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How Effective are Cash Transfers in Mitigating Shocks for Vulnerable Children? Evidence on the impact of the Lesotho Child Grant Programme on multiple deprivations

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HOW EFFECTIVE ARE CASH TRANSFERS IN MITIGATING SHOCKS FOR VULNERABLE CHILDREN? EVIDENCE ON THE IMPACT OF THE LESOTHO CGP ON MULTIPLE DEPRIVATIONS

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ABSTRACT

Shocks can pressure families into negative coping strategies with significant drawbacks for children's lives and development, particularly for children living in disadvantaged households who are at greater risk of falling into a poverty trap. This paper investigates if unconditional cash transfers can be effective in protecting children against unexpected negative life events. Using two waves of data, we found that the Lesotho Child Grant Programme (CGP) reduced the incidence and intensity of multidimensional deprivation for children living in labour-constrained female-headed households (FHH) that experienced negative economic or demographic shocks. Programme design in shock-prone contexts should seek to reinforce and widen the protective effect of the cash transfer for the most vulnerable.

JEL CLASSIFICATION

C93, I3, J16, I38

KEYWORDS

Cash transfers; Shocks; Gender; Labour constraints; Lesotho.

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CONTENTS

1. INTRODUCTION

It is increasingly recognized that child poverty should be analysed with a multidimensional framework (Gordon et al. 2003) and that household-based measures of monetary poverty do not necessarily capture children's experiences of deprivation in areas key to their development and well-being (Roelen and Gassmann 2008, Roelen 2018, Carraro and Ferrone 2020). Monetary poverty and multidimensional deprivation are linked concepts: lack of material means increases the likelihood of deprivation, in both material and non-material ways (e.g. by increasing stress). Cash transfer (CT) programmes emerged at the start of the century as a key anti-poverty tool in low- and middle-income countries (Davis et al., 2016). Social protection programmes such as CTs are key to achieving SDG 1 and halving poverty in all of its dimensions for men, women and children by 2030. It is therefore crucial to investigate the potential of CT programmes to reduce the incidence and intensity of multidimensional deprivation measures.

We operationalize the concept of child poverty using a rights-based approach, in which multiple deprivations provide information on the degree to which children's needs are not met (Gordon et al., 2003; de Neubourg et al., 2013). While there is general evidence of positive impacts of CTs on children's deprivations (i.e. in areas of education, nutrition and health), these outcomes tend to be studied separately (Handa et al., 2015; Pace et al., 2018; Sebastian et al., 2019; de Hoop et al., 2019; Kilburn et al., 2019). The evidence on the impact of CT on multiple child deprivations is scant (Robano and Smith, 2014; Pasha, 2016). In addition, even if it has been demonstrated that CTs can improve outcomes for the recipients, these effects could theoretically be driven by different subsets of the population. It is therefore important to understand if CTs can reduce multiple deprivations *simultaneously* for the same individuals, especially in contexts where children experience sudden shocks and protracted challenges that reinforce the link between poverty and deprivation.

An established body of evidence going back to the early 2000s emphasizes the role of shocks and vulnerability in perpetuating poverty (Dercon and Hoddinott, 2004; Giesbert and Schindler, 2012; Gloede et al., 2015). Covariate and idiosyncratic shocks expose households in sub-Saharan African (SSA) countries to a wide range of risks and uncertainties. The impact of shocks on uninsured individuals include income loss, reduced consumption, and depletion of assets. This is especially true for people who experience social, economic and cultural marginalization. Such people, who are less able to respond to and cope with unexpected adverse events, adopt negative coping strategies at the cost of income gains (Dercon, 2005).

Issues related to gender, disability or labour constraints, increase vulnerability to deprivation by limiting people's ability to cope with stresses and shocks emerging from wider shock-prone contexts (Fisher et al., 2017). As has become clear during the recent COVID-19 pandemic,[2] women are among those hardest hit by shocks, making households headed by single women, and the children living within them, particularly vulnerable to poverty and deprivation induced by shocks.

By providing a reliable income stream, CT programmes can act as a direct mechanism to increase a household's capacity to return to their expected income and utility trajectories after being hit by a shock (Asfaw and Davis, 2018). CTs can reduce the adoption of negative risk-coping strategies and help households manage risks by enabling investments and taking advantage of economic opportunities (FAO, 2018).

While a large body of evidence exists on how households in developing countries respond to shocks, the relationship between CT and shock responses in sub-Saharan African countries remains under-examined (Tirivayi et al., 2016; Lawlor et al., 2019; de Janvry et al., 2006; Macours et al., 2012). Much

2 Women represent the largest share of vulnerable employment across the world (ILO, 2019), which makes them vulnerable to the economic consequences of the pandemic.

of the recent empirical work investigating the mitigating effect of CT on shocks is framed mainly in relation to climate-related hazards (Asfaw et al., 2017; Lawlor et al., 2017). The crucial question of whether a CT has the potential to address multiple child deprivations after a shock, especially among disadvantaged households, remains open. While CTs are mostly targeted to vulnerable populations, other factors can contribute to marginalization of individuals and families within these communities. This limits the positive effect of these instruments.

This paper contributes to the literature by providing one of the first assessments of the impact of a CT programme on children's multidimensional deprivation, investigating if and how it can shield children in marginalized households from the impact of shocks. In line with the existing literature, the paper specifically refers to disadvantaged school-aged children as those living in either female-headed households (FHH) or labour-constrained households or a combination of the two (Morduch, 1995).

The paper analyses the impact of the Lesotho Child Grant Programme (CGP) on a multidimensional index of deprivation for school-aged children, using data from a two-year impact evaluation. The CGP is a large-scale national unconditional CT programme targeted to reach the poorest households with children. Targeting relies on proxy means testing with community validation (OPM, 2014). Households eligible for the transfer are first identified through a proxy means test. The identification is subsequently validated by the community, which has first-hand knowledge of the needs of the households. This procedure allows the local community to take ownership of the programme, avoiding a top-down approach and ensuring the programme is accepted. We use two waves of survey data (2011 and 2013) from the 24-month cluster randomized controlled trial built into the evaluation of the programme to:

- provide rigorous evidence on the impact of a national government-run unconditional CT on children's multidimensional deprivation (using six indicators of child deprivation), thereby going beyond the traditional outcomes of consumption, health and schooling;
- investigate if and how CTs can counteract the effect of multiple shocks on vulnerable populations in a shock-prone context;
- provide evidence on the effects of CTs for children living in particularly disadvantaged households, differentiating by gender of the household head, and households that are labour-constrained due to the head's illness, old age or disability.

During the evaluation period, Lesotho was experiencing different kinds of shocks. The country faces regular climate shocks, especially because of El Niño. Along with other countries in the region, it is vulnerable to climate change because of its heavy dependency on rain-fed agriculture, and this is aggravated by its small territory. Mainly reliant on subsistence agriculture, Lesotho's households are particularly sensitive to variations in weather patterns and disruptions to crop yields. Food security and rural poverty are closely linked to agricultural seasonality and weather shocks. Maize, the main staple crop, is mostly imported from South Africa, and most households are net food buyers (Prifti et al., 2017). All these factors make Lesotho – and especially poor, rural households – extremely vulnerable to any crisis in staple prices.

The HIV pandemic has also significantly affected the structure of the population and of households in the country by reducing adult labour capacity and by further constraining the development of children's cognitive skills development (Smith et al., 2006). Lesotho is affected by what medical anthropologist Merrill Singer described as a "perfect epidemiological storm" (Singer, 2008): the interaction of food insecurity, HIV/AIDS and poverty creates conditions for mutual reinforcement.

The paper is organized as follows: Section 2 provides a review of the relevant literature and derives the hypotheses to be tested; Section 3 introduces the theoretical framework; Section 4 describes the CGP programme and its evaluation design; Section 5 outlines the data and empirical strategy; Section 6 presents the results; and Section 7 outlines conclusions and policy implications.

2. LITERATURE REVIEW AND HYPOTHESES

In this section we review the evidence around the effect of CTs on child outcomes, particularly the more recent literature that focuses on SSA. We draw from the relatively new and growing literature on social protection and shocks as well as on the literature on the relationship between gender and CTs. We conclude the section by examining the evidence around disadvantaged, labour-constrained households and CTs.

Cash transfers and children's outcomes

The use of CTs as a tool of social protection has been expanding in Africa since the early 2000s, following an expansion in Latin America in the 1990s. Similar to the Latin American experience, many of the CT programmes in SSA had a rigorous evaluation component built in, with more than 10 impact evaluations of government-run programmes undertaken in the region between 2009 and 2012 (Davis, Gaarder, Handa, and Yablonski, 2012). A growing literature provides evidence of these programmes having positive impacts on a range of well-being and economic outcomes – namely health, food security and agricultural investment – as well as multiplier effects for local economies (see Davis et al., 2016).

CTs are also generally found to have a positive impact on children's access to education and health services: both conditional and unconditional CTs have been found to increase school enrolment and attendance (Baird et al., 2014), although there are weaker and more mixed results for learning and cognitive development (Bastagli et al., 2019) and for anthropometric outcomes of young children (de Groot et al., 2017). There is also consistent evidence of positive impacts on the use of health facilities and preventive health care services (Ranganathan and Lagarde, 2012).

However, evidence on the impact of CTs on multiple deprivations is scarce, particularly for child deprivation. Among this limited evidence, Robano and Smith (2014) found that an NGO-run anti-poverty programme in Bangladesh (involving transfers of physical assets and information) led to a substantial reduction in multidimensional poverty. In South Africa, households receiving social grants (Pasha, 2016) were associated with lower levels of multidimensional poverty. The same was true for girls and young women in rural areas who received social grants and manifested similar effects in terms of multidimensional poverty reduction (Kilburn et al., 2020).

In line with the above, the two-year evaluation of the Lesotho CGP showed that CTs had a positive impact on expenditure on schooling, clothing and footwear for children as well as on the share of school-aged children who had school uniforms and shoes (OPM, 2014). The programme also had a positive impact on food security for adults and children. There was an increase in birth registration rates and a reduction in the proportion of children under 6 years old who suffered from respiratory infections in the 30 days prior to the survey. Although there was a positive effect on school enrolment, no effect was found on school progression. Given the above, these preliminary studies suggest the following first hypothesis:

> *Hypothesis 1: Lesotho's CGP has the potential to shield children against the occurrence of simultaneous deprivations.*

In this context, accounting for multiple shocks is especially relevant because these affect people's welfare in terms of income, consumption and health (Wagstaff and Lindelow, 2014) and have negative impacts on children through, among other things, increasing child labour (Guarcello et al., 2010) and decreasing school enrolment and health investment (Ferreira and Schady, 2009). Existing literature mainly concentrates on the effects of a single or limited set of shocks (Dercon, 2004; Hoddinott and Kinsey, 2001; Bengtsson, 2010; Yilma et al., 2014), though there are a few recent exceptions (Mazumdar et al., 2014, Lazzaroni and Wagner, 2016). With this work, we further add to the academic discussion on the effects of different types of shocks, and also adopt a multi-shock framework.

The capacity of social protection systems to be responsive to shocks is of crucial importance in this context (Kardan, O'Brien and Masasa, 2017). While all social protection is intended to be responsive in this way, there is a specific need for systems that are flexible and able to respond to covariate and multiple shocks (O'Brien et al., 2018).

CTs can act as a buffer against shocks through several channels. Firstly, they protect households from the need to borrow and consequently from the risk of entering a debt-poverty cycle. At the same time, when borrowing is necessary, CTs can also act as collateral (provided they are predictable and dependable) (Daidone et al., 2014). CTs have also demonstrated potential to decrease beneficiaries' intertemporal discount rate, allowing them to adopt more forward-looking decision-making (Handa et al., 2016). This reinforces households' resilience, through investment and productive decisions. Evidence further suggests that CTs protect households from adopting negative coping strategies to shocks such as exploitative labour and child marriage, and negative behaviours such as violence and alcohol use (Del Carpio et al., 2016; Hidrobo et al., 2016).

By providing a steady and predictable source of income, CTs strengthen households' ability to respond to and cope with exogenous and endogenous shocks, thus allowing them to improve their livelihood and resilience to future fluctuations in asset holdings and consumption. This leads us to examine the validity of a second hypothesis:

> *Hypothesis 2: Lesotho's CGP mitigates the adverse effects of shocks on children's multidimensional deprivations*

Cash transfers and female-headed households

The impact of CT on risk-coping behaviour is also influenced by gender and programme design. Female-headed households (FHH) are different from male-headed households (MHH) for two main reasons. Firstly, FHH generally have less labour force potential, resulting from widowhood or, less frequently, separation and singlehood.[3] Secondly, women face specific socio-economic constraints due to gender-discriminatory cultural norms. While households are typically headed by men in SSA, FHH comprise a meaningful share of households as a result of widowhood, out-migration of the male head, and, to a lesser degree, separation and divorce, and singlehood (Brown and van de Walle, 2020).

In their review on the effects of the crises on women, Sabarwal, Sinha and Buvinic (2011) found that, in general, shocks affected women differently to men — with negative consequences for children's lives. They also observe that CTs are usually more effective than workforce programmes in helping women to cope with shocks. FHH are found to have limited access to resources, including land, insurance and credit markets, and formal employment (World Bank, 2012). Therefore, they are more likely to adopt detrimental coping strategies in the case of shocks. Kumar and Quisumbing (2013) found that

3 In Lesotho, 36 per cent of households are headed by women. The vast majority (73 per cent) of these women are widows, 10 per cent have never been married, 10 per cent are divorced, and 7 per cent report being married still (DHS, 2014). Furthermore, in the early 20th century, Lesotho became a labour reserve for South Africa, with many men beginning to work in the mines, leaving their wives and children behind. In the 2014 Demographic and Health Survey, 28 per cent of the male heads of households were reported as not being usual residents of their households.

FHH in Ethiopia are more likely to face food price shocks and, as a consequence, tend to cut their household food consumption. Women are also more vulnerable to climate shocks. Flatø, Muttarak and Pelser (2017) found that FHH in agriculturally dependent areas of South Africa are vulnerable to even modest variations in rainfall. The reason for this, they suggest, is that women often lack access to coping mechanisms and protective social networks. Moreover, they have lower labour capacity and are subjected to stigma and social exclusion, which erode their social networks and safety nets.

There is an extensive body of literature documenting the positive impact of CTs on gender relations: CTs have been shown to increase women's control over resources in Bangladesh (Ahmed et al., 2009), and women's labour force participation in Brazil (Veras et al., 2007). In Zambia, CTs increased women's ability to save and reinvest (Natali et al., 2016), and increased women's empowerment, though the effect was limited by persistent gender norms (Bonilla et al., 2017). New evidence highlights how CTs can also decrease the occurrence of intimate partner violence, improving gender relations within the household (Buller et al., 2018).

This preliminary evidence builds the basis for our third hypothesis:

> *Hypothesis 3: the mitigating effects of the CGP are different for children exposed to multiple/ single shocks who live in a female- vs male-headed households.*

Cash transfers and labour-constrained households

Another specific source of constraint is chronic illness and disability. While the onset of a condition can easily be a shock in itself, its continuation constrains household resources in two main ways: limiting the ability to work and requiring additional resources for medical care. Genoni (2012) found that in Indonesia, health shocks significantly affected household earning capacity – especially for individuals with low levels of education – while at the same time triggering a system of informal transfers through the family network. In the absence of formal or informal insurance, households can adopt coping strategies that, in the long term, may result in poverty traps, such as selling assets (Carter et al., 2007), and may also result in greater child deprivation. For these households, the effect of the CT should be larger, providing an additional source of income.

Heltberg and Lund (2009) observe that health shocks are among the most frequent for poor Pakistani households, which end up adopting negative coping strategies while their recovery remains slow.

Filmer (2008) found that in 8 out of 13 low- and middle-income countries, disability is associated with the probability of being in the lowest quintile of the population, and that this is mostly mediated by lower educational achievements. Similar conclusions are reported by Dhungana (2006) who found that disability constrains the lives of women, making it more difficult to escape poverty. This is especially true for those who lack access to education because they have experienced disability from childhood. In a time of increasing climate instability and weather shocks, disability and illness can also reduce mobility, making migration more difficult. In this context, CTs can act as both insurance and an empowering tool for people with disabilities and their families.

Investigating the effect of CTs on household members with disabilities in South Africa, Kelly (2019) found that the transfers empower them, giving them agency and a sense of value within the family. Miller and Tsoka (2011) found that the Malawi Social Cash Transfer is instrumental in improving the lives of people with HIV and AIDS. In Lesotho, there have historically been cultural barriers that subject people with disabilities to isolation and exclusion from the society and extreme dependency on their families and society at large (Kamaleri and Eide, 2011). This further limits their ability to cope with shocks and makes social protection tools more relevant. In light of these findings, our fourth hypothesis is as follows:

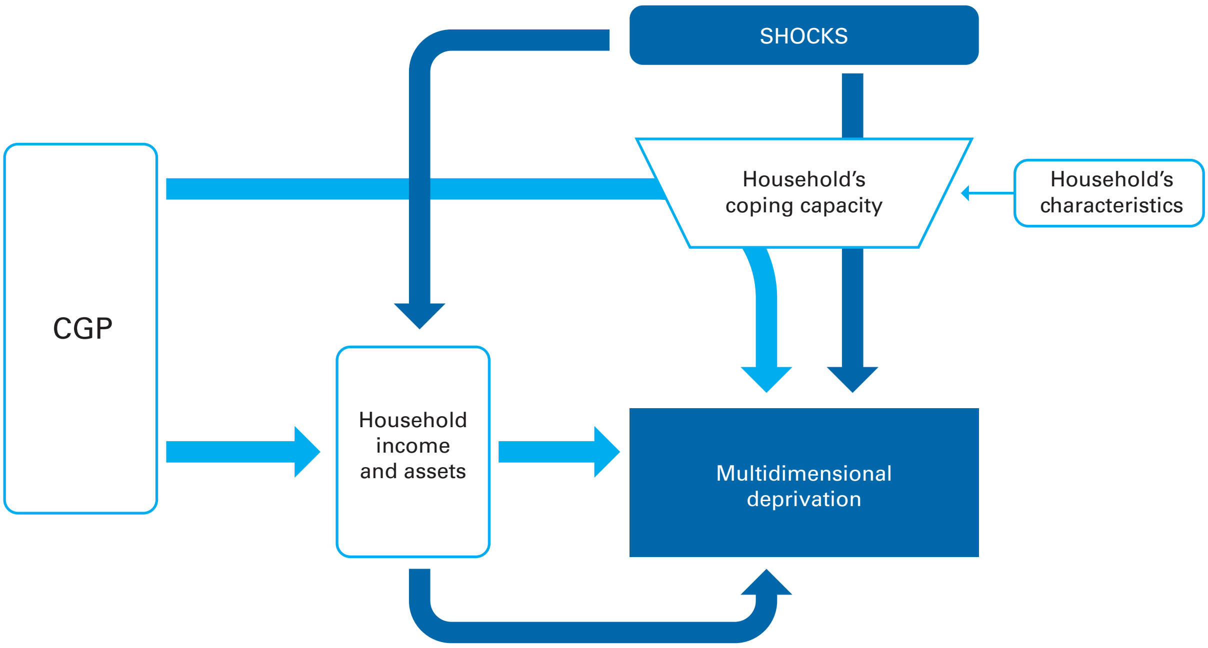
> *Hypothesis 4: The effect of the CGP on child deprivation for children experiencing shocks is differentiated by the gender of the household head AND it is larger if the household's head is not fit to work.*

3. THEORETICAL FRAMEWORK

How does a CT operate on multidimensional deprivations when children are exposed to shocks, and how does this effect differ depending on a household's characteristics?

Figure 1 illustrates a simple framework of the pathways through which CT, shocks and household characteristics influence child deprivation. We can assume that there are two pathways through which CT mitigates the impact of shocks on multiple deprivations (white arrows): either directly, through an income effect, or indirectly through some other effect, for example by preventing negative coping strategies or freeing previously allocated resources such as time, and thereby improving mental health of parents and guardians or the household's outlook on the future. For outcomes that depend on inputs available in functioning markets, the income effect is likely to be a dominant pathway. It is reasonable to assume that shocks affect multiple child deprivations negatively (i.e. increasing single and multiple deprivation, grey arrows), both through a depletion of household income and as a result of negative coping strategies (increased food insecurity, child labour, outmigration of parents, etc.).

Figure 1: Cash transfer mitigation pathways



Source: Authors

We expect households to have varying coping and recovery capacity in response to shocks, depending on their characteristics, including the gender of the household head and her/his ability to work, their initial level of wealth and assets and their access to markets. It is therefore reasonable to think that these constraints influence the results differently for children in different types of households. Borrowing from the Capability Approach (Sen, 1999; Biggeri, 2011), each household has its own 'conversion factor' that determines its ability to cope and, consequently, the impact of shocks on children's deprivation. The conversion factor incorporates all the elements that can attenuate or worsen the effect of the shocks, such as social networks, ability to borrow, savings, safety nets, access to labour and production markets, access to services, and political and institutional factors.

Starting from a standard model with altruistic parents (Becker, 1981) we have:

$$U_{pt}(c_p, \beta(U_{ct})) \tag{1}$$

with U_{pt} being the utility of the parents at time t, which depends on their consumption, and the utility of their child U_{ct} (we assume additive utility functions and normalize the number of children to 1), discounted by a factor β. The utility of the child in turn can be written as follows:

$$U_{ct}(c_{ct}, \mathrm{md}) \tag{2}$$

Where c_{ct} is the child's consumption, while md represents multidimensional deprivation, which is subject to the constraint of $md \geq 0$ and enters the utility function negatively: ideally, maximum utility is achieved when $md = 0$. Multidimensional deprivation, in turn, can be written as:

$$md(y_t, a) \tag{3}$$

where y_t is the household's income at time t, capturing the material deprivation, and a is an aggregate of non-material and other factors (such as infrastructure, social norms, parental care, etc.) contributing to child multidimensional deprivations.

The budget constraint of the family can be written as

$$y_t = c_{pt} + c_{ct} - \mathrm{s} \tag{4}$$

where c is consumption at time t, and s is savings (s can be negative, in that case it represents borrowing).

In a two-period model, shocks happen between period t and $t + 1$. While the CT only operates through the budget constraint, exogenous shocks S, negatively enter the family's utility function in two possible ways: first, lowering income, therefore further constraining the household; second, directly affecting the household's and the child's outcomes (e.g. poor health, disruption in education, mortality, etc.). Assuming there are no other changes between t and $t + 1$ except for the shock, we can write the utility function in $t + 1$ as:

$$U_{pt+1} = U_{pt}(\theta c_{pt}, \theta \beta U_{ct}) \tag{5}$$

Similarly, the budget constraint at $t + 1$ is:

$$y_{t+1} = \theta(y_t + CT) \tag{6}$$

With CT representing the CT lump sum payment, which adds to the budget constraint y_t, while θ is a discount factor. This factor is a function of the shock's characteristics (intensity, type of shock) and the household's endogenous capacity to cope with the shock δ.

$$\theta = \tfrac{\mathrm{s}}{\delta} \text{ with } 0 \leq \delta \leq 1 \tag{7}$$

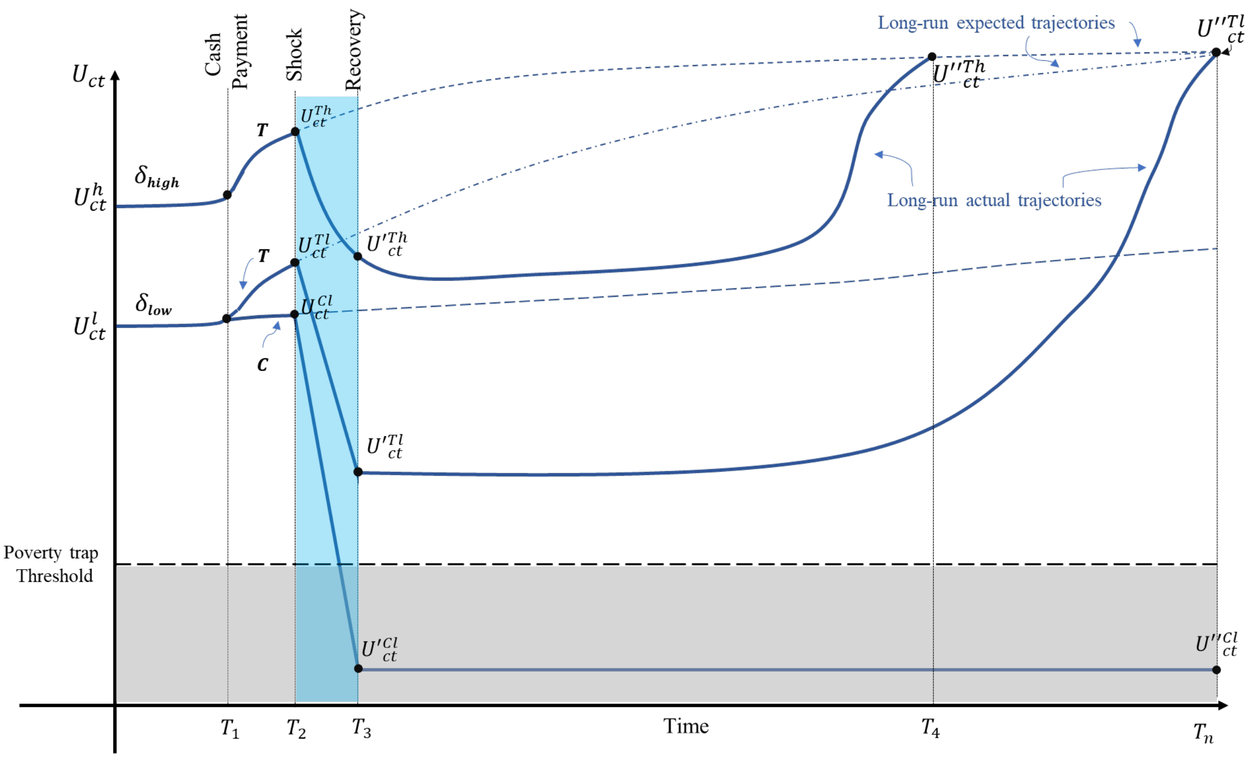
Where δ is a conversion factor that mediates the effect of the shock on the household. A higher δ means a lower transmission of the shock, making the household less vulnerable. In this framework, "0" represents complete vulnerability, while "1" represents complete immunity to shocks.

The total impact of the CT therefore depends on the size of the shock and on the capacity of the household to absorb it.

Figure 2 presents three scenarios showing different child well-being patterns resulting from the interplay between (i) the household's endogenous coping capacities δ , which can be high (δ_{high}) if the household has enough intrinsic ability to manage situations of risk (i.e. has larger networks, a lower dependency ratio, etc.),[4] or low (δ_{low}), if the household struggles to cope with unexpected exogenous events; (ii) direct exogenous coping strategies (enrolment in a CT programme); and (iii) exogenous shocks S.

The x-axis measures time, while on the y-axis we report children's utility, a function of simultaneous multiple deprivations. In line with Carter et al. (2007) we report no-shock (dashed lines) and actual, shocked, trajectories (solid lines) for the utility U_c of children living in households with δ_{high} and δ_{low} . The first trajectory begins with a higher utility level U^h_c. Children living in this type of household experience a lower number of simultaneous deprivations. The second trajectory represents the dynamic pattern of utility for children living in households with low coping capacities (U^l_{ct}). It starts with a lower pre-treatment and pre-shock utility level and bifurcates at T_1 into two separate trajectories, following treated and control households under the same δ_{low} assumption.

Figure 2: Shock responsiveness of CTs, coping capacity scenarios.



Source: Authors' elaboration adapted from Carter et al. (2007).

We assume that the CT is paid to beneficiaries at T_1 before the shock occurs. The CT modifies the trajectory of the utilities. Between T_1 and T_2 the child utility function increases at the same pace for U^h_{ct} and U^l_{ct}, independently from each household's coping capacity, while it remains approximately the same (although with a slight slope as a result of programme spillover effects) for households eligible

4 Here we focus on households that are eligible for CTs. Our assumption is that even among eligible households, there are still variations in the coping capacity. The discussion excludes households that are not eligible (and therefore systematically wealthier).

for the treatment but assigned to the control group (C). The trajectories presented by the dashed lines illustrate the case of convergent utility dynamics where the utility of children (living in treated households) in absence of shock will converge in the long run to the same expected path regardless of household coping capacity. The shock itself is displayed as a short exogenous incident occurring at $T_2 \rightarrow T_3$. It can be represented by an idiosyncratic event (i.e. robbery of assets) or a covariate event (i.e. maize price spikes, drought). After the shock, all children experience a decline in U_c $(U_c \rightarrow U'_c)$. However, the drop in child utility level is buffered by the transfer receipt, with those receiving the transfer experiencing a lower reduction of their utility level with respect to their control counterparts: $U_{ct}^{T} - U'^{T}_{ct} < U_{ct}^{C} - U'^{C}_{ct}$. Within the group of treated households (U_{ct}^{T}), the variation in utility is lower for those with higher endogenous coping capacity (U_{ct}^{Th}). The reason for this is twofold: (1.) they start with better pre-shock conditions (both material and not), and (2.) they are able to use more efficiently a share of the money obtained through the transfer in the aftermath of a shock. Control-eligible households have low coping capacity and are therefore likely to be pushed below the poverty threshold (U'^{Cl}_{ct}), being caught in a self-reinforcing poverty trap (Carter et al., 2007). At T_3, the recovery starts to take place. Their coping capacity, which reflects the absence of assets, is not enough to enable them to regain their expected pre-shock trajectory. Without any form of aid or support, the path for control-eligible households is a flat line that goes from U'^{Cl}_{ct} to U''^{Cl}_{ct} without converging with their dashed expected trajectory. Conversely, the treated households rebound to their expected trajectory with a speed that is proportional to their coping skills (δ). Households with high asset endowments, that are able to access credit or that are working in an efficient labour market will return to their original trajectory at T_4. Households with lower coping capacities but being targeted by the CT will converge to their original trajectories, but at a later stage T_n.

4. LESOTHO'S CGP AND EVALUATION DESIGN

The Lesotho Child Grants Programme is an unconditional CT, the primary objective of which is to improve "the living standards of orphans and other vulnerable children (OVC) so as to reduce malnutrition, improve health status, and increase school enrolment among OVCs" (OPM, 2014). The programme is run by the Ministry of Social Development, with financial support from the European Commission and technical support from UNICEF Lesotho. Launched as a pilot programme in April 2009 with a coverage of 10,000 beneficiary households (phase 1) in five districts, coverage was expanded at the end of 2013 (phase 2), reaching 19,800 households and providing benefits for approximately 65,000 children across 10 districts in Lesotho. The beneficiaries were selected through a combination of proxy means testing and community validation, and were registered in the National Information System for Social Assistance (OPM, 2014).

The country is divided into 10 districts consisting of 80 constituencies; in turn, these are divided into 129 Community Councils (CCs). In each constituency, there are 11 electoral divisions (EDs). The study was conducted across 5 of the 10 districts, namely Berea, Leribe, Mafeteng, Maseru and Qacha's Nek. In each of the five districts, two CCs were selected for CGP coverage, amounting to a total of 10 CCs and 96 EDs. Within the 10 CCs selected for the Phase 1/Round 2 expansion of the programme, half of the 96 EDs were randomly assigned to be covered by the pilot (treatment), while the other half were to be covered after the end of the evaluation study (control). The impact evaluation survey collected information for a sample of eligible households (i.e. the beneficiaries) in treatment EDs (treatment group) and eligible households in control EDs (control group). The sample was selected through a multi-stage stratified random cluster design. The 96 EDs were coupled in 48 pairs in the same CC on the basis of common observed characteristics, and 40 pairs were randomly chosen to be part of the study. Within each of the 80 selected EDs, 2 villages were randomly chosen and, for each of them, 10 random eligible households were selected for interview. EDs were assigned to either the treatment or control group through public lottery events only after the baseline data collection (OPM, 2014).

Baseline and follow-up panel surveys collected information for a sample of CGP-eligible and non-eligible households in treatment and control communities. The baseline survey fieldwork took place between June and August 2011 and comprised around 3,000 households. The follow-up survey fieldwork took place in 2013 at the same time of the year to avoid seasonal bias. A total of 3,102 households were surveyed; 1,531 programme eligible households (766 treatment and 765 control) to be used for the impact evaluation analysis, with the remaining 1571 programme-ineligible households to be used for targeting analysis and spillover effects. In addition to the household survey, two other questionnaires were implemented: the community and business enterprise questionnaires. The programme, which was oriented towards poor and vulnerable households with children, was set up in such a way that the cash would be disbursed quarterly, starting with a flat transfer of maloti (M) 360 (US$36) that was set at baseline, and then increasing to M600 (US$60) and M750 (US$75)[5] respectively, in line with an indexing based on the number of children. However, the payment schedule was not followed over the study period, with the recipients receiving the entire amount in larger and less frequent transfers than expected.

5 The CGP has been indexed at baseline to the number of children as follows: (1) households with 1–2 children M360 (US$36) quarterly; (2) households with 3–4 children M600 (US$60) quarterly; and (3) households with 5 and more children M750 (US$75) quarterly (OPM, 2014).

5. DATA AND EMPIRICAL STRATEGY

5.1. Balance, attrition and outcome variables

In this paper, we focus on children of school age as the unit of analysis. The analysis is conducted at individual level selecting a cohort of eligible children aged from 4 to 15 years at baseline (and 6 to 17 years at follow-up) and living in households eligible for the treatment. We restricted the sample to those children appearing in both baseline and follow up. As shown in Table 1, the final sample size was obtained as follows. A total of 2,865 eligible children aged 4–15 years (1,392 treated and 1,473 control) were interviewed at baseline. Of these, 2,563 eligible children (1,194 treated and 1,369 control) were successfully interviewed at follow-up. Thus, our final sample comprises all matched children aged 4–15 at baseline and 6–17 at follow-up. The attrition rate is about 11 per cent (in Appendix A we report detailed attrition analysis). Attrition can cause problems within an evaluation because it not only decreases the sample size (leading to less precise estimates of programme impact) but can also introduce selection bias, which leads to incorrect impact estimates and may change the sample's characteristics to the extent that the generalizability of the study is reduced. We produced analytical weights to correct for the selective non-response. These weights are applied in subsequent analyses.

Table 1: Children Sample sizes and attrition rates, by treatment group

	Treated	Control	Total eligible for CGP
Baseline children aged 4–15 years	1,392	1,473	2,865
Baseline attriters aged 4–15 years	198 (14% attrition)	104 (7% attrition)	302 (11% attrition)
Baseline children surveyed at endline	1,194	1,369	2,563

Our outcome variables are represented by a measure of the children multidimensional deprivation headcount (HC) and by the average intensity of deprivations (A) experienced by the children. The approach used to derive these measures is a count-based method coupled with a dual cut-off approach. We start by selecting six dimensions of child deprivation at individual (health, education, child labour) and household level (nutrition/food security, water, living standards) *(see Table 2)* following the existing literature on multidimensional poverty and deprivation measures (De Neubourg et al., 2013). As shown in Table 2, two dimensions out of six (water, living standards) are the result of the combination of two indicators using the union approach (i.e. an individual is deprived in a dimension if she/he is deprived in at least one indicator within the dimension), while the remaining four dimensions are constructed based solely on one indicator. Then, we determine a cut-off line (i.e. first cut-off) for each dimension and build a binary variable indicating whether the child is deprived in that dimension (d=1) or not (d=0).

This method allows for the construction of two measures to quantify multidimensional child deprivations, which will represent our outcome variables. The first one is represented by a summary index of simultaneous deprivations, the HC, which is obtained by first aggregating the dimensions by child and then counting the total number of dimensions in which each one is deprived. The HC is calculated at three different thresholds (i.e. second cut-off): the cut-offs of two, three or four dimensions (k=2, k=3, k=4). In this way we derive three variables HC2, HC3 and HC4, reflecting simultaneous deprivations in two or more, three or more, or four or more dimensions. The second measure is the average intensity of deprivation (A), which captures "how deprived are the deprived" by measuring the depth or intensity of simultaneous deprivations for those children classified as multidimensionally deprived. It is defined as the ratio between the number of deprivations divided by the total dimensions considered (see Appendix B for further details on the construction of the measures). Similar to HC, the A measure is constructed using the same three cut-offs.

Table 2: Dimensions, indicators, age groups

Dimension	Indicators	Age groups
Health	Child is deprived (=1) if her/his health status is rated as poor or fair.	4–17
Education	Child is deprived (=1) if not enrolled in school or preschool.	4–11
	Child is deprived (=1) if she/he lags at least one year behind.	12–17
Nutrition/Food security	Child is deprived (=1) if any child aged 0–17 living in her/his household had to eat fewer meals.	HH level
Water	Child is deprived (=1) if the household has access to unimproved water source according to WHO standards*.	HH level
	Child is deprived (=1) if the time needed to reach the closest water source is > 60 minutes	HH level
Living standards	Child is deprived (=1) if house walls are of non-resistant material**.	HH level
	Child is deprived (=1) if house floor is of natural material***.	HH level
Child labour	Child is deprived (=1) if she/he has done any work or > 5 hrs of domestic chores in last 7 days.	5–12
	Child is deprived (=1) if she/he has done > 14 hrs of work or > 5 hrs of domestic chores in last 7 days.	12–14
	Child is deprived (=1) if she/he has done > 43 hrs of work in last 7 days.	15-17

* Unimproved water source is defined as: uncovered spring, river, other not specified. Improved: piped water on premises, piped community water, catchment's tank, public well, private well, covered spring, borehole.

** Non-resistant materials include: Cane/tree trunks, sod, stone/mud, plywood, cardboard, refused wood.

*** Natural materials include: earth/sand, dung, wood planks, palm/bamboo.

Table 3 examines balance in the outcomes for children observed at baseline. About half of the children are deprived in two or more dimensions at the same time, 16–18 per cent in three or more, and 3 per cent in four or more. Given that the sample is restricted to eligible children aged between 4 and 15 years, similar to Ashwini et al. (2019), we expect some discrepancies to arise between treatment and control arms despite the randomized nature of the original study design. The t-test for differences shows that 2 out of 6 outcome variables are not balanced at baseline, namely HC2 and relative intensity of deprivation. Such a difference seems to be driven by a few small but significant differences registered between treatment and control clusters for three out of six single deprivations (health, nutrition/food security, water).

Table 3: Children outcome variables summary statistics at baseline

	Treated		Control		
	mean	N	mean	N	p-val diff
Multiple deprivation headcount and intensity					
HC2: Deprived in 2+ dimensions	0.52	1369	0.59	1194	0.00
HC3: Deprived in 3+ dimensions	0.18	1369	0.16	1194	0.49
HC4: Deprived in 4+ dimensions	0.03	1369	0.03	1194	0.46
Intensity of deprivation 1+ dimensions	0.26	1263	0.26	1127	0.18
Intensity of deprivation 2+ dimensions	0.34	711	0.33	710	0.01
Intensity of deprivation 3+ dimensions	0.45	240	0.45	197	0.50
Share of children experiencing…					
Health depr. (1=Yes)	0.11	1357	0.08	1186	0.03
Education depr. (1=Yes)	0.18	1369	0.19	1194	0.37
Nutrition/food security depr. (1=Yes)	0.71	1369	0.78	1194	0.01
Water depr. (1=Yes)	0.19	1361	0.16	1190	0.07
Living standards depr (1=Yes)	0.42	1369	0.45	1194	0.21
Child labour depr. (1=Yes)	0.07	1369	0.06	1194	0.56

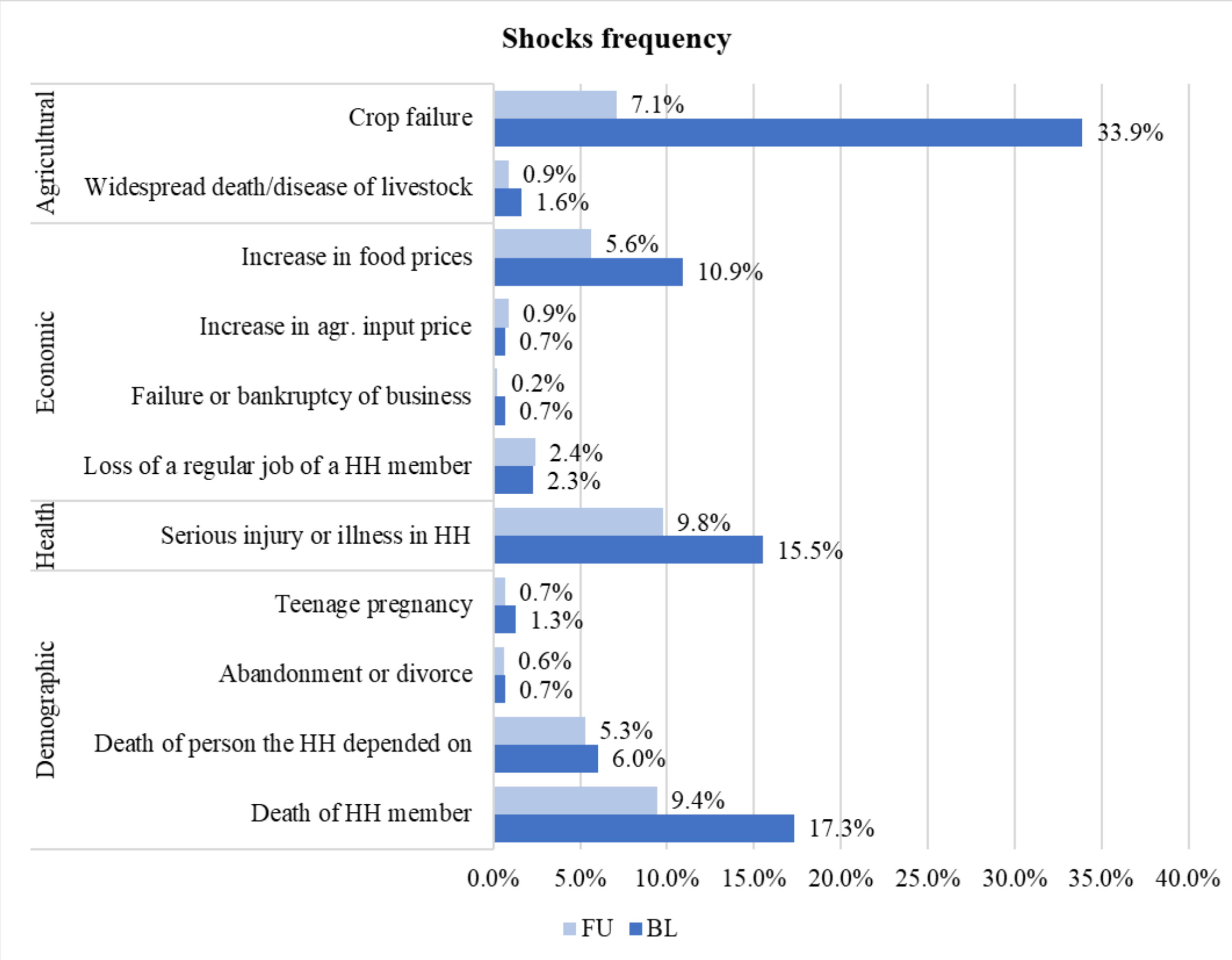
5.2 Shocks and independent variables

The survey provides comprehensive information on experience of self-reported shocks from each household within the past 12 months. Since this information is collected at the household level, we assume that children living in the same household are all equally experiencing the reported shock. There is no information on the intensity of the shock. The aggregate number of shocks each child experiences at baseline amounts to 0.78 on average. We grouped shocks into a few broadly comparable categories, i.e., demographic, health, economic or agricultural shocks.

For the sake of conciseness, we analyse shocks according to these four broad types, which are built from even more detailed categories as reported in Figure 3. Under demographic shocks, we include household members abandoning the household or divorcing; experiencing the death of another household member; and teenage pregnancy. Economic shocks are the aggregate of financial distresses experienced by households, e.g., increase in food or input prices,[6] failure or bankruptcy of business, or job loss by the household member. As the majority of households are at least partly engaged in agricultural activities, crop and livestock shocks account for most of the shocks reported. The incidence of crop failure in particular is reported to be exceptionally high. Finally, due to the high prevalence of HIV, there is a substantive incidence of health shocks, reported here as serious injury or illness of one household member.

6 As reported by Prifti et al. (2018), in Lesotho the households are mostly net buyers and are therefore more likely to be affected by food price surges.

Figure 3: Shock categories and frequency at baseline and follow-up



Source: Authors' elaboration

Table 4 shows sample averages at baseline for the full sample, by gender of household head and t-test statistics for cross-gender differences. In our sample, the children are split almost equally into female- and male-headed households and are split equally by sex. A third lives with an elderly household head, a third with a chronically ill household head, and 10 per cent live in a household whose head is disabled. Household size is quite large, reaching about seven people per household due to the high number of children. Detailed explanations of the evaluation sample characteristics, attrition and balance are available in Oxford Policy Management (OPM) (2011, 2012, 2014) reports, including details on programme design and impacts on a wide range of outcomes. The OPM (2014) official impact evaluation report confirms that the randomization process was successful, and that the rate of actual treatment among the enrolled beneficiaries was as high as 96 per cent. The test of balance between control and treatment at baseline shows that there are no statistically significant differences in household characteristics, poverty, assets, and community-level characteristics. However, new statistical tests of mean differences are performed here to investigate differences at baseline between treated and control groups at the child level *(see Table A1 in Appendix A)*. Treatment and control groups generally look similar, although we find a few pre-treatment differences across demographic, geographical and socio-economic characteristics between the two groups of children. The main violations of balance (at $p<0.05$) are recorded for household size, number of siblings aged 0–5 years, number of household members aged 18–59 years, and two community-level controls, namely wheat and maize prices. To control for differences in the controls, we include them as regressors in the difference-in-difference analysis, thereby limiting concerns that such differences may have impacts on the multidimensional deprivations index.

Table 4: Baseline independent variables at child level, by gender of the household head

	Full sample (n=2537)	MHH (n=1214)	FHH (n=1323)	p-val diff
Independent variables				
Child's age	9.52	9.33	9.69	0.01
Child's sex (1=Girl)	0.49	0.50	0.47	0.12
HH Size	6.68	6.93	6.44	0.00
Age of the household head	53.26	50.09	56.18	0.00
# siblings 0–5 yo	0.96	1.01	0.93	0.04
# siblings 6–12 yo	1.68	1.74	1.62	0.01
# siblings 13–17 yo	1.00	0.96	1.03	0.03
# Members 18–59 yo	1.16	1.38	0.96	0.00
# Males >60 yo	0.16	0.32	0.01	0.00
# Females > 60 yo	0.30	0.13	0.46	0.00
# Orphans	1.71	0.98	2.39	0.00
Highest Education level in the HH	7.72	7.59	7.84	0.01
Ln Operated Land	0.99	1.30	0.71	0.00
Leribe district	0.22	0.19	0.26	0.00
Berea district	0.27	0.26	0.29	0.13
Mafeteng district	0.24	0.26	0.22	0.01
Qacha's Nek district	0.05	0.07	0.04	0.01
Maize Price	3.95	3.99	3.91	0.08
Wheat Price	5.90	5.91	5.90	0.76
Shocks				
Any	0.59	0.58	0.60	0.16
# Shocks	0.78	0.74	0.81	0.04
Demographic Shock	0.20	0.15	0.24	0.00
Health Shock	0.13	0.12	0.14	0.19
Economic Shock	0.11	0.12	0.10	0.15
Agricultural Shock	0.26	0.30	0.23	0.00
Breakdown variables				
Head is disabled	0.57	0.50	0.64	0.00
Head is chronically ill	0.31	0.26	0.35	0.00
Head is elder	0.37	0.30	0.44	0.00

Note: Balance tests at baseline are reported in Table A1 in Appendix A and in OPM (2014).

In Table 5 we compare if and how the outcome variables and shocks differed based on the household head's physical status. The proportion of children experiencing two or more deprivations simultaneously is significantly higher among those living in households whose head is labour-constrained. Children living in households whose head is ill, disabled or elderly are generally more subject to shocks, being generally more likely to experience multiple, demographic and economic shocks.

Table 5: Baseline average values for outcome variables and shocks, by head of household's physical status

	Head is ill			Head is disabled			Head is elderly		
	=0 (n=1765) Mean	=1 (n=798) Mean	p-val	=0 (n=2272) Mean	=1 (n=291) Mean	p-val	=0 (n=1497) Mean	=1 (n=1066) Mean	p-val
Outcome variables									
HC2: Deprived in 2+ dimensions	0.53	0.56	0.01	0.53	0.61	0.00	0.56	0.51	0.00
HC3: Deprived in 3+ dimensions	0.17	0.18	0.32	0.17	0.21	0.02	0.18	0.16	0.27
HC4: Deprived in 4+ dimensions	0.03	0.03	0.17	0.03	0.03	0.63	0.03	0.03	0.18
Intensity of depr. 1+ dimensions	0.26	0.26	0.11	0.26	0.27	0.01	0.26	0.25	0.17
Intensity of depr. 2+ dimensions	0.34	0.34	0.68	0.34	0.34	0.58	0.34	0.34	0.25
Intensity of depr. 3+ dimensions	0.45	0.46	0.23	0.46	0.45	0.49	0.45	0.46	0.07
Shocks									
# Shocks (1–4 scale)	0.58	0.82	0.00	0.64	0.71	0.04	0.62	0.68	0.01
Any	0.46	0.62	0.00	0.50	0.56	0.00	0.48	0.53	0.00
Demographic	0.17	0.22	0.00	0.18	0.23	0.00	0.17	0.21	0.00
Health	0.07	0.19	0.00	0.11	0.10	0.49	0.10	0.12	0.16
Economic	0.09	0.11	0.01	0.09	0.13	0.02	0.11	0.08	0.01
Agricultural	0.16	0.21	0.00	0.18	0.16	0.40	0.16	0.19	0.01

5.3 Impact of cash transfers on multiple deprivations index

This paper investigates the theoretical hypothesis that CTs can buffer against idiosyncratic or covariate shocks, and that this effect can differ depending on the gender of the household head and on whether the household head is fit to work. To capture this effect, we estimate a linear model where the dependent variable is an index counting the number of deprivations children face in several domains.

We calculated the average treatment effect on the treated (ATT) of the CT on multidimensional deprivations by estimating the follow relationship in a linear framework:

$$y_{iht} = \alpha_0 + \alpha_1 Treat_h * Post_t + \alpha_2 Post_t + \alpha_3 Treat_h + \theta \mathbf{X}_{iht} + \pi Z_{ht'2011} + \varrho Q_{ct} + \varepsilon_{iht} \quad (8)$$

where the dependent variable y is either a dummy variable accounting for the incidence (H) or a continuous variable for the intensity (A) (measured as the ratio between experienced deprivations and total number of possible deprivations, *see Appendix B*) of multiple deprivations for child i living in household h, in community c, experiencing two or more, three or more, or four or more deprivations simultaneously. t is the survey year (t = 2011 or 2013).

$Treat_h$ is a dummy variable set to 1 if the household is a CT beneficiary, and $Post_t$ is an indicator denoting the follow-up period. The differences between the treatment and control groups can be mitigated by conditioning on observables, at the community, household and individual levels; hence, we denoted by $\mathbf{X}_{iht}$ a vector of individual control variables, which include age of the child, gender of the child, and whether the child is the son/daughter of the head. Similarly, $Z_{ht'2011}$ and Q_{ct} were household level covariates evaluated at baseline, to avoid bias caused by the inclusion of a covariate that was affected by the treatment, and community controls respectively. Household covariates included age of head, education of head, household size and household composition, by age group and sex. Community variables comprised wheat and maize price indicators, and geographical variables consisted in the inclusion of dummies for districts. Our parameter of interest was α_1, the difference-in-differences estimator, which measures the impact of the CGP on multidimensional child deprivations. Standard errors are clustered at the community level. Children with missing data in at least one dimension are dropped from the analysis.

To estimate the heterogeneous impacts of CT on multidimensional child deprivations, we ran the following pooled linear probability model regression, which accounts for shocked households:

$$y_{iht} = \beta_0 + \beta_1 Treat_h * Post_t * FHH_i + \beta_2 Treat_h * Post_t + \vartheta \mathbf{W}_{iht} + \theta \mathbf{X}_{iht} + \pi Z_{ht'2011} + \rho Q_{ct} + \varepsilon_{iht} \quad (9a)$$

$$y_{iht} = \beta_0 + \beta_1 Treat_h * Post_t * FHH_i * Shock_h + \beta_2 Treat_h * Post_t * Shock_h + \vartheta \mathbf{W}_{iht} + \theta \mathbf{X}_{iht} + \pi Z_{ht'2011} + \rho Q_{ct} + \varepsilon_{iht} \quad (9b)$$

Equation (9a) differs from specification (8) through the inclusion of an interaction term between the Diff-in-Diff coefficient and a dummy taking value '1' if the child is living in an FHH. The coefficient β_1 will return the heterogenous impact of the programme on the outcome variables (children in treated FHH with respect to children in treated MHH). The coefficient β_2 represents the impact of the programme for the children living in MHH, while the $\beta_1 + \beta_2$ coefficient is the impact for children living in treated FHH with respect to control FHH. Equation (9b) incorporates a multiple interaction between the Diff-in-Diff coefficient, the FHH_h indicator and $Shock_h$ variable. The last two are set to 1 if the sampled child lives in an FHH and if she/he has experienced a specified shock. $Shock_h$ relates either to a continuous measure of multiple shocks experienced by the child, or self-reported measures of demographic, economic, health or agricultural shocks as defined in Figure 3.

The equations (9a) and (9b) are complemented by $\mathbf{W}_{iht}$ representing a vector of standard combinations between $Treat_h$, $Post_t$, FHH_i, $Shock_h$, variables.

Much of the literature on households' responsiveness to shocks has focused on transitory shocks. Indeed, ill health events may reflect unexpected health shocks, but lasting conditions like chronic illnesses or disabilities may also permanently affect individuals' ability to work. As reported in the literature, the HIV/AIDS prevalence in Lesotho is estimated to be the second highest in the world (i.e. 25 per cent of adults aged 15–49 years according to MoHL and ICF (2016)), and one out of three Basotho children have been left orphaned as a result of the epidemic (Davis et al., 2016). According to the 2014 Lesotho Household and Demographic Survey, in Lesotho the burden of caring and providing for sick relatives and orphans (MoHL and ICF, 2016) due to HIV/AIDS falls disproportionally on women (30 per cent among adults) compared to men (19 per cent among adults). HIV/AIDS may foster impairments as the disease progresses, making people severely labour constrained and thus unable to continuously perform any economic activity. When individuals live in this 'permanent shock' condition, their capacity to absorb any additional shock is further weakened, making them yet more vulnerable.

As an additional exercise, we break down the sample into pairs of subsamples based on whether a child lives in a household where the head is labour constrained ($LC_h = 1$) or not ($LC_h = 0$) (Equation (10)). Specifically, we run the linear model for three distinct subgroups: (i) the head is disabled (vs. able bodied), (ii) the head is an elder (≥65 years old) (vs. young, <65 years old), (iii) the head is chronically ill (vs. not chronically ill).

$$(y_{iht}|LC_h=1) = \beta_0+\beta_1 Treat_h{*}Post_t{*}\ FHH_h{*}\ Shock_h+\beta_2 Treat_h{*}Post_t{*}\ Shock_h+ \vartheta\mathbf{W}_{iht}+ \theta\mathbf{X}_{iht}+ \pi Z_{ht'2011}+ \rho Q_{ct}+ \delta_i+\varepsilon_{iht} \qquad (10)$$

6. RESULTS

In the following, we report first the CGP impact estimates for our list of outcome variables. We present the results in three different rows: the first one presents the difference-in-difference estimates for the whole sample without considering the potential heterogeneous impacts, i.e., α_1 coefficient from equation (8); the second row reports the differential impacts for children living in treated MHH vis-a-vis FHH, (i.e. β_2 coefficient); the third row (i.e. $\beta_1 + \beta_2$ coefficients) shows the programme effects for children living in treated FHH against their peers in control groups. In all estimates we control for a large set of household and community characteristics and districts as listed in Table 4. Moreover, estimates are adjusted using probability-adjusted sampling weights (for details see Pellerano et al. 2014). Finally, the significance testing accounts for clustering of standard errors due to sampling design.

6.1. Heterogeneous impacts on multidimensional deprivations: female- vs male-headed households

Table 6 reports the results from equation (8) on the impact of CGP on multidimensional deprivation incidence and intensity. Overall, we do not observe any significant impact on the incidence and intensity of multiple deprivations. However, if we distinguish the different household structures by interacting the gender of the head of household with the DiD term, we find some heterogeneous impacts. As shown in Table 7, which provides the heterogeneous impacts of CGP by gender of household head from equation (9a), the (β_1+β_2) coefficient is negative and statistically significant at $p<0.1$. This demonstrates that at large simultaneous deprivation levels (k=4), children living in treated FHH are more likely to experience a reduction in multidimensional deprivation incidence (-2.5 pp) than their control counterparts. When looking at the intensity of deprivations, we observe a statistically significant gender-differentiated impact in favour of children living in treated FHH with respect to their peers living in treated MHH: the CGP caused a reduction by 2.9 percentage points (at k=2) and 4.7 percentage points (at k=4). Further, as seen in columns 4 and 5, CGP significantly contributed to a reduction in the intensity of deprivation for those children living in treated FHH with respect to their peers in control areas.

Our first hypothesis was that: *(1) Lesotho CGP has the potential to shield children against the occurrence of simultaneous deprivations.* We find that there is no impact on the average probability of a child being deprived; however, we find evidence of impact on the intensity of deprivation, and the probability of being deprived in a high number of dimensions, for children in FHH. Lesotho's CGP shows a potential to improve the condition of children, especially the most deprived; however, it is not sufficient to show an average effect.

Table 6: Impacts of CGP on multidimensional deprivation incidence and intensity, pooled OLS[7]

	(1) HC 2+	(2) HC 3+	(3) HC 4+	(4) A1	(5) A2	(6) A3
DiD = β_1	-0.006	-0.030	-0.013	-0.009	-0.008	0.003
	[-0.13]	[-0.89]	[-1.09]	[-0.93]	[-0.94]	[0.24]
Demographic	YES	YES	YES	YES	YES	YES
Community level	YES	YES	YES	YES	YES	YES
Districts	YES	YES	YES	YES	YES	YES
Observations	5065	5065	5065	4652	2726	870
R^2	0.030	0.019	0.007	0.016	0.030	0.076

t statistics in brackets * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the community level. HC: Headcount Ratio of deprived children in n or more dimensions. A: intensity of deprivation in n or more dimensions.

Table 7: Heterogeneous impacts of CGP on multidimensional deprivation incidence and intensity by gender of household head, pooled OLS.

	(1) HC 2+	(2) HC 3+	(3) HC 4+	(4) A1	(5) A2	(6) A3
DiD = β_2	-0.051 [-0.80]	-0.008 [-0.17]	0.000 [0.01]	0.006 [0.43]	0.006 [0.51]	0.027* [1.72]
Differential for FHH= β_1	0.084 [1.05]	-0.043 [-0.79]	-0.025 [-1.31]	-0.029* [-1.93]	-0.025 [-1.55]	-0.047* [-1.98]
DiD * FHH = $\beta_1+\beta_2$	0.034	-0.051	-0.025*	-0.023*	-0.019*	-0.020
	[0.60]	[-1.25]	[-1.83]	[-1.85]	[-1.68]	[-0.96]
Demographic	YES	YES	YES	YES	YES	YES
Community level	YES	YES	YES	YES	YES	YES
Districts	YES	YES	YES	YES	YES	YES
N	5065	5065	5065	4652	2726	870
R^2	0.035	0.020	0.007	0.019	0.036	0.099

t statistics in brackets * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the community level. All regressions include demographic and community characteristics.

7 Because intensity of deprivation is calculated only for children deprived at the chosen cut-off, the number of observations decreases at each cut-off.

6.2. Heterogenous impacts by gender of household head among children living in shocked households

On average, children experiencing any type of shock are more at risk of experiencing multiple deprivations *(see Tables C1–C2, Appendix C)*. The incidence of shocks on multiple deprivations is particularly relevant for those children hit by demographic shocks and, to some extent, by agricultural shocks. In Table 8 we investigate if and how the programme mitigates the impacts of shocks. The most relevant results are shown in panel C where we test our hypothesis on the most vulnerable children (k=4), for whom we find a differential impact depending on the gender of the household head, although at $p<0.1$, for those children living in FHH experiencing a demographic shock with respect to their treated MHH counterparts *(see Table 8, panel C)*. The death of a relative can result in high expenses for the family, and these can be especially high in southern African cultures. Funeral societies are a tool to sustain such post-mortem expenditures, but require a monthly fee: an FHH experiencing shock would therefore probably use part of the CGP to sustain the subscription in such a scheme, that in turn will aid them to cope with the burial expenses. MHH, who are generally richer and better connected, may be able to sustain such a fee, therefore allocating residual CGP amounts to other types of investments. Literature has often emphasized how the impact of CT can be different due to women and men using CT differently (Tirivayi, Knowles and Davis, 2013). Men and women may not invest in the same types of assets and may not use the same coping strategies in response to a shock. For example, in Bangladesh, women's assets were disposed of more quickly to respond to family illnesses, whereas men's assets were typically used to cover marriage expenses and dowries (Quisumbing, Kumar and Behrman, 2011).

In Table 8 we fail to detect a differentiated impact of the programme for treated-shocked FHH versus treated-shocked MHH ($\beta_1+\beta_2$), but we show how successfully the CGP reduces the risk of simultaneous deprivations in the case of a perceived economic shock for children living in treated-shocked FHH with respect to control-shocked FHH. There is a decrease by 6.5 percentage points ($p<0.1$) in the likelihood of being multidimensionally deprived for children in treated-shocked FHH with respect to control-shocked. This means that when there is a self-reported economic shock to the household, receiving the cash possibly helps to mitigate cuts in expenditure in the domains of nutrition, health, education or other living standards among other potential channels. Previous research on the Lesotho CGP has indeed shown that beneficiaries do increase their consumption and production more than the control group (Daidone et al., 2014; Taylor et al., 2014; Dewbre et al., 2015). In order to test further the correct specification of the model we replicated the estimates using the intensity of multiple deprivations as outcome (Table 9). The sign and statistical significance for the ($\beta_1+\beta_2$) coefficients are similar to those reported in Table 8 confirming that the Lesotho CGP can also reduce the intensity of deprivation for those exceeding the cutoff k=4.

Table 8: Heterogeneous impacts of CGP on multidimensional deprivation incidence by experience of shocks and gender of household head

Panel A: HC2+	(1) Any	(2) Demo	(3) Econ	(4) Health	(6) Agr
DiD*Shock = β_2	-0.106 [-0.93]	0.178 [1.06]	-0.003 [-0.01]	0.063 [0.38]	-0.419^{***} [-2.82]
Differential for shocked FHH = β_1	-0.004 [-0.03]	-0.323 [-1.43]	-0.202 [-0.66]	-0.103 [-0.45]	0.537^{**} [2.14]
DiD*Shock*FHH = $\beta_1+\beta_2$	-0.110 [-0.991]	-0.146 [-1.029]	-0.205 [-0.979]	-0.040 [-0.231]	0.117 [0.585]
Other controls					
Demographics	YES	YES	YES	YES	YES
Community level	YES	YES	YES	YES	YES
Districts	YES	YES	YES	YES	YES
N	5039	5039	5039	5039	5039
r2	0.040	0.039	0.040	0.039	0.041
Panel B: HC3+	**Any**	**Demo**	**Econ**	**Health**	**Agr**
DiD*Shock = β_2	-0.035 [-0.40]	0.182 [1.28]	0.017 [0.11]	-0.169 [-1.22]	-0.015 [-0.12]
Differential for shocked FHH = β_1	-0.006 [-0.05]	-0.268 [-1.35]	-0.141 [-0.68]	0.260 [1.48]	0.025 [0.15]
DiD*Shock*FHH = $\beta_1+\beta_2$	-0.040 [-0.492]	-0.086 [-0.717]	-0.125 [-1.031]	0.091 [0.789]	0.010 [0.096]
Other controls					
Demographics	YES	YES	YES	YES	YES
Community level	YES	YES	YES	YES	YES
Districts	YES	YES	YES	YES	YES
N	5039	5039	5039	5039	5039
R^2					
Panel C: HC4+	**Any**	**Demo**	**Econ**	**Health**	**Agr**
DiD*Shock = β_2	-0.001 [-0.03]	0.052 [0.87]	0.006 [0.21]	-0.020 [-0.22]	-0.007 [-0.12]
Differential for shocked FHH = β_1	-0.023 [-0.46]	-0.126* [-1.73]	-0.071 [-1.53]	0.052 [0.50]	0.034 [0.52]
DiD*Shock*FHH = $\beta_1+\beta_2$	-0.025 [-0.803]	-0.074* [-1.878]	-0.065* [-1.827]	0.033 [0.601]	0.028 [0.774]
Other controls					
Demographics	YES	YES	YES	YES	YES
Community level	YES	YES	YES	YES	YES
Districts	YES	YES	YES	YES	YES
N	5039	5039	5039	5039	5039
R^2	0.011	0.012	0.008	0.011	0.009

t statistics in brackets * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the community level. All regressions include demographic and community characteristics.

Table 9: Heterogeneous impacts of CGP on multidimensional deprivation intensity by experience of shocks and gender of household head

Panel A: A1+	(1) Any	(2) Demo	(3) Econ	(4) Health	(6) Agr
DiD*Shock = β_2	-0.013 [-0.45]	0.077 [1.64]	-0.006 [-0.11]	-0.034 [-0.76]	-0.048 [-1.13]
Differential for shocked FHH = β_1	0.002 [0.05]	-0.106* [-1.70]	-0.051 [-0.70]	0.062 [1.17]	0.075 [1.18]
DiD*Shock*FHH = β_1+β_2	-0.012 [-0.428]	-0.029 [-0.782]	-0.058 [-1.245]	0.028 [0.756]	0.026 [0.593]
Other controls					
Demographics	YES	YES	YES	YES	YES
Community level	YES	YES	YES	YES	YES
Districts	YES	YES	YES	YES	YES
N	4652	4652	4652	4652	4652
R^2	0.035	0.033	0.032	0.032	0.035
Panel B: A2+	**Any**	**Demo**	**Econ**	**Health**	**Agr**
DiD*Shock = β_2	0.003 [0.13]	0.051 [1.20]	0.001 [0.04]	-0.050 [-1.24]	0.036 [0.99]
Differential for shocked FHH = β_1	-0.009 [-0.25]	-0.077 [-1.49]	-0.029 [-0.61]	0.083 [1.54]	-0.031 [-0.68]
DiD*Shock*FHH = β_1+β_2	-0.006 [-0.251]	-0.026 [-0.798]	-0.027 [-0.896]	0.033 [0.987]	0.005 [0.185]
Other controls					
Demographics	YES	YES	YES	YES	YES
Community level	YES	YES	YES	YES	YES
Districts	YES	YES	YES	YES	YES
N	2713	2713	2713	2713	2713
R^2	0.029	0.030	0.020	0.023	0.027
Panel C: A3+	**Any**	**Demo**	**Econ**	**Health**	**Agr**
DiD*Shock = β_2	0.003 [0.13]	-0.004 [-0.09]	0.006 [0.26]	0.018 [0.39]	-0.003 [-0.07]
Differential for shocked FHH = β_1	-0.026 [-0.68]	-0.040 [-0.82]	-0.081** [-2.36]	-0.012 [-0.21]	0.041 [0.79]
DiD*Shock*FHH = β_1+β_2	-0.023 [-0.910]	-0.044* [-1.711]	-0.075*** [-3.036]	0.005 [0.134]	0.039 [1.104]
Other controls					
Demographics	YES	YES	YES	YES	YES
Community level	YES	YES	YES	YES	YES
Districts	YES	YES	YES	YES	YES
N	869	869	869	869	869
R^2	0.043	0.047	0.046	0.044	0.040

t statistics in brackets * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the community level. All regressions include demographic and community characteristics.

6.3. Mitigating effects of the CGP on simultaneous shocks

Timing and simultaneity of the shocks may further increase vulnerability and exposure to multiple deprivations by children, potentially worsening the effect of a single shock. Shocks, when occurring simultaneously, may reinforce their resultant effect, making the coping strategies more difficult to realize and exposing children to increased risk of deprivations. Whereas in the previous section we viewed shocks as discrete and separate events, we now treat them as an aggregate to investigate if and how the CT also represents a valuable coping mechanism against multiple deprivations when children are simultaneously hit by manifold shocks. We allow for the concomitance of shocks as follows:

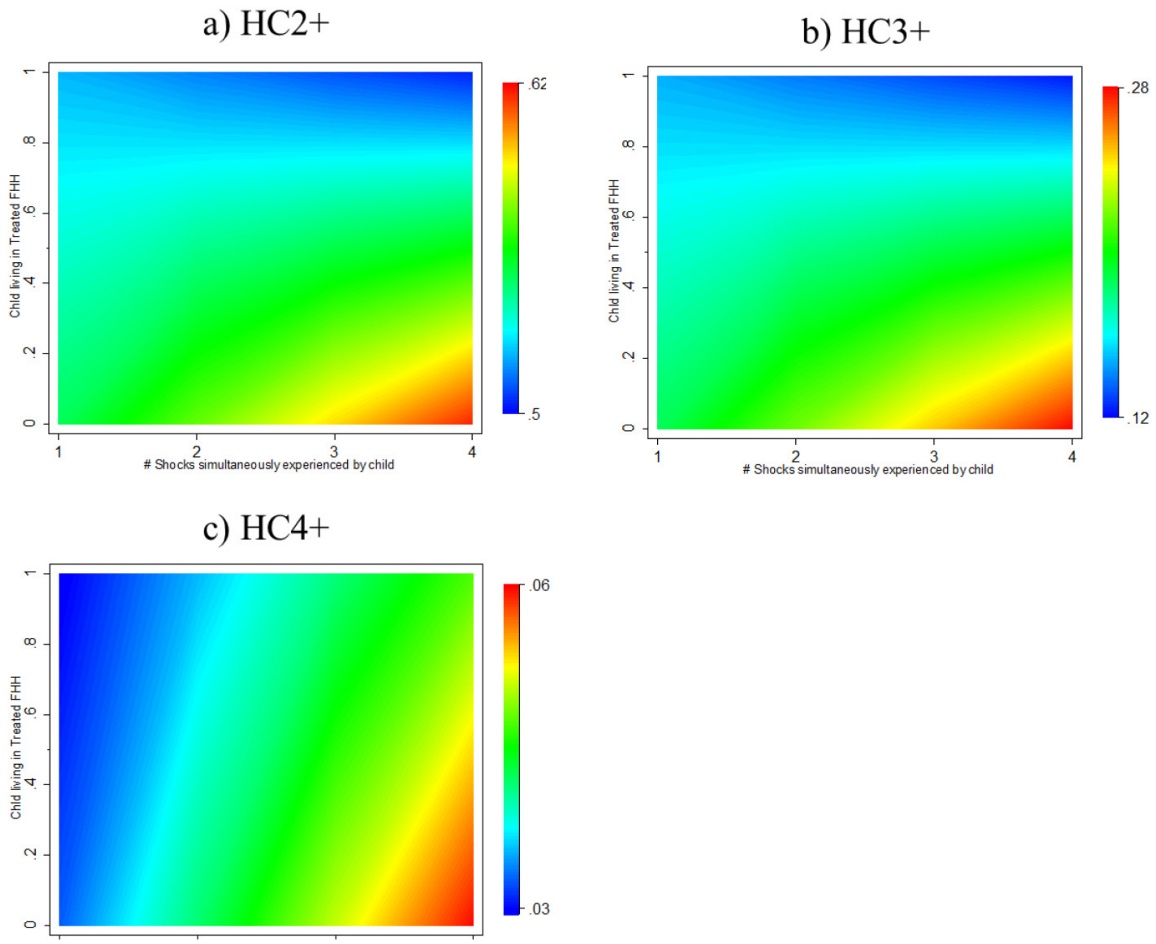
$$y_{iht} = \beta_0 + \beta_1 Treat_h * Post_t * FHH_i * nshocks_{ih} + \beta_2 Treat_h * Post_t * nshocks_{ih} + \vartheta \mathbf{W}_{iht} + \theta \mathbf{X}_{iht} + \pi Z_{ht'2011} + \rho Q_{ct} + \delta_i + \varepsilon_{iht} \quad (11)$$

The variable $nshock_{ih}$ represents the total number of simultaneous shocks experienced by child i . The interaction coefficient $\beta_1(Treat_h * Post_t * FHH_i * nshocks_{ih})$ from equation (8), returns the mitigating effect of CGP on the linear probability of experiencing multiple deprivations as a response to multiple shocks.

In Figure 4 we display a simple contour plot depicting the change in probability of experiencing multidimensional deprivations at three different cut-offs (i.e. marginal effects) using the two most relevant discriminatory factors: (i) living in an FHH benefitting from the CGP (Y-axis) and (ii) number of shocks experienced simultaneously by the child (X-axis). The coloured area represents the change in probability for progressive variations in the X and/or Y dimensions.

Higher marginal effects are reported in red, lower marginal effects are reported in blue, following the colour scale of the legend on the right side of each contour plot. The figures are not directly comparable as the scale is rearranged for each cut-off at its maximum and minimum levels of probability. As such, they should be read as stand-alone plots.

Figure 4: Marginal changes in HC probabilities in response to variation in treatment status and number of simultaneous shocks.



Note: Significance not reported

Though it has some limitations, this graphic representation intends to provide a qualitative snapshot of the potential interplay among CGP and shock intensity. Starting with children living in control FHH (i.e. Y-axis=0), we show that if the number of shocks increases by one unit, the children may be subject to a higher risk of facing simultaneous deprivations (i.e. the probability turns red). Conversely, when the FHH is receiving the cash (i.e. Y-axis=1) we find two results: (i) the marginal effects of an increased number of shocks are on average lower (blue) than control; and (ii) the marginal effects at different shock levels vary only infinitesimally with the shock intensity. This suggests that CGP recipients could be more likely, compared to their non-treated counterparts, to protect their children from the combined impacts of multiple shocks. This mitigating effect varies over the number of shocks at cut-off =4 and is consistently lower for children in treated FHH than for children in control FHH.

Our second hypothesis was that *(2) The cash transfer mitigates the adverse effects of shocks on children's multiple deprivations.* We find that the CT has only a partial effect in mitigating the adverse effects of shocks on child deprivation. Our third hypothesis was that: *(3) The mitigating effects of the CGP are different for children exposed to multiple/single shocks who live in female- vs male-headed households. We expect the effect of the CT to be stronger for children in FHH, since they are more* *vulnerable to shocks and more likely to be constrained.* We find evidence that the mitigating effect works more strongly for children in treated FHH versus control FHH, while confirming that it works as a buffer for more disadvantaged households. We do not find strong evidence of a greater impact on FHH versus MHH.

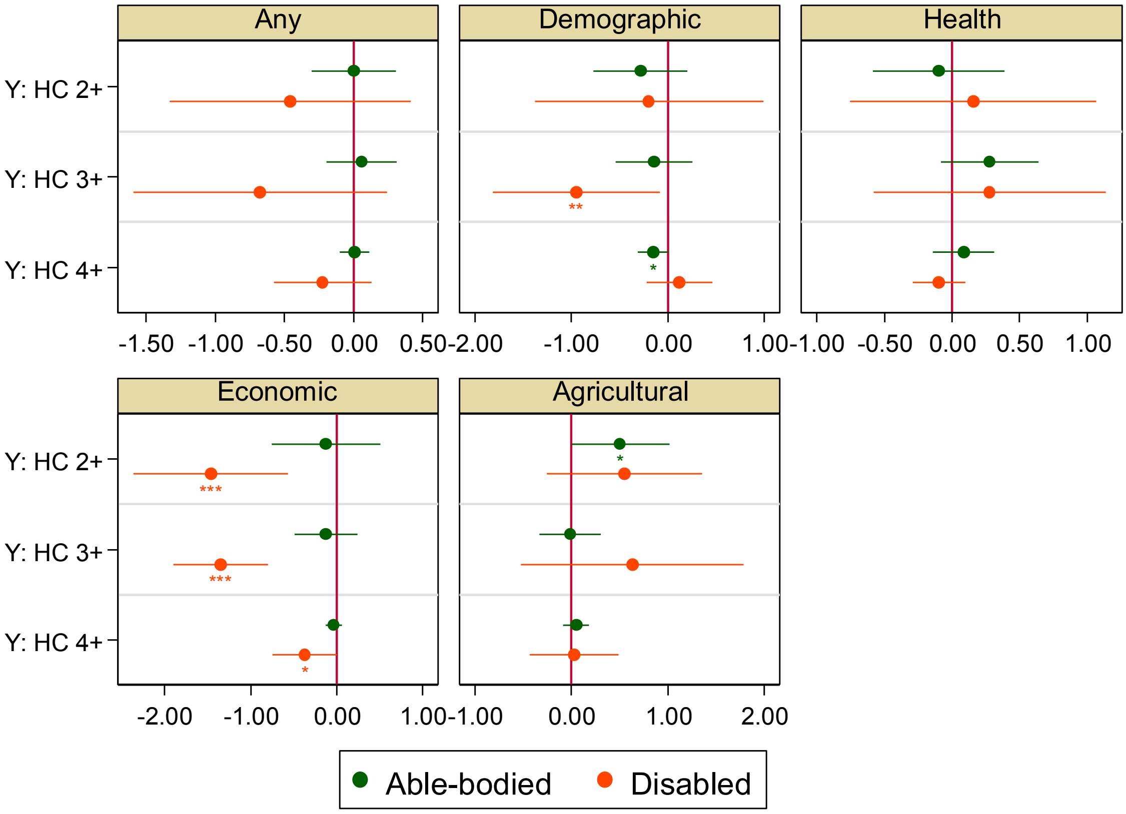
6.4. Heterogenous impacts by labour-constrained status

The findings presented in the previous sections suggest that CTs are successful shock-responsive tools that substantially contribute to the objective of lifting vulnerable children living in treated FHH (versus control) out of poverty. We test here if the CGP is effective in shielding children living in FHH where the head is suffering from a permanent disease against the burden of additional exogenous transitory negative events.

Figure 5 to Figure 7 distinguish the impact of CT on multidimensional deprivation outcomes by shock and gender of the head within the subsamples of labour-constrained vs not labour-constrained households. We plot the β_1 value with related significance from Equation (10), which is the coefficient for the interaction between the DiD term, the indicator for FHH and the shock ($Treat_h * Post_t * FHH_h * Shock_h$), and isolates the CGP impact for children living in FHH hit by a shock.

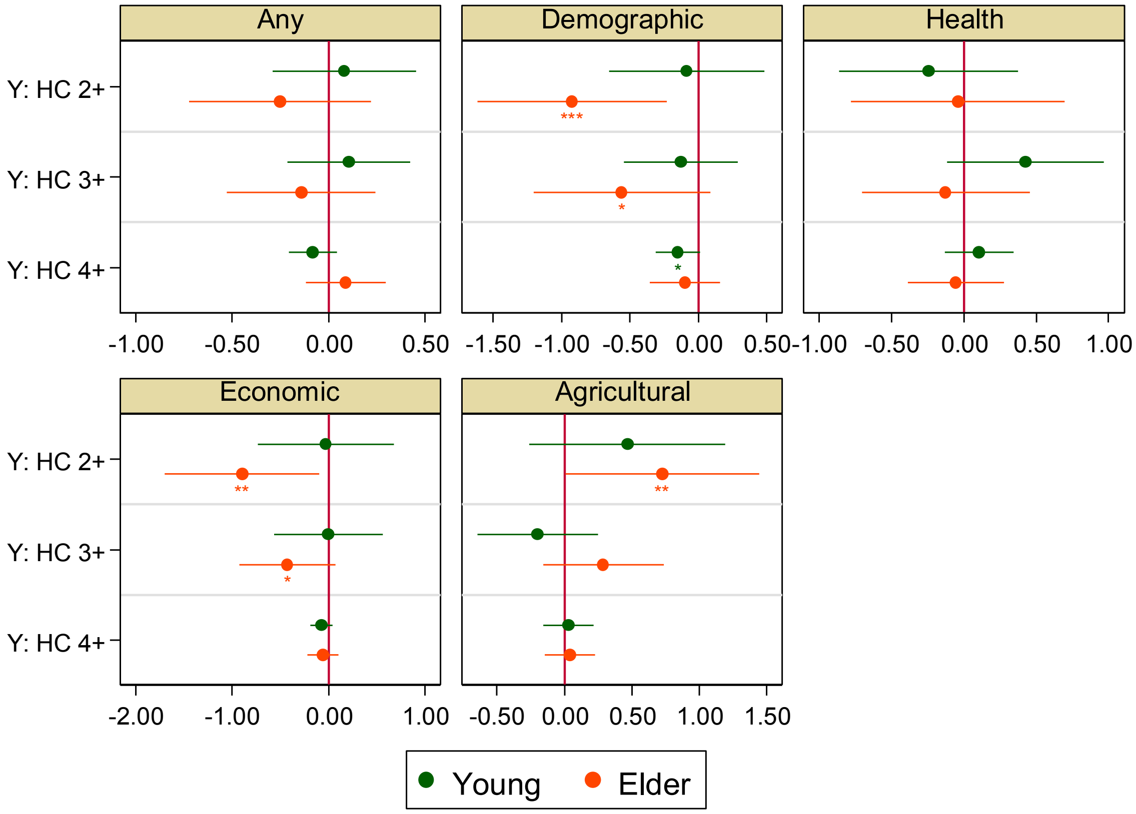
The results for the impact heterogeneities confirm our expectation that cash has a greater and positive impact on shock-coping for those children living in labour-constrained households. Figure 5 indicates that cash generates a reduction in the probability of experiencing multiple deprivations for those children who live in a disabled FHH hit by a demographic shock (significant at cut-off k=3) or by an economic shock (significant at all cut-offs). For children living in an able-bodied FHH, we do not find evidence that cash has any shock-mitigating effect. As such, the overall negative effect found in the previous section seems to be driven by labour-constrained households, confirming that the programme is particularly beneficial for the most disadvantaged. We see a similar trend in Figure 6, with stronger impacts again for those children subject to demographic and economic shocks at k=2 and k=3. Generally, the CT does not appear to be shock-mitigating for those children living in households affected by chronic illnesses (Figure 7). We find only a negative and statistically significant impact at cut-off k=3 for those being impacted by a demographic shock. This may be due to the fact that chronic illnesses, if requiring ongoing treatment and expenditures, can drain the additional resource provided by the CT, making it more difficult to cope with additional shocks.

Figure 5: Heterogeneous impacts of CGP on multidimensional child deprivations by shock, disabled vs able-bodied female head



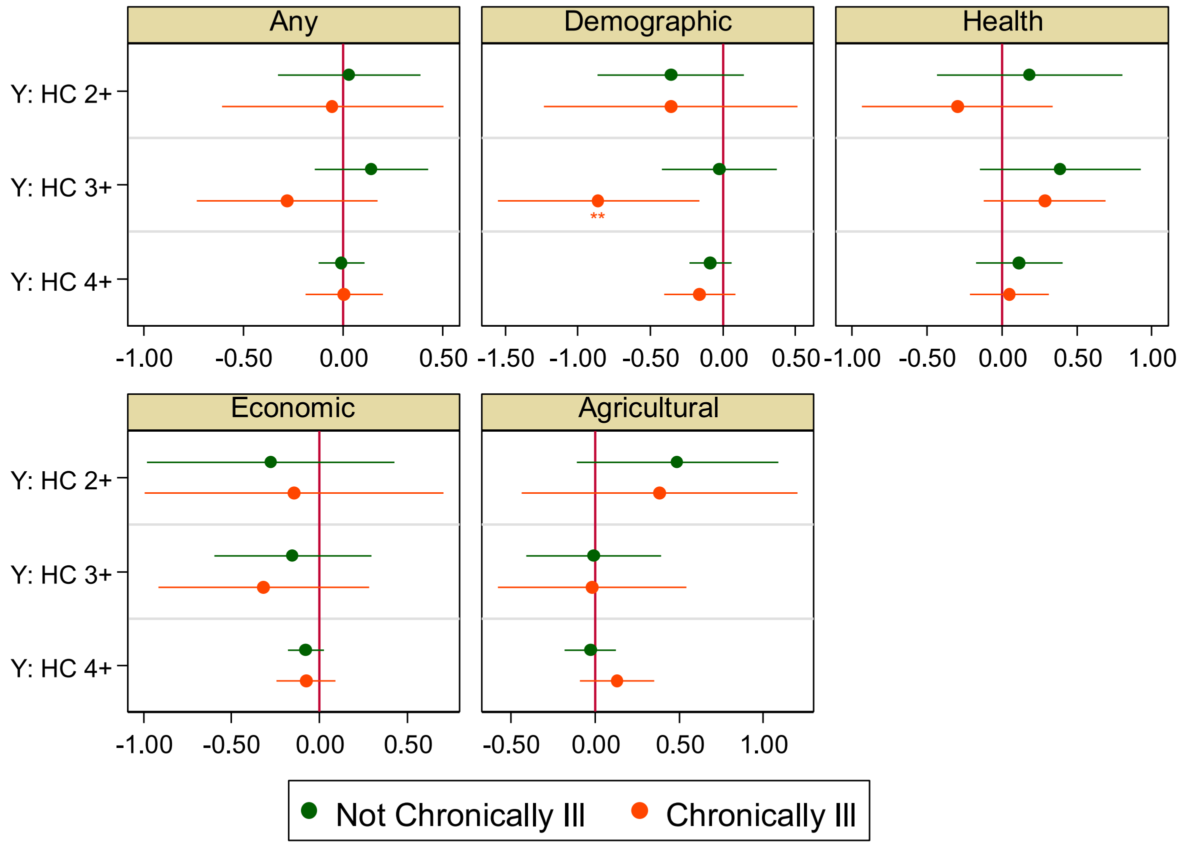
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the community level. All regressions include demographic and community characteristics.

Figure 6: Heterogeneous impacts of CGP on multidimensional child deprivations by shock, young vs elderly female head.



* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the community level. All regressions include demographic and community characteristics.

Figure 7: Heterogeneous impacts of CGP on multidimensional child poverty by shock, chronically ill vs not chronically ill female head.



* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the community level. All regressions include demographic and community characteristics.

Our fourth hypothesis was that: *(4) The effect of the CGP on child deprivation for children experiencing shocks is differentiated by gender of household head and it is larger if the household head is not fit to work.* We find evidence that the CGP can mitigate the effect of shocks on children living in FHH that are labour-constrained, particularly where there are household heads with disabilities. We do not find evidence of a positive impact of the CT in households with a chronically ill head, which opens the question of how much can the CT buffer households with ongoing expenses for medical treatment?

7. CONCLUSION AND POLICY IMPLICATIONS

In this paper we investigate whether the Lesotho CGP mitigates the negative effects of single and multiple self-reported shocks on child well-being, for school-age children already living in disadvantaged household settings. The analysis reveals that Lesotho's CGP can be beneficial for child well-being in female-headed beneficiary households after a shock. This is particularly the case for the most vulnerable households, which are those who are labour-constrained: children in treated households have a lower probability of being deprived at different cut-offs of multidimensional deprivation, and are, on average, less deprived. We find that the CGP mitigates demographic and economic shocks, particularly for those living in FHH whose head is an elder or disabled. This finding, as well as the models that examine all negative shocks, suggests that shocks to demographic and economic capital are the principal shocks negatively impacting households' livelihoods and child well-being in these rural landscapes.

Overall, we find that the CT could help beneficiaries to improve children's livelihood conditions, as elaborated above. However, as extensively explained by Fisher et al. (2017) in their qualitative analysis on beneficiary perspectives, the CT, though helpful, did not stop Lesotho's households being negatively affected by shocks. When beneficiaries are extremely vulnerable because they are labour constrained (elderly, ill, disabled) or have many dependents, they adopt negative coping strategies, either to handle daily problems or to face unpredictable exogenous events, like shocks or delays in CT payments. However, we find that for female-headed and labour-constrained households, the protective effect of the CGP is stronger than for male-headed and non-constrained households, confirming the hypothesis that social protection is a crucial tool for vulnerable households.

Nevertheless, this study has several limitations: while we focus on an array of shocks, some of these could be endogenous to the state of vulnerability of the household. We resolve this partially by interacting the shocks with the treatment variable, which is clearly exogenous; however, findings should be interpreted with some caution. Second, self-reported shocks themselves have a limitation in that their effect on the household is already incorporated in the reporting (i.e. an event that did not affect the household would not be reported as a shock). However, they do provide a crucial insight into where households' main concerns lie. A further extension of this work could incorporate validation from external sources such as objective measures of weather shocks, which are free of respondent bias and can capture reality at a finer scale (Asfaw et al., 2017).

Our study provides evidence that CT can play an important role in avoiding the use of negative coping strategies to respond to idiosyncratic and covariate shocks. Our findings suggest that it is important that the design of social protection programmes considers the inclusion of a shock-coping component and that this takes into account gender and labour-constrained households. While we find a positive impact for the most vulnerable and most deprived children, the CGP fails to deliver broad benefits in terms of child deprivation. This is not unexpected: multidimensional poverty is harder to influence, since the programme needs to be able to lift several constraints at once, and since many deprivations depend on external factors. However, these findings entail substantial policy recommendations. (1) Cash transfers alone cannot act as a panacea: there is a need for integrated programmes, particularly to address the needs of children which cannot be addressed by an increase in expenditure power, especially in contexts with partial or non-functioning markets. In this sense, the recent addition to the CGP of the Sustainable Poverty Reduction through Government Service Support (SPRINGS) component seeks to improve the resilience and food security of households, improving their access to credit and to productive activities such as gardening. Preliminary results across a range of household outcomes, including child anthropometry, are promising (FAO, 2019). However, this type of complementary programme that focuses mostly on the productive aspect of security may not be the best suited to address child deprivation. (2) In a context characterized by widespread poverty and vulnerability, CTs can easily be drained by ordinary expenses, leaving disadvantaged households even more vulnerable in the face of shocks. The design of social protection programmes should integrate mechanisms to support these households. (3) Not all shocks are equal: CGP is able to provide a buffer against idiosyncratic shocks, such as demographic and economic shocks; however, it is less able to respond to covariate shocks, such as weather shocks that impact agricultural production. While this is to be expected, there is an increasing and urgent need for social protection systems to be able to respond to these types of events. On the other hand, we need to be mindful about not shifting the focus entirely onto climate-related occurrences: shocks related to the human and physical capital of households are still one of the major threats to poor populations. Finally, (4) while most CTs already focus on 'labour-constrained' households, the reason for their constraint can play a major role in the effectiveness of the programme. Understanding the role of different types of hindrances on child well-being is necessary to inform better design of programmes.

While CTs definitely have the demonstrated potential to support child well-being and act as a buffer from shock for the most disadvantaged families, there is still substantial room for improvement in design and delivery to make them more effective in the face of an increasingly uncertain future.

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APPENDIX A: BALANCE TESTS

In the paper we reported the sample attrition rate from baseline to endline for children aged between 4 and 15 at baseline. In addition, we examined baseline means for individuals included in treated vs control groups for the main multidimensional child deprivation outcome variables. In this section, we report attrition and balance checks for the whole set of variables included in the analysis, including outcomes and controls. Table A1 presents the baseline means and tests of equality between 'panel' children (i.e. those children interviewed both at baseline and endline) and 'attrited' children (i.e. those children interviewed only at baseline and not tracked at endline) for treatment group (columns (1)–(3)) and control group (columns (4)–(6)). Tests of equality between 'panel' children (treatment vs control means) are reported in columns (7)–(8). Tests of equality between 'attriters' (treatment vs control means) are shown in columns (9)–(10).

The characteristics of children who attrit (n=198) and stay (n=1,194) in the sample are generally similar in the treatment (columns (1)–(3)) group, as only 3 out of 14 household level variables are found to be statistically different at 5 per cent significance. In the control group (columns (4)–(6)), 5 out of 14 variables among demographics differ between attriters (n=104) and panel (n=1,369). The attriters in the control (n=104) differ from treated (n=198) for the following two variables: FHH and number of siblings 6–12. To reduce any bias, in the empirical analysis we included both among the controls.

P-values in column (8) show that eligible children interviewed at baseline in both treatment (n=1,194) and control (n=1,369) groups are generally similar. The main violations of balance at $p<0.05$ are recorded for 3 out of 14 household level variables, namely household size, number of siblings aged 0–5 years, number of household members aged 18–59 years and two community level controls, wheat and maize prices.

Table A1. Means and attrition analysis among all eligible children (panelled and attrited) aged 4 to 15 at baseline by programme status (n=2,865)

	Treatment			Control			Panel T vs C		Attrited T vs C	
	(1) Panel	(2) Attritted	(3) P-value Col (1) - (2)	(4) Panel	(5) Attritted	(6) P-value Col (4) - (5)	(7) Diff Col (1) - (4)	(8) P-value Col (1) - (4)	(9) Diff Col (2) - (5)	(10) P-value Col (2) - (5)
HC2: Deprived in 2+ dimensions	0.52	0.57	0.35	0.59	0.59	0.92	-0.08	0.00	-0.03	0.66
HC3: Deprived in 3+ dimensions	0.18	0.16	0.76	0.16	0.19	0.35	0.01	0.49	-0.03	0.53
HC4: Deprived in 4+ dimensions	0.03	0.04	0.63	0.03	0.03	0.67	0.00	0.46	0.01	0.71
Intensity of deprivation 1+ dimensions	0.26	0.26	0.89	0.26	0.27	0.53	0.26	0.27	0.46	0.18
Intensity of deprivation 2+ dimensions	0.34	0.34	0.60	0.33	0.34	0.26	0.01	0.01	0.00	0.77
Intensity of deprivation 3+ dimensions	0.45	0.46	0.62	0.45	0.45	0.70	0.00	0.50	0.01	0.70
Health Deprivation (1=YES)	0.11	0.08	0.35	0.08	0.15	0.00	0.03	0.03	-0.07	0.07
Education Depr. (1=YES)	0.18	0.28	0.01	0.19	0.18	0.70	-0.01	0.37	0.10	0.05
Nutrition Depr. (1=YES)	0.71	0.66	0.28	0.78	0.81	0.42	-0.07	0.00	-0.14	0.01
Water Depr. (1=YES)	0.19	0.22	0.42	0.16	0.14	0.47	0.03	0.07	0.08	0.08
Living Standards Depr (1=YES)	0.42	0.45	0.54	0.45	0.44	0.87	-0.02	0.21	0.01	0.86
Child Labour Depr. (1=YES)	0.07	0.05	0.41	0.06	0.07	0.92	0.01	0.56	-0.02	0.53
Controls										
Age	9.47	9.98	0.15	9.57	10.03	0.08	-0.09	0.51	-0.07	0.88
Child Sex (1=M; 2=F)	1.48	1.54	0.23	1.50	1.52	0.69	-0.02	0.25	0.02	0.74
HH Size	6.89	6.36	0.06	6.43	5.90	0.00	0.46	0.00	0.46	0.11
Female-Headed Household (1=YES)	0.51	0.36	0.00	0.53	0.62	0.01	-0.01	0.50	-0.26	0.00
Age Head	53.68	48.42	0.00	52.78	50.70	0.06	0.90	0.11	-2.26	0.24
#Siblings 0–5	1.01	0.93	0.46	0.92	0.83	0.24	0.09	0.02	0.11	0.29
#Siblings 6–12	1.71	1.67	0.74	1.64	1.40	0.00	0.07	0.09	0.28	0.04
#Siblings 13–17	1.03	1.00	0.76	0.97	1.09	0.06	0.06	0.08	-0.09	0.38
#Members 18–59	1.21	1.19	0.85	1.11	1.00	0.16	0.11	0.01	0.19	0.13
#Males >60	0.16	0.12	0.24	0.15	0.08	0.01	0.01	0.53	0.03	0.33
#Female >60	0.30	0.23	0.12	0.30	0.30	0.98	0.00	0.79	-0.07	0.21

Table A1. Means and attrition analysis among all eligible children (panelled and attrited) aged 4 to 15 at baseline by programme status (n=2,865) cont.

# Orphans	1.75	1.66	0.61	1.67	1.85	0.14	0.09	0.19	-0.17	0.38
Highest Education level in the HH	7.69	7.17	0.03	7.75	7.38	0.03	-0.06	0.54	-0.22	0.43
Ln Operated Land	1.04	0.75	0.06	0.94	0.85	0.58	0.10	0.16	-0.10	0.66
Districts and community level variables										
Leribe	0.23	0.21	0.73	0.22	0.23	0.75	0.00	0.79	-0.02	0.67
Berea	0.26	0.24	0.68	0.29	0.24	0.11	-0.03	0.06	0.00	0.97
Mafeteng	0.25	0.27	0.64	0.23	0.37	0.00	0.02	0.22	-0.10	0.09
Qacha's Nek	0.05	0.15	0.00	0.06	0.09	0.07	0.00	0.63	0.06	0.10
Maize Price	3.90	4.08	0.10	4.01	3.76	0.02	-0.11	0.03	0.31	0.03
Wheat Price	6.02	5.74	0.11	5.77	5.59	0.06	0.24	0.00	0.14	0.40
Breakdown variables										
Head Chronically ill	0.33	0.34	0.85	0.29	0.37	0.02	0.03	0.06	-0.03	0.56
Head Not Fit to Work	0.58	0.49	0.09	0.56	0.54	0.56	0.01	0.51	-0.05	0.43
Head Elder	0.38	0.31	0.14	0.37	0.35	0.72	0.01	0.47	-0.05	0.41

APPENDIX B: MULTIDIMENSIONAL DEPRIVATION

The **multidimensional deprivation headcount ratio (H)** shows the proportion of children experiencing different numbers of deprivations at the same time.

Once indicators are aggregated into dimensions with the union approach, we start computing the total number of deprivations each child experiences. Deprivations counting happens for each child i separately to inform about her/his breadth of deprivation, so let $j = 1, 2, \ldots d$ index dimensions[8] and let $i = 1, 2, \ldots n$ identify the children.

$$ND_i = \sum_{j=1}^{d} y_j \quad (1)$$

where

ND_i = the total number of dimensions j each child i is deprived in;

$y_j = 1$ if child i is deprived in the dimension j;

$y_j = 0$ if child i is not deprived in dimension j.

Then, the total number of deprivations per child is used to identify those children who are multidimensionally deprived depending on the chosen cut-off point k (two, three, four or more dimensions). This means that child i is considered to be multidimensionally deprived if the number of dimensions in which she/he is deprived (ND_i) is equal to or larger than k. This can be defined as follows:

$$D_k = 1 \text{ if } ND_i \geq k \quad (2)$$

$$D_k = 0 \text{ if } ND_i < k$$

with k representing the cut-off point.

Simply put, the **deprivation headcount ratio** (3) is represented as follows:

$$H = \frac{nch_k}{tch} \quad (3)$$

with $$nch_k = \sum_{i=1}^{n} \mathrm{D}_k \quad (4)$$

where:

H represents the multidimensional child deprivation headcount ratio according to cut-off point k;

nch_k is the number of children affected by at least k deprivations;

tch is the total number of children in specified age group;

y_k is the deprivation status of a child i depending on the cut-off point k.

8 MODA uses the union approach to aggregate indicators into dimensions in order to capture all the children who are deprived in any of the chosen indicators.

The **average intensity of multidimensional deprivation** A measures the extent of child deprivation among those children identified as multidimensionally deprived. It is defined as the sum of all existing deprivations among deprived children, as a share of the sum of all possible deprivations among those deprived in at least k dimensions. The average intensity of deprivation uses the following equation:

$$A = \frac{\sum_{1}^{nch_k} c_k}{nch_k * d} \qquad (5)$$

Where:

A is average intensity of multidimensional deprivation according to the cut-off point k for the specific age group; nch_k is number of children affected by at least k deprivations in that age group; d is total number of dimensions considered per child within the relevant age group; c_k represents number of deprivations each multidimensionally deprived child i experiences, with $c_k = ND_i * D_k$.

APPENDIX C: IMPACT OF SHOCKS ON MULTIDIMENSIONAL CHILD DEPRIVATIONS (PREVALENCE AND INTENSITY)

In this section, we assess the average impact of shocks on multiple deprivations among the group of panelled children. Children hit by "any shock" (columns 1, 7, 13) are more likely to experience an increase in multiple simultaneous deprivations. This effect is significant for those children deprived in 3+ or 4+ dimensions simultaneously. Separate estimates are then conducted introducing each shock at a time. Demographic shocks seem to drive the overall effect, they are positive and statistically significant for children experiencing deprivation in 3+ and 4+ dimensions at $p<0.05$ and $p<0.1$ respectively. Shocks related with agriculture are significant, although weakly, for those deprived in 3+. The average impact of economic shocks is negative and significant (at $p<0.1$) at cut-off $k=4$. One possible explanation could be that self-reported shocks by construction incorporate the subsequent copying mechanism activated by the household. It is possible that the economic shock has activated informal safety nets of the household, through informal transfers and social networks, thus leading to a comparative improvement with respect to other types of shocks. Additionally, given the low number of children deprived in 4+, there could be a selection on unobservables that affects both the exposure to economic shocks and deprivation.

Table C1. Impact of shocks on HC2+, HC3+ HC4+ among all eligible panelled children aged 4 to 15

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	HC 2+	HC 2+	HC 2+	HC 2+	HC 2+	HC 2+	HC 3+	HC 3+	HC 3+	HC 3+	HC 3+	HC 3+	HC 4+	HC 4+	HC 4+	HC 4+	HC 4+	HC 4+
Any Shock	0.027						0.046***						0.012**					
	[1.13]						[3.03]						[2.02]					
Demo Shock		0.010						0.043**						0.016*				
		[0.34]						[2.04]						[1.66]				
Health Shock			0.057						0.029						0.011			
			[1.59]						[1.09]						[1.05]			
Economic Shock				-0.003						-0.001						-0.012*		
				[-0.09]						[-0.04]						[-1.84]		
Social Shock					-0.005						-0.042						0.001	
					[-0.09]						[-1.41]						[0.06]	
Agri Shock						0.018						0.041*						0.009
						[0.61]						[1.95]						[1.38]
DiD	-0.010	-0.010	-0.009	-0.010	-0.010	-0.010	-0.033	-0.033	-0.032	-0.032	-0.032	-0.031	-0.014	-0.014	-0.013	-0.013	-0.014	-0.013
	[-0.24]	[-0.23]	[-0.21]	[-0.23]	[-0.23]	[-0.22]	[-0.97]	[-0.99]	[-0.94]	[-0.95]	[-0.95]	[-0.92]	[-1.14]	[-1.16]	[-1.12]	[-1.12]	[-1.12]	[-1.11]
T	-0.074**	-0.075**	-0.075**	-0.075**	-0.075**	-0.075**	0.010	0.009	0.009	0.009	0.009	0.007	0.006	0.006	0.006	0.006	0.006	0.005
	[-2.03]	[-2.05]	[-2.06]	[-2.06]	[-2.06]	[-2.09]	[0.39]	[0.35]	[0.33]	[0.33]	[0.33]	[0.28]	[0.64]	[0.62]	[0.60]	[0.59]	[0.60]	[0.56]
year 2013	-0.393***	-0.394***	-0.388***	-0.393***	-0.393***	-0.395***	-0.136**	-0.141**	-0.133**	-0.136**	-0.136**	-0.140**	-0.020	-0.022	-0.019	-0.020	-0.020	-0.021
	[-5.40]	[-5.45]	[-5.26]	[-5.42]	[-5.42]	[-5.49]	[-2.34]	[-2.44]	[-2.29]	[-2.35]	[-2.34]	[-2.43]	[-0.82]	[-0.90]	[-0.77]	[-0.82]	[-0.82]	[-0.85]
Demographic	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Community level	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Districts	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	0.854***	0.867***	0.853***	0.867***	0.867***	0.866***	0.267***	0.287***	0.281***	0.287***	0.287***	0.285***	0.050*	0.055**	0.052*	0.055**	0.055**	0.054**
	[8.88]	[9.10]	[8.90]	[9.11]	[9.12]	[9.12]	[3.63]	[3.96]	[3.86]	[3.97]	[3.98]	[3.97]	[1.92]	[2.08]	[1.95]	[2.09]	[2.08]	[2.07]
Observations	5039	5039	5039	5039	5039	5039	5039	5039	5039	5039	5039	5039	5039	5039	5039	5039	5039	5039
r2	0.032	0.031	0.032	0.031	0.031	0.031	0.024	0.022	0.021	0.020	0.021	0.022	0.008	0.008	0.007	0.007	0.007	0.007

t statistics in brackets * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the community level.

Table C2. Impact of shocks on HC2+, HC3+ HC4+ among all eligible panelled children aged 4 to 15 at baseline

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	A1	A1	A1	A1	A1	A1	A2	A2	A2	A2	A2	A2	A3	A3	A3	A3	A3	A3
Any Shock	0.013***						0.003						0.011*					
	[3.33]						[0.70]						[1.92]					
Demo Shock		0.015**						0.005						0.009				
		[2.41]						[0.78]						[1.31]				
Health Shock			0.005						0.004						0.012			
			[0.78]						[0.51]						[1.28]			
Economic Shock				-0.003						-0.012**						-0.006		
				[-0.50]						[-2.05]						[-0.70]		
Social Shock					-0.010						0.009						-0.009	
					[-1.11]						[0.91]						[-0.78]	
Agri Shock						0.012**						0.002						0.012*
						[2.21]						[0.44]						[1.71]
DiD	-0.009	-0.010	-0.010	-0.010	-0.010	-0.009	-0.008	-0.008	-0.008	-0.009	-0.009	-0.008	0.003	0.004	0.003	0.002	0.005	0.003
	[-0.91]	[-0.99]	[-0.95]	[-0.97]	[-0.96]	[-0.86]	[-0.94]	[-0.98]	[-0.94]	[-1.04]	[-1.01]	[-0.93]	[0.23]	[0.30]	[0.21]	[0.16]	[0.37]	[0.25]
T	0.010	0.010	0.010	0.010	0.010	0.009	0.005	0.005	0.005	0.006	0.005	0.005	-0.001	-0.002	-0.001	-0.001	-0.002	-0.001
	[1.38]	[1.42]	[1.39]	[1.40]	[1.39]	[1.26]	[0.82]	[0.84]	[0.87]	[0.99]	[0.88]	[0.80]	[-0.06]	[-0.22]	[-0.07]	[-0.06]	[-0.16]	[-0.11]
Post	-0.007	-0.008	-0.005	-0.006	-0.006	-0.007	0.004	0.003	0.005	0.004	0.004	0.004	0.011	0.010	0.010	0.012	0.010	0.011
	[-0.42]	[-0.55]	[-0.30]	[-0.35]	[-0.36]	[-0.45]	[0.22]	[0.20]	[0.28]	[0.24]	[0.27]	[0.24]	[0.71]	[0.64]	[0.64]	[0.73]	[0.66]	[0.67]
Demographic	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Community level	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Districts	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	0.339***	0.345***	0.343***	0.344***	0.345***	0.345***	0.458***	0.459***	0.458***	0.458***	0.458***	0.459***	0.590***	0.586***	0.590***	0.589***	0.594***	0.589***
	[18.93]	[19.47]	[18.82]	[19.29]	[19.24]	[19.24]	[25.70]	[26.20]	[25.66]	[26.60]	[25.77]	[25.76]	[24.18]	[25.93]	[27.30]	[26.83]	[25.01]	[26.67]
Observations	2713	2713	2713	2713	2713	2713	869	869	869	869	869	869	146	146	146	146	146	146
r2	0.022	0.020	0.016	0.016	0.017	0.018	0.031	0.031	0.030	0.033	0.031	0.030	0.076	0.081	0.077	0.081	0.087	0.076

t statistics in brackets * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at the community level.