurance programs; household has SKTM poverty letter; septic toilet in house; house area in squared meters; floor material; main fuel used for cooking (firewood or not).

In the first two columns of Table 7 are presented results for household BLT coverage. The interaction coefficients are positive in both regressions, even if lower with respect to the Askeskin case. Moreover, differently from results for Askeskin, only the coefficient of the interaction with the dummy *Young* appears to be significant and not the one with *Young2.* A possible explanation for this is that BLT is a one-year program, which is likely to have an impact short after it is introduced. Differently, Askeskin is a complex health insurance scheme, which takes more time to allow take up of beneficiaries and have a positive effect on them. Therefore, in this case we find a stronger impact of BLT when we consider as the most affected group children born short after the reform (*Young*), while the Askeskin impact is stronger when a younger children group (*Young2*) is used in the interaction.

Table 7: Effect of household BLT coverage on child birth weight

	(1)	(2)	(3)	(4)
Young*BLT	0.0849*		0.0730	
	(0.051)		(0.052)	
Young2*BLT		0.0377		0.0205
		(0.065)		(0.068)
Young*Askmother			0.127	
			(0.084)	
Young2*Askmother2				0.150*
				(0.088)
BLT	-0.0511	-0.0264	-0.0469	-0.0301
	(0.033)	(0.029)	(0.033)	(0.030)
Askmother	0.00624	0.00719	-0.0332	
	(0.047)	(0.047)	(0.055)	
Askmother2				-0.0320
				(0.062)
Cohort dummies[1]	Yes	Yes	Yes	Yes
Family background variables[2]	Yes	Yes	Yes	Yes
Family background variables * cohort dummies	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes
Observations	3525	3525	3525	3418
R-squared	0.13	0.13	0.13	0.14

Note: Robust (clustered by household) standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

[1] Dummy variables for whether the child was born in 2003, 2004, 2005, 2006 or 2007.

[2] Child number (relative to siblings); total number of mother healthcare visits during pregnancy; religion (Muslim or not); ethnicity (Javanese or not); urban or rural residence; household size; total household consumption; mother's and father's age and education; mother's and father's coverage to Askes or Jamsostek health insurance programs; household has SKTM poverty letter; septic toilet in house; house area in squared meters; floor material; main fuel used for cooking (firewood or not).

The last two columns show results for regressions, where interaction terms are added for both Askeskin and BLT coverage. The coefficient of *Young2*Askmother2* in column 4 is strongly positive and significant. This shows that having mothers possessing Askeskin card is associated with a 150 grams increase in the weight at birth of newborn children independently on living in families benefiting or not from BLT.

The results for birth weight showed in the previous tables reinforce the evidence found in the analysis on height-for-age. In the two cases a very similar pattern is found, even if they make use of dependent variables indicating different health outcomes. Similarly to the height-for-age case, the two polices have a positive effect on children birth weight, with a stronger effect for Askeskin health insurance. Moreover, for both cases the effect of Askeskin on health indicators proves to be significant independently from BLT coverage, while the same is not true for BLT. The fact that Askeskin has a stronger effect on nutrition than BLT is somehow surprising, since the latter policy has been much more costly to the Indonesian government in the period considered[17]. However, it is also important to consider that according to the data presented in the descriptive statistics the number of individuals covered by BLT almost doubled the ones covered by Askeskin. Nevertheless it is possible to estimate the benefit of the programs for each household covered using data from the IFLS sample. While households covered by BLT received on average a total of about Rp. 1,000,000, I estimate that households covered by Askeskin (assuming all household members were covered) receive on average a benefit equivalent to Rp. 579,500[18]. This provides evidence that Askeskin has a stronger impact on child nutritional status at a lower cost with respect to BLT. But it must be underlined that

[17] While for the BLT program Rp. 23 trillion were spent only in 2006 (World Bank, 2006), for Askeskin were allocated approximately Rp.7 trillion between 2005 and 2007 (World Bank, 2008).

[18] This is calculated by multiplying the Askeskin individual monthly premium (Rp. 5,000) times the average number of months individuals have been covered by the program (19) times the average number of members in the households covered (6.1).

BLT funds could have been used for other investments in children's human capital that are not measured by anthropometric data, such as education.

In the previous paragraphs Askeskin was found to have a positive impact on children's health. However, according to preliminary assessments of the BLT and Askeskin programs, there is the concern that the policies did not comply effectively with the initial targeting (World Bank, 2006; World Bank, 2008). From descriptive statistics mis-targeting seems to be a concern mostly concerning the Askeskin program. Previous research also found some evidence of leakage to the non-poor (Sparrow et al., 2010). It is therefore interesting to investigate if poor households did actually benefit from the program. Table A2 (in appendix) analyses the impact of Askeskin and BLT on height-for-age and birth weight by per capita income quartiles[19]. The first four columns show that Askeskin has indeed a significant effect on height-for-age of children living in households belonging to the lower income quartile, while for children in relatively richer households the effect is positive but not significant. Even if no significant effect is found in birth weight regressions, the coefficients are higher for households in the lowest two income quartiles with respect to richer households. The last four regressions show results for BLT, for which no significant effect is found in the height-for-age regressions for any income quartile. Differently, as regards birth weight, it seems that richer households benefit more from the BLT program (for the third quartile the coefficient is positive and equal to 225 grams). To summarize, while Askeskin seems to affect positively poor households, mixed evidence is found concerning the effectiveness of BLT in providing benefits for the poor. Problems may actually lie in the measure used to denote household consumption, which is constructed by aggregating self-reported data on household consumption. Further research may be needed to investigate in more detail to which extent the two programs improve the health of the poorest.

[19] To construct per capita income quartiles I divide household's total monthly consumption by the number of members in the household.

5.3. Delivery care expenses results

Table 8 presents results for regressions estimating the effect of the two policies on out-of-pocket payments for delivery care. The coefficient of *Young2*Askmother* in column 1 is negative, sizeable and significant at the 95% confidence level. It shows that Askeskin coverage of women implies a decrease of more than Rp. 300,000 (approximately US$ 30) in expenses for delivery care.

Table 8: Effect of mother Askeskin coverage on expenses for delivery care

	(1)	(2)	(3)	(4)	(5)
Young2*Askmother	-327.3**				-349.6**
	(129)				(136)
Young2*Askmother2		-283.5*			
		(147)			
Young*BLT			64.96		
			(118)		
Young2*BLT				55.72	102.8
				(162)	(167)
Askmother	-85.44		-161.7*	-160.9*	-79.80
	(96.7)		(93.6)	(93.8)	(97.3)
Askmother2		-137.7			
		(110)			
BLT	86.96	74.22	62.59	76.22	65.95
	(66.3)	(66.9)	(77.1)	(67.3)	(67.4)
Cohort dummies[1]	Yes	Yes	Yes	Yes	Yes
Family background variables[2]	Yes	Yes	Yes	Yes	Yes
Family background variables * cohort dummies	Yes	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes
Observations	3525	3417	3525	3525	3525
R-squared	0.23	0.24	0.23	0.23	0.23

Note: Robust (clustered by household) standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

[1] Dummy variables for whether the child was born in 2003, 2004, 2005, 2006 or 2007

[2] Child number (relative to siblings); total number of mother healthcare visits during pregnancy; religion (Muslim or not); ethnicity (Javanese or not); urban or rural residence; household size; total household consumption; mother's and father's age and education; mother's and father's coverage to Askes or Jamsostek health insurance programs; household has SKTM poverty letter; septic toilet in house; house area in squared meters; floor material; main fuel used for cooking (firewood or not).

Column 3 and 4 show that BLT coverage has, as expected, a positive effect on expenses for delivery care. However, the coefficients of the interaction terms are small and not significant in both regressions. The last column of Table 8 shows results for a regression including the interaction terms for both policies. The

coefficient of both *Young2*Askmother* and *Young2*BLT* appear to be slightly bigger in this case being "purified" from the contrasting effect of the other policy.

Comparing these results with the ones of Table 6 it appears that Askeskin not only diminished significantly out-of-pockets payments for this type of healthcare, but contributed also to improve the health of women and newborn children. It must to be noticed that weight at birth cannot be considered an indicator of the quality of delivery care, because it depends actually on mother nutrition and health during pregnancy. However, it is likely that delivery care expenses are correlated with expenses for pregnancy care in general. If this is true, Askeskin would have succeeded in increasing the usage (or the quality) of pregnancy care, documented by the positive effect on birth weight, decreasing at the same time the private costs for pregnant women[20].

6. Conclusion

The aim of this thesis has been to investigate the impacts on children's nutritional status of two public policies for the poor in Indonesia: Askeskin health insurance and BLT unconditional cash transfer. Descriptive analysis based on data from the Indonesian Family Life Survey (IFLS) showed that households covered by the programs are indeed more disadvantaged in terms of income levels and health measures compared to other households. To deal with this fact, data on child anthropometrics are used and a difference-in-difference strategy is carried out. The results suggest that the two programs had a positive impact on young children height-for-age and birth weight.

Askeskin appears to have increased young children height-for-age z-scores by 0.5-0.8 standard deviations with a slightly stronger effect for girls with respect to boys.

[20] Some of the benefits in birth weight could actually be due to a reallocation of resources from health payments (now subsidized) to expenditures for better nutrition.

Moreover, it improved birth weight by approximately 150 grams. These estimates are significant independently on whether households receive or not also the BLT transfer. Some evidence is found that the effect is stronger if mothers possess the Askeskin card, which can be explained by the fact that young children benefit from the nutrition and health status of the mothers in the womb and through breastfeeding. As regards BLT, results suggest that it affects positively height-for-age z-scores and birth weight with an increase of respectively 0.35 standard deviations and 85 grams. However, estimates for BLT seem to be due, at least in part, to correlation with Askeskin coverage and coefficients are not significant when this is appropriately taken into account.

The fact that Askeskin health insurance leads to a stronger impact on child nutritional indicators with respect to BLT cash transfer is surprising, given that government expenditures per household were comparatively smaller in the Askeskin case. This provides some evidence that a targeted social health insurance program providing in-kind benefits can outperform a targeted unconditional transfer in improving health outcomes in developing countries. This finding is consistent with previous evidence for the Unites States suggesting that in-kind transfers lead to greater improvements in child health with respect to cash transfers, when these are provided unconditionally (e.g. Currie, 1994; Mayer, 1997). However, BLT could have had a stronger impact than Askeskin on other dimensions of investments in children's human capital that are not measured by child anthropometrics, such as education.

It is also found that Askeskin coverage of women decreases expenditures for delivery care. Differently, Sparrow et al. (2010) find some evidence that the program increases general out-of-pocket payments for health. Other literature on health insurance evaluations has also focused on the effects on out-of-pockets payments for health, which are generally found to decrease due to the insurance (Galárraga et al., 2008; Wagstaff and Pradhan, 2005; Wagstaff, 2010). However, the direction of the effect on private expenditures for health is not particularly meaningful from a

welfare point of view, if not linked to some measure of healthcare quality or output. Such a comparison is attempted in this thesis. Besides decreasing expenditures for delivery care, a particular type of out-of-pocket health expenditures, Askeskin is found to improve nutritional status of newborn and young children, which are also indicators of the nutritional status of the health of pregnant mothers.

The positive results found in terms of health testify that Indonesia is going in the right direction by pursuing the aim of introducing a social health insurance system. Nevertheless this analysis did not consider possible inefficiencies concerning the implementation of the Askeskin program. In relation to this, the World Bank (2006, 2008) addresses several concerns, in particular as regards Askeskin's provision through the private insurer company PT Askes, the lack of incentives to increase quality and the targeting performance. This thesis founds some evidence that Askeskin does improve the nutritional status of children living in households belonging to the lower income quartile. However, further research is needed to investigate in more detail if the program has as well a positive impact on households living in remote areas and on those most vulnerable to catastrophic health payments. Helping households to cope better with major illness shocks, against which they are generally very imperfectly insured (Gertler and Gruber, 2002), is surely one of the main intention of a social health insurance program.

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Appendix

Table A2: Descriptive statistics (birth weight sample)

	Mother has Askeskin card			Health card before 2005 (JPS)	Household has BLT card		
	No	Yes	|Δ|[1]		No	Yes	|Δ|[1]
Birth weight	3.16	3.12	0.036	3.20	3.16	3.13	0.03
	(0.008)	(0.03)	(0.031)	(0.056)	(0.009)	(0.019)	(0.021)
Expenses for	965	365	600***	252	1009	425	584***
delivery care	(33)	(40)	(52)	(51)	(36)	(37)	(51)
Number of pregnancy	9.31	8.86	0.46*	8.7	9.36	8.82	0.53***
care visits	(0.07)	(0.24)	(0.25)	(0.48)	(0.07)	(0.17)	(0.19)
Demographic characteristics							
Urban	0.60	0.47	0.13***	0.60	0.62	0.44	0.18***
	(0.009)	(0.029)	(0.03)	(0.05)	(0.009)	(0.019)	(0.003)
Muslim	0.91	0.91	0.003	0.96	0.91	0.91	0.019
	(0.005)	(0.016)	(0.017)	(0.017)	(0.005)	(0.011)	(0.012)
Javanese	0.42	0.30	0.12***	0.29	0.41	0.37	0.04**
	(0.008)	(0.026)	(0.028)	(0.049)	(0.009)	(0.018)	(0.02)
Household characteristics							
Mother education	2.41	1.62	0.80***	1.87	2.49	1.69	0.80***
	(0.02)	(0.05)	(0.05)	(0.095)	(0.02)	(0.03)	(0.04)
Father education	2.45	1.74	0.72***	1.69	2.54	1.70	0.83***
	(0.02)	(0.05)	(0.06)	(0.97)	(0.02)	(0.03)	(0.04)
Household size	5.80	6.29	0.50**	6.22	5.72	6.42	0.70***
	(0.05)	(0.23)	(0.24)	(0.36)	(0.57)	(0.11)	(0.13)
Per capita consumption	3219	1495	1723***	1525	3394	1508	1886***
(in thousands rupiah)	(68)	(68)	(96)	(113)	(73)	(49)	(88)
Dwelling characteristics							
House area	79.1	59.4	19.7***	52.0	79.5	55.9	23.6***
	(1.5)	(4.3)	(4.6)	(4.6)	(1.5)	(1.21)	(1.91)
Septic toilet in house	0.72	0.48	0.24***	0.46	0.75	0.45	0.30***
	(0.008)	(0.029)	(0.03)	(0.054)	(0.008)	(0.019)	(0.02)
Cooking fuel	0.26	0.44	0.18***	0.52	0.22	0.53	0.31***
(firewood)	(0.008)	(0.028)	(0.029)	(0.041)	(0.008)	(0.019)	(0.02)
Program coverage							
Mother has Askeskin[2]	0	1			0.05	0.25	0.20***
					(0.004)	(0.017)	(0.017)
Household has BLT	0.15	0.53	0.38***	0.51	0	1	
	(0.006)	(0.029)	(0.029)	(0.054)			
Observations	3227	298		87	2926	686	

Note: standard errors in parentheses

[1] T-test for difference in means; *** p<0.01, ** p<0.05, * p<0.1

[2] In the descriptive statistics by BLT coverage the number of observations for mother Askeskin coverage is slightly lower than reported, because missing values are assigned if the health card was received before 2005.

Table A2: Effect of Askeskin and BLT coverage on children height-for-age and birth weight by per capita consumption quartiles

	Askeskin				BLT			
	1st Quartile (poorest)	2nd Quartile	3rd Quartile	4th Quartile (richest)	1st Quartile (poorest)	2nd Quartile	3rd Quartile	4th Quartile (richest)
Height-for-age								
Young2*Askmother	0.788*	0.763	0.623	1.798				
	(0.47)	(0.74)	(0.48)	(1.28)				
Young2*BLT					0.543	0.0227	0.448	1.178
					(0.38)	(0.45)	(0.41)	(0.78)
Askmother	0.362	-0.521*	-0.272	-0.0692	0.549**	-0.394	-0.0946	0.164
	(0.24)	(0.30)	(0.31)	(0.52)	(0.25)	(0.29)	(0.29)	(0.48)
BLT	-0.0685	-0.156	0.470**	-0.153	-0.172	-0.153	0.379*	-0.357
	(0.13)	(0.18)	(0.18)	(0.27)	(0.13)	(0.21)	(0.21)	(0.28)
Observations	878	903	921	937	878	903	921	937
R-squared	0.43	0.37	0.37	0.36	0.43	0.37	0.37	0.36
Birth Weight								
Young*Askmother	0.101	0.160	0.00987	-0.113				
	(0.12)	(0.17)	(0.19)	(0.31)				
Young*BLT					0.123	-0.0540	0.225*	0.287
					(0.090)	(0.12)	(0.12)	(0.24)
Askmother	-0.0205	-0.0300	-0.0460	-0.154	0.0262	0.0193	-0.0530	-0.210
	(0.10)	(0.10)	(0.15)	(0.23)	(0.093)	(0.098)	(0.12)	(0.17)
BLT	-0.0423	0.0112	-0.0841	0.0310	-0.0875	0.0358	-0.158*	-0.0653
	(0.049)	(0.061)	(0.069)	(0.13)	(0.058)	(0.074)	(0.082)	(0.14)
Observations	862	876	891	896	862	876	891	896
R-squared	0.36	0.37	0.35	0.38	0.37	0.37	0.35	0.39
Cohort dummies[1]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Family background variables[2]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Family background variables * cohort dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust (clustered by household) standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

[1] Dummy variables for whether the child was born in 2003, 2004, 2005, 2006 or 2007.

[2] Different controls depending on the dependent variable. See tables in text for the precise list of control variables included in each case.

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