Innovative Finance for Social Justice

Microinsurance and Child Labour: An impact evaluation of NRSP's (Pakistan) microinsurance innovation

Microfinance for Decent Work

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Preface

Entrepreneurs in the informal economy, and the employees that work in those businesses, are often exposed to difficult and dangerous working conditions. The tools used to identify, prevent and rectify such conditions in the formal economy – including social dialogue between employers and employees, labour inspection and other applications of labour law – generally do not apply to the unregistered enterprises that proliferate in many emerging economies. Consequently, alternative approaches are required. But how can one reach these enterprises and influence their conditions?

Microfinance institutions (MFIs) are a potential conduit. In many emerging markets, they have significant outreach, providing financial services to thousands of small and micro enterprises. Since their primary relationship with these entrepreneurs often involves an enterprise loan, they could theoretically use that leverage to encourage improvements to conditions in the business.

Why would microfinance institutions be interested in doing that? Many MFIs have a social agenda, or a double bottom line approach that strives to combine social and commercial objectives. These organizations are often looking for new tools and approaches that allow them to efficiently enhance their social impact, especially since recent research has raised serious questions about the welfare benefits derived from microfinance. It is also possible that such interventions enhance business objectives, which would be of interest even to MFIs without a social agenda.

With this concept in mind, and with the generous support from the German Ministry of Labour and Social Affairs, the International Labour Organization (ILO) launched an action research programme to assess if MFIs could use their relationship with entrepreneurs to target decent work deficits and improve the plight of workers in the informal economy.

This Working Paper presents the results of an intervention of NRSP, Pakistan and is part of a series of impact reports that present the outcomes of this action research programme. The primary target audiences are MFI managers who will hopefully be inspired by their colleagues' ingenuity, educated about the impact of innovative approaches, and informed about the challenges of conducting action research (but not scared off). Other microfinance actors, including networks and associations, investors and funders, regulators and policymakers, academics and anyone interested in the social performance of microfinance will also find this paper informative.

For the ILO's constituents – employers' and workers' organizations and Ministries of Labour – the findings of this research present them with a new instrument in their policy toolkit to improve the circumstances of entrepreneurs and workers in the informal economy.

Through this initiative, the ILO wishes to promote its "Decent Work Agenda" among MFIs and also to demonstrate that MFIs can improve livelihoods of their clients through more comprehensive approaches, often including the provision of both financial and non-financial services.

For anyone interested in reading the other impact studies and the synthesis report, click on the MF4DW button on the Social Finance website (www.ilo.org/socialfinance).

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Executive Summary

National Rural Support Programme (NRSP) of Pakistan participated in the ILO's Microfinance for Decent Work (MF4DW) action research programme from 2008-2012. As part of this experimental research, NRSP launched and tested an extended microinsurance product (health and accidental death) covering extra-nuclear family members of the same household in order to see if there was a positive impact on the reduction of child labour among 2,097 client households, using a target versus control group methodology. Econometric analysis of the panel dataset collected from control and target groups at five equally spaced intervals show that NRSP's innovation can be linked to increased insurance coverage and usage, as well as decreased child labour incidence. Our findings remain robust to different methods, specifications and corrections for selection bias. However, we did not find significant treatment effects on school attendance, expenses (hospital) and household welfare (PPI score).

Acknowledgements

Acronyms

AJK	Azad Jammu and Kashmir
CL	Child Labour
FS	Follow-up Survey
ID	Identification Document
ILO	International Labour Organization
IPEC	International Programme to Eliminate Child Labour
MFI	Microfinance Institution
MF4DW	Microfinance for Decent Work
NRSP	National Rural Support Programme
PPI	Progress out of Poverty Index
SFP	Social Finance Programme
MI	Microinsurance
HH	Household
USD	United States Dollar
Rs	Pakistani rupees

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1.   Background: The ILO microfinance for decent work action research programme

The Microfinance for Decent Work (MF4DW) action research aims to build knowledge on the effects of innovations on microfinance clients' livelihoods. Launched by the ILO's Social Finance Programme (SFP) in 2008, the MF4DW action research began by identifying specific work-related challenges among microfinance clients and, to address them, implemented tailor-made innovations with 16 microfinance institutions (MFIs) worldwide. The MF4DW action research set out to apply an experimental research design to measure the impact of these innovations overtime. The MF4DW action research concluded in June, 2012.

At the outset of the MF4DW action research, each participating MFI conducted a diagnostic survey among 200 of its clients to determine their most pressing work-related challenge. The analysis was guided by ILO's vision of decent work for all and its goal to promote opportunities for women and men to obtain decent and productive work, in conditions of freedom, equity, security and human dignity. Within this framework, the diagnostic determined child labour, working conditions, formalization, job creation and productive employment, risk management/over-indebtedness, and women's empowerment, as key challenges keeping microfinance clients from obtaining decent work.

Informed by the diagnostic results, each MFI developed an innovation to address the work-related challenge that most affected its clients and began implementing the innovations from 2009 onwards. The innovations included new or upgraded:

- financial services (loan, savings, insurance, leasing);

- non-financial services (training, awareness campaign); or

- mechanisms for delivering services (organizational restructuring).

The MF4DW action research used an experimental research design, meaning that one group of clients received the innovation (target group) while another group of clients did not (control group). Ideally, clients of each group were selected randomly. Before the introduction of the innovations, all clients of the target and control groups were interviewed to establish a baseline against which changes could be compared. Depending on the implementation timeline, up to four follow-up surveys were conducted once the innovation was launched. The last follow-up surveys were completed in February 2012.

This report presents final impact results from the innovation implemented by National Rural Support Programme (NRSP) in Pakistan. Established in 1991, NRSP is the largest Rural Support Programme in the country in terms of outreach, staff and development activities. NRSP Microfinance Bank began operations in March, 2011; however, operations for the regulated bank have not yet reached the action research area as the transformation is gradual (which would have provided an extra external variable to be taken into account); however, once complete, NRSP will be the country's largest provider of microfinance services. At present, NRSP is active in 56 districts and in all four provinces and AJK. NRSP is currently working with about two million poor households organized into a network of more than 139,000 community organizations.

NRSP conducted the MF4DW action research in 13 randomly selected branch offices distributed across the city of Hyderabad in southern Pakistan. Hyderabad was chosen due to the density of child labourers known to be working in its glass bangle industry. As all clients are taken from several branches across the same city, the sample has comparable social and economic characteristics between control and target groups. Distribution of control versus target branch designations were randomly assigned with slightly more branches assigned to the group receiving the innovation with a total of 2,097 clients and their households composing the sample.

2. The decent work intervention: Increasing microinsurance coverage

The initial diagnostic conducted by NRSP in 2008 identified several work-related challenges. However, NRSP chose to focus on child labour as a result of the following findings:

- 6.5 per cent of clients reported employing children;

- 12 years was the average age of child labourers in the sample;

- On average, children seven years old and younger were working seven hours per day, often foregoing school, or combining schooling with their work;

- 12 per cent of respondents (total of 24) stated that they had been confronted with a large unforeseen expense in the last year;

- The most common reasons for large unforeseen expenses were death, accident, surgery or illness; and

- 0 per cent of clients reported using insurance or microinsurance as a protective mechanism against such insurable expenses.

Moreover, child labour is particularly severe in southern Pakistan as many children are involved in work within the glass bangles industry – a form of work that has been designated as dangerous and classifiable as hazardous work (for children under 18 years of age) through recommendations signed by both the ILO and the Pakistani government. In the past, NRSP and the ILO (through both the International Programme to Eliminate Child Labour (IPEC) and SFP) have taken steps to reduce poverty and the incidence of child labour in southern Pakistan through the use of financial instruments and the sensitization of populations through anti-child labour awareness campaigns. For example, prior to implementation of the action research, NRSP included in its loan package, a micro health and accidental death insurance that covers client, spouse and children under 18 automatically for the duration of each loan. However, despite these efforts, the use of child labour continues to be present and measurable among NRSP clients in the region around Hyderabad.

In order to address the client's use of child labour in a sustainable and financially viable way for the microfinance institution, NRSP upgraded its health and accidental death microinsurance product in the target branches by making the insurance product available to all non-nuclear family members (between the ages of 18 and 65) in the client's household in an effort to further mitigate household medical and hospitalization expenses that may push children into work. NRSP's innovation then, is to give clients the voluntary option to extend health and accidental death insurance to all household members outside the nuclear family when a client within that nuclear family takes a loan. In addition, and based on findings that showed low awareness among current NRSP clients, NRSP increased its loan officers' awareness on microinsurance to allow them to better assist clients and their household in proper use of the microinsurance product.

NRSP's innovation is an indirect approach to preventing increases in child labour by tackling several assumed triggers that may put a child to work; triggers such as the death of a household breadwinner, illness or incapacitation of a household member, and coverage of associated medical or death-related expenses. In the event that the household member has access to the upgraded microinsurance, more family members may be covered and therefore have a way to mitigate health-related expenses, instead of sending a child to work in order to cover them.

Innovation implementation in three steps

(1) An orientation training for 40 staff members of NRSP, held in August, 2009, introduced and reviewed in-depth the issue of child labour; trained the field staff on the action

research methodology and survey tool; and reviewed the future needs (technical, admin., data collection, etc.) with the research management team of NRSP. Participants included branch managers and loan officers from both target and control groups. Staff who administered surveys in the control group were instructed on the importance of contamination issues in the sample, and as well, the importance their role would play in the final analysis to determine impact.

(2) Beginning September 2009, NRSP's innovation was implemented on a rolling basis and complemented the NRSP loan product. In this sense, as clients came to NRSP for loans in the target and control branches, they were automatically enrolled in the action research programme and given access to the innovation (voluntary health and accidental death insurance covering non-nuclear family members of the household) after completing the baseline survey/loan application form; in the case of the control branches, clients were not given access to the innovation, but completed the same baseline survey. The premium for the voluntary insurance was 100 Pakistani rupees (Rs) per adult + spouse + children under 18 if any /per year (as the loan cycle covered one year).[1] The insurance covered hospital stays of more than 24 hours with a cost ceiling of Rs 15,000 (approximately USD 175) per individual insured. Covered cost categories ranged from room charges, doctor's visits, medication, operations, and pregnancy to transportation costs. Additionally covered were accidents leading to death or permanent disability up to Rs 15,000.

(3) On a monthly basis, during loan payment collections, loan officers inquired among clients in the target group as to whether or not they had incurred any medical or hospital expenses in the last month. If clients responded affirmatively, loan officers then guided them through the insurance usage process (a form of informal needs-based training on the product). This informal guidance could include assisting clients to fill out insurance forms correctly, aiding in the submission of forms to NRSP, or reminding clients to ask for the appropriate paperwork from the hospital.

3. Intended outcomes

NRSP's innovation intends to prevent increases in child labour resulting from insurable health-related expenses that may otherwise force a family to remove a child from school in order to replace an ill, injured, or deceased family member. With access to health and accidental death insurance, clients are expected to use this in lieu of a working child to cover the loss in income or the expenses associated with an unforeseen health-related expense. The indirect training from loan officers inquiring with each loan payment collection as to whether the household has had any health-related expenses is meant to increase awareness of the microinsurance product, as well as assist clients in the paperwork process. It is expected that clients begin to use and increase their knowledge on insurable expenses over the removal of children from classrooms to supplement income losses. The illustration below represents the expected results chain for the innovation:

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[1] If an adult was unmarried / widowed / divorced then Rs 100 for such adults

Figure 1: Extended microinsurance innovation results chain.
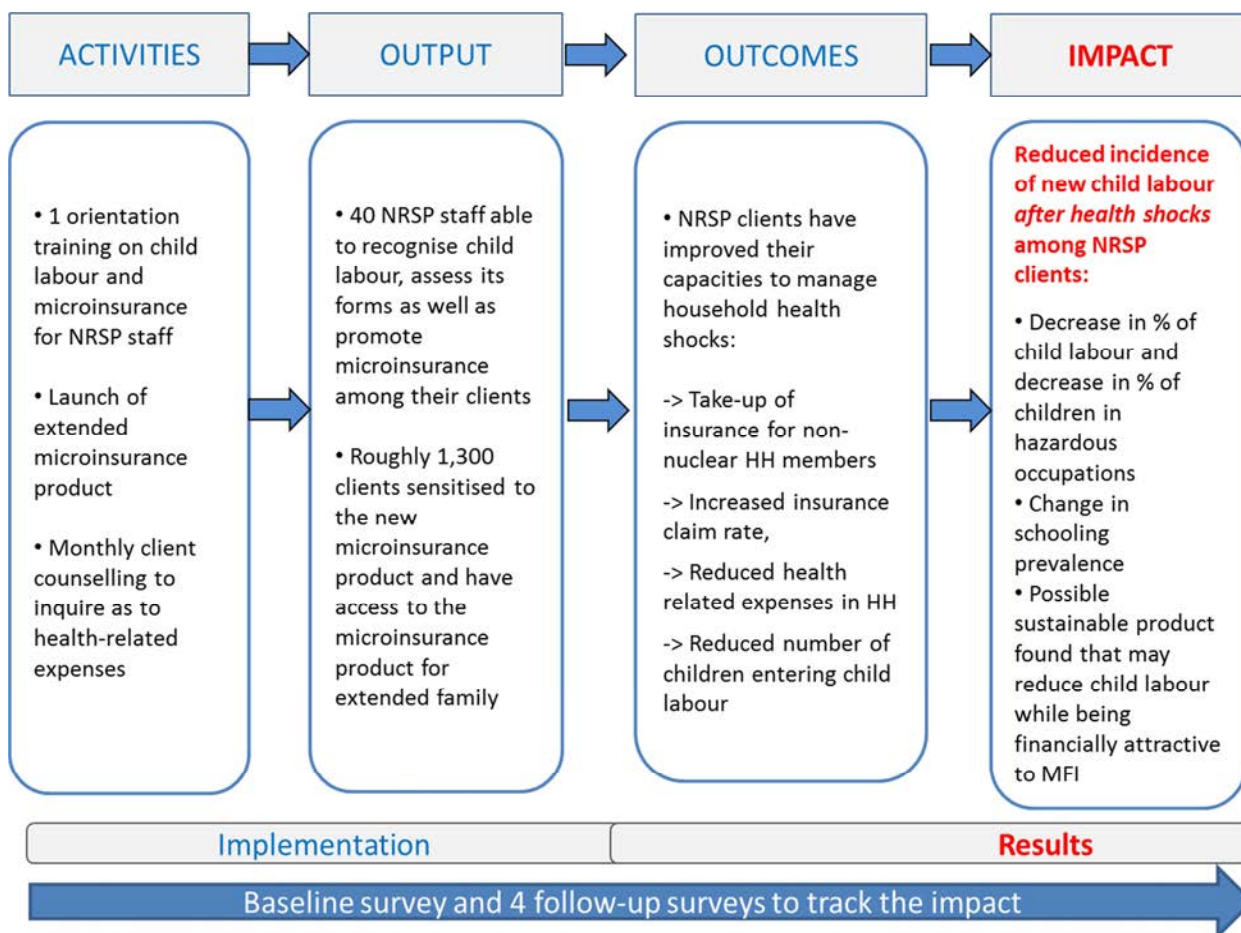
This report analyses whether the innovation had an impact on the following three outcomes:

(1) A reduction in child labour among target households as compared with control group households (see section 5.4 for results). NRSP (2009: 10) specifically mentions indicators "to be used to measure changes in child labour as a result of the innovation and/or external factors". Reducing child labour by increasing protection from economic shocks is an expectation supported by related research. The economic literature confirms that economic shocks are an important determinant of child labour for low-income households. At the same time many studies find substantial negative side-effects associated with child labour, such as lower human capital accumulation, lower wages in adult life and even negative long-term health outcomes.[2] We will assess the following aspects of child labour:

- Type of work/activity done by each household member, including children;

- Hazardous work done by children;

- Percentage of children between five and 17 years classified as child labourers;

- Average household/individual earnings through child labour.

(2) An improvement in schooling of children (see section 5.5 for results). Child work is often associated with lower schooling. From a certain work load onwards, it becomes physically impossible to combine the two. And even if children can manage school

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2   Edmonds (2008) provides an excellent review of the literature on child labour, amongst others focusing on the link between economic shocks and child labour.

while working, working children may have difficulties in concentration or miss more school days. We will assess the following aspects of schooling:

- Percentage of children between five and 14 years attending school;

- Male versus female children;

- Average number of school days missed per month;.

- Reasons for missed school days

(3) Ex-ante and ex-post effects: Being protected by insurance may change risk management behaviour ex-ante (before a shock happens) in many ways. Income sources might have to be less diversified for example. However, facing no shock also means that clients pay for insurance benefiting from a pay-out. NRSP (2009: 10) specifically mentions indicators to "monitor that clients do not become overburdened or indebted as a result of lost child labour hours or the additional cost of the insurance". It is not the hope of the innovation that the additional cost of more insurance coverage in a household pushes the family to rely more on income from child labour. Therefore, we will look at the following indicators (Appendix 3):

- Household incomes

- Household expenses

- PPI poverty score

Ex-post effects (insurance effects if a shock happens) on the other hand should clearly decrease financial pressure and mitigate the need of using child labour as a coping strategy. We will therefore investigate health events with and without insurance payouts taking place (see section 5.6 for results on ex-post effects).

This report focuses on causal relationships between the innovation and the intended outcomes in (1) – (3) without imposing ad-hoc relationships within the outcomes. As the impact of the innovation using microinsurance as a mitigation tool cannot be measured with a single indicator, compound indicators will be used for each of the intended outcomes in the empirical analysis below.

4. Surveys, data and evaluation methodology

4.1. Surveys and data

4.1.1. Sampling and survey instrument

The sample consists of all clients in 13 branch offices in Hyderabad, Pakistan whose credit appraisals were conducted in September/October 2009 (veteran and new clients). In total 2,097 clients and their households are included in the study (777 in four control and 1,320 in nine target branches).

The survey instrument contained questions covering socio-demographic information on the client's household (as well as the Progress out of Poverty Index); household income; household expenditures; work and school-related activities for all household members; financial service uptake and use; loan and indebtedness information; unforeseen expenses; and client satisfaction.

4.1.2. Dates of data collection

The data from NRSP clients was collected around the following dates for the baseline and follow-up waves:

- Baseline: 2009, September and October

- Follow-up I: 2010, March (few in April, very few in May)

- Follow-up II: 2010, October and November

- Follow-up III: 2011, May (few in June, very few in July)

- Follow-up IV: 2011, October and November (very few in December)

This is very close to a six month cycle and data collection is reasonably concentrated to one or two months. Follow-up survey II and IV were subject to variability as NRSP and enumerators struggled with national flooding during both of these data collections.

4.1.3. Drop-outs

Attrition is low between 0.4 per cent and 3.8 per cent each wave (for comparison, see Table 1), and in similar ranges in target versus control branches. In follow-up survey II, III and IV there are a few households 'dropping back in'. Differences in attrition in the final FSIV are not significant (4.8 per cent in control versus 6.4 per cent treatment target branches). Also, we cannot reject that the proportions of households answering all survey waves are the same (92.5 per cent in control versus 91.4 per cent in treatment branches). Removing households and household members who have dropped out of the data from the total number of data points across all surveys reduces the total number of individuals in the data from 70,853 to 65,811.

Table 1: Attrition across waves (of clients / households), by control / target branches.

	All	Control branches			Target branches		
	# HH	# HH	Drop-outs	Drop-ins	# HH	Drop-outs	Drop-ins
Baseline	2,097	777	-	-	1,320	-	-
Follow-up Survey I	2,083	774	3 (0.4%)	-	1,309	11 (0.8%)	-
Follow-up Survey II	2,051	755	19 (2.5%)	0	1,296	15 (1.2%)	2 (18.2%)
Follow-up Survey III	2,003	745	18 (2.4%)	8 (36.4%)	1,258	42 (3.2%)	4 (16.7%)
Follow-up Survey IV	1,975	740	19 (2.6%)	14 (43.8%)	1,235	48 (3.8%)	25 (40.3%)

Note: Percentages in brackets indicate the fraction of the previous wave's observations (drop-outs) or of the previous wave's missings (drop-ins).

4.1.4. Data quality

The dataset is large and most households are present in the data during all surveys. Also, the data is relatively complete (i.e. most items are answered by clients). However, a very basic problem is that individuals cannot always be identified with certainty. Detailed and time-consuming inspection of some cases reveals that IDs are taken from the wrong household member. Possibly related to the problem of identifying individuals, there is conflicting information across waves in some cases. For

example gender of individuals sometimes varies across waves (one per cent of cases), the "relationship to client" variable varies (3.5 per cent of observations), the education variable jumps, etc. Deleting the individuals with contradictory gender and relationship codes across waves reduces the total number of individuals in the data from 65,811 to 63,011. This is a substantial, but nevertheless, acceptable final number.

A more severe problem is that the data lacks a reliable indicator as to whether individuals are in fact covered by the insurance or not. There is an indicator at the client level, but this is almost identical to the indicator of having a productive loan. Hence, it does not account for the fact that some clients repay their loans early and are nevertheless covered for the full loan cycle. Also, this variable cannot identify voluntary take-up of additional household members – which is in fact the main treatment. Fortunately, after the baseline the client's self-assessment on insurance coverage of individual household members appears to be very accurate.

Additionally, it seems that the coding scheme of several items changes across branches and waves. One prime example is that if a precondition is not met (e.g. working status is 'not working') follow-up items (e.g. hours worked) are coded as missing in some cases and as zero in other cases. Detailed inspection reveals that different coding schemes are specific to certain branches and waves. Hence, data had to be cleaned in order to avoid serious bias in the results. Also other inconsistencies / incomplete entries were detected. Further cleaning therefore had to be applied to the following variables:

- Indicator of injury or hospitalization

- Number of days hospitalized

- Application for insurance payment

- Status of insurance payment

- Working hours of children

- Child labour indicator

- Days missed school

- Earning amounts

Taken together, we acknowledge the considerable effort that NRSP put into the data. The resulting large number of observations, low attrition and the completeness of the data are very positive. However, there remain some issues that complicate the analysis and will have effects on the precision of results.

4.2. Evaluation strategy

The research team perceives the experimental approach to empirical research as optimal for the evaluation of interventions. The ideal set-up for the evaluation would involve the comparison of a sufficient number of clients randomly assigned to intervention or control groups and would also draw on data collected before and after the intervention. Such a set-up allows for a clear-cut evaluation of an intervention. The set-up chosen for the evaluation of the NRSP innovation is close to this ideal, as target and control branches are indeed randomly chosen. Yet, the randomization is based on a small number of branches. In reality, randomizing at a smaller level than the branch is difficult due to administrative and logistical constraints. Given the circumstances, the setup is therefore as close to the experimental ideal as possible.

The data at hand allows for the comparison of target and control branches before and after the innovation took place. This is very important as it allows for the detection and correction of potential

imbalances in the target versus control groups prior to the innovation. Methodologically this is achieved by using a difference-in-difference estimator which yields causal effects of the modification of the intervention on outcomes when two assumptions are met: First, there must not be contamination effects from the intervention in the control branches. The geographic proximity of the branches (all branches within the urban area of Hyderabad) on the one hand increases comparability, however on the other hand, in principle it facilitates contamination effects.[3] Second, outcomes in target and control groups must follow a common trend. As the innovation is not randomized at the individual level but at the branch level, this puts factors affecting outcomes at the branch level at the centre of concern. It is thus especially important that there are no strong branch-specific trends that violate the common time trend assumption. We have little information about factors at the branch level that may affect outcomes (local changes in economic conditions, cultural attitudes by neighborhood, and other aspects affecting target or control branches only). However, we have relatively detailed information on the economic situation of the household and its members. We can use this information to control for unbalanced trends that work through these variables (see the annex for a full description of the empirical model).[4]

These considerations aside, we want to stress how the impact of the innovation on outcomes has to be interpreted. When comparing target and control branches we do not compare clients with and without insurance. We rather compare clients with and without the possibility to purchase additional coverage (for adult children and other household members outside the core family). So the effects we present here are effects of extending insurance coverage given that the nuclear family is already covered. Additionally, the effect might include consequences of the monthly visits of credit officers assisting with claim procedures (e.g. higher overall usage of the product).

4.3.   Household characteristics at baseline

We provide information on the distribution of household characteristics across target and control branches before the innovation was introduced in Table 2. These comparisons comprise all covariates that are also used as control variables in the regression analysis. Additional household level variables are presented in Table 3. Table 4 describes the most important child level characteristics between target and control branches. These comparisons help to justify whether the target and control branches are indeed comparable. We use a test for equality of means that accounts for the branch as the level of randomization.[5]

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[3]   A classical spill over effect would be provision of the population in control branches with additional insurance. This can fortunately be ruled out due to the rigorous control by NRSP. Still, one could think of households benefiting from the innovation in treatment branches supporting households in control branches.

[4]   Additional (secondary) data on the branch level (e.g. on ethnic composition of the neighbourhood, economic characteristics, etc.) would help to test the assumptions made here.

[5]   Randomizing at the branch level is different from individual randomization. One expects larger differences to remain with bigger randomization units and the test accounts for this by allowing for branch level random effects.

Table 2: Descriptive statistics of households at baseline, by control / target branch.

	Control branches		Target branches		All	
	Mean	**std**	**mean**	**std**	**min**	**max**
PPI score at baseline	31	9.0	**32***	9.8	8	79
Spouse in household	0.8	0.4	0.8	0.4	0	1
# Children age 0-4	0.6	0.9	0.6	0.9	0	5
# Children age 5-13	1.5	1.4	1.5	1.4	0	7
# Children age 14-17	0.8	0.9	0.9	1.0	0	4
# Adults	3.6	1.7	3.5	1.7	1	12
Mean parental age	43	10	43	10	18	71
Mean parental education (years)	3.1	3.7	**3.9****	4.3	0	16
Monthly income per capita (^)	3,217	1,150	3,140	1,300	190	16,154
Observations	762		1,293		2,055	

Stars indicate a significant difference between random and self-selected groups (*** p<0.01, ** p<0.05, * p<0.1), no stars = no significance, test is accounting for random effects on branch level (implemented as random-effects regression on treatment dummy), income in Pakistani rupees (1,000 Rs = approx. 11 USD), ^ adjusted for minor HH members (factor 0.6).

Households in target branches at baseline seem to have somewhat higher score values using the Progress out of Poverty Index (mean PPI score 32 vs. 31) and are also significantly higher educated (mean of 3.9 vs. 3.1 years of parental education), but in all other aspects there are no significant differences. In both groups around 80 per cent of clients have a spouse in the household. The household comprised on average three minor and three to four adult members (mean household size 6.5). Parents (client and spouse) are on average 43 years old and members have a mean monthly per capita income of around 3,200 Rs (approx. 35 USD).

Table 3: Additional descriptive statistics of households at baseline, by control / target branch.

	Control branches		Target branches		All	
	Mean	**std**	**mean**	**std**	**min**	**max**
Monthly expenses: Total	13,963	4,725	12,705	4,714	3,657	40,780
Monthly expenses: Children	292	381	302	422	0	3,500
Monthly expenses: Book	259	411	200	306	0	3,000
Monthly expenses: Outpatient	501	559	380	435	0	4,500
Monthly expenses: Hospital	107	478	59	365	0	10,000
Credit with NRSP before?	0.73	0.45	0.77	0.42	0	1
Credit amount	16,133	4,387	15,723	4,916	5,000	30,000
Difficulties repaying loan?	.012	.11	.023	.15	0	1
Observations	772		1,320		2,092	

Stars indicate significance of difference between random and self-selected groups(*** p<0.01, ** p<0.05, * p<0.1), no stars = no significance, test is accounting for random effects on branch level (implemented as random-effects regression on treatment dummy), monetary units in Pakistani rupees (Rs 1,000 = approx. $11).

Table 3 shows average household expenditure for several categories and some credit-related characteristics. Children-specific expenditures and books together account for four per cent of total expenses. Outpatient plus hospital costs make up a similar amount. Three-quarters of clients already have previous experience taking financial products from NRSP. The average loan received amounts to approximately 15,000 Rs at baseline and very few (one to two per cent) have difficulties repaying their loan. While there is some variation in numbers across target and control branches, none of the differences are significant.

The same is true for characteristics at the child level shown in Table 4. Average age, education level, child labour incidence (around 20 per cent), earnings through child labour (290-340 Rs) and hours

worked per week (11-14 hours) are all within the expected range given that the unit of randomization is the branch. Note that the income generated through child labour corresponds to roughly ten per cent of monthly per capita income which is non-negligible. Table 5 shows the same comparison, but further disaggregates average characteristics by gender.

Table 4: Descriptive statistics of children at baseline, by control / target branch.

	Control branches		Target branches		All	
Children 5 – 17	mean	std	mean	std	min	max
Age	11	3.7	12	3.8	5	**17**
Education (years)	3.2	3.3	3.4	3.3	0	**14**
Child labour incidence	0.20	0.40	0.19	0.39	0	**1**
Monthly earning from child labour	290	1,038	342	1,092	0	**15,000**
Hours of work (weekly)	11	18	14	21	0	**90**
Observations	1,650		2,971		4,621	
Children 5 – 14						
School attendance	0.68	0.47	0.70	0.46	0	**1**
Observations	1,215		2,065		3,280	

Stars indicate significance of difference between random and self-selected groups (*** p<0.01, ** p<0.05, * <0.1), no stars = no significance, test is accounting for random effects on branch level (implemented as random-effects regression on treatment dummy), income in Pakistani rupees (1,000 Rs = approx. 11 USD).

Table 5: Mean child characteristics at baseline, by control / target branch and gender.

	Control branches		Target branches	
Children 5 – 17	Boys	Girls	Boys	Girls
Age	11	11	12	12
Education (years)	3	3.5	3.2	3.7
Child labour incidence	0.19	0.20	0.26	0.11
Monthly earning from child labour	498	88	610	63
Hours of work (weekly)	12	11	17	10
Observations	814	836	1,516	1,455
Children 5 – 14				
School attendance	0.68	0.69	0.69	0.71
Observations	621	594	1,055	1,010

Income in Pakistani rupees (1,000 Rs = approx. 11 USD).

Out of the 23 variables we compared in the previous three tables, one differs significantly between target and control branches at the ten per cent level and another variable at the five per cent level. This degree of difference between samples is within the expected limits. We therefore conclude that the data is consistent with a random allocation of branches to target and control groups. Both groups are hence sufficiently comparable, meaning that there seems to be no systematic selection between the groups that would confound the results presented in the following evaluation section.

5.   Evaluation results

5.1.   A word of caution

The results ultimately rely on the validity of the difference-in-difference assumptions (parallel time trends, no spillover effects). Even if these assumptions are fulfilled in principle, non-classical measurement error could still lead to violations of these assumptions in our dataset. For example, some

items were coded in a different way in certain waves / branches (e.g. sometimes coding zeroes as missing). Also enumerators in certain waves / branches seem to have been especially aware of issues such as child labour or economic shocks, leading to much higher numbers being reported. If these issues correlate with the innovation in a systematic way, our identification strategy may be disturbed.

Additionally, the results depend on how we account for unobserved effects on the branch-wave level. When we include unobserved random effects at the branch-wave level, effects become much less significant than if we leave them out. This effect hints at the fact that there is indeed a lot happening between branches and survey waves that we cannot observe.

5.2. Overview of the results of the innovation

In section 5.3 below, we describe the fact that the innovation did in fact lead to increased insurance coverage at the individual level. Section 5.6 (ex-post effects) describes that there is also a higher claim frequency and more reimbursements in target branches. Hence, the insurance is more frequently used as a result of the innovation. In this subsection, we provide an overview of the results of the innovation before going into details in the following subsections.

We describe child labour outcomes in section 5.4. Our econometric results show that the innovation decreased child labour incidence significantly in follow-up survey II. The estimated decrease is almost seven per cent. Boys are more frequently active as child labourers and for them we find the largest effects. Also, for weekly hours worked we find large significant effects on boys, while there are no significant effects on girl children. Hazardous occupations (often glass bangle-related) on the other hand, decrease for both genders. Depending on the survey wave, we find around five to six per cent lower risk of hazardous occupations caused by the innovation for boys and girls.

Much of these effects are driven by a shift from heavy wage work or day labour in shops, factories or the street towards less intensive work in the house and the family. Also, we observe that children in target branches generally have a lower risk of being driven into child labour. This is consistent with the main objective of the innovation: to indirectly protect children from child labour.

Another interesting outcome in the context of child labour is schooling. Child labour is negatively correlated with schooling in the data, especially for children between 11 and 17 - in other words, child labourers attend school less often. This apparent inconsistency between heavy work and schooling is one of the main arguments against the use of child labour. Despite the partly substantial effects we find on child labour outcomes, we do not find an effect on school attendance in section 5.5. This may be related to the fact that economic reasons are not very often stated as a reason to stop schooling.

Regarding effects before a shock (ex-ante effects) we lack a comparable indicator for a shock relevant for insurance reimbursement or pay-out (medical incidences for the health insurance in our case). We observe that insurance reimbursements and pay-outs help to decrease child labour incidence and hospital expenses (ex-post effects in section 5.6), but we cannot disaggregate total ex-ante effects of the innovation. Otherwise we would like to analyse ex-ante effects on PPI score, income, total expenditure and hospital expenditure. The overall treatment effect of the innovation on these variables is not significant. Tables with the estimated (insignificant) coefficients are provided in Annex 3.

In the following subsections, we will go through the major intended outcomes and look at their development over time for target versus control branches. This visual inspection of trends is of course not the method finally used for impact evaluation; however, in the absence of spill-over effects and other confounding factors, it can give a good first impression of the treatment effect.

The regression results shown in individual subsections later in this report comprise different specifications. We first show the effects of the innovation for each survey wave without controlling for covariates in specification (1). This reproduces what can be seen from the visual inspection of time trends. In specification (2) we account for unobserved random effects at the branch-wave level. In most cases the precision of estimates decreases considerably, showing that those unobserved effects seem to

be very important. We control for household and individual covariates in specification (3).[6] We repeat the approach separately for boys (3-boys) and girls (3-girls) when we deal with children's outcomes.

5.3. Uptake of the innovation

The innovation introduced by NRSP is the voluntary option to extend health and accidental death insurance to household members outside the nuclear family. The first step of such an innovation is of course to convince clients that they need to take up additional insurance.

Prior to the innovation, NRSP had introduced a mandatory accident and health insurance for all clients that cover the nuclear family (client, spouse and minor children of the client). At baseline (September - October 2009), still only clients and spouses reported to be covered with this insurance (and not all of them–approximately half both in target and control branches), signaling low awareness of the microinsurance product.

Figure 2: Insurance coverage by control / target branches
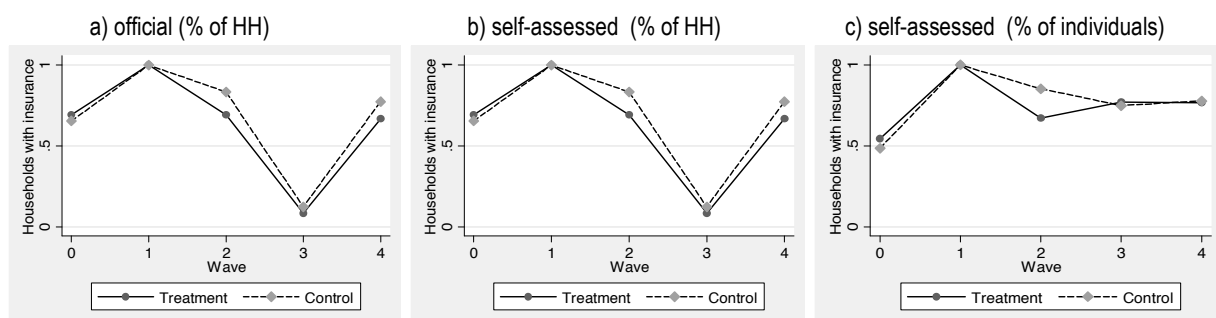
The first graph (Figure 2(a)) depicts official insurance coverage of the household as stated by NRSP. This is almost identical to having an active NRSP loan. Coverage is very similar for target and control branches, except in follow-up survey II (FSII) when more control households retain their loan.[7] The middle graph (Figure 2(b)) shows the self-assessed insurance status of clients. Also here, coverage is very similar in target and control branches except for FSII, when coverage of clients is stated higher in control branches.

The right graph (Figure 2(c)) shows the (self-assessed) coverage of all individuals in the household. As household members outside the nuclear family and children $\geqslant 18$ can be insured in target branches only, therefore we expect a difference in this measure. Indeed, insurance coverage is generally higher in target areas after the innovation is introduced. In FSII, the difference is lower (only ten per cent versus around 20 per cent in FSI and FSIII) due to the lower fraction of covered households. In FSIV, take-up again is very similar for target and control branches, signaling that those household members in the target branch who can insure voluntarily do not use this opportunity to do so any longer. Therefore, the innovation seems to increase insurance take-up mainly between FSI and FSIII.

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[6] See Annex 1 for more details on the econometric specification.

[7] This is due to a higher fraction of clients keeping their loan from NRSP in the control area. In two control branches (Gulshan e Hali, Islamia Colony) 100% of clients keep their NRSP loan in FSII. Without using data from these two branches, coverage would be similar again.

Table 6: Percentage of insured clients (self-assessed, comparison with official records), by wave / target branch.

	BSL		FSI		FSII		FSIII		FSIV	
Officially insured?	no	yes	no	yes	no	yes	no	yes	no	yes
Control	0.06	0.71	-	1.00	0.27	0.97	0.71	1.00	0.01	1.00
Treated	0.04	0.77	-	1.00	0.08	0.93	0.75	1.00	0.29	1.00

The official and self-assessed coverage of clients is not always consistent. Especially in FSIII when fewer clients have a loan with NRSP than in all other waves (reflected in Figure 2(a)). At the same time, self-assessed insurance coverage is high. Table 6 analyses how consistent the self-assessment is with official figures. In the baseline, not all of the insured clients seem to know about the insurance. This changes in both control and target branches as soon as the innovation is introduced (likely as a result of overall increased awareness of the product across NRSP). Except in FSII, all of the insured know about their insurance status; however, it seems that many of the non-insured, in fact, believe themselves to be insured.[8] The figure is especially high in FSIII, when there is a sharp drop in official coverage.

Exact (self-assessed) take-up rates for all household members are shown in Table 7. In addition to providing rates in target versus control branches, we also divide them into three categories: (a) those with mandatory insurance (NRSP loan and client, spouse, or child<18), (b) those envisioned for mandatory insurance but without loan (no NRSP loan and client, spouse, or child <18) and (c) those eligible in target branches only (non-nuclear family or child >18). For voluntary uptake in the target branches (c) we also provide numbers by gender in a graph below. It shows that women are slightly less likely to be covered by additional insurance.

Table 7: Insurance take-up (percentage of household members), by control / target branches.

	All household members		(a) NRSP loan & client, spouse, or child<18		(b) No NRSP loan & client, spouse, or child<18		(c) Non-nuclear family or child ≥18	
	Control	Target	Control	Target	Control	Target	Control	Target
Baseline	14.1%	15.3%	27.3%	28.7%	2.8%	1.3%	0.0%	**0.0%**
N	*4,742*	*8,182*	*2,362*	*4,297*	*888*	*1,297*	*1,492*	*2,588*
Follow-up Survey I	67.5%	88.6%	99.2%	99.4%	-	-	0.0%	**68.5%**
N	*4,781*	*8,051*	*3,252*	*5,238*	*0*	*0*	*1,529*	*2,813*
Follow-up Survey II	56.2%	66.3%	95.6%	97.2%	15.5%	14.9%	0.0%	**53.9%**
N	*4,666*	*7,926*	*2,673*	*3,624*	*432*	*1,501*	*1,561*	*2,801*
Follow-up Survey III	48.8%	66.7%	99.0%	98.8%	70.5%	75.4%	0.2%	**49.0%**
N	*4,592*	*7,809*	*399*	*411*	*2,615*	*4,466*	*1,578*	*2,932*
Follow-up Survey IV	50.2%	46.1%	99.8%	99.4%	0.6%	8.4%	0.1%	**4.7%**
N	*4,603*	*7,615*	*2,307*	*3,271*	*644*	*1,552*	*1,652*	*2,792*

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8 According to Mr. Tahir Waqar, Programme Manager Monitoring, Evaluation & Research NRSP, some clients repay their loans early, but are still covered by insurance for the full year loan cycle. This would explain the divergence of numbers, but on the other hand casts doubt on the reliability of the official insurance status. (This explanation was obtained at a Skype phone conference with Mr. Tahir Waqar on January 20, 2012.)

Figure 3: Take-up of voluntary insurance by gender in target branches.
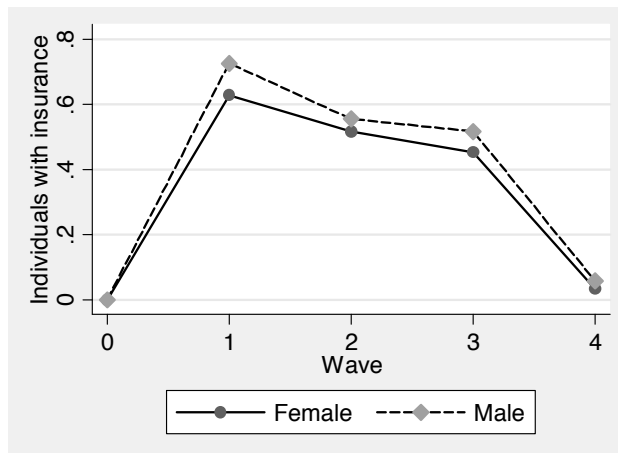
Figure 3 shows voluntary uptake in treatment branches by gender. Note that figures in wave 4 are very low, reflecting problems in this variable in the last wave. Based on the above knowledge surrounding the comparability of target and control groups at baseline, as well as the up-take of the innovation product presented in the figures and tables above, we can now examine the results of the innovation on incidence of child labour.

5.4. Child labour

We will first show some descriptive statistics in Table 8 to illustrate the extent and details of child labour in the study area. Looking at the main child labour indicators, we can see that boys are more often classified as child labourers (20.2 per cent versus 13.2 per cent) than girls. This seems to be caused by a higher work load on boys (12.9 versus 9.7 hours per week on average). However, the incidence of hazardous occupations is similar across gender (around nine per cent).[9] Generating additional income seems to be a dominantly male domain (600 versus 91 Rs on average). This is reflected in a much higher percentage of wage workers, apprentices and day labourers for boys, while girls are predominantly employed as family workers. If girls work, it is almost exclusively at home. In contrast, boys often work in shops/business centres and also sometimes in factories/workshops, on the street or at home. Given that the innovation was tested in an urban context, it is not surprising that agricultural work does not play a large role.

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[9] The list of occupations classified as hazardous is shown in Annex 2. The most prominent category by far is glass bangle work.

Table 8: Average child labour outcomes, by gender.

	unit	Boys	Girls
Main child labour outcomes			
Child labour incidence	%	21.2	13.2
Hours of work (weekly)	hours	12.9	9.7
Hazardous occupation incidence	%	9.4	9.2
Monthly earning through CL	Rs	600	91
Status of work			
Self-employed	%	5.9	7.0
Wage worker	%	7.5	1.4
Apprentice	%	4.3	0.4
Family Worker	%	0.9	24.2
Day Labour	%	8.2	3.1
Place of work			
Home	%	2.1	34.7
Factory/Workshop	%	3.5	0.4
Shops/business centre	%	17.1	0.6
On road/street	%	3.2	0.1
Agriculture/Livestock farms	%	0.4	0.0
Houses	%	0.1	0.5
Others	%	0.3	0.1

These figures are obtained using all survey waves, percentages may vary across time.

Table 9 provides characteristics of households using child labour versus households not doing so. Also, children classified as child labourers are compared to other children. Households using child labour have lower PPI scores, more household members, client / spouses are less educated and those households have lower income per capita. Child labourers are older (but despite that are not much more educated), they are more often male, work more hours and attend school less often.

Table 9: Average characteristics at baseline, no CL/using CL.

HH with children 5–17	No Child Labour	Child Labour
PPI score at baseline	32	27
Spouse in household	0.83	0.80
# Children age 0–4	0.66	0.45
# Children age 5–13	1.7	2.1
# Children age 14–17	0.9	1.5
# Adults	3.5	3.4
Mean parental age	42	44
Mean parental education (years)	4.0	2.5
Monthly income per capita (^)	3,171	2,607
Observations	1,040	586
Monthly expenses: Total	13,244	13,858
Monthly expenses: Children	373	312
Monthly expenses: Book	287	242
Monthly expenses: Outpatient	410	419
Monthly expenses: Hospital	56	93
Credit with NRSP before?	0.75	0.78
Credit amount	15,846	16,101
Difficulties repaying loan?	.014	.027
Observations	1,039	585
Children 5–17		
Age	11	14
Female	0.52	0.38
Education (years)	3.3	3.4
Hours of work (weekly)	5	45
Observations	3,729	892
Children 5–14		
School attendance	0.73	0.47
Observations	2,839	441

Monetary units in Pakistani rupees (1,000 Rs = approx. US$11), adjusted for minor HH members (factor 0.6).

In the following section, we will look at child labour incidence, monthly income generated through child labour, hours worked by children and work in hazardous occupations. Note that the child labour definition depends on age, hours worked and type of work (hazardous occupation or not), and thus any effect on those three variables should also propagate through child labour incidence and earnings.

Figure 4 shows the development of child labour indicators over time for target versus control branches.[10] The incidence of child labour (Figure 4(a)) is initially similar, but shows a diverging trend (except in follow-up survey III). Hence, there is a relative decrease of child labour incidence in target branches. This is influenced by the development of weekly hours worked (Figure 4(b)). Children in target branches start with a higher baseline average and gradually decline relative to the control area in FSI, II, and IV. In FSIII, however, this is not the case. Incidence of hazardous occupations (Figure 4(c)) starts at similar levels at baseline, but is lower in target branches throughout all follow-up surveys. Earnings generated through child labour (Figure 4(d)) decrease in the target relative to control branches. Again, the effect is restricted to FSI, II, and IV.

Figure 4: Main child labour outcomes (age 5-17).
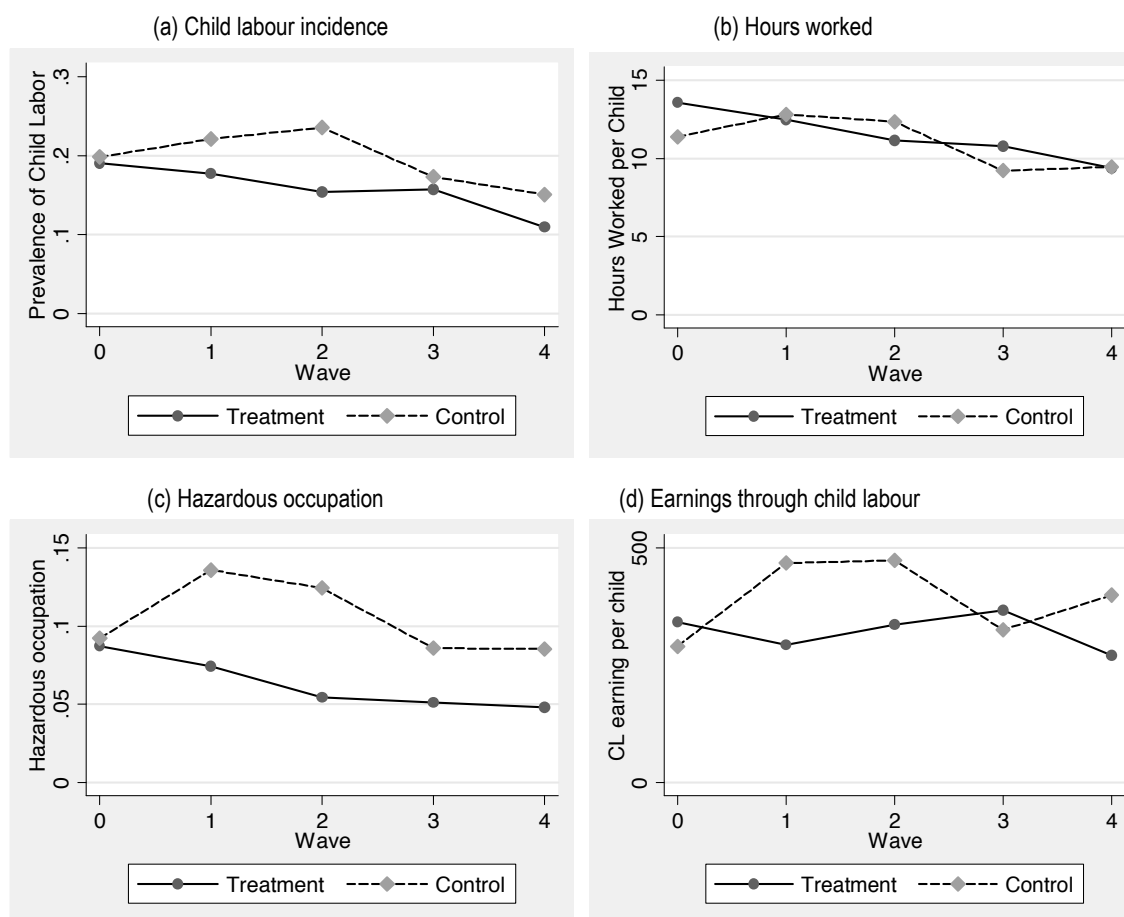
Exact figures for treatment (target) and control branches over time are provided in Annex 3.

Table 10 below shows the results of the econometric analysis. All variables appear to decrease as a result of the innovation in specification (1). Effects are closer to zero in follow-up survey III, but substantial in all other waves (compare the graphs above for a visual impression). When accounting for unobserved wave-branch random effects in specification (2) both the effect on incidence of child labour and hours worked per child become insignificant, though. Including control variables in specification (3) does not change results much, but slightly improves precision. Overall, the biggest effect of the innovation is on prevalence of hazardous occupations and income generated by child labour. Both clearly decrease in target versus control branches and effects are significant overall. When separating the analysis by gender, the largest effect of innovation can be observed for boys in most variables.

In our regression we control for the influence of many background variables (see Annex 1 for more details). These regressions show that parental education, household income per capita and

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[10] We have to exclude two branches with inconsistent data (Liaqat Colony, Pathan Colony) from the analysis in follow-up survey 1. They are part of the target branches. Excluding target branches is fortunately not as harmful as excluding control branches because this affects 'only' two out of nine instead two out of four.

presence of the husband in the household are clearly associated with lower values of all child labour indicators. Shocks (health and non-health) and death of a family member on the other hand have the expected association with higher values of child labour indicators.

Table 10: Difference-in-difference results for child labour variables.

	(1)	(2)	(3)	(3-boy)	(3-girl)
Standard Errors	robust	RE	RE	RE	RE
Controls	No	No	Yes	Yes	Yes
Child labour (age 5-17)					
Treatment Effect FS I	**-0.036**	-0.039	-0.023	-0.067	0.019
Treatment Effect FS II	**-0.073***	-0.069	**-0.067***	**-0.098**	-0.039
Treatment Effect FS III	-0.0080	-0.0040	0.015	-0.037	0.062
Treatment Effect FS IV	**-0.033**	-0.025	-0.029	**-0.10**	0.038
N	20,531	20,531	20,491	10,432	10,059
Hours worked by children (age 5-17)					
Treatment Effect FS I	**-2.52***	-2.42	-1.28	**-3.61***	0.99
Treatment Effect FS II	**-3.38***	-3.09	-2.78	**-4.91**	-0.67
Treatment Effect FS III	-0.60	-0.33	0.67	-1.78	2.97
Treatment Effect FS IV	**-2.26***	-1.75	-1.53	**-5.32***	2.06
N	20,527	20,527	20,487	10,431	10,056
Hazardous occupation (age 5-17)					
Treatment Effect FS I	**-0.057***	**-0.057***	**-0.053**	-0.036	**-0.065***
Treatment Effect FS II	**-0.065***	**-0.062***	**-0.061***	**-0.061***	**-0.058***
Treatment Effect FS III	**-0.030**	-0.030	-0.024	-0.018	-0.030
Treatment Effect FS IV	**-0.032***	-0.036	-0.033	**-0.046**	-0.021
N	21,216	21,216	20,491	10,432	10,059
Monthly earnings through child labour (age 5-17)					
Treatment Effect FS I	**-227***	**-216**	**-162***	-231	**-107***
Treatment Effect FS II	**-190***	**-195***	**-190**	**-272***	**-110**
Treatment Effect FS III	-9.42	-5.66	44.9	87.0	-8.78
Treatment Effect FS IV	**-181***	-172	**-191**	**-377***	-21.0
N	20,531	20,531	20,491	10,432	10,059

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, standard errors either heteroskedasticity-robust (robust) or random effects at the branch-wave level (RE).

To see how these substantial effects come about, we study status and places of work in more detail. First, we identify where child labour takes place. Table 11 below shows that self-employment, wage work, apprenticeships and day labour are often related to child labour (70 per cent to 80 per cent), while family workers less frequently fall into this category. Work in factories/workshops, in shops/business centres and on the street are also often more likely to harbour child labour (78-88 per cent), while other places are less associated with this phenomenon. These places of work and employment statuses are also the ones that on average generate the highest earnings. Therefore, family work at home seems to be a lighter form of work, while going out of the house to do work outside the family is often hard, but on the other hand generates substantial additional income.

Table 11: Child labourers [%] and mean monthly earnings [Rs] in different work status and places.

Status of work	[%]	[Rs]
Self-employed	70	1,810
Wage worker	80	3,122
Apprentice	76	1,083
Family Worker	22	11
Day Labour	80	2,590
Place of work		
Home	37	333
Factory/Workshop	88	3,338
Shops/business centre	79	2,639
On road/street	78	3,293
Agriculture/Livestock farms	63	1,677
Houses	41	1,318
Others	64	2,718

These figures are obtained using all survey waves, percentages may vary across time.

We have identified certain types of work that seem to be very intensive, while family work at home appears less demanding. We therefore aggregate intensive work statuses ('high CL work statuses') and places ('high CL work place') and follow their development over time in Figure 5. Interestingly, there is a decline of high CL work statuses in target branches while in control branches the curve is more hump-shaped. This means that relative to control branches there is a decline of high CL work statuses in target branches. Regarding places with high CL intensity, there is also a relative decrease in target branches, but mainly in follow-up survey I and II. In contrast, there is a marked trend away from low-intensity family labour and work at home in control branches, while those two figures remain more stable in the target branches. In other words, relative to the development in control branches, in the target group we observe a shift from high intensity work to work inside the family and the house.

Figure 5: Work statuses and places of work over time.

(a): High CL work status

(b) High CL work place

(c): Family workers

(d) Work at home
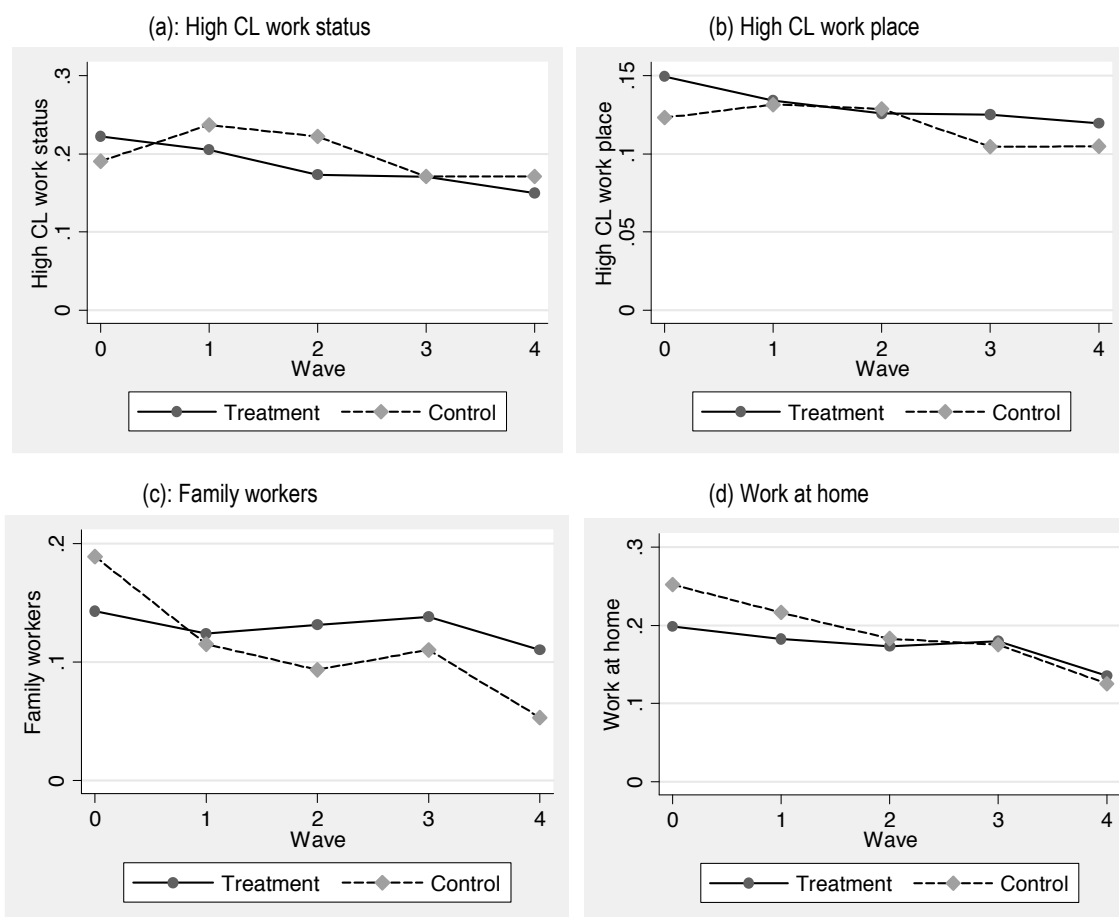
The explicit aim of the innovation is to prevent transition to child labour after economic shocks rather than to decrease existing child labour. We therefore analyse whether the trend we observed above are caused by lower transition into child labour or lower retention in child labour Table 12 below shows the risk of non-child labourers falling into this category. Interestingly, it is consistently lower in target branches. This is not true for retention rates. Here, in follow-up surveys I and III, the risk to remain a child labourer is higher in target branches, while it is lower in FSII and IV. These figures indeed suggest that the innovation has had the desired effect of protecting children from falling into child labour.

Table 12: Transition into and retention of child labour across waves, by treatment/control.

	Transition rates into CL				CL retention rates			
	Wave				Wave			
	1	2	3	4	1	2	3	4
Control	14%	12%	9%	8%	56%	69%	51%	55%
Treated	10%	07%	9%	5%	65%	53%	58%	40%

5.5. Schooling

Similar to the child labour outcomes, we provide an overview of the most important schooling variables by gender in Table 13. Note that we only have information for children between ages 5 and 14. School attendance is slightly higher for girls (72 per cent versus 68 per cent for boys). For boys and girls attending school, absenteeism is similar – 12 per cent to 13 per cent regularly miss school days leading to an average of 0.6-0.7 school days missed per month. The most prevalent reasons stated for stopping schooling early are: no interest of child in studies, no interest of parents, and economic reasons (cannot afford, has to work, death of earning family member). If children attend school, then illness (seven per

cent) is the most common cause to miss classes regularly, followed by punishment at school (0.7 per cent to one per cent), and family events (0.7 per cent). Reasons related to economic shocks (death in family, had to work) seem to play a minor role for missing some school days than they do for general school attendance.

Table 13: Average schooling outcomes, by gender.

	Unit	Boys	Girls
Main schooling outcomes (age 5-14)			
School attendance	%	68.2	71.7
If attends: regularly misses school?	%	13.0	12.4
If attends: school days missed per month	Days	0.66	0.60
Reason to stop attending school			
Illness	%	0.6	0.4
Death of earning family member	%	0.2	0.2
Not interested in studies	%	13.9	10.6
Cannot afford	%	4.7	4.7
Has to work / earn	%	0.9	0.2
Due to distance	%	0.8	0.9
To learn skills	%	0.3	0.1
Disability	%	0.8	0.6
Parents not interested	%	7.5	8.6
Punishment	%	0.1	0.0
It is not safe to go	%	0.3	0.5
Others	%	1.8	1.6
If attends: reasons to miss school			
Punishment at school	%	1.0	0.7
Illness	%	7.0	7.0
Family events	%	0.7	0.7
Death of a family member	%	0.1	0.1
Had to work	%	0.4	0.3
Transport not available	%	0.1	0.2
Strikes / Law & order	%	0.1	0.1
Others	%	1.5	1.2

These figures are obtained using all survey waves, percentages may vary across time.

In the section below, we will look at schooling outcomes, namely school attendance for children that are between five and 14 years old. Figure 6 shows that there are no dramatic changes regarding schooling. There is a slight upwards trend in target branches, while this is less the case for control branches. Trend differences are small, though, and we cannot draw an immediate conclusion from visual inspection of time trends.

Figure 6: School attendance (age 5-14).
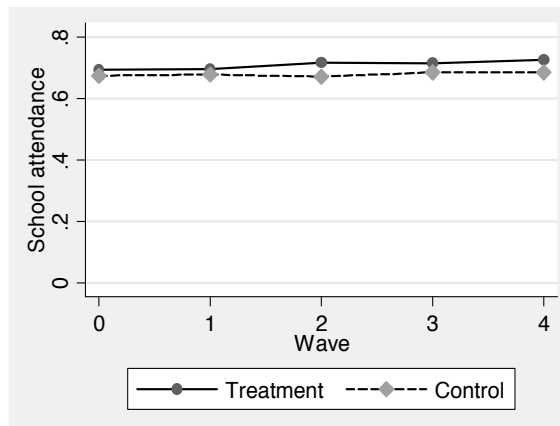
Exact figures for target and control branches over time are provided in Annex 3.

Table 14 below shows the results of the econometric analysis. The difference-in-difference model displays a modest positive effect on school attendance. In our most preferred specification (3) effect sizes range from below one per cent in FSIII to around 2.5 per cent in FSII and IV. Those numbers are not negligible, and partly confirm trends observed in child labour outcomes; however, effects are weaker in FSIII and they are also stronger for boys (compare specification (3-boy) and (3-girl)). However, these effects are not very pronounced and insignificant in all specifications.

Table 14: Difference-in-difference results for schooling variables.

	(1)	(2)	(3)	(3-boy)	(3-girl)
Standard Errors	robust	RE	RE	RE	RE
Controls	No	No	Yes	Yes	Yes
	School attendance of children (age 5-14)				
Treatment Effect FS I	0.005	0.0027	0.014	0.035	-0.008
Treatment Effect FS II	0.027	0.025	0.023	0.037	0.010
Treatment Effect FS III	0.012	0.013	0.007	0.019	-0.009
Treatment Effect FS IV	0.025	0.014	0.026	0.025	0.027
N	15,444	15,444	14,930	7,717	7,213

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, standard errors either heteroskedasticity-robust (robust) or random effects at the branch-wave level (RE).

In Table 13 above we presented the reasons for stopping school attendance. Some of them are economic reasons (cannot afford, has to work, death of earning family member) and could therefore be related to economic shocks. We therefore analyze whether the innovation has a mitigating effect on those reasons. Figure 7 shows that economic reasons for school drop-outs develop in a parallel way. Only in follow-up survey IV is there a divergence, but there is no general difference in time trends.

Figure 7: Reasons to stop schooling (age 5-14).
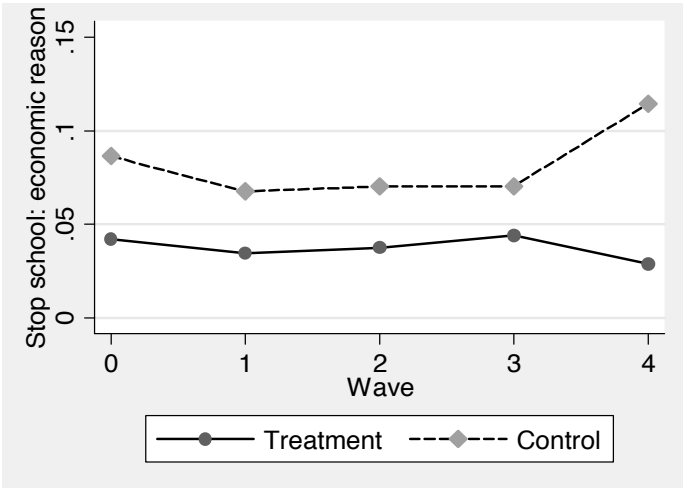
5.6. Ex-post effects

In subsection 5.3 we have already shown that insurance uptake increases at the individual level. In this subsection we start with describing the effects on usage of the insurance product. Figure 8 shows (a) medical incidences in the household, (b) resulting insurance claims and finally (c) insurance payments/reimbursements. Interestingly, a much higher percentage of NRSP clients report injury or hospitalization in the target branches.[11] This higher reporting behaviour is likely caused by the second part of the innovation that involves frequent visits of credit officers to sensitize clients regarding medical incidences and insurance.[12] There is also a consistently higher claim frequency in innovation areas which is consistent with both higher insurance coverage and higher sensitization of clients. Similarly, insurance payments/reimbursements are more frequent.

Figure 8: Usage of the insurance product (% of households with an incidence).
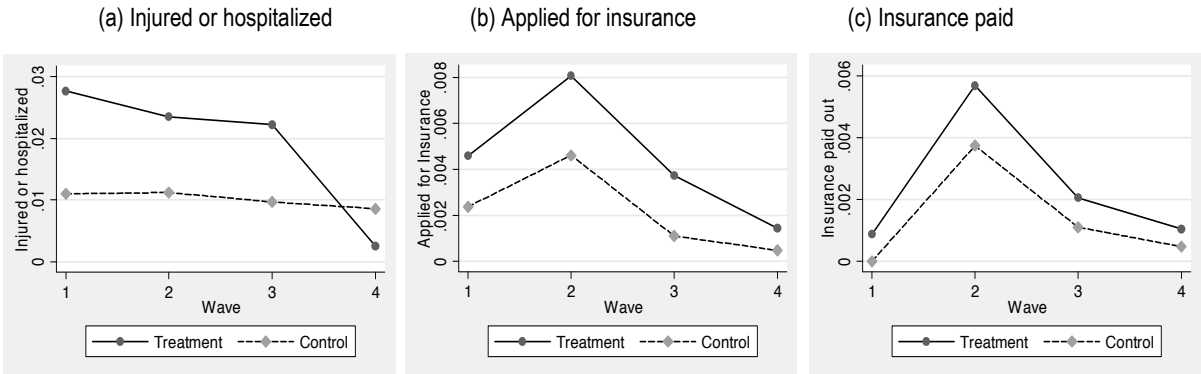
Exact figures for innovation and control branches over time are provided in Annex 3.

In Table 15 we describe the most important reasons for not applying for insurance, and thus why the insurance did not reimburse. The most important reasons for not applying seem to be difficulties either in obtaining (more in target branches) or completing (more in control branches) documents. Together this accounts for around 60 per cent of those not applying. Forgetting coverage or not knowing how to apply seems to be more an issue in control branches (three per cent + 14.1 per cent

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[11] In the last wave numbers decrease sharply in the innovation area, however, casting doubt on their validity for FSIV.

[12] We do not have baseline numbers for injury/hospitalization unfortunately, so we cannot conclude with certainty that the higher frequency of medical incidences is caused by the innovation, but it appears very likely.

versus 0.5 + 9.7 per cent in treatment branches). Also, non-covered diseases are more frequent in control branches (15.6 per cent versus 9.9 per cent).

Table 15: Reasons not applied for insurance [%], by control/target branch.

	Control	Treated
Reason not applied		
Documents incomplete	34.8	17.1
Difficulty obtaining documents	23.0	44.7
Forgot coverage	3.0	0.5
Disease not covered	15.6	9.9
Still undergoing treatment	3.7	2.5
Plan to apply soon	0.7	3.5
Don't know how/too complicated	14.1	9.7
Other coverage/wapda/free	0.0	2.0
Forbidden	0.0	1.0
Rejected	0.0	0.3
No insurance	5.2	8.2
not interested	0.0	0.5
moved	0.0	0.3

These figures are obtained using all survey waves, percentages may vary across time.

Because of the observation that medical incidences are reported very differently, we unfortunately cannot assume that households facing a health-related incident in target branches are comparable to households with an incident in control branches. Therefore, it does not make sense to take the above comparison too seriously. This cautionary remark also applies to other comparisons involving medical incidences and insurance reimbursements. We therefore refrain from including the variable into the econometric analysis.

Nevertheless, we provide average child labour incidence under different circumstances in Table 16. In control branches, an injury or hospitalization is related to substantially higher child labour (23 per cent versus 19 per cent), while this is not the case for target branches (16 per cent without versus 16 per cent with medical incidence). This is consistent with respondents reporting less severe cases in target branches. Indeed, when comparing paid incidences we observe very similar low child labour rates in control and target branches (eight per cent versus seven per cent child labour). The non-paid injuries and hospitalizations on the other hand seem to be more severe in control than in the target branches (25 per cent versus 18 per cent child labour).

Table 16: Incidence of child labour (different insurance circumstances), by target/control.

	No medical incidence in HH	Medical incidence in HH	Incidence in HH & not reimbursed	Incidence in HH & reimbursed
Control	19%	23%	25%	8%
Treated	16%	16%	18%	7%

In Table 17 we repeat the exercise looking at hospital expenses under the same circumstances. We observe much higher average expenses in target branches when there is a health-related incident in the household than in control branches, and exactly the reverse if there is no medical incidence. Considering the sensitization visits of credit officers in target branches, this suggests that clients in those branches are better prepared to report costly incidences. In both target and control group, pay-outs/reimbursements from the insurance seem to considerably decrease costs incurred.

Table 17: Average hospital expenses (different insurance circumstances), by target/control.

	No medical incidence in HH	Medical incidence in HH	Incidence in HH & not paid	Incidence in HH & paid
Control	172	344	361	238
Treated	70	600	625	439

We conclude – with all due caution – that pay-outs/reimbursements seem to help in reducing child labour incidence and expenses for hospitalizations. Hence, the ex-post effect of the insurance extension through increased pay-outs/reimbursements appears to be positive. The desirable effect of a pay-out on incidence of child labour and the financial burden of medical incidences is a first important step. Given that only a few individuals benefit from a pay-out (between 0.0 per cent and 0.6 per cent each wave) and that many more injuries and hospitalizations are reported (0.2 per cent - 2.8 per cent per wave), the total ex-post effects (through unpaid shocks as well) remain unclear. With the incomparable injury/hospitalization figures we cannot do a plausible comparison of target and control branches after a medical incidence. Similarly, we have a problem with the ex-ante analysis.

6. Conclusion and recommendations

This report presents findings from an evaluation of a microinsurance innovation. We employ a difference-in-difference approach to evaluate the effect of the innovation on outcomes such as child labour incidence, child's schooling, and insurance use as a mitigation and risk management strategy. We conclude that there is clear difference for certain outcomes between target and control groups, in particular, incidence of child labour, insurance coverage and usage. Additionally, insurance pay-outs and reimbursements are related to lower child labour incidence and hospital expenses, though we cannot disaggregate total ex-ante and ex-post effects of the innovation. Therefore it is reasonable to attribute this impact on child labour to the microinsurance innovation.

Based on the overall research process and the conclusions presented above, the Social Finance Programme of the ILO would like to make the following recommendations to NRSP regarding the future of the microinsurance innovation:

(1)   Findings early on in the research indicated that clients of NRSP were unaware of the microinsurance product and additionally, how to use such a product. We would therefore like to recommend that NRSP continue to make available microinsurance to its clients and that in doing so, continue to train loan officers in promoting awareness around the characteristics of the product and its use.

(2)   As client awareness and usage of microinsurance products continues to rise among NRSP clients, we hope that NRSP will carry on negotiations with the primary service provider of the microinsurance to ensure that such a product can be supplied in a financially sustainable manner that is still affordable to NRSP clients. We would also suggest exploring the fluctuations in uptake of insurance throughout the duration of time as clients of NRSP as it relates to client cost, marketing and client officer interactions.

(3)   Based on the conclusions which illustrate that microinsurance can be one form of protection for families against the use of child labour that NRSP continue to track its progress in reducing child labour among clients as part of its social performance agenda.

(4)   Furthermore, NRSP may want to consider introducing child labour sensitization sessions on child labour for their staff in order to help loan officers to identify child labour among the children of the clients they serve. Client officers can then guide clients (parents or guardians) toward suitable support organizations in the area (not necessarily NRSP).

(5)   As the research conducted above is distinct to one region and one city in Pakistan, it would be interesting and informative for organizations such as the ILO and NRSP to know how such an intervention can impact the child labour situation in other parts of the country, as well as in rural areas and in different economic sectors. It would therefore be highly recommended that NRSP continue to study child labour among clients when implementing similar expanded microinsurance packages outside of Hyderabad.

(6)   Additionally, the Social Finance Programme of the ILO would like to recommend that NRSP share their tools, methodologies, and findings from the action research through national and international networks of microfinance institutions in order to encourage similar work in the fight against child labour and the campaign for Decent Work around the world.

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Annex 1: The empirical model

The data at hand allows for the comparison of target and control branches before and after the innovation took place. This is important, because it allows detecting and correcting potential imbalances in the target versus control group prior to the innovation. Even though the balancing tests in the data section suggest that target and control branches are on average reasonably similar, we can still improve the estimation by correcting minor imbalances. Methodologically this is achieved using a difference-in-difference estimator. It requires that outcomes in innovation and control group must follow a common trend. As the innovation is not randomized at the individual level but at the branch level this puts factors affecting outcomes at the branch level at the centre of concern. It is thus especially important that there are no strong branch-specific trends that violate the common time trend assumption. We have little information about factors at the branch level that may affect outcomes such as local changes in economic conditions and other aspects affecting innovation or control branches only. However, we have relatively detailed information on the economic situation of the household and its members. We can use this information to control for unbalanced trends that work through these variables.

We estimate the following econometric model:

$$Y_{ibt} = X_{ibt}\beta + T_b\lambda_0 + \delta_t + T_b\gamma_t + \eta_{bt} + \varepsilon_{ibt} \qquad (1)$$

Y_{ibt} is the outcome of interest and possibly varies over individuals i, branches b and time $t \in \{0,1,2,3,4\}$. X_{ibt} is a vector of covariates and T_b is an indicator whether the individual is located in a treatment branch. So λ_0 seizes baseline differences between innovation and control branches and δ_t measures common time trends, while γ_t captures the time-specific treatment effect (γ_0 is restricted to zero). Besides the classical ε_{ibt} error term which is assumed to be i.i.d. we allow for an unobserved branch-time specific error component η_{bt}. It is assumed to be uncorrelated with the treatment variable (random effect). Given the random assignment of branches to the innovation, this is a realistic assumption, especially as we can even control for pre-treatment differences. Thus, η_{bt} should not be a source of bias, but it will still affect precision of our estimates. The larger the effects within branch-wave clusters the more difficult it will be to find effects.

The regression results shown later always comprise different specifications. We first show treatment effects for each wave without controlling for covariates using heteroskedasticity robust standard errors in specification (1). In specification (2) we account for unobserved random effects at the branch-wave level (η_{bt}). In most cases the precision of estimates decreases considerable, showing that those unobserved effects seem to be quite important. We control for household and individual covariates in specification (3). We control for poverty level at baseline, current monthly income per capita (excluding the potentially endogenous child labour earnings), health shocks, non-health economic shocks, death of family members and household as well as individual demographics. We repeat the last specification separately for boys (3-boys) and girls (3-girls) when we deal with children's outcomes.

As discussed above we include several covariates on the household and the individual level. This helps to reduce unexplained variation and also increased robustness by controlling for 'accidental' selection over the small number of randomization units. Covariates at the household level are:

Baseline score in poverty scorecard, spouse in household, number of kids (0-4), number of kids (5-13), number of kids (14-17), number of adults, mean age of client and spouse, mean education of client and spouse, monthly income per capita (excluding earnings through child labour and weighting children with 0.6), indicators of different shocks in the household (health-related economic shock, non-health economic shock, death).

Covariates at the individual level are (if applicable):

Gender, age

Annex 2: List of occupations classified as hazardous[13]

Auto mechanic	Lathe machine work	Tailoring work
Bangle work	Lathe machine work	Welding
Bangles work	Leath machine work	Welding
Bangles related	Leath machine work	Welding work
Bicycle repair	Machanic	Welding work father
Bike machanic	Machanic shop	Welding at shop
Bike workshop	Machanic work	Work at mechanic shop
Construction work	Machanic worker	Work in factory
Electric work	Machiene work	Bangle work
Electrician	Machine work	Shattering work
Electrition	Mechanic	Shettering work
Electrition work	Mechanic shop	Tailoring
Electronic shop	Mechanic work	
Electronic work	Mechanic work	
Electronics shop	Mil work	
Electronics work	Mill worker	
Electronics shop	Motor bike mechanic	
Factory work	Motor cycle mechanic	
Factory worker	Motor mechanic	
Flour factory	Painter	
Flour mill (small)	Papar factory	
Garments factory	Paper factory	
Glass bangle work	Rikshaw mechanic	
Glass bangle work	Scrap work	
Glass bangles work	Scrap wrok	
Glass work	Shatring work	
Glass bangle work	Shattering work	
Glass bangles Work	Shetring work	
Hardware work	Shettering work	
Hardware work	Stone work	
Hawker	Tailor	
Job in factory	Tailoring	
Job in factory	Tailoring work	
Job in mill		

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[13] Based on the list of Identified Hazardous Occupations in Pakistan for Combating Abusive Child Labour II (The Gazette of Pakistan, Extra, December 27, 2005).

Annex 3: Additional tables

Average child labour and schooling outcomes as shown in Figure 4 and Figure 6.

	Wave 0	Wave 1	Wave 2	Wave 3	Wave 4
Incidence of child labour					
Control branches	0.20	0.22	0.24	0.17	0.15
Treatment branches	0.19	0.18 [a]	0.15	0.16	0.11
Hours worked					
Control branches	11.4	12.8	12.3	9.2	9.5
Treatment branches	13.6	12.5[a]	11.1	10.8	9.4
Hazardous occupations					
Control branches	0.09	0.14	0.12	0.09	0.09
Treatment branches	0.09	0.07	0.05	0.05	0.05
Child labour earnings					
Control branches	290	468	473	325	399
Treatment branches	342	293 [a]	336	368	270
School attendance					
Control branches	0.68	0.68	0.67	0.69	0.68
Treatment branches	0.70	0.70	0.72	0.72	0.73

[a] excluding two branches with inconsistent data (Liaqat Colony, Pathan Colony)

Usage of the insurance product (% of individuals with an incidence) as shown in Figure 8.

	Wave 1	Wave 2	Wave 3	Wave 4
Injured or hospitalized				
Control branches	1.1%	1.1%	1.0%	0.9%
Treatment branches	2.8%	2.3%	2.2%	0.2%
Applied for insurance				
Control branches	0.2%	0.5%	0.1%	0.0%
Treatment branches	0.5%	0.8%	0.4%	0.1%
Insurance paid				
Control branches	0.0%	0.4%	0.1%	0.0%
Treatment branches	0.1%	0.6%	0.2%	0.1%

Difference-in-difference results for different household level variables

|	(1)	(2)	(3)
Standard Errors	robust	RE	RE
Controls	NO	NO	YES
PPI Score			
Treatment Effect FS I	-0.99	-1.30	-2.06
Treatment Effect FS II			
Treatment Effect FS III			
Treatment Effect FS IV	0.18	0.52	0.46
N	6,108	6,108	5,754
Total monthly income per capita^			
Treatment Effect FS I	160*	269	108
Treatment Effect FS II	-144*	-105	-144
Treatment Effect FS III	205**	261	242
Treatment Effect FS IV	-110	-101	-123
N	9,677	9,677	9,677
Total monthly expenditure			
Treatment Effect FS I	472	813	831
Treatment Effect FS II	-879***	-503	-57.6
Treatment Effect FS III	46.8	545	73.9
Treatment Effect FS IV	-1,819***	-1,629	-1,175
N	10,103	10,103	9,677
Monthly hospital expenditure			
Treatment Effect FS I	61.5*	67.3	61.0
Treatment Effect FS II	-99.1***	-86.0	-98.0
Treatment Effect FS III	15.3	74.7	63.8
Treatment Effect FS IV	-57.1**	-18.5	-25.7
N	10,091	10,091	9,665

*** $p<0.01$, ** $p<0.05$, * $p<0.1$, standard errors either heteroskedasticity-robust (robust) or random effects at the branch-wave level (RE),
^ income excluding child labour earnings and adjusted for minor HH members (factor 0.6).

Annex 4: Additional statistics on client satisfaction

Questions on client satisfaction are coded as follows:

1 – strongly agree   2 – agree   3 – slightly agree   4 –slightly disagree

5 – disagree   6 – strongly disagree
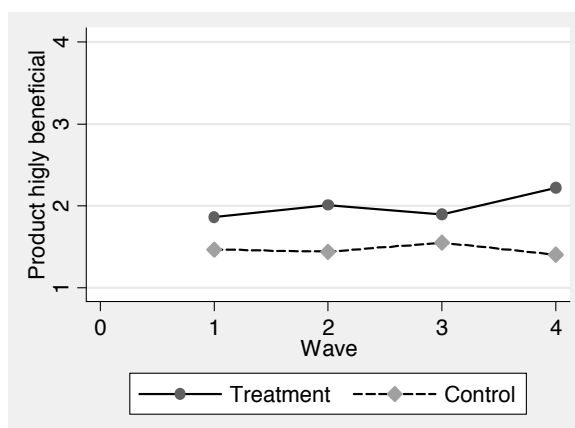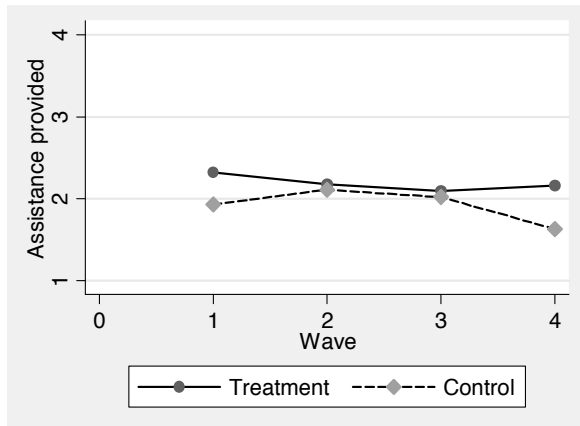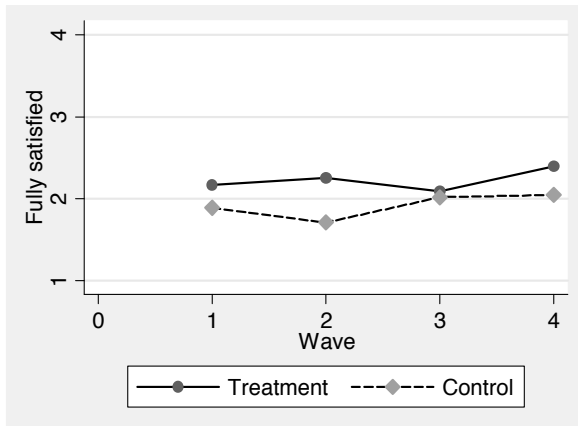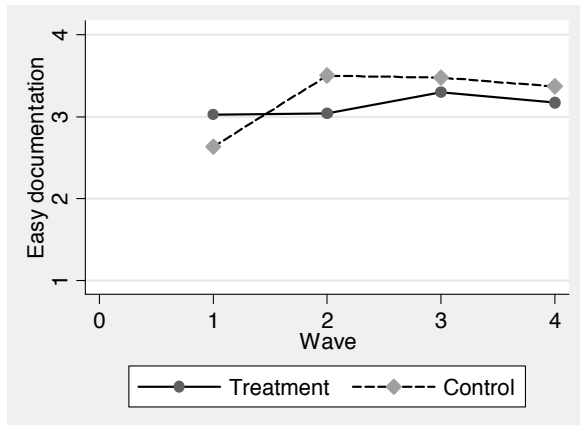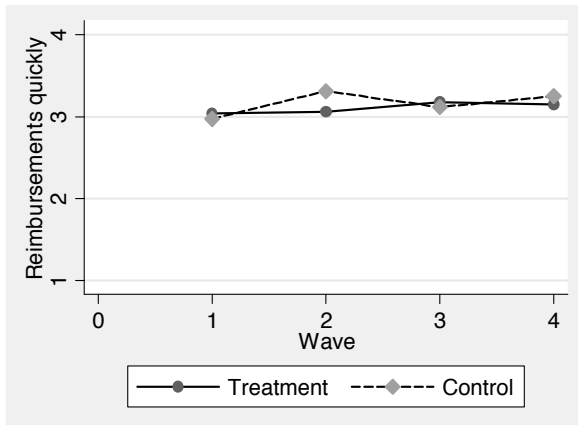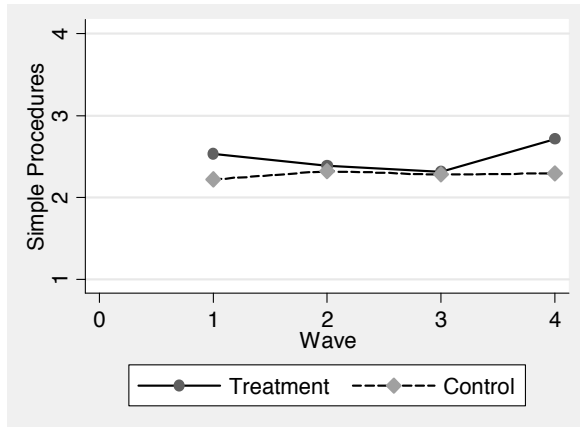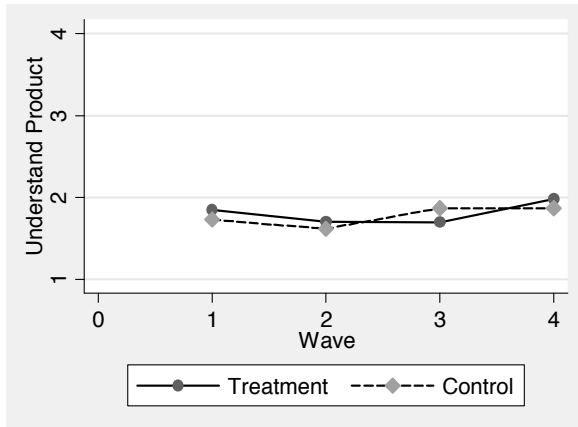
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